

POPULAR CYCLING'S

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# TRAIL BIKE

IND

QUARTERLY

SPRING  
1971

**TIPS ON:**  
▶ TRAIL RIDING  
▶ MAINTAINANCE  
▶ PORTING  
▶ HOP-UP



**TRAIL TESTS OF:**

**YAMAHA ◦ BULTACO ◦ KAWASAKI  
HONDA ◦ SUZUKI ◦ HARLEY-DAVIDSON**



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# TRAIL BIKE QUARTERLY

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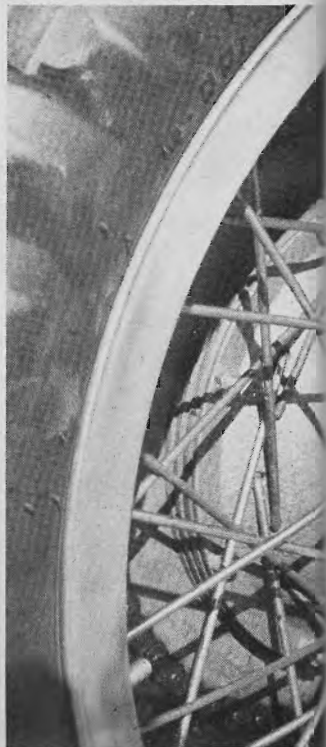
SPRING 1971



ON THE COVER: Two motorcyclists pause during their day of trail riding to take in the view offered by this canyon rim. Ektachrome by Dave Hetzler.

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# HOW TO CHOOSE YOUR FIRST BIKE

BUYING THE RIGHT BIKE DOESN'T HAVE TO BE A GAMBLE

We receive dozens of letters every week requesting advice as to which particular bike the person who writes in should buy. We don't recommend particular brands because they all have their good and bad points and the buyer will have to make the final decision.

There are a number of things to consider when buying a motorcycle, such as the purpose the machine will be used for, the size of the rider, and of course the amount of money to be spent, and what kind of warranty and after-sale service is offered.

If the machine is to be used exclusively for racing it will be much better to pay more money initially and buy a machine that is made for racing. It'll cost much more in the long run to modify a street bike or street/scrambler in an attempt to make it

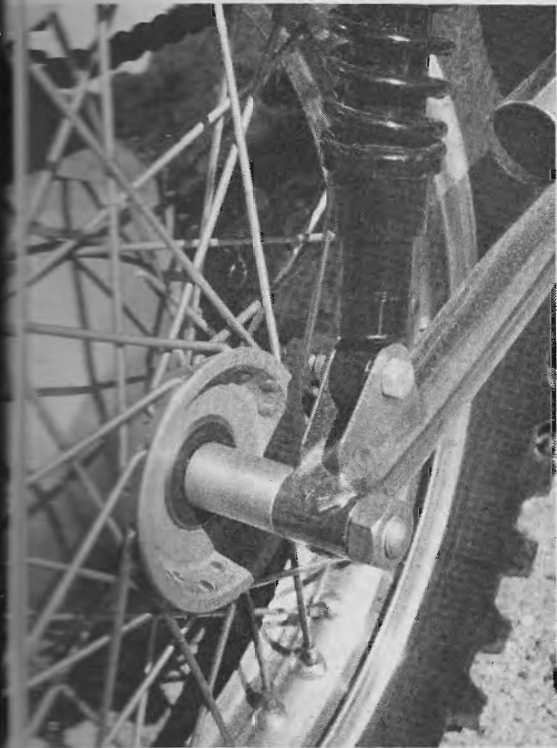
competitive. Generally speaking, street/scramblers can never really be made to be competitive with the genuine racers.

Almost all bike that can be used for trail riding, with the exception of all-out racers, come equipped with full lighting and other equipment to make the machine legal for street use. If there is any possibility that the bike will have to be used for street riding (even for short distances), get a machine that will pass the equipment laws. Any one of the dual purpose street/scramblers will do in this respect.

If you're like the majority of riders you'll log most of your mileage on the street with an occasional day of off-road riding. For this, one of the dual purpose street/scramblers will be required. This type of machine is a

*Many of the dual purpose street/scramblers need better suspension. This Yamaha is getting a pair of Ceriani forks.*





*It's easy to see the difference between a race bike and a trailer. An example here is the conical rear brake hub made from a light alloy on this racer.*



*When you try racing one of the smaller stock Japanese trail machines we suggest you wear full leathers — you'll need them.*

*If you're going to do both street and trail riding, and your machine isn't equipped with a dual range transmission, the use of overlay sprockets can be a help.*





*Here's Yamaha's 1971 line of machines. In it there're street bikes, street/scramblers and race machines. When looking for your first bike ride them all, in all lines, and pick the one that suits your needs.*

compromise so don't expect any of them to handle or go like the full blooded racers. They are all adequate for "fun riding," just don't expect miracles.

What brand? Stick to the well known brands, there's more than enough to offer a large selection. Avoid little known brands, this doesn't mean small companies because many small companies build fine bikes. We know of people who bring fifty or a hundred machines into the U.S., sell them, and then leave the owners without a source of parts or service. Avoid this situation by checking into the machine you plan to buy. Don't feel bad if the company doesn't sell as many motorcycles as Yamaha (very few do), just make sure they back their product.

Find out about parts availability. It won't do you any good to have a machine you can't ride because you broke something and can't get a part to replace it. We heard of one ridiculous situation where the owner of a well known brand from a Communist country bent his frame and the distributor refused to sell him a new one because it might be needed for the distributor's official rider later in the season. Don't get involved with a product whose distributor has so little regard for his customers.

There is another point, often overlooked, to consider when shopping for a bike, and that is the price of replacement parts. Very few people look into this until it's time to shell out the cash, and then it's often a big shock. We were recently told of an instance where a man had to purchase a cam and a set of rocker arms for his motorcycle; the price for the cam was \$48, while the rocker arms were \$100 per set of four. Had he known the parts for his bike were so expensive he would have bought another brand. This might be a factor that will help you to decide on a particular bike if you should have trouble making up your mind after narrowing down the field to a few different bikes.

From the standpoint of quality, all the bikes on the market are just about the same. Any bikes that weren't very good have either faded out of the picture long ago or they're fading rapidly now.

Size is a very important factor when buying a bike. The most common mistake is to buy a machine that is too small. Most new riders feel they should start off with something small because of their lack of experience. This works out just fine for the first few weeks, but then the machine that had more than enough power when it was first bought doesn't seem





*The smaller companies are usually the ones that make the best compromise machine. This Bultaco Matador actually started life as a race bike and was then de-tuned into a street/scrambler. It's almost perfect for enduro riding.*



fast any more. The bike isn't slower, it's just that the rider has gained some experience and is now asking for more performance than his small bike can deliver. So now he has two choices; he can keep the machine he has now even though he's unhappy with it, or he can trade it in on a larger model and take a financial loss. The best thing to do is buy a machine that is a bit too big for you, and then grow into it. As you gain experience your ability will grow to match the capability of the bike.

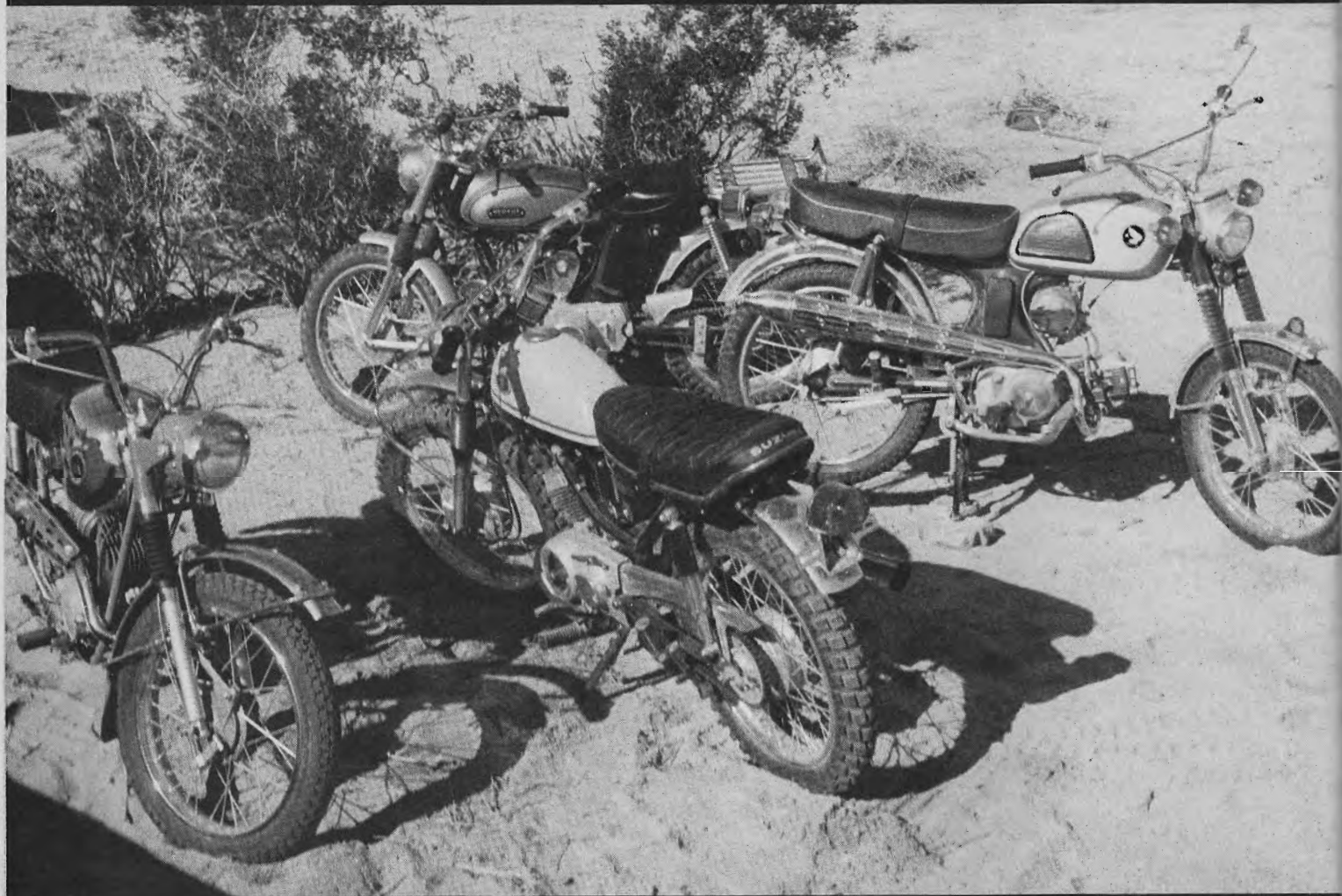
After you've decided on a particular machine the next step is to pick a reliable dealer. We know of many dealers who are only interested in selling bikes. They have very poor parts departments, mediocre mechanics (in some cases they're not really mechanics), and little concern for after-sale service. Avoid this type of dealer even if you have to go to a different city to buy your bike. Ask a few of the dealer's customers to find out if they feel they were dealt with fairly.

Another thing to do before you buy the bike is to find out about the warranty. Some dealers won't honor the warranty if the bike is ridden off the street. If this is the case see another dealer or choose a different brand; it won't do you any good to buy a trail bike that you can't take off the road. If the dealer doesn't have any faith in his bike you shouldn't either. As long as the machine isn't abused you should expect to have the warranty honored. We have heard of a few dealers who make temporary repairs and excuses until the warranty period is over. Then they tell the customer what's wrong with his bike but refuse to repair it unless the job is paid for by the customer.

So first find out about the brand you have in mind, it may turn out that after you find out the facts it isn't the bike for you. Check into the warranty, but remember, the bike won't be covered by the warranty forever; so find out if the parts are over-priced. Make sure the dealer is honest, concerned for his customers, stocks adequate parts, and has a good service department. And another good point, even if you live in a state that doesn't require that you wear a crash helmet, buy (a good one that meets the "Z-90" standards) and wear it whenever you ride.

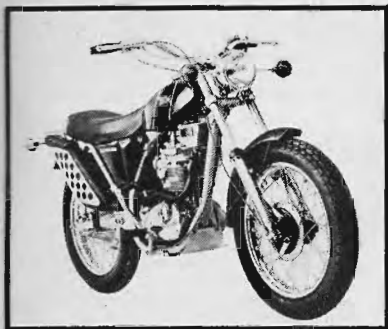
*If you plan to seriously race, buy a race machine. Here is a good example, the Rickman Micro Metisse.*

# TRAIL BIKE MARKET



A SELECTION OF SOME OF THE FINEST





#### BSA 250 GOLD STAR SS

Single cylinder. Four cycle with overhead valves. Bore, 67mm. Stroke, 70mm. Displacement, 247cc. Compression ratio, 10-to-1. Maximum horsepower, 22.5 at 8250 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube – double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Weight, 290 pounds (dry). Wheelbase, 54 inches. Ground clearance, 7 inches. Fuel tank capacity, 2.5 gallons. Tire size, front 3.25x18, rear 3.50x18.



#### BSA 500 GOLD STAR SS

Single cylinder. Four cycle with overhead valves. Bore, 84mm. Stroke, 90mm. Displacement, 499cc. Compression ratio, 10-to-1. Maximum horsepower, 34 at 6200 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube – double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Weight, 310 pounds (dry). Wheelbase, 54 inches. Ground clearance, 7 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.25x18, rear 3.50x18.



#### BSA 250 VICTOR

Single cylinder. Four cycle with overhead valves. Bore, 67mm. Stroke, 70mm. Displacement, 247cc. Compression ratio, 10-to-1. Maximum horsepower, 22.5 at 8250 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube – double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Weight, 287 pounds (dry). Wheelbase, 54 inches. Ground clearance, 7.5 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.00x20, rear 4.00x18.

#### BSA 500 VICTOR

Single cylinder. Four cycle with overhead valves. Bore, 84mm. Stroke, 90mm. Displacement, 499cc. Compression ratio, 10-to-1. Maximum horsepower, 34 at 6200 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube – double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Weight, 298 pounds (dry). Wheelbase, 54 inches. Ground clearance, 7.5 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.00x20, rear 4.00x18.



#### BULTACO LOBITO 125

Single cylinder. Two cycle with piston-port induction. Bore, 51.5mm. Stroke, 60mm. Displacement, 124.98cc. Compression ratio, 14-to-1. Maximum horsepower, 18.4 at 8500 rpm. Primary drive, chain. Gearbox, five speed. Clutch, wet multiplate. Frame, welded tubular, single front down tube – double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 220 pounds. Wheelbase, 48 inches.

#### BULTACO LOBITO 175

Single cylinder. Two cycle with piston-port induction. Bore, 60.9mm. Stroke, 60mm. Displacement, 174.77cc. Compression ratio, 12-to-1. Maximum horsepower, 22 at 8000 rpm. Primary drive, chain. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single front down tube - double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 224 pounds. Wheelbase, 51 inches. Ground clearance, 12.5 inches.



#### BULTACO MONTADERO

Single cylinder. Two cycle with piston-port induction. Bore, 85mm. Stroke, 65mm. Displacement, 362cc. Compression ratio, 9-to-1. Maximum horsepower, 32.5 at 6500 rpm. Primary drive, gear. Gearbox, four speed. Clutch, wet multiplate. Frame, welded tubular, double down tube full cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 251 pounds. Wheelbase, 56 inches. Fuel capacity, 3.5 gallons. Tire size, front 3.00x21, rear 4.00x18.

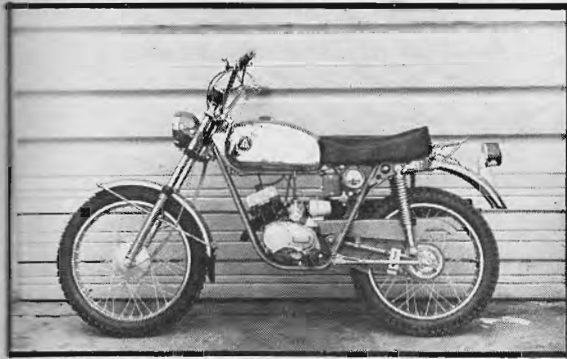
#### BULTACO MATADOR

Single cylinder. Two cycle with piston-port induction. Bore, 72mm. Stroke, 60mm. Displacement, 244cc. Compression ratio, 8-to-1. Maximum horsepower, 23.5 at 7000 rpm. Primary drive, chain. Clutch, wet multiple. Gearbox, five speed. Frame, welded tubular, double down tube full cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 210 pounds. Wheelbase, 53.5 inches.



#### DUCATI R/T 450

Single cylinder. Four cycle. Single overhead cam with Desmodromic valve mechanism. Bore, 86mm. Stroke, 75mm. Displacement, 435.6cc. Compression ratio, 9.3-to-1. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single front down tube - double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with shocks adjustable for both load and degree of inclination. Weight 250 pounds.



#### HODAKA ACE 100-B

Single cylinder. Two cycle with piston-port induction. Bore, 50mm. Stroke, 50mm. Displacement, 98cc. Compression ratio, 10-to-1. Maximum horsepower 10.8 at 7500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, double down tube full cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 187 pounds. Top speed, 65 mph. Wheelbase, 50.5 inches. Tire size, front 2.75x19, rear 3.00x18. Fuel capacity, 2.75 gallons.



#### HONDA Z-50K2 MINI TRAIL

Single cylinder. Four cycle, single overhead cam. Bore, 39mm. Stroke, 41.4mm. Displacement, 50cc. Compression ratio, 8.8-to-1. Maximum horsepower, 1.95 at 5000 rpm. Primary drive, gear. Clutch, automatic. Gearbox, three speed. Frame, welded tubular. Front suspension, telescopic. Rear suspension, none. Weight, 112.5 pounds. Tire size, front 3.50x8, rear 3.50x8. Fuel capacity, 0.7 gallon.



#### HONDA CT-70H MINI TRAIL

Single cylinder. Four cycle, single overhead cam. Bore, 47mm. Stroke, 41.4mm. Displacement, 70cc. Compression ratio, 8.8-to-1. Maximum horsepower, 5 at 8000 rpm. Primary drive, gear. Clutch, automatic. Gearbox, four speed. Frame, pressed steel, backbone. Front suspension, telescopic. Rear suspension, swing arm. Weight, 143.3 pounds. Tire size, front 4.00x10, rear 4.00x10. Fuel capacity, 0.78 gallon.

#### HONDA CL-70K1 SCRAMBLER

Single cylinder. Four cycle, single overhead cam. Bore, 47mm. Stroke, 41.4mm. Displacement, 70cc. Compression ratio, 8.8-to-1. Maximum horsepower, 5 at 8000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, four speed. Frame, pressed steel backbone. Front suspension, telescopic. Rear suspension, swing arm. Weight, 176 pounds. Tire size, front 2.50x17, rear 2.50x17. Fuel capacity, two gallons.



#### HONDA TRAIL 90

Single cylinder. Four cycle with single overhead cam. Bore, 50mm. Stroke, 45mm. Displacement, 89.6cc. Compression ratio, 8.2-to-1. Maximum horsepower, 7 at 8500 rpm. Primary drive, gear. Clutch, automatic. Gearbox, dual range, four speeds in high and low range. Frame, pressed steel backbone type. Front suspension, telescopic. Rear suspension, swing arm. Weight, 180 pounds. Wheelbase, 46 inches. Top speed, 57 mph.

#### HONDA SL-100 MOTOCROSSER

Single cylinder. Four-cycle, single overhead cam. Bore, 50mm. Stroke, 49.5mm. Displacement, 98cc. Compression ratio, 9.5-to-1. Maximum horsepower, 11.5 at 11,000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, double down tube full cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 220 pounds. Wheelbase, 49.5 inches. Top speed, 65 mph. Fuel capacity, two gallons.



#### HONDA SL-175 MOTOSPORT

Two cylinders. Four-cycle with single overhead cam. Bore, 52mm. Stroke, 41mm. Displacement, 174cc. Compression ratio, 9-to-1. Maximum horsepower, 19 at 9500 rpm. Primary drive, gear. Clutch, multiplate. Gearbox, five speed. Frame, welded tubular double cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 247 pounds. Tire size, front 3.00x19, rear 3.50x18. Fuel capacity, two gallons.



#### HONDA SL 350

Two cylinders. Four-cycle with single overhead cam. Bore, 64mm. Stroke, 50.6mm. Displacement, 325cc. Compression ratio, 9.5-to-1. Maximum horsepower, 33 at 9500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, double down tube full cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 345 pounds. Wheelbase, 52 inches. Top speed, 93 mph.



#### KAWASAKI 75MT DYNA-MITE

Single cylinder. Two-cycle with piston-port induction. Bore, 1.81 inches. Stroke, 1.73 inches. Displacement, 73cc. Compression ratio, 6.7-to-1. Maximum horsepower, 5 at 6000 rpm. Gearbox, three speed. Clutch, automatic, centrifugal. Frame, tubular backbone. Front suspension, telescopic. Rear suspension, swing arm. Weight, 121 pounds. Wheelbase, 39 inches. Tire size, front 3.50x8, rear 3.50x8. Overall length 53 inches.



#### KAWASAKI 90S BUSHMASTER

Single cylinder. Two-cycle with rotary valve induction. Bore, 1.85 inches. Stroke, 2.04 inches. Displacement, 89cc. Compression ratio, 7-to-1. Maximum horsepower, 10.5 at 8000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular backbone with double front down tubes. Front suspension, telescopic. Rear suspension, swing arm. Weight, 170 pounds (dry). Wheelbase, 45.3 inches. Tire size, front 2.75x18, rear 2.75x18.



#### KAWASAKI 100E TRAIL BOSS

Single cylinder. Two-cycle with rotary valve induction. Bore, 1.95 inches. Stroke, 2.04 inches. Displacement, 99cc. Compression ratio, 7-to-1. Maximum horsepower, 11.5 at 8000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, dual range with five speeds in each range. Frame, tubular, double cradle. Front suspension, telescopic. Rear suspension, swing arm with five way adjustable shocks. Weight, 185 pounds. Wheelbase, 50 inches. Tire size, front 3.00x18, rear 3.00x18.



#### KAWASAKI 125E

Single cylinder. Two-cycle with rotary valve induction. Bore, 2.05 inches. Stroke, 2.32 inches. Displacement, 124.9cc. Compression ratio, 7.2-to-1. Maximum horsepower, 17.5 at 7500 rpm. Primary drive gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular, double cradle. Front suspension, telescopic. Rear suspension, swing arm with adjustable shocks. Weight, 231 pounds. Wheelbase, 51.5 inches. Tire size, front 3.00x18, rear 3.25x18.

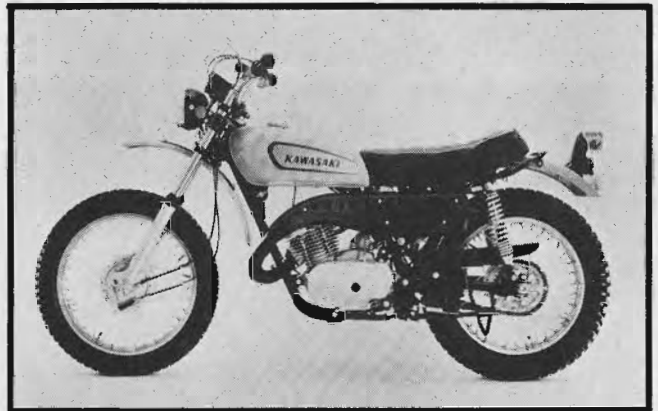


#### KAWASAKI 175E

Single cylinder. Two-cycle with rotary valve induction. Bore, 2.42 inches. Stroke, 2.32 inches. Displacement, 174cc. Compression ratio, 7.1-to-1. Maximum horsepower, 21.5 at 7500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular, double cradle. Front suspension, telescopic. Hatta design. Rear suspension, swing arm with adjustable shocks. Weight, 233 pounds. Wheelbase, 52 inches. Tire size, front 3.00x19, rear 3.50x18.

#### KAWASAKI 250E

Single cylinder. Two-cycle with rotary valve induction. Bore, 2.68 inches. Stroke, 2.68 inches. Displacement, 246.8cc. Compression ratio, 6.8-to-1. Maximum horsepower, 24.5 at 6800 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular, double cradle. Front suspension, telescopic, Hatta design. Rear suspension, swing arm with adjustable shocks. Weight, 271 pounds. Tire size, front 3.25x19, rear 4.00x18. Ground clearance, nine inches.

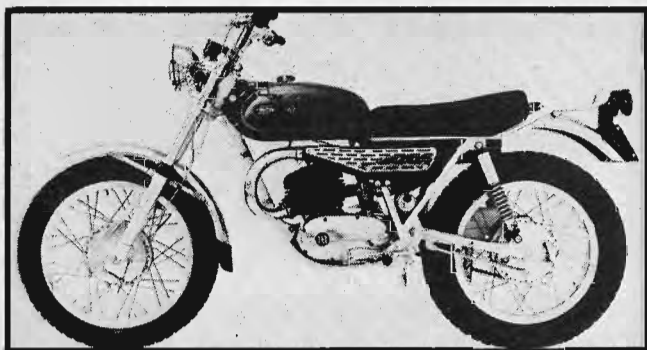


#### KAWASAKI 350E BIGHORN

Single cylinder. Two-cycle with rotary valve induction. Bore, 3.17 inches. Stroke, 2.68 inches. Displacement, 346cc. Compression ratio, 6.8-to-1. Maximum horsepower, 33 at 6500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular, double cradle. Front suspension, telescopic, Hatta design. Rear suspension, swing arm with adjustable shocks. Weight, 265 pounds. Wheelbase, 55 inches. Tire size, front 3.00x21, rear 4.00x18. Ground clearance, 9 inches.

#### MONTESA 250 KING SCORPION

Single cylinder. Two-cycle with piston-port induction. Bore, 72.5mm. Stroke, 60mm. Displacement, 247cc. Maximum horsepower, 22.8 at 6500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single cradle. Front suspension, telescopic. Rear suspension, swing arm with five way adjustable shocks. Tire size, front 3.00x21, rear 4.00x18. Fuel capacity, 2.9 gallons.



#### OSSA PLUNKER

Single cylinder. Two-cycle. Piston-port induction. Bore, 72mm. Stroke, 60mm. Displacement, 244.3cc. Compression ratio, 9-to-1. Maximum horsepower, 16 at 6000 rpm. Special heavy flywheels for trials riding. Gearbox, four speed. Frame, welded tubular, double down tube full cradle. Front suspension, Telesco telescopic. Rear suspension, swing arm with adjustable shocks.

#### OSSA 250 PIONEER

Single cylinder. Two-cycle, piston-port induction. Bore, 72mm. Stroke, 60mm. Displacement, 244.3cc. Compression ratio, 10-to-1. Maximum horsepower, 22 at 8000 rpm. Clutch, wet multiplate. Gearbox, four speed. Frame, welded tubular, double down tube full cradle. Front suspension, Telesco telescopic. Rear suspension, swing arm with three way adjustable shocks. Weight, 225 pounds. Wheelbase, 55 inches. Ground clearance, nine inches.



#### SACHS 125

Single cylinder. Two-cycle with piston-port induction. Bore, 54mm. Stroke, 54mm. Displacement, 123cc. Compression ratio, 10-to-1. Maximum horsepower, 15.5. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, center backbone with double down tubes. Front suspension, leading link with 6.3 inches of travel. Rear suspension, swing arm with Boge shocks. Weight, 217 pounds. Wheelbase, 51 inches. Tire size, front 2.50x21, rear 3.50x18. Ground clearance, 10 inches.



#### SUZUKI TC-90R BLAZER

Single cylinder. Two-cycle, with rotary valve induction. Bore, 1.85 inches. Stroke, 2.04 inches. Displacement, 89cc. Compression ratio, 6.7-to-1. Maximum horsepower, 11 at 7500 rpm. Clutch, wet multiplate. Primary drive, gear. Gearbox, dual range, four speeds in each range. Frame, tubular backbone with double down tubes. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 199 pounds. Wheelbase 47 inches. Ground clearance, 8.7 inches. Tire size, front 2.75x18, rear 3.00x18.



#### SUZUKI TS90R HONCHO

Single cylinder. Two-cycle, with rotary valve induction. Bore, 1.85 inches. Stroke, 2.04 inches. Displacement, 89cc. Compression ratio, 6.7-to-1. Maximum horsepower, 11 at 7500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular backbone with double down tubes. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 197 pounds. Wheelbase, 47 inches. Ground clearance, 6.8 inches. Tire size, front 2.75x18, rear 3.00x18.



#### SUZUKI TC-120R CAT

Single cylinder. Two-cycle, with piston-port induction. Bore, 2.05 inches. Stroke, 2.20 inches. Displacement, 118cc. Compression ratio, 6.9-to-1. Maximum horsepower, 12 at 7500 rpm. Clutch, wet multiplate. Primary drive, gear. Gearbox, dual range, three speeds in each range. Frame, tubular, double cradle. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 205 pounds. Wheelbase, 47 inches. Ground clearance, 7.9 inches. Tire size, front 2.75x18, rear 3.00x18.

#### SUZUKI TS-125R DUSTER

Single cylinder. Two-cycle, with piston-port induction. Bore, 2.20 inches. Stroke, 1.97 inches. Displacement, 123cc. Compression ratio, 6.7-to-1. Maximum horsepower, 13 at 7000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single front down tube, double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 198 pounds. Wheelbase, 51.6 inches. Ground clearance, 9.3 inches. Tire size, front 2.75x19, rear 3.25x18.



#### SUZUKI TS-185R SIERRA

Single cylinder. Two-cycle, with piston-port induction. Bore, 2.52 inches. Stroke, 2.24 inches. Displacement, 183cc. Compression ratio, 6.7-to-1. Maximum horsepower, 17.5 at 7000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single front down tube, double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 218 pounds. Wheelbase, 52.8 inches. Ground clearance, 9.7 inches. Tire size, front 3.00x19, rear 3.50x18.

### SUZUKI TS-250R SAVAGE

Single cylinder. Two-cycle, with piston-port induction. Bore, 2.76 inches. Stroke, 2.52 inches. Displacement, 246cc. Compression ratio, 6.7-to-1. Maximum horsepower, 23 at 6500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, welded tubular, single front down tube, double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm. Dry weight, 245 pounds. Wheelbase, 55.8 inches. Ground clearance, 9.8 inches. Tire size, front 3.25x19, rear 4.00x18.



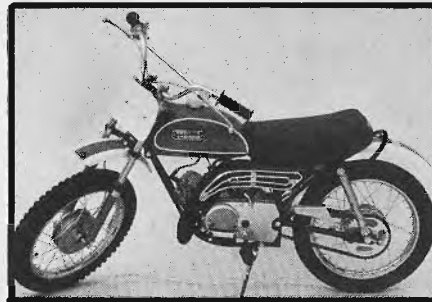
### TRIUMPH 250 TRAIL BLAZER

Single cylinder. Four-cycle with overhead valves. Bore, 67mm. Stroke, 70mm. Displacement, 247cc. Compression ratio, 10-to-1. Maximum horsepower, 22.5 at 8250 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube - double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Dry weight, 287 pounds. Wheelbase, 54 inches. Ground clearance, 7.5 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.00x20, rear 4.00x18.



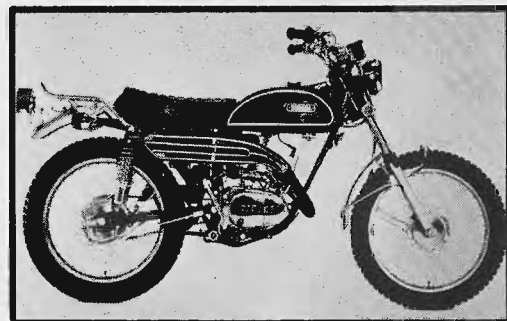
### TRIUMPH 250 BLAZER SS

Single cylinder. Four-cycle with overhead valves. Bore, 67mm. Stroke, 70mm. Displacement, 247cc. Compression ratio, 10-to-1. Maximum horsepower, 22.5 at 8250 rpm. Primary drive, duplex chain. Gearbox, four speed. Frame, welded tubular, single front down tube - double cradle rear section. Front suspension, telescopic. Rear suspension, swing arm with three way adjustable shocks. Dry weight, 290 pounds. Wheelbase, 54 inches. Ground clearance, 7 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.25x18, rear 3.50x18.



### YAMAHA JT1 MINI-ENDURO

Single cylinder. Two-cycle with rotary valve induction. Bore, 42mm. Stroke, 42mm. Displacement, 58cc. Compression ratio, 6.4-to-1. Maximum horsepower, 4.5 at 7500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, four speed. Frame, welded tubular backbone with double front down tubes. Front suspension, telescopic. Rear suspension, swing arm. Weight, 121 pounds. Wheelbase, 41.5 inches. Ground clearance, 6.3 inches. Fuel capacity, 1.1 gallons. Tire size, front 2.50x15, rear 2.50x15.



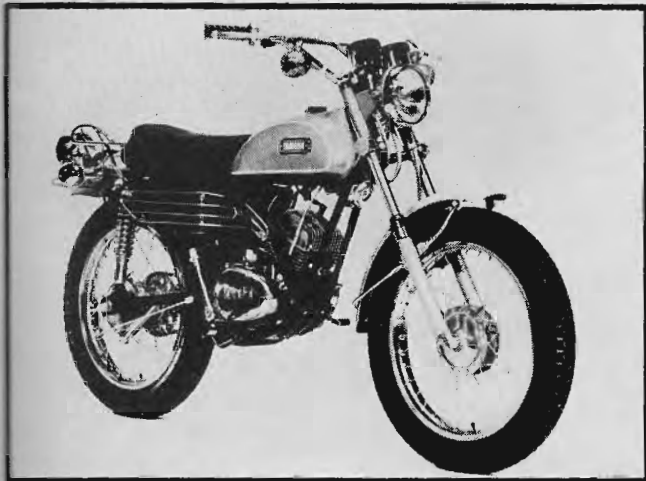
### YAMAHA HT1-B ENDURO

Single cylinder. Two-cycle with piston-port induction. Bore, 50mm. Stroke, 45.6mm. Displacement, 89cc. Compression ratio, 6.8-to-1. Maximum horsepower, 8.5 at 7000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular backbone with double front down tubes. Front suspension, telescopic. Rear suspension, swing arm. Weight, 190 pounds. Wheelbase, 48 inches. Ground clearance, 8.9 inches. Fuel capacity, 1.7 gallons. Tire size, front 2.75x18, rear 3.00x18.



#### YAMAHA AT1-C ENDURO

Single cylinder. Two-cycle with piston-port induction. Bore, 56mm. Stroke, 50mm. Displacement, 123cc. Compression ratio, 7.1-to-1. Maximum horsepower, 11.5 at 7500 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular backbone with double front down tubes. Front suspension, telescopic. Rear suspension, swing arm. Weight, 221 pounds. Wheelbase, 50.6 inches. Ground clearance, 8.9 inches. Fuel capacity, 1.9 gallons. Tire size, front 3.00x18, rear 3.25x18.



#### YAMAHA CT1-C ENDURO

Single cylinder. Two-cycle with piston-port induction. Bore, 66mm. Stroke, 50mm. Displacement, 171cc. Compression ratio, 6.8-to-1. Maximum horsepower, 15.6 at 7000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular backbone with double front down tubes. Front suspension, telescopic. Rear suspension, swing arm. Weight, 214 pounds. Wheelbase, 50.8 inches. Ground clearance, 9.4 inches. Fuel capacity, 1.9 gallons. Tire size, front 3.25x18, rear 3.50x18.

#### YAMAHA DT1-E ENDURO

Single cylinder. Two-cycle with piston-port induction. Bore, 70mm. Stroke, 64mm. Displacement, 246cc. Compression ratio, 6.4-to-1. Maximum horsepower, 23 at 7000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular with double cradle design. Front suspension, telescopic. Rear suspension, swing arm. Weight, 245 pounds. Wheelbase, 54.7 inches. Ground clearance, 10 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.25x19, rear 4.00x18.



#### YAMAHA RT1-B ENDURO

Single cylinder. Two-cycle with piston-port induction. Bore, 80mm. Stroke, 70mm. Displacement, 351cc. Compression ratio, 6.3-to-1. Maximum horsepower, 30 at 6000 rpm. Primary drive, gear. Clutch, wet multiplate. Gearbox, five speed. Frame, tubular with double cradle design. Front suspension, telescopic. Rear suspension, swing arm. Weight, 258 pounds. Wheelbase, 54.7 inches. Ground clearance, 10 inches. Fuel capacity, 2.5 gallons. Tire size, front 3.25x19, rear 4.00x18.

By Preston Petty


To start things off we will divide trail riding into three parts, your machine, yourself and last but not least the type of terrain you will be riding over. The proper mating of these three components will provide you with many enjoyable trail riding experiences. A particular rider/machine combination possess a certain degree of ability; overtaxing the combination by selecting too rough of terrain, can only lead to more work than fun. A reasonable analogy to trail riding expertise would be a ski area. There they have a variety of runs to accommodate the individual's ability whether it be beginner, intermediate or expert with the beginner's run being the lower, flatter and less demanding of them. Try to take the same idea into consideration when planning your trail ride. Going in *over your head* whether it's hiking, swimming, flying, or trail riding can be dangerous as well as unenjoyable. The whole key to it is to progress as slowly as necessary so that you are confident that you spent enough time determining the proper course of action by properly evaluating the circumstances. I will elaborate on each of the three trail riding components separately and leave it to the reader to piece together the points of interest to him (her?).

considerable reservation cornering and braking and you should do the same if you are using knobbies for limited street riding.

If you have pitted oversize tires on your bike it is a good idea to check for proper running clearance between the fender or frame and the tire. An easy, accurate way to do it is to remove the springs from the suspension on either end or both depending on which you are checking, leave the dampeners on, then sit on the bike and try to roll it back and forth. You might be very surprised to find out that the machine won't move when the suspension is compressed all the way because of a bolt or piece of metal poking into the tire tread. You might also find out that you can shorten the footrests somewhat, to reduce them from being bent from rocks, etc. Also check the footrests when the machine is leaned over.

Gearing should be on the low side (higher numerically) rather than having it too *tall*. The machine should be geared so that you can walk alongside of it when the clutch is engaged, in low gear, and the engine turning enough RPM to be able to pull up a reasonable hill. You can, no doubt, see the value to this gearing if you get stuck and must push the bike to the top of a hill. Let the motor pull the

*When coming downhill keep your weight to the rear. If you need the brakes use both the front and rear together.*



there is a chance of much water. I have had bikes that were waterproof when I bought them, only to become susceptible to water later on. When you find out it is usually too late (you are stuck for a while).

One thing on the general subject of machinery — you almost always get what you pay for in trail bike machinery. It is not like buying a Cadillac where you are paying primarily for the name. In trail bikes the more expensive (up to a point), the more performance, not just engine performance but in riding comfort and better suspension, stronger wheels, better waterproofing, etc.

Torque, low speed lugging type of power is what you use a lot of for trail riding and there is no substitute for cubic inches to get it. You do pay a slight penalty, usually more weight for more horsepower as well as more loot to purchase it. You must decide for yourself; your ability, the terrain you ride, the speed you go, and whether you need to pack double should play a part in your decision as to a particular bike.

# BASIC TIPS FOR

## 'THE MACHINE'

The type of trail bike you have determines to an extent where you should be riding it. For instance, the use of narrow width tires (less than 3.25) road or knobby tread will make sandy soft surfaced trails much more difficult to get over, perhaps impassable if the tire is a street type instead of knobby. Generally, if the machine is used for some street and mostly graded dirt roads you can get by fine with a Goodyear Grasshopper or Dunlop Trials type of tread pattern. Get the biggest tires you can fit on it because most of the time when you get stuck it's from excessive wheel slippage such as crossing a stream or climbing soft-steep hills. Of course, if you are riding in these types of conditions a knobby will be the best type of tread.

The knobby can be used successfully on the highway if you cool it, speed wise, and realize that your traction is about 20 per cent less than a comparable street tread. A lot of the riders use knobbies in Baja races of which the first 100 miles are paved roads and they approach speeds of 100 mph. I assure you that they use

bike up the rest of the way and it helps you climb beside it. If the bike is geared higher (lower numerically) than this you must slip the clutch excessively. As you can imagine clutches won't live very long that way and it will shorten the life of the rest of the machine.

I think a chain guide is a necessity so that the chain won't come off the sprockets as easily when it is loose. Of course, it is wise to re-adjust and lubricate the chain whenever it is loose. A chain guard is useful because it protects the chain from picking up mud from the rear tire and transporting it up to the engine. It goes over the top of the chain, next to the tire, to divert mud around the chain. Many trail bikes come with them; do not remove it for appearance sake. There are a few fully enclosed models (Bultaco Matador, Jawa Trials, to name a couple) which permit the rear chain to run in a relatively clean environment that will make it live much longer.

Make sure that you keep a can of ignition waterproofing spray around and give the ignition components a good spraying before each weekend if

Now a plug for civil tranquility and the U.S.F.S. Law requires, in many areas, to have a spark arrestor so please make sure you are using one when it is required. The local fire department or Ranger Station will provide the information and the citations if you should and don't have one on. All the proper ones are stamped U.S.F.S. approved and the ranger will look for that. To keep your own mental tranquility as well as friendship with neighbors, campers, hikers, bird watchers, etc., please use a muffler. Many companies sell spark arrestor/muffler combinations that leave the top end power about the same and actually give you more bottom and mid-range power. It simply clamps or bolts on to the end of your expansion chamber. If you are using a standard muffler please do not remove the muffler portion. You might say, "It gives me more power," well if it does it is only because the muffler core is carboned up. It can be easily cleaned by immersing in a can of carburetor cleaner or parts dip. When up in the boonies you can lay the muffler core in the fire to burn the carbon loose (let it sit in there for an hour or so) and then tap it against a



# TRAIL RIDING

TRAILING FOR  
ENJOYMENT





*If it's rocky going hold down your speed, stand up, and take your time. Big rocks will put you off quicker than anything else.*

rock and the carbon will fall off in flakes. When it is clean your horsepower will be up, not down, and be much more palatable for the people sharing the trail with you.

#### THE RIDER

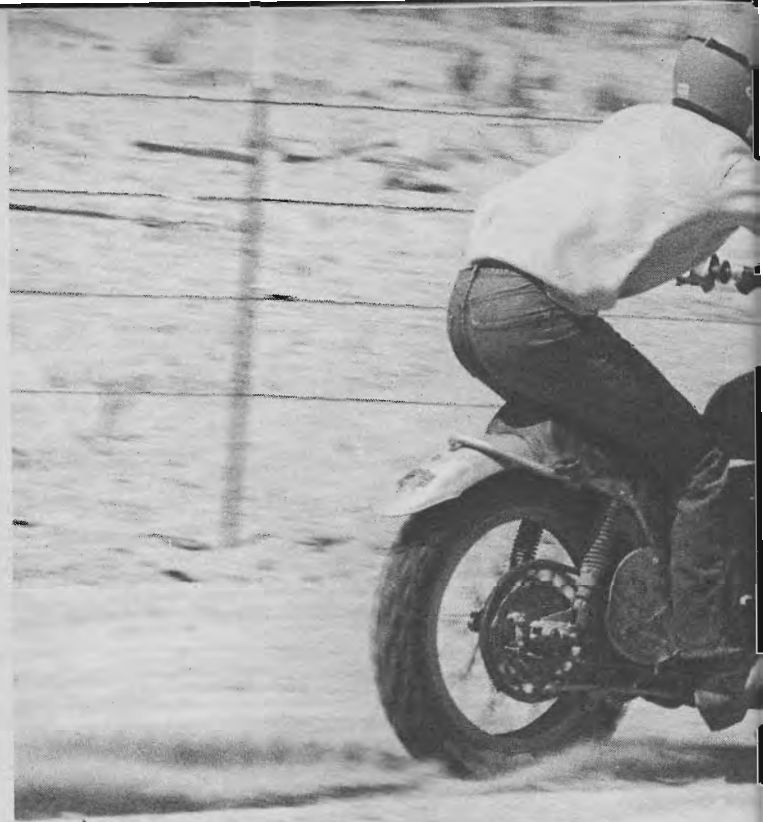
Individual preference is the primary consideration when setting up a bike to be as comfortable as possible. The same is true on rider apparel to an extent. Here are a few tips that may be useful. Get some leather lace-up boots that come up as high as possible on your calves. This affords good resistance to brush, thorns, branches, and the waterproofing is much better. I usually wear a pair of Levis and silk undershorts. The silk makes for less abrasion between Levis and human hide. A 'gut belt' (stomach supporter), long sleeved sweatshirt, jacket (if it is cold enough), and a pair of gloves. Make sure you wear gloves because they really protect the fingers and knuckles from brush abrasions or when you have a meeting with terra firma. Eye protection is necessary and goggles or sun glasses are fine. The goggles are probably better if there is much dust but they will fog up easier

and they feel hotter. I prefer the safety glass lens goggles because they do not scratch up like plastic ones, plus they will last a long time. The glass goggles are also much easier to clean enroute.

The control levers should be placed as close as possible to the handgrips. When resting your hands flat on the handlebars your fingers should lie on top of the clutch and brake levers. This placement will enable you to reach the lever in the shortest possible time. Simply, the brakes should be set so you can apply them in the shortest length of time possible, for safety's sake.

#### TERRAIN AND HOW TO RIDE IT

Streams and other water crossings can pose a real problem, at least in drying you and the bike off, if you utilize an incorrect technique. Since it is usually difficult to see the size of rocks hidden under the surface, I ride with my feet off the pegs and ready to plant it for support on the bottom when either wheel hits a good sized 'greasy' rock. I realize it doesn't look too sophisticated to cross an unknown stream bed with your feet dangling,



*Whenever you come to an unexpected dip that you can't stop for, get your weight over the back wheel and turn on a little throttle. This will lighten the front end and help it smooth out the dip or bump.*

but you can fall real quickly and it can take a long time getting the engine and yourself running after being submerged. Now that you have consented to get your feet wet on watercrossings there are a few observations you can use to minimize the problem. If it is a stream or creek, the water will be moving faster where it is shallow and slower where it is deeper, so pick a path through the faster portion weaving around if possible, the 'bumpy' water (submerged big rocks create the 'bumps' on the water surface). Another advantage to crossing the faster running portion is that moss build ups are not usually as heavy because the faster moving water tends to 'scrub' the rocks.

Rocks, ditches, and bumps are some of the portions of a trail that can use some improvement by the rider. Probably the most important thing is to be able to lift your posterior up off the seat (semi-standing). This permits the machine to move up and down much more quickly than with you sitting on the seat and as a consequence the wheels will tend to stay in better contact with the ground. Also,



*If the bike can't climb a steep hill and you have to get off, ALWAYS dismount on the uphill side. This way if the bike falls it won't be using you for a landing spot.*

it will allow a less jolting ride and less possibility of the rider losing his equilibrium. Pick out a bump by itself and practice standing up slightly on the footrests just before hitting it and notice that even though the machine may pitch quite a bit the ride will be relatively smooth. Ditches are like having two bumps in a row, but the second bump is often a significant climb and make sure that you have plenty of momentum (speed) at the bottom to help carry you up the other side. Rocks of a size much bigger than a baseball can create a problem with small tires. The best approach is to stand up and weave in between the larger rocks. Standing will permit you to maneuver the machine quickly, particularly from side to side and again it can bounce up and down without upsetting the rider. If you do feel as though you are losing balance, quickly lift your foot off the footrest and onto one of the bigger rocks to provide a surface to shove the machine upright again. One foot and two wheels make a great tripod – use them as often as necessary.

