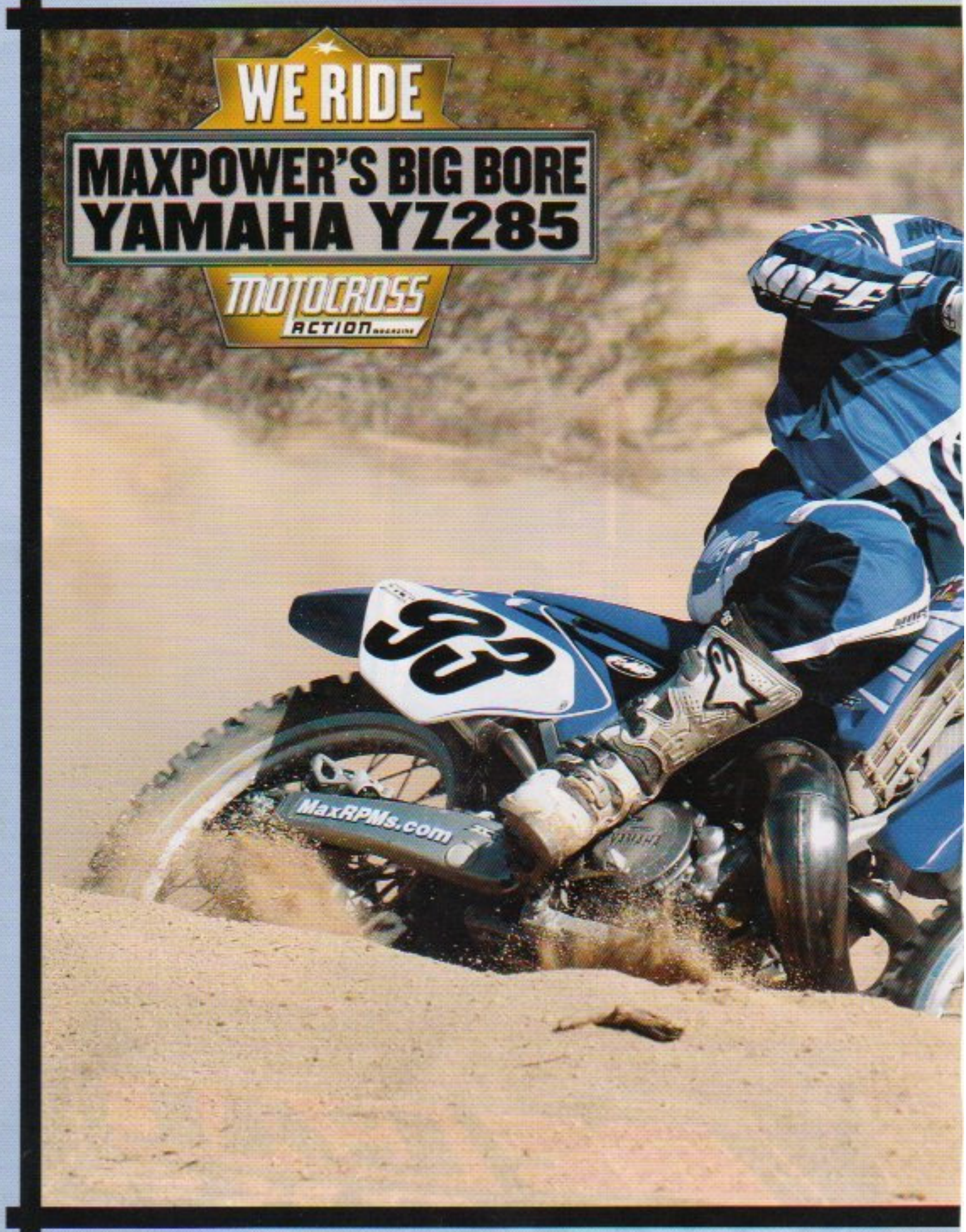
WE RIDE

MAXPOWER'S BIG BORE YAMAHA YZ285

MOTOCROSS ACTION



AROUND THE TIME OF THE DAVE CLARK FIVE, TWO-STROKES WIPED FOUR-STROKES OFF THE FACE OF THE EARTH. AND DURING THE ERA OF KELLY CLARKSON, THE WORLD ORDER WAS REVERSED.

