Cycle Test

MAICO 400 QUALIFIER

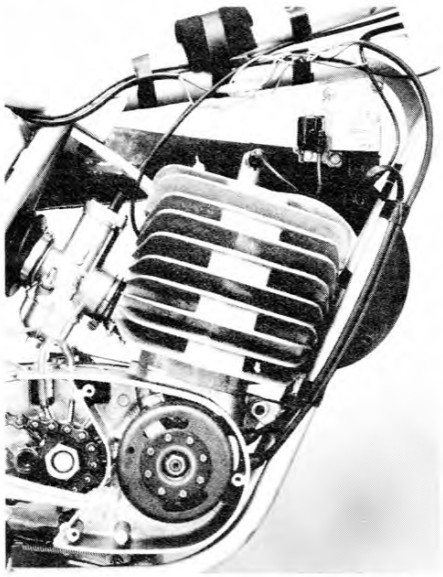
There have always been two types of enduro bikes—European and Japanese. Now there's Maico's version—tractor-like torque, motocross horsepower, bantam weight, the Maico fork and that magic chassis. Given tender loving care it might be perfect.

● Regardless of what any of the old-timers might tell you, there were no "good old days" as rich with superb motorcycles as today. The technological achievements and low cost of motorcycles from Japan has been more than enough to crush many European firms. Excepting BMW's toehold on a segment of the sport-touring market, off-road competition is the only part of American motorcycling still well-represented by European machines. With the Japanese invasion came the lightweight trail bike, later called the *enduro*. And from these machines came a new definition of enduro. It was no longer a heavy British twin or single four-stroke fitted with knobby tires, homemade oil-soaked wire mesh air-filter, Smiths Chronometric rear wheel drive speedometer, and lower gearing *via* a smaller engine sprocket. Japanese enduro bikes came with compromise trials pattern tires, underpowered but dependable engines, five speeds, tough clutches, rotten chains, squirmy chassis, horrid suspension and attractive price tags.

Of the Japanese enduro bikes sold in the last seven years, the vast majority spend over three-quarters of their time on the street—not in enduros. With lights that worked, brakes that stopped, silencers that baffled and an abundance of low-speed power, suburbanites found the Japanese versions of enduro bikes most palatable for domestic chores and stop-light hopping. The factories built what the marketing experts knew would sell to the masses—not necessarily what was best.

But with the magic touch of experienced riders Japanese enduro bikes were transformed from barely adequate trail bikes to superbly competitive enduro weapons. Why? For the dependable engines and drive lines that were available, the low weight that was attainable and the parts that were buyable. With the implacability of the Japanese engine and light-a-foot ability acquired, bad handling habits and horrid suspension units could be overcome by the serious enduro rider.

The Europeans, on the other hand, build their limited offering of enduro bikes with far more serious off-road intentions. Continental factories seem to avoid intentionally street-oriented dual-purpose designs. Most of their enduro machinery is used in local and international events, often by their own employees, so design and development come as direct feedback from enduro or ISDT type events close to home. Streetability is, to them, a necessary evil to be worked around. Street-required paraphernalia is usually tacked on to a serious piece of off-road equipment. The Europeans make semi-streetable enduro competition bikes—the Japanese make semi-dirtable street/trail machines.

