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THUMPING IRON: TT-500 VS. DR-370

MODERN CYCLE

VOL. 14, NO. 10 OCTOBER 1978 PDC $1.25

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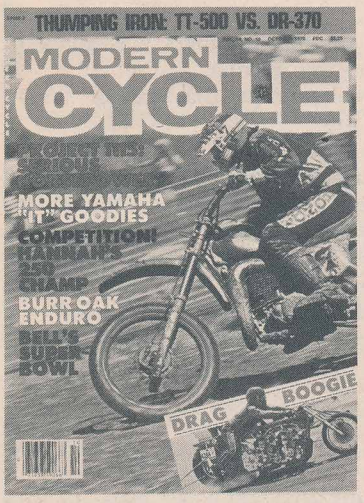

ON THE COVER: Team Honda's Tommy Croft is the force in the 500 class, especially at Sears Point. Photo by Ned Owens.

Ken Annesly aboard the Motorcycles Unlimited's double-engined top fueler. Photo by Jeff Peck.

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A New Champion?

THUMPING IRON

Yamaha TT vs. Suzuki DR

BY NED OWENS

A confrontation was inevitable. For three years the Yamaha TT-500 has reigned as the main thumper and prime mover in the resurrection of the four-stroke dynasty.

With the rare exception of specially built Honda 350s in trick frames, the big Yamaha single has been king. As the only off-the-shelf, semi-serious, open-class, off-road thumper, the TT-500 signaled the changes in environmental policies and a return, say some, to a type of bike *really* worth riding and owning.

But the TT-500 was not without faults and it soon developed a huge aftermarket of power and handling components as well as accessory frames. This did not, however, diminish America's appetite for the thumper. Not at all.

After the rapid success of the TT, the rest of the Big Four went about building a competitor. Honda is currently testing a 450, Kawasaki is rumored to have a DOHC single in a prototype stage. But it was Suzuki who was first to hit the market with their DR-370.

With the TT-500 square in its sights, Suzuki rolled out its first four-stroke single. And, the similarity is there, but mostly in dimension and layout rather than the mechanics.

IN THE ENGINE ROOM

One of the biggest drawbacks to a single-overhead cam four-stroke engine, besides the additional weight over a similarly sized two-stroke, is that they are very tall. Since the modern motorcycle, by design, has only so much room between the backbone and the lower frame, engineering problems exist as to how to fit the maximum amount of motor into the minimum amount of space. Yamaha opted for a dry sump design that would enable the engine to


29
SUZUKI
DR370

Head to head: who'll be the fairest thumper of them all?

be placed very low in the frame and allow a long stroke. But with this type lubrication, the oil must be carried somewhere else. In the TT it is carried up high on the backbone under the tank.

Suzuki, on the other hand, decided to avoid the remote oil tank and lines by using a more conventional wet sump. This usually leaves the crank center slightly higher, provides slightly less ground clearance but redistributes the weight of the lubrication supply and engine mass better.

As anyone who has ever ridden a TT-500 knows, the long stroke 500 is absolute torque city. While providing this stump pulling power, the long stroke has two drawbacks: the bike is hard to control at very low speeds and starting is more difficult. Yamaha riders will also attest to this.

Noting that these were two of the complaints about the TT-500, Suzuki decided to cure both with a short-stroke engine design. Coupled with a slightly lower compression ratio, the 85 X 65.2 (bore X stroke) configuration makes the DR easier to ride at low speeds and makes starting almost as easy as a large two-stroke single. The disadvantage is that the displacement is kept to a moderately-sized 370cc. Will this trade-off of nearly 130ccs keep the DR from becoming a contender? Read on.

Both engines are Mikuni-fed with a correspondingly smaller carb (32 vs. 34mm) on the light displacement DR. Push/pull throttles and oiled-foam filters complete the similarities of the intake systems.

Both ignitions are magneto/points arrangements. The Yamaha points are operated from an accessory drive off the right side of the engine. Similar to the Honda singles, Suzuki has placed the points up top to be operated directly off the end of the cam shaft.

Clutch, transmission, primary drive and timing chain location are very similar on both bikes. Without the accessory drives and a slimmer flywheel, the Suzuki exhibits a narrower engine with smoother side cases. Both motors are protected by aluminum skid plates that offer excellent protection. The Suzuki's is drilled out to be less of a marine-type "bow" in deep water.

FRAME-UP

Both models use a single front down tube, semi-double cradle design crafted of mild steel. Frame tube diameters are very close, with the obvious exception of Yamaha's back bone oil tank. Also the swingarm tubing diameter on the Suzuki is nearly 30 percent larger than the TT, which turns out to be a very important factor in the handling.

Steering angle differs, with a rake of 32 degrees on the Suzuki, compared to only 30 on the TT-500E. Both frames feature bolt-on footpeg mounts with spring loaded, folding, serrated pegs. Although the ground clearance varies by less than half an inch, (DR, 8.9 vs. TT, 9.3) the TT gains another full inch in the footpeg height through a higher mounting position.

SUSPENSION

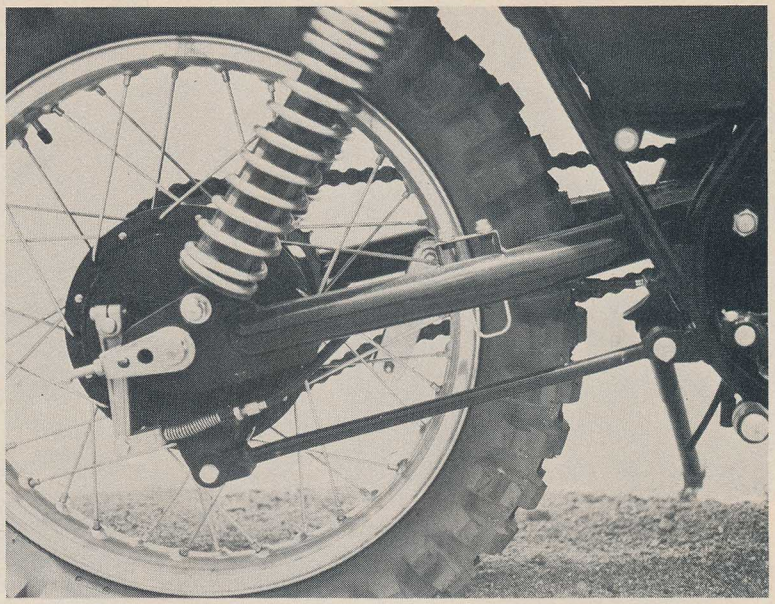
Basically, the Yamaha suspension is the same as when it was first introduced in 1976. Damping and spring rates have been refined and changed, and the basic parts have remained unchanged. A slight steering head angle change made the switch from C to D, along with a little bit more travel, but there are no appreciable changes from D to E models. Non-offset axle forks protected with black boots are still the staple fare up front. Gas-filled, variable pre-load, oil/spring shocks reside at the rear with the task of cushioning this heavyweight.

