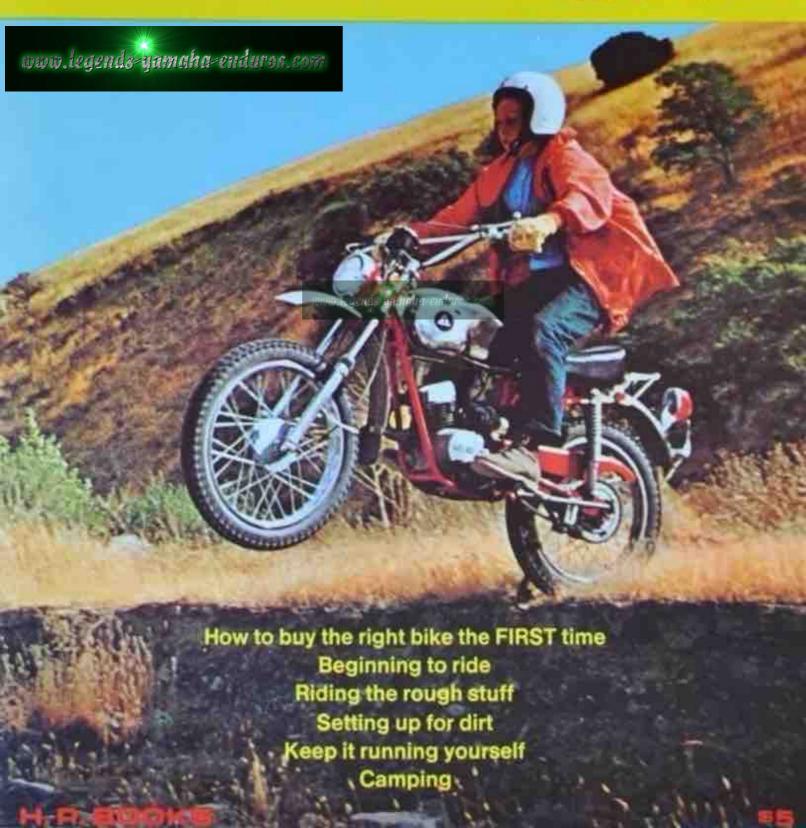
How to select, ride and maintain YOUR

TRAIL BIKE

By Doug Richmond



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How to select, ride and maintain
YOUR TRAIL BIKE by Doug Richmond

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Doug Richmond

Cover and text design

Bill Josh Young

Text and caption typography

Jo Janowski, Alice McCarty, Nancy Fisher

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Introduction



The author on one of his numerous longdistance trial rides. About 1500 miles through Mexico's back country on this one.

lmost anybody can be a trail rider.

I know rich ones and poor ones, hip ones and straight ones, professional men and working men, holy men and notso-holy men.

I know riders so fantastically skilled that even men who themselves are top-hand riders stop to watch them take the hill in back of the Richmond Ramblers' clubhouse, and I know men who fall on their heads riding 15 MPH down a fire road.

I know dirt riders who never throw a leg over a saddle unless there is a trophy in the offing . . . who spend most every week-day evening wrenching their bikes so they will be ready when the Sunday Wars resume. To the great disgust of their wives, girl friends and/or mistresses.

I know trail riders who glory in "classic" machines and spend every spare moment trying to coax their cranky engines to life or locating long-obsolete parts. To the intense disgust of their wives, girl friends and/or mistresses.

I know

hard-nosed dirt riders who are 11 years old and I know trail riders on the chill side of three-score and ten.

But all are bound by a tenuous thread composed of affection for fine-handling machinery. Reinforced with thrills and frights and hills that were too steep and water holes that were too deep and the sure and certain knowledge that there will yet be more hills and water and thrills and frights. Vulcanizéd by appreciation of the outdoors and the end of freeways and traffic cops and jobs and paper qualifications to be found far beyond the end of the four-wheeler's road.

This book

is dedicated to all trail riders, a few of whom I'm honored to call my friends.

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And this is a trail bike . . . a Bultaco Alpina.

What's A Trail Bike?

here's no official definition of a trail bike, so I'll take the bull by the bars and set forth my own — and this book's — idea on the subject:

A trail bike is a motorcycle with suspension and frame geometry designed specifically for off-pavement riding. Weighing less than 225 pounds, it is not designed or intended for competition events where speed is the determining factor. It is suitable for both experienced and inexperienced riders.

Or to put it another way, a trail bike is designed strictly for fun!

I'll admit this definition rules out the vast majority of motorcycles on the market peddled as "trail bikes," especially slightly reworked versions of standard street machines — the so-called "street and trail" machines.

One of Cycle Magazine's anonymous elves, writing in the January, 1971 issue, summed it up very neatly: "A combination street/trail machine requires design compromises that prevent it from being excellent for either purpose."

Not only

is it true that a motorcycle designed primarily for pavement can only be made to handle well in the dirt at the cost of extensive and expensive modifications, but it is equally true that a designed-from-the-ground-up off-road bike is totally unsuited for running errands around the village. And it is definitely inappropriate for fast riding on pavement. To put it bluntly, if it handles well on pavement it won't handle well on dirt. And vice versa. And the so-called "combination street/trail motorcycles" handle well in neither milieu.

I set the weight limitation to rule out the big, hairy cycles displacing over 250 cc's, as well as the overweight twofifties. Even though these are in many cases specifically and well-designed for offpavement riding, they are not generally thought of by enthusiasts as trail bikes, and neither are they too suitable for the inexperienced rider. Riding these machines can be a challenge to the highly skilled rider and a discouragement to the man just starting out trail riding, sort of like learning target shooting with a .45 Automatic. (All right, all right, Col. Charles Askins, Jr. learned with a .45 Auto, but he himself admitted it was doing it the hard way!)

One of the most popu-

lar bikes on the market, numerically speaking, is the so-called "trail bike" built something on the order of a girl's bicycle, step-through frame and all. The latest wrinkle is for these misfits to have an integral auxiliary transmission so the rider can change from "high" (low numerically) gear for pavement use to "low" (high numerically) range for off-road travel. Commonly, these things have severe rear weight bias, a huge luggage rack that the ads usually show packing murdered deer out of the boonies, and absolutely minimum fork travel. Rear suspension matches the fork.

It is impossible to spend very long standing on the corner of the main drag of just about any town in the U.S. without seeing a few of these things hauled by on either the front or back of a so-called recreational vehicle. Pickup-camper or trailer, that is. And this is just exactly where they belong. They are probably the easiest two-wheeler in the world to learn to ride poorly and so are fantastically popular with the Geritol set who use them to run errands around the organized campgrounds and for mild trips on well-manicured trails. This is because once the truck-camper or trailer is parked







And here is still another trail bike . . . a Bultaco 100cc Lobito.

on a site at an organized camp, the rig is moved only at the risk of being claimjumped. And thus, the "trail bike" comes into play for shopping, sightseeing and extremely mild and gentle trail riding while the camper or trailer is parked.

For plugging along on the street they're fairly practical, although so short of power that they are unable to accelerate out of a tight spot in traffic. The ability to speed out of danger is one very practical criterion of a good street machine and they handle so poorly that simply taking evasive action is pretty much out of the question. Although I have never been able to find any statistics on the subject, I believe these things are one of the most dangerous vehicles in the world when used on the street.

But it is as a bona fide trail machine that they're utterly hopeless, as befits a machine that can trace its immediate ancestry back to basic transportation devices for impoverished Japanese.

Their minimal fork travel, poor suspension units ("shocks") with little or no rebound damping and lousy frame geometry make them out and out hazardous for anything more demanding than

running smack dab down the center of a logging road in good condition.

I wound up with one of these abominations a few years ago in a trade and as I'd never ridden one — to an experienced rider they look like a rubber-tired joke — I ill-advisedly took it up into the Sierras on an easy trip over an old jeep road.

David and Danny Murray were along with minibikes and I made the mistake of trying to keep up with them . . . an exercise of poor judgment of the third magnitude as it turned out.

I was used to Bultaco suspension and handling and went so far as to forget what I was straddling. I turned up the wick on a moderately rough section in an effort to catch the fast-disappearing minibikes. At which time I carelessly rode down into a little gully that would have passed unnoticed on the 'Taco and discovered that, one, the suspension couldn't cope with it and, two, without a tank to grab with the knees there is nothing to keep the rider from going over the bars except the bars themselves. I won't say where the right handlebar caught me but two inches to the left and I'd have been singing soprano!

Almost exactly a year later I'm still feeling the twinges.

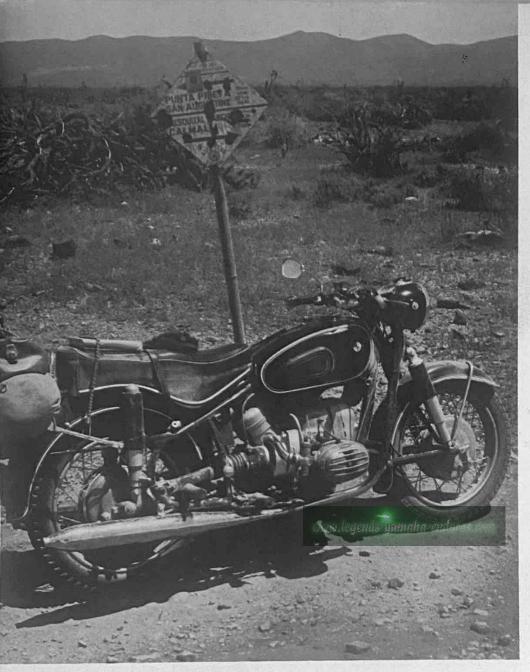
I will have nothing more to say about these clunks in this book.

Considering the popularity – growing popularity! – of trail bikes today, one would think they date from the first days of motorcycling, but actually it all started in the early 60's with the importation of the first Montessas. Greeves, Cottons, Bultacos and Maicos from Europe and the introduction of the American-designed, Japanese-built Hodaka.

Before this

a man who wanted to go dirt riding worked over his 650 Triumph or BSA. Or tried dirt riding with a 200 cc Triumph Mountain Cub. If he was a good mechanic, had a thorough grounding in frame design and got excellent advice from his friends—and was reasonably lucky—the result was passable. But the end result of the average Saturday mechanic's effort was something else again.

My own experience is typical. I first started using a motorcycle for off-road travel back in the late 30's. The bike was a typical huge, unwieldy, cumbersome, awkward flat-head Harley 74. To say there was room for improve-



Only a few years ago one had little choice in motorcycles for back-country riding. Early in 1966 I rode Baja on this BMW R-60. Needless to say, it is definitely and emphatically not a dirt bike!

ment in the suspension and handling would be to make the understatement of the year. It was heavy and clumsy and the bone-breaker suspension would tenderize the steak on the \$1.29 luncheon special. But it went where conventional fourwheeled vehicles wouldn't even start to go and did it ever so much faster than one could do it on a horse.

And if I remembered to park it on a hill - no problem in New Mexico - starting was no trouble of a morning and when I was ready to go I went! I didn't spend half the morning pursuing some wall-eyed jughead who delighted in hiding behind pinon bushes half his size.

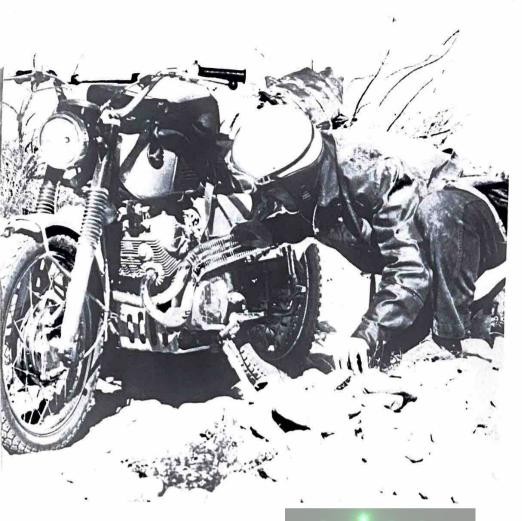
In the early 40's I sorta lost track of bikes what with assorted wars, insurrections, civil disturbances and marriages . . . not to mention Alaska and the Arctic and the Middle Pacific not being the best places in the world for cycle riding.

When I

returned to the Original 48 in the early 60's, motorcycles were just beginning to catch on and the manufacturers were building their first street/trail machines. They didn't show me much but I did try a Greeves and thought it was the perfect ma chine for back-country prowling - except I couldn't keep it running. It handled well, far and away better than anything I'd ever tried previously, and was wellnigh indestructible, but'the Villiers engin required constant mechanic-ing and it was obviously built for a man who regarded motorcycling more as an exercise in tinke ing than as a means of getting from Point A to Point B. In other words, it was to motorcycles as English sports cars are to the automotive field.

After a while I acquired a BMW R-60, at the time the standard cycle for the long-haul traveller. This is the motorcycle with the two cylinders sticking out on each side like something that fell off a 1936-model airplane, a gearbox that always goes "clunk!" when shifted fast, and a very high degree of reliability overall. I used it for camping up and down the coast on the crooked road that runs along the north coast of California - California 1 - and the many equally-crooked roads running between the coast and U.S. 101.

Then, influenced by the BMW ads that showed intrepid souls riding their BMW's through jungles and



The CL-160 Honda that I rode round trip through Baja on my second trip of the year 1966. Although not a trail bike by virtue of excessive weight and essentially street-derived, the Honda nevertheless was a great improvement over the BMW. Note my primitive luggage-carrying methods and armor-type riding jacket.

deserts in odd parts of the world, I made the mistake of tackling Baja California with it. And then I really admired those intrepid souls!

The handling on pavement with forks basically designed for sidehack use was nothing to write home about, but on roads made up of two narrow ruts in the dirt, this bike had to be ridden to be believed!

I unloaded off this black beast going uphill, downhill and on the flat. I turned it completely over and back up on its wheels once — the ignition key on a BMW lives in the top of the headlight and I put several long gravel marks on that key!

ignorance I figured this was just part of the game until down around El Arco a skinny kid caught up with me on a little Spanish two-stroke machine with about 20% of the Bee-Em's displacement. His tiny engine sounded like a mad bumblebee in a milk bottle.

We stopped to pass the time of day, then he rode off with a whoop and a holler and left me plugging along in his

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dust. The worst of it was that he was riding nice and easy and I was fighting my way along, doing my best. My best was about half his regular, easy-riding speed.

I assumed

it was the size as much as anything that gave him his go so I got rid of the Grosser Krautschwein immediately after I returned to the States and bought my one and only street/trail machine, a Honda CL-160.

a fantastic improvement over the BMW. I returned to Baja and only fell off 16 times or so on the round trip between Tijuana and La Paz. I made as good time as anyone ever had on a small machine — speaking displacement-wise — over those roads up until then. But it sure was rough, and

I was fighting the machine every inch of the way.

Next I was persuaded to try a little 100 cc Lobito, my first out-and-out, made-for-the-dirt bike and not just a street cycle with elevated exhaust pipe and lumpy tires. With this cycle I made even better time, didn't fall off very much and really started enjoying the trip instead of work-

ing my fanny off just getting down the pike.

The little Bul wasn't really a modern machine by today's lights. Although it had well-damped forks with 6-inch or so movement it still had itty-bitty wheels and a short-coupled frame that made it dead easy to swap ends on a gravelly curve. But the handling was so vastly superior to what I'd begun to think was proper and normal motorcycle handling that I went out and got another Bultaco when the original Lobito began to get a little long in the tooth . . . this time a 250 Matador.

I rode the Matador round-trip through Baja, plus a lot of other places in the Sierra Nevada and Sierra Juarez mountains. But it was terrible heavy when it had to be horsed out of a mudhole or a sandy wash.

From the Matador I went back down the scale to the newly developed 125 Lobito Trail. This bike had the handling I'd come to expect and at 190 pounds was light enough to be manhandled out of a bog or a rut without



As I said - trail riders can be any age.

Pappy Ford's sign at the entrance of Carnegie Cycle Park near Livermore, California. Truer words were never written!

risking instant hernia. As *all* boondocking motorcycles have to be manhandled *sooner or later* if they're being ridden hard in rough country.

Next was the Lobito 125 Mark IV, pretty much like the Lobito Trail except it had been beefed up and was more of a junior-grade Matador. With the beefing up had come an unwelcome increase in weight to around 220 pounds but in nearly all respects it was an improvement on a fine design. There was more power and more ground clearance so the increased weight did not directly translate into more work in the getting unstuck department.

I still have the Lobito but I also have one of the new Bultaco Alpinas.

The Alpina

is a super trail bike with trials overtones. It is a 250 cc machine that weighs 217 pounds. The engine is specially modified for wide power band and the gas tank is narrow which makes it practical to throw from side to side beneath the rider a la trials.

The Alpina is absolutely superb in the



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kind of going that requires careful handling at slow speed such as through rocky creek beds and along steep, rutty, crooked trails in the mountains. But for fast riding in fairly open going it is not as handy as the Lobito.

It sounds like I went through a lot of bikes but in most cases I rode the machines over 2000 off-pavement miles . . . some of them a good deal more. Not one of them broke down or required much in the way of repairs.

With the modern lightweight dirt bikes, the rider's bull strength has largely been supplanted by skill and finesse and age, sex or physical condition are no longer as important as was the case when "dirt" motorcycles tipped the beam in the 400 to 500 pound bracket.

Take the case of young Danny Mac Murray. Like most kids, he had ridden a minibike a little but this did not prevent him from dreaming about riding Baja on a motorcycle.

He read

everything he could find on the area and almost memorized the Gerhard and Gulick Guidebook. He knew I was due to make a vacation ride to La Paz and pestered me for a chance to go until I finally and with exasperation said, "All right, you can ride along with me if you get a bike and if your mother gives her OK." I thought that was the end of the matter.

The result was foreseeable and illustrates how easy it is for grown-ups to underestimate the determination of children. Somehow he promoted a 125 Lobito Trail of his own. And his mother's reluctant blessing.

He lives in the downtown part of Oakland, California and in California kids too young for driver's licenses do not ride around the city streets. Period.

So he cajoled his mother into taking him and his bike in a borrowed pickup to the Richmond Ramblers' riding grounds in Richmond, California, where the ground is steep and tricky to ride. He put in a couple of hours learning the controls of the bike and that was the extent of his riding experience when we headed south from Bahia San Quintin early one

Rider illustrates difficulty of hill riding with a step-through 'trail bike.' Front wheel hit a little knoll and up! she came. Note lack of helmet.

sunny morning.

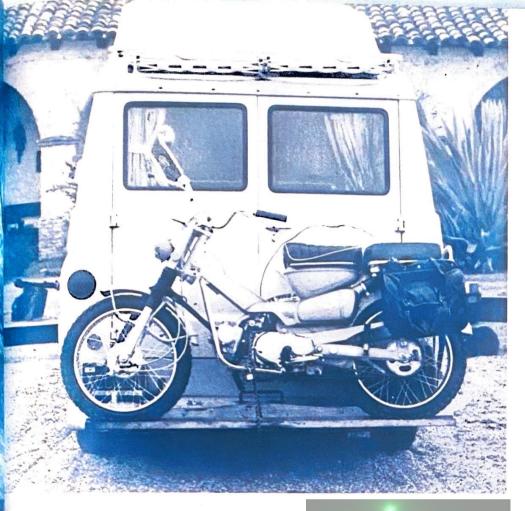
I don't know how many times he fell off on the way to La Paz, but it must have been 10 or 15 times the first day alone. Each day, though, saw him riding a little better and a little faster and he was doing so well on the return trip that we decided to detour the "good road" south of Sta. Rosalia and take the long cut by way of La Purisima over a road pretty much untouched by machinery. The only repair work is done by volunteer road workers, unpaid except for the gifts of passers-by. Traffic is no problem at all.

He did fine on the return half of the trip — I think he only fell off three times north of El Arco, once when he lost it on a reverse-camber curve where the bedrock was overlaid with about 1/4-inch of pea gravel. Another time he ran into a dust-filled chuckhole (locally called "pozo") in the center of the road and lost control when his feet left the foot pegs. The third time was right in the town of El Rosario Arriba when one of the local mongrels ran about a hundred yards to attempt suicide under his wheels.

At the time Danny was 11 years old, about 5 feet tall, and I doubt if he weighed 100 pounds soaking wet.

Age one way or the other is by no means a handicap for certain forms of quite strenuous competition. Offhand I'd say the average age of Enduro riders must be about 45, but if someone claims 55 or so I won't dispute him! This takes into account the fact that some really hard-





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How about bumper carriers? - There are carriers which allow hanging a trail bike onto the rear of your automobile. I hesitated picturing one of these because they do create problems. Your car was not designed to support an extra 200 pounds or so cantilevered behind the bumper. When this amount of weight is hung back there the car takes on a tail-dragging aspect, giving an illegal tilt skyward for the headlights. Oncoming motorists and the highway patrol are sure to be unappreciative of your super-high beams. And the weight increases the car's tendency to bottom on the kind of roads your likely to find in search of new trails to ride. However, if you cannot use a pickup, van or trailer. . . a bumper carrier may have to be your answer to the transportation problem. If that's the way it all works out, be sure to install overload springs or air-suspended shocks on the rear so you can level the car when the bike is loaded.

Although these are very popular with the Geritol set for put-putting around organized camp grounds, I do not regard them as trail bikes...

nosed Enduro riders can barely see over the handlebars of their machines when they're standing on the ground beside it. And I know Trials riders who started their careers in Blighty over 30 years ago and are still going strong.

Actually trail riding, even in fairly rough country, does not necessarily require a good deal of physical exertion or stamina. Riding is mostly a case of sitting on a machine and letting the motor do the work where the going is easy. Where it isn't easy, one changes from a sitting to a standing position and the motor still puts forth most of the effort.

The standing will get a guy in the legs in short order but there is no rule in the book saying a man can't stop for a blow now and then — even if for one's ego's sake it is excused as "taking a break to admire the scenery."

As riding skill increases one is able to spend more time sitting and less time standing. If a rider finds himself horsing the bike around with his feet on the ground much of the time, the terrain is too much for his abilities or he's using the wrong technique. In dirt riding the basic rule is to keep the feet on the pegs as much as possible and every time a Number Ten is planted on the ground it adds to the basic effort involved in motorcycling.

I've ridden many times with riders who "dabbed" continually, even where there was no earthly reason for it. It seems to be something that one does out of habit – and poor habit at that.



Selecting Your First Bike

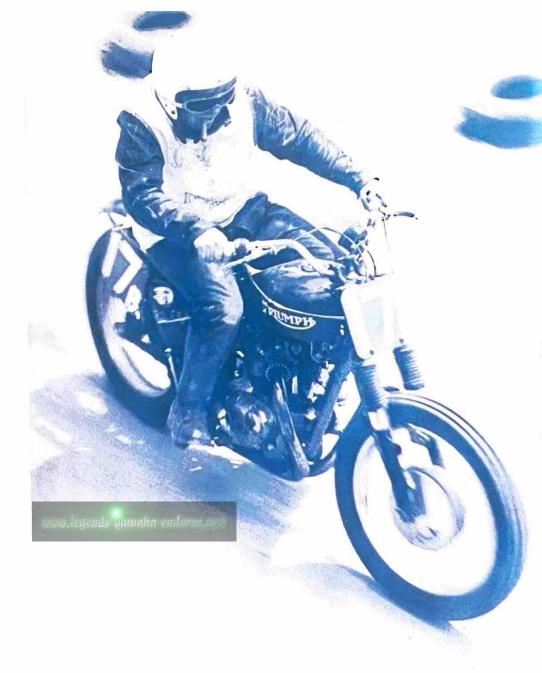
to which you intend putting the machine pretty well determines the cycle you should buy although finances, prejudice and dreams play quite a part also.

The choice is dead easy for the man who has been to a few Moto-crosses and has his heart set on becoming another Joel Robert. Or who has been reading about Dave Ekins and Paul Hunt and their winning ways at Enduros and just has to get on his own two wheels to see for himself if those guys are all that hard to beat (they are!). All he has to do is go to a few events and observe what bikes are most popular with the front-running Novice competitors, go down and buy a machine similar to the ones they are using from the same dealer they patronize and all will most likely be well.

The reason for using the Novices as criterions and not Experts is that the equipment Experts run is not necessarily best for beginners. This presumes Novices are permitted the same equipment as the experts — sometimes they aren't. In fact, the Experts in big-time competition are usually running machinery that isn't available to the general public.

I emphasized the dealer aspect because an awful lot of motorcycle dealers are emphatically disinterested in any and all kinds of competition riding and would rather sell street machines to police departments or blueprint shaggers. There is a sound business basis for this — the competition riders tend to be much more knowledgeable than cops and delivery boys and have the deplorable habit of hollering to high heaven when bilked.

But for most of us the choice is a little more difficult by virtue of the fact that we have no earthly desire to emulate Robert or Ekins. All we really want to do is get a machine that we can ride out in the hills or swamps or deserts of a weekend, a machine not too demanding of skill or mechanical ability, a machine that we can ride rather than monkey-wrench.



In years past we used to use machines like this for trail riding. No fooling! Here Don Brumbelow does his thing in a TT event at Richmond, California, 1967.



One of the great pleasures of trail riding is the good people one meets along the way. Knobby and Doc take a break near Uncle Tom's Cabin, California.

Although one wouldn't realize it from reading the bike magazines, this is precisely what most riders use their cycles for. And the trail-bike manufacturers have responded nobly with sturdy, tractable machines with superb suspensions that enable the newcomer to the sport to cover a maximum amount of ground with a minimum amount of skill.

Most of these little workhorses are very close kin to the Enduro machines rather than to Motocross or Trials irons. This means that dependability has been placed ahead of speed — and slow-speed handling has been placed somewhat behind that of out-and-out Trials bikes.

Motorcycle engines come in two basic varieties — two-cycle and four-cycle. In a nutshell, two-cycle engines have one power stroke per cylinder per revolution of the crankshaft and four-cycles fire every other revolution.

There's a great deal of argument among motorcyclists as to the respective merits of two-cycle versus four-cycle but the discussions are marked by more heat and prejudice than knowledge and light. To keep you from falling into this trap I'll briefly set



This hapless rider attempted to ride a moderately tough enduro with a heavy street-derived machine. Illustrates 'high pipes do not a dirt machine make.' Unposed photograph at the 1971 Jackhammer Enduro west of Maxwell, California.

forth the basic pros and cons of the matter. I've used and now own both types of engines and I'll delineate the basic differences.

In recent years there has been a great deal of development work on small-capacity two-cycle engines by motorcycle manufacturers throughout the world. The two-cycle offers high power-to-weight ratio, manufacturing simplicity (no gears, poppet valves, cams, oil pumps, etc.) and is ideal for a company without sophisticated manufacturing resources. Maintenance is fairly easy.

On the debit side of the ledger is the high fuel consumption as compared to four-strokes because some of the incoming fuel/air charge usually escapes out the exhaust port before the piston can cover it. They require more maintenance than four-cycles although admittedly most of the maintenance is confined to spark plug swapping. Compression braking on the over-run is minimal, almost like the old-time free-wheeling so highly touted by car manufacturers in the 30's although a "compression release" not only restores the braking effect but confers other boons as well. And temperament increases much more rapidly than

power output as the bike is "tuned" for added performance.

I think everyone who has ever been to an outboard race or a motorcycle race can remember the poor devils who got left at the post frantically trying to get the fire lit in their super-hot two-strokes!

Some people regard the oiland-gas-mixing operation — I don't know
offhand of a true dirt bike that uses oil
injection at the present time like street
two-strokes — as an unmitigated nuisance.
But on the plus side one can't run out of
engine oil by forgetting to check the
crankcase before starting out. It has the
virtue of simplicity in that there are no
sophisticated oil pumps and complicated
linkages to get out of whack. And the
machine can be run in any position without incurring lubrication problems, sometimes an important consideration.

In a dirt bike, dependability is important. It is worth noting that when a party of eight of us made an easy Thanksgiving ride in Baja the only bike that blew was a Yamaha that had an oil-pump failure. Believe me, when a two-stroke runs out of oil and is run until the machine locks up it is usually im-

possible to effect trailside repairs!

Four-cycles are more expensive to build because they have several times as many moving parts as a two-stroke. However, they are less temperamental on the average (although anyone who has ever ridden a 500 or 600 cc "thumper" will have honest cause to debate this statement!), use less oil until they are badly worn and long past due for an overhaul, and are nowhere near as hard on spark plugs. They are capable of great power output and in the smaller sizes, especially, they regularly turn much faster than two-cycles. Reliability is high. And they're far heavier than an equivalentsize two-stroke. They don't have to be all that much heavier, really, but they are.

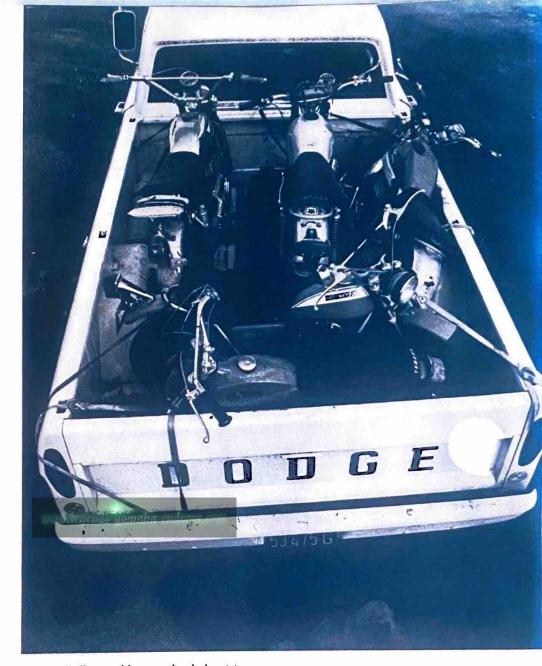
When you come right down to it there is no flat, unequivocal answer to the question, "Which is better, a four-cycle or a two-cycle engine?" Perhaps that is the reason so many companies in the motorcycle field make both types — Royal Enfield, BSA, Kawasaki, Yamaha and Harley-Davidson are a few that come to mind.

Trail-bike manufacturers have pretty well resolved the question of two-cycle versus four-cycle because all the bona-fide trail bikes within the scope of this book are currently equipped with single-cylinder, two-cycle engines — with the shining exception of the Honda SL-70 mini-cycle.

Basically there are three types of off-road competition and all modern trail bikes are either derived from or closely related to one or the other.

Let's take them in order of increasing speed and start with a

Trials Machine - When we say "Trials" in this country we are usually referring to the "English Trials" in which speed does not play a part. An English Trials consists of a number of short "observed sections" over which the rider must pass without putting a foot down ("dabbing"), killing the engine, falling off or crossing the boundary of the section. Committing any of these sins will result in the observer penalizing the rider. As you can see, the basic idea is simple but in practice it is something else again. The observed sections are cunningly laid out over logs, in and out of ravines, along grassy sidehills, through bogs and other impediments to forward progress.



Nearly all dirt machines are hauled out to the jumping-off place. I prefer a pickup for the job — here I have three full-sized cycles and a pair of mini-cycles with room left over for camping gear.



An Enduro rider all suited up in his British Trials Outfit awaiting his turn in a Cowbell Enduro of a few years ago. The suits haven't changed any since. Neither age nor physical disabilities are regarded as handicaps by dyed-in-the-wool Enduro riders. This contestant rearranged his controls to compensate for a bad arm.



A good turn of speed in an enduro machine is a great asset so that one can make up time on easy stretches like this.

One has all the time in the world to ride from one observed section to another but even that isn't simple. I once rolled a Sherpa-T end-over-end for quite a distance down a log-strewn hill while going from one section to another. The worst thing about this fiasco was that it was a borrowed bike. The owner was notably cool for quite some time afterward...

So much emphasis is put on slowspeed balancing in a Trials it follows that a Trials "iron" has developed into a rather specialized breed.

Because a motorcycle can best be balanced in a standing position, the bike is designed to be ridden that way. The tank is narrow to facilitate shifting the bike from side to side beneath the rider and the foot pegs are rear-set both for comfort and as an aid to "lofting," the trick of using balance and power to lift the front wheel over an obstruction. Riding in the sitting position is not a normal part of getting over an observed section, therefore scant attention is paid to a comfortable seat. Distances are not great so fuel tanks are small.

The front wheel may almost be turned to right angles to

the fore and aft center line of the frame. There is less rake and trail than on a normal cycle because self-centering action is of no importance whatsoever to a man riding ten miles an hour through a rock pile. Also, the less rake and trail a bike has, the sharper it will turn — all other things being equal.

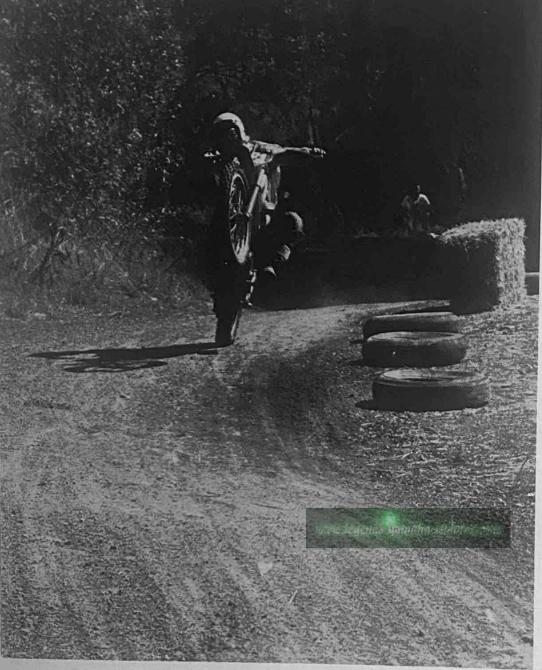
As a Trials iron must have extremely good engine response at low speed and an extremely wide power band, the flywheels usually have extra weight added as compared to a "regular" dirt bike (the Ossa people call their trialer "The Plonker"). To eliminate chain snatch and to provide for the swing arm's long travel many trials irons have chain tensioners on the rear chain.

Because control is enhanced by having the tires on the ground as much as possible, suspension is usually very soft — "if a trials machine doesn't bottom once in a while the suspension is too stiff" — and has very long travel both in the forks and in the rear suspension.

Although the above design criteria would seem to rule out a trialer for any other use, they are actually quite a lot of fun to potter around with as a generalduty trail bike. And a few riders have fitted them with larger-capacity tanks and used them with considerable success in endures.

Enduro Machine - An Enduro is a competition in which the contestant attempts to ride a marked course at a pre-determined rate, usually 24 miles per hour. In this it resembles those exercises in computer operation the sporty-car set calls "rallies," but there is one great difference. The course is likely to be over some of the roughest, toughest terrain imaginable, ground which may even be difficult to walk over. There are numerous checkpoints along the way, often several secret checks, and a rider loses points for being ahead or behind time. And if he is more than an hour late at any checkpoint, a rider is disqualified.

Because an Enduro is usually laid out in back country some distance from roads over which a disabled bike may be hauled, it is vitally important that an Enduro bike be dependable. A breakdown not only means losing all chance for a trophy — it may also mean hours upon hours of hard, sweaty, miserable manual labor getting the motorcycle out of the boonies.



Scene from a rough scrambles event demonstrates fantastic handling capabilities of the modern moto-cross bike.

Although the speed is normally only 24 mph, an Enduro machine has to be capable of a good turn of speed to make up for those places where one can only ride at 4 or 5 mph. Or to make up for the time lost horsing the bike out of a mudhole or righting things after a header in a sandy wash. Or, worst of all, the time lost waiting for a bunch of jerks to sort themselves out on a one-trail hill.

Enduro machine has to be extremely sturdy because back-country riding is really rough on rolling stock. An Enduro rider expects to drop over cut banks, run into logs that are impossible to ride over, hook handlebars on saplings, and run into trees. He *tries* to *avoid* doing these things but he by no means gives up when one or more of them happen. Translation: An Enduro bike has to be tough and it helps a good deal if the rider is, too!

The third type of dirt competition equipment is Moto-Cross Machine - A Moto-cross is an out-and-out race run over uncurried ground in "heats" or "motos," usually of 30-minutes duration. Generally there are three motos to a race with the riders awarded points for each moto. The winner of the event is determined by total score. Extremely popular in Europe, it is catching on by leaps and bounds in the United States. Because it is a race the machinery is highly specialized, extremely sophisticated and, in the professional classes, totally unlike what is available to the general public.

Some factories sell the same machinery they race, and especially in the Novice Amateur classes the rider can buy competitive machinery right off the floor. Although these machines meet the requirements of weight and displacement to be called a Trail bike, they are equipped with high-output engines with relatively narrow power bands and are not actually very suitable for general-purpose trail riding.

Frame geometry and suspension, too, are less than ideal for trail riding because all emphasis is placed on high-speed handling characteristics.

"rough scrambles" is essentially the same as a Moto-cross except for the method of scoring.

There is a fourth type of dirt competition, the



Typical moto-cross scene. A few years ago moto-cross was extremely rare in the United States, but interest has been growing by leaps and bounds during recent years. European riders still dominate the sport and it is doubtful if the Yanks will be able to hold their own in the foreseeable future.

TT, Smooth Scrambles or Tourist Trophy In the United States these events are run on smooth, hard-packed earth. In Europe a TT is a road race run over public highways.

While it is true that some Moto-cross machines can give a fairly good account of themselves in a TT in the States, the fact is that the smooth, packed earth is more like pavement in handling requirements than it is trail riding or other types of dirt competition.

This is the type of event the "street scramblers" are ostensibly intended to run, but actually it has been years since a man could ride his bike to the track, pull off the lights and have a go, then replace the lights and ride home. Essentially, successful TT scramblers may have their origins in street machines, but a competitive scrambler is as highly specialized as any bike in racing. And they do not influence trail-bike design to any great extent.

Although most successful trail bikes are strongly influenced by the more popular forms of competition — the Trials, Enduro and Moto-cross — this influence is seldom as overt as you would reasonably expect. That is, one manufacturer's bona fide dirt machine may be almost a trialer, with great lugging power, steep fork rake and somewhat back-set foot pegs. And his customers will rave about the great handling in really rough going.

Another manufacturer will produce a general-purpose trail bike that leans a bit toward the Moto-cross, with great power output, fairly narrow torque band, somewhat low in lugging power but capable of very high speeds over the kind of ground one has trouble walking over. And his customers will rave about their bikes' abilities to hustle down fire roads and desert trails.

To a casual kes may look pretty much

glance the bikes may look pretty much alike. Both will be single-cylinder machines with lots of fork movement, nearly identical rear-suspension units, about the same seat height and only a slight difference in riding position. But ride the two bikes across an open field a time or two and the differences between them will be as plainly apparent as elephant tracks in fresh snow.

Unfortunately, the manufacturers themselves can't agree on which way to go and are continually juggling the specifications of their machines so I can give no specific recommendations that would be valid six months from now. Talk to the fellows that ride the various models and it won't take you long to read between the lines — you have to allow a bit for the owner's natural partiality toward his own bike!

Take Bultaco's
Lobitos as a case in point. The 125 Lobito Danny Mac Murray rode through Baja
was for all intents and purposes an allaround trail bike with Enduro antecedents.



Leader in a rough scrambles has both wheels off the ground. Speed here is around 60 mph.

Bike weight — the bike should be no heavier than the rider can pick up when he is very tired. This is essential to prevent a rider — especially a very young one — from getting into deep trouble if he happens to fall off out of sight of the others he has been riding with. Riding alone is never a good idea from a safety standpoint, but we all know that there are times when cyclists do get off — and fall off — when they are all by their lonesomes.

It had good lugging power, fine low-speed handling and a muffler that kept it from making a nuisance of itself on long rides.

My current Lobito Mark IV is something else again. It has considerably more horsepower, quite a bit less lugging ability and more top speed than Danny's Lobito. It also has Matador forks, a larger gas tank and an expansion chamber that will make your ears ring at 40 rods. In the process it has gained 30 pounds and a great deal of sturdiness. It is still a fine trail bike but the trails are long, fast, not-too-rough Baja roads rather than hilly, twisty forest trails.

The weight given in the pretty brochures describing a motorcycle doesn't necessarily have any direct bearing on reality. Weight and horsepower ratings are both functions of the advertising departments and not of the engineering people. This applies to automobile as well as motorcycle manufacturers.

A careful reader of "road tests" in the cycle magazines will discover various weights given for the same machine. Some magazines don't actually weigh the machines under discussion but depend on the builders' brochures for their "data." Others weigh the machines dry, that is, without lubrication or fuel. Still others weigh the bikes full of fuel and lubricating oil (which in some cases can't be totally removed without disassembling the bike anyway). And a few magazines weigh the machines as tested to include the rider's weight. In other words, there is no industry-wide method of ascertaining the weight of a motorcycle.

Me? I weigh 'em without fuel but otherwise serviced and ready to go.

companies build a number of models so they can reasonably expect to have at least one bike in their line to match the customer's tastes. If the riding reality turns out to be somewhat different from his expectations, then he would likely have to change machines to bring his equipment in line with his interests.

Hodaka has taken a somewhat different tack — one which goes far to explain the popularity of their basic 100 cc machine. From 1964–72 they built just one motorcycle, a bike ideal for the beginner or the rider who

just likes to ride and is totally disinterested in competition in any form. As the rider's skill increases and his interests become channelled into a specific type of riding — whether trials or even road racing — Hodaka is there with neatly printed instructions and parts lists to make the conversion from basic red to special-purpose finery.

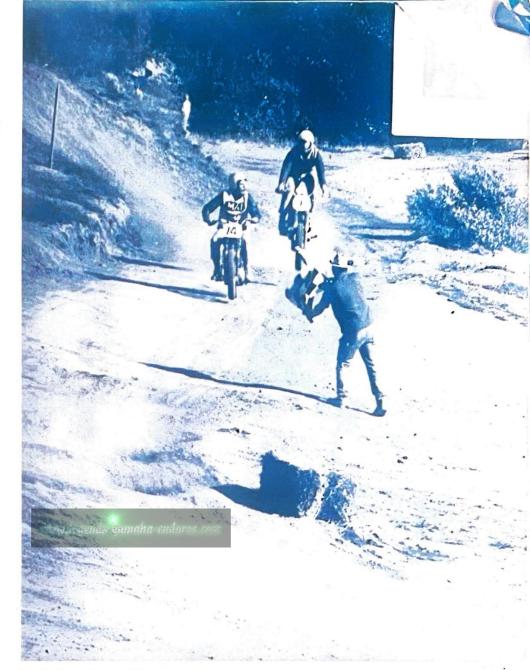
Actually there are three Hodakas as this book goes to press: the basic 100B and the Super Rat, a factory-made go-fast version of the 100B. And, if one has a 100B, converting it to a Super Rat is no sweat. The third Hodaka came on the scene in mid-1972 — the Wombat 125 cc. In addition to a larger bore and detailed engine refinements, it features frame and suspension modifications for improved handling. Weighs just 208 pounds with all the improvements.

I have known Hodaka riders who were afflicted with chronic shorts and who only owned one bike. They made it a true all-purpose cycle, riding TT's in the summer and Enduros in the winter by simply making the appropriate modifications to their Hodakas come fall and spring. And because they knew the cycle thoroughly — inside and out, stem-to-stern, its strengths and weaknesses — they were by no means under a handicap when competing with riders of built-for-a-specific-purpose cycles.

Actually, most "trail bikes" on the market are no such thing nor are they intended as such. They're made by large manufacturers of street machines who are attempting to cash in on a segment of the market developed by and catered to by a number of small specialty manufacturers who — with the sole shining exception mentioned above — are located in Europe.

The situation in motorcycles has a close parallel in automobiles. The large companies make imitation sports cars with fancy names and "rallye stripes" (Mustang, et al.,) and a few small manufacturers build the pure quill (Porsche, Ferrari, Lotus to name a few).

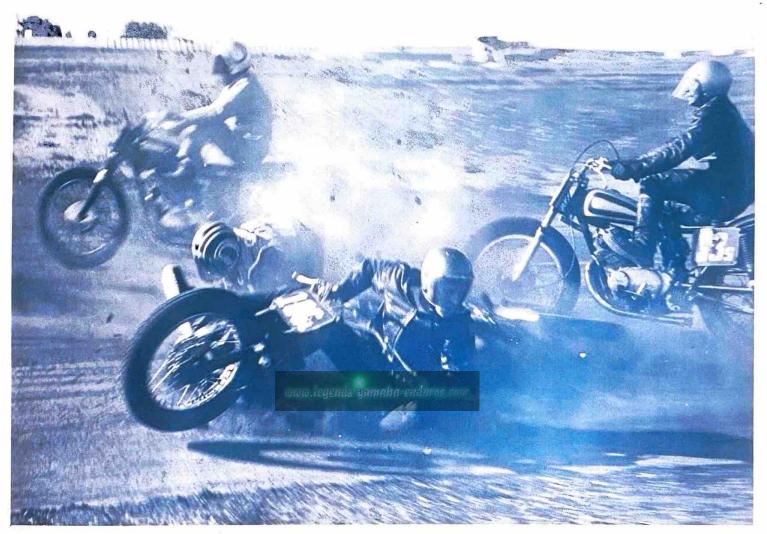
A little careful, educated, between-the-lines reading in the bike magazines will give the tip-off. Take the Yamaha DT-1, touted in the advertisements as a dirt machine. Doug Schwerma's ad in Cycle for a fork damper kit says "it is the most important single change you



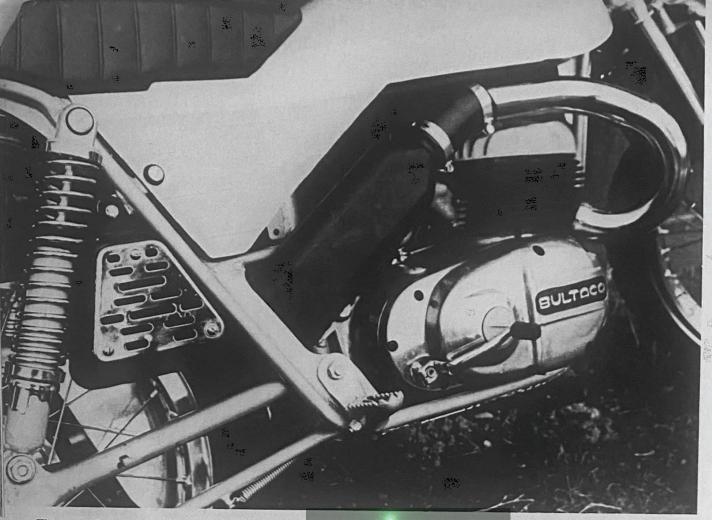
Typical rough scrambles scene at Richmond Ramblers Track at Richmond, California within sight of downtown San Francisco.



Rider doing his yoga exercises in a TT event at Fremont, California illustrates that when a rider speaks of going on his head — he means exactly what he says. In all forms of motorcycling — particularly competition riding — crashes are to be expected. They almost always look horrible, but seldom result in injury. Although this rider made a spectacular landing smack dab on his melon, his helmet and leathers brought him through uninjured. A couple of minutes after this shot was made he came over to ask for a print of the crash!



Because TT races are held on fairly smooth, hard tracks, it follows that speeds are quite high. And when a rider goes down it is usually impossible for the others to miss him. Note up-raised feet of the riders in the background. Rider in foreground is Greg Hodges (106L) with Ken Dalla (63S) at right on Honda.



The extensive and sophisticated muffling on the Alpina.

www.legends-yamgha-enduros.com

can make to improve Yamaha handling." You can wager your bottom dollar that if the need weren't there for improved handling on this supposedly ready-for-the-boonies cycle the very astute Schwerma wouldn't have troubled himself to devise and market a kit.

To the best of my knowledge, there are no handling kits available for DKW, OSSA, Penton, Bultaco, Montessa, Greeves, Husqvarna, Maico or any of the other genuine dirt bikes!

So, the first rule in selecting a bike is: Read the accessory people's ads with the certain knowledge that any accessory sold to improve handling or performance only serves to point up deficiencies in the basic machine.

As explained above, this does not apply to Hodaka.

By the time this book appears, it will probably be impossible to buy an unmuffled motor-

cycle, new, in the United States. This action is the result of the only really concerted effort in the history of the motorcycle industry in the U.S. — aided by a few state laws with sharp teeth — and an amazing thing it is when one considers that for the bigger part of a century noisy cycles were about all that were sold. In fact, to all intents and purposes the word "motorcycle" is synonymous with "noise" in the minds of the non-riding and long-suffering public.

And people got heartily sick and tired of the assault on their eardrums — through their local authorities they began to clamp down.

Southern California is the premier cycle market in the U.S., and although the cycle industry had pretty much ignored the rumblings of discontent from other portions of the country, they really sat up and took notice when first one and then another county in SoCal

passed laws aimed at restricting riding.

As always,

the cash register speaks louder than words. When the cycle industry discovered their potential customers wouldn't plunk down their hard-earned for bikes if they had nowhere to ride, the reaction was immediate and intense, starting with the "Less Sound-More Ground" campaign. But, of course, there were a lot of noisy bikes in the pipeline and the manufacturers and dealers wouldn't extend themselves to fit mufflers — of which there is an everwidening choice — at some slight expense to themselves. So to foist these uncouth machines off on the public the cut-off date was extended to January 1, 1972.

