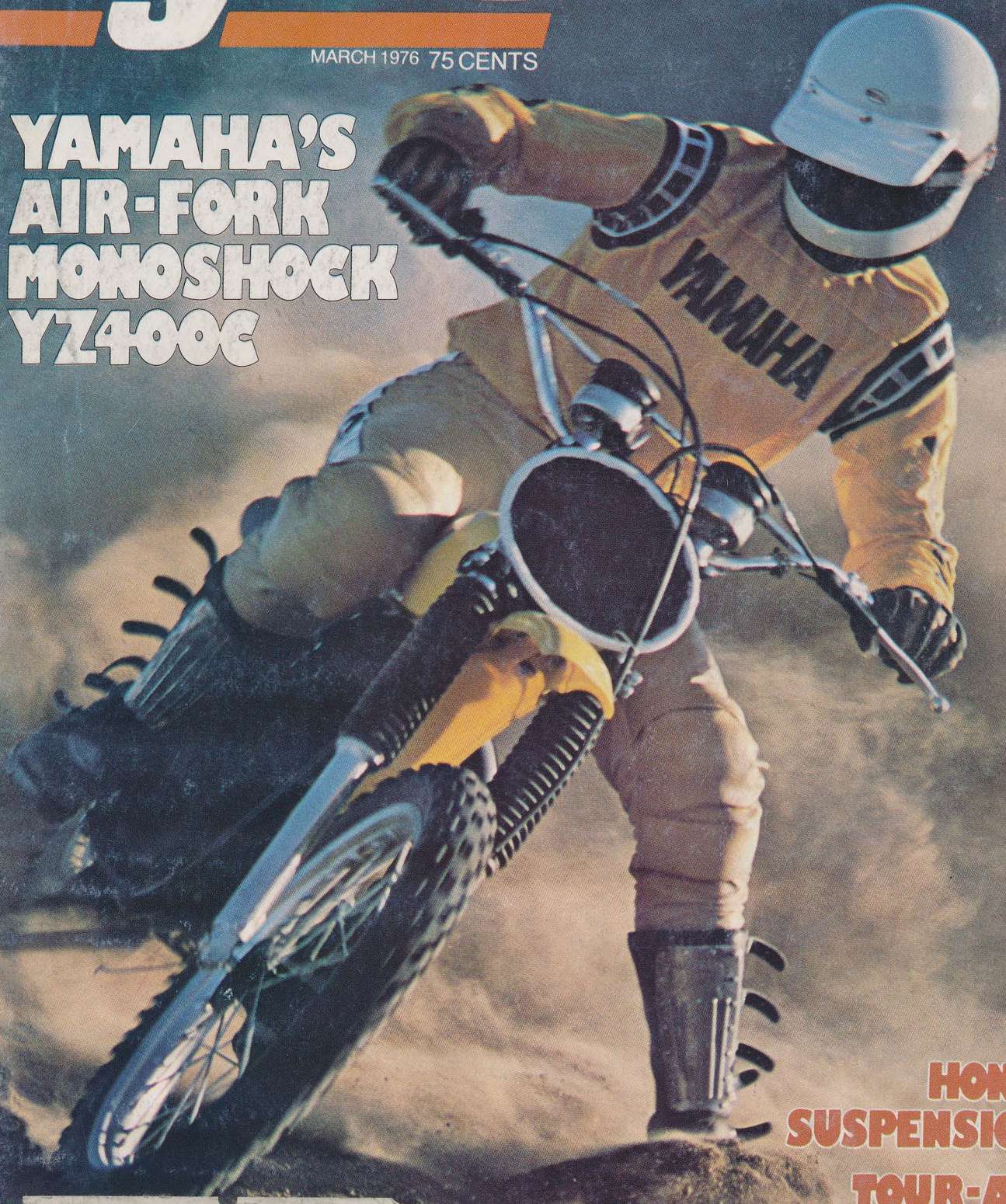


Cycle

MARCH 1976 75 CENTS

YAMAHA'S AIR-FORK MONOSHOCK YZ400C



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TOUR-A-MATIC
MOTO GUZZI TWIN
HATE AND LOVE:
LAVERDA 1000cc TRIPLE**

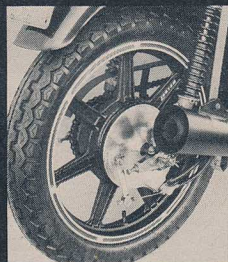
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March 1976 Volume XXVII No. 3



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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.

