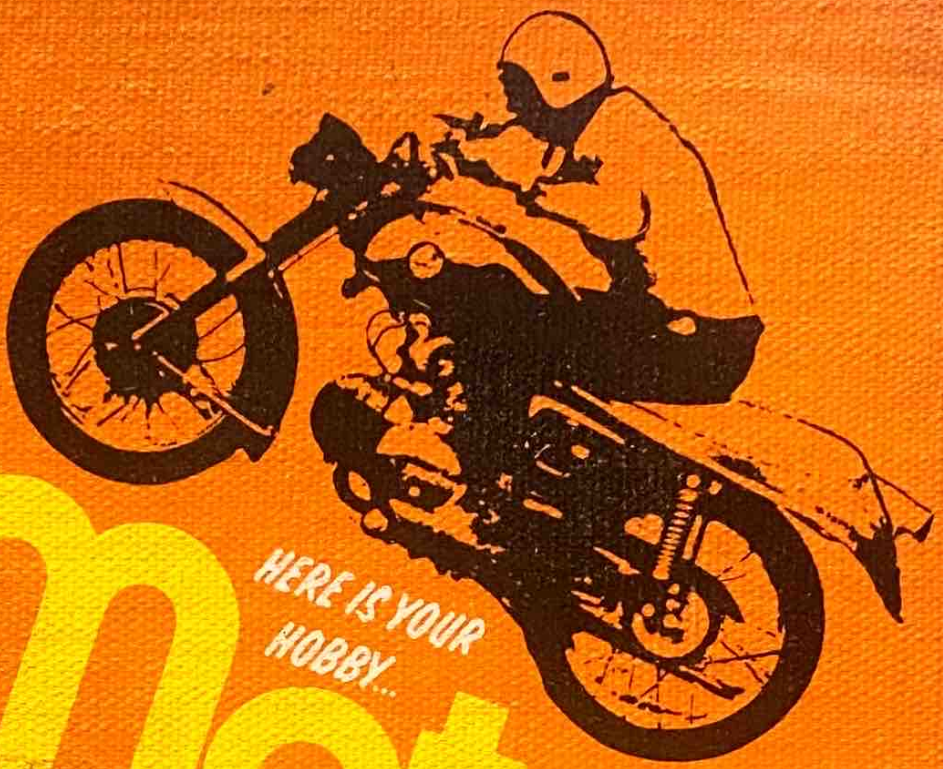

HERE IS YOUR HOBBY...

Motorcycling

by Charles Yerkow

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Here Is Your Hobby

Motorcycling

About the Book

Man-made mechanical beasts seem to be more difficult for man to tame than the beasts of the forests. And the motorcycle is one mechanical marvel that sorely needs to be tamed. Two-wheeled vehicles provide sport, inexpensive transportation, and many opportunities for social outings. But all these benefits come only to the rider who knows and masters his machine, who can ride it in safety and keep it in efficient operating condition.

HERE
IS YOUR
HOBBY...

Motorcycling

by Charles Yerkow

G. P. Putnam's Sons New York

Dedicated to

Manuel "Spags" Gonzales

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Contents

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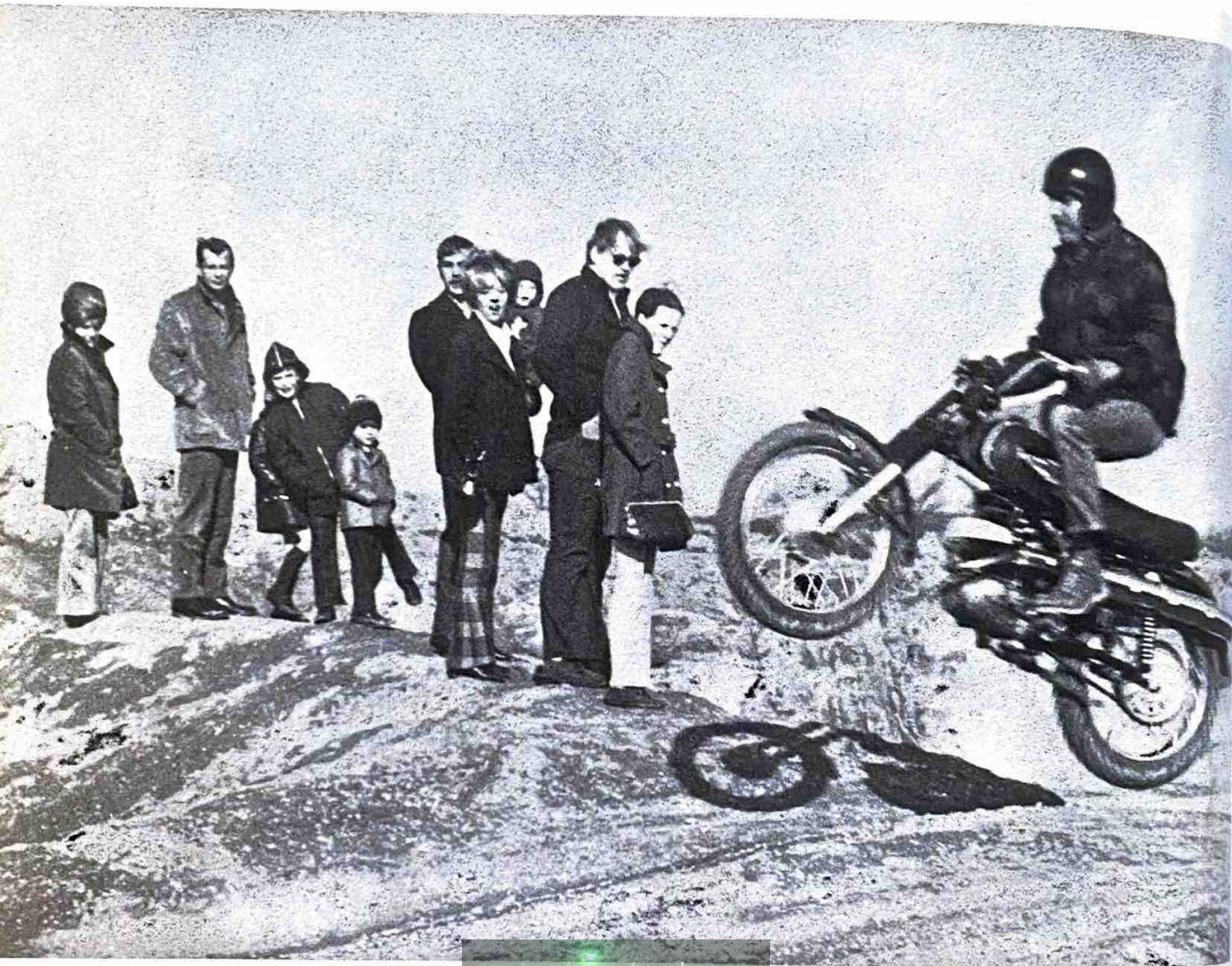
CHARLES YERKOW

Here Is Your Hobby

Motorcycling



To enjoy the sport of motorcycling, the rider must know his machine—and know how to handle it under all conditions.

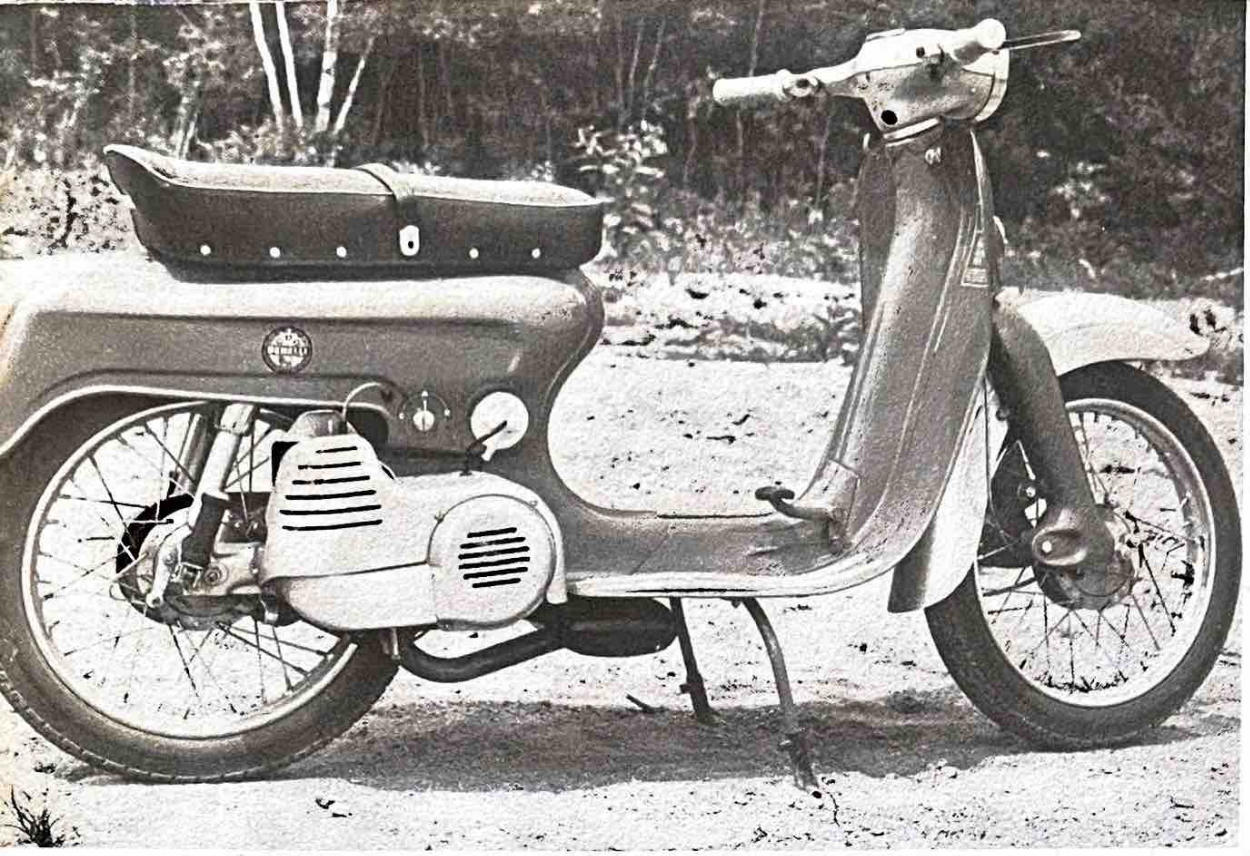
1 Which Two-wheeler for You?

So you're ready to join the millions of riders who prefer a motorcycle to a sports car or a sedan. You're joining a new breed of adventuresome, fun-loving people. Tooling along a highway, purring through a city street, or bulling up a mountain, the motorcyclist is an independent character who loves to ride. He is proud of his riding skill and devoted to his machine.

Before you don goggles and gloves, you should learn something about motorcycles and the engines that make them go. Riding a motorcycle calls for technical knowledge as well as physical ability. This book is meant to be your guide to understanding motorcycles and to becoming a safe, skillful rider—and doing it without a spill.

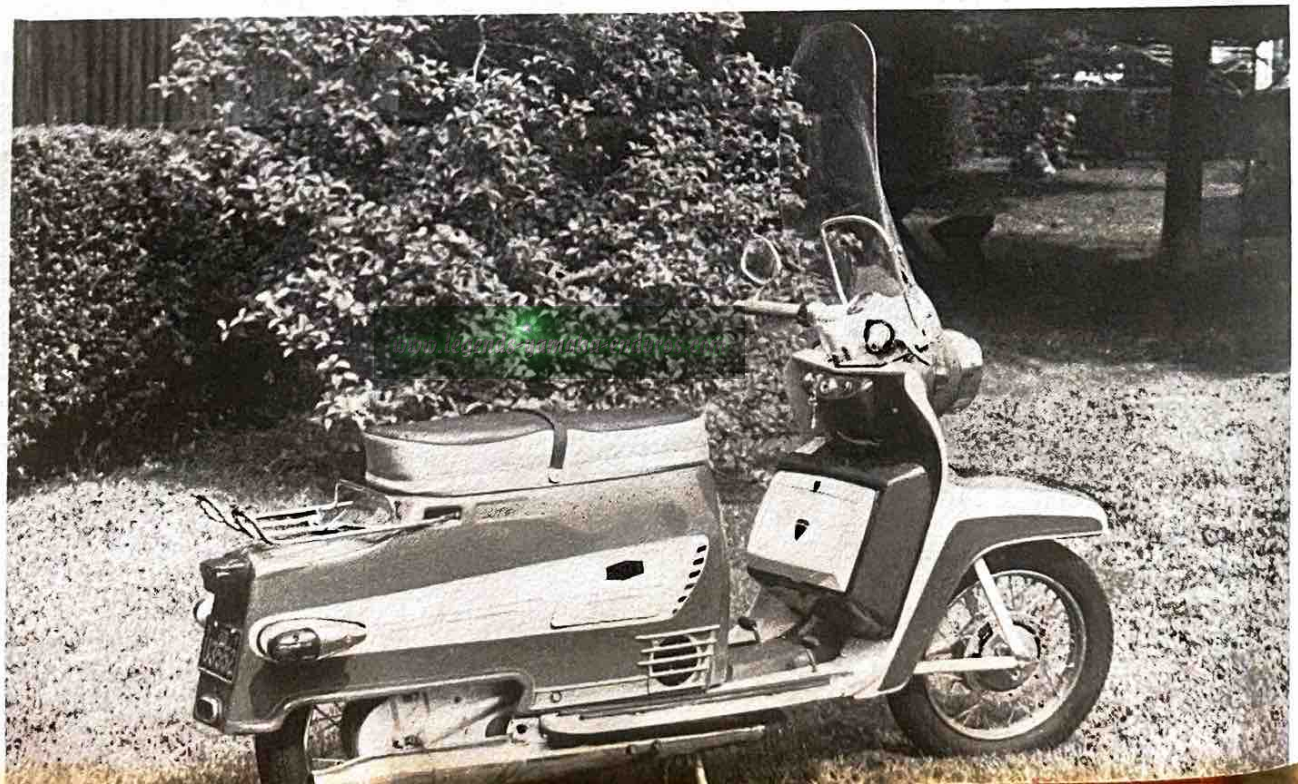
The first step to competent riding is learning how a motorcycle works. Start by comparing it to a bicycle. The first bicycle was merely pushed along. It had no means of power; it was impractical, a luxury. But when pedals were fitted and a chain hooked over the rear-wheel sprocket, the invention became practical and thousands of people began to use it for fun and transportation.

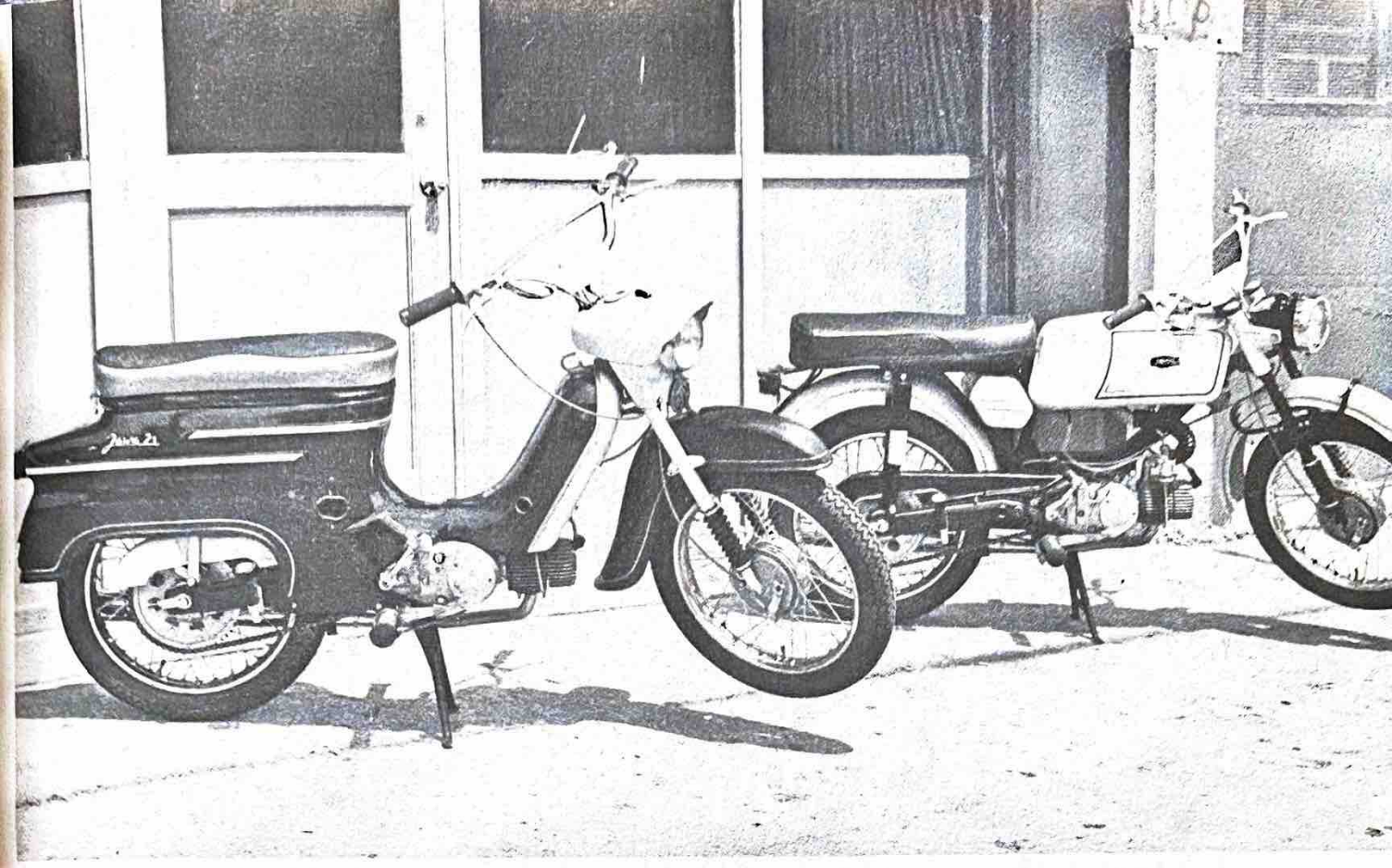
The bicycle became a motorcycle when a small engine was installed in the frame. With engine power the two-wheeler was able to go virtually anywhere, even where no roads ex-



Weighing only 150 pounds, the Benelli Monaco scooter with large wheels can easily double for transportation and fun riding. Engine is a single-cylinder 125-cc, with a three-speed gearbox.

The Jawa Tatran uses a 125-cc single-cylinder two-stroke engine and four-speed gearbox. With its streamlined shroud, lockable battery and tool compartment, and comfortable seat for two, this 250-pound scooter is ideal for short trips or leisurely touring. Note full cover for chain and directional lights.





Reliable single-cylinder 50-cc engines power the lightweight large-wheel scooter (*left*) and motorcycle (*right*), both Jawa models.

isted. Motorcycle riders began exploring faraway places. They raced each other, or they simply used their vehicles for cheap transportation.

The basic concept of a small engine in a frame mounted on two wheels did not change through the years. It's true that the whole machine and its many components underwent countless experiments, all for overall improvements, but in principle the motorcycle remained the same.

Here is a brief view of the kinds of two-wheelers you'll see in the streets and on the roads.

Moped (motor and pedals)

A small-engine combination bicycle and motorcycle. This moped is very popular throughout Europe, and occasionally you will see it in big American cities. The moped uses pedals

to start up the engine and to help it along on steeper hills. On level ground the machine runs nicely and fairly fast. It uses little fuel and is so light you can carry it into a basement or an apartment. The engine on a moped may be mounted over the front wheel, at the pedals, or inside the rear wheel.

Scooter

Heavier than a moped, the scooter uses an engine of from 5 to 7 horsepower and will cruise at 35, 45 and even 55 miles

The compact 89-pound Benelli Buzzer minicycle is powered by a 65-cc two-stroke engine and four-speed gearbox. (*Cosmopolitan Motors*)

per hour, depending on the model. Some years ago in America the scooter proved itself an economical and practical means of transportation in cities and in suburban areas. Whether they worked with a full clutch and a set of gears or the automatic-type clutch, scooters were a dream for many people. The most popular were the small-wheeled Italian Lambretta and Vespa models, with completely trouble-free engines. Even today New York City policemen use them for patrolling the streets and avenues (but ride much more powerful machines for highway traffic checking).

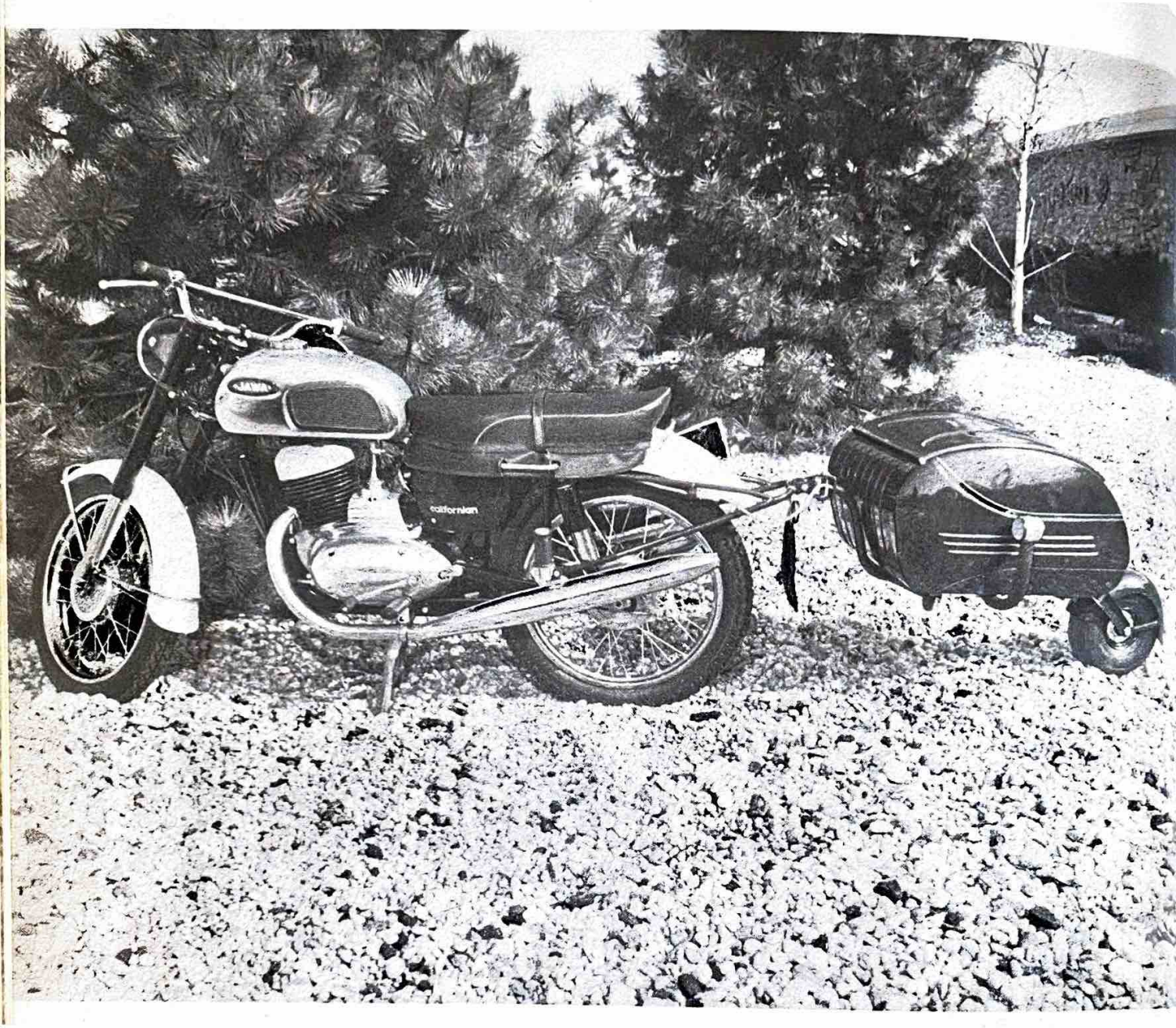
The larger-wheeled scooter models like the Czechoslovak Jawa Tatran and Italian Benelli Monaco perform almost as a lightweight motorcycle. Both models use a 125-cc engine, regular clutch and gearbox, and both have exceptionally comfortable seats for two. You'll find mopeds and scooters fully equipped with fenders, lights, horn, full frontal and bottom shielding against dirt and rain, and even electric starters, directional light signals, and glove boxes.

Minibikes and Minicyles

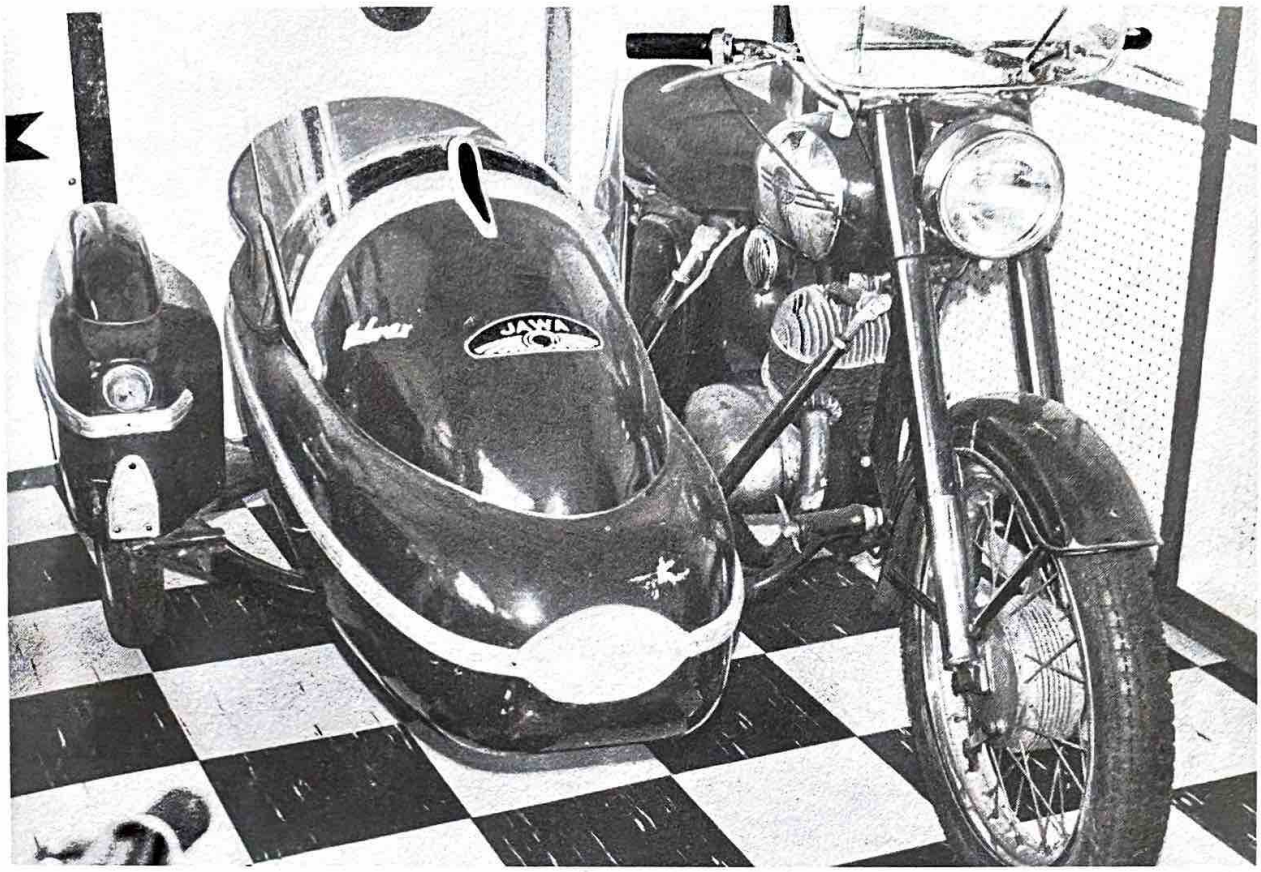
These bikes have captured the fancy of the public. Both are rugged performers when used for what they were designed—learning to ride, short trips in town, riding the trails, and even herding cattle. The minibike has at most two speeds, no horn and no lights and therefore cannot be licensed for road use. The minicycle is a scaled-down version of a full motorcycle, completely equipped and licensable.

Regular Motorcyles

They are divided into lightweights (anything up to 240 pounds, approximately), medium-weight machines (from 250

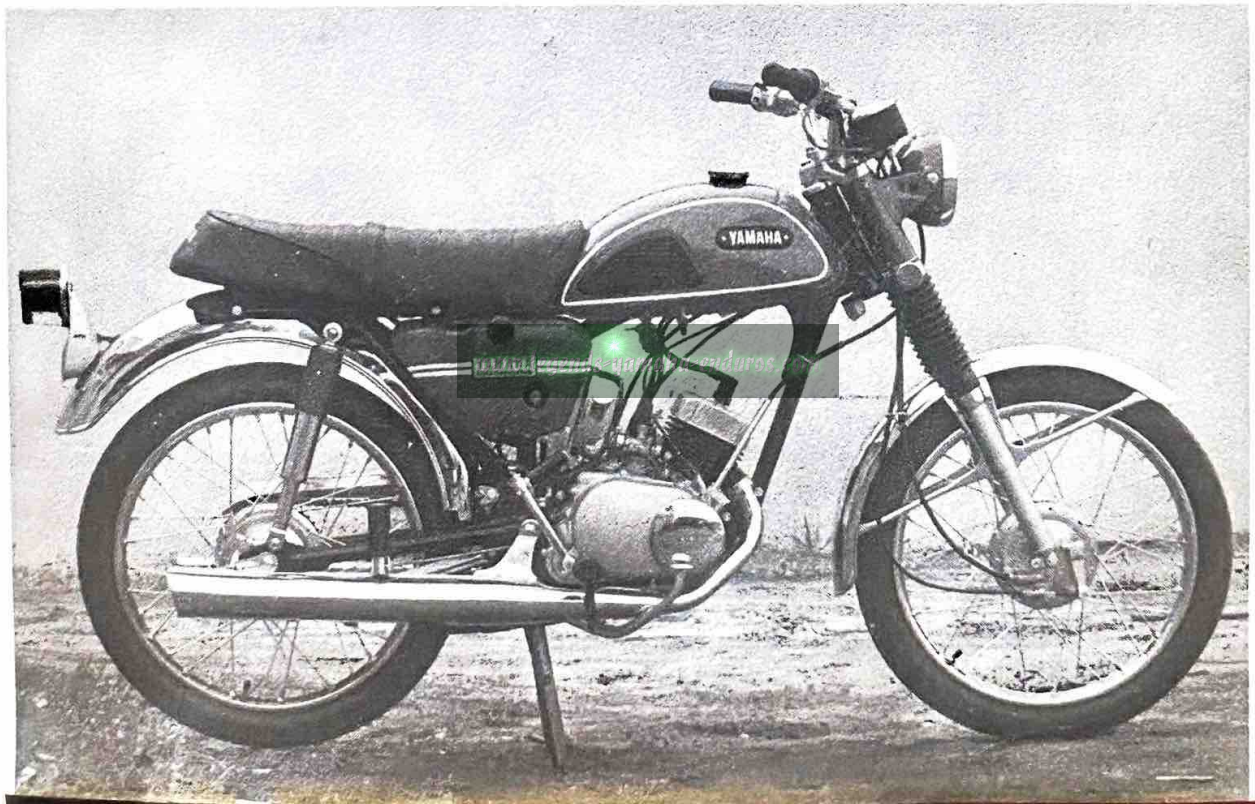


With a compact one-wheel trailer hitched up, this 250-cc Jawa is ready for touring with camping equipment. Side lights on trailer provide safety. (*American Jawa*)



A sidecar can be fitted to certain machines to provide comfort for three and room for extra luggage. Note the light on the sidecar wheel fender.

The HS-1 90-cc Yamaha is an excellent street bike, with automatic oil feed for the two-stroke engine and easy-to-service components.



pounds up to 400), and the heavies (running all the way up to 900 pounds!). You'll find the same basic components in all of them, with either more or less sophistication and chrome. Now and then you'll find a comfortable sidecar attached.

The engine on a regular motorcycle, often called a street bike, may have one cylinder, two, three, or even four, and so the power output will be either on the low side, in the mid-range, or on the high-performance side.

For riding in the streets of a busy city a single-cylinder 50-cc model will keep up with the traffic and, what's most important, will be easy to handle. Going up the line, a 90-cc or 125-cc engine will give you more performance in general, but remember that in some instances the 90-cc model will be geared better for faster getaways than one carrying a 125-cc engine.

When it comes to long-distance touring, the machine with greater engine power and weight will give a more comfortable ride than a lightweight model. It also will be capable of sustained high speeds without overworking the engine.

What it all sums up to is that you have to select a motorcycle for your particular needs. You can't have the best of both sides in one machine, and you must therefore try for the happy middle. Try to fit your requirements. If you're planning to use your bike every day for long trips on an expressway, then a 125-cc model is hardly the answer. On the other hand, if most of your riding will be in congested city streets and only an occasional lark in the country, then a heavy monster with a 60-horsepower engine is not too smart either.