Ruts are a common occurrence on trails or dirt roads and when a wheel drops in one it won't usually roll itself out. If the rut is very deep it is better to get off (if you haven't already) and lift the wheel out. When it is necessary

*When crossing a steep dip stand on the pegs and take it slowly, this keeps the bike under you which allows you to maintain control.*



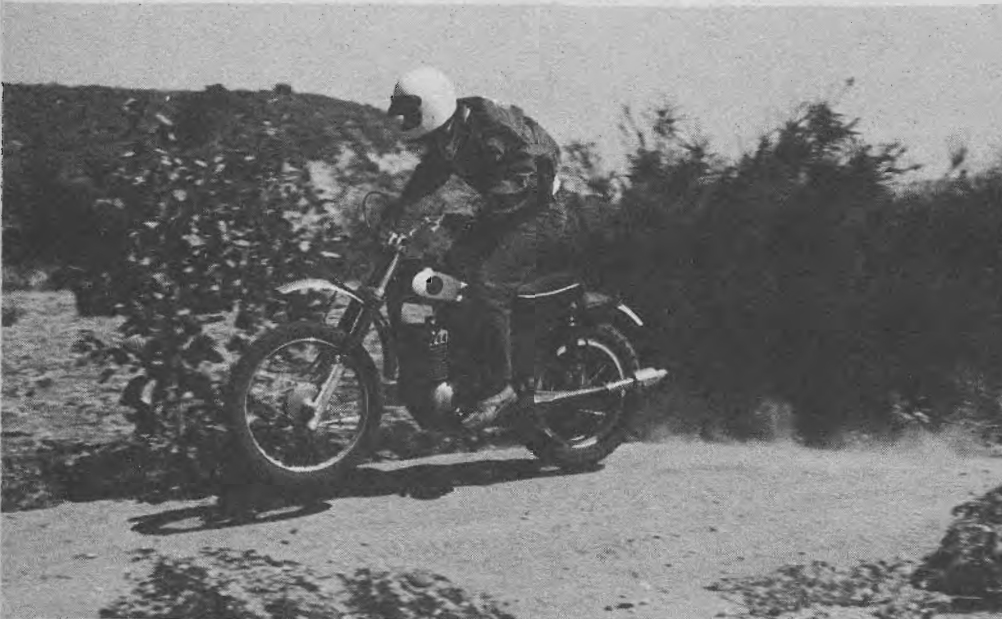
*It's fun, if you know the water is not deep and filled with hidden rocks, to loft the front wheel and ride through on the rear. This also keeps the engine dry if it's not too well waterproofed.*





*When riding in sand try and pick your path where no bikes have gone before, usually the sand will be packed harder there which gives you better traction.*

*When crossing big rocks, especially if they're in a stream, sit on the seat and use both feet to help you along. It's not stylish but it works.*




*If the road suddenly drops away from you stand and take the landing shock in your legs. They're just about the best shock absorbers made. You can see this 360 Maico is equipped with a spark arrestor to keep the neighbors happy.*

to cross ruts (up to 12 inches wide) then cross them perpendicular to the rut at the narrowest spot. The center portion of a jeep trail is usually the last portion to become rutted and will permit you to go to either side. Make sure you don't try to make turns on the off-camber side when riding the center portion.

The ups and downs of hill riding usually manage to bring out the worst in a rider and here are a few tips that may make it easier. Climbing hills is usually easier than going down, but the steeper climbs can present more of a problem. If it is a soft hill the main consideration is to get going as fast as possible at the bottom and use your forward speed (momentum) to help you climb. Generally, given enough speed at the bottom of a hill and a smooth transition at the bottom you

can make it to the top of just about any of them. When your speed slows, don't permit the rear wheel to spin excessively, keep it going about zero to ten per cent faster than the machine is going. It will be necessary to make sure you downshift early enough so that the engine will be in its power band as you gear down, particularly with the smaller machines. It is better to *wind it tight* in a lower gear than to have to downshift right away. When you have slowed to a walking pace and the traction is nil, dismount **ON THE UPHILL SIDE**, and either walk with it the rest of the way up or turn it around and try again. If you want to continue on up then leave it in low gear at a moderate throttle opening (use your front brake to hold it while you are getting started) and as you let the clutch out, help shove it up the hill



initially and then your machine will pull itself up and help you climb as well. Once you have stopped or nearly so, don't sit on the machine and let it dig in because the excessive wheel spin just invites looping the machine or sliding off the trail. If you are in this kind of situation you are probably better off to try it all over again from the bottom with more speed next time. Next you need to turn your bike around, so hold the front brake, engine dead, in low gear (clutch engaged) and with you standing on the uphill side. Release the clutch and 'inch' the front wheel brake with the front wheel turned towards the side you are standing on. The machine will roll around to a position crosswise to the trail. Get back on and turn the front wheel downhill, then release the brakes and clutch and shove off lightly.

Do not use the brakes until you are turned around completely and going straight downhill. The use of the front wheel brake on downhill sections is recommended. It will slow you down more effectively than using the rear brake only. It is better to use the front and rear wheel brakes together, lightly, with just enough pressure to inhibit appreciable acceleration. Don't try to stop when going downhill but always keep the wheels rolling (otherwise, it could be just you that is rolling down). Remember, it is very difficult to balance a motorcycle when the wheels aren't turning. Locking the rear wheel



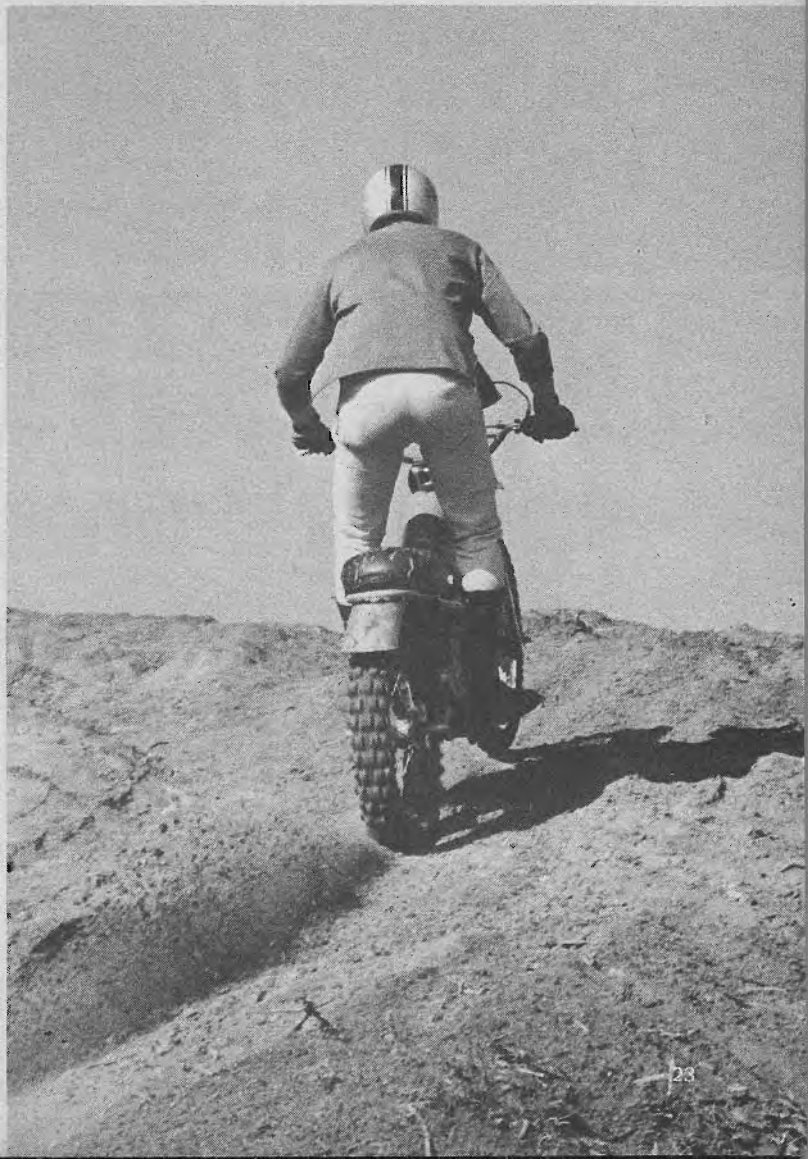
brake and at the instant of tire slippage release it very quickly and then bring the machine straight upright and reapply it . . . gradually.

Sand is always a big problem for a 250 pound man on a Honda 50 but most everybody else can negotiate sandy areas pretty well with some practice. The key is to try and keep up your speed enough so that you don't sink down excessively and in general, the greater your speed, the less the sinkage, and you will have better control. The speed bit comes to a limit pretty quickly and spending some time looking for harder surfaces to ride on will be well spent. Damp sand is always better (harder) than the dry stuff and a quick look around the stream bed might turn up an area of it. If there isn't any damp sand then try to pick out the portions that have not been ridden over since the last rain because they are usually packed better. The biggest tires that will fit on your machine will offer more "buoyancy" on sand and are a wise investment.

also makes the rear suspension essentially inoperative and it invites a broadside. Stand on the footrests, weight to the rear, and *ride* the trail as if it were level using only enough braking pressure to offset acceleration due to gravity. If your speed increases too much then find a smooth area, rock free if possible, near the bottom of the hill and continue to ride it on down. When you get to this area then *bury* the brakes while going in a straight line. If you try to *bury* the brakes on the rougher areas of the downhill then prepare to *bury* the other parts of your body (legs, arms, etc.). Seriously, separate the functions of either braking (to slow down) or *riding* it (to get to the bottom), much interaction between the two will result in reduction of control.

You have probably not used your front brake much and maybe after reading this article you will try riding around grabbing a big handful of front binder every time you go down anything steeper than a curb. This may not be too bad an idea if you are selective in its usage. **ONLY** use the front brake when the machine is perpendicular to the ground and not on any off-camber surfaces. Do not try to turn the front wheel when using its

*Don't crest an unknown hill flat out in top gear, there might be a 200 foot drop-off on the other side. Allow your speed to die as you reach the top.*





# WATERPROOFING FOR WET WEATHER RIDING

YOUR MACHINE ISN'T MEANT TO RUN IN WATER BUT IT WILL  
— IF YOU PREPARE PROPERLY.

By Robert Schleicher

A motorcycle can be far more than merely a fun-in-the-sun conveyance if you've the nerve to ride it with relatively little regard for weather. Most areas of the country provide off-road events in the wet spring and fall months of the year as well as during the summer. If you've enough forethought to clothe yourself in weather-proof gear, riding in the wet can be even more enjoyable than the dry and often dusty conditions of mid-

summer. Your machine, too, must be weatherproofed if you expect it to continue to function in any weather. An effective air cleaner is usually enough preparation for summer's dust, but the weather and mud of spring and fall are a bit more difficult to cope with. Even some of the summer runs will take you and your machine through a water crossing or two so, if you expect to finish, you'd best know what is needed to keep your off-roader

running in any weather.

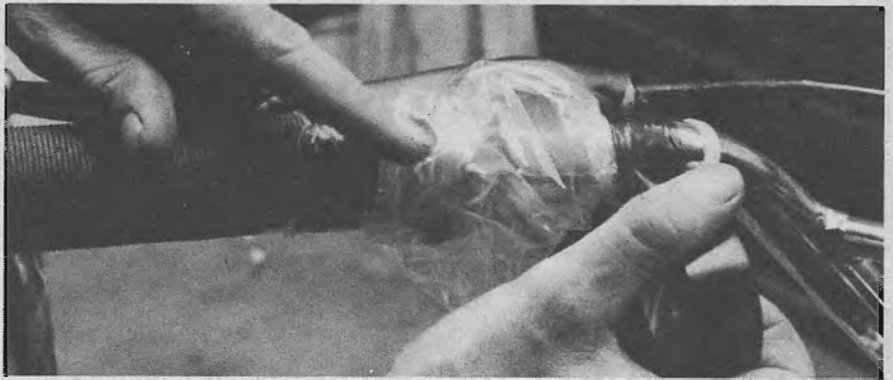
If you are careful enough about waterproofing your machine it will actually be able to run in as much as two feet of water. That doesn't quite make it a submarine but it's enough to keep up the engine's combustion cycle through just about any type of mud hole or water crossing you'll likely encounter. First, realize that none of the trailbikes or scrambler off-road racing motorcycles are really water-



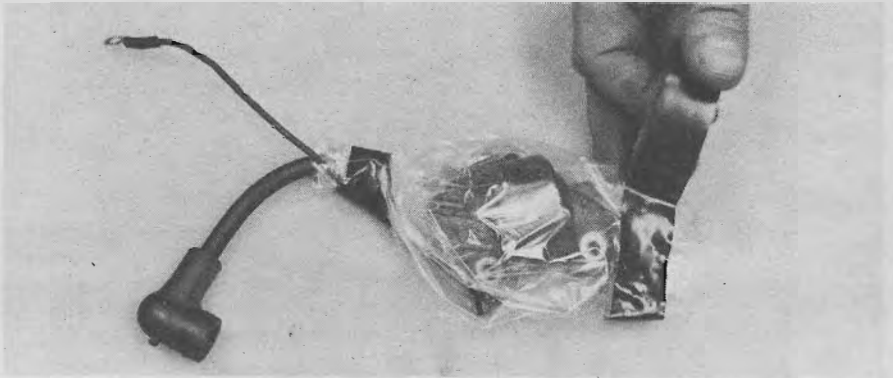
proofed — many have perfectly effective protection against dust entering the engine's working parts, but only one or two of the expensive "factory replica" bikes, copied after their entries in the International Six Days Trials, are fully weatherproof. The obvious goal is to keep water (and dust) out of the engine's vital sources of energy; the gasoline, the air supply, and the electrical ignition system.

One drop of water in your gasoline is enough to stop the fuel flow through the carburetor. The gasoline tank's cap is not always enough to seal it against water splashing up onto the tank top. The cap must be vented to allow the tank to drain into the carburetor without creating a vacuum. The water can enter the vents almost as easily as air. Circle Industries and some other accessory makers supply gas caps that seal the opening completely with a piece of plastic fuel line tubing leading away from the cap's center for a remote vent. The long length of plastic tubing keeps gasoline from sloshing out of the cap onto the tank top and its long tubing duct effectively keeps water or dust from seeping into the gasoline. You can modify your stock cap by drilling a quarter inch hole in its center, soldering on a piece of quarter inch copper tubing, and sealing off the stock vent holes with solder or fuelproof sealing cement. A two foot long piece of quarter inch flexible fuel line leads from the cap's vent tube to some splashproof area behind the number plate or fork crown.

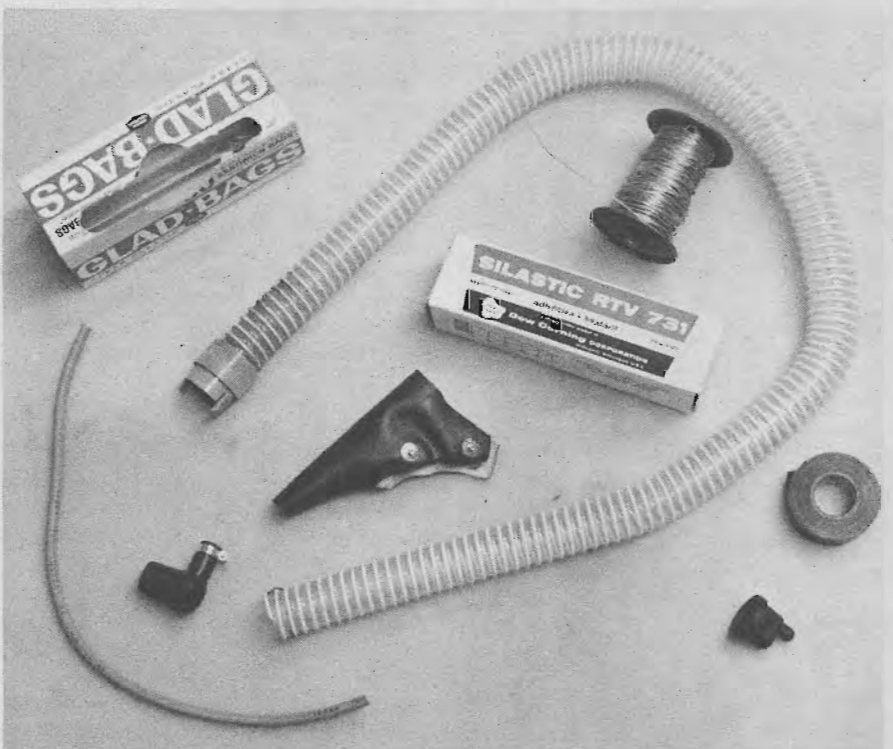
How well you seal off the air supply from water will depend, to some extent, on just how much water you anticipate. If the type of terrain you ride through has just an occasional mud hole or shallow, narrow, stream it may be enough just to shield the carburetor's air cleaning system in a canvas or leather cover of the type standard on most Maicos. Deeper water or prolonged running in a very wet mud hole will demand that you virtually seal off the carburetor and air cleaner with a remote air intake leading into the system located as high up on the machine as possible. The best method is to fit the carburetor with a waterproof flex hose from its intake end up to an air cleaner mounted under the seat. Don't forget to fit a piece of flexible tubing to the carburetor's air vent hole leading up and under the seat or tank as well. The top of the carburetor can be sealed with one of the neoprene covers offered by some motorcycle importers and accessory firms. If no such top cover is available the carb top can be sealed off with a plastic "Baggie" wrapped with electrical tape. Finally, all the joints between



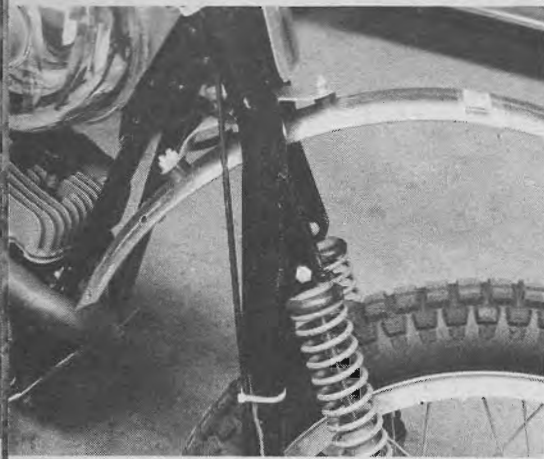
*If your machine has a handlebar-mounted kill button it too should be sealed off from water splashes. Simply cover it with a "Baggie" and tape the ends tight. Press "Baggie" as button.*



*The ignition/magneto coil can be wrapped tightly in a clear plastic "Baggie" and the ends sealed and taped shut with plastic electrical tape to keep any water splashes away.*



*A waterproofing kit for any engine includes a roll of plastic "Baggies," plastic tape, a tube of Silastic caulking compound, tie-off wire, a flexible vacuum or radiator hose, waterproof spark plug connector and cable, plastic carburetor top cover, and leather or plastic handlebar lever covers.*



A front fender is a not-so-obvious must to keep mud from packing up around cylinder's cooling fins. Mud-packed fins allow engine to overheat and eventually seize piston in barrel.



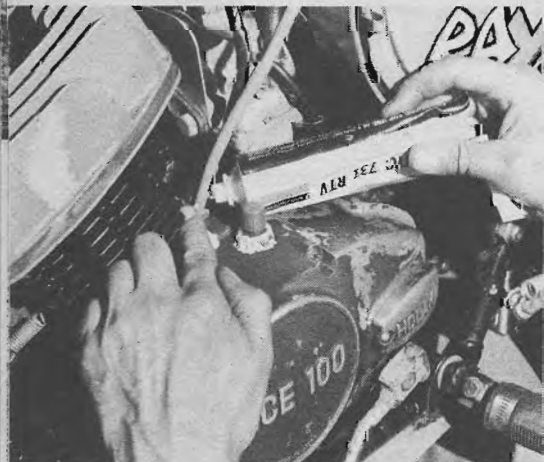
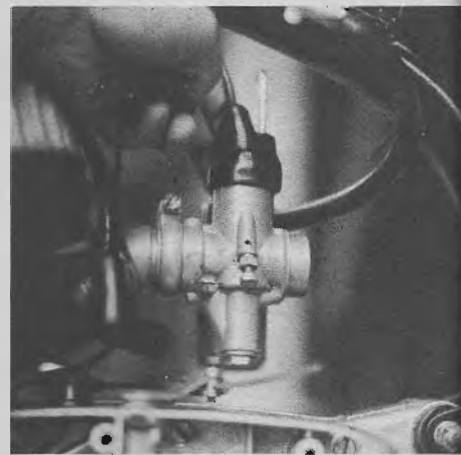
Seal off the joints between the carburetor and air filter and the flexible hose with a thick bead of Silastic bathtub caulking compound. Allow to dry before starting the engine.



On most machines the air cleaner case and element can be clamped to the frame tubes well up under the seat. The flexible hose from the carburetor clamps to the air cleaner.



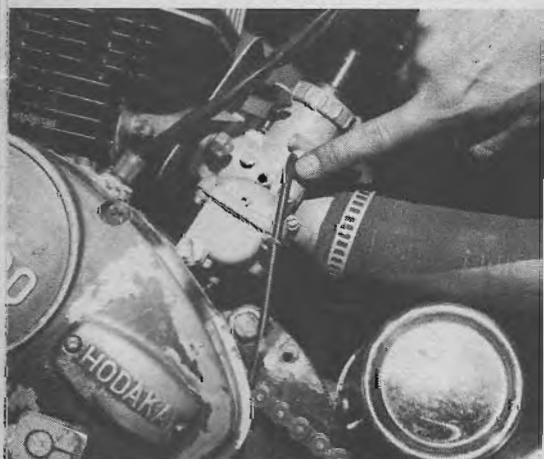
Flexible plastic covers are available for most carburetor tops. Snap it securely in place and caulk the joints between carb and cables with Silastic. A "Baggie" can be substituted.



The crankcase covers that shroud the magneto should be sealed at their joints with Silastic. The magneto's lead wire should be sealed off where it exits the crankcase side cover.



Ideally, the air cleaner should be mounted as high up on the machine as possible, shrouded with a metal or cloth cover to keep mud from splashing in. This stock Sachs setup is perfect.



Most carburetors have a breathing hole located in the side of the main body. Connect a length of flexible tube from hole leading up to "dry" area under the seat and seal joint.



You can manufacture your own remote, waterproof, air cleaner by clamping a length of radiator or heater hose over the carburetor throat with wire or an adjustable hose clamp.

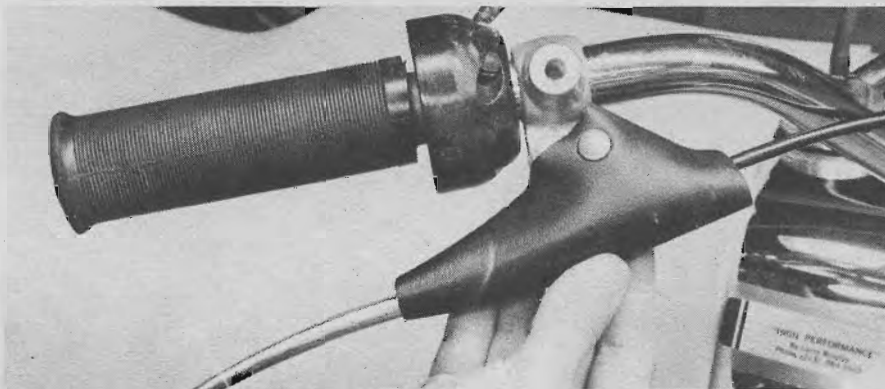


the various vent hoses and the carburetor should be calked tight with Silastic bathtub sealant. With this type of system, and an upswept exhaust system (with an air-tight seal at the exhaust manifold joint), you should be able to literally submerge your machine in about two feet of water without it taking in any water.

Your engine won't fire properly and may even pre-ignite if its electrical system is not watertight. Here, it doesn't matter much how much water you expect; one drop in the wrong place is enough to stop or damage the engine. Webco offers a special watertight spark plug connector/cover and crackproof Autolite ignition lead wires. If the joint between the cable and the spark plug's new waterproof plastic cover, and the area where the cable exits the crankcase/magneto, are sealed with Silastic calking compound most of your electrical problems will be solved. The crankcase cover that shrouds the magneto ignition system must also be sealed shut with Silastic. If you've done the job right the engine will have reliable spark in any depth of water.

If you have a handlebar-mounted kill button it too should be sealed off. A drop of water between the kill button's contacts works just as though you'd pressed the button; the engine dies. You can merely wrap the entire button and handlebar with a clear plastic "Baggie," taped tightly in place with plastic electrical tape. To utilize the kill button you just press on the "Baggie" over the button.

Your final preparation should be the addition of properly mounted front and rear fenders. Yeah, we know it's an off-road racer and racers don't have fenders according to the "bench racing" experts. In action, the wheels act like ever-churning pumps that keep a steady flow of water and mud directed at the engine. Even the best waterproofing can be worn away with such a flood of debris and water. The lack of a front fender can pack the cylinder's cooling fins so full of mud that the engine can no longer cool itself. Then the mud down in the fins dries from the engine heat and acts like a very efficient heat insulator to keep all of the heat inside. Dozens of engine seizures are caused by a mud-packed cylinder. When you mount the front fender keep it far enough away from the tire to keep mud from wedging itself between the fender and the tire. Generally, it's best to mount the front fender up under the fork crown; providing an inch or so of clearance between it and the tire with the forks fully compressed. If the fender will interfere with the cooling fins you can rivet or bolt-on a mud



*Snap-on leather or plastic handlebar lever covers are worth the dollar or so investment to keep mud and leaves from locking levers in their on positions at clutch and front brake.*



*Webco offers a special watertight spark plug cover and heavy-duty Autolite cable to fit any machine. The cover will effectively seal off spark plug in any depth of water.*

flap to hang down from the rear of the front fender.

A number of firms offer plastic or leather covers to shield the working portions of the handlebar levers from ingesting mud and leaves. Use them, they'll keep your front brake in operation and your clutch from sticking.

If you do a lot of wet weather off-road riding it's a good idea to fit waterproof brake lining. It requires a bit more lever or pedal pressure to actuate the brakes but at least you know they're there somewhere. If your dealer doesn't have it try one of the automobile or industrial brake lining shops listed in the phone book's yellow pages.

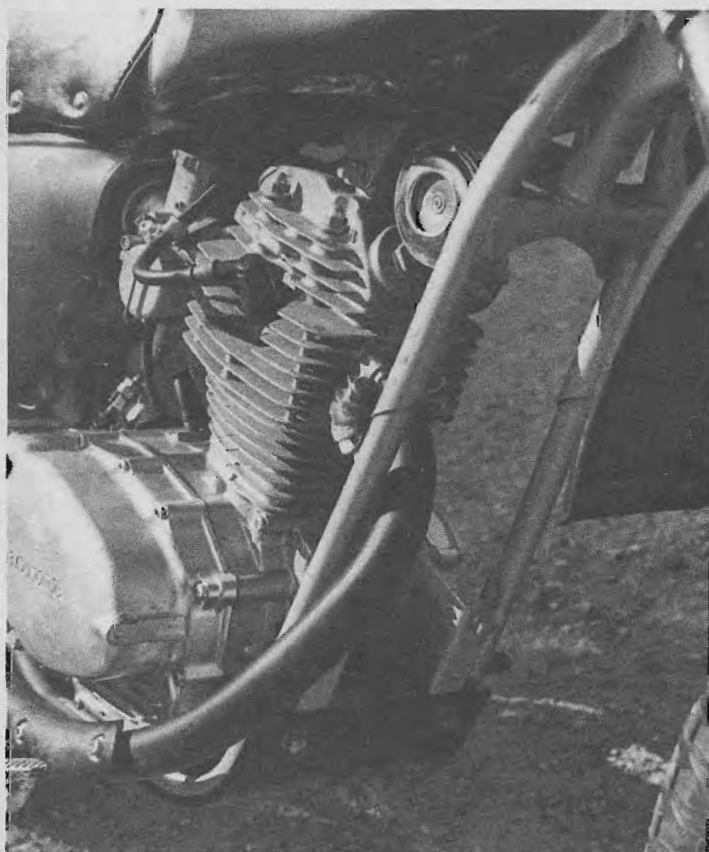
Riding through water or mud requires a special technique you can learn through practice. Always stand up on the pegs, you'll be able to see down into the water better and/or get a better perspective of the mud's ruts and hollows. A standing stance also places the bulk of your weight low down on the machine, right at the

footpegs to be exact, and allows you to throw your body instantly to either side to lean the machine over a bit as a counter to a balance-upsetting slippery rock or hole. Keep the machine running as quickly as you can in shallow water. If you're crossing a really deep water hole go as slow as you can so that, if the engine does get flooded, it will kill rather than try to explode from having its combustion and crankcase areas full of water. If you do flood the engine stop and pull the spark plug. Kick the engine over until all of the water has been pumped out. Water will not compress in the cylinder like air will. If you try to kick an engine full of water over you may just kick the cylinder right off its mounting studs as the piston tries to push up against the water.

With just a bit of proper weather-proofing your two-wheeler will be nearly a universal off-road machine capable of negotiating wet or dry terrain in almost any weather any time of year.

AT LAST, A REAL DIRT BIKE FROM HONDA

# SL-100 MOTOCROSSER



*A double cradle frame carries the engine. A skid plate is standard equipment.*

Well it looks like they have finally done it! After years of making little, softly sprung trail bikes and overweight street jobs called "scramblers," Honda has at last come out with a machine that really is suited for the dirt. We know that in most instances the previous Honda Scramblers were seldom, if ever, used in the dirt, and that Honda really intended them to be scrambler-styled street bikes. But with the trend leaning more and more toward off road riding a new machine was needed to compete with the many good off road models offered by other companies. The SL-100 is Honda's answer.

We know it's not perfect, nothing is, but it is easily the finest machine Honda has built for off road riding. Like most street/scramblers, we're sure the vast majority of SL-100's will be used on the street, but for those of you who want to take your bike in the dirt, rest assured the machine is suitable.

First of all, the engine is all new, not just a bored out 90. Unlike most small trail bikes on the market today, the SL-100 is a four-cycle, and a single overhead cam four-cycle at that. The engine is near square with a bore of 50.5 mm and a stroke of 49.5 mm; that makes a grand total of 99cc. With

a compression ratio of 9.5-to-1 the little engine pumps out 11.5 horsepower. But here's the shocker; maximum horsepower is attained at 11,000 rpm! That kind of rpm is usually associated with super road racing equipment, not trail bikes. Don't get the wrong idea, the SL-100 does not have a narrow power band, something that would make the machine hard to ride. It doesn't come equipped with a tach so we don't know exactly where it starts pulling but it's at very low rpm. This is one of the factors that makes the machine so easy to ride, even for a beginner.

Carburetion is by that old favorite, the Keihin. It has a 22 mm venturi and of course a concentric flat bowl. The air cleaner element was the dry paper type and it worked very well under all conditions except where extremely fine dust was encountered. Fuel consumption was so good you'd swear the bike must be making its own fuel.

Ignition is by a conventional battery/coil setup with the battery being supplied by an alternator. As with Japanese motorcycles of all sizes and shapes, the electrical system was first class. And that includes the lighting which was excellent. As we said previously, a tach is not fitted but there is a speedometer similar to that used on the larger Hondas. It worked very well and didn't have the "floating" needle common to some small bikes.



*In the Honda tradition a kill switch is located just above the headlight switch.*



*Not only does the bike work well in the dirt, it even looks like it should. In our opinion it's the best looking little machine on the market.*



*The front forks have over five inches of travel and are dampened very well for a Japanese machine.*

Horsepower is transmitted through a geared primary and multiple plate wet clutch to a constant mesh five speed gearbox. Clutch action was very smooth, we didn't have any problems with slippage or with the clutch dragging. The transmission ratios are very well suited to the machine and were a great benefit in making the machine easy to ride. Shifts are smooth and as fast as the rider can move his foot.

The welded tubular frame is a work of art. It has a large diameter single backbone with double down tubes starting at the steering head, passing under the engine, and then back up to where the rear suspension units attach to the frame. It's very strong and certainly on a par with other 100cc machines. The swing arm, also of welded tubular construction, complements the frame in strength but because of the way it's made fitting a larger rear tire is next to impossible.

The front forks are Ceriani look-alikes, and while they aren't as well suited for competition as Cerianis they do an excellent job both on the street and for off road use. Both springing and dampening were very good and with five and a half inches of travel it was difficult to bottom them out. Rubber wipers are fitted to the top of each slider to prevent dirt from ruining the seals.

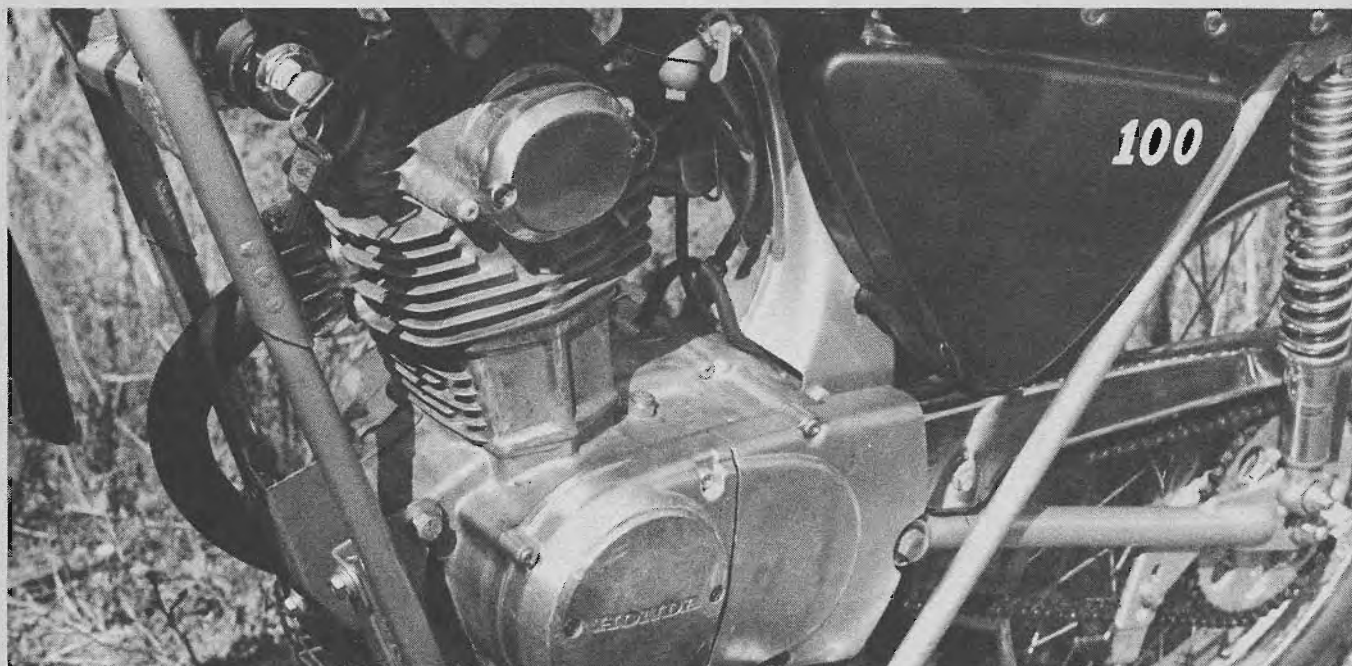
Unfortunately the rear suspension units are not up to the high standards of the front fork. They suffer from a typical Japanese deficiency, insufficient dampening. You'd think with all those super-engineers they have in Japan, one of them would come up



*Both the headlight and the speedometer are of the quick-disconnect type so they can be easily removed for serious dirt riding.*



*Definitely an add-on. We feel that designers should do a better job of incorporating the taillight into the styling scheme.*



*Like all Hondas the engine is an overhead cammer. This one developed its power at 11,000 rpm. Surprisingly it still develops a great deal of torque.*

with a shock absorber that works. For street riding or riding on hard packed smooth dirt they were fine but in the rough stuff they left a bit to be desired.

We feel the wheelbase should have been longer than the 49.5 inches provided on the SL-100. About 52 to 54 inches would help the handling in the rough riding department. Wheels, 19 inch up front and 17 inch in the rear, are laced to small diameter single leading shoe brakes that were more than adequate for any conditions. The tires that are fitted as standard equipment are fine for the street and hard-packed dirt but a change to knobbies will be necessary for good performance in loose terrain.

As long as carrying a passenger is not attempted the seating position and rider comfort are just fine. Judging by the lack of footrests for a passenger we would say that Honda intended the machine for one-up riding only. The seat is very comfortable and gives the rider plenty of room to move around.

A four-cycle is supposed to have a weight disadvantage over a two-cycle but with the SL-100 weighing in at just over 200 pounds it isn't any heavier than the majority of 100cc trail bikes. The lack of excessive weight undoubtedly helps the acceleration which is quite impressive for a small trail machine.

We've all waited a long time for Honda to build something that would perform in the dirt as well as it could on the street. Well, the SL-100 is here at last, and we think it was worth waiting for.



*No buddy pegs are provided and it's a good thing, this seat is very uncomfortable when packing double.*



*The exhaust pipe looks sharp but still does a good job of quieting the high revving mill.*

Every year the various manufacturers introduce their new line of cycles for the coming year. Usually the machines are a re-hash of last year's models. However, this year Kawasaki introduced the 125cc Enduro and for all practical purposes, it's an all new motorcycle. And with very few exceptions, it's one of the nicest trail machines we've ridden. It has ample power, handles well for a Japanese trail bike, and the overall appearance is pleasing.

THIS 125 IS FIRST RATE  
IN BOTH PERFORMANCE AND STYLE

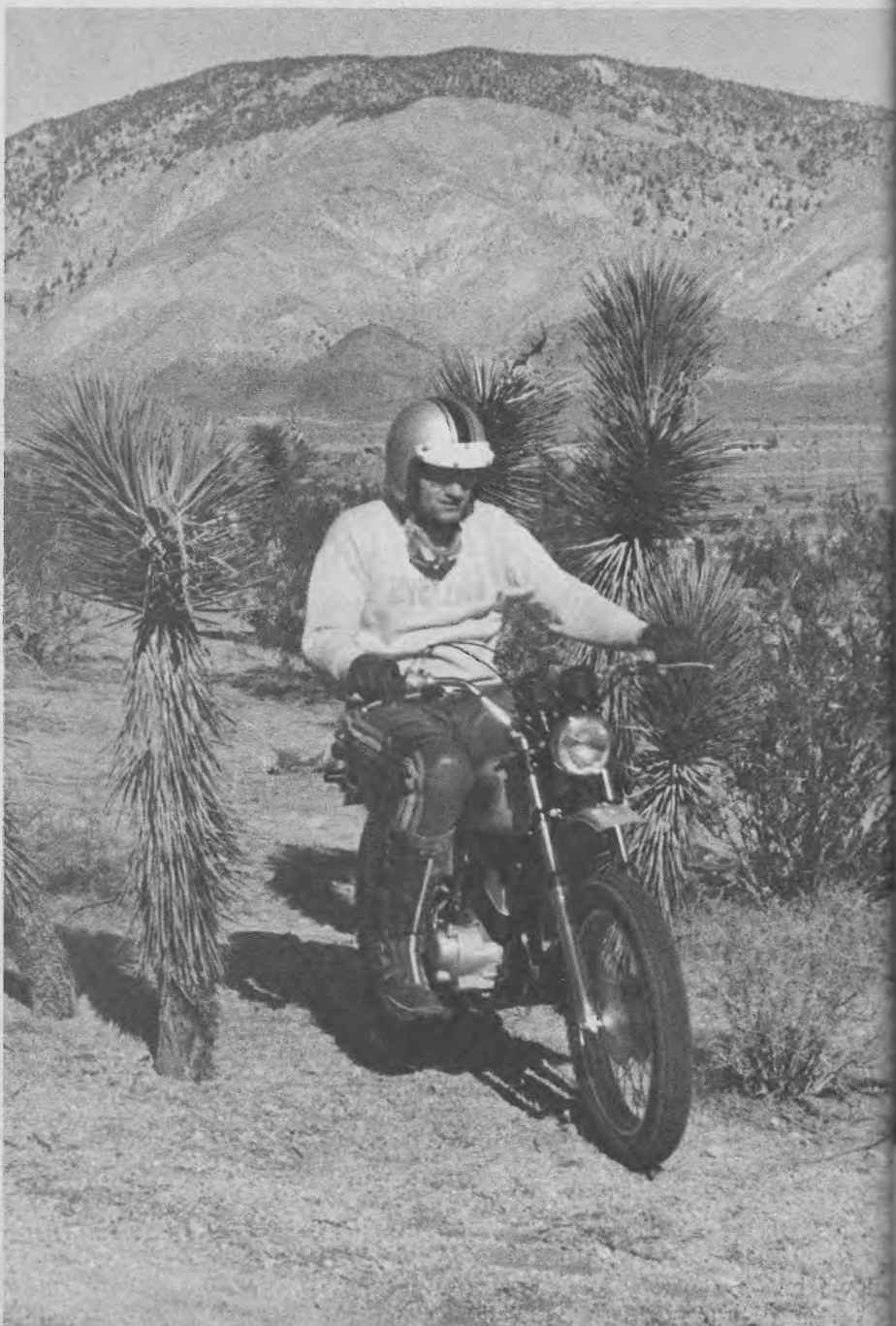
# KAWASAKI 125E

Like most of the smaller Kawasakis, the 125 is powered by a rotary valve engine. In the past we've found that the rotary valve method of induction isn't the best way to go in the dirt. When the bike is leaned to the left and ridden over rough terrain, there is a tendency for the carb float to flutter and richen the engine mixture. When this happens, the engine won't reach maximum revs in any gear until it has burned off the excess gas. Happily we found that the 125 showed no trace of this problem; it ran clean all the way through the rev range.

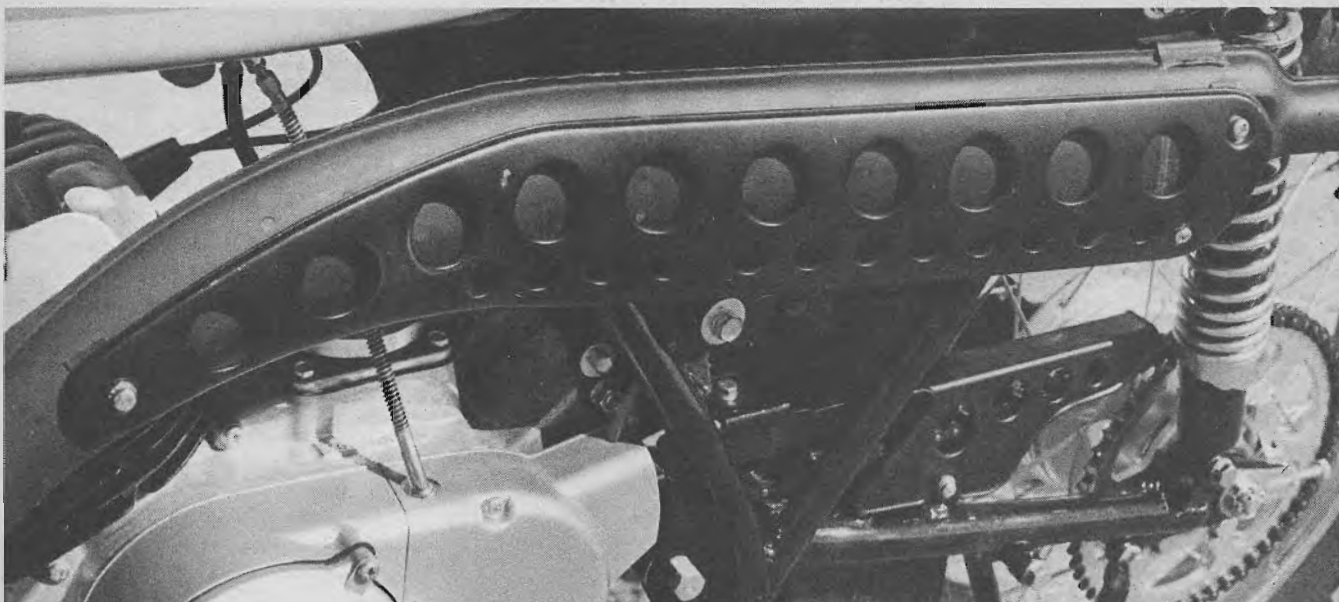
Because of the lay-out of the rotary valve engine, the carburetor is located on the right side of the engine. This leaves the space behind the cylinder, where the carburetor is normally located, free for the ducting of an exceptionally large air cleaner. This can be of great benefit for the trail rider that has to cross streams. The air cleaner uses the engine to block off some of the water that can normally find its way into the induction system. The Enduro will run in deep water longer than most machines of its class.

The engine is a bit under-square with a bore of 52mm and a stroke of 58.9mm. This is one of the reasons why the Enduro pulls well at low revs. The 125E is one of the hardest running trail 125's we've come across.

Like so many of the Japanese trail machines, the 125 has a five speed gearbox. Kawasaki's is one of the smoothest in operation and constructed out of the best materials. This is undoubtedly why each shift is accomplished with a minimum of bother. A nice change for Kawasaki can be found in the shifting pattern. On the older bikes, neutral has been located at the bottom of the pattern



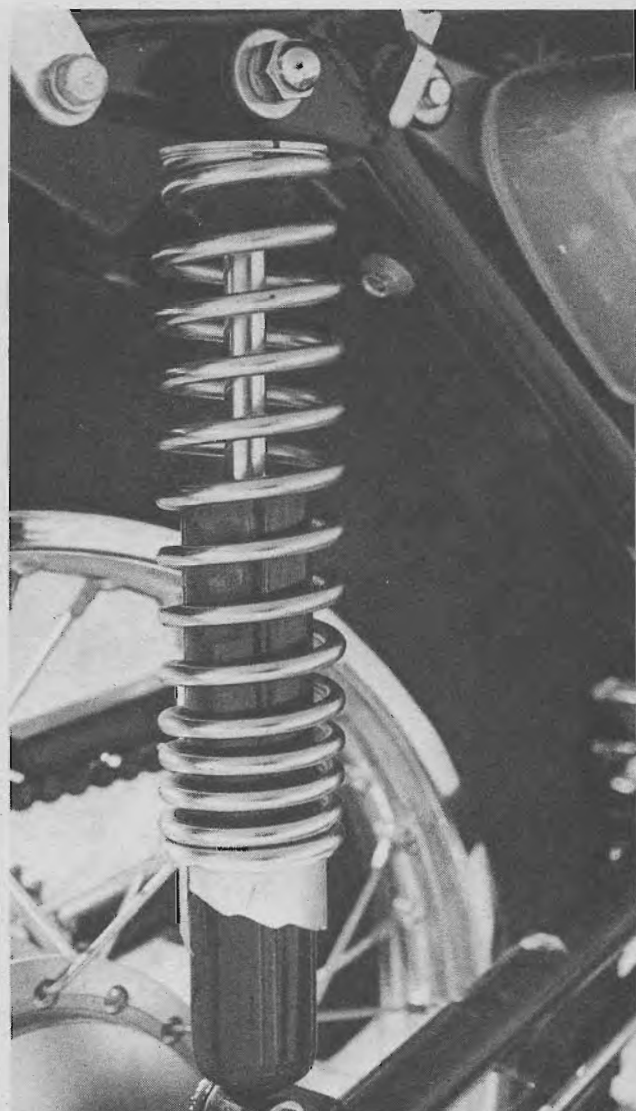




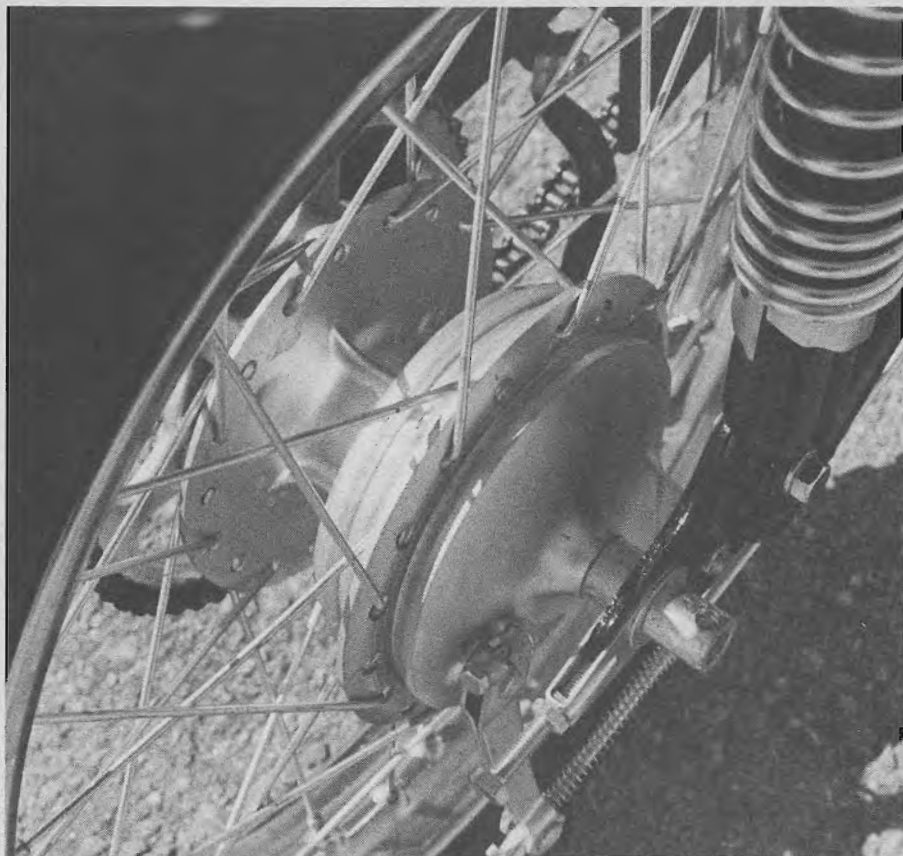
*The racy looking exhaust pipe is in actuality a combined muffler and spark arrestor.*



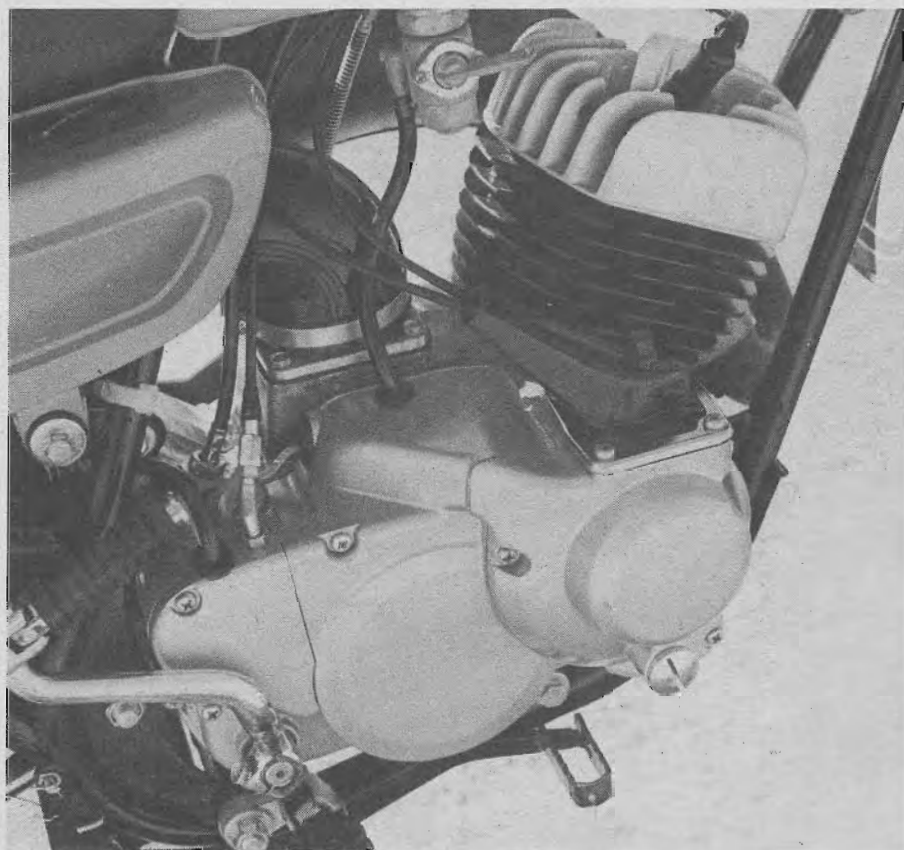
*Hatta forks are featured on the Enduro. The headlight is a quick-disconnect, so the rider can take it off if he is so inclined.*



*Five way adjustable rear shocks allow the rider to pick from a variety of handling traits.*



*In an effort to reduce the unsprung weight, Kawasaki has opted to use only a half-hub rear brake.*



*The rotary valve mill is one of the strongest, both in terms of breakage and horsepower, found in the small trail bike line.*

with all the gears engaged by pulling up on the shift lever. The newer pattern, for Kawasaki, now puts them in line with the majority of the rest of the industry.

