•4
Enduros

Enduro motorcycles try to serve two competing masters: motor vehicle regulations and the requirements of rough-terrain riding. Dual-purpose bikes, designed for street and trail riding, must carry full street equipment for legal operation on public thoroughfares. Unfortunately, headlamps, directional signals, and other street hardware become unwanted—and easily damaged—baggage in off-road riding areas.

Most manufacturers engineer their enduro bikes for only occasional, casual use off-road. Street/trail machines meet the demands of motor vehicle departments far better than the exigencies of off-road riding. That's understandable because a stunning majority of dual-purpose motorcycles never venture from the highways.

Other enduro motorcycles have been seriously designed for off-road action. Generally, these machines have only rudimentary electrical systems to meet the thin letter of the law. That suits dedicated out-back riders who would not waste an excellent off-road motorcycle on the street.

Enduro motorcycles are very personal tools. Riding off-road, an enthusiast can run harder and exploit his machine far more than his pavement-bound brethren on full street motorcycles. Consequently, the off-road rider soon knows his motorcycle intimately and discovers quickly his personal preferences in machinery. With experience his awareness expands: steering geometry, suspension action, riding positions, power characteristics, etc.

Dedicated off-road riders modify their motorcycles to individual riding tastes. One enthusiast may recast a Japanese dual-purpose bike as a way to create his "perfect enduro." Another rider may tailor an already-specialized European mount. In all cases, solid starting points are necessary, and the following machines represent the finest points of departure generally available.

The off-road pilot can concentrate on riding his motorcycle and developing his communication with it—in an auto-free environment.

Montesa V75 Enduro

Typical of first-rate enduro motorcycles in the European style, the Montesa V75 Enduro exhibits a rugged and effective simplicity. Spartan in appearance, the single-cylinder Spanish two-stroke merely has token hardware for street riding. Like the German Maico and Austro-American Penton, the Montesa V75 is almost a motocross bike recalibrated to enduro specifications.

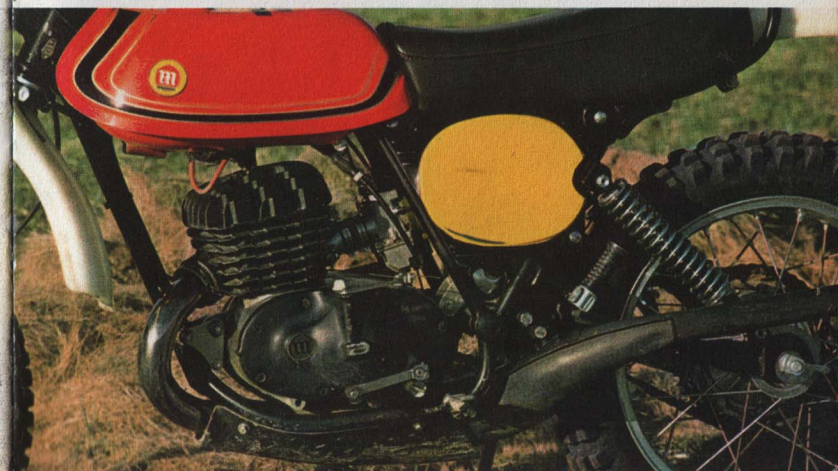
Handling and power characteristics identify the Montesa as an expert's off-road machine. The engine has little low-rpm torque and much high-rpm horsepower. Consequently, the Montesa rider can't plug along slowly with his mount. So it's a good thing that the V75's off-road handling improves as the pace over rough terrain gets hotter.

The Spanish bike employs a cantilever rear suspension system. The extra-long shock absorbers connect to the swinging arm at the conventional junctures. But then the dampers tilt forward at 45 degrees to join the frame at points far forward and lower than standard designs. Such a layout permits an increased up-and-down travel of the rear wheel. In theory, additional rear-wheel travel can result in greater rider comfort and better bump-control and directional stability in the rough.

As a lean, hard, enduro bike, the Montesa is built without frills. Riders must mix gas and oil for fuel since the V75 does not have two-stroke oil injection. The trim 260-pound motorcycle has no place for things such as directional signals.

Yet clever ideas often accompany starkness. Consider the Montesa's gasoline valves. Rather than using the familiar aluminum petcocks, the Montesa has a rubber bladder with a moveable steel ball which regulates (on-off-reserve) fuel flow. It's light, simple, and functional. Just like the rest of the V75 Enduro.