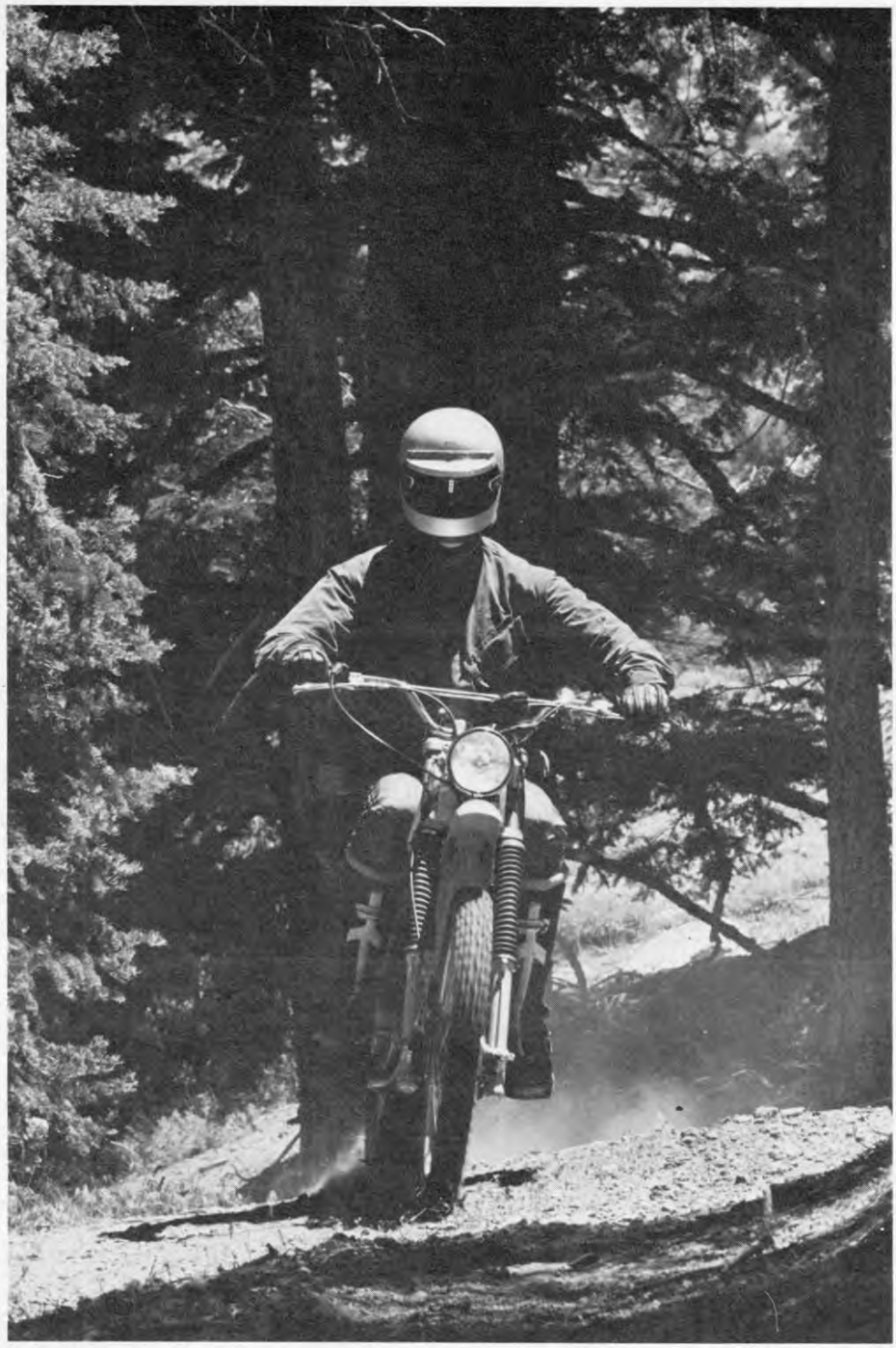


A first for Maico is Boch's external flywheel generator. Ignition spark is pointless CDI.

The Qualifier is identical to 400 MX with addition of high muffler, lights and speedometer.

Maico's involvement with anything except motocrossers has been nil for almost a decade. The tiny 300 employee/two factory concern is a close-knit, family-controlled operation. Where the Japanese thrive on diversification, Maico leans heavily on single line models—specialization. Formed in 1931 by Hans and Otto Maisch, the name Maico (formed from Maisch Company) was initially linked with bicycles. In 1934 the Maisch brothers built their first transportation motorcycles, powered by 98cc Sachs and 125cc Ilo engines. Mandatory production of aircraft parts during the war years left the Maico plant without a production motorcycle from 1940 until 1949.

The root Maico engine was originally designed in 1949 by Willi Tetzlaff (from Heinkel aircraft). It was a 125cc piston-port street engine. Today's 250, 400, 450 and 501 motocross engines still retain the same crankshaft and transmission centerline dimensions as the original 125. After the flop of the 500cc Maico car in the



Mountains trails and fire roads are the Qualifier's cup of tea. Big Bing requires throttle feathering.

All the nine gauge spokes stayed tight. Front wheel is light. Fork action is the best.