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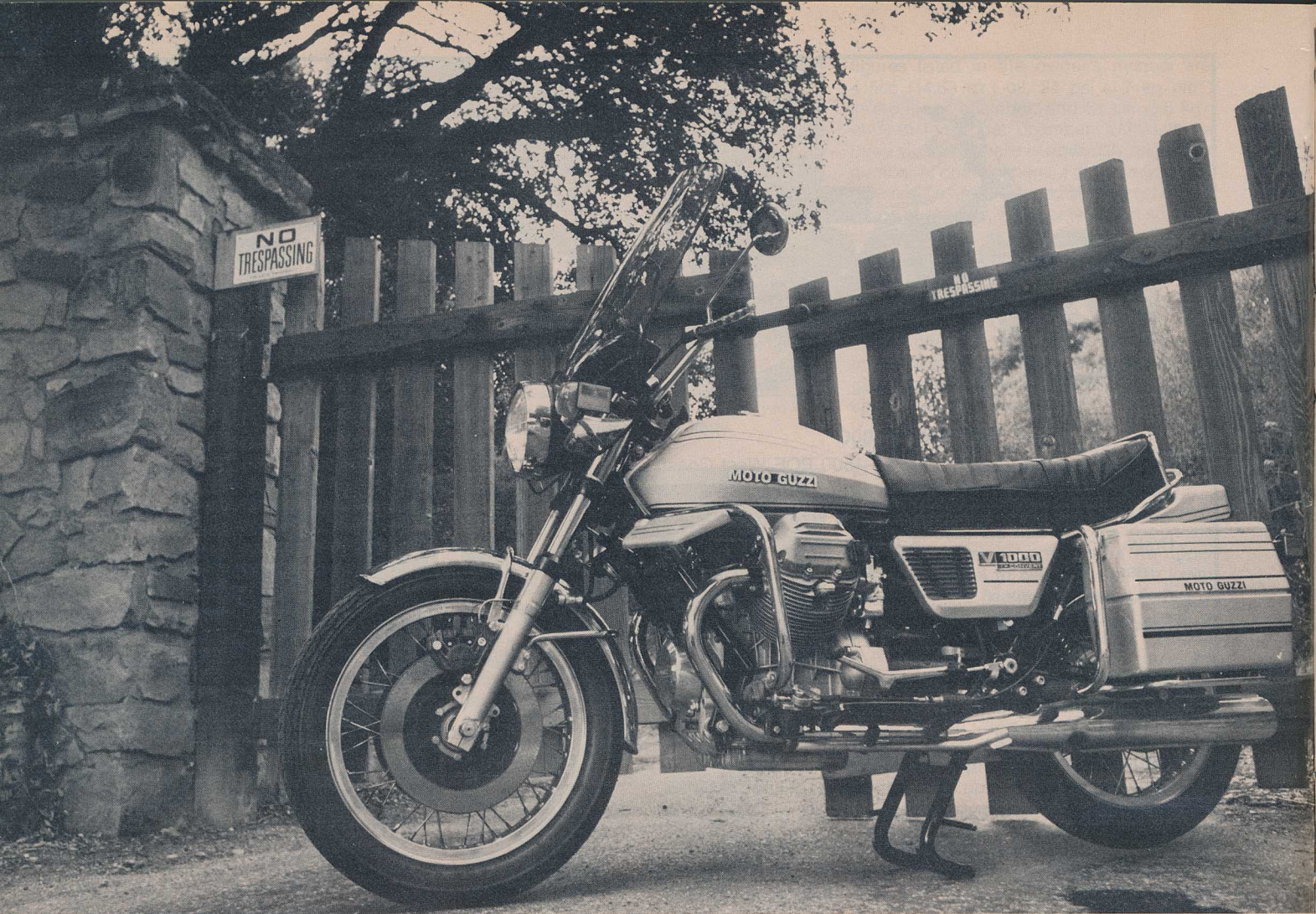
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Cycle Test

MOTO GUZZI V1000 1-CONVERT

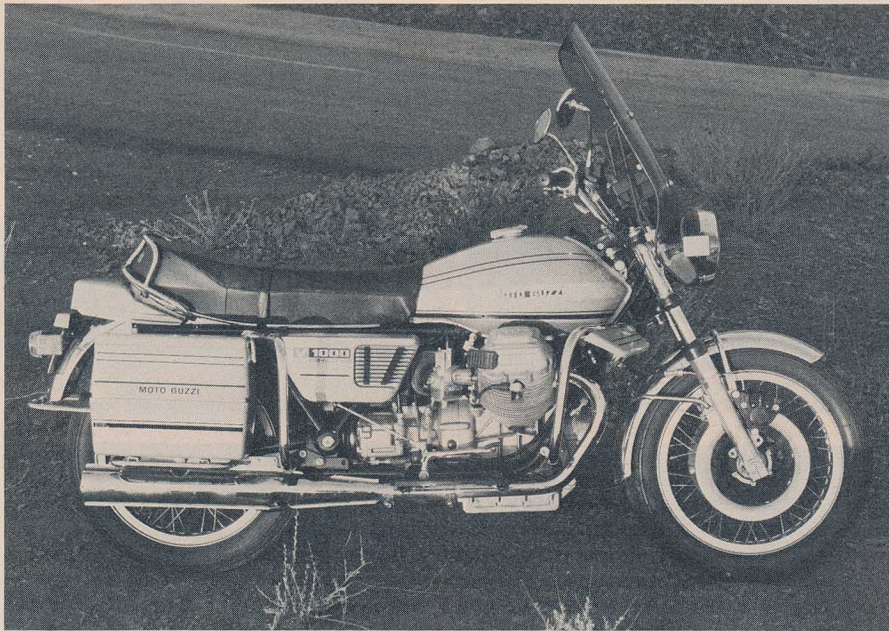
With the 1976 Convert, Moto Guzzi has booted aside sporting pretensions and delivered unto the market a pure, committed touring motorcycle, just like the Eldo of old except . . . not quite.

● The Moto Guzzi V-1000 1 Convert comes, as they say, loaded. It is the only touring motorcycle we know of that is factory-equipped with a windscreen, floorboards and saddlebags; with a braking device that locks onto the rear wheel disc when the bike is propped against its side-stand; with a brake system that causes the rear caliper and one of the two front calipers to be actuated when the foot brake lever is depressed; with a light on the instrument panel that winks on when the clutch lever is pulled in; with a switch that causes the engine to be turned off when the side stand is deployed; with a petcock opened and closed in concert with the ignition key; with spill-bar-mounted air foils that provide a certain amount of down-force at high speeds; with a headlight that flashes when the horn button is depressed (or horns that blow when the headlight flasher button is depressed); with a transmission fluid cooler; with more ground clearance than has been provided on any other pure touring bike, and moderate- to high-speed stability to match; and with the motorcycle industry's first (Rokon aside) automatic transmission.