Suzuki borrowed a set of forks from the RM-250/370 A models that are worth 7.7 in. travel. These leading axle units sport black sliders and the ever-present boots. Since only the internals differ, fork improver kits for the older racers are interchangeable on the DR. The top triple clamp is cast with mounting holes for a tach and speedo that comes standard on the DR's brother, the street-trail SP-370. Non reservoir gas Kayabas with chrome (what?) springs are set at a mild laydown.

Both bikes utilize spring-loaded chain tensioners. The Yamaha's is a slipper type mounted behind the engine and is assisted by a guide mounted near/toward the rear sprocket. The DR's twin-roller tensioner is rear mounted and doubles as the guide. For long chain life, the roller type tensioner is preferred — less abrasion than the slipper.

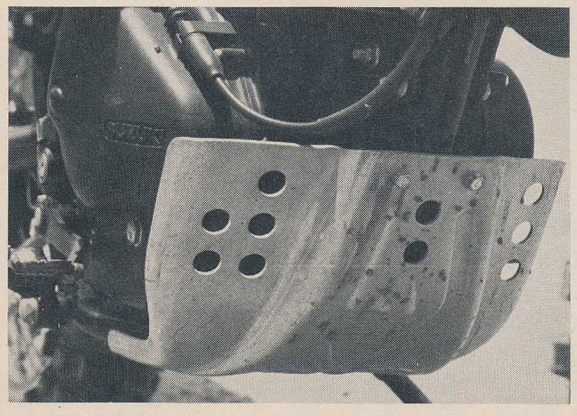
THAT'S THE BRAKES

Up front both thumpers sport conical aluminum hubs, wrapped with aluminum rims and 3.00 x 21 tires. At the

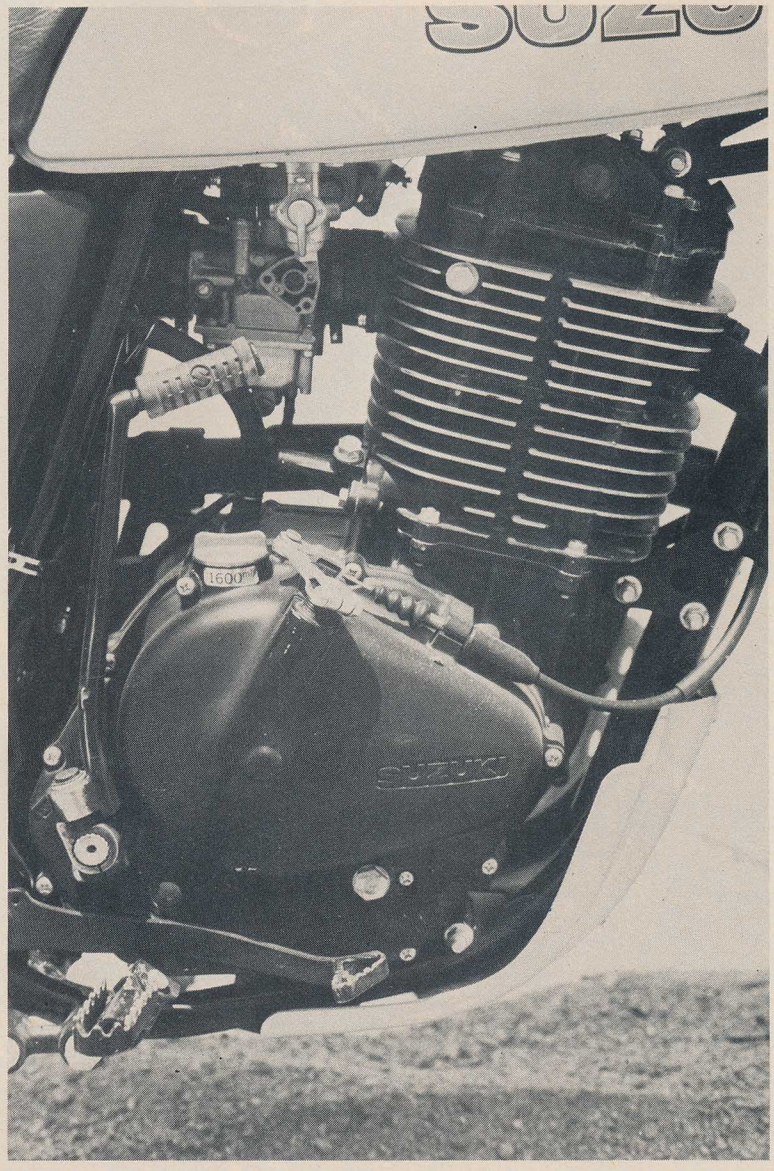


Suzuki's full-floating brake panel features double row bearing and low maintenance torque arm bushings. Feel is excellent.

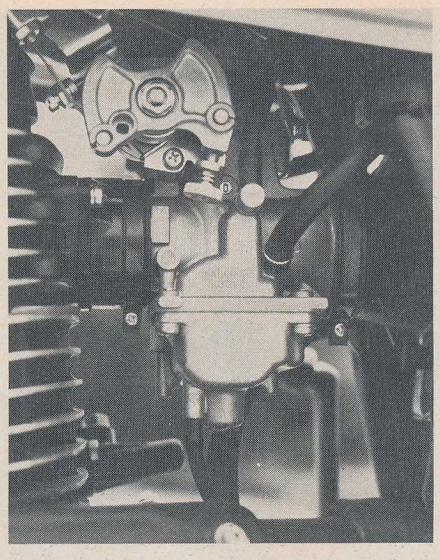
Leading axle forks from earlier RMs are good for 7.7 in. travel. Bobbed front fender is worthless in water.

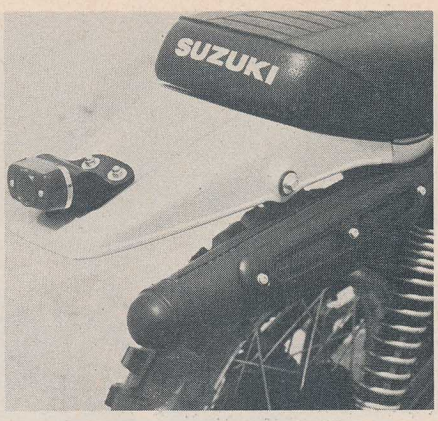


Wide Suzuki skid plate has holes to help avoid "bow" effect.



DR-370 engine more closely resembles Honda single than the TT-500.





Rear fender is steel, and has reinforcements for lifting. Enduro taillight is standard on the DR.

DR is fed through 32mm Mikuni operated by push/pull throttle.

rear, things change with the DR-370 utilizing a full-floating brake panel design, as apposed to the more conventional Yamaha set-up. The floater is cable operated. A split-link rod actuates the Yamaha brake. The DR floating panel is similar to those in use now on the larger RM series machines, and features low maintenance torque rod bushings and a double row bearing in the brake panel.

