

eTech 'n' Stuff

Ronald Headley
www.yardgardenwindmill.com

College & Garden Windmills

I was able to take a trip to Iowa and meet the people that make the windmills.

They are located in a very small town quite a distance from any major city or Interstate.

There are only 6 people working there. The windmills start off as flat pieces of steel. The manufacturer uses presses and shears to cut and form the steel into the legs, ground stakes, braces tail, pivot and wheel. All of the parts are made at their facility. Everything is done by hand with the help of hydraulic machines. They do not use computer driven machines.

The wheels for example starts with cutting and forming the pieces for the hub which are welded together. The Blades are

welded to the hub assembly and then each wheel is hand balanced. The wheel is then painted - the bearings inserted and then the cardboard wrap is added in preparation for shipping.

The steel is cut for the legs and goes through a press which makes the 90 degree bend, adds the taper where the legs fit together and puts in the bolt holes.

Steel is cut for the braces and cross braces - this is done with guides so that every brace is exactly the same.

When a batch in one size is completed, they change every machine so that they can make a batch in the other size.

The parts are packaged and boxed ready for shipping.



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The company started in 1937 with manufacturing full sized windmills that generated electricity. Early on the factory was powered by three of their electricity generating windmills. With the advent of rural electric companies the need for windmills to generate electricity declined. This company is family owned and operated for 3 generations, they have been making the garden windmills the same way for decades.

Repairing an older windmill

I do have parts for the Made in the USA 8 foot and 4.5 foot windmills. I do not list the parts on my website simply because I need to make certain that the parts ordered will actually fit your garden windmill.

The Chinese made windmills look a lot like the made in the USA windmills however the sizes of the pivot, the wheel bearings and mast head are often different. This means that the parts I have will not fit.

First some things to look for. If the blades or the hub of the wheel have come

loose, flow off or the welds have failed you probably have a cheap Chinese made windmill.

Next if the wheel will turn but wobbles the bearings may have failed. The Chinese bearings fail often in less than two years. I do NOT have replacements for the Chinese bearings.

If your windmill is 10 years or more old and the wheel wobbles the chances are good that this is a made in the USA Windmill and the bearings I have will fix it.

Problems with the wheel are the most common and replacement wheels for the

made in the USA windmills are available.

The other moving part - the pivot that fits into the mast head and allows the windmill to change direction as the wind changes can also fail. Again the cheap Chinese ones will fail in a year or so. The made in the USA can fail also but it normally takes 10 years or so to cause enough wear to affect the turning. The weld to the sleeve can fail. The mast head, pivot and tail all are available. Once again the ones I have will normally not fit the Chinese windmills.

eTech n Stuff
105 Magnolia Suite 1
Georgetown, KY 40324
(502) 570 - 5974
(502) 570 - 5975 Fax

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Special points of interest:

- *Repairing an old or damaged garden windmill*
- *8 foot windmill photos*
- *8 foot windmill repairs*
- *Windmill parts*
- *Frequently Asked Questions*

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Repairing your Garden Windmill

