

IND
34355
**HOLESHOT
SECRETS**

**125 SHOOTOUT: KX, RM & YZ
YAMAHA YZ400E & SUZUKI PE175**

DIRT BIKE

SEPTEMBER 1978 • \$1.25 UK60p

CHAIN PAINS 500 U.S.G.P.



**PLUS: HOW TO
DIAL IN YOUR
SHOCKS and U.S.
WORLD TRIAL**



DIRT BIKE

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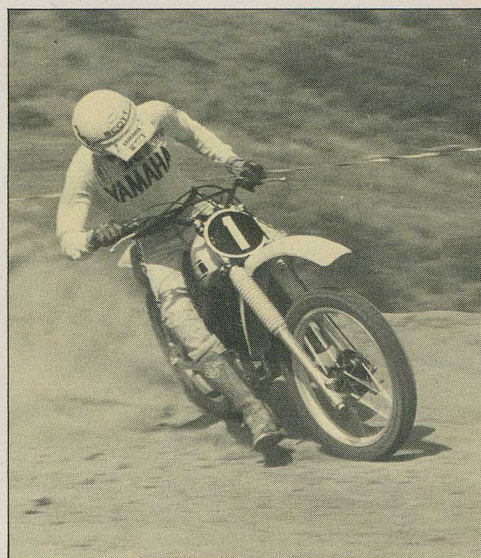
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DIRT BIKE (Sept. 78) is published monthly by Hi-Torque Publications, Inc., with editorial offices at 16200 Ventura Blvd., Encino, California 91436. Subscriptions \$15.00 for 12 issues (one year). Foreign subscriptions add \$3 per year and Canada \$2 per year for additional postage. Copyright © 1978 by Hi-Torque Publications, Inc. All rights reserved. Nothing in this magazine may be reprinted in whole or in part without the express permission of the publisher. CONTRIBUTORS: Photographic submissions must be 5x7 or 8x10 glossy black and white, or 35mm and larger color slides. Please mark each photo with owner's name and address. Manuscripts should be typewritten. Unsolicited contributions must be accompanied by a stamped, self-addressed envelope. Unless special arrangements are made in advance, all published material becomes the sole property of Hi-Torque Publications, Inc. The publisher does not assume responsibility for unsolicited material. Second class postage paid at Van Nuys, California 91408, and at additional mailing offices. DIRT BIKE, P.O. Box 317, Encino, California 91316.

ON THE COVER:
 Roger DeCoster and Mike Bell
 at the Carlsbad Grand Prix.
 Photo by Bill Masho

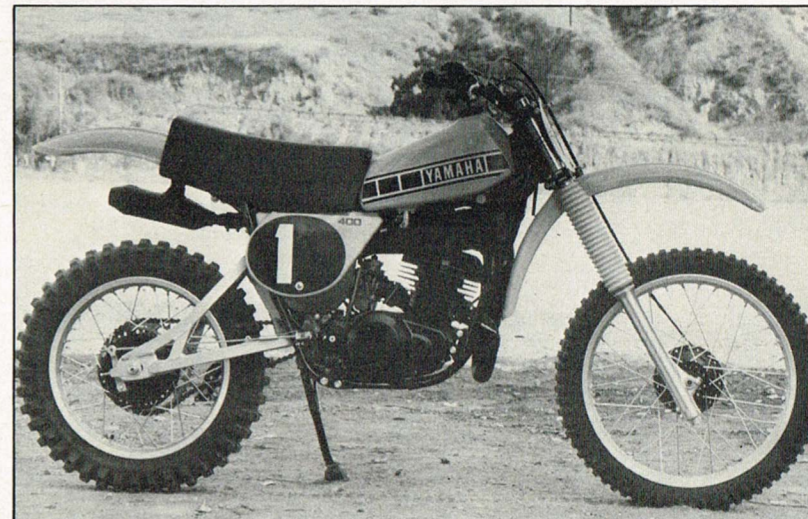
NEXT ISSUE ON SALE SEPTEMBER 19



YAMAHA YZ400E



Plenty of handling, power, suspension, and yellow.



Moto magnificence!



Bare naked. Collar on right near shock eye rotates to adjust dampening force. The nut to its left can be cranked up or down to change preload settings.

Team YZ captures the open class number two spot

By the Staff of DIRT BIKE

Just a few short months ago we found ourselves pleasantly surprised and very impressed with the performance of the YZ250E. After several years of Monocross suspension development Yamaha had finally come up with performance which paralleled or in fact surpassed that of most every stock twin-shocker. At the same time major strengthening modifications to the construction of the swingarm assembly noticeably improved YZE handling. Add great power delivery and a competitive price and it's easy to see how the new 250 quickly copped second spot in the official DB '78 Quarter Liter Lineup. (See the 250 shootout and YZ250E test in May '78 issue.)