A healthy 4.60 x 18 skin is used to transmit the Yamaha's massive amounts of torque to the earth, while a smaller 4.00 cross section rubber is chosen for the DR.

ALL THE REST

Considering cost factors, Yamaha has paid close attention to the weight on the TT-500. The tank is constructed of aluminum, and the fenders and side panels are lightweight plastic. On the other hand, Suzuki chose to use steel as the material for the tank and the "flat track" flavored rear fender. Add to this, an enduro-sized head and taillight, and you begin to wonder how much lighter the DR would be if equipped as the TT is. Even with this extra poundage, the DR comes in 7 lbs lighter than the TT when dry and nearly 10 lbs lighter when they are both full of gas and lubricant—279 vs. 289 lbs.

TWO-EIGHTY-NINE!!

Whew! That made all the Modern Cycle mouths drop open. When you're working with 185 to 230 lb. machines, it really stops you in your tracks to talk about the near 300 game.

But weight, believe it or not, is not a factor to the hard-core thumper freak. Oh, sure, he'd like to have a 240 lb. TT-500, but an extra 50 lbs. is not going to cause him to give up and go to a two-stroke. No way! No doubt about it, they're both heavyweights. But as we will soon see, the distribution of weight is more important than how much.

On the noticeably narrower and taller bars on the DR, one notices the lack of a compression release—a hint of the starting characteristics. Bars, grips and levers are very personal items, so it can't be professed which is preferred—except by each rider. The front half of

the seat and the tank are very slim on the DR and give the feeling of a smaller machine.

THUMPING OUR BRAINS OUT

Starting a four-stroke single like the TT-500 takes a heavy foot and a well-learned drill. With a lot of practice, it becomes more routine, but even long-time Yamaha TT riders have been seen kicking the daylights out of their fickle scoots—especially when they get hot. Some riders, because of physical size or lack of gumption, cannot successfully—time after time—start the TT-500.

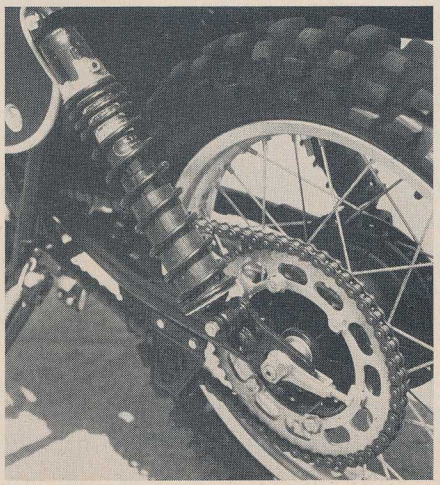
Taking this into consideration, starting the DR-370 is an absolute picnic. Our DR started *first* kick, nine out of ten times, and usually without going through the "slightly-past-top-dead-center-now-leap-on-it" drill. It still takes a deft throttle hand to start first kick when hot, but is a vast improvement over the TT. The short stroke engine is just much easier to get spinning than the long-stroke Yammie.

One of the big questions in this shootfest, was whether or not the DR—down by nearly 130ccs displacement—would be able to match the power of the TT-500E. Our question didn't go unanswered very long. After a short warm-up, the drag racing commenced and the TT walked away easily from the DR on any straight of any length or angle. Three bike lengths in a hundred yards was just about average kicking-butt distance for the Yamaha. If you are concerned only with the speed of both units in stock trim, then read no further, the DR is off the pace.

Since we like to go around corners and over bumps when we ride, too, "most beans" would not be the deciding category for best thumper, though.

"I'd like to have a DR with a TT-500 engine."—Mark

Taking them out of their ordained environment (the netherworld of the play-bike), we pitted them against each other on the motocross track. We didn't choose a killer track like Carlsbad, but rather a gentlemen's track—smoother and shorter. After a couple of bone jarring laps, both bikes were back in for tweaks up to the maximum preload on the shocks, and speculation on whether this was the right thing to be doing with these machines.



Shocks are not as much of a problem at the rear as is the swingarm.

After 15-20 laps per rider per bike, one thing was quite apparent, the Suzuki was the only handler in the test. The bike steers well and reacts well to the throttle. Cornering doesn't take nearly as much work on the DR as the TT, as the bike is stable and tractable. Conversely, the TT front end washes out, the back end moves around and the throttle is primarily responsible for steering the bike.

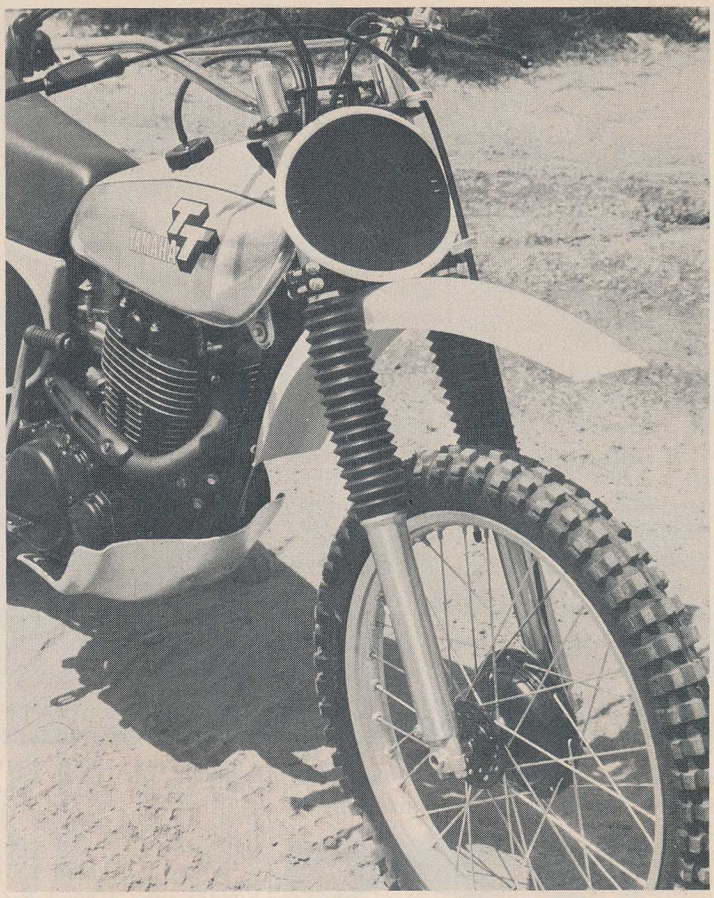
Several factors account for the squirrelly handles on the 500. One is that the wimpy swingarm can't handle the torque and stress on the suspension. This torque also plays a large role in wheelspin, which is easy to do when the bike is laid over for a corner. Also the damping and springing rates are too stiff and too soft, respectively, at both ends.

