

Atomic Zombie™ Extreme Machines

Build it yourself bikes, recumbents, trikes, tandems, choppers and more.



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AZTV



AZ newsletters

Bike builders edition

November 23, 2011



BICYCLE BEARING BASICS



HEAD TUBE BEARINGS



BICYCLE AUTOPSY



DIAMOND FRAME CHOP 1



BOTTOM BRACKET BEARINGS

3-Piece Bottom Bracket Bearings

[New AZTV video tutorial](#)

This basic tutorial will demonstrate the workings of a typical 3 piece bottom bracket, showing the removal and installation of the various components that make up the bearing system.

Although there are slight size differences between different manufacturers, the basic principles of operation and assembly are virtually the same. In this tutorial, the bottom bracket shell has been cut from the frame for later use in a custom bicycle project.

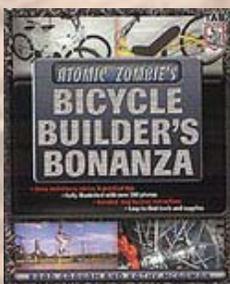


The crank axle is a hardened steel rod that includes a pair of machined bearing races, tapered square ends, and either a bolt or internally threaded section at each end to affix the crank arms.

There is some debate between "axle" and "spindle" as being the correct name, but most seem to use axle now, so I will as well. Why make things more complicated, right?

More on this and other free bike building basics videos at:

atomiczombie.com/aztv



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The Lost Files

The Secret SpinCycle Vortex Mod

By Radical Brad

We usually classify our bike projects into categories such as practical rides, choppers, cargo bikes, motorized vehicles, and general fun rides. The [SpinCycle](#) is a very unique delta trike that can turn on all three wheels, creating an endless supply of high G-force entertainment. It definitely falls under the “fun rides” category. In fact, I would rank the SpinCycle only second to my [SkyWalker tallbike](#) when it comes to all out fun. The effects of riding the SpinCycle can only be described as a cross between recumbent racing and some kind of spinning amusement park ride. Of course, a project is never really finished. One afternoon I had an idea that would take the SpinCycle to the next level of craziness. I called this project the SpinCycle Vortex Mod.



The original SpinCycle is a one of a kind 360 trike.

My idea was to add another set of caster wheels to the original SpinCycle in order to allow it to continuously spin around in circles on four caster wheels once the momentum has been started. The original SpinCycle can do a full rotation by



The new centering caster wheels are much larger

gaining speed and then turning so that the momentum causes the front wheel to skid around in a controlled manner. This can be seen in the product video on our main AtomicZombie.com page. My goal was to continue this momentum by allowing the front traction wheel to lift from the ground, placing the weight onto a set of four caster wheels

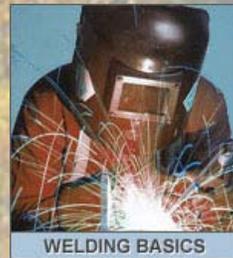
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HEAD TUBE BEARINGS



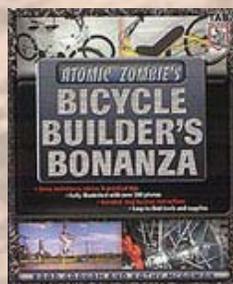
BICYCLE BEARING BASICS



WELDING BASICS



BASIC FISHMOUTH CUTTING



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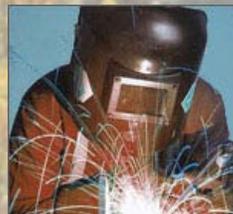
so that the momentum of the spin is maintained. In the original design, only a single rotation could be achieved since the friction of dragging the front wheel during the spin. By adding a second rear boom in the center of the frame, the rider could lean backwards and get the front wheel off the ground in a controlled manner - at least, that is my theory. You see, I have not yet tested this prototype, and due to space constraints, had to take it apart.



BICYCLE BEARING BASICS



HEAD TUBE BEARINGS



WELDING BASICS



DIAMOND FRAME CHOP 1



Reconfiguring the SpinCycle for the new design

Because 90 percent of the weight would shift from the front drive wheel onto the new set of casters, I chose large pneumatic caster wheels, which are huge in comparison to the shopping cart casters used in the original design. These casters were salvaged from an old electric power scooter, and include high quality bearings and inflatable tires that run up to 30 PSI. The pivot points are actually the same as a bicycle head tube, so I cut up some old frames in order to join these casters to the SpinCycle frame. A twin pair of headtube bearing components were also dug from my parts bin to complete the new caster hardware. Now, the SpinCycle frame had to be cut and re-made to adapt to the new design.

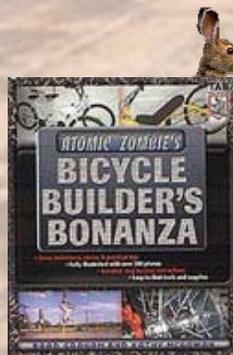
To make the SpinCycle balance over the new large caster wheels, the frame had to be chopped up and completely reconfigured for length and height.



The main set of caster wheels installed

For this prototype to function, weight balance will need to be perfect in order to maintain both traction and the ability to lean back and tip the frame onto the second rear set of casters. Weight shifting will be done by leaning back so that the body weight of the pilot moves over the center of the boom that connects the main set of caster wheels, forcing the front wheel off the ground while the cycle sits on the four caster wheels. The front end will remain unchanged from the original design, using a single speed 20 inch wheel with front wheel

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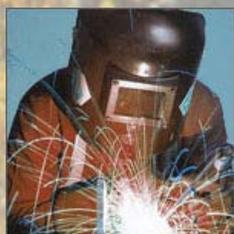
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BICYCLE BEARING BASICS



HEAD TUBE BEARINGS



WELDING BASICS



DIAMOND FRAME CHOP 1

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drive.