When you look into the special competition machines, you'll realize how finely tailored these bikes are for the job they have to do. This is where you meet the fantastic *dragster*, or the hot and lively *scrambler*, or the rugged *motocross* or *enduro* models, the *road racer, trials machine, hill climber, trail bike* and so on. Each shines in its own backyard, and you'd never

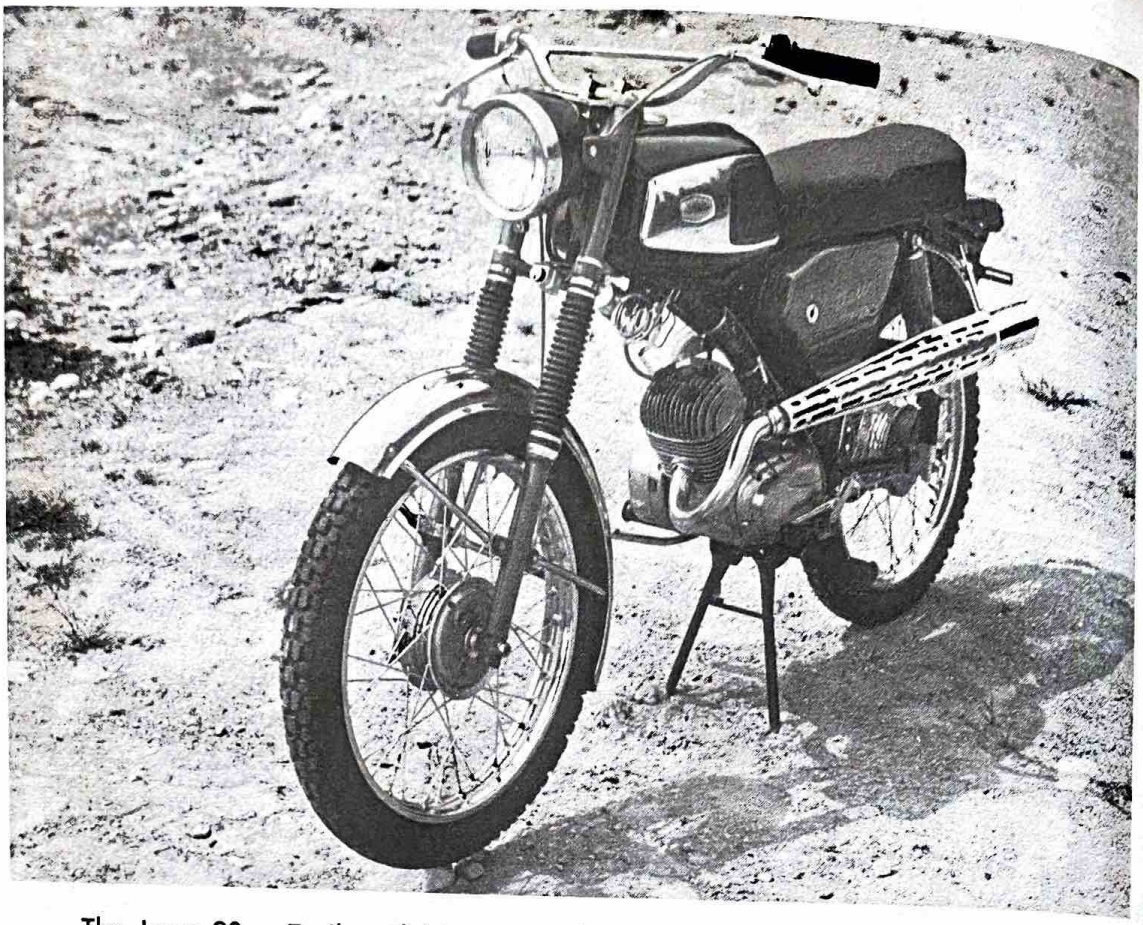
try running it in another place because you know it would be a washout.

For competition and off-the-road riding neither you nor your machine needs a license, but if you plan to use your machine in the streets and on the roads, then your bike must be registered and you must have an operator's license. What you must know to pass a motorcycle-riding test will be covered in another chapter.

Now before you buy a motorcycle, you should know a little about engines, clutches, gearboxes, rear sprockets, tires, and other things that make one bike do things that another bike can't do. Knowing the simple technical things, you won't find yourself on a trail bike wondering why it can't get up to 90.

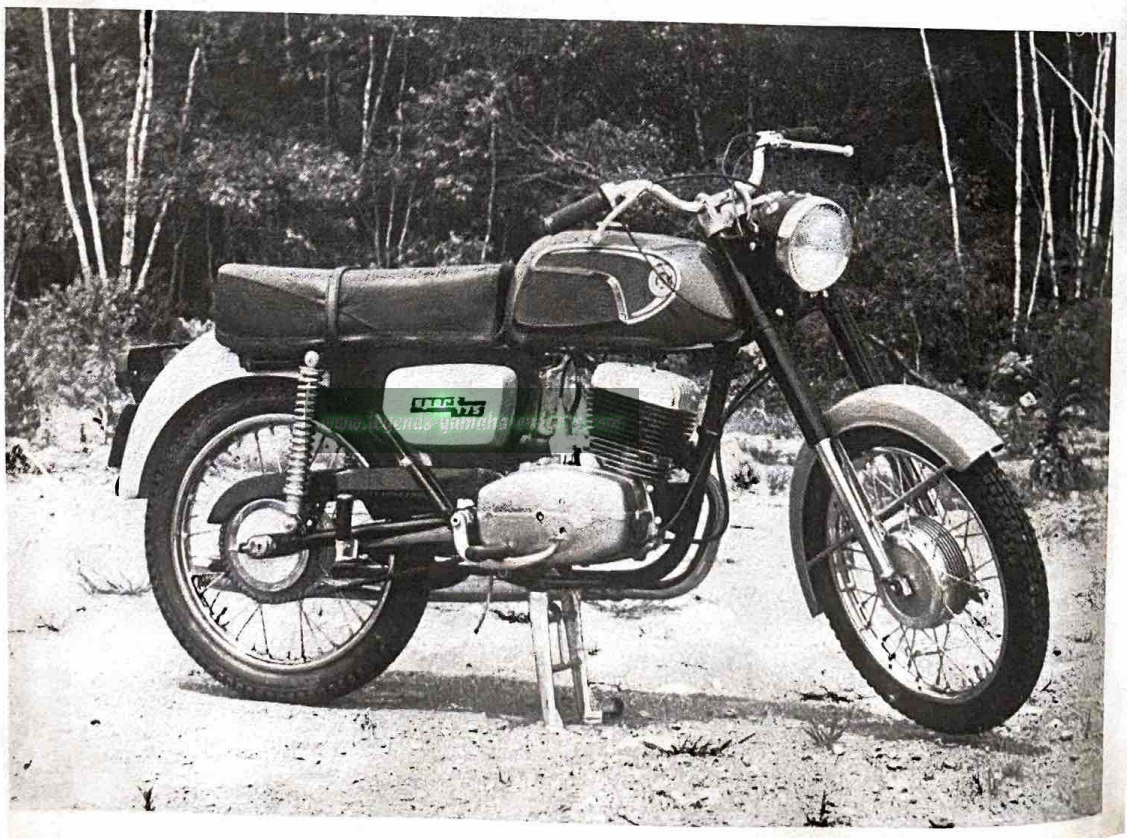
The engine is the heart of the motorcycle, and like any heart it works in order that other parts may also work. Every engine consists of a crankcase with one or several cylinders fitted to it either vertically, sideways, or in some slanted position. Inside a cylinder is a piston, and around every piston are several piston rings which make the upper part of the cylinder air-tight. (The cylinder must be air-tight because the piston must compress the fuel mixture so that it can be ignited by the spark plug.) A rod connects the piston to an arm that is part of the crankshaft, located inside the crankcase. In this way, when the engine is running, the piston moves up and down inside the cylinder and the connecting rod turns the crankshaft. And that's all any engine does: It turns a crankshaft, and this turning force is sent through the gearbox and clutch to the rear wheel of a motorcycle.

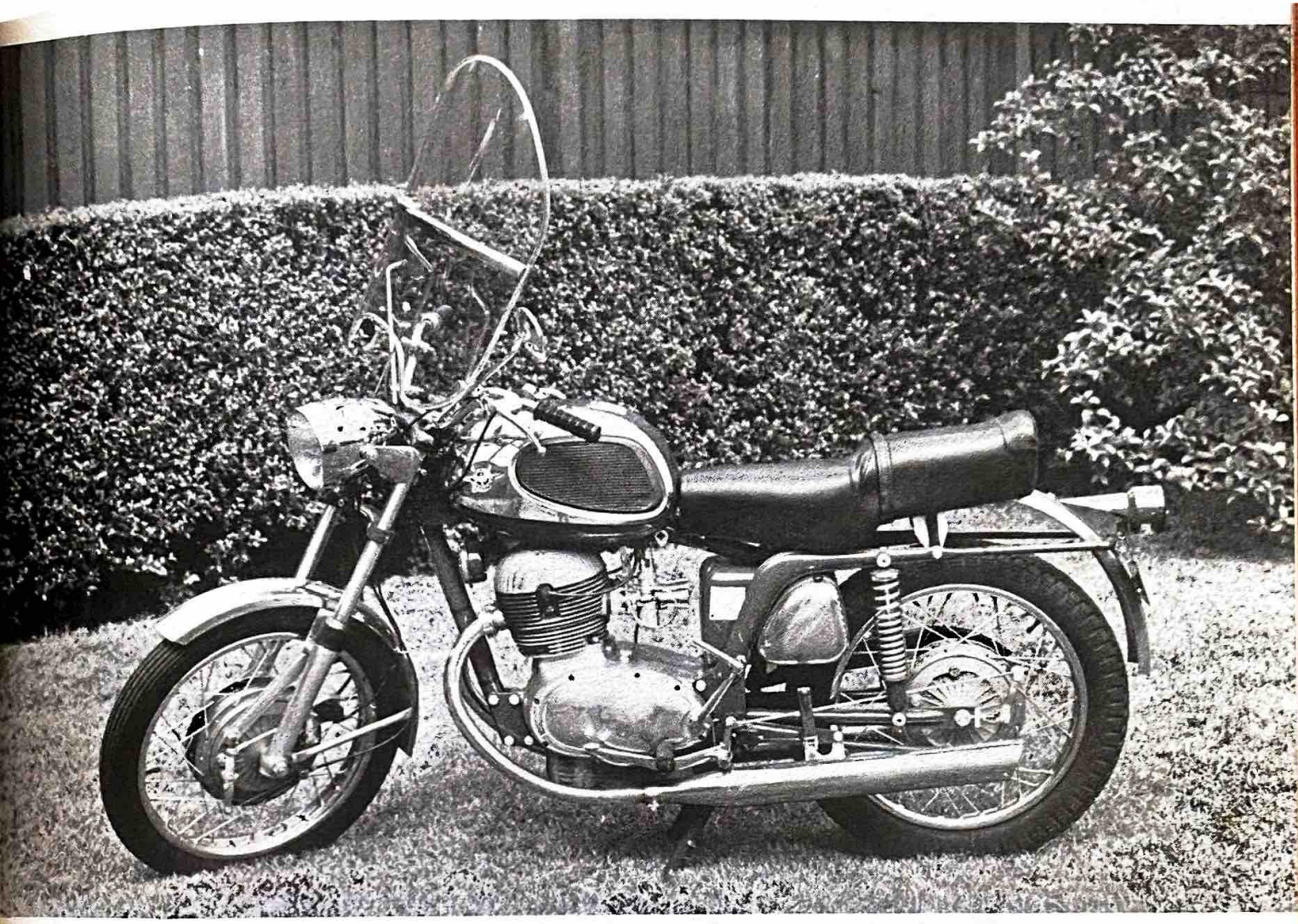
In a four-stroke engine the piston moves up and down inside the cylinder four times to produce one power stroke. Thus on the first stroke the piston moves down and sucks in the fuel mixture, which consists of one part gas to roughly fifteen parts air; this mixture is drawn through the carburetor and atom-



The Jawa 90-cc Trail model is a rugged machine designed for both street and trail riding. The high exhaust pipe is shielded, and the front fork, handlebars, and gearing fit the purpose of the bike.

Weighing 260 pounds, the CZ Sport 175 (Jawa) is provided with automatic oil feed for its two-stroke one-cylinder engine.





Engine on this M. V. Agusta is a vertical twin four-stroke of 250-cc with a five-speed gearbox and a rocker-type shift on the right side. This model weighs 330 pounds. Note design of seat for two.

ized, or vaporized, for the intake stroke. Then the piston moves upward and compresses the vapor into the top of the cylinder, completing the second stroke. When the fuel mixture is compressed, the ignition system sets off an electrical spark inside the top of the cylinder. The compressed fuel vapor explodes and pushes the piston downward into the third stroke, called the power stroke. Finally the piston moves upward again and exhausts all the burned gasses out of the cylinder.

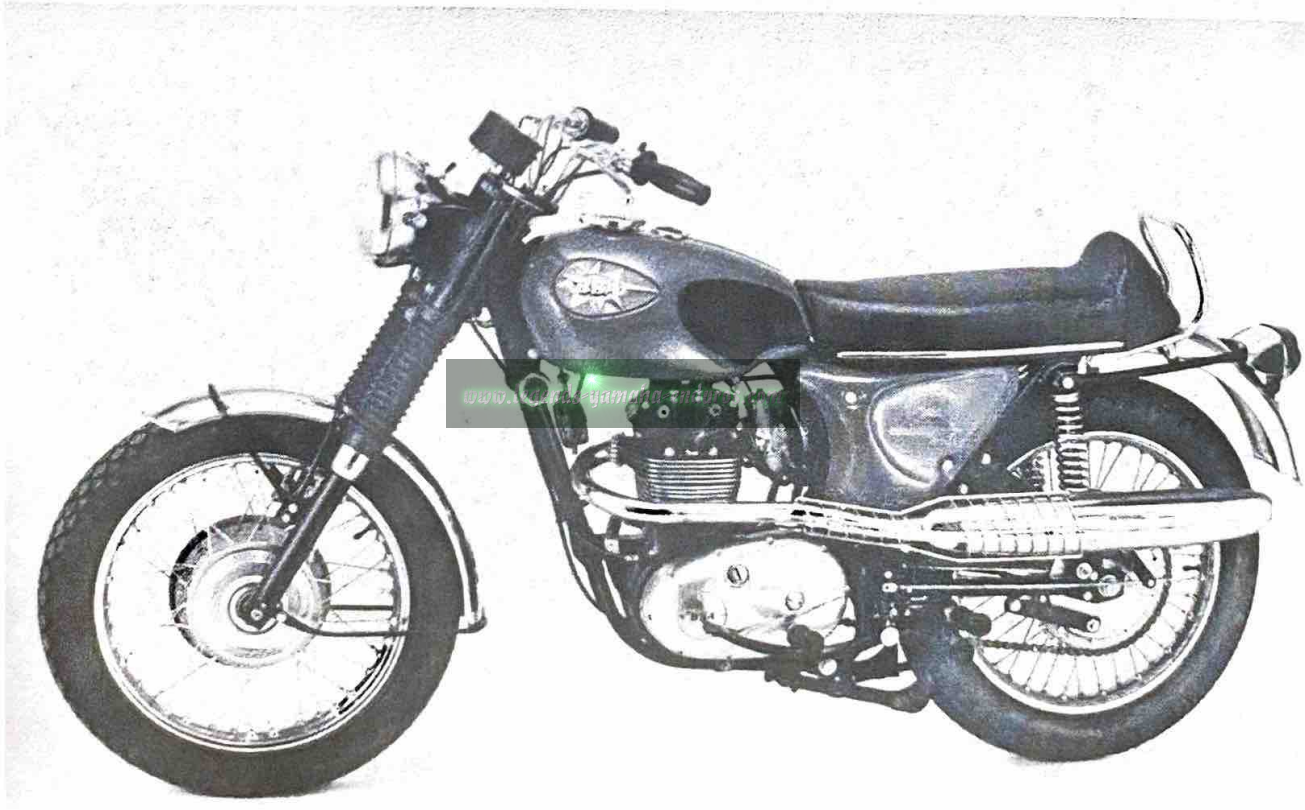
In order to make these strokes possible on a four-stroke

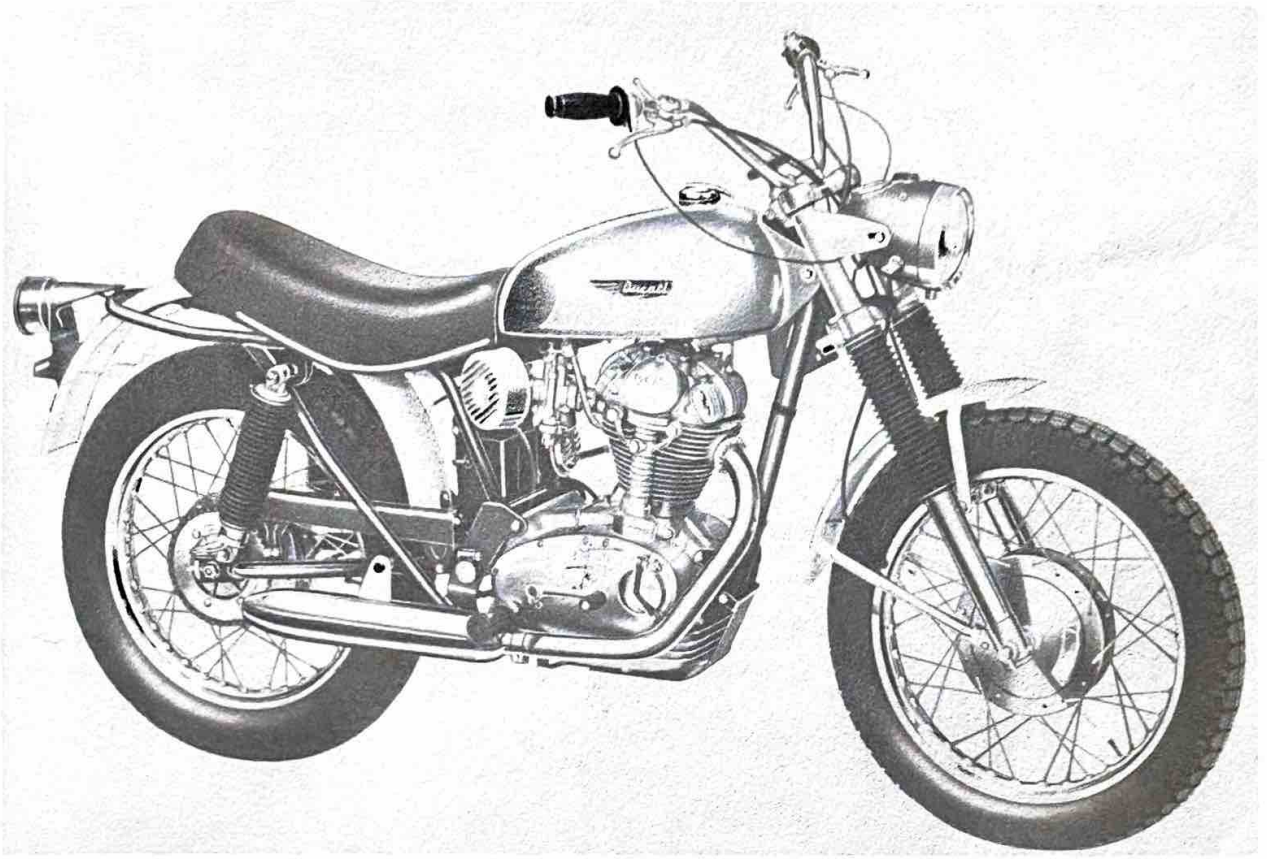
engine, the cylinder is designed with intake and exhaust valves which open and close as needed for the various strokes.

In a two-stroke engine the piston moves up and down only two times to produce one power stroke. And the cylinder is designed with openings, or ports, which are covered and uncovered by the piston itself as it moves up and down. Thus compression and intake occur on one stroke, and the exhaust takes place as the explosion pushes the piston down into the power stroke. There are no valves that open and close, and therefore there are no rockers, no pushrods, no springs, no valve guides, and no oil pump for the valve gear. The fuel mixture is one of gasoline and oil and either is premixed in the tank by the rider or is fed to the carburetor by an automatic oil feed system. This same mixture is also used to lubricate the crankshaft and connecting-rod parts.

Note a simple fact. The engine with the higher compression ratio (how tightly the piston squeezes the fuel mixture into the top of the cylinder) will usually outperform a similar engine with a lower compression ratio.

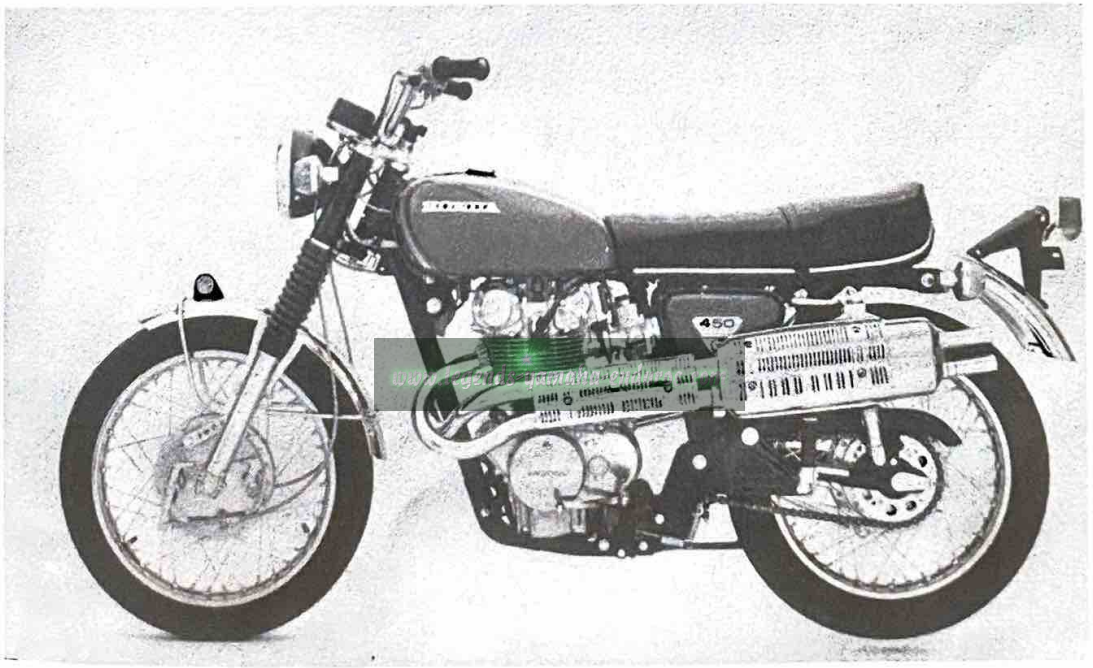
The 250-cc BSA Starfire single-cylinder four-stroker is ideal for short or long-distance runs. (*BSA-East*)





The 350-cc Ducati Scrambler four-stroke single features overhead camshaft. (*Premier Motors*)

The 450-cc Honda twin four-stroker features a special exhaust system, overhead cams, tachometer, and directional lights. (*American Honda*)



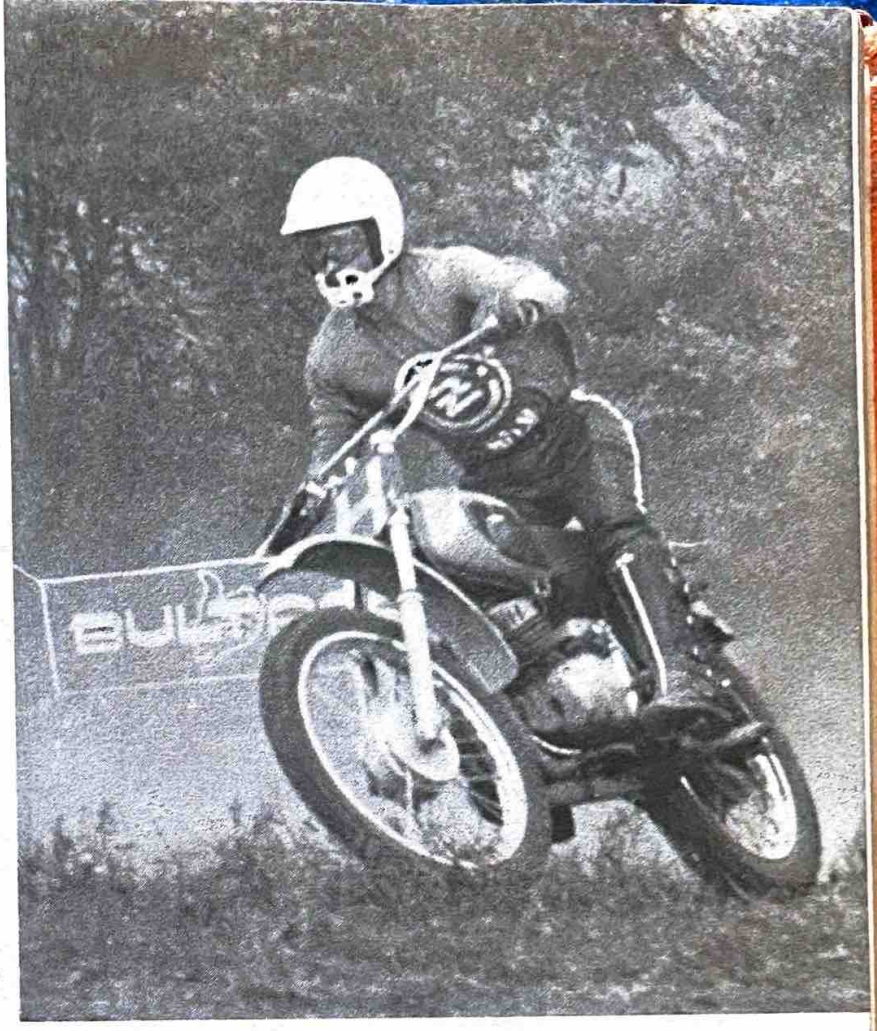
It is only natural that motorcycle riders have been arguing throughout the years about which type of engine is the best. The only thing that can be said is that they'll go on arguing for many more years. Every rider decides for himself what he likes and why he likes it. Consider:

On a four-stroker you don't have to bother mixing gas and oil (the proportion is about one part oil to twenty parts gas). But then many two-stroke models have automatic oil feed, and some of the toughest motocross machines are two-stroke types and the riders mix their own gas and oil. On a four-stroke you must watch the oil level in the crankcase, while on a two-stroke type this is taken care of by the intake stroke. On a four-stroker valve trouble can be costly, but a two-stroker must be decarbonized every so often. A four-stroker gives better mileage per gallon of gas, but if it's out of tune, you'll have a harder time starting the engine On a two-stroker you don't have to worry about timing the valves and setting the clearances, but during the break-in period of the engine the exhaust will give off telltale gas-oil burning smoke.

And so the arguments go on and on. . . .

When you discuss an engine, you can't help but discuss its size, which means that you're talking about the inside area of the cylinder or cylinders. You simply add up the bore (width of cylinder) and the stroke (length of piston travel), and you state it in cubic centimeter (cc) displacement. When you ask a motorcycle rider what he rides, he'll answer something like this: A Yamaha 250, or a Jawa 350, or a Benelli 125, or a BMW 750. First the name of the bike, then the size of its engine in cubic centimeter displacement. For those who know motorcycles, this much information immediately pegs the machine, and often the rider.

The size of the engine also indicates the approximate power output. A glance at a moped, scooter, or lightweight machine

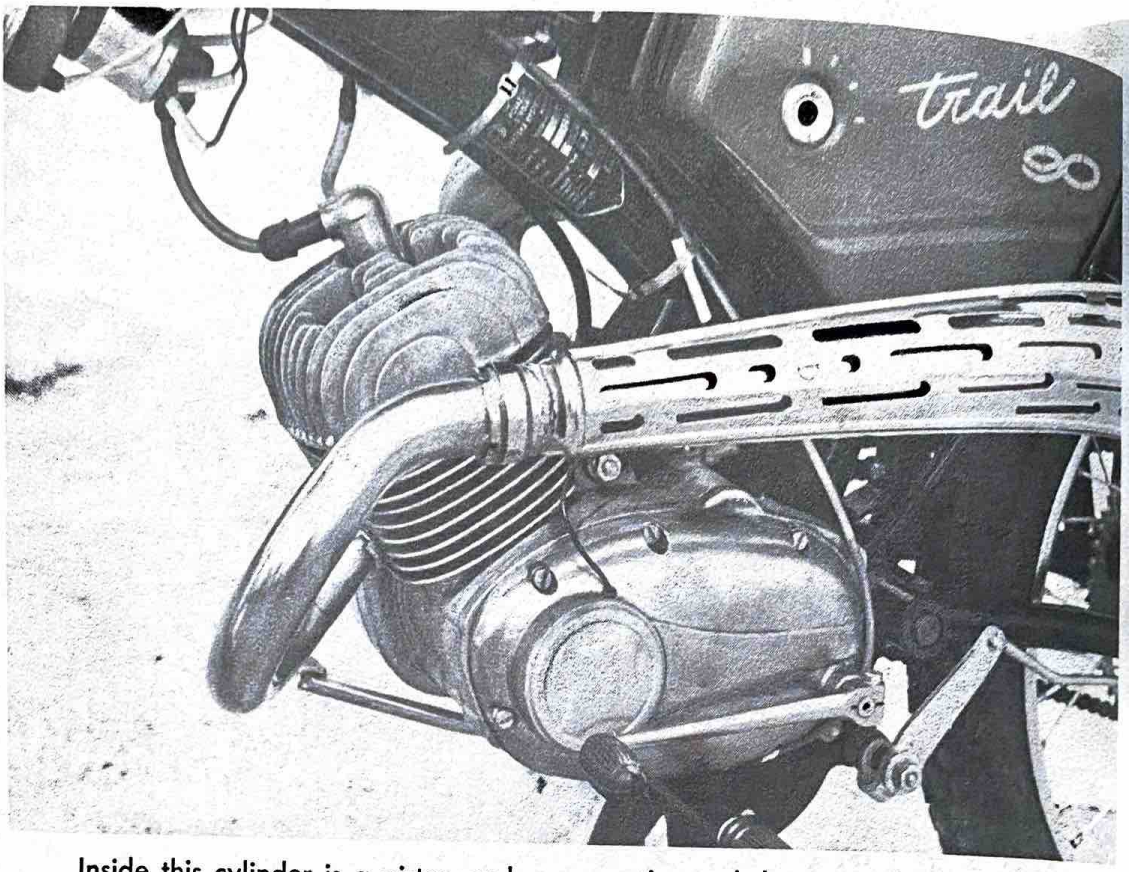


Machines that run in "motorcross" events must be able to take the toughest terrain and withstand the tremendous shocks and stresses. Like the Bultaco, Husqvarna, and others of its class, this CZ is able to take the punishment. (*Photo by Roy Morsch*)

with one cylinder will tell you that its engine is from 50cc to 125 cc, which can provide about from 4 to 9 horsepower. This power will be good enough to reach top speeds of from 35 to perhaps 55 miles per hour. Remember that this is very good performance from this size engine.

If you have a two-cylinder engine of 200 cc, you actually have two cylinders and each displaces 100 cc. Thus two 175-cc cylinders equal 350 cc. The more cylinders, the smoother the running.

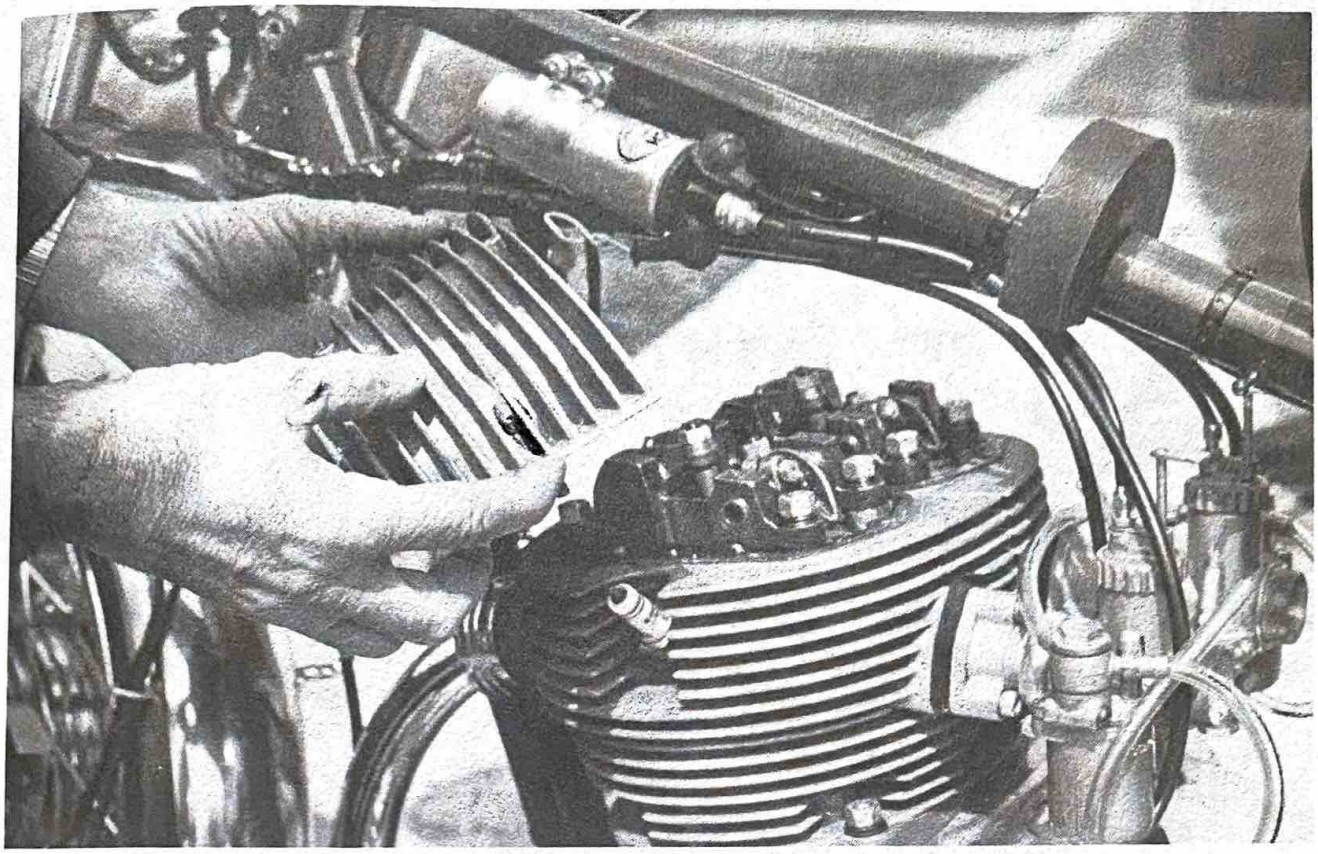
But when it comes to performance, size and power output of the engine are not the whole story. Take two engines of the same size and power, and then change the gearing setup in the gearbox of one, and you'll end up with one performing rings around the other. Go another step and change the rear-wheel sprocket, and you'll again change the performance ability of



Inside this cylinder is a piston and a connecting rod that turns the crankshaft. The gearshift lever is visible at the side of the gearbox. Finning on cylinder is for more efficient air cooling. Note spark plug at top and coil at extreme top left.

the machine. The regular street bikes are designed around a particular engine and gearbox to provide the best performance possible without overstressing the engine or any other part. But when it comes to competition machines, the manufacturer will have a variety of gearing and sprocket arrangements to choose from in order to fit the bike for specialized riding requirements.