The Metzeler tires work very well. Girling shocks don't work at all. Brakes stop easily.

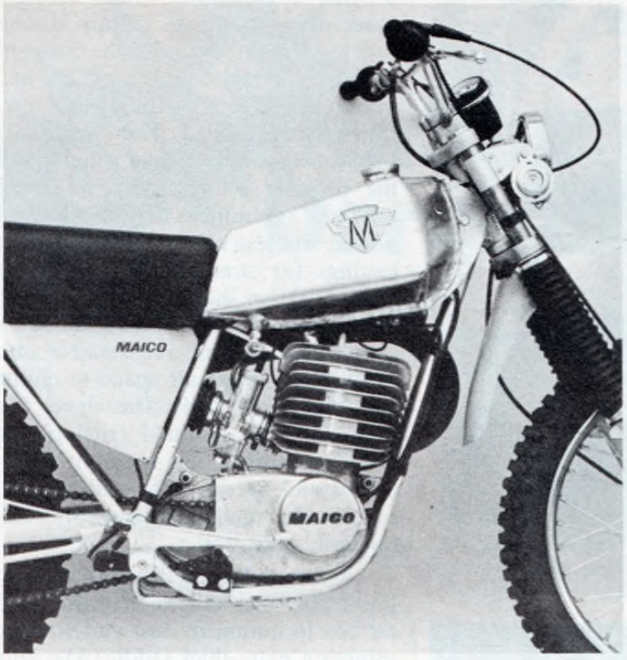
mid-1950s, the Maisches made the huge 175cc and 250cc Maicoletta scooters for over a decade, and contracted in the early Sixties to make 10,000 German army bikes (many of which are still in service today). In this country 250cc Maico Blizzards were converted into scramblers in the early 1960s and won thousands of races.

Maico's decision to re-enter the enduro field was straightforward. Though motocross sales are not, at this time, diminishing, the once-great machine shortage will have dissipated before the end of the year. Adding enduro machinery to the line simply bolsters sales potential. And having promoted factory enduro and ISDT bikes (mostly in Europe) since 1952, Maico is anything but a stranger to the field. Literally taking a production motocrosser off the line and transforming it into a feasible enduro bike would be out of the question for any of the Japanese and most of the European manufacturers. Maico, on the other hand, has developed their motocrossers with three prime development areas in mind: maximum engine torque, exceptional handling and the best in suspension. They accomplished each goal years ago.

The Maico 400 engine (actually 387cc) is to dirt riding what the Chrysler Hemi is to drag racing, the Ducati 750 Desmo to cafe racers and the Offy to Indianapolis. But unlike its off-road peers, the Maico two-stroke single is amazingly simple and devastatingly effective. It doesn't boast nine ports, reed valves, ram air induction, hyperventilated liners or pistons that resemble Swiss cheese. Induction is the basic Schnurle loop system with one intake, two transfer and one bridged exhaust port. The head has two combustion pockets, one shallow, the other deep, and a 12:1 compression ratio. The forged Mahle piston uses two rings, the top Dykes and the bottom conventional. Both the small and big ends ride on caged needle bearings. The hardened steel connecting rod rotates on a mammoth crank pin that is pressed into an equally monstrous pair of flywheels—the biggest in the business. Lubrication is by premixed gas and oil.

