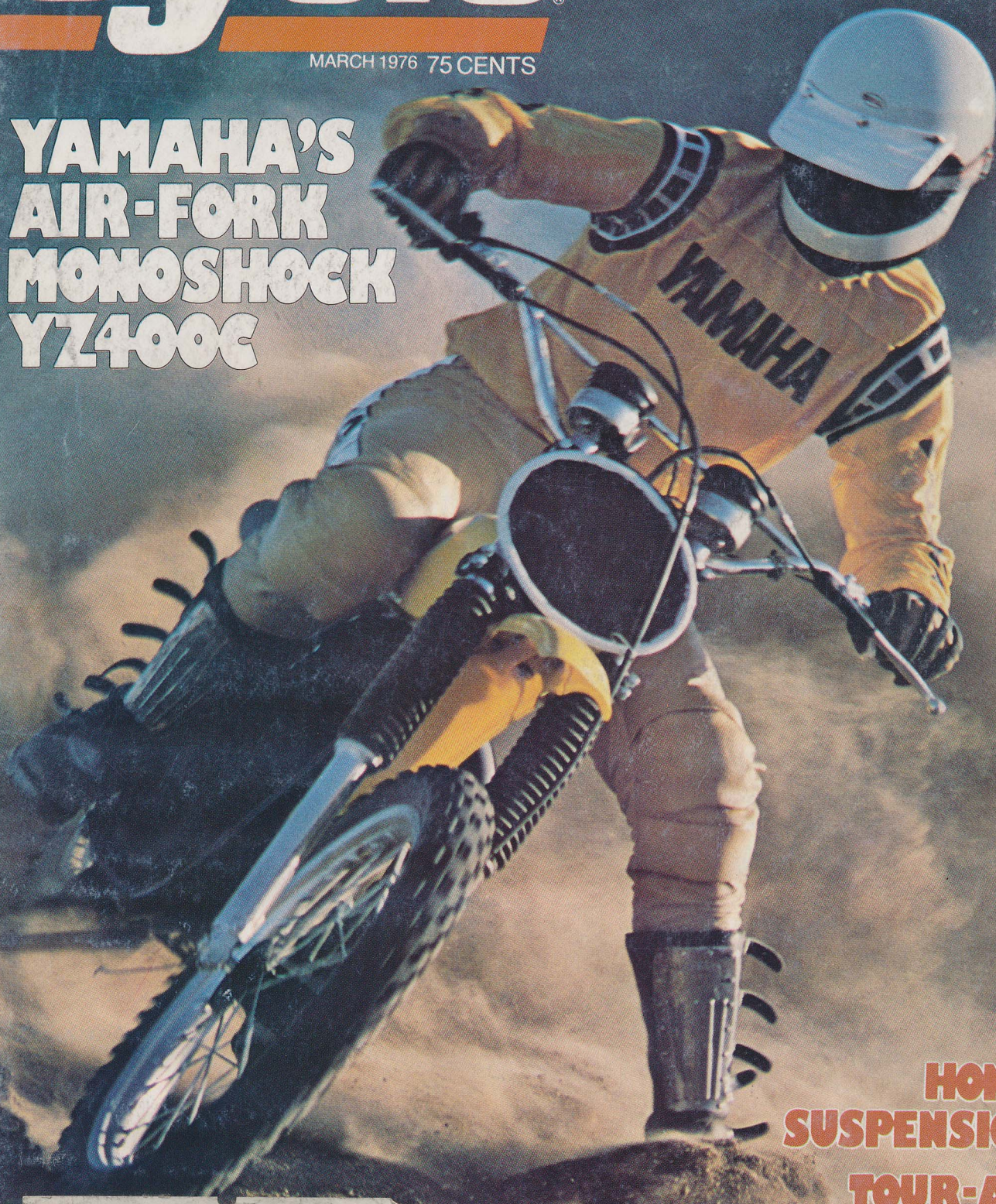


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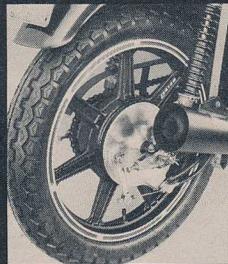
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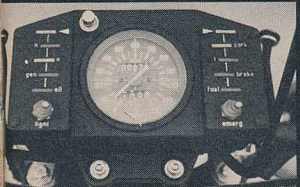
March 1976 Volume XXVII No. 3



p.28



p.50



p.36



p.75

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This Month's Cover: Those lumps on top of the fork legs don't look like much, but they represent technology that may revolutionize motorcycle front suspension. Variable spring rates out of an air hose, after all, can't be all bad. Photography by Dale ("the Poor Man's Steichen") Boller.

