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CHRISTINI 450

Every revolution has a start

► Christini didn't invent two-wheel drive motorcycles. We don't know who did—the idea has been around the block a few times. In fact, that's probably the reason that the concept isn't widely accepted today; the motorcycle industry had been there, done that and collectively yawned.





But that's where Christini *is* different. No one is yawning. When we first rode the Christini all-wheel-drive CRF250X we were blown away. It certainly wasn't a Rokon. In fact, it did some things better than any dirt bike on the planet. Now the guys at Christini have a follow-up act based on the Honda CRF450X. And we're still blown away.

WHEELS A TURNIN'

Steve Christini is an engineer who came up with the concept over 10 years ago. It began as a college project with the primary application for mountain bikes. There are obvious design problems in getting power to the front wheel of any two-wheeler. It's been attempted with chains, belts and most recently with hydraulic lines. As far as we know, Christini is the first to do it with two counter-rotating driveshafts that run along the fork legs. Steve patented that idea in 2001 and the production version of the bicycle came shortly afterward. Now Christini two-wheel-drive bicycles are produced with the Jeep name.

Mark Tilley is as skeptical as test riders come. After his first day of riding the Christini, he signed up to race the U.S. World Enduro round on one.



CHRISTINI 450

The motorcycle version was first tested on a 450 for the sake of over-engineering the various components. Christini uses a chain that comes off the countershaft sprocket and goes up to the base of the fuel tank. Then drive shafts take over the job. Within the steering head are the beveled gears that transfer the power to the bottom triple clamp and then to the two external drive shafts. They drive the front wheel at a ratio that is slightly slower than that of the rear wheel, so basically it freewheels through a one-way clutch until there is some

wheelspin. Then the front wheel engages. That means that most of the time the bike not only acts like a normal, rear-wheel-drive bike, it is a normal, rear-wheel-drive bike. Under acceleration, though, there always is some wheelspin. That's when the front wheel actually contributes to the output.

What about efficiency? After all, that's what kept Yamaha out of full-scale production with the hydraulic two-wheel drive system—there was significant power loss in the system. There is almost no power loss in a

chain drive system, but shaft drives are usually associated with some inefficiency, particularly at the points where the drive makes a 90-degree bend. Christini borrowed technology from the helicopter industry to help with this. In the steering head there's a series of gears that work just like those that drive the tail rotor in a helicopter. This was no easy application and took a great deal of testing. The fact that the two drive shafts rotate in opposite directions is critical, too. That eliminates any torque effect that could mess with a bike's steering.



Richard Pelkowski, Olympus

Yes, the Christini will drag itself up almost anything. All you have to do is make sure the front wheel is on the ground.

If you like the stock Honda CRF450X, you can't help but love the two-wheel drive version. Christini is currently working on a kit for KTMs as well.

ENGAGED & PULLING

Riding a two-wheel-drive motorcycle is a strange mix of convention and the unexpected. At first, everything seems normal. You don't even notice the big chain running right up the left side of the bike. But when you start going fast, things change. The first advantage you really notice isn't traction, hill-climbing or any of the things you might expect. It's the way the bike turns. When you lean into a berm and gas it, the Christini snaps through the turn so fast that you know something is very, very different. The front

wheel doesn't wash out no matter how tightly you crank it over. And it goes exactly where it's pointed.

Next on the "something's up" list is acceleration. We remember that the 250 version of the bike managed to accelerate with much larger bikes. The 450 ups the ante even more. You have to remember to keep your weight forward because two-wheel drive can't do much if the front wheel is off the ground. Think about how easy an MX start would be if you never had to worry about balancing your weight between too much

wheelspin and too much wheelie. You just lean as far forward as you can stand because wheelspin is never an issue.

Somewhere about third on the list is climbing ability. Again, it's all about keeping your weight forward and the bike will climb things that a normal bike simply can't. It will make you a better rider—or at least look like a better rider. In extreme riding situations the bike has a natural advantage. When you have to crawl up rock steps, tractor tires or big logs, front-wheel drive would probably be preferable over rear wheel drive. Having both just means that hard jobs are easy. In a way, that kind of bums us out. If that stuff gets too easy, will the challenge still be there? We suppose you could say the same thing about any technological advance, from suspension to electric starters.

Disadvantages are few. A bike's weight certainly goes up when you have more shafts and gears. We haven't put a Christini on a scale, but the company says the kit adds about



Richard Pejkowski / Olympus

How the magic happens: The shaft under the tank transfers power to the beveled gears within the steering head and on to the two counter-rotating driveshafts that run along the fork legs. Fork action is unaffected.

15 pounds and that sounds honest. And you can't deny that a bike handles *different*. Some riders won't like it in all types of turns, which is why the whole system can be disengaged on the fly.

WHAT NEXT?

Christini is a very small company catering to a very small crowd. While there are certainly a zillion people who say they want a two-wheel drive bike, there aren't many who have the dough to make it happen. In order to get a Christini 450, you have to already have a Honda CRF450X. If it's brand new, that's best; the company just wants your frame in exchange and they'll give you a kit for around \$6000. If your bike is used, they'll need more time to modify your exact frame. The kit has the new frame with all the shafts and gears installed, a customized fork (which also



With two-wheel drive you can stop on a steep hill and the bike won't roll back until you pull in the clutch. On gnarly stuff this is a great feature if you need to back down. The super cool benefit of the Christini is that if you can't make it up riding it, you can stand next to it and let it pull you up. Tilley demonstrates by stopping on a steep incline and letting the bike pull him up.



requires an exchange) a new fuel tank, a new front hub and new triple clamps. Christini is currently setting up dealerships. There aren't many, but they can be found at Christini.com.

Frankly we love the concept. We love the bike and we love the way it lets us be better than we are. And we don't care if it ruins the sport by making things easy. As long as it makes those things easy for us, we're happy. □