Build a Microwave Transformer Homemade Stick/Arc Welder

by **stasterisk** on December 23, 2007

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intro: Build a Microwave Transformer Homemade Stick/Arc Welder

I had no idea making a DIY welder would be so easy to do. And, it's pretty much **FREE**!

Additionally, the stick welder you get is definitely better than anycheap commercial welder you can buy.
Why is this homemade thing **better than something you can buy**? Because when you factor in shipping and labor and the little bit of retail markup - the companies that make typical cheap buzz boxes will skimp on copper as much as possible. Whereas you can use enough copper in this to make something really juicy, and still spend less, to nothing, compared to a store-bought arc welder.

So here's what you need to build a welder:
- Two beat up old microwaves
- Some 10 gauge wire
- Wire nuts

People throw out microwaves all the time, if you keep your eyes on the curbs.
Or, you can get microwaves at the local thrift store for $10 each.
Try the warehouse that processes donations - they have to pay to get rid of tons of broken ones.

Stuff you need for welding:
- Welding helmet ($16 and up)
- Welding rods ($6)
- Vice grip or purpose-built electrode holder ($6 for either)
- C clamp for grounding clamp
- Gloves
- Thick nonflammable (leather) clothing that will cover your arms

Disclaimer: High Voltage ELECTRICITY and lots of CURRENT! Heat, electrocution, and DANGER! You could die and you could go blind.

That said, *try this at home!*

See this for a lot of welding safety tips

Here are the really good how-tos that this project is informed by:
build a 70 amp welder
the tiny tim welder by tim williams
home made welding machine (via afrigadget)

Dan Hartman's how-to is good for reference, too.

And here's the quickest way to make a DC welder with a bunch of 12 volt batteries.

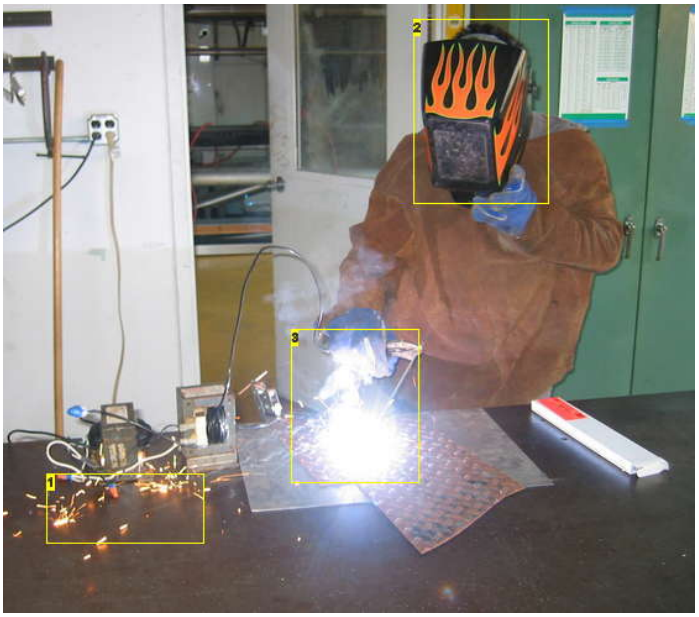


Image Notes
1. sparks! The good kind, from the weld, not the bad kind from the welder.
2. me welding
3. call me Flashdance.

step 1: Dissect the Microwaves

Invite your non-hardware oriented pals over to help help dissect your donor appliances.
They'll love it. David Grosof donated one of these microwaves under the condition that we take it apart together.

Good safety tip:
You'll find a gigantic capacitor inside the microwave. It looks like a metal can with two tabs on top.
Short it out to make sure it doesn't have any leftover charge on it, before you poke your hands anywhere near. Just put a screwdriver or something metal you aren't connected to, across the two metal terminals shown here.

Image Notes
1. microwaves are full of surprises - smelly sneaker surprise!

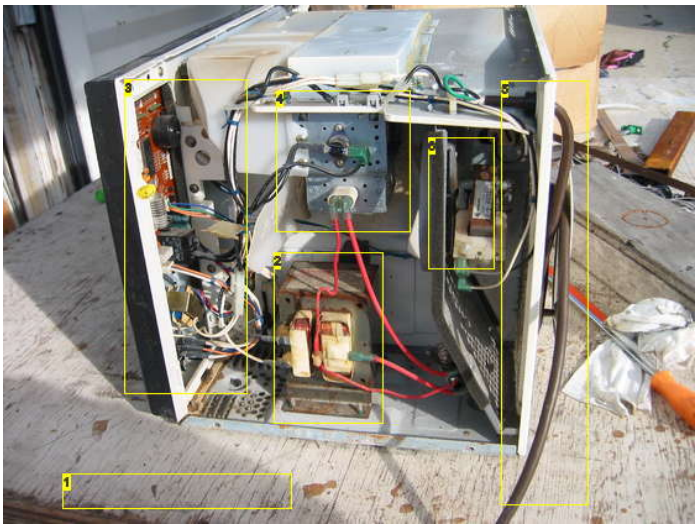


Image Notes
1. microwave guts!
2. transformer: save this and use it!
3. front panel electronics: recycle!
4. MAGNETRON: coolest name ever!
5. AC power cable: save this and use it later!
6. fan: recycle!

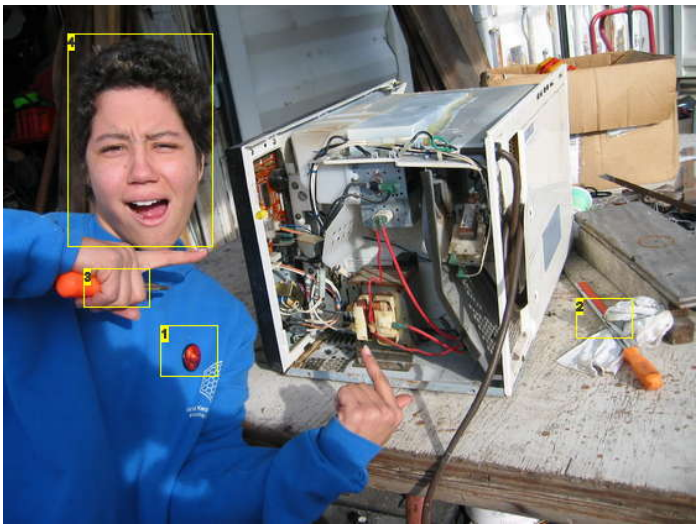


Image Notes
1. Big Cinder: earth after global warming?
2. very long screwdriver
3. five-bit switcheroo screwdriver
4. Star Simpson's dismantling-microwaves face

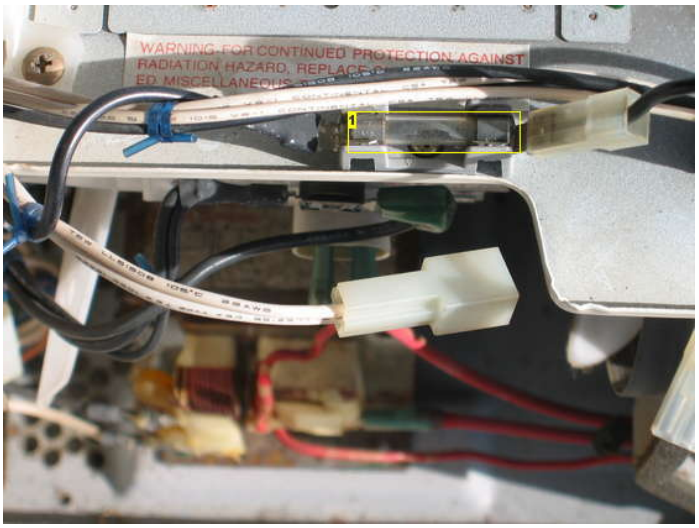


Image Notes
1. magnificent fuse

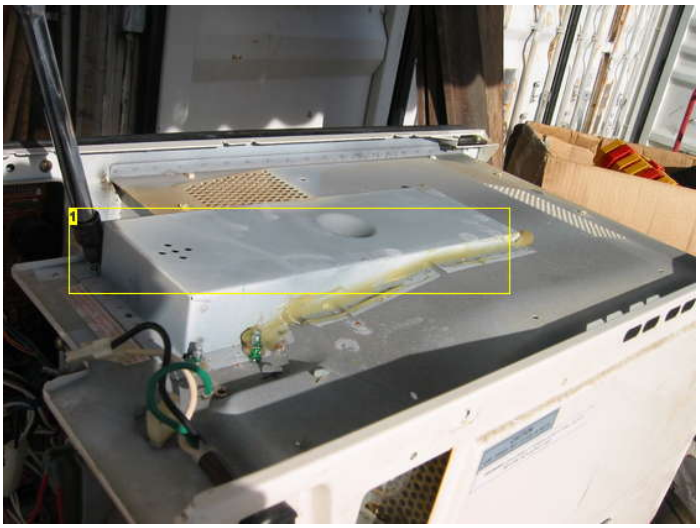


Image Notes
1. waveguide: the magnetron drools its 2.4GHz microwave rays into the oven area, through this.