Road Tests

- 28 Yamaha YZ400C
Industry's first pneumatic fork.
- 36 Moto Guzzi V-1000 1-Convert
Meet the Turbo-Glido-Slusho-Hydro-Matic.
- 75 Laverda 1000 Triple
Bucks-up price, buckboard seat, bucking bronco ride.

Features

- 44 Trendy Terminology
To make you a conversational giant. By Duane Bibby.
- 110 The Cafe Enduro
Just the thing for asphalt berms. By Dale Boller.

Technical

- 48 How Things Work: The Battery
Care and feeding of the humble plastic cube. By Gordon Jennings.
- 50 Product Evaluation: Lester Cast Wheels
Lighter? Some. Stiffer? A lot. By Jess Thomas.
- 53 Honda CB550 Suspension Tune
Or, how they do it in California. By Phil Schilling.
- 84 Product Evaluation: Marzocchi ZTi Fork
Grable aside, the best legs in the country. By Dave Holeman.

The Shop

- 89 Changing Tires
If you care about how your wheels look. By Jess Thomas.

Competition

- 103 Daytona Preview
Bet against Roberts—if you dare. By Kevin Cameron.

Departments

- 4 Editorial/Throw the Rascals In!/Cook Neilson
- 6 Letters/From the Top
- 12 Pipeline/Memories Are 7Rs/Jim Greening
- 20 Newslines/Some Worthwhile Stuff
- 24 Tips/Carb Sync
- 109 Cycle Test Index
- 122 Classified Ads/Goods And Services New And Used
- 125 Readers Service/How To Find What You Saw And Liked

● Cast alloy wheels first found common usage on the fighter planes of late WWII. By 1950 the ex-war mechanics had transferred their technology to racing, and alloy wheels, both multi-piece disc and one-piece cast versions, began to show up on Indianapolis cars. During the mid-Fifties, the Halibrand Company had developed the cast wheel so thoroughly that there hasn't been a wire wheel seen at Indy since. At the same time Cooper of England was producing small racing cars for the Formula III class (powered by 500cc bike engines) that had cast alloy wheels with integral brake drums.

Cycle did a story on cast wheels for bikes when they first became generally available early in 1971. At the time only Tabloc, with their still-popular "Snowflake" magnesium alloy wheel, was in real production. Indeed, the Snowflake was the only wheel mentioned in the article that ever really got off the ground.

Since then, the Morris firm in Santa Ana, California has developed and proven a truly excellent line of ultra-lightweight cast magnesium alloy wheels for professional roadracing, and a corresponding

group of less exorbitantly-priced, but similar-appearing, cast aluminum wheels for the café racer and special-builder. Several other makers have also offered cast wheel kits for the bigger Hondas and Kawasakis. But all the kits to date have shared one common drawback: money. They all had a front wheel that could be reasonably adapted. Trouble was, the rear wheel had to have a disc brake added. And the price for a matched pair of wheels, with all the necessary bits and pieces there ready to assemble, was over \$500—just in parts. If the proud owner wasn't handy with tools, there was the additional price of assembly.

Our first impression of Lester Industries' wheel kit package was positive enough for us to get a set for detailed investigation. Kerker Racing uses a Kawasaki Z-1 as a testbed for their products, and for their own Production-class racing effort. They wanted to try a set—even though the wheels aren't marketed as racing wheels. We took one look at Kerker's Lester wheels and immediately arranged to get a set to try on our "Gentleman's Express" Honda 500.

Apart from being very attractive visually, as are some of the other cast wheels, the most appealing feature was an integral brake drum in the rear wheel that would accept the standard Honda components. This allows Lester to offer the complete package of both wheels for less than \$300 suggested retail—only slightly more than it would cost to replace a pair of damaged standard wheels.