Montesa's cantilever rear suspension, which uses canted dampers, increases rear-wheel travel.



Penton 125

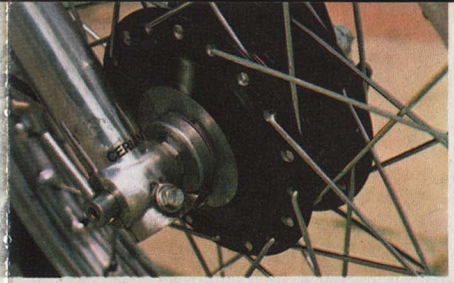
Penton's 125cc Enduro shows the international character of the motorcycle industry. The 125cc Sachs engine originates in West Germany; packed off to Austria, it is finished to KTM specifications and bolted into the Austrian motorcycle. KTM machines are marketed in the United States under the Penton nameplate. This American firm, with deep roots in national and international enduro competition, guides the Austrian company in shaping its products to the tastes of serious off-road riders in America. Those preferences sometimes make the Penton even more international—the Austrian bike uses Italian Ceriani forks.

The pricetag reflects the expertise with which every Penton motorcycle is built. Extraordinarily expensive, the Penton has no appeal to low-budget riders. The 125 Penton's competition credentials make it even less attractive to off-road buffs who ride only on sunny afternoons.

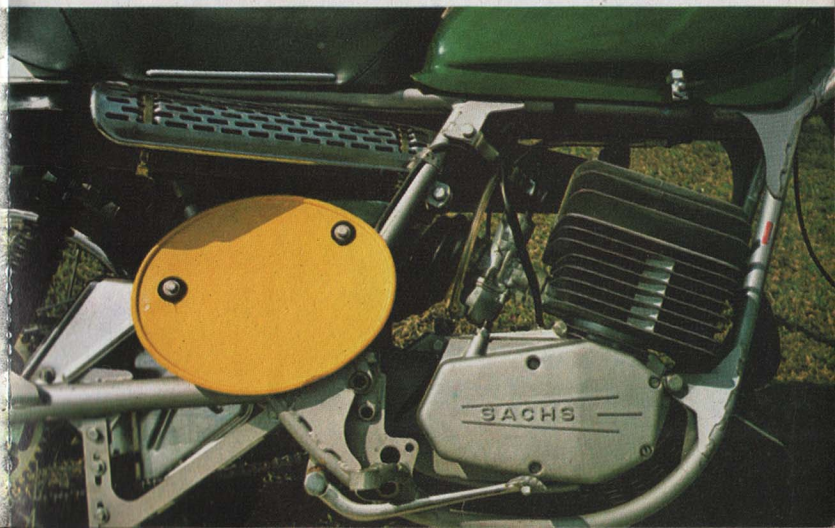
The six-speed Sachs engine has all the instincts of a motocross engine. That's understandable, because the unit is a motocross engine with more effective muffling. The rider must keep the engine at an angry buzz all the time; the unit's real willingness begins at 4,000 rpm, so the rider can't fall back to an easy poke through the woods.

The 125cc Penton—with its snappy engine, chrome-moly cradle frame, Ceriani forks, quick-detachable rear wheel, magnesium hubs, fiberglass tank, and plastic fenders—is an expert's mount in every sense. The lighting kit, which gives a quick nod toward street legality, is just an afterthought.

You'll never find a Penton on the street anyway; look off-road only. Find an enduro in progress, then you'll uncover Pentons by the score.



Rarely are Penton 125 enduro bikes seen with much lighting equipment; far more important are things such as an accurate enduro-type speedometer.



Kawasaki KS-125

Experience improves the breed, and the KS-125 Kawasaki underscores that axiom. For years Kawasaki has been building off-road trail bikes; the old 175cc F7 has been generally recognized as Kawasaki's best example of the trail-bike genre. The KS-125 belongs to a new generation of Kawasaki off-road motorcycles which have been planned and developed in the United States in close cooperation with the parent Japanese company.

Rotary-valve engines once implied bulky powerplants, and bulk is an undesirable feature in an off-road motorcycle. In the KS-125, the Japanese engineers managed to narrow the rotary-valve design without resort to tunnel ports. At the same time, the KS-125 makes horsepower both at high and low rpm. The wide powerband accommodates beginners who need tractable power in the rough, and serves veterans who use high-rpm horsepower to make time off-road. The six-speed gearbox guarantees that all kinds of riders will be able to find an appropriate gear for any situation.