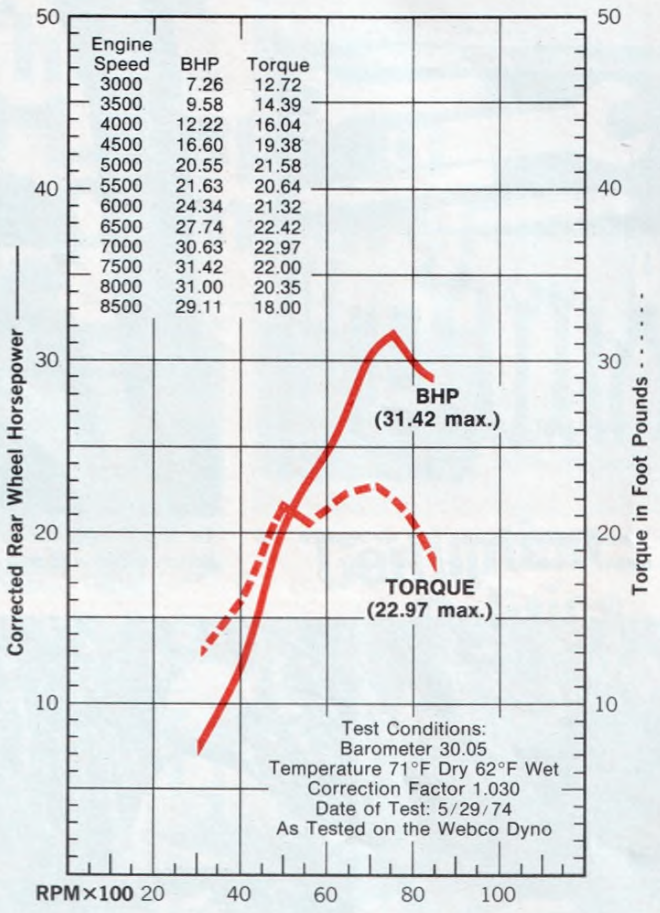
Many years ago distributor Frank Cooper pressed the factory hard for the chassis geometry and engine dimensions that are still used in the entire Maico line, including the 400 Qualifier. The 400 is the only undersquare big two-stroke in production today. Its 83mm stroke and smaller 77mm bore produce the largest and broadest torque band in off-road motorcycling—with the exception of the bigger 450 Maico motocrosser. The 31.42 hp the Qualifier produced on Webco's dynamometer is over seven more than any other enduro ever tested by *Cycle*. The torque curve is virtually flat, floating at 20 lb/ft for 4000 rpm—far above other enduro engines at their *peaks*.

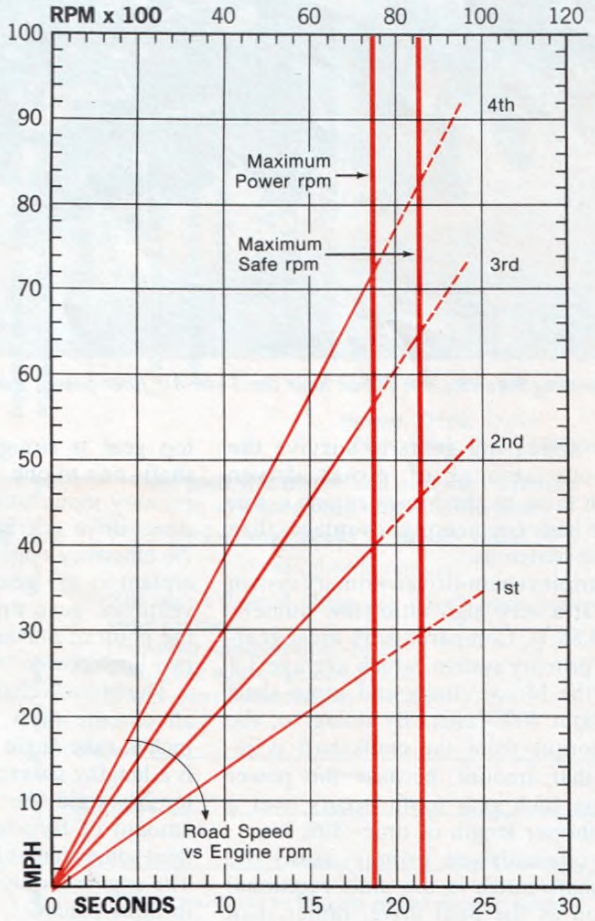
The gearbox, absolutely tiny in size by Japanese standards, is made of the best machine steel available. The ability of the