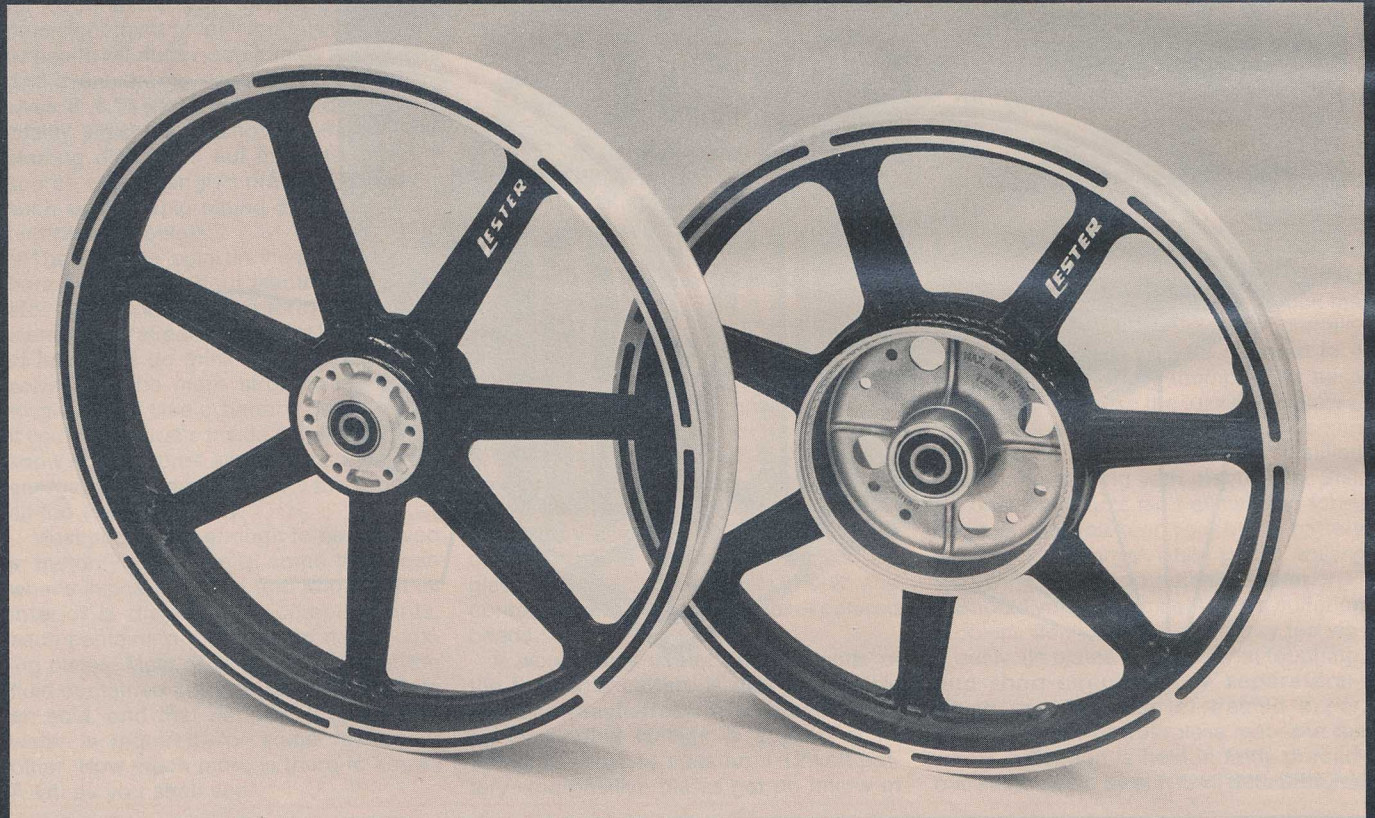
Our wheels came shipped in a pair of special cardboard cartons which had reinforcing and cushioning pads built into them to protect the rims. The Lester Wheels are very nicely manufactured pieces of equipment. All the machining is very clean and quite accurate. After a quick visual inspection, spare axles were inserted in the already-assembled wheel bearings and clamped in a bench vice to measure the runout at the critical surfaces where the tires mount and the brakes attach. Maximum dial gauge movements were: .021-inch radial on the rear wheel, .006-inch lateral on the front, .004-inch on the front disc mounting surface, and .003-inch on the inside of the rear brake hub. There wasn't a single

LESTER ALLOY WHEELS

A new concept in custom wheels: very high strength and rigidity combined with an integral rear wheel brake drum that makes the whole kit affordable.

By Jess Thomas

PHOTOGRAPHY: DALE BOLLER, PAUL R. HALESWORTH



casting fault visible. All runout figures are negligible.

Closer inspection of the wheel hubs showed that the wheels are not one-piece castings. The rim, spokes, and part of the center are a single casting, but the actual hub is machined from a separate casting and then welded in place. Presumably this allows Lester to use the extremely intricate, hence expensive, outer wheel for several different models, having only to select and weld the appropriate hub.