American developers and Japanese engineers tried to keep the KS-125 as trim as practical—though the machine had to meet requirements for street legality in all states. Especially for beginners, the lighter the off-road bike is, the better; every additional pound cruelly taxes the novice rider. Riding an overweight motorcycle off-road is something akin to playing basketball with a medicine ball. At 235 pounds, the KS-125 isn't the lightest 125cc off-roader around, but the figure does keep the bike out of the millstone category.

The stout frame has surprisingly good suspension fore and aft. Since Japanese dual-purpose motorcycles usually skimp on suspension units, the KS-125's excellence may well reflect Kawasaki's stateside program of development. Chalk that up to experience!

The KS-125, like other small enduros, must be tough. Novice trail riders usually bounce off the scenery, but do little maintenance.

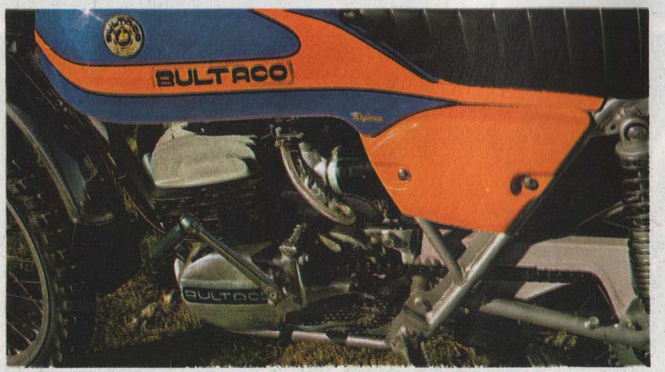
Bultaco Alpina

Around some motorcycles tribes of real partisans cluster. The Spanish Bultaco draws such a faithful band: Bultaco enthusiasts know the factory history, model chronology, and peculiarities of certain engines. The faithful treasure the idiosyncrasies of the breed; they willingly understand and explain why individual Bultacos are built in a given way. Perhaps no other European factory could have offered an off-road motorcycle like the 250cc/350cc Bultaco Alpina. Companies without loyal followers may well shun bold novelties.

The Alpina series began as a unique hybrid. Originally a crossbred between a European enduro motorcycle and a genuine trials machine, the Alpina combined low weight, cat-quick steering, and slogger-power. Its two-stroke, single-cylinder engine had power from idling speeds straight to the 5,500-rpm redline. Exceedingly light, the engine could power the bike up a mountain-goat trail, and the fast steering heightened the bike's low-speed agility. Bultaco even engineered a stand-up riding position, à la trials, into the Alpina.

The Alpina's trials-bike characteristics work best in the woods of New England and the Middle West. There the bike's lightning responses allow a rider to pick his way through dense vegetation and pasty mud. Novices might find an Alpina a bit too nervous and over-reactive, though Bultaco experts can play the motorcycle like a fine instrument.

Later Alpina models have had some of their trials features screened out, thus moving the bike closer to the mainstream of European enduro design. Current models have sit-down saddles and slower steering. Nevertheless, the Alpina retains its singular hybrid character—much to the delight of Bultaco enthusiasts. Or anyone who wants to chug along in sure-footed splendor.



Spanish off-road machines have always had a graceful starkness. The Alpina has no gratuitous fripperies.

Kawasaki 175 F7

The Japanese manufacturers are master engine builders. In the power-plant department, the Japanese have repeatedly demonstrated their expertise.

Consider the Kawasaki 175 F7. This rotary-valve, two-stroke single generates an amazing spread of power. The 175cc engine is strong enough in its first 5,000 rpm so that easy-going riders can poke the bike along gently climbing trails. And if the innocent trail leads to a tough, spiky hill with an absolutely grim ascent, the F7-rider can charge the upgrade by spinning the 175cc engine to 8,000 rpm, tap-dancing through the five-speed gearbox, and slipping the clutch if necessary. The Kawasaki power-train can withstand the brutality of such a rough uphill thrash without self-destructing.

The strength of the engine extends beyond horsepower figures and the size of internal ball bearings. In many ways Kawasaki has tried to make the F7 engine as idiotproof as possible. Riders need not remember to close the gasoline tap. The petcock has a vacuum-controlled shut-off; when the engine stops, the tap closes. On the other end of the fuel-delivery system, another pressure-sensitive valve prevents raw gas from entering the crankcase should the bike flop down on its side. Pointless electronic ignition eliminates the vagaries of contract-breaker timing. The oil injection system lubricates the two-stroke engine automatically. The rider must only remember to fill up the oil tank from time to time.