1970 saw Kawasaki introduce the Hatta forks on the 350cc Big Horn. For '71, these forks can also be found on most of the off road bikes in the line. They're on the 125 and they certainly are a big improvement over last year's units. They can't be adjusted at the axle like those found on the Big Horn can, but they can be re-located at the triple clamp for an infinite number of angles. Between changing the fork angle, and the fork oil to a different viscosity, the rider should be able to find a set-up that will work for him.

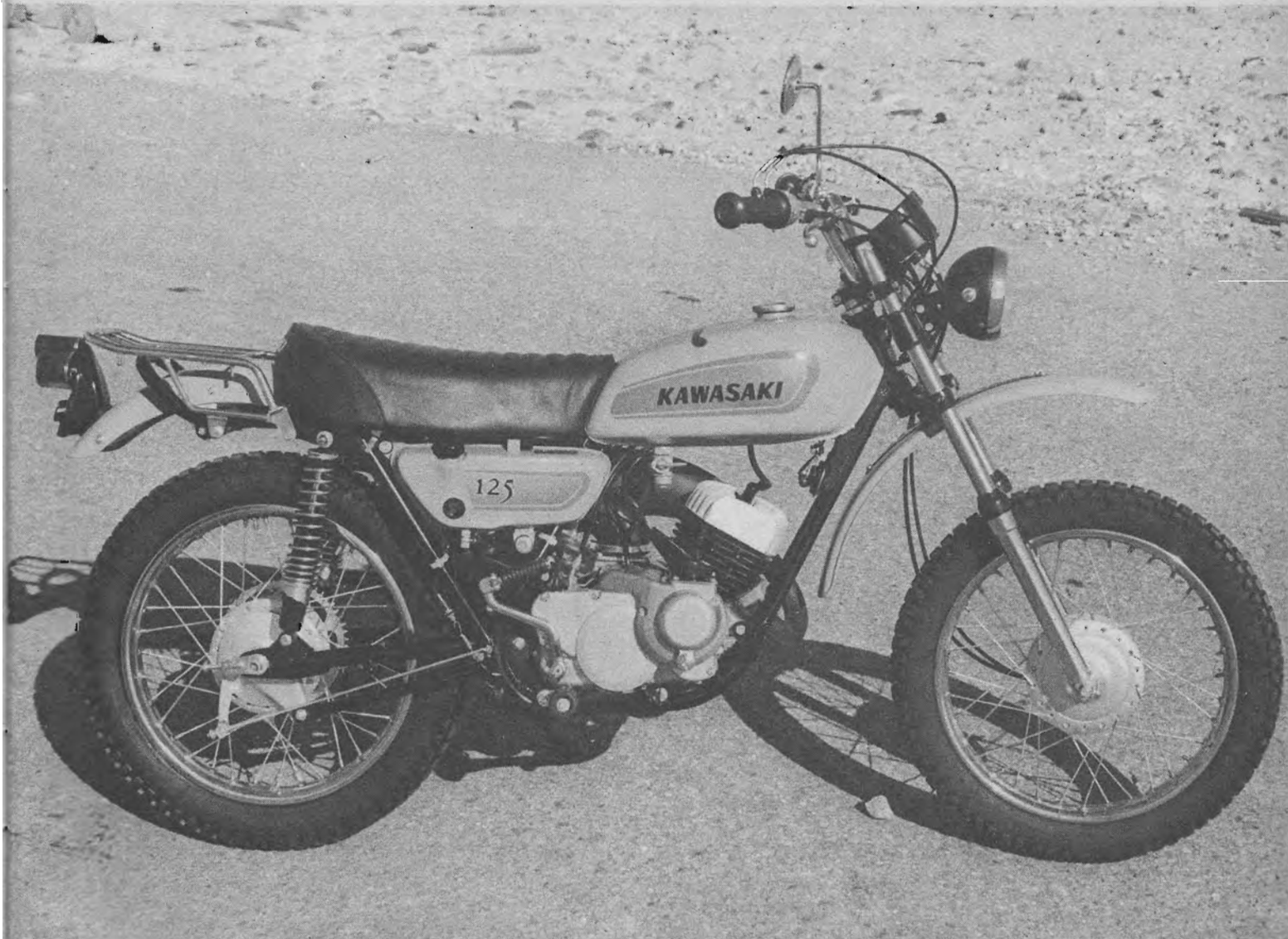
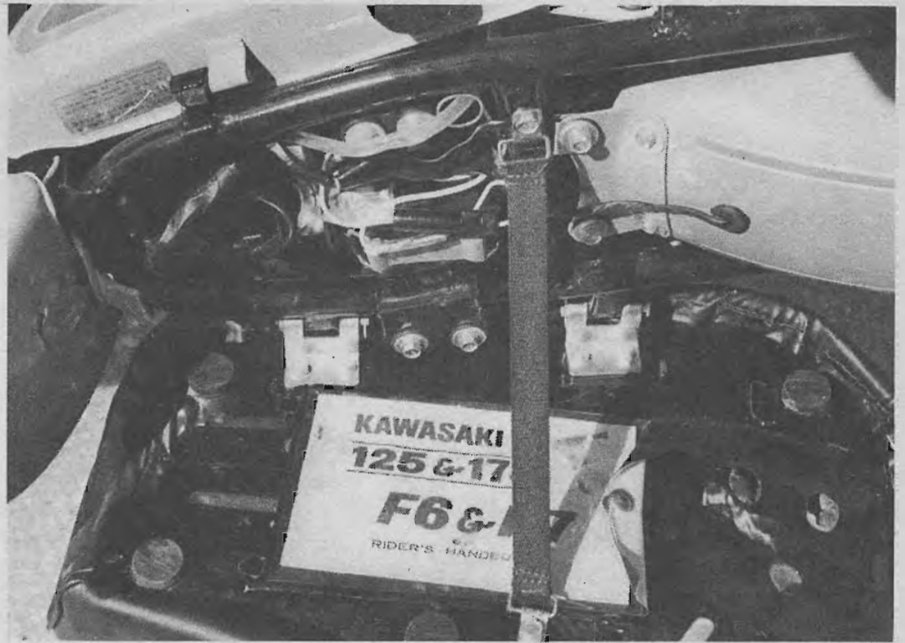
Besides the new forks, Kawasaki has come up with some rear shocks that actually seem to do the job. They're five way adjustable and while we found them to work best in the softest position, we suggest that the owner experiment around until he finds the arrangement that satisfies him.

Helping with the riding comfort is a well padded seat that is definitely meant for one-up riding. The handlebars are high enough that a fairly tall rider is still comfortable while standing on the pegs. As most of you know, standing is the best way to ride over rough terrain.

The gas tank holds just under two and a half gallons and with this, the Enduro has a range of about 125 miles. The oil tank holds one quart and that's more than enough for a weekend ride.

It's not too often that a new machine comes out in the small trail bike market that really excites us; we see and ride enough bikes that one has to be a big improvement over what came before, before we become enthused. The Kawasaki 125E Enduro enthused us because it's a giant step forward over their previous attempts. Actually, it is a very nice motorcycle.

*The seat conceals the battery, tool kit, and the filler for the one quart oil tank.*



*Overall appearance of the Enduro is appealing. It's evident here that the seat was meant for one-up riding.*



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HARLEY-DAVIDSON JUMPS INTO THE OFF-ROAD MARKET WITH THE . . .

# BAJA 100

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If, just a few years ago, someone had told us that Harley-Davidson would be in the off road motorcycle business we would have had a big laugh. Everyone knew that all Harley was capable of building was those large, expensive road machines that were only good for taking trips of over 400 miles.

Today that's not true. Harley makes cycles for all forms of motorcycling, including that form we're most interested in — off road.

Leading Harley-Davidson's off road brigade is the 100cc Baja, a motorcycle that bears such little resemblance to Harley's road-going group, that one might easily think the bike was made by a whole different company. Instead of being large and ponderous it's lightweight and agile.

Providing the push for the Baja is a port timed two-stroke with square dimensions, 49.9 mm by 49.9 mm. Inside the engine can be found all the goodies that mean long life; ball or roller bearings at all of the stress points and husky ones at that.

Fuel comes from a large 24 mm Dell 'Orto racing carburetor. Even as big as it is there's no problem starting the machine. The most it ever took us was three or four prods on the kick-start lever and the engine roared to life. After we were used to it we could start it in just one or two.

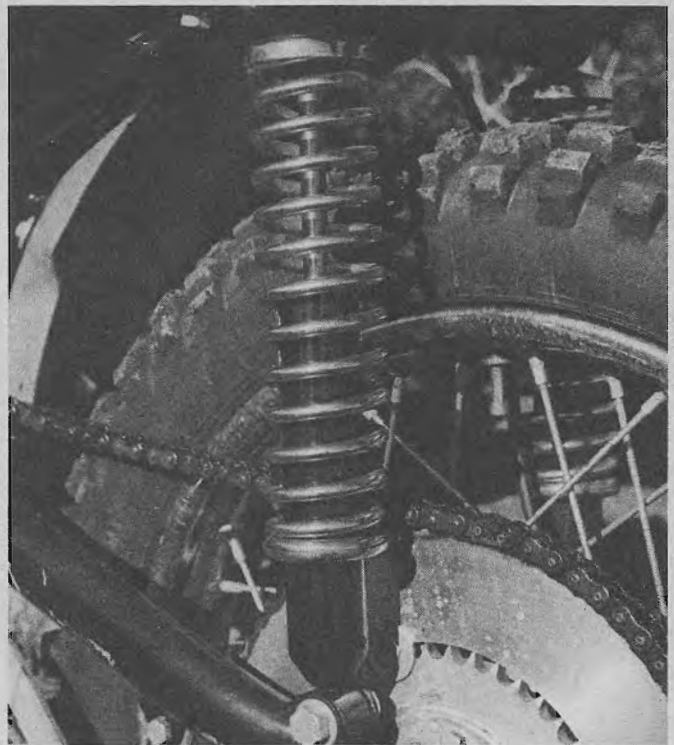
Like most of the transmissions in the Harley line the one in the Baja is a study in ruggedness. It's a five speeder



*A 24mm Dell 'Orto remote bowl carburetor comes stock. More power can be found by using a larger jug.*



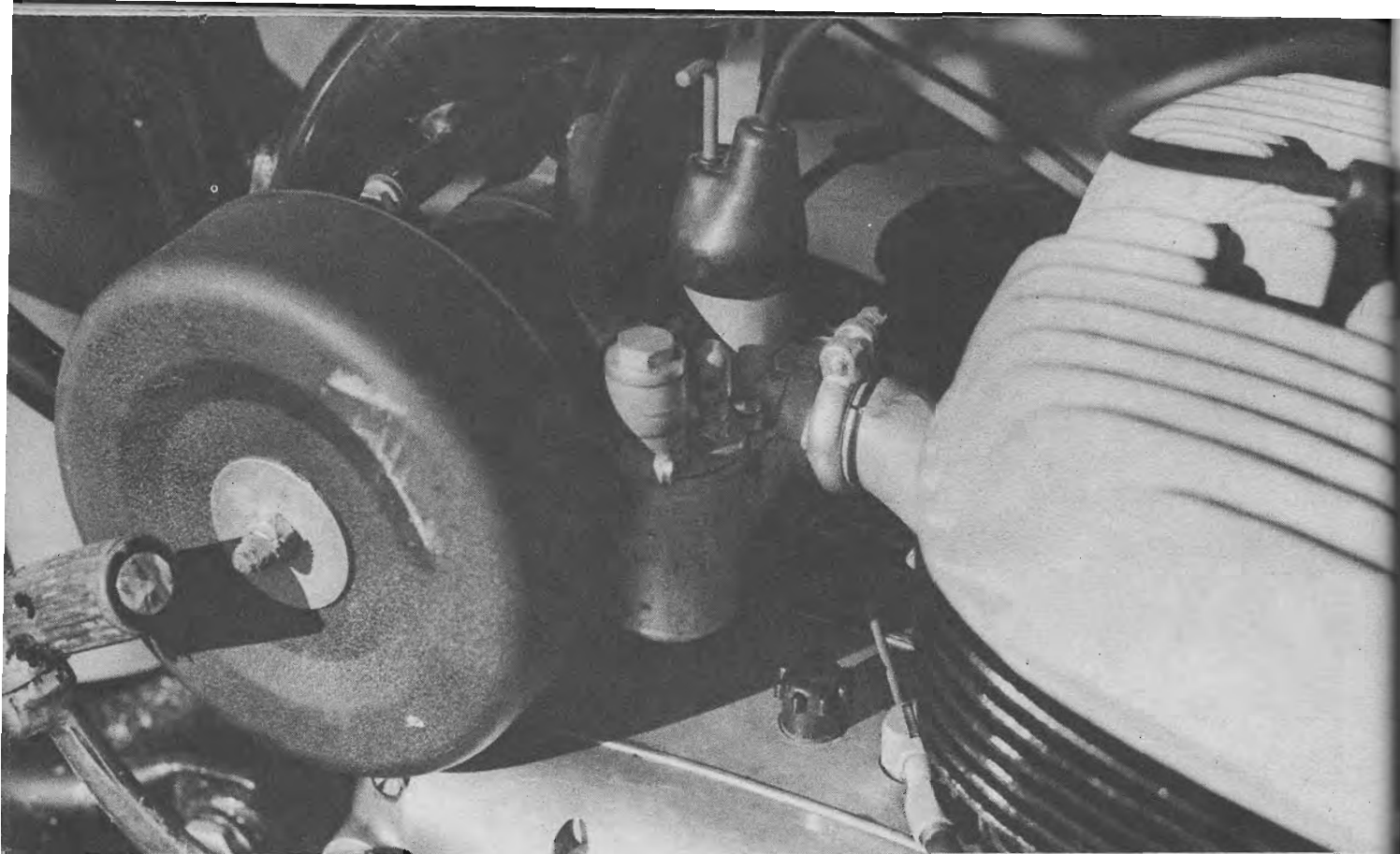
*Ceriani forks are used in conjunction with a 21-inch front wheel. The fender should be pulled up to under the fork clamp.*



*The Ceriani shocks are not adjustable. They provide over three inches of dampening. Both rear sprockets are standard.*



*The Baja has over 11-and-a-half inches of ground clearance. There's not too many places this bike won't go.*



*A large air cleaner is used. A Filtron element is standard equipment.*



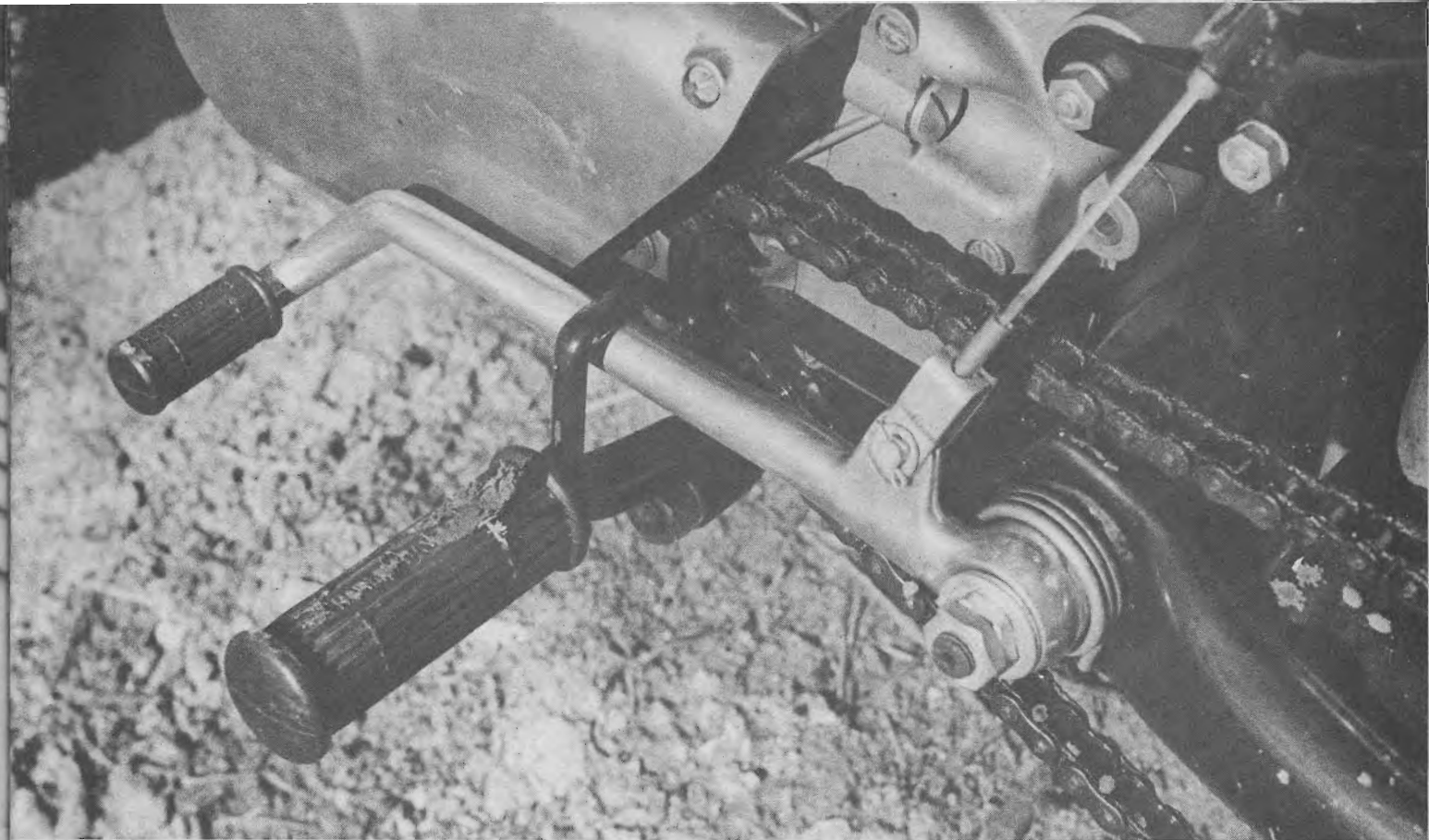
*The saddle is well padded for those long extended desert rides.*

and you have a choice of internal gear ratios. The standard set could be called close ratio and to implement this a wide ratio set is available. We've been told the wide ratio set is perhaps a bit wide for the narrow power band of the engine. Our test machine had the close ratio box so and we've never ridden a Baja with the wide ratio set so we can't comment on that, but we do think the close ratios are just about perfect on this bike.

As to the operation of the gearbox — it's flawless. Once the bike is put in motion you can forget about the clutch, it's not needed to shift up or down. Just match the revs and flick the lever; you have to work to miss a shift.

The handling is good but it is a bit slower than what one expects from a 100cc machine. The reason for this is because of the height of the bike. If you didn't know the engine size when you climbed on you'd think the bike might be a 250. In our estimation this isn't all bad. We hadn't ridden a 100cc racer, until the Baja, that wasn't very quick handling. This is fine once you get used to it but the learning process can be hard on the body. One of the reasons for the height of the machine is the 11.5 inches of ground clearance.

Helping the handling in the rough are the Ceriani forks and shocks. With seven inches of travel in the front, and over three in the rear it takes some



*Footpegs are of the non-folding variety. A nice feature is the brake stop.*

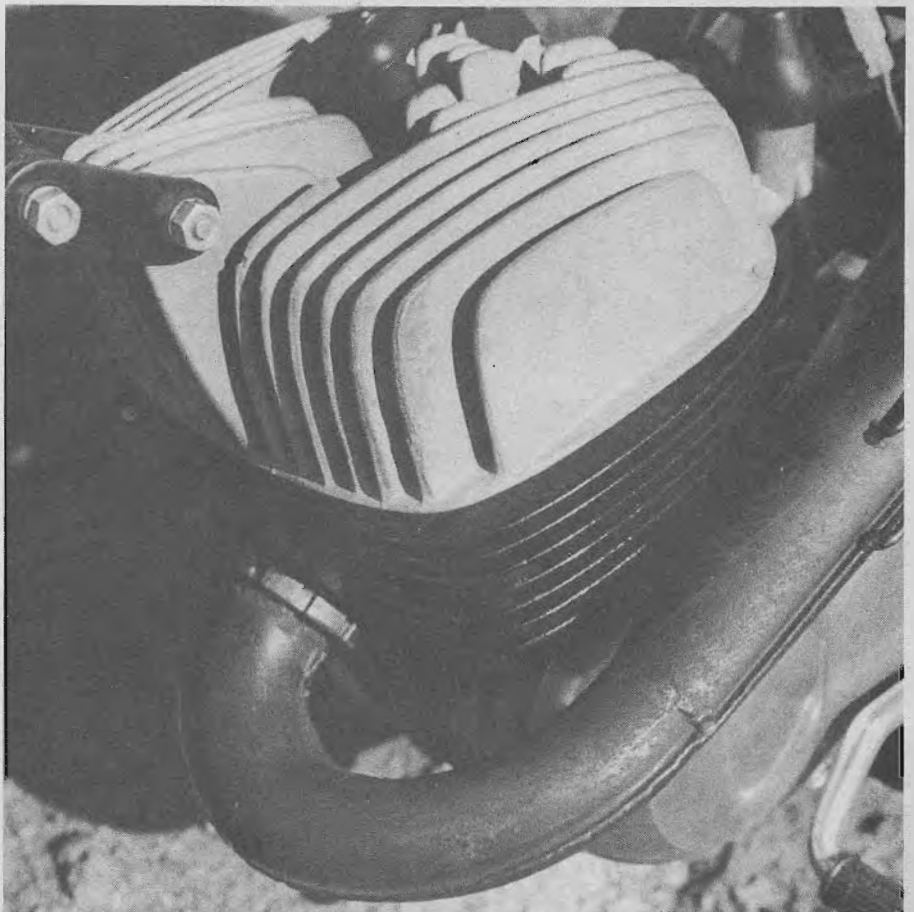
kind of bump to bottom out the suspension.

One feature the Baja has that we'd like to see more manufacturers provide is a forestry approved spark arrestor for the expansion chamber. When you're racing it's nice to run unmuffled, but when you're just cow-trailing it's easier on your ears, and the ears of the non-motorcycling public, if you use the spark arrestor, if for no other reason than public relations.

The tire sizes are more what you'd expect on a 250. At the front is a 3.00 by 21 inch knobbie while the rear is shod by a 3.50 by 18 knobbie. The front tire is covered by a fender that mounts only about a half inch from the tire, something we definitely didn't like. In any kind of muddy going the mud could pack up between the tire and fender and lock the wheel. If you buy a Baja we suggest you make this your first modification.

About the only other thing we didn't like was the lack of water protection for the brakes. During our testing period we rode through a couple of small streams and immediately lost the brakes. Some kind of baffling should be provided to correct this.

Other than these two problems we were impressed with the little Baja. Like we said at the start of the story, it's not the type of machine you'd expect from Harley-Davidson.



*Harley doesn't rate the horsepower of the Baja engine, but we'd guess it to be around 12 to 14.*

# TUNING THE MIKUNI CARBURETOR

SPECIFIC FACTS  
ON THIS  
JAPANESE MIXER

By Leon Wilbanks

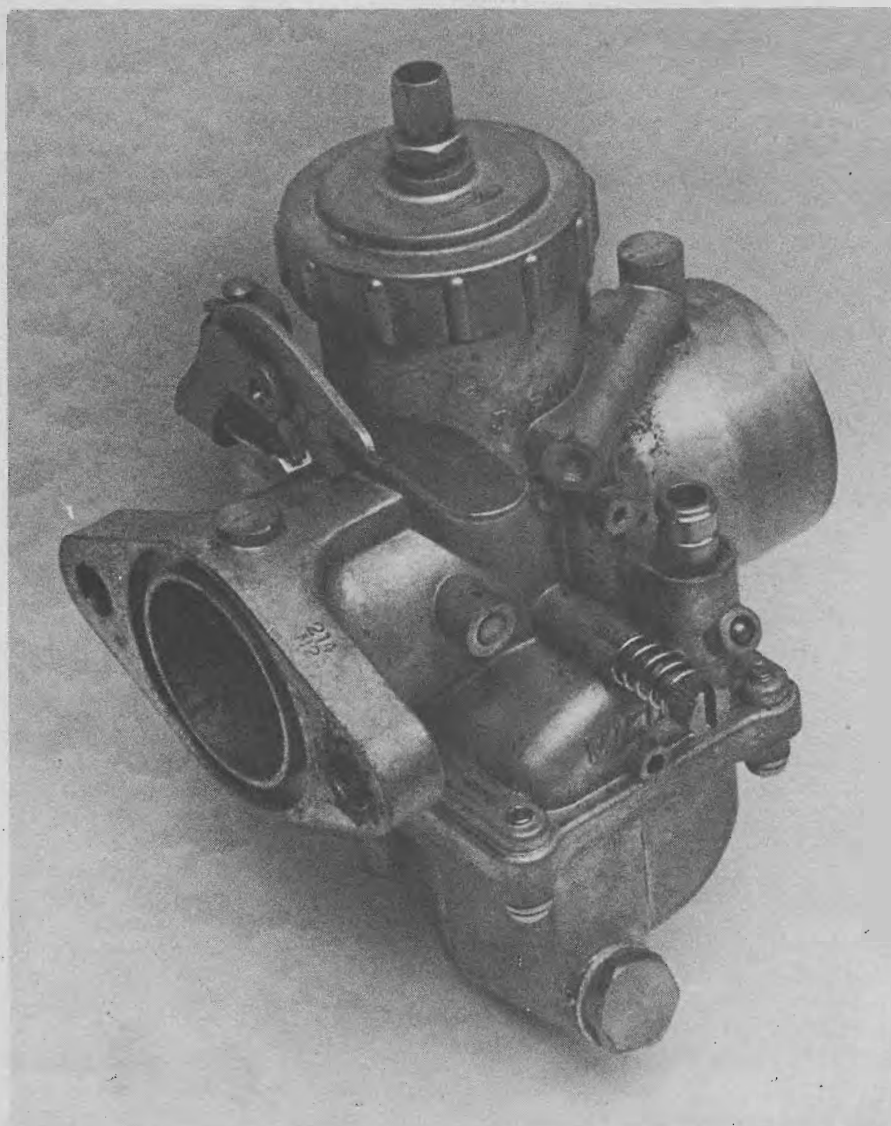
The Mikuni carburetor is a very simple and effective device and as a general rule it functions quite happily with very little attention. The purpose here is to outline the proper method of initially tuning the carburetor; once set it does not require frequent maintenance or adjustment. Due to the many variable which can effect carburetion (temperature, humidity, altitude, rider weight, terrain, etc.), it is impossible to set a carburetor (especially a racing engine carburetor) at the factory and have it perform perfectly in all field areas. It is therefore a must for any mechanic to be very familiar with the specifics involved in carburetion adjustment.

There are four basic areas which can be adjusted to effect the fuel/air mixture and thus the tune of the carburetor. The four adjustments are:

1. The pilot jet air adjusting screw and pilot jet. These two items control the fuel/air mixture at idle speed through the first 1/8 of throttle opening.
2. The throttle slide cut-away. The amount of cut-away will effect the tuning area between 1/8 and 1/4 throttle opening. The larger the throttle cut-away, the leaner the mixture will become at this range.
3. The needle and needle jet. These two items and their relationship to each other control the fuel/air mixture through the mid-range ( $\frac{1}{4}$  to  $\frac{3}{4}$ ) of the throttle operation.
4. The main jet. Varying the orifice size of the main jet controls the fuel/air mixture from  $\frac{3}{4}$  to full opening of the throttle.

To tune the carburetor for your particular situation, follow these steps in this sequence, but first make sure that float level is correct, there are no leaks in the induction system and that timing, point setting, spark plug and etc. are set properly.

**CHECK THE PROPER FLOAT LEVEL SETTING.** With float needle, float, etc., in place, turn carburetor upside down and allow float to rest on the spring mounted float needle. With float bowl gasket removed, measure from the flat gasket surface to the edge of the float, for a 24mm Mikuni, the distance should be one inch (25mm), for a 20mm Mikuni it should be  $\frac{7}{8}$  inch (22.5mm). Check owners manual or local shop for your particular size. When adjusting float level, bend only the needle actuating tab; be careful not to bend or twist floats.





### FIND THE PROPER MAIN JET.

To accomplish this, run machine at full throttle on level or slightly inclined roadway, if engine runs heavily and sputters or four-cycles at full throttle, the main jet is too large. Insert the next size smaller and repeat this process until engine runs clean at full throttle. If engine runs crisp and clean at full throttle to begin with, BEWARE, mixture may be too lean. Insert two sizes larger jet and recheck, repeat until heavy running or four-cycling is encountered at full throttle, then use next lower main jet size. Main jets are numbered from 0- up (usually in steps of ten, as: 100- 110- 120). The larger the number, the larger the jet orifice, which in turn provides a richer fuel/air mixture.

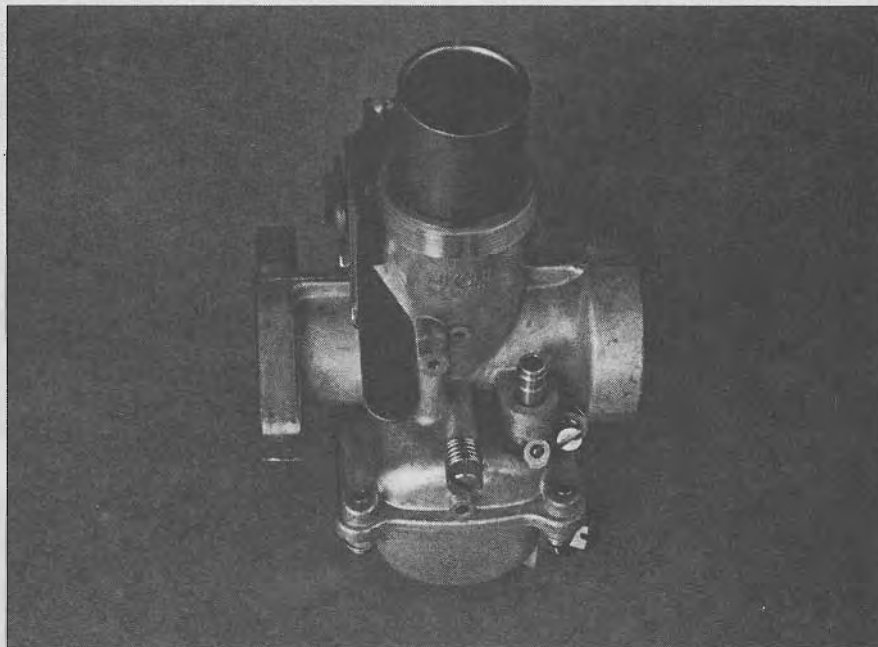
**PILOT AIR SCREW ADJUSTMENT.** With throttle slide resting against idle speed adjusting screw (slacken throttle cable adjustments at twist grip and carburetor top), turn the idle speed screw in until engine begins to idle faster, then back the screw out slowly until engine runs slower and begins to falter, now adjust pilot air screw in or out until engine runs smoothly. Turning the pilot air screw in richens the mixture, turning it out leans the mixture. Slowly screw idle speed adjusting screw out again until engine slows and begins to falter, repeat pilot air screw adjustment. This procedure can be repeated until the proper engine idle speed is attained. After you have attained the desired idle speed, gently screw the pilot air screw in and count the number of turns required to seat it (use caution not to force, damage to pilot seat may result). The pilot air screw adjustment should range between  $\frac{1}{2}$  and 2 turns out from a fully seated position. If it takes  $\frac{1}{2}$  turn or less, the pilot jet is too small and the next larger size should be used. If more than 2 turns are required, the pilot jet is too large and the next size smaller should be installed. The machine may idle smoothly without being in the  $\frac{1}{2}$  to 2 turn range of adjustment but it will cause problems in smooth transition to the mid-range of throttle operation. Pilot jets are numbered 20- 25- 30 and etc. The larger the number, the larger the jet orifice, which causes a richer mixture.

### THROTTLE SLIDE CUT-AWAY.

The amount of throttle slide cut-away effects the fuel/air mixture in the  $\frac{1}{8}$  to  $\frac{1}{4}$  range of throttle operation. If, as you take off from the idling position, there is spit back or the engine hesitates, a possible leanness (too large a throttle slide cut-away) is indicated. On the other hand, if the engine runs heavily, four-strokes and bogs down in



1. Before any tuning is attempted, the float level should be checked and made right if necessary.



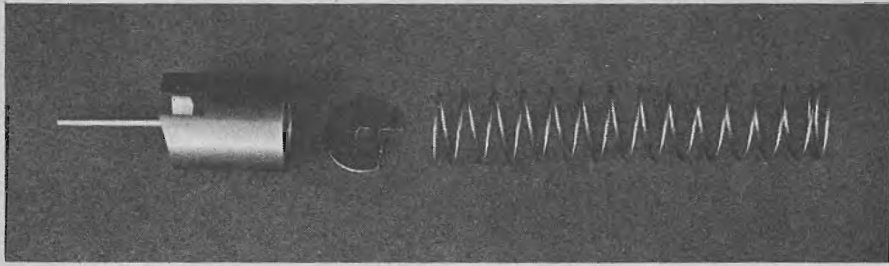
2. After removing the top of the carb, the slide assembly can be taken out.

the same range, a richness is indicated. If adjusting the pilot air screw slightly does not correct the situation, a different throttle slide should be tried. Slides are stamped with a number such as, 1.5, 2.0, 2.5, etc. The larger the number indicates a greater amount of slide cut-away which provides a leaner fuel/air mixture.

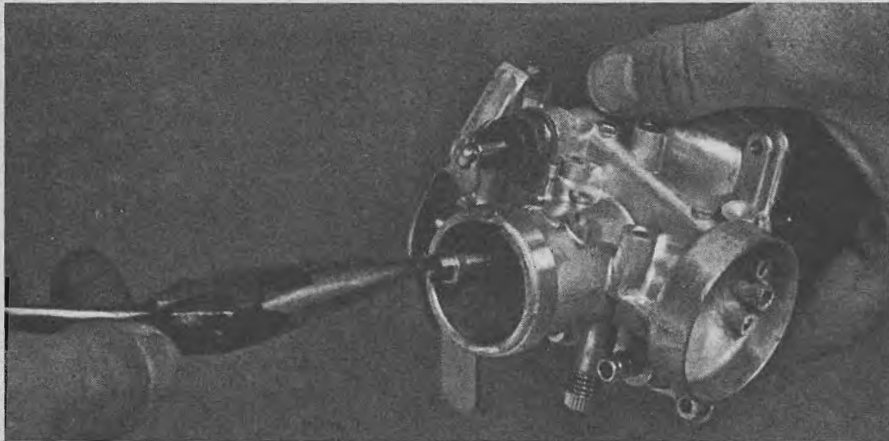
### NEEDLE AND NEEDLE JET.

These two parts and their relation to each other control a wide range of the throttle operation ( $\frac{1}{4}$  to  $\frac{3}{4}$  open). The needle can be set in one of five different positions by moving the

needle clip to one of the different grooves on the needle end. For tuning purposes, the grooves are numbered from the TOP down as: 1, 2, 3, 4 & 5 with the number 1 groove the leanest needle setting and the number 5 groove the richest. If proper mixture is obtainable only by using the number 1 or number 5 groove, other adjustments to the main jet are indicated. The needle is stamped with a number/letter series such as 4D3, 4E1, etc. The first number, in this case a 4, designates the overall length of the needle. A number 3 would be a shorter needle and the



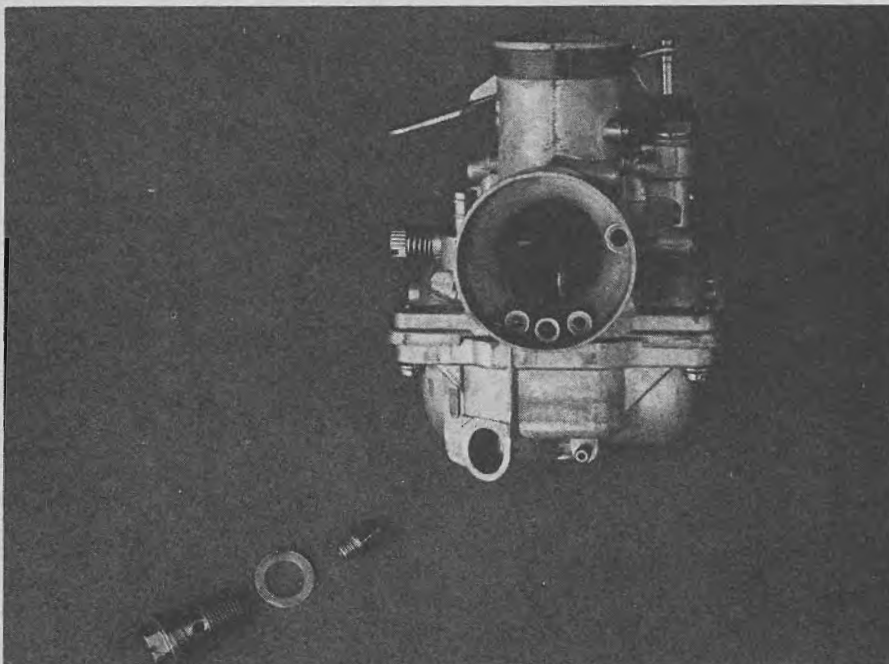
3. The slide assembly consists of a return spring, a clamp to keep the slide on the throttle cable, and the slide itself.



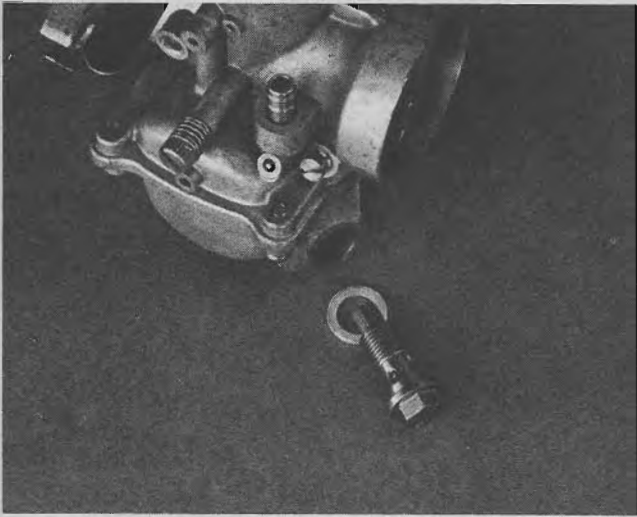
4. The needle jet and spray bar can be removed by taking out the nut at the bottom and removing the bar from the top.



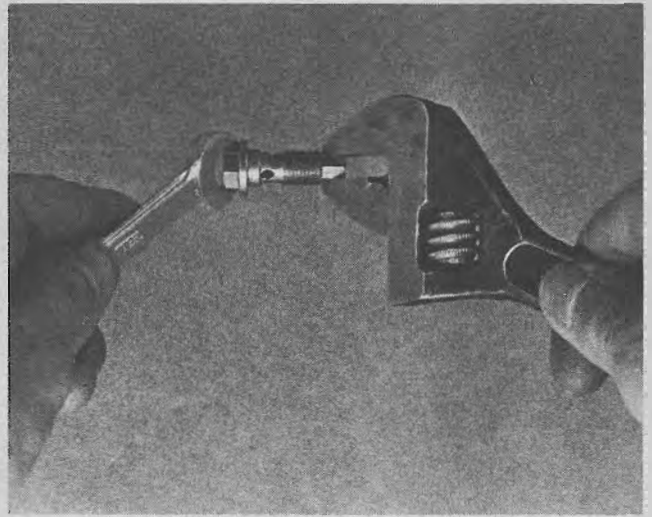
5. The mid-range of the engine is controlled by the needle and the needle jet.



6. In the newer Mikuni carbs, the main jet is removed from the bottom left side of the float bowl.



7. Don't lose the washer that goes around the main jet because all of the gas will escape from the float bowl if you do.



8. Don't use big wrenches on the main jet because it's easy to strip out the threads.

number 5 a longer needle. The letter indicates a scale of richness and needle taper i.e., an "E" needle will have more taper and thus provide a richer mid-range fuel/air mixture than a "D" needle will, and so on up the alphabetical scale. The last number indicates materials and finish used.

The Needle Jet works in direct conjunction with the Jet Needle in controlling the mid-range fuel/air mixture. Needle jets come in various orifice sizes, the orifices are the same diameter the entire length of the jet and do not taper as the needle does. A change in the needle jet will have a far greater effect on the mid-range mixture than a step change in the jet needle.

The Needle Jets are stamped with a letter followed by a number, such as N8, O1, P3, etc. Each letter has a ten digit increment, i.e., N0, N1, N2, N3, N4, N5, N6, N7, N8, N9, O0, O1, O2, etc. The letter designates orifice size and a "O" needle jet will provide a richer mixture than a "N" needle jet. The number also relates to the orifice size, only in finer calibrations, the larger the number the richer the jet.

The method for tuning the mid-range is similar to that used for the main jet, i.e., use richer needle positions, needles and/or needle jets until "four-stroking," running heavily, etc., indicates a too rich mixture, then back up to next leaner setting to provide correct fuel/air mixture.

All of these adjustments will override into the next range to some degree, to provide smooth acceleration the pilot jet, slide cut-away, jet needle,

and main jet must overlap to make the proper transition. A rule of thumb is that a major change (such as a different size main jet) will have a ten percent effect on the mid-range operation. One notch jet needle change will effect main jet by ten percent. It is apparent at this point that several

different combinations of pilot jet, slide, needle, needle jet and main jet can be used to produce the same end result. The text here is to relate the various parts, the sizes and the effect that can be expected when making an adjustment to one or the other of the carburetor tuning ranges.

#### NEEDLE JET AND JET NEEDLE CHART

Orifice Size of Needle Jet in Millimeters

	0	1	2	3	4	5	6	7	8	9
A	.000	.005	.010	.015	.020	.025	.030	.035	.040	.045
B	.050	.055	.060	.065	.070	.075	.080	.085	.090	.095
C	.100									
D	.150									
E	.200									
.										
.										
N	.650	.655	.660	.665	.670	.675	.680	.685	.690	.695
O	.700	.705	.710	.715	.720	.725	.730	.735	.740	.745
P	.750	.755	.760	.765	.770	.775	.780	.785	.790	.795
.										
.										
Z	1.250									

Example: N5 = .675mm

Jet Needle Code

Example: 4D3 - First digit indicates overall length from shortest (2) thru 3, 4, 5, 6, 7, 8, 9, to longest (1)

Letter indicates amount of taper

A: Smallest amount of taper

Z: Largest amount of taper

Second digit indicates various materials and finish used.

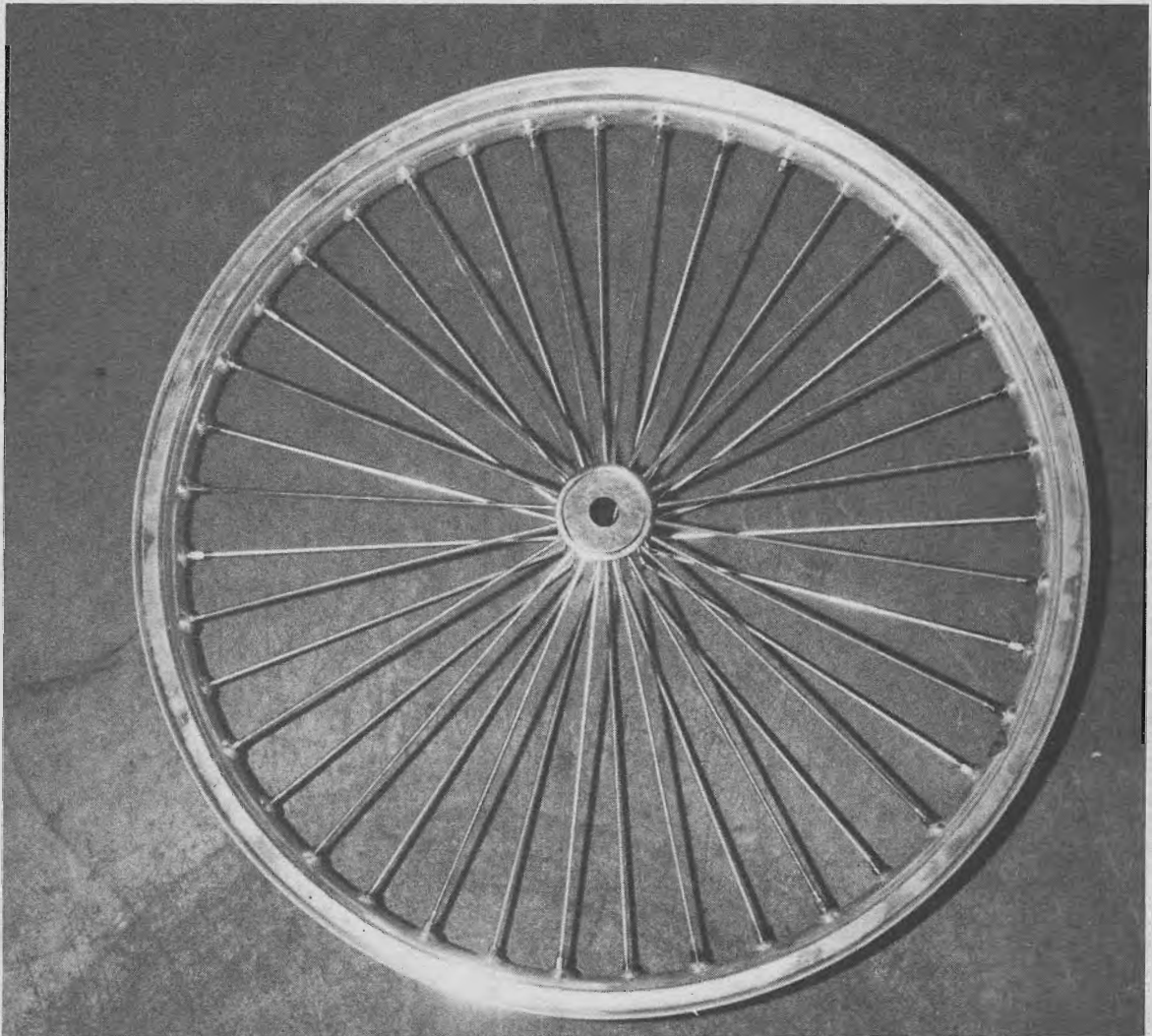
# PROPER WHEEL LACING

LACING WHEELS RIGHT IS A MUST IF YOU  
DON'T WANT THEM TO COLLAPSE FROM UNDER YOU.