With the Convert, Moto Guzzi has come full-circle. Our first sampling of the in-line-engined Italian V-twin came in 1967, when it was a 700, had drum brakes front and rear and a four-speed transmission, and one of our sport's most comfortable seats. Two years later its price had risen from \$1339 to \$1439, its displacement from 704cc to

757cc, and its weight from 540 lbs. to 586 lbs. It had a new name: Ambassador. By 1972 its name had changed again—to Eldorado—and its displacement and price had been bumped to 850cc and \$1985. It also, for the first time since it came to the United States, had a sibling—the astonishing 750cc Moto Guzzi Sport—which would influence the orientation of the marque right up to 1975. That influence was given maximum expression last year, when elements of the Eldorado and Sport were blended to produce the 850T. It used an updated Eldo engine in a lightly-modified Sport chassis and has its own handsome body-work. It cost \$2700 and was flawed to an extent by the factory's attempt to universalize one product. It had a touring soul in a semi-sporting body, and proved to be not as good as the Eldorado for touring or the Sport for raising hell.

The Convert reflects a new commitment on Guzzi's part to doing well what it does best—build touring motorcycles. Although what they learned from developing the Sport rings clear whenever the Automatic is pitched into a tasty-looking corner, the bike has been designed and appointed to move its owner over great distances in exceptional comfort, with minimal intrusion, and with a great number of his special requirements attended to. Nearly all touring riders equip their mounts with some kind of a windscreen. Although the GuzziMatic's doesn't offer the kind of protection that a full-scale



Wixom or Vetter handlebar fairing provides, it is optically near-perfect, adjustable as to height, smoke-tinted and very light.

Just behind the screen is the instrument console, finished in matte-black and punctuated with an array of idiot-lights unmatched for number. On the left side, lights transmit information about: the left turn signal, high beam, neutral (achieved when the clutch lever is pulled in), generator, oil pressure; on the right, the right turn signal, the status of the sidestand (with the key switched on and the stand out, the light flashes), headlight, brake fluid level, and fuel

tank level. Below each column of lights is a switch; the left one is for auxiliary lights and the one on the right turns on the bike's four-way emergency flashers. The odometer, of course, is resettable.

Problem is, the lights are so small and so dim that the rider can't read them in daylight, and since their function-legends are not illuminated they don't do that much good at night either until you have memorized their locations and color-codes.

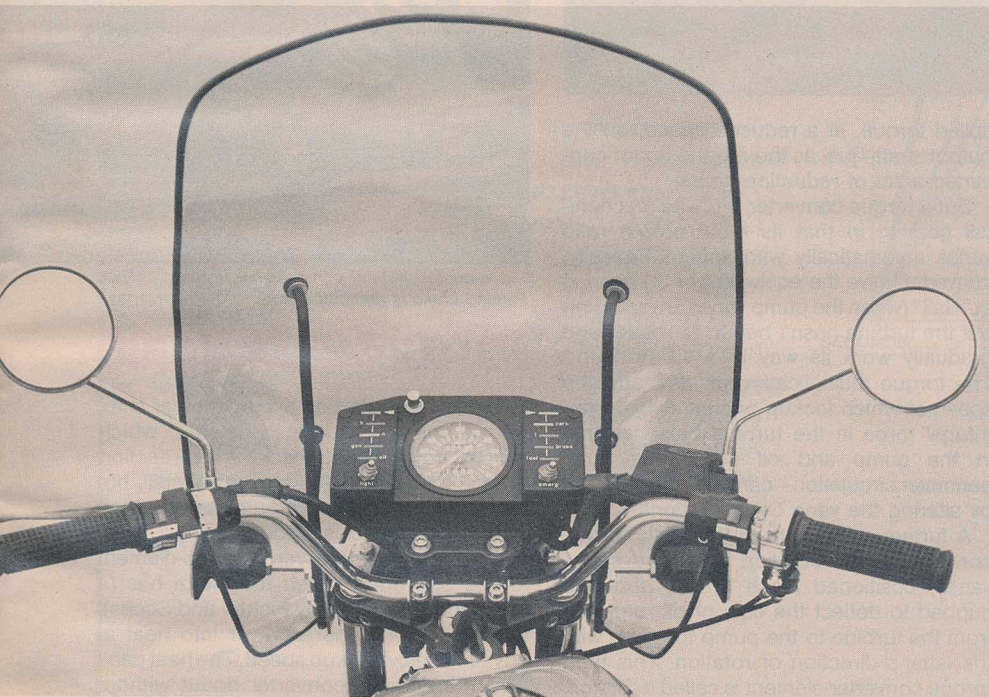
Spill-bars front and rear and plastic saddlebags are also part of the basic package, and while a few touring riders we talked

to had reservations about the panniers' carrying capacity and the absence of any quick-detach provision, they are nicely integrated into the design of the V-1000. The bike in fact is exceptionally handsome and well-finished, with tank, sidecovers, spoilers, panniers and tail section finished in a genuinely lovely silver-gray with black accent-stripes of different widths.

