

# TRAIL BIKES

ARGUS

WPS

## TESTS

HONDA • YAMAHA • SUZUKI  
KAWASAKI • HUSQVARNA

**HOW TO:**

BUILD A TOOL KIT • EASY TIRE CHANGES  
RIDING GEAR - MAKE IT LAST

**PRO  
RIDING**  
and  
MAINTENANCE  
**TIPS**



# OFF-ROAD'S 1982 TRAIL BIKES

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1982 Trail Bikes is published by ARGUS PUBLISHERS CORPORATION, 12301 Wilshire Blvd., Los Angeles, California 90025. Business, Advertising and Editorial offices, phone number (213) 820-3601. Single copy price \$2.25; in Canada \$2.75. All editorial contributions should be addressed to the Editors at P.O. Box 49659, Los Angeles, California 90049, and should be accompanied by return postage. Not responsible for loss or damage to unsolicited manuscripts. This publication is purchased with the understanding that the information presented is from many sources from which there can be no warranty or responsibility by the Publisher as to accuracy or originality or completeness. Printed in U.S.A. Copyright © 1982 by ARGUS PUBLISHERS CORPORATION.

# SUZUKI DR500

## *Bigger Biceps*

**W**henever the subject of trail riding or fire roading comes up at the usual garage bench race sessions, nobody overlooks the big single cylinder four strokes. These bikes, big on muscle, with lots of torque and thumper thunder, are what trail riding is all about. You just haven't lived until you've pitched a big four-stroke bike