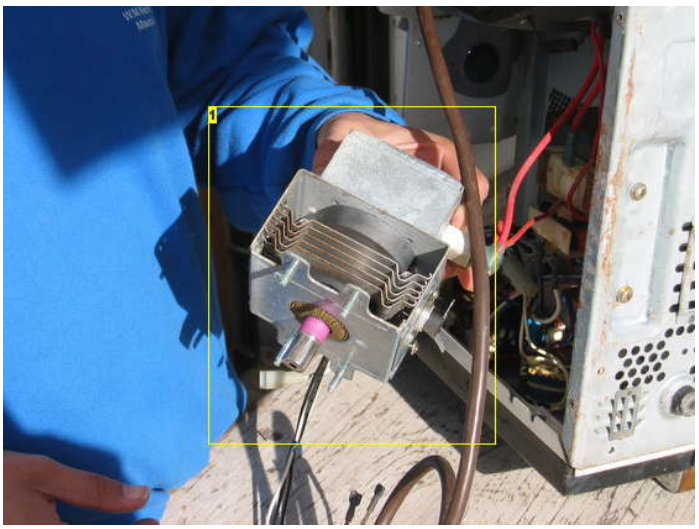


Image Notes
1. this is the magnetron. it's good for tronulizing magnetoids. by which I mean, it produces 2.4GHz radiation.

step 2: Prepare the Transformers

Chop and and knock out the secondary (thin wire) windings.
Don't nick or damage the primary windings in any way.

If you do, you could create shorts where two windings conduct to each other, allowing electricity to bypass certain parts of the coil, making effectively a smaller coil, and creating something different than what you expect at the output. Or, you might chop the connection entirely, ruining the primary. So do your best to keep it intact.

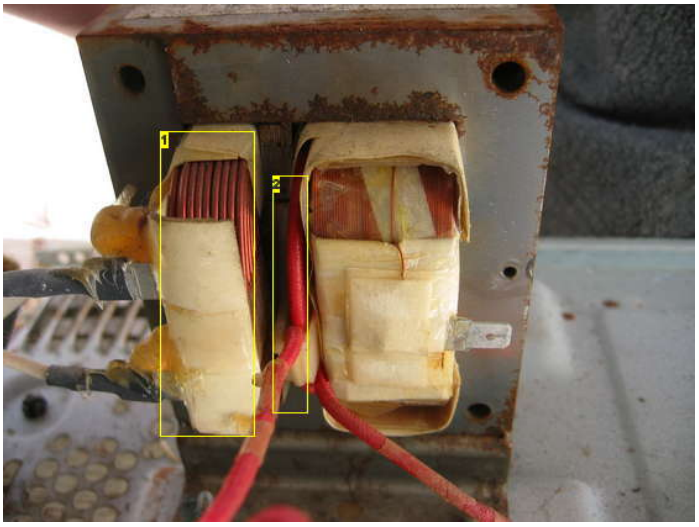
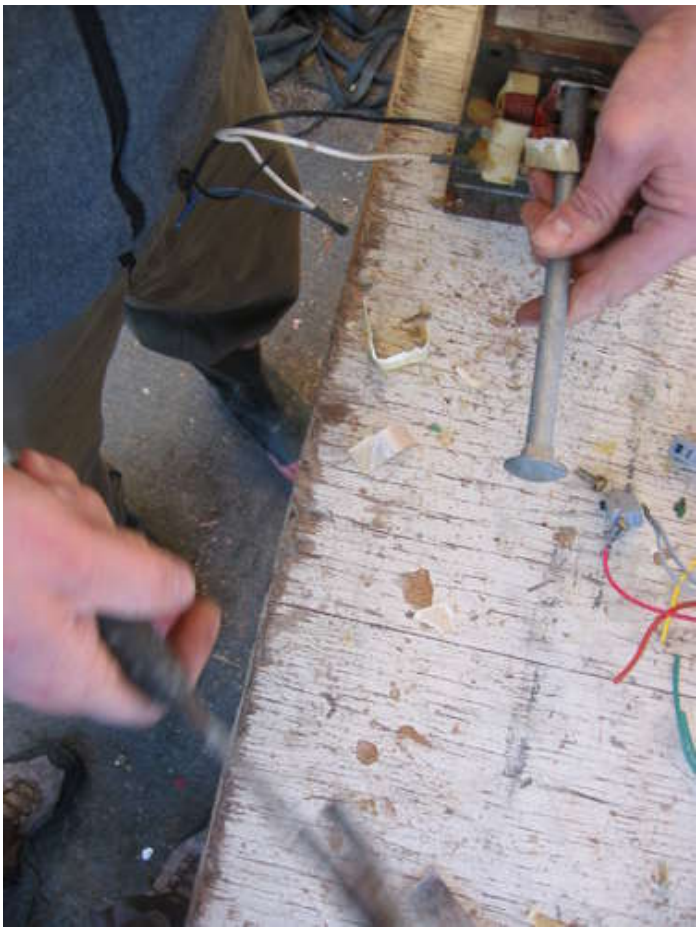


Image Notes
1. Primary windings - powered by the gods of walljuice. Don't harm these in any way.
2. Low-voltage winding for filament current or somesuch thing to feed the magnetron. Remove this.

Image Notes
1. use a sharp chisel to cut the copper winding

Image Notes
1. after chiseling, pound the wiring out. be really careful to keep the primary intact, with no nicks.



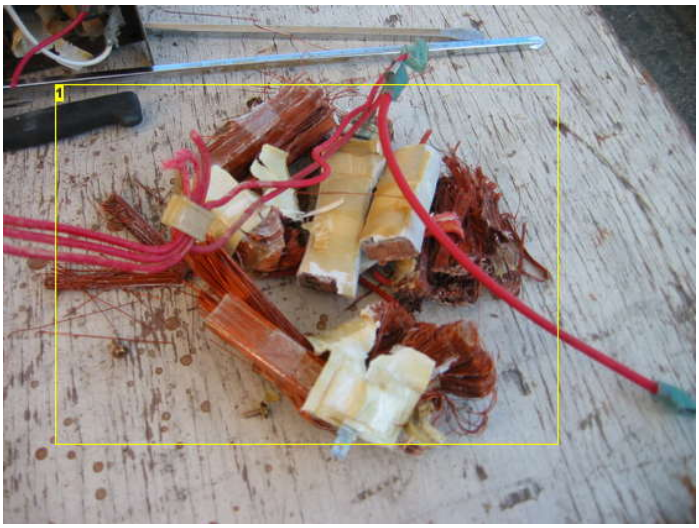


Image Notes
1. the disemboweled remains of the transformer secondary coils. This is at least a few pounds of pure copper. Sell it to the scrap yard for $4.50 a pound and take a nice trip.

step 3: Get some 24 foot chunks of ten-guage wire

We scavenged some heavy wire from an old powerboat the owner was scuttling.
We stripped the outer jacket off and separated the inner conductors to wind new secondaries on our transformers.

CLICK TO PLAY VIDEO

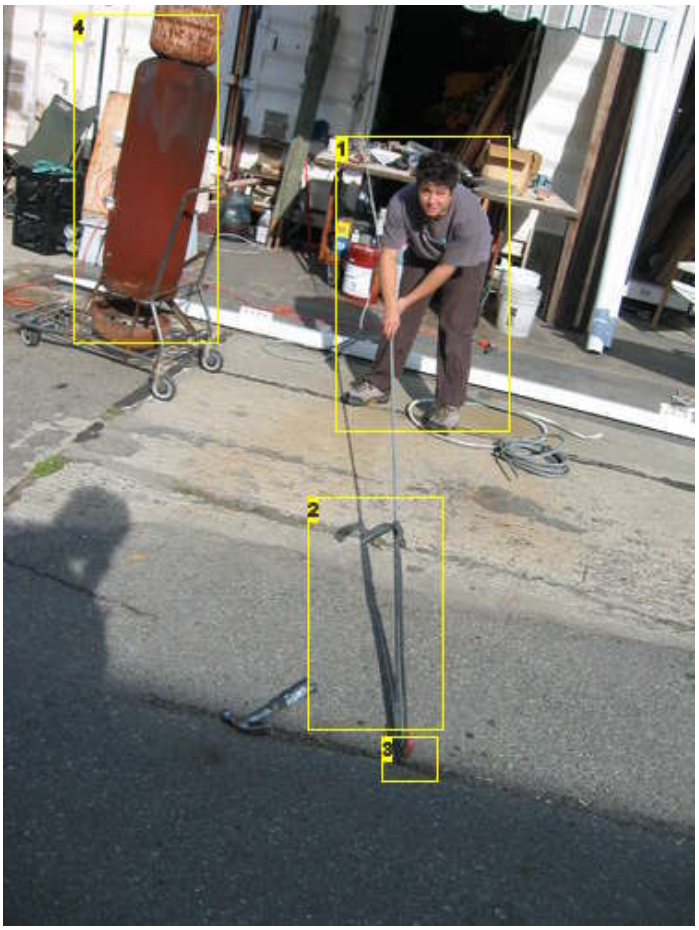
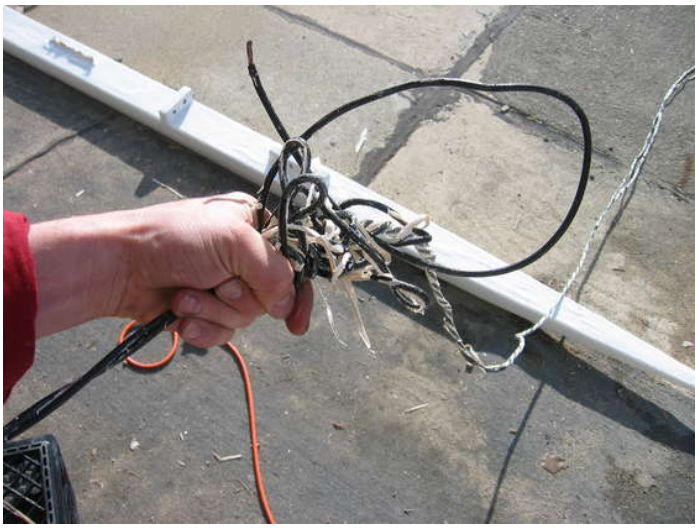