The gearbox provides you with a set of gears so that by selecting the right gear, you can start the machine rolling from a standstill, then shift to second gear to gather more speed, then increase the speed with the next gear, and finally use the top gear for cruising speed. The usual arrangement is four gears, but you will find certain models with three gears, and



The valve rockers on a 250-cc M. V. Agusta twin are accessible for adjustment after removing the covers. Each cylinder is fed by a Dell'Orto carb.

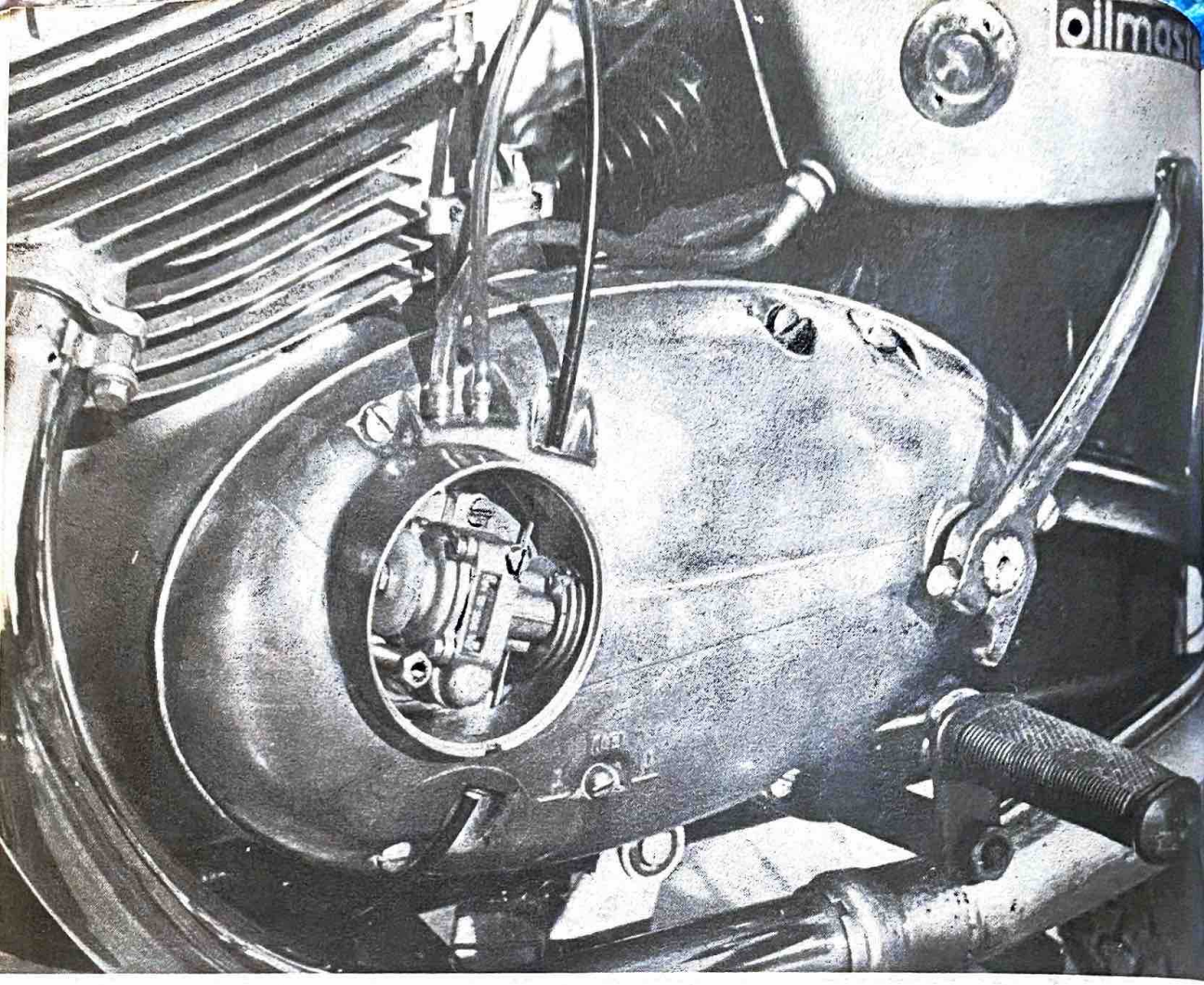
others using five, six, or even eight gears. The actual use of gears will be explained later.

When the gearing is "low," it means that the bike has great pulling power but not much in the way of high speed. When the gearing is "high," the bike will be able to reach high speeds but will not get away fast at the light.

The shifting of gears is done by your foot, either the left or right foot, depending on which side the shift lever is located. All gearboxes have a basic neutral position, and many models have additional neutral positions—sometimes as many as there are gears.

Remember one thing about the gears: Always disengage (pull) the clutch first, then shift gears. (On certain Jawa models clutch disengagement is automatic whenever the gearshift lever is moved.)

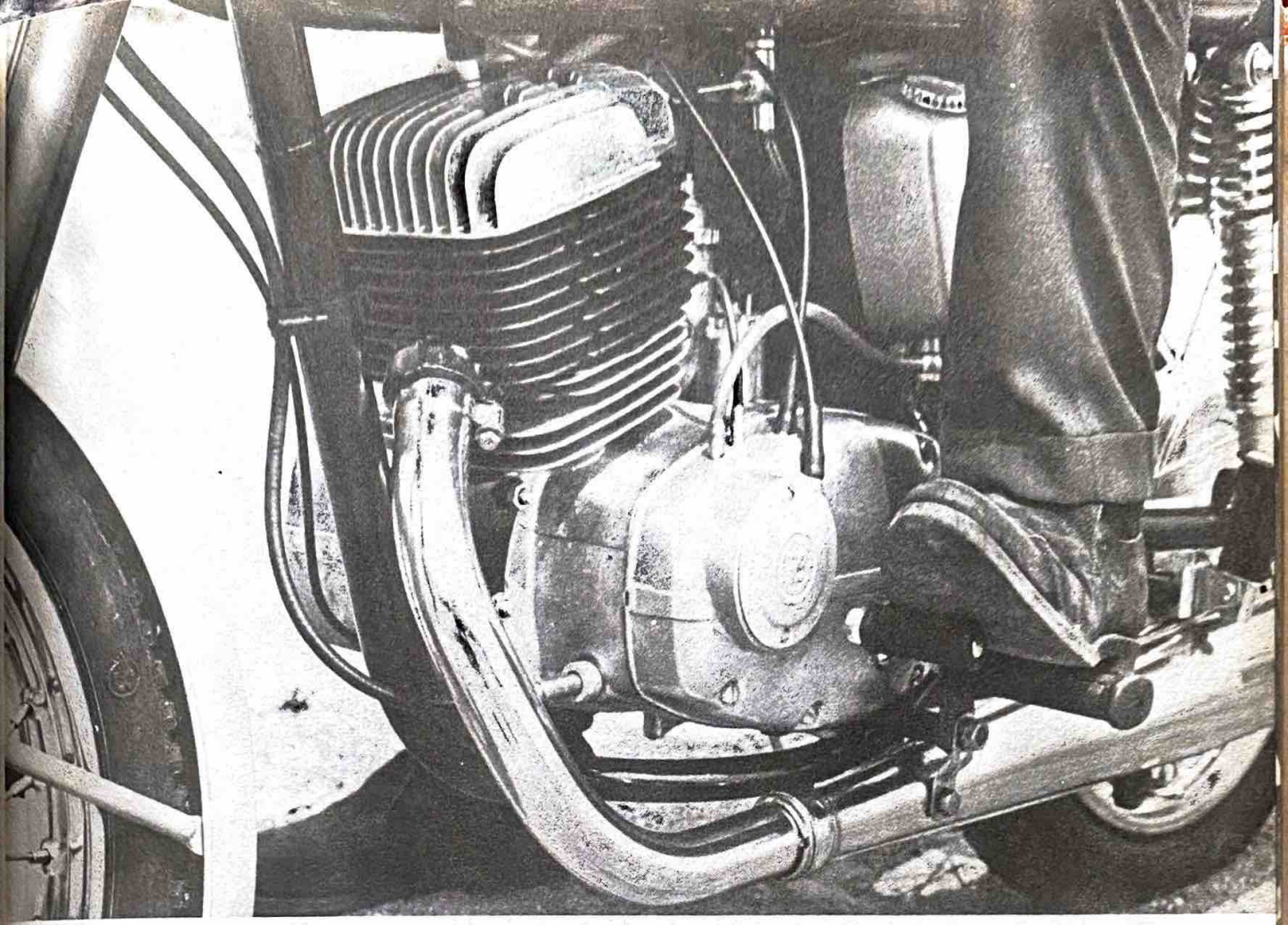
The clutch is a coupling device between the engine and the



Left-side cover on a 350-cc Jawa twin two-stroker is removed to show the automatic oil feed mechanism, which is controlled by the throttle twist grip.

gears and is made up of either two plates or a set of plates. These plates are forced together by powerful springs inside the clutch housing so that all the plates rotate together when the engine is running. If the gears are in their neutral position, nothing can happen, but if one of the gears has been selected, then the engine will drive the bike. The clutch control lever is always located on the left handlebar. When this lever is pulled or squeezed, the clutch plates are separated (disengaged) and the gears are free to be shifted. When you start releasing the lever, the clutch plates are forced together (engaged) and the bike will start rolling.

The engine, clutch, and gearbox are one unit: The engine produces the turning force, or torque; the gears make it possi-

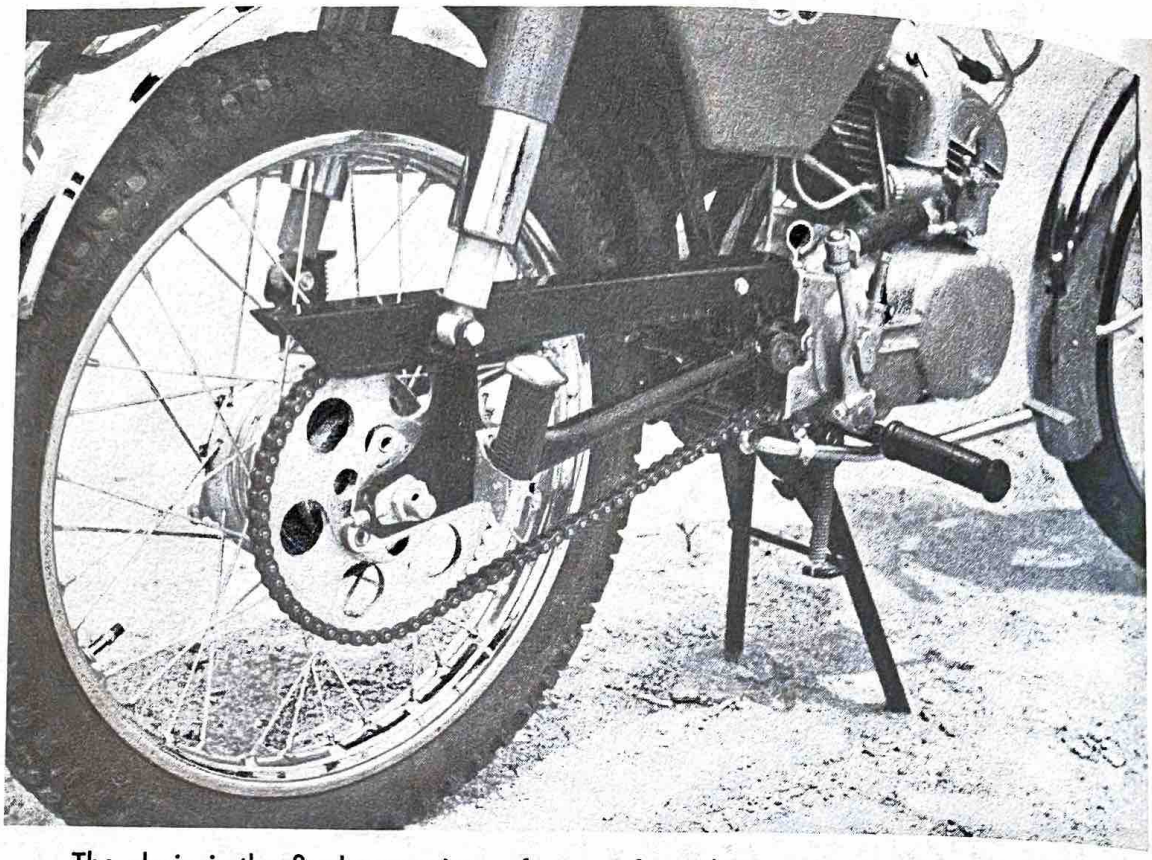


Gear shifting is done by either right or left foot, depending on the model. On this CZ the lever is lifted up for first gear, then is tapped down for second, third, and fourth gear.

ble to start from a standstill and increase the speed; and the clutch provides the smooth coupling between the engine's crankshaft and the driven gear.

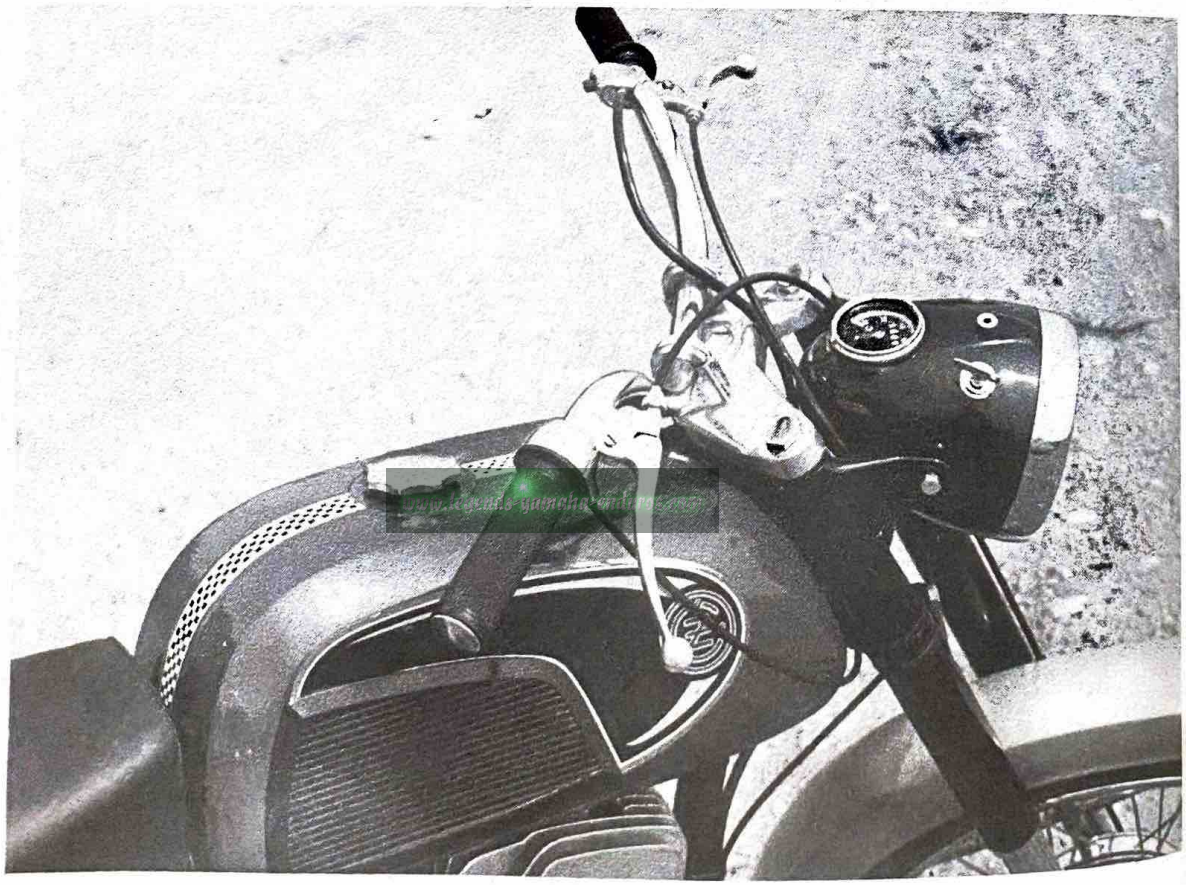
The only step left then is to pass the engine power from the selected gear shaft sprocket to the rear-wheel sprocket, which drives the bike. For this job most machines use a chain, just like the chain on a bicycle, but a few manufacturers (BMW, M. V. Agusta, Moto-Guzzi) equip their machines with a driveshaft to the rear-wheel hub. Both methods serve the same purpose: to drive the rear wheel.

The brakes on most motorcycles are the internal expanding-shoe and drum type, fitted inside the front and rear hub. The front brake is worked by a lever located on the right handlebar,



The chain is the final transmitter of power from the gearbox to the rear-wheel sprocket. Note foot brake pedal ahead of the peg.

Front brake lever on right handlebar and clutch lever on left give rider easy control. The ignition key and speedometer are visible on the headlight of this CZ.

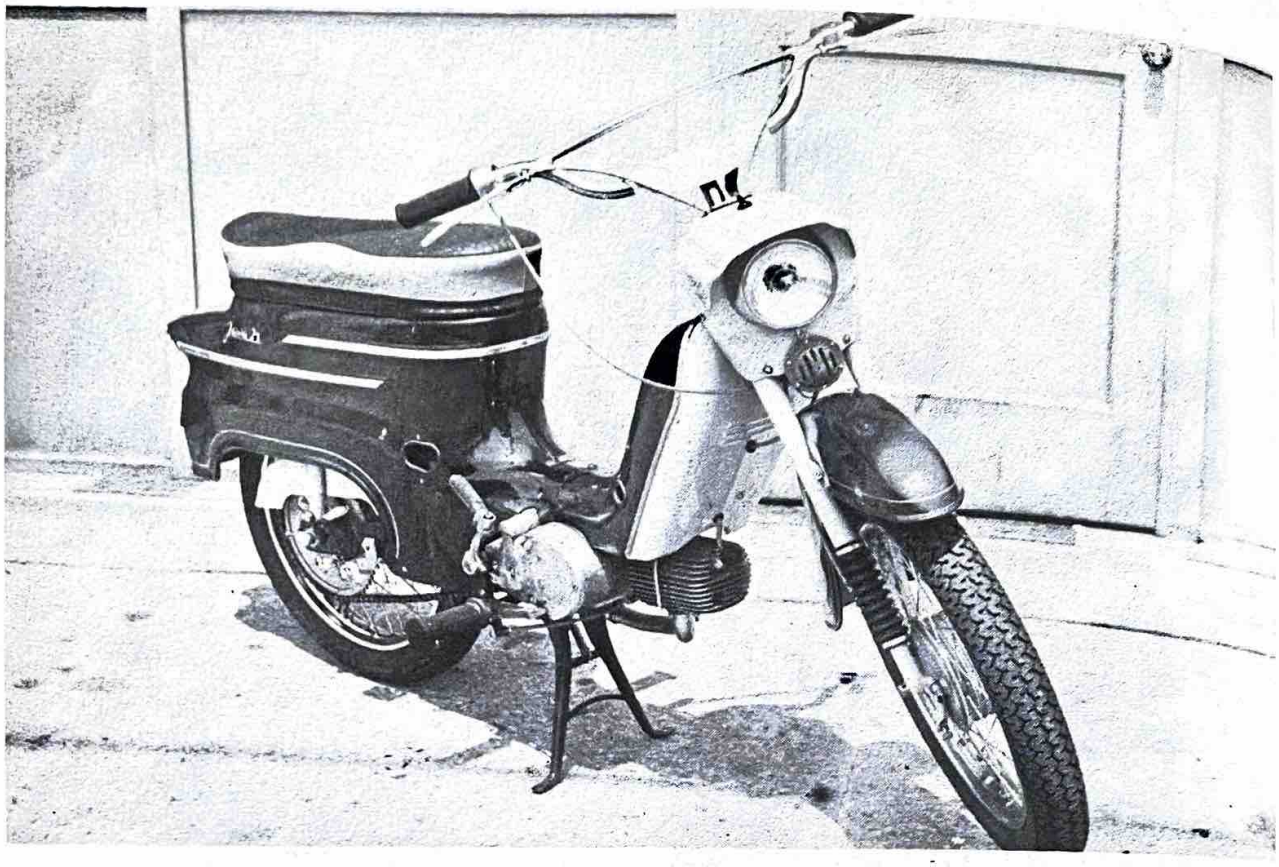


The rear brake pedal is located near foot peg so that foot can easily apply pressure. But foot must not rest on the brake pedal while riding.

and the rear brake is worked by your foot—either left or right, depending on the machine. The two brakes are used together for maximum and equalized braking action. If you're approaching a sharp curve or a corner, use the brakes *before* you start leaning into the turn.

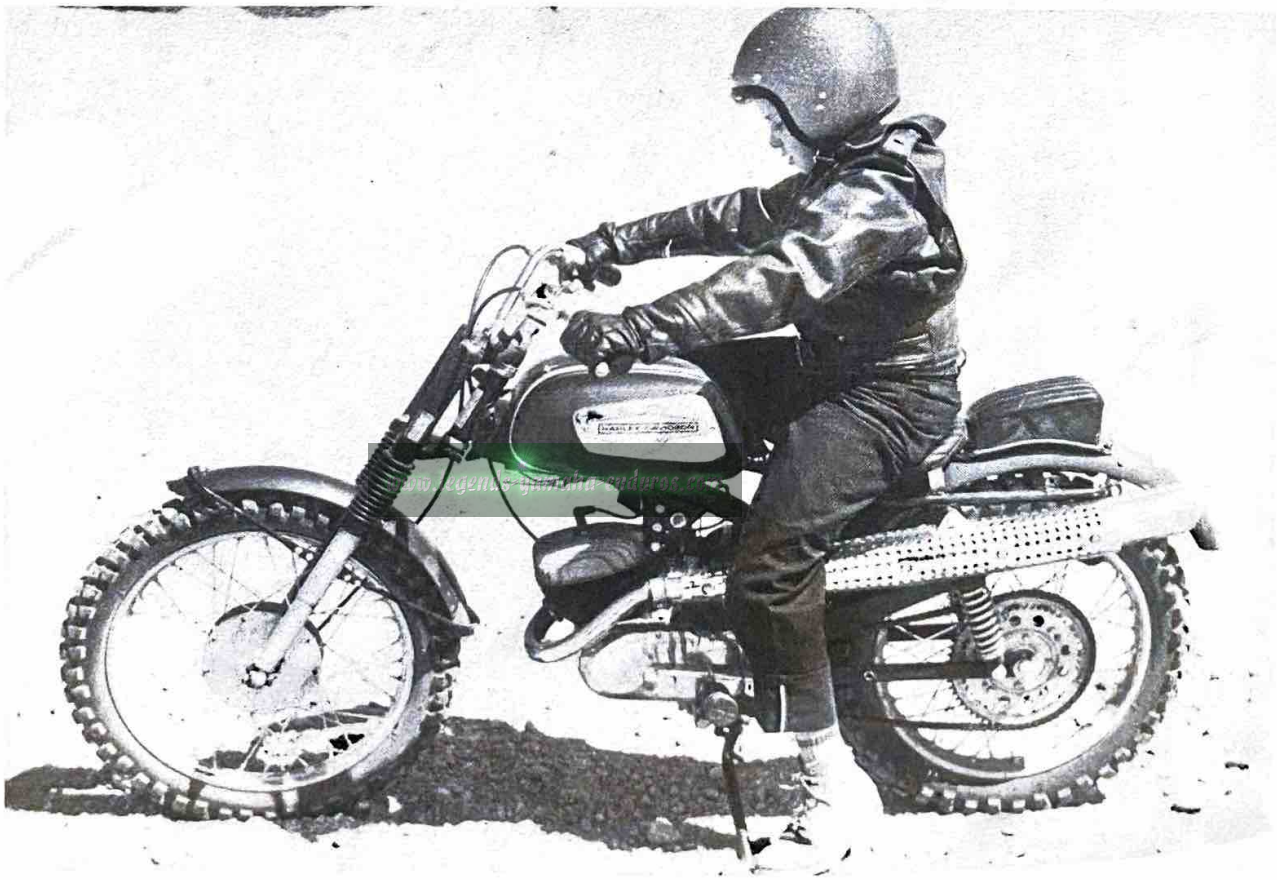
Most machines use the 18-inch-size wheel, and the tires are always selected for the kind of riding to be done. For street and road riding, tires are of a smooth tread design, while those intended for rough terrain use, like enduro and motocross racing, the heavier tread design, called knobbies, are used.

Tire pressure is important. The average machine needs about 22 pounds per square inch (psi) in the front and about



On this Jawa scooter the Barum tires are of a fairly smooth tread design and work well on hard road surfaces and also on trails.

For best traction on rough terrain, heavy cleated or knobby tires are used. Note absence of headlight and the shielded high exhaust pipe.



28 in the rear tire. But pressure needs vary in relation to weather conditions, the road surface, and the load carried. The manufacturer always explains tire pressure requirements in the owner's manual, and smart riders follow the manufacturer's recommendations. A soft tire will give a mushy ride, while a hard one will bounce around too much. In both instances you'll find that the handling characteristics of the bike change for the worse, especially in a curve or where the surface is rough.

Tires naturally cushion the ride, but even so all machines are built with excellent shock-absorbing systems. The front wheel rides in a telescoping set of tubes, with special coil springs and oil-filled chambers, and the rear wheel rides in a swinging arm which is attached to a separate shock-absorbing system. Add to this the cushioned seat or saddle, and the roughest road surface becomes endurable even on long rides.

It is said that most motorcycles are bought because they provide the rider with a feeling of freedom and a sense of power at the twist of the wrist. Maybe they're bought for one more reason—the sound of the exhaust as the engine (often called the mill) begins to rev up.

To a bike buff there is no sweeter sound than a finely tuned engine being put through its paces. At motorcycling meets, engines howl, groan, scream. This is part of the scene as riders and bikes whip across the track or come flying out of gullies. But the same sweet sound has, of course, no meaning other than being a nuisance when heard in a town or city street or on a parkway. There it is hard to take. So the law says, "Don't change the exhaust system of your machine." Some riders think the law is reasonable and they go on enjoying their riding, while others alter their pipes and then complain when the police hand them a summons.

Some exhaust pipes are run under the frame rearward, either in a straight line or with an upsweep. On other models

the pipes are midway up, or even way up. It's all a matter of styling, function, and personal preference.

Without the exhaust pipes and the mufflers inside them every explosion inside the cylinder would sound like a rapid-fire cannon. Your job as a motorcycle rider is to create a favorable image for the police and for other users of the road. You can easily do it by not producing roaring and ear-splitting sounds. Remember this: The less noise you make, the more respect you'll get from nonriders!

Before you handle the throttle twist grip on the right handlebar, you should know something about the carburetor. The carburetor (usually called a carb) mixes and atomizes one part gasoline and fifteen parts air and allows the piston to draw this fuel mixture into the cylinder during the intake stroke. As already explained, the spark plug ignites this mixture on the compression stroke.

The carb works in a simple way. When you twist the throttle open (turning the grip counterclockwise), a slide or valve inside the carb opens the passage and lets more fuel vapor through the venturi tube into the cylinder. This speeds up the engine. By completely closing the throttle, the engine will slow down to idling speed.

Every carb is fitted with adjusting screws so that the position of the throttle can be set for best idling and running, and also for setting the best proportion of gas to air. In this way a carb can be set on the rich side (too much gas) or lean side (too much air), depending on the tuning requirements.

The gas flows from the tank to the bowl of the carb. If there's enough gas in the bowl, the float with a shutoff needle will be lifted and the flow of gas will be shut off. As the gas is used from the bowl by the carb, the float and needle will drop and so let more gas into the bowl. This process is continuous as long as the engine is running.

Every carb is fitted with a few devices to make starting easy when the engine is cold. A primer or tickler is a short plunger-like rod which when pressed down forces the float inside the bowl to let in more gas and so flood the carb. This delivers a rich mixture for starting.

Another device is the choke, which comes in many forms, and is used simply to close off the air supply, thus again producing a rich mixture.

To prevent dirt from entering the carb, manufacturers fit special filters to both the fuel inlets and the air induction system. The rider's job thereafter is to make sure these filters are clean.

Once the fuel mixture is drawn into the cylinder, it must be ignited, and this job belongs to the ignition system. There are two types: the magneto (mag) and the battery and coil.

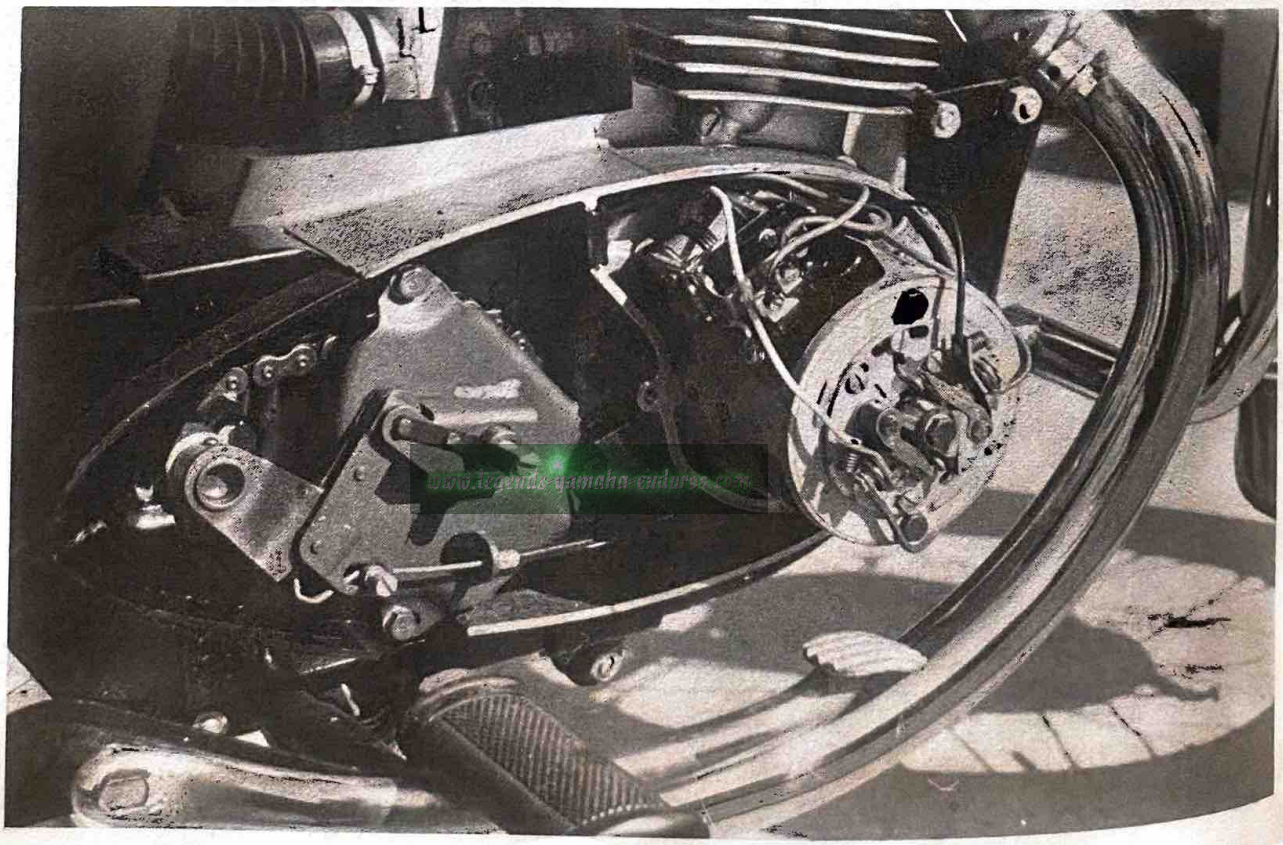
The mag is a self-contained unit consisting of a set of magnets and coils, one or the other rotating. As soon as the engine is kicked over, the magneto produces a powerful spark at the spark plug. In other words, electrical energy here does not depend on a battery. The magneto provides power for ignition, lights and horn. Because competition-type machines do not carry lights and a horn, they use a mag system, saving on weight.