Actually

it was mostly the dirt-bike manufacturers who had to wake up. The Japanese, who make the bulk of the street machines, had long since seen the handwriting on the wall and had sold only well-muffled bikes



If you're going to be riding on public land or anywhere that spark arrestors are required, make sure your new bike comes ready-fitted with a USDA-approved arrestor in addition to the muffler. This one is on a Hodaka B.

for years (with the exception of a very few machines with dirt-bike pretensions but these were actually quite detuned and were not all that noisy). Unfortunately, Japanese dirt bikes are as rare as natural blondes in El Salvador and it was the pursang (no pun intended!) dirt and competition riders who caused most of the uproar—along with the oafs who took their new Japanese bikes home and proceeded to vandalize their silencing under the impression that riding a noisy nuisance improves their masculinity or something.

So point

two in selecting a bike is: *Insist* on a quiet machine. As a last resort buy a muffler and install it yourself but by my lights this is definitely a vendor's responsibility.

There are definite styles in dirt bikes as opposed to the more practical considerations. In some regions it is quite the thing to court the off-road "image" by removing all lighting — the motorcycle equivalent of the sporty-car set's ersatz "rallye stripes." In my book this is a definite don't for a couple of reasons which I consider good and sufficient.

The first is that a dirt rider who hasn't been caught out in the dark a time or two is a rider who either hasn't done much riding or who never gets out of camp. And riding an unfamiliar route — even a fairly good road — in the pitchy dark can be damned scary at best, and at worst can result in bumps and contusions galore.

The second reason is that by their very nature cycles aren't very visible. This goes double in the woods and boonies where bike and rider are liable to be covered by dust and generally camouflaged. If there is even a slight chance of another vehicle being in the area, I make it a point to ride with the headlight on. Translation: I mostly ride

with the headlight on. The very thought of a head-to-head collision with a jeep or a dune buggy or even another cyclist gives me the jim-jams.

The third reason, applying to only a few riders, is that certain types of competition, notably Enduros, are more and more requiring full street equipment as a condition of entry. That is, they require it at the start — woods riding being what it is a lot of the bikes finish the run with lights that won't work.

Some dealers

will swear that the mount of your choice is not equipped for lighting, therefore none is provided. This is especially true of Trials irons but if you will stand pat, the dealer will usually "remember" that the lighting equipment came unattached and all neatly packed in a separate cardboard box.

Insist on full lighting equipment, even if you're dead certain you won't be



Test ride should be as near as possible to the type of riding you'll be doing.

riding in the dark or in Enduros.

Before handing over your hard-earned and taking delivery on your new scooter, make absolutely sure that the dealer has done his set-up work properly. Examine the bike carefully, inch-by-inch, for loose and dangling wires, floppy cables that should have been Ty-rapped, oil leaks. Check to see that the clutch has been adjusted properly, brakes, ditto, and that the wheels are correctly aligned. Look for everything wrong that can possibly be spotted short of a complete tear-down and/or a 500-mile trip. Even lighting: Don't be satisfied just to have a headlight and taillight - make sure they work! And make

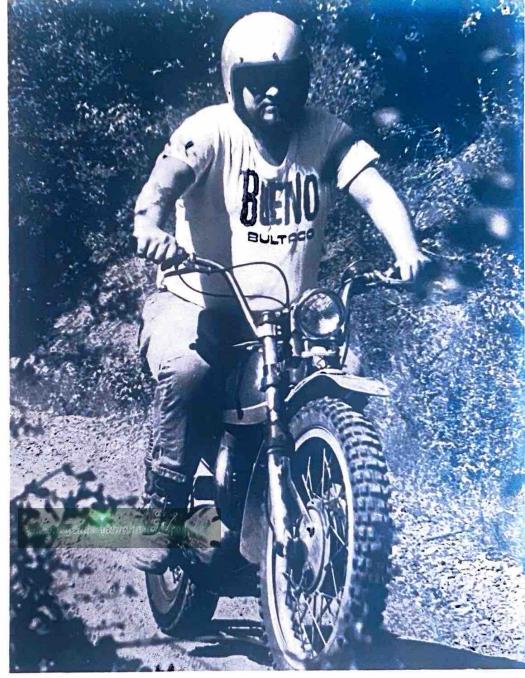
sure the bike meets the maker's specifications. A number of Lobito Mark IV Trails were assembled at the factory with 54-tooth rear sprockets instead of the 64-tooth jobbies called for in the printed specifications. A 10-tooth difference makes a fantastic difference in the performance of a cycle! With a 54-tooth sprocket, the extremely lively and fine-performing Lobito Four is an absolute dog. It won't climb a curb in low gear without running short of steam and the acceleration is about equal to a 1920 Locomobile Saloon.

Fortunately, I caught the discrepancy and my dealer, Sonny Kenyon, fitted the correct sprocket promptly, cheerfully and without comment although I was apparently the first to call it to his attention.

But when

my friend Don Hamilton bought a 175 Lobito (because I persuaded him it was one of the best all-around trail bikes going for his type of riding) and had trouble in the performance department, he took it back to his dealer. He was blandly informed that it was too bad but the bike had been changed by the factory and the dealer pointed out the disclaimer in the owner's manual, "Specifications subject to change without notice" rubber-stamped in the back.

A new sprocket cost Don \$6 plus tax — not a jacked-up price by any means, but he would have been in a much better bargaining position if he had counted the sprocket teeth before he bought the bike. As he pointed out with some asperity, he could have found something better to do with his six bucks than paying it back to his dealer for something



I will repeat, test ride should be as near as possible to the type of riding you'll be doing.

he should have received automatically in the first place!

So Point Four: Make as sure as humanly possible the dealer has done his thing properly. As the Romans used to say way back in the days before pasta, caveat emptor - it's your money!

There are

all sorts of reasons why dealers won't let customers take trial rides, all valid from the dealer's standpoint, but none of 'em worth a ward-heeler's promise from the customer's.

Insist on a trial ride. Demand a trial ride. And don't pay your money before you get it. If the dealer hasn't facilities for riding on the premises - naturally very few do - offer to haul the salesman and the machine somewhere youself if need be. But ride it before you buy it. Period.

When I say "trial ride" I definitely do not mean a quick 'round-the-square. Try the bike in the exact type of terrain you expect to ride later. Taking a wee bit of a spin on a trail bike down the main stem of Weed Patch, California or Chugwater, Wyoming proves only that it will run down a street, a foregone conclusion anyway. It tells absolutely nothing about whether or not it will cut the mustard in the rough and untrimmed.

And be

sure to ride a bit in the dust if at all possible - more later on that subject.

During the test period is the time to decide whether or not you can live with the machine. To a tried-and-true four-cycle man the rat-atat exhaust note of a hot two-stroke may be slightly offensive at first but with time it may become absolutely unbearable!

Be particularly

critical of any peculiarity that seems objectionable to you in the handling department, even if this is an inherent characteristic of the machine and in no way a mechanical defect. If you buy this bike thinking you'll get used to it, you may very well find it to be just the opposite - and wind up detesting the beast as you do your exwife. And like the ex-wife it may cost you some money with no tangible return . . .

Therefore I

give you Point Five in cycle buying: Always get a trial ride under conditions roughly similar to your usual riding.

Motorcycle

dealers are like other businessmen. They

come in all sizes and degrees of enthusiasm and have their own areas of special interest. Some are competition-oriented - a competition-oriented dealer may go so far as to be skewed specifically to one single, solitary type of competition. That is, he may only be enthusiastic about Enduros, or Road Racing, or even Trials. Others are completely disinterested in any and all types of competition, prefering to sell large, heavy motorcycles to municipalities and/or older riders – this dealer wouldn't know a Scrambler from a Trials iron if he fell over it. And some are true enthusiasts and try to give a square shake to all facets of their clientele. Unhappily, there is another (common) type of cycle dealer who has a part-time high school kid uncrating bikes out in the alley, couldn't care less about the cycle business and would be just as happy selling dump trucks or trusses as motorcycles.

The off-

payement-oriented customer is looking for a specific type of dealer. Because dirt riding is inherently hard on equipment he needs a dealer who will stock parts for his line(s) - parts on backorder are small comfort when one has beautiful riding weather and a broken-down bike on his hands.

Ideally, he should have someone in the organization with an avid interest in the same type of riding in which you will participate because even the best-intentioned street-oriented shop will probably be ill-equipped to cope with those little technical problems that continually crop up in the life of a trail rider.

But most of all. the dealer must be thoroughly aware of the vital importance of delivering a customer's machine repaired and set to roll on Friday afternoon - fettled and ready for the week-end riding. For nothing, but nothing, is quite as bad for a rider as being fresh out of bikes when he has the weather, time and inclination to spend a week-end riding the boonies!

You only find your dealer the hard way unless you're lucky. The best way is to rely on experience - the experience of others, that is! Ask the riders you meet on the trail, ask the competition riders at the local meets, but above all, ask riders. Discounting the few inevitable soreheads, after a spell of asking, "What kinda service do you get from your dealer?" you will narrow it

down to a dealer who is interested in doing business with people like yourself. And after you've been riding the dirt for a while you will be able to spot the kind of dealership a man operates within a couple or three minutes after entering his shop.

Personally.

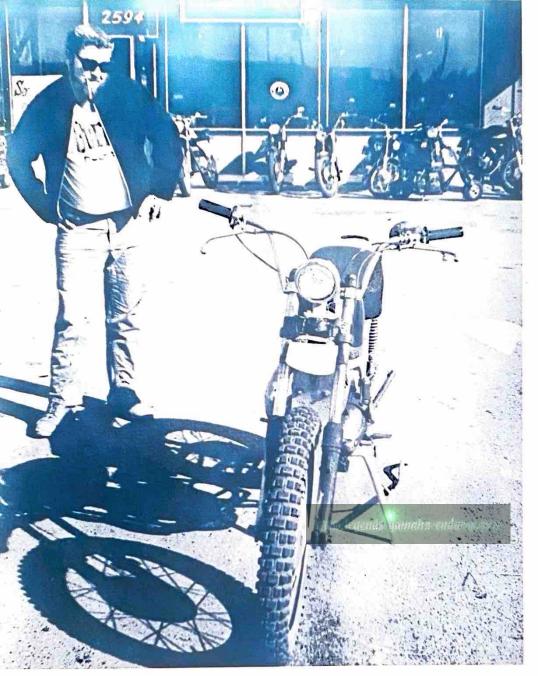
I'm turned off by the kind of cycle merchandiser - I won't honor them by using the word "dealer" - who has one of those "take-a-ticket-and-await-your-turn" schemes in his parts department. This is positive proof that he hasn't enough help in parts and you can bet your bottom dollar he never uses these tactics out front for selling motorcycles because he knows just how many customers would do a smart about-face and walk right out the front door when confronted with it!

he has sold the machine, he feels free to install this sorry arrangement back in the parts department on the proven theory that a customer who has laid out the best part of \$1000 (or more) for a bike will stand still for anything to obtain the parts to keep his expensive toy operative. In my experience, the "take-a-ticket" dealers are the poorest-equipped and least inclined to give expert advice to their customers - and this advice is one of the principal justifications for the long markups in the cycle business.

Choosing the right dealer is just as important for the man who buys his machine second-hand oops, the word is "used" - as for the man who buys his bike new. Locally there are some brands of bikes I wouldn't touch with a ten-foot pole because the dealers admit responsibility for the machines they sell only on a 30/30 basis. That is, 30 feet from the front door or 30 seconds on the engine.

And once chosen, be ever alert for the signs of ennui and disinterest that all too often go hand-inhand with affluence. A dealer who is really scratching for customers in a competitive market may have a somewhat different outlook three years later when he is more concerned with the Dow-Jones average than with the bike business. It pays to always have a good dealer in reserve, just in case you need him.

Point Six in number, but by no means in importance: Pick your dealer with the same care you would use in choosing a wife.



With the machine on a stand, back off a ways and give it a searching, dispassionate look. Pay particular attention to anything that 'doesn't look right' or just seems 'wrong' somehow. Subtle things, such as an oily spot on the tank indicating a slight, insidious fuel leak ... Note stand welded from EMT (electrical metallic tubing) for bikes not having one.

Don't forget to lunge on the front forks. I've actually seen forks that were frozen solid and as completely rigid as the forks on a 1911 Flying Merkel.

Rules for Selecting a Bike

- 1. Read the accessory people's ads with the certain knowledge that any accessory sold to improve handling or performance only serves to point up deficiencies in the basic machine.
- 2. Insist on a QUIET machine with full lighting equipment.
- 3. Make sure the bike meets the maker's specification.
- 4. Make as sure as humanly possible the dealer has done his thing properly.
- 5. Always get a trial ride under conditions roughly similar to your usual riding.
- 6. Pick you dealer with the same care you would choose a wife.





Wiggle rear wheel back and forth to check for swing-arm-bushing wear.

So far most of my remarks have concerned buying new cycles but for various reasons you may elect to buy a used bike. Maybe you're short of money. Or the model you particularly admire has been obsoleted by the maker and is no longer available in pristine condition. Or — fill in your own reason.

So we

have the manly art of self-defense as applied to buying used motorcycles.

The biggest difference between buying a pig-in-a-poke and a used motorcycle can be stated very succinctly. With a pig you cannot get totally stung - if you can't make chops or ham out of him you can at least get some summer sausage. But with a bike it is entirely possible - it happens every day to wind up with a machine that can't be ridden, repaired or even palmed off on another mark. If you're like me, you will discover that finding a sucker to take the lemon off your hands is a flat impossibility! Over the years this state of affairs has forced me to refine the caveat emptor technique to a fairly high degree.

Almost by definition a used bike is lower in purchase price than a new machine, but it may or may not be cheaper in the long run. Partially, this depends on the cost but mostly on the mechanical condition. A \$50 machine that can't be ridden or repaired is no bargain at all, whereas paying somewhat higher than the going price for an immaculate, better-than-new motorcycle capable of affording thousands of miles of dependable service may be a rare bargain indeed. The choice is entirely yours, but I'll try to give you a bit of an assist in the right direction.

Probably the most important single thing is not to let enthusiasm carry you away. I'm no longer surprised to find prospective purchasers of cycles (and cameras and boats and women and other hobby items) simply don't want to know the faults of the device they've sold themselves on. And if you don't think a canny vendor takes full advantage of this smidgeon of psychology, you're hopelessly naive and this won't do you any good at all.

Which brings us to Used Bikes, Rule One: Keep an open mind at all times during the transaction. If you don't buy this particular bike the world will not actually come to an end!

The most common reason for getting rid of a bike (or boat or camera or woman) is not mechanical wear. The plain, sad truth is that most used bikes are sold simply because their owners are dissatisfied with them — not because they have come anywhere near reaching the end of their allotted life span. In other words, a lot of people have simply managed to buy themselves the wrong sickle in the first place. This is almost as bad as buying an out-and-out dog and something to be avoided like the draft!

Don't,

for example, do as so many do and buy an around-town tiddler to use for trail riding. Or get a big, heavy, open-road bike, as agile as a Bulldog Mack 12-yard dump truck and then expect to enjoy a long back-country trip on it. As I once did.

So we have Used Bikes, Rule Two: Buy the cycle that exactly fits the type of riding you'll be doing.

With these elementary considerations out of the way, let's assume you've fairly well settled on the type, make, model and so on in which you are interested, have located same, and are entering negotiations. It will save a lot of time, and perhaps some ill will to boot, to have it absolutely and unequivocally understood at the onset that you're going to take a trial ride — or have a knowledgeable third party do so — before any legal tender changes hands. Exactly the same as if you were buying a new bike, but even more important with a used one.

frost a deal now and then. I understand there are quite a few old-timers around who still believe their customers should buy their pigs all done up in paper (money) pokes. Go back to Rule One and tell the seller, "Forget it, Mate," if he balks on the trial ride. Do this immediately and without rancor before you waste too much of each other's valuable time. Remember it is always easier not to get into a sour deal in the first place than it is to get your money back. From anyone.

And never, never, never buy a bike for riding purposes if it doesn't run unless you are really and truly an expert on this particular machine and the price is right. Very, very, very right.

I know a kid who put months of his paper route money into a

highly-experienced Matchbox Thumper that wouldn't run. Run hell! — it wouldn't even turn over. Turned out it wouldn't run because it had a broken crank pin and it wouldn't shift because someone had pulled the box down, discovered it was completely clapped out and then simply stuffed most of the bits and pieces back into the case without assembling them.

To this day the bike languishes in a corner of his garage — a constant reminder of his naiveté — and I do believe it was this experience that directed the young man toward economics as a profession and the stock market as a paying hobby. His disinterest in things motorcycle is profound. This brings us to another rule and an exception:

Used Bikes, Rule Three: Don't buy it unless it runs like the proverbial watch.

Exception to Rule Three: Collectors and/or fanatics.

The guy who is a collector and/or restorer is admittedly some kind of nut in the first place. I, myself — right now — would buy a 500 cc Moto Guzzi Falconi, the one with the outdoor flywheel that looks as if it came off an A&P coffee grinder. Or, if the price was right, a LE Velocette "Noddy Bike" in almost any condition or stage of disassembly. I'm not even remotely interested in street riding and both of these machines are most emphatically street machines!

The trial

ride and inspection will commonly turn up defects in a machine the seller is honestly unaware of. Because the vendor has quoted a price on the bike without spavins, glanders, string-halt or other faults, he is generally responsible for putting it in good condition unless he is selling it "as is." And bear in mind that repairs, as such, do not normally add to the value of anything.

If the seller is to make repairs, the time to do so is before the sale is consummated. Over the years I've found it much, much easier to get a vendor — even a thoroughly reputable dealer — to correct a fault before he gets the purchase price in his hot little paws. And when one is dealing with individuals off the street, as is often the case with motorcycles, this is the *only* way to go.

When I say "correct a fault" I mean just exactly that. I emphat-

ically don't like the bit about "I'll just knock the cost of repairs off the price and you can have it done yourself so you'll know it's done right." Estimates of repair costs given by sellers, regardless of what they're selling — from Circassian virgins to second-hand Roto-Rooters, seem to have the same degree of accuracy as newspaper estimates of crowd sizes, only in the opposite direction. And on motorcycles, simple valve jobs have a marked tendency to run into ring, piston, valve, rebore, etc., jobs with what the military calls "escalation of costs."

When buying a bike second-hand, my personal view is that the guy who is peddling the machine either screwed it up himself or bought it from a guy who did, so let him make any necessary repairs before I take title. Fortunately, all a buyer has to do to keep himself from getting bilked on repairs (in this context) is to apply

Used Bikes, Rule Four: Have the vendor make the necessary repairs to put the bike into satisfactory shape before you hand him any money. Any money includes deposits, earnest money and/or any and all arrangements whereby you give someone else your money prior to delivery.

An extremely important consideration when buying a second-hand motorcycle is to be sure parts and/or service are available. The mortality rate among motorcycle importers is about the same as for marriages in San Mateo County, California — or New York magazine editors. And although the manufacturer probably continues in business, it may be next to impossible to get parts after the importer or distributor goes up the stack. Even if the importer is still importing and you see his ads everywhere, be sure the model you're contemplating has parts generally available.

Unfortunately, parts availability has no direct relationship to the age of the bike. I don't even like to think about getting parts for a Royal Enfield 250 or a BSA Bantam or a Garelli K-150 — all fairly recent models. And the difficulties posed by a broken widget on a 600 cc Panther Sloper three miles north of Bad Axe, Michigan would probably be insurmountable. Thus follows

Used Bikes, Rule Five: Don't buy an orphan make or model unless you're not

depending on it running regularly and reliably.

Now, let's inspect the used bike we're considering buying. Look at the machine from head on while it's on the stand and with the front wheel pointed dead ahead. The front and rear wheels should be parallel in all planes. If one wheel or the other is cocked a bit it indicates something is bent, warped or busted. Forks, front axle, swing arm or frame it could even be a bum rear-suspension unit. No matter what it is, don't buy it unrepaired unless you're an expert enough repairman to think you don't need advice. Let's face it, engine work and electrical work come under the heading of trades but a good straightenerupper is an artist and artists are few and far between. And this may be a contributing factor to the owner's urge to peddle the bike.

Also, it is well to bear in mind that a bike bent enough to be noticeable to the non-professional eye has been pranged or subjected to fantastic stress because modern cycles resist deflection to an amazing degree.

If all is straight and true and plumb, examine the region where several frame members join the fork head. This is an area of extreme stress and generally subject to fatigue cracks on bikes ridden long and hard. It may be necessary to lift the tank to make a thorough inspection, but tanks come off easily and it is your own interests you're looking out for.

It is indeed fortunate for guys peddling used bikes that the tank usually covers this defect. And if the bike has been freshly painted, recall the old boatman's adage, "A coat of paint can cover a hell of a lot of sins." Make this examination after the trial ride with attendant passage over rough ground if the bike has been painted recently. If there are cracks they will probably "come through" the paint after a ride in the rough.

The actual riding — and the type of riding — performed by the previous owner/s of the bike does not necessarily have any direct relationship to the condition of the machine. But you are interested in the care he/they gave it.

For example, a man may be a "hard rider" and still not be hard on the bike because he takes meticulous care of it and keeps after the re-

pairs. On the other hand, a guy who buys a bike for cheap transportation on hunting and fishing trips and otherwise has no interest whatsoever in motorcycles or motorcycling may treat it like the family car. That is, give it no maintenance. Ever. No primary-chain lube check. No chain lube. No fork oil. Nothing. And this guy is hard, hard, hard on a motorcycle (car, too, but we're not dickering for his jalopy).

Unless we know from other sources, a careful examination of the skins will tell a lot about how and where the bike was ridden and quite a bit about the rider himself.

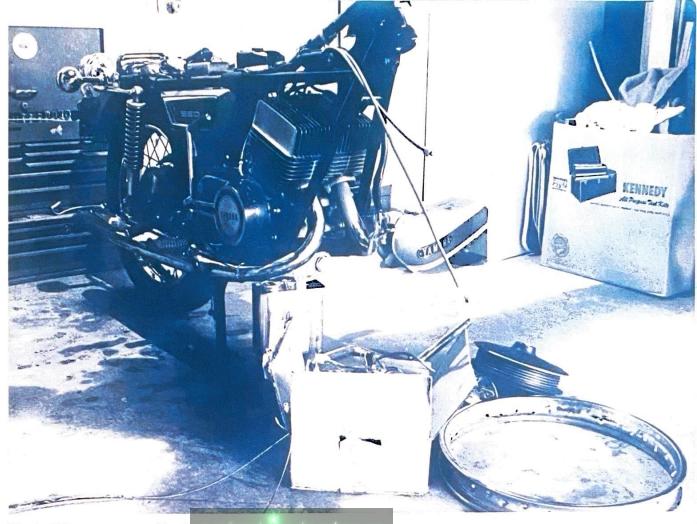
A bald center on the tires with little side wear indicates a guy who pretty much rides straight up, doesn't take corners with verve and vigor and who may even wear a checkered cap while riding. This type of riding is almost a necessity for the girls' bicycle-type "trail bikes."

Completely bald, treadless tires are a positive indication of poverty or ignorance on the part of the previous rider. Or both. Look carefully elsewhere on the machine for signs of neglect and you'll seldom be disappointed.

Knobby tires are for dirt. Period. And actually, for extremely soft dirt. Knobbies worn off on their centers with little wear on the sides, not chewed or gouged, have usually been run on the street or too much on hard ground. Although riding a dirt bike on the street is not as hard on it as riding it in the boonies, it does indicate a certain lack of knowledge on the part of the owner and the bike should receive a careful survey with emphasis on things that have to be lubricated and maintained. Cables, swingarm bushings, fork bearings, suspension and so on.

Examine the rear-wheel adjustment with particular attention to even adjustment. If the axle adjustments are different on each side of the wheel, check carefully for a bent swing arm, bum suspension unit or warped frame — the wheel may well have been offset to keep the bike from "sidelin" down the street.

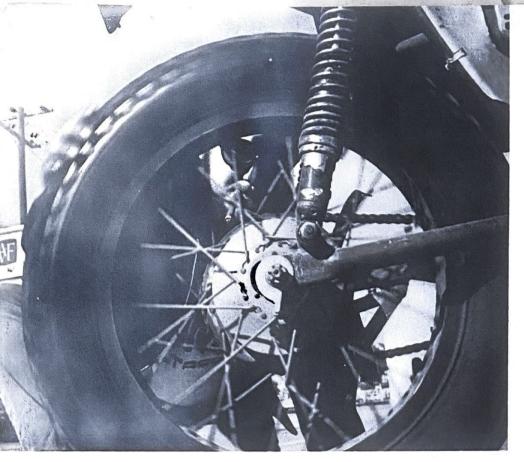
While you're looking at the rear wheel, check the chain adjustment and sprocket wear. A loose, floppy chain indicates lack of attention to detail and a sprocket with dubbed-over teeth indicates that a chain has been run



Wrecked Yamma street machine bought ...egenus yamaha enduros. for \$300 as-is from an insurance company with full knowledge that it needed new forks, tank, bars and front-wheel respoking . . . but without pricing the parts. The final tab brought the total cost of the bike to just under \$800. At the time a used bike of the same kind in good shape was selling for \$600 - \$700. Think of the work - and \$\$\$ which could have been saved by avoiding the basket case.

Rules for Selecting a USED Bike

- 1. Keep an open mind at all times during the transaction.
- 2. Buy the cycle that exactly fits the type of riding you'll be doing.
- 3. Don't buy it unless it runs like the proverbial watch.
- 4. Have the vendor make the necessary repairs to put the bike in satisfactory shape before you hand him ANY money.
- 5. Don't buy an orphan make or model unless you're not depending on it running regularly and reliably.
- 6. If buying a competition bike, make sure it competes well.



With the bike on the stand, spin the wheels as fast as possible to check for out-of-lineness.

vww.legends=yamaha=enduros.co

way past the end of its useful life. This is usually done by street-type riders — as a general rule competition riders and boondockers experience chain breakage or throwing before the chain reaches this point.

A new chain and sprockets aren't too expensive, but a dollar is a dollar.

Spin the wheels – they should spin free with no wobble or run-out. No bent or busted spokes, no nasty dents in the rims.

Look the whole bike over for looseness where things are supposed to be loose and tightness where tightness oughtta be. The fork head is intended to rotate freely on its bearings with no binding, but wiggling the bars from side-to-side should show no play or slack. And when rotating the bars from lock-to-lock there should be no grating feeling, no roughness, anywhere.

The swing arm should have arms parallel in the horizontal plane. With the adjustment equal on each side of the wheel, the wheel itself should line up with the center of the frame. With the bike on the stand, wiggle the rear wheel back-and-forth. There should be no discernible play in the swing-arm bushing.

With the machine on its wheels, check the fork action by locking up the front brake and lunging on the bars, compressing the fork tubes or front-suspension units. The tubes should telescope smoothly with no sign of binding anywhere in their travel. There should be damping action — some manufacturers damp on the compression, some on the rebound and others (true dirt bikes) damp on both. The important thing is that there be damping and the front of the machine should have not the slightest ten-

dency to bounce up and down like Junior's Super Ball.

The damping and springing action should be equal on both fork tubes. While working the forks up and down observe the front wheel very carefully. Many times unequal fork action can be detected by the wheel wobbling a bit from side-to-side while the forks are alternately compressed and relaxed. It is important that any inequality of the fork action be corrected for this can cause some spooky handling problems that are extremely hard to track down by conventional methods. Guess work, that is. And the handling problems become more severe as the speed goes up and the trail gets rougher!

Without exception, modern dirt machines use oil-damped suspension units and forks, and many oils are so clear they are almost invisible. If at least part of the trial run is made under dusty conditions, any oil leakage — anywhere! — will be highly visible.

But bear in mind that some bikes leak naturally and persistently from the day they're new until they make that last trip down to Cycle Salvage. And some designers have built-in leaks on the front forks simply for lubrication purposes. Find out from other riders or by observation if the bike you're inspecting is one of these. To put it bluntly, a leaking Betor fork is nothing to be alarmed about.

The clutch should clutch. That is, when the bike has been warmed up by a few miles of the type of riding you expect to be doing, the clutch should not slip when the throttle is opened — wide! A defective clutch is not — six, two and even — gonna get better of its own accord. While a clutch job on a bike is not all that expensive by automotive standards, it is something you should not have to stand in the first place. Rule Four again.

A muffled motorcycle engine of modern design is remarkably quiet while running, making it easy to hear untoward clankings, rumblings, knocks, clicks, rattles, whirrs and just general racket originating in the innards.

Warm up the engine thoroughly—thick, cold oil has a superb ability to quiet the sounds of anguish emitted by an engine sick even unto death. If you don't have an educated ear, get a friend or—

better yet - a mechanic who knows the marque in question to give his considered opinion. Expect to pay him.

It is vital that the consultant know the brand under inspection because, for instance, a wrench trained on *Bier und Wurst* in *der Vaterland* might just feel the rough, typically two-cycle idle of a hot 125 cc cornpopper from the land of the *bota* and flamenco was about to call it quits when it is simply doing what comes naturally. Plus he may be affected by chauvinism or something and not really have the requisite degree of open-mindedness.

Rent, borrow or (last resort) buy a compression gage and check the compush. On multi-cylinder machines the compression should be fairly equal on each barrel. I'd regard a difference of over 15 psig with a great deal of suspicion in a motorcycle engine.

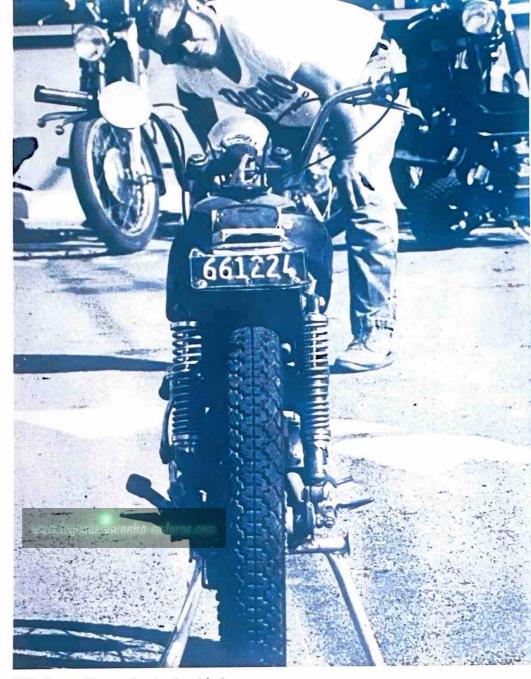
In the case of a single-cylinder machine, find out what the correct pressure should be and use this as a standard. A drop of over 10% is cause for alarm. This will work in the case of multi-engine machines too, but I regard a difference between cylinders as a better indication than absolute pressure readings.

Lacking a

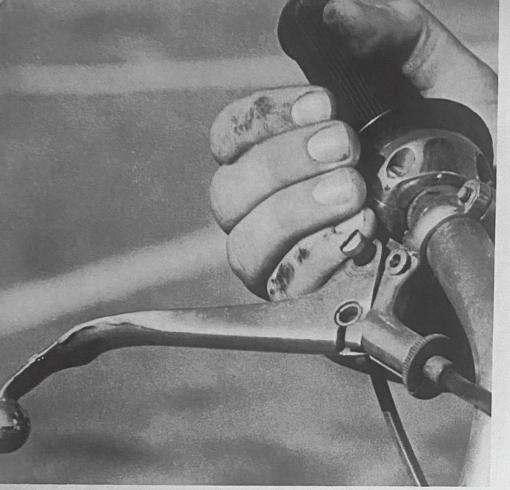
compression tester, a pretty good estimate can be made by kicking the engine through very slowly and listening attentively to noises from the engine room. A stiff resistance, with only a little or no air noise is standard — compare with a new machine of the same breed if possible — but a loud hiss and little resistance indicates deep trouble in a two-cycle. With a fourcycle, a loud hiss from the carb indicates a bum intake valve. Ditto from the exhaust pipe means a sour exhaust valve. It is by no means rare to have both intake and exhaust valves bad at the same time.

Textbooks on engine work go to great pains to delineate methods of separating valve troubles from ring and piston troubles but I feel the question is academic at best. A compression leak means the engine is going to have to come down and any time a fourcycle is down one automatically grinds the valves and replaces the rings — on a two-cycle one replaces rings as a matter of course and checks the piston as well. So what's the difference whether the trouble is upstairs or downstairs?

The important



With the machine on the stand and forks centered, take a long, searching look to see if everything lines up like it should.



Bent lever is part of the game — loose screw is proof-positive of poor maintenance.

ROAD TESTS

I thought it over and came to the conclusion that road tests are not a proper part of a book like this, although I do feel that a few remarks about the bikes should be appended.

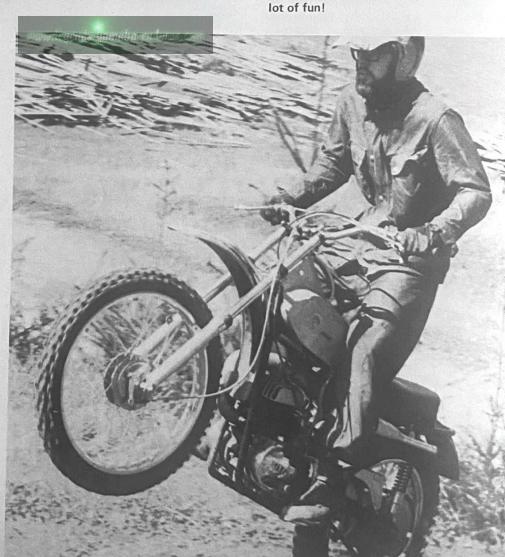
Unfortunately, I made the decision after I shot a bunch of detail shots!

Incidentally, one of the reasons I am against road tests per se in a book is because the tests are out of date before they are in print. For instance, Hodaka has a policy of making continual running changes and vital statistics change almost from day to day. The Hodaka 'B' designation is a convenient handle — nothing more — and in reality merely serves to differentiate the machine from the Super Rat.

Get the lights that came with the bike —

If there are no lights on the used bike you are considering, ask the owner to dig them out of his garage and check to make sure that they are all there. Whether you trail ride or plan to participate in night enduros, lights are essential!! Jury-rigging lights is a colossal pain, a lot of work and expensive. So, ask for the lights. Because new ones will cost far more than you could guess, get price and availability from the dealer before you conclude the deal on a bike without lights — whether you are buying from a dealer or a private party.

Doug Schwerma's 209-pound special cannot really be considered a trail bike because it is totally unsuited for the average rider. But Doug isn't an average rider by any means and thoroughly enjoys trail riding on his Yamaha-engined moto-crosser. He calls it testing but to me he looks a dyed-in-the-wool trail rider having a helluva lot of fun!



thing is to locate something that will have to be fixed in the immediate future in time to keep from having to shell out your own dough for the job.

But if it makes you feel any better, on a four-cycle with wet sump you can remove the filler plug and listen at the crankcase for ring leaks.

If two

cycles kick through *too* easily it is odds on piston or ring troubles, but to judge this takes an intimate experience with the engine under inspection.

Don't be shy about compression checks — it doesn't make the least difference if it irritates the seller. Hell, lots of people are trying to sell bikes and you're out to keep from getting stung ... not to make new friends!

I still remember with affection the big guy with the beard and sandals who bought my R-60. I ran an ad in the local rag and he was the first to show. Apparently, someone had told him about the valve troubles these things were prone to have and he arrived fully equipped with a compression gage and a friend to kick the bike through.

From the seller's standpoint I liked this — it told me he was an interested, bona fide prospect and not just another feckless tire-kicker and throttle-twister. As I'd just ground the valves with only enough miles on them to seat them thoroughly, I could pretty well depend on the pressures being strictly according to Hoyle.

The kicker-through did his thing, the pressures matched, and that was all she wrote! He grinned hugely through his bramble patch and reached deep into his robes somewhere and started peeling steel engravings of U.S. Grant off a roll that would gag a goat.

All switches should function correctly and regularly and all electrical wiring should be smooth, with unfrayed insulation that exhibits little evidence of bygone traumas. Wires should show care in routing past wheels, exhaust pipes, chains, pedals and levers. Insulating tape here is not in itself too bad if it's smoothly and carefully applied — but nothing turns me off quicker than a bunch of black plastic Irish Pennants dangling from a bike's electrics. Liquid level in the battery (if used) should be over the plates and about equal in all cells. There are few things that make a pedestrian out of a

rider quicker than a failure in the electrical department, and walking is not such a sweet sorrow!

The fuel system should be tight. Gasoline isn't supposed to drip out of carbs like rain off a tin roof, although it does seem that way at times. But a well-adjusted carburetor is *not* under any circumstances supposed to drain the contents of the gas tank into the crankcase overnight and I don't care what country the carburetor originated in!

The gas tank is not supposed to leak either when the bike is just sitting or — more important — being ridden. Few things can cause a more critical decrease in heterosexual activities than a leaking gas-tank lid that goes undetected for half an hour or so on a scorching-hot day.

There are some notable exceptions to the above. Nearly all models of Bultaco motorcycles have wept gas through the gas-tank cover and when the fuel didn't ooze past the cover, it went out an over-flow tube down onto the front fender. This gives rise to the expression, "If a Bultaco stops leaking, the gas stop better be handy!"

Although the foregoing remarks apply to all motorcycles, competition machinery is in a somewhat different category. A gung-ho racing or Enduro bike may look kinda care-worn and still be well-found in wind and limb.

When buying a competition motorcycle, the best — almost the only — criterion is how it competes. A bike that is a consistent high-placer in Enduros, for example, just has to be in excellent condition.

You will note that I have not mentioned "road tests" and "impressions" in cycle magazines as a factor of any importance in your decision as to which bike to buy. The reason for this is that I am not altogether sold on road tests for a number of reasons.

For one thing, they are seldom conducted over a sufficiently long period to have any great validity. 'Most any motorcycle will run pretty well for a few hundred miles and it takes quite a bit of time to put the miles on a bike, time that costs money, and money is something that the cycle magazines are saving with.

Now I've done road tests myself. I did one for Popular Mech-

anics some years ago that entailed riding from Tijuana to La Paz, Baja California and back to Oakland, California. That test covered 2500 miles of on-and-off road riding and the bike was strictly box-stock. A test like that can mean something, but a "test" consisting of a weekend of riding in the hills around Port Wine, California is something else again.

Significantly, my 2500-mile test was *not* for a bike magazine!

Another reason for my not having much faith in road tests conducted by motorcycle magazines (or publishers thereof) is that I feel the advertisers have entirely too much leverage on the editorial departments. And this influence is by no means confined to the cycle magazines. Bob Greene, writing in the May, 1971 issue of Hot Rod Magazine reviewed the Harley Davidson 125 Rapido as a dirt bike.

He mentions

the Ceriani forks with their 4-inch travel and I know of no honest-to-God trail bikes with less than 6 inches. He admits the wheelbase is 48-1/2 inches and shorter than many of its competitors but doesn't apply his own considerable expertise in pointing out that a short wheelbase in motorcycles leads directly to "quick" handling and difficult control. Hodaka found this out years ago and upped their wheelbase from 47 inches to 50 inches, thereby making a notable improvement in handling that was already pretty fair by early trail bike standards. Greene only says in passing that the Rapido might benefit from a slightly longer swing arm but this isn't emphasized.

He has fine things to say about the built-in mixing cup in the gas-tank cover but fails to mention that different oils are mixed in different proportions or just which oils the built-in mixing cup is tailored for.

He raves about the yummy saddle. No foolin', he says "yummy saddle"... all in all the review seemed so odd that it made me turn the pages of the magazine until I came to—surprise!—a full-page, 4-color ad for the Harley Davidson Rapido...representing some few \$\$\$\$'s in the advertising till!

He doesn't

give any clear, hard figures on performance — just how steep a hill it will climb, what depth water it can be depended on to negotiate, how fast it is in

the quarter-mile - no empirically obtained figures that would take time-consuming field work.

On the obverse side of the coin, it is by no means unheard of for advertisers to attempt to kill a story. A few years ago when Walt Fulton was honshu at Triumph, he got wind of a story I was working on for Cycle Magazine on improving (debugging, that is) Triumph electrics and immediately got on the horn to the then-Managing Editor, John Covington. This took me by surprise because it was no secret from anyone but the prospective buyers that, at the time, Triumph electricals were about as reliable as \$2.29 sixtransistor radios. Personally, I thought it would come under the heading of a public-service piece, but the article was never run.

I have yet another reason for distrusting the road tests and anything even faintly technical in the cycle press . . .

Basically, a magazine is the reflection of its editorial staff and editors last quick in the bike book field. Modern Cycle, for example, by Volume 7, Number 9 had no less than five editors that I know of. And of the lot, to my personal knowledge, only Jim Davis and Dave Ekins were known in the field prior to their involvement with the magazine or since. A short time ago the senior editor of another cycle magazine was running ads in the Berkeley Barb offering to "photograph your love fest (or feast)." Apparently this didn't pan out too well, for he shortly ran another ad in the same publication offering guitar lessons. And the next time he surfaced he was near the top of the masthead!

Don't misunderstand me. I'm an avid reader of cycle - and outdoor and electrical and history and mechanical and hydraulic and camping magazines and I get quite a bit of good scan therefrom. But most of this information I glean from the writings of freelancers. I have the additional advantage of having been a cyclist since the days of solid-frame flat-heads and can therefore separate most of the wheat from the chaff.

In the

final analysis, local riders are the best source of information if for no other reason than they are doing their thing in the same area you're doing yours. What is perfectly true in Maine may not apply in Florida.

Probably the best place to meet cyclists is at the local cycle club.

Cycle clubs come in all shapes and sizes. Often they have specific areas of activity. Older clubs, for example, may specialize in road runs on week-ends. Or TT's. Or Enduros. Take care to pick a club with the same interests as yourself.

Unfortunately, there is no motorcycling equivalent of the National Rifle Association. The American Motorcycle Association could be - but it isn't.

Primarily, the AMA is an industry-oriented group which graciously allows the lumpen to "join." These members of the riding public are not accorded voting rights - this is reserved for industry members (read manufacturers, distributors, magazine publishers, etc.).

Sometime back Ivan Wagar called the AMA "The Anti-Motorcycle Association" in a Cycle World editorial.

cycle clubs are affiliated with the AMA and AMA "membership" is a requirement for members. AMA membership is required for participation in most forms of competition. "Sanctioning" races, Enduros and the like is one of the principal functions of the association.

Most riders, except competition riders, are not members of the AMA . . .

CYCLE MAGAZINES

Recently a very refreshing and heartening change has occurred in the (better) bike publications. Without delving into the whys and wherefores, let me state flat out that the tests and general editorial content are starting to become somewhat more realistic, and facts are being mentioned out loud and in print that would never have been whispered outside the Motorcycle Merchandising Industry a few months ago. As a "for instance," Cycle Magazine's May, 1972 issue had a test on the Triumph Bonneville that even goes so far as mentioning sundry oil leaks, vibration, and the Joe Lucas electrics that are 'creative in their inconsistency!'

For whatever reasons. this newfound frankness can only have a salutary and beneficial influence on the industry as a whole.



Trail-bike riding is often a whole-family affair . . .

Most Important... Your Gear

the most important part of a cyclist's outfit is not his motorcycle, it's his personal gear . . . his clothing, boots, helmet and so on. If the bike won't do what it's supposed to do, all that results is some inconvenience and perhaps a little bitterness. But if, say, a helmet turns out not to be up to its intended purpose, the cyclist can end up very permanently dead.

Let's start at the head of the list with the most important, the most crucial, the most vital part of the motorcyclist's going-away gear his helmet.

A good helmet costs money. For the life of me I have never been able to understand the psychology of the man who will lay out the better part of \$1000 for a cycle without batting an eye and then wail at \$35 to \$50 or so for a quality helmet. It's being done every day and people by the scores are getting themselves killed as a direct result of this penny-wise/ dollar-foolishness!

During recent years, all quality helmets except Buco have carried Snell Foundation stickers - Buco has their own very extensive testing facility and prefers to do their own evaluating.

many helmets have been carrying the "Z-90" stickers. A careful shopper will soon notice that some awfully crummy brain buckets are Z-90'ed. The American National Standards Institute drew up these specifications in 1966 specifically for road

Recently

riders - racers and dirt riders were not deemed worthy of consideration.

Any approval system is only as good as its continuing inspection and there is no provision for continuing inspection of Z-90-approved helmets. Which means, bluntly put, that a manufacturer can put this sticker on anythink he chooses. I feel this makes the Z-90 sticker as worthless as a 'coon dog at a fox hunt.

The Snell Foundation sticker means something. The Snell Memorial Foundation was named after the late racer Pete Snell and is one of the best memorials I have ever heard of. The



An English Trials Rider wearing a puddingbowl helmet. As head protection it is about on a par with an ostrich egg. But it carries on the grand traditions of the sport. Trials Riding is the only form of motorized competition I can name offhand that doesn't require helmets, but I expect them to change their rules any decade now.

Don't Save the Helmet That's Saved You! Helmets wear out! They not only wear out like the rest of us through the passage of time, they are subject to damage by doing what they're intended to do. The shock-absorbing material is a crushable plastic.

Once this material is crushed by - say - a hard fall, the helmet must be repaired or replaced.

This is not to say that helmets are damaged severely by each and every crash in which the head is hit. But I do say that after a real ear-ringer, return the helmet to the manufacturer for checking and be sure to wear another one while waiting for yours to get back!

When you buy

your helmet inquire about this feature and avoid as the plague any product of a maker who will not check his helmets for

Now that just about everyone has gotten the word on helmets, the helmet business is getting competitive at last and prices are becoming somewhat more reasonable.

The April,

1972 Motorcycle Dealer News had one ad offering SHCA-approved helmets to dealers for \$11.87 each. When the Friendly Local Dealer takes his usual markup and rounds off the nearest merchandiser's price, these buckets will go over the counter for \$19.95 + taxes, a far cry from the over-\$30+ prices we've become used to in the past . . .

Snell Foundation makes extensive tests on helmets and their requirements are more stringent than Z-90. The Snell Foundation people even go so far as to simulate field conditions with actual cadavers and, best of all, they conduct random sampling so a Snell sticker actually has a definite relation to the quality of the helmet wearing it.

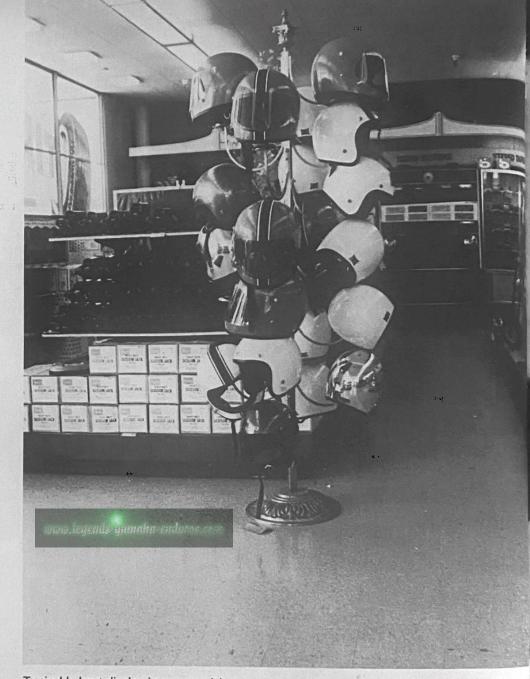
There is another helmet sticker that means something. It is the SHCA sticker issued by the Safety Helmet Council of America. This sticker means that the SHCA has conducted random sampling and that the manufacturer of the helmet has met Z-90 specifications. To put it another way, the SHCA is the policing body for Z-90 helmet makers.

Unfortunately, there are some marginal buckets made that, even though they are approved by some sanctioning body (AMA, various Auto Clubs and so on), are no prizes. I have had personal experience with only two makes of helmets, Bell and Buco, but I can recommend both companies' top-of-the-line helmets without reservation. Undoubtedly there are many other manufacturers making quality, dependable products that are well up to their intended task but I have had experience only with the two mentioned.

Helmets are an obvious safety device and many cities and states have enacted laws requiring motorcyclists to wear "approved" (usually Z-90) helmets while street riding. This has brought about the unseemly spectacle of an industry clamoring for the repeal of regulations designed to protect its customers!

The motorcycle industry waxed highly indignant over compulsory helmet laws and howled to high heaven that they were an infringement on the individual's God-given right of self-determination and the constitutionally guaranteed privilege of each of us to kill himself upon the public road system.

Lest you suspect the industry of becoming altruistic in taking up the cudgels on behalf of individuals suffering under sumptuary laws, let me hasten to point out the real story behind this show of indignation. The cycle industry felt that forcing people to wear helmets would point up the fact that a street rider stood an excellent chance of having an accident (usually involving a tin coffin on wheels) and would



Typical helmet display in a store with no pretense of servicing cyclists. Not one of these had a Snell '70 or a SHCA sticker. When I asked the salesman about them he assured me that he had never had a complaint or a returned helmet, and got very irate when I pointed out that corpses don't complain!

IMPORTANT IMPORTANT VITAL Helmets come in almost any color you can imagine -buy the color you want. By no

imagine — buy the color you want. By no means figure on reaching for the everhandy spray can to express your personality at some later date. Certain helmet materials are not — most emphatically not — compatible with paints. As the information sheet furnished by the helmet manufacturer covering this extremely important point has a tendency to get mislaid, in all cases where you have no specific information, consult the manufacturer before you paint!



A living, breathing testimonial for highquality helmets. David was center-punched by a guy on a heavyweight while riding his SL-70. Although the helmet has scratches and dents all over it, the only damage was these facial lacerations. After a crash like this a new helmet is in order.

therefore scare off a few customers.