Image Notes
1. Star is skinning the 24 foot anaconda
2. this bike innertube creates tension for stripping away the wire jacket. the other end of the cable is C-clamped to the table.
3. Screwdriver pounded into the pavement temporarily.
4. Mr. Fireface is mobile now. A cozy glow whereever you're working.



step 4: Wind the new transformer secondaries

We wound 20 turns of 10-guage wire on each transformer. That's just about how much wire would fit into the available space. It took a little over 20 feet of wire each.

tip: draw tally marks on your table to keep track of the number of windings.

How does a transformer work?
The primary winding is an electromagnet connected to alternating current.
The humming magnetic field of the primary induces a current to flow in the secondary winding. If both windings have the same number of turns, the output voltage is the same as the input.
(minus a smidgin due to eddy currents, resistance, etc.)
If the secondary has more turns than the input, its output voltage is higher. That's the type of transformer you started out with.

OUTPUT VOLTAGE = INPUT VOLTAGE * (NUMBER OF SECONDARY TURNS) / (NUMBER OF PRIMARY TURNS)

Our primary has 100 turns and gets connected to 100 volts AC. We're winding 20 turns on the secondary, so we'll get about 20 volts out.

The available POWER STAYS THE SAME regardless of what the output VOLTAGE is.
POWER (WATTS) = AMPS * VOLTS

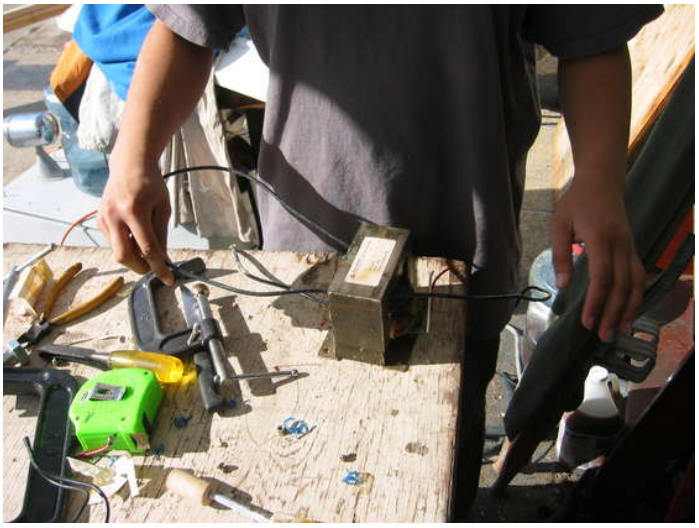
If the primary is made take 1000 watts (100 volts * 10 amps) out of the wall, we'll be able to take 1000 watts out of the secondary. With 1/5 of the windings, we can draw 50 amps out of the secondary.

That's the cartoon version with play numbers anyway.
Over here in our shed full of reality we've got two of these beasts in series and plan to short the outputs through a welding rod like Jennifer Beals.

Let's just say we're going to pull a whole lot of amps, which is why we need to wind our secondary with such thick wire.

The copper conductor in ten-guage wire happens to be 1/10" (0.1") in diameter.

Here's a table of conductor diameter, guage, and current rating.



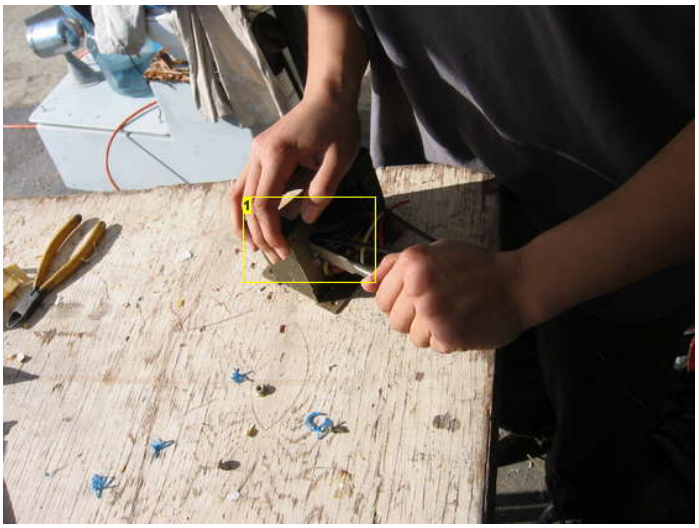


Image Notes
1. use a flat bar as a wedge to make space for more windings.

step 5: Schematic

It's a pretty simple circuit.
In fact there's nothing in it except wire!

We'll take two transformers and wind low-voltage secondary windings on them with thick wire.

We'll put the secondaries in series with our welding rod and workpiece.
We'll plug the primaries into the wall.

I really like the way aaawelder put it: "do not include yourself in this circuit"

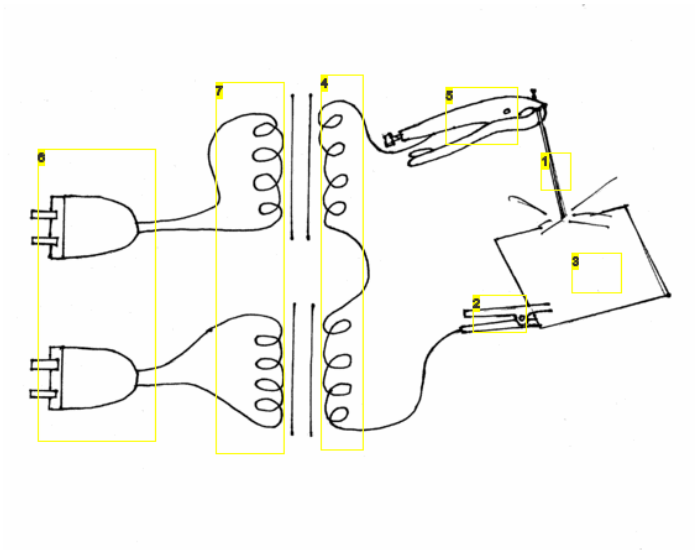
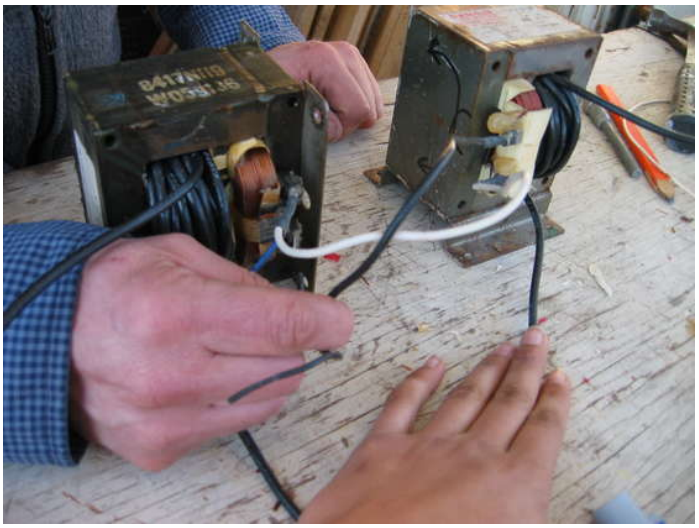


Image Notes
1. welding rod
2. ground clamp
3. workpiece
4. New 10 guage low-voltage high current secondary windings
5. electrode holder
6. To use this unit on 220 volts put the primaries in series rather than parallel as shown here
7. existing primary windings

step 6: Wire your two transformers together

Why do we use two transformers?
Just one of these isn't big enough to make a really juicy welder.
If you happen to find a big enough transformer somewhere, feel free to use that.

Here's how to hook up two transformers.
First we wire both primary windings in parallel to the wall cord.
Then we wire the thick secondaries in series so they both"Push and pull" in the same direction.