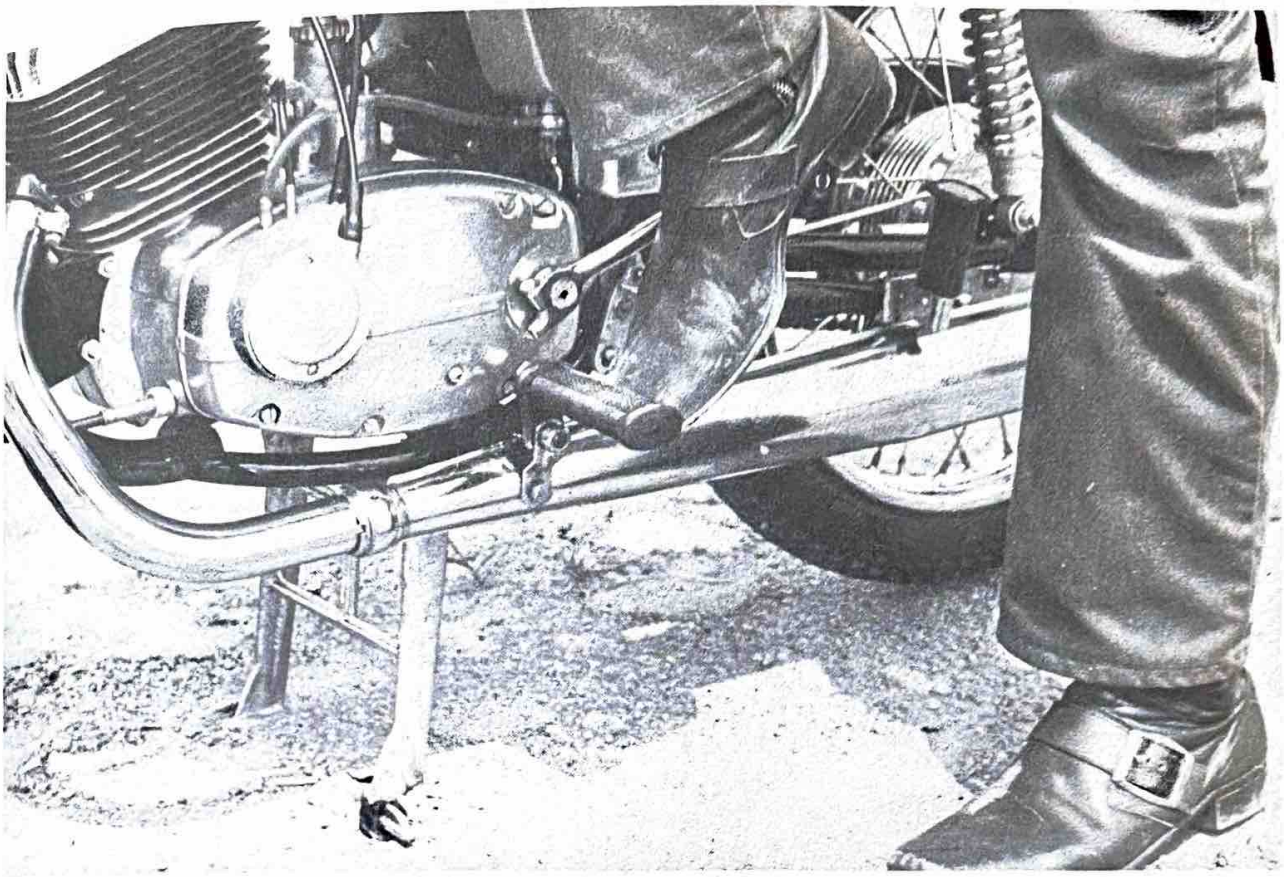
The average motorcycle, however, operates with a battery and coil, which is slightly more complicated and also more bothersome because the battery needs periodic attention to the electrolyte level in the cells. In this system the battery is continually charged by a regulated generator, or an alternator. The system may be a 6-volt or a 12-volt type and will further consist of a set of breaker points and a condenser.

On some motorcycles you will find both a magneto for running the engine and a battery with its generator for the lights and horn. And several models now feature the convenience of

Batteries for motorcycles are either the 6-volt (three cells) or 12-volt (six cells) type, usually fitted under or at the side of the seat.

With right-side cover removed on this 350-cc Jawa, the ignition breaker points and condenser are shown. Clutch cable and automatic clutch mechanism are visible and also the rear brake pedal at the peg.





On this CZ model the left-side gearshift lever also acts as a kick starter.

the electric starter, which also draws current from the battery.

The usual engine-starting device, however, is the kick lever. For years this has provided motorcycling enthusiasts with a mixture of satisfaction and utter heartbreak, depending on whether the engine fired up or teased its rider with consistent coughs.

All motorcycles feature a headlight and a taillight and also a stoplight at the rear. Conveniently located switches on the handlebar make it easy for the rider to signal with the horn, raise or lower the headlight beam, and signal left and right turns. A speedometer and sometimes a tachometer are fitted near the headlight (or in it) so that the rider can tell how fast he's traveling and how fast the engine is turning over. On some machines small lights tell the rider whether the gearbox is in neutral, whether the high beam is on, whether the battery is

discharging, and whether the oil pump is providing adequate pressure. And on the latest water-cooled Suzuki even a water temperature indicator is featured!

Designers and engineers are constantly striving to give riders efficient machines with all sorts of safety and comfort items. The actual use of these items is up to the individual rider. Chromed bars sticking out just ahead of the engine are called crash bars and are designed to protect the rider and the engine. One rearview mirror on the left side of the handlebar is required by law; another mirror on the right side gives you added safety. A heavy-duty front windshield gives added protection for the eyes, face, and body when loose stones are kicked up by the car in front of you. In cold weather the shield keeps the cold wind from hitting you full force. But on windy days the windshield acts like a sail and has been known to force the bike right off the road—so be careful.

One thing that every rider should carry is a set of tools for making small repairs or adjustments on his bike. A tube patching kit should be part of this equipment, and so should a spare spark plug, chain links, tire pump, set of points, spare taillight, and anything else you think might come in handy when you have a breakdown. Nothing is more exasperating than to have a breakdown on the road and not have the means with which to help yourself.

2 Learning to Ride

Learn to handle a bike before you buy one. No doubt you have a friend who owns one. Perhaps there is an adult in your neighborhood who will let you get the feel of his motorcycle. Maybe he'll even take you for a spin or give you some riding tips.

Get on a motorcycle as soon as possible. Start by getting the feel of the machine without the motor running.

Take hold of the handlebars and push the bike around. Next, roll the bike to a roadway that slopes downhill. This should not be a steep hill, and the road should be lightly traveled.

Don't start up the engine. Just get on the bike, and then let its momentum roll you downhill. Keep your feet on the pegs and your knees against the tank. Remember that your right hand controls the front brake, and your foot (left or right, depending on the model) controls the rear brake. Let the machine roll freely, gathering speed, while you simply ride it the way you would ride a bicycle. If you can ride a bicycle, you can ride a motorcycle.

While rolling downhill, keep the bike heading straight, keep to the right side of the road, and occasionally glance back over your left shoulder. But for the most part keep your eyes front. As you reach the bottom of the hill, begin pressing lightly on the foot brake, and then press harder to bring the bike to a

full stop. Then place both feet on the ground, and use the hand brake to keep the machine from rolling.

After rolling downhill several trips, start using both brakes at the same time. You'll be surprised at the stopping power of the brakes when they're used this way. Then, as you're rolling downhill, start practicing gentle swings left and right—just the way you would do it on a bicycle.

Having thus become familiar with the weight and handling of the bike, start up the engine and roll downhill the same way as before. You may even want to blip the engine a few times on your way down. This will test your coordination between handling the machine and the throttle at the same time.

This brings you to the next stage of learning to ride—starting to roll in first gear under power and doing it solo. For this practice you need an empty area on level ground and with virtually no traffic around you.

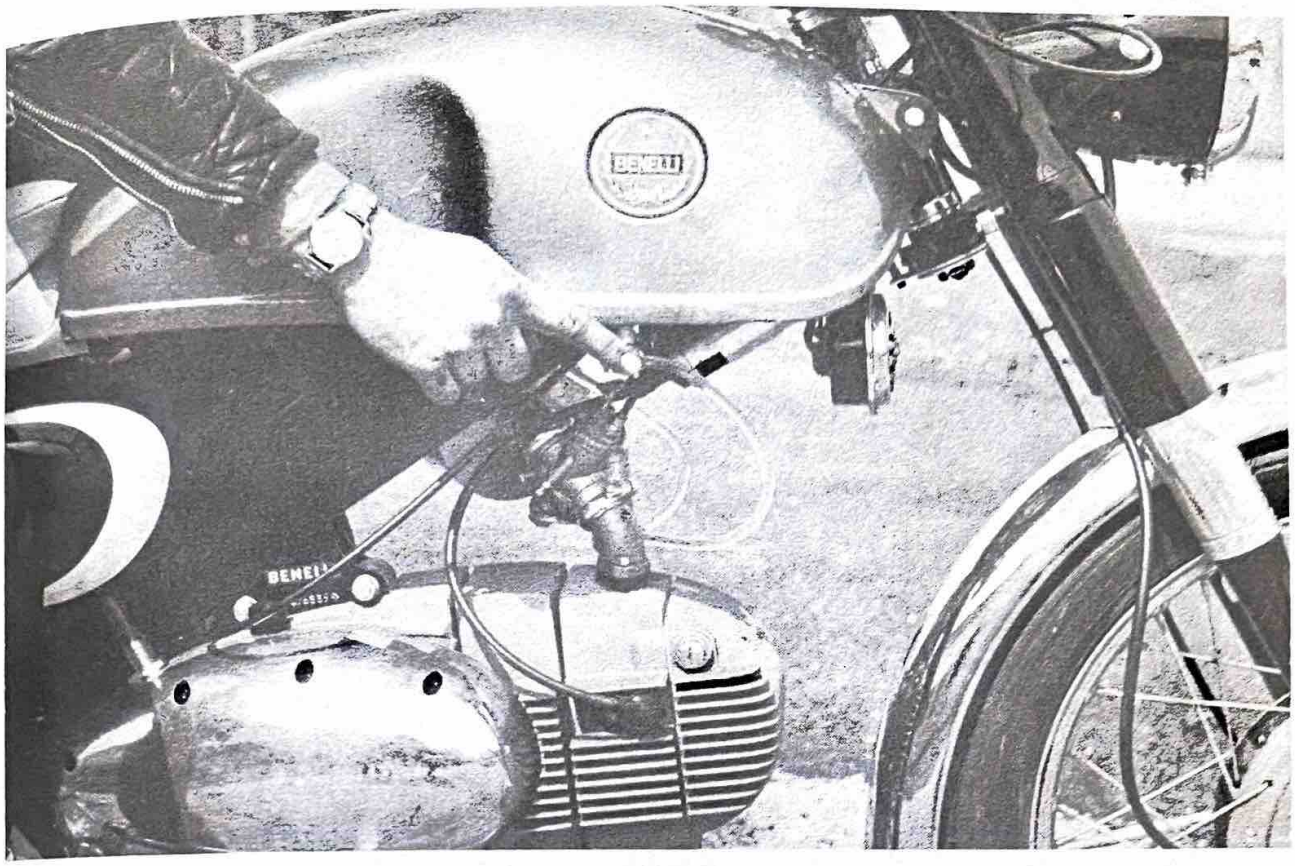
Pull on your gloves, strap down your helmet, and fit your goggles in place. From now on helmet, goggles, and gloves are a must.

A word of warning: Whether you're a beginner or an experienced rider, *never let anything distract you* when you're operating your motorcycle!

Now that you'll be in charge of a live engine, let's retrace our steps so that you get the whole picture right.

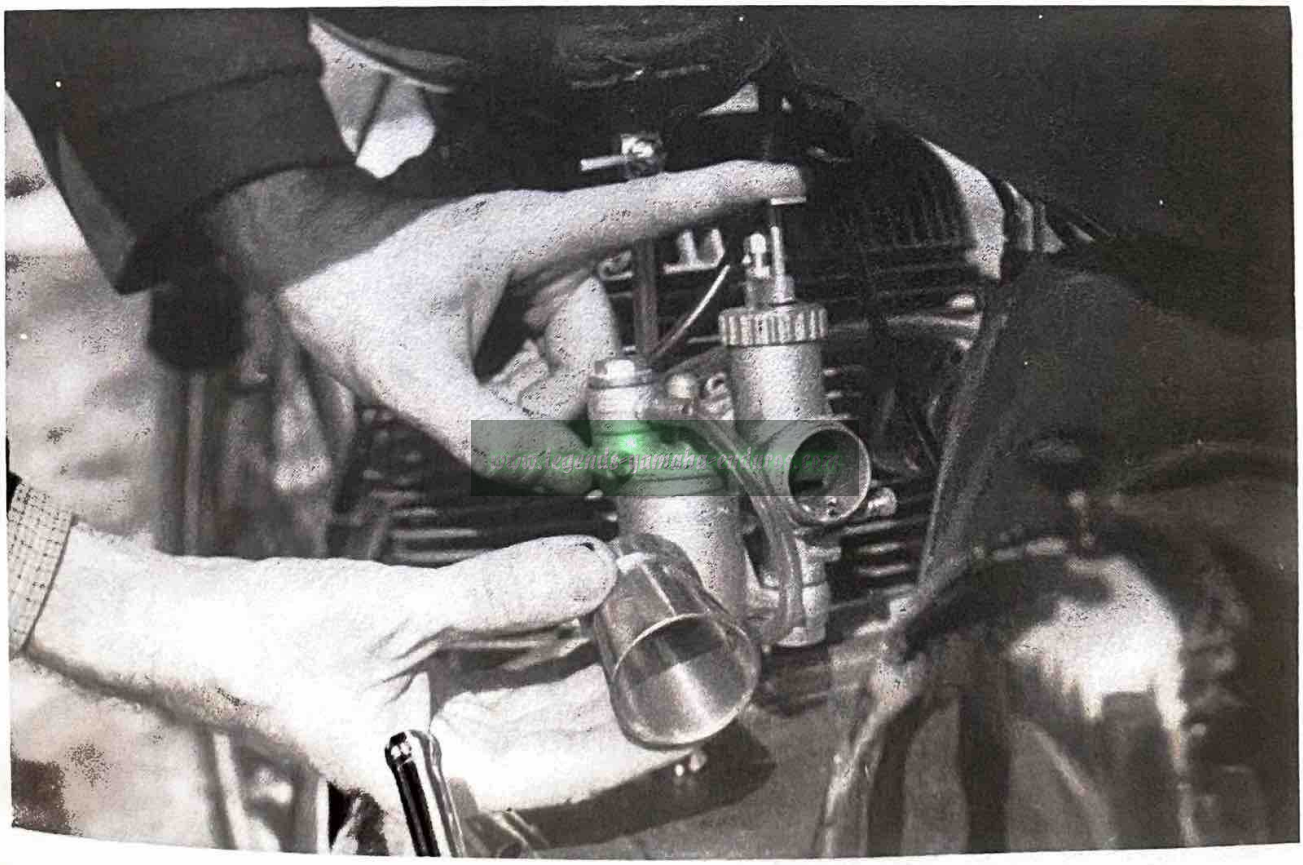
Most likely the machine will be on its center stand, and the engine will be shut off. As a beginner, you should practice starting the engine while the bike is up on the stand because this eliminates the problem of balancing the machine and kicking at the same time (the problem is eliminated if your bike has an electric starter).

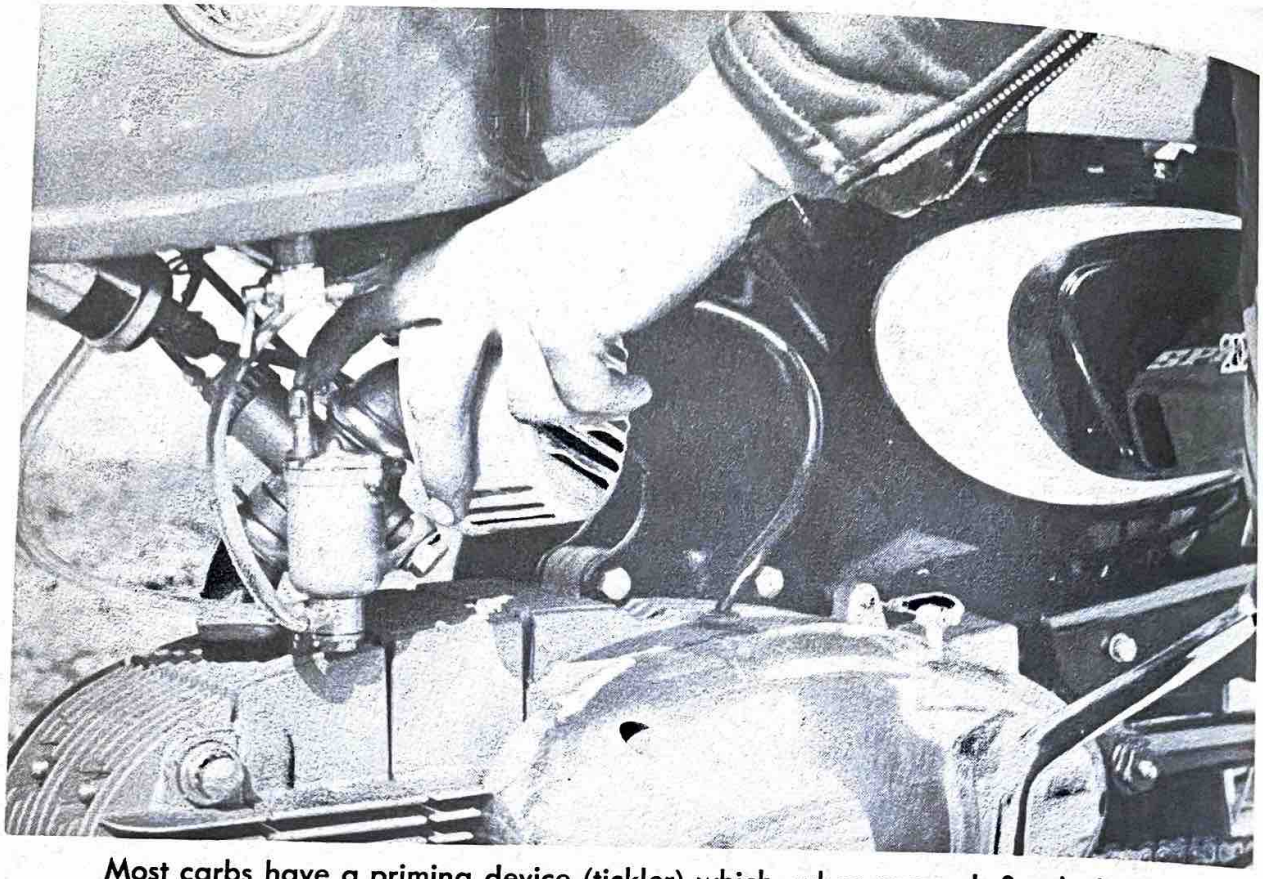
Starting up a cold engine can be difficult or it can be easy, depending on how much you know about carburetion and ignition. If the engine is in good mechanical condition, meaning



Before trying to start up the engine, rider checks gas in the tank and opens the fuel valve.

To enrich the fuel mixture for cold weather starting, rider pushes down choke lever, as shown on this Dell'Orto carb, to cut off air supply. Velocity stack is removed to show throttle slide inside carb.





Most carbs have a priming device (tickler) which, when pressed, floods the carb with raw fuel to help start a cold engine. Never press hard against the tickler.

that no part is broken, shafts are not bent, gear teeth are not chewed away, all connections for gas and electrical power are tight, the engine should start after about three kicks of the starter lever.

It should. Sometimes it doesn't, or it may start after twenty kicks, which won't make you happy.

Experienced riders have a way of starting a cold engine, and their system never seems to fail. This is the way it's done:

1. Check the fuel level in the tank, and open the gas line valve underneath the tank to let gas flow into the carb bowl. If the engine you are starting is the two-stroke type with automatic oil feed, check the oil level in the separate oil tank. On a four-stroke engine, check the oil level in the crankcase; on a two-stroke, check the oil level in the gearbox. Gears must be in neutral.

2. If the weather is on the cold side and if your carb is equipped with a choke, set the choke partially or fully closed. This is the way you ensure that the engine will draw in more gas than air, which helps it fire up on the first kick. In warm weather you will not need the choke.
3. Prime the carb by pressing down the tickler or priming rod located on top of the bowl. Press down *gently* for a count of two or three. This floods the carb and ensures a rich mixture for starting.
4. With the ignition still *off*, open the throttle halfway and kick the engine over several times so that the piston draws in the rich mixture. Close the throttle.
5. If the weather is on the warm side, set the ignition *on* and kick the engine over sharply. It should start on the first kick. If the weather is on the cold side, set the ignition *on*, prime the carb once more, and then use the kick starter. Again, the engine should fire up on the first try.

The manner in which you kick against the kick starter is also important because—everything else being equal—this can spell the difference between a start and a no-start.

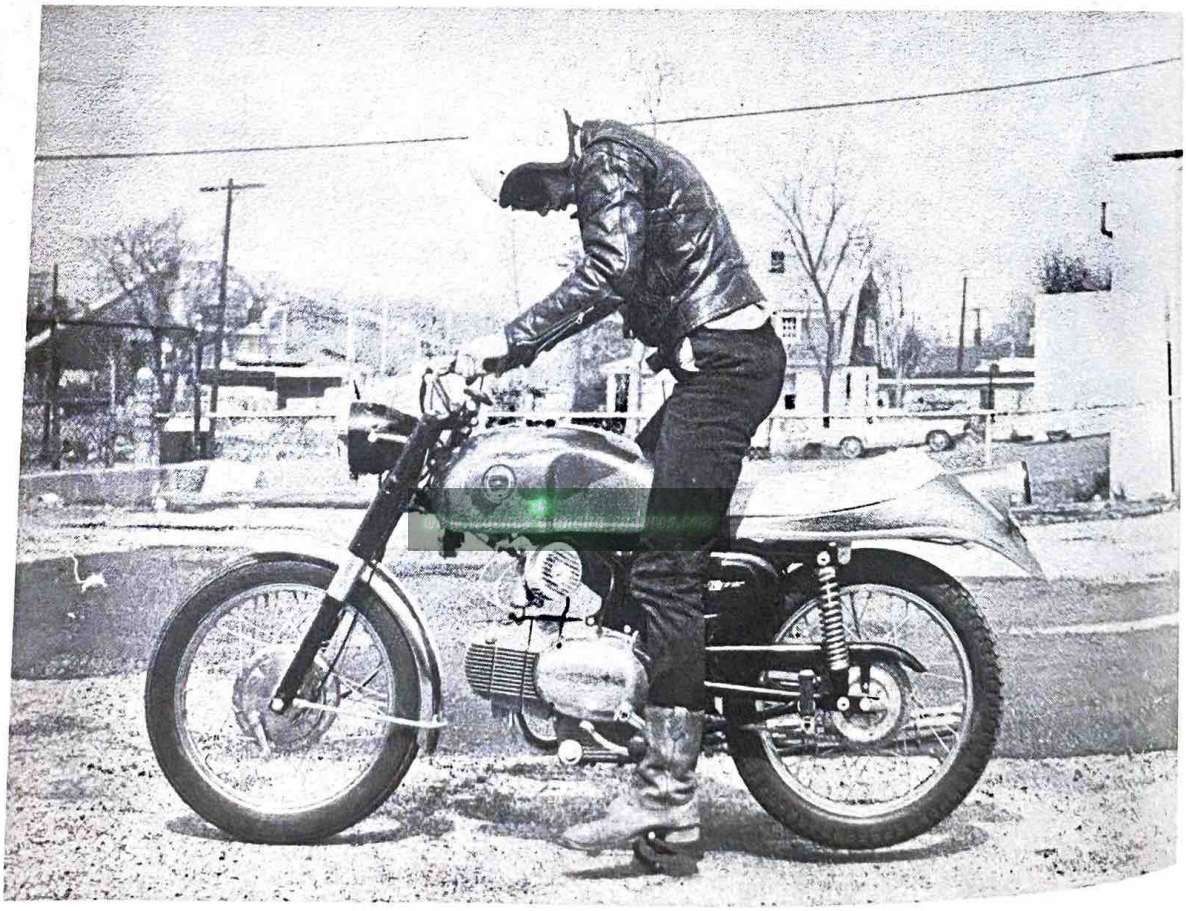
Position the kick starter lever at the top of its stroke, then bring the lever down slightly with your foot until you feel engine compression. This means the piston inside the cylinder is on the upstroke, compressing the fuel mixture, and just about ready to fire.

Hook your heel into the lever and point your toes down so as not to strike against the peg. Now lift yourself up, hands on the handlebars, and bring your full weight down into the kick. Kick sharply, and kick through—as if you wanted to go clear around the stroke!

If the engine fails to start on the second kick, it will mean poor carburetion (too lean or too rich a mixture) or faulty igni-

Experts begin kick starting with the lever high up, on a compression stroke. Note rider's body weight about to come down onto slightly bent leg.

The kick must be completed to the bottom of the lever's stroke, cleanly and forcefully, and held there for a moment.



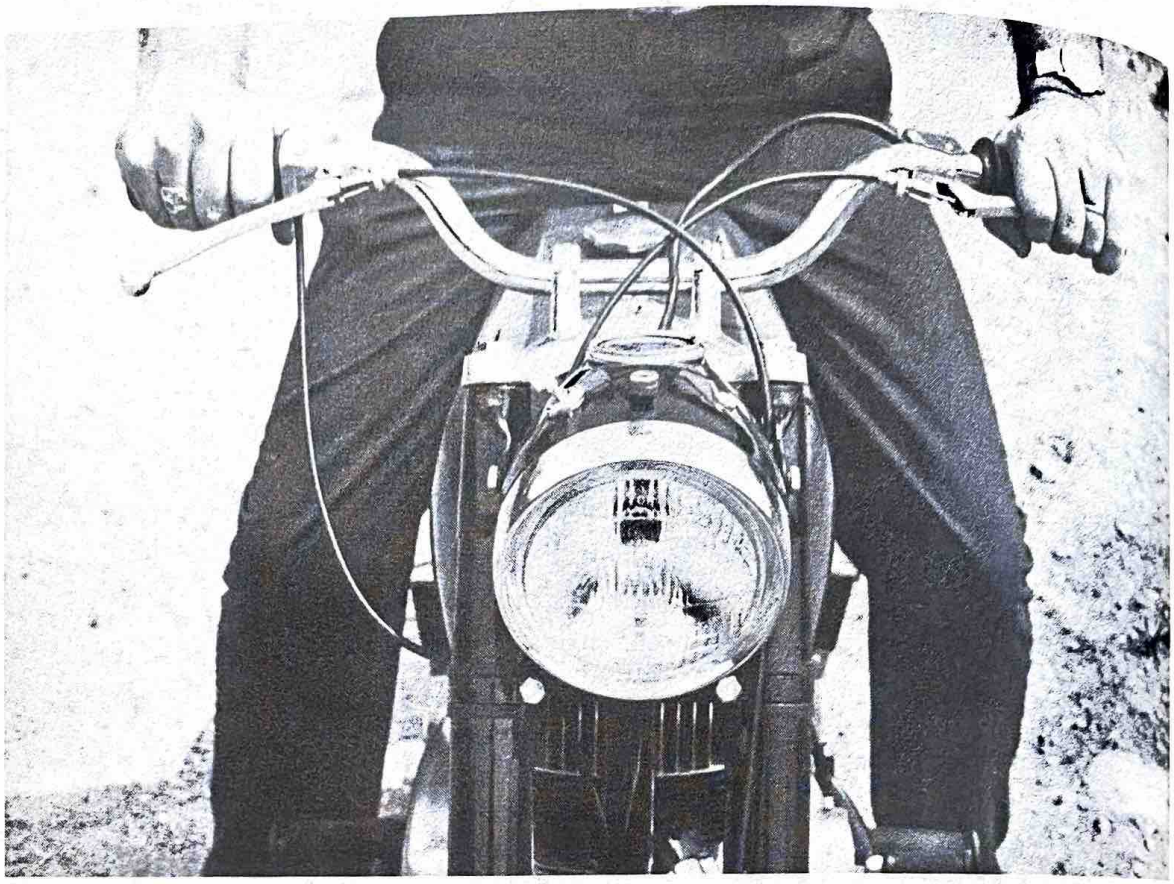
tion (loose wires, poor gapping at the spark plug or points). We will discuss troubleshooting and maintenance in another chapter.

Once the engine is running, open the choke partially or fully. In very cold weather keep the choke on for at least one minute. Since motorcycle engines are cooled by air passing over the cylinders, it is not a good idea to stand still too long with a running engine. Play the throttle to keep the engine running, until it warms up. Push the bike off its center stand.

At this stage we will assume that the engine continues to run so that you may start learning how to handle a motorcycle under power. You're in a clear, flat, and traffic-free area, ready to go.

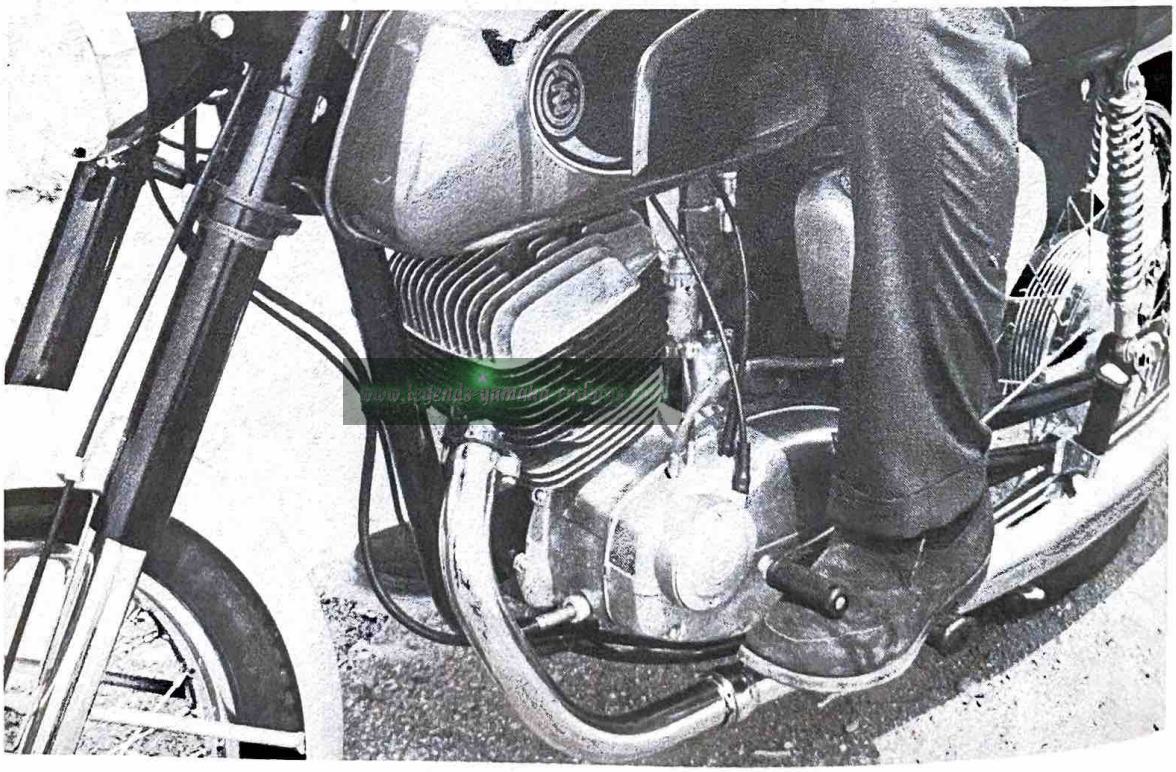
And the going is easy indeed.

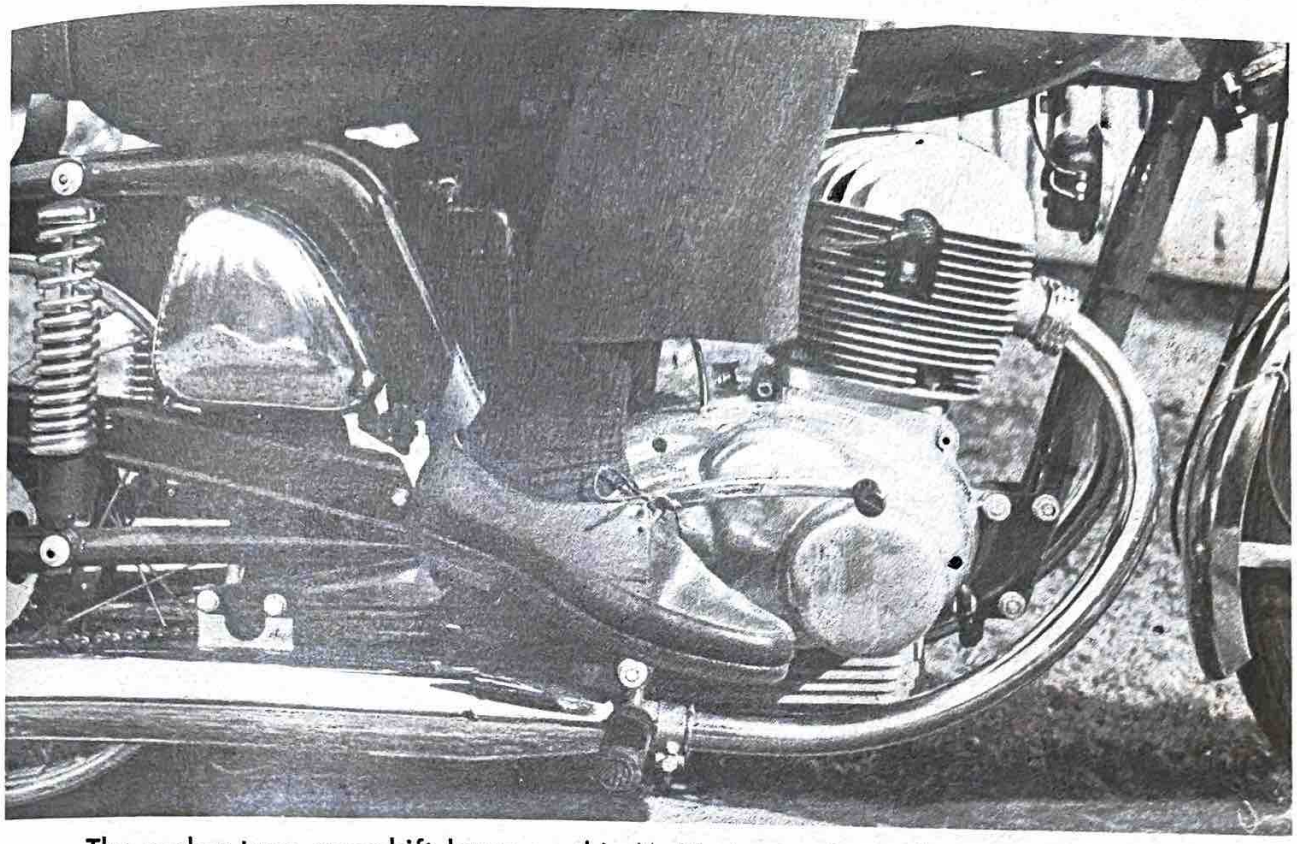
1. With both feet on the ground for balance, lean the machine away from the gearshift lever side, all the while holding the front brake on with your right hand. Then with your left hand squeeze the clutch lever on the left handlebar, and hold it squeezed in. The clutch is disengaged.
2. Using your foot, shift into first gear. On most models this gear is one position up from neutral, so that you'll hook your toes under the shift lever and then lift upward until you hear the gear click into position. If your bike has a rocker-type shift lever, then you can press down against the back part of the lever with your heel. Straighten up the bike, both feet on the ground, clutch lever still held squeezed.
3. You are now in gear and ready to move forward. Let go of the front brake lever with your right hand and open the throttle just enough to speed up the engine. Keep both feet on the ground to balance the bike, and then start releasing the clutch—slowly, smoothly. You'll feel



When the clutch lever is pulled, the clutch plates inside the engine housing are disengaged so that rider may shift into gear.