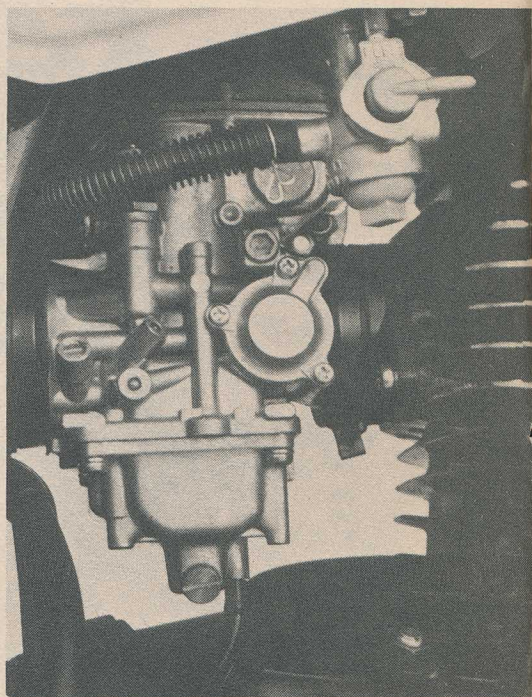
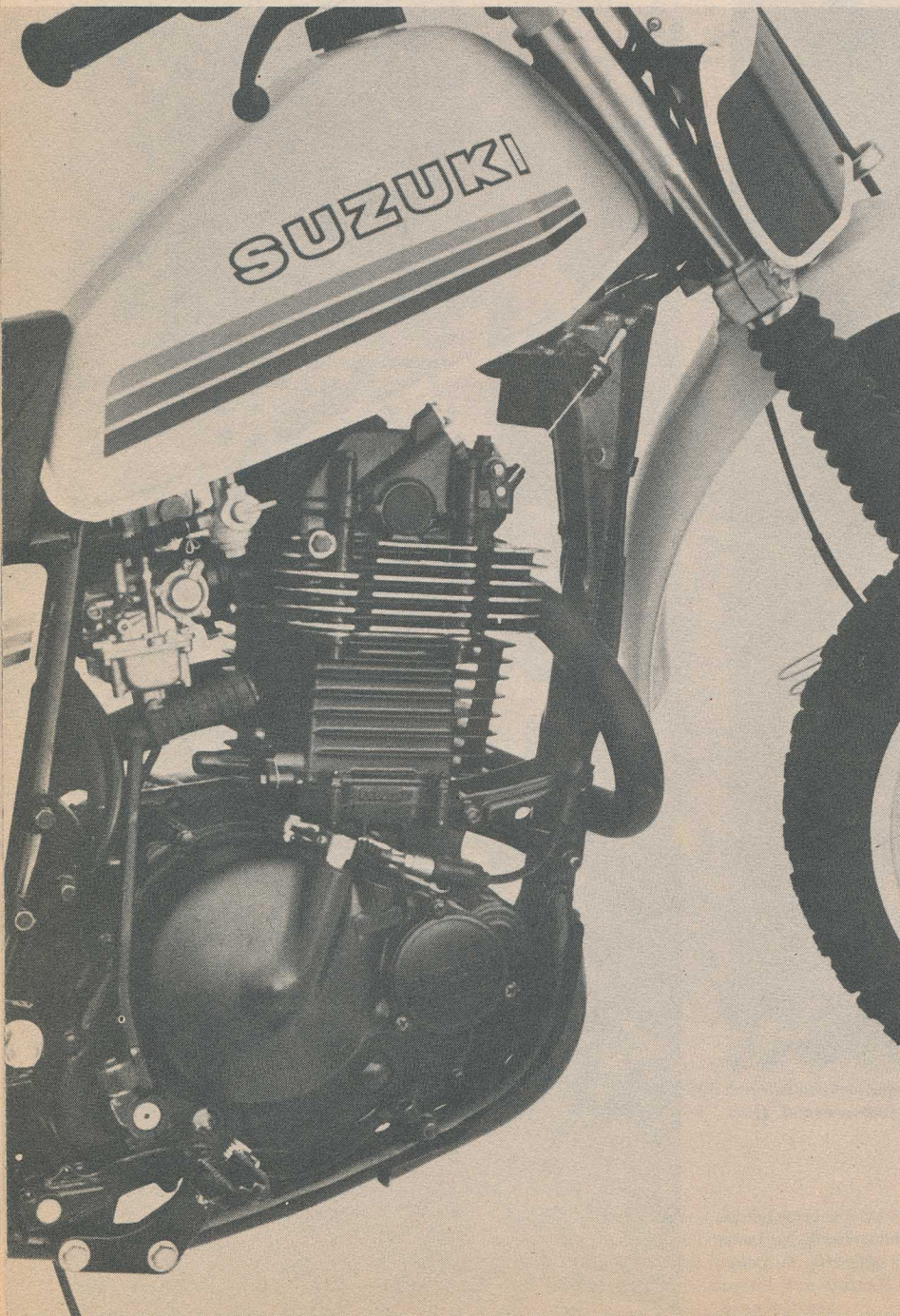
sideways on a fire road. It's one area where the two-stroke riders have to take the back seat.

There have been big bore four strokes for as long as trail riding has been around. Over 10 years ago it was difficult to find anything else in a play riding area. BSA 441s, Triumph Cubs and twins were the pioneers of off-road riding in the United States. Back then, if you didn't have a four stroke, you just didn't go riding. Those were the days when trail-worthy two-strokes were ridden by brave souls, riders who could fill their pockets with spare spark plugs, and when

needed, perform trail side miracles to keep their "ring-dings" running.

Things have changed, and the two strokes have taken over dominance of the sport, but the hearty four strokes still live. Honda blazed a trail for the Japanese with the XR series—starting towards the "large engine" with the XL350, moving it up to their eventual XR500, and picking up avid fans along the way. Yamaha wasn't about to be left out in the cold, and countered with the XT500, moved up to an XT550 for 1982.

Four years ago Suzuki jumped into the fray with their new single-cylinder



*The 35mm Mikuni carburetor pumps the fuel into the DR500. It's a stingy carb, keeping the bike's gas consumption to a minimum.*

*With four valves in the cylinder, this 88 x 82mm single cylinder four stroke packs plenty of torque yanking ponies. She's heavy, but she's strong.*

four stroke—the DR400. Although a lot of people went out and purchased the bikes, they quickly found out that it wasn't exactly a threat to the trail king XR500 Honda. But it was a four stroke, and if you were a Suzuki fan, the waiting was over.