From this flashback we segue to today, where we have in the Vise-Grip grasp of our sweaty hands the big brother of the potent 250, the YZ400E.

A noble beast. It now holds its head up proudly at any starting gate. The big 400 comes equipped with all the same fine suspension and handling characteristics of its smaller brother, plus a very healthy and well-behaved power spread that gives you a full 40 horses on top.

The making of an E

Surely the most significant modification in the evolution of the monoshock suspension was changing to the Dr. DeCarbon-type shock unit. Although it is the same basic shock unit that was used in the D, several internal changes were made to cut friction against the shock shaft. These changes allow for a much more conventional feel to the unit. A special system within helps to automatically compensate for changes in oil viscosity and dampening through temperature changes.

A unique feature of the Monocross suspension unit is its easily adjustable dampening system. By inserting a flat-bladed screwdriver into the frame just behind the steering head you can rotate an aluminum collar to any of 13

YAMAHA YZ400E



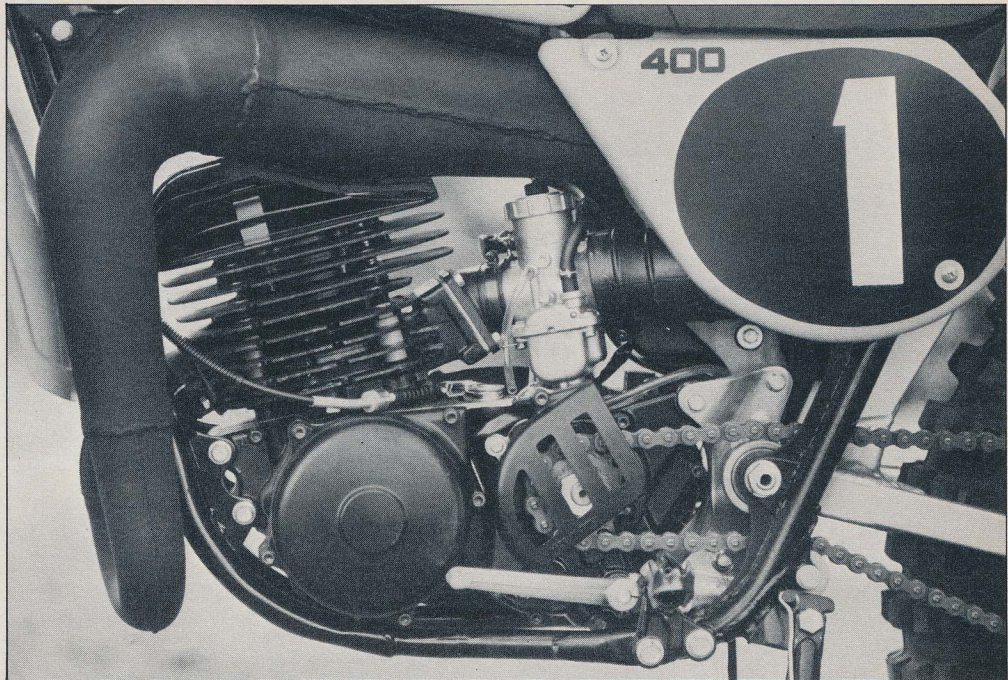
The Bell Ringer in flight. Mike crashed five times during the photo session but we promised we wouldn't say anything about it.

detented positions on the shock shaft. Each setting gives you a unison setting for both compression and rebound dampening. With this system you can quickly fine-tune your rear end to suit the needs of many different rider weights and spring rates.

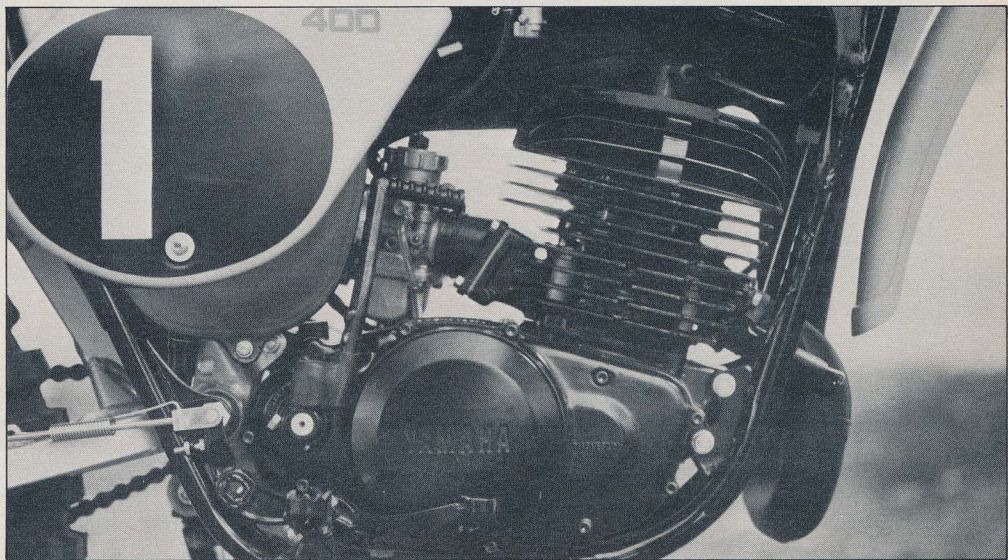
Changing the pre-load setting is much more involved, compared to the standard two-shock setup. The shock unit must be extracted from the chassis. This involves removing the seat, tank, left number plate and a bolt and a pin that hold the shock in place. Preload is adjusted by moving a large nut up or down the shock and locking another nut against it.