Not that the DR springing is anything to shout about, but a stronger swingarm,

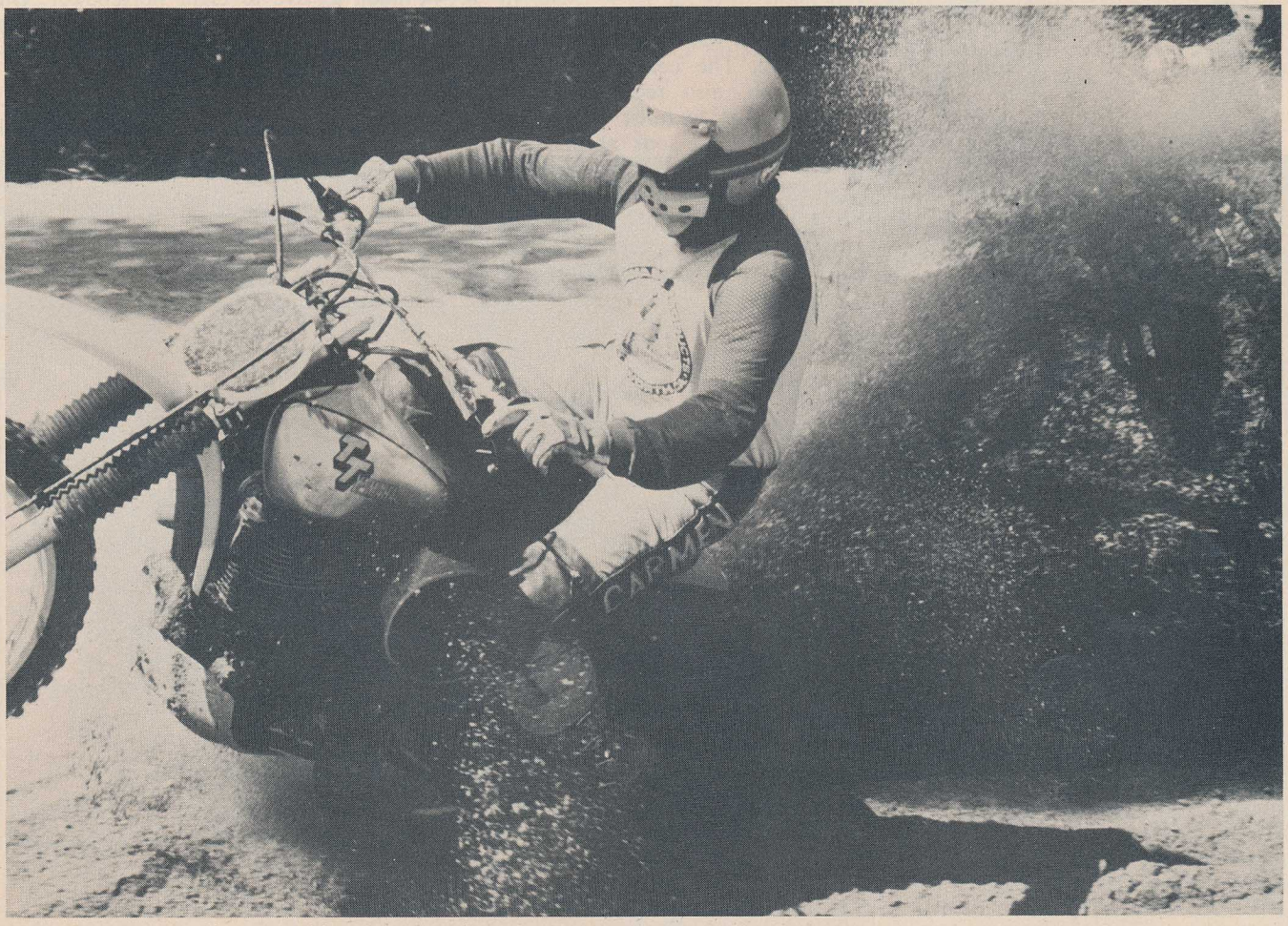
"We'll have a double order of torque, please, but hold the bumps."—The Crew

more closely damped rear and better geometry put it ahead in this area. What both of the machines lack, when they are thrashed hard, is an abundance of suspension travel. It's easy to bottom the suspension at both ends on either machine. The difference is that when the TT bottoms, it starts flexing as if it is jointed somewhere between the natural joints—the swingarm and steering head. When the DR bottoms, it

(Continued on page 74)



Center-line axle forks have a bit too much damping. Fork boots help seals last much longer.



TT is winner of wheelie competition— torque city.

IRON

(Continued from page 38)

doesn't do anything but let you know through the thudding sound that it has reached its limits.

Probably the most important aspect of the handling, though, is the weight distribution. Although the difference in weight is only 7-10 lbs, the DR *feels* 30 lbs lighter. The weight on the TT feels like it is all up at the level of the carb, while the Suzuki feels more like all the weight is down at the pegs. It's a tribute to Suzuki engineers, whose choice of designs and suspension geometry provides a low "lean" weight.

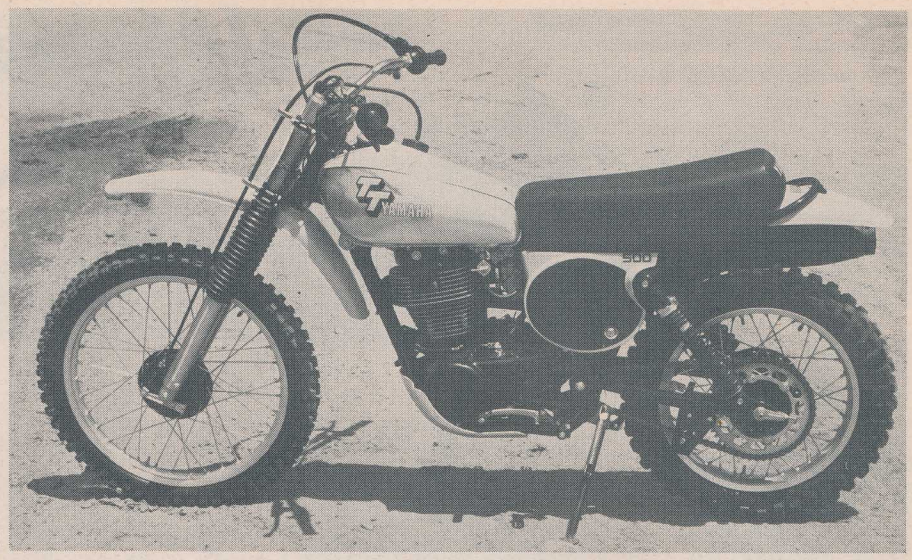
Races on the motocross track, prove that might makes right, as the DR could outbrake and out-corner the TT only to be left on the straights in a shower of gravel.