Fortunately the guys at Suzuki didn't just throw the DR400 out to the masses and leave it unattended. First year sales were impressive enough, and rider reaction good enough, for Suzuki to do a repeat performance in 1980, pumping out more units that were beginning to show up on trails and OHV parks across the country in increasing numbers.

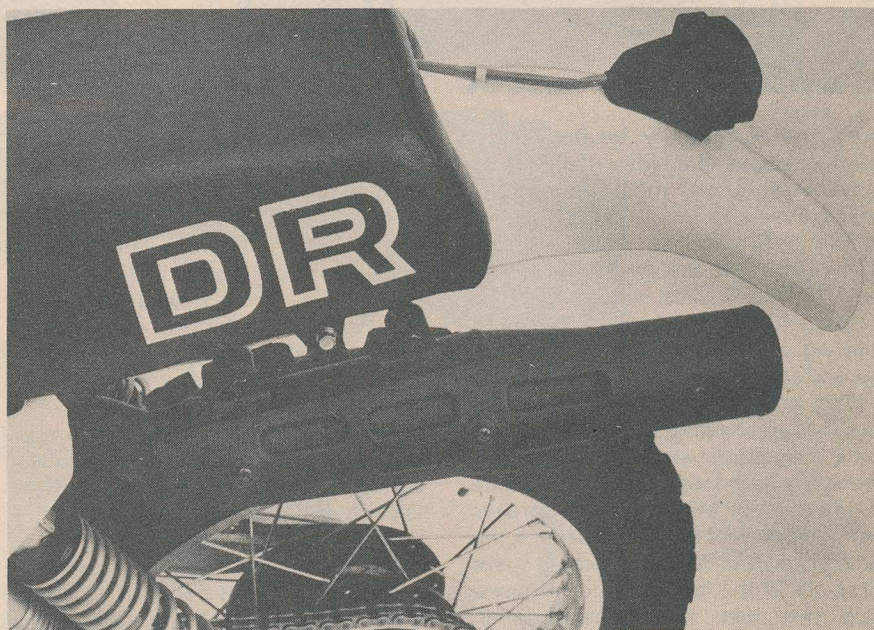


Yet there was still that nagging little factor—the DR400 still wasn't a 500. Its biggest competition was bigger—all you had to do was read the side panel to see that the Honda XR and Yamaha XT were bigger—and to many potential customers, bigger must be better.

Suzuki countered the attacks. The DR400 went up to a 500cc motor, and became "established." During the 1980-81 engineering season, the DR was pulled into the design rooms and received a major transformation. The standard engine was kept—but the top end went through an exercise program that increased its punch.

To increase the engine displacement in the DR, Suzuki engineers increased the stroke, and lengthened the rod. The cylinder bore (width) remained at its established 88 millimeters. The stroke was increased from 65.2 to 82 millimeters. For those of you with calculators handy, you probably beat us to the final figure—a total displacement increase of 102ccs, breaking into the magical 500 category.

The DR400 became the DR500 and joined the ranks of established ground shakers. Suzuki engineers could have easily stopped there, simply increasing the stroke to classify themselves into the 500cc division. But knowing what they were up against, they threw in a little extra touch—a new four valve head and



*A large silencer is well balanced and attached to the DR500. Some riders replace it with a smaller equally quiet unit, to cut down on the DR's 290 pound weight.*

their Twin Swirl Combustion Chamber design.

The Twin Swirl Combustion Chamber (TSCC) provides better power and throttle response than a normal two-valve four-stroke engine, or even a four-valve unit without TSCC. Suzuki designed the TSCC with the goal of improving intake charging efficiency and burning efficiency.

If you were around for the muscle car era of the late Sixties, you'll remember "hemis," or hemispherical

designs. Car engineers discovered that if they put depressions or dimples in areas of the combustion chamber like piston tops and head domes, the engine burns and pumps fuel through the chamber faster and more efficiently.