All in all, it's a nice system and it finally works. Contrary to popular beliefs, the monoshock does need regular servicing to maintain proper performance. Depending on how serious you are, the nitrogen pressure should be recharged at regular intervals, or every time you ride the bike. You must also keep the rear pivot pin clean and well-lubricated.

Without a doubt, the most significant improvement to the handling of the YZ in recent years stems from the switch to the works-type, rectangular tube, aluminum alloy swingarm. Past efforts were weak enough to flex and allow you to slip off of your intended line. The



This is where it all happens. This baby pumps out 40 of the finest horses money can buy. Hope we can keep this one for a while.



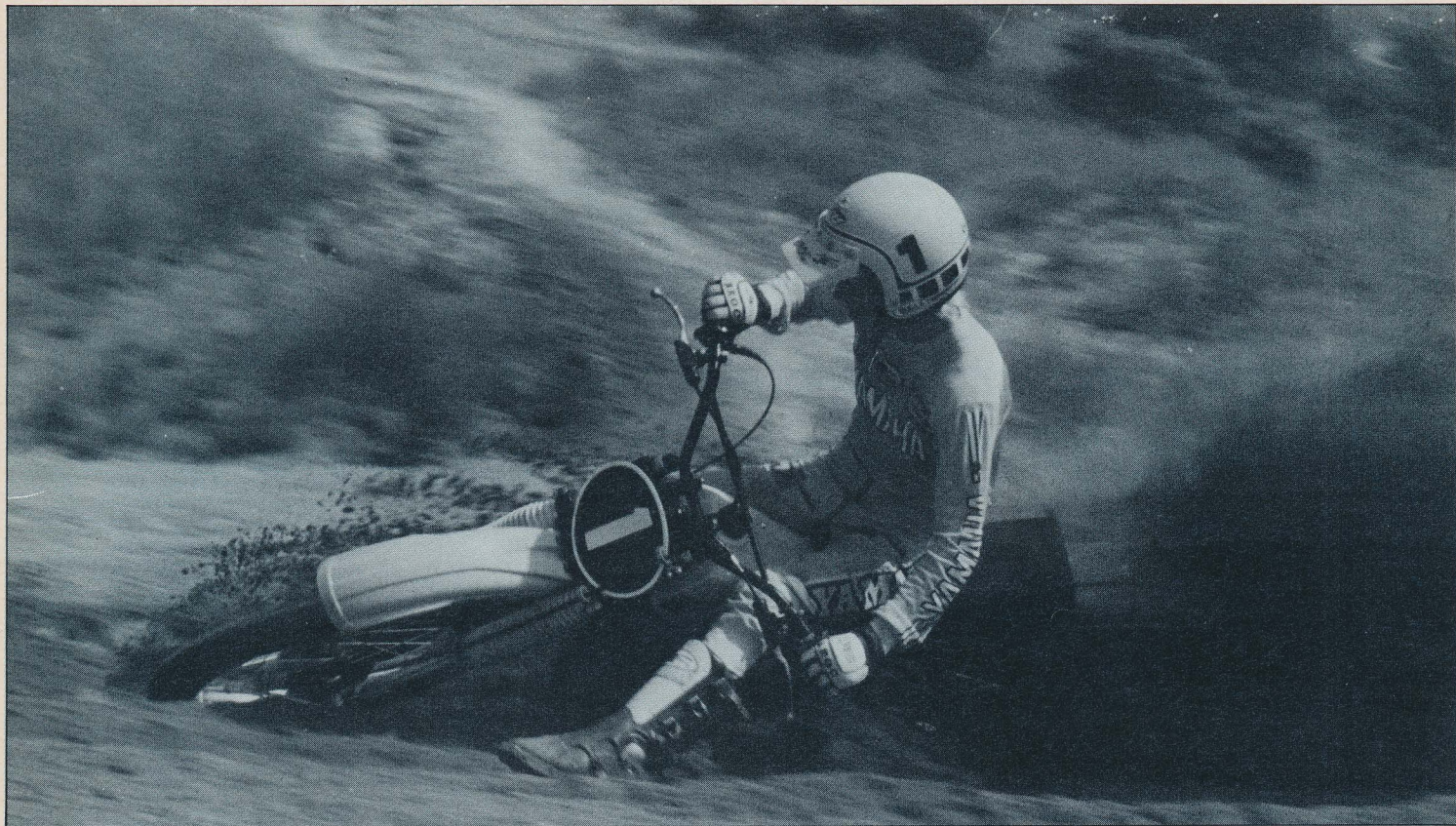
Grunt supreme. Note that the brake actuating rod pivots directly over the swingarm pivot point to help maintain a consistent length between it and the actuating lever as the suspension moves through its arc.

more power you dialed on, the more it tweaked.

