

KEG to BOILER

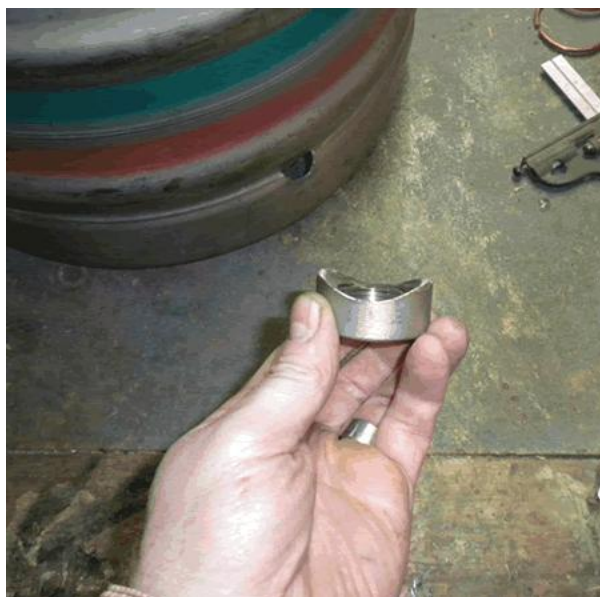




To convert the stainless steel pony keg (7.5 gallons) into a boiler I need to mount a 1" NPT stainless steel half coupler to the side of the keg, (McMaster and Carr part# 4464K475) this will hold most of the off the shelf hot water heater elements that turn the keg into a boiler. I want to solder the 1" NPT half



coupler to the side of the keg and I need to mount the coupler as low as possible to make boiler efficient but the kegs ridges get in the way. I use a Contour Profile Gauge to get the exact



shape of the ridge and then transfer the contour to both sides of the coupler. Using a grinder I remove the necessary metal until the coupler fits the keg pretty good.



While test fitting the coupler to the keg I use a felt pen to mark the inside and outside diameter of the coupler onto the keg. I then mark the center of the circles and drill a pilot hole (it can be useful to use a punch or even a nail to make a small dent so that the drill bit doesn't travel when starting the hole). I then use a step drill bit to enlarge the hole.





I use my rotary grinder (Dremel, which I am personally finding to be one the most valuable tools for still making) with a grinding disc to enlarge the hole to the exact inside diameter.



After the keg and coupler are modified I then sand all surfaces until they are smooth and shiny and then further clean with steel wool in preparation for soldering the part together.

I used Soldering Flux for Stainless Steel (McMaster and Carr part# 7695A1) and gave all surfaces a thorough brushing with it. The technique I used to solder the coupler to the keg was to tin each surface first; this means that I applied solder to each surface individually first to “wet” the surfaces with solder. I made sure that both the keg surface and the coupler surface had a significant amount of solder covering the entire surfaces. This can be a little tricky and you might have to stop and cool the parts down and then clean them and reapply flux until you get the solder to wet/stick to the entire surface areas. I found that when using Map gas I had to adjust the flame of my torch to its lowest possible setting and then slowly bring the temperature of the steel up to the melting point of the solder. After I had both surfaces covered with a significant amount of solder I then put them together cold (keg on its side with the coupler resting on it) and then slowly applied heat with my torch until the solder on both keg and coupler started to melt. Then using gloves (a cheap set of welding glove are very handy for still making) I pushed down on the coupler squeezing out the excess solder between the coupler and keg and then cooled down both parts with a cold wet towel. After joining the coupler to the keg I went around the connection about a ¼ turn at a time cleaning and re-applying flux and then again slowly bringing the area up the melting point of the solder I put more solder on the connection until I had built up a good even amount of

solder around the entire coupler. I then used my rotary grinder with a sanding drum bit and made the connection look pretty.



After screwing in my 2000 watt 120V hot water heater element (off the self at any Home Depot) I decided to make the elements electrical connection cover out of a 1 ½" PVC conduit coupler and a 1 ½" PVC conduit end cap (again off the self Home Depot).



To get the PVC coupler to fit the ridge on the keg I first roughed out the coupler on each side with the rotary grinder and then attached a strip of 60 grit sand paper with some spray glue to the ridge of the keg and moved the coupler over it until it had the perfect contour. I then drilled a 7/8" hole in the top of



the end cap and ground off the connection end of a 1/2" Cord Grip Connector (Home Depot) which I put through the hole and screwed down the cap to use as the power cord's strain relief.



Since the inside diameter of the PVC conduit coupler is just slightly larger than the outside diameter of the stainless steel coupler I used a bit of cardboard to line the PVC coupler to make a very nice tight fit. I

also tapped (put some threads in) the lower part of the PVC coupler for a set screw to hold the PVC coupler in place (I don't really think this is necessary but it can't hurt).



After putting the coupler in place over the stainless steel coupler and hot water heater element I use a short piece of 1 1/2" pipe (maybe 2 1/2" in length) that will join the coupler to the end cap. The wire is

12/3 power cord that has been put through the hole of the

cord grip connector with a good amount of extra wire so that the ground (green wire) has enough length to go through a hole in the side of the PVC coupler (hole should be as low as possible). After cutting the extra length off the load (black wire) and neutral (white wire) I crimp on solderless connectors to attach to the hot water heater element. After press fitting the end cap into the coupler I crimped on a solderless connector to the ground wire and use a little bit of shrink tubing to sheath the ground wire. I



then drilled a hole in the support ring of the keg and tapped the hole for 10-32 threads (you don't need to tap the hole if you use self tapping sheet metal screws). I connect the ground to the keg with a green grounding screw and Ta-Da KEG to Boiler!