In the Suzuki DR500 the improved charge burning efficiency is achieved with the two semi-hemispherical depressions in the head, which have corresponding spots in the flat piston. There is an extremely wide squish

*The front suspension travel is 8.6 inches—a little short for a machine this large. The forks are air assisted, a nice addition that many riders find useful for a smooth ride.*

*This small chrome grab rail is priceless when you “stick” the DR500 and have to muscle it back on a trail. The handle is flush with the seat, so you won’t land on it if you fall.*



area and a centrally located spark plug—instead of a side entry plug as is common on most four-stroke bikes.

The shape of the cylinder head, combined with the two (rather than one) intake valves causes the incoming fuel and air mixture to start zipping around the cylinder in two separate high-speed swirls. The wide squish area at the top of the piston helps to accelerate the swirls. At the time of ignition, when the spark plug lets loose and does its thing, the flame introduced to burn the fuel spreads very rapidly. The flat topped racing type piston and centrally located spark plug aid in the fast burning of gases. The two fuel swirls, traveling in separate directions, achieve their goal of keeping the air and fuel thoroughly mixed—one of the keys to good ignition and performance.

Suzuki went after more high charging efficiency by using two high flowing intake valves, recessed in at a 20-degree angle. The valve guides don't protrude into the critical areas and hamper intake flow. The overall design results in fuel getting quickly into the cylinder in the best possible position, only to be pumped out rapidly after it's burned. By installing four small valves in the engine, rather

than two large valves, they're able to get a more efficient running engine with a lot more muscle. Four little valves will pump more fuel than two giant valves. The four-valve system also helps to keep heat down, since each valve, when viewed alone, has less work to perform, and doesn't have the individual high demand that a standard two-valve cylinder head is burdened with.

When you build a faster motorcycle, you've got to upgrade suspension at the same time. In its fourth year, the DR has gotten longer legs. This year's version offers long travel leading axle forks with 9.1 inches of movement, topped off with air caps (a touch that was sadly lacking last year). Suzuki depends on a company called Kayaba to supply them with suspension. Kayaba is one of the giants in the fork and shock worlds. They're the ones responsible for most of the suspension on today's Japanese machinery, both on the dealer's floor and the exotic racing bikes.

Rear suspension on the DR500 Suzuki is handled by a pair of piggy-back gas/oil Kayaba shocks. These shocks have five different preload settings and are mounted to an aluminum box-type swingarm unit that floats along on needle bearings.

Total travel in the rear end is 8.5 inches.

Frame geometry on the DR500 has changed little over the years. Other than a few adjustments to accommodate the longer suspension, the same basic frame has remained on the machine for four years.

There is a wide firm seat, large enough for two-up riding. Just below the seat on the right side is a grab rail, handy for pulling the DR out of places it shouldn't have gone. The grab rail is tucked well enough under the seat that it poses no threat to the rider. If you manage to land on the grab rail, we'd like to know how you did it.

Up front is a very small but effective headlight and a resettable trip-meter with magnified lens. On the left of the bars is a hand-operated compression release. By pulling in the lever the rider can move the piston to top dead center, a position that is ideal for starting. The compression release not only alleviates a lot of kicking, swearing and heavy breathing, it makes the DR500 a machine that just about anyone can start—provided they follow the standard procedures.

The DR has a five-speed primary kick start transmission. The gears are spaced well to correspond with

engine power. We rarely found ourselves lacking for good pulling power. If there are blemishes in the gear box design, the engine is strong enough and impressive enough to cover them up completely.

Our first ride on the DR500 brought to light one fact very quickly. This is not a featherweight motorcycle. Spoiled by 200-pound two-stroke machines, we really noticed the DR's over 300-pound weight when going down a trail. The white Suzuki weighs in at 280 pounds without fuel or oil. Add gas, fork oil and gearbox lubricant and you've topped the 300 mark. It may not be overly heavy in today's four-stroke field, but it sure adds up about the second or third time you have to pick it back up.

The weight is barely noticeable when you're pounding the trails. The DR500 is fast enough to easily handle its own payload, along with the rider. We managed to race with a few XT500s in all out throttle twisting drag races. The bikes were fairly even in acceleration, with the Honda getting the nod about 60-percent of the time.