All the wheel castings are hydraulic permanent-mold pieces of A-356 aluminum alloy artificially aged to a T-6 treatment specification after the hubs are welded in place. Each wheel undergoes two different kinds of hidden-flaw inspection during its flow through the Lester factory. The raw castings are first X-rayed to ensure that there are no air pockets hidden in them. Then, after the wheel is finished, it undergoes a penetrant-type crack test called Xyglu, wherein the wheel is immersed in a bath of penetrating liquid, then inspected under an ultra-violet light.

After a wheel passes the "casting fidelity" tests, it is prepared for painting by

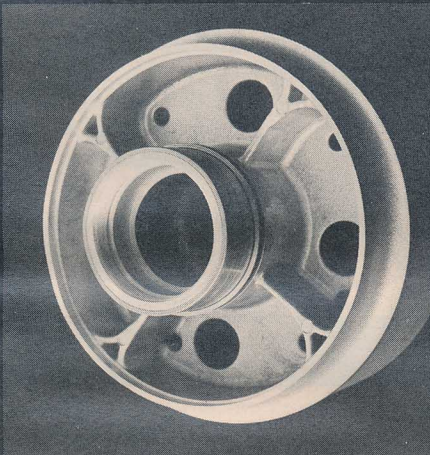
being shot-blasted to remove tiny mold flashing flakes and then acid-etched to give the paint the right chemical bond with the aluminum. The paint is a very special two-part polyurethane enamel, made by the Sherwin-Williams Company, called "Polane." It is an extremely durable and mechanically tough finish that is also quite resistant to the strong solvents used to clean bikes.

Several different types of laboratory tests were developed by Lester engineers to check the static and dynamic strengths of both prototype and production wheels. Since there were no industry or government standards to go by, the obvious path was to find out how strong existing conventional and cast wheels were, and proceed from there. In the static load test rig, wheels are supported by axle stands while a hydraulic press exerts a vertical force on an inflated tire until the wheel is permanently deformed. The CB500 rear wheel was shown in one of Lester's pictures supporting over 8000 pounds without permanent deformation. A drop test rig was fashioned by welding long extensions to a standard motorcycle

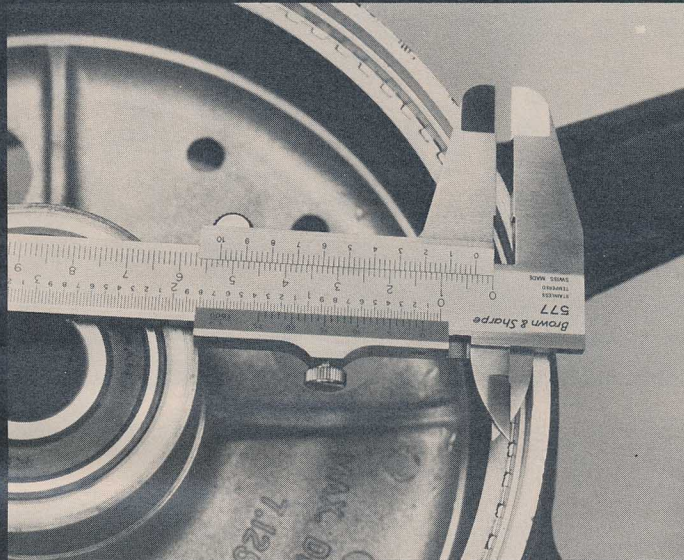
frame and then letting the whole device pivot from the other end of the extensions. A thousand pounds of lead weights were then shackled to the frame's engine-gearbox area. With different wheels mounted to the standard swinging arm and shock absorbers, the frame was released to crash to the floor from different heights. At 20 inches, a standard wire spoke wheel would buckle almost 1/2-inch. The equivalent Lester wheel was unaffected, but it transmitted so much force to the test rig that the axle and swinging arm bent drastically.

In a dynamic test apparatus, production wheels ran up to 100,000 miles at over 150 mph. There were lots of tire changes, but no wheel failures. Loads on the wheels during this roll test were approximately fifty percent more than the bike would exert with its maximum gross vehicle weight.