With clutch disengaged, rider can shift gears freely. On this CZ the shift lever is lifted from neutral once for first gear, then is tapped down for higher gears.



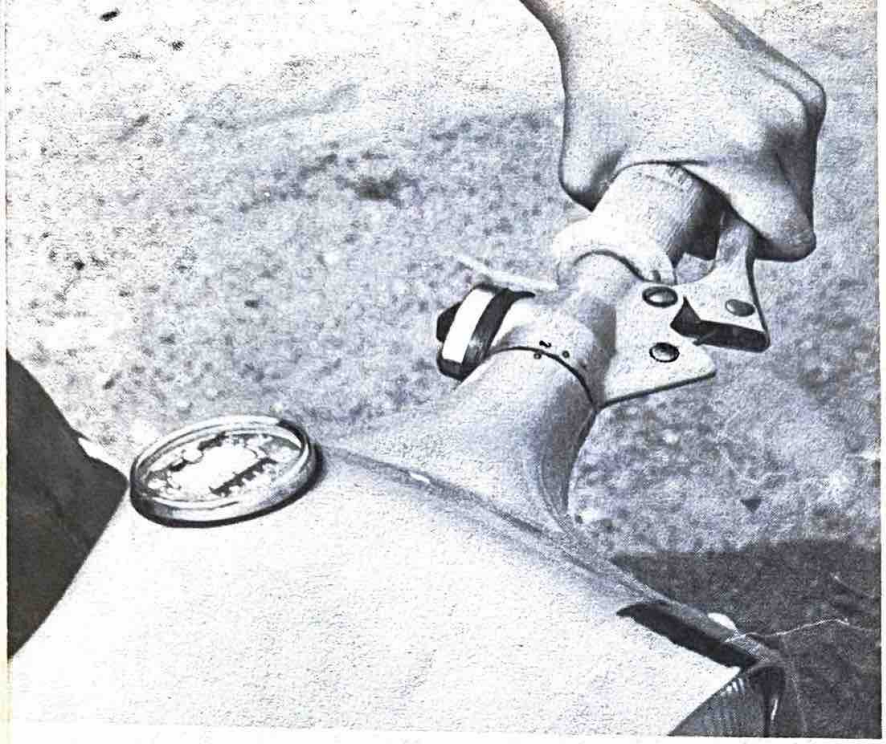


The rocker-type gearshift lever on this M. V. Agusta is on the right side of the machine; the heel is used to kick into first gear, then the toe taps forward lever down for higher gears.

the machine moving forward. The clutch plates are beginning to grab. Continue releasing the clutch all the way, and add just enough engine power to keep rolling. Place both feet on the pegs and ride the bike.

4. After covering a distance of about fifty feet in first gear, disengage the clutch by squeezing the left lever, shut the throttle to idle the engine, and with your foot tap the gearshift lever lightly to get back into neutral position. Release the clutch lever fully.

If you're not sure you have the neutral position, try opening the throttle slightly, very slightly, and if you feel the engine pulling, it means you're still in gear. If this is the case, squeeze the clutch, use the brakes to come to a stop, then shut off the ignition. If, however, you are in neutral, then simply apply the brakes and bring the bike to a stop.



On this Benelli scooter the left hand operates the clutch (shown pulled) and the gearshift by twisting the grip (shown in second position).

It's as simple as that. If you do it as just explained, you'll not have any trouble with this first practice. Keep this point in mind: If you don't give enough power when releasing the clutch in first gear, you'll stall the engine. And if you give too much power, you'll have a jackrabbit start and may lose control of the bike.

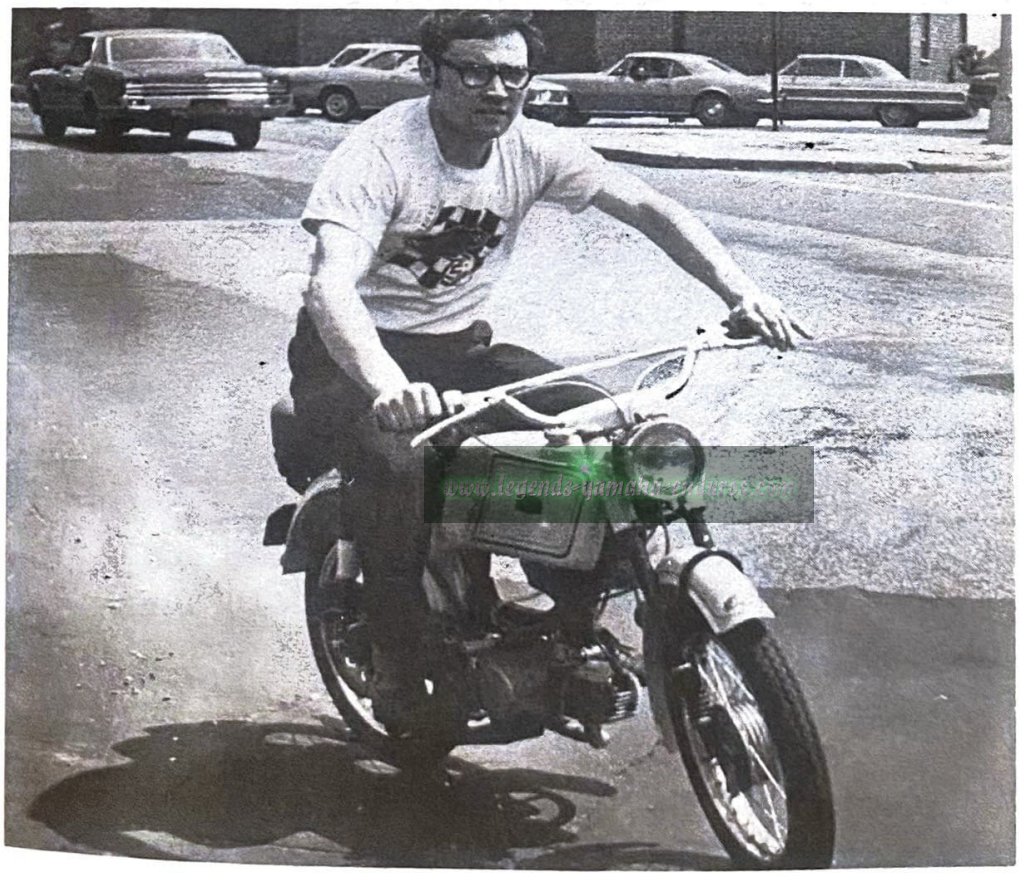
Keep another point in mind. It has to do with the *power-to-weight ratio* of the machine under you, and it simply means that any sudden application of power in first (and second) gear will move you forward awfully fast. At this stage of your learning you don't want any surprises of this kind. So practice riding in first gear until you're able to use the clutch and the throttle smoothly and naturally, with the machine under your control.

After riding awhile in first gear, you'll be ready to shift up into second gear, and then into third, and finally into fourth or top gear. Most bikes have a three- or four-speed gearbox; some models have five, six, and even as high as eight gears. The high number of gears does not make shifting complicated. It just means that the machine has a close ratio gearbox designed for smooth acceleration without straining the engine.

Shifting from first to second gear again calls for you to squeeze the clutch, tap the shift lever downward once past the neutral position, then release the clutch and apply power. For second gear the releasing of the clutch does not have to be slow. You can actually let go of the lever and open the throttle the moment you've selected second gear.

Upon reaching second gear, most beginners make the mistake of easing up on the throttle. The physical and emotional tension connected with learning how to handle a live engine causes them to feel that they've accomplished the ultimate by merely reaching second gear, and at this point they expect the engine and the gearbox to take care of things. So they shift into second, let out the clutch, and then dillydally along with the throttle barely open. What happens is that the bike slows down and the engine begins to lug—the thing you don't want the

As bike starts to roll when the clutch is released slowly, rider feeds more gas by twisting right grip. Shifting to next gear calls for pulling the clutch again, shutting off the throttle, selecting the gear with the gear lever, then releasing the clutch as the throttle is opened.



engine to do under any circumstance. So the moment you're in second gear, open the throttle smoothly and get the bike moving. And the same advice holds for the next higher gears.

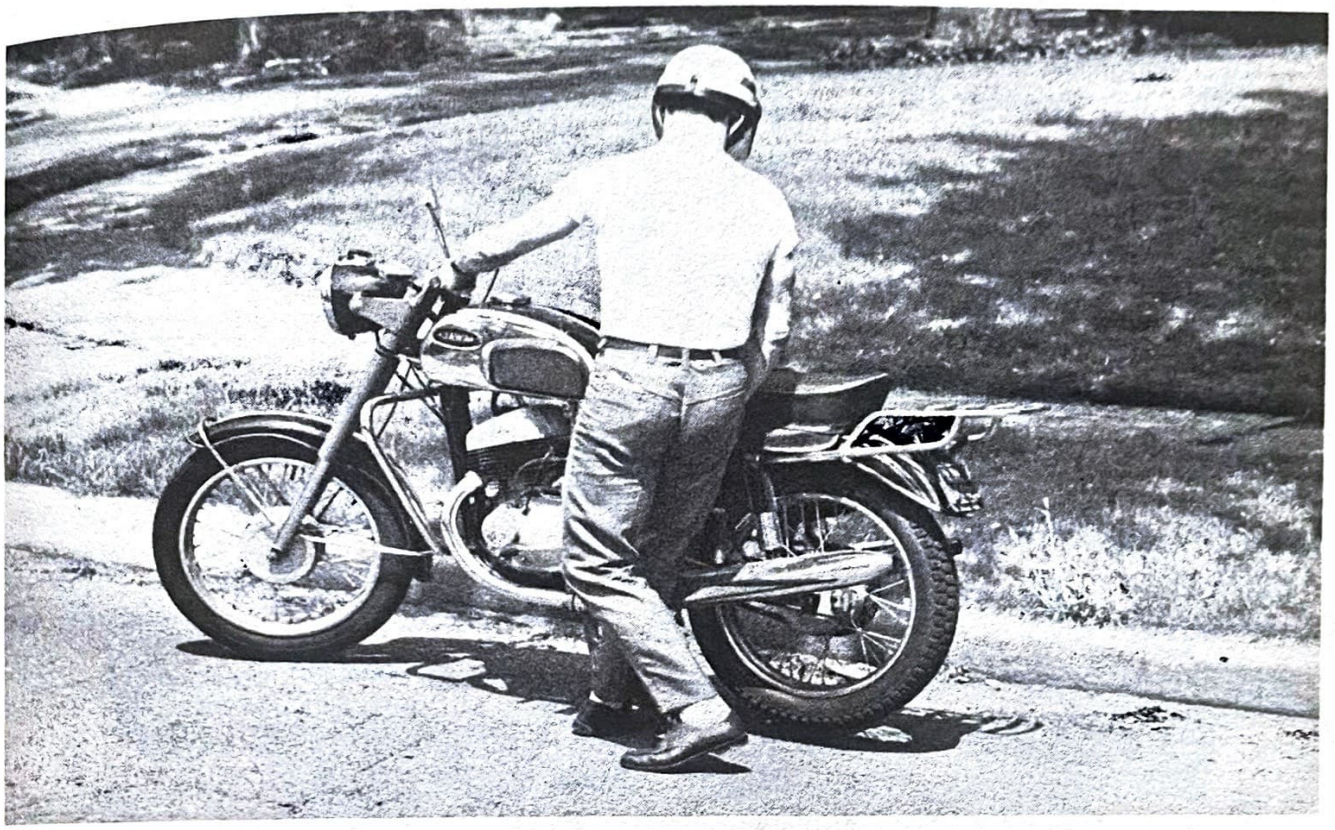
Keep in mind this rule about shifting: It is better to wind out the engine in a lower gear than to lug it in the wrong high gear.

Only practice in shifting will teach you to recognize the right rpm (revolutions per minute) sound for shifting to the next gear. It's the way experienced riders do it. If your bike is equipped with a tachometer, which tells you how fast the engine is turning, then you may want to use this as a guide for shifting, handling the engine strictly by the book. Many riders use the speedometer as a guide, especially if the face is marked off with numbers to show when to shift to the next gear.

But all it takes is a little practice to recognize the increase or decrease in rpm when you open or close the throttle. Do not race the engine needlessly, and also do not strain it in the wrong gear.

As you're riding around and practicing how to use the clutch and the gears and the brakes, you may experience small difficulties in locating the basic neutral gear position. The reason for the term "basic neutral" position is that many machines have secondary neutrals, usually between next-to-the-top and top gear. Some models, like the M.V. Agusta, have a neutral position between all gears, thus providing the rider with the convenience of a neutral anywhere along the line, and this eliminates the need to shift down three or four times to reach basic neutral.

As soon as you're able to shift from first to second gear, you'll have no trouble shifting through the gears to top gear. Keep up the practice on a straight road, then simulate traffic conditions which call for you to come to a full stop often, and then start up again in first gear.



With right foot against the lowered stand and holding the left handlebar and the frame at the seat, rider can easily lift the machine onto its center stand by pulling back and upward.

Whenever you want to come to a stop during this early practice, always do it by disengaging the clutch and using both the front and the rear brakes. Once stopped, get the gears into neutral. Then start up again in first gear.

After each practice ride, shut off the engine. First pull out the ignition key, or turn it to the off position. And then be sure to close the fuel valve under the tank.

If you shut off the ignition and the engine continues to run, you are faced with the condition known as *preignition*. This means that the inside of the cylinder is coated with carbon deposits which, in their extremely hot state, keep firing off the fuel mixture. To shut off the engine, place the bike in second gear and let out the clutch quickly, stalling the engine. An-

other way of doing it is to close off the choke. Preignition is not desirable, so have the condition remedied.

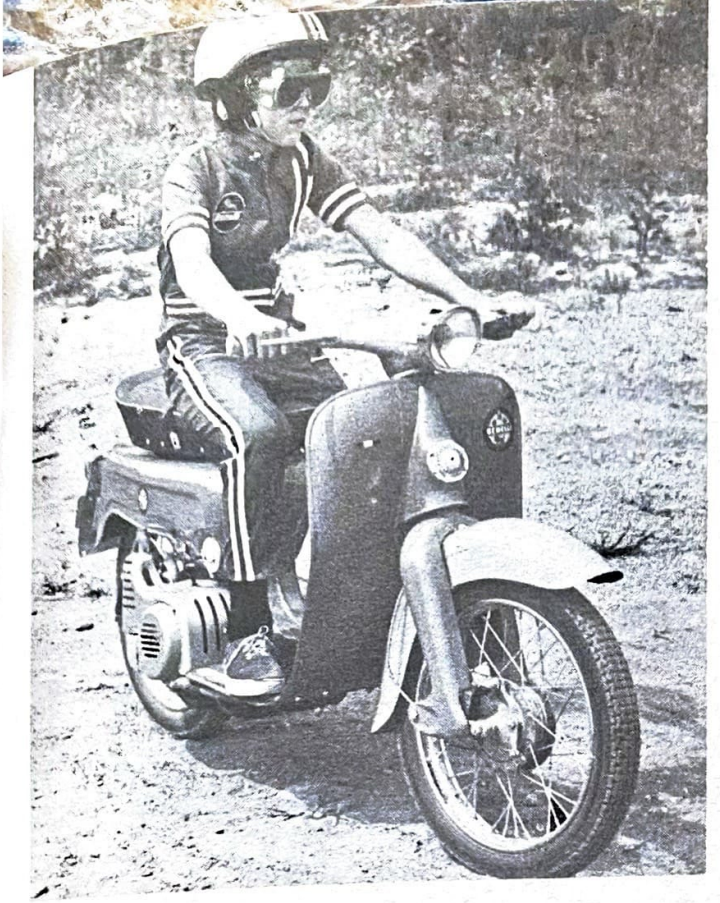
If you will not be using the bike for a long time, a good technique is to "starve" the engine to a stop. Simply shut off the fuel valve under the tank and let the carb use up all the gas in the line and in the bowl. When the engine dies out, shut off the ignition.

With all this done, lift the machine onto its center stand. This can be done without straining yourself. Roll the machine to where you want to leave it, drop the stand so it touches the ground (be sure the surface is solid), and place the sole of your right foot at the bottom of the stand to keep it from sliding backward. Then turn the handlebar to the left, holding it with your left hand, and with your right hand grab the frame under the seat, or the handle fitted to the frame on some models. Then simply press away with your right foot and at the same time use your arm power to pull upward and to the rear. Try it a few times until it all becomes as easy as lifting a chair.

The outlined practice for handling the clutch and the gears and the brakes is important because it's the only way to prepare yourself for controlling the unexpected situations. Too many beginning riders do not prepare themselves for handling the motorcycle in tight quarters or in slow-moving traffic. All they want to do is open the throttle and roar away at top speed. That kind of riding is too easy, and it's too dangerous.

After a few weeks of practice, you too will find it very easy to speed up through the gears. But the true test still is how well you can handle your bike, under perfect control, at slow speeds, in tight circles, in figure eights, in smooth start-ups, and fast, sure stops.

If you can do all that, your next practice will have to be in shifting down through the gears, because this shifting down is



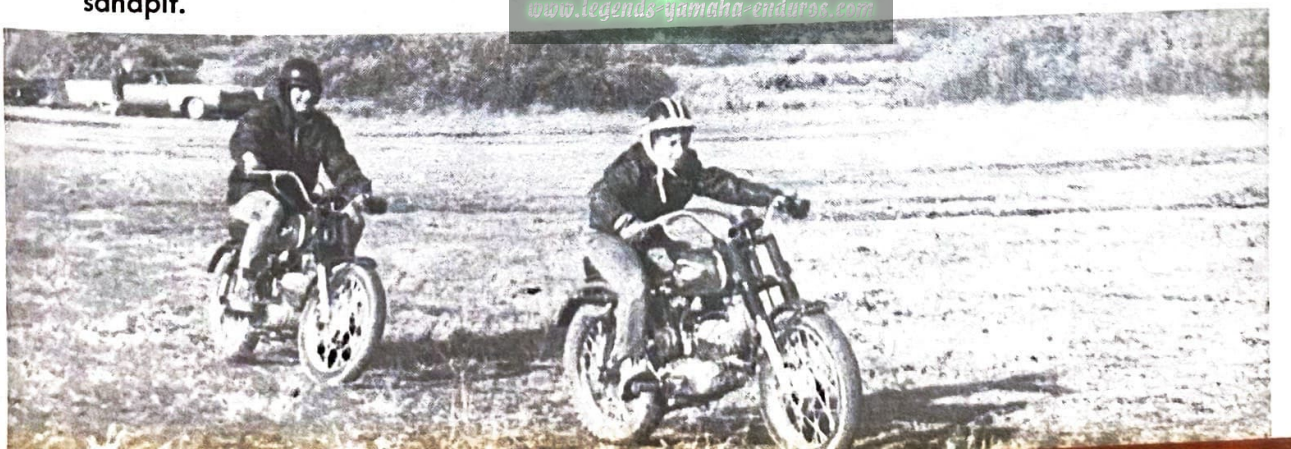
A rider is maneuvering a Benelli scooter at slow speed, has pulled the clutch, and is ready to shift to next gear.

the mark of the expert. When done correctly, this technique gives you better control of the machine and also saves the wear on brake linings.

For this practice you get up to top gear, let's say fourth, and you begin shifting down. You want to drop back from fourth gear to third gear. Maybe the traffic has slowed, or maybe you've started climbing a hill under insufficient power and speed, and the engine has begun to lug.

Remember this rule for shifting down: Engine rpm must equal the next lower gear's rpm for that road speed. In simpler terms, don't use an idling engine to catch the lower gear. It can be done, all right, but it will wear out the clutch in a hurry.

Using identical H-D Bajas, father and son play tag around an open area of a sandpit.



Dropping one gear lower is not difficult if you remember to keep up the engine rpm after you have selected the next lower gear and just before you let the clutch grab. It works like this: You're doing 40 in top gear (fourth). You pull the clutch (disengage) and lift up the shift lever once for third gear, and you shut the throttle for the instant—but then you open the throttle to rev up the engine, and then you let the clutch grab. Smoothly and without jerking, you have made the shift from fourth to third. Close down the throttle and the bike slows down.

Repeat the same steps, and drop down to second gear, always making sure you rev up the engine before you let the clutch grab.

At this point you have the choice of dropping into neutral or even going into first gear for really slow traveling—or coming to a stop.

Once you get used to the up-through-the-gears and down-through-the-gears game, you'll want to put it to work for practicing circles to the left and right sides. At first your circles may look a little squarish, oval, or otherwise rough. But as you keep running the bike around and around, clutching and shifting, you'll soon develop excellent control.

But don't let the good feeling develop into overconfidence. Overconfidence is like throwing the reins over a horse's neck and letting it take you where it pleases. You want to control the machine all the way and not let it run away from you.

Basic training in handling a motorcycle properly is so important that many major motorcycle companies have sponsored rider training programs for youth groups.

For example, R. D. Rockwood created for Yamaha a complete instructional program which has been used with high school groups to instruct new riders in four basic points: how to start, how to operate, how to stop under normal conditions,

and how to stop under emergency conditions. This program points out that speed is not a factor in learning, but perfect control of the machine in first and second gear is. Besides actual practice on lightweight 90-cc Yamaha machines, classroom sessions dealing with written examination requirements of particular states are included in the program.

Similarly, some years ago the Cairo Public School started a pilot training program for the state of Illinois in driver education training for motorcycles, and for this purpose American Jawa provided a dual-control trainer machine—the only machine designed for giving the student actual road-riding practice with the instructor along and in control of the machine in case of emergency.

The makers of the BSA (Birmingham Small Arms) cosponsored, with the Southern California Automobile Club, the Boy Scouts of America, and the Los Angeles Police Department, an instructional program that taught fifteen Boy Scouts how to ride, with the skills and knowledge necessary for safe operation of a motorcycle in today's traffic. The boys were members of Explorer Post 981-X. After classroom work and basic training in riding, the group covered a 200-mile run from La Mirada to Lake Arrowhead Boy Scout Camp over a Saturday and Sunday. The run was supervised, of course, by sponsor personnel, and they did not have so much as a single bad incident.

For interested groups BSA makes available an instructional film, *The Critical Hours*, for classroom use. American Jawa has motocross racing films, and American Honda similarly provides several excellent productions, the most famous of which is *The Invisible Circle* in full color. The mentioned motorcycle companies, along with others, are more than willing to cooperate with authorized leaders of youth groups who want to learn what motorcycling is all about and how to ride safely.

By this time you should be very familiar with the ways of

A California high school group of boys and girls, with their motorcycling instructors and the bikes on which they received their basic riding instruction, which was sponsored and supervised by the police department of their city. (*Yamaha International*)

your own machine. You know, for instance, that anybody can open up a throttle and speed off. But you also know that the big test is not how fast you can run a bike but rather how precisely you can handle it at slow and intermediate speeds.

Can you make it through perfect circles in first and second

Members of Explorer Post 981-X are checked out by instructors before their 200-mile run from La Mirada, California, to Lake Arrowhead camp. (*Birmingham Small Arms*)

Here a Scout rides a BSA machine through a prescribed practice course. The program covered lectures and riding instruction for safety in traffic long before the run was scheduled. (*Birmingham Small Arms*)

gear and do it to both sides? Can you execute wide and tight figure eights and do it smoothly? Are you able to come to a near stop, nearly standing still, balancing yourself without touching the ground with either foot, and then shift to first gear and move off? Are you able to hold a curve at speed, or do you wobble through it? Do you start off like a jackrabbit because you can't handle the clutch and throttle? How often do you stall the engine? Next time you're out riding, try these maneuvers and see how you make out.

In another chapter you will read about various techniques of skill which you may want to try after you've gained more experience, but at this stage there are two basic techniques you should know. The two techniques have to do with the quick start and the quick, hard stop—both of which can be handy in case of an emergency.

Let's take the quick start first.

For whatever reason, you want to pull away fast from a standstill, and you don't want to mess it up with a stall-out. Don't try a quick start or jackrabbit getaway in tight traffic. Practice on a straight open road where, even if you stall out, you can try again until you get it right. Once you master this technique, you'll find it useful in different situations, including tight traffic.

Your engine is idling, and the gears are in basic neutral. From here on everything will hinge on how well you pour on power and let the clutch grab. Pull the clutch and get into first gear. Now start letting go of the clutch and at the same time open the throttle, winding out the engine. If you make the first ten feet without stalling out, keep going. Then work the clutch, gear lever, and throttle almost together. Pull the clutch as you barely ease off on the power, shift to second, let the clutch pop in, and open up fast. Hit third gear, then fourth. If you do it right, you'll almost slide back off the saddle!

Success depends on not letting up on the power once you decide to go. It's a valuable technique, and it's not difficult even for a beginner.

Now try the fast, hard stop.

This technique may come in handier than the quick start, and you should know how to do it safely. It's very simple: Use both brakes, and use them hard!

What you want is a hard straight-line stop, and you want it under complete control. If you use one brake alone, you have a chance of sliding to one side. Use them together and you'll be surprised how effective they can be.

A warning: If you're in a curve, *do not* use either brake! If you see a curve ahead, use your brakes *before* you reach the curve, or shift down one or two gears, depending on the time

you have left in which to do it. You want your machine to be upright when you apply the brakes.

This is one rule you cannot afford to ignore: Don't hit the brakes when you're in a curve.

Heading for Lake Arrowhead, new riders follow the project pace car, entire group maintaining a sensible separation pattern. (*Birmingham Small Arms*)

3 Buying Your First Motorcycle

Before you pick your first motorcycle, decide whether you want a mini, a scooter, a regular street bike, or a hot competition job. By doing this you eliminate a lot of confusion.

Since the minis, scooters, and competition models are rather specialized and do not require complicated comparisons, let's take a look at the great category of regular street bikes. If you know the model or models you like, look in the telephone directory for the nearest dealer. Visit his showroom. Look over the models carefully. Collect all the advertising folders you can, and visit another dealer, where you'll repeat the process.

Visit at least four dealers, and collect material that will help you evaluate the different models. Evaluate them in the quiet of your own room, comparing them feature for feature, item for item, performance for performance, and price for price. This will help you narrow down the field to fewer models over which to worry.

Don't be in a hurry to buy. After you've narrowed it down to two or three machines, talk to riders who own them and see how they feel about their bikes. Ask them how they feel about the particular dealers. Listen carefully. Even then don't be in a hurry. Evaluate what you have read, what you have seen, and what you have heard. For this is the only way in which

you can pick the one bike that will be right for you and the one dealer who'll treat you right.

Let's assume that you have decided on a machine. You know the size of the engine in cc's, and you know the weight of this machine. You're sure you want to buy this model because it has all the features you like. It looks good, and you hope it will handle nicely when you get your demonstration ride.

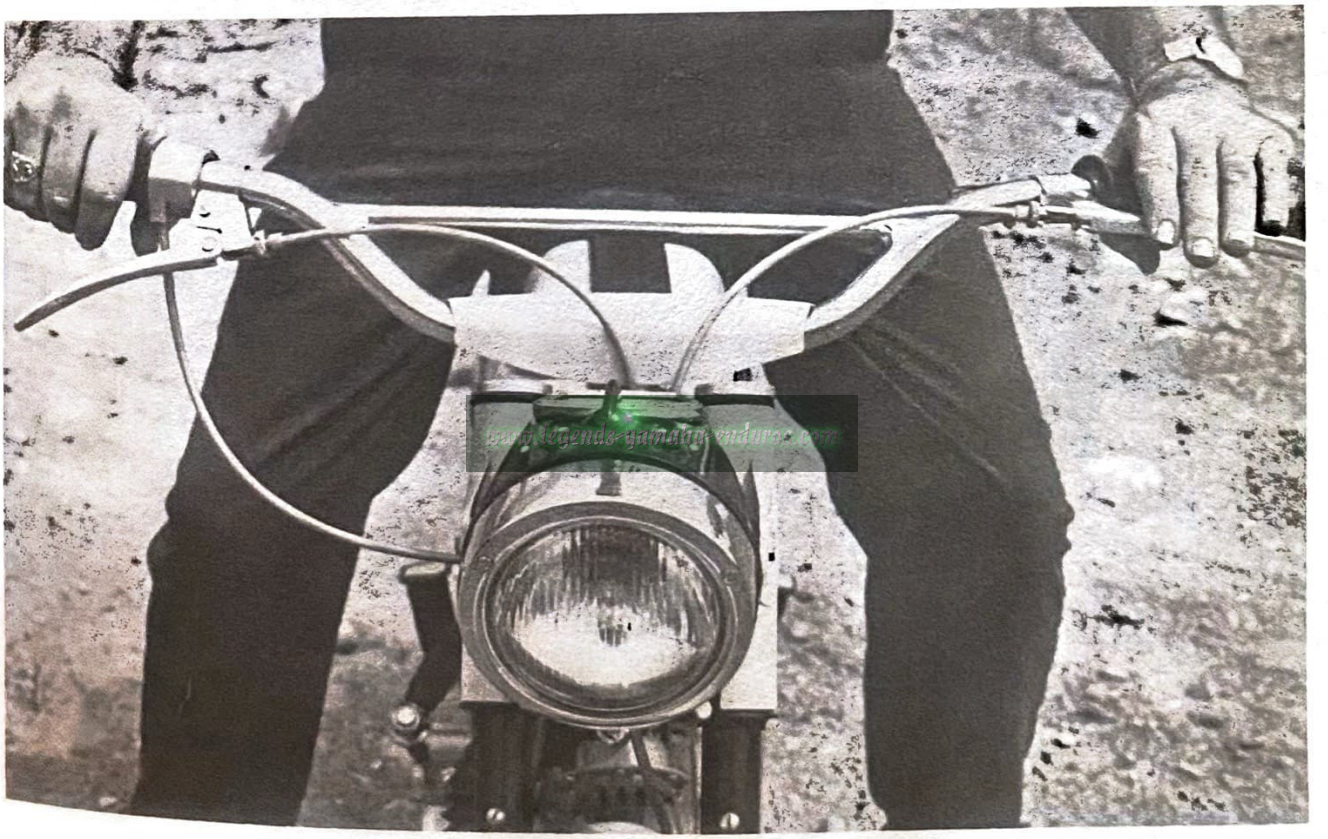
This is the time to check out the bike with your family's insurance broker. The reason the insurance broker enters the picture is that most states require you to carry basic property damage and personal liability insurance. This is where the weight of the motorcycle and the size of the engine become important in certain states, because insurance rates are often computed on this basis. Rates vary of course from state to state and even from locality to locality in the same state. In New York, for example, the rate for an under-300-pound machine (called a lightweight) is nearly half that of anything over 300 pounds.

Right at the start you'll be faced with insurance costs. If you plan to use the machine for relaxed tooling around in town, the all-around costs of owning a lightweight will pay off in many ways. If you want better performance because you'll be climbing steep grades and sometimes carrying a friend as a passenger, and money is not a problem, then you'll need a machine with a bigger engine. This would be the place to compare the available models with the same size engines to see if perhaps one of them is under 300 pounds, or whatever weight requirements will keep you in the lower-cost insurance bracket.

When you buy a new machine, be sure you understand the terms of the warranty. Have the salesman explain the fine print. Be sure that an owner's manual, and if possible a parts catalog, is given to you, along with a set of tools. Many riders also purchase a shop manual in which they can find detailed

When selecting a two-wheeler, check the ground to seat-top distance. Rider's feet should comfortably reach the ground.

Sitting on the motorcycle, the rider must feel right when he holds the handlebars. Clutch and brake levers must be within easy reach—fingers, hand, and wrist forming a straight line.



repair and overhaul procedures, just in case they want to tinker with their motorcycle.