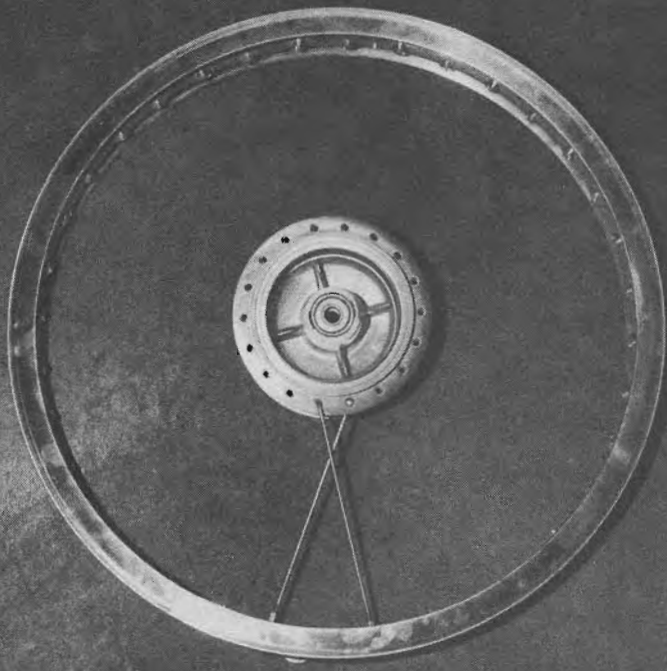
By Frank Scurria

Whenever anyone thinks of speed tuning they almost always think of engine work first. Then comes chassis tuning, but in most cases one of the last things that receives any attention are the wheels. When it comes time to have new wheels laced, or to have existing wheels rebuilt, they are just sent out to someone who does this kind of work for a living.

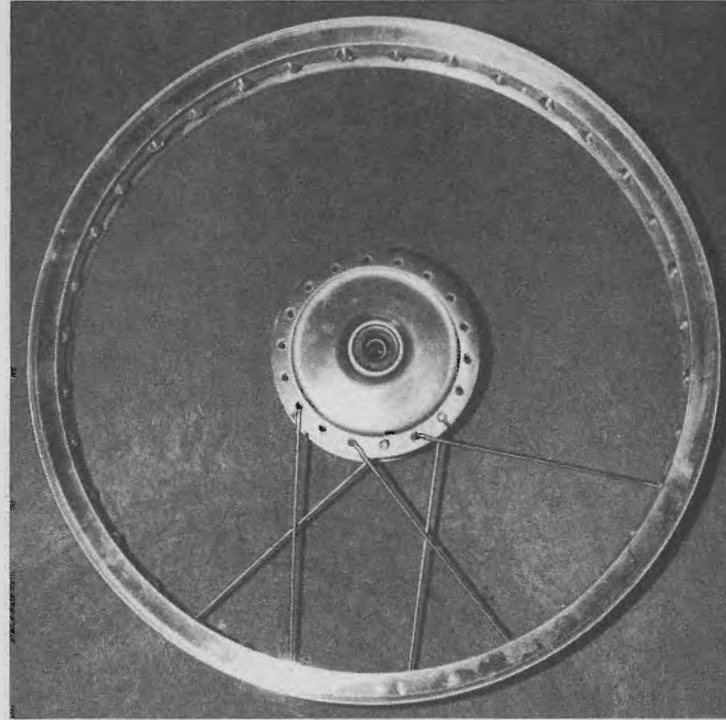
For example, without looking at the bike, how many of you out there know what pattern was used to lace your wheels? Was it cross-one or cross-four? Now look at your machine; if each spoke crosses two other spokes from the point where it leaves the hub to where it joins the rim it's laced with, that's what's known as a cross-two pattern. We've even seen wheels where each spoke goes straight from the hub to the rim without ever crossing another spoke. This type of wheel is used for show bikes or chop-



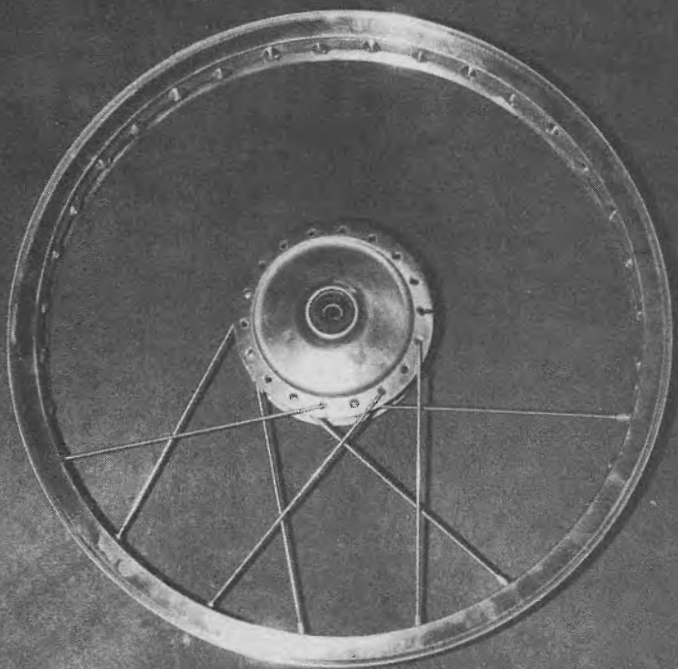
1. This type of wheel is made for show bikes, but isn't practical for normal use because it has very little strength. It couldn't be used if it had a brake.



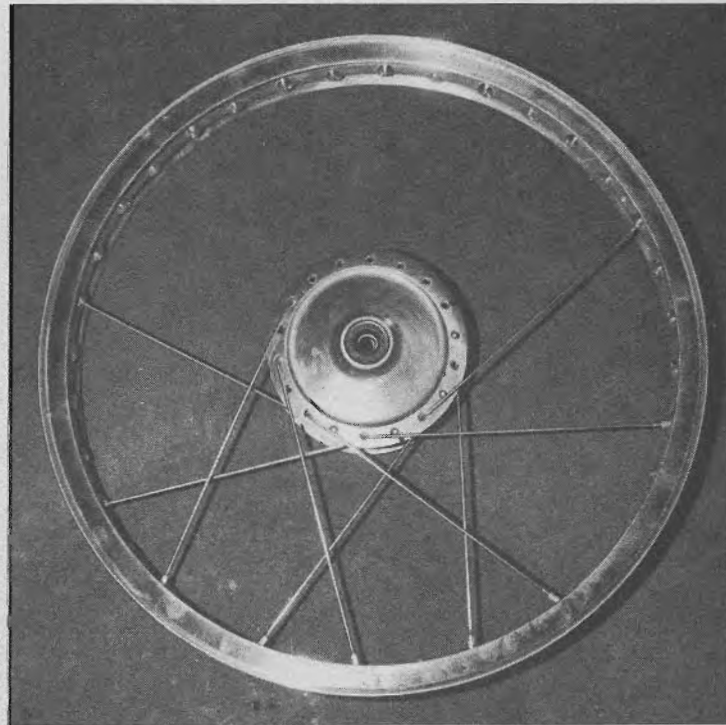
2. The cross-one pattern makes for a stiff front wheel but hitting a sharp bump or curb could easily pull the spokes from the hub.



3. When this wheel is complete each spoke will cross two others on its way from the hub to the rim. Like the cross-one this is one of the easier patterns to lace.



4. The cross-three is a little harder to lace but in this case makes the wheel stronger.



5. This is what you're aiming at; the spokes leave the hub at 90 degree angles to the circumference. They're pulling against an area where there is considerable material.

pers, and like many items designed for this type of bike, it's totally inadequate for practical use.

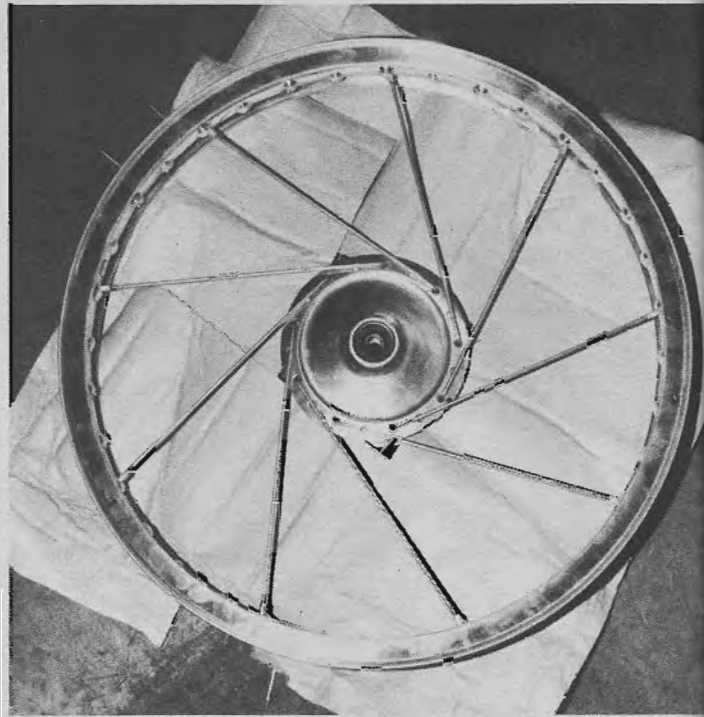
So which pattern is the right one to use to lace your wheel? Well there's more than one right way to do a wheel. It all depends on the diameter

of the rim and hub. The main objective is to have the spokes pull at as close to a 90 degree angle from the hub as possible, that way the spokes aren't trying to pull straight out of the hub at a point where there is the least amount of metal. Using this principal

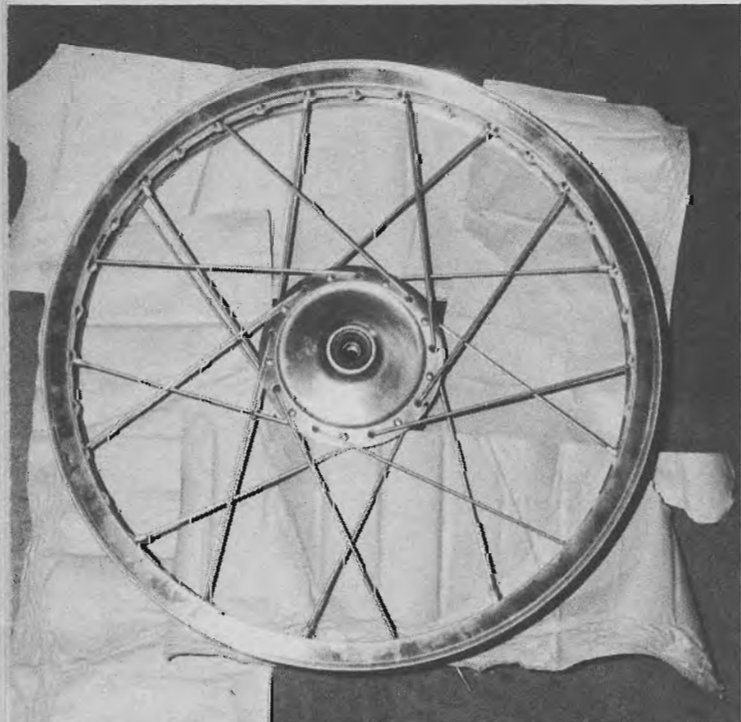
it is easy to see that when the hub is of large diameter and the rim is of small diameter, as on a road racing machine, the spokes will be short and will cross less than with a small diameter hub with a large diameter rim as used on a moto-cross machine.



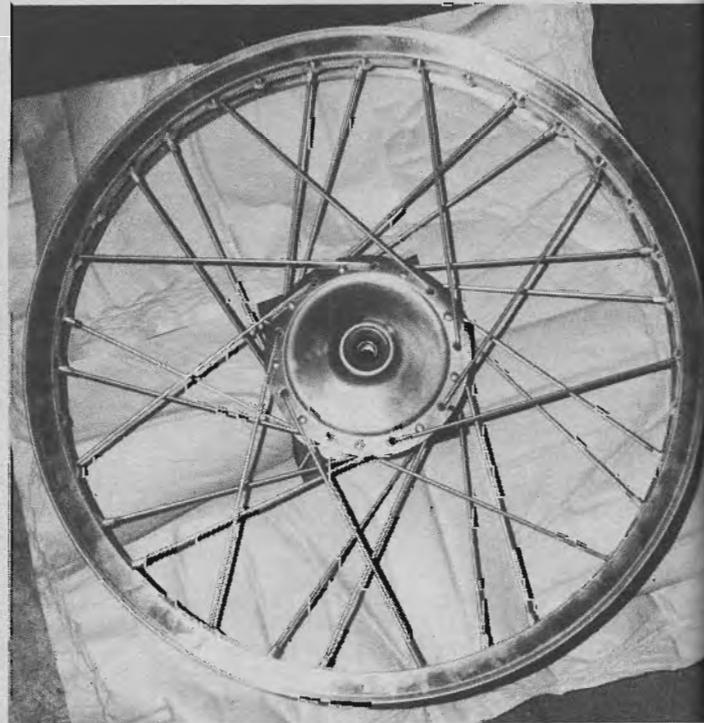
6. When lacing the wheel all the spokes must first be put through the hub. Lay it on a flat surface and begin by putting the top nine (or ten if it's a 40 spoke rim) spokes through the proper hole in the rim. Use another wheel as a guide if necessary.



7. This is what it will look like when the top nine spokes are in the right position.



8. Then move down to the next row of nine spokes, they're the ones on the underside of the top flange.



9. Keep working down one row of nine at a time. Don't try to turn the wheel over, you'll just have spokes falling out.

Another point to remember is that there is more give in a wheel with long spokes so a cross-four pattern with long spokes on a typical moto-cross wheel will take up a lot of shock and will resist pulling spokes out of the hub or braking spokes. Unfortunately

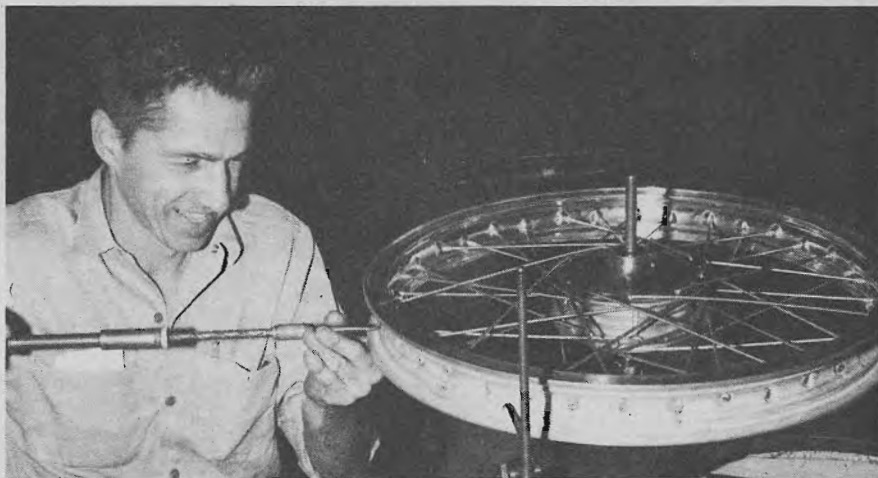
it is much more time consuming to build wheels using the cross-four pattern so very few machines come standard with this feature.

Road racing wheels with very large brakes and relatively small diameter rims have the added advantage of using

short spokes. The shorter the spokes, the more rigid the wheel, which is very necessary for a road racer.

Generally speaking, a moto-cross machine should have long spokes to absorb shock and should be laced in such a manner so the spokes aren't

10. The spokes are then tightened with a screw driver as Jim Buchanan demonstrates here. Don't tighten them too much or you'll have to back them off later.



11. Buchanan uses a special work bench but a vise with an axle clamped in it will work just as well. Using a fixed pointer on the inside of the rim, work out any irregularities by tightening or loosening individual spokes.



trying to pull straight out of the hub. The same can be said for road racing in regard to the angle at which the spokes leave the hub, but it is also desirable to have the spokes as short as possible for rigidity. Street machines can be considered a compromise somewhere between moto-cross and road racing.

If you plan on changing to a wider tire it might be necessary to use a wider rim. The following chart gives the right rim width for the most popular tire sizes.

TIRE SIZE	RIM WIDTH
2.25 to 2.50	WM-0
2.50 to 3.00	WM-1
3.00 to 3.50	WM-2
3.50 to 4.00	WM-3

One more thing to remember; when ordering the new rim, make sure you distinguish between 36 or 40 spokes, both of which can be considered standard.

The wheel we used to demonstrate how this job is done is a new 21 inch for our Project Yamaha, but the same applies for any machine. All work was done at Buchanan's Frame Shop, 629 E. Garvey Ave., Monterey Park, California. Buchanan also supplies any size rim and spokes to suit your need.

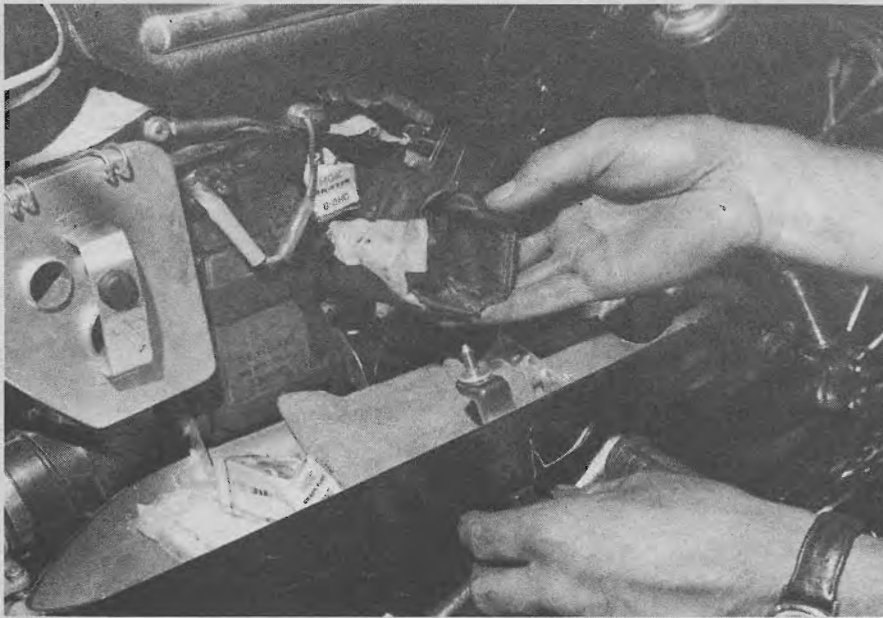
It's a tedious job if you're a beginner so be prepared to struggle a little.



12. When all nipples are tightened equally grind the sharp spoke ends flush with the nipples so they won't puncture the inner tube. The wheel is now ready for use.

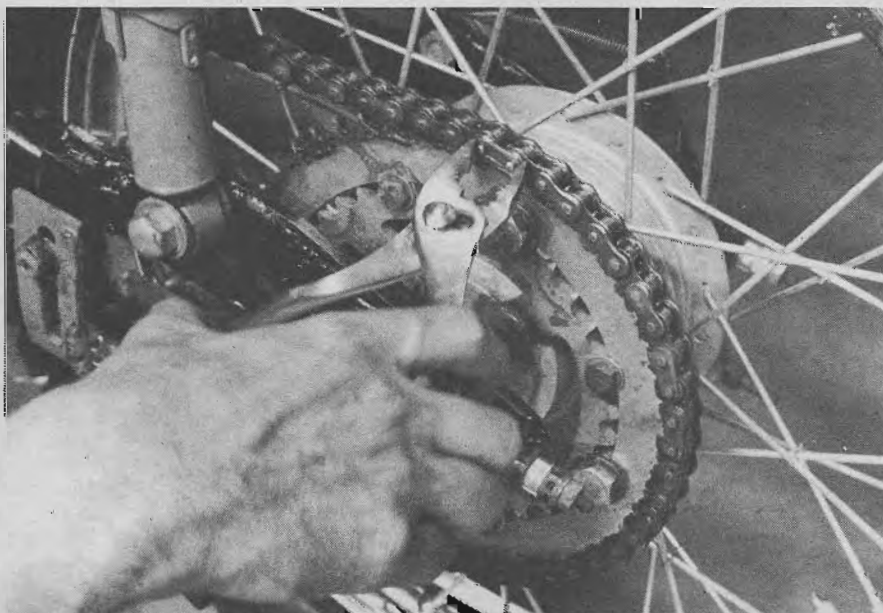
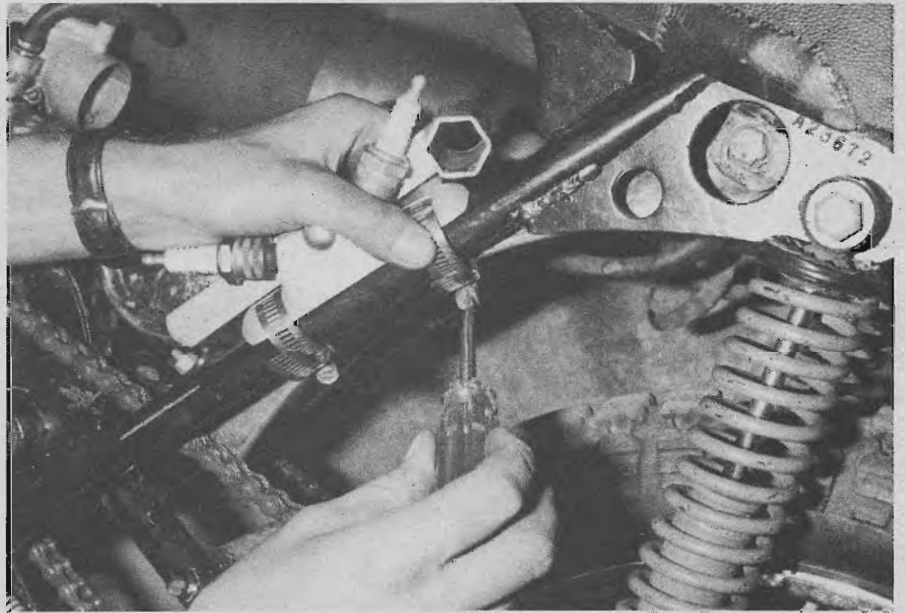






*If you ever have the occasion to open that toolbox in the "middle of nowhere" you'd better hope you had enough forethought to pack in the tools and parts that'll be needed to get you home.*

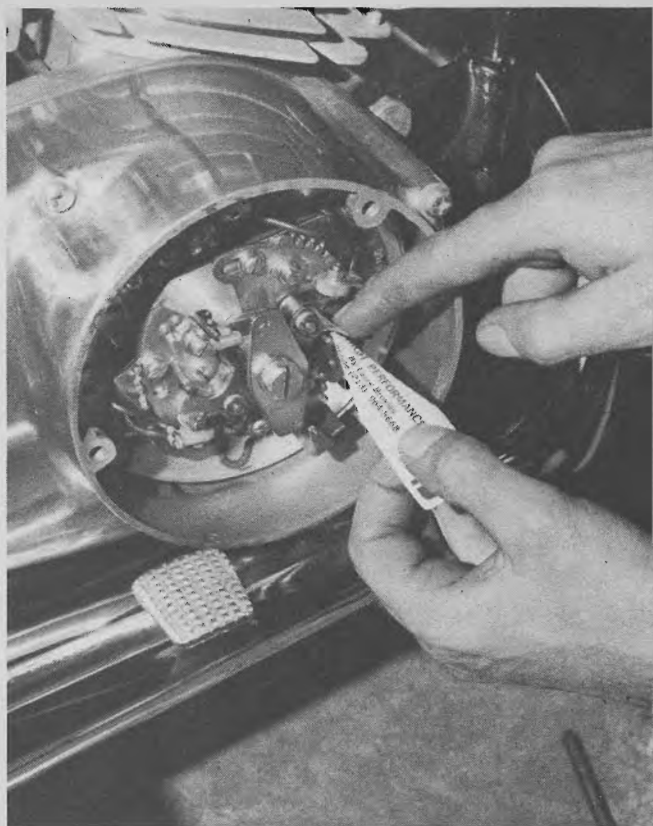
*A spare spark plug and spark plug wrench are a must, particularly for any two-stroke. Your dealer can supply a combination plug holder and wrench that'll clamp right onto one of the frame tubes.*



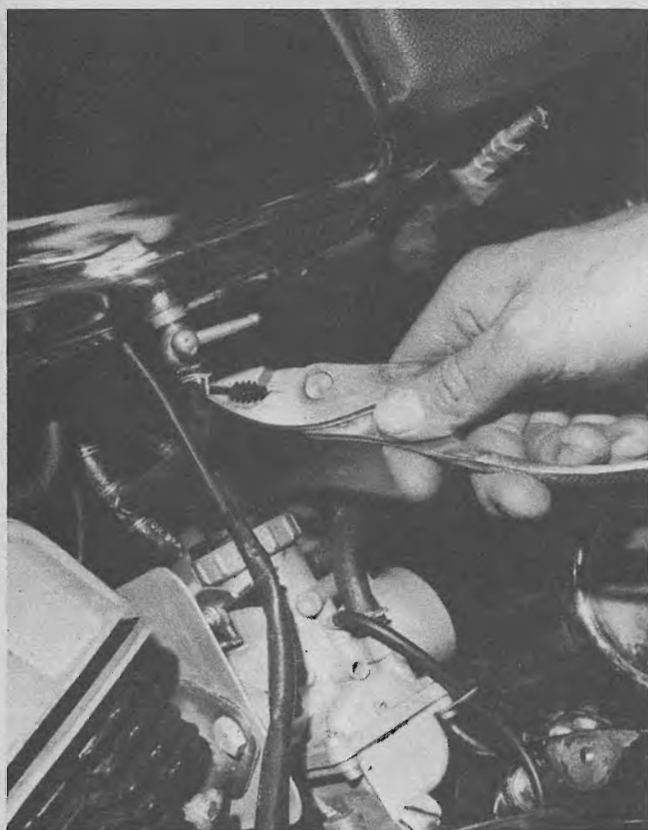
*A pair of pliers and a spare chain master link are often enough to repair even a broken chain well enough to get you where you're going. Grip link's clip as shown to snap it into place.*



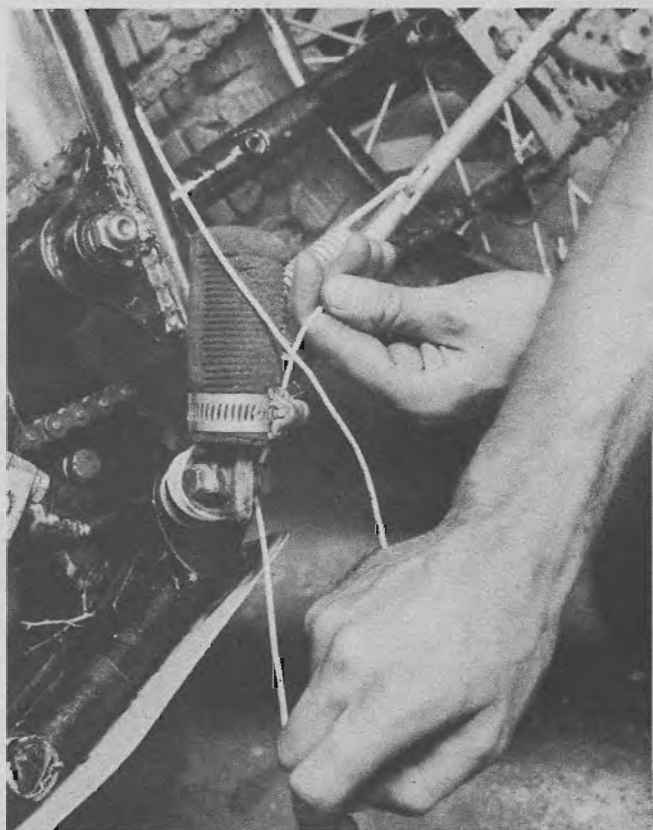
*That pair of pliers can be used to give the added leverage needed to break loose most screws, particularly those that hold the ignition point's access cover in place.*



*A plain business card works extremely well as an ignition or spark plug point cleaner. Simply hold the points together and pull the business card back and forth until they're polished.*



*A short piece of .040 inch steel wire, carried in your toolbox of course, can serve as an emergency clamp to hold slipping fuel lines or other parts firmly in place. Twist ends tight.*



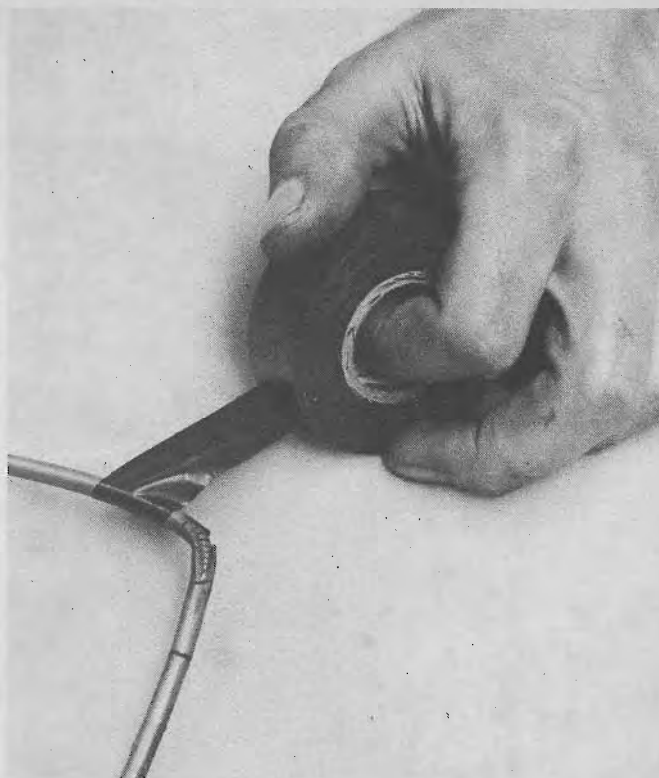
*Several wraps of steel wire, between the folding footpeg and its stop, can be used to temporarily adjust badly bent footpegs for the ride back home.*

whatever it is you probably broke is something you won't have a spare of — we've actually seen riders in long cross-country events with an entire spare engine strapped to their backs.

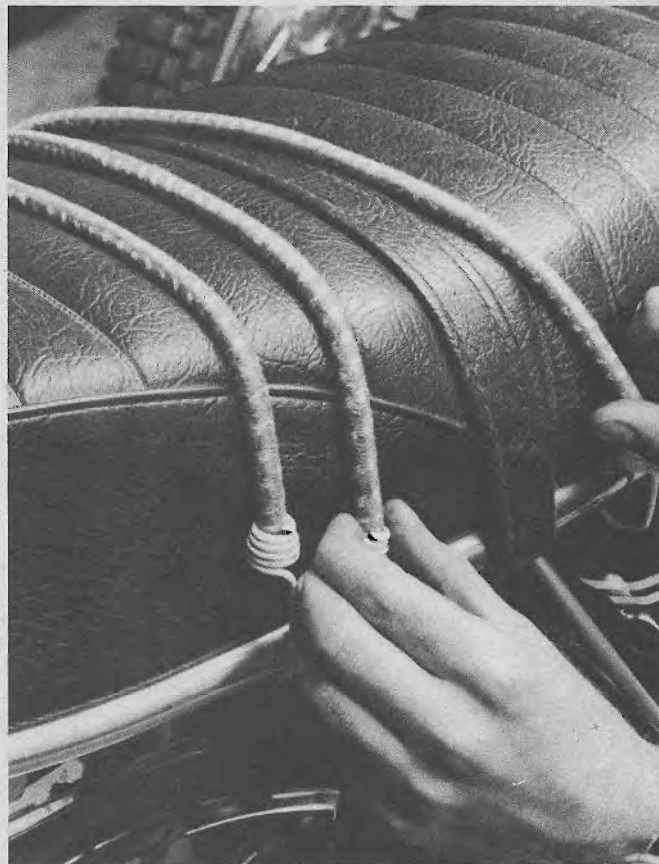
There are some failure-prone parts on a few machines. If yours is one of those machines you've probably already broken whatever it is often enough to think about carrying a spare. If you and your machine are brand new friends you might check with owners of identical makes and models to find out if it does have one or more of those Achilles heels. Generally, however, you had best hope to make a temporary "fix" on any part that might fail and try to carry enough "fixins" to get you back to civilization or to the nearest garage. At least one spare spark plug and a spare chain master link are always a good idea. You should carry a four-foot length of flexible fuel line. The fuel line can be tied up under the seat or even stuffed into the open end of one of the frame tubes. You'll need it occasionally to siphon gas from a friend's tank when you run dry or to replace a torn or missing fuel line on your own machine. A pair of medium-sized radiator hose clamps (which can do double-duty in holding on your spark plug holder/wrench set) will clamp on a lot of parts including flat tires, just be sure you have a screwdriver to fit the clamp's adjusting screw. Other "emergency fix" items include ten feet or so of .040 inch steel wire, a roll of heavy-duty plastic electricians tape, and two or three elastic-with-hooks "Bungee" cords.

Not all of these items necessarily belong (or will fit for that matter) in your toolbox. Many accessory firms, like Webco, can supply combination spark plug and spark plug wrench holders that will clamp onto any of the frame tubes. The steel wire can be wrapped around the center of the handlebars or a hidden frame tube for instant accessibility. The "Bungee" cords can be strung over the unoccupied rear of the seat or stretched among the frame tubes beneath the seat. The chain master links can be clipped over one of the handlebar levers, between a couple of wheel spokes, or around some convenient frame bracket. The rest can go inside the toolbox wrapped in a clean rag.

You won't have whatever it is you need, but at least you'll have the "junk" to effect a temporary repair and the tools to accomplish the task. You may be lucky enough to never need one of the items we suggest — we sincerely hope so — but if you do you'll thank yourself a dozen times over for taking a few minutes and spending a few dollars now to save that long walk home later.



*Heavy-duty plastic electricians tape will also hold errant parts in place for a while. Tape can be used as an emergency wrap around badly frayed cable housings.*



*Flexible "Bungee" cords are handy just to hold packages onto the seat or tank. They have also been used as emergency gas and oil tank hold-downs or to support broken exhausts.*

# **HANDYMAN'S.**

YOUR HODAKA CAN BE ANYTHING FROM A  
PRO RACER TO A TRAIL OR TRIALS BIKE  
WITH EASY-ON PARTS

# **DELIGHT**



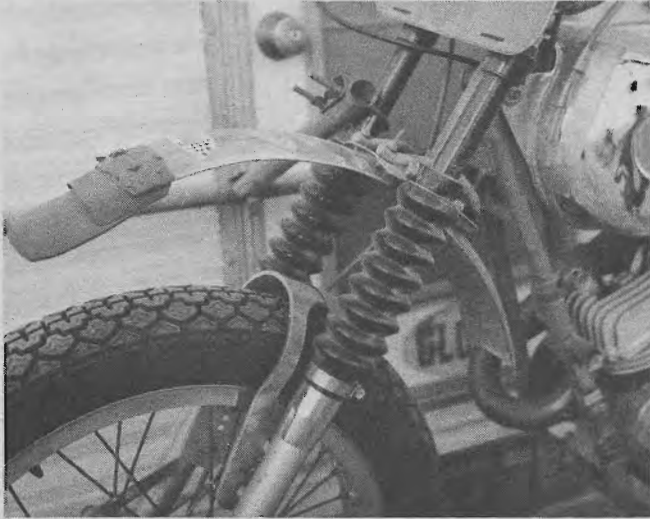
By Robert Schleicher

No trailbike has ever had the impact on the motorcycle market like the Hodaka. You can even say, with much basis in fact, that Hodaka really started the whole trailbike concept with their 1964 "Ace 90" model, the first production machine that was designed from the ground up to be used for off-road trail riding and only occasional street use. From the beginning of time (to Hodaka owners) until now only one model was available from any

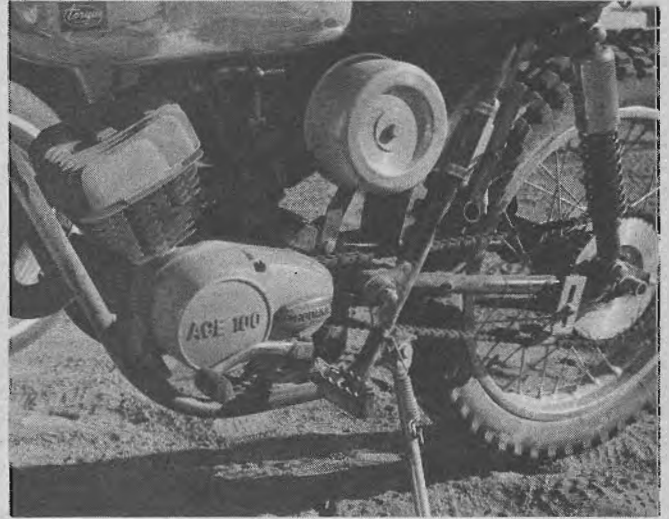
Hodaka dealer; the "Ace 90" was superseded by the five-speed "Ace 100" in mid-1967 and the "Ace 100" superseded by the "Ace 100B" in mid-1970. In early 1970 a ready-to-race version of the Ace; the "Super Rat," was introduced and it sells side-by-side with the current "Ace 100B" model. None of the Hodakas sell for over \$500 and that, coupled with their off-road design, may be the reason why more Hodakas have been raced with more success than any other single make. If you have a Hodaka

you've at least the start of a machine capable of winning any under 100cc class off-road event.

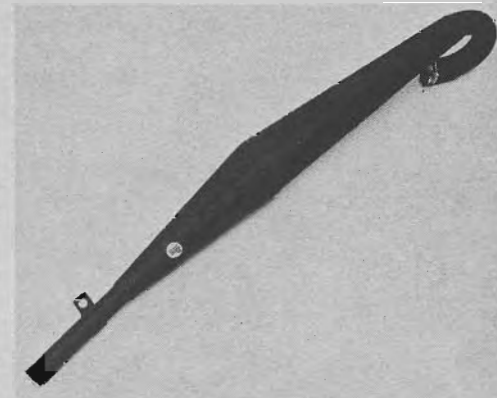
The Hodaka importers, Pabatco, Inc., have always offered the greatest possible assistance to riders and racers, nice little things like making sure there was enough interchangeability to allow the owner of an "Ace 90" to update his machine to a "100," "100B," or "Super Rat"; supplying a full series of racing parts, and offering a factory-prepared booklet on tuning and modifying the Hodaka for either off-road



High mount front fender, rubber fork gators (accordian-pleated covers), fork brace, alloy-rimmed wheel, and number plate on one of Jack Morgan's winning desert racing Hodakas.



This racing "Super Rat" has a Webco air cleaner, Circle Industries footpegs, Girling rear shocks, and a wheelbase extended by splicing in a two-inch section of tubing to the center of the swinging arm.



Expansion chambers will add power to the "Ace" series but noise level is far too high to be legal on the street and they lack a spark arrestor for forest riding. This is Webco's racing chamber.

Just a few of the hundreds of hop-up and handling parts that are offered by nearly a dozen firms. These are offered through Hodaka dealers by Pabatco who can also provide specific tuning booklets for racers.

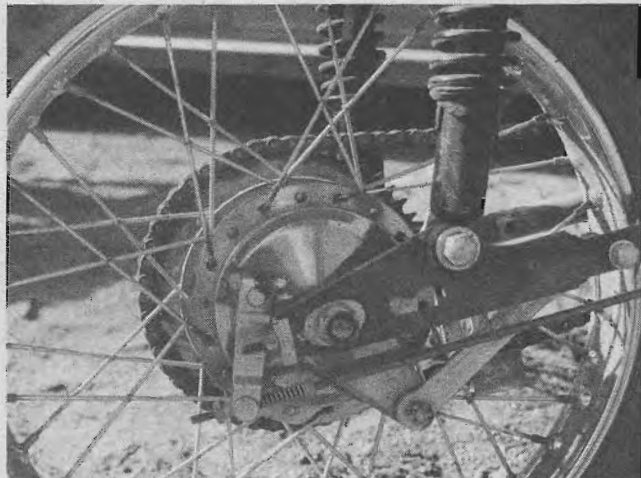
racing, flat track and TT, trials, or road racing. These booklets are available for half a buck apiece from Pabatco, Box 327, Athena, Oregon 97813, Attention: Customer Relations Department. The speed parts, a complete catalog of every racing part offered for any Hodaka by Pabatco, and complete service manuals are available through any Hodaka dealer. In the days of the original "Ace 90" and

"Ace 100" there was quite a lot to be done to a Hodaka to make it race-worthy. Today, however, the best bet (with Pabatco/Hodaka parts) is to bring the older models and the "Ace 100B" up to full "Super Rat" specifications using either Pabatco's parts or accessory items offered by a half-dozen different firms. Energy transfer ignition, 24mm carburetor, giant air cleaner, high compression cylinder

head, race-ported cylinder barrel, Dykes ring piston, expansion chamber, five-speed close-ratio gears, straight cut primary gears, two-gallon slim-line gas tank, heavy-duty MX forks and shock/spring units for the rear, high-mount front fender, 18/19-inch rear/front wheels and knobby-treaded tires, even number plates are all standard on the "Super Rat" and available to bolt right on to any other Hodaka model.



*Slim seat and two-gallon gas tank that are standard on "Super Rat" will make the "Ace 100" Hodakas more comfortable for short races and rides. Stock "Ace 90, 100, or 100B" tanks hold 2½-gallons.*



*For smoother and more controllable performance most riders prefer a slightly longer wheelbase than any the Hodaka models offers. This neatly-extended bracket has second rear notch to add 1½ inch to wheelbase.*



*Perhaps the ultimate in handling, appearance, and expense; the Micro-Metisse with Hodaka power. Pabatco offers complete "Ace 100B" or "Super Rat" replacement engines.*

*Vented gas caps, like this Webco item, are recommended for off-road riding. Sloshing gas won't leak out onto tank like it does with the stock cap. Tube allows air in but slows exit of fuel if bike tips.*



The same modifications that can make a Hodaka (or most other brands of trailbikes) into a serious off-road racer can and should be used to make the maximum in trail-riding machinery. The trail rider may not need that last ounce of "pipy," instant-on, power that the out-and-out racer wants but the superior handling and reliability do apply to the trails. Hodaka has corrected most of the

minor faults of their previous machines in the production ready-racer "Super Rat" model, you won't go wrong in duplicating the "Rat's" specifications. There are, however, a few things that even the "Super Rat" needs. The wheelbase can be lengthened one- to two-inches by cutting a piece of flat steel to match the bracket that is welded on to support the rear wheel and shock absorber; duplicate

#### HODAKA RACING AND PERFORMANCE PARTS SUPPLIERS

A&A Manufacturing  
830 Kayane St., Dept. TB  
Redwood City, Calif. 94063

Circle Industries  
2536 Seaman Ave., Box TB  
So. El Monte, Calif. 91733

Webco, Inc.  
P.O. Box 429, Dept. TB  
Venice, Calif. 90293

J&R Manufacturing Co.  
6001 Maywood Ave., Bldg. N  
Huntington Park, Calif. 90255

B-N Supply Distributors  
Box 651  
La Mesa, Calif. 92041

Steen's Inc.  
Box 2276, Dept. TB  
Alhambra, Calif. 91803

North American Imports  
2325 Cerro Gordo, Rm. TB  
Mojave, Calif. 93501

Suzuki Fun Center  
515 No. Victory Blvd.  
Burbank, Calif.

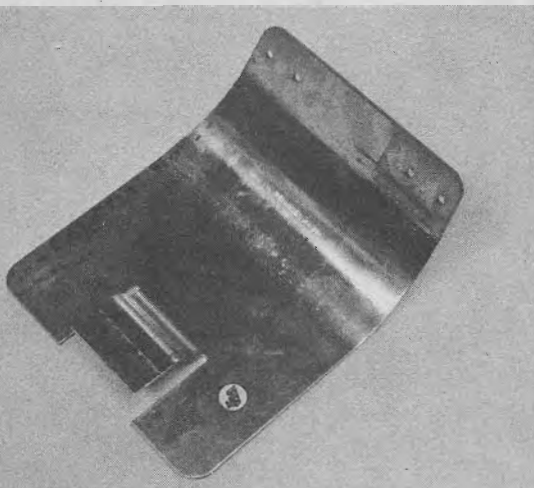
Pabatco (Pacific Basin Trading Co.)  
P.O. Box 327, Dept. TB  
Athena, Oregon 97813

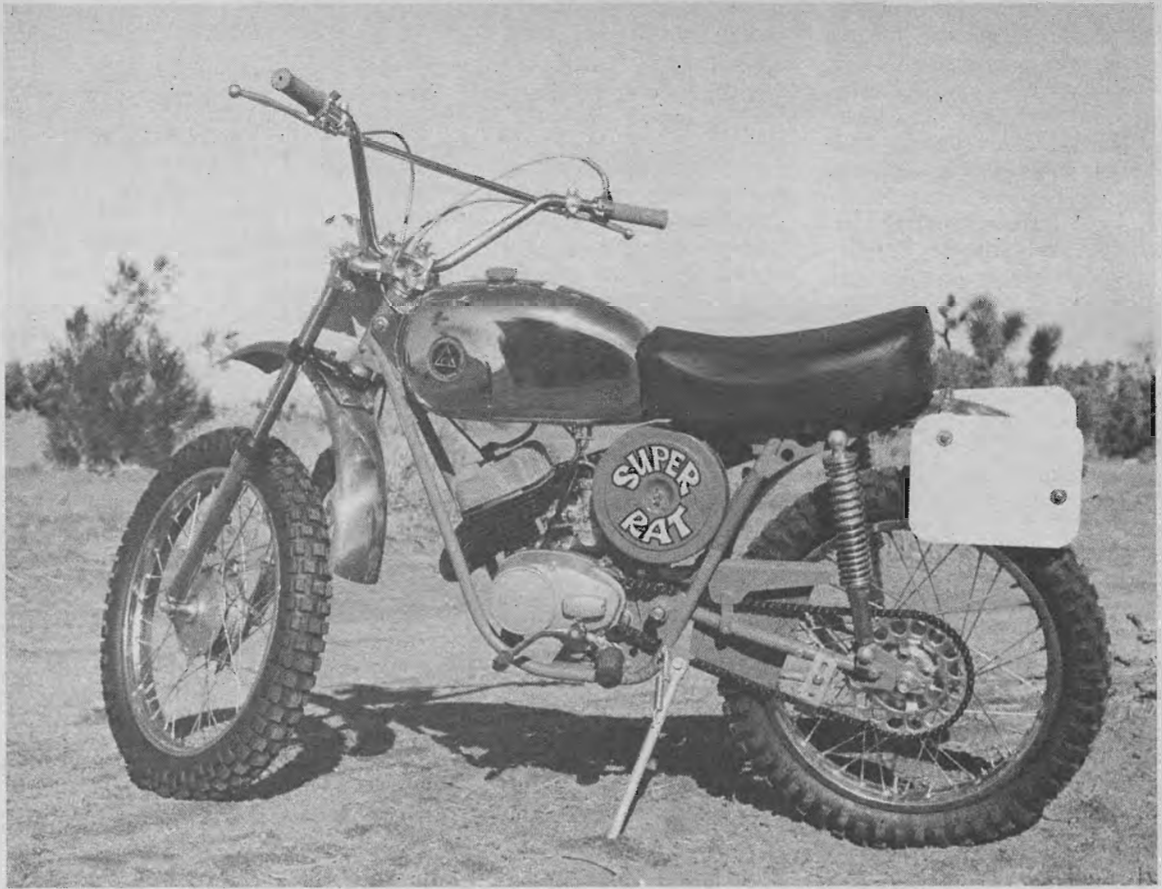


*The current production Hodaka, the "Ace 100B," is the development of the 1965 Hodaka "Ace 90" that helped to start the whole trailbike concept. All Hodaka's current parts can be used to update earlier bikes.*

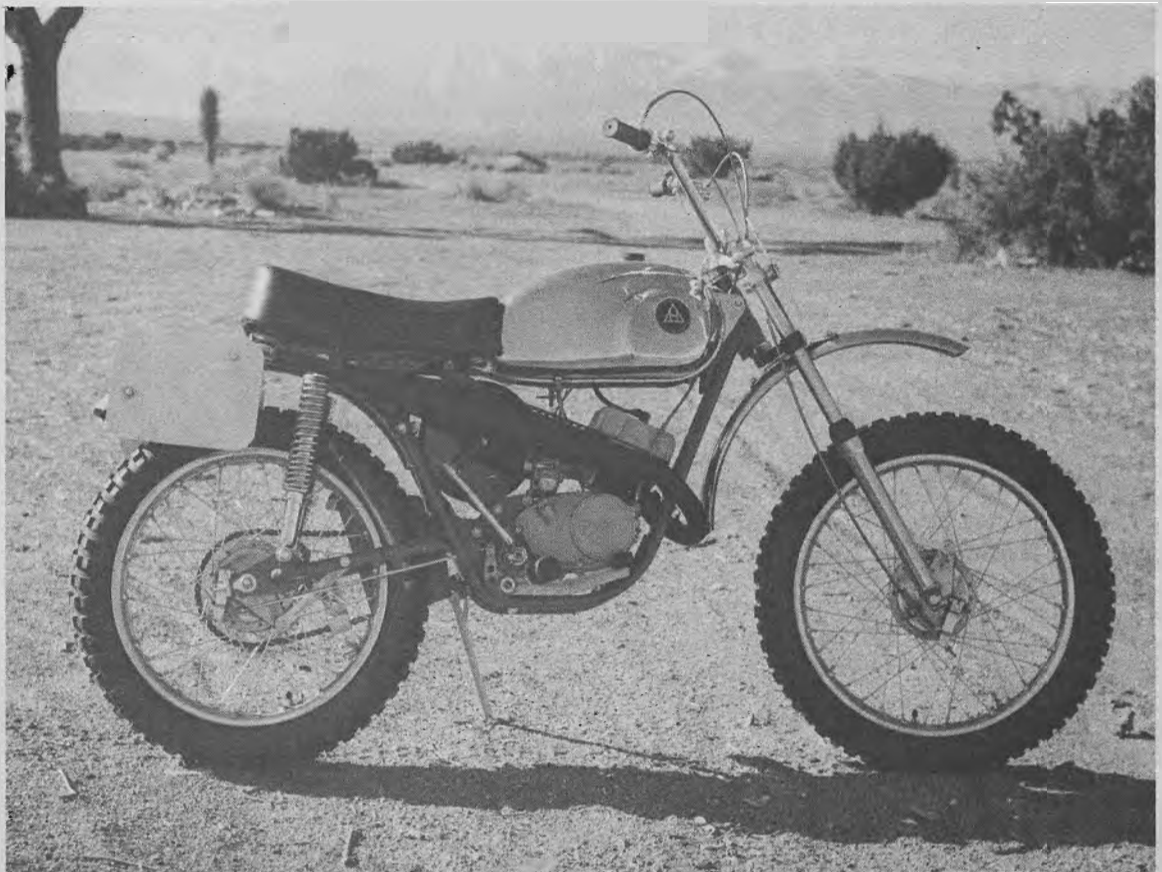
*Hodakas are among the lightest of the machines in the trailbike class; bumper-loading and carrying is easy enough. This number "1" is the Southern California four-year champion's, Jack Morgan, who has consistently beaten the best with a series of Hodakas.*

*A larger skid plate is recommended for most off-road riding or racing. This one is Webco's all aluminum item; one of a full line of Hodaka hop-up and handling parts.*





*The ready-to-race Hodaka "Super Rat" incorporates the best of the five-years of racing experience into one machine. "Rat" sells for less than \$500. All "Rat" parts can be fitted to the "Ace 100B" as well.*





the bracket (or add an extension to it) to move the slotted wheel mounting-hole back two-inches. Have a professional welding shop do the job right and, incidentally, be sure to leave the lower shock absorber mount in its stock location. A remote breather gas cap, front fork brace, larger skid plate, compression release, even better shocks and/or forks, and different tire sizes and tread patterns will all help to make any Hodaka into the perfect trail bike or the quickest competitor. Webco's 125cc replacement barrel/head/

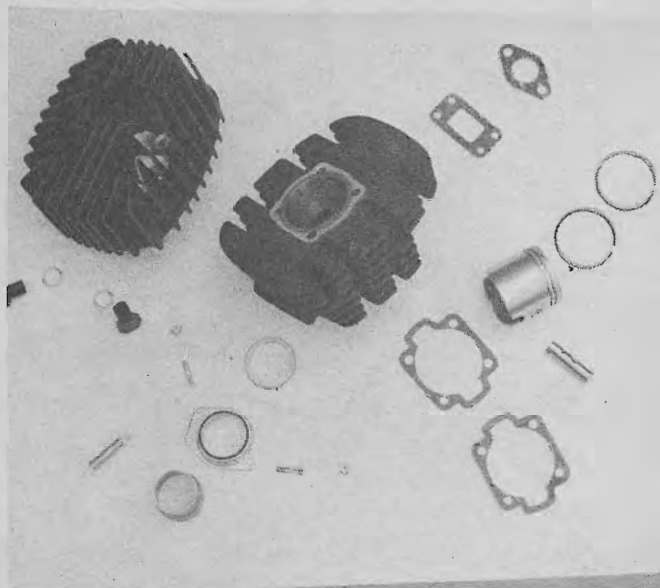
piston kit will up the displacement and power by 25 per cent and is a must in areas where trailbikes compete in under-125cc (rather than under-100cc) displacement classes. A complete selection of primary and countershaft sprockets are available, in one-tooth increments, from most suppliers of Hodaka hop up parts.