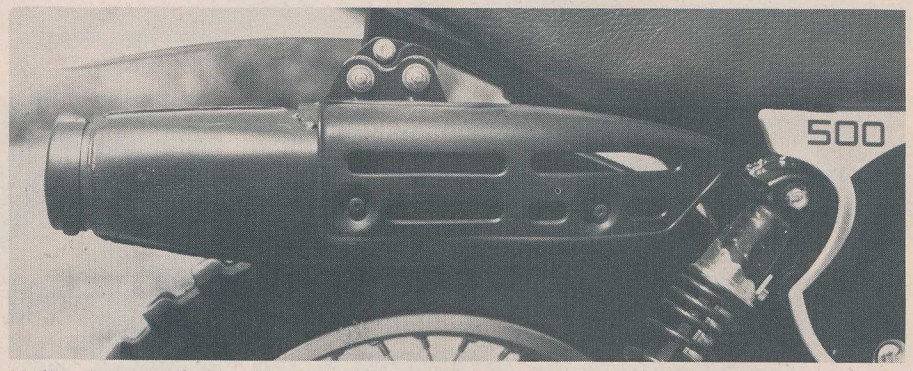
Our next test came on the TT-scrambles track at Indian Dunes. The freshly-smoothed track soon became home for the TT which thundered around blowing the side covers off DR—until the track broke up. The worse the track got as we pummelled away at it, the harder it was to keep someone on the TT-500. As the stutter bumps grew, and the hard-packed clay surface of the smooth corners started to break up, the TT became a bigger and bigger handful. Rapidly, the DR began to gain ground on the 500. The TT still ran away on the straights, but the machine became increasingly more difficult to handle in the corners. Each end of the bike suddenly had a mind of its own, and it wasn't uncommon to see either or both ends off the ground in the corners. Blanched, white-knuckle testers returned with hairy tales of near-terminal augers. Meanwhile. the DR plugged along with determination and finesse.

We continued to thrash.

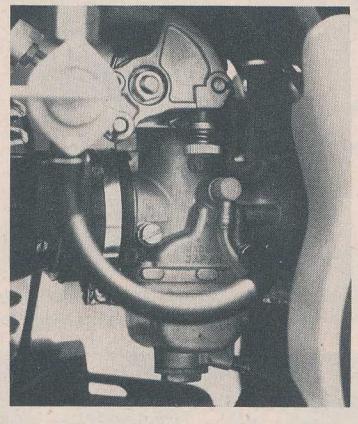
Next stop: all sand and whoop-de-dos. With limited travel, we didn't expect to get great results in the whoops, and we were right. The less than 6.5 in. rear suspensions went away quickly as both bikes' tires made inroads to the fenders and seats. Running at a slower pace found the DR relatively happy, as it maintained fairly good flotation and directional stability. The TT, on the other hand, knifed under at every opportunity and wallowed in all but the smallest whoops. Weight distribution is suspect, as well as geometry.

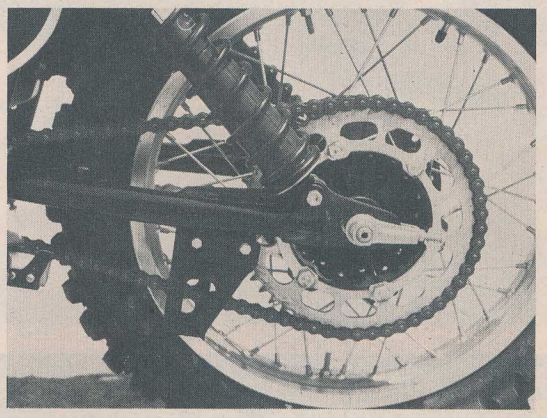
Off to the hills with two torquey climbers, we found that either machine could spin the rear wheel to a stop, but the weight distribution on the 370 enabled it to maintain traction longer. With a mis-application of power the DR was also harder to loop. It took a

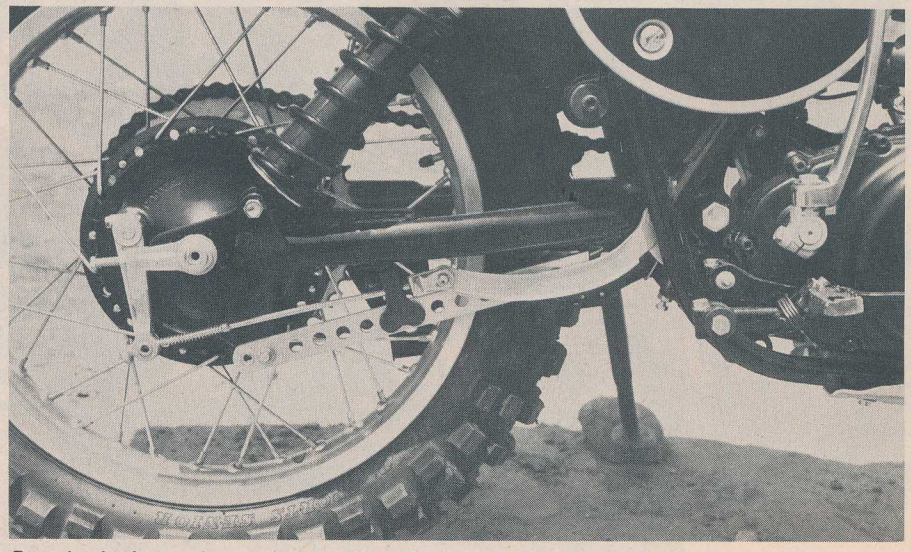




Muffler looks bulky, but is admirably quiet.







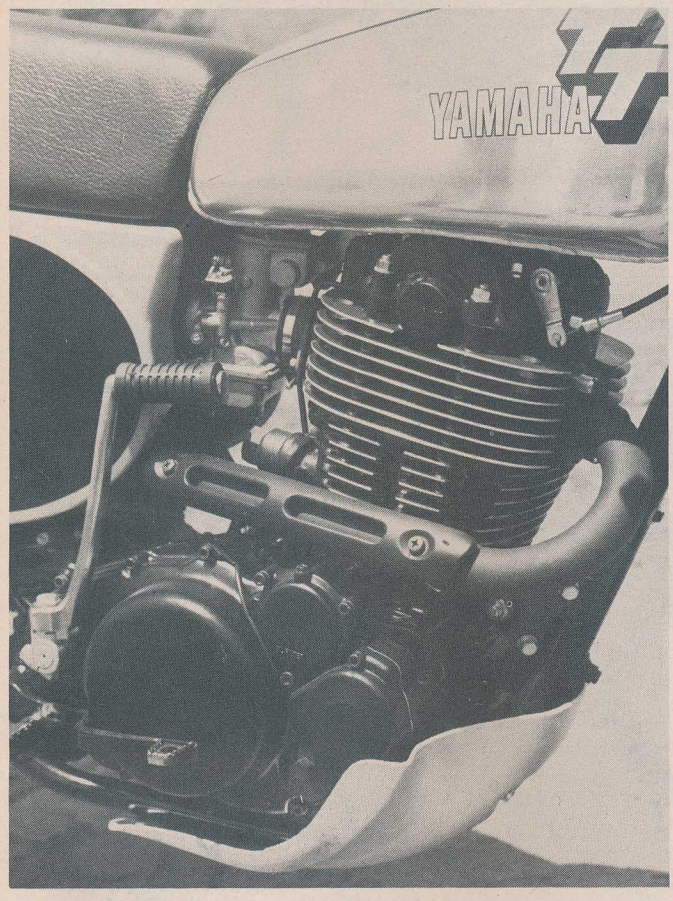
Rear brake is overly sensitive on the TT. Lock up is easy and often.