It is interesting to note that by concentrating on helmet laws and ignoring the noisy equipment offered by their members, the industry brought itself to the ragged brink of disaster. Only belatedly have the cycle manufacturers and distributors realized that noise is actually the bête noire of the business.

The cycle industry has succeeded in getting a few compulsory helmet laws erased but in so doing they're helping neither themselves nor their customers. The helmet is the best thing to happen to motorcyclists since miniskirts and I, myself, won't even ride around the block without one. Period.

I've heard

dirt riders say, "I don't ride fast, and the ground is soft anyway . . . and I don't fall off very much anymore, so I don't think I need a helmet."

"Horsefeathers!" says I.

Let me

tell you about an experience I had while riding on "soft" ground:

Some years ago I was plugging along in Baja on the usual two-rut road. The going was pretty good for Baja, with a light coating of finegrained sand over the hard-packed earth. I wasn't riding very fast — with the BMW one couldn't ride fast! — when suddenly the front wheel slid a little in the slippery sand and I found myself in trouble.

The bike

went from one side of the rut to the other and try as I might, I couldn't get out of the groove. Inevitably, I got off. It was one of those spills that are a long time a-comin' and when I finally went over the handlebars I was doing about 20 kph...say 12 mph.

I landed in the middle of the rut right on top of my head. Thanks to the Buco Shorty I didn't even get a headache. I regarded it as nothing out of the ordinary and immediately righted the big black animal and proceeded on into Punta Prieta.

When I pulled the helmet off that night in Juana Fuerte's I discovered a small, neat dent in the plastic about the size of the end of my little finger, apparently caused by a small rock lying concealed in the sand where I had my spill.

The very sight of that dent gave me cold shivers – you can bet your



The Vizor-Vu is one of the most practical accessories made — I regard it as being almost as necessary as the helmet itself where I'm sharing trails with Jeepers, dune buggies and other cyclists. I've used it for 7 or 8 Baja runs and the more I use it the better I like it. It is the only rear-view mirror that will work on a dirt bike for more than a day at a time!

bottom peso that any mishap severe enough to put a dent in a modern, quality helmet will sure as God-made-little-greenapples do the same to a man's skull, and being trepanned in the middle of the Viscaino Desert is not my idea of the way to spend a vacation!

Roughly, helmets come in three basic types. The lightest and coolest is the "shorty" or half-helmet mentioned above, offering somewhat less protection than a full helmet. I wore one for years and for most riders it affords at least minimal protection. It is standard issue for most police departments.

I was sure it afforded sufficient protection until the day I ducked my head to dodge a limb and didn't quite make it. The limb was attached to one of the toughest trees around, a little pinus monophylla, and it whapped me on the side of the head just below the rim of the helmet. The leather strap kept me from getting my left ear mangled, but it didn't prevent me from winding up with an ear swelled to about twice normal dimensions!

The next day I got a complete-coverage or jet-type helmet.

My current helmet is a Buco GT. It is by no means a lightweight but it affords really first-class protection. Although on occasion I've hit it so hard my ears rang like the bells of Saint Mary's for a day or so, I've never even had a headache as a result.

The third type is a so-called "full-coverage" helmet — the kind that makes the wearer look like something out of the 15th century. It offers far and away the most protection of all the helmet family, but I don't care for it for ordinary trail riding where one is not too concerned about being run over by the opposition. In trail riding one needs all the vision he can get — and then some — and the full-coverage helmet is something like looking through a knothole. I don't like losing even a small part of my peripheral vision.

If I were racing again, I'd have nothing else.

There is a fourth type of helmet that deserves mention without recommendation. This is the porridge-bowl type so beloved by traditional-minded English and Italian riders. You might as well wear an ostrich-egg shell on your head and these frauds have been the direct



Helmets like this are next-to-useless cranal protectors — but they are still being sold. Worse yet, they are still being bought by fathers with no feeling for their kids' skulls.

cause of many deaths that could have been prevented by correct head gear. Nowadays their use is mostly confined to a few kids with unfeeling and/or ignorant parents, and English Trials riders who wish to preserve the Traditions of the Sport. If you think this is funny, consider that some Trials riders wear cloth caps!

The only practical use for these death traps is for feeding the dog. Or perhaps under the bed at your country cabin.

For most of my riding, I wear a "Hickory" shirt — long-sleeved, of course. These are the standard for loggers and other professional out-doorsmen and so many riders wear them that locally they're known as "scrambler's shirts."

Winter or summer, rain or shine, I always wear gloves while riding. My favorite is made of two layers of cotton flannel glued back-to-back with the fuzzy sides out. The Giant Mail-Order companies sell these under the general heading of chore gloves and they're sold in the West at country stores and wherever there are loggers.

I much prefer them to leather and other hand shoes because they're warm

wet or dry, washable, make good blotters for cold and runny noses, and are fairly good protection against branches, brambles and the like. They've saved my hands from injury for years — I've never even broken the skin while wearing them!

Not only

do I prefer cotton flannel gloves to leather, but I have some strong objections to leather gloves. They get cold and slimy when wet and offer almost no protection from sharp objects. Wet, they loose their grip. They must be dried very carefully or they wind up stiff as boards (and just as useless for their intended purpose). When dirty, they can't be washed vigorously with lots of detergent to remove the grease - they wind up minus their natural oils and dry out hard and stiff (genuine buckskin washes well, but all of my other remarks apply here). They make lousy handkerchiefs unless you have the foresight - rare - to Velcro powder puffs to their backs. And they're several times as expensive as rag gloves.

Pants.

I very much favor Frisko Jeans for riding. These are the black pants that most long-haul truck drivers wear. They're made from quite heavy cotton cloth and have



An extremely poor boot design for trail riding. High, square-front heel is a cinch to catch on something — one of the easier ways to break a leg! A little manicuring with a hacksaw would work wonders here.



An excellent boot for trail riding. Bevelled front on heel lessens likelihood of catching on rocks, roots and so on.

pockets that are cut so things don't fall out every time you land on your head. They don't have cuffs to catch on things and collect junk — and they last like a bottle of Tabasco Sauce.

Many riders favor denim jeans. They're very good, widely available and practical but I can think of no point on which they beat Frisko Jeans. Boots.

My personal choice is Russell Bird Shooters, the double-vamp version. These are made-to-order boots and I specify Vibram Montagna soles, much heavier than the look-alike Vibram Rocca. I do a great deal of walking, so I order them with 9-inch tops; if I were to buy them exclusively for cycling, I would get somewhat higher tops, probably 12 or 14 inches.

Motorcycles, generally, are hard on ankles and shins. Trail bikes, especially, are the worst of all because nearly all true off-road machines use steel foot pegs for their non-slip qualities — the street riders' sole-saving rubbercovered pegs are next to useless in the wet and muddy. After a hard week-end of riding in the woods and rocks and sagebrush, I can tell just exactly where the Russell's stop — above the boot-line my

legs are pretty well scarred.

There are special boots made for motorcycling and for straight motorcycle riding they're hard to beat. But the trail rider is going to spend some time walking, either by inclination or simply because sooner or later you have to walk out after riding in. Motorcycle boots are good only for motorcycle riding; like cowboy boots — walking in them can be pure torture.

Quite a few experienced riders lean to lineman's boots, those heavy affairs with special reinforcements to bear a man's weight while standing on his hooks. They work equally as well for footpegs as for climbing irons, but again, walking can be such misery in them.

I prefer a low heel or — best of all — the "wedgie" or "spring" sole because the higher the heel, the more likely it is to get caught on something in passing.

Goggles. Sometimes I do and sometimes I don't. When riding slow in fairly open country I seldom wear goggles but as speeds increase, goggles become more and more of a necessity.

At slow speed, say a maximum of 15 to 20 mph,

the front tire doesn't tend to throw up a great deal of gravel. And running into a bug isn't all that disastrous. As the velocity increases, however, small rocks and sand tossed up and forward by the front tire become more and more of a problem, and running into a grasshopper at 50 mph or so is like being hit by a gooey bullet!

When riding as part of a group, regardless of the speed, eye protection is always a wise precaution. Even when riding on fairly hard ground with an absolute minimum of loose stuff, I've been hit by tire-tossed detritus when the closest rider was over a hundred yards ahead of me.

Everyone has his own particular, individual preferences in the ridingglass line. I have two.

When conditions are quite dusty — or extremely severe — it's RAF-style glasses. These have flat two-piece lenses that are remarkably free from distortion and padded leather margins to protect the eyes from fine, irritating dust. The glass is tempered and although not impossible to break, I have never broken a lens although I've bent the frames pretty badly a time or two and once knocked one of the lens segments completely out

of the frame.

But when all I'm worried about is bugs and a minor amount of flying gravel or an occasional grain of sand, I wear Wilson's safety glasses. Almost all riding is done during daylight hours, so I usually wear shaded lenses, either green or grey, there being no appreciable difference. I obtain these glasses from safety equipment dealers and they are much more comfortable to wear than goggles when the weather is hot.

Riding suits. Our British cousins (second cousins, that is) dote on riding in the nastiest, wettest weather imaginable, and toward this end have developed special suits — the next thing to hard-hat diving dress — for inclement weather riding. Although made by a number of companies, they are usually referred to as "Barbour Suits" or "Belstaff Suits" after the two leading makers.

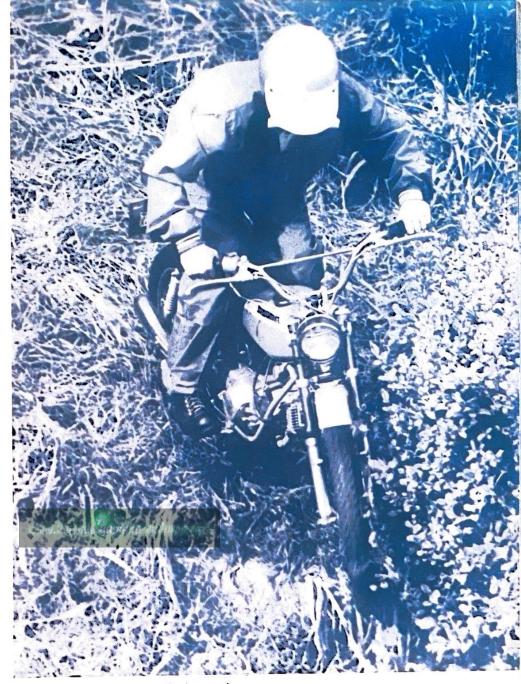
In addition to offering excellent weather protection, they are heavy enough to be well-nigh brush-proof and are almost as much protection as racing leathers in case of a spill. They also have lots of pockets and a multitude of adjustments to adapt them to just about any riding situation except the nice and warm.

On the debit side is the natural British disinclination to change, which means they use lots of those unwieldy snap fasteners instead of modern Velcro. The suits are inclined to be fairly stiff when dry and even more rigid when wet because they're made out of a sort of canvas, waterproofed with wax or oil. And after a hard day's riding, this archaic combination makes the outfit smell like the forecastle of the *Bluenose*!

For most riding, this degree of protection is not only unnecessary but undesirable.

Of late, I've been experimenting with a riding outfit made by Top Gear. It's constructed somewhat like the Limey outfit but is made of light-but-sturdy nylon material. The nylon is watertight although there is no intention of making the suit waterproof and the seams are not sealed. Considerable attention has been paid to venting and for its intended purpose — breaking the chill breezes — it can't be beat.

One of the nicest things about this suit is that it is extremely compact, making it easy to stow on a



Top Gear riding suit is increasingly popular for trail and enduro riding for all but the wettest weather. Although made of water-proof material, it is intended primarily as a windbreaker — the seams are not sealed. Capable of being compressed into a very small package it can be stowed almost anywhere on a bike. Unlike the more traditional riding outfits, it is available in right, highly visible colors. This is an important consideration for the man thoroughly aware of the near-impossibility of seeing a fallen rider in the trail — one wearing conventional dark clothing.

If you wear glasses — finding a set of goggles to fit over your prescription glasses may drive you wild. Out of all the brands available, Uvex goggles may work when nothing else will. This is Webco's No. 1177. You can also get goggles ground to prescription. Large-lensed glasses with safety frames and lenses are also available — both tinted and non-tinted — for use as eye protection when you are riding in non-dusty areas.



One of the reasons for the popularity of the trail bike vs. the traditional heavyweight. Can you imagine horsing a 400-lb. sickle over this kind of country?

bike for donning when the chill sets in along toward evening. Conversely, an early-morning starter can wear the suit until the day begins to warm, then take it off and strap it to a handlebar, or even tie it to his belt.

For the usual reasons, the British have not seen fit to make their suits in bright colors but Top Gear offers a choice of five colors. Two of them are safety colors for the trail rider — fireengine red and an International Orange that will catch the eye two miles away.

For my money, the fact that the Top Gear outfit is not waterproofed and affords somewhat less protection than the ones imported from Blighty is a small trade-off for the convenience and bright colors.

During cold weather, it takes more than an Enduro suit to keep from getting the chills and shivers. My first line of defense is one variety or another of made-for-outdoorsmen underwear. My favorite is the loose-knit stuff sold as thermal underwear and I always wear at least the lower half — as the weather warms along toward midday I often remove the top part.

I've tried goose-down insulated underwear and found it extremely practical, but not for riding. In my experience, it is too affected by sweat to be as good as the knit variety, and too airtight. And the knit stuff thrives on washing, whereas the down-insulated outfits are usually made of

nylon that sheds its stitching with repeated washings.

Although I can't recall ever having worn it for riding, a down-filled jacket (by Sierra Designs) is often included in my pack when the weather appears to be getting sour. The Enduro suit keeps me in pretty good shape when riding, but when resting, eating or just plain loafing around the fire at day's end, nothing, but nothing can beat a down-lined jacket. For its weight there is no garment that is warmer or more comfortable.

Most riders are not especially troubled by cold feet but for those who are, I suggest the purchase of socksthat-fit rather than the stretchy-fits-all variety so energetically marketed nowadays. Any constriction cuts down on circulation — even the mild variety applied by stretch socks. Also, it is important not to lace boots too tightly.

For those sore afflicted with cold feet, a good trick is to get a pair of heavy wool Ragg socks from Norway (Sierra Designs is one supplier) and a pair of boots large enough to wear over them without cutting circulation. I've resorted to this trick on several photographic assignments where I spent most of the day standing around in the cold and it works.

In extreme cases, insulated boots are available, both in rubber and leather. I wore these in the Artic because that was what most of the Eskimos were wearing and the boots perform as advertised!



For those sore afflicted with cold feet (real cold feet, not the figure-of-speech kind!) coarse woolen sox like these Norske Ragg socks are the ticket.



Honda SL-70 hitting pozo in Baja California.

to be that I always recommended a new rider get a little experience on a minibike before trying a full-blown motorcycle, but that was before the introduction of the new breed of little cycles known as "midi-bikes" or "mini-cycles." The Yamaha Mini-Enduro and the Honda SL-70 are good examples of the genre.

For beginners

these have it over minibikes in several ways. Most important, they almost always have regular motorcycle controls and always a full set of brakes, both front and rear. Admittedly some minibikes are so equipped but most aren't. Learning to ride on a minibike with an automatic-clutch-cum-torque-converter and rear brake only means that after one learns to ride the minibike all he has really learned to do is balance. When he progresses to a motorcycle he will have to cope with a set of totally unfamiliar controls. In es-

sence, he will have to learn to ride all over again.

Of equal importance, a minicycle handles like a motorcycle. In fact, David Murray's SL-70 Honda handles like a dirt motorcycle – high praise indeed! After a person learns to ride a machine like this, all that remains is to familiarize himself with the placement of the rear brake and gear shift – if they happen to be arranged differently – to make the change to a forsure cycle.

Learning to ride on a minicycle has a great advantage over learning to ride on a regular bike. The minicycle is a helluva lot easier to learn on because it is smaller, lighter, not so powerful, more maneuverable and, probably just as important, ever so much less intimidating to the new rider!

On the little bikes one doesn't have to learn to handle an excess of power when first starting out because they are

equipped with a small-for-the-weight detuned engine relying mostly on slogging ability to haul the bike and rider over the countryside. They are light enough so that a novice seldom gets himself into a spot where he has to go for help to get his machine unstuck and most of them don't have so much power that they will pull any hill in sight. It's easier to ride uphill for the beginner than it is to ride back down again — as many a learner has found to his dismay!

But whether one learns to ride on a minicycle or a full-size motorcycle, the technique is the same.

Where to begin? That's easy. Start on reasonably level ground with grass and/or ground cover if possible but not on pavement.

The reason for this is (1) you're not learning to be a pavement rider, (2) if you fall off the ground is soft, hopefully, and you have

almost no opportunity to hurt (and discourage yourself), (3) when the bike is dropped, it won't get all scarred up (note I said "when" and not "if") and (4) it's much easier to ride a dirt machine on dirt than it is to ride a dirt machine on pavement.

Your first step is to read the instruction manual that came with the machine and familiarize yourself with the machine and its nomenclature. Learn the positions and functions of the various controls (there are ordinarily five operative controls on a dirt bike and a host of adjustments). Before you even attempt to start the engine you should be able to automatically pull the clutch lever on command and confuse it with the brake lever on the other end of the handlebar only about 1 out of 20 tries. Learn to shift and be able to stab either the shift or the rear brake pedal without dithering.

Think nothing of it if this "dry-run" period takes four or five days, or a week or so of spare-time effort. It's time well spent.

When the controls are thoroughly familiar, start the engine and practice keeping it running. Dirt motorcycles are *not* required to be able to idle for minutes at a time without attention and few of 'em will! They have to be goosed from time to time and with a little practice, you will develop a trained ear that automatically notifies you just when the throttle is due for blipping.

There is a major benefit to this drill. Starting an engine and keeping it running is a chore you will face throughout your riding career, but it also familiarizes you with throttle operation, the most essential part of cycle riding.

When beginning anything it is essential to learn a step at a time. In motorcycling this means one gear at a time, starting with low and progressing through second, etc. It may take several hours in each gear before you feel confident to tackle another and higher gear and the attendant faster pace. But there's no hurry—the skin you save will be your own!

On the

day of the first ride, take the bike to the aforementioned open area and start the engine — with the practice you've had it won't all be new and strange.

Place your right hand on the throttle with the wrist

bent in such a way that you won't be able to open the throttle more than 1/3. This is a precaution that will combine with your previous blipping practice to prevent getting confused and opening the throttle wide instead of closing it, something that happens a lot more often than you would think with new riders.

Now, with the engine running pull in the clutch, slightly open the throttle and shift into first gear. You do these three things at the same time when you've had a bit of experience and you should do them at the same time now — but if you don't manage it the first time or two all that will happen is a dead engine. Do not despair, you will finally get the machine into first gear with the engine still running.

Speed up a little on the engine and gradually release the clutch. As the clutch engages, the engine will slow down — give it a little more petrol. As the bike begins to move under its own power, give a slight assisting shove with the foot. Or feet. Don't feel bad if it takes you half a dozen or more tries to get rolling. I think everyone who ever rode a cycle the first time has killed the engine again and again when getting under way. If it's any comfort, it will still be happening now and then after you've been riding for years!

There is a school of thought that recommends an instructor stand slightly in front of the rider with his hands extended toward the handlebars and that the beginner ride slowly toward him. I've never agreed with this, especially after I watched a guy's bride widen on the throttle one afternoon and knock her ever-lovin' hubby sprawling in front of a goodly number of convulsed spectators.

All right, you've managed to get the bike rolling under its own power; the next thing to do is to speed up to just a little better than a fast walk. The reason for this is that it is extremely difficult for anyone to ride a two-wheeled vehicle dead slow.

That's all there is to it. If you've ridden a bicycle at any time in your past you will immediately be struck by how much easier a motorcycle is to ride.

The situation is a little bit more complicated if you haven't ridden a bicycle because then you will have to learn to ride a two-wheeler from scratch, If that's the case — and even if it isn't — don't be the least bit ashamed to duck-walk the bike, balancing with your feet. Persist and you'll discover you are able to go progressively greater distances without touching ground. In a surprisingly short time it will be the most natural thing in the world to simply ride slowly and casually along without conscious thought to manipulating the cycle.

But regardless of whether you have had previous experience or not, make it a point to learn to ride with your feet on the pegs as soon as possible.

Remember,
you're still puttering along in first gear.
Don't use any other gear until you are
quite proficient at taking off and able to
ride indefinitely with your feet on the pegs.
You've learned

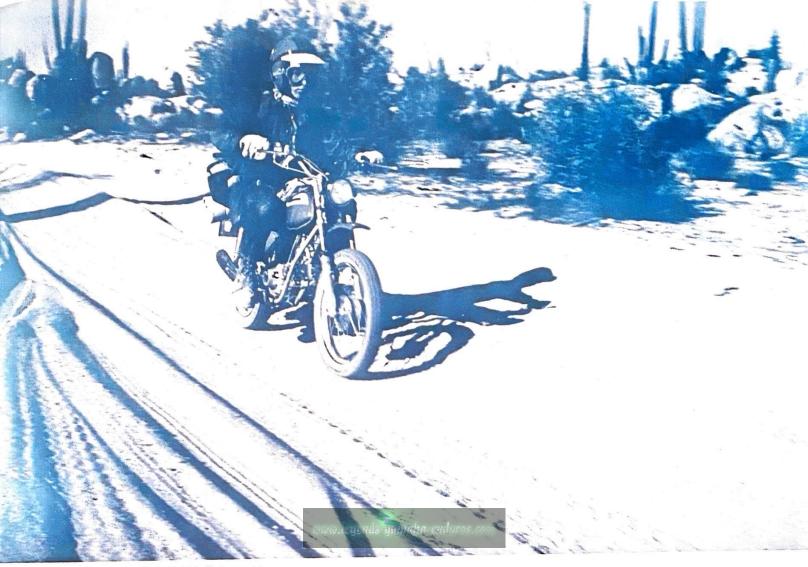
to ride. Now, practice stopping. Use both brakes — most braking is done with the front brake and you *must* learn to utilize the front brake efficiently as one of the first steps in learning to ride if you're going to keep out of trouble later.

At the same time you're practicing getting under way and stopping and balancing, you should be conscientiously practicing throttle operation. Controlling the engine precisely and at will is the key to successful motorcycling whether it is dirt riding or (ugh!) pavement riding.

And you will soon learn some basic truths — opening the throttle on a curve tends to make the machine run wide, shutting down decreases the radius. Opening the throttle takes weight off the front wheel, easing off makes the front wheel heavier and gives the front brake more effect. And so on. The basic essentials of throttle operation.

When you can operate the controls automatically, start and stop without too much engine stalling and have cultivated a delicate touch on the front brake that does not lock up the wheel — instant disaster! — you are ready for second gear.

With second gear you will only have to learn to shift from first to second through neutral as the bike picks up speed, with attendant throttle and clutch manipulation — nothing at all like the complexities faced a few day ago with a whole passel of unfamiliar controls to sort out.



Soft sand such as that on this Baja road is NOT the place to learn to ride!

You must also learn to down-shift from second to first because, transmission-wise, a motorcycle is handled like a truck. It is shifted up as speed increases and down as speed decreases. Under almost all circumstances an experienced rider comes to a halt in low gear if he intends to ride on promptly or neutral if he intends to stop for a bit.

It's bad policy to spend much time with the clutch disengaged and the engine running. Motorcycle clutches are nothing like automobile clutches (it isn't good for automobile clutches, either, but they'll stand more of it) and some clutches will give up with very little of this sort of treatment.

Actually,

the hardest shifting is between first, second and neutral and once these three "gears" are mastered, the shifts between other speeds will present no particular problems.

The higher gears — and speeds — represent an almost irresistible temptation to a beginner. Fight this temptation with vigor because now is the most dangerous period of your motorcycling career.

Most serious

motorcycle accidents occur during the first six months of riding, and a disproportionate number of these accidents occur on borrowed bikes. It is hard enough to learn to operate your own machine during this period without adding to your difficulties by trying out your friends' bikes.

It should be pointed out right here that immediately after you buy your own motorcycle you will discover that a large number of your friends are just dying to try your new bike. If they don't have a bike of their own, don't let them do it! A man who isn't interested enough in cycling to buy his own machine should not be given the opportunity to wreck *your* bike.

One of the elemental truths of motor-cycling — or ballooning or backpacking or skiing or any other active sport — is that those with a vital interest in an activity will manage to own the proper equipment.

I make

it a rule to only let people ride my machinery who own equipment of their own. And by sticking to this rule I have never had a bike suffer more than normal wear and tear. I have seen too many well-meaning, friendly people get their bikes severely damaged by jerks too damn cheap to lay out their own money!

Even with

two identical machines of the same make, model and degree of wear, the individual adjustments of front and rear brakes, clutch and throttle can make a marked difference in handling characteristics. The problem is vastly compounded by the fact that there is no standardization of shift patterns between makes (or some-

times even models within brands), nor is there an accepted "side" for rear brake/ shift levers. Some bikes shift on the right, some on the left. Gear boxes shift down from neutral to first, and other boxes shift up from neutral to first. Even for highly experienced riders, changing machines can be a hassle, and sometimes a guy can ride a bike for years and then in a tight place revert to the pattern of a former machine, probably the one he learned on — with catastrophic results!

It's much

too easy for a motorcyclist to ride fast ... faster than his abilities warrant. This is such a common phenomenon that there is even a term for it, "riding over his head," and all too often the guy who is riding over his head ends up landing on it!

There is a very thin line between riding at an easy pace and riding over your head, sometimes only a couple or so miles an hour. Oddly enough, the former pace may actually be much faster than the latter when you consider how much time is lost picking the bike up off the ground after crashes.

The maximum practical speed varies with individuals, of course, and with the terrain, the bike and the way the rider happens to feel and perform on a particular day.

Like most riders, I enjoy fast, hard riding and I discovered years ago that slacking off the smallest bit will change hard, fast riding into a relaxing afternoon's spin.

As soon as the basic shift and control patterns are thoroughly imprinted on your mind — imprinted to the point where bike handling becomes subconscious — and only then can you begin to seek out rougher, ever rougher ground. The trick is to ride just to the

limit of your constantly increasing ability and *not beyond it*. That is, ride to the level of your incompetence because falling off too much is a waste of time insofar as the learning process is concerned. It's also hard on people and scooters.

My own feeling is that falling off a couple of times a day is about right at this stage. If you are *continually* falling off, revert to easier terrain and/or slow down. Or even stop and think and survey the path ahead now and then. The point is, an excessive number of spills indicates you're doing something wrong. And in motorcycling, when you have reason to suspect you're doing something wrong, you are! And you'd better change. Fast!

But the fact remains — most cycle riding, dirt division, involves the challenge of negotiating places that common sense and prudence tells you are not really meant for wheeled traffic. Therein lies the pleasure of offroad riding.

Donnie Murray, Expert-classed TT racer, maintains that nobody can be taught how to ride a motorcycle. He is right, but by using the foregoing precepts I've been able to at least assist in the learning process. And the riders who learned by these techniques did so with an absolute minimum of fuss and bother. Perhaps the best statement I can make in favor of my slow and easy self-instruction method is that not one of the beginners who learned to ride this way got discouraged and gave up.

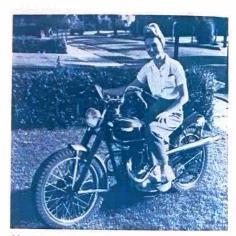
In closing, I want to offer the old-time cyclist's proverb that was passed to me one afternoon in the New Mexican desert a good 30 years ago. It is just as valid today:

"When in doubt, widen on it!"

When first learning to ride — make sure you have *lots* of room free of obstructions. The time to go trail riding is when you have learned to ride automatically and not before!

A while ago a guy in Redwood City, California killed himself by starting out in a school yard. He forgot how to shut off the gas and ran smack dab into the school building.

. . . the building didn't give . . .



Hard to believe — but true! In the late forties, thinly disguised street bikes such as this rigid-rear 350 cc Triumph 3T were used for "cowtrailing." This one, with its full three inches or so of fork travel, modified bicycle fender and accessory high pipes belonged to H.P. Books publisher Bill Fisher — who shot this photo in early 1948. Minimal ground clearance made rock guards an absolute essential to avoid tearing out the engine vitals. A few bikes began to get rear suspensions about this time.



A steep rocky hill is hard to ride because if the wheel looses traction and spins and then catches it is almost sure to elevate the front end. Knobbies accentuate the problem. This rider has his weight too far back and his feet off the pegs — he's in bad trouble.



Sad result of faulty technique . . . at the crucial moment he let go of the handlebars instead of guiding the bike around and winding up with it pointed down hill.

Ridin' The Rough Stuff

are four limitations faced by a trail bike in riding up hills: power, traction, stability and the ability of the rider to make the most of the bike's characteristics.

The first is pretty obvious — if the engine won't keep the rear wheel turning, it isn't going to shove the bike up the hill. Period. The answer to this is usually to regear the machine, either by installing a smaller countershaft (transmission output) sprocket or a larger rear sprocket — the bigger rear sprocket is the right way to go. Even a small change of 10 or 15% can sometimes make the difference between an out and out dog and a machine that will haul you up the grade like a Caterpillar D-9.

The traction problem is not quite so easy. All machines sooner or later get to the point where they simply spin the rear wheel — if their engine has the power. In some instances, it helps to soften the rear tire. Most trail bikes have rear suspension units damped both coming and going. If you

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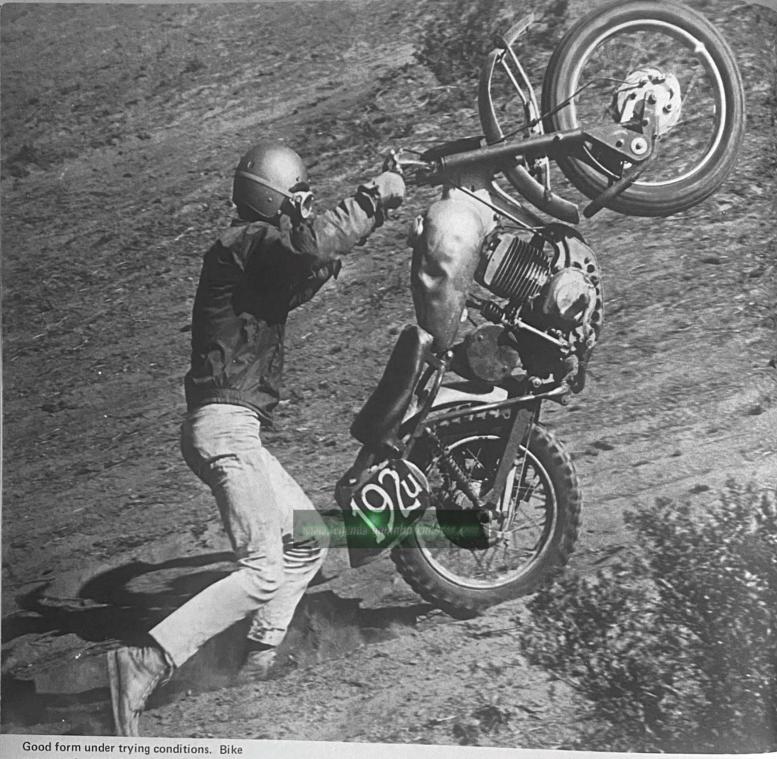
are troubled with excessive wheelspin and suspect wheel hop, have a friend observe the machine on a hill. Better yet, have a friend try the machine and you watch the rear-end performance.

Another cause of poor hill-climbing traction, less rare than you would think, is an incorrectly selected rear tire.

For some unknown reason, trail bike riders seem to think that knobby tires are a requirement for any and all off-road riding and the manufacturers cater to their idiosyncrasies by installing knobbies on most of the trail bikes sold. Actually knobbies don't work well for most riding. They are a poor choice indeed for hard ground, they don't contribute much of anything in sand, and nothing at all in gravel. Knobbies really only help things in grass, mud and extremely soft dirt and they can rob a bike of 30% of its traction on a hard-packed trail!

All Moto-cross machines are shown with them and I suppose this is where people get the idea they are de trop, but Moto-cross competition is a special application. Nothing can be more discouraging to a rider, particularly a new one, than to be forced to ride his knobby-equipped machine along hard-packed trails with a group of more experienced riders who have shod their machines with the correct skins.

There is a school of thought that says knobbies are especially bad on small-displacement machines - in the neighborhood of 100 to 125 cc's where a part of the riding is done over hard, rocky ground. In this situation, the wee engines are kept on the boil by letting the rear wheel spin in difficult going. When a free-spinning wheel encounters a solid resistance, say a tree root or a sharp rock, the knobby tends to get an instant grip and up! goes the front wheel. When this happens there are only two solutions in sight: Either get off the gas - in which case the engine is liable to sudden death or take a chance that the tire will lose its grip (usually by having a chunk torn out of the tread) before the bike comes over



Good form under trying conditions. Bike got away from the rider, but he kept his head and the grip on the handles and eased the bike to earth. Dirt riders were using this sort of equipment in the mid-sixties.



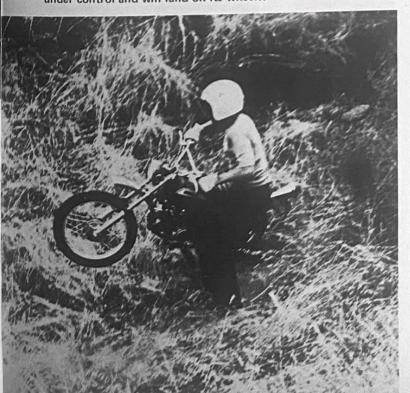
Spinning rear wheel has just hit a rock hidden in the grass. Danny MacMurray plants his feet firmly as the front wheel starts up. He shuts off throttle and hangs onto handlebars!



Front wheel has left the ground and Danny is off the bike guiding it around him.

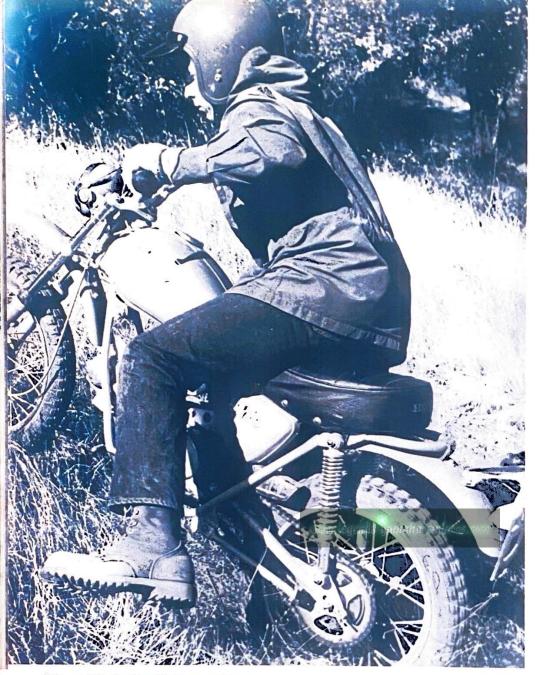
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Bike is now pointed downhill but still under control and will land on its wheels.



Front wheel has come to earth, bike is still upright and Danny is about to remount for a fresh start.





When a bike has insufficient traction to negotiate a hill it spins out without any spectactular didoes. Dry grass like this is much more difficult to climb than a hard-packed dirt hill of the same gradient.

on top of the hapless rider. Either solution is distasteful, the second especially so, and therefore many experienced smalldisplacement competition riders win most of their trophies with relatively smooth skins.

Now and then the traction problem on hills can be solved by zig-zagging — this solution has been used by road-builders for millenniums. The fly in the ointment here is that most of the bikes will climb at least as steep a grade as they will ride around. To put it another way, riding on side hills is not all that easy!

only a few things to do about stability. In hill-climbing, stability relates to the eventual inclination of the bike to loop—to bring the front wheel up and up and finally over the back wheel—a situation that can cause premature wear and tear on machine and rider.

A skilled rider minimizes this tendency by standing on the pegs and leaning his weight forward and over the handlebars. Unfortunately, this also transfers some of the weight from the rear wheel, where it's needed for traction, to the front and at the same time increases the likelihood of spinout.

Keep running up hills and sooner or later you're going to loop a bike. No matter where it happens — on a hill or on flat ground — it is always scary and I, for one, never quite get used to it. However, there is a definite procedure to be followed that will minimize the likelihood of damage.

When the bike starts over, close the throttle the moment it becomes apparent it is going past the point of no return. Get both feet on the ground as soon as possible and turn the machine to one side or the other — the idea being to keep it from landing upside down on the bars and seat. Ideally, the bike will come to earth front-tire-first with the two tires in line at right angles to the steepest part of the hill, or even with the front wheel lower than the rear. Ease the bike to the side in any event, because the more you retard its fall, the easier it will hit when it finally comes to rest.

Some years ago Donnie Murray, Bill-the-Shoe and myself built a Van Tech Scrambler with a super-tuned Honda 90 engine. This little dandy tipped the scales at something around 170 pounds and really had beans.



The wheel had been spinning on the grassy hill when it caught suddenly and the bike rared up on its hind wheel. Danny Murray immediately dismounted and got ready to steer the bike around him.



Although the bike is falling it is under full control. If Danny were to let go the handlebars at this time the bike would probably damage itself when it hit the ground, and could even come over on top of Danny.

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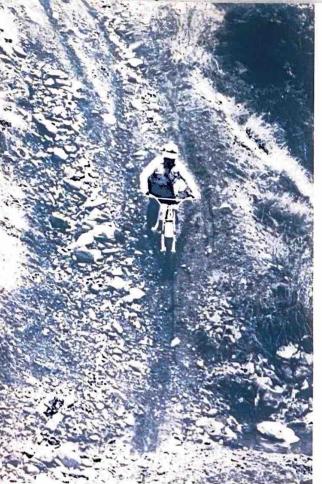
Came the day we finally had it ready to run and we took it out to the Richmond Ramblers' cycle playground in Richmond, California for trials. Don and Bill got to it first, rode it until they were tired and had it pretty well broken in before I got my turn.

I rode the bike around the clubhouse for a while to get the feel of it and then started up the steep hill right behind the clubhouse.

Running along the side of this hill are several dirt roads and I was doing great until I came to the second of those roads. I shot up onto the road like a cork out of a bottle of Cold Duck and, to my horror, discovered myself facing a practically straight up and down wall on the other side. I immediately got off the gas and barely had time to get up on the pegs when the front wheel started up the bank. Then, having

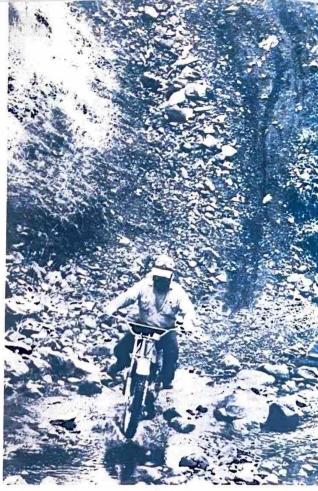
Danny has eased the bike safely to earth with front wheel hitting on the side of the tire. Note how his body is braced against the seat to aid control.





Rocky hills like this are a severe test of the bike's suspension — and the rider's ability! Riders in the Jackhammer Enduro — who got this far — remember it well...





Ordinarily, when one reaches the bottom of a hill his troubles are over. But it doesn't always work this way. Excessive speed here will get a rider all wet. Dunked, that is. Even at controllable speeds the slippery rocks can be tricky — note my right foot is off the peq.

slowed down to keep from running the risk of tweaking the forks, I killed the engine.

I thought I had killed the engine. As I stepped off, the little Honda restarted and without my weight, immediately started spinning the rear wheel. As I'd stepped off to the left of the machine I'd inadvertently opened the throttle and when the bike rared up on the hind wheel I couldn't get my wrist around far enough to close the throttle to save my soul!

There

was nothing to do but hold on and waltz that bike around and around — at least three or four full, 360° revolutions — before finally getting my feet braced and bringing the machine gently to earth on the left side. No damage.

As soon as I hit the

kill button, I heard Don, Bill and other assorted layabouts laughing fit to be tied . . . my dancing with that Van Tech must have been the funniest thing that happened at Richmond since Smoke Thomas found the mudhole hidden in the brush!

Admittedly,

there is no pat solution to the stability problem short of mechanically altering the geometry of the machine. And each and every bike and rider combination has a maximum slope beyond which they cannot climb. Lengthening the swing arm will sometimes make a better hill-climber of a bike, but often at the expense of other handling parameters.

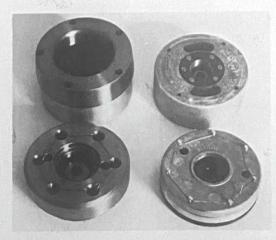
Because of incorrect throttle operation, very few riders get the most out of their bikes. Opening a throttle wide at relatively low engine RPM's will often result in a sudden lowering of torque. And widening to the point where the wheel spins wildly will result in a severe loss of tractive effort.

Coming back down the hills you've ridden up can be quite a problem. Bluntly put, in riding uphill you either make it or you don't – but in coming down you either bulldog the bike down, ride down, find another route down, abandon the machine, or roll endover-end!

One of the interesting scenes in "On Any Sunday" was Malcolm Smith spinning out on a hill, turning his bike around and riding down. This is completely beyond the abilities of most hill-climbers. Ordinarily a climber who doesn't make it to the top has to be helped off the mountain by a pickup



Rider in foreground riding loose and easy on the pegs passes a rider who has spun out on the hill.



Although as a general rule it is not possible to improve hill-climbing ability by engine modification, there are some shining exceptions. One of the most practical things to do is to increase the rotating mass. Note the extra weight I added to our Hodaka 100B's clutch and flywheel on the left — compared to stock parts on the right. This sort of work coupled with a reed-valve conversion lets the bike run slower than a walk and it climbs like a D-9 Cat. But don't write Pabatco for this kind of conversion detail — work it out with a local machinist. Watch the case clearances!



Greg Ekins demonstrates the way to ride the loose & dusty. Note how the front tire is barely skimming the surface and nearly all weight is on the rear wheel. Speed is so high that the rear wheel doesn't bury. Standing on the pegs allows the bike to 'work' easily and maintain its upright posture.

Getting downhill with no rear brakes -When Greg Ekins was helping us check the printer's proofs of this book he told us about something that had happened to him in October, 1972. "I was riding the Sierra 200 Enduro and lost my chain and rear brake when the anchor arm on the hub broke. This caused me to pile (crash!). There were still a lot of downhills because I fell at the top and had to make my way down. I tried going downhill with just the front brake but couldn't stay on the bike because this was in deep shale. Bulldogging it didn't work either because the front tire kept washing out. So I turned the bike around and walked it down backwards just like unloading it from the truck. It worked so good it surprised me.

crew with ropes.

There's no disgrace in walking a bike down a steep hill. Riders call this "bulldogging" and we all do it sooner or later when the going gets a little too much for us. The big danger in walking a bike downhill is that you will slide the front-wheel brake — it takes less to lock a wheel when the bike is being walked than when it's being ridden — and dropping the bike. This seldom results in any damage but it's a confounded nuisance having to pick that sickle up again and again. And again, I know. I've done it!

down is the best way but sometimes it isn't practical!

As a rule of thumb, come down in the same gear you used to go up although, here again, it is not possible to make a hard and fast rule.

Riding downhill is technically the opposite of riding uphill so it follows that one puts his weight to the rear of the bike as much as possible to obviate the tendency of the bike to do frontwheel wheelies.

Front-wheelies are a no-no, invariably resulting in coming at least part way down end-over-end. Unlike looping the bike on the uphill shot, there is no way to ease the stresses on the bike and damage in this situation is not at all unusualy, believe me!

The bugaboo of downhill riding is stalling the engine by a mite too much rear brake. The weight transfers naturally to the front wheel in riding downhill and it follows that there is not as much weight on the rear wheel. Translation: If engine stalls it will often lock up the rear wheel with resultant hairy handling and loss of control. With a standard in-and-out compression release, all that is necessary is to actuate the release and the mill will immediately start turning over — and things go back to normal right away.

For starting a dead engine, sometimes a one-way release will help and sometimes it won't. And sometimes it will stall an engine completely on a hill.

Keeping

the weight as well to the rear as possible makes the life of the forks much easier and gives more rear-wheel traction. Both are worthwhile.

One technique for downhill riding is to kill the engine — deliberately —

put the bike in low, and then use the clutch as a rear wheel brake. I tried this just one time.

I was riding a Sherpa-T between sections at a Pacific International Trials Society English Trials and the route was intended to be used by those masters of rough-country riding, the club members themselves.

The trail was actually a gully from six inches to a foot deep, more of a rut than a trail. There was no way I could ride it without footing it, so I killed the engine and used the clutch for a brake as the Sherpa lacked a compression release.

Shortly,

the variation between theory and practice became painfully apparent. Just as my front wheel dropped over a "stairstep," the engine caught. I promptly and automatically squeezed a bit more on the front brake lever and the bike immediately reacted by doing a forward one-and-a-half

Dave Ekins on sand — Getting started in sand is just a matter of blipping the throttle on and off in low gear until you get enough forward momentum to grab second gear and get on top. Use of the kill button is also effective.

gainer — the two of us went ass-over-tincup down the hill for a ridiculous distance. It is testimony to the construction of the Sherpa that damage was confined to a few scratches and the hurt feelings of its lawful owner.

All I got out of it was a good scare — I thought for a while there that the bike was going to come down on top of me — and some valuable experience . . . see what I said about unfamiliar bikes!

This

points up the fact that hills do not necessarily have the same gradient all the way down and when the going is really tricky, it is essential not to pick up any speed above the minimum for control if it can be avoided. On really steep downgrades, it will be impossible to lose any speed inadvertently picked up, and unless you are careful you find yourself gradually going faster and faster with complete inability to slow down. This gets scary and hairy fast!

Remember, when you are on the far, frayed edge of control it takes but the slightest increase in velocity or the barest increase in slope angle — same thing — to put you on your melon!

Sand. The basic rule for motorcycling in sand is: Sit back and turn it on. The theory is that if one goes fast enough the bike proceeds along the top of the sand in the same way a water skier does his trick on the water.

opinion, the different tire tread patterns don't make much difference one way or the other when riding on sand. Although no two riders agree on this, it seems to make little difference whether you pick knobbies or pavement tires or something in between. The smoother tires don't get good traction if the speed drops below a certain point. In the same situation, the knobbies tend to dig themselves a hole. You pays your money and you takes your choice.

Most of the time, speed can be maintained because almost by definition sand occurs on the level, usually in the form of dry creek beds. Dunes are much commoner in landscape photography than in actual fact.

One thing that does make a difference is tire size. The biggest skin you can get under your machine is the one you want for sand and mud — a time or two I've wished I could get a 10:00 X 20 truck tire under the bike!

There are many varieties of sand, ranging from the fine stuff like talcum powder that won't support a snowshoe rabbit to coarse grains almost like pea gravel that wouldn't take the tracks of a one-legged man on crutches.

But always, always, the idea is to keep the front wheel from digging in — this is why the sitting-back part — and losing control and creating drag that will slow the bike to the point where the rear wheel will sink, start to slip, churn and lose traction.

If the bike loses headway enough to begin digging down into the sand, don't wait until it comes to a wheel-spinning halt with the rear wheel in a grave of its own digging before you lend the machine a hand. The slower a bike is going, the more help it requires and when it is stopped with the rear wheel buried to the axle, it requires the most help of all!



Greg Ekins doing his thing in a sand wash. Front wheel barely skimming the surface, weight mostly on the rear wheel and really cranking it on is the right way to handle these sand pits. Handled otherwise, they can be very nasty indeed!



A graphic illustration of how *not* to ride sand and/or hills. This rider nosed over the hill with his weight too far forward, put the front wheel down so hard it compressed the suspension and buried the wheel. The rear wheel is off the ground and the next thing to come to earth will probably be the rider's helmet.





Unless the front fender is mounted independently of the wheel it tends to mudpack at every opportunity — an obvious fact that makes me suspect that most designers of 'street/trail' bikes have never ridden off the pavement. Here the mud has packed so hard that it was necessary to remove the front wheel to clean the fender.

As soon as you become aware of the fact that stalling is imminent — something you determine by feel and experience and not by actual speed — jump off the bike, without stopping, and run alongside. Often you will be able to get the speed up to 10 or 15 mph this way and remount. Hard work, I'll agree, but by no means the hard, sweaty physical labor that getting a stopped and stuck bike going again is.

Note that I said, "jump off and run." Duck-walking is not the thing for sand because your weight is still jamming the rear wheel ever deeper into the loose and sticky and is doing nothing for the basic traction problem. The front wheel, meanwhile, is plowing a deep furrow. Worst of all, duck-walking takes more effort than running and riding—this can be important because if there is much sand to be ridden, it will take a lot of pure unadulterated work before the day's riding is finished.

The bike feels like it has a flat tire when moving fast over the sand. The forks wag back and forth and the machine feels "snakey." This is entirely normal. If the dirt bike has correct geometry (I have never ridden a dirt bike that did not have the correct geometry for this kind of riding), all you have to do is point it in the general direction and the cycle will do the rest.

But the beginning rider feels this erratic motion and immediately grips the bars firmly to keep the forks from swinging from side to side — and he's making a severe mistake.

The range of movement made by a good-handling bike is not as wide in actuality as it feels, but the moment the bars are locked by a strong-shouldered rider the bike loses its inherent stability and quite often bike and rider wind up making a huge dust cloud.

Mud.

I've been assured by people who should certainly know better that riding mud is just like riding sand, but it is a different pot of bouillabaisse altogether.