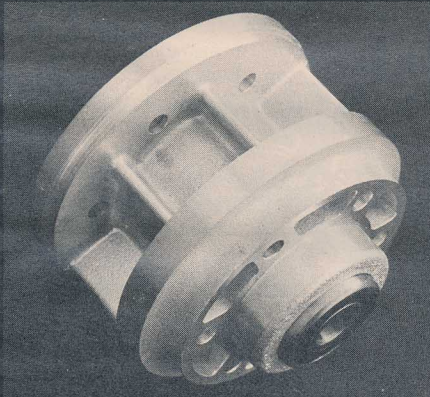
Another very significant test was to pump air into the tire until the rim split from the pressure. No figures are quoted from this test, but there is a warning sticker on each wheel that cautions against inflating any tire mounted on it



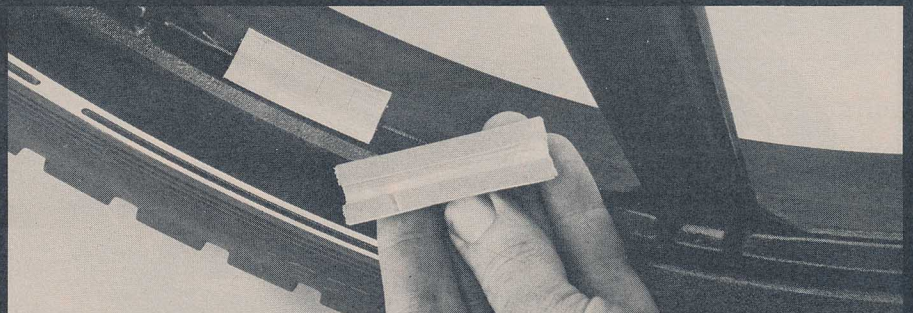
A separate brake drum casting is made to accept the standard Honda brake and transmission shock absorber parts.



The brake drum was eccentric by .050 inch in the hub casting of our rear wheel, but the drum was machined true and didn't distort after our riding. Note the cog wheel union between the hub and drum.



The front wheel hub takes all the standard Honda parts without modification. Wheel bearings and retainers come fitted.



Adhesive-backed balancing weights are available through Lester which have grooves in the center for positive location on the rim. The weights come in sawable strips and are marked at each half-inch.

above 60 psi. The wheels are designed to be air-tight when used with a tubeless tire. Although there are no tubeless tires currently available for road bikes, Lester seems to believe that there are some on the way from several manufacturers.

As the wheels are now, the front is one pound lighter than the standard Honda, and 1.3 pounds heavier than the standard Honda fitted with an Akront 1.85 inch (WM2) aluminum alloy rim. The Lester rear wheel is 0.5 pounds lighter than the standard Honda, and 1.5 pounds heavier than the standard wheel fitted with an Akront 2.15 inch (WM3) aluminum alloy rim. These figures were obtained by weighing the bare wheels with only the bearings and permanent fittings on them.

The Honda 500-550 wheels are very light compared to other standard wheels. On Kerker Racing's Kawasaki Z-1, slightly more than 7 pounds were pared from the total front and rear wheel weights by replacing the stock wheels with the Lesters.

Reducing wheel weight provides a double benefit. In addition to the obvious advantage in handling by reducing un-

sprung weight (the portion of the bike's mass not controlled by the suspension system), less rotating weight appreciably improves braking performance. Rotating mass in the wheels embodies an additional form of energy called rotational kinetic energy and it adds about 15 percent to the work done by the brake system of a bike.

Installing the wheels is relatively easy in that no extra parts have to be bought or fabricated. Anyone good-enough mechanically to fix a flat can install the wheels on his bike in a casual afternoon's work. (Please see the accompanying article on changing tires if you are in doubt.)

Most bikes are front-heavy when supported on their centerstands. A sturdy wooden box, or other suitable prop about 12 inches high, is needed to support the bike's fork after removing the front wheel.

With the Honda's front wheel removed, the standard axle, speedometer drive components and disc assembly were transferred directly to the Lester hub. We had to make a slight modification to the hub on our bike; it had been fitted with

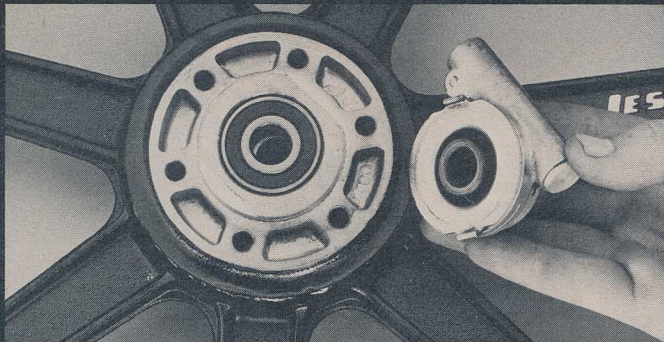
the speedometer drive unit from the Yoshimura dual-disc kit so that the wheel could be turned around to mount the brake caliper to the rear of the right fork leg. Standard CB500 and 550 forks are a direct switch, with the brake disc going on the longer spigot of the Lester hub. Be sure to follow the sequence in the Honda shop manual if you are not familiar with the standard wheels.

