

# PUNCHING OUT THE RM400 FOR NO GOOD REASON OVERKILL: BUILDING A 422cc SUZUKI

*E. C. Birt is alive and well . . . and still making bullets*

By Rondo Talbot

□ OK, OK, we know that a stone-stock 400 Suzuki MXer has a lot of horsepower. More than most people will ever learn how to use in the first place. So why did we build (with the help of Mr. E. C. Birt) a monstrous 422cc bike?

Hmmmmmm.

Actually, E. C. Birt talked us into the whole thing. But, as it turned out, we not only ended up with a faster engine, we ended up with a better engine. One that was far more flexible and easier to ride.

We took our motor apart and shipped it off to Dickson, Tennessee, the home of E.C. For those folks who may not be familiar with the name, E.C. Birt was one of the very first of the Mad Tuners in the late '60s and early '70s. He made a lot of very fast 100s and 125s and — at one time — had the honor of creating the single fastest 125cc dirt bike ever made. Of course, it cost around five grand back then. We shudder to think what it might cost to duplicate that effort nowadays.

A short time later, a large box appeared in the mail. With it came a letter and the following:

## Info about your motor:

This motor is what we would call the E.C. W/R-3 422 Kit. In short, everything that we know how to do to an engine today has been done. As with any other engine that we build, this engine is designed for the rider who will be using it. In short, I have designed it for you, with the thoughts in mind that you will be doing some motocross, some Grand Prix stuff and general fun riding. Put tall gears on it and I think you can even go road racing. In your off weekends, you can hook it up to your plow and redo your garden.

With the use of the Maico 450 piston, the engine size comes out at 422cc on standard bore. This is .075 thousandths (or 2mm) larger than the stock RM400 bore.

So, in short, a rider can wear out his cylinder and use up all of the Suzuki 400 pistons and we can still save his cylinder

and start him all over again, for less money than he would pay for a new cylinder and Suzuki piston assembly.

## Wrist pin spacers:

The wrist pin spacers that are enclosed must be used with the Maico piston conversion. Suzuki uses the piston to hold the rod in the middle of the crank pin. These spacers are made of T6 aluminum and will have a very long life. When installing piston, if spacers are too thick/tight to go in (one on each side of rod eye), take 600 sandpaper and a piece of flat glass and hone spacer till it will just slip in.

## A little background on the reeds

When I was in Florida, Kippy Pierce was the hot rider and I had been tuning his bikes for more than a year. Kippy got one of the first RM250s that hit Florida. The paint wasn't quite dry yet and before it did dry, I had the engine apart. Looking at the engine, I just had that gut feeling that the reed that came on the RM was nowhere big enough. As you know, I have been playing with reeds since Day One. Anyway, after looking at it, a wider reed, one that would flow more, would have to be the hot tip. So, it was set-down-time and draw-a-print-time.

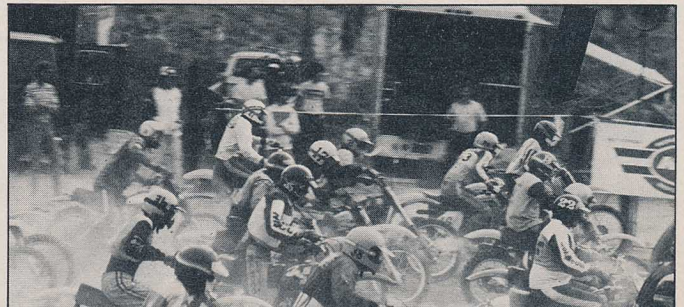
Simple; nothing to it. Just take a Yamaha YZ three-petal reed assembly and steal the reed stop from it and use it with one of my fiber Yamaha reeds. As I said, nothing to it. Two days of machine time and I had the first one in my hands. Horsepower was there and it was worth the time spent making it.

But at the time, there was no way that I had the time to make them for the market, and the cost would have been too much for most to afford. The other hang-up is that the cases have to be machined to handle this reed.

The following weekend after the race, I was tooling up the Interstate thinking about this reed problem. All of a sudden, it came to me. Why not just take the stock reed block and cut



Here's the start of the 500 race. As you can see, the riders are lined up according to the numbers they drew.



Here's John on the 422, coming from way back in the fourth row to near the front. By the top of the start hill, the 422 was running fourth and gaining.

# OVERKILL: BUILDING A 422cc SUZUKI

the back off of it and machine some holes in the back of the reed, and add one more set of reed petals? Wham-O! The first four-petal reed! Later, a four-petal reed came out on the market that was a casting. Not too clean, but they worked. But, facts are facts, the Suzuki casting is a lot better, and that's why I prefer to make them from the stock Suzuki reed.