It's only when you fall and start picking the White Knight up off the ground that you realize she's so heavy. The extra weight is one of the

things you have to accept when shopping for a four stroke. They have more moving parts, and larger parts, than a two-stroke. If you want the all out torque and muscle that a four-stroke provides, you've got to be ready to accept the accompanying weight.

Bulk aside, the DR500 is really a blast to ride. Our test riders got a real kick out of charging almost impossible uphill from a dead start in third gear. A little clutching, and good choice of lines, will let you climb things slightly easier than Mount Everest in one gear. The DR isn't quite an automatic, but you're definitely not going to wear out your left boot shifting all day.

We were surprised that it stopped so well, knowing that it weighed 300 pounds, we were a little careful at first, being cautious about overshooting corners. Once a little confidence was installed, we discovered that the brakes, although they look small, are capable of grinding the DR to a halt at a moment's notice.

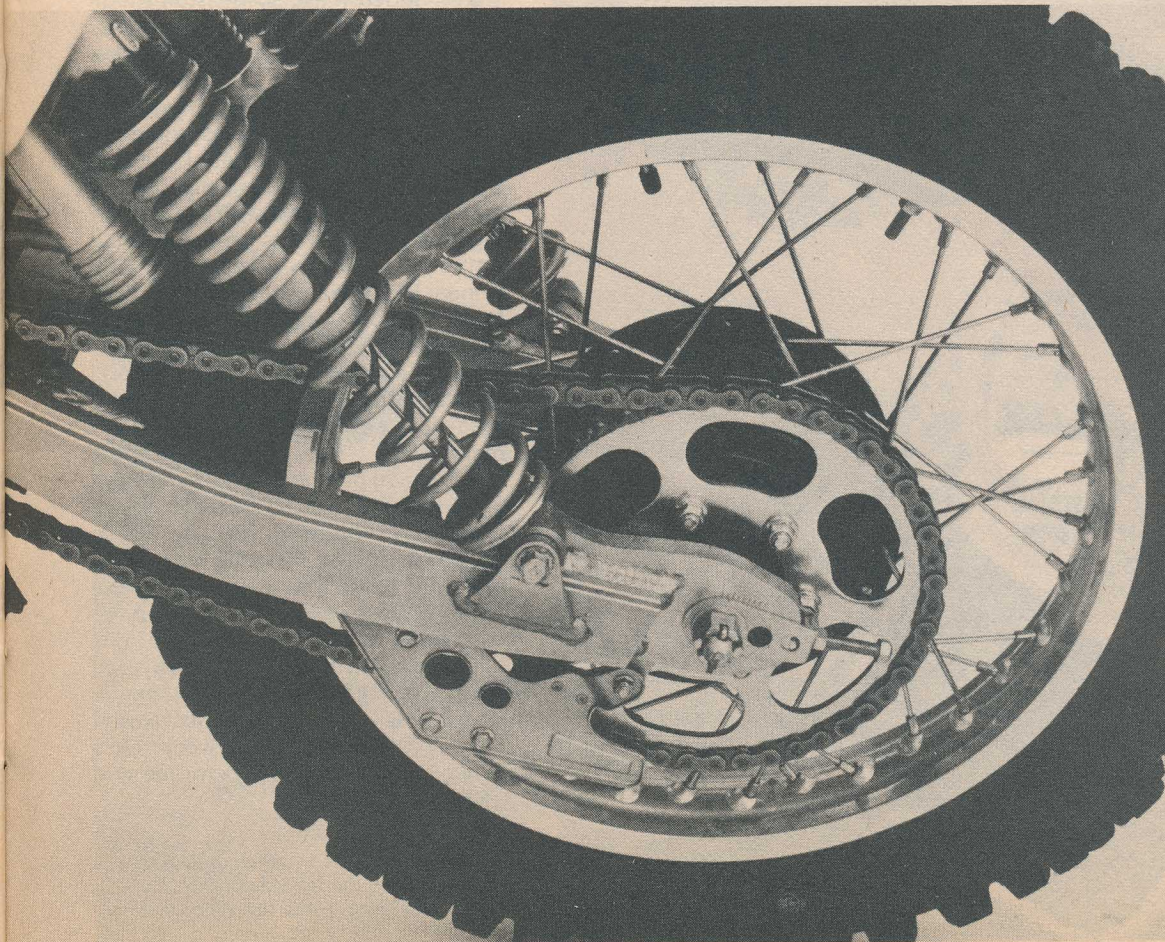
The ability and advantages of the DR's stopping power and weight were vividly demonstrated during one of our fire road runs. Riding on a deserted two-track trail, we had the DR500 and a pair of two stroke

machines. Clipping around a corner, we discovered something new about our favorite riding area—it was being used as open grazeland for sheep.