Decide whether to transfer the existing tires and tubes or fit new ones. The Gentleman's Express was fitted with Dunlop K-81s, and their angular sectional shape is very harmonious with the CB500 and CB550 frames and steering characteristics of the bikes.

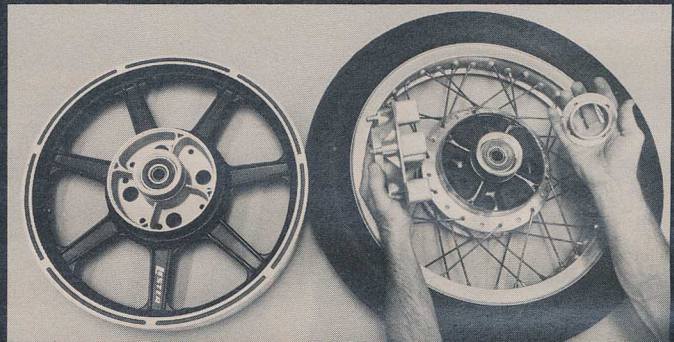
If you don't have access to a wheel balancing stand, separate the brake pads so that the disc won't rub, and leave the axle sleeve nut slightly loose when you temporarily install the wheel in the fork for balancing. The Lester weights weigh 1 ounce for each 1.25 inches of length. The weights have a crotch molded in their centers to fit directly and positively in the

(Continued on page 95)

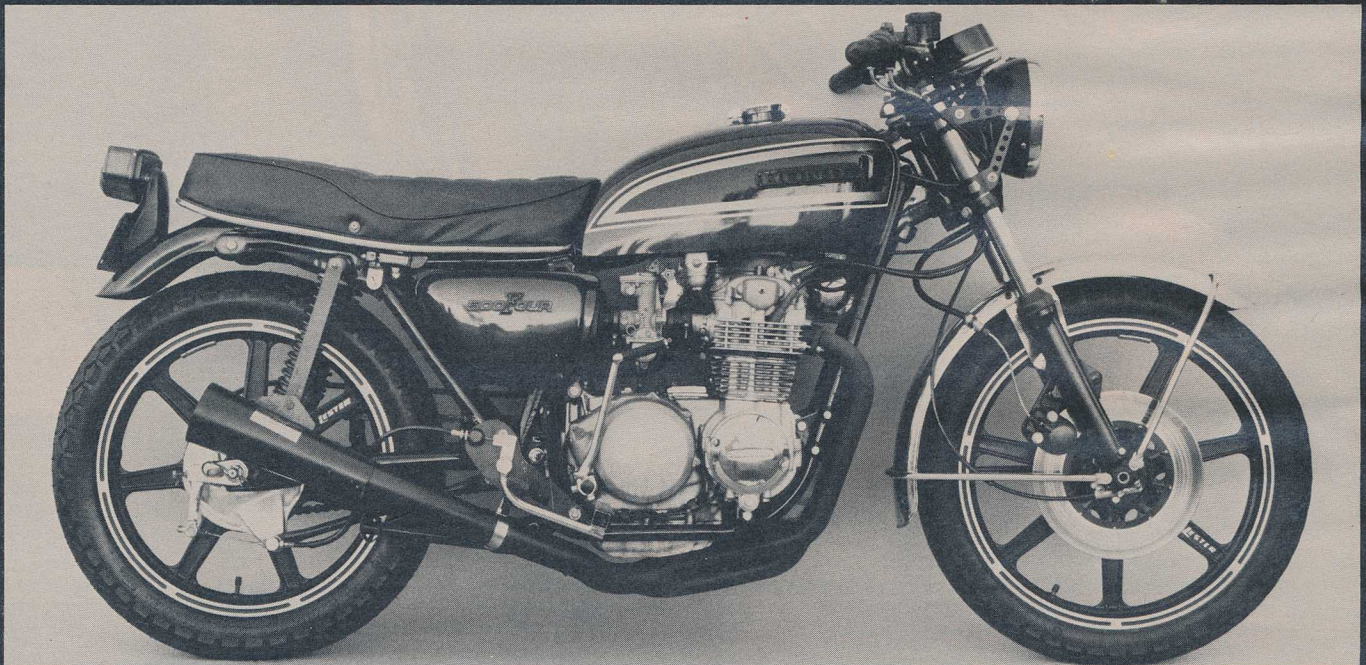
LESTER ALLOY WHEELS



The Gentleman's Express used a Yoshimura speedometer drive adapter which required slots to be filed. Stock parts fit without change.



