

# DIRT BIKE

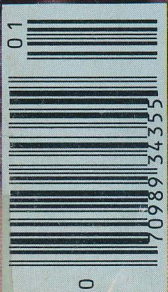
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MINIS:  
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# DIRT BIKE

January 1980

Volume 10, No. 1



**On the cover:** Test rider Kenny Zahrt is about to grow wings on the CR125. Clipper photo. And a sneak preview of the TT250.

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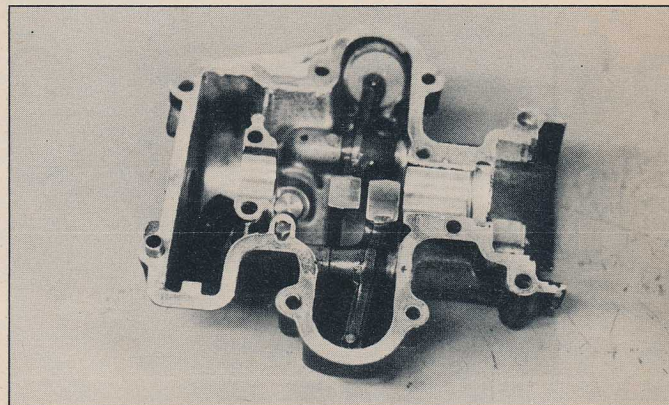
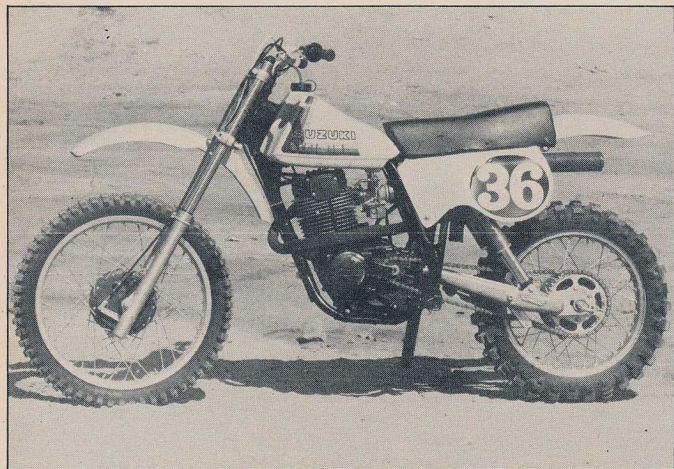
**DIRT BIKE** ISSN 0364-1546 (Jan. '80) is published monthly by Daisy/Hi-Torque Publishing Co., Inc., with editorial offices at 16200 Ventura Blvd., Encino, California 91436. Subscriptions \$9.98 for 12 issues (one year). Foreign subscriptions add \$3 per year and Canada \$2 per year for additional postage. Copyright © 1979 by Daisy/Hi-Torque Publishing Co., 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 Daisy/Hi-Torque Publishing Co., 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.

# PROJECT DR/RM370: CONCLUSION

## IN SEARCH OF THE RIGHT KIND OF HORSEPOWER

We wanted a mellow missile, not a hand grenade

By Rick Sieman



*The head is easily removed from the DR. No special tools are required.*

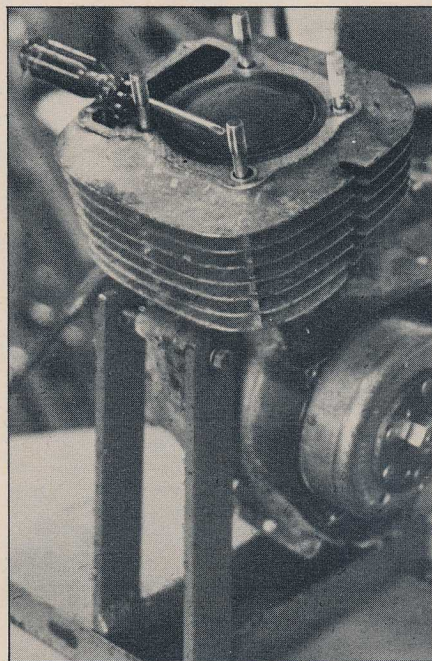
After months of fiddling, frame work and dialing in suspension components, we finally got the Project RM/DR370 ready for some serious motor work. If you've been following this project bike, you might remember that we started with a stock DR and did some low-buck modifications. Mostly in the suspension department.