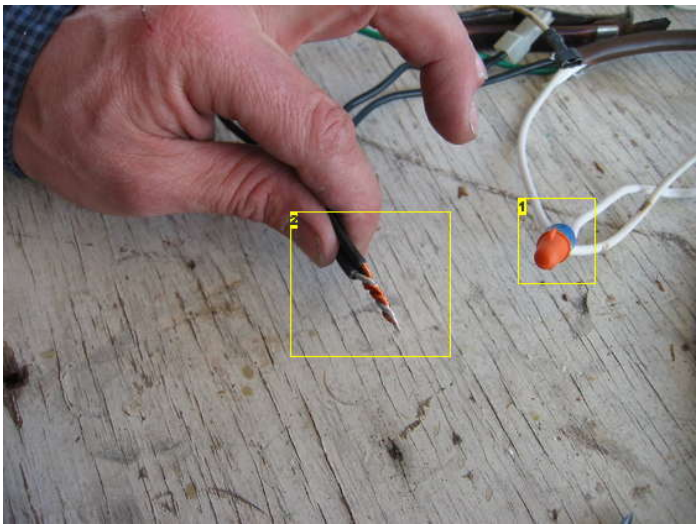


Image Notes
1. Wire Nut
2. Three wires twisted together

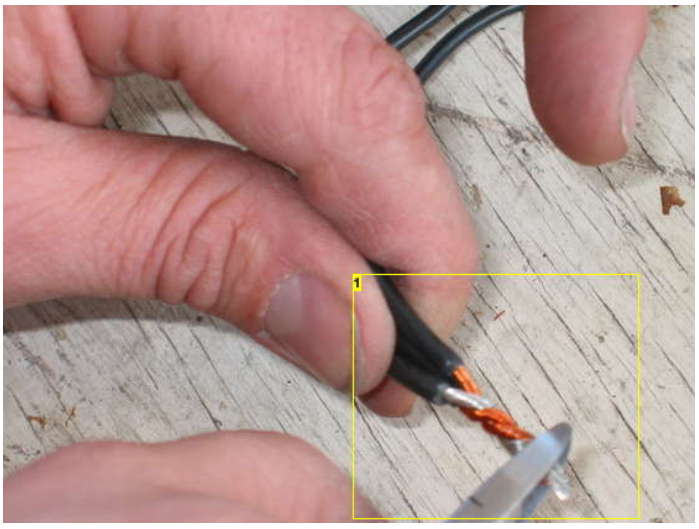


Image Notes
1. If the bare part is too long the wire nut won't cover it. If the end is too pointy the threads inside the wire nut might not grip it well. Cut it square if you're concerned.

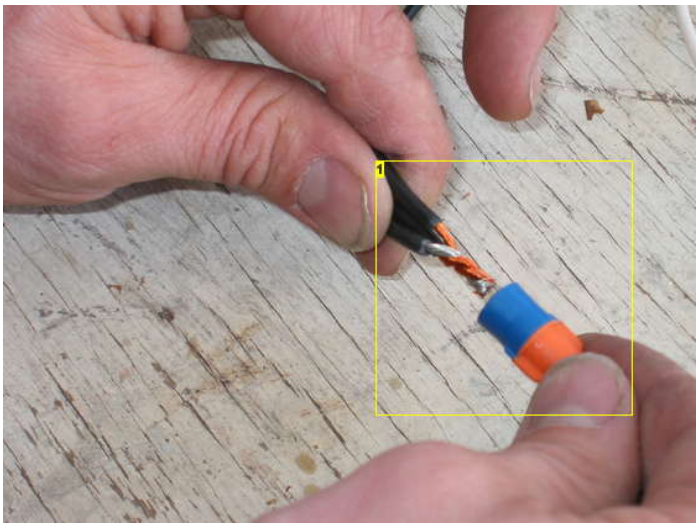
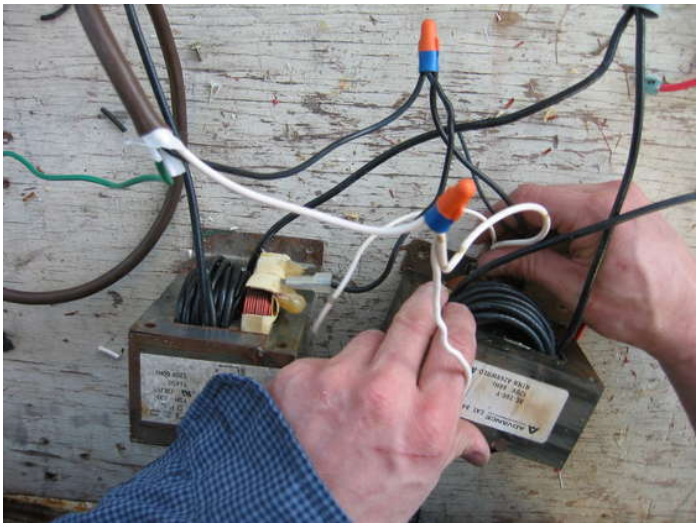
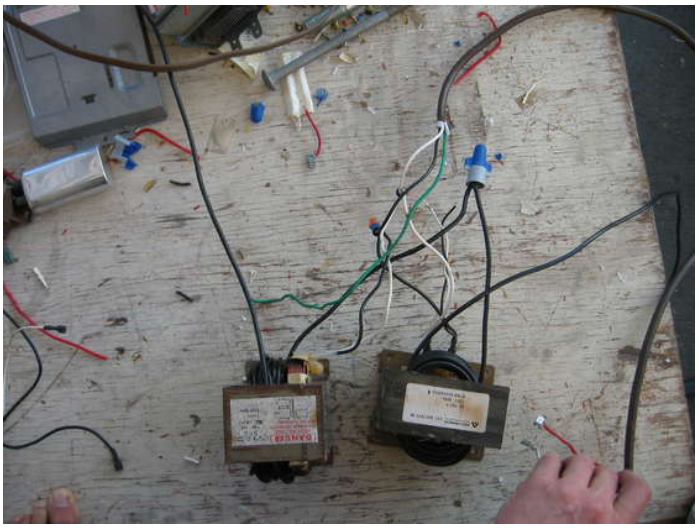
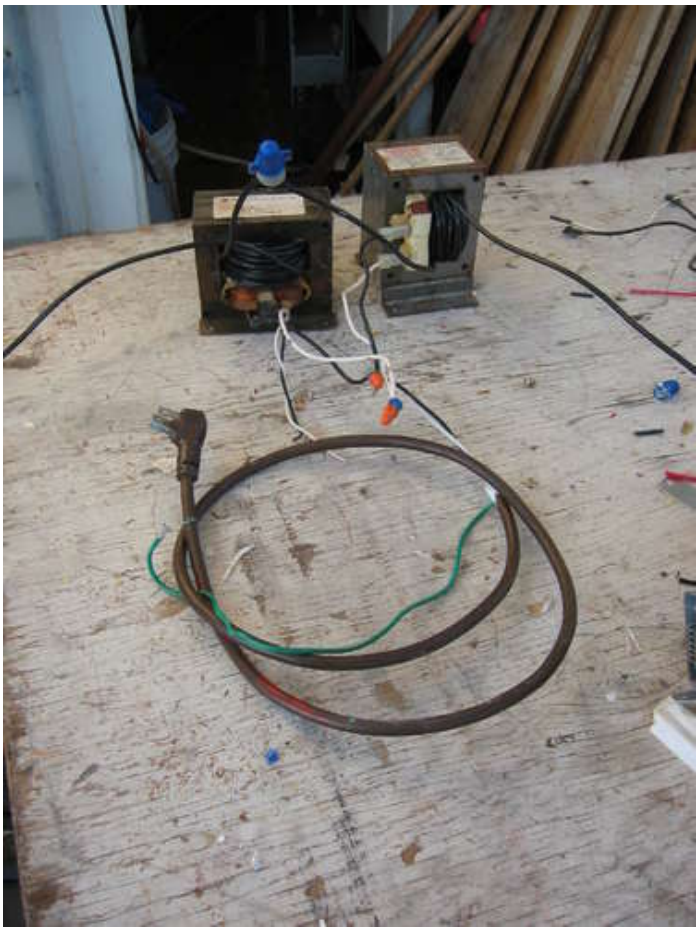


Image Notes
1. To everything turn turn turn there is a season turn turn turn and a wirenut for every purpose such as cover twisted wire ends and shoot through conduit-compressed-air guns at rats.







step 7: Test

Get out yer voltmeter:

Here's the test to make sure the secondaries are both pushing the same direction.
Our two secondaries in series produce 38volts AC with no load. That seems about right.
If they'd phased wrong it could have been fixed by reversing the wiring to any winding.

Where Tim says "out of phase" in the video, he means "in phase". That is, the center tap **should** be less than the outer two leads, and if things weren't that way, the transformers would be fighting each other, or phased wrong.

CLICK TO PLAY VIDEO

Image Notes
1. Non conducting shoes. Not standing in a puddle of water.