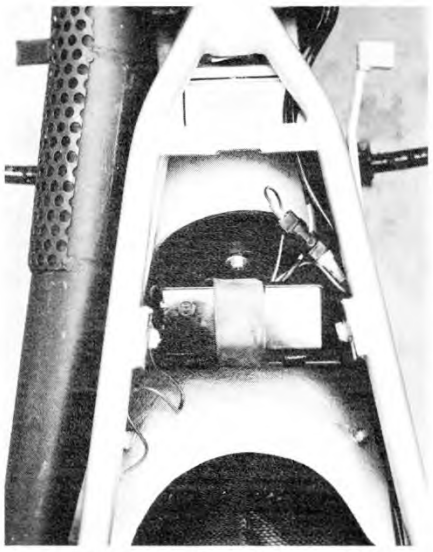
MAICO 400 QUALIFIER

Price, suggested retail	$1678
Tire, front	3.00 x 21 Metzeler
rear	4.00 x 18 Metzeler
Brake, front	5.5 in. x 1.2 in. (139.7 x 30.5mm)
rear	6.2 in. x 1.2 in. (157.5 x 30.5mm)
Brake swept area	44.1 sq. in. (906.5 sq. cm)
Specific brake loading	5.8 lbs./sq. in. @ test weight
Engine type	Two-stroke, piston port
Bore and stroke	3.03 x 3.27 in. (77 x 83mm)
Piston displacement	387cc
Compression ratio	12.0:1
Carburetion	1;36mm Bing
Air filtration	Washable foam
Ignition	Bosch CDI
Bhp @ rpm	31.42 @ 7500 rpm
Torque @ rpm	22.97 @ 7000 rpm
Rake/Trail	31°/6.0 in. (152mm)
Mph/1000 rpm, top gear	19 mph
Fuel capacity	2.2 gal. (8.3 l)
Transmission oil capacity	2 pints (1 l)
Electrical power	6V-Bosch/45 watt AC generator
Battery	6V-4ah
Gear ratios, overall	(1) 20.68 (2) 13.32 (3) 9.60 (4) 7.44
Primary transmission	Renold Triplex Chain 3/8 15/64 1.86:1
Secondary transmission	1/4 x 5/8 Regina Extra
Wheelbase	55.0 in. (139.7cm)
Seat height	34 in. (86.4cm)
Ground clearance	9.0 in. (22.8cm)
Curb weight	256 lbs. (116kg.)
Test weight	456 lbs. (207kg.)
Instruments	Speedometer
Sound level (California Standard)	88.5 db(A)
Specific brake loading	5.8 lbs./sq. in. @ Test Weight





The Maico tool kit is the best we've seen. No box means you have to carry the tools.



Air box is ideal for dusty and wet conditions. Battery location is poor. Simple, diode works.

After drowning bike like this for an hour the Twin-Air filter passed water. Ignition never faltered.

fragile-appearing gears to survive the enormous amount of power driven through them by the Maico engine is due more to basic engineering advantages than superior materials.

The triplex chain-driven primary system is run at a very high ratio (low numerically; 1.86:1). Compared with most gear-driven primary system, which average 3:1 ratios, the Maico clutch and input shaft spin about 40% faster. By doing so, the input torque from the crankshaft is *reduced* that amount, because the power drive on each gear tooth occurs over a much shorter length of time—40% less.

The chain-driven primary turns the input shaft/clutch in the same rotational direction as the final drive, rather than reversing it as a gear primary does. This permits a direct-drive transmission, where top gear is straight through the mainshaft—one-to-one. The use of chain for the primary input rather than gears, and the direct-drive gearbox, deliver as much as 7% efficiency edge for the German powerplant in top gear, compared with conventional gear driven transmissions. At the point of maximum torque that's over two horsepower.

The Maico's chassis tubing members are all chrome moly. The wheelbase is 55 inches, rake angle is 31 degrees, and trail is a lengthy six inches. Rather than being terribly rigid the frame has an unusual amount of free-flex that lets the engine float somewhat at high crankshaft speeds. The engine is only mounted to the chassis in three places.

The extraordinarily strong fork assembly is unmatched (demonstrated in *Cycle's* July 1974 fork comparison test), but only because it does fewer things wrong than other units. With the (33mm diameter) fork legs mounted close to the frame head, there's a tremendous reduction in any pendulum effort as they pivot on the frame steering head. The weight of the fork legs and front wheel is held close to the pivoting center line. The forward-mounted axle adjusts for an ideal amount of trail and also affords the use of lengthy castings for strength. With the springs external rather than internal there's more space inside for an effective, though very simple, damper unit, a reasonable amount of oil and a huge air space to eliminate pneumatic fork lock. The clever use of materials with minimal frictional resistance is invisible. The hard chrome stanchions and special alloy sliders are free of bind, or stiction, at slow speeds and on washboard trail.