The Kawasaki F7 engine has the character of a first-rate whipping boy—a great capacity for abuse, with little attention required.

The casual trail rider can plonk along easy pathways, paying scant attention to the affable F7, which makes no demands on the rider.

Honda XL-250

Long ago, four-stroke motorcycles became obsolete as first-string off-road bikes. Four-stroke thumpers—as they popped out of their shipping crates—emerged far too heavy and packed too little horsepower, especially when compared to good two-stroke enduro motorcycles. No matter. Honda wrote a success story with its XL-250, a 15-cubic-inch, four-valve single. How could that happen? Simple: most dual-purpose motorcycles roll up much of their mileage on hard-surfaced roads. And on- or off-road, the XL-250 engine is virtually unburstable.

Since 18 horsepower must propel the 300-pound XL-250, the Honda's straight-line performance, on or off the tarmac, can hardly be called dazzling. Those riders who want an agile, lightweight, rapid-fire off-roadster would immediately bypass the XL-250. The Honda thumper has a different orientation. It trades away much of its off-road capability for civility, reliability, and general street-worthiness.

For the pleasure rider who limits his activities to occasional jaunts into cow pastures and along well-defined trails, the XL-250 makes a good sunny-day companion. The willing little Honda has a broad band of power and a great capacity for high-rpm abuse.

Honda's XL-250 is essentially a short-excursion motorcycle which meets the needs of a vast number of enthusiasts. They like dual-purpose motorcycles, but these riders usually stay out of woods and deserts. So the XL-250's street orientation aligns nicely with owner preferences. When he does leave the asphalt byways and follows a meandering cow trail, the XL-250 rider wants a reliable, torquey, mild-mannered vehicle under him. And he gets just that.

Beginners love the Honda XL-250; it may not be a first-line enduro bike, but novice riders can't abuse it enough to break it.

Can-Am 250 Enduro

Motorcycles may qualify as experts' mounts for many different reasons. Some motorcycles require careful debugging by the owner in the first months of riding. Other bikes may handle so well that fun-day riders are simply unconscious of the machinery's excellence. Still other expert-only motorcycles quickly serve notice to less accomplished riders. The Can-Am 250 Enduro is such a machine.

Most off-road riders prefer engines which can slog along at low engine speeds like a tractor. Nervous, raspy engines (which have little low-speed torque but squirt with high-rpm horsepower) don't endear themselves to many off-road riders—save those expert practitioners who can use a bike with the Can-Am's power characteristics. The rotary-valve two-stroke really comes alive at 5,500 rpm and wields nearly 28 horsepower at 8,000 rpm. This steep power curve demands that the pilot be able to ride rough terrain quickly. So the 250cc Can-Am permits the fast men to go faster—and encourages others to try something else.

Built by the Austrian Rotax company, the Can-Am engine is an extraordinarily narrow rotary-valve design. Rotary induction normally leaves the carburetor huddled under a blister on one side of the engine case. Although rotary-valve induction is a very attractive way to extract a lot of horsepower from a two-stroke engine, the carburetor positioning makes the instrument very vulnerable in rough-and-tumble riding. The Can-Am unit sidesteps this problem with an ingenious ram-tunnel which allows the carburetor to be tucked in safely behind the engine.

The 250 Can-Am Enduro has other earmarks of an expert's motorcycle. Patient development work has produced truly superior front fork and rear suspension units. For those who want to fine-tune handling characteristics, Can-Am bikes have a system for changing the rake and trail of the front fork. It's just another clever feature engineered into this bright-idea motorcycle. And only the experts know how bright!

The Can-Am's gas tank and fenders are molded in polyethelene, which distorts under impact, then springs back to normal.

Rokon RT-340

Unique machines in motorcycling have often been bizarre contraptions. Great ideas expressed precisely in blueprints may fall apart when tested in the field. The American-made Rokon RT-340, however, sparkles with unique features that work.

The Rokon looks unconventional. Familiar spoked wheels have no place on the Rokon; cast magnesium alloy wheels carry the tires. Hydraulic disc brakes replace the normal drum-and-shoe stoppers. Powered by a 355cc snowmobile engine, the motorcycle starts with a rewinding pull-cord!