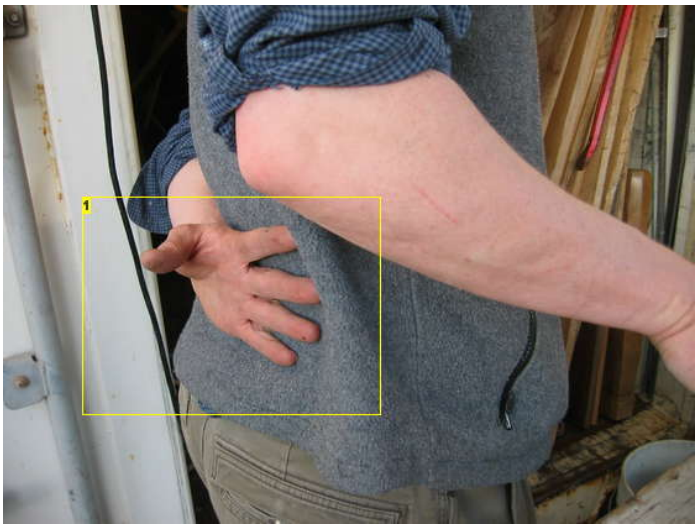


Image Notes
1. Electrical safety - keep one hand behind your back or in pocket so you don't accidentally short across your heart by carelessly grabbing two wires.

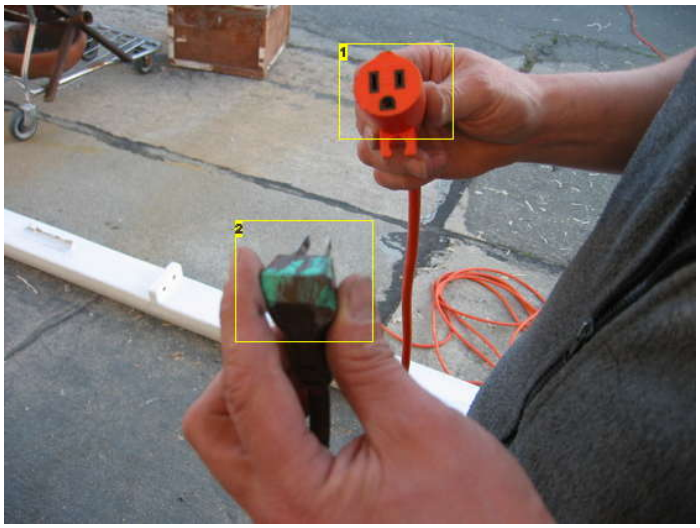


Image Notes
1. Hi! I'm MR. Baby tongue fun toy!
2. Come here often?

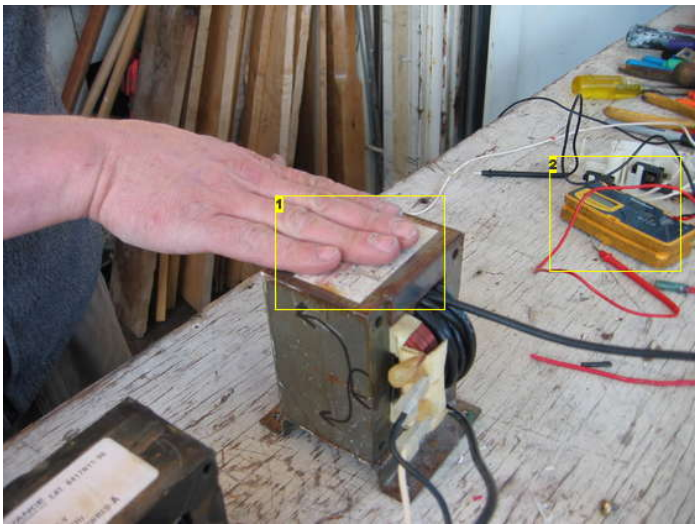


Image Notes
1. check the heat - these didn't really get warm, which is a great sign!
2. Radioshack autoranging multimeter. The best deal I know of for a little meter.
Why hasn't progress happened?

step 8: Weld

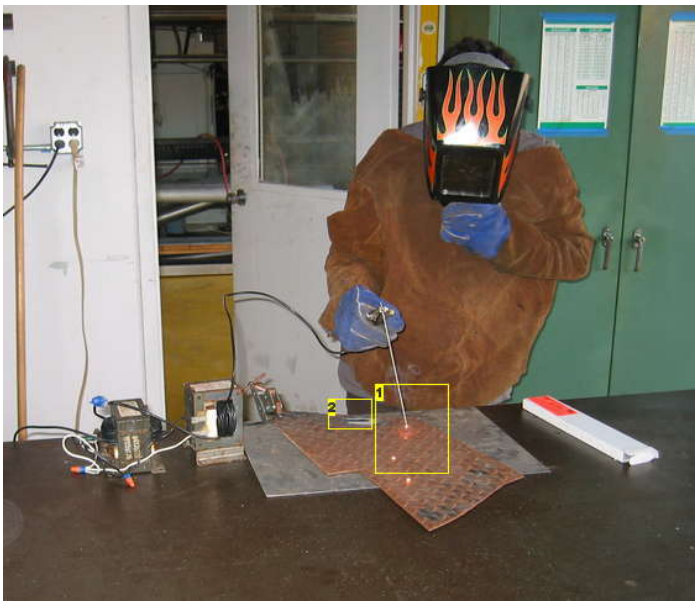
holy cow, it works!

We wanted to add a series inductor to give the unit more "inertia", but it didn't matter!

Here's Tim welding with some of those.

Built your welder, but not sure how to weld? Check out the instructional videos on youtube - search "how to arc weld". They're very good.

Here's Star striking an arc.
It welds great with these thin 1/16" 6013 rods. Even better with 3/32" 6013 rods.



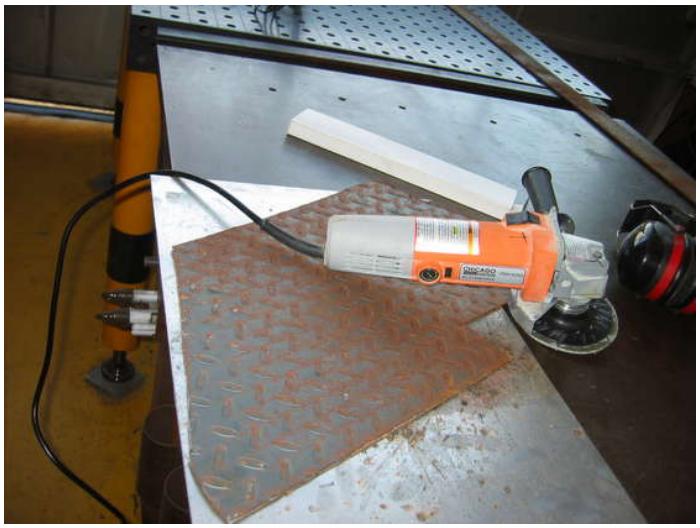


Image Notes
1. scratch start technique
2. Awesome first weld bead!

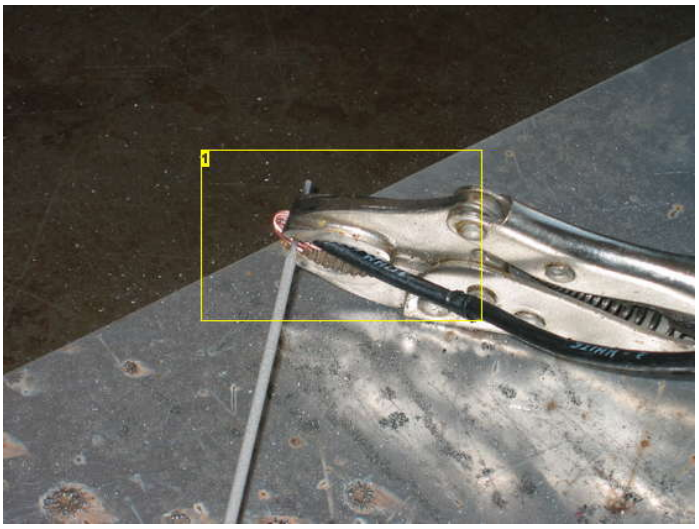


Image Notes
1. electrical connection, stick, and vice grip to hold it all together (all electrically active)