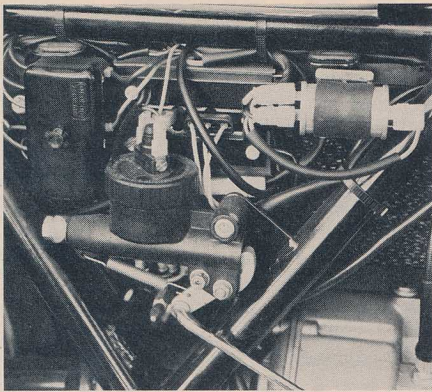
Much can be said for a factory-tourified touter: things fit together properly, there is a visual harmony between elements which would otherwise be accessory-company-manufactured and owner-added, and the bike has a functional consistency and balance that only factories can impart.

The GuzziMatic is propelled by a refined and enlarged version of the engine used in the mid-Sixties on the V-7. It was designed originally to power a small car used by Europe-based NATO forces, and was subsequently installed in Italian military motorcycles. Its V-7 dimensions were 80mm bore and 70mm stroke; the Ambassador and Sport versions measured 83mm by 70mm; in Eldorado and T-850 trim its bore stayed at 83mm while stroke was increased to 78mm; and as a 950, it now measures 88mm by 78mm. Internal design is fundamentally as it has always been: one-piece crankshaft supported in huge mains, plain-bearing connecting rods riding side-by-side on a shared crankpin, a chain-driven cam shaft located above the crank and working with cam followers, pushrods and rocker arms to control valve timing. Shallow-hemi cylinder heads are aluminum, naturally, as are (chrome bore) cylinders, and both attach to as nice a set of (externally-ribbed) crankcases as we've seen. Rocker covers come loose quickly for valve adjustment, the ignition distributor can be fiddled with easily once the tank is removed, and if it ever has to be done the rod bearings can be freshened up by simply removing the aluminum pan and having at them. The engine's 90 degree configuration provides near-perfect primary balance; its in-line installation keeps cylinders and heads decently cooled and makes traditionally owner-maintained assemblies easy to work on.

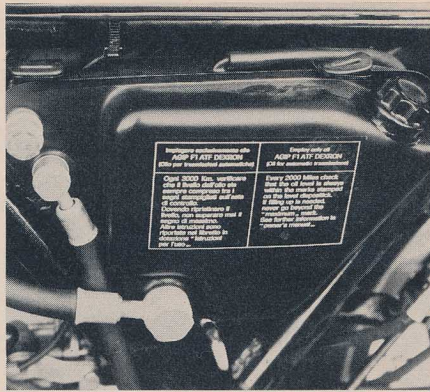
The Moto Guzzi Convert departs from convention in two of its systems: braking and power transmission. Conventional motorcycles route engine torque from the crankshaft to the clutch to the transmission (four- or five-speed) to the rear wheel. The Guzzi sends it from the crank to a fluid-drive torque converter to the clutch to the (two-speed) transmission to the rear wheel. If you didn't notice the badges on the side covers, you'd never suspect that it differed from any other Moto Guzzi in any substantial way; it has, after all, a normal clutch lever, a normal gear shift lever and a normal transmission housing. But a host of tiny tip-offs (mystery oil lines where they aren't normally seen, a wet sump and a remote transmission fluid reservoir, a transmission radiator mounted beneath the steering head) suggest a power delivery system that may—or may not—revolutionize the touring bike category. Guzzi, while first to equip a mass-produced motorcycle with a fluid torque-multiplier, will not be alone for long—Honda has one coming too, and from



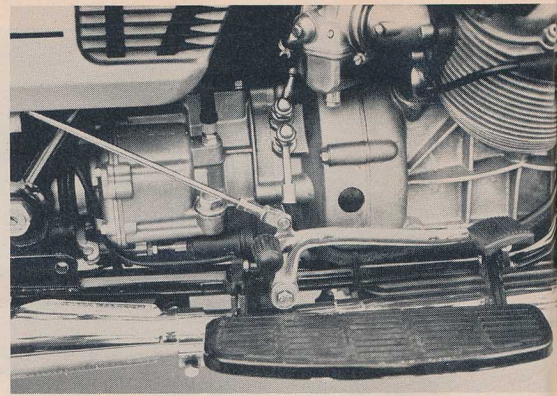
The instrument console tells the operator everything he needs to know, but the warning lights are too dim for daytime reading and difficult to decipher at night. Ignition key also operates the main petcock.