The race-ready Hodaka is one of the lightest of the trailbikes; we've seen them on the scales at less than 180-pounds including a full tank of fuel. Surprisingly they don't seem to

break any more often than their heavier competitors. The wide selection and instant availability of really proven racing parts makes hopping up a Hodaka a project with the barest minimum of risk. These same suppliers offer all of the comfort, tuning, and reliability-increasing items that you could possibly want. The beauty of the whole thing is that you don't have to be machinist (or even, really, a mechanic) to make the whole Hodaka setup work, just bolt the parts on and ride away . . .



Heavier rear shocks and springs are necessary for fast off-road riding with the Hodaka "Ace 100" models. Every shock maker offers units that'll fit the Hodaka — these are Girlings.



The maximum performance kit for the Hodaka; Webco's cylinder barrel, head, and piston kit to increase displacement to 125cc. Kit is designed to use the "Super Rat" 24mm carburetor.



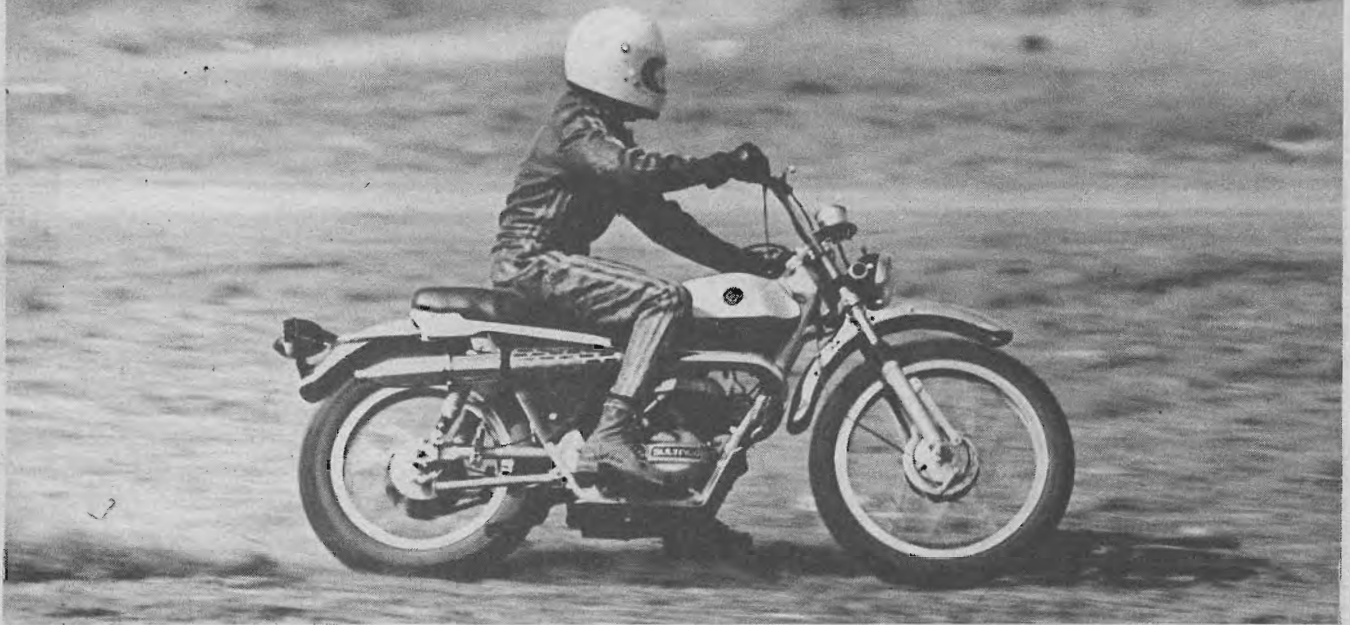
Suzuki Fun Center offers this Van Tech-built leading link front fork to bolt right on to any Hodaka model. "Springer" fork, as they're called, is one of the best for smoothing chuck holes and sharp dips.



Circle Industries offers two styles of fork braces for the Hodaka; this steel brace and a wider aluminum brace. Circle also machines a full line of aluminum countershaft and rear wheel sprockets for Hodakas.

# MONTADERO

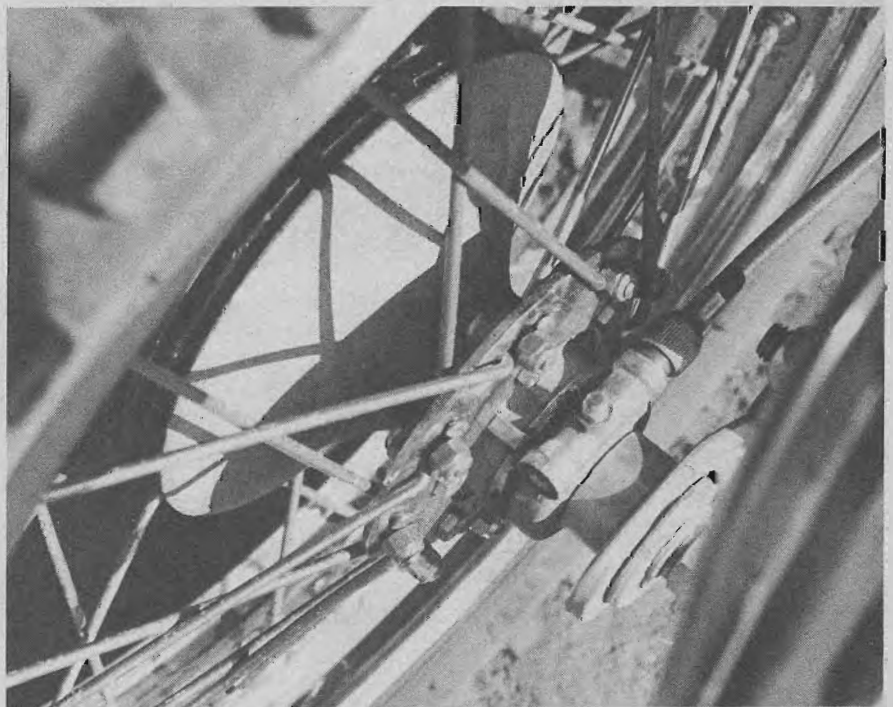
MUCH MORE THAN A TRAILBIKE



The Bultaco factory's method of building trail machines is quite a bit different from the practice used by most other large motorcycle manufacturers. Instead of taking road bikes and adding a high pipe, universal tires, and a wide set of handlebars, they take a racing machine and detune the engine, add a muffler and lights, plus a few other accessories for the street, and then market it.

By building trailers in this way, they come up with some of the best off road bikes available. In the past we've tested their Matador, a 250cc trailbike, and it has to be one of the best two or three around. About 18 months ago they introduced the Montadero and it was an instant success. The latest version is even better than the first one. It has more torque, handles better and even has a key ignition, which can't be all bad.

Giving serious thought to the Montadero we have to say it's not a racing machine, but then again it has to be one of the best cycles around for riding enduros. And as a fun trailbike for the experienced rider, the Montadero will be at the top of the list.



*Aircraft nuts are used in the hub to keep the spokes from flexing right out of their holes. Conical hubs are used.*

Powering the Montadero is a single cylinder two-stroke with a bore and stroke of 85mm by 64mm that combines to give a displacement of 362.8 cc's. The engine is said to produce 32 horsepower at 6000 rpm but that's not the whole story. The engine is not a bit peaky and starts to pull hard around 2500. By 3500 rpm, it's fully on the boil and continues to pull strong until just over 8000. With this type of powerband the bike can be lugged down and still move smartly away when the tap is opened.

Part of this lugging ability can be traced to the smooth carburetion of the Spanish 32mm Amal. It seems to carburete cleaner than most of the Amal Concentric jugs we've seen. Additionally, there's no flat spots.

Spark is by the now famous Fesma-tronic pointless ignition. One of the better features of the Fesma system is that for all practical purposes it's completely waterproof. The spark plugs fire simultaneously and with the hot spark provided there's little chance of the plugs fouling.

Besides the torque band the most outstanding characteristic is the handling. The Montadero goes around corners and over the rough stuff like a race bike, and well it should because the suspension components can be traced directly to Bultaco's excellent line of racing motorcycles. The front forks are made by Betor. In the past we've stated our preference for these units and those on the test machine did nothing to change our opinion. They still provide over seven inches of travel with fantastic dampening.

The rear shocks are also Betor. They're five way adjustable and for once they seem to be mated to the weight of the machine. In the past we've been a bit harsh on Betor shocks, perhaps now they're getting the message.

We've never faulted Bultaco frames because they've always been among the best available. Granted, the welding doesn't look like it was done by an aircraft mechanic, but the frames don't fall apart under stress. The Montadero's shouldn't either.

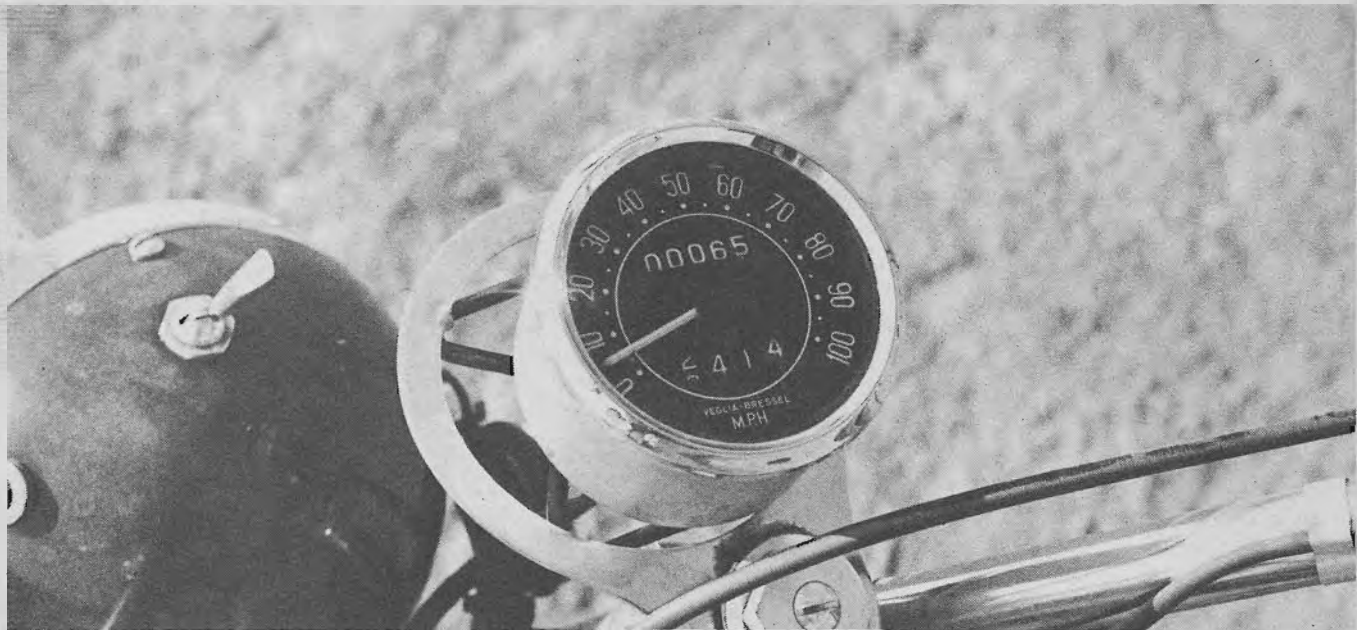
Bultaco provides a large three and a half gallon gas tank that will carry the machine over 100 miles. We can't think of any enduro that has a loop even close to this distance; our only complaint is that for road use a larger tank would be nice. One must remember that the bike is meant as a dual purpose machine and as such the road rider should be thought of a bit more than he is. On the other hand it's nice to see a company that provides good handling in a trail machine. Most of the Japanese companies don't.



*Like Bultaco's trials machine the Montadero incorporates a chain tensioner on the drive chain. Having no slack in the chain provides better throttle response.*



*The double loop frame protects the engine but the addition of the skid plate guarantees rocks won't damage the cases.*



*The speedometer has a re-setable odometer for enduro riding. It's mounted in rubber to cushion it from shock.*



*Forks are Betor, probably the finest in the world. The fender is mounted high so mud and dirt won't pack up and stop the wheel.*

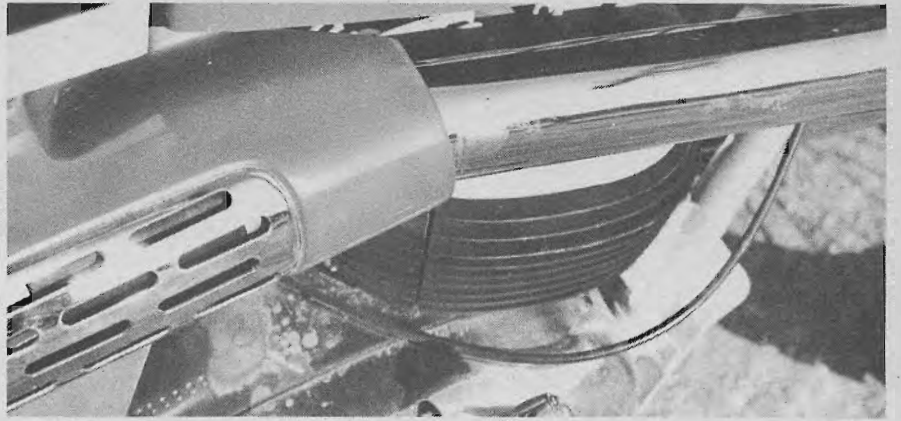
One area where Bultaco falls down is in the muffler department. The existing unit does quiet the exhaust but it's not an approved spark arrestor. With the federal regulations being what they are, we feel any dual purpose bike should have one. Hopefully in the near future Bultaco will see fit to spend the money necessary to provide their bikes with a muffler that even your friendly forest ranger will appreciate.

The tires are meant more for the dirt rider than the man who likes to ride on the street. At the front is a 3.00 by 21 knobby, while the rear is a 4.00 by 18. Riding with these on the pavement can be a bit touchy if the rider doesn't take care. Of course in the dirt they're just what the doctor ordered.

The speedometer, the only instrument available, features a re-setable odometer, a must for the enduro rider.

As you can tell there's very little about the Montadero we don't like. It runs well, has a bunch of torque, the fiberglass work is flawless; even the lighting equipment is better than what we're used to on Spanish machines. In fact we're going to end the test right here and head back to the mountains — you'd better believe the Montadero is going with us.

*Shielding on the exhaust pipe doesn't come far enough forward to completely protect the leg.*



*Even though it's equipped with everything necessary for the street, the Montadero's heart is in off road work.*



*Like most Bultacos, the Montadero breathes air from under the seat. This, along with the air filter, keeps the inside of the engine clean.*





# YAMAHA CT-1C

ANOTHER WINNER FROM YAMAHA



*The adjustable rear shocks are fine for slow speed off road riding, but for serious racing, different shocks will have to be fitted.*

Here we go into another Yamaha Enduro test. It seems that every other month we're testing one of these models from the Yamaha line. In the past we've looked at the 360 Enduro, the 250 Enduro, the 125 Enduro. This time it's the 175cc Enduro, sometimes known as the CT-1C. And we're not through with Enduros yet, there's still one more left.

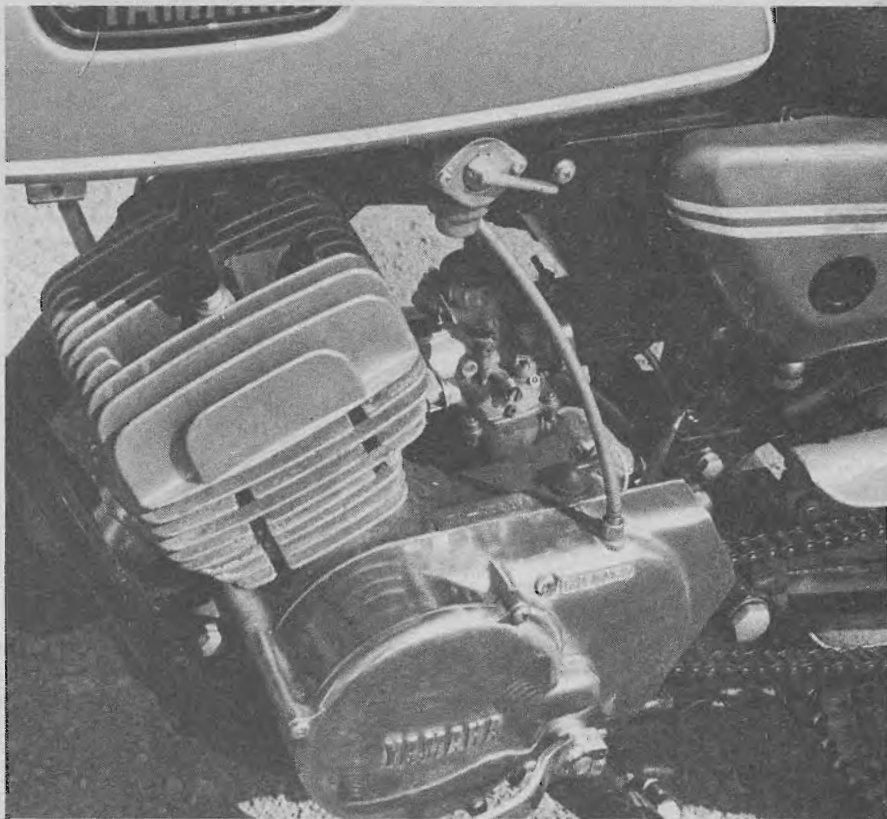
In the past two years Yamaha has staked the vast majority of their projected sales with the Enduro line. Over 70 per cent of their sales have come from here, and rightfully so, their lineup of off-road cycles is second to none.

One of the many reasons the 175 was brought out was to help cut into the sales of the 125 and 250 Enduros. Yamaha couldn't supply all of these two models the public demanded, so they hoped the 175 would be an

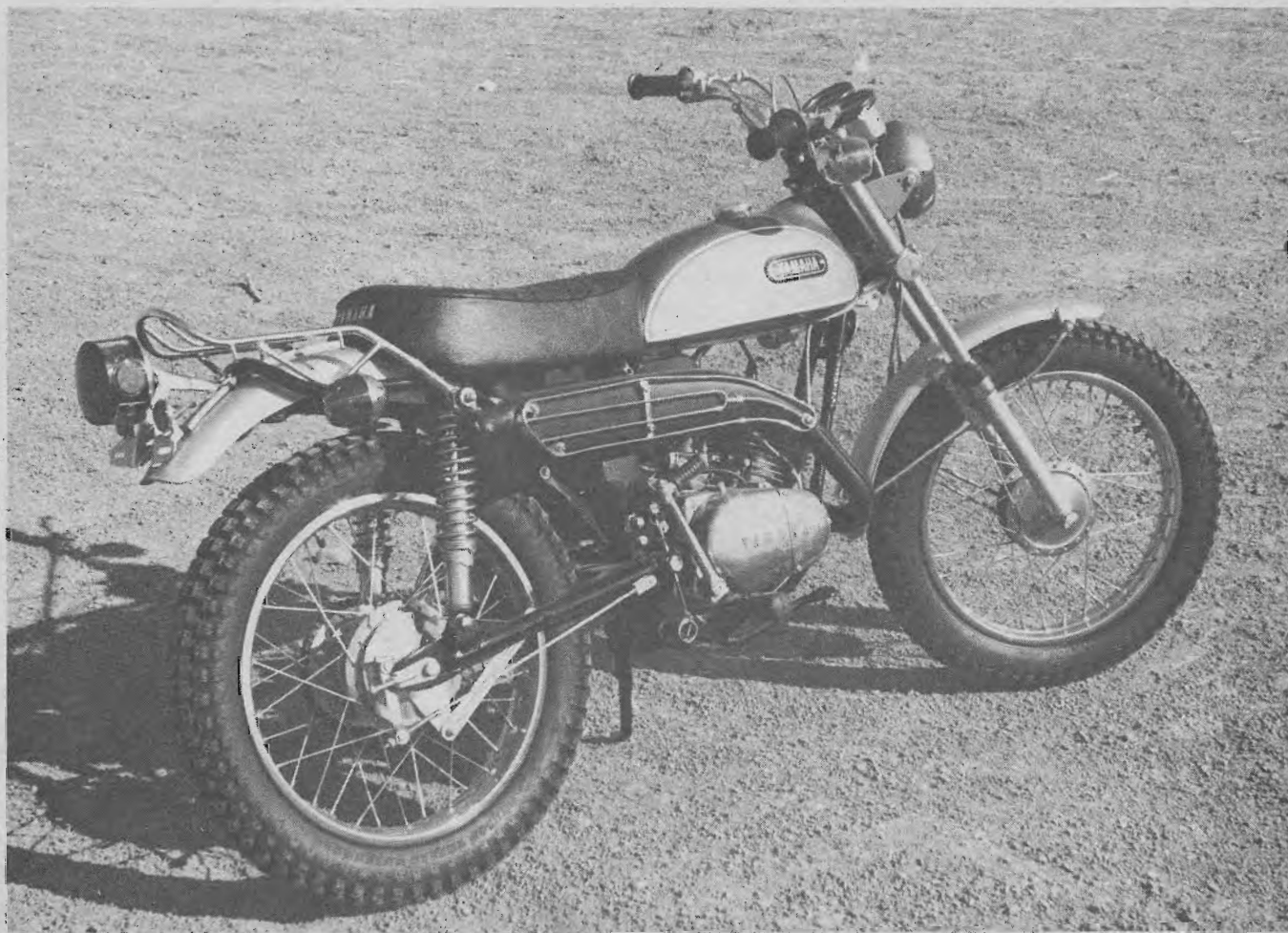
attractive alternate. It became so attractive that Yamaha now runs out of this model just as often as the other two.

Exploring the 175, we find that it's quite a bit like the 125, in fact about the only difference is the cylinder bore. The 175 is 66mm by 50mm while the 125 is 56mm by 50mm. Looking at the two machines, it's hard to tell them apart. The first time you can really tell the difference is when you ride the bike. While the 125 performs well, it's one of the fastest stock 125's you can buy, the 175 really gets with the program. The most noticed difference between the two is the increased torque of the bigger motor. Whereas the 125 will climb most hills the average trail rider will come across, many times he will have to backshift in order to keep the revs up. The 175 has enough low end torque that unless the hill is very steep, a rider will be able to climb it with little, if any, bogging.

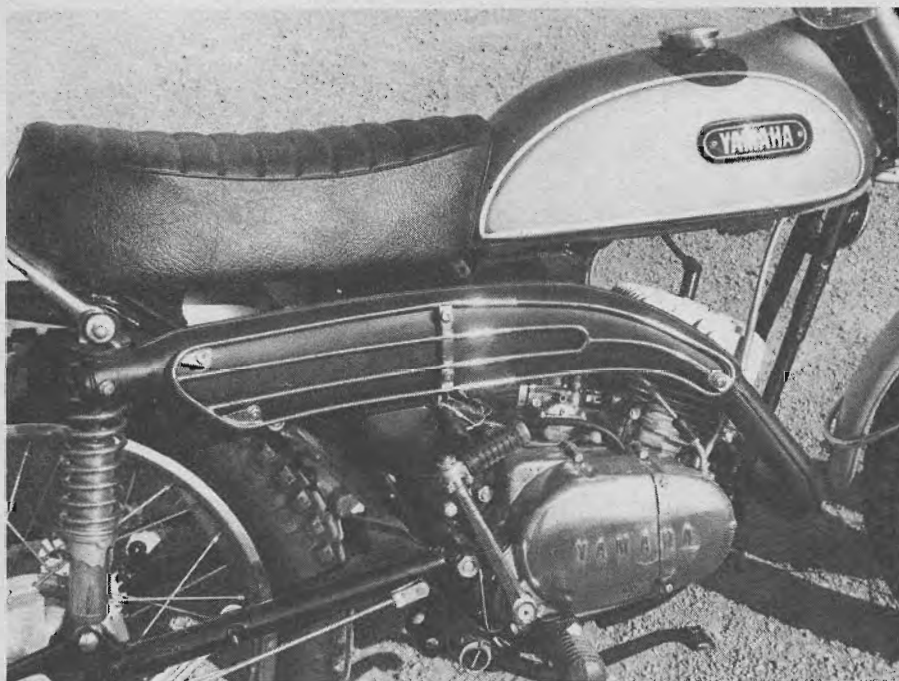
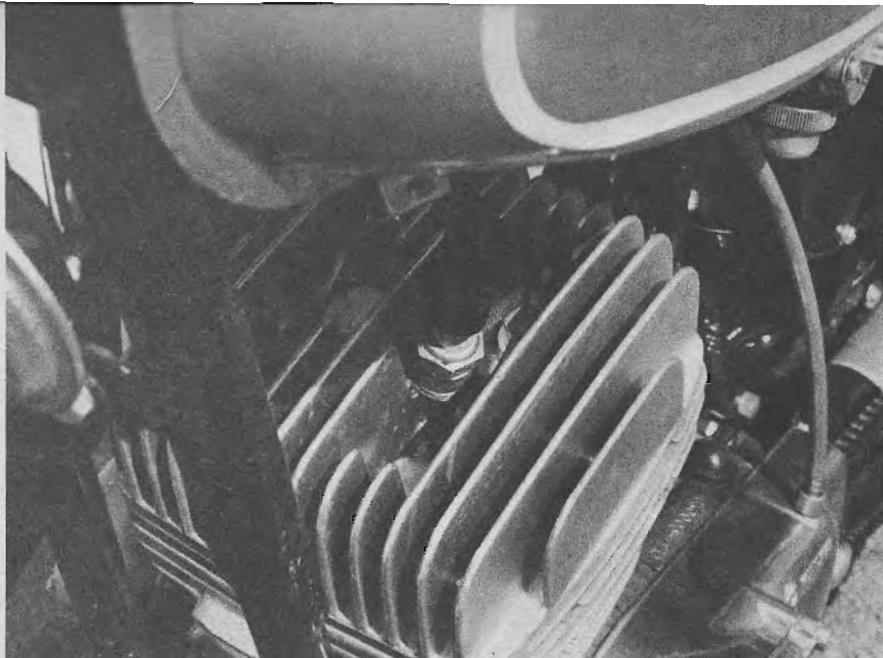
The 175 engine should run for a long time. All the stress points inside the engine run on either ball or roller bearings. Both shafts of the five speed transmission also have ball bearings at either ends. A double ring piston is used and neither of the rings are of the Dykes type.



*In stock form, the five port engine produces 15.6 horsepower, five more than its smaller brother, the 125 AT-1.*

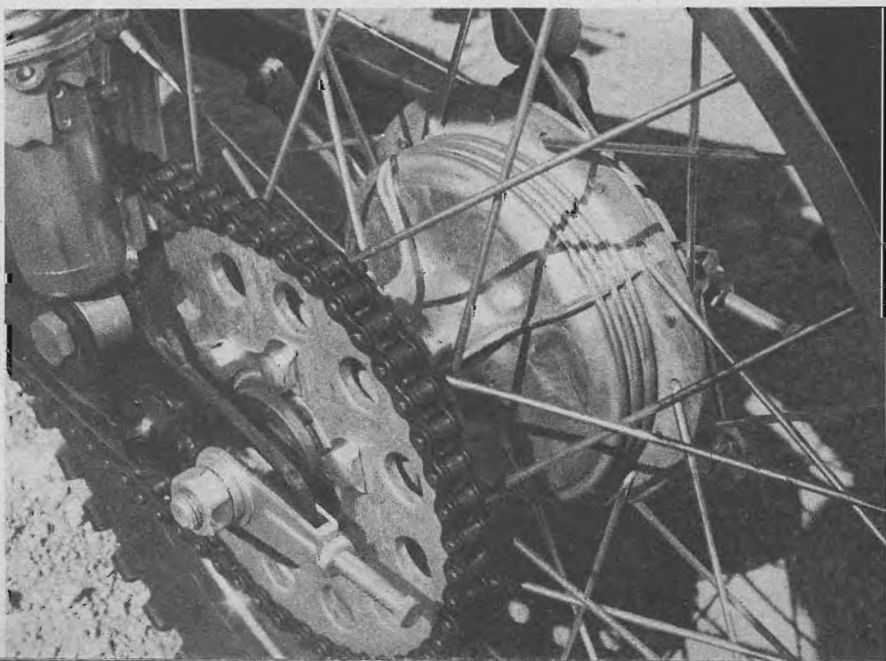


*A plug hole other than the normal spark plug hole is provided for either a spare plug or a compression release.*



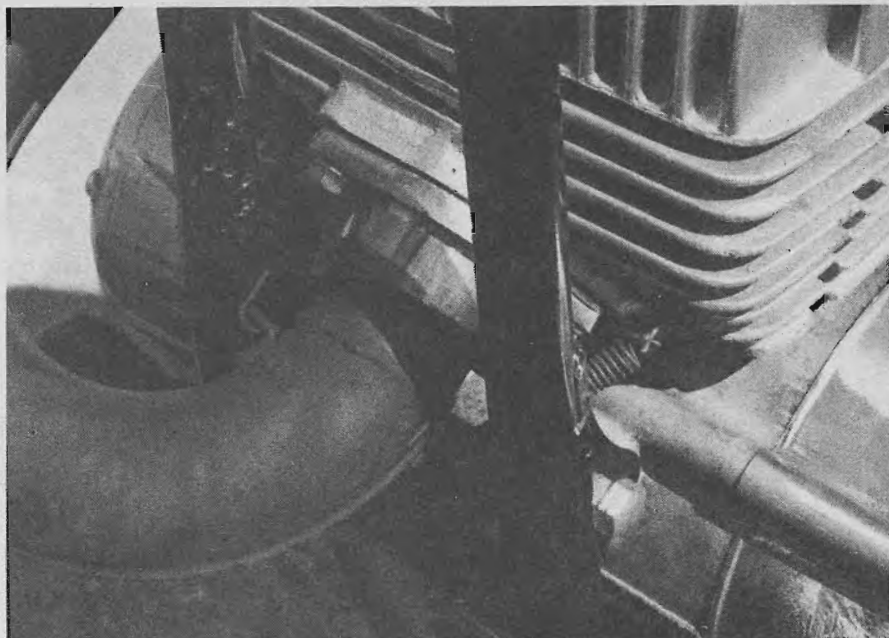
*Even though the exhaust pipe ends in a racy-looking can, it's a muffler, tuned pipe, and a spark arrestor all in one.*

*To reduce unsprung weight, the hub carries the brake only about a third of the way across the hub diameter.*





*Because of the double loop frame, it was possible for Yamaha to route the exhaust pipe between the frame rails.*



A Mikuni carburetor handles the mixing chores while the spark is provided by the standard coil and battery setup.

For appearances sake, the aluminum side cases are polished to a high luster.

Every year Yamaha seems to update their suspension slightly. The '71 versions of the Enduro line handle better than the '70 models but the 175 could still be better. At normal riding speeds off the road, everything is fine, but when the speed is upped into a more sporting pace the suspension problems come rapidly to the fore. The front forks are too softly dampened and the rear shocks seem to have no dampening at all. There are quite a few handling kits for the forks available. As for the shocks, replacing them with one of the better accessory units will cure most of the bad ride characteristics.

The frame itself works fine but if it's ever redesigned, we'd like to see the engine moved more to the rear. The engine weight now is carried at the front of the double loop frame and consequently the machine is front end heavy. This should cause little if any problems for the plonker trail rider but if any kind of a sporting speed is wanted, the rider will notice the forward weight bias.

Like all of the Yamaha Enduros, the lighting equipment is first rate. The rider will not have to worry about being caught out after dark because the headlight will clear a path, either in the dirt or on the road. Also helping the rider's peace of mind is the soft saddle. Many miles can be covered without making the rider feel he just rode the Greenhorn Enduro.

For those long rides, we'd like to see Yamaha offer a larger gas tank. The standard unit will hold just under two gallons so the man who likes to take long desert rides will need to carry some spare gas with him.

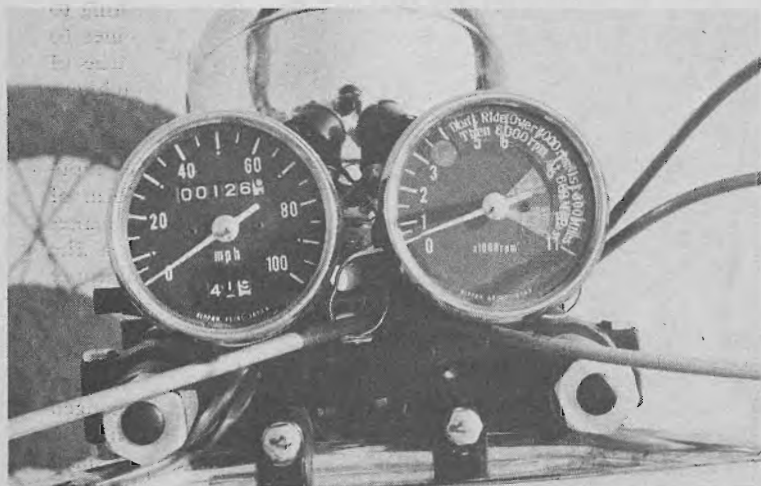
All in all, the 175 is a very nice machine. Some minor modifications would be nice but this can be said about any motorcycle. When it comes to picking a small trail bike, the 175 CT-1 is tough to overlook. For a suggested price of \$625, it's a super deal.



*With the addition of one of the fork handling kits offered by many of the accessory companies, the Yamaha forks can be made to work quite well.*



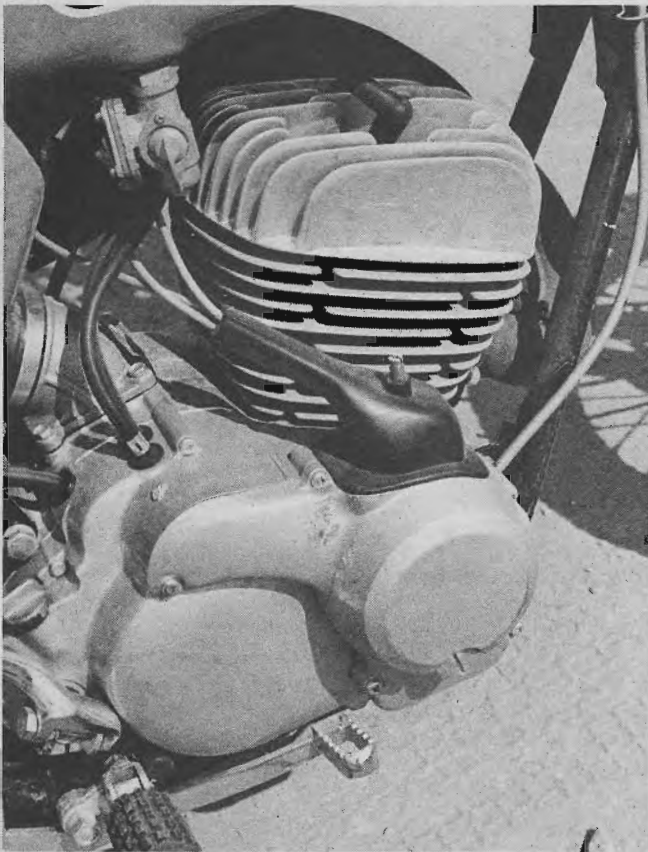
## KAWASAKI'S BEST TRAIL BIKE



Both a speedometer and tach are provided on this dual purpose street/trail motorcycle.

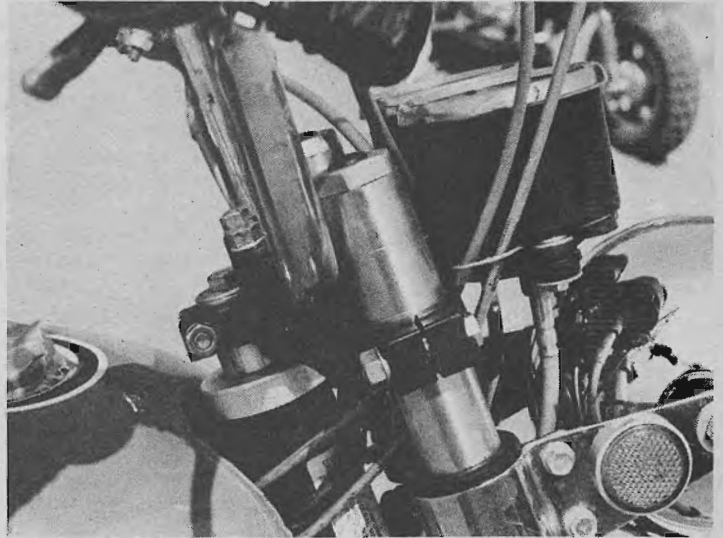


By relocating the front axle in one of three locations the rake and trail of the bike can be changed.



*The rotary valve engine puts out its horsepower over a wide, usable power band. It's a true dual purpose motorcycle.*

*Fork length can be increased or decreased by relocating where they're clamped in the fork crown and triple clamp.*



## THE BIGHORN 350

The world has come to know and respect the ability of the Japanese when it comes to the design of motorcycle engines. At the same time their machines have never been anything to write home about when it comes to handling. This was especially true of sporting or competition machines. Well, Kawasaki in general and an engineer named Mr. Hatta in particular are doing something about this reputation, and it comes in the form of Kawasaki's F5 Bighorn. What makes this machine particularly nice is the fact that it's made as a dual purpose street/off-road machine that works very well in both surroundings.

With the F5 Bighorn, if you don't like the fork geometry you can change it. Fork spring tension can be changed without changing the springs. This can be accomplished by removing a small plug at the top of the fork tube and rotating the slotted adjuster to one of three positions.

The trail or castor can also be changed to three different positions by

*A half-width hub houses the rear brake. During our test we found no signs of brake fade with this small, light unit.*



simply moving the front axle to the rear or the front of its normal location.

There is also four inches of adjustment that can be made to the length of the fork tubes in regard to the steering head by loosening the pinch bolts in the steering crowns and sliding the tubes up or down. By using this adjustment the forks can be set short and steep, for smooth fast handling, or long and shallow for rough terrain.

The rear suspension units are also very good with about four inches of travel and excellent dampening. We suspect that Mr. Hatta also had something to do with the design of these units. Aiding the excellent forks and shocks is the new double loop frame for the F5 which is rigid, well made and beautifully finished.

For the engine in their Bighorn, Kawasaki has again chosen a rotary valve design. This design is used by Kawasaki for all of their production machines with the exception of the three cylinder 500cc Mach III. The big single cylinder two-stroke has a bore of 80.5 mm and a stroke of 68 mm for a displacement of 346cc.

Kawasaki states a compression ratio of 6.8-to-1 for the Bighorn which at first glance seems rather low. This is because Kawasaki, like all other Japanese companies, use the very peculiar method of measuring the compression ratio from the time that the exhaust port closes, not when the piston is at bottom dead center. Because this is equivalent to measuring the compression ratio of a four-cycle engine when the exhaust valve closes (which is never done), the figures gained by this method are very misleading. Premium fuel must always be used in the Bighorn.

Smooth, clean carburetion is provided by a 32 mm Mikuni instrument. It was smooth and clean, at least in the low and mid ranges. Unfortunately our test machine was a bit rich on the main jet, causing a drop in performance in the higher speed ranges. The carburetor is located on the right side of the engine in a sealed compartment. Anything that gets into the carburetor must first pass through the air filter. Any fuel that collects in this chamber is expelled by means of a one-way diaphragm valve at the forward part of the crankcase.

After much success with their capacitive discharge ignition system, Kawasaki has again called upon this design to make the sparks for the Bighorn. With all of their CD systems a surface gap spark plug is used. Starting the engine is a very simple thing, one or two kicks is all that is necessary. Even though our test bike was running

a little rich we didn't have any trouble with fouled spark plugs.

As with other modern day two-cycle designs, oil is injected directly into the engine by a throttle controlled pump. This does away with the mixing of gas and oil and also makes for a cleaner running engine.

We've come to expect the alloy crankcases of a single cylinder engine to split vertically. Crankcase castings, like all of the other castings on the machine, are first class and very well machined. A one piece connecting rod with needle bearings for the small end and rollers for the big end is used with the pressed together crankshaft. The main bearings for this crankcase assembly are two large diameter ball bearings.

Port timing in the alloy cylinder is very mild, which is part of the reason the Bighorn has a wide power band. Even though the timing is mild, there is still a lot of port area. This comes from the use of the rotary valve design which permits one more transfer port than the conventional piston-port layout. The cylinder is held on by four studs that come up from the crankcases and also hold on the alloy cylinder head. There are also four additional bolts that hold the head to the cylinder. This should guarantee that there won't be any blown head gaskets in the Bighorn. The cylinder head has two spark plug holes tapped into it so a spare plug can be put into the head, or a compression release can be used in its place.

Kawasaki claims a maximum output of 33 horsepower at 6500 rpm. This isn't as much as others claim for their 350's but it's more than adequate for a genuine dual purpose machine. The power is spread over such a large range that the Bighorn is extremely easy to ride in just about any terrain — from smooth freeways to rough, rock-strewn hillsides.

Horsepower is transmitted through a gear driven primary to a clutch that looks like it is strong enough to handle a lot more power if one would care to do some super tuning.

The gearbox, which is in unit with the engine, is of the constant mesh variety and has five speeds. The robust gears and shafts run on ball and roller bearings and although we wouldn't say that it's impossible to miss a shift it was very uncommon. Smooth and positive shifts were the norm and only the very quickest of speed shifts were occasionally missed.

One very good feature, one that all motorcycles should have, is a shift lever that can be changed from side to side. The shift lever shaft on the F5 runs through the entire engine and is

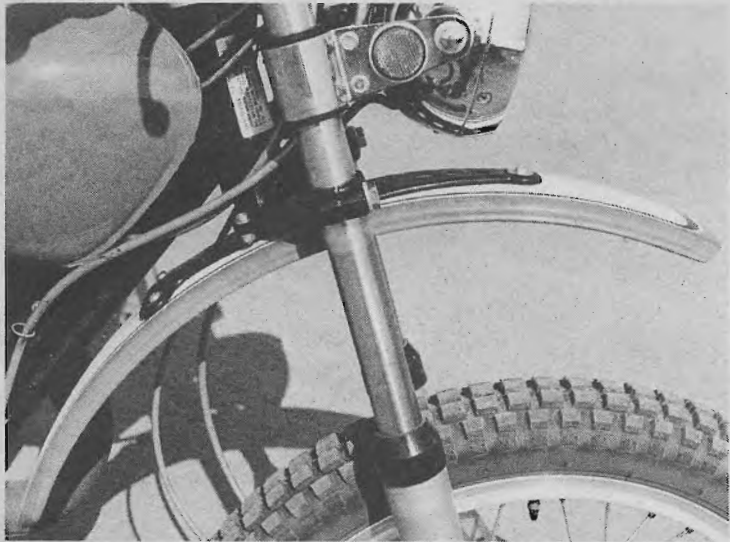
splined on both ends so the machine can be made to shift on either side. It is then a simple matter to change over the rear brake lever and cable.

The alloy brakes, both front and rear, are six inches in diameter and have cast-in iron liners. They were powerful enough for street use but not grabby in the dirt. Laced to these brakes are alloy rims, a feature rarely found on street/scramblers. These wheel rims are shod with trials tires, a 3.00 x 21 up front and a 4.00 x 18 rear.

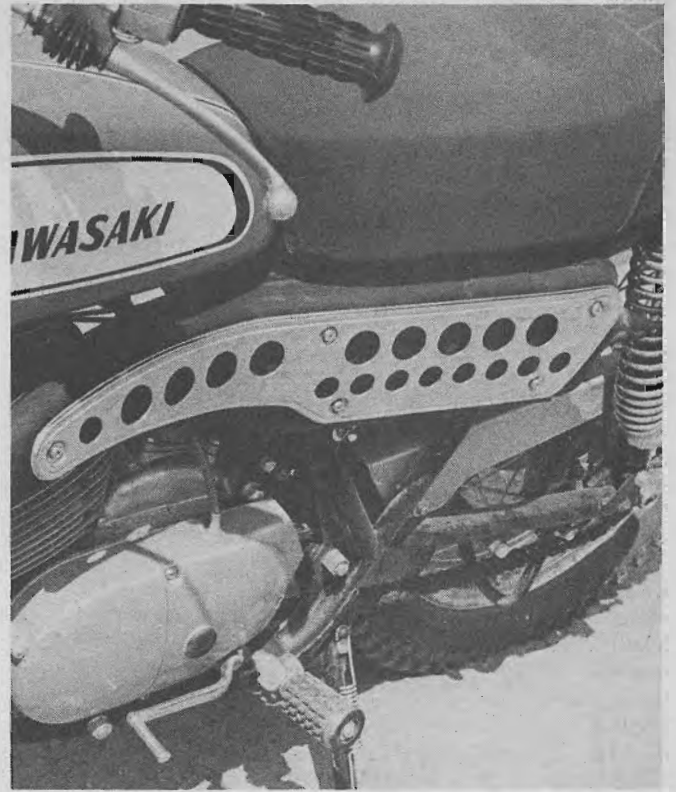
Both front and rear fenders are alloy, and both are mounted up high for maximum clearance. They're painted to match the rest of the machine in a light brown and white, trimmed in black. The frame is also black.