Interestingly, this was not so noticeable in the first YZs with the rectangular and round tube steel arms, rather it became evident when they went to the full round tube arms in '76. The 125s were especially weak. All that is in the past now. The new YZs track perfectly. This new, heavily gusseted and well-triangulated unit does the trick nicely. Adding five millimeters to the length of the arm makes the bike a bit more stable at higher speeds and gives

you an additional ten millimeters of axle travel, a full 250mm.

In the transformation from the D to the E the forks gained 20 millimeters more overlap to minimize flex and smooth out the action during the initial few millimeters of compression. To accommodate this additional overlap, the lower legs now extend an equal amount farther below the axle. Like the other YZs, the now-conventional air-over-oil/spring design is used, offering a wide degree of adjustment possibilities. Fork tubes are a beefy 38mm in



America's number one small-bore professional, Broc Glover, checks out our big-bore. "This thing is really a lot of fun."

diameter to resist bending and flexing. Two bolts at each clamping point secure them to the crowns. Front wheel travel equals that of the rear at 250mm.

Rather than going to the full-floating rear brake design as on their works bikes, Yamaha has chosen to stick with their quick and simple slip-in lug arrangement for securing the rear backing plate. At this point they must feel that the suspension and braking advantage is so slight that it doesn't warrant the cash outlay for the change-over. Maybe on the F. . .

Both brakes are mounted on magnesium alloy backing plates and press against steel drums pressed into conical aluminum alloy hubs. The front unit has a much better feel than the rear. The rear seems a bit on the weak side by comparison, and must be adjusted carefully so that the pedal doesn't bottom out on the frame tube. Poor planning, we'd say. The hubs themselves have proven to be very durable in design, and have been chosen as replacement hubs on many a machine over the years.

D.I.D's usual fine offering for rims are found at either end wrapped with IRC's latest moto knobby nasties. Although these are not the ultimate tires, Team Yamaha's Mike Bell does

run them on his practice stocker, at least until they wear out. Then he switches to Metzlers.

Another E improvement is the use of genuine chrome moly steel in the chassis. This accounts for a good part of the kilo and a half weight reduction between the two models and gives you more rigidity and strength as well. The split-downtube double-cradle chassis uses tapered roller bearings in the steering head and a hefty set of needle bearings at the swingarm pivot. The rear or bottom shock mount pivots in the swingarm on a steel bushing.

Although the 400's engine uses none of the same cases or internal pieces as the 250 six-speeder, it does use some of the same space-saving design features and is likewise patterned after the works motors. Porting is straightforward and fairly conventional by today's standards. It utilizes the familiar Eyvind Boyesen-designed six-petal reed arrangement. The entire intake tract of the E model was hogged out for more efficient airflow from the intake port right out to the air filter. Air filter, we use that term loosely on the YZ. More on that later. A 38mm Mikuni supplies you with the correct fuel/air mixture when you need it.

Five close-ratio gears get you

smokin' on down the track. Yamahas have never been famous for smooth shifting and our 400 was no exception. It takes deliberate and comparatively slow movements to catch the next cog up. Speed shifting was out.

Surprise! This is the only one of the top three (our top three) contenders that has primary kickstarting. Let's hear it for 'em. Somebody cares about us open class heroes after all.

The YZ's engine bolts to the chassis in the rear with the help of a heap of intricately designed, formed and stamped plates and spacers of aluminum. It's quite a sight, really. From the engine these plates are secured by the hollowed-out swingarm pivot bolt. The air box is bolted above. It connects to the carb with a long L-shaped rubber boot.

The look and feel of a champion. . . loose and weird in a Valencia sand wash . . . good vibes, and a cockroach surfaces in their gearlube

Climbing aboard the big YZ instills a feeling that something serious is about to happen.

What comfort! The consistency of the seat padding is something so beautiful that only your own two cheeks can explain it to you.

YAMAHA YZ400E

Reach out with your eyes closed to where you wished the bars would be — and they're there. Spot on. Then, if you dare, drape a few fingers over the magnificently designed control levers. Now you're hooked. You've got to ride her now. There's no backing out. These levers and these alone are now considered by the staff of the Mighty DB and members of the Wide Open In Fifth Club to be an absolute necessity for any machine you plan to spend any amount of time on.