The most distinctive feature of the RT-340 is its "automatic transmission." The Rokon does not employ a conventional clutch and multi-speed transmission. The engine transmits power to a fixed-ratio gearbox by means of a variable-ratio primary drive. Two pulleys, which have

Cast wheels and snowmobile engine give the Rokon a unique appearance. Pulling the rewind cable starts the engine.

sides that move in and out, are joined by a V-belt. A system of centrifugal weights and springs in the engine pulley, and a spring-and-cam arrangement at the driven-pulley, permit the speed ratio to change according to engine rpm and rear-wheel traction.

Relieved of shifting, the rider can concentrate totally on the terrain. The Rokon is wonderfully controllable; the frame and suspension deserve much credit for the bike's stability and accuracy.

The variable-ratio drive gives the rider tremendous control of power. An erring pilot may charge up a hill, lose traction, and completely stop in mid-passage. With the Rokon he can turn the power back on again, and the bike will begin to march up the hill—no shifting, no clutch-burning, no engine-killing lurches.

The RT-340 Rokon may well be the harbinger of a new generation of "automatic" off-road machines. Unique motorcycles—with bright ideas that work—richly deserve imitation.

Yamaha DT-400B

Yamaha has devised an appealing compromise with their DT-400B. This 290-pound motorcycle carries all the equipment necessary for street riding, yet the bike has impressive credentials as an off-road mount. The big Yamaha can be tailored to almost any rider preference. Since the DT-400 costs 25 percent less than top-line enduro motorcycles, the demanding off-road enthusiast can afford to upgrade the machine to enduro-competition standards. But owners who occasionally pleasure-ride in rough terrain will find the DT-400B a satisfactory compromise as delivered.

More than anything else, the 397cc engine makes this Yamaha an outstanding machine. Barely churning above idling speed, the power comes flowing out of the reed-valve two-stroke. The Yamaha boasts a formidable torque curve. The low-speed chugging ability enables novice riders almost to forget about shifting, because the Yamaha will slog through sand, chug over ruts and rocks, and tractor up hills without much coaxing. The DT-400 will plow ahead if the engine is running anywhere between 2,000 and 6,000 rpm. The engine's power delivery and its smoothness make the DT-400 Japan's finest enduro engine.

The DT bike won't overwhelm beginners. Yamaha has built the DT-400 on the same general physical scale as 250 enduro motorcycles. Though the rider does pay a weight tax for the extra displacement, the 400cc engine delivers the kind of pulling power which 250cc engines can't produce. Even beginners who can stall broad-powered 250 enduro bikes will find it difficult to bog down and choke off the DT-400B.

Novice off-road riders love the way the DT-400 engine forgives errors. Experienced hands prize the engine as a solid starting point for an off-road special.

Enduro bikes, like the DT-400B, have great ground clearance; a strong bashplate protects the engine.

Maico 400 Qualifier

Only a hard-core devotee of off-road riding would own a Maico 400 Qualifier. It is a pure enduro motorcycle. Although the bike sports lights, muffler, and speedometer, the Maico barely tolerates such trappings. No fancy paint graces the Maico; the 387cc, single-cylinder two-stroke even lacks oil injection. Quality-control and detail-refinement, as practiced in Japan, seem unknown at the German Maico factory.

Maico owners receive something of a kit. The factory bolts all the pieces together in the form of a motorcycle. The enthusiastic owner must actually finish off the product—waterproofing with silicone-seal, and securing all nuts and bolts. The casual motorcyclist could never understand the Maico (or its stratospheric pricetag). But off-road experts really appreciate the German marvel. Why? Because the Maico 400 Qualifier is the best-handling and strongest-running enduro bike that money can buy.

The big piston-port two-stroke churns out steam-engine power. The Maico produces more torque over a greater range of engine speeds than anything in its class—without booster ports or reed-valves. The Qualifier is devoid of common frills in two-stroke engineering.

In all fundamental things, the basic Maico excels. Oil injection may be absent, but Maico constructs its frames with chrome-moly tubing. The 260-pound bike has the best front forks in off-road motorcycling, and the finest-handling chassis. Against such credentials, shoddy paintwork counts for little.

No Maico enthusiast would fritter his Qualifier away on the street. The machine belongs out in the rough where Maico's fabulous engine and running gear make the bike a sensation. Of such stuff are legends made.

A good enduro must be able to motorboat through shallow water without drowning out.