Figure 1 - Garden Windmill Parts

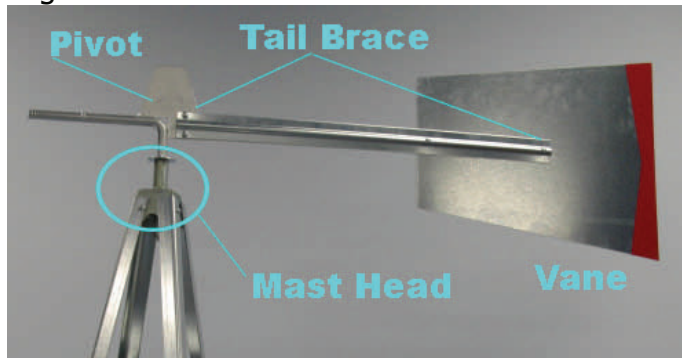


Figure 4 Wheel

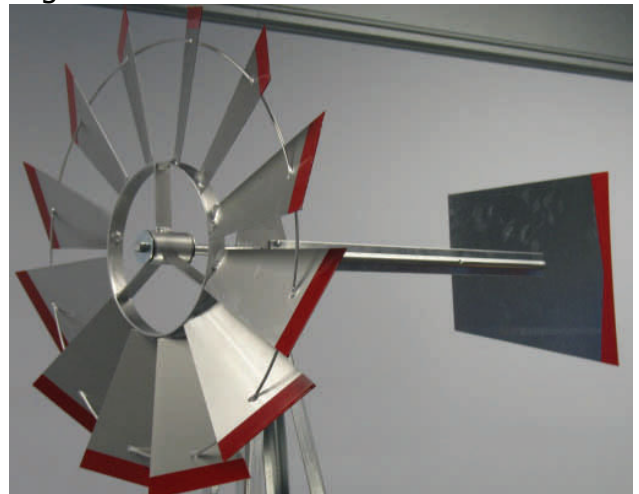


Figure 2 Eight Foot Windmill deminsions

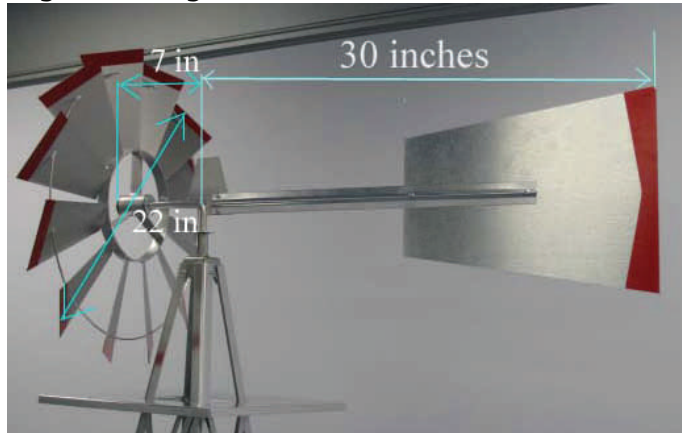


Figure 5 Wheel Hub and bearing (Back)



Figure 3 Pivot



Figure 6 Pivot in mast head - tail attached



Repairing your Garden Windmill

The first step in repairing a broken or damaged windmill is to identify the parts of a Garden Windmill.

Figure 1 shows the parts

A complete tail is made up of the vane, the 2 tail braces and the pivot. A complete tail assembly has a cost of \$17.25. The tail braces bolt to the Pivot and the Vane bolts to the braces.

The mast head has 4 holes which bolt to each of the legs and a welded on sleeve where the vertical part of the pivot slides into. A new mast head costs \$11.90. The pivot rotates inside the mast head sleeve. The mast head holds and supports the entire top of the windmill. When you slide the pivot into the mast head it should be a "close" fit. If the inside of the mast head sleeve is worn or if there are any cracks in the mast head or sleeve it should be replaced.

To check for excessive wear in the mast head sleeve insert the pivot and lift and push down on the tail braces. The should be just a small amount of "play". Always make certain there is

a washer at the top of the mast head. The weight of the windmill actually rotates on the washer. (there are "stops" in the pivot shaft) - a broken or worn mast head will make the windmill wobble as it change direction.

The pivot is 1/2 inch - the inside diameter of both the wheel bearings and the mast head is 1/2 inch.

If you have anything other than the Made in the USA windmill there is a very good chance that a new pivot will not fit the mast head - plus on most of the Chinese windmills the mast head is not a good quality of steel and the sleeve will have a lot of wear if it has been up for any amount of time.

It is important that the mast head is level. Start with getting the tail braces at 90 degrees from the vertical pivot. The part of the pivot that the tail braces are bolted to has slots rather than holes so there is some adjustment possible. Next take a level and place hold it to the tail brace and rotate the top around a complete circle.