As the sport marches blindly into the four-stroke epoch, we still live in a world where the majority of motocross riders have been born and bred on two-strokes. That simple fact makes the two-stroke appealing to a large number of racers: who wish for the simpler times of premix, expansion chambers and snappy rev. In time, perhaps five years from now, riders with two-stroke experience, beyond 85cc minicycles, will become as rare as computer programmers who can decipher Fortran or Cobalt code. As each new wave of teenagers enters the sport, they will know only the thrumming sound of a four-stroke. Never given the opportunity to race a two-stroke, they will think of them in the same way that '70s, '80s and '90s motocrossers thought of BSA, Triumph, Lito, Cheney and Rickman thumpers. *Que sera.* After all, around the time of the Dave Clark Five, two-strokes wiped four-strokes off the face of the Earth. And during the era of Kelly Clarkson, the world order was reversed.

Is the two-stroke dead? Not completely. But it's getting hard to find its pulse. This is a shame, a crying shame, because what this sport needs is a good, inexpensive racing motorcycle. And no engine is better suited for motocross than the two-stroke. Contrary to popular belief, pound for pound, cubic centimeter for cubic centimeter and head to head, the modern four-stroke is an antiquated piece of agricultural equipment when compared to a two-stroke. Yes, Virginia, we know that isn't the way it is portrayed in the mass media, but it is true. And we can prove it.

As Dragnet's Sergeant Joe Friday would have said during the first four-stroke era, "Just the facts, ma'am."

Horsepower: A two-stroke engine produces 0.2 horsepower per cubic centimeter (a YZ250 makes 50 horsepower out of its 250cc of displacement). A four-stroke only makes 0.12 horsepower per cubic centimeter.

Beefed up: In a heads up match against a 450 four-stroke, a stock YZ250 depends on its light weight and snappy rev. Not the YZ285. It has enough grunt to pull through deep sand.

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Eye to eye: Stare at MXA's Yamaha YZ285 all you want. There is no way to tell a 285cc engine from a 250cc engine externally.

Moving parts: Stripped to its essence, a two-stroke engine has three moving parts (crank, rod and piston). A four-stroke has five times as many moving parts (and over 100 extra auxiliary parts).

Weight: A two-stroke engine weighs 15 pounds less than a four-stroke engine.

Cost: The rebuild cost of a 250cc two-stroke ($250) is five times less than that of a four-stroke ($1250). And in case of a major malfunction, the rebuild cost of a two-stroke can be as much as 12 times less.

Performance: If you compare a 250cc two-stroke to a 250cc four-stroke, the two-stroke is a vastly superior machine, making 33 percent more power (50 horsepower versus 35) with a quicker rev, snappier powerband, simpler design and lower cost.

GIVEN THESE FACTS, YOU MIGHT BE ASKING YOURSELF, "IF ALL OF THIS IS TRUE, THEN WHY IS EVERYONE BUYING FOUR-STROKES?" AND THE ANSWER ISN'T WHAT YOU THINK.

Given these facts, you might be asking yourself, "If all of this is true, then why is everyone buying four-strokes?" And the answer isn't what you think.

First, the four-stroke revolution was not a Japanese manufacturer conspiracy to sell more motorcycles. On the whole, the motorcycle manufacturers had little to do with the advent of the racing four-stroke. It was the brainchild of a lone Yamaha engineer. Yoshiharu Nakayama had to fight corporate reluctance to get his single prototype built. Apart from Yamaha, everyone considered Nakayama's YZ400F to be folly (which is why it took them four to six years to respond with their own four-strokes).

Second, the EPA had nothing to do with four-stroke motocross bikes. They do not regulate closed-course competition machines.

Third, if you are looking for someone to blame for the four-stroke migration, blame Roger DeCoster, Keith McCarty, Bruce Stjernstrom and Chuck Miller. As team managers and representatives on the AMA Advisory Board, they signed off on allowing Yamaha to race its hand-built, one-off, exotic YZ400 proto. Even worse, they were so sure that it would be a failure that they gave it an upper displacement limit of 550cc to race in the 250 class. Talk about short sighted! It wasn't until the damage was done that the AMA lowered the displacement to 450cc—which proved in hindsight to be way too much.

Finally, all fingers must point to the AMA. The only reason that James Stewart, Ricky Carmichael, Ryan Villopoto, Chad Reed and Davi Millsaps are racing four-strokes is because four-strokes are allowed to be 100 percent larger than a 125cc two-stroke and 80 percent larger than a 250 two-stroke. Take that displace-

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Stock market: The biggest difference over the stocker is that the YZ285 doesn't have to work as hard to get the job done.

Source: The Wiseco piston (bottom) is visibly larger.

ment advantage away and four-strokes would be relegated back to play bike status.