Admittedly, there are a few similarities but sand is seldom slippery and mud almost always is. Hitting a mud puddle unexpectedly and at speed on a curve has put most trail riders on their ear a time or two! In this case the mud acts exactly like glare ice—and you can't ride a motorcycle on glare





fast enough to prevent the front wheel digging in, and the rear tire spinning rapidly so as to make it self-cleaning. Photo taken on an island on the San Joaquin with an impervious layer of clay overlaying sand. The clay held the water and even the thin layer of grass did not make it hard enough to support a bike unless the bike was ridden rapidly. Unusual terrain, but unless standard mud-riding techniques were used a bike mired itself to the axles.

Some riders have difficulties maintaining are no help whatsoever in cases like this.



When a bike is ridden through water at a certain speed the front wheel acts as a cutwater, creating a hole through which the rider travels surrounded by water but not soaked by it.



But speed up just a fraction too much and the water flies high enough to come back down on the rider.



But hit the water fast and the water splashes up into the air above the rider and he finds himself riding in a tropical rain-storm. Water driven like this will fall on the rider for 20 feet or so after he leaves the stream.

ice with ordinary tires. Period.

But because riding on slick, slippery mud is so much like riding on glare ice, it pays to keep the feet ready to aid in balancing. When the front wheel of a motorcycle loses its grip on the earth, the bike is going to fall down unless forcibly restrained. Sure, your cronies will laugh at you for footing it through a mud hole now and then, but your turn will come when they try it themselves. Especially if they try it feet up!

Also unlike sand, tire tread plays quite a large part in mud. It is here that knobbies come into their own, but the knobbies should be real knobbies, with the valleys between the knobs being at least equal in area to the knobs themselves. A few tires especially fabricated for mud have valleys that take up about 2/3 the tread of the tires. This allows the knobs to sink into the soft material and squeeze the excess out between the knobs and thus get a better grip.

But for the knobs to do their thing they must be fairly clean -

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if the spaces between the knobs get jammed with mud they are no better than a drag slick. Any knobby worth its salt is designed to be self-cleaning if turned rapidly enough. Many times, the only way you'll be able to get going in mud is to spin the rear wheel to get it up to self-cleaning speed. Run beside the bike and, with luck, the wheel will clean itself and as soon as the bike is moving well, say 10 to 15 mph, you'll be able to jump aboard and take off.

I don't know an answer for the kind of mud that balls up on the wheels and forks and the undersides of the bike, adding pound after pound of dead weight to the machine. If anything, the answer is speed but sometimes speed is impractical. Read impossible. Mud like this will try your patience, strength and maybe your guts. Avoid it like the plague.

Not long ago, quite a few trail bikes were fitted with a front fender mounted on the lower forks so that tire and fender went up and down as a unit. Some of these fenders were mounted

closer to the tire on their leading edge so that, in theory, they would trim the mud from the tire as it built up. Sometimes this worked reasonably well, but in other conditions it was a complete failure, especially if there were rocks in the mud.

A number of years ago I overnighted in Mulegé, BCS, Mexico and during the wee small hours it rained. Hard. In those days the road followed the beach and was made out of the same material as the rest of that part of the world. Immediately after crossing the Mulegé River on the outskirts of town, the road began to travel through a region of about the stickiest clay I ever encountered.

It was so slick that when I would fall off – which was frequent! – I would often lose my footing and fall down several times before I could get the bike up and going again.

After a few miles of this, I began to hit patches of weather-broken rock. The mud had been bad enough but when rocks began reinforcing the clay, it became all too apparent that the fender

couldn't cope.

I stopped several times to clean the mud off the tire and from under the fender, a chore that necessitated the removal of the front wheel each time and the use of a tire iron for prying and digging. As the day wore on, the patches of mud were getting smaller and the stretches of rock were getting longer. The hot sun was rapidly drying the remaining mud so I began to cheer up a little — I thought I could see the light at the end of the tunnel.

I'd made what I figured to be the last fender-cleaning stop half an hour before I hit a short stretch of clay, only about a hundred meters long, that had been shaded from the morning sun by one of Baja's many mountains. The engine started to labor but I was sure if I could make it just a little farther on to the next rocky stretch I wouldn't have to dismount the wheel again.

Just as I reached the hard stuff, the front wheel locked completely with predictable results. And I went over the bars like a giant bird and landed on my (helmeted) head and shoulders in the center of the road...

Rear fenders are never mounted so that the clearance. between fender and wheel remains constant and hence there is less trouble with rear fenders locking the driving wheel. But it most definitely can happen under some circumstances — and when it does, it is just plain murder to get going again.

The best

way to get started with a mudded-up rear wheel is to have a friend pick up the rear end of the bike, get the wheel spinning rapidly, and then drop the bike. The tire will remove a little mud and the bike will make a little progress. Repeat the treatment until the bike is able to progress on its own, then get up speed as rapidly as possible.

Generally, there is some warning of rear-wheel build-up: the bike will start to labor. The drill is to bounce on the seat as heavily as possible and let the still-moving rear tire clean some of the mud out. It is vitally important to go as fast as possible.

Mud build-up usually occurs on fairly level, reasonably smooth stretches because there is little up and down motion of the rear wheel. And it varies with the riding speed. Generally, it is at a mini-



Water may be encountered anywhere when trail riding — even in the middle of a desert as illustrated here. A bike that won't ford a creek is an abomination.

Taken at Arroyo Cataviña in the Viscaiño Desert.

mum when moving fast because the bulk of the mud leaves the tire as soon as the tread leaves the ground with the forward motion of the bike. It is more likely to happen with knobbies than with trials-universal or pavement-tread patterns.

But there are times when all your skill, all your cunning, and all the bike's power will not prevent the mud building up and binding the rear wheel. And when it happens, you have my sympathy!

One last remark about mud. Unless your cycle is fitted with a waterproof sparkplug terminal that does what it's supposed to do, the engine is at least as likely to stall out in mud as it is in water - perhaps more so. If it stalls out, wipe the gooey mud off the sparkplug and secondary wire as soon as possible. I've seen riders go into a frenzy of kicking on the crank lever instead of simply cleaning off the plug and waiting for the heat of the engine to set things right. By the time they got around to doing what they should have done, the engine was thoroughly flooded and their problems were compounded.

Water. Water is closely related to mud — so closely related that sometimes it's hard to tell them apart!

Techniques

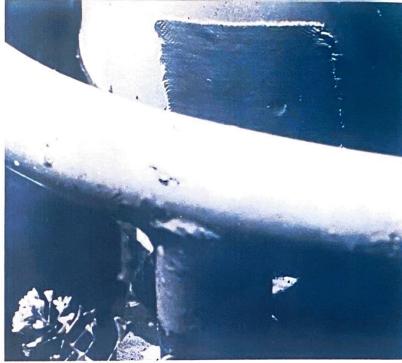
for riding in water are largely determined by how *deep* the water is and whether or not you can *see* the bottom. And what's *on* the bottom.

Every cycle has a maximum depth of water it will negotiate, but oddly enough, this cannot be determined by static measurements made while the machine is at rest. This is because a motorcycle's front wheel acts as a cutwater and parts the water to each side, leaving the following machinery to travel in an air-filled, fairly dry cavity. A bike will actually cross a stream that's deeper than the air intake for the carburetor. Sometimes. And under certain circumstances.

A bike will do this, but as standard operating procedure I can't recommend it. Sooner or later one will hit a hole a wee bit too deep, or a stray boulder, or simply slow down a mite too much and then it's immediate disaster. If the engine merely drowns out or gets waterlogged you can count yourself lucky. In this case, you wrestle the bike ashore — sometimes easier said than done — get the water out, dry it



Crossing Grizzly Creek near Taylorville in the High Sierra. The water was just deep enough to obscure the bottom, and I hit a rock that put me downstream into deep water so quickly that I hadn't time to get off the gas. Result: One broken connecting rod and a miserable struggle getting the cycle out of the snow-fed creek.



A bike ridden in water should have provision for draining any leakage. It is hard to waterproof the magneto case on a Hodaka 100, although the machine will continue to run with considerable water in the case. The answer is to drill a small hole in the bottom of the case and cover it with super tape to keep the dust out. After fording a few creeks, pull the tape off and drain any

www.legends-yamaccumulated water.

off and eventually it will carry you home.

But if

the bike inhales water through the air intake while running briskly with the throttle open, it is likely another story entirely. Water is incompressible and a cylinder or crankcase filled with it usually bends the connecting rod — or worse.

I was posing for pictures late one evening, crossing and recrossing Grizzly Creek in the Sierras and taking advantage of the cutwater ability of the Lobito's front wheel when I hit a round rock I hadn't discovered in my reconnaissance. I hit slightly on the downstream side of center and because the force of the rapidly moving water wanted to push me downstream anyway, I suddenly discovered myself heading straight for still, deep water. Before I could close the throttle, I was lying on my side in water about waist deep. The result was a broken connecting rod. And it took about an hour and a half - and a thorough drenching in snow-melt water - to manhandle

the Little Wolf out of the creek!

So if you can see the bottom and know it is hard enough to support the bike, not mud or quicksand and not too deep or strewn with big rocks that you would have difficulty in riding over on shore, then go ahead and ride across. Don't hit the water fast, even if it's only a foot or so deep, because hitting water at speed can flip you end-over-end. Or at least over the handlebars.

Even if you don't flip, crossing shallow water at high speed will get you thoroughly wet because the water thrown up by the front wheel will be driven high into the air and will meet you coming down. I have pictures of riders being drenched by water from a pool they'd left over 20 feet behind!

My own experience leads me to recommend riding at just above minimum balancing speed, with the bike in the lowest gear available. To keep the aqueous solution out of my boots, I

ride with my feet on the pegs and avoid footing it if at all possible.

I don't recommend doing as so many riders do — fording streams with feet held handlebar high.

Sooner or later the front wheel will discover an unexpected obstacle or you'll simply lose balance and then it's Katie! bar the door! All in all, I'd rather have wet feet than a wet seat. Any time. It's so hard to dry out my billfold, too.

Several times

I've hit deep spots while crossing a stream, deep spots I located the hard way. When this happens and you get that awful sinking sensation emanating from around the front wheel, there is only one thing to do—grab a big handful of throttle, tug on the bars, lean back and wheelie on through...hope you can wheelie on through. A bike will ford much deeper water on the rear wheel than it will on both wheels. Even if I manage to get across the creek this way I always wind up soaked, regardless of the type of riding suit I'm wearing!



I don't like rocks. Not that rocks are all that hard to ride, but nothing, nothing is as hard as rockery on motorcycles and riders. It makes little difference whether the rocks come by the acre as they do in some mountain areas or just as a now and then thing sticking out of a trail.

When you encounter a trail where there are rocks sticking up now and then, the trick is to take it easy so that proper evasive action may be used to avoid slamming into them at speed.

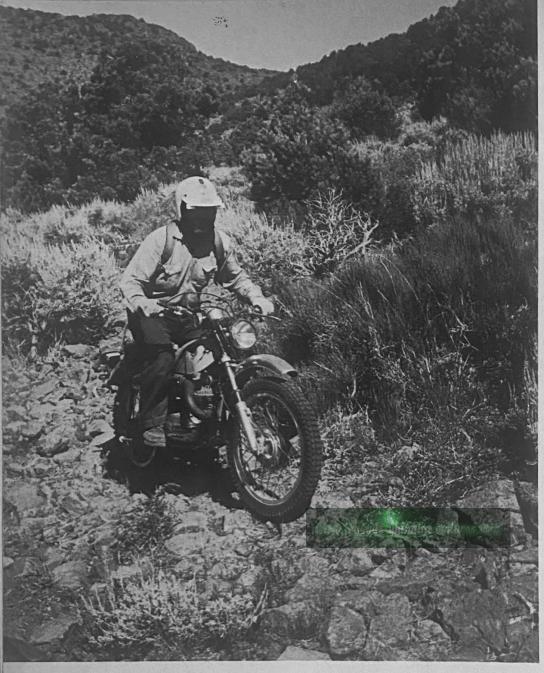
But when it's rocks, rocks everywhere with not a smooth place in sight, rocks varying in size from marbles to basket-balls, your riding ability is tested to the utmost.

Modern trail bikes with up to a foot of ground clearance will negotiate rocky stretches — that would have meant manhandling only a few years ago — with casual ease. But there is no bike made that will clear any size rock you can get the front wheel over. Slamming the frame into granite boulders is exceedingly hard on a motorcycle — whether the bike is equipped with a skid plate or not.

The way to ride large rocks is to hit 'em square; to do otherwise is to have the front wheel kick out from under you eventually. And when riding over a rock, don't try to keep your eye on it!

This is important. Once you get closer than five or six feet (distance varies according to riding technique, bike and conditions), you are committed, the rock is going to have to be ridden over. The thing to do is concentrate — on the *next* rocks in the path. I continually see new riders come a cropper because of overlooking this basic fact.

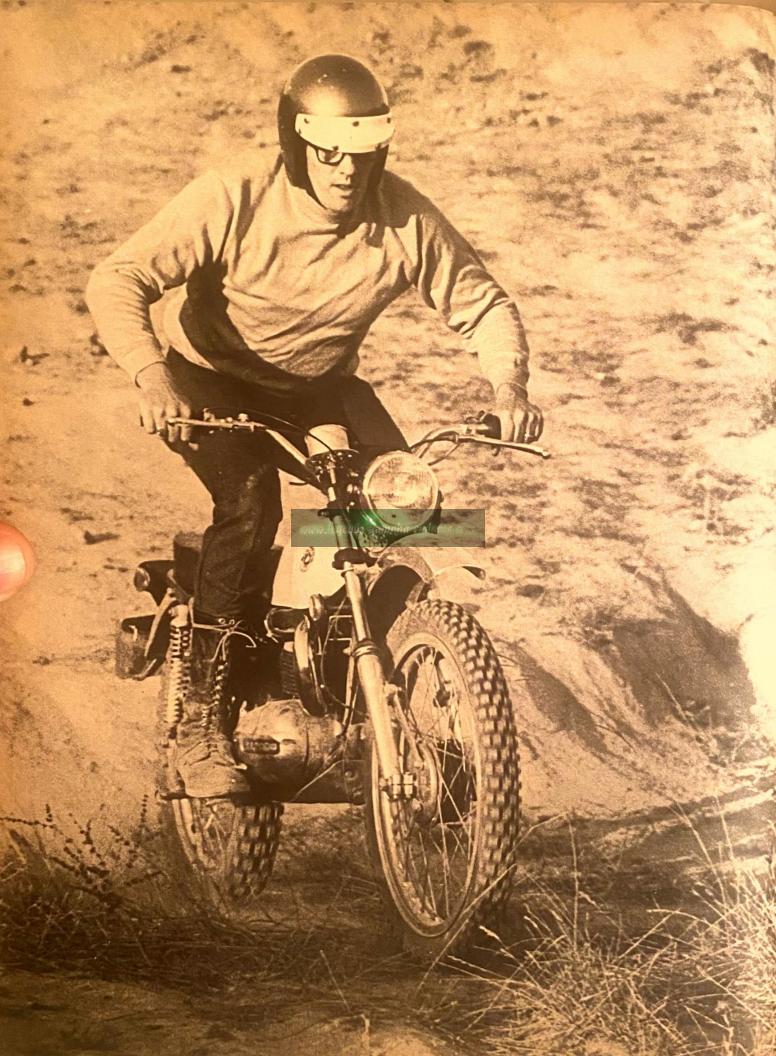
With the long-travel suspension on modern trail bikes the smaller rocks, say up to 6 inches or so, pose no problems. Ride them fairly fast and stand on the pegs to lessen the strain on the machine—and yourself. Although they don't impede forward progress very much and can be easily handled by the suspension, speed should be held somewhat below the maximum because small 6-inch rocks have a common and nasty way of suddenly turning into large 10- and 12-inch rocks. To ride full tilt into a bunch of donnikers the size of basketballs is a sure way to get off and, believe me, a fall in a rock pile is to-



In rocks like this sometimes it is easier to ride fast than slow. Here I am riding about 25-30 mph. It is important to keep the weight on the pegs to ease the strain on the suspension. Taken in the Pine Nut Mountains about 20 miles from Dayton, Nevada.



In rocks like this one rides slow and carefullike, ever ready to loft the front wheel over rocks too high to ride over. In this kind of going knobbies are definite detriment — they don't grip smooth rock as well as pavement tires.





The trick in riding rough ground is to learn to stand on the pegs automatically when the occasion demands. Dale Saunders doing his thing.



Skilled trials rider can ride over rocks he'd have trouble climbing over. Paul Olleges is the best jumper I ever saw. There was no ramp up the other side and when his Sherpa landed, the front wheel was only a few feet from a big, solid tree!

tally unlike a header into a mud hole or sand wash!

Riding fast on rocky, hard ground is hard on tires and wheels. If you have enough air in the tires to keep the rocks from pinching the tube against the rim, then you must be constantly on the alert for loose spokes, especially on a new machine. Low tire pressures and rocks are a combination that often result in bent rims.

A low, low first gear is a blessing when you're riding rocks. Low-speed control is essential and the standard way of getting the front wheel over a rock a foot or so in diameter is to "loft it." That is, approach the rock at low speed, weight well back. butt off the seat, and just as the front wheel almost touches the rock, tweak the throttle and haul back on the handlebars. Ideally, this will lift the front wheel over the obstruction without touching - but the ideal isn't always attained. It makes no difference most of the time anyway because even if the wheel doesn't leave the ground, it will be light enough to ride up onto and over a good-size rock with ease.

If the rock is larger in diameter than the ground clearance of your machine, stay on the gas after lofting the front wheel and ride on the back wheel at least until the tire climbs part way up the rock. Then stay on the gas until the wheel has climbed pretty well over before letting the front end down because, in this situation, it is prudent to land on the rear wheel after clearing the rock rather than coming down front-wheel-first.

This front-wheel-first business is a severe test of the fork-designer's skill. It is also a severe test of the rider's ability and no matter how good he is — sooner or later landing front-wheel-first is going to put him off. Hard.

I've seen

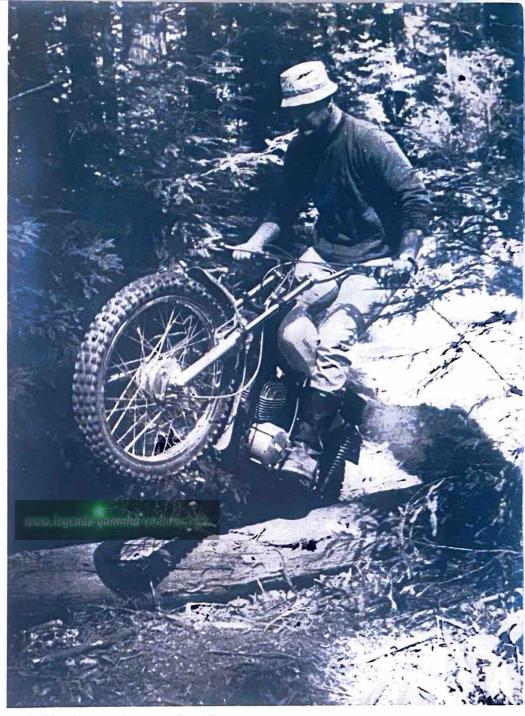
this technique used to ride over rocks more than 3 feet (three feet!) in diameter but it was done by a highly skilled Trials rider on a trials iron. I can't do it myself.

All modern

trail bikes are equipped with folding foot pegs that fold diagonally up and back when they hit an obstruction — and it is in rocky going that they prove their worth!

Logs.

It is important to hit logs at as nearly right angles as possible. Although in some cases bikes *can* be angled diagonally over logs,



Trials rider demonstrates correct way to loft a front wheel over a log. (Trials are the only riders who generally disdain helmets — they didn't use 'em 30 years ago in Blighty so why start now? seems to be the attitude.



Ruts don't have to be very deep to cause difficulties. Here Danny came around a bend in the road and discovered that his path had turned into a shallow rut. He is footing it to get in shape to negotiate the rut.



Danny has lined up in the shallow rut with a few quick dabs and is now on course. Ruts like this with loose material on the sides are tricky for the unwary.

eventually one will be found with loose bark and the front wheel will kick out from under the bike.

Logs too big to be easily ridden over are handled precisely as are rocks of the same diameter.

Rough ground.

Under this definition comes just about every remaining type of riding — the ordinary, everyday, ultimate purpose of trailbike riding: Ditches. Power lines. Old strip mines. Old hydraulic-mine operations. Water-torn foothills. Construction sites. Abandoned factories. Abandoned railroad grades (usually bumpy but easy to ride otherwise — until you suddenly come upon a missing bridge!). Old logging roads. Creek beds. Deserts. Woods trails.

rough-riding activity is confined to a fairly small area but steady distance riding in rough country has a technique of its own.

Modern

trail bikes are equipped with foot pegs made for standing – learn to use them!

Back when

I was nursing my flat-head Harley across the New Mexico landscape, I rode sitting down. When the terrain got a little lumpy, I figured to foot it along or duck-walk, depending on just how rough it was. The bike had no foot pegs we'd never even heard of 'em — and ordinarily our feet rested on footboards. In rough going, it was flat impossible to stand on the floor-boards with any degree of stability because the unsprung frame bounced around so badly we couldn't keep our feet in place. Fast riding on rough ground was out of the question.

The hardest thing I had to do when I started riding 20th Century machines was to learn to stand on the pegs and not foot it along like a 7-year-old on his first bicycle with learner's wheels. My critics maintain I still haven't learned but what the hell, there are always a few down-putters around!

Riding on the pegs entails more than just getting the fanny off the Naugahyde. When riding a bike in rough country, the bike is shifted from side-to-side under the rider, an entirely different technique from the road-rider's practice of always having the bike and rider in a plane at right angles to the axles.

The trick of shifting the bike from side-to-side is one of the techniques Trials riders use to get their fantastic bike-handling achievements. And it's the way fast-moving desert racers dodge obstructions that would be impossible to ride around at th speed they're travelling.

Riding the pegs is not easy and riding hard in rough country is about as hard on the underpinning as any sport on earth, not excepting soccer.

The beginning rider has more occasion to stand on the pegs than an experienced cyclist because there are more places that tax his skills. As he gets better, there are fewer places where he has to get on the pegs to negotiate them and he can spend a greater proportion of the time on the seat.

Ruts. You can't expect to ride the really rutty kind of ruts feet-up and sometimes you can't ride them at all to put it bluntly. Riding ruts that are deep and narrow is one place that footing it is not looked on with disapproval by the purists.

When riding ruts in unfamiliar terrain, the nice, wide kind of ruts that can be ridden feet-up, it's wise not to ride them as fast as your abilities will let you.

I was riding in the deep, dust-filled ruts just north of R. Laguna Chapala one time.



When the ruts are the deep kind that grip the sides of the wheels it is no disgrace to get off and lead the bike — to attempt to ride this rut downhill would invite a crash.

Dave Ekins on ruts – Generally the rear wheel will climb out of a rut and join the front wheel's rut if you just shut it off, throw your weight over the handlebars and a bit to the outside. This works on level ground or going downhill. If you get cross-rutted going up hill simply wheelie the front wheel into the proper rut: this maneuver takes a bit of skill.



Always look for a ramp where the bank has caved when coming out of a stream bed. Here a natural ramp has made getting up the bank a simple matter of riding over it. But as Danny wasn't absolutely sure the frame would clear the edge of the bank he took no chances and lofted the front wheel.



There the bank is a little higher and although there is still a take-off ramp it is absolutely certain that the frame would hit the bank if the bike were merely ridden. So the wheel is lofted a good deal higher and carried farther than the preceding shot. Note how Danny has his weight well forward to control the elevation of the front wheel and prevent looping the bike when the rear wheel gets a grip on the bank

The ruts were about 8-inches deep and a foot or so wide — no sweat. The dust was the kind that flows out from under the wheels like water and I was looking far ahead, picking my route through the maze. Things were going so well that I unconsciously speeded up a bit and then the rut decided to get narrower and deeper — narrow enough and deep enough for the frame of the little Original Lobito to wedge solidly.

The bike stopped but I didn't. I landed in the dust a good 15 feet in front of the bike and like to have drowned in the polvo before I could get it cleared out of my breathing apparatus. Taught me a lesson (for the fortieth or fiftieth time!): don't over-ride your trail conditions and ability.

Sooner or later if you persist in riding rutted terrain, you will wind up with the front wheel in one rut and the rear in another. The drill here is to stop, unload and sort things out. Nothing can dump you quicker or at least send you skittering off your chosen course, than to have the back wheel suddenly join the front in the same rut. My own practice when I get into this condition is to stop and sort things out.

Banks. There are two ways to come off a bank — which technique you choose depends on your bike, the height of the bank, your riding ability and your degree of bravado.

The usual way is simply to sit back and ride down, keeping the weight as far back as possible and mostly on the pegs, and letting the forks do what they are designed to do. Often a bit of speed helps here because it decreases the effective angle at which the forks receive their stress. Ideally, the forks should hit with the impact applied in line with the fork

tubes.

As the bank becomes higher and/or steeper there comes a time when riding over it is obviously going to result in a forward outside loop. This is bad. Definitely.

When the bank becomes too much to simply ride down, you have two choices. The first and obvious one is find another way down. Or you can "jump" the bank. We won't talk about lowering the bike with a rope or some other undignified procedure.

"Jumping a bank" means just what it says. You ride up to the bank, gas the bike slightly, perhaps give a tug on the bars and leap into space. If done skillfully you will land at the bottom slightly rear-wheel-first. I leave it to your imagination what happens if it isn't done skillfully.

I've seen banks jumped that were



Although not very high, this bank is still too high to simply ride over because the frame would hit when the front wheel dropped over. Slack in lower run of chain indicates power is still being applied to keep the front wheel slightly above the horizontal. Danny is keeping his weight well to the rear to keep the front wheel up.



With the bike in free flight, Danny has closed the throttle to keep the wheel from spinning wildly and perhaps looping him or breaking a chain when he lands.

www.legends=yamaha=enduros.com

higher than I could reach, about 7 feet. And I've seen riders get horribly messed up trying to jump off a bank about deskhigh.

Coming up a bank has three versions. You can simply ride up. Or find another way. Or you can jump out.

After a bank becomes so high and so steep, it can't be ridden in the ordinary way. The bike either won't start up from the bottom because the bank is too steep or because the frame hits as the cycle breaks over the edge of the bank.

Getting started at the bottom of a really steep bank requires lofting and sometimes a bit of speed — about the same technique as riding over a rock or a log. If the top edge of the bank approaches 90° the speed must be maintained until there is no danger of the frame hitting as the front wheel comes down. Most riders

keep the front wheel up until the bike's rear wheel is almost to the top edge.

If the throttle is eased off too soon the front wheel will break over ahead of time and the frame will ground on the edge of the bank. Bad scene.

If the throttle is completely closed before the break-over point the bike will stop like it hit a brick wall and the whole schmeer will wind up in a heap at the bottom of the bank.

Leaves, pine needles and

grass. All of these are potentially mighty slick. Knobbies are a definite help here; it is not imperative that they be self-cleaning as in mud.

If this kind of dry, slippery going is encountered on the level, it's no problem unless the bike is running fast and needing all the traction it can get. Then you must be cautious about sliding into an immovable object while taking evasive action.

But especially when pine needles are encountered on a hill, the best thing seems to be to widen on the throttle and keep the tire turning rapidly so it will keep digging in and — hopefully — down to solid material. Makes a splendid rooster tail and leaves scars that sometimes last for years. Which means that I'm loath to utilize the technique except in case of *dire* emergency. If the effort is made, you can almost always find a way around that will not entail scarring up the countryside.

bike having good low-velocity performance it is sometimes possible to get off and let the bike pull both itself and the rider along although with the rider aboard it would simply dig in and desecrate the landscape.

It's YOUR Life!

Vision.

It cannot be stressed too much that both novice and experienced riders alike must consciously refrain from over-riding their eyes. That is, *never* ride into a place where you can't see, depending on luck and ability to see you through any hazards that may be lurking.

It's so easy to do with any wheeled vehicle. 'Most everybody does it when driving a car at night, where it's called "over-driving the lights." People who habitually do it tend to wind up with their names in the Irish Sports Section at the back of the paper.

Even when you're on the lookout for the symptoms of this deadly disease, it has a habit of insidiously creeping up on the dirt rider.

Take the

time I was riding in the Viscaino Desert. The road was the standard two ruts. In many places, the years of traffic, wind and no repairs had depressed the *carretera* several feet below the desert floor.

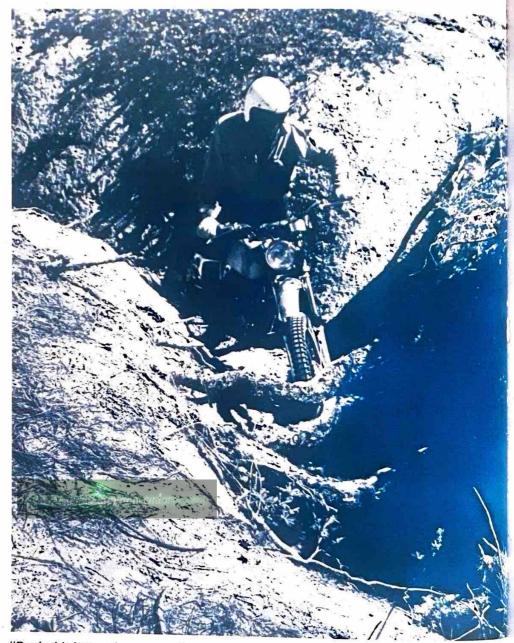
The ruts

were wide, smooth, hard, and extremely conducive to fast riding. Before long I was enjoying myself — whizzing around corners and riding the berm like Speedy Babbs riding the barrel.

After a while the inevitable happened. I rounded a corner at a good 50 mph and halfway up the bank when the bank merged into the earth and disappeared!

I had my speed down to something like 30 mph when the bank vanished completely but riding into a rocky, brushy, cactusy area at 30 is no laughing matter.

I got up on the pegs and made the ride of my life. Running full tilt into a cholla is only comical in the comics — when you're all alone and the temperature is well over 1000 and rising, it could be fatal. Thinking back on it, I



"Don't ride into a place you can't see your way out of." Overlooking this basic rule caused me to spend a hard half hour in the old hydraulic mine diggings near LaPorte, CA.

realized it was the long-travel suspension and quick handling of the Original Lobito that brought me through the episode unscathed more than any skill on my part.

say "unscathed?" Actually, I got a few scratches and spent about ten minutes

picking a cholla "joint" off (and out of) my leg with Vise-Grips. Under the circumstances that seemed like unscathed.

You can

ride over your head and over your vision anywhere. I was riding down the sidewalk leading from the Hotel Hacienda in Mulegé. figuring to ride over the curb at the end of the block and into the cross street. The catch was — and I should have known better for I'm thoroughly familiar with Spanish-American construction practice! — the curb was a good three-feet high and I only just barely had time to get the front end up and I inadvertently jumped the bike into the dusty street.

Again, it was more because of good luck than skill that I didn't go end-over-end . . .

Hypothermia. I've read many articles on riding techniques, although regrettably there were few of them aimed at the dirt rider, but I have yet to read a how-to-ride that even mentions hypothermia. Yet hypothermia is probably as great a hazard to the rider as all natural obstacles combined. And it's one of the most misunderstood facets of outdoor life in general.

First off, let me state positively and without equivocation that there is no such disease, ailment or disability as "exposure." This is one of the many newspaper inaccuracies used to describe the condition of anyone who suffers a mishap outdoors that is obviously not shooting, drowning or mule kick. What a newspaperman generally refers to as "exposure" is hypothermia — although sometimes it takes a careful reading of the text to even make a guess as to exactly what the hell he is talking about. "Exposure" is also commonly used to describe shock and other non-related difficulties.

Simply put, hypothermia refers to the chilling of the inside of the body itself, the part that really counts — the "core." In mild cases it causes discomfort and slight shivering. In severe cases it causes pulmonary edema — the lungs fill with liquid — and sudden death.

It doesn't have to be very cold to induce hypothermia. Motorcyclists are particularly prone to the ailment because when the riding is easy, they don't exercise enough to generate much body heat and their movement through the air robs them of heat much faster than if they were standing or walking.

Some years ago, I rode a motorcycle south from the Bay Area on my way to Mexico and palm trees. The weather was clear and cool as befits coastal California in middle May and I was fairly well-dressed, although I hadn't



You just never know when you will find water across your path — or road — as in this case in Baja where high tide covered the normal roadway.

thought it necessary to don my riding suit. I reached Santa Barbara shortly after dark and decided to check into a motel for the night. I felt chilly, but not excessively cold.

I swung up in front of the motel office, put out a foot to steady the bike and fell flat on my face! Shortly thereafter the bike settled gently on top of me.

I managed to extract myself from under the cycle and arose with great difficulty. I could barely right the machine but I finally succeeded in getting it on the side stand. As I walked into the office to register, I realized I was shivering violently.

Cursing myself for being careless enough to get into the picklement, I managed to register and then ran as fast as possible, clumsy as a cub grizzly, to the room. Once there, I had so much trouble getting my clothes off that I finally gave up, removed the stuff from my pockets and got under the shower wearing everything except my helmet. I set the temperature as high as I could stand it and while I was thawing, I turned the event over in my mind.

The onset of shivering is the first indication that the core temperature is dropping below 99°F. As the temperature drop to around 96°F, one becomes clumsy and his thinking becomes "muddy." For a man with his feet on the ground this is serious but for a man operating any kind of motorized equipment, from a minibike to a road grader, it is extremely dangerous.

And even if one is on the ground he could be in dire straits because the violent shivering, coupled with clumsiness and muddled thoughts, may render him incapable of lighting a fire or even seeking shelter.

The remedy for hypothermia is simple and obvious. Immediately upon beginning to feel chilled or the very moment shivering begins — and it always starts gently — is the time to take steps toward increasing the body temperature. AND IT MAKES NO DIFFERENCE HOW IT IS DONE!

Increase the exercise. I often dismount and run up and down the trail when the going is easy enough to allow me to start chilling.

Put on warmer clothing. If I'm going to be more than a few miles from camp during the cold



Even where there is a road — of sorts — trail bikes often have the edge.

season, I always take a down-filled jacket along.

Build a fire. This is self-explanatory, although in many areas it's forbidden that you engage in random fire-building and will result in a whopping fine and considerable loss of privilege.

Get out of the blasted wind. For a cyclist, this usually translates, "stop riding and take a break."

Dry off.

Easier said than done. Under field conditions, the best way to accomplish this is not to get wet in the first place. Generally, this means that when the hard work starts, such as wrestling the bike out of a mud hole or up a hill, strip down before getting wet from perspiration.

And if you're

caught in the rain without the right kind of protective gear, be extremely cautious — the combination of wet, clammy clothes and the wind a cyclist creates in passage can very easily be lethal.

I've been caught in this predicament on numerous occasions and many's the time I've sheltered in an old building or in thick brush, lit a fire, warmed up, and partially dried out.

Hot liquids. Imbibing a pint of hot, sweet tea is fine, but guzzling a quart of scalding-hot sweet tea is better. Or hot milk. Hot coffee. Cocoa. Chocolate. Anything hot except liquor when you're out on the trail.

The belief that hootch warms a man out on the trail has killed a lot of people — the place for

that warming drink is back in camp by the fire, not 'way out back of nowhere!

a completely unfounded idea that a person suffering from hypothermia should be warmed gradually, with perhaps the hands and feet rubbed with snow. As a guess I'd say this particular bit of folklore has con-

There is

tributed to at least as many deaths and dismemberments as the barbaric practice of giving whiskey for rattlesnake bite.

When you

get right down to the rock-hard facts, the best, simplest and most practical method of treating hypothermia is to always be on the lookout for it and never, but never, put off doing something about it. While you're still able to do something about it!





Doug Schwerma riding an uphill, muddy trail in the Santa Cruz Mountains. Note that front wheel has started to leave the ground but forks are prevented from extending by the recoil damping.



Keeping It Running...Yourself de yamaha-enduros e

Some street

riders do at least part of their own maintenance but I believe it is a flat *necessity* for the dirt rider to learn to keep his own machine running.

The obvious reason is that having your Friendly Local Dealer do minor repairs is both time- and moneyconsuming out of all proportion to the benefits gained.

A more subtle reason is that the longer I deal with people in the business of selling and repairing motorcycles, the more discouraged I get with their back-room abilities. Or lack of same.

One of

the most severe problems facing the cycle industry today is the recruiting, training and encouraging of mechanics. It is the subject of recurring articles in Motorcycle Dealer News, although MDN wouldn't dream of mentioning the prime cause of the shortage of wrenches in the motorcycle industry — poor wages and generally lousy working conditions.

To paraphrase Miss Stein, a mechanic is a mechanic — and a good mechanic will adapt just as readily to repairing Caterpillar tractors as repairing Hondas. Repairing Cats hereabouts pays \$7.66 an hour plus fringe benefits, with overtime starting at time-and-a-half after 8 hours, rising to double time after 10 hours and *triple* time after 12 hours.

Cycle shops pay around \$4.00 to \$4.50 an hour (there's no set scale and the dealers generally pay the smallest amount the employee will stand still for) and you should ask about fringe benefits and overtime rates!

As most cycle shops are staffed – front to back – with what are essentially hobbiests, it follows that the help isn't very militant about organizing and, on the average, their working conditions are just what you would expect.

Furthermore, it is extremely rare – rare, hell! it's almost unheard-of – for a

A graphic illustration of the advantages inherent in fixing-it-yourself. This rider's bike ran out of sparks during an enduro. So he casually built a fire, laid the bike down and pulled a cover off and prepared to solder the broken wire. When I asked him how he knew just what to do, he said, "Well, that's what went wrong last time, so that's where I started looking!"



Honda's Shop Manuals (one is a supplement) for the ST-70 and CT-70 are compared with much smaller SL-70 Owner's Manual. Owner's book details operation and adjustments but steers clear of telling you how to make even simple repairs. You should memorize the owner's manual and have a shop manual handy for reference if you are going to maintain the bike yourself.

Service and/or Workshop Manuals — If the dealer claims it is hard — or impossible — to get a service manual, I recommend that you think long, long thoughts about buying that particular bike! My theory is: service manuals are a logical function of the parts department and in all probability if there are no service manuals available then parts are probably a bit on the tight side, too!

Tom Patton of Bultaco Services reminded me that the importer/maker has no control over what the dealer sells in the way of parts or manuals. And some dealers have the weird and mistaken idea that stocking and selling manuals steals business away from their service shops. What they fail to realize is that a manual helps the bike owner to maintain his machine and promote the reputation of that make in his area. The dealer wins on all counts because his satisfied customers buy more parts by far than he could ever sell on a repair-shop basis. Bultaco's manuals range through prices up to \$50 for a complete one on all the engines and components. Tom did point out that there is

sometimes a lag between the availability

of a new model and the printing of a manual truly covering that particular bike. But in most cases the changes are not so dramatic that an owner can't get by with an earlier manual.

If a Bultaco dealer does not have manuals in stock, write to the importer asking the price for a manual for your particular model — and enclose a self-addressed stamped envelope for the reply.

If a Hodaka dealer does not have the manual you need, write Pabatco and ask for the current price for the manual on your bike. Remember the stamped and addressed envelope to make their reply come back faster.

Should a Honda dealer not have a factory manual — or a Clymer copy — try another dealer. Honda will always refer you back to the dealer, so don't bother to write about a manual.

What

if you have another make bike? I can't tell you what to do because I didn't check on all of them.

motorcycle shop to be properly equipped.

Take the

dynamometer situation, for example. Technically, a dynamometer is a device for measuring the power developed by an engine but in addition, it is the perfect running-in tool. Offhand, I don't know of a single shop making a specialty of repairing diesel engines that does not have a large and expensive dyno. But there are almost no cycle shops in the San Francisco Bay Area that routinely run dyno checks on their work although an extremely efficient motorcycle dynamometer can be had for well under \$2,000. And the Bay Area, with thousands of licensed competition riders alone, is one of the prime cycle markets in the United States. Think what the situation is down around Peculiar, Missouri or Twodot, Montana!

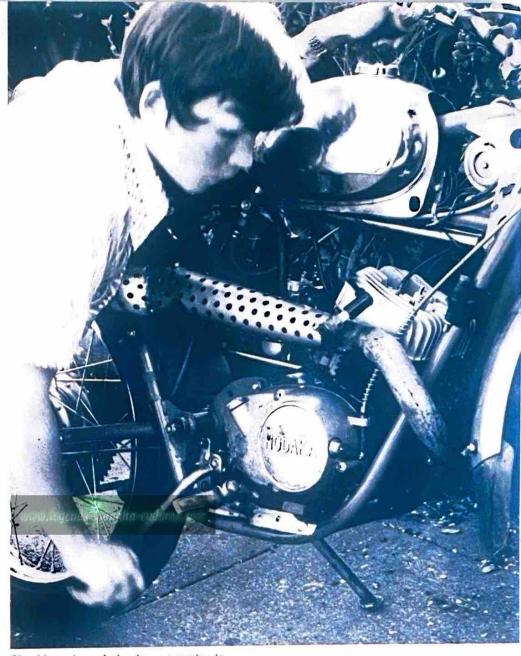
Without a dyno, it is impossible for the mechanic to make adjustments under load, or even to check the operation of the engine under service conditions. Worst of all, he can't even check his own work with any degree of precision.

The usual practice is for the mechanic to take the bike around the block a time or two for a "road test" after he's worked on a cycle. All this is likely to tell him is that the bike will run. Even a 100 cc trail bike will exceed the average city speed limit in a matter of a few feet and it just isn't practical to check the performance of the engine under full-throttle, warmed-up, operating conditions.

Therefore, given the sorry state of affairs in the service end of the motorcycle industry, the average rider becomes a shade-tree mechanic out of pure, unadulterated self-defense.

But there is another, perhaps even more compelling, reason for the the trail rider to indulge in his own repairs. That is the demonstrated fact that a man who services his own bike gets to know it very well, inside and out. And when comes that inevitable day it begins to make sick sounds down deep in its secret workings, it's a great help to be able to remember that the last two times the bike was checked over the enginemounting bolts were a mite loose.

So far, we haven't even mentioned the time and money saved by do-it-yourselfers, but believe me, it's a bunch! The monetary sav-



Checking a 'spare' plug by connecting it to the ignition lead with the base touching the machine. By pulling the compression release the bike can be spun rapidly and easily with the eyes close enough to the action for easy observation.

ing is obvious, but the saving in time and inconvenience by changing your own oil, for instance, versus hauling the bike down to the Friendly Local Dealer and then returning sometime later to haul it back home again is even more striking.

The first step in maintaining your own bike is to obtain all the mechanical information you can about it. The single most practical source for routine maintenance information is the owner's manual that comes with your bike. There are a few poor manuals around, but I can't think offhand of a dirt bike that doesn't have a fairly comprehensive owner's manual, and some of them are practically full-blown service manuals.

Owner's manuals are free, but you will have to buy a service manual. Some dealers are extremely reluctant to part with them on the (sound) theory that their customers can use the manual to do their own repair work, thereby saving themselves some money. The customer's gain is the dealer's loss — as some dealers see it. A second reason (also sound) is that comparing the service manual with the work actually performed by some back-room incompetent will often show the customer just how badly he has been bilked. And where.

To save argument, the time to buy a service manual is when you buy the bike. Period. No manual, no purchase. Stay with it and you will discover that service manuals really aren't as hard to come by as you may have been led to believe.

I learned this the hard way. Years ago I bought a NSU Super Max, at the time quite an advanced machine. I thought I had an understanding with the dealer (no longer in business) that he would obtain a copy of the service manual for me.

To sum the situation up, I never could get my hands on a copy of that service manual, try as I might. In all fairness, the NSU performed reliably, faithfully and dependably. All I did was adjust and oil the chain, change sparkplugs, and set the valves during the 10,000 or, 12,000 miles I rode it. But the memory of the dealer's perfidy still rankles and I like to think things like this contributed to the demise of the excellent NSU motorcycles.

Semantically, there is a differ-

ence between set-up, maintenance and repairs.

"Set-up" refers to the preparation of a machine for a specific type of riding. Thus, we say, "We set the bike up for Trials," or "The sickle was set up for the flat and it wouldn't climb worth a damn!" "Maintenance"

refers to the things one does to keep the bike running, and not breaking down.

"Repairs" are what one does to fix a machine after something breaks, bends, or just plain wears out.

But there are no hard and fast

"Trick" spark plugs - Any plugs used in high-winding motorcycle engines usually fall off sharply in efficiency after only a few hours of running. Some enthusiasts attempt to "cure" the problem by installing a much colder heat range plug. This leads to premature loading up of the plug - and still shorter plug life. In desperation, others have installed "guaranteed, lifetime, more horsepower, mileage and engine life" trick plugs. Don't bother. No one winning races uses them - so why should you? Most of these plugs, easily identified by the full pages used to advertise them, appeal to the "something-fornothing" owner who thinks that screwing in a new plug will give instant and enormous improvements in HP and mileage. We know that this is impossible and so do you. But, Barnum was right, there is a sucker born every minute. And unfortunately, the greedy advertising departments of the magazines and newspapers continue to accept the advertising dollars for this junk.

rules separating each of these from the other, so all three will be treated interchangeably to some degree.

The most common maintenance chores have to do with the ignition, drive chain and tires.

Let's start with the ignition. Motorcycles generally, and two-strokes specifically, are hard on sparkplugs — I have before me an advertisement in which Kawasaki gives an expected service life of their surface-gap plugs as 5,000 miles.(!)

It is hard to overestimate the importance of sparkplugs — on

the plug largely rests the responsibility for good or bad starting. Or not starting at all. A wrongly chosen plug will affect the engine performance so much that it may wreck the engine at worst, or just keep it from running correctly in milder instances.

Most owner's manuals give recommended sparkplug gap setting, but it ain't necessarily optimum for good starting!

Time and time again, I have simply closed the sparkplug gap to around 0.010 to 0.012 inch and cured a hard-starter on the spot. Very infrequently this has resulted in an engine that would start all right and not run worth a hoot. The drill when this happens is to let the engine warm up a bit and then open the gap out to whatever the owner's manual recommends.

The owner's manual is by no means always correct, though. One of my Bultacos simply wouldn't run well at low speed with a gap of more than 0.009 to 0.012 inch although the owner's manual called for 0.016 to 0.020 inch. And getting a fire lit at all was a matter of bump-starting with the gap at the maximum recommended setting. With the narrower gap, the machine ran well for some thousdands of miles with nary a bobble.

I finally got to the point that I could tell by the sound of the engine when the plug needed gapping!

The sparkplug is also the check on carburetion. A normal two-cycle plug is ordinarily a sort of brown color, only slightly oily. Of course, a greasy coating of black soot indicates too rich a fuel/air mixture or too much oil in the gas — or both. This situation is a nuisance because plugs will foul out often and with monotonous regularity, causing chronic hard starting.

But the one to watch out for is the clean-looking plug, with possibly little metallic spatters on the electrodes and insulator. This is an indication of either a too-lean mixture, maladjusted ignition timing or a plug too "hot" for the service — or any combination of the three. The spatters are bits of metal melted off the piston and, needless to say, if the condition is allowed to persist for very long the repair bills are going to skyrocket. At the very least, it is going to mean a new piston and pistons for dirt bikes can run as high as \$40 a pop!

Lower-end repairs are priced right along with the pistons.

When a plug check uncovers this condition, the first step is to check the ignition timing. This procedure varies considerably from machine to machine — the majority of dirt-bike engines don't even have timing marks — so I won't go into detail here except to say get out the owner's book and check the timing right away. If the timing is right on, then it has to be either the plug-heat range or the carburetion.

"Heat range" of a plug refers to the ability of the business end of the center electrode — mostly the center electrode — to carry off the heat of combustion. A "cold" plug is constructed to carry more heat away from the electrodes than a "hot" plug.

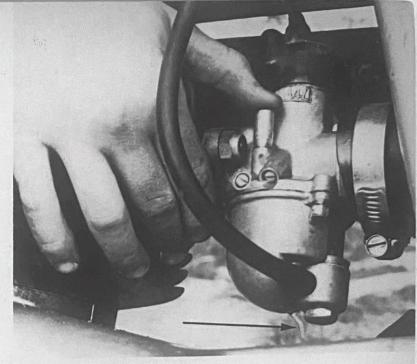
In cases where bikes are temperamental, it is sometimes advisable to carry a "hot" plug for starting. When a two-cycle is first started it must be fed excessive amounts of fuel, much of which winds up as liquid gasoline in the crankcase.

During the first part of the warm-up period the mixture must be constantly enriched by choking, carb flooding or some other method. During the second stage of the warm-up the engine heat begins to evaporate the fuel in the crankcase and the engine runs extremely rich, often rich to the point where four-cycling or firing every other stroke occurs. A cold plug tends to foul during this time and substituting a hot plug for starting sometimes helps this situation.

One of the most common ways to foul sparkplugs is by starting and stopping and starting and stopping repeatedly — without ever really warming up the engine. Lots of riders are natural-born, certified tinkerers and cannot resist going out to the garage now and then and firing up the engine just to hear it run, without actually riding the bike.

Two-cycle dirt bikes ordinarily run on a mixture of oil and gasoline and if the engine is repeatedly started without being run hard enough to warm up the engine, the gasoline evaporates, leaving oil in the crankcase. When at last the cycle is ridden, this concentrate is transferred to the combustion chamber and often fouls the sparkplug then and there.

