

Lesson 2.2: Fact Sheet - Welder Set Up

1. Wear PPE.
2. Select the welder that you will be using.
3. Inspect the area for flammable materials; remove anything flammable from the welding area.
4. Inspect all cables for cracks in the insulation or bare wires, notify your instructor of any cables in need of repair.
5. Inspect all connections and be sure that they are properly secured.
6. Look at the wire on the spool and make sure that it is the right type of wire for the base metal that you are welding on.
7. Check the polarity terminals and follow the cables. The wire feeder or welding gun should be connected to the positive terminal. The work cable should be connected to the negative terminal.
8. Turn the welder on.
9. Open the valve of the shielding gas cylinder or manifold system connected to your welder.
10. Depress the trigger or press the “purge” switch on the welder to activate the shielding gas.
11. Using your other hand, adjust the flow meter or regulator to the desired pressure, typically 20-30 cfh.
12. Adjust voltage and wire feed speed settings according to a chart or your instructor’s recommendation.
13. Attach the work clamp to the welding table in a welding booth or directly to the work piece.
14. Get comfortable and weld!

Lesson 2.2: Fact Sheet - Welding Maintenance

Changing Wire

How to change wire:

1. Turn the welder off
2. Release the tension on the drive rolls
3. Remove excess wire from gun cable
4. Remove empty spool of wire and discard
5. Remove the nozzle and contact tip
6. Put a new spool of wire onto the spindle so that the wire is coming off the spool in the proper direction toward the drive rolls
7. Holding onto the wire, remove (or cut) the end of the wire from the spool; if the end of the wire is released, the wire will unravel off of the spool
8. Clip the end of the wire so that it has a clean cut
9. Guide the wire through the first guide
10. Line the wire in the grooves of the drive rolls
11. Guide the wire through the second guide
12. Replace the tension on the drive rolls; it is now safe to let go of the wire
13. Turn the welder on
14. Feed the wire through the gun cable until wire comes out of the diffuser; press the “jog” switch or depress the trigger to feed the wire
15. Replace the nozzle and contact tip
16. Weld

Changing Shielding Gas Cylinders

How to change shielding gas cylinders:

1. Turn the cylinder valve off completely
2. Remove the pressure gauge and flow meter from the cylinder; use a wrench to unscrew the nut of the pressure gauge
3. Set the pressure gauge and flow meter down in a safe place
4. Secure the cylinder cap onto the cylinder
5. Unchain the cylinder from its secure place near or on the welder
6. Move the cylinder to a cylinder cart and secure with a chain
7. Mark the cylinder as empty
8. Move the cylinder to the empty storage area
9. Remove the empty cylinder from the cart and secure it with a chain along with the other empty cylinders
10. Select a full cylinder of shielding gas
11. Place the full cylinder onto the cart and secure with a chain
12. Move the cylinder to the welder
13. Move the cylinder from the cart to the welder and secure with a chain
14. Remove the cylinder cap and put in a safe place
15. Standing on one side of the cylinder, crack open the valve slightly to blow away dirt
16. Replace pressure gauge and flow meter
17. Tighten the nut of the pressure gauge onto the valve connection with a wrench
18. Open the valve and observe the amount of pressure on the pressure gauge
19. Set the pressure on the flow meter

Setting Tension

When to adjust tension:

- The wire is burning back into the contact tip
- The wire is getting bound at the drive rolls
- The wire creates a bird's nest at the drive rolls
- There are excessive shavings coming off of the wire at the drive rolls
- The drive rolls are deforming the wire

How to set tension:

1. Make sure that the spool brake is not too tight; too much tension on the spool brake will cause the wire to behave as though the tension is set too tight
2. Loosen the tension adjustment
3. Retrieve a block of wood and point the gun at the block of wood from several inches away
4. Depress the trigger so that wire comes out
5. Tighten the tension adjustment a little bit at a time until the drive rolls grip the wire without slipping and the wire curls against the piece of wood

Drive Roll Maintenance

- Drive rolls wear out over time, causing wire to slip
- Drive rolls can become dirty from shop dust and wire shavings

Changing drive rolls:

1. Release the tension on the drive rolls
2. Remove the wire from the drive rolls by turning the spool of wire backwards so that the wire winds out of the gun and onto the spool (to save wire)
3. Secure the wire on the spool to prevent unraveling
4. Remove the drive rolls. Note: There are many different styles of wire feeder systems and drive rolls, see owner's manual for removing and replacing drive rolls.
5. If the drive rolls have two grooves, check the side of the drive rolls and read the size dimension. If the grooves are the same size, the drive roll may be able to be turned around as long as the other grooves are still in good shape. If the grooves are different sizes and the other size grooves are still in good shape, keep the drive rolls for the other size.
6. Retrieve a new drive roll if needed.
7. Replace the drive roll
8. Feed wire through wire feeder system (see changing wire directions)
9. Reset tension (see setting tension directions)

Contact Tip Maintenance

When to change contact tip:

- The orifice of the contact tip is oblong: there will be a loss of control over the wire while welding when this happens
- The contact tip is bent
- Wire arced the orifice of the contact tip closed (could be repaired)

How to change a contact tip:

1. Remove the nozzle
2. Using a pliers, grip the contact tip and loosen; some contact tips are threaded, some are oblong and seat in the diffuser
3. Remove the contact tip; if the wire is arced to the contact tip, you will need to clip the wire behind the tip to remove
4. Repair the contact tip if possible
5. Replace the contact tip with a new one or after being repaired
6. Tighten slightly (not too much) with a pliers
7. Replace the nozzle

How to repair a contact tip:

- Most of the time, contact tips can be repaired and reused. Wire can arc back into the contact tip and fuse, clogging the orifice and keeping wire from protruding through the hole.
 1. Remove the contact tip from the diffuser; if the wire is arced to the contact tip, clip the wire behind the contact tip so that there is enough wire to grip with a pliers
 2. Take the contact tip to a belt sander or grinder and lightly touch the end of the contact tip against the belt sander or grinder
 3. Once the end is smooth, push the fused wire through or pull the wire out of the contact tip
 4. If the wire doesn't come out, touch the contact tip to the belt sander or grinder and try again
 5. Use tip cleaners to remove excess impurities that may block the wire's path
 6. If the wire breaks off inside the contact tip, tip cleaners can be used to remove the wire
 7. Use a piece of welding wire to test the orifice of the contact tip to make sure that wire will feed through smoothly.
 8. Replace repaired contact tip
 9. Tighten slightly (not too much) with a pliers
 10. Replace the nozzle