For the last three years the *MXA* wrecking crew has been imploring the AMA powers-that-be to do something to save the two-stroke in racing. Our simple suggestion was to legalize big-bore 125 and 250 two-strokes to compete against the already big-bore four-strokes. Nothing could be simpler...or fairer. We didn't suggest this because we love the smell of castor oil in the morning, but because the overall health of the sport depends on people being able to afford to pursue it. To say that the AMA turned a deaf ear to our suggestion that they do for the two-stroke exactly what they did for the four-stroke would be an understatement.

BUT AMA IGNORANCE ASIDE, OUR REJECTED REQUEST RAISES THE QUESTION OF WHETHER A BORED-OUT TWO-STROKE COULD COMPETE AGAINST A MUCH LARGER FOUR-STROKE.

But AMA ignorance aside, our rejected request raises the question of whether a bored-out two-stroke could compete against a much larger four-stroke. The only way to find out was to build one. Based on our proposed AMA rule change that homologated 250cc two-strokes should be allowed to increase their displacement (by bore only) up to 450cc, we started a development program. In practice, the technical limitations of a bore-only rule would limit a 250cc two-stroke to under 300cc.

The *MXA* wrecking crew contracted with MaxPower to build us a big-bore YZ250. After several tests, it was decided that the best displacement for our big-bore YZ250 wasn't at the max, but closer to 285cc. When we went to 300cc, we got solid increases in horsepower and torque, but we had crossed the tipping point on powerband usability. At 300cc, we got a chunky, grunty and short powerband. Backing the displacement down to 285cc gave us a solid two more horsepower everywhere (with up to four horsepower more at points on the curve) and a healthy increase in torque—without changing the basic characteristics of a 250 two-stroke engine.

The MaxPower kit is easy as pie. It consists of three elements: **(1)** A 4.6mm larger Wiseco piston (that amazingly only weighs four grams more than a stock YZ250 piston). The head is modified to work with the piston diameter. **(2)** MaxPower bores out the cylinder and replates it. This is not a sleeved cylinder with a steel liner. It is an all-aluminum cylinder with an Apticote ceramic bore coating. Very sweet. **(3)** The cash cost of turning a YZ250 into a YZ285 is $1025 for everything you need (piston, rings, wrist pin, circlips, O-rings, gaskets and engine mods). If you want to keep your stock YZ250 top end, MaxPower will supply you with a new cylinder head and power valve for $678.

The *MXA* test crew spent a month racing a stock YZ250 against our YZ285 (and of course against full fields of 450 four-strokes). At each race, we tried different combinations to see what worked best. We added a nine-ounce flywheel weight to try to be more four-stroke-like. Not surprisingly, we achieved a much torquier and more manageable feel in off-cambers, tight

Wheelie bar: Torque is a big plus.

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turns and slippery dirt. The 35cc larger engine and extra weight made the YZ285 tractable, but a little lazy off idle. We added one tooth to the rear sprocket to improve the snap, and for hardpack this would be the setup we would choose.

For the majority of racing, we ran the stock YZ250 flywheel weight and gearing. This produced a stronger thrust over the weighted engine and a broader powerband than on the stock YZ250. The extra torque was appreciated in slow sections of the track, where four-strokes have a tendency to walk away from two-strokes, while the two extra horsepower paid big dividends on the starting line, out of corners and in deep loam.

Do we think the YZ285 kit was worth it? Yes and no, but not for the reasons you think. On the positive side of the scale, there is no doubt in our minds that if you are running a 250cc two-stroke competitively in a pack of 450 four-strokes, the 285 kit is going to get you a couple of places higher in the pecking order. It enhances the two-stroke in a four-stroke way. It is a simple hop-up that produces a healthy increase in power and torque and places those additions directly in the two-stroke's weak spot (when compared to a four-stroke). We got better starts, stuck closer to four-strokes on slippery off-cambers, and could respond tit-for-tat on hard dirt.

On the down side, most of *MXA*'s hard-core two-stroke riders love the way their 250cc two-strokes respond. The snappy feel, quick hit and aggressive output make the basic 250cc engine a quarter horse in a field of 450cc Clydesdales. It's not that the 285 kit took the rat-a-tat-tat away from the YZ250, but it did make it into a gruntier powerhouse.

Could our MaxPower YZ285 beat the 450 four-strokes in hand-to-hand combat? With a motivated rider it would be "mission accomplished."

For more info, contact MaxPower at (608) 224-2524. ❑