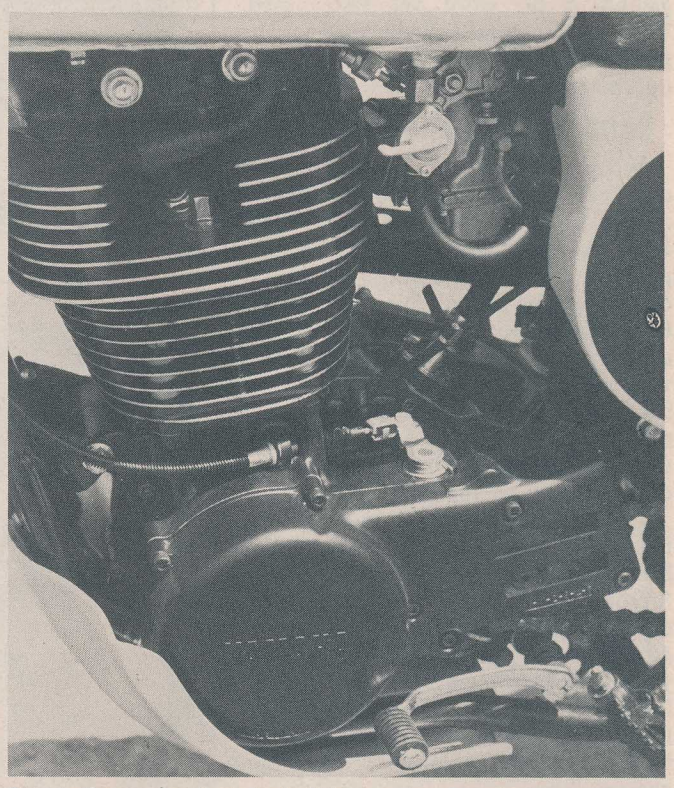
ham-fist or a really steep grade to get the DR to go for the sky.

Downhill braking, by nature of the four-stroke, is good, and the larger TT engine provides a goodly amount. Use of the rear brake on the TT is a very delicate operation. Locking up the rear and stalling the engine is a fairly common occurrence. The overly sensitive brake and massive compression braking are difficult to deal with, especially in panic situations. The tasty, floating brake on the DR-370 can be easily manipulated to find the maximum braking point just before lock up. Soooo nice.

Our next session was up in the tight trails, woods and streams north of L.A. Here its good handling qualities makes the DR the bike to beat. On narrow trails, in tight switch backs on steep ledges, the DR is happy as a little clam. Neither machine seemed to be affected very much by our changes in elevation on these trails up to around 8,000 ft. Where some of the two strokes in our tour where gagging and operating on about one-fifth of the throttle range, the thumpers power tailed off a bit, but throttle response was still pretty good.

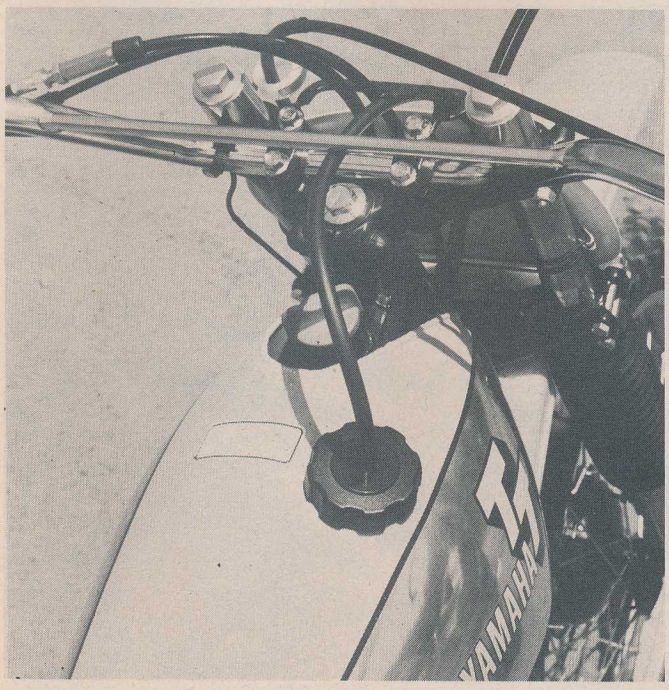
Down out of the mountains in the stream beds, the TT was not particularly happy. Front wheel traction on wet and



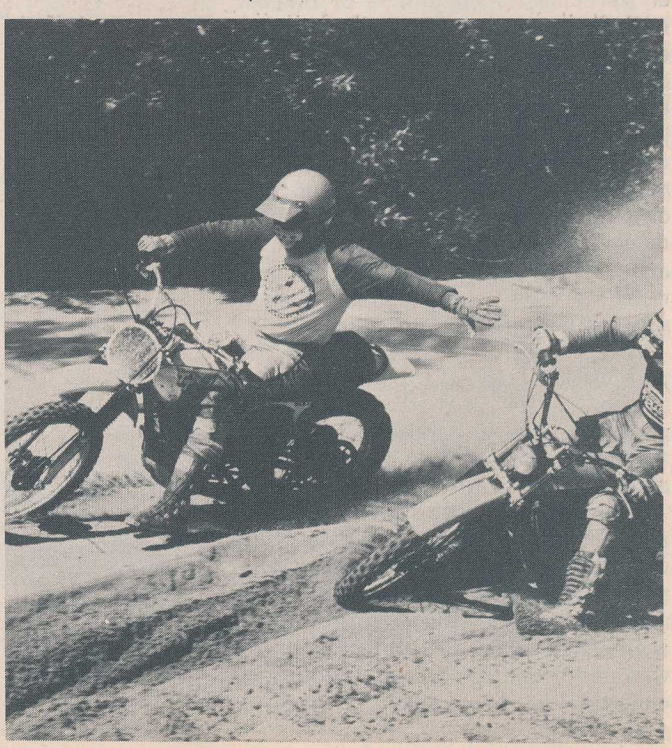


This is the engine that started the resurgence of thumpers. Yamaha's five-speed, 499cc puts out some formidable torque.

Right side of TT-500 engine is very busy with points and other accessory drives. Skid plate works.