Even knowing this two-cycle idiosyn-



Bikes are still being fitted with carburetors of ancient design that enrich the mixture for starting purposes by depressing the float with a 'tickler.' Orifice at side of tickler is intended to prevent out-and-out flooding. Note fuel leaking out of the orifice (arrow) and running off bowl.

won't start cold no matter how much fuel you run out on the ground, try putting your finger over the overflow orifice.

The instruction books never mention this, but after a few years experience with ticklers one does it automatically.





Carburetor jets. These are for a Keihin as fitted to many Hondas; jets for other makes differ only in detail.

crasy, you can get caught . . .

When I took delivery on my Lobito IV I rode it out of Sonny Kenyon's shop and into the bed of my pickup and then I started it again and rode it up my driveway. The first time [actually rode it in the hills, I unloaded it from the pickup and rode it up a steep bank to the campsite - about 200 feet. The bike never got even slightly warm so when I finally went riding it ran about a quarter of a mile at slow speed over rough terrain and promptly fouled out. Realizing what had happened, I didn't waste any time kicking and praying and cursing - I reached into my pocket for another plug. The Little Wolf started the first poke on the new plug which I'd previously gapped to around 0.012 inch.

Some gas/oil combinations cause sparkplug "whiskering." Suddenly a bike will quit dead, start running rough or become impossible to start. When the plug is pulled it will look as if nothing is amiss at first glance (provided extensive efforts to start the machine have not been made), but a careful examination will reveal a fine, hair-like deposit between the center and side electrodes.

Many perfectly good plugs that have whiskered are thrown away when all that is necessary is for the whisker to be whisked away — and the plug will perform like a new one.

Conversely, as I mentioned, a lot of whiskered plugs are fouled beyond use because the rider persists in trying to start the machine with the whiskered plug instead of cleaning it.

When a bike won't start and shows little intention of eventually doing so, the first thing to do is check the spark. This can be done most efficiently by removing the plug, placing the threaded end against a metal part of the machine and cranking the engine. Shade the plug from direct sunlight because a spark that is perfectly capable of starting the engine may be invisible in bright sunlight.

If the plug doesn't fire, check for whiskering and/or try again with a new plug. If the new plug doesn't fire under test, the trouble lies deeper.

Next to bad plugs, the usual cause of non-sparking is a loose connection somewhere in the primary ignition system. Almost always the

loose connection is caused by a quick connection coming quickly loose — but now and then a woods rider will find a vital wire has been snagged by a stray limb.

A frequent cause of ignition failure on motorcycles is a wire touching the frame where the insulation has chafed away. Often this results in very rough running and/or cutting-out that is extremely hard to pin down.

In common with automotive practice, many of the connections in a motorcycle-ignition system are made with threaded fastenings. Check these over diligently. A loose connection can manifest itself by complete ignition failure or it may show up as an intermittent miss. When trying to discover why the iron won't run, routinely check all connections made with threaded fastenings.

Next comes worn ignition points. There are two varieties of point trouble. The first is caused by wear on the fiber rubbing block that shows up as a too-small point gap. If the points don't open you don't get any spark! Cure is simple and obvious — regap the points to the correct setting as indicated in the operator's manual.

As timing changes on motorcycles with variations in the ignition-point gap, check the timing as soon as convenient after a by-guess and by-golly trailside gapping. Be especially on the lookout for any untoward noises emitting from the engine room. On some machines, point gap is extremely critical and a set of points that open too wide (soon) will make the machine fire too early. On a well-tuned two-stroke, an ignition that is only a little too far advanced may be past the critical point. Instant expense.

The second form of ignition-point trouble commonly encountered is with points that no longer make electrical contact. In some instances, it will be possible to get at the points when the engine is turned to the position where the points are closed. Try closing the points, then opening them manually and letting them snap shut with the full force of the contact spring a few times.

If it is not possible to turn the engine to the points-closed position and still reach the points themselves, try adjusting the points so they have zero gap and then snapping them a few dozen



With the Mikuni carburetor no tools are required to get the slide out of the carb, and although it helps to have a jackknife handy to change the C-clip position, it can be done with the hands alone. To get the slide out of Danny's Hodaka took about 30 seconds; to get the slide out of my Bultaco's Amal takes about 10 minutes. And it goes back no quicker than it came out.

times. Readjust the points and check for spark.

I know some riders who always carry a Flexstone in their trail-riding kits — it gives them a feeling of security to be prepared for a problem. A Flexstone is a plastic ignition file with extremely hard material embedded in the plastic — hard enough to abrade tungsten contact points — something that most conventional ignition files won't do. After using a Flexstone, carefully clean the filings from the points with a strip of clean paper and then blow the paper dust away.

It must be emphasized that filing points is not a repair in any sense of the word and doesn't do anything but enable the bike to be ridden a little longer. The points should be replaced at the very first opportunity because invariably the points are going to fail again in the very near future.

When points are installed they should have their rubbing blocks lubricated with a high-temperature silicone grease. Unless there is special provision for oil it should never be used. And regardless of the applicator involved, oil should be applied sparingly. Modern oils are especially compounded for creeping action and the oil will get on the contact surfaces and definitely shorten point life.

The latest thing to appear on the cycle scene are various types of pointless ignitions. When the solid-state systems work, they work very well indeed – but when they're dead, they're usually beyond hope insofar as trailside repairs go. If there are no obviously broken or loose wires, the only thing to do when a transistorized system "goes West" is to start pushing.

Once back at the shop, the whole unit is replaced as a rule — free of charge if the machine is still under warranty but terrifyingly expensive if you're paying for it out of your own pocket.

I don't know of a single distributor of cycles using solidstate components that at one time or another didn't wind up with a pile of the complete units in an obscure corner somewhere, a pile a tall Swede couldn't polevault over.

Personally, I can't see any great advantage in solid-state ignition except as something to put in the ads — unless they are used for special applications. Insofar

as the private rider is concerned, these sophisticated devices that can't be repaired have taken the place of a simple affair that usually can be patched alongside the trail in an emergency.

It is interesting to note that my Alpina, with its Trialsderived engine as dependable as the tides, uses the "old-fashioned" points and coil system.

Ignition troubles are usually related to starting difficulties, so I'll throw in a few pointers on starting gleaned over the years.

The first thing to do when a bike won't start is to check the fuel. See that there is gas in the tank and the appropriate valves are turned on. Simple, you say? Well, you're right, but I've seen many a

About changing carburetors — The modern carburetor as used on trail bikes is very highly developed and functions well when the bike is used within its design parameters. Changing to a different size carb is a common ploy by beginning riders who are anxious to get more performance out of a smaller bike. They end up destroying the low-end performance in most instances. Generally speaking, they would be better off getting a larger machine.

So-called fuel injectors are widely advertised but for my nickle they are a waste of money for trail and enduro riding.

man kick a bike for ten minutes before looking into his empty gas tank.

In honest truth, I've done it myself. Once. A helluva long time ago. Now the first thing I do is check the fuel situation.

Next, check the spark. If necessary, put in a new plug.

vitally important not to try to start the bike for an extended period without taking remedial steps. Often by the time a man gets to the plug-changing stage, he has pumped the crankcase so full of gasoline and lube oil that the new plug promptly fouls out.

Most trail riders nowadays seem to have a thing against push-starting bikes, but pushing, also known as "bump-starting," is about the most efficient method known for starting a bike. In fact, I've started a bike by pushing it less than a hundred feet after the proud owner had pumped the commencing lever to the point of utter exhaustion.

The racers with their super-tuned engines usually pull the clutch or shift into neutral and push the bike as fast as they can run. When they're going their best, they leap into the saddle and just as their weight takes effect, they dump the clutch — usually selecting a fairly low gear for this and trying to spin the mill as fast as possible.

With trail bikes, however, I prefer to pick a higher gear and get the bike moving at a pretty good lick, then release the clutch without leaping into the saddle. If the correct gear is selected, the engine will turn over smartly and I keep right on pushing until it catches.

If the bike is not highly tuned, when the engine starts I simply leap aboard and ride away. With the more highly tuned cycles, I start shifting down the moment I get aboard until I get to a gear where the engine will pull the bike and accelerate. In other words, I shift all the way down to low as fast as I can manipulate the shifter.

Whether or not hard starting is involved, a motorcycle deserves all the encouragement it can get when it first starts. Some riders start the engine and sit and nurse it, goose it and blip it for quite a while.

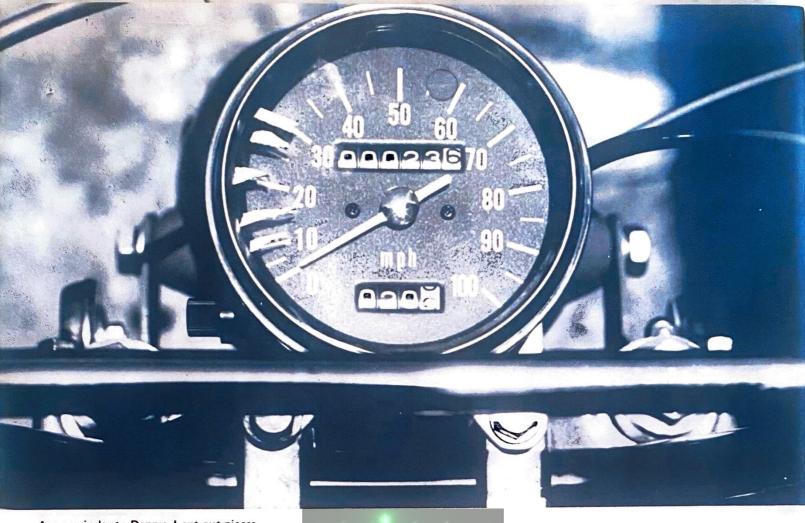
My practice is to take off the moment the engine catches – take off and immediately start riding as fast as I can get the machine to pull me.

This eliminates a lot of mixture enriching and general diddling around and warms the engine up as quickly as possible with the bare minimum of gas/oil mixture in the crankcase.

This is

for the usual two-cycle trail bike. I also wait not a bit to warm up a four-cycle engine — I get underway the moment the engine will pull me.

It is quite common to see a trail-bike rider spend 15 or 20 minutes nursing his bike and trying to get it to run when — if he would get on the gas as soon as the engine starts — it would be pretty well warmed-up and running normally in four or five minutes at the outside.



As a reminder to Danny, I cut out pieces of adhesive tape and stuck them to the speedometer on his new Hodaka as reminders of the maximum recommended speed. But in truth, these guidelines were honored mostly in the breech and the bike was broken in on our 1971 Thanksgiving Baja Run at considerably higher than the recommended speeds. And a tear-down when we returned showed a perfect break-in.

There's a canyon just north of Rancho San Luis in the Baja desert where we often camp. On a cold morning I don't even try to start the bike in camp. Instead I push it as far up the road as I can — warming myself up in the process! — then turn around, flood the carb thoroughly, and start the machine by bumping it down the hill. Usually the bike catches in 20 or 30 feet and I immediately open the throttle and start picking up speed downhill. The flat bottom of the canyon is about 200 meters wide so by the time I cross it

I ride the bike a kilometer or so up the road toward Rancho Sta. Ynez, then turn around, ride back to camp and load up for the day's journey.

But I've

and reach the up-grade on the other side,

I'm going pretty well.

seen men load up first, then kick-start their bikes only to find the cold-blooded two-stroke engines won't pull them up and out of the arroyo. They then go through all kinds of clutch-slippings, chokings, ticklings and cursings before finally getting underway.

Most failures at cold-bike starting are due to an insufficiently rich mixture. Always remember, it's next to impossible to flood a *cold* engine.

Conversely, most failures to start a hot engine immediately are due to a too-rich mixture – flooding.

Therefore, the basic starting rule is to "choke hell out of 'em when they're cold" and "leave 'em alone when they're hot."

But it's those in-betweens that cause the most trouble. The engine that has been off for a short time — is it hot or cold?

When in doubt, the best thing to do is try three or four kicks without choking — as if you were starting a hot engine. If this doesn't do the trick, try a little choke. Or if a mixture enricher is available, use it sparingly. If it still doesn't fire, choke the devil out of it and general-



When oiling a chain — oil it! A correctly oiled chain will be dripping oil but actually the important oil is the tiny part that oozes into the interior of the chain.

More about chain lubing — The Dirt Rider Chain-Lube Handbook has a lot of good info on chains and here are a few ideas from it on lubrication.

Nobody ever lubed a chain too much! It's not how much you put on — it's how often that makes the difference.

Apply lube every time the chain looks dry. It's a good idea to do it when you put the bike away after each ride so the lube can soak in until the next time you ride. This is a lot less trouble than trying to fix a busted chain while neighboring with alligators or rattlesnakes. Lube the chain thoroughly each time you wash your bike. After washing it is a good idea to run the engine until it gets warm

enough to dry out the nooks and crannies, welds on the backside of the exhaust pipe and such like. Oil the chain and because you have to run the engine anyway, ride around slowly to help work in the lube—and work out the water. Remember that wet brakes don't work!

Riders addicted to spray-can chain oiling have been oversold on pushbutton convenience because chain oiling takes about the same amount of time whether you brush, drip or spray the lube onto the chain. You should elevate the rear wheel so you can spin it. A good way is to push the bike onto its side stand and kick a box under the frame to hold it up. The motorcycle's posture will be about like a puppy addressing a fire hydrant.

Get another box and sit down by the rear wheel. Turn the wheel to put the master link on the sprocket and start lubing there. Apply a bead of lube along the top edge of the chain plates on one side — then do the other side. Spin the wheel a couple of times to distribute the lubricant — all in about two minutes total time.

Did you notice the built-in side benefits of the Dirt Rider's drill? You will be automatically examining every chain link as you lube. And you are also checking sprocket bolts, sprocket and chain tension at the same time. The closer you get to a bike, says Carl Shipman, the more likely you are to see the things that need attention, are about to break — or fail.

ly proceed as if dealing with a cold engine. Try kicking it at first but if it doesn't show signs of starting with three or four prods, stop choking and try bump-starting. Don't just stand there and kick as if your very life and sanity depended on it. If it doesn't start when bumped, check the sparkplug. You did check the gas tank, didn't you?

I won't go into carburetion thoroughly — there have been whole books written on one specific make of carb! — but I will give a few general pointers. Most carburetors used on trail bikes are of the same general type, and differ basically from the carburetors used on cars in that they have no accelerator pump. And they do have more and handier adjustments.

There are three modes of carburetor operation. With the slide (which takes the place of the butterfly valve in automotive carburetors) closed, with the slide partially open, and with the slide fully open.

When the slide is closed and the engine is idling, mixture is controlled by a small screw on the side of the carb that varies the amount of fuel added to the air. Usually it works backwards so that screwing it out admits less fuel and winding it in admits more.

Mid-range mixture is controlled by a tapered needle that projects out the bottom of the slide. The needle is adjusted by changing the position of a clip in grooves machined in its upper end. Lowering the needle (moving the clip up) leans the mixture. Raising the needle (lowering the clip) enriches the mixture at any given slide position.

With the throttle fully open the slide is at the top of its travel and mixture is controlled by the main jet. On most carburetors, the main jet is not adjustable and any mixture variation is made by changing the jet. Jet changing is simple and any dealer worth his salt stocks every jet his customers are likely to require.

Jets are identified by numbers stamped thereon, usually in multiples of five or ten. The larger the number, the more gas admitted by the jet. When rejetting, the prudent mechanic goes one step at a time. That is, from a 130 he will go "up" to a 140 or "down" to a 120

It is rare for a bike to require a jet change of more than one "number"

from the factory setting. If you find a carburetor with a main jet more than two "numbers" off the original setting, you can figure that someone "lost the rabbit" in his tuning efforts.

When rejetting, it is usually necessary to reset the needle — my own practice is to center the clip and go from there.

Most variations in altitude, to 5,000 feet or so, can be taken care of by resetting the needle. Beyond this you can expect to change jets, but this is not universally true. And no matter what the altitude change, I've never had to go more than one number to compensate.

If the foregoing sounds simple, that's because it is — in theory at least. Actually, there is some interrelationship between the three basic adjustments. Slides and needles are also variable but this is so seldom needed for trail riding that I will not go into the matter.

You must expect to do your own carburetor adjusting. Neither bikes nor riders are exactly alike and it is quite surprising that the factory engineers are able to hit the right combination as often as they do! It's unlikely that a dealer will ever change the carburetor jet/s unless his store is located in a high-altitude area. The factory gets'em awful close and once correctly jetted, the adjustments should hold fairly true for as long as you have the bike.

"Breaking-in" means wearing the various parts so that they fit each other. There is nothing mysterious about this and the owner's manual delineates what the manufacturer considers is the right method for your bike. Follow it to the letter and you will never go very wrong — although you might well go bonkers in the process.

My own technique, developed over half a lifetime's association with internal-confusion engines ranging well up into the thousands of horsepower, is most definitely not to operate the engine at low output for a considerable period. As recommended by most manufacturers.

the maker's break-in instructions recommend this. And he envisions that when he says, for instance, to run no faster than 30 mph in 3rd gear, large numbers of people will do exactly that. An unreasonable assumption.

Now, I break in engines

with very short periods of hard pulling interspersed with proportionately long, closed-throttle periods to allow the heat to dissipate. In other words, I start right out riding normally, but I am careful not to pull really hard more than a hundred feet or so for the first 10 or 15 miles.

The first tank of fuel gets a 50% richer oil mixture. Instead of my normal Bardahl VBA mixed 4 ounces to the gallon (or 30 ml to the liter in metric countries), I increase this to 6 ounces to the gallon (45 ml to the liter).

I charge up little hills, 100 to 200 feet at the most, and then turn around and coast down. I plug along level stretches by alternately opening the throttle wide and shutting off instead of keeping a steady throttle setting as is my usual practice.

And when the first tank of gas is all used up, I consider the bike broken in.

When we

were actively engaged in racing, I regarded a TT course as the ideal break-in. A TT is a very fast race with lots of turns, and the riders usually run wide open on the stretches and out of the corners and shut off completely in the turns. The races are seldom long enough to get the engine very hot — which actually takes considerable time — and frequent tear-downs led me to believe an engine suffers no more ill effects from this technique than when the manufacturer's instructions are followed religiously to the letter.

There is another breaking-in theory that also differs sharply from the usual manufacturer's precepts. This method suggests you flat widen on the engine until it shows signs of seizure—that should say "if it shows signs of seizure" because most engines don't complain too much about this treatment. If it does show signs of seizure, it is immediately dismantled and the piston examined for signs of scuffing. When a scuffed piston is located, it is carefully sanded down a bit and the engine reassembled. And it's completely broken in!

I like my method better and I dislike the seize and tear-down method for a number of reasons. First, it is exceedingly inefficient. Dismantling the usual trail-bike mill is no great trick and doesn't take a great amount of effort, but it is still relatively time-consuming. It goes against my training and inclination

to drive a machine to the raw edge of self-destruction unnecessarily. It places enormous stresses on the machine, stresses it is not designed to withstand. And I am not convinced that it does too good a job.

What it

boils down to is this: a lengthy, elaborate break-in is some slight protection against sloppy assembly techniques at the factory but it is largely unnecessary if the engine is correctly built. If it isn't put together right, the sooner you find out about it the better — like while it's still under warranty!

My break-in technique works just as well on automobiles. I ordinarily figure on 75 to 100 thousand miles from a car or pickup without engine repairs and the only vehicle I've owned that required engine work within this period was an MGA that went in for a valve job at 32,000 miles, about par for English Sporting Cars.

The majority of motorcycles on the market — and all trail bikes — use chain drive for the final link in the power train. Every now and then I hear some non-thinker extolling the virtues of shaft drive and putting down the chain drive but a minimum of cross-examination always reveals (a) that he is a rider of a large, strictly-pavement machine, and (b) he is a mechanical illiterate who takes his scooter back to the dealer to check the level in the gas tank.

Let me

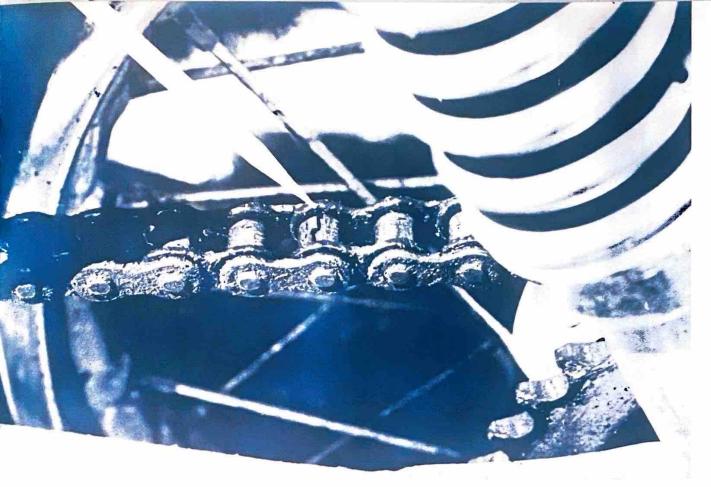
compare the advantages of chain versus shaft drive. There are many other methods of power transmission, but for obvious reasons I'll ignore them here — I doubt, for example, if anyone is going to build a gaselectric drive for a motorcycle in the near future!

As compared to shaft and bevel gears (which the bike magazines call "differential" every now and then, so help me!), chain is more efficient and has less power loss. Chain-drive components are lighter and do not require an additional oil-retaining enclosure. Chain-driven machines have lower unsprung weight than shafties. And best of all, changing gear ratios is ever so much more economical with chain drive where the change is effected by merely switching sprockets. Here's an example:

Back in the dim days when I rode a BMW I soon discovered that the machine was overgeared for my type of riding. Diligent and pointed in-



A quick test for chain wear. A badly worn chain will pull away from the back of the sprocket almost to the height of the teeth. This chain is in quite good condition and has about 1000 off-road miles on it.



Some industrial chains fitted with selflubricated rollers can be used on motorcycles, but as cycles generally stress their chains far more severely than industrial applications trouble may be experienced with roller breakage. We tried this 40 industrial chain on the Honda SL-70. Note broken roller.

www.legends-yamgha-enduros.com

quiry at the dealer brought to light the fact that there was an alternate set of final drive gears available — intended primarily for side-car use. I thought these would just about do the trick until I discovered that the bits and pieces would cost something like \$130 plus labor! Needless to say, I decided I could live with my overgeared bike a while.

Not too long ago, I came to the conclusion that the Matador was geared too high and was offered three alternatives. I could either put on a slightly larger rear sprocket—the Matador is unique among dirt bikes in that it employs a chain case for chain protection—or I could put on a smaller countershaft sprocket for even more overall reduction. Or I could do both. None of the three alternatives would cost more

than a small fraction of the cost of a set of final drive gears for the BMW.

The black mark for chains as compared to a well-engineered gear drive is that chains require much more maintenance — which they usually don't get.

The slack in the chain must be continually checked and it must be kept lubricated at all times.

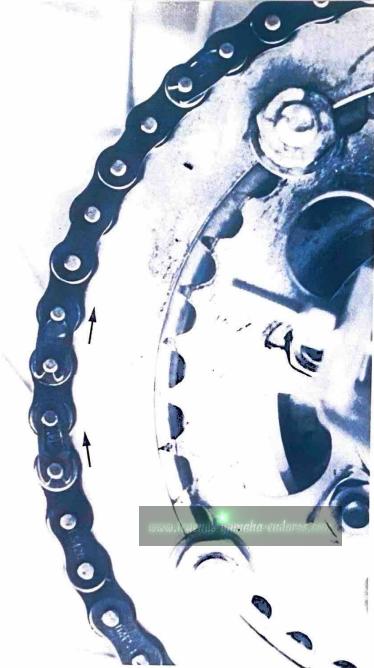
Cycles employing chain drive anticipate the adjusting and make it easy to compensate for wear — ordinarily it takes about a minute or two to adjust a chain once the tools are out.

All modern dirt bikes use swing-arm rear suspension and unless the suspension pivots about the countershaft, the distance from countershaft to rear wheel

varies with the position of the swing arm. Sometimes the chain is tightest when the suspension is compressed — sometimes when it's fully extended. And sometimes the middle position is tightest.

Regardless of where the slack is least, that is where chain tension is checked. This often overlooked point can result in catastrophic chain wear. And it ain't so good for countershaft bearings, neither!

So the chainadjusting drill: situate the bike so chain slack is at a minimum. Turn the rear wheel and move the chain and try the slack in several places — it is common to find different amounts of wear in the same chain. Put the bike in gear and roll backwards slightly against compression to force all the slack to the lower run. Check



The articles always say to point the clips in the direction of chain travel to keep them from coming off, but I can't see it makes all that much difference. Note 'overlay' sprocket bolted to smaller sprocket.

the slack by moving the chain up and down at the midpoint between the sprock. et at right angles to the chain. In the absence of other instructions, 5/8 to 3/4 inch will probably be about right.

But by all means check this out with the owner's manual if available — it's too important a point for guesswork.

Assuming the rear wheel is correctly aligned to begin with, all that is necessary is to adjust each side equally and the alignment will be maintained. My own practice is to turn the adjusting screws, where used, a "flat" (1/6th turn) at a time. Bultacos use a snail cam with calibrating marks that make it easy to maintain alignment.

I find it is preferable to adjust a little at a time until the correct setting is reached. But if I overshoot, I back off the adjustment and give the tire a hearty boot from the rear to move it forward into the adjusters.

Be sure to tighten the axle nuts correctly. The adjusters are that and nothing more. They are definitely not intended to bear the task of maintaining the correct wheel alignment!

There is more superstitution connected with chain lubrication than anything else in the world – with the possible exception of snakes and sex — so let's bury a few ghosts right here and now.

A chain is a machine with parts that move against each other and the sprockets and, like all machines, it requires lubrication. Period.

Time and time again you'll hear, "An oily chain collects dirt and wears out quicker than a dry one." Half of the statement is correct—an oily chain collects dirt all right, but the dirt is on the outside and what we're trying to do is keep the chain from wearing out and destroying itself internally.

The ideal

oiling method for a chain is to squirt it with filtered oil from jets under considerable pressure, the oil being cool and filtered down to 1 micron absolute. Next best is to run the chain immersed in oil, the cleaner the better, not over $160^{\circ}F$.

The poorest

method is the one used on most motorcycles — put oil on the chain now and then and let it run in dirt and muddy water the rest of its life. Actually, a welloiled chain sheds dirt quite well. A slightly oiled chain is the one that earns the reputation for dirt sticking to it.

From a strictly lubrication point of view, the ideal oil for a motorcycle chain would be a thin, extreme-pressure oil (such as ATF) that penetrates to the inside of the chain with ease. Unfortunately, such oil is promptly thrown off by rapid chain motion and hence is nearly useless for cyclechain lubrication.

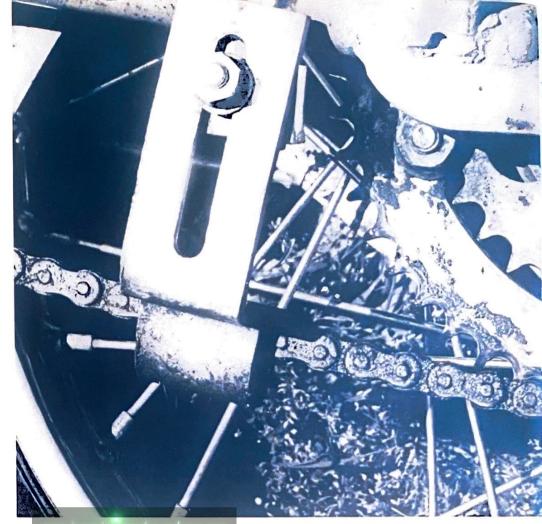
Next best is a mediumthick oil, still thin enough to penetrate with reasonable alacrity to the chain's interior, but viscous enough to last for a day of riding in reasonably bad weather oil is slushed off by mud and water, of course.

When doing my servicing at home, I prefer an EP (Extreme Pressure) gear oil of about "90 weight" such as the ones compounded for hypoid gears and tractor final drives. But it is too much trouble to carry on back-country trips when I have a perfectly good oil along anyway: especially compounded two-cycle engine oil. I mix VBA with the gas and I use it for chain lube. It works without fault for both purposes. I have no reason to believe that other makes of synthetic two-cycle oils would not serve equally well.

Periodically

I used to try one of those special "dry" lubricants but I have yet to find one that performed as advertised. Or anywhere near it.

The last bottle I tried was one I bought on a trial basis when I ran the Matador round trip, end-to-end, in Baja. Because of the enclosed rear chain I was



Typical chain guide. Adjust so that the chain does not quite hit the guide. A properly adjusted guide will eliminate about 80% of chain breakage due to sticks and rocks being carried around the sprocket by the chain. And it will also help prevent throwing a chain when it gets a little out of adjustment and there isn't time to fix it!

Roller Chain Dimensions

CHAIN NO.	PITCH (in.)	ROLLER DIA. (in.)	ROLLER WIDTH (in.)
35	3/8	0.200	3/16
40	1/2	0.312	5/16
41	1/2	0.306	1/4
420	1/2	0.306	1/4
425	1/2	0.312	5/16
428	1/2	0.335	5/16
520	5/8	0.400	1/4
525	5/8	0.400	5/16
530	5/8	0.400	3/8

This table gives roller diameter, pitch and roller width of the more common sizes of motorcycle chain. If you are having chain troubles, use this table to determine if there is a chain with the same pitch and roller diameter that you could substitute for your chain. Generally, you get better wear from a wider chain, all other things being equal. Use a short length of chain to check if the chain will hit the case as it goes around the countershaft sprocket.

The wider chains have more bearing area in the

rollers and hence are not so overstressed.

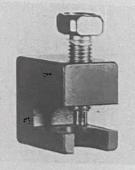
if your bike has a 40 chain you could try 425 with 25% more roller bearing area. Most of the time this would be entirely practical, but now and then you will find a bike without enough clearance around the countershaft sprocket for it to work. Similarly, a 520 might be replaced with 525 or 530.

For example.

When employing this trick, be doubly sure your sprockets are in as near perfect alignment as you can make them. (That may well have been your trouble in the first place!)



A chain breaker is a simple tool — but disconnecting a chain without one is anything but simple. This one has lasted for years and originally cost \$3.50 US.



Another small chainbreaker: the Beavertooth. Hardened screw-tip punches out pin so chain can be separated and new parts installed. A chainbreaker and assorted chain parts are a necessity on long trail rides into the back country because if you ride you are going to have to fix chain sooner or later. Make sure you have the tool with you to avoid coming out on "Shank's Mare."



The disgusted look on my face is real! I don't ordinarily have too many flats, but the bike shop that repaired the tire put on a huge patch instead of replacing the tube. Not only did the patch not stick, but I didn't have any patches large enough to cover the hole adequately. I fixed this tire 5 times before a Mexican truck driver took pity on me and gave me the largest hot patch I ever saw — and the hot patch stuck!

able to make a pretty fair test. I applied it strictly according to directions, but being somewhat of a skeptic, I checked after riding about 50 miles and discovered — to my horror — the chain was running so hot that I could feel the heat through the chain case!

I immediately got out the oil bottle, doused the hot chain thoroughly with VBA, and readjusted it. The rear wheel required setting back about 3/16 inch – 25% of the chain's life gone in 50 miles! And I threw that bottle of patent goo out into the desert in the general direction of the Pacific Ocean.

My next adjustment — over a thousand dirt miles later — about 1/8 inch!

There are two periods in a chain's useful life when it requires checking more often than usual — when it's brand new and when it's old and tired.

When it's new, it goes through a period when the parts are mating with each other and just hitting the high spots and wear is quite rapid. During this period, the problem is accentuated by a certain amount of stretch — and some chains stretch more than others.

Once

past this period, the wear rate settles down and is quite predictable, although it will vary to a considerable extent with the type of riding. A guy who takes nice, easy, Sunday-afternoon rides through the woods and over grassy trails is not going to be as hard on chains as the rider who spends his Sunday afternoons riding the desert as fast as he can and climbing the steepest hills he can negotiate.

Because a chain must be hard and at the same time extremely resistant to breakage, current practice is to make chain pins and rollers with tough cores and a hardened surface. Minimum wear occurs on the case-hardened part of the chain but when this extremely thin surface is penetrated, an avalanche effect makes the remaining life of the chain very brief indeed.

More than anything else this is an indication that the chain is about done, a better indicator by far than the actual amount of elongation — which is not to say that elongation is an unimportant consideration.

Therefore, you can expect and anticipate a sudden and drastic increase in the frequency of chain adjustments. The moment this happens, replace the chain. Don't try to get your money's worth by running it out to the very last mile.

It won't last much longer anyway and is telling you in plain and simple language that you are going to be a pedestrian very shortly. But, long before giving that final gasp, it's going to put the kibosh on your (expensive) sprockets. That's the point most riders fail to realize or remember.

Sprockets don't wear as much as chains and the dis-

tance between the teeth is machined into the part. A worn chain will no longer drop down into its proper position; it tends to ride up out of the grooves and do its pulling on the sides of the teeth. The teeth wear rapidly as a result and the first evidence of this wear is that the teeth tend to become sharp-pointed. If the condition is allowed to persist the points will be rounded or "dubbed off." In very severe cases the chain will ride over the ends of the teeth even if the chain is more or less correctly adjusted.

If a

sprocket shows any wear of this type at all it should be discarded when a new chain is installed. A new chain will not fit a worn sprocket and will be subjected to abnormal stresses that will shorten its life. I do not run chains anywhere near the bitter end so I have never had to install sprockets, but too many riders practice Dutch Economy and put off buying a chain until the sprockets require replacing.

The best

indication of excessive chain wear is the frequency of adjustment but an experienced rider checks constantly for excessive elongation by pulling the chain away from the back of the sprocket. If the chain can be pulled much over half a tooth away from the back of the sprocket opposite the countershaft, it's time to retire the chain. Any further service you get will cost you a new pair of sprockets.

Most bikes are now



But sometimes the cause of the trouble is painfully apparent. I discovered this nail as I was rolling the bike into the garage, although the tire never actually went flat, thanks to Safe-T-Seal. This tire has about 800 off-road miles on it.

being fitted with a chain guide or tensioner. Both are worthwhile. A guide will usually keep the chain from being pried off the sprocket by limbs and brush and will help keep rocks out of the limited space between the chain and the sprocket.

Some bikes

are being fitted with a tensioner on the final drive chain. My last Lobitos have

been so equipped and so is the Alpina.

When I

first saw the tensioner I was almost positive it wouldn't work worth a damn. I figured it would be OK under load but wouldn't do anything on the over-run. I was wrong. It works like a charm and also helps direct the chain on its travels.

But, by

the very nature of the beast, the tensioner is fragile and vulnerable to damage from falls. Check it for alignment after every fall because if it is allowed to force the chain out of alignment, premature chain and sprocket wear will result.

Originally, the tensioners were applied to Trials irons to smooth out the power impulses and although they aren't used so much for that on trail machines, they are still a definite benefit in the control department.

told that the hard plastic that bears on the chain would wear out right away but I ran one tensioner-equipped machine over 3,000 miles and the wearing block was still usable. I suspect the dry-chain advocates are responsible for these short-life fables!

There's also a myth to the effect that the extra flexing the tensioner puts on the chain results in shortened life but the facts are just the opposite — chain life is actually enhanced. I credit this to the decrease in whipping action. But it is important to run lots of oil on the chain when a tensioner is used. Oil on the outside of the chain lubricates the tensioner's rubbing block.

When a chain lets go it is usually the master link that parts. This is fortunate because replacing master links is strictly no sweat — assuming, of course, that one has a spare master link!

I've never seen anything published on this but I am thoroughly convinced that one of the most frequent causes of master links coming unglued is wedging a rock between the side of the case and the chain, or between the guide and the chain, thus forc-

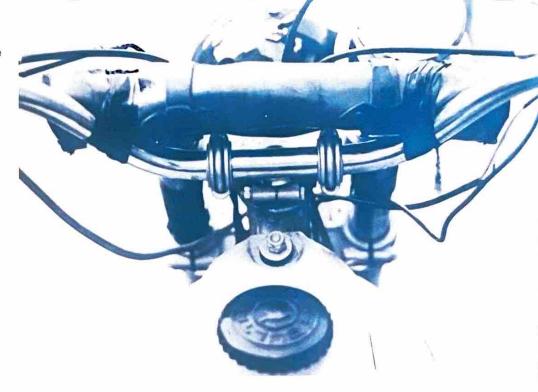
ing the pin through the keeper. And it is a fact that failed master links are more frequent when riding in rocky, gravelly country than when riding in sand.

The instructions always say to be sure to put the clip's open end away from chain movement but I don't feel that this makes much difference one way or the other. Putting the clip's opening toward the rear as viewed from the point of chain rotation puts it in a leading position on the lower run as regarded from a stationary point on the ground — a chain is always moving forward as referred to a stationary point although it moves much faster on the top than on the bottom.

Master links may be removed and installed with only a jackknife or screwdriver for tools but any chain work more ambitious than this requires the use of a chain breaker to remove the riveted pins.

There are many chain breakers on the market but I use one that I got from Sonny Kenyon. It has no brand and is identified only as "Made in England." Dismantling for compact stowage, it has provision for two different sizes of chain. I got it some four or five years back and

Tape the tire patching to the handle bar and you won't discover it was left at home when you go flat out in the boonies.



it still works like a charm.

Usually, one of the first things done in the way of maintenance is chain adjustment and this is a good time to check rear-wheel alignment; once the correct alignment is made, it's simple to maintain it unless something gets bent.

The easiest way to make a positive check of alignment is to put the bike on a stand — not the side stand — and aim the front wheel straight ahead. With the help of a friend, stretch a string as high on the rear wheel as possible and extend it forward horizontally to at least the far side of the front wheel. Correct the front wheel to make sure it is pointed straight ahead.

With the string barely touching the rear tire, measure the distance to the side of the front tire, if any. Repeat on the other side. One side or the other will ordinarily have the string some distance out from the front tire on the initial check-up. If the front tire is narrower than the rear, the string should clear on each side by an identical amount.

Make a note

of the findings, turn the rear wheel a quarter turn or so and repeat the string-

stretching process. This is a check for a wobbly rear wheel or an incorrectly mounted tire. Make several checks at various points on the rear wheel until you're sure you know just what the rear-wheel alignment is and if any correction is needed. Correct via the rear chain adjusters.

With a little experience and practice and a good eye, you will be able to make the alignment check without the string within very close limits. But the tautstring method is far and away the most accurate.

Sooner or later everyone gets a flat tire. This truth is self-evident and the result can be deucedly unpleasant. But the sad fact of the matter is that most trail riders are completely flabbergasted when it happens to them. I know riders who have been disabled by flats on several occasions and had to walk out to get assistance each time. But they still don't come prepared. They must like heel blisters!

When you

have a flat you have four practical choices: walk out for the fixin's to repair the tire, send a friend if you're not riding alone, ride out on the flat, or get out the kit and patch it then and there.

The first explains itself.
The second is somewhat better.

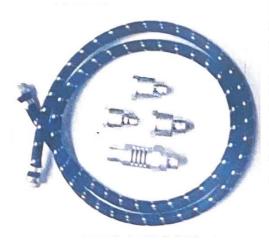
The third is not as impractical as it seems. My friend Pat Tomas never carries a flat-repair kit but is fully prepared to ride out on the flat. He rode out of the rugged country where the Cowbell Enduro is held one time on not one but *two* flat tires — and rode out for 30 miles!

Certain tires have such stiff casings that—even flat—the carcass affords a modicum of protection for the rim and a bit of assistance in handling. The Avon Trials Universal comes under this heading as do a few moto-cross tires such as the Barum.

But most of the time a flat occurs in a tire that simply goes blah and handling is snakey at best. At worst, the bike is completely unrideable over rough ground for the average cyclist.

Motorcycle tires come with a tube fitted with a lock-nut on the valve stem. I always remove this and throw it away so that in case of a flat, the stem can pull inside the tire rather than being yanked out by the roots.

It is also a great help to have security bolts if you



Pocket tire pump screws into spark-plug hole for inflating a flat tire using the engine as a pump. Multi-cylinder engines can be run while using one cylinder for pumping. On singles, rotating the engine with the kick starter pumps up the tire. The pump is used by the United States team at the International Six Day Trials — the Olympics of off-road motorcycling. This is another trail-bike accessory offered by Dick Cepek and The Dirt Rider.



Always and without fail test the valve for leakage before dismounting the tire.

have to ride out on a flat — this is the only place I prefer them to sheet-metal screws inserted through the rim into the bead of the tire.

The fourth alternative is generally the most practical and the one I myself practice. I fix 'em on the spot.

Motorcycle tire repairs are so simple that experienced 6-Day Trials competitors can repair a flat in around 5 minutes. My way takes longer, but the results are permanent.

The first thing I do when I get a new bike is tape

my tire repair kit to the handlebars with black-plastic electrical tape. My kit is contained in the imitation-leather roll that shelters my "Baby" tire pump — another buy from Sonny Kenyon's. In addition to the pump, I have some fresh patches and a bottle of stickum, tire irons, a piece of coarse emery cloth and a bit of crayon or chalk.

Ready-made kits (patches, glue and a bottle of compressed air) are sold by many dealers nowadays and they work fine as far as they go. But I have good reason for preferring to stay with my faithful old pump and with the ready-

made kit there remains the problem of what to do with the rest of the fixin's . . .

This is not to say the bottle won't blow up a tire — it will — and in very short order. The catch is that too many flat tires on motorcycles entail multiple punctures and repairing a tube with a large number of leaks means blowing it up, locating a few holes, deflating the tube and applying the patches, inflating it again and repleating the process — I have a tube that has 45 patches!

The tire went flat on a steep hill, so steep I figured the only way I could safely repair the tire would be to rope the bike to a tree to keep it from sliding off the mountain. There were no convenient trees and I had no rope anyway, so I elected to continue on down the trail to a more level place. The tube had over 50 punctures when I finally dismounted the tire.

In a situation like this the handy-dandy kit with the cunning little gas bottle would be hopelessly outmatched, but a half-hour's work with pump and patches — about six inflatings and deflatings — and the tube was ready to carry me 20 miles back to camp.

There are special tire irons made for motorcycles and I suggest you invest in a pair of these. I wish I had a peso for every tube that's been pinched through use of screwdrivers and other handy pieces of ironmongery. My own preference is to use a couple of flat tire irons in conjunction with one of the special tire tools with a notch for hooking over a spoke. Hooking a spoke leaves me a free hand to manipulate the two flat irons. I'm definitely not 6-Day Trials caliber so I need all my irons!

Repairing a tire is a cinch if you can locate the hole from the outside. Fixing a tube that has a leak caused by a big, fat nail that still remains imbedded in the case is no problem (unless it punctures twice and you don't notice the second hole on the rim side of the tube). In this case, you only remove the casing from enough of the rim to allow the tube to be pulled out and repaired. The tire is *not* dismounted and the wheel is not removed from the bike.

The operation is best performed with the bike laying flat on its side. Some bikes have hidden vents for their cases that will dribble oil if laid

on the chain side, some don't. If yours does, make it a point to flop the bike down chain-up.

If the cause and location of the flat is concealed, the tire will have to be dismounted and the tube examined closely. It is still unnecessary to remove the wheel from the machine. The simplest way to locate the leak is to inflate the tube and immerse it in water and watch for bubbles — if water is available.

I have located a leak or two the way wolves mark their territories . . .

But too often the only way to locate a leak when undertaking trailside repairs is to blow the tube up to about twice normal size and listen for the hiss of air that signifies a leak. If this fails, place your cheek or ear on the tube and move slowly along, feeling for the escaping air which marks the puncture.

When the leak is located, by whatever means, mark the spot with chalk or crayon. The tube must be deflated to repair the hole and it is surprising how often a fairly large orifice can simply disappear. I took up the marking-crayon trick after I patched the wrong place one blazing afternoon!

If the tire has to be dismounted to locate the leak, mark the casing at the valve so the piercing agent can be located in the casing by the hole in the tube. And be very, very careful when searching for the hole-maker because a tiny piece of wire, or a thorn, or a cactus spine, or even a bit of a knot from a rotten pine can inflict a nasty wound on the hand.

Remount

the tire in the same location it occupied originally to preserve the balancing.

Some tires are more subject to flats than others, with the heavy-case Trials Universal about as resistant to flats as any. Knobbies are inherently subject to more flats than conventional tires because there really isn't much material in the valleys between the knobs. To a degree, this also applies to knobbies with heavy carcasses.

There are a number of products on the market claiming to eliminate flat tires and I used one, "Flat Proof," for a while. Under some circumstances it seemed to do pretty well but when I finally had a flat in a tire containing Flat Proof, it was the very devil to patch.



Before setting-to with the tire irons 'break' the bead loose from the rim by tramping it down

Special tire tools intended for motorcycle use are so inexpensive and practical that there is no excuse for risking damage with makeshifts such as screwdrivers and automobile tire tools. Note hooked tool (arrow) holding bead while tire iron is getting another 'bite.'

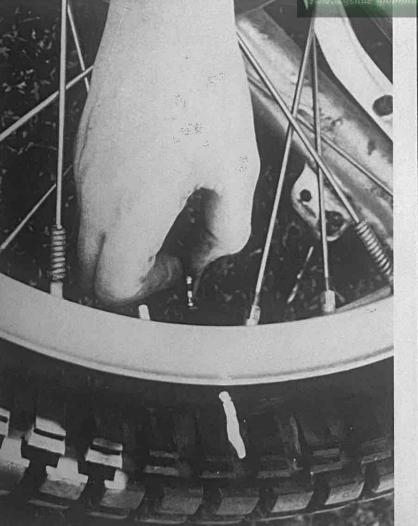




Flat tires can happen to anyone, anywhere. This tire repair job was under way about 400 miles south of Ensenada. The bandana over the head was occasioned by the noonday sun — about 110°F. in the shade. And no shade, of course!

The most practical way of deflating the tube is to remove the valve core. Note the mark on the tire to enable remounting in the same place so balance won't be disturbed.

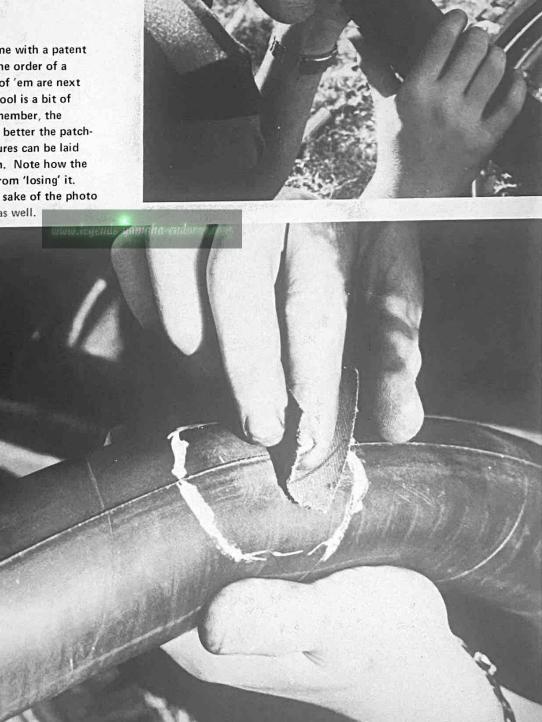
Before remounting the tire, carefully feel for the cause of the leak, and after it is located, feel all the way around the inside of the casing for additional sharpies that may be lurking. Be careful here — a cactus spine or piece of wire can nastily wound your finger in the process.





If there is no water handy inflate the tube and 'feel' for the leak with the cheek. If the leak can't be located, blow the tube up some more, about twice natural size.

All tire-patching outfits come with a patent scratcher — something on the order of a small nutmeg grater. Most of 'em are next to useless. A much better tool is a bit of 60 or 80 emery paper. Remember, the better the abrading job, the better the patching job. Most patching failures can be laid to incorrect site preparation. Note how the leak was outlined to keep from 'losing' it. Here paint was used for the sake of the photo but chalk or crayon works as well.





Too many tire pumps sold for cycle use won't blow up your little brother's Mickey Mouse balloon. Try it at home before you haul it way the hell and gone out in the boonies. This 'comes with' pump from the Hodaka B works like the proverbial charm. Hodaka part 909511.

www.legends-yamaha-enduros.co

Although I've had sad experiences with stuff that purported to stop leaks in cycle tires I've had good luck with Safe-T-Seal.

Application is simplicity itself — remove the core from the valve stem and squirt it in.



experienced pavement riders use the valve cap because at high speed centrifugal force coupled with the normal jouncing from the pavement will lift the valve from its seat, allowing the tire to deflate. This is not too severe a problem until the bike slows.

Speeds are not that high for dirt riders and the valve cap tends to act like the keeper nut on the valve step, preventing the stem from pulling through the rim in case of a flat.

I omit the valve cap when setting a machine up for dirt but before attempting to locate a leak — unless it's as obvious as a 16d nail sticking out of the tread — I always make the spit test to check for a valve leak. It is amazing how many tires are dismounted because of a leaking valve core.

In my back-country kit I carry a valve cap of the kind that is also a valve-core wrench and should I suffer a leaking valve, I would simply pump up the offending tire and install the cap. But I replace the core at the first opportunity and return the cap to the tire kit.

Nearly all bona fide trail bikes use security bolts to keep the wheel from rotating independently of the tire. Street bikes do not normally use security bolts because they are not operated with as low air pressures as dirt machines. Or ridden on flats.