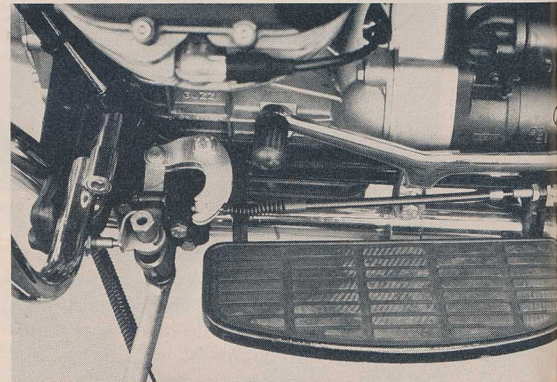
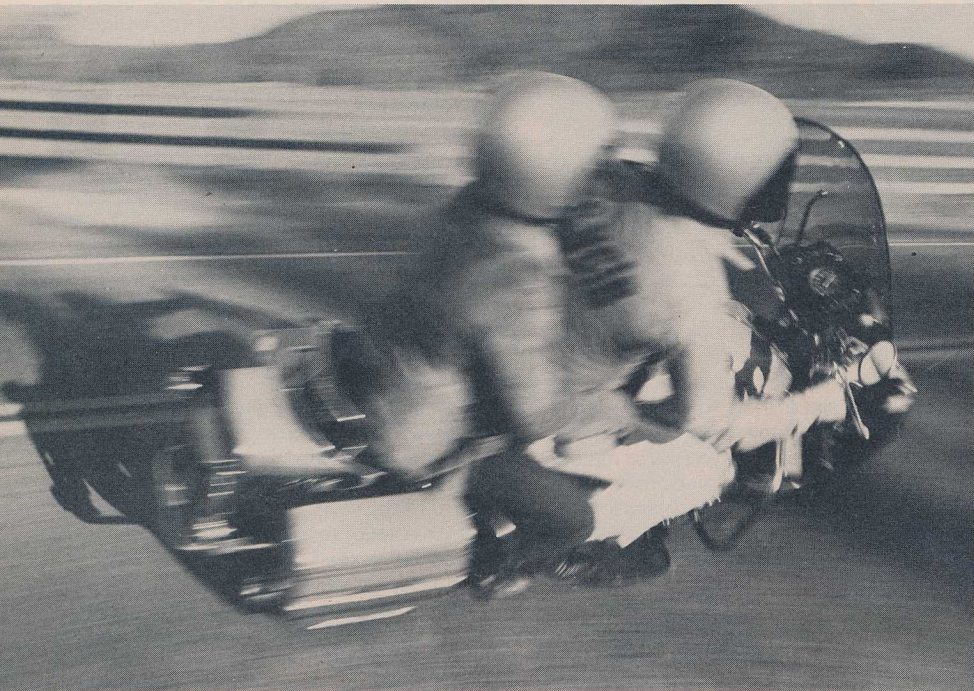
Rear master cylinder cap is wired to monitor fluid level; cylinder resides behind right side-cover.



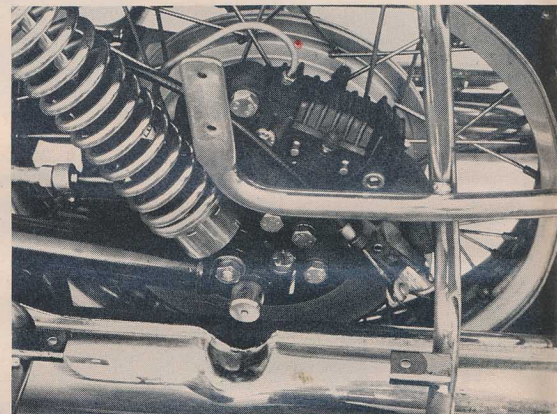
Behind left side-cover, a remote reservoir for converter fluid. Return lines come from fluid cooler.



Responsive to the new touring orthodoxy, the Convert is fitted with hinged, rubber-covered floorboards.



Bellcrank swivels when bike is rested against its sidestand, pulling cable that locks on parking brake...



... mounted behind conventional Brembo caliper. Parking brake is mandatory with torque converter.

what we have been able to gather from conversations with Mr. Suzuki, head of R&D at Honda, theirs is not substantially different from Moto Guzzi's.

Briefly, a torque converter is a hydraulic pump and turbine combined in a single donut-shaped unit. The donut is driven by the engine, and a great oily commotion inside emerges in the rotation of an output shaft. Cut the donut open and you find that it's a shell carrying a bunch of semi-circular vanes, and that another, similar set of facing vanes sprout from an interior hub splined to the output shaft. From appearances, you'd guess it was merely two close-set fans working in an oil bath: drive one fan and let oil drag move the other. It's a lot more complicated than that. The shape of the vanes in the driving fan are such that rotation—centrifugal force, really—pulls oil from the donut's center and jets it across at the driven fan, or turbine. Then the turbine's vanes absorb the oil's energy, applying a torque on the output shaft, and deflect its flow back down at the hub where it again enters the pump vanes and repeats the process. So you literally have a pump squirting oil into a turbine, and in this application the vanes' shapes and angles trade rotational speed on the input side for mul-

tiplied torque, at a reduced speed, on the output shaft—just as though the donut contained a set of reduction gears.

But a torque converter is unlike mechanical gearing in that its input/output ratio varies automatically with speed. Typically, converters give the equivalent of 3:1 gearing at "stall" (when the pump vanes are spinning but the turbine hasn't begun to rotate) and gradually work its way to a 1:1 "lockup." The torque multiplication at stall, and the speed at which lockup occurs—when centrifugal force in the turbine balances that in the pump and oil ceases its hub/perimeter circulation—can be shifted around by altering the vane configurations.

A further refinement in the basic torque converter is the addition of a third set of vanes, positioned close to the hub and cupped to deflect the flow of oil returning from the turbine to the pump to agree with the latter's direction of rotation. This third torque converter element is called a "stator" and that's a bit misleading because it, too, has to rotate.