The SpinCycle Vortex untested prototype

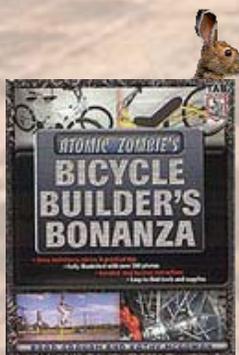
The new larger set of caster wheels and the support arm are both welded under the center of the pilot's seat to keep the center of gravity positioned over the caster wheels. At this point, the SpinCycle can be ridden, but leaning back causes it to tip over onto the back of the seat, as there is nothing to hit the ground. The rear set of casters will be installed so that when the SpinCycle is tipped backwards, the front wheel is just slightly lifted off of the ground.

Leaning forward allows the front wheel to maintain enough grip to get rolling so that the SpinCycle can get up enough speed to start a spin. The 5 degree head tube incline keeps the casters pointing forward when the SpinCycle is moving forward and then sets them at 90 degrees when the rear set of casters hit the ground. This slight caster head tube angle variance makes the difference between forward maneuverability and all out loss of control.

To complete the new design, the original shopping cart caster wheels were installed at the rear to act as landing wheels when the pilot leans back to get the front wheel off the ground. When riding with the front wheel hitting the ground, the landing wheel casters ride about 1 inch off the ground, this way the angle of the larger caster wheels only change slightly when the cycle is tipped backwards.

A few tests in the only uncluttered 10 foot area of my garage showed that this configuration worked well, able to maintain enough grip for forward momentum yet tilt back with a slight shifting of weight.

Sadly, when I built this prototype it was winter, and by summer time I had to cut up most of my designs to make room in the garage. So, I will leave it up to my fellow garage hackers and SpinCycle owners to try out the new SpinCycle Vortex mod and then report back. I now live on a dirt road, so it may be a while before I can once again try out this design. If you get this thing to work, let us know in the [Atomic Zombie builders forum!](#) See you there. ~Radical Brad



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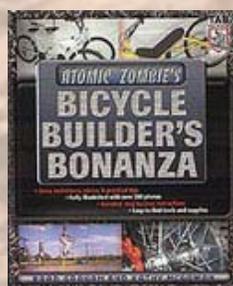
DIAMOND FRAME CHOP 1



WELDING BASICS



WORKING IN THE FIELD



Zombie feedback

"Greetings from Colorado, Brad!

Great website and AWESOME information!

I purchased and downloaded plans and promptly developed some very painful back issues. On the mend and looking forward to creating some custom bikes. In particular, a bike that will allow me to share some of the local bike paths with my 90 year old mother. She is excited!

Keep in mind that she has limited vision and has been declared legally blind. You would think that would slow her down. Not! Still living alone and is still in business selling vintage jewelry and retro clothing after 50 years!

Her choice of design is the LodeRunner Tandem. I had initially thought that the Kyoto Cruiser would be the way to go. However, she has her own thoughts. Her comments: "The Kyoto looks too wide for most of the bike trails. As a passenger, this design would put ME on the street-side and I wouldn't like that." and "The LodeRunner would put me behind you and I would feel more secure." Talk about being sharp!

Now, if only hub-motors would become more reasonable in price. I wonder how I could incorporate dog power. My black lab LOVES to pull my down the road on my tadpole trike.

BTW, how does one transport the LodeRunner?

Thanks for the great work!
Stay warm!
George "



LODERUNNER TANDEM



LODERUNNER TRIKE

**THANKS,
I BUILT IT!**
ATOMICZOMBIE.COM

WANTED

Pictures of your homebuilt bike!

Send us a picture of your completed handmade bike: gallery@atomiczombie.com
Please — Send one picture per bike, no larger than 2MB in size, .jpg format is best.

*** Don't forget to include your name and the country where you live. ***

The gallery is updated every week. Looking forward to seeing your bike creations!

~ KoolKat and RadicalBrad

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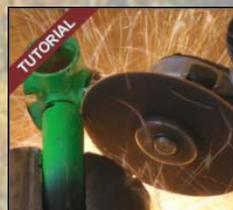
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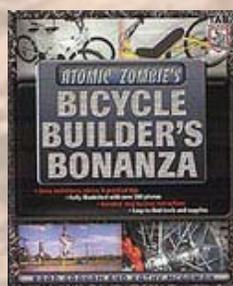
HEAD TUBE BEARINGS



DIAMOND FRAME CHOP 1



WORKING IN THE FIELD



"Brad, thank you for the great plans.

Looking forward to building a Warrior trike next."



WARRIOR TADPOLE TRIKE

Zombie feedback

"Hi there I am a big fan of your projects. The other day I was running on my elliptical stationary bike, then it occurred to me that it would be great to have an elliptical bike that I could build for cheap.

So, I was thinking that you should build an elliptical bike like the elliptigo (www.elliptigo.com) and make a walkthrough for the rest of us.

I would design one myself but I lack the skill and the time to go through the design process.

Thank you for taking the time to read this message.

~ Montana"

Zombie feedback

"Hey Zombies! I just joined the bike building forum. What a great community. So glad I found you guys and gals. I check in a few times a day. Tons of great info .

I'm issuing a challenge to you all to send as many people as you can to the Atomic Zombie site to support the amazing work Brad and Kat do for all of us.

Heck, I even bought more plans than I'll ever build just to support the AZ community. Love the AZTV videos. Hope Brad and Kat make more after they unpack. I know they've been super busy this year with the move and all that goes along with that.

Been following their adventures this year and want to offer my support as much as I can. Hope you other zombies will spread the word and get more people to join up. Bike builders are cool!"

~ Josh in California



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