Before you make your final decision, get the salesman to take you for a demonstration ride. But remember that this kind of riding has nothing to do with how the bike will feel when you take over the handlebars. What you learn from a demonstration ride is the feel of power or the lack of it as the machine is taken through the gears. If you pay attention, you'll also find out whether or not the engine is easy or hard to start. And if you go over rough roads, you'll learn how good the suspension is.

When you return to the showroom, do what experienced riders do when they begin evaluating a new machine.

First, remember that sitting on a stationary bike may feel very comfortable. But you must also feel comfortable once the bike is under way and going over different kinds of road surfaces. Comfort and handling go together. You must feel at ease in the saddle, and once under way, the bike must handle easily and naturally. There are models that look as if they can outperform anything on the street, then turn out to be unstable and hard-riding.

Second, make sure your feet reach the ground easily when the bike is off the center stand. This is an important point, because a high seat can be awkward in stop-and-go traffic. Another thing about the seat or saddle is its width, which can be uncomfortable if too narrow or if too wide.

Third, do the handlebars feel too narrow or too wide? While they can be adjusted for height, they cannot be squeezed or forced apart. In connection with handlebars, remember that the extremely high type, called ape-hangers, not only are illegal in most states but do not give you good control of the machine.

Fourth, look down and see where the exhaust pipe is in relation to your leg, and then decide whether or not this may be awkward once the pipe gets hot. Yes, the special shielding around the pipe will protect you, but a hot pipe and very warm shield in hot weather can be a nuisance. If not a nuisance for you, it may be one for your passenger.

Fifth, check the hand controls and the foot controls to see whether they work easily. Are the foot-operated levers spaced sensibly when you try to shift or use the brake pedal? Also check the swing of the kick starter to see if your toe or heel catches in the peg.

Sixth, if the salesman starts up the engine, note whether it fired on the first or second kick or if starting was difficult. And once the engine is running, decide if the exhaust sound is the kind you can live with.

Seventh, sound the horn. It should be clear and loud, not feeble like a weak buzzer. It's also a good idea to check the brightness of the headlight and the effectiveness of the stoplight at the rear.

The next step is for you to ride the machine yourself. Ask the salesman to let you take the machine for a trial run.

Start up the engine—yourself. Decide whether it was easy or hard. Next, make up your mind not to abuse the machine in any way. Take the bike out for a ride, go up and down through the gears, handle the brakes, and do the whole thing over and over.

What you want to find out is how the bike behaves in your hands. Everybody handles a bike differently. You handle it your way. You are now the test rider putting the machine through its paces, checking if the handling and comfort suit you. Now you'll find out if the suspension system reacts well on a rough road, if the engine pulls effortlessly when you open

up, if the brakes are tops or just so-so, if the bike wobbles or runs straight after hitting a bump, and if the overall riding qualities are comfortable or leave something to be desired.

Learn about these things *before* you sign the purchase order.

Now that you own a motorcycle, you'll need certain basic equipment to go with it, and this equipment has to do with both safety and comfort.

Make sure you have at least one mirror (on the left handlebar); another mirror on the right handlebar gives you an even better view of what's behind you. But don't neglect to turn your head to make doubly sure what's behind you before you change lanes or start a turn.

If you read even one copy of any motorcycling magazine, you'll learn about the pros and cons of wearing a helmet. In many states the law says motorcycle riders must wear a helmet and must also wear shatterproof eye protection, usually in the form of goggles or a face shield. Anyone who has ever taken a spill on a motorcycle will vouch for the benefits of helmet and goggles, especially if his head hits the road, a wall, a tree, or the side of a car. Since competition riders wear both, there is no possible reason for not wearing a helmet and eye protection.

Competition riders wear special boots and padded gloves to protect their hands and feet in case of a spill. They don't expect to spill any more than you do, but they wear these items, along with heavy trousers and jackets, just in case. So make it a rule to wear full shoes (no sandals and certainly no barefoot riding!) and gloves to suit the weather conditions. For wintertime riding you'll need heavy, lined clothing, and for the rainy season you'll need special waterproof coveralls.

With your equipment and machine ready to ride, you're still faced with two legal requirements: Your machine must be registered with the State Department of Motor Vehicles and must

carry a license tag, and you must be licensed to operate your machine. Normally the dealer is willing to help you on both counts.

Many states issue a junior motorcycle operator's permit or license for fifteen- and sixteen-year-old riders.

The riding test itself is never so difficult that a rider who knows how to handle a machine cannot pass the first time out. The details of the written test and riding test will be covered in the next chapter.

4 Riding in Traffic

The laws for registering a motorcycle and licensing a driver vary from state to state. Visit your local Department of Motor Vehicles and ask for all the booklets available for motorcycle riders. This is your only way of familiarizing yourself with what you must know and how your bike must be equipped.

Here are a few examples from the New York State manual:

1. Riders are not allowed to ride more than two motorcycles abreast in any one traffic lane.
2. You are not allowed to ride a motorcycle between rows of cars in lanes of traffic or between lane traffic cars and those parked at the curb or at the side of the road.
3. You are not allowed to pass other vehicles on the edge of the lane. (In order to pass a car you must move into the adjoining lane.)
4. You must use hand signals (or lights, if your machine is equipped with them) to indicate your intention to stop or to make a turn. (For stopping, extend your left arm downward at your hip with palm facing to the rear; for a left turn hold your left arm straight out to the left at shoulder level; for a right turn crook your left arm at the elbow so that your hand is pointing over your head to the right.)
5. Day or night, you must ride with your lights on.

The state manuals or booklets will give you a good deal of other valuable information that will help you pass your written and riding tests. For example, you'll learn which special roads or parkways are closed to you, how you're expected to park your bike in city streets, and that certain bridges may be closed to you on very windy days.

The inspector who conducts your road test will want you to demonstrate how well you can handle a motorcycle and how familiar you are with traffic rules. With sufficient practice on your part the riding test should be easy.

You'll be asked to run your bike in circles within a small square area and then in figure eights in a larger area. You may be asked to ride in traffic to show how well you can handle the bike on the road, while the inspector follows in a car. In some instances you may have to demonstrate a zigzag run between rubber cones.

Generally, the test is easy, but what can make it difficult is your nervousness, physical tension, or the desire to drive perfectly. Now think back to your practice (in isolated areas away from traffic, if you didn't have a rider's permit, or on the roads and in the streets with a licensed rider along, if you had a permit). All that practice was meant to give you the confidence and the know-how for the riding test. Imagine your inspector is another enthusiast (which he probably is) and that you're showing him how well you can do things on two wheels. Relax and ride your bike as if it's the only thing you've ever done.

Now that you have a driver's license and your bike has a registration tag, you can ride in traffic. This calls for concentration and patience. You must keep in lane and flow with the rest of the motorists, speeding up or slowing down as the traffic demands. You must be aware of every car near you; you must anticipate situations that may develop twenty cars ahead. A motorcyclist must always be prepared for the unexpected.

To better understand your position in traffic, imagine that you are an automobile driver following a motorcycle. You're driving alone on a four-lane highway. You're in the fast lane with the slower traffic on your right. There is a motorcycle driver in front of you traveling at 10 miles below the speed limit. Now all that you want is for the rider to either increase his speed to what the limit permits or move to the right into the slower lane so that you can pass him.

You blip your horn once. There's plenty of room in the right lane. You know he heard your horn. But he continues to ride in front of you. So you blow your horn again. The motorcycle rider doesn't even turn his head. So you pass him on the right side. He looks at you, and you give him a look of anger. And then you decide that all motorcycle riders are arrogant fools and should not be permitted on the roads.

Put yourself in another example. You're sitting at the wheel of your car in the middle of a city street, waiting for the light to turn green. A motorcycle rider is alongside you, and he too is waiting for the light to turn green. Then, as soon as the light turns green, both of you move ahead in the normal manner, except that the rider speeds up a little more and then cuts in front of your car—and turns into the avenue. His turn forces you to jam on your brakes, and you again decide that motorcycle riders as a lot are not very smart.

For the next example of how *not* to act in traffic, you are again behind the wheel of your car, and you're barely moving, bumper to bumper. All the cars are tightly lined up in lanes, and suddenly a motorcycle roars through between the cars, just missing doors and fenders. You growl and shake your head in disbelief. What would happen to the bike rider if one of the cars suddenly moved into his path? Well, again you decide that all motorcycle riders are arrogant fools and should not be permitted on the roads.

You can help the sport of motorcycling by making a good impression with sensible, skillful driving. In traffic hundreds of people will instantly witness your attitude all within a mere fifty-mile range of riding. It's the big test.

Now let's discuss the actual traffic riding techniques that you need in order to ride in utmost safety. The techniques revolve around conditions, and these can be sorted out as follows:

Separation.
Speed.
Quick Start—Panic Stop.
Passing.
Horn Signals.
Headlight—Rear Lights.
Rain.
Intersections.
Distractions.

As you know, aircraft are separated from each other in flight by air traffic controllers in airport towers. Separation provides safety for every plane. As a motorcycle rider you must see to it that you have plenty of separation in the road traffic that surrounds you. You must be your own traffic controller.

Whenever you ride close behind another car, you are ignoring the factor of safety that *separation* provides. If the car in front of you stops suddenly, for any reason whatever, you'll need enough separation in which to react—either for stopping or for moving into the next lane. Stopping at slow speed is not a problem, but tailgating the end of a car at 50 or 60 is stupid.

The higher your speed, the greater should be your separation. At high speed everything becomes more critical—your reaction time, road surface conditions, brake effectiveness. Also bear in mind that at high speed any distraction—looking too long at the scenery, watching another car or motorcycle, talk-

ing over your shoulder to your passenger—can suddenly reduce your separation to the danger point. Keep your mind on separation! If you must look at something, make it a glance. If you must tell your passenger something, keep your eyes front. If you want to look at the scenery, pull off the road and enjoy the view.

A road-safety slogan says "Speed kills," but the experts tell us that speed in the right place and under the right conditions does not kill. What kills is the wrong rider speeding in the wrong place.

Most motorcycles are lightweight machines with excellent power-to-weight ratios, which means they can pick up speed fast. They can also stop fast. So too many riders get the idea that they can control this easily. They can, under the right conditions. But under the wrong conditions—speeding and then having the unexpected suddenly loom up—they meet with disaster.

You can learn a great deal by watching how the experts handle their machines in street traffic. Their technique is in the correct use of the gearbox. They start up smoothly, flow with the traffic, maintaining speed and also maintaining separation, and they ease to smooth, controlled stops every time. They almost never resort to jackrabbit starts. They don't wind out the engine to the red line in every gear; they don't weave in and out of lanes or between tightly packed cars. And so they never slam into such obstructions as trees, curbs, rear ends or sides of cars, trucks, or buses.

Now, let's take a look at passing. Whenever you pass another vehicle, obey the rules of the road, always signaling your intention and always being on the alert so as not to be surprised by another vehicle. The whole secret for successful passing is in the word "surprise": You don't want to surprise the driver behind you and certainly not the driver of the car you're passing.

Never pass if you cannot see what's ahead.

Never squeeze into a position between cars in order to pass.

And always glance back before you start passing! Even if your mirror doesn't show anything bearing down on you, glance back to make sure that the mirror isn't lying.

If you have directional light signals on your motorcycle, use them to show the driver behind you what you intend to do; or use hand signals, as required by law.

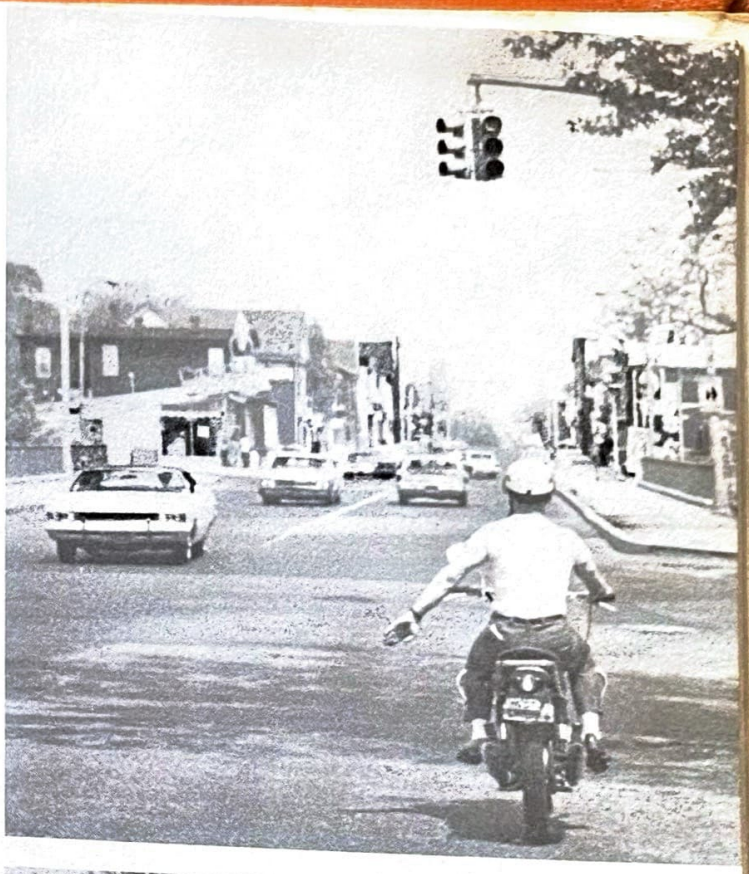
The use of the horn by motorcycle riders is a touchy subject. Some say you should use it to let car drivers know you're near them, and others say you should ride in such a manner that the use of the horn is completely unnecessary.

Most motorcycle horns produce a high-pitched sound, and most car drivers don't like to hear that high-pitched sound, particularly if it's close at their side. It has a startling effect, even an irritating one. Use the horn as a signal only.

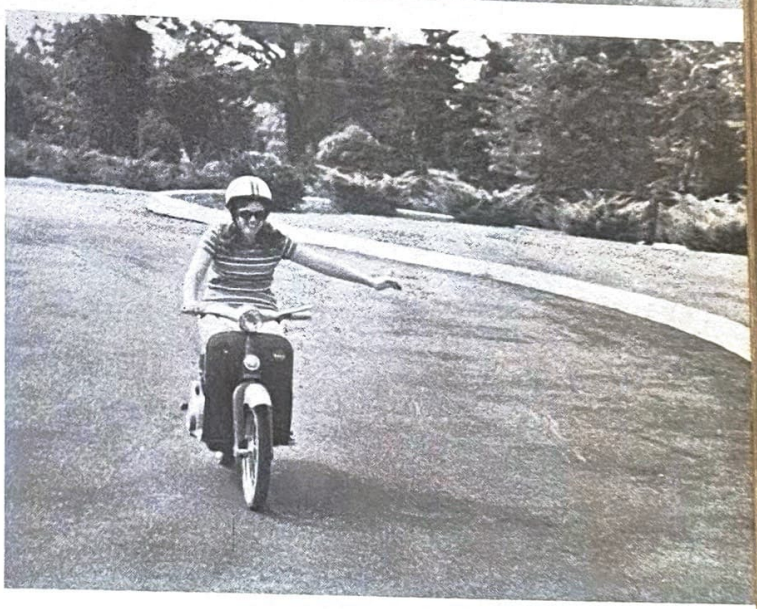
The headlight and rear lights of your machine should be in perfect working order whenever you ride at night. Before starting out, check the operation of your low and high beams and the rear stoplight. If the glass of either lamp is dirty, wipe it clean so that it gives best illumination and that others may easily see you.

When you ride at night, you should be twice as cautious as when you ride in daytime. Keep in mind that various light reflections may confuse you, and any momentary confusion can spell trouble. Fast riding compounds your problems. And wearing sunglasses at night is about as necessary as pointing your exhaust pipes to the front.

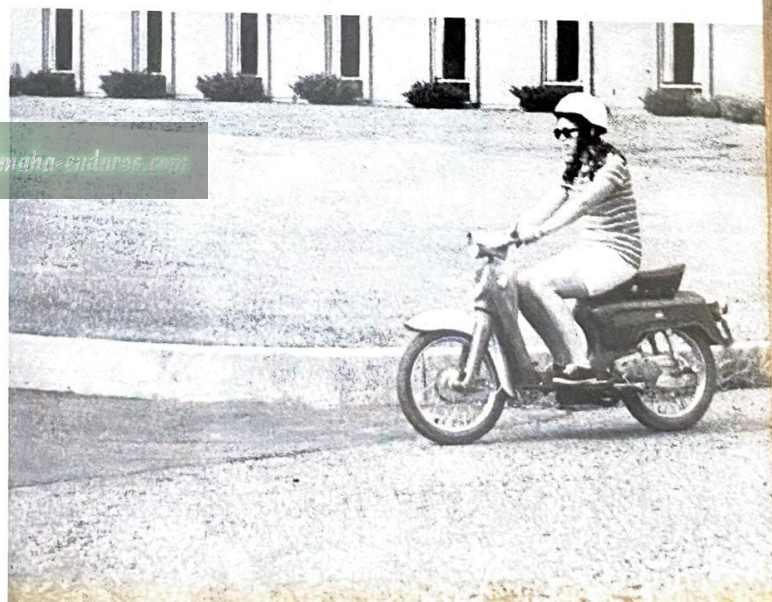
All vehicles behave one way on a dry surface and an entirely different way on a wet surface. When a car skids on four wheels, it's nothing more than a skid. But when a two-wheeler skids on a wet surface, it's usually a bad spill, with damage to the machine and the rider.



A motorcycle rider in traffic always signals his intentions. Note stoplight overhead and signal that bike will be brought to a stop.



A beginner practices signaling a left turn while keeping the machine under control.



All turns must be set up *before* reaching the corner. Here a rider practices a right turn from the right lane.

If you're riding and it begins to rain, remember that this beginning rain and the oil and dirt on the road will form a very slippery substance. If the rain continues to fall in a downpour, the water will wash away the oil and dirt, so you'll be able to ride at higher speeds (not meaning wide open). Needless to say, you'll be wearing effective rain gear.

If you add the darkness of night to the rain, you have the most critical riding condition. At night the wetness reflects every light source, even when that light source is far from you. These reflections have a way of confusing you, and they also have a way of confusing car drivers. For this reason experienced motorcycle riders avoid the combination of night and rain.

Did you know that most accidents take place at intersections? Wherever one road crosses another or feeds into it, there is the possibility that somebody isn't going to pay attention to the STOP or YIELD sign or to the control light. So you as a motorcycle rider need only one piece of advice as you approach an intersection. *Do not* depend on the signs or on the control light. Look to all sides as you slow down, and then either ride through or make your turn. And whenever you make any turn, always make it from the proper lane so that you don't cut in front of a car.

While the car is the main thing on the road that you must be concerned with, aside from weather conditions which make riding dangerous, there will be a few surprises waiting for you nevertheless.

The worst is the iron-grated bridge surface, or trolley tracks, maybe even railroad tracks. Riding a motorcycle parallel to any track or to a deep cut in the road surface can easily cause loss of control. As you ride along, you won't be aware that you're approaching these hazards, and they'll take you by surprise. About the only defense you have is to watch far enough

ahead in order to spot these hazards. On iron-grated bridges, slow down; if possible, cross the bridge at an angle—even a slight angle helps. As for tracks and deep cuts in the road, cross them at sharp angles, always.

Now consider man's best friend, the dog. For some reason even the friendliest dog seems to like to chase motorcycles. You'll be riding along a street or a lonely road, and all of a sudden you'll hear a rushing sound behind you and then the outburst of barking. Yes, you'll be scared. Being scared is natural, depending on the size of the dog, but don't let yourself fly into a panic. Riders report that a barking dog will keep a distance as he continues to run slightly behind you and to the side, all the while barking. They claim he's bluffing, and that he will not come closer. Some riders report that when they come to a stop the dog comes to a halt too and continues barking. But everything depends on the disposition of the dog, so advice is risky here. You can easily outdistance him, but in heavy traffic this too is risky—either you or the dog can get hurt. On an open road the advice is to keep pouring it on and get rid of the nuisance.

As a dog is attracted to motorcycle riders, so is a bee. This problem arises when you wear loose-fitting clothing—the bee accidentally flies inside your shirt, you become aware of your problem and start a wild brushing away with one or both hands trying to get to the bee, and this leaves the bike free to run into an accident. Advice: Don't wear loose clothing. A bee also has a way of flying in under a face shield, in which case simply lift up the shield and let the rush of air take care of the bee.

So far most of your riding has been solo. Riding in pairs or in large groups calls for more caution on the part of every rider and also for prearranged signals to be used to let everyone know what to do in traffic.

A group of riders keeps in line and not too close together. The leader sets a sensible pace.

If you and a friend are riding on a wide open road, the side-by-side method is all right. If traffic is heavy, then one bike should follow the other, with adequate separation.

If you take the lead, glance back often to see if your friend is still with you. Any number of minor reasons could cause him to stop, and at speed it's not likely that you'll hear his horn signal. Also, pace yourself in traffic so that you don't create tight or dangerous situations for him. Don't speed through a light that has just turned amber. The lead rider, whether for two machines or a club of twenty, must think for the riders behind him as well as for himself.

There are three conditions that take the fun out of riding: an accident, an engine that won't start, and a flat tire.

By this time you know how to handle yourself in traffic so as not to have an accident.

You'll be told how to troubleshoot an ailing engine in another chapter.

That leaves a flat tire, the curse of all riders whether in city traffic, on the highway, or in competition.

When it happens to you—and it will, sooner or later—you can have it repaired if you're near a gas station where the mechanic is willing to do the job. Or you can do it yourself. Since it's not an impossible task, let's see how you go about it.

First, when you buy your bike, check the tool kit to make sure it contains tire irons. Some manufacturers include them, some don't. Then read the owner's manual to see how the manufacturer wants you to handle the wheel, tire, and tube. Even if the tool kit includes tire irons, it is not likely to contain a tube repair kit of scraper, patches, and glue, or a tire pump (Jawa models feature a pump). So you'll have to buy these items for the inevitable emergency.

The easiest way to patch a tube is to get the wheel off the machine, unscrew the valve from the stem, and let all the air out of the tube (walk around on the edge of the tire, with the wheel flat on the ground). Then pry one side of the tire off the rim. For the prying job, use a tire iron—not a screwdriver!

If a nail caused your trouble, you might be able to find the nail in the tire and so locate the hole in the tube. Otherwise you'll have to inflate the tube partially and then locate the spot where air is escaping. If you're near a creek, simply dunk the tube and watch for telltale bubbles.

Once you have located the hole, rub it down with the scraper. If you don't have a scraper, use a rough file. Usually the tube repair kit gives you the simple steps for patching—apply the glue to the tube, then peel the backing off the patch and fit the patch in place. You do all this, of course, with all the air let out of the tube.

Then you must fit the tube back into the tire carefully, then fit the tire onto the rim, without pinching the tube and causing another puncture. Be sure to center the valve stem through the rim hole, then begin fitting the tire into place. After you've completed the whole job, check the tire around the rim to make sure it is correctly seated, screw in the valve, then use the hand pump to inflate the tube to the correct pressure.

This is not an easy or enjoyable job, so check your tires for imbedded nails after every run.

5 Techniques and Skill

The motorcycle, like the human body, has limitations. You can jump only so far. You can lift only so much. You can stay underwater only so long. When you're tired, your mind and body slow down. These are your limitations.

The motorcycle can go only so fast, can stop only so quickly, and can take only so much stress. These are the limits of its performance, and it means that you can't make a street bike do things that a true competition machine is able to do.

If you are planning to practice rough riding at a sandpit or a scramble course, be sure you have the machine that can take the abuse.

And even if you're riding the right bike, after a day of hard riding practice be sure to clean up the machine. Sand and dirt have a way of packing in around the chain, sprockets, and other parts of the engine, wheels, and frame.

When you see an experienced motorcycle rider snap the front wheel of his bike off the ground and keep it up for a long run, you'll be tempted to try it too. If you happen to watch the riders in a motocross spin their machines around the hairpin turns, you too will want to get out there and try it. If you try these things and succeed, all will be well and good. But if you spill and if you hurt yourself, you won't like it.

The way to learn how to ride like the experts is to take it

Miroslav Halm, famous competitor from Czechoslovakia, tears uphill on a CZ to win the heat at Unadilla, New York, in 1970.

one step at a time. Take each step slowly enough to make sure you can handle it. The experts didn't just up and do it. They learned their techniques in easy steps.

What you're really about to learn is how to handle your bike under harder conditions than those of city and road riding. You'll be practicing at a sandpit or some other area where this kind of riding is allowed. Right from the start, keep in mind that you'll use caution throughout. You want to learn, not damage your bike and yourself.

First, inspect every important part of your machine, including the tires and the chain. Make sure all bolts are tight.

Then start up the engine and slowly ride around the area where you intend to practice, and check out the location of rocks, ruts, mounds, logs, mud puddles, old tires left lying around, and anything else that looks like an obstruction. And, finally, stake out your own area where you'll begin your first practice at becoming a hard rider.

Knowing how to *swerve* a machine suddenly can often mean the difference between a crash and getting out of a tight spot alive. Swerving means to change directions suddenly and at the risk of having the bike slide out from under you, which is also called "laying her down."

Imagine yourself riding behind a car in traffic, and the car comes to a sudden stop, so sudden in fact that you are totally unprepared to brake to a full stop. You don't want to slam wheel first into the car, so, to avoid a crash, you swerve sideways. Even if you hit the car this way, you're better off than going in headfirst. (Remember the rule about riding with separation? Had you maintained separation, you wouldn't be faced with this problem.)

To practice swerving, select a fairly hard surface at a sandpit and approach it at about 20 miles per hour. Keep your body relaxed. Hold the handlebars lightly, letting your elbows and

At moderate speed, the rider swings his 350-cc Jawa from a right to a left curve by simply leaning into it. Too much lean lays the bike down.

With left foot acting as the pivot, the rider leans the bike over hard and guns it around to the left. Note right foot near the brake pedal.

The lean and slide of the rear wheel keep the machine spinning around. If control is lost, pull clutch and shut the throttle.

shoulders absorb the shocks. As you approach the spot where you intend to swerve, wiggle your buttocks on the seat to get even more of a feel of the bike under you. Plan the swerve to the right.

Using your hips and buttocks, gently push leftward against the seat, and at the same time very lightly press the right handlebar *forward*—very lightly!

The moment you press the right handlebar forward, you'll feel the machine lean to the right. If you keep up the pressure, you'll be going into a right-side swerve.

Straighten out, circle back to your starting point, and go through the same maneuver again—but this time do it a bit more quickly. Sharpen the swerve. Then straighten out. Then with your hips and buttocks push the seat toward the right side, and with your left hand push against the left handlebar. Swerve to the left. Straighten out.

If you press too much, you'll slide the bike out. Your hand pressure against the handlebar shouldn't be too hard. A kind of quick jab, coupled with the right lean, does it nicely. At first you may doubt that a motorcycle will go to the right when the right handlebar is pressed *away* from the curve line. But if you do it the way it was explained, you'll find that it works and that it's exciting.

Whether you're on dirt or on concrete or macadam, overcontrol can result in a spill. And you can be sure of a spill if you try it on a wet or oily surface.

While practicing swerves and even laying the bike down, try to develop a feel for the machine's reaction to your hand and body movements. Keep relaxed. When the bike starts to slide out from under you, have the presence of mind to slide your foot along the ground on the lean side. You don't want the bike to trap your foot underneath.

If you happen to be watching an expert doing fast swerves

from side to side, note the way he keeps his head upright in relation to the ground. This trick gives the rider a better perspective and feel of the machine.

At the sandpits a quick turning around in one spot comes in as a practical maneuver when you suddenly decide that you want to go back from where you came. Some call it a *spin-around.*

All that you have to do is lean the machine hard over to one side, low gear selected and the clutch pulled, then play the clutch and the throttle so that the rear wheel spins—but without grabbing the ground too solidly. If the rear wheel bites into the ground too hard, the machine may run away from you.

The whole trick is to balance yourself and the bike on your supporting foot, which acts as the center of the circle. By keeping the handlebar turned slightly into the turn, the bike will go around and around so long as you play the clutch and the throttle right.

If the machine starts to run away from you, simply shut the throttle and pull the clutch.

To carry this spin-around to its logical conclusion, after you've spun the bike around once or twice, straighten out the handlebar, snap the bike upright, and then ride off in a straight line—just the way motocross racers do.

More likely than not, the sandpit will have some fairly steep dirt hills, and you'll surely want to run your machine up and down these grades. Remember that it's easier running a hill if the ground is hard; if it's soft ground, you can easily bog down right in the middle of it.

Let's try it *downhill* first. You'll find it easy, because all you have to do is keep your body weight farther back on the seat —or over it, if you're standing up on the pegs. In this way you'll have better control of the bike once you start heading

Rider keeps his body weight to the rear when running downhill. In unfamiliar areas it is dangerous to run downhill too fast.

When running uphill, rider leans forward and usually keeps off the seat. Power usually must be on all the way.

down. When you reach the bottom of the hill, take your natural sitting position.

On a long downhill run, don't overdo it with a lot of speed. Keep power on, but only enough to give you good control. Keep your eyes ahead, searching for rocks, tree branches, ruts, and anything that may be in your way to cause a problem. And if you must use the brakes, don't slam them on.

For an *uphill* run, select a short slope, and make sure no rider will be coming your way once you start up. Keep to a low gear, and keep the power on. As you approach the hill and start up, lean your body forward over the tank—and stay there. Keep power on all the way.

When you reach the top of the hill, ease off on the power and take your natural position on the seat. If you come up too fast, you'll find your bike leaving the ground in a jump. This

At high speed this motocross racer takes a hill in good form during practice. Note position of body off the seat.

is not serious under the circumstances or unusual. Just remember two things about running up a hill: You need power all the way, and that same power may produce a jump at the top of the hill.

It's the hill that dictates the amount of power and the gear to use.

If anything goes wrong halfway up and you find yourself bogging down, don't try to hold the bike upright with your legs. Simply lean to one side and fall over, and if possible keep the clutch pulled until you can kill the engine. Some machines have a kill-button on the handlebar for this exact purpose—by pressing the kill-button the rider shorts out the ignition to stall the engine.

Jumping a motorcycle is common practice by riders in *enduro* or *motocross* races. Racing against time, these riders don't slow down when they approach low or high mounds, or when they go into a gully or tear uphill out of one. They just ride at the highest speed possible under the conditions.

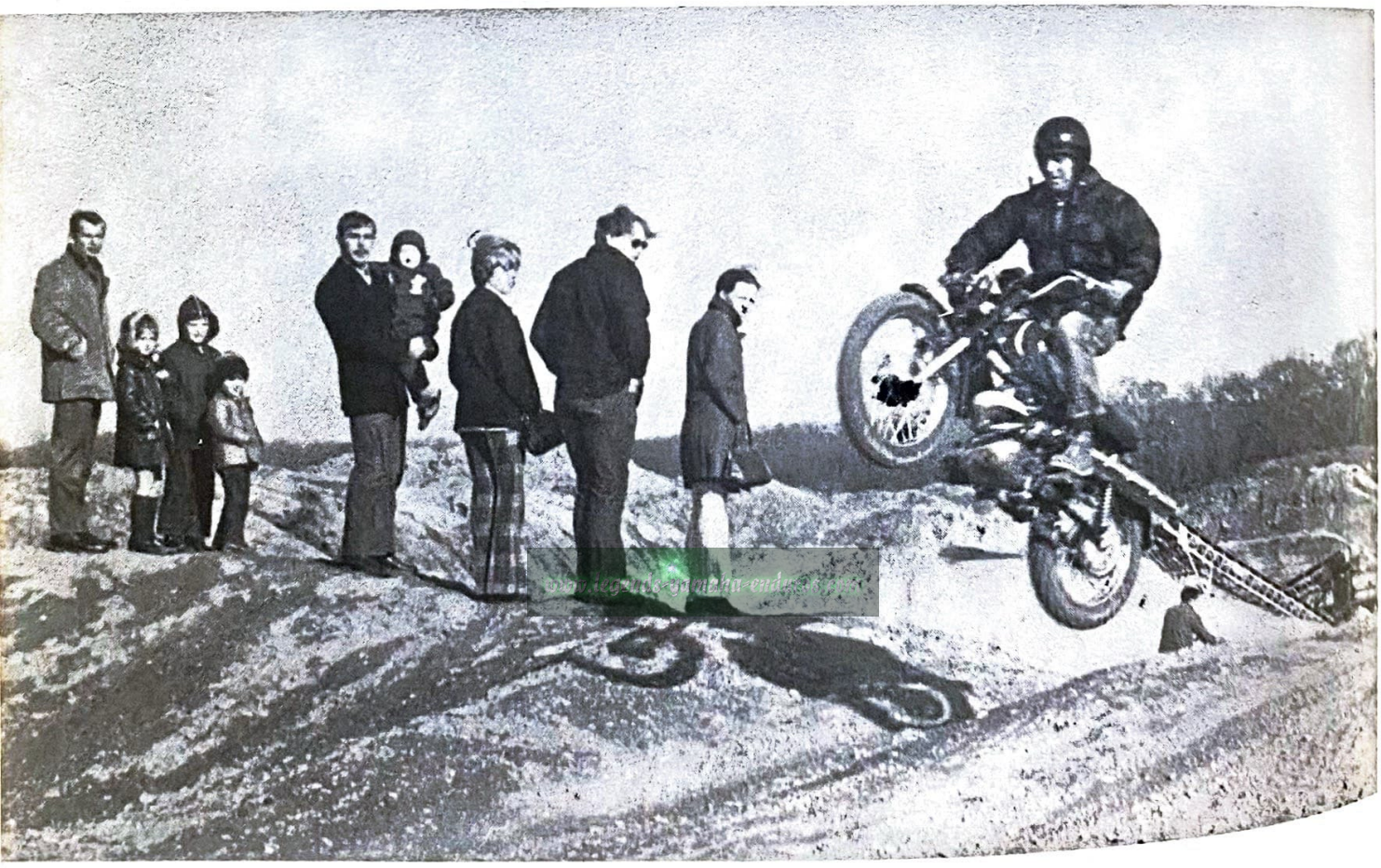
For the average rider, jumping a motorcycle is simply a stunt, and the worst of it is that the stunt abuses many of the mechanical parts of the machine. The average bike designed for street and road riding can't take too many jumps and not show the signs of the strain.

