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WHIRLPOOL PORT INSTALL



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WHIRLPOOL PORT INSTALL

BY KURT DRESNER

Punching a hole for a weldless port

During a brew day several years ago, I was lamenting the extremely sluggish process of draining my boil kettle into my fermenters. I have a counterflow chiller, but in order to get pitchable-temperature wort into the fermenter, I had to run the wort at just a trickle even while my chilling water was at full bore. As one familiar with Newton's Law of Cooling, I realized also how much water I was wasting; heat transfers more quickly when the temperature gradient is steeper. This means the wort needs to move faster, so it will be more turbulent and so the hot wort can be chilled by the cold water, not by the slightly-less-hot wort in front of it. As an experiment, I took my output hose out of my fermenter and dropped it back over the edge of my boil kettle, and cranked open the ball valve on my wort pump. Presto: The chilling water was coming out piping hot, meaning it was taking more heat out of the recirculating wort. As an added bonus, the boiling hot wort would sterilize my whole chiller and all of my hose for me, saving me the effort of pre-sanitizing it.

"I should do this every time!" I thought. But I sure would look like a schmuck standing there holding the hose in the boil kettle so that it didn't shoot boiling hot wort all over my brewery. Also, hadn't I heard something out there about the positive effects of whirlpooling in the kettle? Uh-oh ... time for another brewery upgrade. A whirlpool port addition to my boil kettle was the solution to my predicament.

My system features a bunch of *weldless fittings*, inspired by the popular Electric Brewery (www.theelectricbrewery.com) build you can find online. Instead of welding a new port, I'd create one by drilling a hole, and then sealing it with a high-temperature silicone O-ring. This has several benefits. Firstly, I don't know how to weld. It looks like fun, but I've just never learned. Sec-

ondly, if I want to adjust, remove, or change out this port later, I can do that. The downside to this approach is that you can never fully sanitize it, as it involves pipe threads. A properly welded, tri-clover port could be sanitized at room temperature, if that's a requirement for you. That said, it's going to be in the boil kettle, and I'm going to run boiling wort through it on every brew, meaning I don't really have to worry about unwanted microbes taking up residence (and living to spoil my beer). This weldless approach has proven popular on the hot side of the brewing process and has been used on every Blichmann Boilermaker kettle for years.

The perfectionist in me loves the idea of a fully welded, tri-clover setup, and those can be had for a reasonable amount of money these days (relatively speaking), complete with whirlpool ports. However, if you are like me and have already dropped a fair amount on your system and you're looking to step up your end-of-boil capabilities without shelling out for a whole new system or replace all of your hoses, this approach could work well for you.

Tools and Materials

- Step bit (e.g. Greenlee 36414 Multi Hole Step Bit, 1 $\frac{3}{8}$ in.)
- Greenlee 730BB- 1 $\frac{3}{16}$ -in. Standard Round Knockout Punch)
- 5 in. (13 cm) of 1/2-in. OD stainless tubing
- 90 degree 1/2-in. MPT to 1/2-in. compression
- 1/2-in. NPT coupler
- 7/8-in. ID, 1 $\frac{3}{8}$ -in. OD washer
- 1/2-in. NPT nipple close
- 1 $\frac{1}{8}$ -in. ID, 1 $\frac{3}{8}$ -in. OD washer
- 211 Silicone O-Ring 70A Durometer: 1 $\frac{3}{16}$ -in. ID, 1 $\frac{1}{4}$ -in. OD, 1/8-in. width
- 1/2-in. NPT locknut
- 3-piece ball valve, 1/2-in. FPT.
- 1/2-in. MPT quick disconnect (or whatever connect you use)
- PTFE (Teflon®) tape

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PHOTOS BY KURT DRESNER

I. DRILL A PILOT HOLE

The first thing you need to do is put a hole in your perfectly good boil kettle. I had debated extensively with myself where to place the port, in terms of height. After doing some reading, I decided to put it right about at the 5-gallon (19-L) level. I wanted to be able to use it if I was only doing a 5-gallon (19-L) batch, but I didn't want it too low, to ensure that the wort would mix enough during cooling. In retrospect, unless you really think you'll be doing a lot of 5-gallon (19-L) batches, put this reasonably high up, otherwise chilling won't be as efficient.

It's a good idea to make a small dimple if you can with a nail or other tool so that the step bit won't wander around. I didn't have a nail, so I just went to town with the step bit, pushing the kettle up against the wall so I could use a lot of force. You will want to be careful with the step bit. Cutting oil will help keep things lubricated and prevent the bit from getting too hot. You should also use protective eyewear, as metal shards may get thrown all over the place. After a while, you should have a hole that's big enough to feed the knockout punch through.

2. USING THE KNOCKOUT PUNCH

The knockout punch comes in two pieces that unscrew. One piece fits flat against the side of the kettle, and the other screws onto the other side. As you tighten the punch, the not-flat piece will be pulled inside the flat piece, and that's what will cut the metal. With my pilot hole big enough, I fed the punch through, and got ready to tighten that bad boy down.

Knockout punches are expensive (see if you can borrow one or get one used), but they sure do make a really clean cut without the rough burrs that could prove to be problematic with weldless ports.

3. INSERT AND TIGHTEN THE NIPPLE CLOSE

Next, feed the nipple close in from the outside. This is actually important—if you feed it from inside, you will wind up with too much slack on the inside. Some of the threads that would wind up on the inside need to wind up under the o-ring and locknut on the outside, so that all the connections can be tight, including the one holding the o-ring up against the kettle wall. I applied PTFE tape to both sides of the nipple, fed it in from the outside, and twisted the smaller washer and coupling on the inside. Once there, I put the o-ring on the outside, placed the larger washer around it, and tightened down the locknut, making sure the grooved side was against the kettle wall.



4. ASSEMBLE THE REMAINING HARDWARE

You can now attach your quick disconnect (or camlock fitting, or barbed fitting, or whatever you use to connect your hoses) to the 3-way ball valve. First, get some PTFE tape onto the fitting. Then screw it firmly into the ball valve.

Now you can attach the compression fitting to the inside and the ball valve to the outside. With a 3-piece ball valve, you don't need to get it perfectly aligned. Just get it to the closest 90 degrees, and then you can disassemble the valve and re-position the handle on top (or wherever you want it). Crank everything down extremely tight—the large washer and groove in the locknut will prevent you from overcompressing the o-ring.



5. BEND AND INSERT THE STAINLESS TUBING

You'll want to bend the stainless tubing so that the wort comes out as close as possible to parallel to the kettle wall. I borrowed a conduit bender from a friend, and with some fancy clamping and abuse of a screwdriver, was able to bend the stainless tubing to better match the curve of the kettle wall. The clamp and the screwdriver both deformed the ends of the tubing a bit so that they wouldn't fit into the compression fitting, but if this happens, you can just cut off about half a centimeter of the end of the tubing on the affected side it should fit again. Insert the tubing into the compression fitting, tighten it down by hand, and then use a wrench to get another turn or so to swage the ferrules and seal the fitting.



6. BREW DAY

Brew day just got a little bit easier. When it's time to chill, instead of running wort once through the chiller, or putting a hose in the top of your boil kettle, hook up the output of the chiller to the whirlpool port, open the ball valve, and start whirlpooling! I actually do this *before* the boil is done, to make sure I completely sanitize my whole chilling setup. (Be sure your pump is properly rated to handle boiling temperatures though.) Once the temperature coming out of the chiller hits my desired pitch temperature (or as close as I can get if the chilling water isn't very cold), I simply turn off the pump, close the whirlpool port, and move that hose to my sanitized fermenter(s). 