Now slip a foot up on one of the pegs. Now the other. There you have it. If you were like us you were so into feeling the machine that you forgot about balancing and tipped over. But before you hit the dirt you remember the feel of the near-ultimate riding position. A comfortable position that allows you to get on with the business of racing.

Now light her off. One or two stabs always did it for us, even when cold. Ah yes! Feel the mighty throb of 40 raw and uncut ponies beneath you. Waiting to obey your every command at the pull of a wire. Baarrunnga! Baarrunnga! Now go for it.

As your partner drops the gate the rear meat hooks up with the bed of your pickup and you're launched out the back. Landing in a full-lock slide, which you maintain through the pits and into the start area, you loft the front wheel, slip it into fourth, and wave bye-bye. The YZ strain of yellow fever claims another victim.

Stuff it into the first turn with the wire pulled tight. The YZE is a good slider, especially in the loamy or powdery stuff. Yep, that new swingarm makes the YZ a whole new machine.

Now snick it up through the gears and head for turn two. As you do so you'll discover that you must either back off on the gas almost completely or use the clutch to catch the next ratio. And just pulling up on the lever is something like trying to cut a slice of zucchini cake

with a pencil. The hang-up here stems from the location of the shift shaft compared to the footpeg. As you pull up on the lever the toe-piece has to drag across the top of your boot. This friction makes the upshift action feel much stiffer than it actually is.

Downshifting is no problem. A roller-type toe-piece would no doubt remedy this foible completely. It won't cure the mechanical hang-up mentioned earlier, though. It is something you'll just have to live with. If you remember the drill — back off, shift or clutch, shift — you're in fat city. The clutch action is light,

though, and it never gave us any problems. On a scale of one to ten we'd have to give the shifting a 7.6, but from here on out most everything is in the nine-plus category.

Leave that throttle pegged to the last millisecond and then get on the binders. The leading unit hauls you down quickly with little lever pressure and has a good progressive feel to it. You are in total control. On the other hand the rear stopper is not quite as strong as it could be, but at least it doesn't stick like the old ones used to. The pedal height is adjustable, but you have very few

OFFICIAL MIKE BELL REPLICA TEAM YAMAHA RACE PREPS AND SET-UPS AS PERFORMED BY HIS ACE MECHANIC, DAVE OSTERMAN

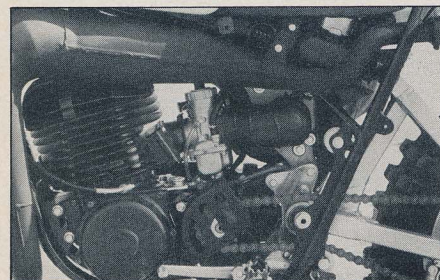
□ It seems like just a short time ago Dave Osterman was working over at Al Baker's R&D helping Al turn out his zoot-capri race-proven moto and desert accessories. Dave also joined us for testing now and then. Well, it's actually been a year and a half that Dave has been tuning Mike Bell's machinery and collecting his check from Yamaha.

In setting up Mike's bike for National and otherwise big-time motocross events across the country Dave makes a number of set-up modifications that he has chosen to share with you here.

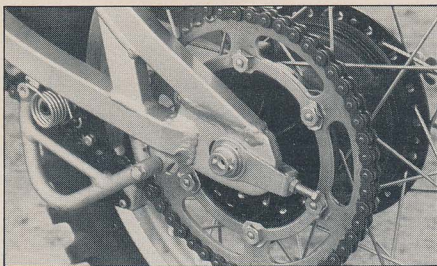
Dave feels that anyone who is serious about racing his YZ should invest in a nitrogen bottle and a good gauge so that he can recharge the shock to the desired specs before every outing. All of the Monocross units leak ever so slightly. To keep the performance of the monoshock at an optimum level recharging is a must. Dave sets Bell's bike at 15 kg/cm² (or 213 psi), the standard pressure setting. He used the standard spring within the standard preload settings of between 300 and 305mm spring length, depending on track conditions.



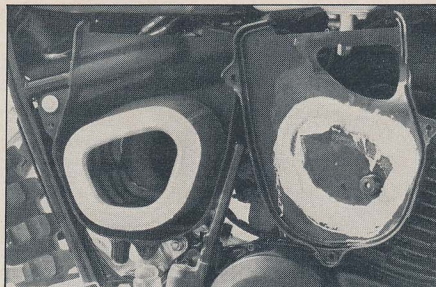
To get a little more rebound dampening, Dave fills the standard hole in the dampener rod just below the piston with silver solder, then drills it out to a number 65 drill size, or .035-inch. It sometimes takes three or four tries before the solder sticks well enough, but it's one of the few materials soft enough to be easily drilled with a tiny number 65 drill without breaking it.