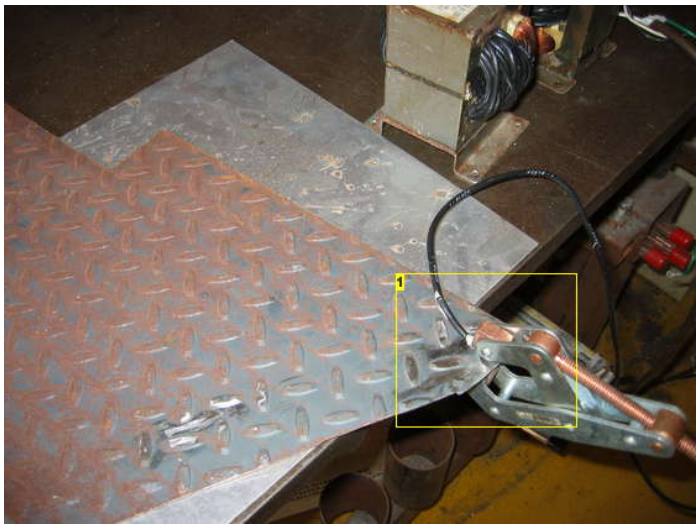


Image Notes
1. ground clamp

Image Notes
1. insulated glove for grabbing the electrically active vice grip

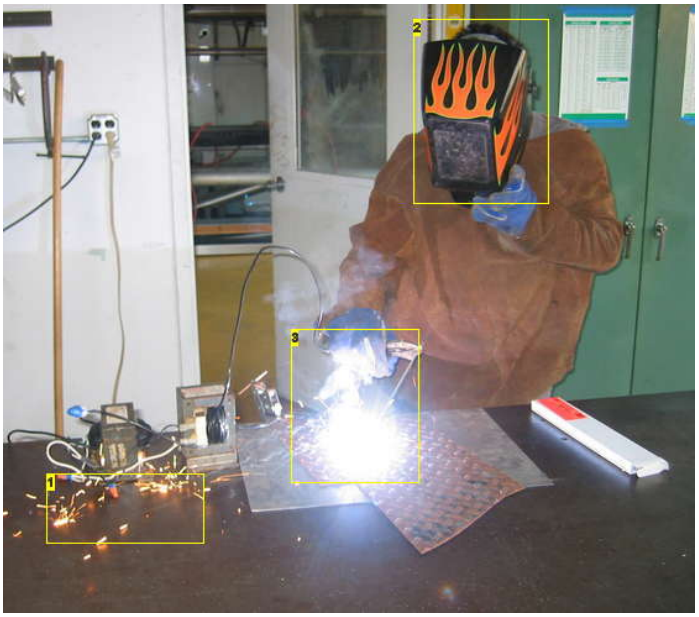


Image Notes
1. sparks! The good kind, from the weld, not the bad kind from the welder.
2. me welding
3. call me Flashdance.

step 9: Thick Rod Test

Those skinny 1/16" electrodes cost about twice as much as thicker ones.
We wanted to see how our welder works with thicker electrodes.
The next size up is 3/32", but we got a box of 1/8" 6011 electrodes.
When we pulled one out of the box we both said "wow, that's thick".

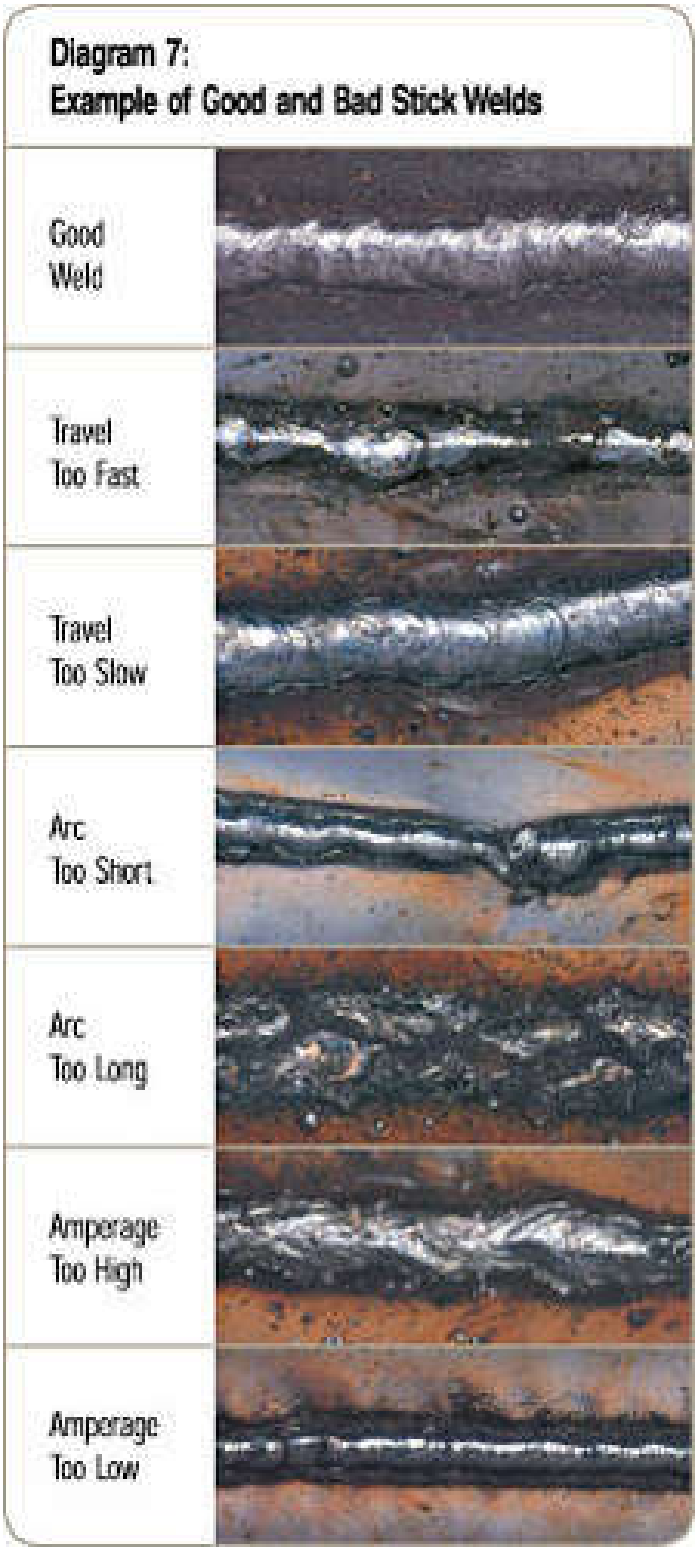
We fired up our welder and I welded this bead across the diamond plate with 1/8" rod.
The arc was pretty short but it burned in well and felt pretty good once I got used to it.
I had to shove it in a bit more than I'm used to to keep the arc going, but sticking wasn't a problem. I welded a long bead and used up more than half the rod without stopping.
That's the long weld in this photo.

Then I set the "torch" in this plastic tub so it wouldn't short out to anything.
I checked the transformers, and they didn't even get warm!
3/32" rods are less likeley than 1/8" to blow a circuitbreaker though. For your first welds get 3/32" 6013 rods.
6011 rods have thinner flux and make it easier to see what the metal of your weld is doing, but tend to spatter a bit more.

The next picture is for reference, from
hobartwelders.com

Udate 4/16/2008:
This is now my favorite welder. I made new leads for it from a pair of jumper cables. I left one alligator clamp on for a ground clamp, and added a $6 electrode holder. I've taught a bunch of people to weld using it.
The next photo is Ita welding for the first time, making an awning frame. That project was welded with this welder by total beginners using 3/32" 6013 rods. As you can see we have every other kind of welder, but the homemade ones are more fun.

Image Notes
1. It burns back into the coating, making it easy to maintain enough distance.



step 10: Welding Stainless Steel

We needed some brackets for Solara's mizzen mast.
So we went to the welding store and bought some 3/32" "Hobart Smootharc+ 316L - 16" stainless welding rods. They're only 12" long because stainless has high electrical resistance and they get really hot.
After much designing and sketching Victor, Kenny, and I cut, drilled, bent and welded these brackets. Very easy. When it cooled the flux went "tik" and fell off the weld. The dark area around the weld is soot from the flux.The welder could have handled much thicker rods due to stainless' high resistance and low thermal conductivity.

Important:
Use a fresh grinding wheel on stainless, or one that you only use on stainless.
You'll get rust if you use any abrasives that have been used on non-stainless steel. Same for the wrong wire brush. It will smear rustable iron on the stainless, and due to galvanic effects it'll rust quick if it gets damp.

Hooray! Where did I get the idea you needed TIG for stainless? Stick welds on stainless are just great!

step 11: Dimmer Control and Welding Thin Wall Tubing

The welder was too hot for thin-walled tubing frames, I kept melting holes even with the 1/16" 6013 rods. So I plugged the welder into a variac dimmer and turned the power down about 30%.
That gave me very fine control over power. Marc Lander and I did some very nice welds as seen here. After a few we got good enough to do the same welds with 3/32" 6013 rods and no dimmer and not burn holes.
More tricks - I used my left hand to feed a piece of mig welding wire into the weld to add more metal in and soak up the heat. Here's Marc doing that. Any wire is fine for this, coathangers are traditional for muffler work. Sand off the paint first if you don't like fumes.
Stopping to eat lunch helped a lot also. Your welds won't be good when you're shaky and tired.

I got my variac for free, don't buy one for this, they cost as much as a welder.
A solid-state dimmer that's rated for inductive loads does the same thing and costs a lot less.

If you're feeling particularly fancy, you can add in your own scr-based switching circuitry to vary the power, like this guy did.