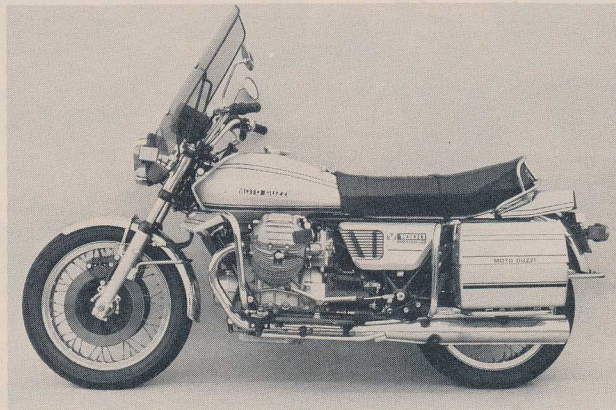
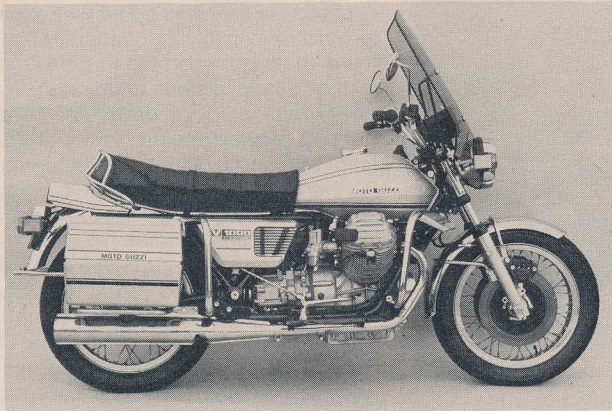
If the stator were fixed, it would do wonders for the converter's stall efficiency, but you wouldn't want the thing just standing there stirring oil after the converter's speed increased beyond the stall point. So

MOTO GUZZI V1000

the stator is located on a fixed tubular stub, with a one-way clutch in its hub, which keeps it from spinning backward in reaction to the oil flowing over its vanes at stall, but allows it to spin with the pump and turbine elements at higher speeds.

Be it known that even a three-element torque converter, which the Guzzi has (a component supplied by Fichtel and Sachs), converts a lot of horsepower into heat at anything below lockup speed. The heat can't be left inside the converter donut without quickly raising the fluid to its boiling point, and that's why there's an engine-driven trochoidal pump circulating the fluid from the converter housing through a radiator to a reservoir and back to the housing.

The effect of all this is, you can select "high" when you take delivery of the motor-



MOTO GUZZI V-1000 1-CONVERT

Price, suggested retail \$3495

Tire, front 4.10 x 18H Metzeler
 rear 4.10 x 18H Metzeler

Brake, front 1.5 x 11.7 x 4 in. (38 x 300mm x 4)
 rear 1.5 x 9.43 x 2 in. (38 x 242mm x 2)

Brake swept area 144.4 sq. in. (931.3 sq. cm)

Specific brake loading 5.30 lbs./sq. in.
 at test weight

Engine 90-degree 4-stroke V-twin, OHV

Bore and stroke 3.46 x 3.07 in. (88 x 78mm)

Piston displacement 57.9 cu. in. (948.8cc)

Compression ratio 9.2:1

Carburetion 2; 30mm; VHB Dell'Orto

Air filtration Dry paper

Ignition Battery and Coil

Fuel capacity 6.6 gal. (26 liters)

Oil capacity 6 pts. (3 liters)

Transmission oil capacity 20 oz. (.6 liter)

Electrical power 182 watt alternator

Battery 12 V, 32 AH
 (40 AH battery available)

Primary transmission Helical gears

Secondary transmission Shaft, bevel gears, 3.79:1

Converter ratio 1.60:1 (max.)

Gear ratios, overall (1) 6.12 (2) 4.58

Wheelbase 58 in. (147cm)

Seat height 30.5 in. (77.5cm)

Ground clearance 6 in. (15.2cm)

Curb weight 601 lbs. (272.6kg.)

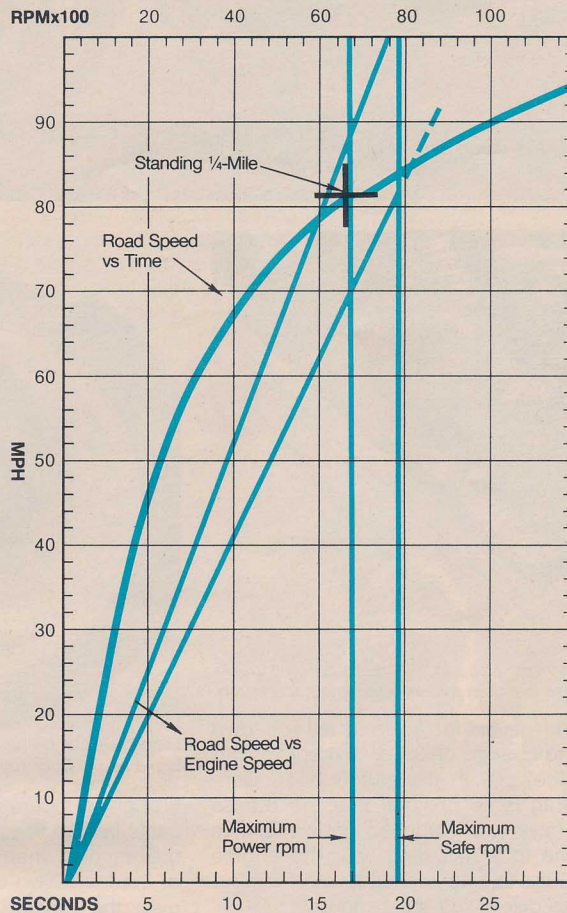
Test weight 766 lbs. (347.4kg.)