Check it out. Distance between countershaft and swingarm pivot is what caused Hannah lots of chain problems last year. Without the top chain roller the chain will cut into the air boot. Use Loctite.



Steel sprocket, aluminum chain guide/tensioner protector, and the works replica, aluminum alloy, box-section swingarm that gave the YZ its handling back, and then some.



The air filter looks harmless enough. Actually it's closer to worthless. Trash it immediately. Just like the old days and paper filters, huh?

In order to gain a few millimeters more travel, he cuts the long, lighter, top-out spring to 58mm in length. Be sure to grind the fresh end down flat so that it won't snag the other spring. Or better yet, heat it with a torch on the end, flatten it, then grind it. Now remove the long stock spacers on top of the big springs and shelve them too. With the forks out of the crowns and fully compressed, fill each leg with ten-weight oil till the level is between 160 and 165mm from the top of the tube. Be sure to work the leg up and down to release air bubbles below and fully fill the valving. Check the level once again. Now insert your springs, twist in the caps, and fill them with 13 or 14 psi of air. You now have a set of Mike Bell practice bike lookalikes. It may not be right for you, but he likes them that way. He also likes the geometry with the fork tubes extending 19mm from the top of the crowns to the top of the tubes.

Although Mike is well over six feet, Dave pointed out that shorter riders can gain a tremendous handling (and safety) advantage by welding a 5mm wide strap of steel to the top of the footpeg teeth, then cutting new teeth with a file. These small risers make the bike surprisingly more controllable, especially in sand, for shorter riders like Hannah.

All of Yamaha's team racers use the JT Racing Phase 2 air filter, and for good reason. Get one now before it's too late. Dave stresses that you must grease the filter and air box for maximum protection.

They've had problems with the aluminum chain tensioner protector breaking loose because the stock welds don't always penetrate well enough. Take yours to a good heliarc welder and have him go over the welds.

To make quick work of checking chain slack at the fast-paced indoor events, Dave came up with this hot setup. With the shock fully extended and the chain adjusted to the specs in your manual, pull down on the tensioner and pull up on the top of the chain where it passes by the rear frame downtube. Note its position and scribe the frame with this dimension. From now on all you have to do is pull down on the tensioner and up on the chain to see that it's not too far off the mark.

Dave replaces the stock chain rollers with skateboard wheels with sealed bearings. To keep the chain in line, he clamps each one in the lathe and cuts a groove wide enough for the chain before installing it.

Mike uses chrome moly Al Baker "Broc Glover" works Yamaha-bend bars in the high bend with half an inch lopped off of each end. Al's, Eddie Cole's Answer Products bars, and Hi-Point's "Bob Hannah" handles are all nearly identical.

Rumor has it that adding 40mm to the length of the swingarm makes the big YZ handle even better in the fast stuff without sacrificing much in the way of slow-speed handling. Rumor also has it that Pierre Karsmakers cut three to four seconds off of his lap times with the longer arm installed. This mod is not recommended for 250s or 125s and runs around \$70. If you're interested, contact: Profab, 3185C Airway Ave., Costa Mesa, California 92626.

That's about it. Throw on a set of Metzellers and you can try out your Mike Bell impersonation at your local Yamaha dealer and maybe win a bite of a giant cookie.

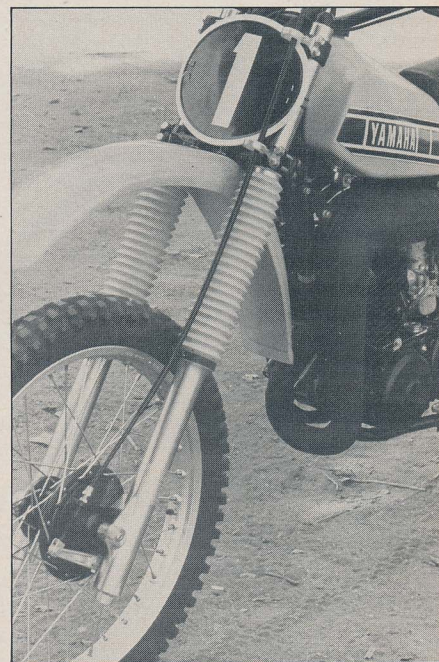
Dave is very impressed with how well the bikes hold up. "You'd be surprised. All we do is take them apart, clean them up, lube everything, put them back together and they're like brand-new! We hardly ever have to replace anything."

millimeters to play with. Adjusting the height down too far allows the pedal to bottom out on the frame cradle. The stock pedal also flexes a little too much for our liking.

You've got her slowed down now and you're ducking into a hairpin to the right. You just flick it over, get on the gas and you're through it. There's no fighting the bars, forcing it to steer or pushing the weight of the shock unit around. It simply does what you wish without a fuss. The new YZ has really learned how to turn. Under any conditions it is very precise and easy to maneuver. High-speed sweepers to hairpins, it loves 'em all. We'd give it a 9.7 here. The Honda is a 10.