So, the bottom line is, if the rider sends us his stock reed, we will remachine it into a four-petal reed for \$49.95. If he has no core to send us, like he rides a 100 or a 125, then he has a core charge of \$25.

Back to the three-petal reed. They are available now, and the cost is high — \$80 at the moment and case work has to be done. But, what can I say? Horsepower is like hamburger meat. You can have all you want to buy.

## COST TO DO'S AND TYPES OF RM400 MOTORS

### E.C. W/R-1 Engine:

Porting — Clean and match up ports, no port timing changes made: ..... \$65.00  
Head work — Machine and cc: ..... \$24.00  
Kal-Gard cylinder and head: \$10.00 for cylinder head  
\$15.00 for cylinder  
Carb — Stock carb works well.

### E.C. W/R-2 Engine:

Porting — Change port timing to fit rider's needs, blueprint motor for file reasons: ..... \$80.00  
Head work — Machine and cc: ..... \$24.00  
Kal-Gard cylinder and head: \$10.00 for cylinder head  
\$15.00 for cylinder  
Carb — Recommend the use of a 38mm Mikuni or a 36mm E.I. carb.  
E.C. prejetted 38mm Mikuni: \$52.95  
E.I. carb: \$86.95

### E.C. W/R-3 Engine:

Porting — Change port timing to fit rider's needs, blueprint motor for file reasons: ..... \$80.00  
Head work — Machine and cc: ..... \$24.00  
Machine W/R-3 back boost port (like yours) ..... \$30.00  
Machine piston, boost port, and bead-blast: ..... \$12.00  
Kal-Gard cylinder and head: \$10.00 for cylinder head  
\$15.00 for cylinder  
Carb — Recommend 38mm Mikuni or 38mm E.I.  
E.C. prejetted 38mm Mikuni: \$52.95  
E.I. 38mm carb: \$89.95

I also recommend that these carbs be machined to our W/R-3 specs. This will increase the fuel flow by 10 percent. Cost for machining carb, \$25.00

### Forgot something:

On the E.C. W/R-1 engines use stock reed, or convert reeds and reed stop to E.C. parts.  
Reed stop cost: ..... \$3.00  
Reed cost: ..... \$2.00  
On W/R-2 and W/R-3 engines, I recommend the three-petal or four-petal reed assembly. Three petal reed: \$80.00; four-petal reed: \$49.95 plus core.

The only time a rider would be looking at this core charge would be if he had a 100 or 125 RM.

The core charge for a stock Suzuki reed is \$25.00.

### E.C. W/R-422 Kit

W/R-1 and W/R-2 are the same mods and steps as Suzuki 400 with stock piston, except add the following prices for parts and labor.

Maico 450cc piston assembly: ..... \$63.42  
Wrist pin spacers: ..... \$8.00  
Boring and fitting piston: ..... \$30.00

### E.C. W/R-3 422 Kit

The only difference here is the piston machining cost on the Maico piston. We set the piston up and put the two lightening holes in the side of the piston to help bring the piston weight back close to stock. This helps on the balance of the engine. Piston machining for Maico piston: \$16.00

What did I leave out? Oh, I know. Go blow them off the track.

End of letter.

So, we did just that. The RM422 was assembled with no problems, and we broke it in and jetted it at the track. The track was Pioneertown, and we had one of our regular test riders, John Rudder, ride the bike in the 500 Novice class. John is a winning Novice in the 100 and 125 Novice classes, and only rarely rides the bigger bikes in races.

He drew a poor starting number (48) and had to stay way back in the fourth row. By the top of the start hill on the very first lap, the big 422 had already moved up to fourth place. Going up the very long uphill, the modified RM pulled every bike as if they were running a gear lower.

At the end of four laps, John had moved up to second, right behind the leader, and was trying to make his move for the lead when the 422 stopped cold. Kickstarting did nothing but get the rider tired and sweaty. Ten minutes later, a spark plug wrench was located and the plug yanked and replaced. The bike fired up immediately. However, the race was history by that time.

Later, we questioned John about the performance of the 422 motor.

"Outstanding. I had a chance to ride the bike when it was stock, and the shaking and vibration cramped my hands and forearms. This motor here does not shake. I can't believe it. And up the start hill, it pulled *everything!* Funny thing, though, even though it's faster than stock, it's easier to ride. There are no surprises. You just ride a gear or two higher than you're used to and let the torque do all the work."

We had plenty of time to ride the 422 later, and found that his statements were indeed correct. The bike is now a virtual missile, but a controllable one. It has the distinct honor of being the fastest single-cylinder dirt bike we've ever thrown a leg over, to date.

### WHERE TO GET MORE INFORMATION

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