Of course your tower must also be level and you can check this with a level on the lowest horizontal brace. Always start with a level tower.

If the tower is level and it is not level all the way around on the tail brace you may need to adjust the mast head. (loosen the bolts that hold the mast head to the legs.)

Figure 2 shows the dimensions of the 8 foot USA windmill. The wheel is 22 inches in diameter, from where the pivot bends 90 degrees to the end of the shaft is 7 inches and from the same bend to the end of the tail vane is 30 inches. The wheel and tail balance so that the top can turn easily into the wind.

Make certain these are the dimensions of your windmill, some of the Chinese windmills have different dimensions.

Figure 3 is the pivot (this one is powder coat Red from a college windmill.) It has a 1/2 inch shaft bent 90 degrees with a trapezoidal plate welded to it. The tail braces bolt to this plate.

Fixing your damaged windmill



Here are a couple of photos from a severely damaged windmill. The wheel broke from the hub. I would guess that the bearings failed and froze so the part of the pivot where the wheel attaches appears to be worn. The part of the pivot that goes into the mast head appears to be in fairly good shape. As you can see on the photo to the right the trapezoidal part is cracked. The fix for this one was a new wheel, complete tail and mast head.

Figure 4 shows the wheel mounted to the pivot. The thing to note is there are two washers - one on the back and one on the front of the wheel. The grease zerk goes toward the front and a cotter pin hold the wheel onto the shaft. Once again the shaft is 1/2 inch. (Many of the Chinese windmills have a 3/8 inch shaft - and the fact is it is really metric.

Figure 5 shows the wheel. There are two bearings on the wheel. The bearing 1/2 inch inside diameter. The bearings have a flange on the outside and go inside the hub which is 1 1/4 inch. The bearings cost \$2.80 each and it is usually best to replace both of them. A new wheel with bearing is \$34.00.

The bearings that I have will fit only the made in the USA windmills. If you have a Chinese made windmill these bearing will not fit. The bearings on the Chinese windmills are metric. Some people have located bearings at garden equipment shops. The type of place that sells garden tractors, lawn mowers, tillers and so on.

To remove the bearings place the wheel on a couple of wood blocks so that the blades are above the surface. Place the blocks so the bearing is able to be driven out. A 3/8 or 1/4 steel rod or bolt can be used - Put the rod or bolt through the bearing and angle it so it is in contact with the outer edge and tap on the bolt or rod with a rubber of plastic hammer. Move the rod or bolt around and tap so that you force it straight out just a little at a time. Once you have the first bearing out the second one is easy, it can be driven out with the bolt or rod by putting it through the now open hub. Once again put a couple of small pieces of wood under the wheel.



Installing new bearings is done by tapping them in with a plastic or rubber hammer. The bearing needs to be driven all the way in to where the flange is snug against the hub.

When you put the windmill together be certain to place a washer on the vertical shaft before putting it into the mast head. It is normal for this to be pretty tight and for the windmill to not turn so well into the wind. This will loosen up in a week or two. It is a good idea to put some grease on this shaft. Before you put the wheel on place a washer on the horizontal shaft, place the wheel with the grease zerk out - toward the front, add another washer and the cotter pin. You should add three or four shots of grease in the zerk. (I use a Lithium based grease in a mini gun) - Only put in 2-3 shot of grease, this should be done once a year. You should be able to find a mini grease gun with lithium grease locally. If not I do have them for \$19.95

Ronald Headley
105 Magnolia Suite 1
Georgetown, KY 40324

Phone: 502 570 5974
Fax 502 570 5975
eMail - ron@etechnstuff.com
Hours 8AM - 8PM Mon - Sat

You can see all of my sites at my Google Profile site which has links:

<http://www.google.com/profiles/etechnstuff1>

I am constantly looking for items to sell on line, if you are a small manufacturer with items that could be sold on line or have products that might be sold on line please contact me. I am learning more and more about how to sell directly on line. One of the areas of interest that I am learning how to do is information products - basically "How to" eBooks, audio books and video books.