After reaching the logical limits of the standard chassis, we slipped the DR engine in a 1978 RM chassis. It was a genuine bear to get it right, but Red Line supplied the expert advice and necessary craftsmanship.

Our original thinking behind using an RM chassis was clear; it's just that the complications of execution were fuzzy. We figured that a rider who wanted a really trick DR four-stroke could locate a late-model RM Suzuki motocrosser with a mangled motor. Oftentimes, it's too expensive to rebuild a badly lunched motor and the bike can be purchased for something in the \$300 to \$500 range. This way, the builder gets a good chassis, aluminum swingarm and a decent set of forks. Often, he can even recover a bit of his money by selling parts from his left-over DR chassis. But that takes a bit of patience.

With the engine installed in the RM, we then made only two changes to the stock motor: a handmade pipe and the installation of an EI carb (36mm). At this point, we had a fairly light bike with a slightly stronger than stock powerplant.

Rather than jump right in and build the motor, we experimented with suspension components for a long time be-



*The cam chain should be held in place while working on the top end.*

fore settling on what we have now. It's our pleasure to report that the RM/DR has an absolutely plush ride and the bike turns like a bandit. We used KYB air shocks (the ones with the internal springs) at the rear and stock 1979 RM forks at the front. Once we got the air pressure and the very light fork oil setup dialed in, the forks proved remarkably good.

Our progress was interrupted at this point by a large banging noise, made by this editor as he attempted to move the Coliseum about three feet to the west

with an unintentional crash. (Are there any intentional crashes?) With the healing process well under way, we started looking around at various options for building the engine up.

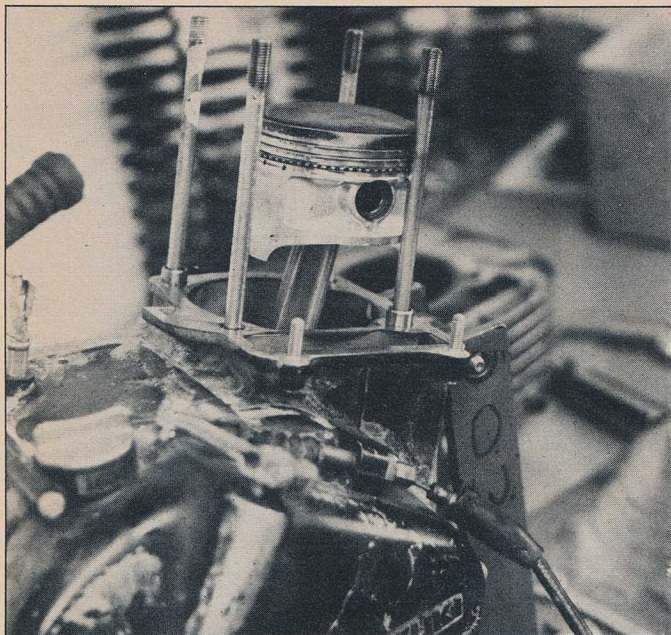
We talked to a number of folks and they had a wildly varying number of approaches to making a better motor. In the end, we chose the services of White Brothers because of the unarguable logic of Tom. Or was it Dan? It's hard to tell, because the White Bros. are certified genuine twins and seem to delight in confusing people as to which one is which.

Anyway, after Dan (Tom?) explained their philosophy behind building *any* four-stroke, they got into some valid reasons why we should build our DR370 the way we did.

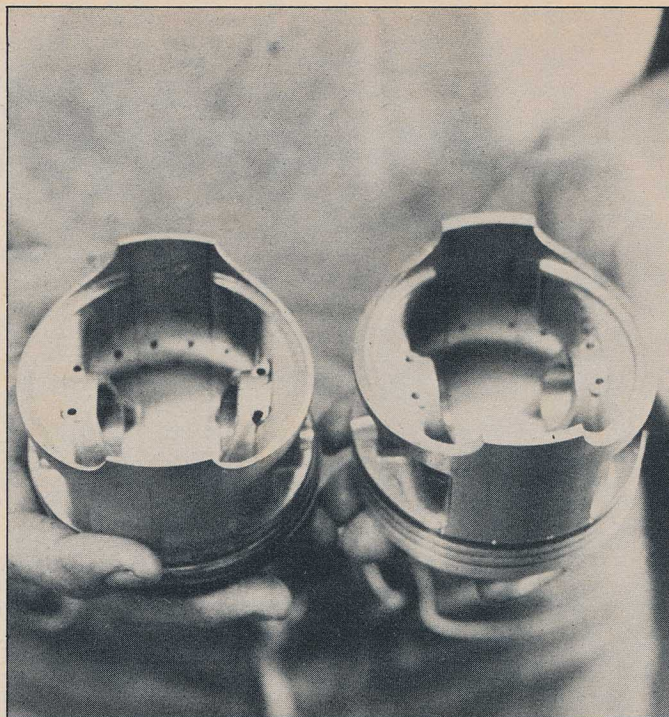
First off, 420cc is just about the maximum anyone should take the 370cc motor out to. Any more than that, and the liner ends up way too thin. This could mean distortion, warpage and at the very least, no more available overbore.