The F5 Bighorn is a well designed, well made machine that will satisfy most anyone, whether he be an expert or a newcomer to motorcycles. We firmly hope that this is a sample of the type of machine we can expect from other Japanese companies in the future; if this is the case, life will be much more pleasant for us.

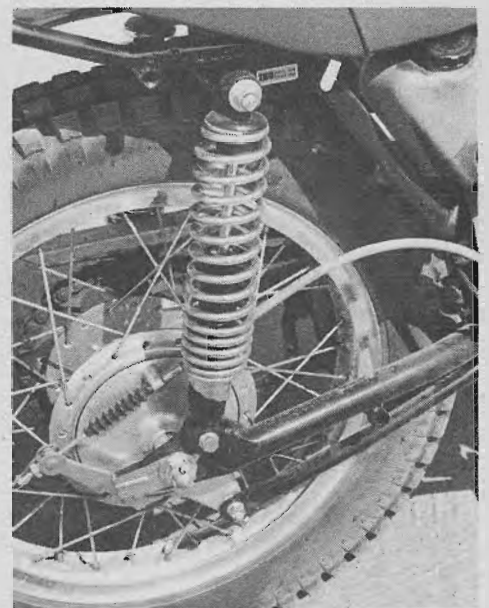




*In true moto-cross fashion the fender is mounted clear of the tire.*



*The muffler is concealed in this expansion chamber-looking device that has an outstanding heat shield.*



*Five way adjustable shocks are provided and to our surprise they worked fairly well.*

*Kawasaki's Bighorn is probably the best dual purpose machine on the market today.*



# YAMAHA

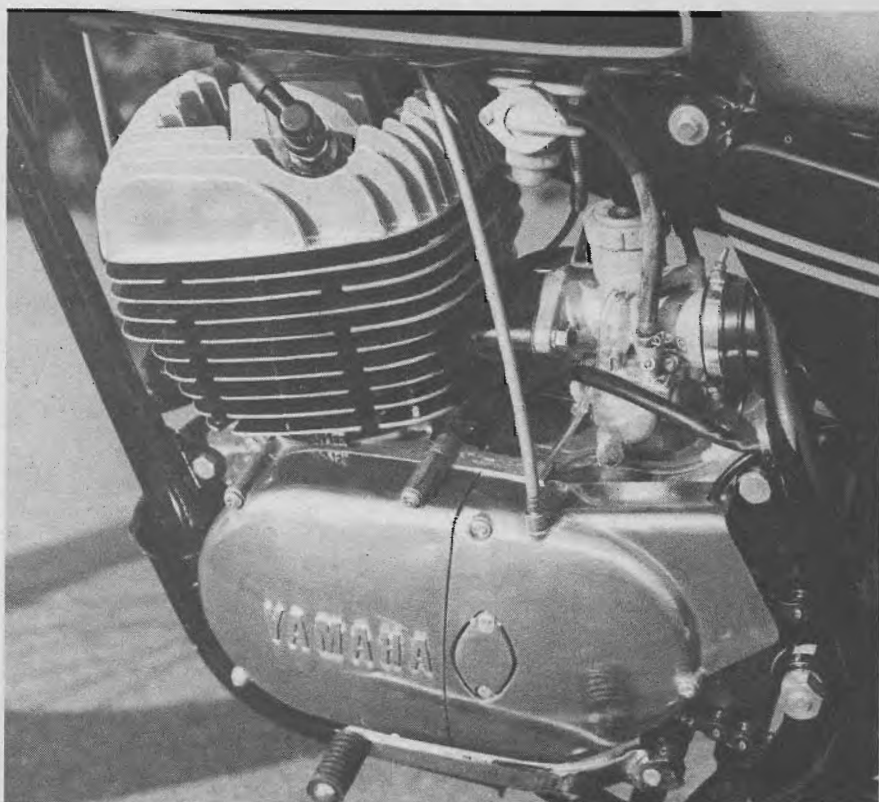
YAMAHA'S BIGGEST TRAILBIKE

## RT-1B

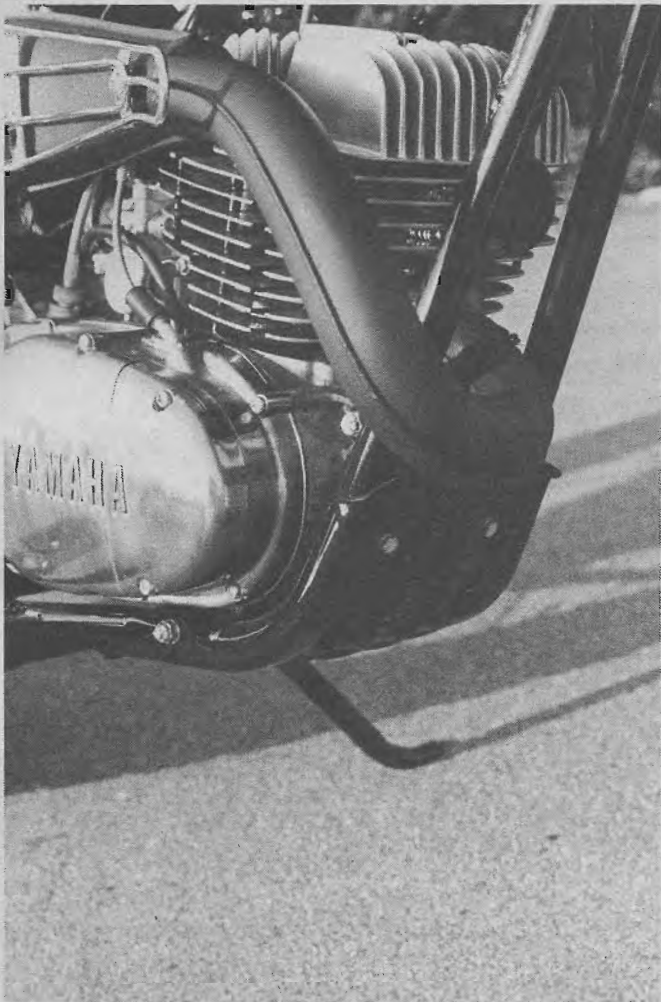
With the success that Yamaha had with their DT-1 it came as no surprise to anyone when they introduced a 360cc version of the same machine. Yamaha, one of the more progressive of the Japanese companies, was never one to let the grass grow under their feet when they knew they were onto something big, witness this by the fact you can now buy one of their Enduro models in 90, 125, 175, 250, and the aforementioned 360cc, the subject of our test.

When the bike was delivered to our door the first thing we noticed was that it looked right — it looked like what you'd think a racing machine should be if you were going to design one and add lights.

After firing it up and running it around the block the second thing we noticed was that it has a lot of power for a street machine. We'd go so far as to say that when it comes to making engines that are reliable, plus putting out power, Yamaha has few peers.



*The head has two locations for spark plugs. This way you can screw in a second one and if the first fouls just change the plug lead to the second.*



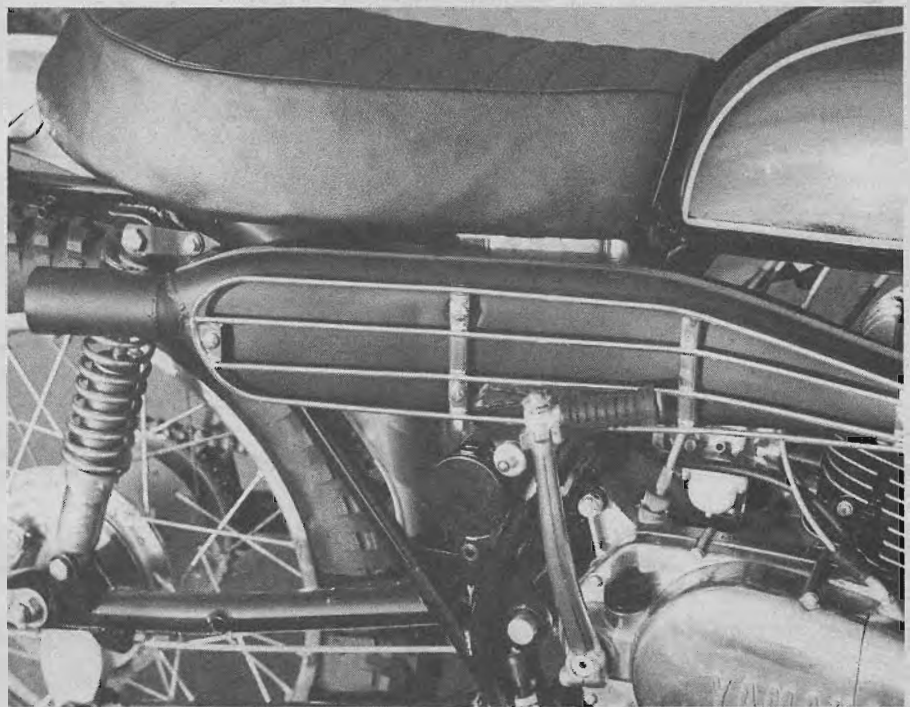
*A double loop frame cradles the big single. For off road riding the skid plate should come out farther to protect the side covers.*

*Turn indicators are nice but they have no place on a dirt bike. The first time the bike falls over the rear lights probably will be broken off.*

The heart of the 360 is a single cylinder port timed two-stroke with a claimed 30 horsepower at 6000 rpm. Definitely oversquare with a bore and stroke of 80 by 70 mm, a maximum of 26 ft/lbs of torque is developed at 5500 rpm. Like all the street Yamahas Autolube is used to lubricate the engine.

Coupled to the mill is a five speed transmission which now seems to be standard on any of the machines from Japan. Yamaha's works well and in the past has been one of the trouble-free units going; we see no reason why this smooth shifting gearbox should be any different. Once the machine was moving we found there was no need to use the clutch for either up or down shifting. The wet, multi plate clutch seemed to enjoy this rough treatment because it never showed any signs of wanting to slip.

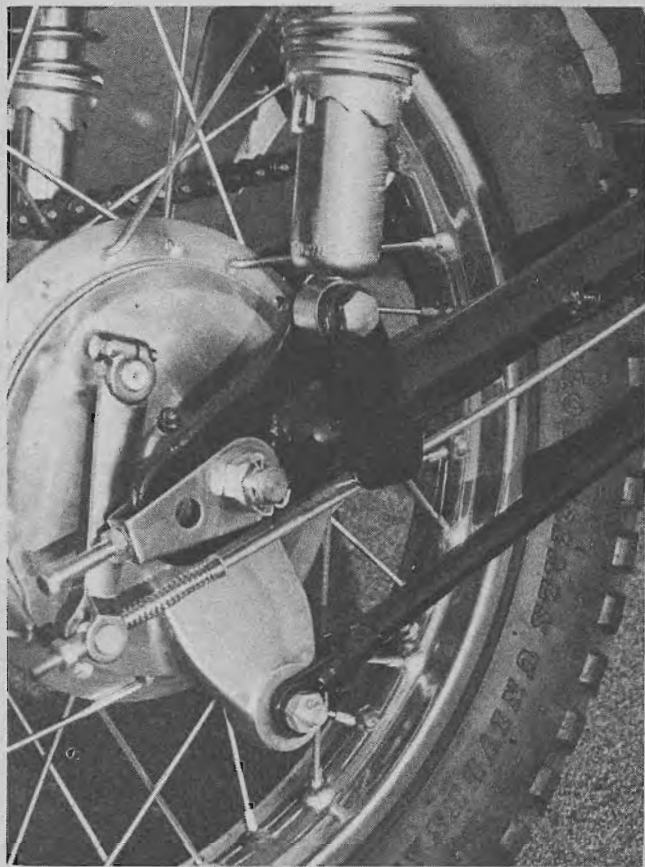
Riding on the street, if it's wet or covered with a light film of dust, can be a bit touchy because the machine comes equipped with trials tires, a 3.25 by 19 at front, and a 4.00 by 18 at the rear. However, when the bike is



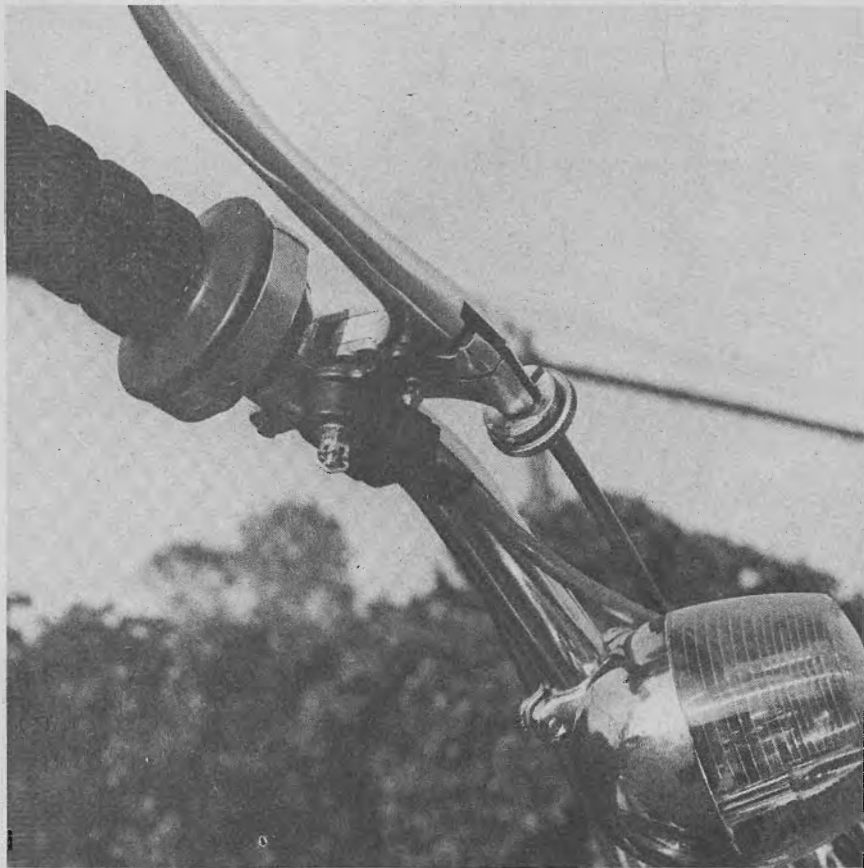
*Racy looking, the muffler incorporates a forestry approved spark arrestor.*



*The forks are better than they've been in the past but for serious off road riding the dampening rates must be changed.*



*A full floating rear backing plate is used. This helps to keep wheel hop down under hard braking.*



*To comply with the new Federal law Yamaha now uses a brake light switch on the front brake lever.*

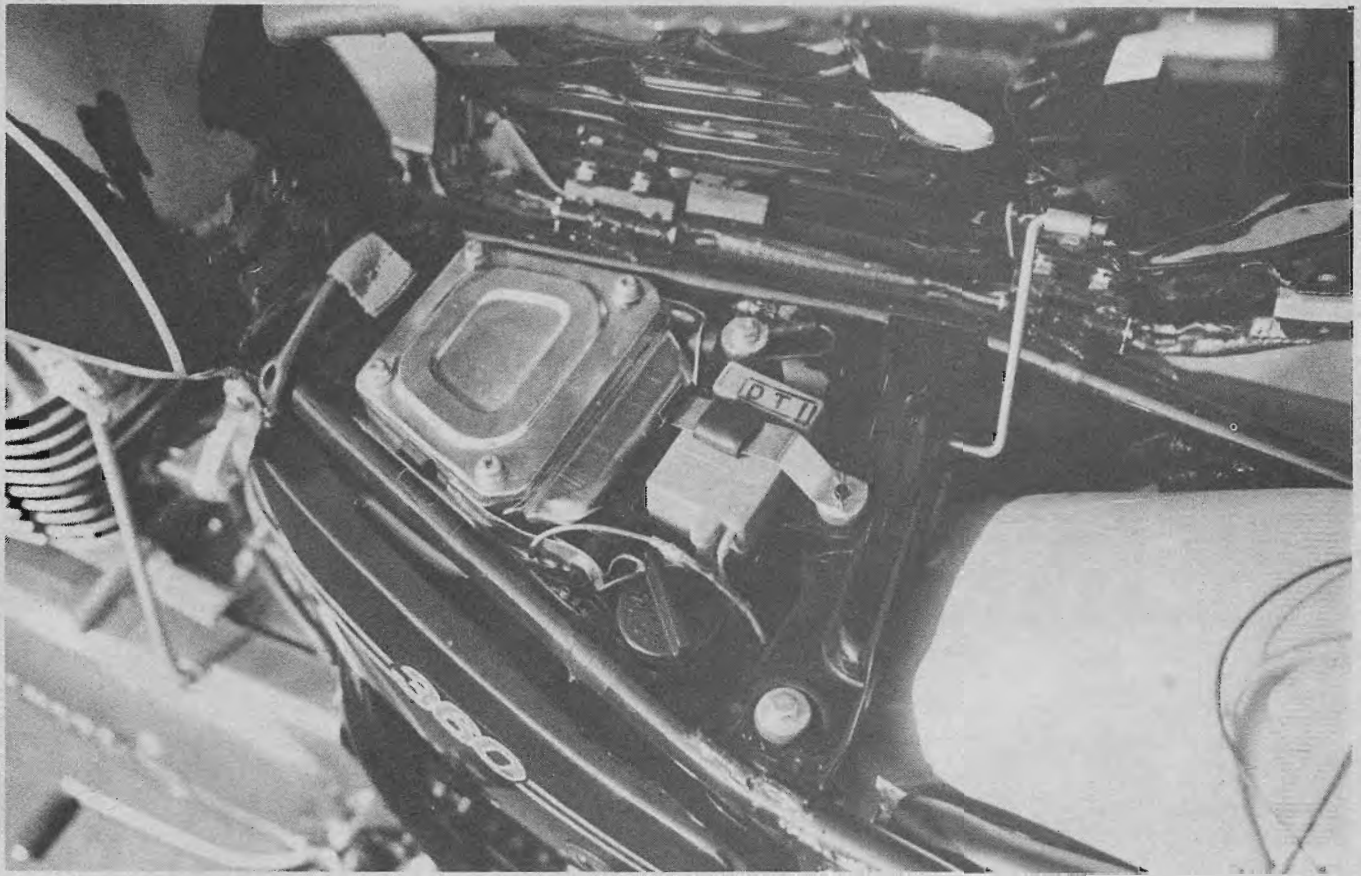
taken off the road you'll be glad they're there. In fact if the off road riding is serious we suggest you change to all-out knobbies at both ends.

Handling in the dirt is good, but don't make the mistake of believing that the RT-1B is a racing bike because it's not. To make the machine really handle some minor suspension mods are called for. The springing at both ends is a bit stiff and the dampening is a bit lacking. Many of the accessory companies have now come out with handling kits for the forks and they benefit greatly from their use. As to the shocks we suggest you invest your money in either Girlings or Konis — they make all the difference in the world.

The frame itself seemed to work alright. During the period of time we had the Enduro it was ridden hard on both the pavement and dirt and at no time did we find the frame flexing. As to breakage, we don't think that will ever be a problem, there's enough welding at each junction point to hold the Queen Mary together.

One thing we liked about the frame was that it allowed ten inches of ground clearance. Too many of the so-called street scramblers have so little clearance that you're in real trouble if you take the bike off the smooth ground.

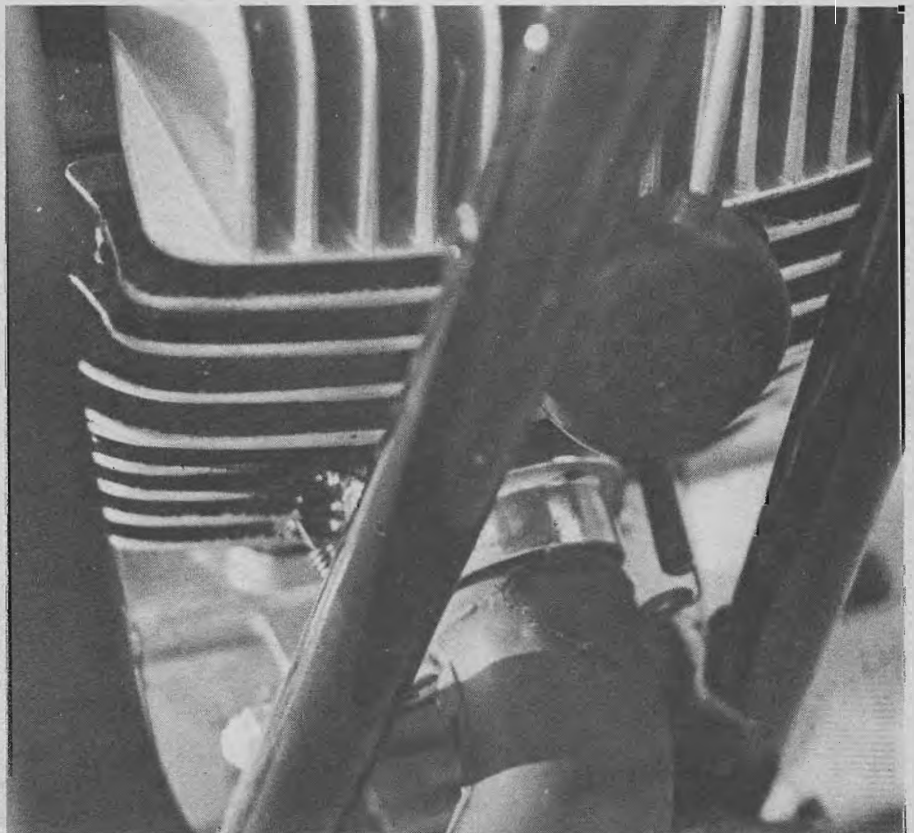




*Under the seat is the air cleaner, filler for the oil tank, and the battery, the same one that's used in the 250 Enduro.*

We would like to see more padding in the seat. Stock, it's fine for normal riding on the pavement but after just a short period of time in the dirt we wished either it or our various staffers were better padded against the ruts and gullies we rode over. The bike comes without buddy pegs even though there is a location on the swinging arm for them. However, the seat is strictly a one man show for any but the shortest, like around the block, trips.

What the RT-1B is meant for is a fun motorcycle for a lone rider. It's a bike that is equally at home on or off the road. With stock gearing the bike will cruise at 70 mph all day, even though with a smallish two and a half gallon gas tank the range isn't much over 60 miles at that speed. The engine produces enough torque that the bike can climb any but the steepest hills in the dirt without a gearing change. And the best part is that if and when the owner decides he wants to get serious about off road riding he can buy the parts necessary to increase the power by over 20 per cent. That, and a few suspension modifications and the bike is a strong contender in any type of dirt racing. Since the initial cost of the Enduro is under 1,000 dollars it's a good bet for the man who wants to have his cake and eat it too.



*On the front of the cylinder, and controlled by a lever on the left handlebar, is a compression release that is used only to help start the large displacement single.*

# BASIC FORK SERVICING

THE KEY TO BETTER OFF-ROAD RIDING

Trail riding can be a very enjoyable way to spend some time, or it can be reduced to hard, dangerous, work. A lot depends on how well the bike is set up.

Front forks can be a problem because some machines just don't have forks that are adequate for rough terrain. In that case it will be necessary to replace them with an accessory fork such as the Ceriani, a fork from another brand, or possibly one from a different model of the same brand.

Any one of these alternatives can be expensive so before a switch is made it would be wise to make sure it's necessary. With a bit of "tuning" some forks that are thought to be inadequate can be made to work very well. It could be that they are worn or that they aren't properly set up.

The best way to check for worn forks is to disassemble the units and clean and inspect all parts. In some cases replacing the bushings and/or fork leg seals will solve the problem.

If all the parts are in good shape then maybe all the forks need is a careful servicing. Always start with the amount and grade of oil that the factory recommends for your particular machine before experimenting with different grades of oil.



1. Remove the large plugs at the top of the fork legs. This will permit the oil to flow free when the drain plugs are removed.



2. Remove the oil drain plug at the bottom of the fork slider.



3. In order to get all the oil out, it will be easier if you hold the front brake on and push on the handlebars. This action will pump out the oil.



4. Carefully measure the specified amount of the proper grade of oil. An ordinary baby bottle can be used for this purpose.

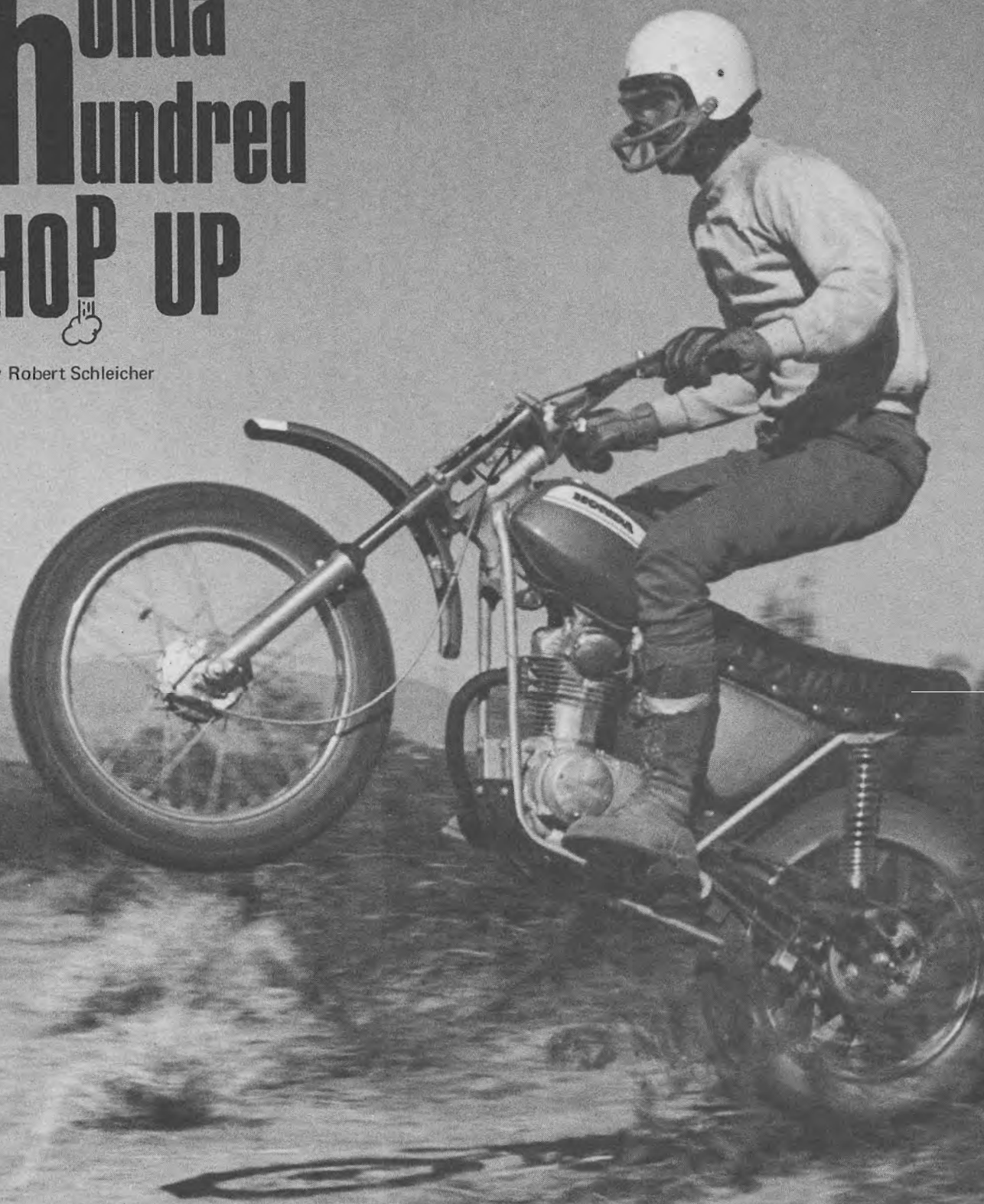


5. Pour the oil into the top of the fork leg and replace the plug. Repeat these steps on the other leg and the job is done.

MORE POWER LURKS INSIDE HONDA'S  
ELEVEN-GRAND MINI-RACER; THE SL-100.

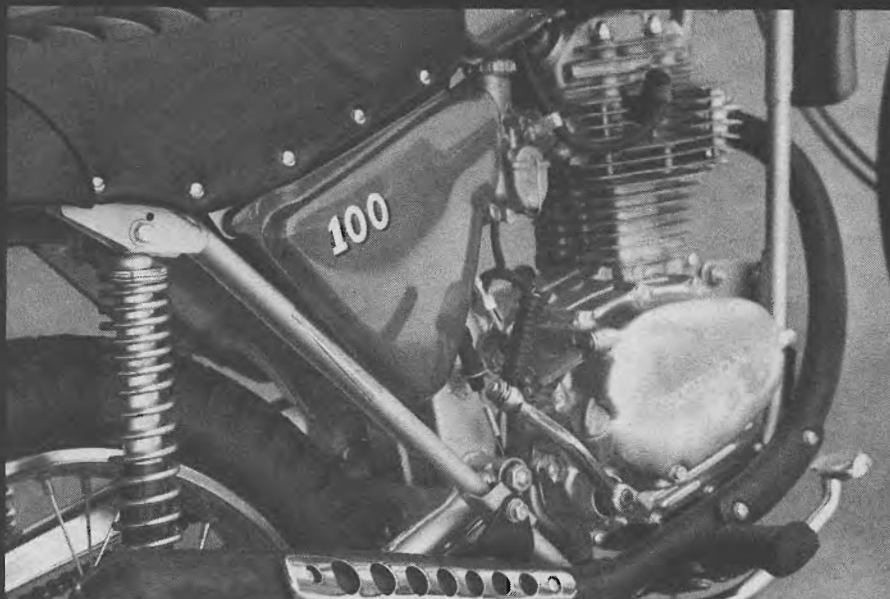
# honda hundred HOP UP

By Robert Schleicher



The best off-road machine yet from giant Honda has to be the new-for-seventy model SL-100. Many motocross racers have found themselves staring at the knobby of nearly box-stock versions of the 100cc displacement trailbike. Now, there are ways to extract even more power than the factory's 11.5 horsepower and higher reliable revs than the 11,000 of the showroom cycles. Webco's valve springs and Harman & Collins' camshaft for the Honda hundred are available through most dealers. We'd love to tell you that there're triple-sized valves in the offing, but truth is, Honda has filled their head so full that you'd have to do away with the spark plug to fit anything bigger. The cam and springs, coupled with some care in shaping and polishing the ports, will give you enough of an edge to keep up with the quickest of those pesky two-strokes.

The owner's manual supplied with the SL-100 should provide all the data you need to pull the coffee can-sized

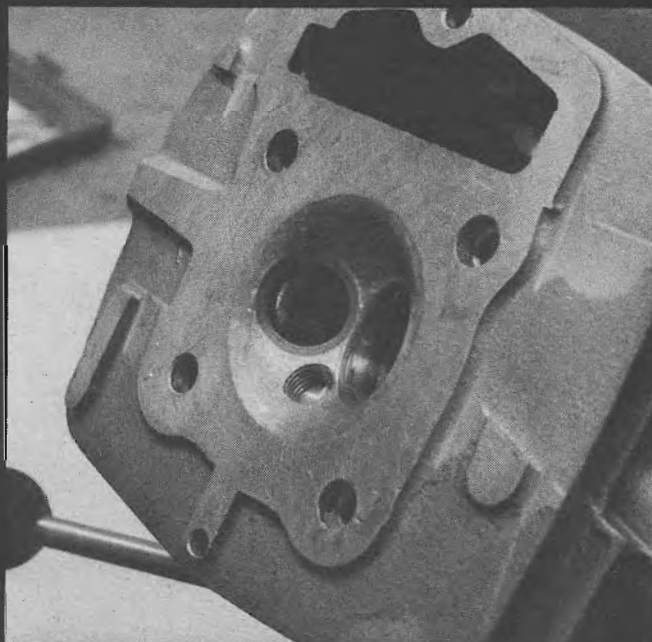


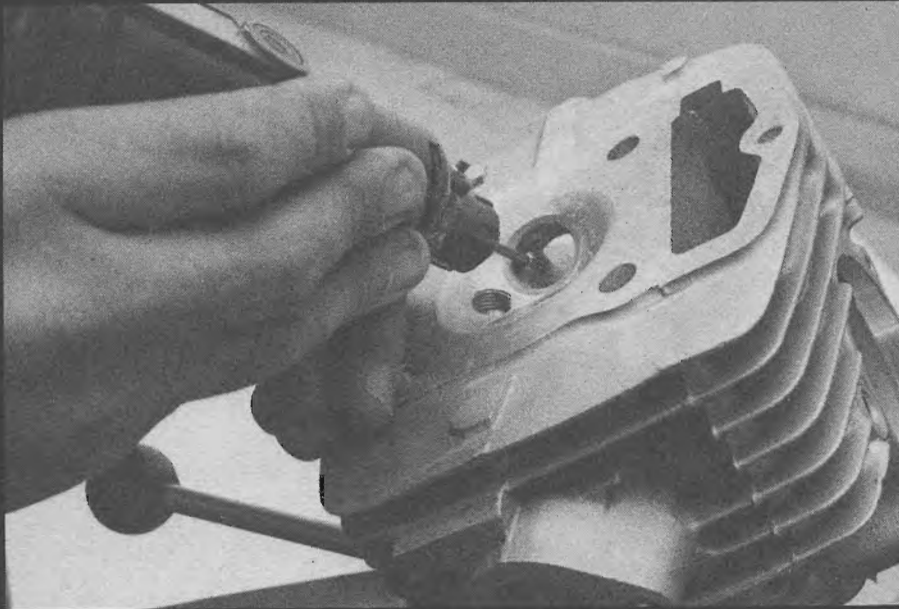
1. Honda's number one entry in the trailbike-class off-road market; the SL-100. Slightly-modified versions of this same machine have proven themselves to be capable of keeping up with the best of the two-strokes.

2. Honda's factory manual will give you all the information you need to pull the cylinder head. Clean away all carbon and grease and clamp it down for proper polishing and cleaning. We used Webco's head holder.



3. There is very little you can do to improve either the shape or size of the superbly engineered ports on the SL-100. About 1/32 of an inch can be removed just inside each seat to form a pocket.



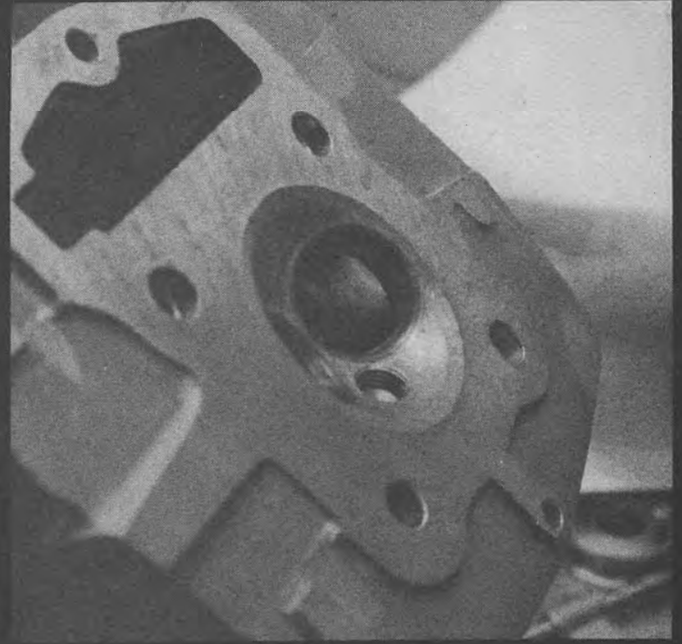
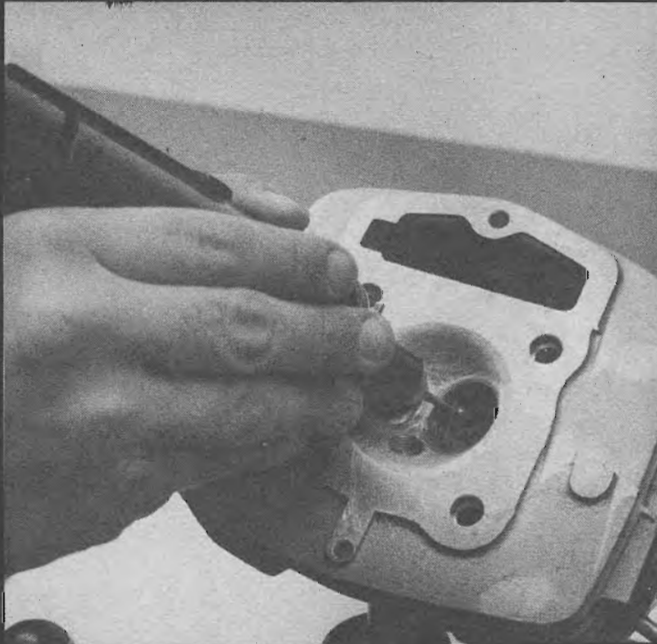


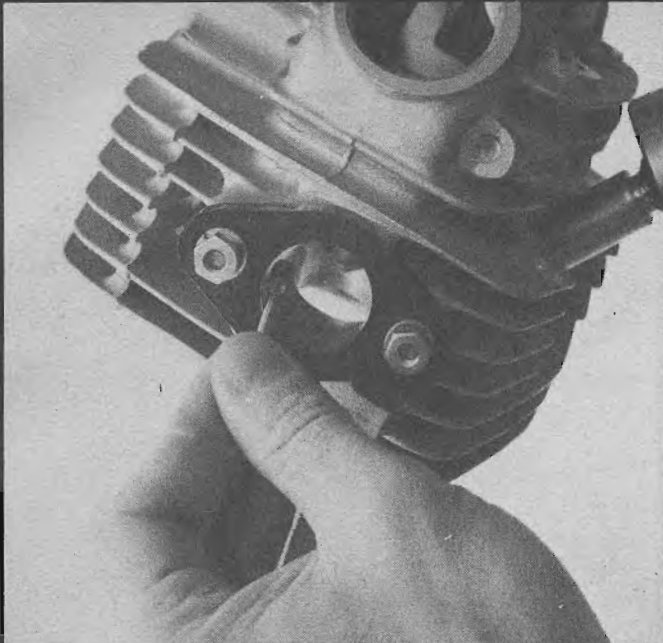
4. A high speed grinder and rotary file bit will be needed to rework the ports. Added "pocket" area around the port side of both valve seats gives the gases someplace to expand in, as they enter and exit.

cylinder head from the Honda. The entire engine and other working parts should be thoroughly cleaned and dried, just like any other machine, before disassembly. The relatively small size and light weight of the Honda hundred's parts makes them a joy rather than a job to work with. With the head in your lap, so to speak, clean out any and all accumulated carbon and traces of ancient gaskets. A high speed grinder and a medium-grit grinding bit will be enough to smooth out the shape of the ports; there are a couple of lumps across the top of both ports — leave them there if you want full power. The best thing you can do is to exactly match the shape and size of the intake port to the intake manifold and the exhaust port to the exhaust pipe. A belt of material, about 1/32 of an inch thick can be removed from the port just inside the edges of the valve seats to give the incoming and exiting gases some area to expand into. Polish out the ports with fine emery cloth and clean the head again

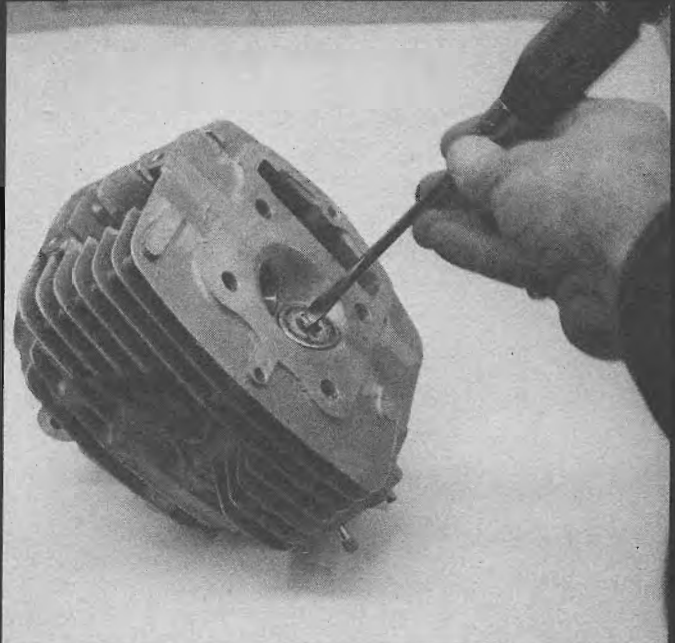
5. Any reshaping of intake and exhaust ports must be done with long tapers and radii into the enlarged area. Be careful to keep grinding bits and files away from the valve seat area.

6. Small lumps are built into both the intake and exhaust ports of the Honda — leave them there; removal will cost you at least one horsepower. Polish ports with fine emery cloth dipped in light oil.

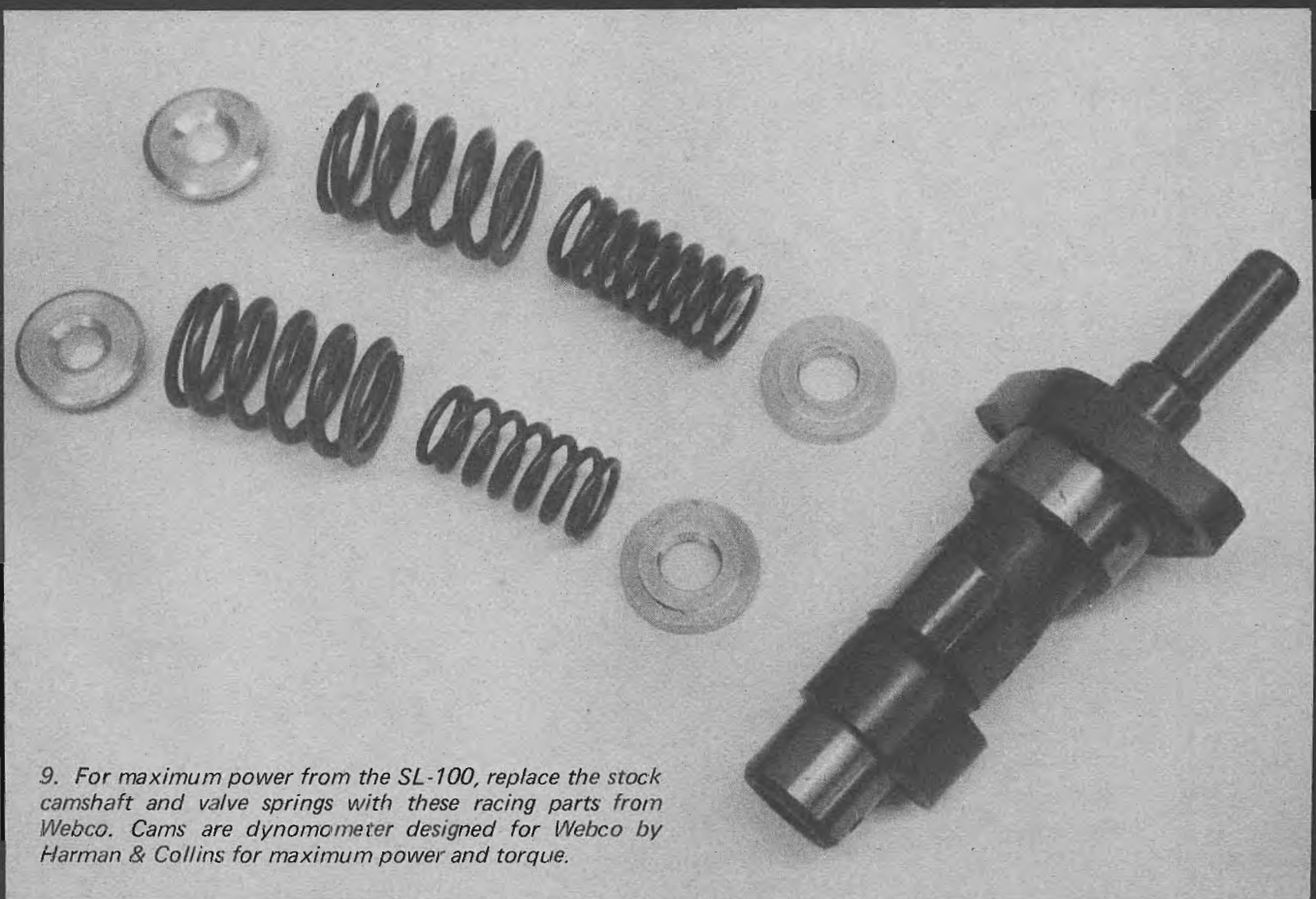




7. The intake manifold and exhaust pipe should be matched to their respective ports so there is no ridge on either port or manifold/pipe side. Temporarily assemble parts and check inner surfaces by touch.

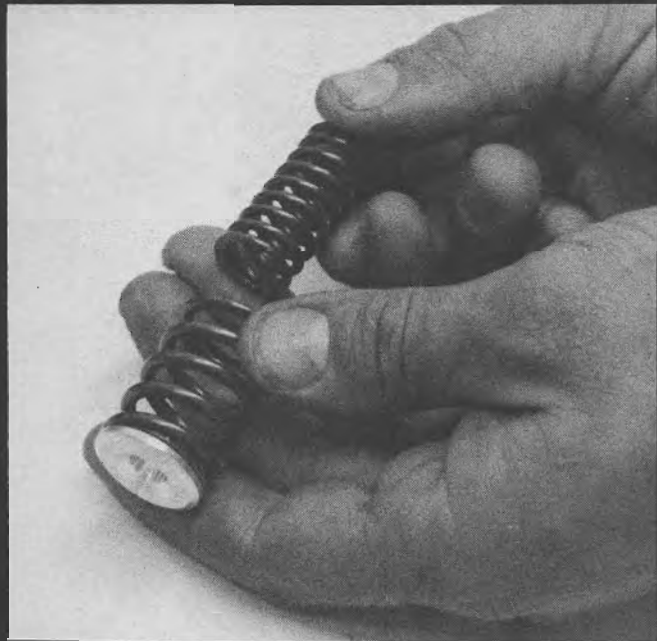


8. The valves must be carefully cleaned and their seats checked for pitting. Both valve and seat can be ground to match by most Honda dealers. Valve and valve seat should then be lapped in with valve grinding paste.

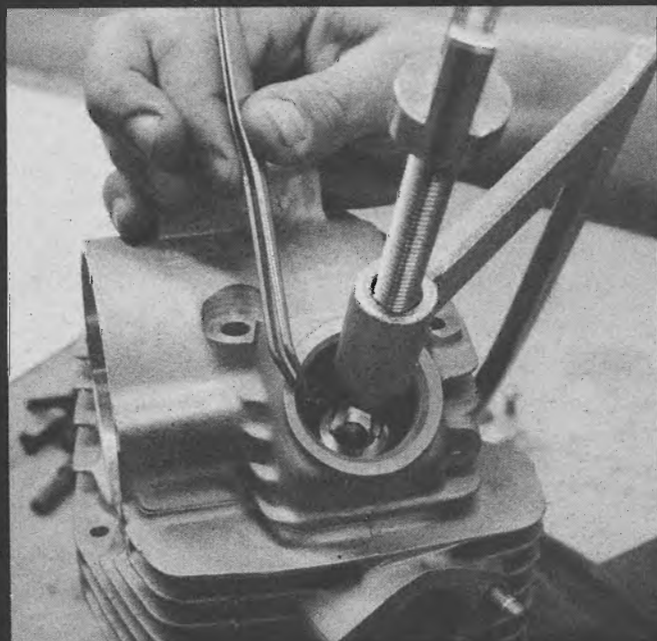
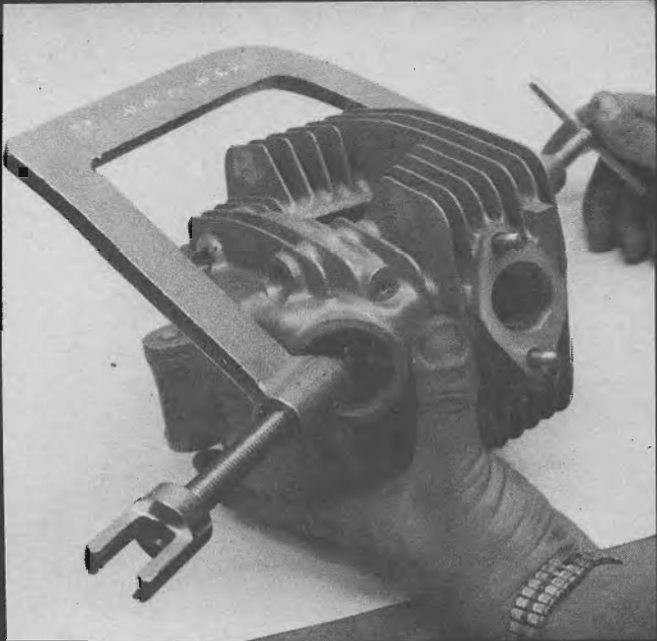


9. For maximum power from the SL-100, replace the stock camshaft and valve springs with these racing parts from Webco. Cams are dynamometer designed for Webco by Harman & Collins for maximum power and torque.