So let's assume that you have the right machine. Play it smart. For your first jumps, find a small mound at the sandpit. Approach the mound from a distance that will let you get into second gear. The size of your jump will depend on the speed with which you go over the mound and how you carry your body once the wheels leave the ground.

Using the same technique as when you ran uphill, lean slightly forward and keep power on. Not too fast. As you go up the mound, lean back, extend your arms, and lift yourself off the seat onto the pegs.

This young rider controls his jumping bike perfectly as he reaches the top of the hill—with power still on.

Once the bike leaves the ground during a jump, the rider must correctly manage his body in order to keep things in control. Here the machine is about to settle on its rear wheel, as it should.



Once airborne, keep the handlebars straight and steady—in line with your path. Since your first jump is rather small and short, you might come down on both wheels at the same time. If you do, you're doing well. If you come down on the rear wheel first, that's even better.

But *never* come down on the front wheel first!

Don't become overconfident.

Bigger and longer jumps, using the right machines, are only a matter of experience, the development of an instinctive feel for jumping.

The sandpit is a good place to find out how fast you can bring your bike from speed to a full stop. On level ground, it's no problem at all. Just get on the brakes together, and there's your hard stop.

But suppose you're running over rutted ground, parallel to the ruts? Motocross riders find that they must use the brakes under such conditions and do it without losing control. They approach a curve which has several grooves dug through it by the wheel of every machine that had gone through, and each rider plays the power and the brakes to get around as fast as he can, without spilling. How do they do it?

What may appear to be a bold use of brakes in a curve is in reality the only right way to use the brakes—the wheels must be vertical to whatever the surface. In a slow-motion projection of the motorcycle speeding through a curve and the rider using the brakes, you notice that the wheels are in contact with the ground at a right angle, or nearly so. Doing it any other way would send the bike and rider into a spill.

You can experiment with this technique in easy stages. Running slowly, head into a lazy curve and then apply the front brake, and see what happens. The rear wheel will come around, and if you have too much speed, you'll fall. Make another slow run, and this time apply only the rear brake as

Approaching a mound for jumping practice, rider keeps power on and pulls up on the handlebars.

As both wheels leave the ground, rider keeps the front wheel straight and leans slightly backward.

you enter a curve. The bike will either snap upright or go out from under you.

Convince yourself how easy it is to spill if you use the brakes improperly, and then bear in mind the rule to *keep your bike upright whenever you brake hard.*

The spectacular technique of riding a motorcycle with the front wheel off the ground involves considerable coordination between throttle, clutch, and weight distribution of the rider. Many race riders, after getting the winner's flag, will *wheelie* along in front of the grandstand and do it for great distances with perfect control.

Some machines, because of power and gearing, are easy to snap into a wheelie. Other bikes just haven't the right setup in this department.

You can find out quickly enough if your bike has the ability

Bike should be landed on the rear wheel, and rider should be off the seat. Note deflection of rear tire.

to wheelie. Find a hard surface at the sandpit, then engage first gear and hold the clutch. Open the throttle for some power, and then let the clutch grab fast and hard. If the bike has it, you'll surge forward and you'll feel the front wheel lifting up. But by instinct you'll shut the throttle and slow down.

Now try it again, but this time, when the bike starts to move forward, pour on more power and lean slightly back on the seat. As the front wheel comes up, try running a short distance, lean forward, and then ease off on the power. Make several runs this way until you develop a feel for the bike and its ability (or lack of ability) to bring the front wheel up.

Machines with very low gearing can be wheelied quite easily. As a matter of fact, some of them literally leap into the air, standing almost vertically on the rear wheel, and the rider is thus forced to dismount. Therefore, if anything goes wrong

with your attempts to wheelie, simply cut the power and pull the clutch.

Developing the described techniques of skill is a challenge, of course, and once learned can be quite enjoyable. However a new rider should always remember that all techniques are best learned when done in easy stages.

Let's suppose you have a friend who wants to go riding with you but who has never before been on the back seat of a motorcycle. The first two-up advice is for you to explain to your friend what to expect and how to ride with you.

For example, explain to your friend to sit upright and forward and not to lean in the opposite direction when you go into a curve. Also, not to clown once you get under way. Your friend can be a real help in signaling your intentions to stop or turn. Make sure your passenger is wearing full shoes, gloves, helmet, and eye shield. Ten minutes of an explanation is not a long time, but one spill can put a would-be motorcycling enthusiast off the sport forever.

Another way in which motorcycling enthusiasts enjoy their bikes is by riding the trails through the woods and across open country, where such trails are open to the sport. Since the sport has been developing fast, manufacturers have been designing special machines for this kind of off-the-road riding.

Many trail machines are completely equipped so that they can be licensed for road use as well, while for trail riding they are outfitted with spark arresters in the exhaust system to eliminate the possibility of igniting dry grass and causing fires.

Trail-riding techniques call for a little more caution because you'll be riding across unfamiliar territory. Riding the trails is for enjoyment, not for racing through the woods and under-

brush at top speed. You're out to enjoy nature, by yourself or with a group, and you want to make the right impression on everyone who may meet you along the trail.

Here are a few pointers:

Give pedestrians the right-of-way—and smile at them. Avoid streets and residential areas as much as possible. Before you leave your base of operations, let someone know which way you're headed. And no matter where you park your machine, be sure to shut off the fuel valve and remove the ignition key.

While riding, keep your hands on the grips and your feet on the pegs, and if there had been any rain and the ground appears soft, be doubly careful. If you lose control on a hill and fall over, get off the machine on the uphill side. If the engine stalls while you're climbing a hill, use the front brake to hold the bike in place, and again dismount on the uphill side.

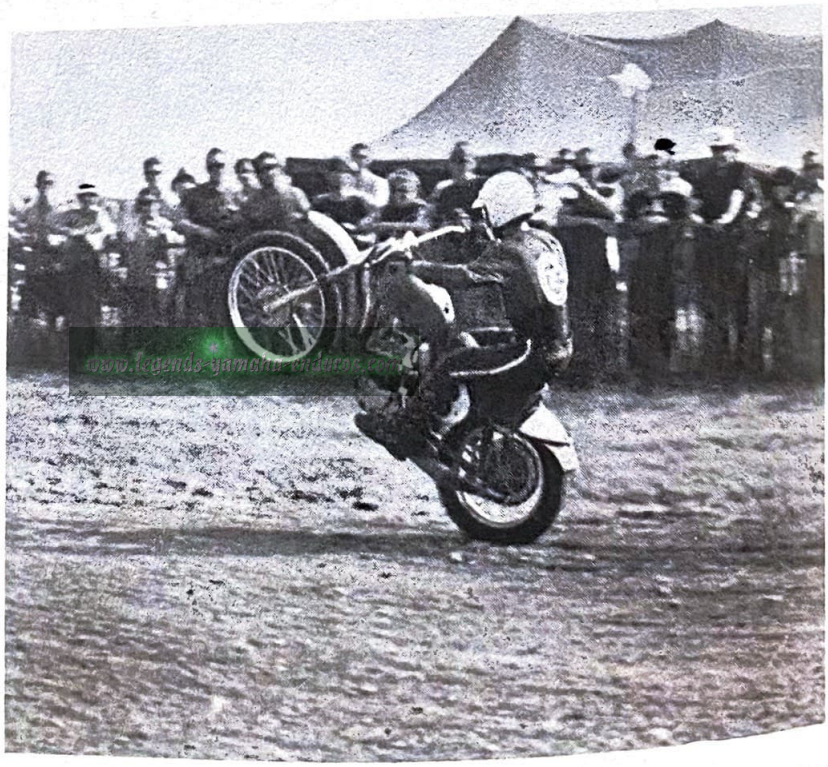
Motorcycle racing is a subject unto itself. It can be further divided into such special events as short dirt track racing, straight scramble, a very long road race, a closed-circuit motocross, a cross-country endurance race, and any one of many other kinds of races. Each kind of race has its followers of course, but somehow two of the most popular in the United States are the motocross and the enduro, while in Europe the long road race seems to have more appeal.

To get a closer view of a long road race, we interviewed Joseph Rottigni, who at one time had raced in Italy and had also competed in the International Six Day Trials (ISDT) in Germany (1956) and in Czechoslovakia (1957). In Joe's words:

"I started the way I suppose many young fellows start—I worked after school in a machine shop, and next to the shop was a motorcycle shop, so all day long I heard the sound of

Roaring toward the finish line at Unadilla during the 1970 Motocross, Miroslav Halm takes the jumps easily. . . .

Then, passing the flagman, Halm wheelies his CZ in perfect control past the cheering spectators.



engines. You might say this is what attracted me in the first place. I played soccer in Bergamo for about a year and a half, but every year a road race was held in Bergamo's old town. . . . Bergamo is seven hundred years old, built on a hill, with narrow streets and sharp turns, and so we kids used to watch the race.

"Well, the race got us, so every lunch hour about thirty of us would race . . . sure, the police tried to stop us, but we raced every time we could. Later on I worked for the Parilla motorcycle factory, and I became very familiar with this machine. I actually started in endurance (enduro) racing and then went to road racing. Twelve years ago it was different, the European style was for the rider to keep his feet on the pegs and his body low. About four or five years ago this style started becoming popular in the United States, too. Our usual road race was anywhere from 50 to 75 kilometers, and the endurance runs were about 350 kilometers. I enjoyed the enduro because it's a tough race, through woods, water, mud, sand, everything.

"The Six Day Trials is different again. You have twenty-nine nations competing, and you may have three hundred riders starting . . . not many finish, of course . . . my own Parilla broke down . . . that year the Czechs won the race. You must have a good machine to win any race, and then comes mental and physical preparation . . . you must be prepared for the race.

"Like other riders, I owned my machine and I had to service it myself. You race because you like to race . . . just like others like to climb mountains. The biggest race I won was the Giro D'Italia, the nine-day race around Italy. It's a race against time, four riders starting out every thirty seconds. The weather was mostly rain and snow. My Parilla was a Formula 3 machine, capable of 150 kilometers per hour. The first day we covered 175 kilometers, then averaged about 220. The longest run was 378. In that race were such riders as Venturi,

Libanori, Zubani, Tartarini. Some of the racers hit speeds of 200 per hour! I guess I liked road racing because you could achieve such high speeds, but then one mistake can cost you the race. Also don't forget that twelve years ago you couldn't do what's possible today—if you start comparing speeds—because today you have improved designs in machines, and specially in tires.

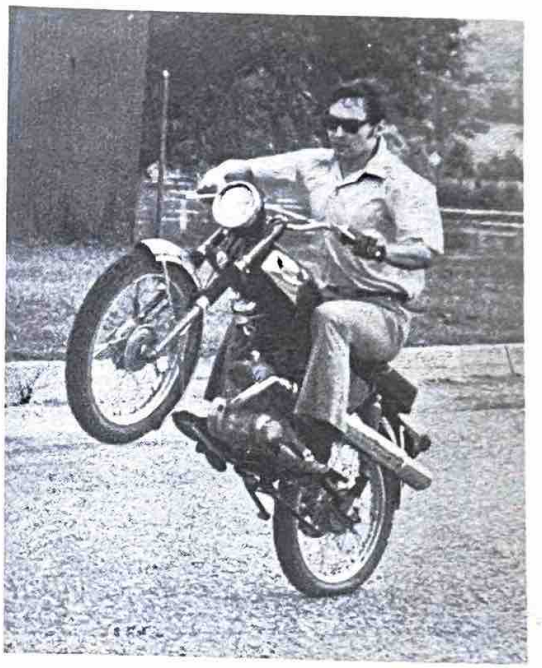
"Like in everything else, there are techniques. You keep your eyes on the tachometer. You must be aware of what the machine is doing . . . the carburetor, ignition, gears, clutch. When you realize that a 50-cc engine with seven or twelve gears is good for 100 miles per hour, you also realize that you must not miss a shift point. If you miss a shift, you're in trouble. Much of it is a matter of experience . . . it's up to the rider. One day you know you can do it, and another day you know you can't. When the competition is tight, for example, you've got to know to hold back and to make your move carefully. If you go too fast, speed will exceed traction and you'll have a drift. You must control it. If you can't, you have trouble. You sense these things, you feel them. My own technique was to fit my body to the circumstances, switching weight, leaning, pulling the bike . . . it was right for me, maybe not good for somebody else.

"What advice would I give? Well, not to become overconfident. And to keep the machine in good shape. If you let the machine go, it becomes more expensive in the long run."

Participating in fifteen races in one season running from May to October, James Cooke placed third several times in three-quarter-mile speed track events, scrambles, and motocross races, all of them taking place in Japan and mostly against Japanese riders. In Jim's words:

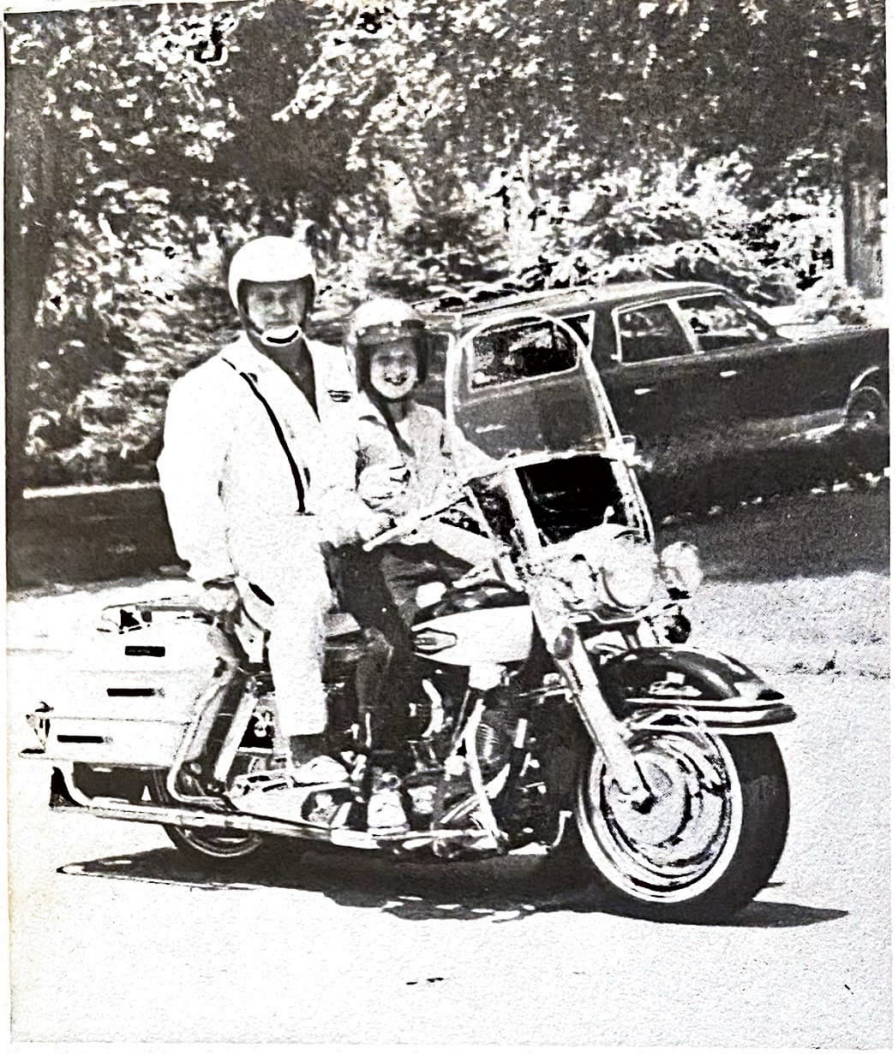
"Yes, there are some differences in racing in Japan. Here in

This young rider kept this wheelie going quite a distance. To stop a runaway wheelie, shut the power off or hit the rear brake. Note position of rider's feet, just in case.



Lifting a 90-cc Jawa Trail bike into a wheelie is easy, but too much power can cause a complete roll-over.

Rider on this Benelli 200-cc Sprite shifts his weight, pours it on, and lifts up the front wheel for some fun riding.

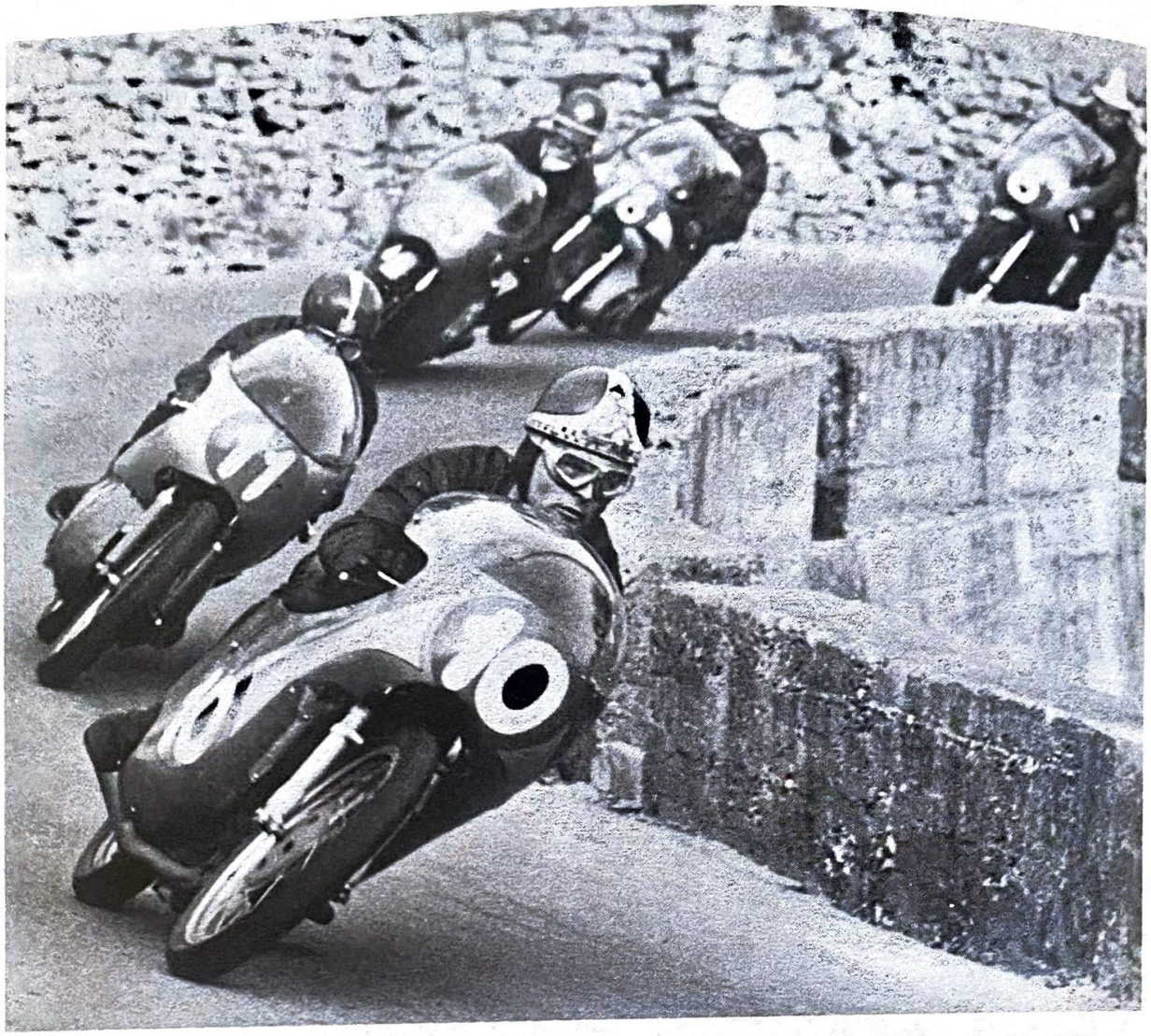


Two-up on a H-D heavyweight in full dress. The young rider is actually in control of a 900-pound machine, with father along to help a little when they come to a stop.

Down the path and up the hill on a 90-cc Jawa Trail bike provide this rider with a thrilling and satisfying sport.

A group of trail riders and their bikes alongside a lake. Trail riding should be done only on designated paths.

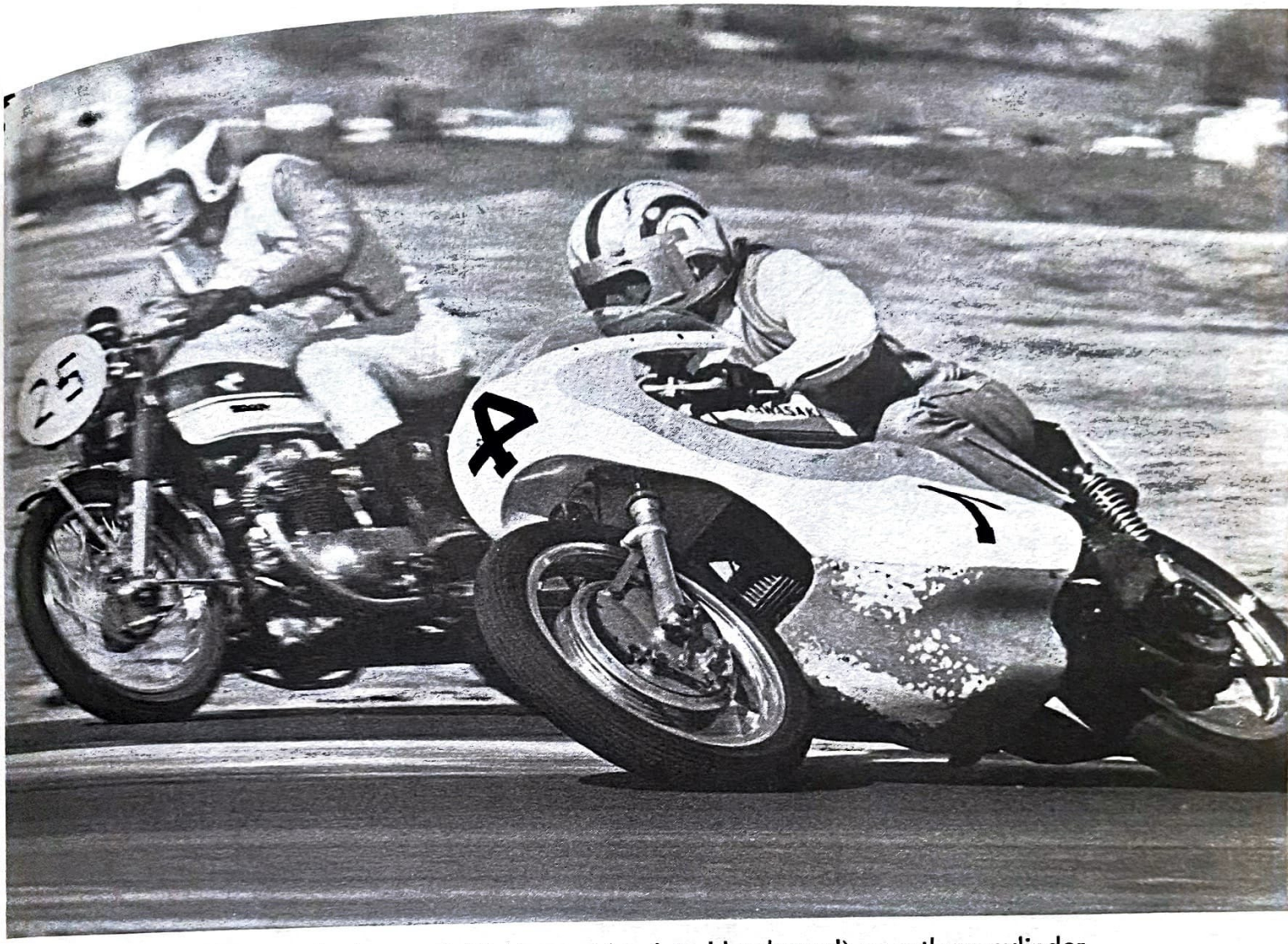
For long cross-country touring, many riders prefer a heavier and more powerful machine—like a 650-cc Benelli shown in this scenic view. (*Cosmopolitan Motors*)



Famous racer Campanelli (10) leading the pack through the curves on his 250-cc Benelli during a road race in Italy. (*Cosmopolitan Motors*)

the States you start a motocross with a live engine in gear and ready to go. In Japan you first warm up the engine, then on the crossed-flag signal kill it, and when the flag drops you kick-start and go. The start is the side-by-side kind used here. I was using either a 250-cc or 350-cc Yamaha.

"As for speed tracks, most of them are clay-surfaced, and it's similar to a scramble, without a jump. It's eighteen laps for the 250-cc class, and twenty-five laps for the open. This is



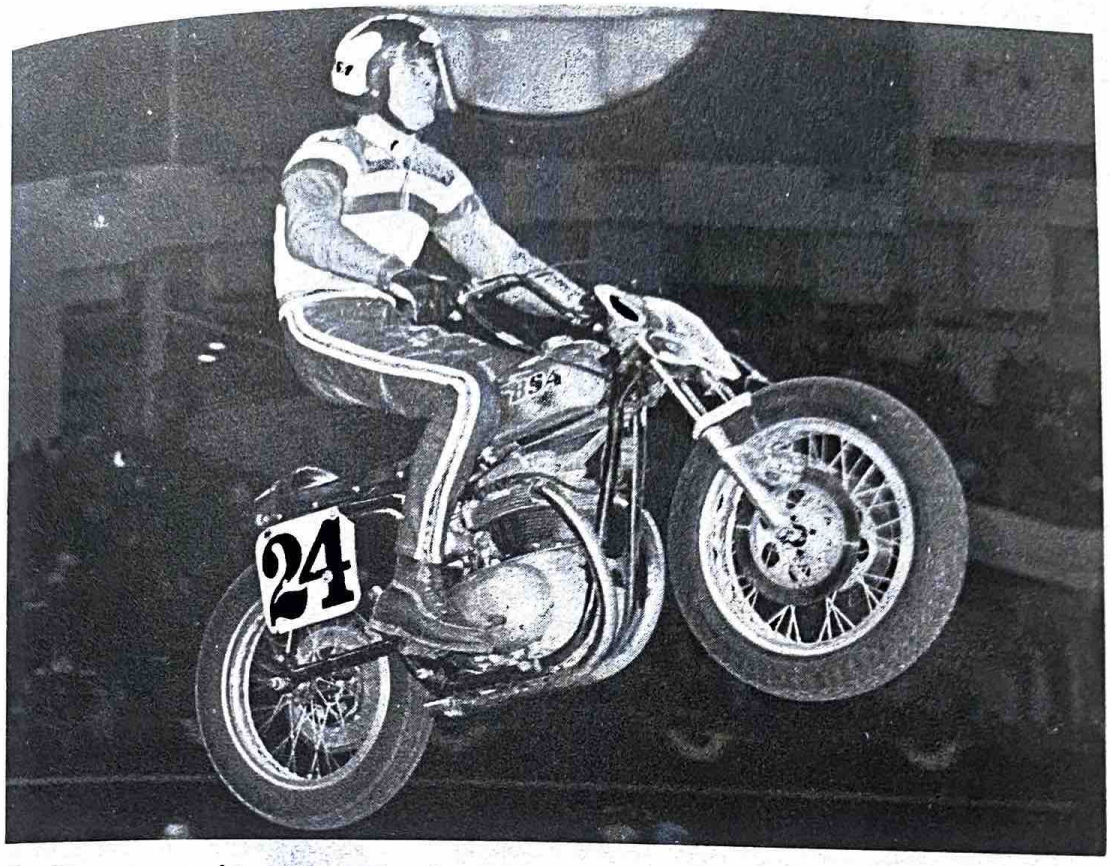
In a hard lean at high speed, Ed Moran (4 painted backward) on a three-cylinder Kawasaki road racer laps another competitor at Virginia Raceway in Danville, 1970. (*Kawasaki Motors*)

where you often see a smaller machine outrun the bigs—I often lapped a 350 with my 250.

"The thing you learn quickly is to watch everything, and at the same time listen to the sound of your bike. Mental attitude is important—you keep going in spite of being tired, bruised, and your kidneys killing you. Our common trouble was fouled plugs and wet coils. No matter how we wrapped the coil in plastic and tape, it would get wet.

Racing in Japan in motocross, scrambles, and speed track events, James Cooke of Valley Stream, New York, is seen in action on a Yamaha.

Sometimes one bike can stop a whole motocross. James Cooke is somewhere in the center. No one was hurt!



Jim Rice powers his BSA 650 twin to victory at the Houston Astrodome TT Race, February 6, 1970. (*BSA Motorcycles*)

"Advice? Find someone who can tell you what to do. Ride on dirt and see how you like it. It's a lot different from riding on pavement, a lot different. It's all a matter of learning when to do what—when to hit the brakes, the gas, or both. Otherwise, good luck."

Dirt track racing is another popular event that draws enthusiasts to watch riders tearing around an oval at highest possible speeds. Interestingly, these machines do not have any brakes front or rear because experience has taught the racers that you can get around a corner faster by sliding than by braking.

Skill is needed for any kind of competition riding, but one of the greatest tests of skill is to be found in the "English Trials"

riding. There the contestants must ride their specially prepared machines over rocks and fallen trees, through brooks, streams, and mudholes, and any other nearly impossible-to-negotiate terrain. Trials machines are not set up for speed but rather for pulling power at a nearly standstill pace, high ground clearance, and short turning radius. Points are deducted from a rider's score when his foot touches the ground for any reason, if he rides out of the boundaries, if he comes to a stop, or if the engine stalls.

Faced with this variety of competitive opportunities, the would-be racer has only this question in mind: Where shall I try my hand first?

6 Maintenance and Troubleshooting

As you become familiar with your motorcycle, you realize how important it is to check the various parts from time to time. This routine checking is the one factor that will keep your bike from developing unexpected trouble on the road.

It's not difficult to maintain your machine in top shape. You don't need more than the average set of tools and the checklist in your owner's manual. In instances where special testing or overhaul equipment is mentioned, the work should be left to experienced service technicians at your dealer's shop.

When it comes to lubricating moving mechanical parts, no one can deny the value of oil and grease. If the wheels are to turn freely, the hubs need grease around the bearings—a job that needs to be done about every 10,000 miles. The shock absorbers also need oil replenishment if they are to give you a smooth ride. Wheel bearings and shock-absorber jobs are best handled by your dealer.

What you yourself should regularly check (once a week) is the oil level in the crankcase (if you have a four-stroke engine) or the oil in the gearbox (if you have a two-stroker).

About once a month check the condition of the chain to make sure it is not dry and caked with dirt. Simply dip a brush into some engine oil and run this over the full length of the chain, then wipe off all the drippings.

About twice a year apply a little oil to the insides of the speedometer cable housing and also to the throttle, clutch, and brake cable housings.

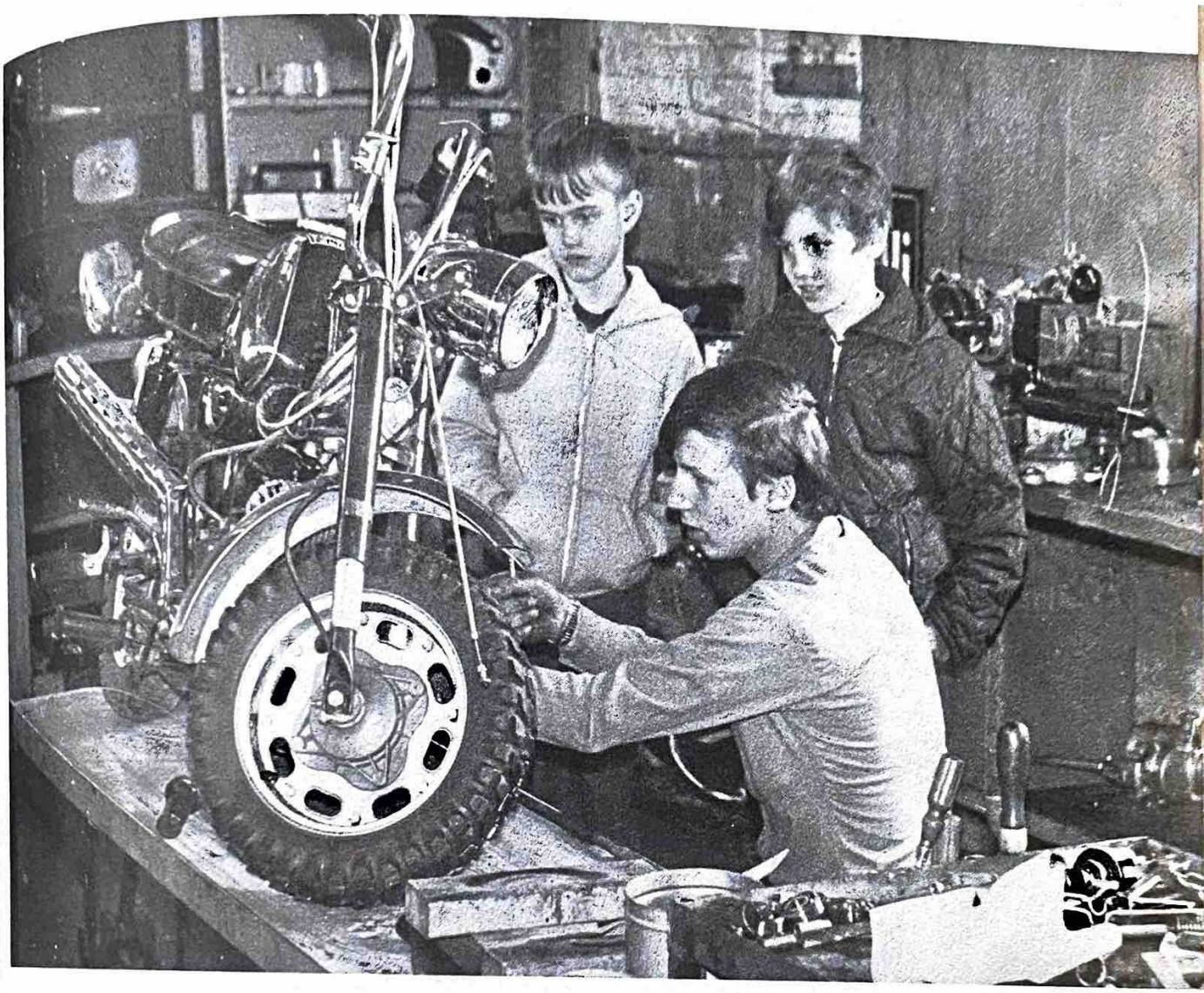
If your machine is equipped with a magneto system, you won't have to worry about the condition of the battery. If you have a battery and coil system, then the condition of the battery is important indeed.