Handsome-looking aluminum tank holds 2.2 gallons premium. Oil filler cap is in backbone behind steering head.



dry rocks alike is not good, causing a good deal of dabbing. Again the DR displayed the well-mannered characteristics that it has shown during all phases of the great shoot. It would plonk over logs (small, remember the ground clearance) and pick its way through rocks with more aplomb than the herky-jerky TT. The long stroke surge at low speeds on the TT doesn't enhance any kind of stand-up, trialsy business. "Ungainly" is the word one tester used. This kind of terrain didn't need all the grunt of the 500 either, so the TT came up short again.

AND THE ENVELOPE, PLEASE

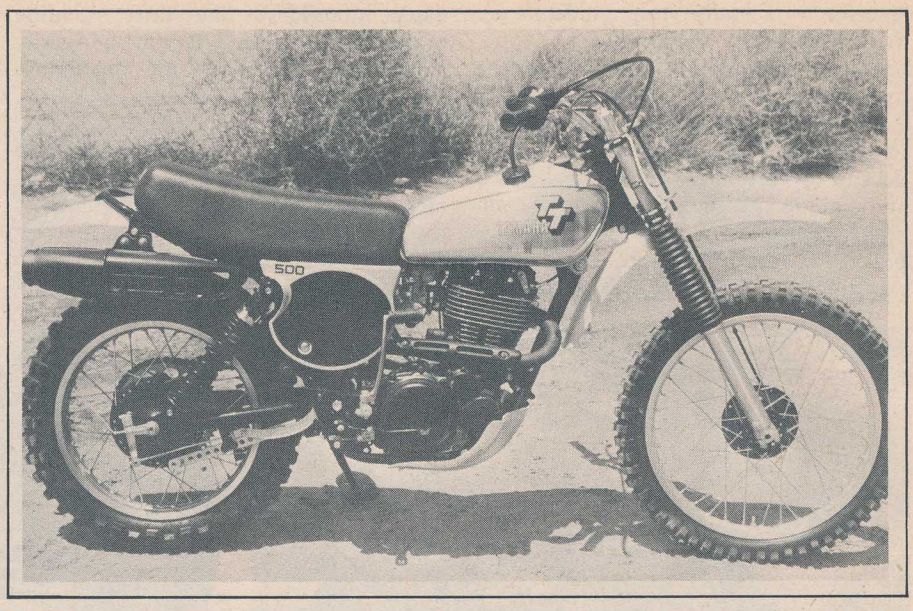
When it came down to the final question: "Which one would you buy?" all five test riders went for the DR-370. Even though it won't stay in the ballpark with the TT in a drag race, everyone picked the Suzuki. Why? All agreed that the massive power of the TT is an exhilarating feeling that sends great vibes through the senses, but as we rode the bikes more and more over different terrain, we found that we dreaded anything but straight line acceleration while on the TT.

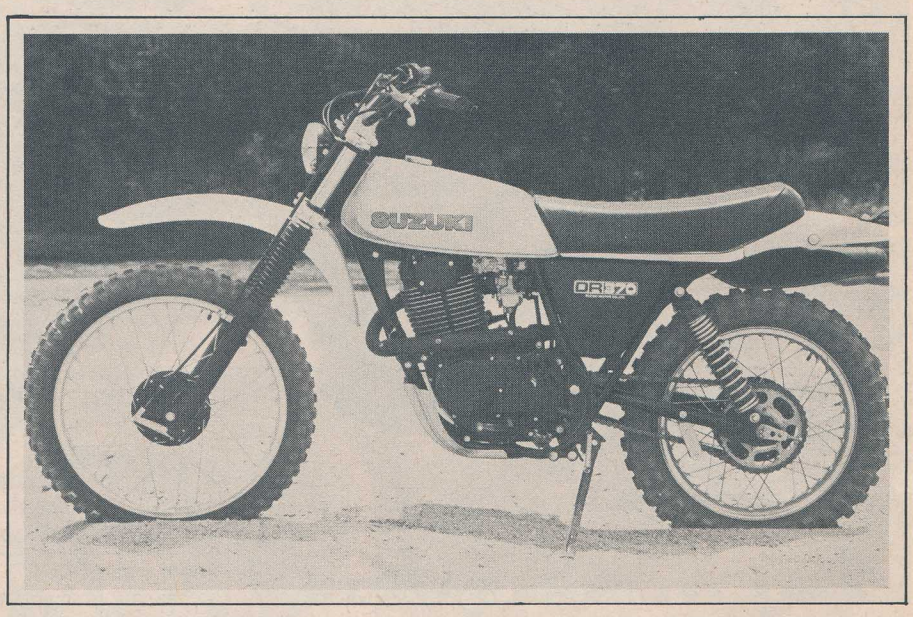
It seems like whenever you go riding with someone who has a stock TT-500 it's to a place full of wide-open fireroads and long smooth desert stretches. If you try to convince him to go trail riding, he's reluctant, because you don't get enough, if any, chances to "open 'er up." And that, basically is mainly what the TT-500E has going for it. A two-gallon engine in a one-gallon chassis.

The "doctor" on the other hand can be happy in a number of situations. It never wants to punish the rider, whether it's being started, turned or braked. It lacks only the punch that the 500 offers and is surpassed in that one area alone. But that's just on a comparison basis. It has enough power to get the job done—especially for its intended use. And the difference in suggested retail prices will easily afford the DR owner performance on a par or better than the TT. And, it will still handle and brake better. If anything, the DR is the opposite—a one-gallon engine in a two-gallon chassis.

A sure sign of the popularity is the post-test use that the bikes get. The "doctor" is always "out" while the TT gathers dust in the Modern Cycle shop. When you want to have fun the DR is ready.

But, are we going to settle for being down on power, but up in handles? No way. We've already figured out a good reliable 41 hp combined with long travel mods to the stock suspension. Happiness is a balance of power and handles. Stay with us for one of our most anticipated undertakings: "The Doctor." It starts next month. ●

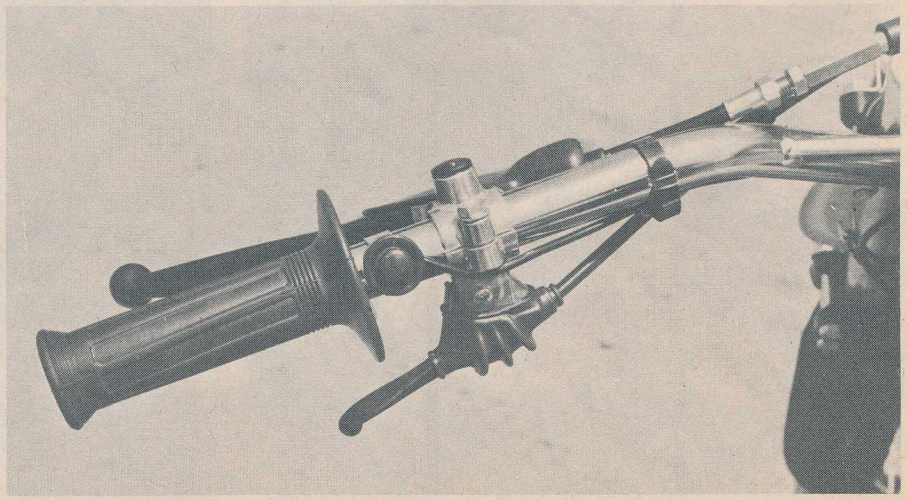




550 RUMORS

Yamaha realizes that their three-year-old work horse is out of date, but they haven't been sitting on their hands. Rumors here have the new TT as lighter; with more suspension travel, incorporating a laydown shock angle and leading axle forks; and more (whew) horsepower—possibly from 550cc.