With the ring nut removed, the stock transmission shock absorber rubbers and sprocket adapter are transferred to the Lester hub.



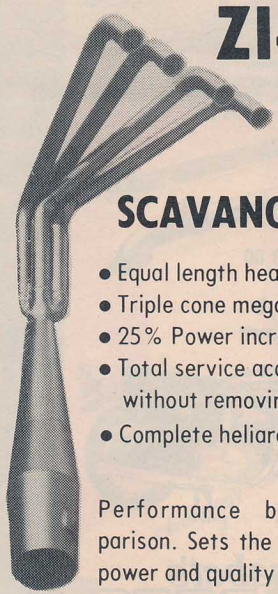
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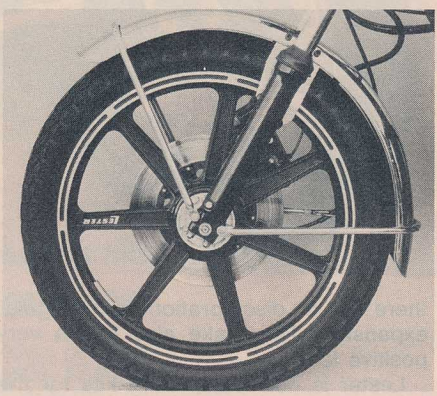
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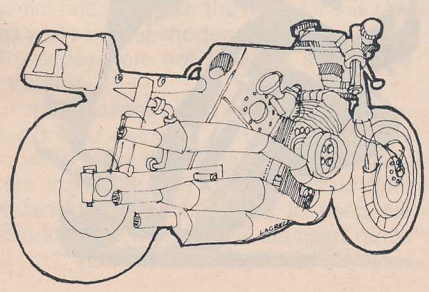
center of the underside of the rim. Be sure the axle nut is tight before the cup nuts are tightened, and that the disc bolt nuts are torqued to 15 ft./lbs.

With the rear wheel out, place the standard axle, adjusters, and brake parts in the sequence removed to facilitate reassembly. After the sprocket nuts, cover plate and o-ring are removed, the CB500 and CB550 present you with a ring nut that holds the rubber drive cushion assembly. The easiest way to remove the ring nut is to place two 8mm or 5/16-inch diameter studs (the ones for Honda 350 twins and single exhaust flanges are very tough) in the jaws of a large vise, 2.5 inches apart, and sticking up far enough to fit all the way into the ring nut holes without letting the sprocket studs hit the vise. With the vise clamped tightly on the studs, the wheel can be rotated from its outside diameter to remove the LEFT-HAND-THREAD ring nut. In other words,



the wheel must be rotated clockwise on the vise to remove the nut. Don't hammer on the nut with a drift—it won't work. After the ring nut is removed, the shock absorber plate can be pulled off with your fingers. Pull out the shock absorber rubbers and carefully remove the rubber o-ring from the groove in the steel bearing support sleeve. Clean and inspect all the parts. If any of the rubber parts are distressed, replace them with new ones. A small amount of grease on the shock rubbers' locating nipples will let them slide easily into place. Put a thin coat of Loctite on the ring nut threads. Grease the o-ring groove and steel sleeve before putting the sprocket hub in the Lester wheel. Pull quite hard on the wheel when tightening the ring nut. No other special precautions are needed during reinstallation of the brake plate and axle components; they mate perfectly to the new wheel.

(Continued on page 96)