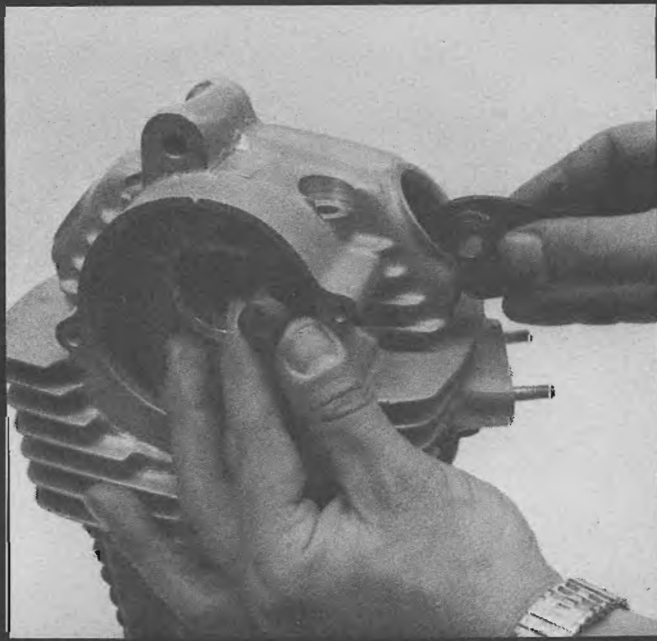
10. Webco's valve springs and their collar assemble as a snap-in unit prior to inserting in the head. All springs are pre-matched for even tension.



11. Rent or buy a valve spring compressor to assemble valves and valve springs — there just isn't any other way with the tight head clearance of the Honda 'hundred.' Insert valve, spring, then compressor.



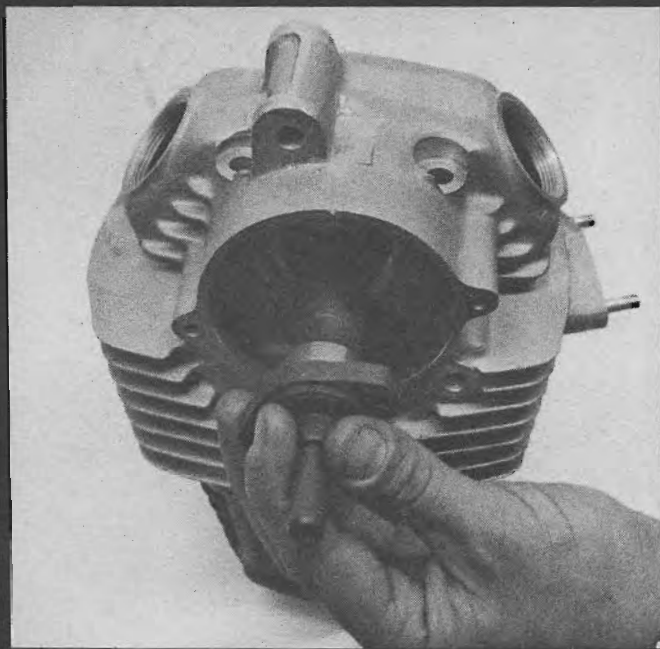
12. Tweezers will help to position the stock Honda valve retainers after the valves are compressed.



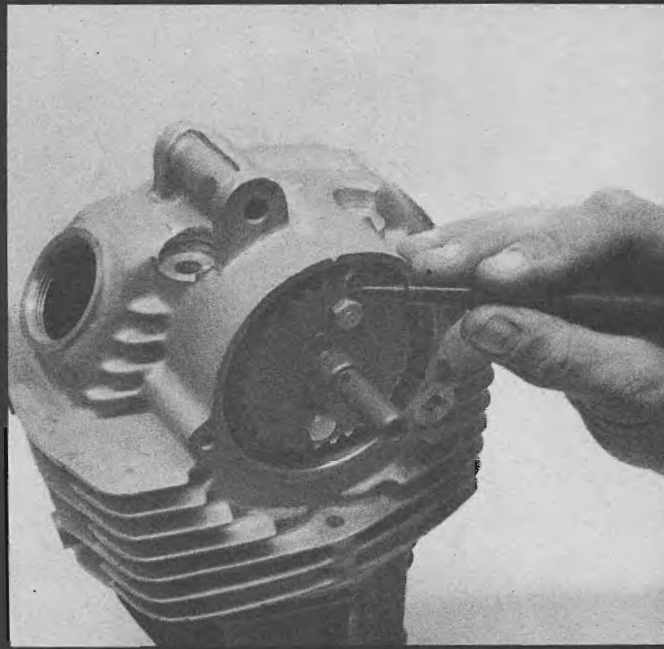
13. Check the contact surfaces of the rocker arms. Polish if necessary, and assemble rocker arm (right) and rocker arm shaft. Lubricate surfaces.



14. Harman & Collins cam fits the same mounts as the stock Honda cam. Blow out the oil passages to be sure they're clear and lube bearings.



15. Small dots or marks on the head (just above the camshaft sprocket), on the sprocket, and on the camshaft are lined up with engine at precise top dead center to assemble chain for correct valve/cam timing.



16. Valve clearance is adjusted with valves, springs, and rockers assembled inside the head, however, the clearances are so tight you can barely see what you're doing, let alone photograph the process. Feeler gauge is inserted between contact face of rocker and valve stem end. Screw and lock nut on rocker are then turned to allow feeler gauge to just slip between rocker arm and valve stem with valve fully closed. The SL-100 owners manual gives clearances for the valves when using the stock cam; camshaft instruction sheets give settings for replacement cams like Harman & Collins.

in solvent. Oh yes, be sure to check the camshaft bearings before doing any work on this Honda's head. The cam rides in plain aluminum and this is usually just great; however, if the bearings are worn, a new head is usually the cheapest way out . . .

There are no particularly unusual tricks to assembling the valves and springs other than, perhaps, reaching down into those valve spring caves to check and adjust valve clearance. Just be sure to blow out the oil holes in the camshaft and to pre-lube the camshaft bearings with a quality grease. The camshaft timing is close enough for most riders if it is simply assembled to accurately match the marks stamped into the cam's retainer plate, the top of the cam cover opening, the mark on the drive gear, and the engine rotated so the piston is at exact top dead center. If you do fit the Webeo valve springs and Harman & Collins cam, you'll likely need one size larger main jet and to raise the carburetor needle a notch.





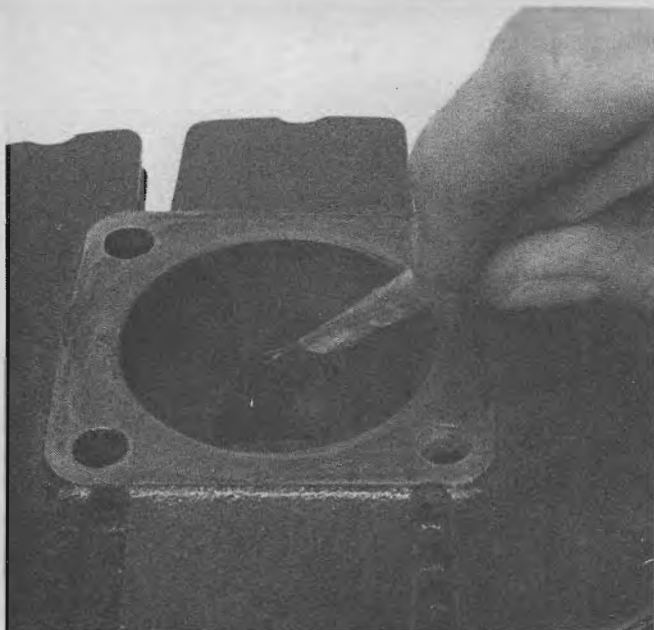
THE LOW COST PATH  
TO MORE POWER FOR  
YOUR TWO-STROKE

# Basics of Hi-Performance Porting

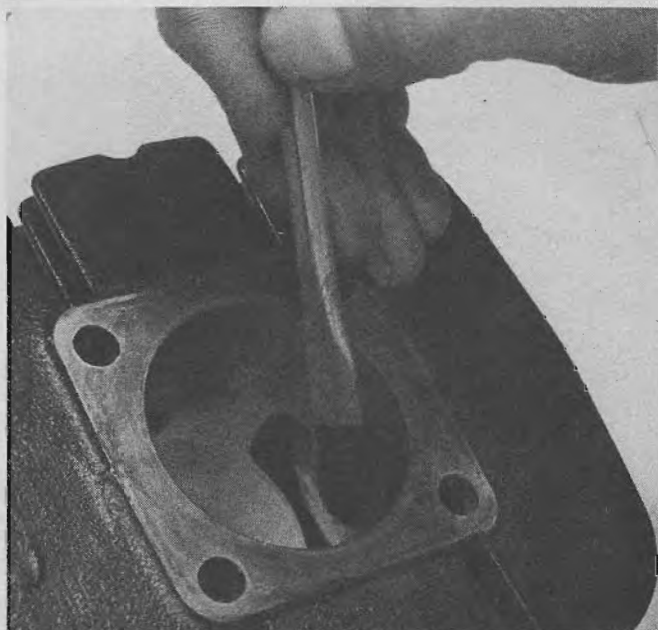
By Robert Schleicher

“Two-stroke”; sounds simple; is simple . . . The term used to describe the design of the most popular motorcycle engine is accurate. There isn’t any way to build an internal combustion engine with fewer moving parts. Count ’em; the piston, connecting rod, and crankshaft. Three parts plus the various bearings and seals. Some of the two-stroke designs have what is dubbed a “rotary valve” but this is nothing more than a “c”-shaped disc on the outside of one end of the crankshaft. Since it rotates with the crankshaft it can’t even be properly called a fourth moving part. The four-stroke engine adds a camshaft, at least two pairs of valves, valve springs, rocker arms, pushrods, and tappets to that list of moving parts. If you’re trying to get more power from your engine the number of parts you must replace on a four-stroke *can* include every one of these moving parts except the crankshaft and connecting rod. The only part you usually need to replace, when boosting the power of a two-stroke engine, is the piston — merely moving the shape of the ports around inside the barrel of the two-stroke will accomplish the same thing as a complete valve train replacement on a four-stroke.

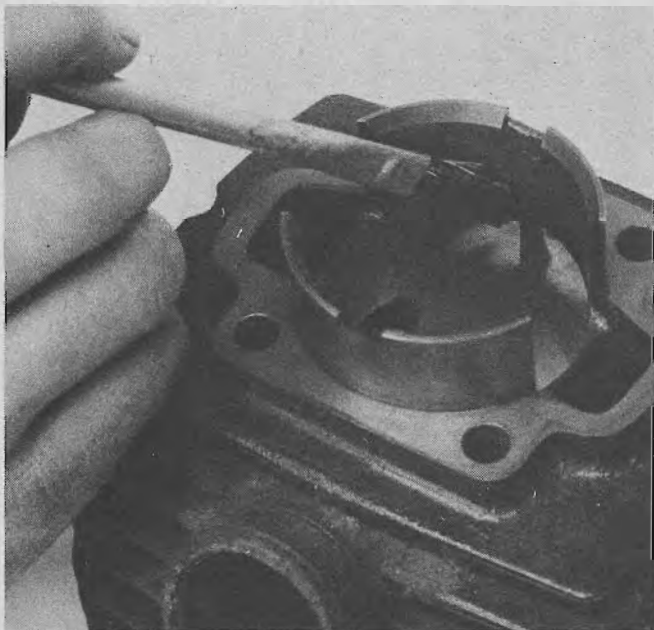
Those holes (called ports) inside the walls of any two-stroke engine’s cylinder barrel control the entry and exit of the combustion gasses. The piston’s bottom skirt and crown act as the timing device to open and close the ports as the piston rises and falls through its normal operating cycle. With only the cylinder barrel and the piston effecting the engine’s operation it should be obvious enough that the shape and location of those ports is super-critical to performance of any kind. If you hack away at your engine’s ports without some experience or prior knowledge, you stand about an even chance of reducing its power rather than increasing it. If you have one of the racing versions of your brand; like the Hodaka “Super Rat,” Yamaha AT-1MX or DT-1MX, Kawasaki, Jr. Green Streak, or the “speed” parts from these engines, leave the cylinder ports to the experts. The advise we offer here is strictly limited to the “street” or production engines supplied as standard in most motorcycles. If you’ve any doubts about whether your machine is “mild” enough to stand a bit of port enlarging



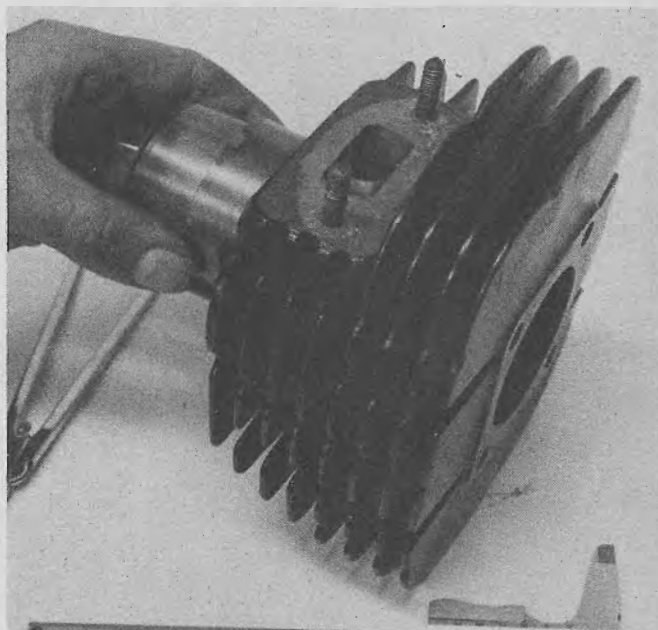
1. Follow your machine's instruction manual to remove the cylinder barrel. There's only about twenty-minutes worth of work for most machines. Coat inside of barrel, above transfer ports, with "Dykem."



2. Coat the area above the top of the exhaust port with "Dykem" or a similar machinist's bluing/marking dye to ease reshaping location marks.



3. The area below the intake port is coated with "Dykem." The dye blues the surface of the bore so scribe marks for new port size will show.

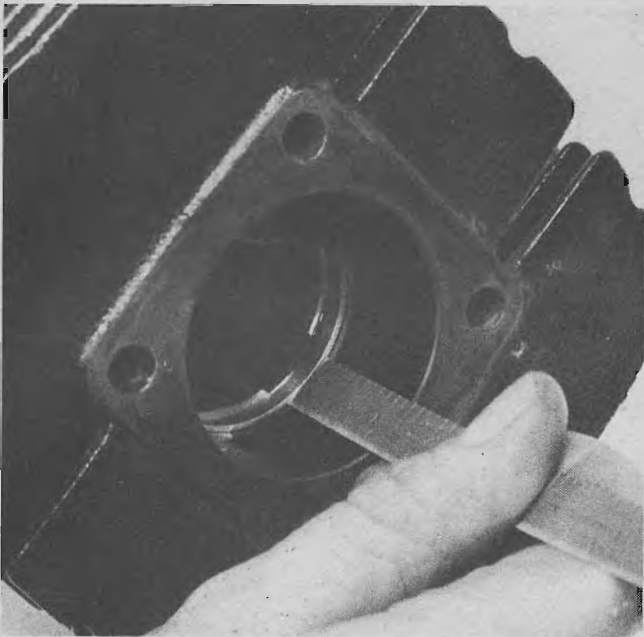


4. Slip the rings off the piston and use the piston as a guide to keep scribe marks for port size-increase parallel with piston's skirt and crown.

ask your dealer or someone who races a similar mount.

This judicious juggling of port position and shape can easily boost your power by ten per cent if you're willing to experiment with the carburetor and spark plug settings to take advantage of the increased gas flow potential in and out of the engine. There's no

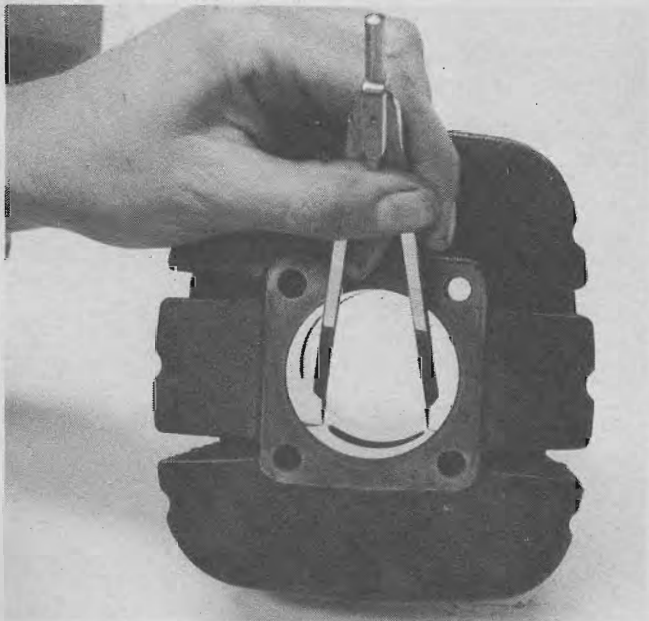
difference between tuning a "ported" engine and a stock one. We won't cover it here in any depth, but basically it involves running the engine to coat the spark plug, pulling the spark plug to check its color, then adjusting the carburetor's setting and/or jet sizes so the engine will run properly as shown by the chocolate brown color



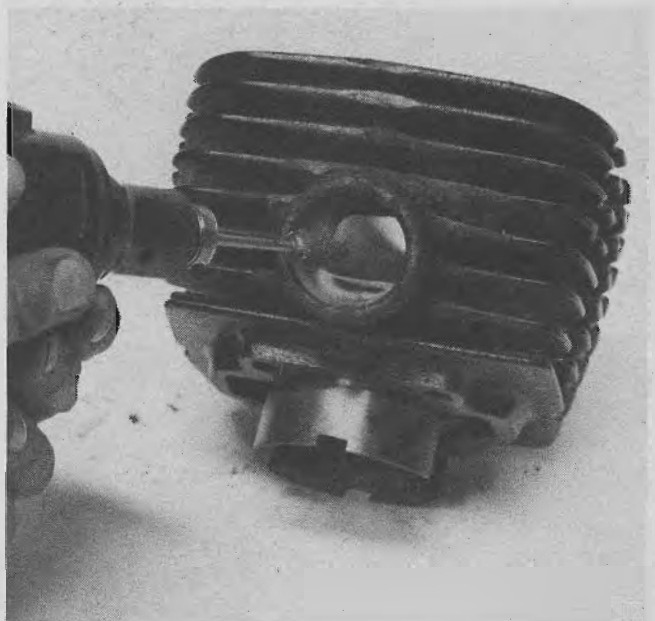
5. A ruler marked in hundredths of an inch is best for measuring port locations. Follow the motorcycle manufacturer's porting diagrams or the .090/.045/.030 inch enlargement series listed in this text.



6. Use a machinist's scribing tool or an icepick-like pointer to scribe the lines that indicate the maximum size of the yet-to-be-enlarged ports.



7. Draftsman's dividers are best for determining the location lines of any width increases in port size. Maximum is usually about 1/16 of an inch per side for exhaust ports, .030 for transfers, and .050 for the intakes.

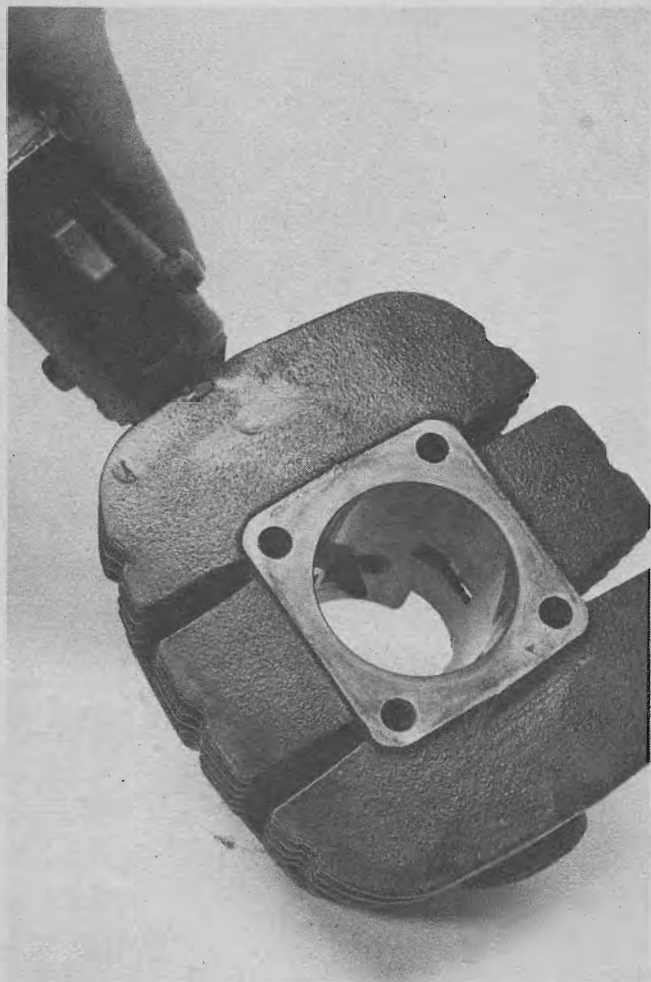


8. High speed grinder is an absolute must — buy one like this Dremel tool or rent one. A medium grit grinding bit is fine for slight smoothing or final finishing. Use carbide-tipped rotary file bits for enlarging.

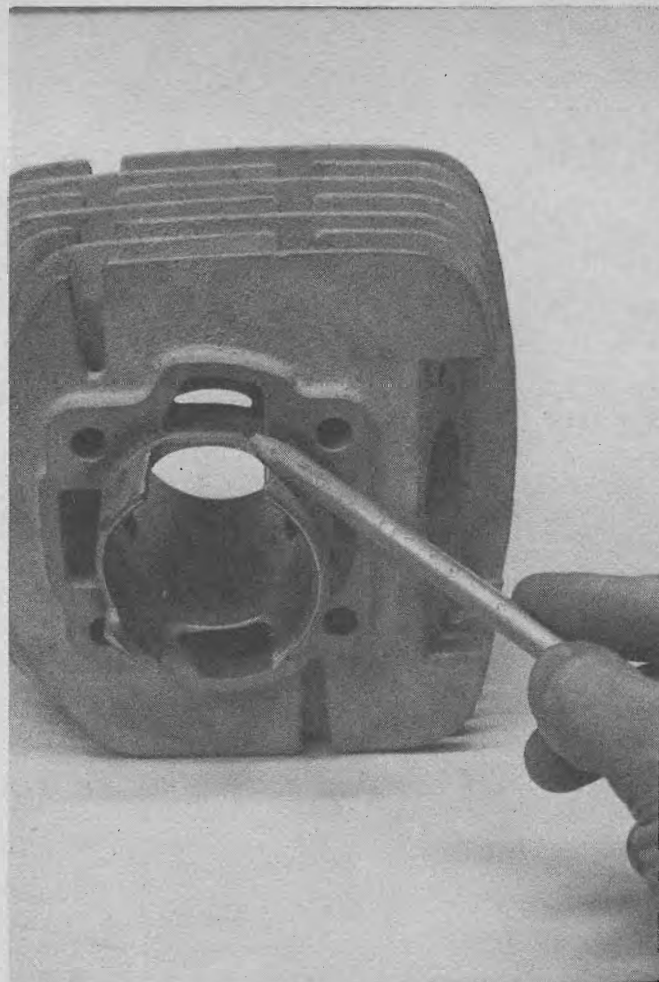
at the spark end of the plug. Learn how to tune your stock engine to perfection before you even consider enlarging or reshaping its ports. There is no way we can say it often enough; learn to tune before you try to hop up any engine. It's silly to try to add more power through modifications when you aren't getting the full power

the engine offers in dead stock tune and, further, you won't know how to take full advantage of any hop up changes like porting if you can't get the engine to run its best.

Port reshaping is best done with a high speed grinder equipped with carbide-tipped rotary-file cutting bits. You can often rent these from a



9. Intake ports can be reshaped working from the outside. Any dividers in the center of the ports, like the intake on this Hodaka barrel, **MUST** be left as-is to keep piston rings from snagging on edge of the port.



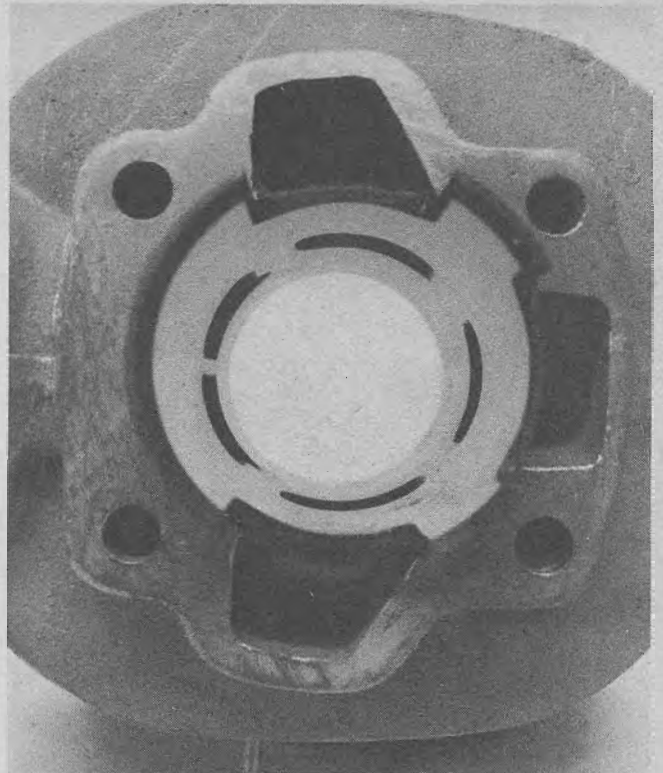
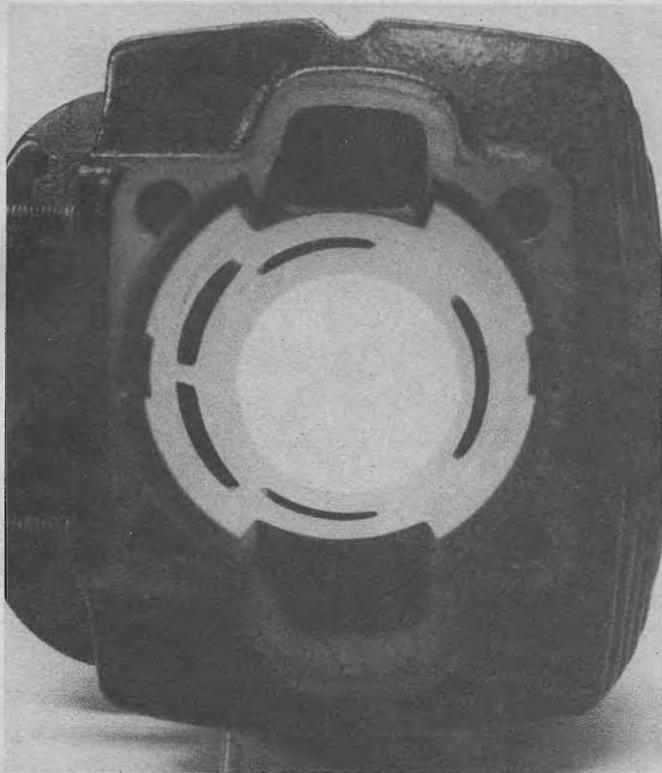
10. Taper and smooth the transfer port lip on the edge of the cylinder barrel's spigot end. **NEVER** alter the shape — only the size — of ports.

nearby rental yard or you can purchase them from any large machine tool supply shop. We used Dremel's \$40 ball-bearing-equipped grinder and a pair of carbide-tipped bits; one ball-shaped and the other barrel-shaped. Medium and fine grit emery cloth will do for final detail shaping and polishing. You'll need some "Dykem" type bluing dye for marking the cylinder walls. A pair of draftsman's dividers, a scribe, and ruler will be necessary to lay out the shape of the enlarged ports on the cylinder walls.

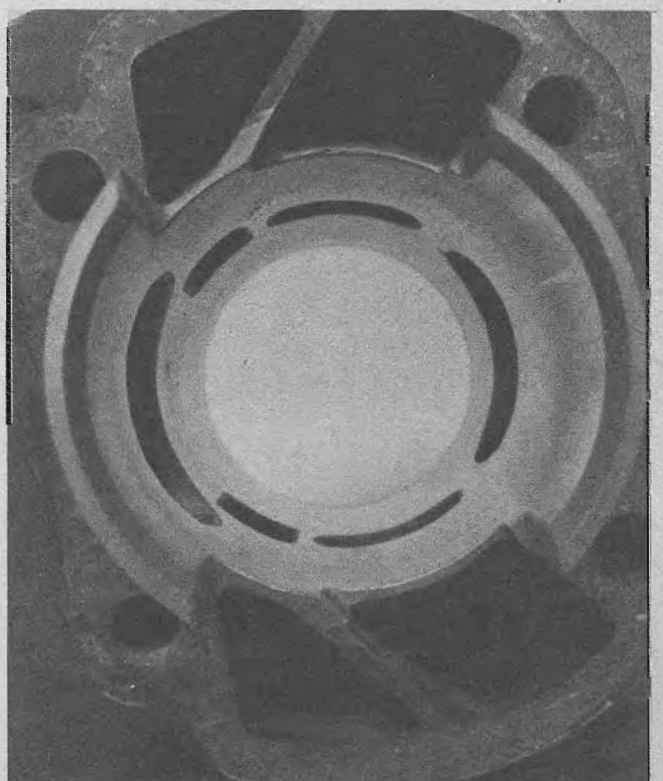
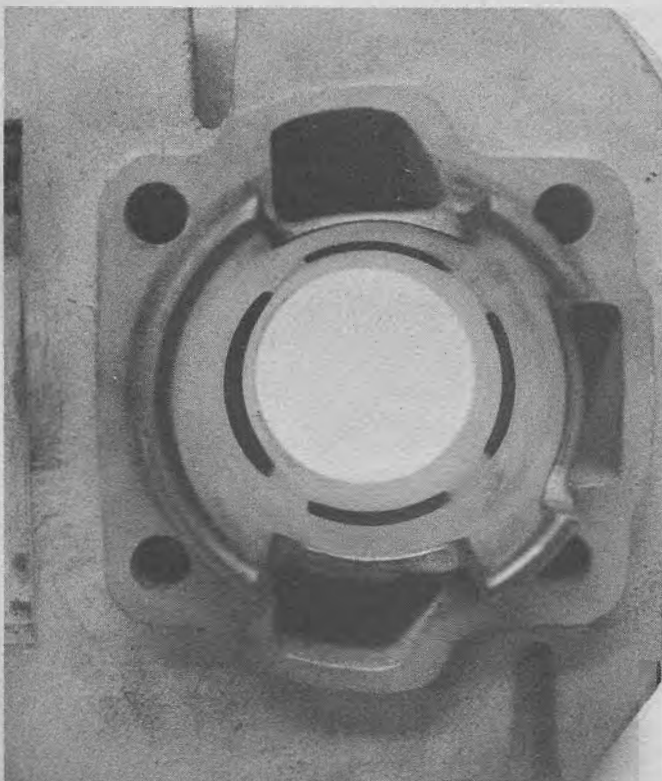
The shape of the interior of any port *must* remain the same as it is on the stock machine. You can widen the exhaust port by about 1/16 inch per side, the transfer ports about .030 inch per side, and the intake port by about .050 inch per side on most engines. A

general formula applies to the modification of the port's height since even a minor change here can drastically effect the timing and performance. If the exhaust port is enlarged (at the top side *only*) by .090 inch, the transfer ports can be enlarged (at their top edges *only*) by half that amount or .045 inch, and the intake port can be enlarged by one-third the amount of the exhaust (*only* on the lower side of the intake port) or .030 inch. Keeping the bottom edges of the exhaust and transfer ports and the top edge of the intake port exactly in their stock position will help to maintain the engine's high stock torque peak — the extra power you obtain from increasing the port sizes will then be spread nearly evenly over the entire performance range from high speed to low.

Few individuals, outside of the factory experimental shops, have either the experience or the time needed to alter the port-controlled timing. Some factories or importers (Hodaka is one) will provide altered port timing diagrams for increasing the high speed performance of their engines — never change the timing without the aid of one of these diagrams. The edges of the ports, where they exit to the inside of the cylinder bore, should be radiused about 1/64 inch to keep the piston rings from picking at the edges of the ports. These barrels are the work of Broyles Hi-Performance Porting, 1727 So. Santa Ysabella, Rowland Heights, Calif. 91745. Your local dealer may be able to suggest a nearby porting service if you don't want to do your own.



11, 12, 13, & 14. Four port barrels (from their crankshaft end) that represent the wildest porting you'll want for these particular machines, each is a factory-tuned "racing" barrel: the Hodaka "Super Rat" barrel, the Suzuki 99cc MX barrel for their 90cc trailbikes, the Kawasaki "Jr. Green Streak" barrel for most 90 or 100cc Kawasakis, and the Yamaha DT-1MX barrel.



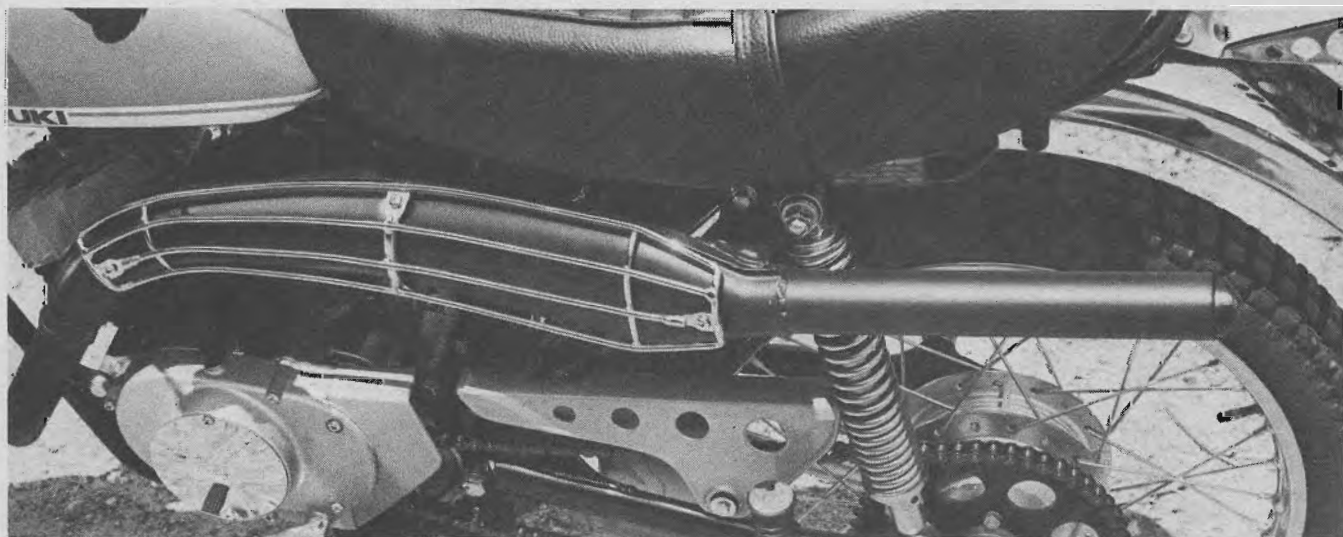


# "BOSS" Suzuki

HONCHO MEANS BOSS IN SPANISH,  
AND THIS BIKE IS JUST THAT

There's already a wide selection of lightweight street/trail machines available to the prospective buyer, so whenever a new one is introduced it must be good to survive in the battle for sales. On this basis Suzuki's TS-90 Honcho will be around for a long time.

The first thing that one notices about the Honcho is that it feels and looks like it's bigger than 90cc; it doesn't have that moped feel that many 70's and 90's have. Part of this is because it is a bit heavy for a 90 with a dry weight of 199 pounds. Quite a lot of this weight (about 25 pounds) can be disposed of by the removal of the lights, fenders, horn, etc., if the machine is intended for off road use only. Just about all these parts have quick disconnect plugs. While we're on the subject of lighting we might say that the lights on the Honcho are typically Japanese; that is to say super. No

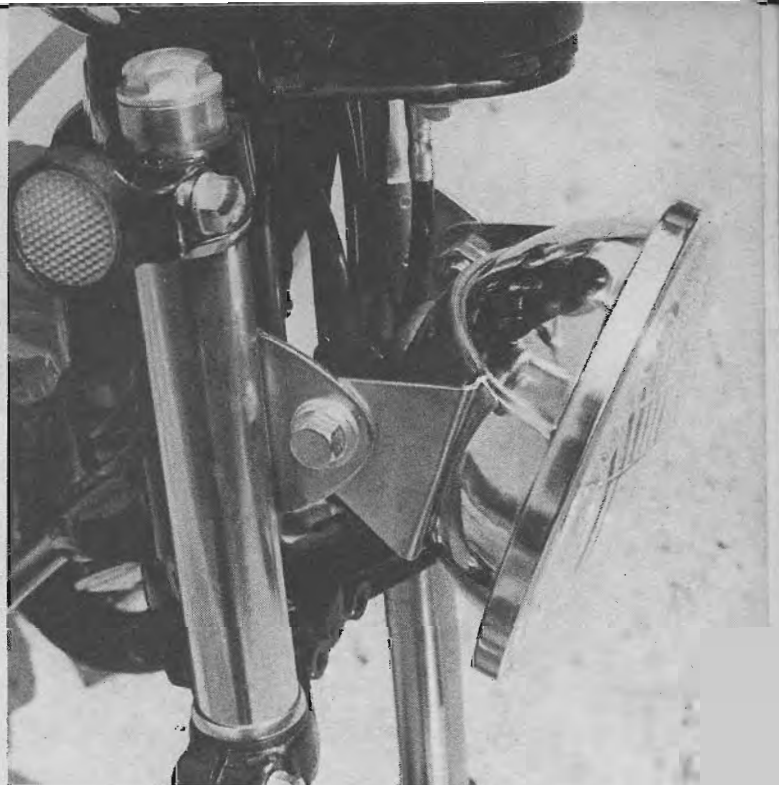


*A black painted tuned exhaust is standard equipment; it looks loud but it's fairly quiet and it has a built-in spark arrestor.*

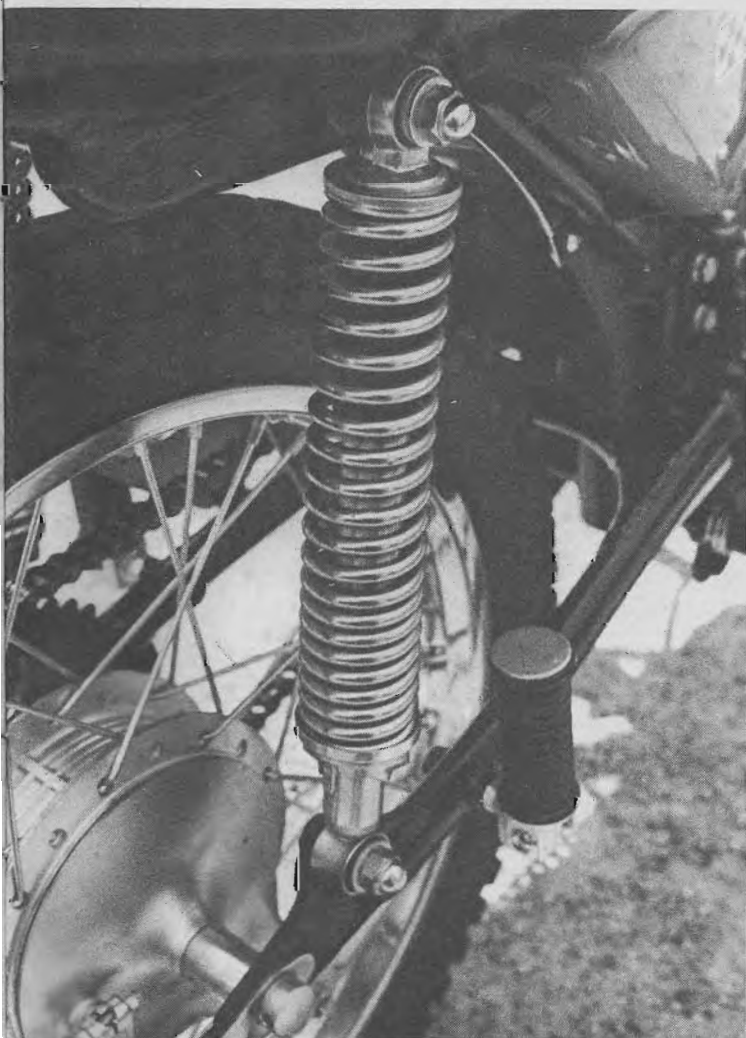




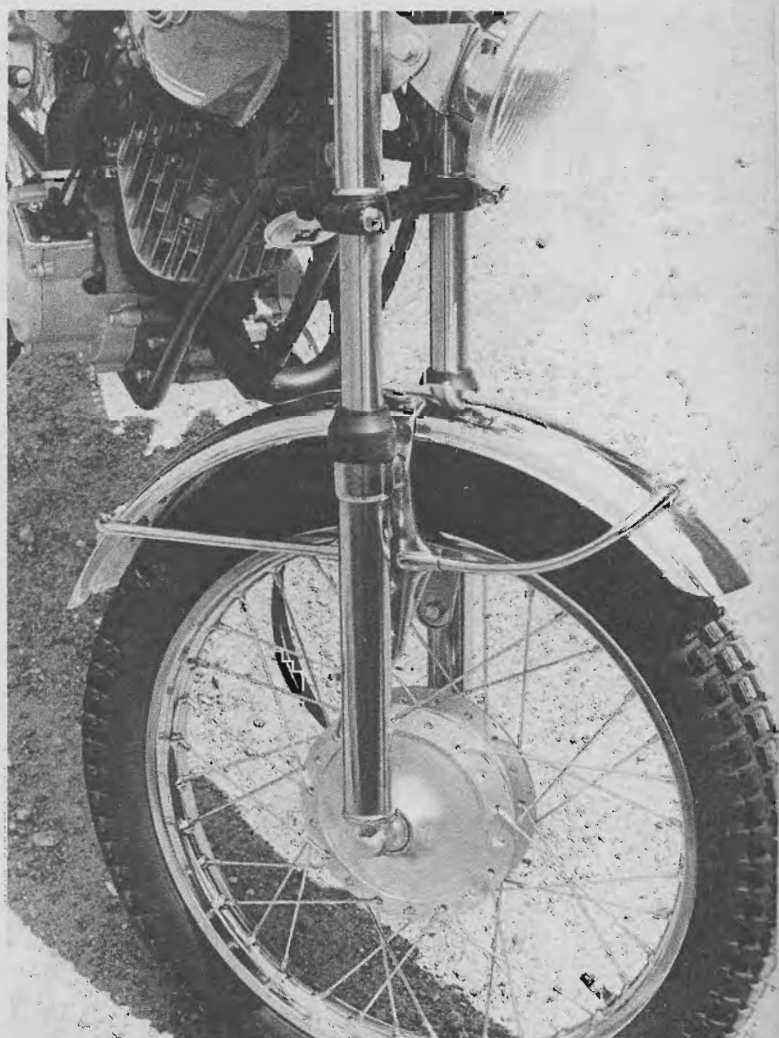
*Under the seat will be found the battery, oil tank filler and tool kit. The wires from the taillight can also be unplugged under the seat.*



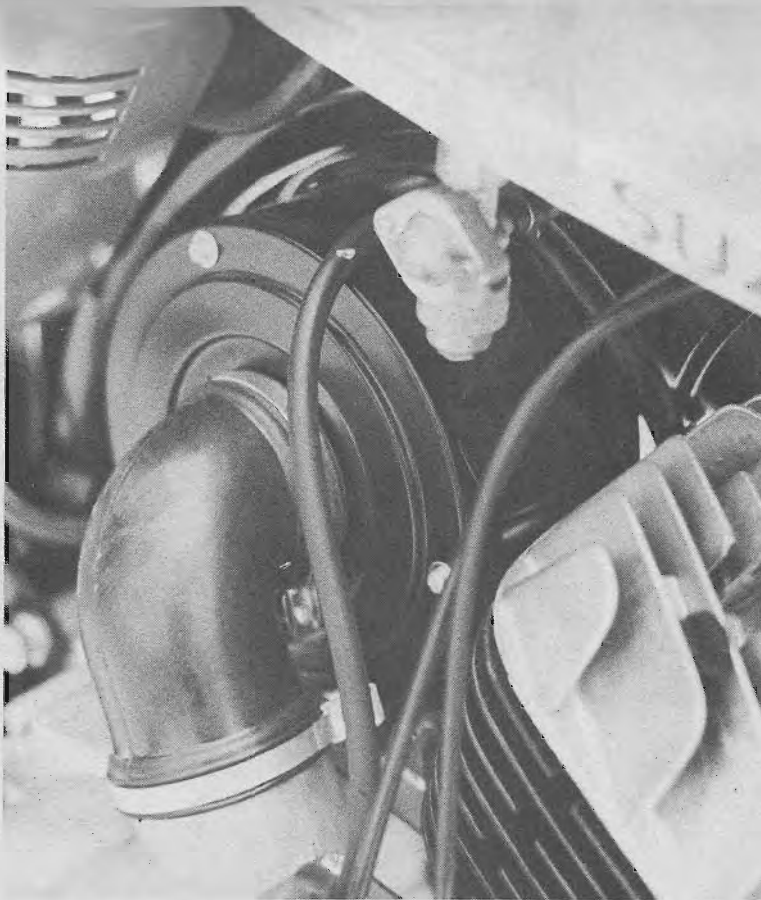
*The flat headlight can easily be disconnected, just remove the two bolts and unplug the wires.*



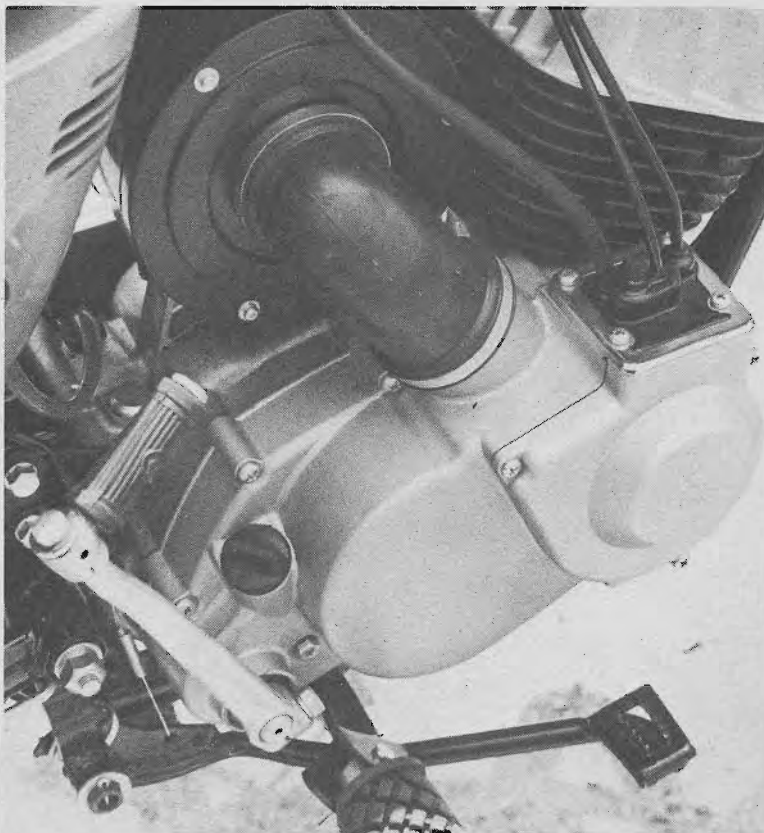
*Honcho's rear suspension units are nice looking but they lacked dampening for riding in rough terrain.*



*An abundance of chrome gives the front end a look of class, unfortunately the fork springs are a bit too soft.*



*The air cleaner is mounted neatly behind the cylinder in the space normally taken by the carburetor in a conventional piston port design.*



*With a rotary valve engine the carburetor is enclosed in an airtight compartment on the side of the engine. The air cleaner has to fail before the carburetor can get dirty.*

trouble riding at night with this equipment. The same can be said for the rest of the electricals on the machine.