So the great thumper debate is just warming up, and for four-stroke freaks, '79 is going to be a banner year. ●



Compression release lever aids in starting.

SPECIFICATIONS

NAME AND MODEL ..... YAMAHA TT-500E

Engine type ..... Air cooled, SOHC 4-stroke single
Bore and stroke 87x84mm
Displacement 499cc
Compression ratio 9.0:1
Horsepower:
  Claimed by factory ..... 31 hp @ 5500 rpm
Claimed torque ..... 28.8 ft./lbs. @ 5500 rpm
Carburetion ..... Mikuni VM-34SS
Factory-recommended standard jettings:
  Main jet 240
  Needle jet Q2
  Jet needle 6H-2
  Pilot (low-speed) jet 30
  Needle position 4
  Idle-air screw (number of turns) 1¾
Recommended gasoline (from factory) ..... Premium
Fuel tank capacity ..... 2.24 gal.
Fuel tank material ..... Aluminum
Lubrication ..... Dry sump
Oil tank capacity ..... 2400cc (2.5 qt.)
Air filtration ..... Oiled foam
Clutch ..... Wet, multi disc
Transmission ..... Constant mesh, 5 speed
Gear shifting ..... Left side, manual
Gearbox ratios:
  1st ..... 2.35 to 1
  2nd ..... 1.55 to 1
  3rd ..... 1.19 to 1
  4th ..... 0.92 to 1
  5th ..... 0.77 to 1
Primary drive ..... Gear
Primary reduction ratio ..... 2.566 to 1
Final drive ..... 520 chain—104 links
Final ratio ..... 50-15, 3.33 to 1
Ignition ..... Magneto with points
Starter (type, location) ..... Right side, kick
Primary starter? ..... Yes, sort of
Recomm. spark plugs ..... NGK BP7ES
Recomm. plug gaps 0.07-0.8mm
Silencer/spark arrester (if any) ..... Yes
Exhaust system ..... High, right side
Frame (type) ..... Single downtube, cradle
Overall length ..... 2120mm (83.4 in.)
Wheelbase ..... 1425mm (56.1 in.)
Ground clearance ..... 235mm (9.3 in.)
Overall width ..... 905mm (35.6 in.)
Steering head angle ..... 30 degrees
Trail ..... 132mm (5.2 in.)
Weight, dry ..... 123 kg (271 lbs.)
Wheels/rims:
  Front ..... Spoked, aluminum
  Rear ..... Spoked, aluminum
Tire sizes:
  Front 3.00x21 4PR
  Rear 4.60x18 4PR
Brakes/hubs:
  Front ..... Internal shoe, conical
  Rear ..... Internal shoe, full
Suspension:
  Front ..... Telescopic fork
  Fork travel ..... 195mm (7.68 in.)
  Rear ..... Swingarm, gas shocks
  Rear travel ..... 159mm (6.26 in.)
Fender material ..... Plastic
Color(s) ..... Yellow on black
Intended use (fact.) ..... Off road
Where made ..... Japan
Price $1638
Distributor:
  Yamaha Motor Corp.
  6620 Orangethorpe Ave.
  Buena Park, CA 90620

SPECIFICATIONS

NAME AND MODEL ..... SUZUKI DR-370

Engine type ..... Air cooled, SOHC 4 stroke single
Bore and stroke 85x65.2mm
Displacement 370cc
Compression ratio 8.7:1
Horsepower:
  Claimed by facotry ..... 26 hp @ 5700 rpm
Carburetion ..... VM 32 SS Mikuni
Factory-recommended standard jettings:
  Main jet 125
  Needle jet P7
  Jet needle 6CH2
  Pilot (low-speed) jet 25
  Needle position 4
  Idle-air screw (number of turns) 2
  Cutaway 2.5
Recommended gasoline (from factory) ..... Premium
Fuel tank capacity ..... 2.2 gal.
Fuel tank material ..... Steel
Lubrication ..... Wet sump
Oil capacity ..... 1600cc (1.7 qt.)
Air filtration ..... Oiled foam
Clutch ..... Wet, multi-disc
Transmission ..... Constant mesh 5 speed
Gear shifting ..... Left side, manual
Gearbox ratios:
  1st ..... 2.63 to 1
  2nd ..... 1.75 to 1
  3rd ..... 1.29 to 1
  4th ..... 1.00 to 1
  5th ..... 0.81 to 1
Primary drive ..... Helical cut gear
Primary reduction ratio ..... 3.04 to 1 (67/22)
Final drive 520DS, 100L
Final ratio ..... 2.8 to 1 (42/15)
Ignition ..... Points, magneto
Starter (type, location) ..... Kick, right side
Primary starter? ..... Yes
Recomm. spark plugs ..... NGK D8EA, ND-X24ESU
Recomm. plug gaps 0.6-0.7mm
Silencer/spark arrester (if any) ..... Yes
Exhaust system ..... High, left to right
Frame (type) ..... Single downtube, cradle
Overall length ..... 2120mm (83.5 in.)
Wheelbase ..... 1415mm (55.7 in.)
Ground clearance ..... 225mm (8.9 in.)
Overall width ..... 860mm (33.9 in.)
Steering head angle ..... 32 degrees
Trail ..... 146mm (5.75 in.)
Weight, dry ..... 120 kg (264 lbs.)
Wheels/rims:
  Front ..... Spoked, aluminum
  Rear ..... Spoked, aluminum
Tire sizes:
  Front 3.00x21 4PR
  Rear 4.00x18 4PR
Brakes/hubs:
  Front ..... Internal shoe, conical
  Rear ..... Floating, internal shoe
Suspension:
  Front ..... Telescopic fork
  Fork travel ..... 195mm (7.7 in.)
  Rear ..... Swingarm, gas shocks
  Rear travel ..... 132mm (5.2 in.)
Fender material ..... Plastic/steel
Color(s) ..... Silver on black
Intended use (fact.) ..... Off road
Where made ..... Japan
Price $1359
Distributor:
  U.S. Suzuki Motor Corp.
  13767 Freeway Dr.
  Santa Fe Springs, CA 90670