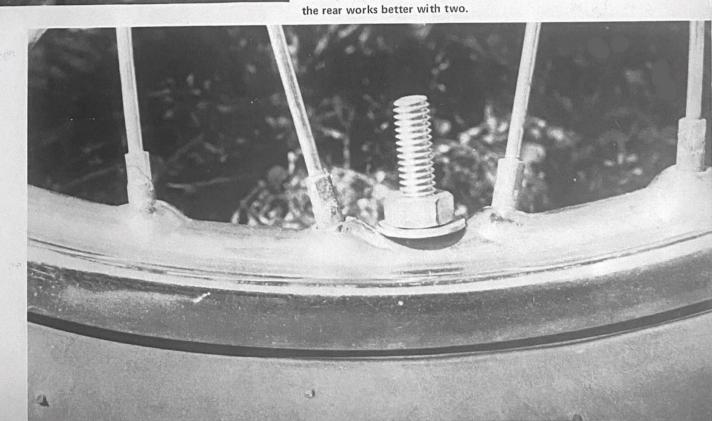
security bolts, the most practical way of securing the tire to the rim is with sheet-metal screws just long enough to reach through the rim and about halfway through the casing. I normally install four of them on each side, both front and rear. This assures me that if I have to let the tire pressure down to three or four pounds to get through a soft spot the casing won't spin and pull the valve stem out by the roots. When drilling for the sheet-metal screws I put a spacer on the drill bit so the drill won't poke a hole through the tire when it breaks through the rim.

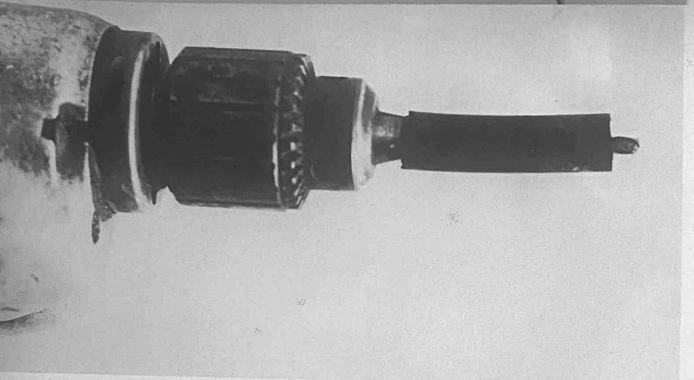
Some dirt bikes use steel rims; some use light-alloy rims. The light-weight rims have the advantage of decreasing the unsprung weight — always a step in the right direction — but are not nearly as strong as steel. There are some very fine alloy rims and a lot of bummers, but they are never quite as sturdy as steel rims of equivalent quality.



The trick in installing security bolts is to tuck them haphazardly under the bead and then push them up into the tire to the full length of their bolts. Put a little air in the tube and the bolt will settle into position. Wiggle it a bit to make sure and then inflate the tube. Tighten the nut after the tire is inflated.

Dirt bikes commonly run with very soft tires — 6 to 12 psi is not uncommon — and tend to spin the tires on the rims unless fitted with security bolts. They should be applied to both the front and rear tires. Usually one is enough on the front while





Almost anything that will fit over a drill can be used for a depth gauge when drilling the rim for sheet-metal screws. This is a piece of 2556-4 Aeroquip. Rim thickness varies, so don't use this illustration for setting your drill!



The drill stop in use — without some means of stopping the drill it will probably go clear through the casing into the tube when the bit 'breaks through' the rim!

Hard riding in dirt is tough on rims, so tough that eggshaped wheels are nothing uncommon among dirt riders. There is even a rim jack made for the express purpose of prying skewed rims back into a fair semblance of their former selves.

All too many dirt bikes, especially the so-called street-trail bikes, are fitted with too-small tires. The obvious answer is to install larger-size tires. For instance, a 3.50 x 18 can be replaced by a 4.00 x 18 for increased flotation and traction.

Most of the time this is the way to go, but sometimes handling will actually be inferior to what it was with the smaller tire - and no amount of juggling tire pressures will help the matter. This can usually be traced back to the fact that motorcycle wheels are fitted with rims of different widths and the rims must fit the tire reasonably well for best handling. But a tire-size increase to the next larger usually won't involve rim-fit difficulties.

Nearly all motorcycle wheels need balancing. Few of them get it!

another area where the majority of motorcycle dealers are remiss. If you doubt this, go down to your Friendly Local Dealer's establishment and observe the new bikes as they are delivered to the customers. If a good proportion of 'em don't have wheel weights, the dealer is doing a slipshod job and you can tell him I said so.

There's

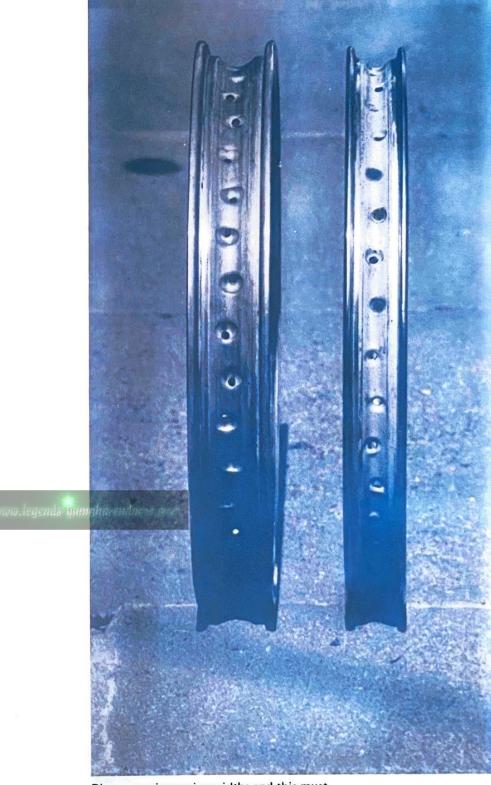
little excuse indeed for this sorry state of affairs because cycle-wheel balancing is much easier than automobile-wheel balancing. All that is required is quickattachable weights of one kind or another, and a wee bit of time.

You'll have to do it yourself sooner or later, so here's the drill: Raise the

front wheel clear of the ground and make sure there is not the slightest bit of brake drag; sometimes even disconnecting the speedometer helps. Spin the wheel with vigor and let it die a natural death. When it comes to rest, mark the top of the tire.

this several times and if the marks on the tire demonstrate random distribution, you're lucky. The wheel is good enough as is.

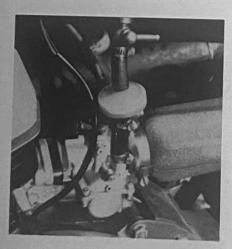
But if (as is more likely) the marks are



Rims come in varying widths and this must be kept in mind when selecting such accouterments as rim locks and tire sizes. Usually one can go up or down one tire 'size' but more than that usually requires a rim change at the same time to keep the correct match between tire size/rim width.



When balancing a wheel, try for the 'high point' at least twice. Here 3/32" rosin-core solder was used for weight. 1/8" would have been better because it's about 1/3 heavier.



Small in-line fuel filter can save you a lot of trouble on the trail. This unit, made by Carter Carburetor, filters particles down to 40 microns and flows 2.5 gallons per hour with gravity feed from fuel tank. Flow rate is adequate for bikes up to about 350 cc. Note use of worm-drive clamps. They are a lot more positive and easier to install/remove than the spring-wire Corbin clamps. Carl Shipman photo.

pretty well congregated, the wheel is out of balance and needs weight to compensate.

There are special wheel-balancing weights available, but a piece of 1/8- or 3/32-inch rosin-core solder will do as well. It's cheaper and handier, too, unless you're in the business.

Don't use acid-core solder. The acid is highly corrosive to aluminum and rust-provoking to steel.

Take a guess at the length of solder required and whack it off.

Starting

from about the middle of the high-point marks, go about 1/7 around the rim and wrap the solder around a spoke and spoke nipple as close to the rim as possible. Cut off a second piece about the same length as the first and from the first starting point, proceed 1/7th around the rim in the opposite direction. Wind the second hank of solder around a spoke as before.

Now, give the wheel a lusty spin and check for out-of-balance as before. In all probability, the high points will have shifted slightly or they may not even reappear. Keep adding solder until the tire has no concentration of high-spot marks.

The rear wheel balances the same as the front and requires "breaking" the chain.

I repeat the balance check any time I have occasion to dismount a tire although — thanks to my system of marking the casing before removing — I have never had to change the balancing weights. But I keep checking.

Entirely

too many bikes come factory-equipped with nice, clear plastic fuel lines these days. When new, they're fine. As they get a little long in the tooth they get hard and brittle, especially if they've been subjected to a lot of sunlight.

The answer to this is to replace the good-looking plastic jobbies with the vastly more utilitarian Neoprene industrial hose. My personal choice is Aeroquip 2556 secured with "aircraft" type worm-gear clamps. This fiber-reinforced hose is available in sizes from 1/4-inch ID up. The final digit indicates nominal ID in 1/16-inch increments. Therefore, a 2556-4 is 1/4-inch – about.

Many cycles and most cars today are equipped with Corbin hose clamps, simply a ring of

spring steel with two ears. They are inflicted on the public for the simple reason that they are cheap to buy and install and to most manufacturers, first cost is all. The fact that they have about the same dependability as the average Banana Republic dictator has nothing whatsoever to do with the matter. After all, it is the customer who winds up pushing the bike or calling the tow truck — not the production people responsible. One of the first things I do when I buy a new bike is install worm-gear type hose clamps in place of these abominations, whether or not hose replacement is necessary.

I don't know of any stock dirt bike that comes without a fuel filter but now and then you have fuel troubles anyway. I generally install an in-line type fuel filter even if a filter is built into the tank.

The dirt rider is probably the hardest on fuel filters of any motor-cyclist because he routinely gets his fuel out of rusty tin cans with quite a bit of condensate in them. He also tends to use old "sour" fuel at times. Both habits are conducive to plugged filters.

The built-in filter is usually quite small and is not intended for really severe service. Some of the filters, especially the ones fashioned in the form of a cylinder of metal gauze closed at one end and installed in the fuel tap, have an extremely small filter area. And they can be inordinately hard to clean.

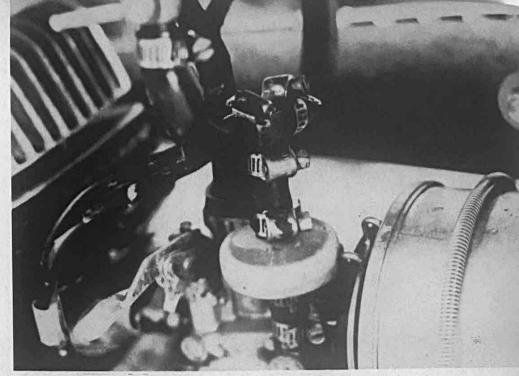
The in-line type, on the other hand, usually has quite a respectable area and is relatively simple to clean.

Ordinarily, cleaning can be accomplished by removing the filter and blowing through it in the opposite direction to fuel flow.

I've had no trouble with the plastic variety but I feel deep down in my heart that the metal ones are stronger than their plastic brethren.

Almost all off-road motorcycles sold are equipped with one or another variety of waterproof sparkplug terminals. When new, just about all of them work — note I didn't say "all!" But when they get a little age and a little sunlight on them, they generally fail. The answer is to replace the factory terminal with a "Sparky."

Sparkies are a terminal kit consist-



Plastic fuel-line filter installed in industrial push-on hose fuel lines. Note extensive use of worm-gear-type hose clamps.

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One of the beauties of the plastic in-line filters is the ease with which they may be cleaned by simply blowing through them in the reverse direction. Care must be taken when reinstalling to point the filter in the same direction as before!





A can of oil never seems to come out 'even' and a measuring bottle is a practical necessity. A baby bottle like the one on the right is excellent if it isn't necessary to carry it on the bike, but the best and most rugged bottle is a 500cc plastic item from Germany. I get these from Sierra Designs, but they are sold by nearly all mountainclimbers' supply houses. I scribe ounce marks myself with a point of a krife.

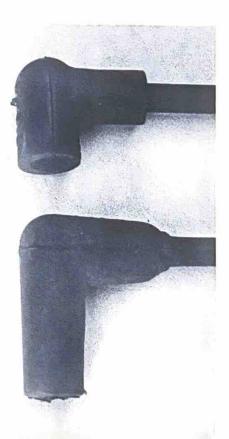
Left — the two parts that go to make up 'Sparkie' waterproof wire terminal.

Upper right — Sparkie assembled on 7mm secondary wire. Lower right — Belden 'factory-made' ignition wire with molded-on terminal.



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ing of a waterproof nipple and a wire sparkplug terminal. Directions are on the package and they are sold by all betterappointed cycle and marine stores.

Sparkies work. I used them back in the days when I raced Class C outboards and I continued to use them when I used a P-50 Johnson to shove myself around Southeastern Alaska. The P-50 service version of the PR-50 racing engine was distinguished by the opposed cylinders with the sparkplugs hanging out in the ocean spray. It takes a fine terminal to keep a P-50 running in salt water but Sparkies did the trick. I've used them on a number of bikes with no failures whatsoever.

Some factory terminals have metal parts and when I fall afoul of one of these things, I automatically replace it with a Sparky even though it seems to be performing adequately.

The BMW I had came equipped with handsome plug terminals, a fine example of Teutonic ingenuity befitting a machine in that price range. Unfortunately, one of the well-finished and highly ornamental gimcracks covering the sparkplug terminal crapped out deep on the back roads of the Coast Range. The bike was new and, of course, I didn't think that a bike with such a fine reputation would use terminals so cheap that they would short out at the first water splash — so I automatically changed plugs.

This seemed to help a little, but the bike still ran rough as a logger's Monday morning and the longer I rode it, the rougher it ran. Finally, I limped into Ukiah and put in a pair of new plugs (again). When the condition didn't improve, I sat down beside the bike to get to the bottom of the matter in earnest.

The situation was exacerbated because it would run pretty good with the throttle slightly opened, but it would miss under openthrottle conditions — the classic symptom of a fouled plug. I doubted my senses when I pinned the difficulty down to the fancy terminal ends!

Luckily, Ukiah is a town catering to grape-squeezers and wood-cutters and I was able to find a power-saw shop stocking Sparkies. No time was wasted in installing the practical Sparkies in place of the over-fancy Kraut product and my troubles were cured.

That is, I never had any more difficulties in *that* department.

Invariably, the instruction books that come with two-stroke dirt bikes say to mix the oil thoroughly with the gas before adding it to the tank, but an awful lot of two-strokes run on oil mixed right in the tank.

Most of the time, I make a pretty good guess at how much gas I'll take on, add about 2/3 of the oil I figure it will take, top off the tank, and make up any necessary oil.

That is, if I'm running my usual 4 ounces to the gallon mixture and I figure I'll need 1-1/2 gallons to top off, I dump 4 ounces of VBA in the tank before adding the gas. If it only takes 5 quarts to fill up instead of 1-1/2 gallons, I add an ounce to bring the proportion up to operating level. This is the way I do it when I'm filling at a metered pump — about a quarter of the time.

If I'm not using a metered pump, I use a dip stick which is merely a stagged-off yardstick which I calibrate in 1/10-gallon increments with the aid of my friendly pump jockey. There is nothing new about this — I poached the idea out of an old book of tips for people who did their touring in Tin Lizzies.

But the "official" instructions go on implying that the only way to mix oil with gas is to put it in a can and stir hell out of it — which only goes to reinforce my theory that the people who build motorcycles don't ride 'em much!

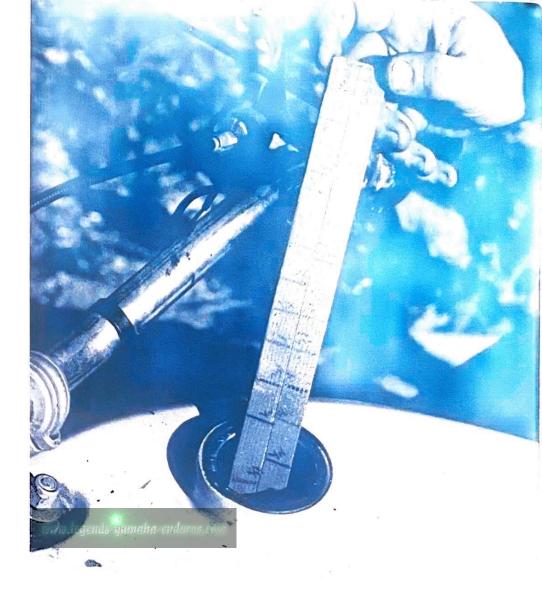
There is only

one trick to observe in mixing oil and gas in the tank. Have the fuel tap in "run" and not "reserve" position because when the straight oil is added, some of it will run straight down into the carburetor if you're on reserve. Poor performance is the direct, immediate result.

I know, I know,

this doesn't achieve perfect mixing and hence results in imperfect proportioning but then, gas/oil lubrication is a fairly inefficient way to lubricate an engine anyway. No matter how the mixing is done, the bike is going to wind up with 'way too much oil under some conditions and (hopefully) just barely enough under others.

At present writing, dirt bikes are almost without exception lubricated by gas/oil mixture although street machines



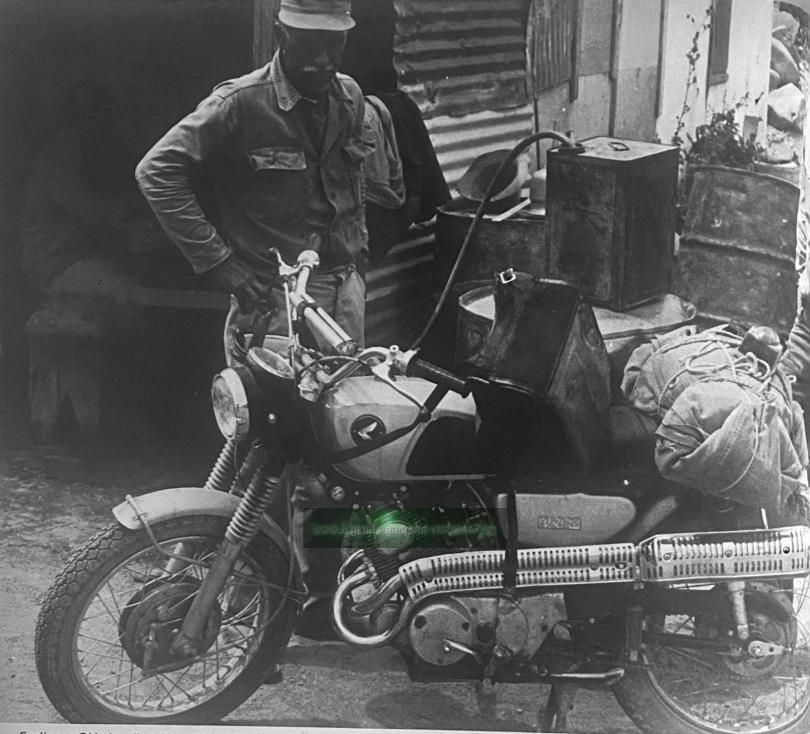
When fueling away from meter-type pumps I measure the fuel in the tank with a dipstick and add oil before pouring in the gas. This dipstick is calibrated for both Lobito and Hodaka.

have had "oil injection" of one form or another for years. With oil injection, the oil is pumped and metered into the crankcase instead of being carried by the gasoline as a sort of afterthought. Aside from the obvious fact that lubrication can be controlled better by the metering-pump system, there is an even more practical side for the long-distance, out-back rider. The metering-pump system will get far and away better oil mileage than will a petroil-lubricated machine.

I am keenly aware of the benefits derived from oil metering but from the strictly dirt riders' viewpoint, there is some loss of reliability because of the increased complexity.

idle statement. In a recent trip eight of us made through Baja, the only bike that came out of the desert in the back of a Mexican truck was a Yammy with a lunched piston caused by a failed oil pump!

This is no



Fueling at Okie Landing. Motorcycles have fairly efficient fuel filters as a general rule and although I have taken on fuel like this hundreds of times I have never felt that filtering it through old felt hats or chamois was worth the trouble. Note the early method of packing the bike — extremely clumsy and inefficient by today's standards Tank pack was less than a success, having a tendency to shift to one side or other at the most inopportune times.

Setting Up For Dirt

quipping a machine for general dirt riding is just about the same as setting it up for Enduro riding over the same terrain. And always keep in mind that a motorcycle well-ridden over rough ground will go as far in an hour as a man can foot it in a day and a half. Ten miles doesn't sound like much but it can be a great distance for a man with no chain-repair kit who suffers a broken chain only 20 minutes away from camp in the middle of nowhere. Say a four hours' walk if the ground is fairly level and smooth or all day and all night if the ground is steep and the trail is littered with round rocks like grapefruit.

Once in camp with the wherewithal for the repair in his hand he comes face-to-face with another hard fact — the long trek back to the immobilized cycle. A whole riding day, or several, shot in the head just because he didn't take elementary precautions.

These facts should be self-evident, but all too few dirt bikes are prepared for anything except riding around in circles in sight of the pickup — which is why so many riders are the target of rescue operations. Or have to waste their valuable time rescuing themselves.

Most dirt bikes come with a reasonable set of tools for simple roadside repairs. Almost always there is a tinny sparkplug wrench in the kit, normally about a 10ϕ item. The only reason the makers furnish the customer with a 10ϕ piece of junk is because the demand for 5ϕ sparkplug wrenches outstrips the supply!

Make sure it will actually remove a tight-seated plug before you haul it 'way out in the boonies!

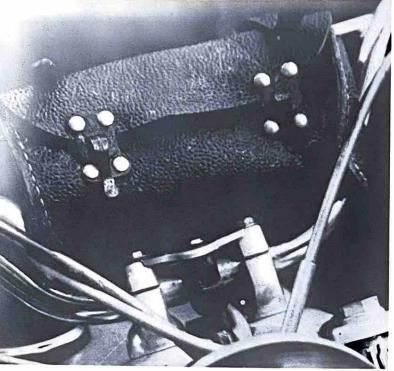
A cycle with a dud plug is completely immobilized — right now there is no such thing as a two-banger dirt bike! — and you are going to have to get the plug out of the head or you're going to wind up a pusher. A tickey-tack, pressed-tinplate plug wrench that opens up under stress is going to do it out in the middle of nowhere if it isn't weeded out first.



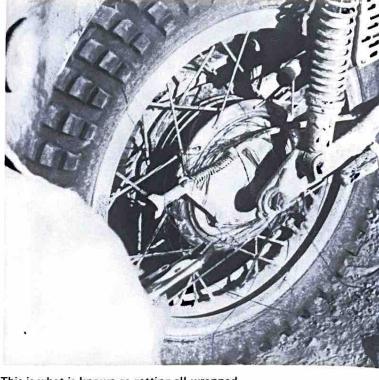
Field-repair kit was used with a Triumph Mountain Cub. As this bike was prone to losing fastenings, LocTite was added. No. 27 Scotch is an extremely strong Fiberglass tape with thermosetting plastic adhesive.



125 cc Penton motorcycle set up for offroad riding with Rap-On Fork Covers to
protect front fork seals from abrasive sand
and grit; lever covers on the control levers;
a carrying-bag for tools and spares, mounted
on the fork tubes; a fuel-line filter to keep
junk out of the carb; and rear shock covers
(Shock Sox) to keep the rear tire from
flinging mud on the shock operating shafts.
Note the silencer on the end of the expansion chamber. Factory-installed fork
brace helps prevent fork-leg twisting on
rough terrain. Accessories shown in this
Carl Shipman photo are available from
The Dirt Rider.



The Honda SL-70 is one of the few bikes that doesn't make an effort to provide a tool kit of one kind or another, or a place to put it. We fitted a bicycle tool pouch to the handlebars and it served the purpose well for over a thousand off-road miles.



This is what is known as getting all wrapped up in my work. Without a good pair of pliers, getting a wheel cleared of haywire can take hours. This is on my Bultaco Alpina. Even with Vise-Grips I took over an hour to clear David's SL-70 one night, working with a flashlight.

The drill is to test it at home, just as you do the tire pump and the chain breaker.

A few bikes will accept a "crescent wrench" for plug changing – most won't.

While

we're on the subject of tools. Nearly all bikes have a tool box that will hold the bare minimum of tools (the "comes-with" set) if they're arranged carefully, but a bike has room for lots more tools. And a goodly assortment of spare parts, too.

Some trail

riders install auxiliary tool boxes made of electrical boxes which come in a wide variety of sizes. The best for bikes are the hinge-lid, clamp-cover JIC boxes that are available in aluminum, steel and stainless. Most riders use the plain enamelled-steel boxes. Get them at the local electrical wholesaler. Hoffman brand is universally available and of good quality.

The round Hodaka tool box is also quite popular. It can easily be secured to any machine with super tape or black electrician's tape.

One of the most practical sources of tool contain-

ers is the local bicycle shop because bicyclists, too, are faced with the tool problem. and in a way their problem is more acute than motorcyclists. The Dirt Rider has applied himself diligently to the problem — get his catalog!

I carry a few tools that are not ordinarily furnished by the manufacturers and with them and the comeswith iron I can face a good 90% of trailside repairs with equanimity.

First and fore-most is the adjustable end wrench or "shifting spanner" — commonly known as a Crescent wrench, no matter who made it. Comes in a number of sizes which have nothing to do with the dimensions of the nuts it will grab onto. A Crescent wrench, alone among nut-turners, is measured in overall length.

Buy the very best you can find; unless lost, a Crescent will last three days past forever. The better ones are made of high-alloy steel, are considerably lighter than the cheapies, and have much narrower jaws that will reach into more places. The strength edge is also in favor of the better quality wrenches.

When looking for these at the hardware, don't shop for price. Recommended brands are Crescent, Snap-on, Proto and Diamond Caulk Horseshoe. I've used these but there are many other quality brands to choose from. And a lot of bummers.

Vise-grips.

These patent pliers are as near a universal tool as anything on earth except perhaps the human hand. They make a wrench that stays put — something of great importance when one is doing his thing alone — and a clamp for gluing and welding and tire patching and lots of other things. And many's the rider who has finished his trip with a pair doubling for a broken shift or brake lever.

Electrician's knife.

Most of the clerks who sell these don't know the proper name, but they are the only pocket knives I know of that are still made for a craftsman's tool. In their customary form, they have a single cutting blade and a screwdriver blade although there are versions with two cutting blades. The screwdriver blade is sturdy enough to be used for all the things a screwdriver is

used for except a cold chisel.

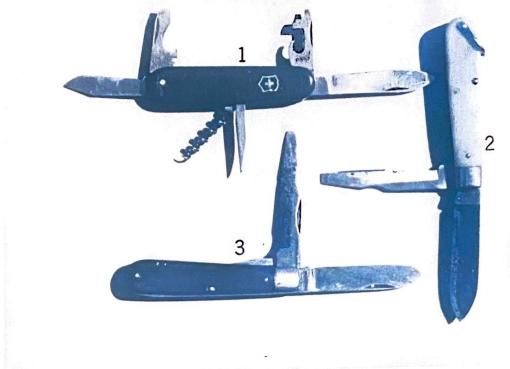
A recent development – the only new concept in knifemaking to my knowledge within the last hundred years – is the application of a tungsten carbide coating to the cutting edge. Tungsten carbide is second only to diamond in hardness. On knives this results in a rough, jagged edge ideal for stripping wire or cable as well as most camp chores, although a sharp-enough-to-shave-edge is impossible to obtain.

I have both the regular and the carbide-reinforced types and use them interchangeably. The carbide-edge model comes in high-visibility yellow which makes it easier to locate when dropped in forest duff, but otherwise it's a toss-up. If money is a consideration — isn't it always?! — get the old-fashioned knife. It costs about half as much as the more sophisticated model.

varieties are intended for use as tools and not symbols of something or other, so these knives are always made of good steel. Electrical wholesalers stock these as a favor to their customers. Klein is the brand for standard knives; H-I for the space-age kind.

Recently I have been experimenting with the Swiss Army Knife. I tried one years ago that had about 18 blades and would do everything but blow your nose, but it was a case of too much of too many things and not enough knife. The one I am using now has six "blades," including two knife blades, two screwdrivers, a can opener and a leather punch. Probably the best for the cyclist is the "Tinker" model which is the same as mine except a Phillips screwdriver has been swapped for the wine-bottle-cork puller.

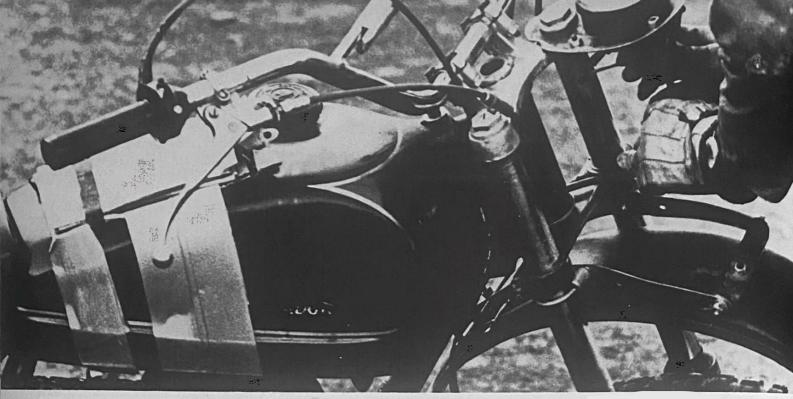
I have been using my Swiss Army Knife for about six months now and am considering replacing my tried-and-true electrician's knife with it. It will do more things than the electrician's knife, has good, rustproof, stainless-steel blades (not all stainless-steel is rustproof) and the only place it suffers by comparison to the electrician's knife is in the screwdriver department. The electrician's knife has a better screwdriver blade but on the other hand, my Swiss Army Knife has two—the second one arrived at by regrinding the end of the can opener blade. The Tinker model actually has three screw-



A good knife is almost a necessity to a cyclist — here are three types I feel most suited for the job. 1 — small Swiss Army knife. Only the lack of a screwdriver-blade lock keeps it from being the supreme tool for the bike rider. 2 — Holub electrician's knife with carbide-edged blades. Yellow handle makes it easy to notice when picking up after a trail-side repair job. 3 — Klein electrician's knife. Standard of the electrical industry and an excellent choice for the cyclist. Costs about half as much as the carbide-edged model.



Socket-head-capscrew kits are available for most bikes. Remember that metric screws take different hex wrenches. They are NOT the same as U. S. size wrenches you may already own. Get the wrenches when you buy the bolt set and check them before you leave the counter. If ordering by mail — order the wrenches at the same time. Otherwise you could spend days finding a metric hex-wrench kit. Believe it!



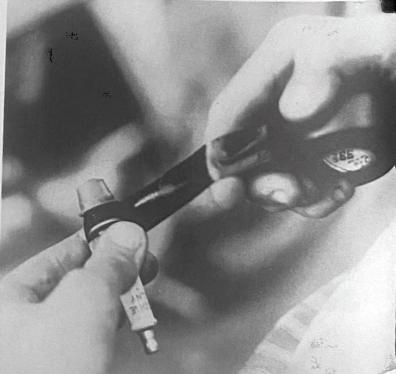
Duct tape — called super tape by most cyclists — can be used for just about anything. Here it holds the bookkeeping department on an enduro rider's tank.

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Dirt bikes use such extremely low tire pressures that ordinary tire gauges are useless. For some reason these are hard to get from cycle dealers so I got mine from The Dirt Rider. Dick Cepek has 'em, too. Stem nut (arrow) was added to simplify the photo-taking — I don't run with the stem nut for reasons explained in text.

Spark plug boxes afford mighty poor protection — I put 6X Caplugs (obtainable from any firm dealing in hydraulic components) over the ends for mechanical protection and then bandage tightly with black electrician's tape to make a moisture-proof package.



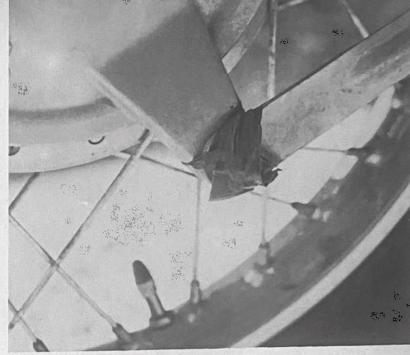




One of the handiest ways of quick-fastening things to cycles is with black electrician's tape. Its only disadvantages are that it won't withstand oil and heat.

All knives require resharpening and 'touching-up' from time to time. The most convenient method of doing this for a go-lighter is using a piece of emery cloth for a sharpening 'stone.' It is light, not fragile, and much faster than the conventional 'stone' method. 120 grit is quick but leaves a rough edge that works best on meat. 180 or 220 grit gives a better all-purpose edge.





In some places electrician's tape works exceedingly well for a nut-retainer. This taped brake-anchor bolt was prevented from loosening for over 2000 off-road miles by this tape bandage. Tape was used because it stretches enough to accommodate constant backing-plate movement.

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It is by no means necessary that a knife have a fancy bottle-opener blade — here the screwdriver blade of the electrician's knife is being used to spread the 'gripper' on a bottle of Dos Equis.

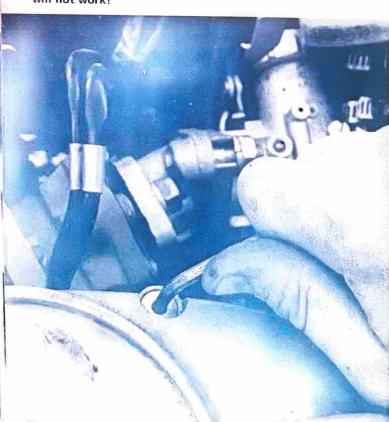




A 'knocker' or Impak Driver is an absolute necessity for working on bikes with Phillips-type screws. These work best with a hammer of 16 to 20 oz, and all our ball-pein hammers are either too heavy or too light, so we borrowed the carpenter's beater from the kitchen mechanic.

As soon as I take delivery of a bike I replace any Phillips-head screws with Allen (hex socket) screws. These are available as a kit from most dealers. Be sure to get the L-shaped Allen wrench; it is usually Metric and just any old Allen wrench or wrench cluster laying around the garage will not work!

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driver blades if you regrind the end of the can opener.

There are a few necessary items that may be called either parts or tools. One is black electrician's tape. In my experience the most reliable is MMM No. 33 (now 33+), standard of the electrical industry. There are lots of cheaper substitutions on the market that serve only to point up the old wheeze: there's nothing in the world that someone cannot make a little shoddier and sell a little cheaper.

You see

No. 33 used for electrical insulation now and then, but mostly it's used to help anchor lids that persist in coming loose, for securing boot laces, for stopping cables from whipping in the breeze where they're liable to be snagged by passing limbs, for repairing handlebar grips, for taping goggles to the helmet, for taping sleeve cuffs tightly around the wrists to stop chilly drafts — and a thousand other things. Get the 7 mil. x 3/4-inch x 66-foot size. And when applying it, always install it under tension; 5 to 10% stretch is about right.

Off-road

riders are almost as fond of "super tape" as they are of black-plastic tape. You buy this at better hardware stores and from heating and air-conditioning contractors. The Mechanical Trades (plumbers and sheet-metal workers) use it for installing air ducts and call it "duct tape." Occasionally you will find a cycle or off-road vehicle dealer who knows about it and stocks it.

This is the universal spare part of the off-road racer and is used for holding gas tanks on, ditto gas tank lids, "sewing" torn clothing, etc.

If you saw the movie "On Any Sunday" — and if you haven't seen it you should! — you will remember the poignant scene where Dick Mann wraps super tape around his broken leg at the Sacramento National so he can go out and duel Gene Romero for the Number One plate. He didn't make it that year, but he did the next — without super tape.

Super tape

is by no means limited to cycle-connected tasks. Many's the dirt rider whose house is held together with the stuff. I've seen it used for fixing baby cribs, holding refrigerator doors closed, window repairs that "temporarily" sufficed for three years, holding a door in place after a hinge pulled loose from its moorings — in

the midst of a heated discussion between the rider and his wife over whether he would go riding one week-end or stick around for the honeydews . . . Honey, do this and Honey, do that — and lots of other things.

I have a very important tool that almost never goes out in the boonies. It's a dial-type tire gage. Many riders depend on the gas-station tire gage attached to the air hose to read their tire pressures, but they have never done any checking or they would know just how inaccurate these are. In fact, the average gas station gage is worse than no gage at all — it can mislead you far more than simply feeling the tire! And anyhow, they won't usually register the low pressure most dirt tires run.

Too many dirt cycles use Phillipstype screws and a lot of them have been inserted so tightly by the factory that the owner-mechanic with an ordinary screwdriver hasn't a prayer of removing them. I know of only two ways to remove these mechanical malaprops — drill 'em out or use an Impak driver.

An Impak driver is a sort of round-handled socket driver that works by being struck smartly on the end with a hammer. Because much of the hammer force keeps the screwdriver blade seated in the recess which also tends to compress the screw and loosen it, an Impak driver will loosen a fastening with ease that is impossible to remove any other way short of total destruction.

Once the

Phillips-head screws are out, replace them with Allen (hex) socket-head screws. Your Friendly Local Dealer probably stocks a kit of exact-replacement Allen screws for your particular model if it was originally equipped with Phillips-head.

And once

the Allen-heads are installed, all that is necessary to get inside the cases, say to adjust the points, is an itty-bitty Allen wrench.

Loctite thread sealant is the product you want to keep threaded fastenings from working loose. It is a liquid that coagulates in the presence of metal and the absence of air, making a locking fastening out of any ordinary threaded fastening.

Some bikes have more trouble with loose nuts and bolts than others. I once rode a BSA 250 that required Loctite



There are places you don't use Loctite and this is one of them. Danny persisted in tightening his lever clamps excessively — and broke two levers in two days as a direct result. He started adjusting them so that they were just tight enough to keep from working around the bars of their own accord. And hasn't broken one since!

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everywhere. And a Honda of the same vintage only required one thorough retorquing after the dealer delivered it, after which nothing worked loose.

Some riders complain that Loctite doesn't work and in every case careful questioning reveals that the Loctite is used either on plated fastenings or on fastenings that have not been purged of grease and dirt before application.

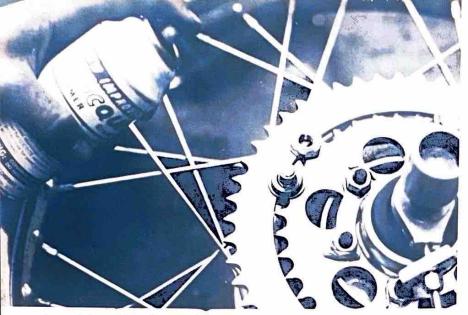
The Loctite people have a special primer-cleaner (Locquik) for their products. It comes in spray cans of various sizes, from about one ounce up, and not only functions as a cleaner but also as a catalyst to reduce the Loctite's setting time.

Most riders think of Loctite as a nutand-bolt securing agent only but it does a lot of other things. As a gasoline and oil fitting sealant, it can't be beat. It will anchor those miserable handlebars that persist in slipping regardless of how tight the anchor bolts are tightened. It will even make a pretty good gasket substitute — I once used it to seal a head to the cylinder after it had been allowed to leak so long the hot gases had worn a groove in the head along the mating surface (most cycles don't use head gaskets).

One place you generally don't use Loctite is on lever mounts themselves, that is, between the mounts and the handlebars. Dirt-bike clutch/brake lever mounts should be able to shift if the bike falls. Do Loctite the clamp screws. Otherwise, they will tend to work loose because they are not fully tightened. Alternatively, they may be taped. Loctite lever-pivot nuts.

I feel the correct lever-clamp adjustment is one that allows the lever to be moved around the handle-bar with the unaided hand, yet is tight enough to prevent the jarring of rough-country riding to cause the lever to work out of the correct position.

Epoxy cement, the stuff that comes in two tubes and is mixed around 50:50 for application, is not used nearly as much as it should be for trailside repairs. I've used it to install a new fuel tank tap when the replacement was an imperfect fit, for repairing a crankcase leak caused by running into a piece of broken spring at speed, for fuel tank



Locquick used here is several years old; it has been replaced by a similar product called Clean'n'prime. Smells and works the same. Unless primer/cleaner is used Loctite will not hold plated fastenings.



Apply Loctite a drop at a time - slathering it on doesn't make it work any better, and it is deucedly expensive. Here the bolts holding an overlay sprocket in place are being Loctited. In over a thousand miles of off-road use they have shown no signs of coming loose.

Silastic RTV vs. gasoline - Although the various RTV (room-temperature-vulcanizing) compounds are among the handiest things in a cyclist's tool kit, utmost caution must be used when using them where they may possibly come in contact with gasoline. Various sickle-magazine articles on the product have blithely ignored the fact that nearly all RTV confections tend to turn to Jello when gasoline-wet for any length of time.

leaks generally, and to remount a headlight that had broken the mounting lugs loose from the shell.

Epoxy is far and away the strongest of glue and better yet, it gains from being reinforced with any convenient fiber. Most people think of fiberreinforced plastic (epoxy or otherwise) as fiberglass but actually any kind of fiber can be used for reinforcement. I have made reinforced-epoxy repairs with Dacron sail cloth, linen handkerchief scraps and even a piece of my Frisko Jeans - in addition to the more customary fiberglass. All worked perfectly.

The only serious disadvantages of epoxy lie in its slow curing time and the rigidity or lack of flexibility with the ordinary garden-variety of epoxy cement.

An excellent adhesive for many cycle applications is Silastic RTV 732 put out by the Dow Corning people. It is a silicone-rubber product that is always flexible when cured and is ideal for a quick fuel-tank repair job - just position the bike so that no fuel is running out of the hole, clean if off as best you can, and glue a patch over the leak with Silastic. In a very few minutes it will develop a hard crust and the bike can be ridden. But don't count on Silastic for a lasting repair where gasoline is involved because it may eventually turn into a jelly-like consistency.

One of the most persistent nuisances a bike rider can face is a leak along one of the crankcase or gear-box joints. A very thin strip of Silastic strung along the mating surfaces will form an impervious gasket.

The air-induction system leading from the intake-air filter to the carburetor should be periodically checked; if a leak is found, Silastic will plug the hole – whether or not one contemplates many water splashes in his riding - even a tiny hole can suck in an awful lot of dust!

also makes a good nut-retainer. Used for this purpose, it does almost as well as Loctite although it only develops a fraction of the holding power. To apply. clean the threads - the cleaner the threads, the better the job - and rub Silastic into the male threads. Join the fastenings immediately without waiting for the surface skin to develop. Properly applied, Silastic will squeeze out under



Fiberglass components are becoming increasingly popular with trail-bike makers. As any Corvette owner can attest, fiberglass has lots of advantages but high strength and resistance to holing are not among them. But the are easy to patch. Paul Stewart does the deed on a hole in the Alpina tank. First step is opening the area around the hole to give the patch area to grip. Paul uses a hobby-style grinder here but an air-driven type might be better for the task.



Hole readied for patching with the hand grinder. Next step is to apply epoxy or fiberglass patching compound. The latter is simply fiberglass resin with finely chopped fiberglass already added. Because the Alpina has a painted tank, I smoothed the patch carefully while the repair compound was still soft, thereby eliminating sanding.



Final step in repairing Alpina tank is to put a Bultaco decal over the patch. Total time to effect this repair was 20 minutes.

the nut. Loosening or removing the nut entails breaking this "seal."

The better-made bikes come with one form of self-locking nut or another and some are better than others with the Elastic Stop Nut (the one with the plastic ring around one end) at the head of the class. But there are an amazing number of bikes around with plain, ordinary nuts and bolts holding them together. These bikes benefit the most from the Loctite or Silastic treatment. It pays to replace the ordinary kind with self-locking nuts if you can locate them. Usually the dealer is only too aware if there are fastening problems with his marque and will stock Elastic Stop Nuts or a near-equivalent.

But even with a full complement of self-locking nuts, there is still a lot of room for Loctite and Silastic.

Note I have made no mention whatsoever of lock washers. This is because I consider them anachronisms out of place in today's technology. This goes double in spades for the U.S. favorite, the "split" lock washer. The theory is fine but in practice these washers have a nasty habit of breaking. It is not at all unusual to dismantle a machine that has been assembled with split washers and find the washers have broken and worked out from under the fastenings, leaving the nut or screw head standing some distance away from the part it was intended to secure. The Europeans tend to favor wave washers and while they don't break, they don't hold a tenth as well as a chemically bonded or self-locked fastening.

Nearly all dirt bikes have a kill button as standard equipment. And if they don't, they ought to! But the majority of the kill buttons I've examined have been strictly Mickey Mouse in design and construction.

Years ago, there weren't too many of us riding and there weren't accessory makers on every third corner in the Los Angeles area, so we made our own kill buttons. They were crude-looking all right, fashioned as they were from used hacksaw blades, but they were tough as goat hoof.

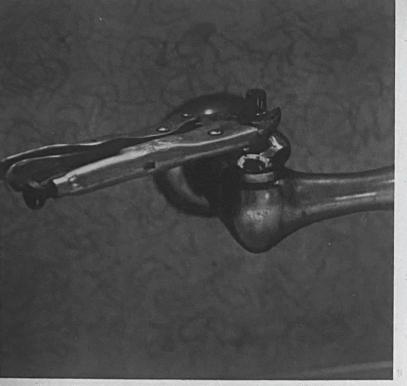
The only commercial kill button I know of today that I can recommend without reservation is the one put out by Webco and based on our old hacksaw models.

Frankly, I prefer the hack-

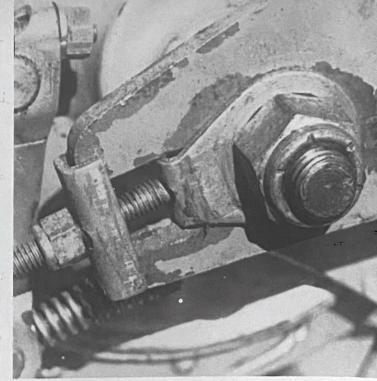
saw types because they require no holes drilled in the handlebar for installation, have a very low profile and are not subject to damage from the more usual cycling contretemps. And they're about as cheap as can be had.

The ordinary kill-button installation suffers from fragile wire - as well as being quite delicate itself. Some of the primary wire that connects to factoryinstalled kill buttons is around 20 to 22 gauge. I dislike using wire of less than 16 gauge anywhere on a motorcycle because that's the smallest size you can use with the requisite strength for the job. The best available automotive wire is the Hypalon-insulated variety that costs a cent or so more a foot than the usual vinyl-coated stuff and hence is seldom used by garages serving the general public. It is widely utilized in industrial shops where the basic philosophy is to fix something so it will run as long as possible before it has to be repaired again. Obtainable in 100foot rolls from most parts houses, one roll will be enough to keep six motorcycles running for years.

The advantage of Hypalon wire is that it is tough and in case of a short and subsequent heating,



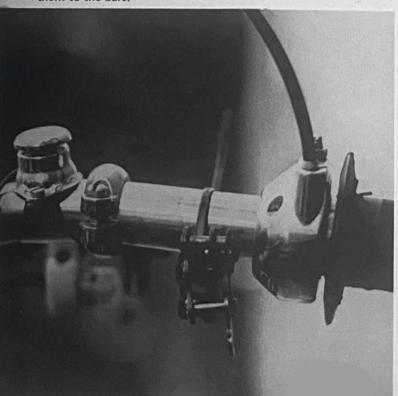
Vise-grips are by no means confined strictly to motorcycle applications!



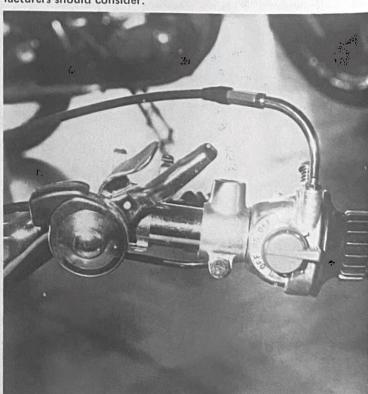
Elastic stop nut on rear axle — if there is anyplace on a bike that fair cries for a self-locking nut it's here! If your bike comes without a self-locking nut or a jamnut, Loctite makes the stock item into an acceptable substitute.

www.legends-vamgha-enduros.co

Many riders simply assemble spare master links around (any) convenient control cable, but as I always carry a block link as well as master links, I prefer Ty-rapping them to the bars.



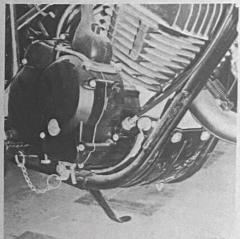
Ignition switch on Kawasaki is handy but I'd still add a kill button. Support for cable with a stiff tube where it comes out of throttle is an excellent idea more manufacturers should consider.





Because I'd been too busy — or lazy! — to install a brush guard I got 'brushed' one afternoon. No harm done except that I had to stop and clean it out, but I have seen this happen to riders who were unaware of it and who wound up with a blue brake drum, worn-out rear brake lining and no grease left in the rear wheel bearings. A brush-preventer is a practical necessity for my nickle.





Brush guards on a Kawasaki: factory-installed chains keep brush out of the brake and shift levers. Rock guards under the engine are also standard on this bike.



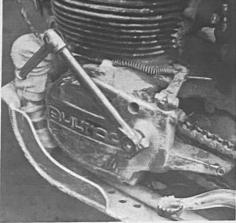
Brush guards on Bultaco's Matador "Six-Days" model are cables attached from the frame cradle to the shift and brake levers. Note that the cable fastens to the outer edge of the shift lever and that brake lever is rounded to make it less likely to hang up on rocks or in brush. Shop rag contains tools. Dave Ekins photo.