Add to these credits other already proven benefits, such as the fully enclosed air box to minimize dust and water consumption, extra-thick saddle (Ake Jonsson replica), Penton-type rear fender, CDI (waterproof) ignition, Metzeler knobbies, Magura controls and a 256 pound weight (wet) figure (the lightest of any big bore enduro bike). The result is the most powerful, lightest (except the Bultaco Alpina) and best handling *real* enduro bike to yet land on our shores.

Engine performance of the Qualifier is an enduro rider's or weekend racer's dream. Having ridden one of the fantastic 350 Jawa ISDT trophy team bikes we can vouch for the fact that the Maico engine's stump-pulling performance is closer to that of the world championship Six Days machines than any bike we have ever ridden. The Maico Qualifier has more of a mid-range power surge than the Jawa due to its motocross port timing and the big 36mm Bing carburetor. Though not as smooth as the Jawa, the Qualifier shakes considerably less than the Suzuki 400 Apache or 360 Yamaha Enduro.

Acceleration from the absolute bottom of the rev range in any gear is smooth, predictable and strong enough to pull rider and machine out of any imaginable quagmire. Acceleration from mid-range engine speeds will literally pin back your ears. Figuring horsepower to weight, the Maico Qualifier scores the lowest figure, 8.14 lbs/hp, of any enduro bike *Cycle* has ever tested. This is over 3 lbs/hp less than the next-closest enduro bike, and even lower than the YZ 250 Yamaha and Penton 250 motocrossers.

Compared to other Maicos we have ridden, the Qualifier's shifting wasn't as smooth. The lever was brutish to move with or without use of the clutch for the first 200 miles. As the miles built up the shifting smoothed, but never to our liking. Finding neutral at a stop is impossible due to clutch drag. For serious enduro riding

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this is the Qualifier's biggest drawback. Using the same 12-plate metal and cork clutch that comes with the motocrossers just doesn't work in those infamous enduro traffic jams, rock piles or trials-type sections. We had to accustom ourselves to locating neutral before we came to complete stops.

The gearbox used in the Qualifier is a cross-country version that has slightly more distant ratios than the close-coupled motocross transmission. With the huge torque spread on tap, four gears are all that are necessary to deal with any enduro situation. The countershaft sprockets will have to be changed to match terrain and personal riding requirements (sprockets from 11 to 14 teeth are available). Fast Baja riding will mean a 14, desert demands a 13, woods is best with 12 and mountain trails requires an 11.

Our test bike (the first model off the production line) had variances with the photo bike on the cover. Due to soaring petrochemical costs in Europe, especially West Germany, Maico has gone to aluminum gas tanks rather than fiberglass. Alloy materials are now cheaper than fiberglass resins. The fenders are ABS plastic instead of fiberglass for the same reason. Rather than using a sidestand the Qualifier comes with an ISDT type centerstand. It's nice on hard surfaces and impossible in sand and mud. The Italian CEV speedometer (reading in kilometers) will be replaced with enduro unit (probably a VDO) with a resetable tripmeter.

We were plagued with a series of irritable problems—some from not-yet-corrected early production, some from poor design. The first two times out with the Qualifier the Bosch flywheel sheared its locating woodruff key and spun off the crankshaft. Both times it was due to the retaining nut being insufficiently torqued and untouched by locking fluid. A few drops of Loctite cured the situation. The exhaust pipe welds cracked and the sheet metal cones fractured. The lack of rubber mounting and constant pressure of the engine tugging against the header section and mount were the problems.

Extreme miscalculation in carburetor jetting caused early retirement from the Greenhorn Enduro after 130 miles. Later the jetting was zeroed-in for the dynamometer. Compared to standard motocross settings the main jet went down four sizes, pilot jet three sizes, needle jet three sizes, and the needle position went from the very top notch to the lowest. All these changes were due solely to the new muffled exhaust system.

