

MAFES Dawg Tracks

March 26, 2018



MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Welding & Cutting

A big part of agriculture is maintenance. A set of cutting torches and a welder are invaluable tools to help with repairs at a farm operation and all the equipment that goes along with it.

The first thing that comes to mind with welding & cutting is **sparks and flames**. So of course there is the potential for a fire. Clean up the area where you will be working beforehand:

- Move any flammables – gasoline, lacquer thinner, aerosol cans, and batteries (may be leaky & potential for explosion if spark contacts it)
- Move or protect combustibles – dry grass, remnants from harvest time, cloth pieces (equipment seat or electrical/hose protective sleeves).
- Watch for greasy or oily areas and move work rags.

If a hazard cannot be cleaned up or moved (for example fuel & hydraulic lines), protect it from the sparks using a fire-resistant shield such as a piece of sheet metal or fire resistant blanket ... and no, a piece of dry cardboard or old shirt cannot be substituted.

Another, not so commonly known, hazard associated with welding is **electric and magnetic fields (EMF)**. Electric current flowing through any conductor causes localized EMF. For example, the welding current flowing through your arc welder and welding cables creates an EMF field near the welder and the welding cables.

- Never coil the electrode or work cables around your body.
- Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side. There is an EMF field at and between each cable.
- Connect the work cable to the work piece as close as possible to the area being welded.
- If a welder (person) has a pacemakers or defibrillators, they should consult their physician before welding.

You receive an **electric shock** when you touch two metal objects that have a voltage between them. Arc welding involves open circuit (when not welding) voltages which are typically from as low as 20 volts to as high as 100 volts. The voltage inside welding equipment is commonly much higher: from 120 volts to 575 volts or more. The primary voltage shock - at 115 volts to as high as 600 volts - is very hazardous because it is much greater voltage than the welder secondary (or welding) voltage.

To avoid primary electrical shock:

- Do not touch a lead or other electrically "hot" component inside the welder while you have your body or hand on the welder case or other grounded metal with the power to the welder "on." Turn the machine "off" and unplug it before doing anything inside the welder case.
- Ensure power cord (and to the case) and outlet is properly grounded, through the power cord. If a problem develops inside the welder a fuse will blow, disconnecting the power and letting you know that repair is required.

A secondary voltage electric shock occurs when you touch a part of the welding or electrode circuit - perhaps a bare spot on the electrode cable at the same time another part of your body is touching the metal upon which you're welding (work). To receive a shock, your body must touch both sides of the welding circuit, electrode and work (or welding ground) at the same time when the welding output is on.

- Insulate your body from the metal you are welding. Do not rest your body, arms, or legs on the work piece, especially if your clothing is wet or bare skin is exposed (and it should not be if you are dressed properly). Use plywood, rubber mats or some other dry insulation to stand or lie upon. Wear dry gloves in good condition when welding. Do not touch the electrode or metal parts of the electrode holder with skin or wet clothing.

Maintain the welder and torches:

- Keep gas cylinders secured from falling.
- Ensure regulators are not physically damaged and in working order.
- Replaces torch hoses as needed; overtime they may become dry rotted or develop leaks.
- Replace power cords and leads at first signs of damage.

For more info contact – Leslie Woolington

MAFES /MSU-EXTENSION

Risk Mgmt. / Loss Control

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Sources:

<http://www.lincolnelectric.com/en-us/education-center/welding-safety/Pages/welding-safety.aspx>