Bultaco Pursang equipped for desert racing with a Bill Water's rock guard to protect the down pipe from minor bumps. For enduros or true rocky going it is a better idea to switch to a high pipe and gain ground clearance — without the rock guard.

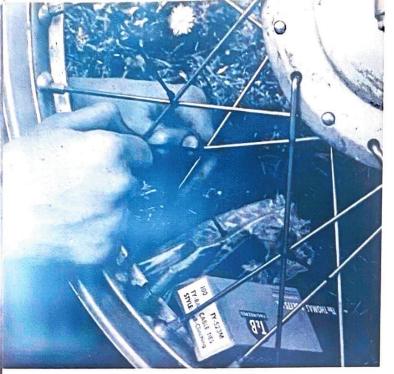




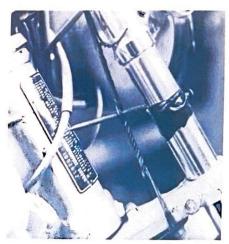
Bultaco Alpina with add-on rock guard of the sort with enough extra over-hang and rigidity to cause more harm than help in most riding situations. Note roll of tools in shop rag at front of engine.



Suzuki adds this rock guard to protect the down pipe on their 175 cc model. Still, it affords only minimal protection. So, if you get really serious about riding in the rockery — install an up pipe.

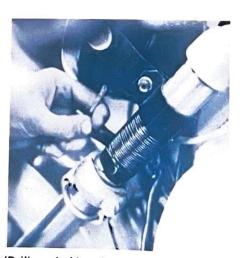


Unless secured, a broken spoke will thrash around and cause all kinds of difficulties. Most riders wire 'em to prevent this, but my favorite method is to Ty-rap the spokes at their outermost crossing. Ty-raps have the advantage over wire in that they are lighter, faster to install and remove, and neither rust or wear out. If your Friendly Local Dealer doesn't know about these good things, then get your Ty-raps from your nearest electrical wholesaler. For spokes get No. 523MX.



A bailin' wire repair — when the pivot-bolt nut came of David Sean Murray's SL-70 the trailside repair was effected in a few minutes, but it withstood over 500 miles of fast riding over Baja roads.

www.legends=ynmaha=enduros.com



'Bailing wire' is as handy on bikes as on trucks, but when carried wrapped around a frame member it rusts to uselessness, and while rusting generates ugly stains. A very practical substitute is No. 16 or 14 enamelled magnet wire obtainable from any electronic store. Secure it with tape. Because there was not enough room to wrap the tape direct from the roll, a length of tape sufficient for the purpose was transferred to a stick.

Dave Ekins comments on rock guards -I don't run rock guards - I dodge the rocks A big skid plate will often cause you more trouble than help. You can find yourself glancing off a rock - out of control where you would have missed it if you hadn't had the skid plate. Most rock quards are run to protect down pipes - but when you get into rocks you've got problems the guards may not help. You'll note that Doug has not discussed rock guards in the text because he feels - as I do - that they are basically non-essential "status symbols." Most bikes designed for the dirt have double tubes under the engine with a steel screen to protect the engine's underside. Any more protection than this

the Hypalon swells but doesn't melt. Best of all, when it is heated it doesn't melt its way through the insulation of adjoining wires and ruin every conductor in the harness. When the heat is removed it shrinks back to something like its original dimensions.

may just borrow trouble you didn't need.

Next to Hypalon is the commercial MTW wire made like THHN (which isn't available in 16 gauge). This is a thin, extremely hard plastic insulation which is in turn thinly coated with nylon. Basically intended for machine-tool wiring (that's the origin of the MTW designation), it is resistant to oil, gasoline, and just about any chemical you can name. Heat resistant to 90°C. Waterproof forever. And because it has to be pulled through confined areas, the small outside diameter (about 0.030 inch less than equivalent automotive or fixture wire) and slick nylon coating permits more wires in any given amount of space. Unfortunately, I have never been able to buy it in less than 500-foot rolls but it is worth trying to hit an industrial electrical contractor up for some.

Because the insulation is so tough and resistant to chafing, it is an excellent motorcycle primary wire. I get it in stranded form, of course, but there aren't quite as many strands in a given size as in equivalent automotive wire. It is therefore not quite as flexible. If reasonable care is used in dressing the wires, this is not a problem and I have never had a broken conductor on a wire I installed myself.

Any wire

used on cycles has to be secured to the frame to prevent chafing. It is an easily demonstrated fact that floppy wires get snagged often on fences, brush, limbs, feet, and even other cycles.

There are two basic methods of securing wiring.

The most common, especially for the do-it-yourselfers, is to simply tape it here and there with electrician's tape.

In most cases this is perfectly satisfactory, but the tape is attacked by gasoline and oil and heat, and there are some places you want the wires to "work" a bit. Cables need securing, too, and generally they must either hang loose or have a slight bit of play.

Where the wires aren't to be fixed in place — and in all instances where a neat, workman-like job is desired — it's a task for Ty-raps.

Although Ty-raps have been used for this purpose for years, most cycle dealers have yet to hear of them and this is another item you get from from your local electrical wholesaler. Ask for 528M-X. The "X" designation means the Ty-raps are black and resistant to sunlight, although for cycle use you can get by with the white "regular" 528M variety. This Ty-rap is longer than you will ever need, but the extra length doesn't cost much and makes it ever so much easier to install.

If your dirt riding entails riding through any amount of brush — most dirt riding is also brush riding — then it is advisable to install guards on the gear shift and rear brake pedals to keep them from being jammed by organic matter picked up in passage.

The easiest way to do this is to drill a hole through the pedal and thus connect it to the frame with a deflector chain. Some riders have rings welded to the frame, but I dislike welding to frames except where it is unavoidable. Any frame, but especially the modern lightweight frames fashioned of heat-treated and/or alloy steel.

When welding is unavoidable I either go the heliarc route or MIG, neither of which are "stick" welding techniques as performed by most welding job shops.

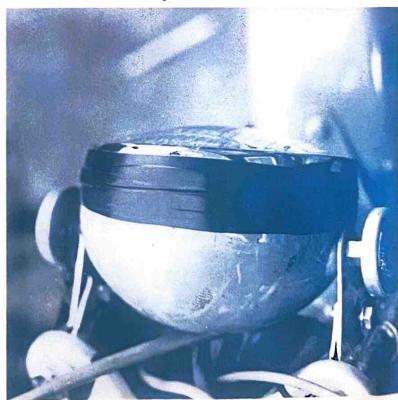
I have never seen a dealer with either MIG or heliarc facilities . . .



Stow foam-padded spare bulbs behind headlight.

oww.leaends=uamaha=enduros.com

Headlights are fragile things that have a habit of getting pronged at the earliest opportunity. David bent the bezel on his SL-70 so badly it wouldn't hold the headlight — No. 33 made a quick repair that lasted for 1200 off-road-riding miles.





If lights are important to you, tape plastic foam around spare bulb with black tape and stow behind headlight reflector. Here a tail light bulb is being cocooned.

pw.legends=yamaha=enduros.com

Another thread/nut grabber — Auto trim cement is often used for holding threads so fasteners won't back out or fall off from the incessant vibration which is part of every trail bike. And, it can be a real help for sealing around air-cleaner housings. Some riders prefer it to Silastic or Loctite. It is usually yellow in color.

Riders who do much of their riding in rocky areas or on extremely hard ground are sometimes troubled with broken spokes.

Now a broken spoke in itself isn't too bad, but often it gets all tangled up with the other spokes and the fender supports or the drive chain. It's the very devil to remove and is likely to flatten the tire to boot. The remedy is simple: secure the spokes to each other at the outer crossing points, then even if a spoke happens to break it is not nearly so likely to cause a sudden cessation of forward progress. And if the spoke isn't all twisted and snarled you can remove it at your leisure.

Some riders use electrician's tape for spoke lashing, others rely on bailin' wire — but I turn again to Ty-raps. Once installed, Ty-raps never require replacement because of rust, don't create staining and/or electrolysis problems, don't stretch, and can be removed in a matter of seconds when the time comes.

As mentioned above, the little Ty-raps I use for the purpose are designated 523M-X.

Broken spokes are almost always caused by loose spokes — when a spoke loosens it doesn't carry its share of the load and the remaining spokes are overstressed.

I've read articles recommending that spoke-tightening be done by the Friendly Local Dealer but it's not all that complicated. Like most things, however, there's a right way and a wrong way to go about it.

The wrong way is the way it's usually done: pick a convenient spoke, adjust it, and continue on around the wheel adjusting spokes until back at the starting place. Invariably this results in uneven tensioning.

My system is slightly more time-consuming but quite efficient. I mark the starting spoke, adjust it, and then skip to the 9th spoke in line, repeating the process until I reach the starting point.

I have also read that you can tell the degree of spoke tension by the sound – by the "ring" of a spoke when tapped – but this is not reliable because spokes touch each other and interfere with their respective vibrations.

In my book. spokes are adjusted by feel which takes

some experience but not a lot. Just make an effort to have the same torque on each spoke nipple. The Friendly Local Dealer probably has some kid spoking wheels and if you think he uses an inch-pound torque wrench you're kidding yourself!

I'm a

headlight enthusiast as mentioned before. Even the thought of being caught out at dusk and having to ride back to homebase in the dark through the wild and uncut makes me shudder. So I not only ride with lighting equipment installed, but I also carry an extra headlight bulb wrapped in foam and packed inside the headlight shell. The taillight is not so important—ride fast and you don't have to worry about being run over—but if you feel a taillight is vital to your health and wellbeing, you will find room beside the spare headlight bulb for an extra taillight illuminator.

Dirt bikes get dirty — fast! Most riders like a clean bike for esthetic reasons but there is a practical aspect, too. A bike coated thickly with vintage dirt is difficult to work on and almost impossible to do a good repair job on because dirt has an uncanny way of working its way into the machinery during the repair processes.

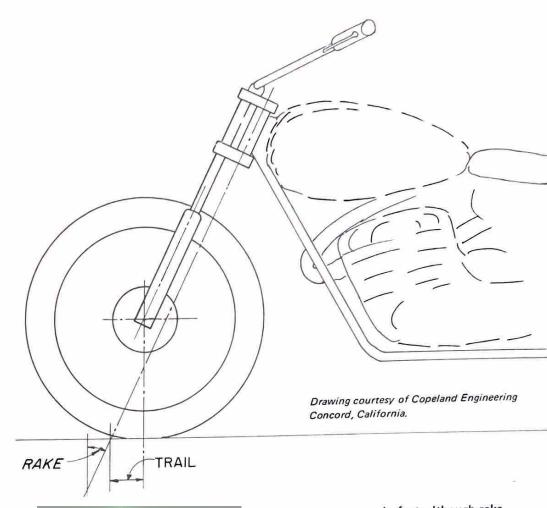
Another thing — and important. Dirt, especially grime mixed with oil, forms the perfect camouflage for the tiny cracks, breaks, loose nuts and things that must be discovered and repaired early to prevent them from growing into major and expensive repair operations.

The easiest way to get a dirt bike clean is either with a steam cleaner or a two-bit car wash. Although similar, the two don't work quite the same way.

The two-bit car washes that have sprung up all over the country use high-pressure jets of hot water. Detergent is optional. They're excellent for getting mud and grime off the machine where their water jet works like a "water pick" toothpick.

The steam cleaner uses superheated water that turns to a saturated steam/water mixture as it leaves the nozzle. As with the car wash, detergent is optional.

Of the two, the steam cleaner is by far the most efficient, and even without the detergent will do a pretty fair job of bike cleaning. It it fairly hazardous in the



A great deal is made of 'rake-and-trail' by the cycle magzines, who tend to make much of the fact that (generally) a trail bike has more rake and more trail than pavement machines.

To hear them tell it, the amount of rake and trail determines the handling characteristics to the exclusion of all else, a simplistic approach to an extremely complex situation that probably surprises frame designers no end!

If handling was solely the result of the rake-and-trail geometry the frame designer's life would be much easier, because he could give a standardized amount of rake and trail with the sure and certain knowledge he had taken care of the handling situation. In fact, although rake and trail is an important handling component, it is only one of the many parameters involved, some of which are fork spring rates, rear suspension spring rates, fork damping in each direction, suspension-unit damping in each direction, tank size, the relationship between foot pegs and seat and bars, wheel diameters, tire sizes, tire types, braking characteristics, torque ditto, tire pressures, wheelbase, swingarm length and a few other things.

For that

reason, there has been no emphasis on rake and trail in this book, but for those who have an interest in things technical and frame geometry in particular I suggest a copy of the Boonie Book which goes into great detail on just how a motorcycle works.

When riding in very soft sand the trick is to keep the speed high. Note how the sand is plashing from under the front wheel — like water!



hands of someone unfamiliar with its care and operation and every beginning steam-cleaner operator winds up with a few blisters.

The detergent used by both systems for cutting oil and grease is nothing at all like the kind mamma uses in the family laundry. It's strong enough to eat the flukes off a Danforth anchor and should be applied to motorcycles with extreme caution.

It is very conductive and under no circumstances should detergent-laden water be squirted directly on coils and other high-tension electrical components. Most dirt bikes carry their electrics tucked up under the fuel tank, so it pays to be doubly cautious about blasting the cylinder head because the cleaning fluid will inevitably glance off the fins and wet down the coil.

Another area in which caution is advised is the wheel bearings. Most motorcycle wheel bearings are of the sealed-ball-bearing variety, but "sealed" is a relative word and the bearings were never meant to withstand the direct blast of a steam or high-pressure cleaner. This is especially true if detergent is used because it contains a wetting agent which enables the fluid to seep through cracks where water will not ordinarily flow. Offhand, I'd say the detergent/pressure-cleaner combination is the direct cause of most premature wheel-bearing failures on bikes, both dirt and street.

It is also bad on chains, because the detergent removes the protective film of oil from the working parts of the chain and the high-carbon steel rusts almost immediately.

The detergent also attacks most light-metal alloys. I learned this the hard way when I pitted a chaincase cover so badly on my old NSU that it looked like it had been hit with a shotgun.

All dirt bikes have extremely sophisticated suspension, both front and rear, with damping in both directions. The heart of the suspension system lies in the various seals and valves, both of which are subject to wear with the passage of time and distance.

The most obvious failure is in the seals — the oil leaks out and it is no secret at all! When enough of it is lost the suspension becomes undamped with deleterious effect on handling. It is the nature of things that all dynamic seals leak to a greater or lesser degree. There is always some normal leakage, plus a severely limited amount of fluid to lose, so now and then a suspension will cease damping from lack of fluid and the rider will be oblivious of the fact.

Oddly enough, it isn't always easy to detect a failed damper because when a failure occurs in the front end, it often manifests itself as a lack of rear-wheel control. And a rear-suspension failure can make a bike snakey in the front end!!

The problem is compounded by the fact that a loss of control is normally encountered on one unit at a time — seldom is the loss of damping identical on each side.

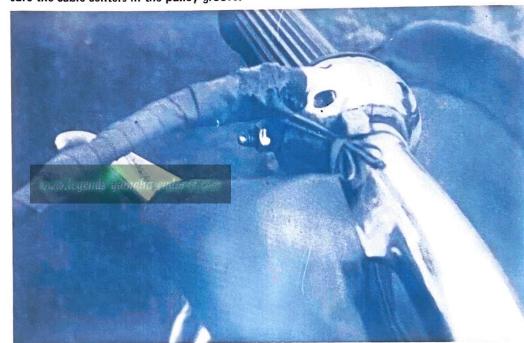
So when a bike begins to get a little long in the tooth, I make it a regular habit to remove the rear-suspension units and test them one at a time by lunging on them and forcing their springs to compress. It is only a rough check, I know, but it is very effective in detecting a malfunctioning "shock absorber." If I'm the least bit suspicious I remove the spring and repeat the process with one end in a vise, alternately pushing and pulling. This is the ultimate test.

About once in a thousand miles I test the fork action. I do this when changing fork oil by pulling the front wheel and putting first one and then another of the front-fork elements on a block of wood, alternately compressing and releasing it. Admittedly crude, but much more effective than the usual method of simply ignoring the forks until the bike becomes unrideable — and extremely expensive to repair.

No exact guidelines on permissible suspension-oil leakage can be given. Some bikes just naturally leak more than others of the same make and model. Some designers believe that a certain amount of oil leakage is beneficial from a lubrication standpoint.

A few years ago I was riding a little Original Lobito north from San Ignacio B.C.S. and making pretty good time over the incredibly rough desert road (this stretch has since been replaced). The forks worked so hard they actually became hot to the touch and the heat-thinned oil began to leak past the fork seals in quantity. The leakage was

Carl Shipman shot this photo for me and explained the two main reasons for throttle-cable failure. The first is flexing and rubbing where the cable comes out of the twist grip. If the cable's outer cover/ housing/conduit is not attached firmly to the twist grip with automotive-trim cement (which also helps exclude dirt) and stiffened against flexing, cables fail in a hurry. Here the cable housing is stiffened with doubled-over wire clamped to the handlebar and taped to the housing. The second common failure cause is wear and cutting of the cable by the "pulley" inside the twist grip. The pulley's sharp edges can be dressed down with a file and the interior packed with grease. And, if the cable has an offset end, you can be sure the cable centers in the pulley groove.





The most practical way to identify cables seems to be DYMO tape around the cable with the sticky side pressed against itself. I have never had one of these tapes come off — but under extremely hot conditions the letters will sometimes erase! Cables should be pre-lubed before adding them to the equipment carried on or with your bike. Put them in a heavy-plastic zipper-closed bag to keep the oil from wandering onto everything else in your kit.

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How to lubricate a cable - Most control cables are bought and used dry and they fail prematurely. This is because it ain't easy to get lube in a cable unless you know how. Carl Shipman (The Dirt Rider) says that you can make the job easy by putting in a few drops of gasoline which zips into the cable and makes its surfaces very attractive to the lubricant that you WANT in there. Then you start feeding in the lube - which forms a column in the cable - urged downward faster and faster by its own weight and creating suction above. This pulls in more lube. The more you put in, the easier it goes in and the more it wants. In only a minute or two it comes out the other end - on your shoe.

carried by the slipstream back onto my riding suit and pretty soon I looked like a Morrison-Knudsen grease monkey.

I was under. standably worried. From the amount of oil on my clothing I figured the forks had completely lost their seals and there wouldn't be enough oil left to lubricate an Ingersoll watch by the time I got to Juan Lopez' place in El Arco.

The first thing I did when I got to El Arco was pull the fork oil and as I did so, I measured the amount extracted. To my utter astonishment, I found that I'd lost only about 1/2 ounce on each side at the most, an insignificant amount. My mind at ease, we filled the forks with automatic transmission fluid type ATF measured from a baby bottle and I continued north the next day without a worry.

I've had five Bultacos since, every one of which leaked fork oil, and none of 'em actually lost enough to be concerned about. If they didn't lose it around the fork seals, they pumped it out the breather holes — messy, yes, but not at all important.

So I get a little dirty now and then from the oil—but what's being dirty to an off-road rider?!

If either a fork or a rear-suspension unit differs drastically from its mate in spring or damping, it will make the bike "snakey" and hard to steer in a straight line on rough ground. The faster the bike is ridden and/or the rougher the ground, the more acute the problem. As mentioned before, it can be confusing because a rear-unit problem often feels to the erstwhile rider like something amiss in the front end. And vice versa.

It isn't

just suspension units, either, that cause this illusion. A worn swing-arm bushing will do it. A loose fork clamp. A "tweaked" fork that causes one slider to bind. A loose axle, front or rear, but generally rear.

Some years back I was riding one of the first BSA Starfires in the High Sierra — and riding it fast on fire roads looking for a lost boy.

It seemed to me the bike was handling poorly and I checked for soft tires once, but the feeling that something was wrong persisted. Perplexingly, the bike handled differently under acceleration than it did on overrun.

We pulled into Uncle Tom's Cabin for fuel and refreshments and the first thing I noticed when I dismounted was that the rear axle nut had worked loose, allowing the axle to move forth and back. The thought of what could have happened if that axle had come completely out at speed on one of those high-mountain fire roads gives me the willies to this day!

As any bicycle rider knows, tire pumps and the like secured to the machine are the first thing the rip-off punks appropriate.

Dirt motorcyclists don't have this problem to the degree that city-side pavement riders do, but it exists and the touring dirt rider, especially, should take steps to guard against it.

I tape things on with black-plastic tape, and a few years back some anti-tourist Mexican took his Saturday Night Knife and simply slashed the tape and swiped my tire-patching outfit lock, stock and barrel.

Shortly after returning the the U.S. of North America, I chanced to pass a surplus store and noticed a bunch of 1/16-inch aircraft-control cable in the front window. Close examination revealed the cable was stainless steel, guaranteed to blunt the edge of the best blade a thief ever owned.

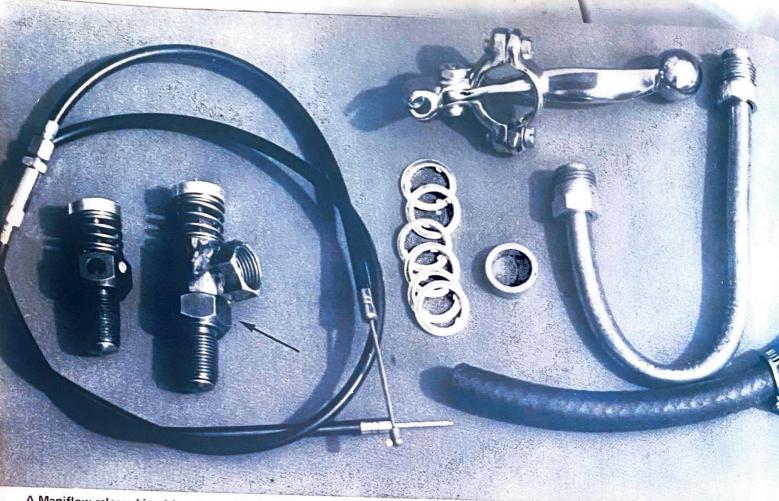
So now where there is even the slightest chance of theft or when theft would cause the maximum inconvenience. I secure the items with my usual black tape - then, I take a few turns around the tire-patching kit or whatever with the stainless-steel cable and over that another few turns of covering tape. On two occasions when I've left the bike out in the boonies. I've come back to find knife marks on the tape holding the tirerepair outfit. Unwrapping the bindings can be presumed to take longer than the average gutless gonif feels he can spare. In the back of his mind he knows that a man who is caught monkeying with someone's equipment in the back country runs a good chance of being on the receiving end of Judge Colt's permanent cure for knavery! Under

most conditions an experienced rider can ride without one cable, or perhaps with more than one, gone but it's no fun and once in a while it can be almost impossible.

For instance, riding an extreme down-



Muffs or knuckle guards such as these shown on a bike in the Greenhorn Mountain Enduro serve a dual function of protecting the knuckles and levers from damage — and also serve to keep the hands warm. Photo courtesy I mage International.



A Maniflow release kit with a conventional release shown for comparison. One of the problems with the Maniflow (arrow) is that the customer has to do all the silver-soldering, tube bending and so forth. That puts the Maniflow release installation beyond the capabilities of the average bike shop. But it is a damn good release!

hill trail any distance without a frontbrake cable is courting disaster. And a long uphill shot would be very inconvenient without a throttle cable.

I once rode about 20 miles in gently rolling country with a broken throttle cable — it had been snagged on a limb — by simply screwing in the idle-speed adjustment and using the kill button to regulate the speed — but it was extremely awkward.

Many experienced riders tape an extra cable alongside the original just in case. It makes for a fast replacement but I dislike it because the replacement is subject to being snagged by the same limb that gets to the original.

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assuming the cable will be broken by something and not worn out. A cable wears out by breaking one wire at a time

although it should not be run to this point — and the first time an inspection reveals a fatigued cable is the time to replace all cables on the bike.

I have worn out only one cable. It was on the Honda CL-160 and some 1800 off-road miles, together with the usual sand inside the housing, simply wore out the cable. Only a few minutes were required to replace it.

The Enduro

rider particularly favors the taped-cable so many articles recommend. I met a rider in the Cowbell Enduro a couple of years ago who had torn his throttle cable out of the twistgrip by the roots — then both the original and the replacement taped beside it had been ground under the rear wheel. This ruined both ends of the original and so mangled the intended replacement that it was useless. Luckily, he was riding a 125 Yammy and a passing Yamaha pilot

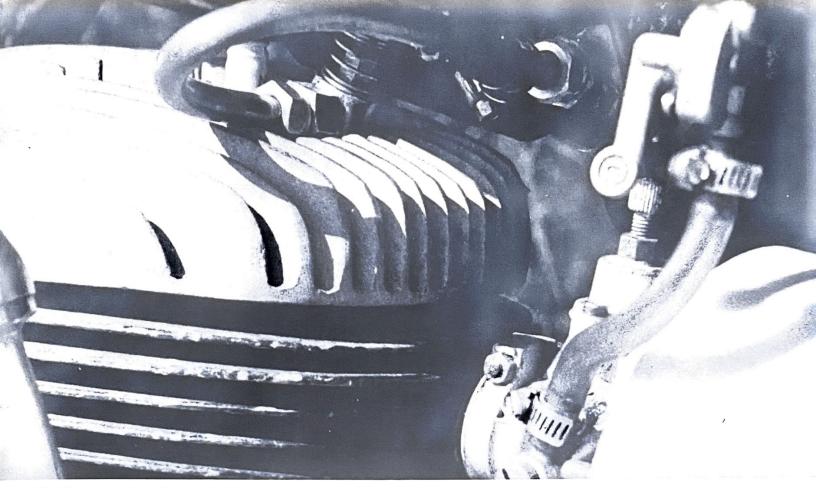
was able to supply another cable or he'd have faced a long walk in some mighty confusing country.

Most bikes have a lot of space under the rear seat that is just perfect for carrying a lot of odds and ends – a lot of odds and ends! Among other things, I use this space to carry my extra cables if I'm riding a bike other than a Bultaco – Bultaco puts the air cleaner under the seat on most of their models.

To eliminate confusion in time of stress, label the various cables with Dymo tape stuck sticky sides together. I make it very long and then wrap it around the cable and bring the gummy sides together. Used in this way, Dymo tape is stable for years.

The better

class of control lever bends rather than breaks. If the lever clamp is not too tight, control-lever breakage is not common.



Maniflow release installed — probably most practical for the casual rider, but it's a bear to install!

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But some bikes and some riders tend to break more of any kind of lever. If you or your bike fall into this category, stash an extra lever or two under the seat with the cables.

But the cure for control-lever breakage may be for you to replace the factory items with a set of Maguras, the Rolls-Royce Saloon of the control-lever clan.

Every

bike has its built-in weaknesses — on Bultacos the shifter shaft is subject to breakage if the bike falls just right. The solution: weaken the shift lever by drilling holes in it so the lever and not the shaft is the weak link in the chain.

It is interesting to note that my friend Pat Tomas (of the 15-foot-deep dab!), a highly experienced Enduro rider, carries only a spare shift lever and extra sparkplugs in any event. He was the one who put me onto the

drilled (or notched) lever trick, and he feels he is liable to break a lever every time he rides the hills. His spare lever is mostly a security blanket, though, for he has never broken a lever or bent a shifter shaft!

Experienced woods riders expect problems with branches whipping them on the knuckles, so many of them install a sort of leather sleeve, or one-handed muff, on their handlebars to deflect limbs. A secondary advantage is that the protectors keep the hands relatively warm and dry.

Two-cycle engines do not have the braking ability of four-cycles as anyone knows who has ever ridden one down a really steep hill.

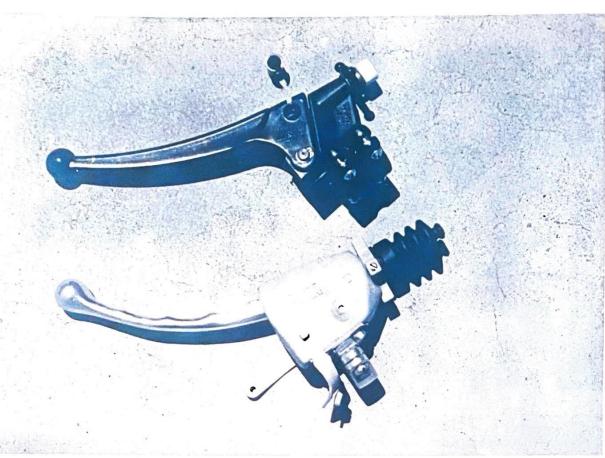
But there is a cure for this that gives *controlled* engine braking with at least the retarding power of a fourcycle, and also retains the very moderate

drag of the two-cycle when not activated. You can have your cake and eat it, too, in this instance! This winsome little device is called a "compression release" and for my money every two-cycle, whether ridden on the trail or on the street, should be equipped with one.

The compression release is just what the name implies. It allows the compressed air to escape from the cylinder on the upstroke of the piston and it may or may not allow air to be sucked back through the release on the downstroke.

There are three variations on the basic compression-release theme. Two of them differ slightly in detail; the third operates on a somewhat different principle.

The first release, developed by Trials rider Dick Bygness, was simply a threaded valve that screwed into the cylinder head.



Accessory lever comparison: Magura lever has boots to reduce entry of dust into lubricated wearing surfaces; Uni lever is Lexan plastic and requires no lubrication. However, boots would still be a good idea to keep dust out of the cable itself. Uni lever is sold on a minimum charge replacement guarantee: break one and you merely return it with a dollar or so to the maker and a new one comes back to you in the mail. A good idea!

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The valve was cable-actuated from a lever on the left handlebar. Learning to operate the release was no sweat and the difference in handling in hilly country was simply fantastic, especially for those of us who do not have professional-type riding ability.

The releases sold like hot cakes right from the onset and then Dick found out about patents and things the business world holds in high regard.

But it soon became apparent that the compression release as originally executed had some disadvantages. The foremost was that on the inhale-cycle the release was open to the atmosphere and could suck in dirt—which the front tire tended to throw up in copious supply.

Mulling this over, Dick came up with his first variation on the basic release, the Maniflow Release. Instead of exhausting and inhaling into the atmosphere at the top of the cylinder head, this release was piped to the exhaust system — which was essentially free of flying detritus. It had the added benefit of being much more quiet than the conventional release which under some conditions was almost painfully noisy.

The only problem was the installation. To put a Maniflow Release on a bike required silversoldering a fitting to the exhaust pipe or muffler — and the number of bike shops equipped for such a basic technique as silver soldering is scant indeed. Also, some bikes required quite a bit of manicuring with a deftly wielded cold chisel to pare out the fins to the point where the connecting tube would fit.

A wiser Dick Bygness patented this release.

With two releases under his belt, Dick put in some
more thought and came up with still a
third version: the one-way or check valve
release. This is exactly what the name
implies — a release incorporating a check
valve to prevent air being drawn into the
cylinder on the downstroke of the piston.
The basic

idea was to eliminate the scouring action of aspirated dirt, but to Dick's delight, the one-way release afforded much better braking than the in and out type.

The reason is that on the downstroke the piston develops a considerable vacuum which, with conventional releases, is relieved to a degree by air flowing back through the valve into the cylinder. The one-way release maintains a vacuum on top of the piston until the piston uncovers the exhaust port, when the suction is lost by air entering the cylinder from the exhaust system.

In addition to the improved braking action afforded

by the one-way release over the conventional release, at higher speeds there is another — and not always beneficial — differ-

ence between the two types.

With a conventional release, all braking is lost at very low speeds. Moreover, the engine turns freer than it would without the release action. In practice, this means that pulling the release and kicking the engine through is a handy way to clear a flooded engine. Bump starting is greatly facilitated—all you do is pull on the release lever, put the bike in the appropriate gear, and push. Let go the release handle when the engine is turning over smartly—it's already primed!

But more important, when the engine is stalled coming down a steep hillside, using the release will allow it to turn over and restart. And the release will not stall the engine.

These things are lacking

on the check-valve release. It's always a brake, at any speed, and can stop the engine dead. And when the engine is killed the rider is in exactly the same straits he would be in if he had no release at all; he has to manipulate — juggle would be a better word — the clutch and gear shift to get the engine turning over, then shift down again to get meaningful braking action. In practice, the rear wheel tends to slide down the hill at some point in the festivities and the rider is suddenly afflicted with dire difficulties.

All things considered, I'd take the Maniflow-type release before the others for ordinary riding and the check-valve release for riding events in which speed is the determining factor.

We have nothing but conventional releases installed on our bikes right now but by way of mitigating circumstances, I plead that in our riding we only use the release for starting engines, etc., and it is seldom employed in going downhill except where the engine is stalled.

I enthusiastically endorse compression releases for all two-cycle bikes and if they can be fitted mechanically, I also recommend them for four-cycle machines.

I know. Four-cycles don't need 'em because they have considerable inherent braking power as is.

It's not for braking power that I'm recommending them. For starting purposes they work exactly the same on four-strokes as they do on two-strokes at low speeds, and are a starting aid par excellence. And four-cycles are even more prone to engine stalling on steep hills than two-cycles — and harder to restart. Four-cycle bikes tend to be generally heavier, displacement for displacement — they don't have to be but generally are — so handling a bike in this situation can be most demanding on the rider's skill, courage and luck.

One final remark: It cannot be stressed too strongly that you should not, if humanly avoidable, engage in promiscuous and extensive trailside repairs.

A modern bike will almost always limp home under its own power. If it will do so at all, trailside repairs are unnecessary.

Too many things can go wrong when

overhauling a machine out in the boonies and no problem is minor. A dropped needle clip that lands in forest duff, a point-retaining screw that disappears, the fuel line that won't go back where it belongs — all minor problems in your garage on a Wednesday evening. On Saturday afternoon 14 miles beyond the roadhead, they're serious!

Some repairs are absolutely necessary and some adjustments are simple enough so that almost nothing can go wrong. Chains, for example, may be adjusted with confidence — there is little to go amiss. And changing a sparkplug must be done just exactly where the plug decides to give up the ghost. But it must be understood that any repair job can go sour.

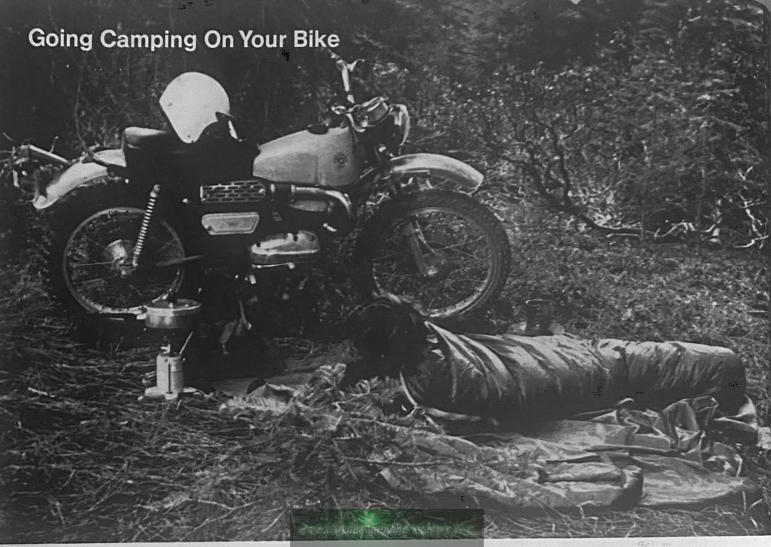
Take the time I worked my way up to the 6,000-foot level in the Sierras. The bike was jetted and adjusted for sea level and as I gained altitude the bike kept running worse and worse. It finally began to four-cycle (fire every other time around instead of each revolution), so I stopped to drop the needle in the carburetor.

The carburetor was a Mikuni with the needle held in place by a tiny "C" clip and disassembling it to the point where I could reach the needle took only a couple of minutes.

The weather had been getting colder by the minute as I gained altitude and when I pried the "C" clip off the needle with the point of my knife, my stiff fingers were unable to cope with the tiny part. It leaped into the forest duff. I saw it fall, but I simply couldn't locate it, try as I might. I looked for the retaining clip for 15 or 20 minutes before giving up and anchoring the needle with a piece of copper wire twisted in the proper groove with Vise-grips.

The wire worked as well as the original part and I was only slightly discomfited by losing the clip, but every time I consider making a trailside repair I think of this and try to nurse the bike back to camp where at least I will not be required to make a long push if things don't go right.

I've followed this policy religiously over the intervening years and although many's the time I've ridden into camp on a bike that sounded like one of Herr Otto's original engines, precious little walking has been required.



Daybreak in the High Sierra near Laporte, California. Note utter and complete absence of tent. Taking a tip from Colin Fletcher, we often cook breakfast while snuggled in the sleeping bag. When it's really cold, the gasoline-burning Primus replaces the temperamental Bleuet . . .

o read

the motorcycle press, one would get the idea that touring and camping by motorcycle requires that the cyclist start with an 800-pound machine (no fooling, some cycles weigh that much loaded with all the bolt-ons!) and enough dunnage in the way of tents, cheap-jack sleeping bags, suitcases, dinner jackets, "portable" gasoline two-burner stoves and cast-iron cookware to outfit the 7th Army Mess.

Nothing could

be farther from the truth!

Touring thus described is confined by all the avoirdupois to freeways and autobahns and autopistas. The rig is so ungainly by the time it's

loaded that the rider wouldn't dream of taking a chance on that fascinating-looking side road that looks as if it might lead somewhere people don't often go.

I don't know why but the people who do most of the touring and camping and — worst of all, writing! — simply ignore the remarkable advances made in outdoor gear during the past decade. They persist in hauling exactly the same stuff that dear old dad sused. The pity of it is that not only is it unnecessary but it also robs the cyclist of so much pleasure in his riding.

It also discourages the dirt rider who would like to tour on his pursang dirt machine — be-

cause he knows damn well there is no use in trying to trail ride with a hunnert an' fifty pounds of junk strapped here and there on the bike!

The backpacker and mountain climber have been using light-weight, durable, practical and efficient gear for years — it's a mystery to me why it has not been automatically adopted by every class and type of motorcyclist, from the guy who uses a minibike to the man who elects to do his thing on a Hog.

cyclist, just as to the climber, backpacker and just plain walker, weight is the implacable enemy of travel enjoyment.

It is very

seldom today that a hiker carries more than 40 pounds, with the average probably around 25 to 30 pounds for a week's jaunt.

Although a cyclist, of necessity, has to haul a few items that are not on the foot-slogger's list, there is no excuse for exceeding this by any great amount. And it is important the cyclist *not* exceed this because adding dead weight to a rough-country bike trip is extremely hard on the machine from a strictly mechanical point of view.

For instance, hauling a 120-pound passenger is nowhere as difficult as hauling the identical weight in equipage. For one thing, the passenger can get off and walk through the really bad stretches as well as be reasonably expected to lend a pair of helping hands in the almostimpassable places. And a passenger, particularly a lady passenger, has considerable built-in absorbency.

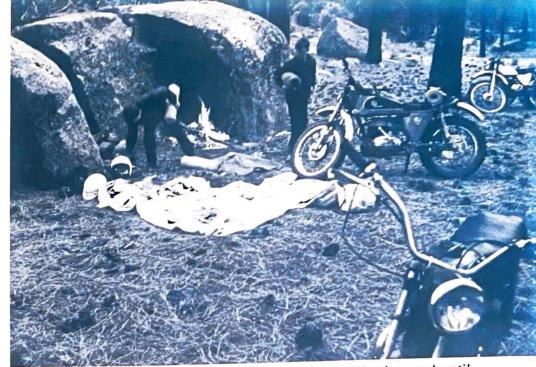
But a dead weight of say, 60 pounds — nothing at all like the huge loads advocated by most writers of touring articles — is going to have to be unloaded and then packed over the tough parts of the trip. Worst of all, inert weight has very little resiliency and imposes an excessively taxing load on the suspension.

Most camping outfits recommended for motorcycles are also very bulky, bad enough for the street rider but an anathema to the dirt rider who can be depended upon to scrape and bang hell out of a bulky load on every handy bank, tree, cactus and/or rock. And a bulky, unwieldy load impairs the handling of any bike out of all proportion to its size.

A number of years ago I spent some time in Guaymas, Sonora and because my wife had always been interested in Mexico, I invited her down to ride back north with me on the BMW R-60.

I neglected to tell her not to prepare as if going on an African safari and like most ladies! — she showed up with our big old Samsonite bag last used for winter gear in Alaska. Packed like a sausage, of course!

Although I'd never hauled a suitcase on a cycle, I'd seen other cyclists packing them, so I never gave a thought to its effect on handling. Anyway, the BMW had a luggage rack obviously intended for transporting anything up to and including



Camp scene in the San Pedro Mártir Mountains. . . Baja ain't all boojums and cacti!

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a steamer trunk.

When we left the old Malina Hotel where we'd been staying, I simply lashed the suitcase to the bike, my helpmate got aboard and away we went.

Now the

handling on the BMW was not much to be proud of at best, but its reaction to the case took me by complete surprise.

To sum up that first try at transporting a suitcase, the whole outfit wound up on its side in front of the *Mercado Super* — to the intense joy of the usual crop of local loafers! No harm done to aught but dignity but from that date forward, I approached the whole subject of baggage with extreme caution . . .

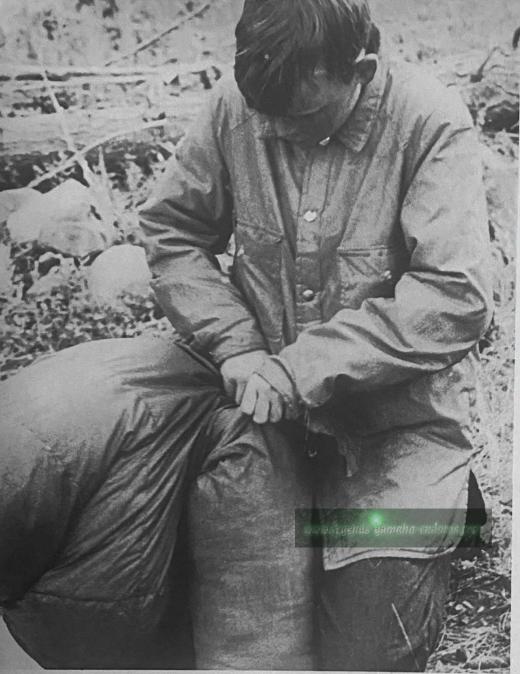
The most important single part of the cyclist's camping equipment is his sleeping gear. It is here that things start getting out of hand because most riders put price ahead of quality, weight and comfort and pick a plastic-stuffed monstrosity a backpacker wouldn't use for bedding down his bull terrier. And a big, heavy, chilly air mattress to go with it.

An upsurge of interest in backpacking and climbing

has only recently generated enough demand for modern go-light equipment to allow making it in sufficient quantity in the U.S. to permit fairly reasonable prices. But although very good light-weight equipment is readily available everywhere today, a good 9 out of 10 cycle campers burden themselves with sleeping gear pretty much like the soogans cowboys hauled in chuck wagons up the Chisholm Trail to Dodge City a century ago. Just about as heavy, too!

Let me tell you about the equipment we've been using for cycle camping in the desert and forest, in the High Sierra, in the Siskiyous, in the Sierra Juarez and the Sierra Madre Occidental. We'll start with the most important part — the bed — for nothing takes the fun out of a trip quicker than sleeping cold, cramped and uncomfortable.

We've been using mountain climber's bags the last few years, Sierra Designs No. 100. This mummy design is nothing at all like the abominations foisted on hap-



More than anything elese, the development of the 'stuff bag' made the lightweight sleeping bags practical.

less grunts by the U.S. Army.

It has a drawstring to pull the hood in close to the face on very chill nights you encounter in the high mountains during spring and fall—and sometimes summer. The bag also has a differential cut, that is, the inner shell is smaller than the outer and the baffling and seams are made so there are no through seams between the inner and outer shells to form a conduit for cold. The massive nylon zipper is covered with a thick down-filled flap.

Insulating material is, of course, goose down, warmest, lightest insulation known to man. Laid out flat on the ground and fluffed up these bags are over six inches thick. Shells are made of rip-stop nylon cloth weighing 1-1/2 ounce to the square yard.

A little known fact: something like 40% of a man's heat loss occurs through his head. Grandpa knew exactly what he was doing when he put on his nightcap during chill New England winters! For this reason the new breed of sleeping-bag designer takes great pains with the hood. Sierra Designs' bags close the hood with a heavy nylon pucker string secured with a plastic "slider" type keeper — a notable improvement over the type using an "O" ring lock. And to frost the cake and make the hood even snugger, there's a Velcro closure backing up the drawstring.

I continually run into people who take the trouble to assure me, "I can't stand mummy bags — the very thought of closing myself up in one like a bug in a cocoon gives me the shudders."

Or, "I get all cramped up because I can't turn over in one of those bloody things."

A little adroit questioning almost always discloses them as the proud owners of big, bulky, heavy, Dacron-filled bags that wouldn't keep a polar bear warm at 45°F.

And they've

never even tried a modern bag, so the moral of the story is, "Don't knock it if you ain't tried it."

Although the shells of the modern bags wear relatively well — especially well when you consider how light they are — the thing that makes them thoroughly practical for the hard-nosed cyclist is the stuff bag. This is a nylon bag made of somewhat heavier waterproof material than the sleeping bag and equipped with a dustflap and a drawstring

closure.

As the name implies, the sleeping bag is stuffed into the stuff bag. The first time I did the deed I was ready to swear I'd been given the wrong stuff bag — that big sleeping bag just couldn't be jammed into that 6 x 18 inch chorizo-shaped sack. So help me, it took me a good hour to get it stuffed the first time around. Now it takes from two to four minutes — depending on how hard I work, if the sleeping bag is damp and where I do the stuffing.

Out in

the desert you have to be very careful about keeping the sleeping bag off the ground where it is liable to collect cactus spines. It takes a lot less time in a nice, clean redwood grove where all you gotta do is get with it. Danny and David Murray, 13 and 15 respectively, take about the same time.

A disconcerting thing about the new-era sleeping bags: after an especially cold night you will wake up with the top outside of the bag either wet or coated with ice. There are two theories for this phenomenon. One is that body moisture works through the inner shell and the down insulation, condensing on the outer shell and working through to the outside by wicking. My own theory is that while this may be true to a degree, the down is such an efficient insulator that much of the moisture is atmospheric condensation — dew — on the cold nylon.

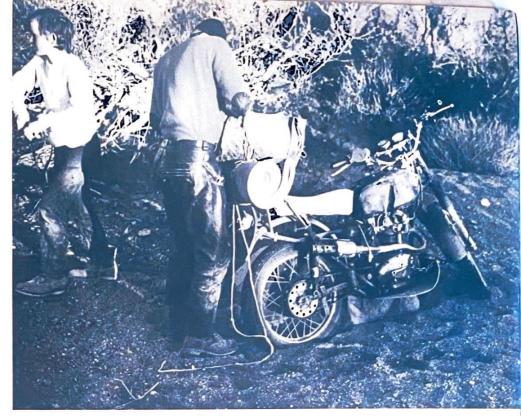
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as it may, the dampness does no harm; you will sleep as warm as ever even if the outside of the bag is running water. And if you give the bag a few minutes to dry in the warm morning sun before stuffing, the dampness makes no difference at all in the scheme of things.

But if you right a away try to stuff that cold — maybe icy — sleeping bag, it is something else again. Pure misery. Next time you'll wait until the sun dries the bag before packing. Unless it's raining or snowing, always put off the stuffing chore until the last thing when breaking camp.

The sleeping bag is only half of the night-time outfit; the mattress is the other half and nearly as important as the bag itself.

For too many years I, along with everybody else, carried an air mattress and a patching kit. Not only was the blowbed just about as cold as bare rock itself



Example of how NOT to load a bike for rough-country riding. Needless to say, he had problems keeping all the dunnage aboard!

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Although not absolutely necessary, most campers prefer to dry the shells of their down-filled sleeping bags before stuffing them into the stuff bag.





Author on a two-weeks trip. Almost the entire outfit is shown here — proving that touring is not the exclusive province of the rider on the full-dress machine!

to sleep on, it also had a distressing tendency to go flat at the oddest hours — like two in the morning. Finding the leak wasn't always so easy, either. And sometimes if the leak was on a seam, it was no cinch to patch.

When my last mattress got to the patches-on-patches point and then came down with a slow leak that absolutely refused to take a patch, I hied myself to the Sierra Designs store for a new one. And they wouldn't hear of it!

Now one of the things about Sierra Designs is that it is the only company in the business I've been able to locate boasting a rider in the organization. Bob Swanson, one of the partners, is a rider himself and a camper from 'way back. He appreciates a rider's problems as they sometimes differ from those of an ordinary camper.

"Look," Bob said, "You know the troubles with air

mattresses. Well, the answer is one of these Ensolite pads that we stock for climbers. It's not very thick — only about 3/8 inch — and about 20 x 40 inches in its other dimensions. It's warm and actually a layer of insulation instead of being a magnet for all the cold in the country — like the old-fashioned air mattress."

"Yeah, and if I spread it out on a dime I'll be able to tell whether it was minted in Denver or Philadelphia by dawn, too. With everything wrong with air mattresses, at least it isn't like sleeping on a sack of snooker balls!"

Bob gave me a disgusted look. "Daggone it, will you listen to me? This thing works! If you will take the trouble to clear your sleeping area of the larger bits of debris, you'll find you don't need a featherbed to get a good night's rest. If I can, though, I always dig little depressions for my shoulders and hips."

Fingering the spongy material, I asked, "How many times its weight in water does it pick up?"