Image Notes
1. Darth Vader doing crafts with his lightsaber on the weekend

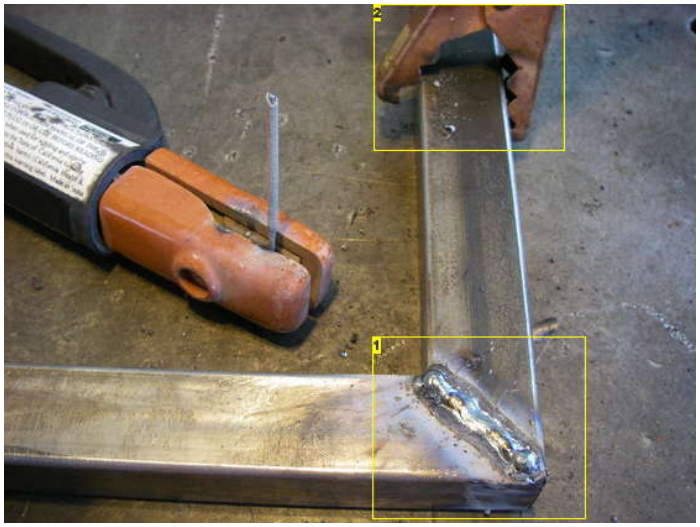


Image Notes
1. Nice Weld
2. automobile jumper cable ground clamp

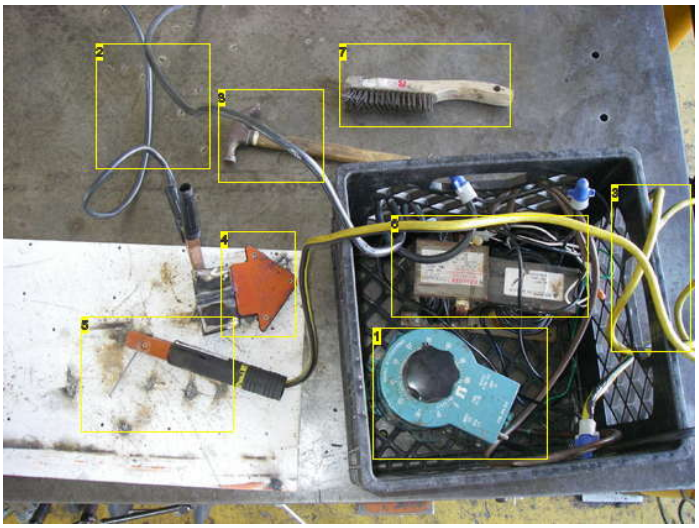


Image Notes
1. Mr. Variac a.k.a variable center-tapped autotransformer
2. Jumper cables
3. jumper cables. How many times in your life can you pull apart a zip-cord this big?
4. handy welding magnet
5. Handy non-vicegrip electrode holder should bring great joy to safety lovers everywhere
6. rewound microwave transformers
7. Your pal ms. Wire Brush. Brush rust away before welding, brush flux away after chipping.
8. Your pal ms. Hammer. Use to chip flux and peen the weld to reduce stress from weld freeze contraction

step 12: Other Welders

Folks have sent me a few photos and videos of welders they've built off of this instructable. I want you to be able to see them too, so here they are!

Here's a video I got from Paul du Buf, of the Netherlands (nice case, Paul!)

'

Cheyyne said:

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Hey there, here's my welder based on your instructabletion. It outputs 35.5v, because the
transformers were a little smaller than yours I think (couldn't wind a single more turn). So far I
have managed to lay down gobs of metal on various steel objects in my garage, but I still suck
at welding. Luckily I rented a nice welding video from Smartflix that had good reviews, hopefully
that'll give me some insight into the process. I did manage to lay down a 1" bead though! The
whole thing is going into a tacklebox housing.

Props for a great instructable. Thanks for it!
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llamafur followed with:

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Heres another one, same basic welder, but its housed in a .50 cal ammo can. Looks pretty
sweet. Its relay controlled ( two 15 amp HVAC control board relays wired in parallel) , I
measured 24 volts ac across the output wires.its also sorta heavy, 30 pounds.
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Image Notes
1. llamafur's welder

Image Notes
1. llamafur's welder

Image Notes
1. this case is metal, so it should be connected to ground.
2. llamafur's welder

Image Notes
1. llamafur's welder

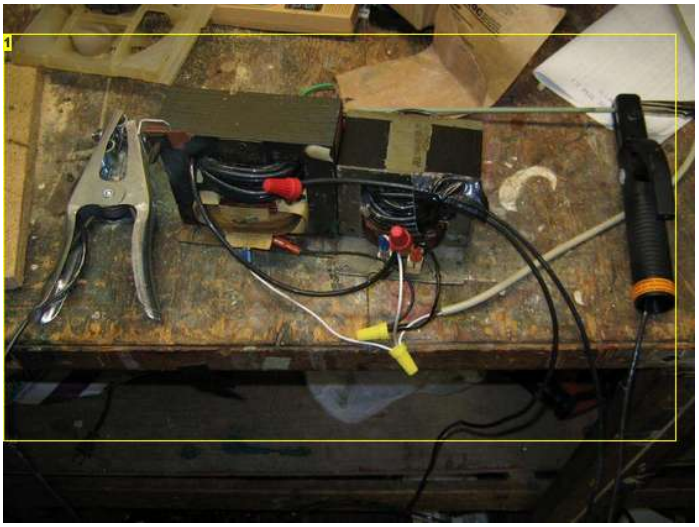

Image Notes
1. Cheyyne's welder

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nickajeglin says: Jun 3, 2009. 1:20 PM REPLY

since I hear that AC welding is harder than DC, but I don't want to have to recharge car batteries, couldn't one use a full wave bridge rectifier, and then a smoothing/reservoir capacitor to make the AC act more like DC? Would the caps and diodes be too large and expensive to be practical?

twenglish1 says: May 24, 2009. 12:16 PM REPLY

i got my welder working!!! i am so happy it works great on thinner pieces of steel and alright on thicker pieces i used 1/16 E6013 they worked really good here is a video of me welding with it for the first time:

stasterisk says: May 24, 2009. 5:02 PM REPLY

Hey -- could I add this to the insturctable, or a still photo of your welder if you have one?

bobbybuchay says: Jun 1, 2009. 9:07 AM REPLY

i am still unclear on how to wire them togher. can you help me?

twenglish1 says: Jun 1, 2009. 2:05 PM REPLY

wire them one way, measure the voltage and if it is not about 40 volts then wire try it again

twenglish1 says: May 24, 2009. 7:40 PM REPLY

hey yah its cool you can add it, i also have a picture of me using it too if you want it

stasterisk says: May 24, 2009. 11:20 PM REPLY

sure! post it up! or if you prefer, you can email it to me -- stars@mit.edu

twenglish1 says: May 25, 2009. 6:55 AM **REPLY**

here are two pictures one of me welding with it and the other is the welder transformers

stasterisk says: May 24, 2009. 5:00 PM **REPLY**

AWESOME!!

padronlj says: May 31, 2009. 7:20 PM **REPLY**

do you just wrap the wire and just stick it in the gap of the transformer

taoybb-TH says: Mar 4, 2009. 9:19 PM **REPLY**

Thank You for stasterisk I have a welder now.thank you
(Good Instructables)

stasterisk says: May 24, 2009. 5:01 PM **REPLY**

Cool! Can I add this photo of your welder to the instructable?

taoybb-TH says: May 27, 2009. 7:52 AM **REPLY**

It's OK! and Why it look good?(When i see it I think it's resemble Tube amp a little bit) and Thank you again Because this my first projects
To see around this welder and to taste you must in Thailand Thank You

(Sorry I'm not good in English.Now I practice for long time to be better)

twenglish1 says: May 25, 2009. 7:26 PM **REPLY**

hey, i have a few questions about this welder:
1. how would i measure or calculate the current it is putting out?
2. how thick of metal were you able to get good welds on
3. how many volts was yours putting out
4. above you mentioned you added an inductor to give it more inertia, could you explain this more? will adding one make it a better welder?

5 stars for the instructable, i really enjoyed doing this

levand14 says: May 19, 2009. 7:42 PM **REPLY**

Cheyyne, see if the high school in your area has adult lessons that you could take. i was welding better than that in under 30 minutes and i was only 14.

autophile says: Feb 2, 2009. 5:06 PM **REPLY**

Could this thing weld, say, two pieces of 0.25-inch aluminum square bar together? I'm not sure if aluminum can be arc welded...

double_g says: May 16, 2009. 11:02 AM **REPLY**
I'm not sure if it works to well, but I have seen aluminum arc welding rod for sale. Therefore it should be possible.

gabethegeek says: Apr 26, 2009. 1:39 PM **REPLY**
I don't know for sure but my hunch would be no. Aluminum oxidizes too easily. It is normally welded while enveloped in an inert gas. But it's possible that it would work. Give it a try!

kekeiffer says: Mar 7, 2009. 9:33 AM **REPLY**
not to prove my ignorance here... but what would happen if you tried to beef up this design by adding two extra transformers.. 4 insted of 2?
ive seen plans for an ark welder with 10 but thats too out there again there is probably a logical reason just wondering why not four

Grimarr says: Mar 12, 2009. 10:52 PM **REPLY**
If you use 4 in series do about 10 turns per transformer instead of 20. The plan using 10 transformers uses about 4-6 turns of wire per transformer.

eric m says: May 4, 2009. 2:19 PM **REPLY**
Hey Grim. Do you increase the gauge size of wire when you use 4 instead?

I have 8 mots? 5 turns = gauge?