Instruments Speedometer, odometer, tripmeter

Standing start 1/4-mile 16.432 sec.; 80.71 mph

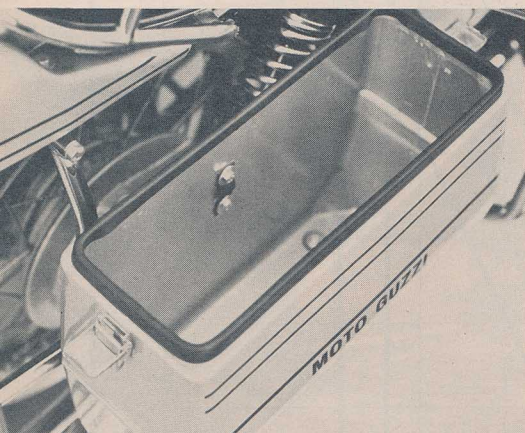
Average fuel consumption 40.9 mpg

Speedometer error 30 mph, actual 29.46
 60 mph, actual 59.84





MOTO GUZZI V1000

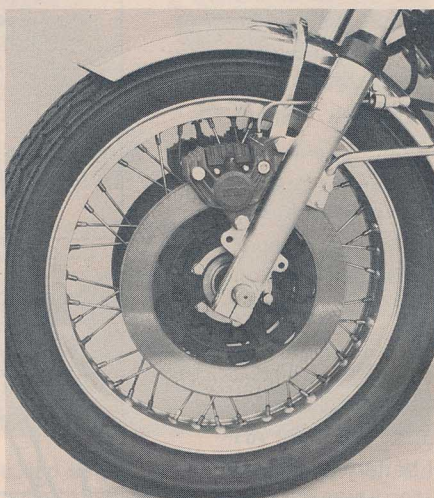


Plastic panniers are part of the GuzziMatic package. They're lockable, securely mounted and tough.

cycle and never, for as long as you own it, have to change gears or (except to start the engine) pull in the clutch lever. Converter drag is so minimal that the brakes do not have to be applied once the bike has come to a halt, and with the engine off the Guzzi can be pushed around without having to disengage the clutch.

Because of elaborations undertaken by Guzzi on account of the bike's transmission, the starting drill is slightly more complicated than normal. Switching on the key (located in front of the top of the fuel tank) energizes the electrical system and activates a solenoid that opens the main petcock. The bike must be taken off its side stand, and the stand must be retracted. That done, the clutch must be pulled in—and then the bike fires up with a push on the slightly awkwardly-located starter button. Like your automatic transmission car, idle is set a bit higher than you would expect—but it drops to a pleasant level once the clutch is released and the engine engaged through the fluid coupling to the drive shaft.

The sidestand on the Guzzi is far more complex than the humble stalk grafted to the frame of an ordinary motorcycle. In the



Left-side front brake caliper is operated by "rear" brake pedal. Concept is controversial—but effective.

first place, operating through a bellcrank/cable lashup, it applies locking pressure to the rear disc when it is supporting the weight of the bike. Two calipers work on the rear disc: the forward caliper, a conventional hydraulic dual-action Brembo, responds to brake pedal pressure; the caliper located directly behind the Brembo is operated mechanically by the pull of the sidestand cable. This "parking brake" is a necessity with the Guzzi, since the bike cannot be left in gear in the conventional sense.

The sidestand's other function, to shut off the engine when the stand is swung out, is more than likely an offshoot from Guzzi's police bike program. In an emergency situation, a cop could park his bike and the engine would be killed without interfering with the functions of his accessories—like flashing red lights and radio. For a non-cop the stand's kill-button capability also serves to keep one from riding off with his stand sticking down and out.

"Riding off" is not a task the Convert takes to lightly in any case. With the engine ac-

ceptably warm and the choke lever returned to its non-use position, the clutch can be released—to little effect. The bike might drift forward perceptibly, but generally it just sits there—until you open the throttle. Then the mighty 88mm pistons thud at increasing rates of speed up and down their bores and the bike moves forward, slowly at first and then with more and more determination. Further increases in throttle opening are accompanied by greater and greater thuds and greater and greater rates of acceleration until the bike has quaked and rumbled up to whatever speed you find acceptable.

Then, having attained 55 or 60 mph, you stabilize the throttle opening and the 1000cc Guzzi settles in, the sound and fury diminishes, the engine ceases its cacophonous intake roar and you're left rolling gently and with decorum down the road, shielded from the wind-blast by the fairing and for the most part isolated from the engine's now-faint pulsations.

You also notice that you are isolated from any posterior discomfort by what is the plushiest, softest, most extravagant seat in all of motorcycling. Fully 6¼-in. thick (a Z-1 seat is 5-in., a Honda 550 4¾-in.) and 12½-in. wide, the Convert's perch is compliant without being mushy. With a stem-to-stern length of 28-in. there's plenty of room for a passenger; despite an arch in the seat base for rear fender clearance, passenger comfort is practically a match for operator comfort. There is no question in our minds that the Guzzi's seat is its most successful component.

Other ergonomic details are less appealingly executed. The handlebar, in the opinion of staffers and non-staffers, is too flat and too far forward. "If the factory had equipped the bike with a handlebar that was too high or raked back too far," said one, "then at least a customer could replace it with another one more to his liking. But this way it'd be hard to change without splicing in additional length to all the wires and cables." The dual mirrors are prone to vibration that the rider can hardly feel, and never transmit clear images. We continue to be unimpressed with Moto Guzzi's headlight flasher and horn being activated by a common button (although the Convert's dual horns are loud enough to wake an automobile driver out of a sound sleep). The turn indicator switch is a bit delicate for anyone wearing gloves, and the headlight dipper switch is difficult to get at even after much practice. We aren't big fans of floorboards either. Although the ones on the V-1000 are mounted high enough not to interfere with ground clearance and hinged in case they do, the boards, like the mirrors, seem particularly vibration-sensitive. At a steady cruising speed the rider can put his feet on the passenger pegs, on the rocker covers or on the front spill bar and feel no vibration at all. Ride with your feet on the boards and they'll start to tingle. The twist grip is hard to turn. When we tested the 850-T we noted that softer return springs should be fitted. Same here. Finally, the spatial relationships between the rider and some parts of the V-1000 aren't quite right. A taller rider would have no real gripe with