"The stuff's

impervious — closed-cell construction,"
Bob answered. "You can lay on it in a puddle of water and it will still have about the same insulating qualities. It's lighter than an air mattress and doesn't require any special care. Just use it."

"And the weight?" "This size weighs 14 ounces."

Turned out Bob was right in every respect. Plus Ensolite is far cheaper than an air mattress, even without figuring in the price of patching and a pump. It's ready to use immediately after unrolling and ready for rerolling in the morning without a maddening wait for deflation.

That portion of the trail-touring kit carried on the bike or in the Day-tripper.





Home-made tank pack with oil-measuring bottle and two cans of oil. The 16-ounce cans are relatively fragile and have a pronounced tendency to split their seams on rough trips. If I were to have to depend on not losing a drop of oil I would carry it all in plastic bottles like the one shown. This tank pack is more satisfactory than the commercial models I've tried, but even so there is a lot of room for improvement. Because of this I am loathe to give construction details. Also shown in its plastic package is the "Baby" tire pump.

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And I discovered getting a little dog-eared and ragged doesn't stop the Ensolite from doing its job, either.

After writing the above a number of foam mattresses have appeared. Softer, constructed with cunning, softer than Ensolite. But as many's the man has found to his sorrow — they are of opencell construction — just like the DuPont "sponge" housewives use.

Bob did me another favor. He introduced me to the Day-tripper, the only pack I ever saw that I consider suitable for use on two-wheelers.

The Daytripper, under various similar names, is a stock item with most of the quality backpacking outfitters. Unfortunately, it's getting to be a stock item with the schlock artists as well.

I emphatically disapprove of using the popular packframes on bikes. They are designed to carry the load high, and a person using one has balance problems afoot. People who need sure-footedness and good balance such as ski-tourers,

climbers, rock-scramblers and so on use the framed rucksacks as a general rule. And the problem of balance is much more severe on a cycle than on foot.

Another thing about both framed rucksacks and pack frames: Unloading from a bike while wearing one with their many sharp edges is a sure way to injure a man severely. Anyway, they're too big and carry too much for a cyclist.

Back to the Day-tripper: It's a small frameless pack that splits into two compartments, an upper and a lower, with a zipper that goes 3/4 of the way around the bag. This eliminates one of the ancient bugaboos of packsacks: "No matter what I want, it's at the bottom of the blasted sack and I gotta dig everything out to get at it!"

The bottomis armored with leather which also extends an inch or so up the sides. This means sparkplugs, tools, nuts and bolts and other hard-to-pack items won't promptly work themselves



An extremely successful design in its day, this Matador carried the author thousands of miles. By today's standards it is overweight and lacks agility.

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out through the bottom of the pack. It also means the bag can be put down 'most anywhere, even on sharp lava and cactus spines, without concern. There are a number of leather tabs on the outside for tying things on and as delivered, a bellyband is included.

The belly-band is the only part of the Day-tripper I actively dislike — I throw mine away when I get a new bag. That is, my first bag lasted about five years, I'm now on my second and I got rid of both belts. There is a theory that the belts make load carrying easier and keep the bag from shifting around on the back but I can't see this at all and have never had any problems with either carrying or load shifting — whether I'm riding or walking.

A long time ago I slipped and fell in white water while crossing above a falls on the North Slope of Mount Hood. I had the very devil of a time getting away from my packboard. And if I hadn't been able to get rid of the load, the force of the water would have

rolled both the pack and myself over the falls. The waterfall was a little one, about 75 feet or so, and the pool was deep enough so the pack survived pretty well. But I'm not at all sure I would have come out of the situation nearly as well if I'd been swept over the brink. You might put it that I have an ingrained dislike of being trussed up in my equipment like a hen in the Oaxaca Market!

Day-trippers are tough as a Salvadorian tortilla. I wore one bag on two round trips the length of Baja California on motorcycles, and on countless minibike, motorcycle and footslogging trips in the Sierras. And although quite travel-marked, it showed no signs of fatigue and seemed to be about as good as new. I passed it on to my Number 3 son and he used it with satisfaction for a year or so before deciding he would like a different color.

For some reason I don't quite fathom, most people seem high on tents — I'm not. Because I never, never! camp in one of those transistorized rural slums

called "organized campgrounds" I don't feel a pressing need for privacy. During most of my camping season — 12 months a year — there is very little rain in the various regions I frequent. Comes the rare shower, I pitch my waterproof nylon ground cloth as a lean-to.

This works fine for one or two persons. If there are three of us — and I heartily detest parties larger than three — I take my tarp tent, an experimental Sierra Designs number. It measures 11 feet x 11 feet and weighs 31 ounces. Rolls up into a package about the size of one of those pocketable raincoats carried by the Brooks Brothers types in the San Francisco Financial District, and is light-weight, waterproof nylon with loads of grommets around the edge.

tent can be pitched in any number of ways depending on my mood, the weather, terrain and so on, but in my case I almost always put it up as a lean-to if I pitch it at all. The lean-to is the quickest and simplest way to put up the tarp tent so it will



When packing the ground-cloth-wrapped Ensolite pad on the bike I have found it pays to add electrician's tape keepers to the nylon tape to keep the lashings from working. As Ensolite has a "memory" it should not be lashed too tightly or permanent scars will be left — hence the black tape.

After cutting the nylon tape, the ends are fused to prevent ravelling.



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keep the rain off the party, usually the idea of pitching it in the first place.

The experienced back-country prowler doesn't carry his tent for privacy — he carries it for warmth. The chill factor of even a moderately cool night coupled with a hard, keening wind may be too much for any sleeping bag but a 17-pound, canvasshelled relic of the forties. They were called sleeping robes in those days and I still own one but haven't used it for years! For anything!

Several times during the past few years one of those hard winds has found me — all in Baja California as luck would have it. Twice I was alone and simply folded the ground cloth over the top of the bag, something like a sandwich made of one slice of bread. Rocks piled on the down-wind edges kept it from flapping its way out of the territory and with the fold breaking the wind, I slept comfortable as a flea in a Corgi's ear.

two boys and I were camped high in the piney woods of the Sierra Juarez Mountains near Laguna Hanson. When we turned in, it was far below freezing and the night was crystal-clear. During the wee hours the wind began to blow with force and I feared a tree might come crashing down on top of us. We hurriedly crowded our beds together and covered all three with the tarp tent spread like a blanket, then plenty of rocks were placed around the edges. We slept comfortably the rest of the night, disturbed only by being pelted from time to time with pine

And once

alone the ground cloth that doubles as a tent is a piece of the same waterproof nylon used in the stuff bags. It's about 7 feet square with 8 grommets spaced even-

ly around the edge.

Other than serving as an emergency tent, the ground cloth is a

cones the size of small flower pots.



When camping in areas where there are no trees or poles the trail bike makes an almostgende yamaha enduros corperfect support for one end of the tarp tent.

practical necessity. Or a necessary accessory. Dressing and undressing on the cloth keeps limbs, leaves and such out of the sleeping bags — and britches. In the desert I wouldn't be without a ground cloth because of the cactus spines littering the desert floor, although the nearest prickle: plant is half a mile away!

Even some pine needles can be a hazard. While camped in the Pine Nut Mountains in Nevada recently, I was using my bare hand to clean out the nest for my Ensolite pad and ran a little, inoffensive piñon needle about half an inch into my left index finger.

Guarding against getting spines and needles and thorns in the sleeping bag becomes second-nature after a while, and putting the ground sheet out first is most important! Getting cactus spines in the insulation of a sleeping bag ruins it forevermore because the dratted pricklers will work themselves into your tenders just when you're

sleeping the soundest. No way I know of getting them out of the bag — just get yourself a new one.

Most of the published "authorities" on two-wheel travel recommend the use of "bungee cord" — glorified rubber bands covered with cloth and factory-fitted with metal hooks — to secure things to bikes.

Other "authorities," apparently with economy in mind, go so far as to explain how you can home-grow your own rubber tie-downs from old inner tubes and over-age coat hangers . . .

And these "authorities" err seriously and cause a lot of needless sorrow in the process. The stretchy rubber allows the load to bounce up and down and sooner or later — usually the former — the cargo will work out from under the restrainers and be lost along the trail. Because a trail-riding camper carries just exactly what he requires on the trip and not one item more, losing anything at

all is really serious!

Again it was Bob Swanson who put me right, proving once more it pays to consult an expert who actually does the things he talks about!

At hi

suggestion, I now tie the load on the bike with 9/16-inch nylon tubing. This looks like a sort of heavy tape but close examination shows it to be hollow. It is fantastically tough and strong with a breaking point well over a thousand pounds.

Unlike most nylon cordages, it is rough-textured and holds knots like grim death. In fact, it is one of the easiest materials to tie I know of and once tied, has no tendency whatsoever to keep working itself into a tighter and tighter knot. Water doesn't affect it and it can be untied just as readily wet as dry, unlike "manila" rope that usually requires a sharp knife to get it loose when wet.

Best of all, it's cheap, running about



Preheating a Primus 71 gasoline stove.

Obviously, this can be quite a trick when the wind is blowing. At best, it takes two or three minutes. But the stove always lights regardless of the weather!

Standard stoves for go-light outdoorsmen. Primus 71 is extremely reliable, but a drag to light. Bleuet LPG stove works like a charm — in warm weather. It is convenient and quick to light. Around 40° to 45° F it loses most of its vigor and quits entirely when it's really cold. Other drawback to Bleuet is the use of heavy, indestructible steel cylinders.

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15¢ a yard. It isn't cataloged by Sierra Designs so I just mail them a couple of dollars and they send me a chunk of the stuff sufficient for all the load binders I need for one trip — plus assorted dog leashes, knot-tying practice, truck tiedowns and so on.

If you decide to go this route — and I heartily recommend that you do — use a lighted match and melt a little of the nylon when you cut off a hunk. This keeps the raw ends from fraying. Commercially, it is cut with a hot wire so the problem doesn't arise.

Most modern books on camping, outdoor cooking and allied subjects seem to be written by people who used Horace Kephart's fine old "Camping and Woodcraft" as source material although they are seldom willing to admit it!

The trouble with this bit of poaching is the C&W is over half a century old and several things have changed since he explained the proper way to make camp and lay a cooking fire.

First, in most of the United States there are entirely too many campers for everyone to be running around cutting down little trees to make thatched shelters or lopping the limbs off balsams to make browse beds.

These and

other traditional camp-craft techniques rank with beer-can littering but still come the books and articles recommending it. Worse yet, camp-craft camps last and last. I'm continually coming across old messes that have survived as an eyesore and a blot on the face of creation for over 20 years with their tinder-dry remnants of brush lean-to's and beds, and huge piles of ashes from fires that must have been big enough to take the chill off King Arthur's castle. Even the fancy little potholders and axe-fashioned seats and tables have a survival value about the same as aluminum foil — which lasts forever!

Actually, there aren't too many places left where you can run around building open fires for cooking or anything else with a clear conscience. In most of the U.S. today it is absolutely illegal to kindle any kind of an open fire at certain times of the year. Period. In our National Forests during the fire season, the first sign of smoke will bring you face to face with a stern personage with a Smokey-the-

Bear hat and a dour disposition — in very short order.

When entering a National Forest, keep an eye out for a sign "Campfire Permits Required." These permits are issued gratis by the rangers and sometimes by postmasters at towns within the forest. In many cases they are good for a number of forests, not just the one in which they are issued.

Be sure to carry it on your person at all times when you have a fire going!

Another

thing that's changed drastically since the days when Horace was footin' it up and down the Great Smokey Mountains: by today's lights, open-fire cooking is about as inefficient and exasperating a cooking system as you can use. As Bill Lloyd, the best free-style, catch-as-catch-can outdoor cook I know, said one day while nursing a draftwood fire on the Playa de Coyote about 12 miles south of Mulegé, BCS, Mexico: "Having to cook on a lousy fire like this is awful retribution for having been careless enough to run out of coal oil."

Bear in mind that this was a picture-book fire he was talking about — small, properly nestled between rocks, a sort of iron grill to support the big old cast-iron skillet, almost no wind, and fuel that burned fairly clean and almost smokeless.

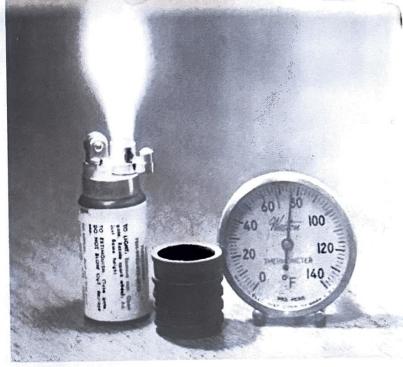
But Bill was constantly having to diddle with it, to add just the right piece of draftwood, to move the pan of shrimpers and rice back a bit when it flared hot and reverse the action when the fire eased off a bit.

Careful

as he was, he still got his pan all sooty and the black stuff managed to work its way onto his hands. The upshot of it was by the time the grub hit the table he looked mighty like the end man in the minstrel show.

Today the go-light camper — and this most emphatically includes the trail-riding motorcyclist — usually carries one of the dandy little stoves made for the purpose. It's a safe bet it will burn either gasoline or LPG (Liquified-Petroleum Gas). Most books on camping recommend alcohol and such jokes as Sterno and heat tablets but for my money, these latter are suitable for nothing more demanding than maybe heating a cuppa tea. And they're not very good for that!

There are



For strictly emergency use I carry a fire starter. This is a gas lighter somewhat similar to a cigarette lighter, but designed specifically for survival, last-ditch fire lighting. One reason it is so efficient is that it doesn't have to be held to maintain its flame. And it has a healthy flame!

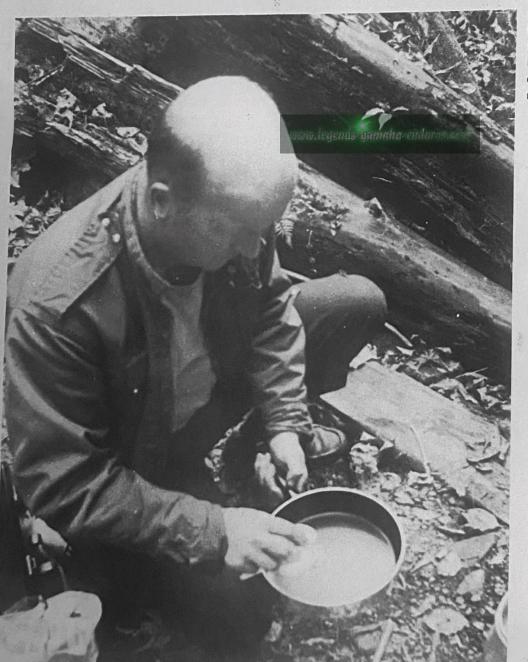
Devices using unregulated LPG for fuel exhibit a marked loss of efficiency with decreasing temperature. Needless to say, I carry my fire starter in my pocket during inclement weather. But there isn't room for the Bleuet and so I switch to gasoline when it's cold.





A skillet-cooked, one-dish meal is nothing to sneer at on a cool morning. Here Danny lifts the lid on a pan of Chinese sausage steamed on top of the rice. At least the equal of the conventional — and unimaginative — cook's hot cakes, bacon and eggs.

And no matter what's cooked in it, Teflonlined pan wipes clean. Of recent years durability is improving, and in normal household use a Teflon-II lining may be expected to last a year or so. For trail riders they will last for years. Or should.



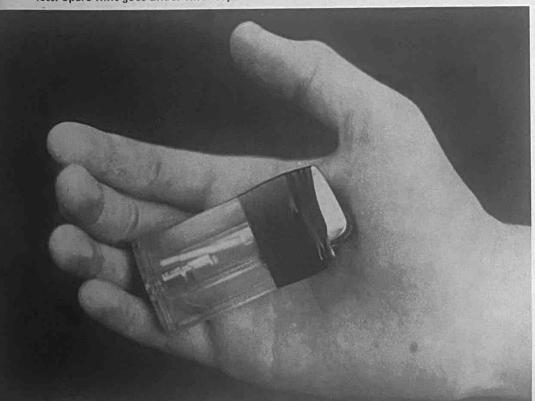
Use the bike as a fire starter — carefully! Sometime you may need to start a fire to keep from freezing or getting awfully uncomfortable. Greg Ekins claims that all you have to do if your bike has gas and spark is to unscrew the plug and dampen a rag, Kleenex or leaves with a tiny bit of gasoline. Hold the plug against the frame and kick the engine over. The spark will ignite the gasoline vapors and you can build your fire from this start. Just be sure you don't set your bike on fire, too!



The local supermarket (if it is a GOOD supermarket) makes a pretty good expedition outfitter. In 10 minutes at the CO-OP on Shattuck in Berkeley, Calif. I picked up this assortment which includes Shrimp Bisque, Ramen, Fruit Soup, Kleenex in handy packages, tough plastic bags — all extremely practical and costing but a fraction of the price of the special-purpose, go-light foods peddled by sporting goods and camp & trail suppliers.

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Campers traditionally carry matches and many's the ingenious method used to render them waterproof. I rely on a couple of gas lighters. The LPG kind you've noted on a previous page. This one is a Scripto I carry with the valve taped so it won't bleed itself off in my pocket. Taped this way it holds its charge over a year with no appreciable loss. Spare flint goes under filler cap.



several light-weight, climber's gasoline stoves on the market. Most are made in Sweden and generally operate in much the same manner. To light 'em one "cracks" the filler to admit air, closes the filler and cups the tank in his hands to warm the fuel. The warmed fuel expands, the valve is opened to let a little gas flow out the orifice and down into the priming cup. The valve is closed and the priming fuel ignited. When the primer is about gone, the valve is opened and — with luck — the stove takes off with a roar. If the priming fuel goes out, as is usually the case, ignite the vapor with a match.

After many bitter, hand-chilling experiences I quit monkeying with the book method of preheating and now I tip a little fuel onto a spill of Kleenex, shove it under the tank and touch it off. It is surprising how much better a little, tiny flame will do at prewarming the tank than human hands.

stunt is to use the warmth of the engine for pre-warming the tank. Immediately on stopping I put the stove on top of the transmission case and proceed to go about my occasions. Again, it takes very little time to warm the tank.

Regardless of the method used for starting the gasoline stove and no matter the time of day or the ambient temperature, it's a bit of a hassle.

With a liquid-fuel stove the most practical way to carry fuel is in an aluminum bottle intended for the purpose. Be sure to try it at home. I bought a little bottle about 10 years ago that, according to the label, was designed for use as a fuel container only to find the gasket under the cover was subject to attack by petroleum products. The gasket melted and the fuel spilled all over everything.

At the time I was very bitter . . . Somewhat more

convenient is the Bleuet stove, the only made-in-France contraption I ever saw that works as advertised. The French are justly famous for several things, but there is nary a mechanical device among them.

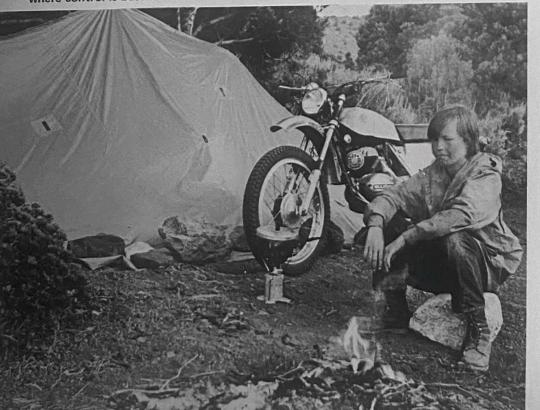
cost isn't too high — the stove with a gas cartridge sells for around \$9 and spare cartridges (11 ounces) cost around six-bits each. They are so popular nowadays that just about every sporting-goods store worthy of the name and offering anything



Danny MacMurray, being somewhat smaller than the author, prefers a 500cc water bottle. Shown filling it at a spring in the Pine Nut Mountains. Filling a narrow-mouth canteen under these circumstances is a slow, hand-chilling process. A few drops of Clorox or Purex sterilizes the water, but gives it a nasty, medicinal taste just like the tap water at home . . .

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A camp in the Pine Nut Mountains in Nevada. Fire is for companionship — cooking is being carried out on the Bluet where control is better.



at all for the backpacker has these stoves and cartridges.

Use is almost embarrassingly simple. Just set the Bleuet on its base, open the gas valve like on mama's stove at home, and touch 'er off. Fuel consumption will vary widely, depending on the individual using the stove, but I guesstimate half a cartridge per day on ordinary trips and about 3/4 when it's fairly chilly—this for a two-man party. But I always wind up with extra fuel, so perhaps this is on the conservative side.

When it's really cold, freezing or below, revert to the gaso-line stove because the rub with the Bleuet is as liquid gas gets colder, pressure decreases, Because these stoves have no regulators, cold weather = smaller fire, just the opposite of what's required!

time it happened to me I unthinkingly assumed the cartridge was about empty and put on a fresh one. It didn't work, either, and than I realized what had happened. I got a little gas from the bike's tank and preheated the stove just as I would have done for the old gasoline model I'd so recently abandoned (and promptly resurrected).

A seldom-mentioned disadvantage of the Bleuet and similar stoves is the empty-cartridge problem. The cartridges are made of extremely strong steel that cannot practically be crushed and the empties weigh almost as much as the full ones. I haven't found an entirely satisfactory method of disposing of the empty cartridges, so I find myself bringing out the same number I haul in.

Throwing them away is definitely *not* the answer. I've found coffee cans over 40 years old laying in the desert, still wearing their original paint. Using that as an indication, a discarded LP cartridge would be as enduring as the Sphinx.

If there is a solution to the problem I wish the makers would get around to discovering it 'ere the Sierras are paved with little dead blue soldiers!

misunderstand me — if it is legal to build a fire and I'm not taking anything away from anyone else by so doing, I usually have an evening companionship fire. I don't think there is anything on earth more enjoyable than just loafing around the campfire on a chilly desert evening, listening to the pop-

ping of the burning mesquite and savoring the acrid smell of smoldering meadow muffins. Or stoking a fire in a damp forest, watching the sparks vanish up into the canopied trees and yarnin' until sack time...

Until quite recently there was no one good answer to the problem of cooking utensils for go-light campers. There was light-weight, usually flimsy, stuff but cleaning it was a devil of a job. It commonly took more water to wash up than for the rest of the meal combined.

Several years ago Teflon lining looked like the answer and I bit on one of the very first Teflonlined pans to hit the market. If you recall anything about the early Teflon-ware, you know the experiment was emphatically not a success and was an example of how manufacturers use the paying public as a proving ground. The Teflon came off in patches and in two weeks of use the dratted things looked like a poodle with the mange. While it worked, it worked very well indeed, but it was just another instance of theory being somewhat ahead of practice - in this case by about six years!

A couple of years ago I stumbled onto Teflon-II. It is a fantastic improvement over the original and has been subject to steady improvement since.

When I'm

alone I use a Teflon-lined skillet as my sole utensil — it works better than a pot for boiled dishes because its flat bottom soaks up btu's like a sponge. Washing up is simplicity in itself.

When comes clean-up time, it is only a jiffy's work to scour the inside with a paper napkin or a handful of leaves. A time or two I've been absentminded — all right, careless! — and cooked the rice too long...the bottom layer came out like the sole of a Curran-Green boot. But it came out all in one piece with no prying, chipping, boiling out and/or profanity.

By the very nature of cycle camping, one seldom stays out more than two or three days at a time — after all, when we go out by motorcycle we spend most of our time *there* and not getting there.

Because

we don't have to get down to the really fine points of having to make a pound of grub take us as far as possible, we're able to avoid the special light-weight foods



Passing the time of day on a Baja road. Included mostly to show the long-haul outfit. When this picture was made it had over 1500 miles behind it on this trip.

prepared specifically for the climbing and backpacking set, thereby saving ourselves lots of money — these highly specialized products cost the world when figured on a cost-of-food-per-day-per-person basis.

Throughout this book I've emphasized the necessity of trying things at home rather than waiting until you're way out in the middle of nowhere, but there is no area in which the early-trial is more important than in the commissary department. It is only in this way you can protect yourself from some of the awful junk being peddled as prepared food today. It is one thing to be able to chuck the mess into a handy garbage disposal and quite another to discover the concoction would gag a maggot when to throw it away means a day of fasting! And these remarks apply to some of the highly-expensive "campers foods" as well as standard supermarket provender.

We concentrate

on standard supermarket items such as macaroni and cheese, beef stroganoff and the like. As the flavors tend to favor the blah! side, we spice 'em up with spices carried in plastic pill bottles or 35 mm film cannisters.

It's surprising just how few spices it takes, too, to vary the awful monotony of U.S. commercially prepared

grub. I carry home-made chili powder that is completely and totally unlike the pretty red stuff you find on the spice-department shelves, and strong enough to blow the door on a Mosler safe plumb off its hinges unless handled with care and respect. Oregano, dehydrated garlic, coarse-ground black pepper and salt complete the list. The salt is from force of habit because nearly all ready-made foods contain an excess of salt, cheaper than the expensive spices.

Although we deliberately rely on the so-called convenience foods, we do quite a good deal of old-fashioned cooking, too, specializing in that culinary lost art, the one-dish meal.

Now don't think of one-dish meals as being strictly bleah!

— some of the very best are one-dishers.
Or one-pot, anyway. Ragouts. New England Boiled Dinner. Chili con carni y frijoles. Frittata. Omelettes. Bacon and bannock. One of the finest backwoods meals is Irish Turkey (corned beef and cabbage) because the fine odor won't bring the neighbors down on you! There are lots more one-dish meals that are very tasty.

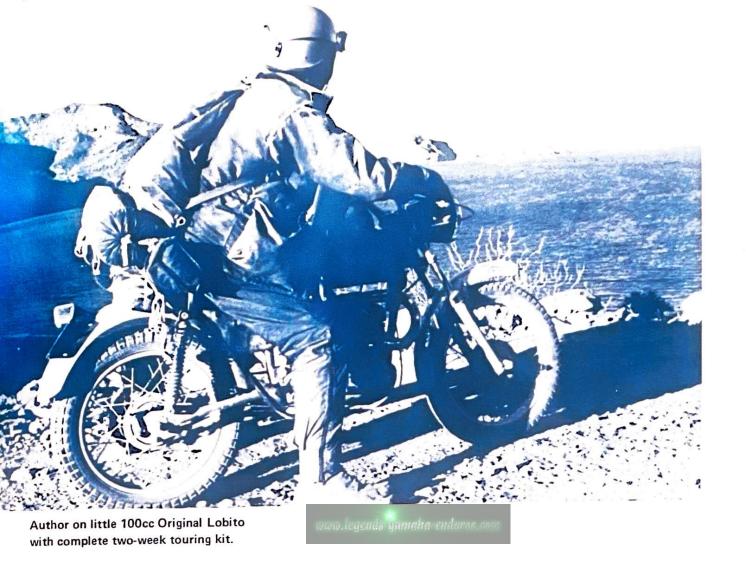
I've tried a number of schemes to carry water and have come to consider the wide-mouth plastic bottle sold in most



Doug Richmond giving his Alpina a rock test in the High Sierras.



David (left on Honda SL-70) and Danny Murray (right on Hodaka 100B) plugging along a Baja road.



outfitting stores to be the most practical. This is the same as the oil bottle, except I use the liter size rather than the 500 cc used for measuring (and transporting) oil. It has lots and lots of things going for it, more than any other water container I know of. It doesn't dent. It's easy to fill from a shallow stream or pond. It's easy to drink out of. It's very compact for its content. It is absolutely unbreakable. It is cheap, so cheap that if you find it necessary to use one to transfer fuel from one machine to another - ruining the bottle for future use as a container for potables - it won't take too much food out of the children's mouths.

A very popular

water bottle with cyclists is the Spanish bota, the leather bottle shaped more or less like a leg of mutton you see romantic types using in various national ads these days. I've used botas and I'll admit they're a lot of fun to use, particularly when loaded with the vino they were designed for. But they are hard to fill, they are only practical to carry when slung by their strap over a shoulder, and good ones are expensive. They are strictly a single-purpose water and wine transporter and not too convenient for the purpose.

Canteens and the like are subject to dents and dings, and mostly are suitable only for water.
They tend to be noisy when empty and a

motorcyclist has enough janglings and rattlings without going out of his way to acquire more. They are also hard to fill except from a tap.

Nope, I've tried them all at one time or another and I keep coming back to my German 1000 cc bottles.

Any camper is continually finding it necessary to tie things to something. Your local hardware — if it hasn't regressed completely to housewares — can supply a heavy nylon cord ever so much better than the braided nylon material peddled by campers' supply outfits. It's called "masons's cord" and is about 1/16 inch in diameter. It comes on a 500-foot spool.



Above: Complete trail-riding kit for a one-week back-country jaunt.

At right (next page): Riding kit that goes on the rider.

Mason's cord is so cheap and easy to transport that you don't feel constrained to stint on using it. I've used it for some years now for putting up my tarp tent and although I've been in storms that took the tops out of trees, I have yet to suffer a blow-down. It has sewn up many a rent in my clothes that was too much for comfort and/or modesty. In a pinch it will serve as a fair shoelace although it won't stand chafing well enough to be more than a temporary field expedient.

Clothing doesn't present the problem to the cycle camper that it does to the hiker — the cyclist simply wears what he usually wears for riding. But

there are a couple of items that can be worth their weight in gold at times.

One of

them is a down jacket. It goes in a stuff bag just like the sleeping bag. Nothing can be handier when the weather suddenly turns cold or you have a breakdown far from camp and have to siwash it. The better ones have an attachable hood. Mine is a Sierra Designs' number, several years old, that — on one occasion — probably saved my life.

The second valuable item is a plastic rain suit. I have a light-weight one I got from Kelly's in Oakland. It weighs 1-1/4 pounds and comes in a durable plastic container. The importer is

Dorfman-Pacific Company of Oakland, California.

These two items are the best and most practical insurance against hypothermia and are so light and compact that there is no excuse for not taking them along on an extended trip.

Of all the ways
I've travelled in the back country — using
everything from burros to helichoppers
for transport — getting around on a bike is
the most practical.

And far and away the most fun!

Doug Richmond



An actual inventory of the equipment used for an extended trail ride of two weeks — On person:

Buco helmet, GT model
"Hickory" shirt
Mountain parka, Sierra Designs
Fish-net underwear
Frisko Jeans

I IISKO Jean

Shorts

"Long-John" bottom, cotton thermal weave

Sox that fit (not fits-all or stretch)
Russell Bird Shooters, double-vamp with
Vibram Montagna soles

Leica M2R with 35mm 3.5 Summaron (around neck)

Bandana, folded over camera to protect it from sweat and to keep the cocking lever from catching in the fish-net undershirt

In pants pockets:

Billfold Swiss Army Knife Loose change Chapstick

Scripto Butane Lighter taped to prevent inadvertent discharge

In shirt pockets: yamaha enduros.com

Cross pencil
Flair marking pen
T&B EZ-Markers for film identification
Some 3 X 5 inch file cards for notes

In pocket of Mountain Parka:

Passport

Gossen LunaSix light meter
90mm f4 Elmar lens for Leica (in soft leather draw-string pouch)

Proventie shutter release for remote.

Pneumatic shutter release for remote tripping of camera

2 rolls CT-18 Agfachrome 35 mm, 36exposure film

In Day-tripper:

Sierra Designs' Model 100 sleeping bag (lashed to bottom)

6 rolls Agfachrome CT-18-35mm, 36exposure film

2 rolls Ilford Pan F, 35mm, 36-exposure

2 rolls Ilford HP-4, 35mm, 36-exposure film

2 sparkplugs, taped and protected by Caplugs

Chain breaker
Turtle-neck sweater, Ban-lon
4 pair sox
3 extra pairs of shorts, not "Jockey"
type
Turtle-neck sweater, light-weight Ban-lon
Knit cap, wool (actually made for use
under construction man's hard hat)
5 plastic bags, one gallon size intended for

Heavy-duty (toenail) nail clippers

Mallory flashlight

freezer use — not "Baggies"

Extra pair of double jersey chore gloves.

New, but washed to remove sizing.

3 rolls of 33+ electrical tape

4 packets of Kleenex "10-packs"

Ban anti-stinkum, 1.5 fl. oz. size Fuel measuring stick for proportioning oil High-quality screwdriver Vise-grip pliers, Model 7WR

Emery paper, short length of ribbon, secured by rubber band (120 grit) 10-inch Crescent wrench

Total weight of above items w/Day-tripper: a shade under 11 pounds

Tied on bike:

Ensolite pad rolled in ground cloth

In tank pack: (experimental tank pack —
I have yet to see a commercial model
anywhere near satisfactory)

Measuring bottle, 500 cc, full of VBA Bardahl VBA in 16 oz. cans (not as good as the old 12 oz. cans!) 6 cans

Secured to skid plate with Ty-raps:

Spare tube

Taped with electrician's tape to handlebar: Tire repair outfit

Ty-rapped to handlebar:

Spare chain parts, including block link

Secured to down tubes:

Another sparkplug
Length of copper wire to be used as
"bailin' wire."

In cycle tool box:

The "comes-with" tools

As this was for a trip into Baja California where almost all ranch ladies serve meals to wayfarers, no food was taken. Water ditto, for they sell beer where they serve food.



One of the greatest aids to back-country prowling is the trail bike. Here the boys have ridden easily back to this long-abandoned mining camp in the Pine Nut Mountains over a road that destroys Jeeps, Broncos and Scouts.

The Bikes We Used



One of the nicer ways of wiling away a spring afternoon is to go cowtrailing with a few carefully selected friends.

hree brands of motorcycles were used for the majority of the illustrations in this book. They were by no means selected at random, but rather because each illustrates a specific type of dirt bike.

The Bultaco because the various models are representative of the special-purpose, expensive, state-of-the-art dirt bike. And because I have been riding them for some years now and know them well.

The Hodaka because it is one of the most highly developed and best engineered 100cc off-road machines and because it is intended as a basic machine and so designed that with simple modifications it can be turned into any one of a number of special-purpose machines, from a trials iron to a —so help me!—teacup racer.

And the Honda SL-70 mini-cycle because it is Honda's

best effort to date in the off-road line, it is technically a trail bike within the scope of this book, and because it is the ideal beginner's machine for the smaller rider. This was written after the unveiling of the XL-250, but no 250cc dirt machine that tips the beam at 265 lbs. without lighting equipment shows me much.

The bikes were used for more than photographic props. As we felt that including them in the book could be construed as an endorsement, the bikes were selected from stock and ridden just as any dirt rider would ride them. And to top it off, they were ridden from Bahiá San Quintín to San Ignacio and return, around 900 miles of reasonably fast riding over roads that have digested more bikes than you can shake a stick at. No mechanical problems and the bikes ran as well after the trip as they did before.



Stealing a little gas for cleaning purposes. Bandana on head is to ward off flies.

BULTACO - Several types

Photographs used in this book were taken over a period of several years, many of them on extensive back-country trips. Because of this no less than *five* Bultacos appear in the illustrations: an Original Lobito 100cc, a 250 Matador, a 125cc Lobito that replaced the Original Lobito, a Mark IV 125cc Lobito that is very, very rapid but barely gets under the wire as a trail bike, and the unique, trials-derived Alpina.

With

the exception of the Alpina, each of the Bultacos was ridden at least 2000 miles off-road. In all that time I never had mechanical problems more serious than flat tires and broken chains. The only exception was the time I dropped one of the Lobitos in a creek, allowing the engine to inhale water and thus create internal damage which wasn't the bike's fault!

several of the bikes a bit while riding them into some peculiar places, but they always brought me back — I never had to walk out!

HONDA SL-70 MINI-CYCLE

The SL-70, unlike all too many mini-cycles being foisted off on the eager-but-unknowledgeable public to-day, is not afflicted with creeping cheapness. It is well and sturdily built with dirt-handling characteristics superior to most of the full-size machines sold these days.

As a case in point, let's take a look at the suspension. The forks are to all appearances, miniature versions of the Betors used on the Bultacos. They have over four inches of travel and are damped. Compare it to the Yamaha Mini-Enduro with no damping whatsoever and a single suspension spring, for example.

The rear-suspension units are not adjustable but are fitted with progressively wound springs so cunningly chosen that they will carry a 180-pounder without complaint. But they are at their best supporting a rider in the 125-lb class.

The engine

is standard four-cycle Honda, unit-constructed with a four-speed gear box. Not highly tuned, it has an extremely wide torque band and hauls hills like a Shay locomotive.

Tires are 2.50 X 16 in front and 2.75 X 14 in the rear. Someone at Honda had the good sense to fit the SL-70 with universal-type tires rather than the knobbies with which nearly all factories see fit to inflict on the customers these days.

The air filter departs from the usual Honda paper unit. It is the oiled-foam type. Its advantage lies in the fact that it



Hodaka's 125 cc Wombat came onto the trail-bike scene just as we were putting this book on the presses. At 225 pounds it is about 20 pounds heavier than our 100 B+. Has a 21-inch front wheel and a 3-1/2-inch longer (52-1/2-inch) wheelbase. Rear swing arm is 1-1/4-inch longer and the saddle is lower so that even shorties can reach the ground easily. Angled foot pegs are serrated so you can still hang on when you are up to here in mud.

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can be washed in gasoline or Stoddard Solvent, re-oiled and reused. This is an important consideration in off-road riding.

The wheelbase is 44-1/2 inches, shorter than full-scale motorcycles could live with, but—although the handling is 'quick'—it is by no means objectionably so.

It is interesting to note that David Sean Murray on the SL-70 had absolutely no difficulty in keeping up with the larger bikes in Baja California. Admittedly we make it a practice to hold ourselves to around 30 mph, but while 30 doesn't sound fast, it is nevertheless faster than most people ride Baja.

For those of you who are conversant with Baja, one day we rode 170 miles, from Rancho San Luís to Rancho Mesquital, in seven hours riding time, including gas and lunch stop!

Our only mechanical problem with the SL-70 was the loss of the fork-pivot-bolt nut—the only fastening on the bike we'd neglected to retorque before starting the trip (blush). A couple of nails and a hank of bailing wire and a few minutes work make a repair that brought the bike back over 600 miles of Baja with no strain.

Shortly after returning from Mexico we were riding in a local cycle park and David was center-punched by a rider on a heavyweight machine. The fork stop was knocked off, the tank dented on both sides, the lights destroyed, the frame bent, the swing arm sprung and the front fender accordion-pleated. But the bike was ridden over a mile across hilly country to the truck.

I don't know of a better testimony to durability and reliability than that! We fixed it and it is back on the trail.

HODAKA"B"

A good share of the popularity of off-road riding can be traced directly to the introduction of the Hodaka Ace 90 in the mid-sixties. Before this there had been bikes touted as off-road machines, but they tended to be heavy and clumsy and awkward and about as reliable overall as a political promise.

I liked the first Hodaka I rode back around 1966 . . . liked it immensely! But, it was so light and agile that I didn't believe it would stand up to my kind of off-highway, long-distance riding. Not too long after that, big Frank Wheeler and his partner, Marv Foster, rode a pair of Hodakas from Tijuana to La Paz and proved just how wrong I could be. And to frost the cake, Wheeler turned around and rode another Hodaka over the Alcan Highway to Alaska. That first Ace 90 looked muchly like the Hodakas sold

today, but the manfuacturers have gone the VW route with continuous running changes that have kept their machines technically in the forefront among lightweight cycles. And their old machines can be upgraded by simply installing later parts -everything fits!

Take the matter of wheelbase. Along about 1967 it became very apparent that the axles were too close together, and that the best way to correct the quick-handling problem this caused was to lengthen the swing arm. On their production machines the wheelbase was upped without fanfare, but instead of selling their customers new-and expensive -swing arms to update their older bikes Hodaka offered them do-it-yourself drawings that with a few minutes welding and some scrap iron off the shop floor gave the same result. And without even removing the swing arm from the frame.

The Hodaka is a mechanic's dream. It is the simplest and easiest motorcycle engine and transmission to repair. Parts are cheap and because of the one-model-one-color policy, Hodaka dealers tend to be able to fill most parts orders on the spot. And a piston assembly for a Hodaka goes out the door of the Friendly Local Dealer for about 1/5 the price a slug for a Bul or a Husky would cost.

One of the real beauties of the 'daka is the transmission-the Hodaka transmission is the most reliable and has the fewest extra neutrals of any cycle I have ever ridden.

Perhaps I should point out here that there are really two versions of the ubiquitous Hodaka. We used the 100-B, the basic, no-frills trail bike, but there is also a factory-breathed-on variant called the Super Rat intended for flat-out desert racing. It goes very briskly indeed, but is not really a trail bike within the context of this book.

It is interesting to note that although the Hodaka is the oldest trail bike on the market by a long shot, it is more than competitive in every department with the newer and betteradvertised machines.

An old saw has it that 'the proof of the pudding is in the eating' and in the case of the Hodaka its best recommendation is that wherever there are trail riders, some of them will be doing their riding on Hodakas.



The author solves a problem - A perennial nuisance afflicting backpackers, balloonists, spelunkers, back-country trail riders and other "doers" is the guy who begs to be included in the activity - participates religiously in the planning and preparatory stages - and at the very last possible minute backs out with a lame excuse. You know what I mean. Like, "My boss won't let me take off work." Or, "My wife's mother is visiting from Snuff Dip, Arkensaw and I gotta stay home." That sorta thing!

Unfortunately

this quitting at the last minute can at times cause extreme inconvenience to the host

a few sad experiences of this kind I evolved the "minimum inconvenience" invitation. It is wonderful from the recipient's viewpoint because it allows him to dream to his heart's content without having to bestir himself to think up a specious excuse.

And best of all, from the standpoint of those who actually make the trip, the last-minute backer-outer causes no inconvenience whatsoever!

> ILLUSTRATED ARTICLES-BOOKS

DOUG RICHMOND

You are cordially invited to accompany us on our

ANNUAL THANKSGIVING RIDE

This year the trip will -- hopefully -- take us from Cananea, Sonora south through Arizpe and thence along the Sierra Madre Occidental to the historic town of Alamos which lies east of Navajoa.

Actually, the trip as proposed may not be physically possible. We have been unable to find any good maps of the area. In fact, the best map so far located is the map intended for aviators and even it is demonstratively in error in numerous places.

Probably there will be roads, but not necessarily road signs.

There will likely be a gas station or two, but most fuel will come from ranchers' barrels. Hotels and motels and conventional restaurants will be the next thing to non-existant. Trailside repairs will be the order of the day, although I would hazard a guess and say that as our trek parallels Ruta 15 it will be possible to truck a disabled machine out to the highway.

Because this trip will be into unknown (to us, anyway) country it should be obvious that all riders be in fairly good physical condition and have had back-country, off-pavement experience. Some desert experience would be of benefit. So many things can turn sour on an expedition of this nature that I recommend no rider, experienced or otherwise, be under 14 years of age and also that all riders be capable of making their own emergency repairs.

The only requisite for making the trip is that the rider be at Cananea at High Noon on November 25 equipped, fettled, and rarin' to go.

There will be later mailings on the subject which will give such details as I have been able to glean about the country, including any information on maps and suggested reading.

No acknowledgement of this invitation is required.

Danny Mac Murray David Sean Murray Doug Richmond

SUPPLIERS

The following is a list of concerns supplying information, services or products that I have found satisfactory and who (mostly) are refered to in the text.

Although

I get no cut on any business generated by these listings it would be a nice gesture to mention this book when writing these concerns as some of them went far, far out of their way to assist in the preparation of the book. And without them it would not have been anywhere as comprehensive an effort!

Monthly Magazines

Cycle World Cycle Guide Dirt Bike Modern Cycle Motorcyclist

There are over 30 bike magazines on the market — most of 'em are not going to survive. The above have been around quite awhile and appear to have the best chances for survival.

Weekly Newspapers

Cycle News Motorcycle Weekly

These publications are aimed at the organized motorcycle sport with emphasis on competition in all it's various guises. Due to their short lead times, ads featuring equipment designed to correct deficiencies in the various cycles tend to appear some months in the weeklies before they show up in the monthlies.

Books

The best book available on go-light techniques is: Colin Fletcher's *The Complete Walker*, Alfred A. Knopf, Inc.

Considering the immense popularity, there is a notable lack of books on dirt riding. And most of 'em are junk and hard to obtain. One however is worthy of recommendation. It is: The Boonie Book by The Dirt Rider, Post Office Box 14422, Albuquerque, New Mexico 87111. Price is \$2.95 postpaid.

Motorcycles used for (most) of the illustrations in this book are products imported by:

American Honda Motor Company Post Office Box 50 Gardena, CA 90247

Bultaco-American Post Office Box 101 Santa Clara, CA 95052

Cemoto East Importing (Bultaco) Post Office Box 1065 Schenectady, NY 12301

PABATCO (HODAKA) Box 3270 Athena, OR 97813

Equipment, other than motorcycles, is available from the following companies:

Loctite, fastenings and many hard-to-get items adaptable to trail riding are available through Caterpillar Tractor Dealers throughout the world. This is the only source I know of that sells only the very best available. Ask for catalog PEP 72201-00

Helmets:

Bell-Toptex Incorporated 2850 East 29th Street Long Beach, CA 90806

Buco

7652 Burnett Avenue Van Nuys, CA 91405

Boots

The W.C. Russell Moccasin Company Berlin, WI 54923

Camping equipment and down-lined garments.

Also a mountain parka that adapts exceedingly well for general riding:

Sierra Designs 4th & Addison Berkeley, CA 94710

Compression releases, plastic fenders, reed valves:

A&A Manufacturing Company 830 Kaynyne Street Redwood City, CA 94063 Catalog \$1.00

Fork & suspension boots, lever covers and a lot of other neat stuff:

The Dirt Rider Post Office Box 14422 Albuquerque, NM 87111 Catalog \$1.00

Tire sealant & low-pressure gages, off-road & camping equipment:

Dick Cepek, Inc. 9201 California Ave. South Gate, CA 90280 Free Catalog

Mechanical accessories, especially a kill button:

Webco Post Office Box 429 Venice, CA 90291 Catalog \$1

Specialized Cyclist's Equipment, including a lightweight practical riding suit. Your Friendly Local Dealer or write:

Top Gear Accessories, Inc. Post Office Box 6790 Baltimore, MD 21204 Catalog \$2

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A trail bike will easily make 25 – 35 MPH in this kind of going while a jeep will be pushed to make 10 – 15.

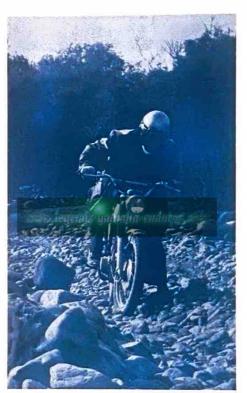


Want parts information?

Enthusiasts often complain about "tight-wad" manufacturers who won't answer requests for information or literature. Advertisements in the bike magazines offer catalogs or instructions typically for 50¢ to \$1. Why should you pay a manufacturer for his catalog so that you can buy something from him? The answer has two parts: (1) you probably won't buy anything, and (2) his outof-pocket costs for sending the catalog (printing, envelope, addressing and stamps) are more than what he charges in every case. He asks that you help to defray literature costs because he has no way of determining whether you are a literature collector, a discount shopper, or a bona fide cash customer.

How about letters with questions? Many questions which are asked obviously indicate that the writer has not done his "homework" by reading workshop manuals, magazine articles, or this book. Some intelligent questions would probably be answered if there was room for an answer on a neatly typed letter sent with a dollar for literature and a self-addressed, stamped envelope for an answer. Indicate on your letter that a handwritten scribble will be fine for an answer - and word one or two questions carefully so that they can be easily answered with a word or two. Some enthusiasts' letters contain such long and involved questions that \$100 in time and research would be required to create an answering letter. Even if the manufacturer has the answer "in his head," a typed letter costs at least \$4 not counting the man's time - whether you buy anything or not. Small wonder that so many letters are thrown out - or that manufacturers react with undisguised disinterest when called upon for information. Selling catalogs and literature is an absolute necessity in the motorcycleaccessory business. If you cannot grasp that fact, then don't be surprised when your requests go unanswered.

Although H.P. Books and the author cannot answer requests for information on trail bikes, your letter pointing out where this book could have been more helpful will always be appreciated and acknowledged... and may help us to make the next edition even more complete and informative.



Author in mid-1960's on Honda CL-160 at the time not too bad a choice for trail riding, although by today's standards the suspension was primitive and much inclined to put the rider on his ass at the slightest error — a very unforgiving piece of machinery!

Acknowledgements

I am deeply indebted to a number of men who helped in many ways as this book went together.

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- To my friend Big Jim who helped with the "how to buy a used bike" section.
- To Carl Shipman (The Dirt Rider) for special technical assistance with manuscript preparation.

All of these friends were enthusiastic and helpful when they learned that a book was actually going to dare to "tell it like it is" about trail bikes and trail riding.

ABOUT THE GRAPHICS

Even if this is your first HP Book and you've just flipped through it several times before settling here, you've probably noticed that it "looks different." All HP Books do look different and for a good reason. We put them together so they're easy to read, so you can get some information from them. We make the pictures big – so you can learn from them. We select a type which is easy to read, run three columns to the page and leave some space between the lines so the lines don't tend to "run together" when your eyes get tired. We do a couple of other things which other publishers are not onto yet either. We don't align the type at the end of each line. It has been proved that this irregularity (in printing, it's called "unjustified") is easier on the eyes and faster to read. You'll also notice that when we start a new paragraph, we start where the last paragraph came to an end.

Like this — which also makes for easier reading. In other words, from start to finish, we put these books together so they can be put to good use — easily!