We talked about stroking the crank to get more displacement, but Tom (or Dan) thought that the transmission simply could not take the increase in torque. He felt that right around 35 to 36 horsepower out of the 420cc engine would give a satisfying boost and still retain the desired reliability.

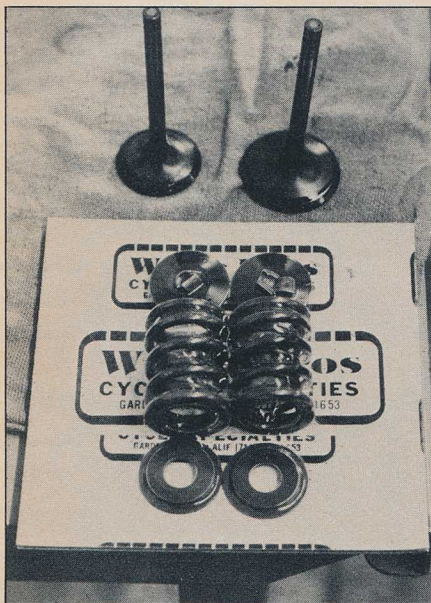
We agreed. After having heard a number of horror stories about DR clutches not being strong enough to take a stroker motor and having seen a number of wasted gearboxes from 40-plus horsepower motors, the last thing in the world we wanted was a fussy



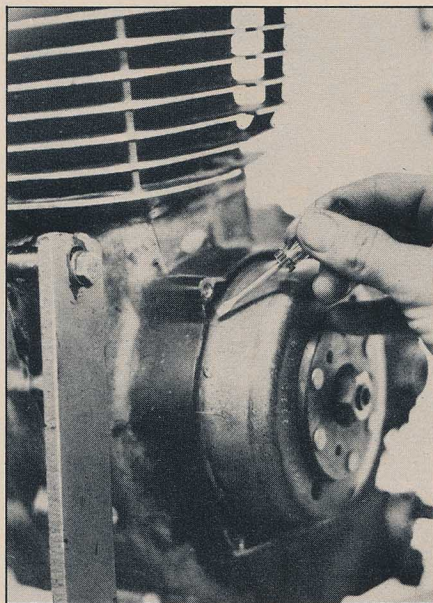
*This is as far as you have to go to build a 420 DR motor. No need to split the cases. The work required is within the scope of the average weekend wrencher, with the exception of boring.*



*Stock piston is on the left. The thinner skirts are obvious.*



*S&W valve springs are a must when a hotter cam is installed.*



*Timing should be fractionally advanced to work with the new cam and top end.*



*Here they are... the White Brothers... and the completed 420cc motor. Dan is on the left and Tom is... aw, forget it.*

motor. After all, one of the reasons people like four-strokes is because of their inherent reliability.

Here's what we ended up with in our engine. The stock 85mm piston was removed and the cylinder bored to accept the new 89mm piston. While we had the two pistons side by side, we could see the very thin skirts on the stocker. Also, the stock piston has rings with a very low sealing pressure, and we found that our stock motor had been blowing a great deal of oil past the rings. In fact, in about 30 hours of riding time, we had to decarbonize the exhaust port twice due to excessive buildup.

Since we already had a good carb on the bike, we didn't use the pre-jetted 36mm Mikuni carb kit that the White Bros. sell. We like the tuning ease of the EI, even though the Mikuni is a fine carburetor. Also, because we had an oddball chassis instead of a stocker, we couldn't use the White Bros. pipe that's specially designed for that motor. Our pipe used the stock head pipe rather than the larger I.D. White Bros. pipe. After putting a tape on our pipe, Dan (or was it Tom?) told us that our effort was nice, but about six inches too long for maximum revs out of the 420 motor. He said we might pick up some more snap down low and

at mid-range. They also prefer the Super Trapp muffler; we stayed with our Pro-Tech muffler, because, again, we already had it on the pipe and it seemed to be doing a reasonable job.