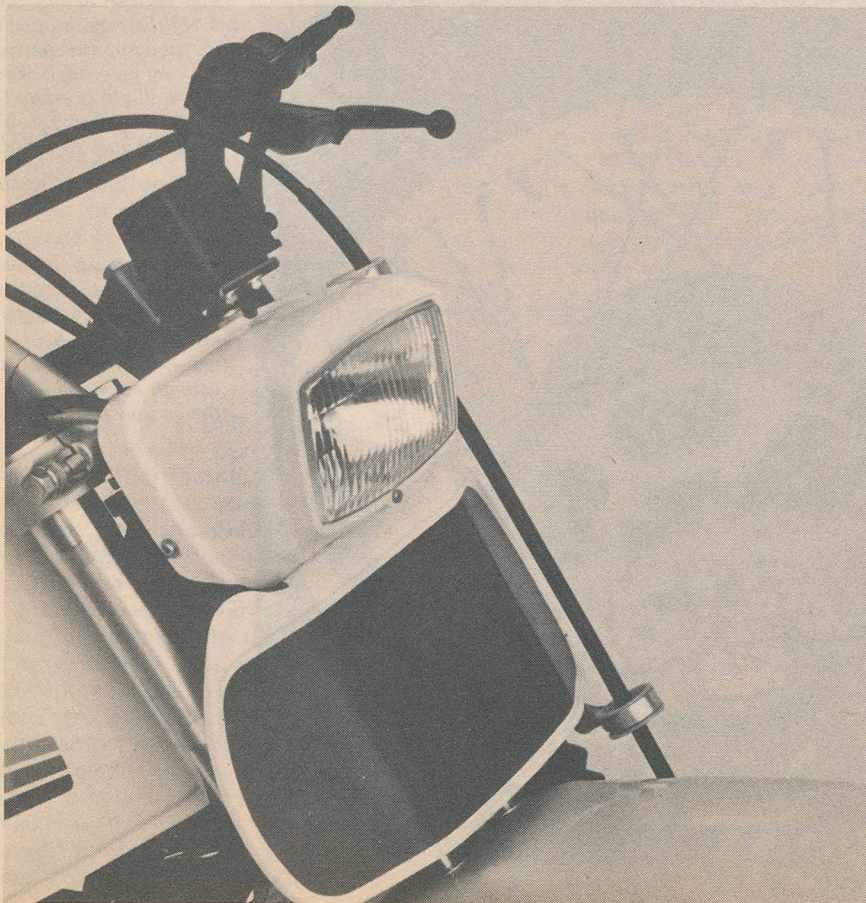
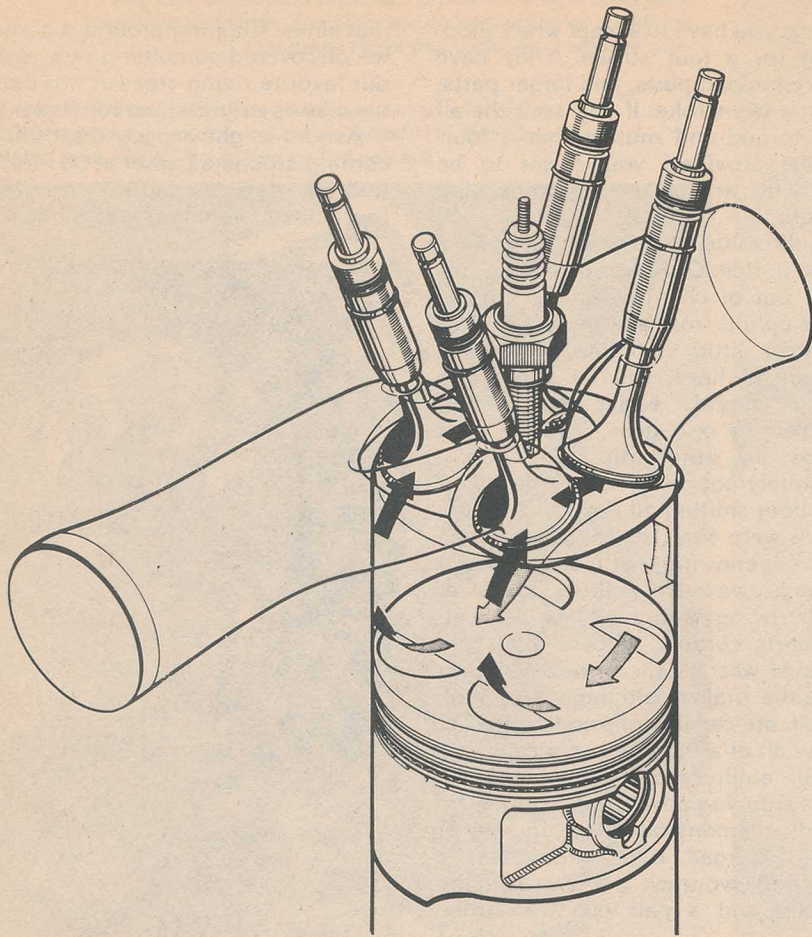
As you might expect, the thrill of coming around a corner at 50 mph to find the road covered with over 100 four-footed wool sweaters tends to