Launch off a drop-off and let that nearly ten inches of travel at either end suck up the jolt. Ah yes, the suspension. You were having so much fun that you hardly noticed. Things must be working pretty good when you don't notice them.

The YZ's forks worked well from the very first time we blasted off. Their dampening rates and springs were so well suited that we didn't even change the oil. Still, it wouldn't be a bad idea to go to a better quality oil of the same weight set to the same level. Furthermore, after the forks break in fully you may need to go to something a tad thicker. We preferred the progressive quality of the air forks at around 12 psi for the smooth and sandy tracks we tested on. For rougher, more radical



Some of the very finest production forks available. Travel is a full 250mm or 9.84 inches.

YAMAHA YZ400E



YAMAHA YZ 400E

PRICE: (approx. retail, West Coast) \$1758

ENGINE: Two-stroke, piston-port with reed-valve induction

DISPLACEMENT: 397cc

BORE & STROKE: 85mm x 70mm

COMPRESSION RATIO: 7.6:1

CARBURETION: Mikuni VM38SS

HORSEPOWER: 39.9 at 7500 rpm

CLUTCH: Wet, multi-plate

PRIMARY DRIVE: Helical gear, 2.666:1

TRANSMISSION RATIOS:

- 1) 2.286
- 2) 1.706
- 3) 1.300
- 4) 1.000
- 5) 0.840

FINAL DRIVE: D.I.D 520TR, 3.57:1

14-tooth countershaft

50-tooth rear sprocket

ELECTRICS: CDI

LUBRICATION: Pre-mix, 20:1

RECOMMENDED OIL: Yamalube R

FUEL TANK CAPACITY:

7.6 liters (2.0 gallons)

FRAME:

Double loop, double cradle, chrome moly

SUSPENSION:

Front: Kayaba air/spring forks with

250mm (9.8 inches) travel

Rear: Yamaha DeCarbon monoshock

offering 250mm axle travel

STARTING: Primary kick

WHEELS & SPOKES:

Front: D.I.D with cross-3 shouldered spokes

Rear: D.I.D with cross-2 and 3 shouldered spokes

TIRES:

Front: 3.00 x 21 IRC Motocross GS-45F

Rear: 4.50 x 18 IRC Motocross GS-56F

DIMENSIONS:

Wheelbase:

145.0cm (57.1 inches) + 3.0cm

Swingarm length: 44.8cm (17.6 inches)

Ground clearance: 31.8cm (12.5 inches)

Bars, height: 118.0cm (46.5 inches)

width: 87.8cm (34.5 inches)

Pegs, height: 39.4cm (15.5 inches)

width: 47.3cm (18.6 inches)

Seat height: 96.7cm (38.0 inches)

Fork angle: 30.5 degrees

Weight: 107 kilos (235.5 pounds) without

fuel; 45.9 percent on front, 54.1 percent on rear

HUBS & BRAKES:

Front: Conical, cable-operated

Rear: Non-floating, rod-operated

PARTS PRICES:

Piston: \$19.76

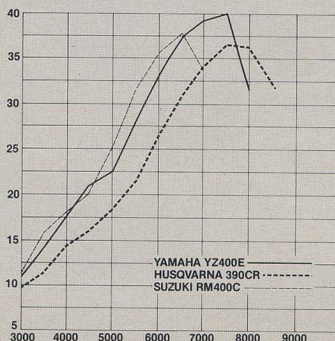
Rings: \$10.06

Cylinder: \$117.95

Clutch cable: \$5.96

Clutch lever: \$4.10

Brake pedal: \$11.70



running you will prefer the stock pressure setting of 14 psi or more. Small braking bumps, medium-sized holes, giant craters and deep sand whoops were all taken in stride equally well. A very minimum of shock was transmitted to the rider no matter what we rode over. We rank them among the very best production forks available.

Comments on the performance of the rear suspension ranged from equally as good as to better than the front end. Again, among the very best, This rear end makes the bumps disappear like very few rear ends can. Riders were surprised again and again by surviving impacts with large holes while caught sitting down. The dampening adjustment preferences ranged from one to two clicks lighter among our staff and test riders. Most preferred the two clicks lighter position, while an occasional long moto go-faster preferred the single click for deep sand blasting to maintain the correct dampening. Our only complaints were that the heavier (175-pound-plus) riders were bottoming out back. Switching to the heavier Yamaha accessory springs cured this problem for them.