The boring job was done on the cylinder for us by Micro Bore (owner Len Norris) while we pigged out at lunch. Norris has his facility right next to White Bros., which makes for maximum convenience for the W.B. customers. Dan (or Tom?) swears by the quality of the Micro Bore work.

The stock cam was removed and a wilder Megacycle cam slipped in. Stock valve springs and keepers were

*Continued on page 82*



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# HORSEPOWER

(Continued from page 38)

discarded and S&W items installed. The angle of the valve seats was changed slightly by Tom (No... I think it was Dan), and the whole works bolted back together.

The entire job should have taken less than two hours from start to finish, but photographic needs, a multitude of technical questions and a very rare level of bench racing turned it into an all-day job. A pleasant one, we might add.

As Tom said, "This is a job a guy can do by himself if he wants to save money. The engine is easy to work on and only the top end has to be pulled off. You don't have to split the cases and get into all kinds of weird welding on the crank and stuff like that."

Timing was advanced a fraction more than stock after the engine was buttoned up. We were running a 10½ to 1 compression piston. No head or barrel milling was required to get this bump.

How did the whole works run, you ask?

Fair question.

We took the bike out the next day and put a half-hour of easy running on the fresh motor before making it work. It was, how shall we say... deeee-lightful! Most of the increase was down low and at mid-range, even though the motor still ran out nicely on top. If we'd used the recommended W.B. pipe specs, we'd probably increase the top end more. But we're satisfied with the results. To give you an idea of how the bike works now, we tried several third-gear starts at the Indian Dunes track and the healthy motor churned off the line without a protest. We didn't have to shift once all the way to the first turn. Try that on your two-stroke whatever and see what happens.

Our stock motor only put out 22 or 23 horsepower and didn't have a whole lot down low. Our new motor puts out right around 35 horsepower and has so much grunt down low, that we're considering a taller countershaft sprocket.

Yes, we're done building our project bike. It's now going to be ridden and raced regularly. We don't expect everyone to go through the work that we did, now that there are more sensible alternatives to start with. When Project RM/DR was conceived, there were no XR's and KLX's around.

Still, for the DR owner on a budget, here're some thoughts on modifying what you have on a budget basis.

Stage I—A pipe. The White Bros. pipe with a Super Trapp goes for \$72.95 and makes a very big difference in performance, even with the stock carb. For those who've already removed the

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# HORSEPOWER

stock muffler and replaced it with something else, the bare W.B. pipe without the Trapp is available for \$44.95.

Stage II—Carb kit. This is a complete package and not just a carb. It comes with a pre-jetted 36mm Mikuni, a good kill button, a Terry throttle cable, a Magura throttle, a K&N air filter and a crank vent hose and filter. You do not use the stock air box with this setup. The carb kit sells for \$94.95. With the pipe and carb together, you can realize a 15-percent gain in power. The most noticeable difference will be from 3000 rpm on up. This means that you can use second gear where you had to use low before. The front end can be lifted under power in third gear and you'll be able to pull fifth gear on a straight, without the bike falling on its face like the stocker.

Stage III—Here's where you go for the piston, cam and valve springs. This should only be done in conjunction with a pipe and a carb kit. The changes here are the most dramatic. The engine will pull much like it does with the pipe and carb kit under 4000 rpm, then really shines above 4000 all the way up to 9000 rpm, if needed. Considering the fact that the stock DR engine runs out of breath at 7500 rpm or so, this is a solid boost.

Of course, you can go even further than this in refinement, like head porting and such (around \$90), but we were plenty pleased with our bike as we did it, and chances are, you'll be, too.

Right now, you can buy a DR370 at a low price. There are still some '79s sitting on showroom floors going for a bargain. Add a few hundred bucks' worth of engine work, and you've got a bike that'll run with any XR500 built. □

## WHERE TO GET IT AND WHAT IT COSTS

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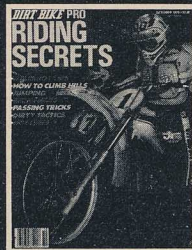
- Pipe, with Trapp silencer . . . \$72.95
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