The petcock had to be drilled out during the dynamometer runs to permit sufficient fuel flow to the thirsty Bing. The oil-soaked foam Twin-Air air filter, after being drenched in 20/50 weight, allowed water to pass into the carburetor while we were drowning the Qualifier in a river bed. The battery retaining strap broke and let the battery flop around freely inside the air box. Insufficient support of the rear fender let the too-heavy taillight fracture its plastic. The vented gas cap leaks and the wiring is routed in such a fashion as to invite hassles. The CEV headlamp-bulb filament reflector broke loose and shorted out the light. Finally, the Girling dampers acquired a mid-stroke hydraulic compression lock (as have the last five test bikes equipped with Girlings), and consequently they had to be replaced.

It's obvious that Maico has been away from the keen development now built into modern enduro motorcycles. Simple refinements that are standard with most enduro bikes have to be bolted onto the Qualifier. Vibration of the Maico 400, though not severe, will shake loose all the street accoutrements unless they are rubber-mounted. The wheels have to be balanced and wiring re-routed and shielded. The magneto cover and inlet wires have to be waterproofed with silicone seal. Cutting the rear part of the magneto cover away (à la the MX models) will expedite countershaft sprocket changes. In water or mud the round, slippery Maico foot pegs will have to be replaced with cleated style rests. It will take the factory a while to correct these problem areas on the production line (which they said they will do). Before the start of Greenhorn we made most of the aforementioned modifications (excluding jetting). It took a full day, but saved us losing half the motorcycle along the trail.

Riding Maico's 400 Qualifier in Greenhorn and post-weekend trail outings was the most enjoyment we have had with an enduro bike. The huge power range made coming out of corners a one-down-shift, full-throttle thrill in each of the thousand turns on the twisty mountain fire roads in the Angeles National Forest. After losing 18 minutes while trying to sort out the jetting on the trail during the beginning of Greenhorn it took only 23 miles to get back on time—in speed sections ranging from 24 to 42 mph. We just couldn't have done it on anything else.

During that harried 23 miles we slid through a hundred turns that would have put us over the side of the mountain road on a lesser bike. The tremendous amount of predictable power makes sliding a dream—even if you don't know how. The bike accelerates so hard so fast that it can get you into over-your-head predicaments faster than you ever dreamed possible—but the chassis responds, as if it's thinking for you, and gets you out of what would normally be a disaster. It's really and truly a magic chassis.

The forks are everything they've been lauded to be. After changing to six-ounces of 20 weight oil, they delivered well over seven inches of travel and provided unusually soft and pleasant damping. The Maico forks absolutely gobble up rough stuff like no others we have tested. After installing a pair of S & W shocks and 75 pound springs on the back (for a 200 pound rider), the Qualifier all but eliminated its rear-end hop and skitterish actions in bumpy turns and whoop-de-doos. The bike tracks straight as an arrow up or down hill, whether it's choppy or smooth. It repeats in every kind of situation like it was electronically programmed.

Going by standards set by Japanese enduro bikes the Maico 400 Qualifier is a miserable failure. It's not practical for street use, makes too much noise for suburban travel, has lousy lights, lacks oil injection and comes with knobby tires. Out of the crate it isn't ready to go out and flog. It requires a day's love of labor, rubber cushions and re-jetting.

Its aluminum gas tank holds a mere 2.2 gallons; it should have 50 percent more capacity for enduros. Installation of a skid plate will be necessary before bashing through any rocks. The thick saddle is far better than most, but is shy of adequate firmness for day-long jaunts cross country. The quarter-turn throttle will have to be replaced with a ⅜-open twist grip. Bouncing over choppy terrain makes your right hand flick slightly and causes the powerful engine to surge; that's both irritating and dangerous in tight sections.

Going by standards set by today's endurance events the Maico Qualifier is as ready to do serious business as any dual purpose bike on the market. Maico's 400 Qualifier is the hardest accelerating, best suspended (excluding the shocks) and finest handling enduro bike to ever come down the pike. It's also the most expensive one yet: at $1678 it costs $88 more than the Penton 250 Hare Scrambler and $33 more than Rokon's 340cc automatic. Justifying that obscene price tag is almost out of the question. Nevertheless, what the Qualifier delivers in performance, handling and suspension is unmatched by any other bike. If there's such a thing as an ultimate experience in dirt bike riding, the Maico 400 Qualifier delivers it. ◉