Frequently Asked Questions

Are your windmills USA Made?

Yes the 8 foot and 4.5 foot garden and college windmills are made in Iowa. The windmills start out as flat steel. The steel is cut and formed and packaged at their facility. This manufacturer has been making garden windmills for several decades.

Having Said That

There is a line of windmills, lanterns, thermometers, and other items that I carry that have Farm Tractor brands - John Deere, International Harvester, Case, Allis Chalmers and others that are made in China. The windmills are not as well made as the USA ones however they are pretty good and are the only licensed items with the tractor brands and colors. This line is fairly new to me so I do not know how well they stand up over time.

What about the mini Windmills?

The mini windmills are 17 inches tall and are made in the USA. There are now 13 different mini windmill models. The manufacturer has been making these since 1946 and are excellent quality. The mini windmills are a bit of a pain to put together. There are some tips on my blog site. The mini Windmills can be placed outdoors. Like the 8 foot and 4.5 foot models they have to be well anchored.

The John Deere and International Harvester Mini Windmills

do come from China. They are pre assembled and while not as well made as the USA ones they too are pretty good and so I do have them available.

Can you get parts for Chinese Windmills?

No - I do not sell the cheap Chinese copies so I am not able to get parts for them. The best I can do is replace the parts with made in the USA parts. In most cases you will need to replace a lot more than just the wheel or the bearings of the Chinese windmills. While the Chinese windmills are copies, the parts are not interchangeable. Typically the 8 foot Chinese windmills have a 3/8 inch shaft - the American Windmills have 1/2 inch for example.

What are the most common failures (USA Made Windmills)?

The most common failure of the American made windmills are the bearings - they tend to fail in 15 or 20 years. If the windmill tower is not well anchored the windmill can tip over in high winds and this will bend the wheel. It is usually not possible to get the wheel back to where it runs smoothly if it has gotten bent.

The paint on the wheel and tail can discolor and begin to get some rust on the edges. These parts can be repainted. The USA made towers and platform are galvanized steel and do "weather" - it is not easy to paint galvanized steel so I recommend just let them weather.

eTech n Stuff opened in April 2007. We are located near exit 126 of Interstate I-75. We sell your items on eBay.

We are able to convert analog media to digital formats. Tapes, reels, records to CD and film, Super 8, mini dv, VHS & VHSC to DVD. Also we can copy CDs & DVDs.

We invite you to stop by to see if we can help you sell your unneeded items on eBay, Amazon, or other online venues.

If you have a business with overstock, closeout or liquidation items give us a call. We may be able to sell your items on line for you.

We are pretty specific as to what items we attempt to sell on eBay, Amazon and other sites.

The bolts tend to rust - I recommend coating them with a very thin coat of the same grease used for the wheel.

What are the most common failures (Chinese Made Windmills)?

The Chinese wheels tend to fail in a few months and or high winds. The blades will come off, the welds break, the wheel tends to fly apart. The bearing fail in a short time. The mast head is light gauge steel and tends to wear inside the shaft. The pivot is smaller and tends to bend. They just are not worth the \$30- \$50 that people pay for the 8 foot ones.

Is it better to just get a whole new windmill?

A new windmill is around \$92 plus shipping at around \$30. A new wheel, mast head and tail is around \$63 plus around \$15 shipping. So replace or repair is up to you.

Are Other College Windmills Available?

There are only the three colleges available. University of Nebraska - in Red and White. University of Iowa - in Black and Gold and Iowa State University in Cardinal and Gold. There are no plans to have any other colleges available. You can customize the college windmills - the logos and trim are vinyl - so a vinyl sign shop can make custom designs.

Custom Mini Windmills?

Custom made mini windmills can be done for your group or event. They can be in a single color or up to three colors.