*The rear fender is narrow enough to stay out of the way, but wide enough to keep mud off your back. The taillight is securely mounted and won't leap off on a trail ride.*



*These reservoir piggyback shocks help the DR reach it's 8.2 inches of rear wheel travel—not quite enough suspension for the serious trail rider.*



get your attention. All three riders came down hard on the brakes—and the DR500 was the first to stop. The pair of two strokes, which were lighter and thought to stop quicker, both went zinging past the DR500. After that incident we never hesitated to dive deep into corners. The DR500 proved that it can slow down as well as it accelerates.

The only area where the DR500 seemed to let us down was in suspension. Although it's got over nine inches of front fork travel, and 8.5 inches of rear wheel travel, it just doesn't seem to be enough. This is a heavy bike, and needs a lot of suspension to help carry the weight and smooth out the bumps. Its closest competition, the Honda XR500R has over 10 inches of travel front and rear.

If you go riding with people considered to be fairly competent on a motorcycle, the DR500 probably won't lead the pack—at least not in stock trim. Big jumps, deep ruts and the usual rocks/log obstacles will slow down the DR a little more than other machines, primarily because the suspension can only be pushed so far.

Fortunately a lot of the aftermarket guys have come up with different swingarms and shocks for the rear of the DR, along with fork extension kits. The total travel can be increased to over 10 inches for a little over \$400. We've ridden these suspension modified machines, and found that they turn the DR500 from a good trailbike, to a great trailbike.

Without the suspension upgrades, there are still a lot of places where the DR will work well. Normal play areas, that aren't extremely harsh in terrain, are easy to maneuver with the thumping Suzuki. Fire roads are its absolute home turf—even trouncing the Honda. In fire road situations, the DR's lack of long suspension actually results in a better handling motorcycle. It's easy to pitch a tall, long legged motorcycle sideways on a dirt road—but sometimes they're hard to reel back in.

When you pitch the Suzuki sideways on the same road, it arcs out slowly and surely. You never feel like you've "cast out" too far. The DR acts like a half-mile bike, with plenty of horsepower on tap, despite the fact that the rear wheel is spewing shovels of dirt out the back. During our fire road blasts, the DR500 Suzuki consistently lead our racing pack. There just wasn't anyway that the hybrid two strokes could compensate for its torque and good sliding abilities.

*The front headlight is above the number plate area. On the left side of the handlebars you can see the compression release lever above the clutch.*