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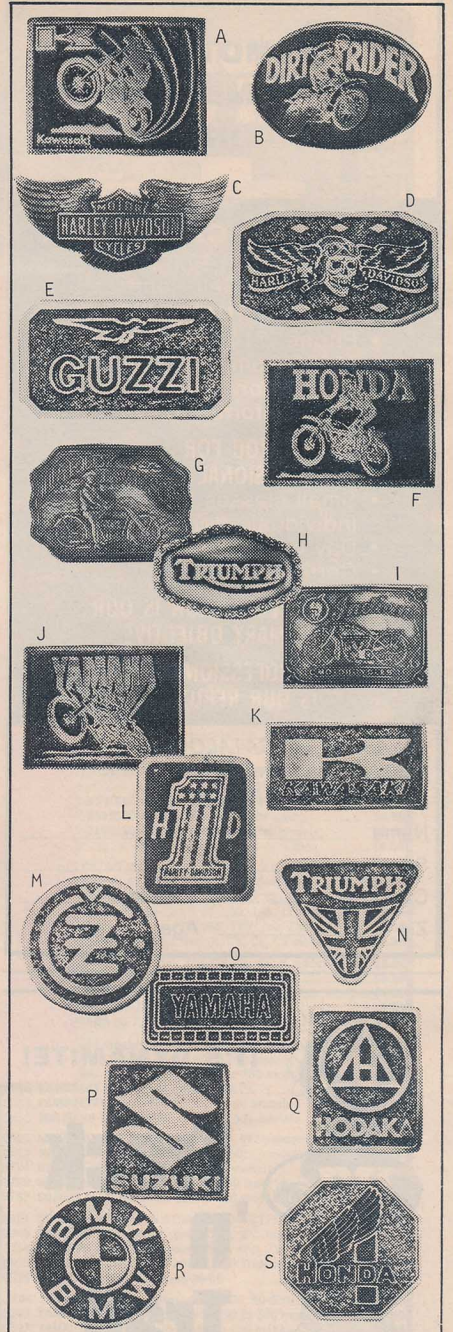
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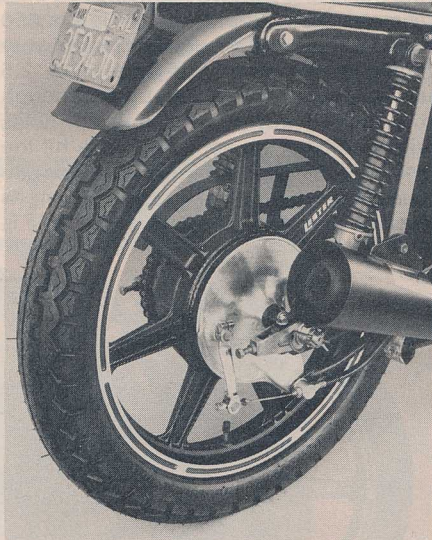
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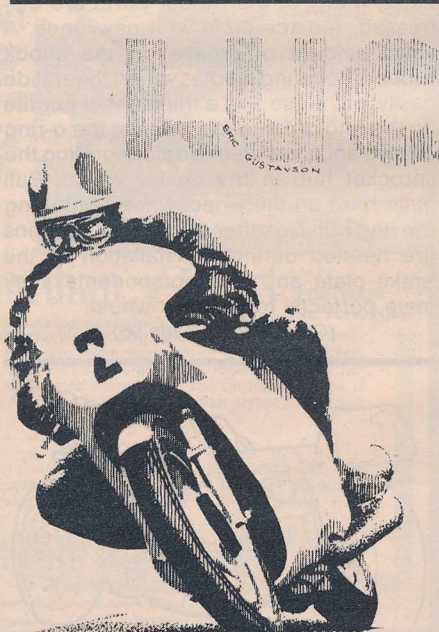
We weren't too sure what to expect functionally from the wheels, since they weren't significantly lighter than the stockers. But it only took one fast ride on the bike to find out what extreme wheel rigidity does for the feel of the machine. The Lesters make the bike feel as if it were on a guiding rail. Steering has distinctly more positive feel and the bike stopped wallowing in a particularly fast turn near our shop.

After a week's hard use, the rear wheel was removed for inspection. The brake drum showed an even wear pattern and



there was no discoloration from irregular expansion. The brake also had a very positive feel.

Lester is now completing kits for the bigger-displacement bikes made by Honda, Kawasaki, Suzuki, Yamaha, the Harley-Davidson FL and XL series, and the entire BMW /6 series. All kits except the Honda GL1000 and the BMWs will be under \$300 for both wheels. The shaft drive kits will be about \$35 more. Alternative 16-inch-diameter, 3-inch-wide rear wheels will be available.



Alphabet's

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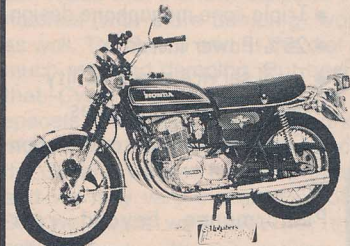


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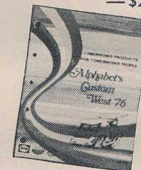
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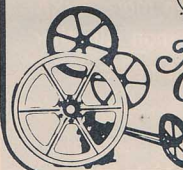
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