Batteries, whether 6-volt or 12-volt types, are installed by the dealer after being given the correct charge. This means that the only thing you need to check is the electrolyte level in each cell. Once every two weeks unscrew the cell caps and, if necessary, add distilled water so that the plates inside the cell are submerged. Do not overfill. In very warm weather battery refilling may be necessary more often than in cold weather.

Neatness pays off where batteries are concerned. Use a special battery filler sold inexpensively in auto parts supply stores, and try not to spill the distilled water all over the battery. If you do mess up the job, be sure to wipe the battery dry before replacing the cell caps.

A weak battery is often the cause of hard starting, summer or winter. The spark needed to fire up an engine must be a good spark, and a weak battery just will not produce it. One simple way of quickly checking the condition of the battery is to switch on the headlight or sound the horn. The light should be bright, and the horn should sound healthy. During the winter months many riders remove the battery from the machine and store it indoors and also recharge it periodically with an inexpensive low-output "trickle" charger. When spring comes, they will have a battery in excellent shape. Others simply visit the garage once a week and start up the engine, run it for a while to charge the battery, and let it go at that.

But the quick check of switching on the light and sounding the horn could be deceptive; if any wire in the ignition system



No matter what the bike, sooner or later it must be serviced. Here two young enthusiasts learn about the simple musts from an experienced technician.

is loose at its connection or corroded, the energy from the battery simply won't get to where it's needed. So anytime you check the battery, also check the wires and their connections.

Whether you have a mag or battery system, make it a point to know the location of every fuse in the circuit, and then from time to time check the condition of the fuse holder itself.

If your machine suddenly becomes sluggish when you open the throttle or coughs and sputters when you're trying to start

Even on a minicycle the electrical connections must be checked. Most troubles can be traced to the wiring, spark plug, or breaker points.

up the engine, the trouble lies either in the ignition system or in the carburetor.

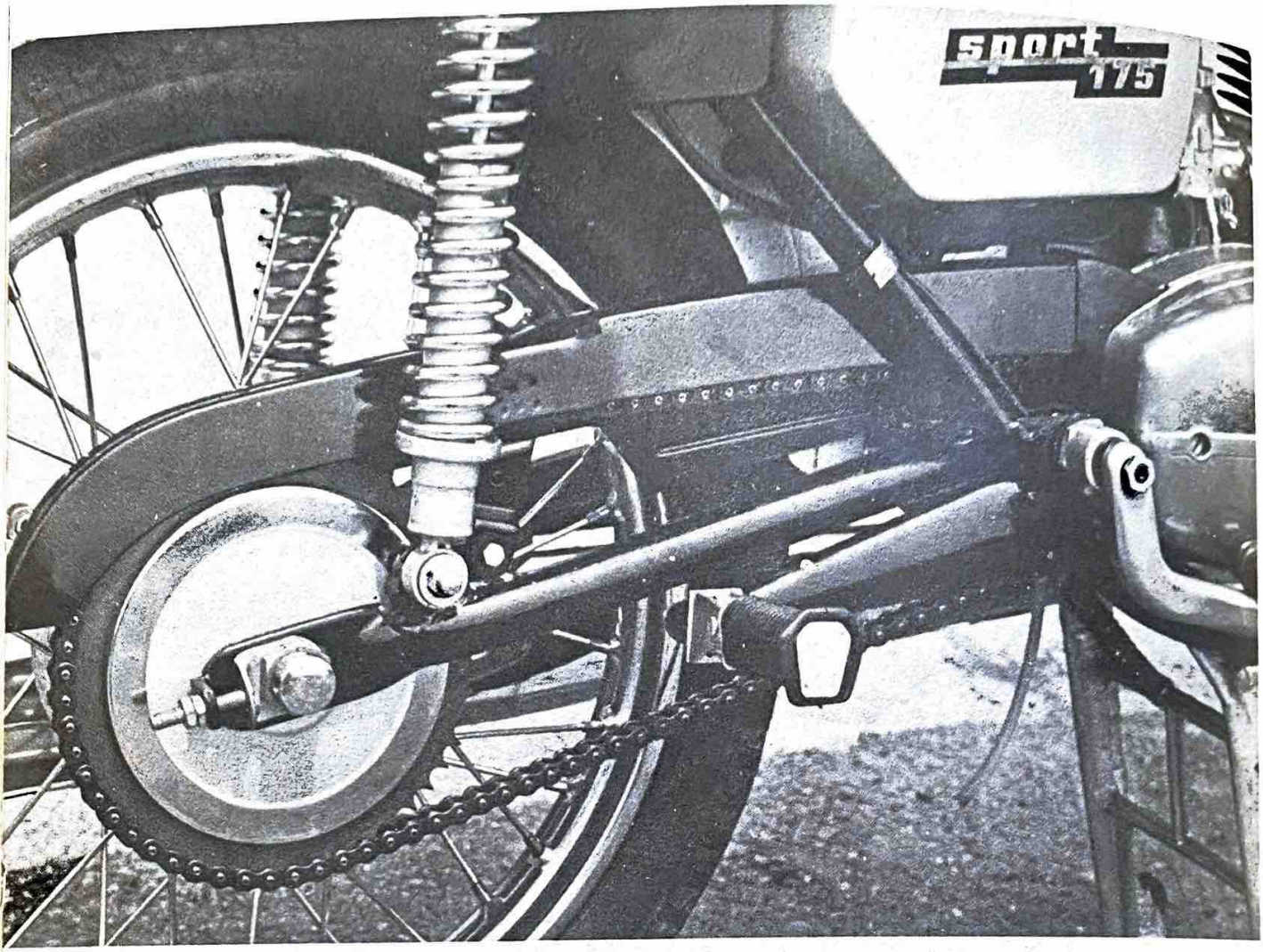
If you suspect ignition, disconnect the spark plug wire, get the plug out, and inspect the condition of the gap and the kind of carbon deposits around it. If it's black and sooty, your fuel mixture is too rich and is fouling the plug gap. The plug should be a dry gray kind, and the gap clearance should be as recommended by the book.

If you find the plug in good condition, check the breaker points. They may not be opening fully or opening too far, or they may be actually burned away. Any of these conditions will give you poor performance.

If you suspect carburetion, first check the gas tank, then the fuel shutoff valve, then the filter (if any). Finally, check whether or not the throttle is actually opening when you twist the grip. Also remember that a plugged-up air vent in the gas tank cap can create a vacuum and thus affect the running of the engine.

Another part of your routine checking or maintenance has to do with having a correctly tensioned chain. (Your tool kit should contain spare chain links.) Place your finger at midpoint of the upper stretch of the chain and press downward. If the slack is more than an inch, loosen the rear-wheel axle bolts and by turning the adjusters move the wheel backward to tension the chain properly. The slack should be about a half inch down—a total play of one inch. Tighten the bolts, and then check the rear wheel for alignment. If you do not move the rear wheel backward evenly on both sides, you'll have an out-of-line wheel, which will affect the handling of the bike. Checking the tension of the chain must be done with the bike off its center stand and with a rider seated. Wheel alignment can be done with the bike on the center stand.

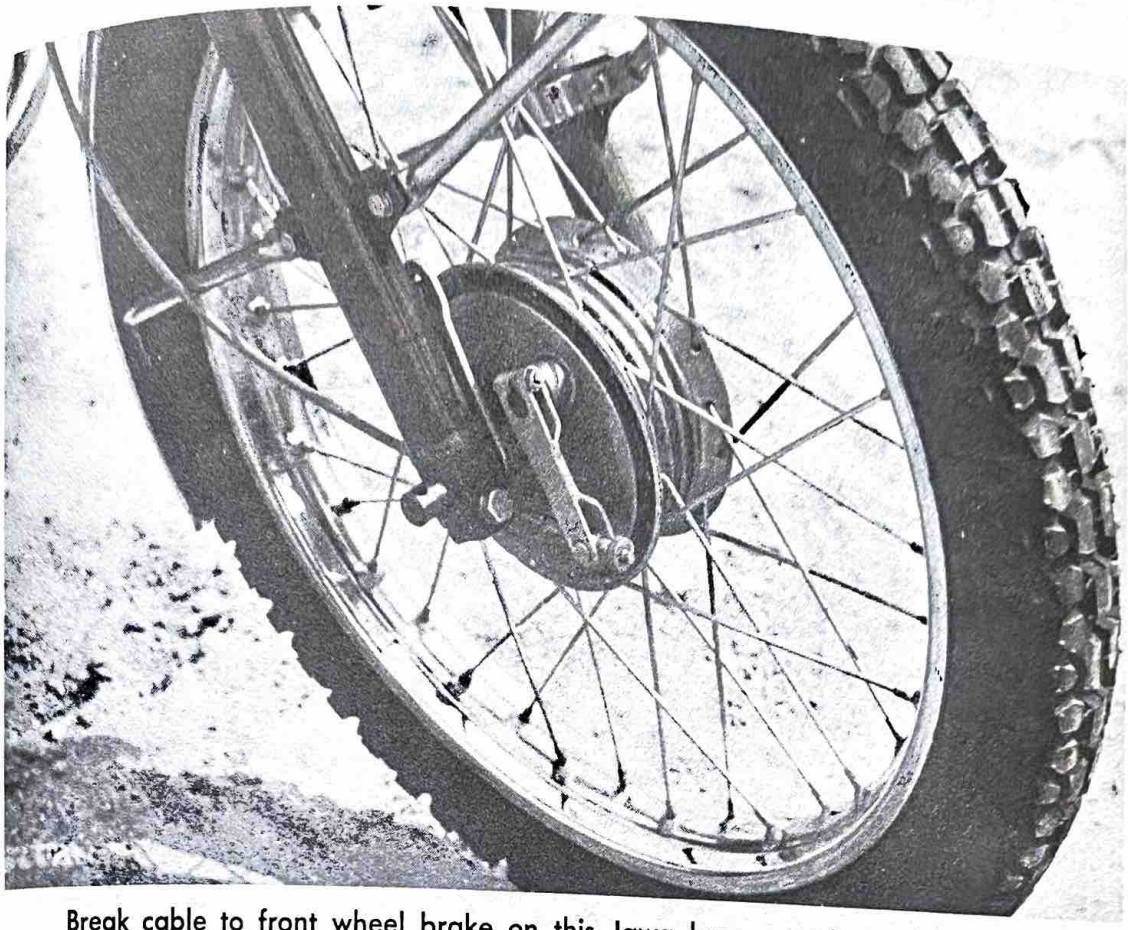
Check the pressure in the tires once each week. Your man-



An improperly tensioned chain will cause trouble in the long run. Chain tension adjusters are located at the ends of the rear fork. After making an adjustment, be sure to tighten the locknuts and the main bolts.

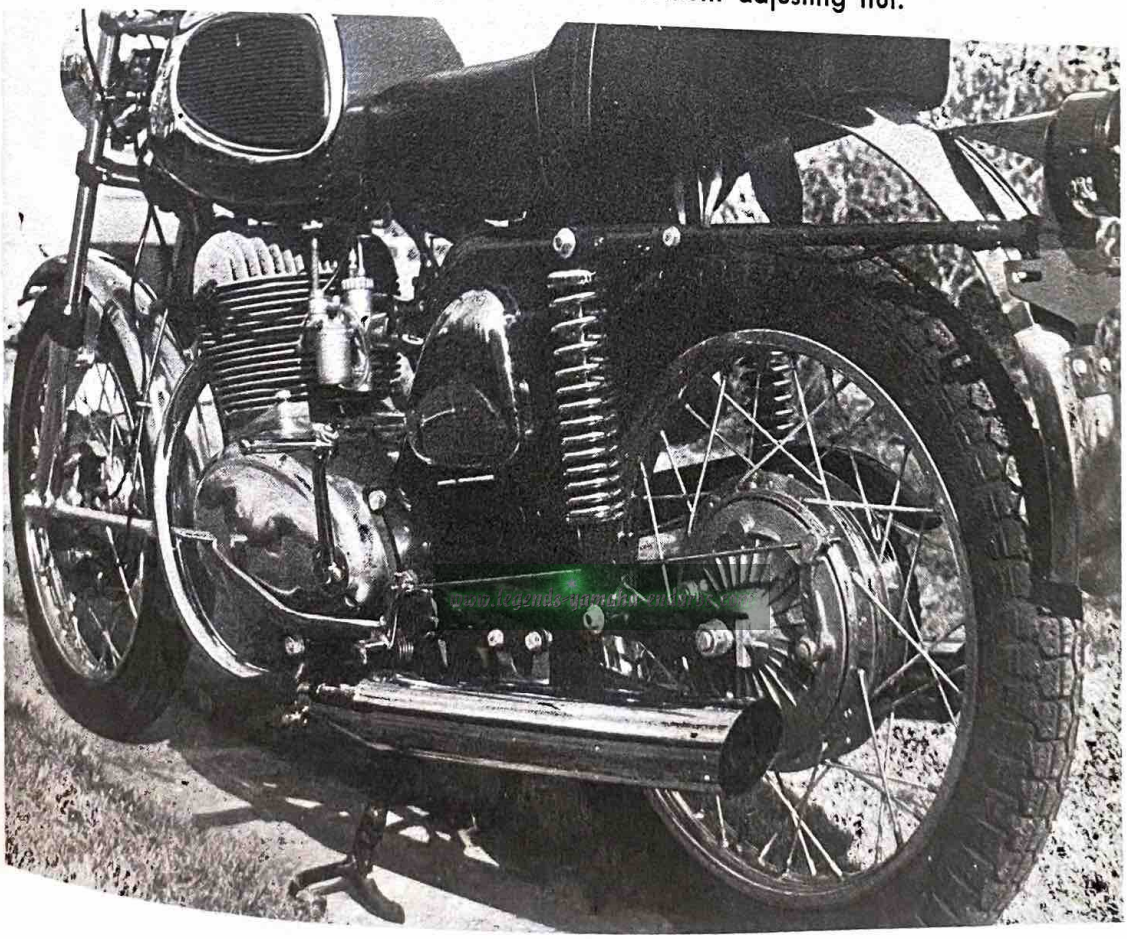
ual will tell you which is the best pressure for solo riding and for two-up. Soft tires cause a motorcycle to veer erratically in a curve, refusing to keep to a straight line, while hard tires create too much bounce. For average riding 20 psi (pounds per square inch) for the front and about 25 psi for the rear are normal pressure.

The moment you start rolling out of your driveway or away from the curb, make it a point to check the action of both brakes. If either the front or the rear brake action feels soft, make the simple adjustments before you ride out into traffic. After you adjust the brakes—usually done by taking up the



Break cable to front wheel brake on this Jawa has convenient adjusting nut. After making adjustment, spin the wheel to make sure brake is not dragging.

M. V. Agusta rear brake is by rod, with convenient adjusting nut.



Clutch lever needs slight free play at the hinge. As fingers pull up the slack, a ⅛-inch gap is correct.

slack in the front cable and a few turns of the wing nut on the rear rod—spin each wheel to see if it turns freely. There should be no dragging or binding.

Since the clutch is directly responsible for transferring engine power to the rear wheel, you should make sure the clutch is properly adjusted on your bike. If it's not, you'll be damaging the clutch itself, and even the gears.

Clutch cable slack can be taken up at the clutch lever on the handlebar. This is a simple operation and is always explained in the manual. On some models you'll be able to see the clutch rod where it enters the clutch housing itself, and at this point the lever may also require a certain adjustment. Both adjust-

ments, cable and rod, are simple and easy to do and should be part of your routine maintenance.

If you value the appearance of your motorcycle and are proud of it, as so many riders are, then dust on its polished paint surfaces and caked oil around the engine will bother you enough to give everything a periodic cleaning. Some riders wipe off dirt after every ride, others do it once a week, others once a month. How often you clean your bike shows how much you care for it.

This practice of routine checks and maintenance will work for you in the long run. It's the factory-trained motorcycle mechanics who say: Fifty percent of all problems can be eliminated if the machine receives routine care and maintenance!

Every owner's manual for the particular model motorcycle contains a troubleshooting chart which tells what to do when the engine starts to give you problems.

The usual troubleshooting chart is divided into three columns: TROUBLE—POSSIBLE CAUSE—REMEDY. Some charts are no more than brief outlines, while others cover many pages in the manual and explain all points in detail.

While the approach to troubleshooting is the same in nearly all cases, different engine and ignition configurations may require slightly different methods. For this reason a troubleshooting chart for all motorcycles is impossible in this book. The following, however, will provide you with a general understanding of what to do under the listed conditions.

One of the simplest forms of TROUBLE is that the engine cannot be started. If you begin to look for the POSSIBLE CAUSE, you may find no spark at the points or at the plug, or you may find an irregular spark, or you may find that you cannot flood the carb. The REMEDY then may be in one or in a combination of conditions, such as incorrect gap, blown

fuse, empty fuel tank, closed-off fuel valve, or even a clogged air vent in the gas tank cap.

Now let's assume that the engine has been started but that the TROUBLE is poor performance. The engine may be misfiring, pinging, coughing, and each of these symptoms is a clue to POSSIBLE CAUSES, such as overheating, temporary short circuit, lean mixture, burned breaker points, or incorrect gap. And the REMEDY may be found in changing the spark plug to the right type, tracing for a loose wire connection and checking the battery terminal connections, checking the carb settings, replacing the breaker points, or adjusting the gap.

Whenever your machine misbehaves and you're sure that no parts inside the engine are broken, check for proper fuel delivery and the existence of a spark inside the cylinder. It is not uncommon for a rider to waste ten minutes or more kicking over his engine and then realize that he forgot to switch the ignition *on*. And many a rider has been forced to pull off the road and spend a great deal of time troubleshooting in the wrong direction, while all the time he had forgotten to fill the gas tank (or had forgotten to switch to his reserve fuel supply).

7 The Motorcycle's Family Tree

If you know what a Henderson, Pope, Merkel, Super-X, or Indian is, then either you are an old-time motorcycle rider or you have been reading the various magazines devoted to the sport of motorcycling. Those and other American models existed during the early development stage in motorcycling's history. Today they are only a reference for the millions of enthusiasts who are familiar with the current breed of bikes—mostly of European and Japanese manufacture.

After Gottlieb Daimler proved in 1885 (in Germany) that a gasoline engine could be mounted into a frame and the whole supported on two wheels—the real birth of the motorcycle!—people in different fields of manufacture turned their attention to the invention, and the struggle for improvement was on.

In England the Birmingham Small Arms Company, for example, was manufacturing small firearms and then began producing the BSA machines. Similarly, in Czechoslovakia the Janecek Arms Manufacturing Company merged with the German Wanderer Company and so, with the first two letters of each name, formed the now familiar Jawa range of bikes (the only manufacturer today producing regular street machines with automatic clutches). In Italy the same kind of sequence of events developed fine motorcycles for racing and for economical transportation.

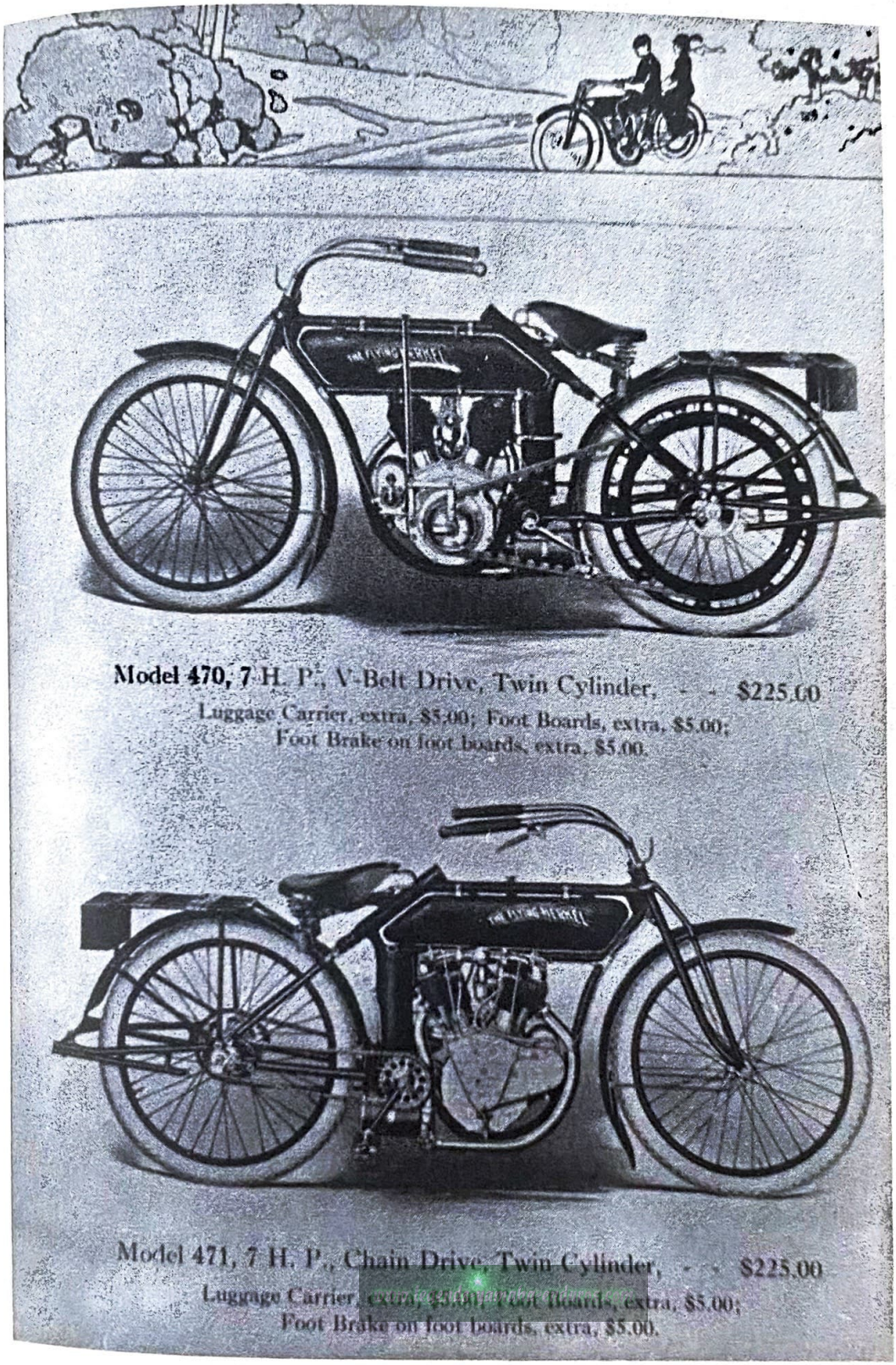
In Japan, however, motorcycle production did not begin until quite late, and yet today their machines dominate the world market.

In the United States, oddly, the only name today is Harley-Davidson. Since the history of American motorcycling is unique, Emmett Moore, regional manager of Kawasaki Motors Corporation, who has long been associated with the motorcycling industry and who founded the Antique Motorcycle Club of America, agreed to provide the following historical highlights. In his words:

"In the spring of 1901 in Springfield, Massachusetts, Carl Oscar Hedstrom, the inventor and builder of the first *Indian* motorcycle, was about to demonstrate his motorized bicycle to a group of skeptics who, if the demonstration was a success, were to become Hedstrom's financial backers. The critical test was to be a run uphill on the steepest paved road in the area known as Cross Street Hill. Hedstrom's partner, George Hendee, was standing at the top of the hill, and when he gave the signal, Hedstrom started pedaling the motorized bicycle into popping activity. He made his dash uphill successfully, and thus began the motorcycle industry in the United States.

"Prior attempts by others to build commercially successful motorcycles were not sustained, and this left the *Indian* as the pioneer.

"The motorcycle was the natural outgrowth of the bicycling craze of the late 1890's and early 1900's. Then the development of a light, air-cooled engine made it possible to produce a machine that would eliminate pedaling. Between 1901 and through 1905 dozens of companies entered the motorcycle manufacturing field, and large numbers of machines were sold to people in all walks of life. These early motorcycles were essentially motorized bicycles, most of them with a direct belt or chain drive from the engine to the rear wheel, which neces-



A motorcycle ad during the 1910 era. The twin-cylinder Flying Merkel was available with belt or chain drive, with a 7-horsepower engine. A dandy motorcycle of its day. (*Emmett Moore*)

sitated pedaling the machine to start the engine and then a complete engine stoppage to come to a halt.

"Soon enough, however, manufacturers began to install clutches, and during this period of experimentation the engine was set in different positions, some on the handlebars, over the front wheel, over the rear wheel, and finally arriving at the now-standard position at the bottom of the V-shaped frame. The engines themselves were almost universally single-cylinder four-stroke types, with automatic intake valve operated by atmospheric pressure on the piston downstroke. Power was very low—one to two horsepower.

"In 1906 the motorcycle became heavier and more powerful. While the single-cylinder engine reigned supreme until about 1910, the twin-cylinder engine made its appearance. By 1907 some advanced makes, including Indian, Harley-Davidson, Excelsior, and Thor, were fitting two-speed gears, and all had some type of a spring front fork. During this period over one hundred manufacturers were producing motorcycles in America!

"Then in 1912 a small black bug appeared on the scene—the early-day Model-T Ford. Before this the motorcycle was aimed at the transportation market, but when the cheap and quite practical motorcar was made available, the market for motorcycles entered a rapid decline and by 1914 had virtually ceased to exist. By 1918 only about six manufacturers remained. Pope resumed bicycle production in Westfield, Massachusetts; Merkel today is Miami Cabinet Company; Thor entered the electrical appliance field; Ace was bought out by Indian; Henderson was bought out by Excelsior (Schwinn) in Chicago. By 1931 there remained only Indian and Harley-Davidson, and both were operating on a vastly reduced scale. At the time fewer than one hundred thousand motorcycles were registered in the United States.

"In 1950 Indian left the field, and so today Harley-Davidson is the only remaining motorcycle manufacturer in this country, but even they have joined the importers for their lightweight machines built in Italy.

"Following the end of World War II a new interest in motorcycling as a sport and hobby developed in the United States, and with no American-made machines to supply the demand, there began the present era of imported motorcycles, from England, Germany, Italy, Czechoslovakia, and then Japan.

"In the 1950's Honda (in Japan) began producing light two-stroke models designed for transportation purposes, and unlike their preceding production based on some British and American designs, these machines were new and original in concept. Yamaha, Suzuki, and Kawasaki followed Honda, all launching extensive advertising and promotional campaigns and selling hundreds of thousands of light machines across America. As the years went on, these manufacturers added larger models and increased their range to include off-road and competition machines. Within six years the motorcycle registration leaped into the millions!

"Perhaps one day United States industry will again become interested in motorcycle production. In the meantime an increasing segment of our young population is happily buzzing, burbling, and crackling across the countryside on well-designed, attractive, and reliable motorcycles in this New Age of Motorcycling."

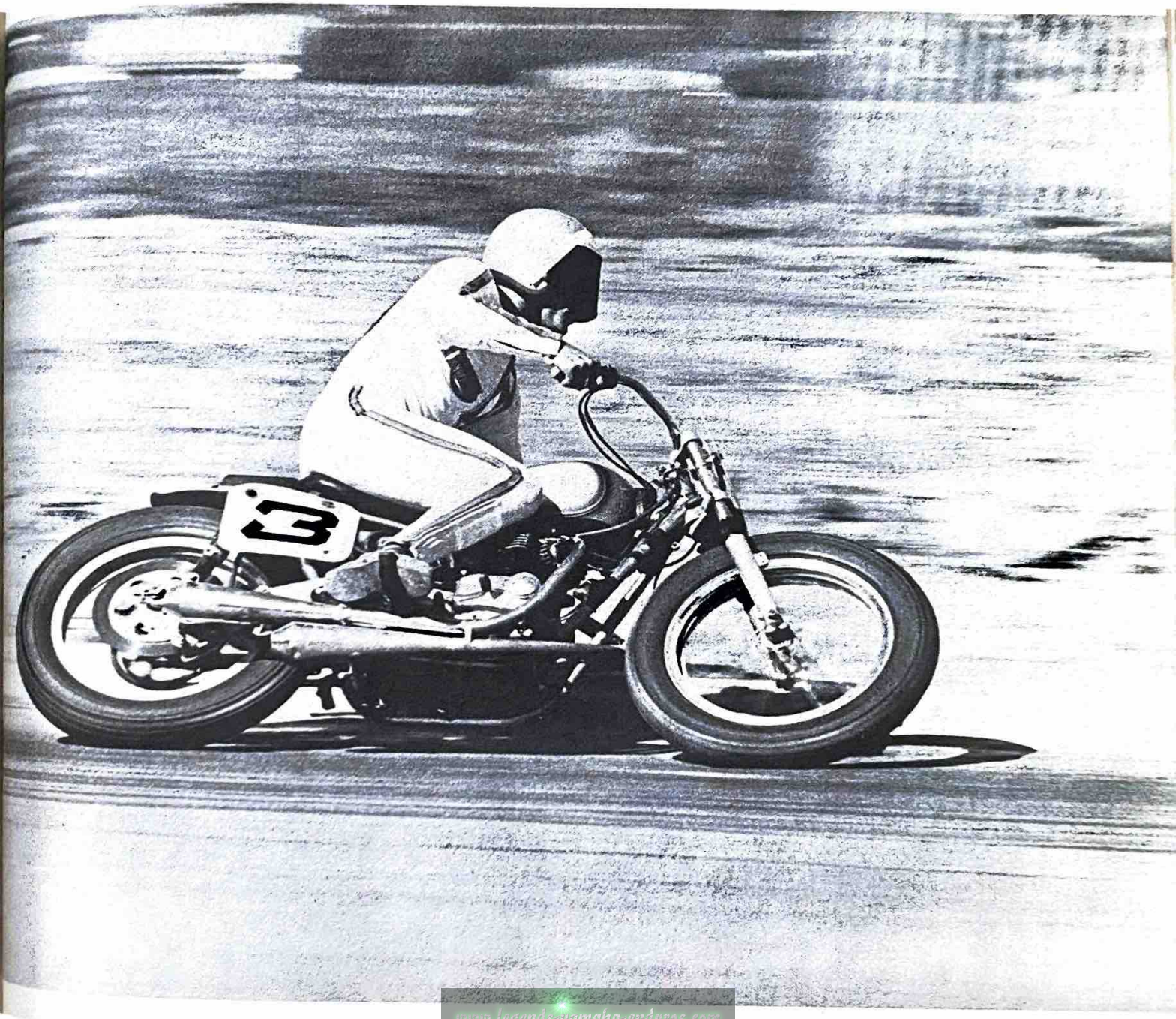
Mr. Moore's sweep through history reminds us that as far back as 1904 the first hand twist-grip throttle was introduced; in May, 1907, the first Isle of Man T. T. (Tourist Trophy) race was run; in 1919 the first scooter appeared on the scene; in 1925 the first foot gearshift was used; and a world speed record of 134.6 miles per hour was set by Ernst Henne on a BMW in 1929, and the record stood for fourteen years!

In 1924 the American Motorcycle Association was organized for the purpose of having one organization which would set uniform rules and regulations to govern the sport of motorcycling over the entire United States and also sanction events for the charter clubs. At present the AMA has more than 125,000 members and 1,500 chartered clubs. It sanctions 500 professional events and 5,000 sportsman events each year, in which approximately 2,600 professional riders and 50,000 sportsman riders participate.

The Competition Congress of the AMA, made up of elected and appointed delegates, establishes the rules. One delegate is elected by the chartered clubs in a district to serve a two-year term. There are twenty-five AMA districts, and the districts are divided into three regions. A manufacturer of two-wheel motor vehicles, if he is a member of the AMA, may appoint two representatives to serve on the Competition Congress. The congress meets once each year in the fall to review all rules and make necessary revision, deletions, and additions, all of which have been submitted to the delegates by the AMA members and clubs. Riders who are interested in competition or a group wishing to form an AMA club may get particulars from any motorcycle dealer.

It was only natural that the increasing popularity of motorcycling has created a vast readership interest. Today the newsstands offer a variety of monthly magazines in which the latest trends, legislation, models, and racing reports and personalities are discussed. By reading about the sport, your enthusiasm will keep ticking, and at the same time you'll learn about the latest technical aspects—and even riding techniques.

Gene Romero rides his Triumph twin to victory at Sacramento, California, on September 13, clinching the 1970 Grand National Championship. (*Triumph Motorcycles*)



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CHARLES YERKOW has been owner of three motorcycles at one time, has flown open-cockpit airplanes, and has taught judo at Queens College, but nevertheless has spent most of his waking hours at a typewriter. After an education in American and European schools, Mr. Yerkow began his writing career by specializing in aviation. Since then he has broadened his field into writing fiction for numerous magazines and nonfiction about a variety of technical and semitechnical subjects. Mr. Yerkow, a native New Yorker, lives in Beechhurst, New York.