Although it's no racer, handling was fine for street as well as for riding out in the boonies, but there was a definite lack of dampening in the rear suspension units. This coupled to a rather short (47 inches) wheelbase made for a choppy ride when the machine was used on anything but smooth trails or city streets. The front fork has the style that was introduced by Ceriani but have chrome plated steel sliders rather than aluminum. Unfortunately the fork springs were too soft and the dampening was a little weak for rough going. At the top of these forks will be found a large, easy to read speedometer which can be very useful in the event the rider wanted to compete in an occasional enduro.

Brakes, both front and rear, are the single leading shoe design. They're easily strong enough for a machine of this weight and speed potential on paved roads, and in the dirt they were hard to beat, strong but not grabby. Laced to these brakes were 18 inch steel wheel rims shod with trials tires. They worked very well in the dirt but on the street, discretion was necessary. A 2.75 x 18 is used at the front with a 3.00 x 18 for the rear. If serious trail riding was the intention, putting the rear tire on the front and buying a slightly larger tire for the rear would be a wise choice. They seemed a might too narrow for the dirt.

Like other Suzukis the Honcho is beautifully styled and finished. Its paint work is flawless and there is an abundance of chrome plating and polished alloy to set off the orange paint. The moto-cross-styled handlebars also add to its competitive appearance. Not only does the seat look good but it's very comfortable for one or two up riding.

Suzuki built a real jewel to power the Honcho. It's a 90cc rotary valve two-cycle that puts out a generous amount of power for such a small engine. In its standard form, the engine puts out 11 horsepower at 7500 rpm but Suzuki offers a "hop up" kit which increases the engine size to 100cc. The "hop up" kit isn't necessary to make the Honcho run; it goes very well just the way it comes stock. Grab some revs and snap the clutch out and the result can be the need for a new taillight. A quick shift to second gear can also produce a wheelie and the same for third. Acceleration is very impressive to say the least. The Honcho's 70 mph top speed is also impressive for a 90cc machine.



*It may be just a 90 but it has the styling of a bigger bike. It looks a lot like the 250 Savage.*


VM-19SC instrument that has a 19mm venturi. Smooth, clean carburetion is a feature we all liked about the Honcho. The carburetor is located on the right side of the engine in a sealed compartment. The only opening to this area is the passage that goes to the air filter. The large air filter is mounted just behind the cylinder. The black painted tuned exhaust system looks good as well as being functional, and it comes with a built-in spark arrestor, one more thing that won't have to be bought later.

Suzuki's Posi-Force lubrication system, the same as used on the larger Suzukis, is employed on the Honcho. The oil tank is located on the right side of the machine with the filler just under the flip-up seat. It holds 2.5 pints. Ignition is by conventional battery/coil with the battery also found under the seat. It never took more than one kick to get the engine fired up, and we didn't foul any spark plugs.

A multi plate wet clutch and gear primary delivers the horsepower to the

five speed transmission. Shifting was smooth and light with a very short stroke on the shift lever. Shifts were very positive and we can't remember anyone missing one.

In summation, the TS-90 Honcho is one of the best buys around. The quality of workmanship and the design makes this one of the better light-weight trail/street machines as well as being on a par with any but all out competition bikes in performance. This just has to be one of Suzuki's biggest sellers.



# THE MIGHTY MINI

YAMAHA'S NEW MINI-ENDURO  
A BIKE WITH A FUTURE

It would appear that in one fell swoop Yamaha has captured the mini-bike market. By the time you read this they should have introduced their new Mini-Enduro, a 60cc mini-machine that looks like a full-sized cycle that was caught in the rain and wasn't Sanforized. It's got to be the cutest thing we've ever seen.

The Mini-Enduro is the type of cycle everybody wants to try. The day it arrived at our offices the boys from our sister magazine, Popular Hot Rodding, saw it and the next thing we knew the bike had disappeared. The next day we found the Editor of Pop Rod had borrowed it. That's the way the whole period of time we had the bike went. We had to struggle just to keep it long enough to do the test.

Actually, we can understand why the Pop Rod guys were so enthused, the Mini-Enduro is a whole bunch of fun wrapped up in one package. As the Editorial Director of our company said, "The most fun is to sit back and watch your kids blow their mind." And that's just what they do. Show

this bike to a child and he'll throw rocks at any other mini on the market.

The bike is powered by a rotary valve two-stroke single displacing 60cc. This is not a new engine for Yamaha, the 60 has been around for about five years, and it was developed from Yamaha's 80cc engine, which has been around forever. Like every other model in the Yamaha line, oil injection is used to lubricate the engine. A positive displacement pump injects oil into the port on demand. Being a rotary valver the carburetor is mounted on one side of the engine with the flywheel magneto on the other. Thus the engine is fairly wide but it shouldn't cause too great of a problem. A plus with the rotary valve design is that the space behind the cylinder is available for the air cleaner. This location happens to be one of the cleanest spots on any cycle.

Coupled to the engine is a four speed transmission, not the usual three speeder most mini-bikes have. Since this is the same unit that Yamaha has used for years we feel we can say that

it will be reliable for the life of the bike. Primary drive is by helical-cut gear; the clutch is a wet, multi plate arrangement.

Not being a real racing machine we didn't expect too much from the suspension and we weren't disappointed. We were told the forks were hydraulically dampened but we had to remove one of the top fork bolts to prove it to ourselves; there doesn't seem to be any dampening to the front end. Hopefully a change to a heavier weight oil will help the problem.

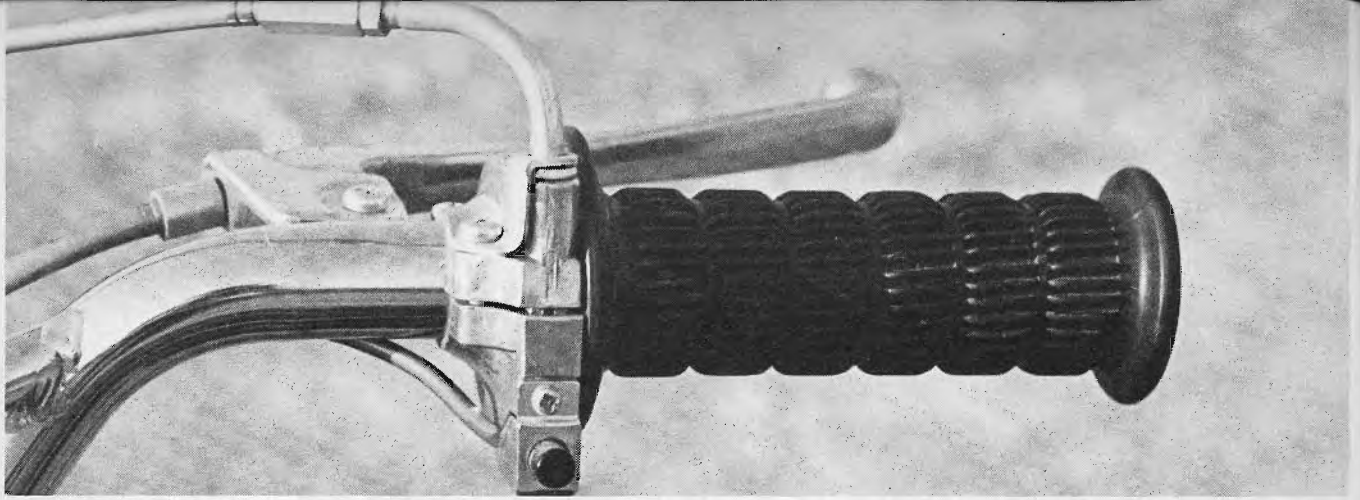
At the rear are the familiar coil-over-shock arrangements but these are a bit different than the normal combination. In trying to hold down the production price of the machine, the Japanese engineers have come up with a shocking method that uses grease instead of oil. No one connected with Yamaha in this country shed light on the way they work, the bike is that new. They aren't even too sure that this is in fact the way the shocks are made, they just think this is what they are. Whatever the situation, the shock-



*In reality the muffler is concealed in a covering that looks like an expansion chamber.*



*Duane Elliott shows it's easy for a seven year old to light the fire in the Mini-Enduro.*



*The ignition system is straight magneto; no key. The button by the throttle is a kill button.*



*Until compared with a larger bike, the Mini-Enduro could be taken for a full-sized machine.*



ing isn't all that good. A point to remember, though, is that most mini-bikes don't have any rear suspension at all so the Yamaha is better than 95 per cent of the minis around.

One thing the Mini-Enduro doesn't have is road-going equipment. There are no lights, horn, or turn indicators. Many people won't agree with us but we think this a good thing. Too many mini-bikes can be licensed for the street and that's the one place no mini should be, even though some are street legal. It's almost impossible for the driver of a car to see something as small as a mini if it's in the blind spot of his car. Many accidents can, and will, happen from this situation before it could happen with their machine.

The Mini-Enduro is equipped with 2.50 by 15 universal tires both front and rear. We don't happen to know what other sizes of tires are available in the 15 inch size, but for trailing in soft sand or dirt a bigger cross section tire would be an advantage. There is room for bigger tires so perhaps Yamaha is planning on making something available as an accessory.

The seat is well padded for something this small, however it's strictly for one person, as is the whole bike, for that matter. And that's the way it should be, as small as it is it could lead to handling problems with two aboard.

Frank Scurria, our Technical Editor, said he hopes Yamaha has been stockpiling the Mini-Enduro for about two years because otherwise they'll sell their production in the first three weeks they're out. After riding it we can only agree, we haven't seen anything that's better for a child to learn on, the only trouble he'll have is keeping his dad away from it.

Carburetion is handled by a Mikuni. The choke for the 60cc engine is the little knob sticking out from the top of the right crankcase cover.



*Young Duane Elliott shows off the Mini-Enduro after he beat his Dad who was riding our Project Yamaha.*



*A small engine guard is provided. For most off-road work it should be enlarged to protect the rest of the engine.*



*With the addition of heavier weight oil the front forks should work better than the stock arrangement.*



*On our test machine the grease-dampened rear shocks were mounted upside down. Perhaps they'll work better when mounted right-side up.*

# WHEEL BEARING MAINTENANCE

SAVE DOLLARS, AND YOUR HIDE, BY MAKING SURE YOUR WHEELS CONTINUE TO GO AROUND

By John Larsen

If and when a wheel bearing seizes it is going to lock the wheel in an uncontrollable skid, or seriously damage the brake backing plate or hub. Either case is an expensive one.

Most of the cycles manufactured today use one or more types of ball bearings for the wheels. Some of these are factory sealed bearings that are never supposed to need lubrication. By far the majority of the machines, however, use the independent seal-packed bearing. Either of these bearings should remain trouble-free for many miles, but there's no guarantee of how many. The long mileage quoted is assuming the factory did its job in packing the bearing properly. We have seen where they've missed the boat completely and did not pack the bearings at all.

The first thing you should do is check the owner's manual for your machine and see what the recommended mileage is for packing the wheel bearings. You will no doubt find that some manufacturers vary the wheel bearing inspection time according to the usage, in other words, under heavy water conditions the bearings will have to be serviced sooner. Don't

overlook the following point. If you like to wash off your machine at the local car wash you should use the figures given for heavy water usage. Many of the wand type car washers use nearly 600 pounds of pressure on their equipment and this can drive the water right past the bearing seals and into the bearing if care is not taken.

Rust is probably the biggest enemy of a ball bearing. The way a ball bearing bears weight is that the balls run in the semi-circular grooves in the bearing races. As long as the balls can travel freely there is no problem. Actually there is only a very thin contact line where the ball touches the race. A rust pit on either the ball or the race gives the same effect as a chuck hole in a road. The ball hits the rust pit and tends to hop slightly, just as the wheel of a car or bike would do. This can continue over a long period of time until the inside of the bearing has been destroyed by this washboard effect. If a bearing loses its ability to bear the load properly, usually due to lack of lubrication, it can begin to spall, or flake, off the inner surface of the race, causing jamming or seizing. Of course rusting alone can be the factor that leads to early failure as the continued pitting of the bearing makes it impossible for it to carry the intended load.

Okay, you suspect you have a worn bearing and you want to know what to do with it. This can be a problem because many cycles have the bearings pressed into the wheel hubs from the outside. The best method for removal is to use the special puller designed for

this purpose. Almost all dealers have one of these but we won't guarantee he can find it. They aren't used too often because many cycle riders don't think of repacking the bearings until they have burned or rusted out.

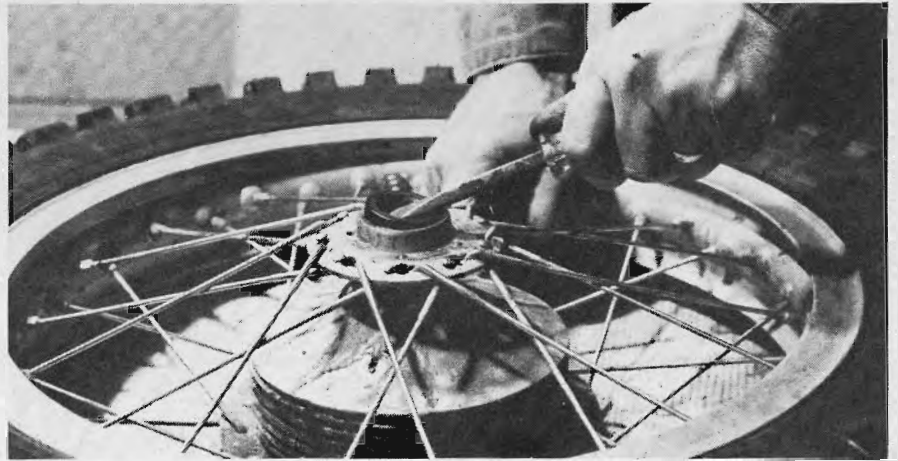
You can usually remove the bearings by the screw driver method, if you don't have access to a puller. All cycle wheels using pressed-in ball bearings have a spacer that fits between the inner races of the bearings inside the wheel. This item is there so it will keep the bearings a healthy distance apart. Without it the bearings could be damaged by getting the axle nut too tight. The procedure is to first remove the seals by forcing the blade of a broad screwdriver under the seal, between it and the outer race of the bearing. All seals of this type have a steel outer ring and you will want to pry against this, not the soft seal material in the center. When both seals have been removed, you can force the bearings from the wheel by placing a drift through the hole in the inner race of one bearing so that the end of the drift is caught on the end of the spacer. Now take a light hammer and drive the spacer and bearing out the opposite side. Once one bearing has been removed, it is a simple matter to reach through and tap out the other.

Once you have the bearing out, repacking it is fairly simple. However, before you can do a good job it's necessary to clean the bearing. Do this by getting a clean pan of solvent or diesel oil (gasoline is too inflammable), and a brush and wash the bearing until it is perfectly clean.

Now is the time to closely inspect the bearing. Spin the bearing with one hand and the inner race with the other. The bearing must turn freely without any signs of roughness. If the bearing turns quietly and freely except for an occasional binding, this is a sign that one piece of foreign material is still in there somewhere. Rewash and see if you can get it out. If the bearing



1. Remove the seal by prying with a screwdriver and working your way around the hub.



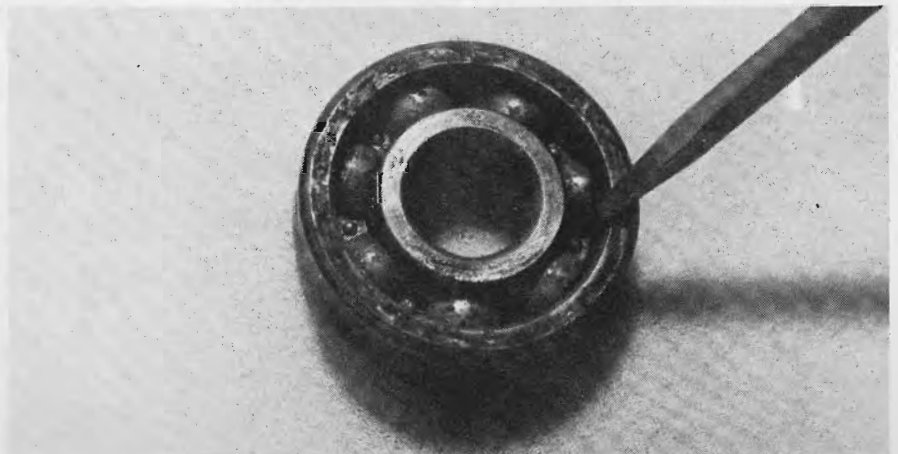
2. If you can't find a bearing puller, take a drift and drive out the bearings by pounding on the bearing spacer.

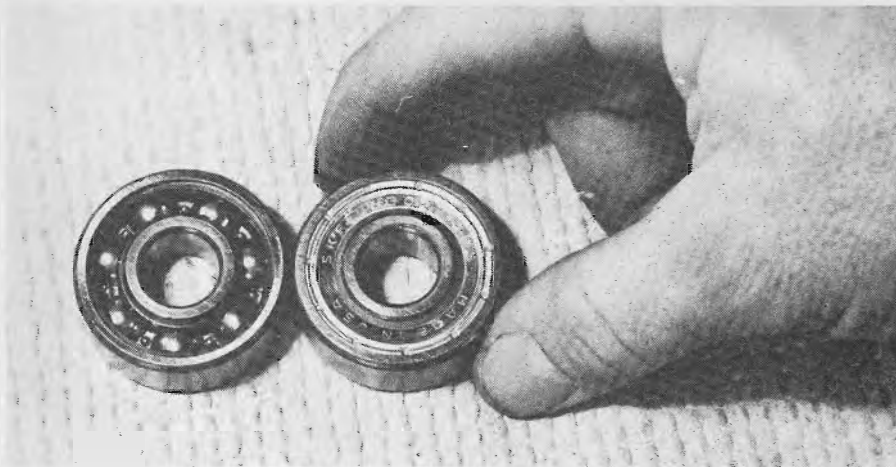


3. Clean the bearing in solvent and dry it with compressed air. Don't spin the bearing with the air because this can ruin an unlubricated bearing.

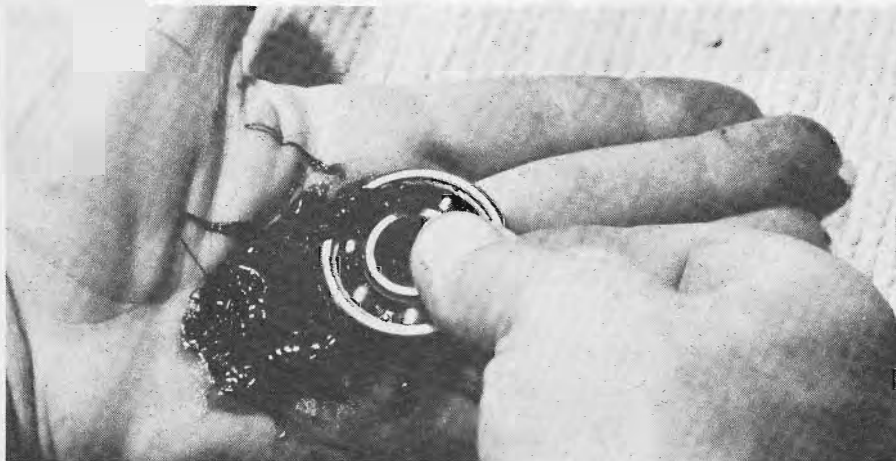


4. Rust has pitted the balls and races of this bearing. One like this has to be replaced.





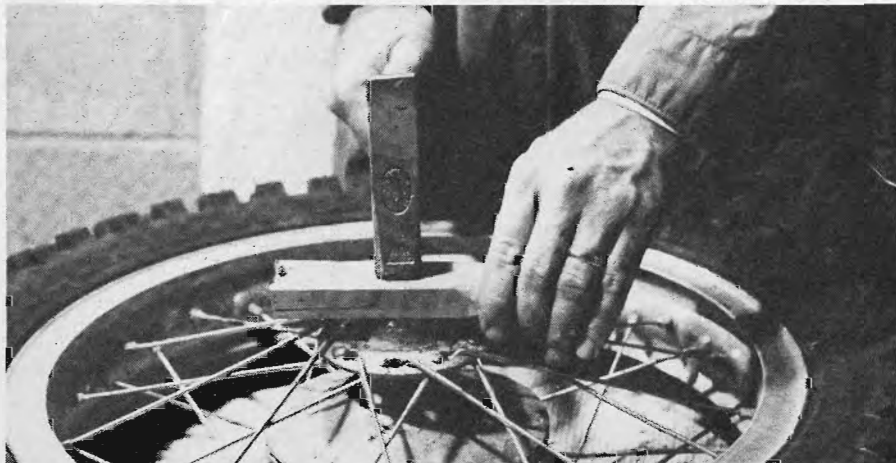
5. Many cycles imported here can have their bearings replaced by ones of American manufacture. Some can even be replaced with sealed bearings.



6. Repack a bearing by putting the grease in your hand and forcing the bearing through it. This guarantees the grease will flow into the races.

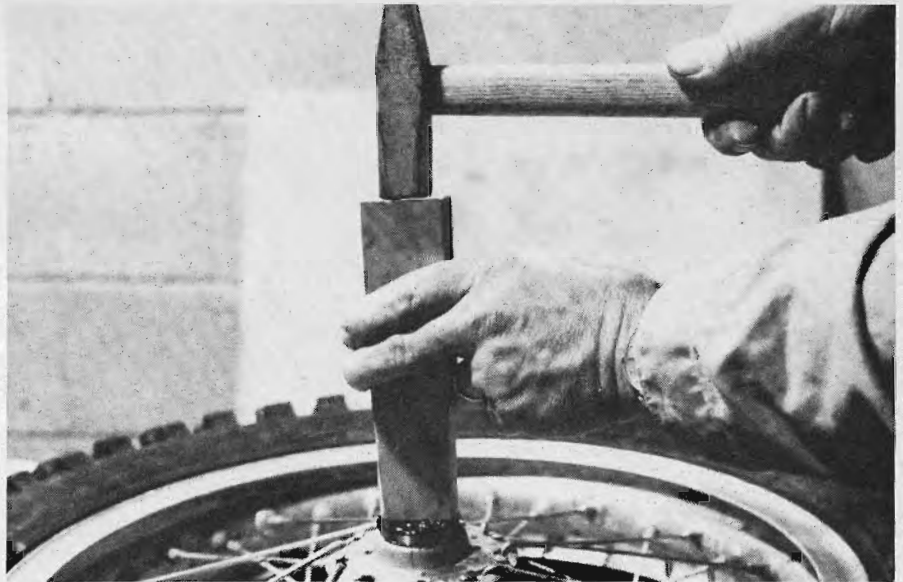


7. Work the bearing in the grease until it has been forced completely through the races.

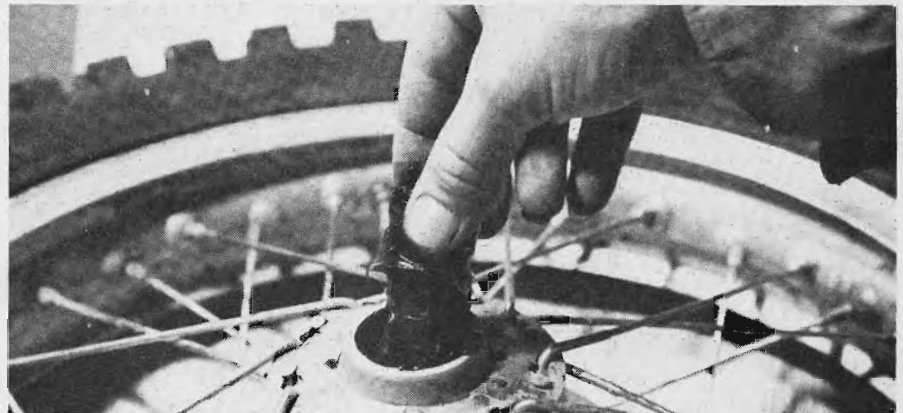


8. Start the bearing back into the hub as shown. Avoid pounding directly on the bearing itself.

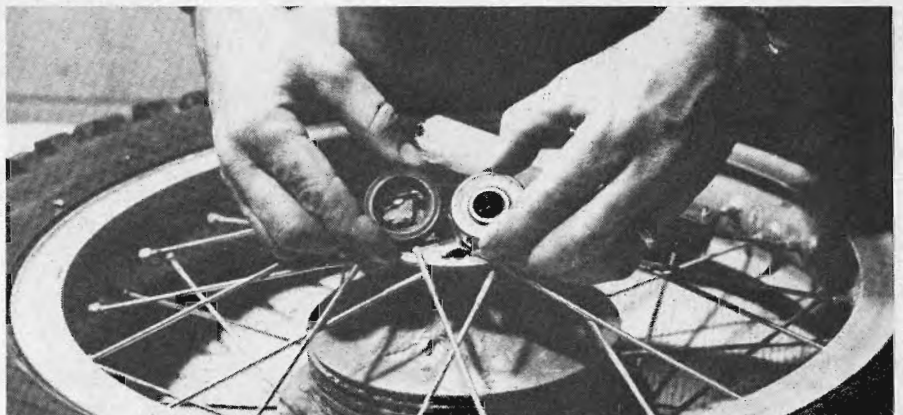
9. You can make sure the bearing is fully seated by taking a piece of wood and pounding on the bearing until it won't go any farther.



10. When replacing the bearings, don't forget the spacer that goes between them.



11. Last to be replaced are the seals. Use these even if you are running a sealed bearing.



has any roughness in it after you have recleaned it, replace the bearing. Dry the bearing with compressed air but do not spin it with the air pressure. This can burn the unlubricated bearing.

If your dealer is out of the bearing that you need, go down to a bearing supply house and take your damaged bearing along. Very possibly he'll have the identical bearing, American-made, in stock.

The actual packing of the bearing can be done by getting a can of E.P. (extreme pressure) grease and forcing it into the bearing. Extreme pressure is a grease that has a fibrous texture that makes it cling to the surface of the

bearing and is less likely to melt and flow away under high heat conditions.

Take about a full tablespoon of the grease in the palm of your hand and force it into the bearing with a wiping motion. Don't stop until grease is forced completely through the bearing. It does no good to wrap a big wad of grease around the bearing, the grease must be packed into it. Keep in mind that this is all the grease the bearing is going to get until the next repacking rolls around.

When the bearing has been repacked, it is time to replace it in the hub. Avoid pounding on the inner race of the bearing if possible. New seals

should be used on reassembly, especially if there was any evidence of water having gotten into the wheel when you inspected it.

A little preventive maintenance can give you the trouble-free service that you are looking for. Sooner or later a bad bearing will eventually force you to replace the brake mechanism and possibly the wheel hub when the wobbling wheel starts riding on the backing plate. Worst of all, the wheel can bind up and cause you to step off heavily, and that can be the most expensive of all.

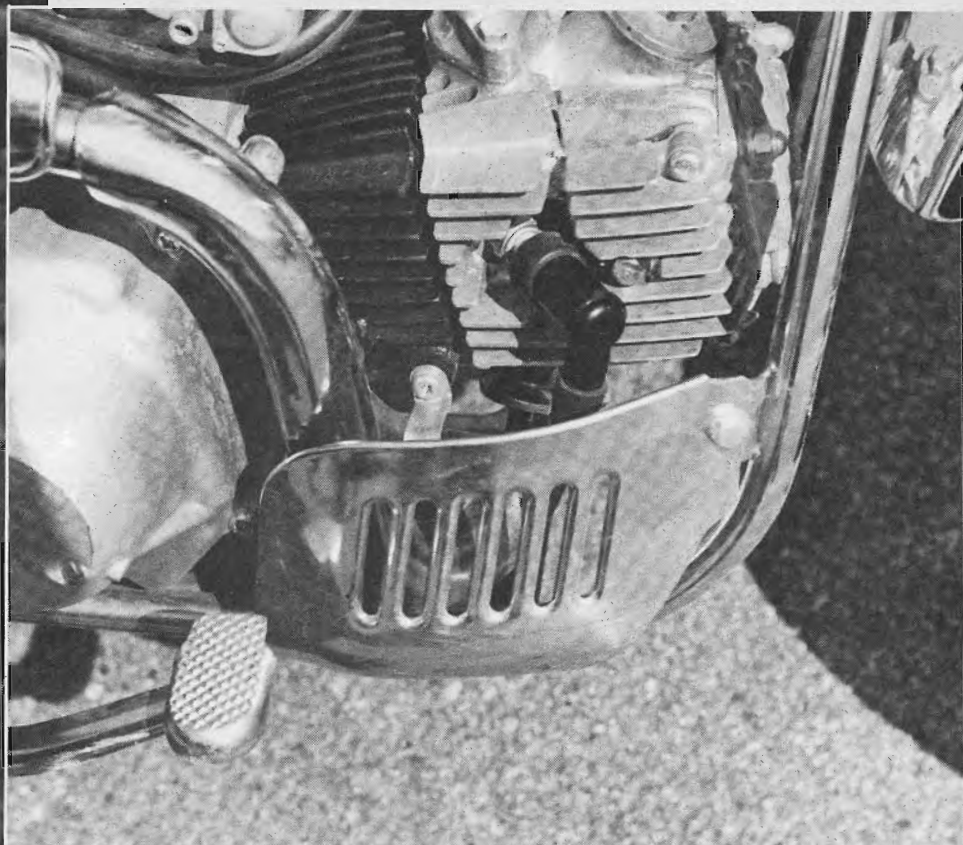


*The engine is the typical single cylinder overhead cam unit that Honda uses for all their machines under 100cc.*

# **honda**

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## **MINI-TRAIL**



*For added protection, a large heat shield covers the front portion of the exhaust pipe.*

## HONDA'S SUPER TOY

It's hard to believe but the mini-bike market is one of the fastest growing segments in the motorcycle industry. And like almost every other area in the cycle business, Honda leads the way. Two or three years ago, they offered their 50cc Mini-Trail and it was an instant success. Soon after this bike was introduced, the Honda dealers started asking for a more powerful mini-bike. Honda answered with the subject of our test, the 70cc Mini-Trail.

The first thing we found out about the 70 is how much fun it is. It's

certainly not the most powerful cycle in the world, and it's not the best handling, but it just might be the most fun of anything we've ever ridden. When we say fun, we obviously don't mean the same kind of pleasure we receive from riding something like the 380 Greeves. The Greeves is fun but in a serious manner; you don't play around with a 30-some-odd horsepower bike without keeping in mind just how fast you're going. With the little 70, it's something else again. Here is a bike meant for free and easy riding and once you're used to it you can almost forget you're on it.

The ease of riding the Mini-Trail is due to many things, not the least of which is the centrifugal clutch. What this means is that even though there is a three-speed gearbox, the clutch operation becomes automatic when the shift lever is pushed to shift gears.

A centrifugal clutch looks like a regular clutch except for the clutch springs. In a normal clutch they force the clutch plates together. When the clutch lever is actuated, a rod forces the outer clutch retainer back, allowing the plates to release. With a centrifugal clutch, the clutch springs hold the plates apart. Inside the clutch hub are a number of rollers. As the engine accelerates, these rollers are forced from the center of the hub to the outer edge of the clutch plate

retainer. This forces the clutch plates together, coupling the engine to the transmission. It might sound complicated, but in practice it's simple and very reliable.

For what it is, the 70 has more than an adequate top speed, around 40/45 mph. With small wheels, it's not advisable to run much faster than this because with the center of gravity so low, things tend to happen in a big hurry and all of your mistakes are magnified. However, the 70 has ten inch wheels where most mini-bikes have six or eight inchers. Honda's larger wheels add greatly to the stability this machine enjoys over many of its smaller brethren.

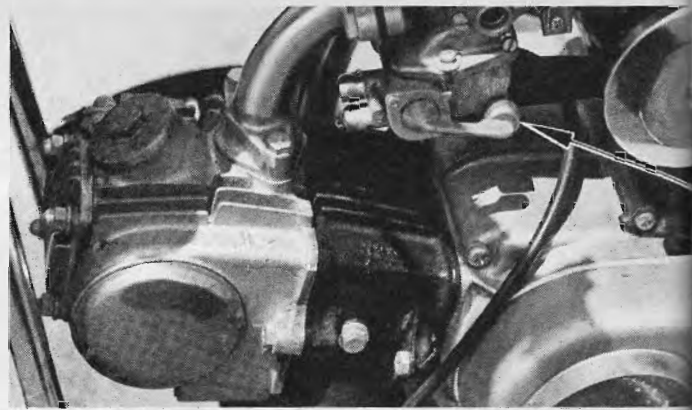
Helping the stability is the 42-inch wheelbase. Most mini-bikes usually have a wheelbase of around 28 to 32 inches which is much too short-coupled for our taste. We feel the 70cc Mini-Trail is the best handling, and consequently the safest mini we've ever ridden.

Something else the Mini-Trail has that much of its competition lacks is workable suspension, both front and rear. Coil-over springs handle the job at both ends. As we said earlier, the 70 isn't the best handling bike we've ever ridden, but as we remember back, it's the best handling mini-bike.

The engine is another version of the justly famous overhead cam single



*No spokes are used in the wheels. Instead, a pressed steel hub is used to keep the weight and maintenance down.*

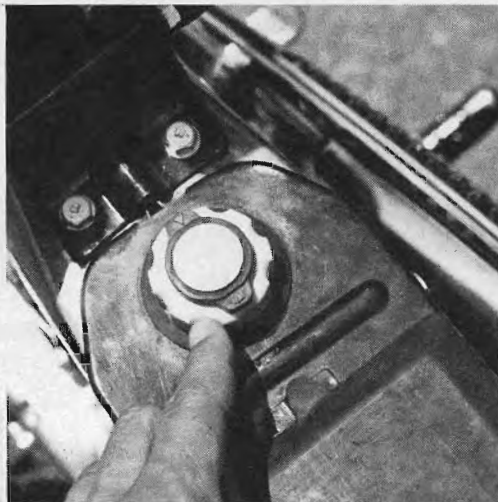


*It might not be big, but you can have more pure fun with this little cycle than almost anything we can think of.*



*The tool kit resides under the fold-up seat that is more than comfortable enough for two-up riding.*

Two conveniences are provided for storage in a car's trunk. The gas can be shut off so it won't drain from the tank, and it can be drained from the carb float bowl by means of this knob.



cylinder that powers all the small Hondas. This model displaces 71cc's, has an alloy barrel with a steel insert, and is as reliable as the day is long.

A three speed transmission is used but we'd like to see a four speeder instead. An engine this small needs all the help it can get.

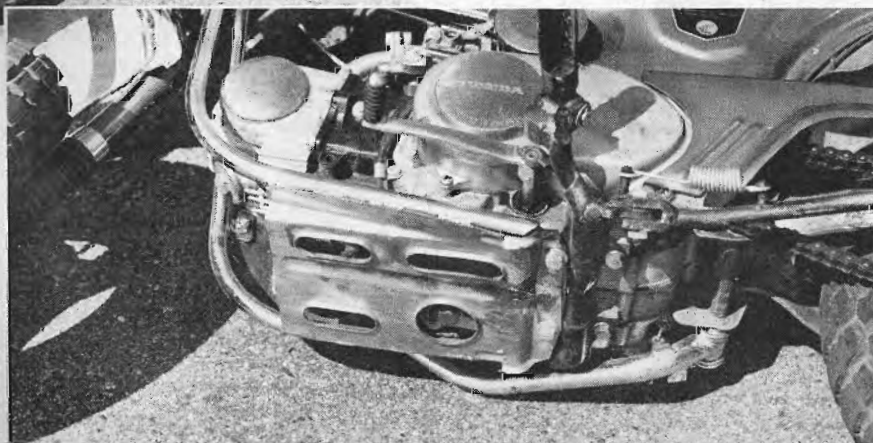
Like its smaller brother, the 50cc Mini-Trail, the 70 can be sealed up and carried in an airplane or the trunk of a car. The gas can be drained from the carburetor via a valve located on the float bowl, and it can be shut off at the filler cap, guaranteeing no overflow there. The handlebars fold down along the fork legs to make a fairly compact package that will easily fit into the trunk of a car.

Complete lighting equipment is standard. The headlight has both high and low beam, the tail light incorporates a brake light that works off either the hand or foot brake. Since the clutch is centrifugal, a rear brake lever is provided on the left handlebar, along with the normal foot pedal, so both brakes are available to the rider if he's footing it through a rough downhill section. Even the speedometer has a light in it for nighttime riding. In short, the Mini-Trail is completely street legal - if you want to ride something this small on the street. Even the seat is comfortable enough for a long ride both on and off the road.

As you probably can tell by now, we thought the little 70 was a real gas, it's small enough to be unobtrusive but it's large enough to have fun with. Come to think of it, isn't that what we said at first?



Unscrewing the two black knobs allows the handlebars to collapse alongside the forks for storage.



Under the engine, Honda provides a sturdy guard to protect the powerplant from stray rocks.

# buyers guide

## MINI SUZUKI

One of the newest bikes from Suzuki is called the Trailhopper. It's fun, tough and loaded with features often found only on the bigger Suzuki machines.

Sporting a two-stroke, air-cooled, three-horsepower engine, the new Suzuki Mini-Bike is designed for superior performance. Handlebars that swing in for easier storing require only a twist and a snap. This enables the Trailhopper to fit into even the smallest car. The MT-50's three speed transmission and automatic clutch makes shifting a breeze when you "take on the country" on dirt, over hills, or across open fields.

Built just like the big Suzuki motorcycles — out of reinforced steel, the Suzuki mini-bike features high rise fenders, head and tail lights, and an extra long padded seat. The seat can be adjusted to any height so that it can be ridden by any sized person.

Five other special features found on the Suzuki Trailhopper include: a louvered muffler guard, a built-in spark arrestor, hand-operated brakes for both front *and* back, a half-gallon fuel capacity, a rugged tank and ignition cover.

For endurance and long riding enjoyment the Trailhopper comes equipped with Suzuki's specially built ruggedly constructed front and rear suspension system and knobby tires.



## HONDA 100CC STRAIGHT PIPES

Honda 100cc straight pipe for the serious competitor! Turn your Motorsport (SL 100 or CL 100 & CB 100) into a real BLASTER. On the track, enjoy increased performance with this Bassani tuned hi-pipe. Easy installation utilizing existing Honda mounts, fits stock cycle. Designed to tuck in tight to the contours of the machine while allowing easy access to the side cover tool kit. Finished in desert black heat paint. \$14.95.

Dealer Inquiries Welcome.

Contact: Bassani Manufacturing,  
Dept. PC  
1164 C Fountain Way  
Anaheim, California



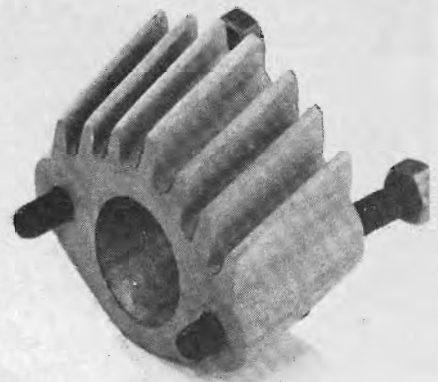
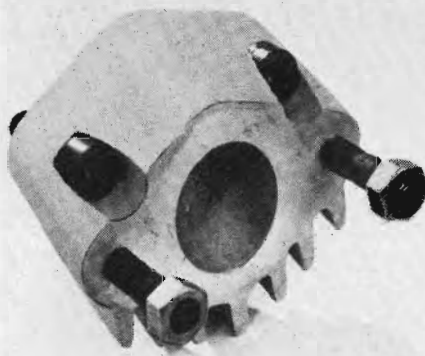




#### ANTI-FOGGING CLEANER

Steem-Off, a new anti-fogging plastic and glass cleaner for cyclists prevents helmet visors and goggles from fogging for days when used on the inside. When used on the outside, it will get rid of the oily road scum that most cleaners miss. Steem-Off is a new non-toxic formulation that makes riding safer and does the job other cleaners fail to do by preventing steam from forming on all inside plastic and glass for up to five days. When applied to rear view mirrors, Steem-Off's invisible protective film keeps them clean for days. Laboratory tests have proven that Steem-Off stops fogging and does a superior job of cleaning plastic and glass, and can be used on bathroom mirrors and windows in the home as well as on auto glass.

It comes in an exclusive plastic pump spray bottle for easy storage and is available by mail order for \$1.39 per 8 ounce bottle, plus 50¢ for postage and handling from KAR PRODUCTS COMPANY, Dept. PC, P.O. Box 10334, Portland, Oregon 97210.



#### BIG CARB ON LITTLE BIKE

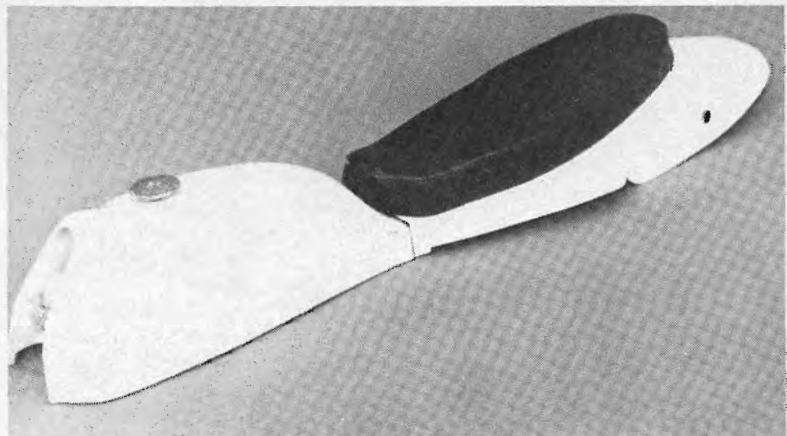
WANT MORE POWER from that 125 or 175cc Yamaha Enduro or MX? Sure you do, and it's now an easy bolt-on with a new item from PACER Consolidated Industries. Conversion requires only basic tools and is easily accomplished in an hour or less.

Sounds simple - and it is! The extra push for the AT-1 and CT-1 models is obtained by bolting on the larger carburetor standard on the DT-1 Yamaha. PACER makes it possible with a conversion manifold which bolts directly to the cylinder of the smaller displacement bikes and accepts the 30mm carburetor from the 250cc machine. Throat diameter is raised from 24mm on standard models, and up 4mm over GYT-kitted versions.

Proven performance increases attend the conversion, tested and

being used extensively by top runners in both Moto-Cross and Cross-Country events. All necessary hardware for conversion is included with the manifold, cast of T356 heat-treated aluminum and finned for both heat dissipation and appearance. Only the larger carburetor and gaskets need be purchased from a Yamaha dealer, many of whom stock the conversion parts as well.

Retail price of the manifold is \$10.95, and like all PACER products, it is sold only through authorized dealers. For full information on this and other of the broad PACER product family, write for information on item M-3, enclosing 25¢ for handling, to PACER Consolidated Industries, 17841 E. Valley Blvd., City of Industry, Calif. 91745. Your color brochure containing dozens of items will be sent promptly.

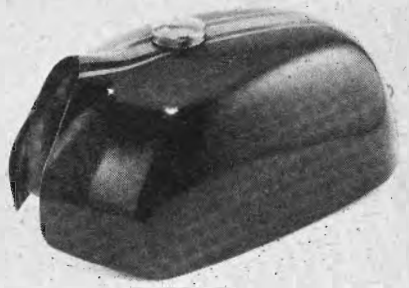


#### EXPANSION CHAMBERS

Competition proven by top Moto-cross and TT riders. Hi torque or high RPM expansion chambers in either upswept or downswept styles. Designed and quality built by Bassani from start to finish. One of the only manufacturers who rolls their own cones. Upswept pipes feature perforated metal heat shields. All mounting hardware is of aircraft quality. Improve the performance of your Bultaco, Yamaha, Kawasaki, Hodaka,

American Eagle by installing a Bassani expansion chamber. Other models also available. Write for complete information. All expansion chambers are available in part (cones), kit form or completely assembled. Complete units include all mounting hardware. From \$39.52.

Dealer Inquiries Welcome.  
Contact: Bassani Manufacturing  
1164 C Fountain Way  
Dept. PC  
Anaheim, California



### PACER PLASTIC TANKS

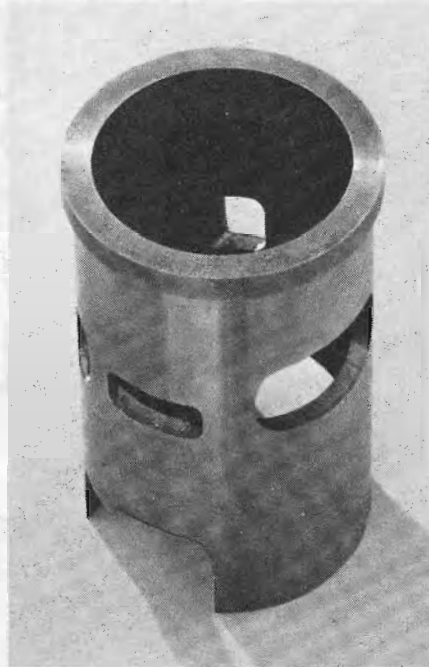
Custom-sized gas tanks are in big demand with the street riders as well as the track and off-road racing enthusiast. Those in-towners who take such pride in their bike's appearance are particularly careful that every accessory be top-notch in quality and good looks. It's hard to beat the factories any more, so custom treatments have to meet a real challenge if they're going to be successful!

One company in the accessory field to pick up the glove on the leaders' own ground is the new American pacesetter, PACER Consolidated Industries. A fresh example of their progressive attitude is announcement of metallflake finishes with racing stripes for their special gas tanks. Even the stripes are a 'flake finish, pleasantly contrasting with the basic color. Several popular combinations are available; it's even possible to find a helmet to match your PACER tank!

The unit shown here is the big 4-gallon enduro gas tank used by the big winners of the Mint 400 race (as well as many others). This one is made expressly for those popular Yamaha Enduro and MX bikes; in both 125/175 and 250/360 displacements. Still, the design is universal enough that they're finding homes on many other brands as well — just as long as a single top frame tube is there to provide a simple mount.

Your local dealer may be one of PACER's authorized sales outlets, so drop by and look over his selection of sizes and colors. If you don't see the size and color you want, he can order it for you, with prompt delivery. Prices are comparable with plain colors, so you can don custom plumage without paying exorbitant prices.

For additional information on this and other performance and custom accessories, send 25¢ handling charges to PACER Consolidated Industries, 17841 E. Valley Blvd., City of Industry, Ca. 91745. Ask for item number M-10.



### PACER'S POWERFUL STING THINGS

THE INSTANT EXPANSION CHAMBER is what they're calling these new exhaust stingers from PACER Consolidated Industries. It's as simple a bolt-on performance item as you'll find anywhere, and like all PACER products, it's carefully engineered to work, then tested in the field by the best riders.

These two stingers are designed for the Yamaha Enduro singles, and are made to bolt on to the stock muffler after the baffle is removed. Power comes on strong, as if you'd slipped on a MX model expansion box, but it only takes a minute to change over from street silent to dirt din, and even faster to convert back. The two sizes allow fitting to the correct displacement model.

You'll find PACER stingers are in stock at your nearby authorized dealer parts counter, priced at \$7.95. The finish is heat-proof black wrinkle for best appearance and wear. For full information on the many performance products from the industry pacesetters, send 25¢ to cover handling of the color brochure and price list to PACER Consolidated Industries, 17841 E. Valley Blvd., City of Industry, Ca. 91745, specifying item number M-19. Your material will be sent promptly.



### PACER CYLINDER SLEEVES

PORT TIMING IS CRITICAL for utmost power in a two-cycle engine, and new developments in "window" design can bring a fuller potential to your engine. PACER Consolidated Industries has now smashed the economy gap in permitting owners of older machines to up-date their power without buying new engines or cylinders. The barrier buster is a cylinder sleeve, perfected after long experimentation and refinement. The old cylinder is bored by the local motorcycle shop or parts house, and the new sleeve installed, bringing with it new timing and torque characteristics.

Additionally, the use of sleeves permits rebuilding of scored cylinder walls in special high-performance engines where boring is not normally permissible due to chroming of the aluminum cylinder material to achieve a hard wall surface. In the past, these parts had no future but the scrap pile.

Engineering accuracy and two-stroke expertise at PACER have brought forth some exciting developments in sleeve design. They are prepared to offer design and production for OEM, performance specialty companies, and shops catering to the racing trade.

For the individual, several standard configurations are ready for over-the-counter purchase. The first group is specifically for the Yamaha Enduro and MX series motorcycles, though others are in the works for snowmobiles, mini-cycles and other brands, models of bikes. Current offerings allow GYT-tuned specification sleeves to be installed in standard barrels for the Yamaha AT-1, CT-1 and DT-1. Retail prices are \$32.50, \$34.25, and \$37.50, respectively. Only selected, authorized dealers handle PACER products.

Full information may be obtained by writing with reference to item M-4 to PACER Consolidated Industries, 17841 E. Valley Blvd., City of Industry, Ca. 91745. For a color brochure illustrating sleeves and other of PACER's wide line, enclose 25¢ for cost of handling.