(Continued on page 44)

the Guzzi's handlebar—but would be plagued by contact between his upper shins and the small, hard-rubber pads fitted to the rear of the rocker covers. The pads are there to keep your shins from contacting the aluminum rocker covers—but they take space, so while contact with them is less distracting than with the rocker covers, it is also more frequent. A shorter rider wouldn't be banging his shins at all—except he has to ride far forward on the seat to reach the handlebar. Simple solution: locate the floorboards and foot controls slightly to the rear and fit up a handlebar with more pullback.

The V-1000 uses the same fuel tank as the 850-T, and it is a thing of beautiful proportion and generous capacity. Holding 6.6 gallons in a container that looks like it ought to hold 3, the Convert can lope for well over 200 miles before the 1-gallon reserve is tapped. During our test the 850-T averaged over 45 mpg; the Convert, encumbered with a windscreen, a fluid coupling and 150 additional ccs, got just under 41.

One would think that the torque converter would do more harm to mileage than it does; it certainly contributes to the bike's only unacceptable characteristic, noise. Little racket comes from the Guzzi's large and effective twin mufflers—it comes from the intake system, and when the engine is

working hard it's a penetrating, tiring noise indeed. The converter is calibrated to the engine's torque peak. At maximum load and moderate-to-maximum throttle, the engine operates continually at its torque peak. Climb up a steepish hill and you'll be wishing for ear plugs by the time you get to the top. You can't change gears and get away from the hammering, like you could with a conventional bike; even if you select low range the noise and vibration remain.

It all goes away in steady-state cruising, as we have noted; maintain 55 or 60 mph and the big Guzzi is calm, unobtrusive, serene, composed. It's seat is as good as, if not better than, a BMW's; its suspension system is superior to the German twin's in terms of accuracy and inferior in terms of long-distance comfort. The Guzzi, for a pure touring bike, is a marvelous handler. At brisk speeds its steering accuracy, lightness of feel and ground clearance are unmatched by other pure tourers like the R90/6, GL1000 and HD 74. But it pays a price for mountain flickery, and that price is suspension suppleness. The fork and shocks react better to small highway irregularities than the components fitted to large Japanese bikes, but not as well as the long-travel, soft-spring BMW fork and shocks.

Some of the reason for road shock being transmitted through the front fork to the rider's arms is the Guzzi's front wheel unsprung weight. That weight is contributed to by a pair of cast iron brake rotors and twin dual-action calipers, part of the Convert's other ground-breaking, and controversial, system. The right-hand-operated master cylinder works one of the bike's two front wheel calipers. The other caliper responds to right foot pressure. The "rear" brake works as follows: the brake pedal connects to the rear master cylinder through a rod; pressure generated by the master cylinder is transmitted through a hydraulic line to a distribution valve, which has its own piston. Seventy percent of the total hydraulic pressure generated operates the rear caliper; 30% of the pressure is transmitted through a line running forward

(Continued on page 92)

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GUZZI 1000 . . . Continued from page 44

to the front wheel's left caliper. Theoretically, the rear wheel will achieve lock-up well before the front—that's the reason for the distribution valve. There is no question in our mind that the system, for most touring riders, is a valid one, since the average long-distance buff seldom uses his front brake properly in an emergency situation. Controversy arises when circumstances call for no front wheel braking whatsoever—like slowing or stopping on dirty or wet pavement while negotiating a corner. Then, who knows? The system might get you in trouble, since your option to use *only* the rear brake is no longer an option at all.

On dry pavement, though, the Guzzi's brakes are truly splendid. A heel-rest has been provided so the rider can be delicate when he jumps on the brake pedal, and with familiarity one can be as precise with the right foot as one had been with the right hand. And try as we might, we were never able to lock up the front wheel.

Cycle is not in a position to anticipate whether the market will find the revolutionary Moto Guzzi an enticing alternative. Some touring riders we've talked to tell us that, for them, a power transmission system that can operate without manual inputs would be a Good Thing; others indicate a preference for more direct participation and control, or feel that it wouldn't make much difference since they spend most of their time in top gear anyway.

We are in a position to evaluate how the bike functions, however, and our general opinion is that under traditional touring circumstances it functions more than satisfactorily. It offers better-than-average comfort and straightforward and painlessly-accomplished primary maintenance (carbs, timing, valve adjustment, etc.). It can't match a BMW or a big Honda for speed, acceleration, overall smoothness or noise control, but it is superior to both in the handling department and superior to the GL-1000 in terms of seating comfort. Its torque converter and two-speed transmission (with manual change) free the rider from chores that some consider a hassle, especially in down-town traffic, but the bike's engine performance is noticeably diminished and there's no doubt that the fluid coupling adds mechanical and hydraulic complexity. At steady cruising speeds the Convert is at peace; accelerating up to those speeds it is at war. Attention has been given the needs of the touring rider in the areas of wind protection and carrying capacity; more should be given in the areas of instrument readability and hand control layout.

Your choice. If you choose the Moto Guzzi, though, do yourself a favor: pick up a pair of ear plugs. ☉

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