Grimarr says: May 5, 2009. 9:48 PM **REPLY**
You don't have to increase the wire gauge, since the amperage should be the same, but if you *want* to you certainly can. With fewer turns per transformer you should be able to get heavier wire in there.

vernors says: Apr 9, 2009. 5:38 AM **REPLY**
then wouldnt that be pointless. 4 transfomers with 10 turns each would do the same as 2 transformers with 20 turns each and you would be just carrying extra wight around. now 4 transformers with 20 turns each would produce double the voltage then 2 trnasformers with 20 turns each wich would allow you to weld thicker metal. but id put switches on each trnas former to control the voltage

Grimarr says: Apr 12, 2009. 6:16 AM **REPLY**
Not pointless, just heavier.

I'm not really sure if using 4 transformers with 10 would be better than 2 with 20 from an electrical standpoint because I just woke up and really don't feel like working the math, but trying to get 20 turns of 10 ga. wire onto a microwave transformer can be tricky.

couchman420 says: Apr 13, 2009. 6:47 PM **REPLY**
Ok, today I was grinding away the sec. coils on a transformer and I accidentially nicked the pri. coils. Is it possible for me to re-wind the pri. coil like you are supposed to with the sec. or am I s.o.l.?

eric m says: Apr 30, 2009. 11:08 PM **REPLY**
they sell liquid tape at home depot. rewire it and solder it. add bit of new copper wire.

i did the same to one transformer.

thorning says: Apr 29, 2009. 5:00 PM **REPLY**
I completed the welder a few weeks ago and have done a few small jobs with it so far. The unit will run 1/16 rod very well on a 110 volt 20amp outlet as long as it is not running more than a few minutes at a time. Using the fan from the microwave keeps the transformers fairly cool. I wired in a switch and a 110 volt indicator light to make it look better. Also the output terminals are connected to the electrode holder and ground by way of nut and bolt terminals which allows the leads to be removed for more compact storage. All of the metal items including the box cover not actually part of the circuit are hooked to the green ground wire which is part of modern 110 volt circuits in houses . I also put a leather flap over the terminals as they are connected to the electrode and ground so as to prevent anyone getting a shock or a piece of metal falling across them.
I kept track of the cost and have about $50 in this rig and about 20 hours of labor. The most laborious part was removing the secondary windings from the transformers. Adding the new winding was a challenge also. I did not try to keep absolute track of the number of turns but rather measured the open circuit voltage on each one and got the voltage to be within a volt of each other and no less than 20 volts each. The last turn of wire was really hard to get into place but it can be done.
A good project but the attention to detail I described was something I feel should have been included in the writeup .

larze says: Apr 25, 2009. 7:39 PM **REPLY**
So if you connect two transformers primaries in series (for 220V) then wouldn't it just be all the same use just one transformer? Because, with 2 x windings on both sides it makes the ratio equal to 1 x windings, for example 2:20 = 1:10. Right?

dionysus2008 says: Sep 7, 2008. 10:51 AM **REPLY**

in preparing my transformer, i used my disc grinder and grind off the welding at the sides and just hit off the bottom of the core. then i side out the coils. its seems like a waste to destroy a perfectly good secondary coil so i kept it and dropped in my primary back and used some heavy duty welding wire to wrap my secondary, oh its much much easier to wrap it with the bottom of the core gone then when i was done just bolt it up and ready for use

eric m says: Apr 17, 2009. 12:15 AM **REPLY**

i might have to do it that way too.

hitting a rod is not working for me. Ruining the secondary like that is a waste.

autophile says: Feb 2, 2009. 11:48 AM **REPLY**

Agreed it's easier to wind, but the circuit formed by the magnetic flux going round and round the metal of the transformer is probably not amused by the sudden decrease in magnetic conductivity when it hits a poorly re-attached side. Make sure the side is firmly attached by bolts, C-clamps, or by re-welding, otherwise your transformer's efficiency will be vastly reduced.

eric m says: Apr 30, 2009. 11:14 PM **REPLY**

exactly right. My transformer turned into a LOUD magnetic speaker. LOL.

I need to reweld it.

Find a good puch/dowel and just hammer the copper out. Don't ruin the metal laminations.

yanggers says: Apr 6, 2008. 10:21 AM **REPLY**

Do I have it correct that the direction of this secondary wire winding is negligible as long as they fit into the space? clock wise vs. counter-clock wise, all-over-the-place vs. neat-like-a new-twine-spool ?
Thanks for the awesomeness.

yanggers says: Apr 13, 2009. 3:19 PM **REPLY**

I sent this question to * and got a reply right away. Sorry I didn't remember to put it in the comments until a year latter! Here is what she said:
"
The winding direction doesn't matter so much, so long as you connect the two secondaries together so that they add in the end, rather than subtract. You can find that out by measuring the voltage across the two leftover leads (you want it to be around 20).

The physics works out a little better if you wind the secondaries neatly. It will still _work, if it's not neat, though. You'll also be able to stuff more windings in the space if you wind neatly, than if you don't.

Cheers! I wanna see the welder, when you're done!
"

shammallamaman says: Apr 12, 2009. 6:44 PM **REPLY**

what are the ratings on the transformers, how many amps, watts and volts?

thorning says: Apr 3, 2009. 3:55 AM **REPLY**

I am building the welder but am a little confused about your schematic. It shows 2 plugs for the primaries. I thought they were wired into a single 110 volt plug. Also you dont show a grounding wire in any of the diagrams from the 110 volt side. Isnt this necessary as all the outlets in modern wiring in the USA use a 3 prong plug with the 3rd round prong being the green ground wire. Also there is no fan shown. I intend to put a 110 volt fan into place to cool the transformers. It came out of the microwave anyway when I took it apart to use the transformer. I also hope to use some sealer around the secondary windings to keep them in place and a 110 volt indicator light and a switch on the 110 volt side. The switch would be OK if I dont need to use 2 plugs. Any comments ?
Tom H

trigalg693 says: Jun 19, 2008. 10:50 PM **REPLY**

Meh I'll make another post.
I'm pretty sure you can saw or cut using other methods the welds holding the "I" part of the transformer to the "E" part, which would allow you to pull the coils out (have to cut off any attachments to the steel part of the transformer first) then you can wind the new secondary more easily, then just put the primary back on and somehow get the I to stay on. The tinytim carbon arc welder was made like this and has a picture showing a C clamp holding the transformer together, but maybe you could use lots of packaging tape or something.

I had ambitions even before I saw this, went ahead and cut into the coils. Only after I wasted a lot of time cutting it and trying to get the stuff out did I look closely at the transformer, and I realized the welds did nothing but to hold it together, and simply cutting 2 of the welds holding the "I" on would allow removal of the windings.

Scubaholic says: Mar 25, 2009. 7:37 PM **REPLY**

A picture paints a thousand words.
Would you show us a pic of what your talking about?

Notn4 says: Mar 23, 2009. 1:53 AM **REPLY**
so did i get this right? to make the welder work on 220v i just wire the transformers in series instead of pararell? thinking of building a welder as soon as i find 1 more microwave =)

twenglish1 says: Mar 18, 2009. 7:19 PM **REPLY**
how do you think using a wire with two wires in it, with both of the inner wires soldered together would work?? you can't get as many turns but i suppose i will just need to add more transformers

dtvercon says: Mar 14, 2009. 3:35 PM **REPLY**
can two 110-volt welding transformers be connected in series and plugged into a 220 volts mains outlet?

TimAnderson says: Mar 15, 2009. 10:13 AM **REPLY**
Yes. Mine is set up that way now. I was blowing the circuit breaker too much.
So I wired it up for 220 and made a long extension cord with 220 volt connectors.

dtvercon says: Mar 16, 2009. 6:48 AM **REPLY**
Thanks, Tim. I was thinking more of 2 separate complete units (each one with its own primary/secondary windings and electrode holder) so 2 welders can weld at the same time. Can the 2 units, if 110v, be connected in series to a 220v power line?

TimAnderson says: Mar 16, 2009. 10:33 AM **REPLY**
I don't know. Maybe it would probably be better to wire them both for 220. Or maybe the electrons wouldn't notice the difference between those two options.

welder guy says: Feb 24, 2009. 6:09 PM **REPLY**
is it possible to hook up the transformers 120-110 volt house end into each other? like in parallel or something where they both share the voltage? or do you need two outlets? please reply someone

TimAnderson says: Mar 15, 2009. 10:15 AM **REPLY**
You can do it either way. I wired mine in parallel. It's one less wire to put away.
When it was running on 110 that is. I now have it wired for 220 with the primaries in series.

dpsilver says: Mar 14, 2009. 7:33 PM **REPLY**
correct me if im wrong but u said to connect the transformers in series but that will bring up the voltage not the currnet and ur diagrams show me them in parallel to bring up the current

N1CK4ND0 says: Mar 14, 2009. 4:12 PM **REPLY**
Sounds dangerous O.o I'll still with my little solder gun.

vernors says: Mar 12, 2009. 6:05 PM **REPLY**
where do you find a solid-state dimmer that's rated for inductive loads ?

vernors says: Mar 12, 2009. 5:57 PM **REPLY**
what/which part do u plug the variac dimmer into (input or output)?

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