Blasting from corner to corner noticing some of the YZ's fine points is easily done when you've got a powerplant as fine as the YZ's pumping out the ponies. This honey is mellow. Mellow and yellow, yes. Slow it's not. From the very bottom it pulls strong and clean. Healthy horses that'll pull you through mud and glop as thick as you like without faltering. The power builds steadily and smoothly up through the mid-range till it revs out at 7500 rpm. There's really no set separation between the ranges, it just comes on progressively as you wick it up. Just the way you want it. We even liked it a little better than our current open champion, the 390CR Husqvarna. It has that same kind of good, usable torque, but more of it all the way through. All in all, it's a fine motor. Everyone loved it, even confirmed European-type power lovers.

When you turn all of those pent-up ponies loose you get the full picture of what the YZ is all about.

Riding the YZ cranked nearly full-on out in the sand for long periods of time will clearly show you why this bike is so popular in the desert. Even under hard acceleration through deep whoops and old car bodies the rear end tracks straight and true. Because of the fine seat/bar/peg relationship it is very comfortable to ride in long-distance events. And when you need the seat, there is none finer.

(continued on page 66)

HOT STUFF

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YZ400E

(continued from page 32)

Senior test rider Jim Connolly decided to make his career debut as an enduro rider by entering the 400E in the Tough Enough enduro, an event which yearly fully lives up to its name and then some. After being told that he had won the event overall, he was brought back down to earth upon hearing he had not won top honors after all. Jim is full-on head-over-heels in love with the YZE. After the event he thought it strange that some testers had said that the shifting was not up to par, for he had not missed a gear all day.

In short bursts between corners the rear end just digs in and gets the power to the ground without any foolishness. Just crank it on and go. There are no surprises hiding anywhere. It is extremely predictable in most any situation. This predictability contributes greatly to the confidence you need to win.

At 107 kilos (235.5 pounds) ready for gas, the 400E is no lightweight. But then, neither are the other top open classers. What's important is that the bike doesn't feel as heavy as it is. Because of its good handling abilities and power you are able to flick it around the track with the usual bursts of power and a bit of body English without too much effort.

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Some bits and pieces

All of the plastic goodies on the YZ are top-notch stuff. The fenders are long and wide to protect you from flying debris. Deep strengthening ribs help them maintain their shape under all but the most ridiculous mud conditions. The fuel tank does exactly what it's supposed to do. It's easy to fill, doesn't leak, and it sits there looking very yellow. As with many of the latest machines, the width of the tank increases drastically toward the front to keep your leg away from the pipe in tight corners.

Plenty of fancy little doodads cling to cables and things here and there to protect them from premature wear.

Two plastic rollers that spin on ball bearings help take up excess chain slack as the rear suspension moves through its arc. These are necessary because of the comparatively long distance between the countershaft and the swingarm pivot point. A nice spring-loaded chain guide/tensioner near the sprocket does the rest. After losing the bottom roller, we bolted the top one in its place. Then, to keep the chain from sawing through the air intake boot, we constructed a sort of limiter out of a bolt and an old plastic roller. Remember, if you lose the top one, put something in

there to take its place or you'll lose the air boot and maybe a bore job.

Most all of the bolts, nuts, springs, cables and things are of the quality you would expect on a machine of this sort. Except for the air filter.

A major design flaw

An autopsy revealed that the cause of



death of our 250E was death by dirt due to an ill-fitting air filter. So, to begin with, the inner sealing edge of the stock filter is not wide enough to give a proper seal.

After washing our 400E filter just once, its glue job went south and it fell apart.

Your air filtration system is the single most important factor in determining the life span of your engine. Don't jeopardize the life of this fine piece of machinery by gambling with the stock filter. It is junk. Throw it away immediately. Don't even run the bike. Replace it with a JT Phase 2 filter like Team Yamaha does. The Phase 2 works.

Bottom line lowdown

Yamaha's latest offering to the open moto market has been received very warmly by big-bore junkies everywhere. The differences between the D and the E are few, but their effect is of great magnitude. Yamaha has finally got it all together. In the YZ400E they have a fine-handling bike with great power that's available at a competitive price. Comparing it to our current open king, the 390 Husky, the differences are many, but the final product is not that far off. ■

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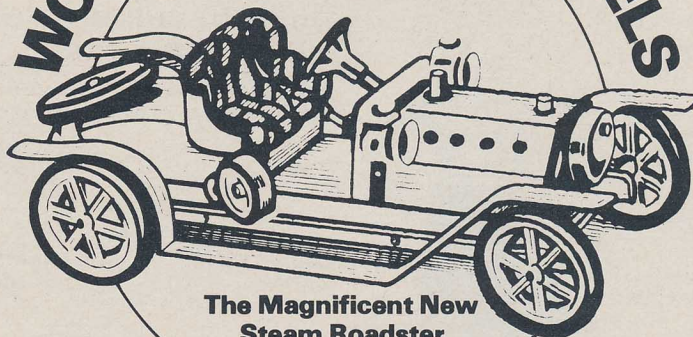
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