In The Shop

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The times and places you need good welds are often the times and places it's difficult to create good welds. When equipment breaks in the field, it's time for fast and dirty welding.

Whether you haul a generator and/or welder out to the field to repair broken metal or drag the damaged unit to the shop for repairs, conditions aren't optimum. The metal flexed and distorted before it broke, the edges are ragged and uneven and the adjacent surface has a thick coat of paint or rust.

Aside from the blocking, bending and clamping necessary to get the broken metal pieces realigned, there are several steps and tricks to fast and dirty welding that can make these repairs more durable.

Metal preparation is essential for lasting welds. Use an angle-head grinder to smooth ragged edges. On metal thicker than 3/8", consider grinding 45° bevels on the edges of the two pieces to be joined.

"Some guys don't bevel thicker metal and just turn up the heat on their welder to burn a single pass into the joint," says John Leisner, product manager for Miller Electric. "Two problems result from this: Too much heat at one time can weaken the metal, and incomplete joint penetration will likely lead to that area breaking again.

"It's better to bevel the edges and make a couple passes at lower heat," Leisner explains. "You will make a stronger repair if you make one pass, clean the slag off the bead and weld a couple more passes."

Note that he said to clean off the slag between passes, indicating the use of a stick welder. He's not an advocate of MIG welding for field repairs.

"MIG is a great process, but stick welding is generally better for field repairs or welding outdoors," Leisner says. "The problem with MIG is that if there's any breeze at all, it disrupts the gas shielding and you get really ugly, porous, weak welds."

MIG welders can be converted to weld outdoors by using special flux-core wire, rather than solid wire and shielding gas. But the conversion is time-consuming, so it's not the best option for a quick repair.

Hurried repairs often prompt amateur welders to shortcut proper stick welding practices. Welding textbooks recommend carefully matching the diameter and flux coating of welding rods to the thickness and type of the metal to be welded. Leisner has a farm background and knows the realities of ag repair work.

“I carry 1/8" and 3/32" 6011 rods and can do pretty much whatever I need to do,” he says. “A 6011 rod is a good all-around rod for farm use. It has good penetration but leaves a little rougher-looking weld than a 6013. If you’re concerned about appearances, you might make the bottom welds with a 6011 and finish with a 6013 for a little smoother finish.”

Pretty strong. Leisner acknowledges that many farmers have MIG welders in their shop because of the smooth, clean welds they create, as well as their ease of operation. He admits that MIG welds are prettier than stick welds but warns that pretty welds aren’t necessarily strong welds. Stick welders equipped with new technology are just as easy to use as MIG units.

“A lot of farmers base their opinion of stick welders on their experiences using the old welder they inherited from their dad or even their grandfather,” Leisner says. “Or, they’re using a 120-amp economy-model buzz box they bought from the local farm supply store. If they’d just try a newer smart stick welder, especially the DC units, they’d be amazed at how easy they are to use.”

For in-the-field repairs, Leisner recommends farmers use a portable DC welder and generator or the new lightweight stick welders that use inverter technology. “Our Maxstar 150 S runs off either 115-volt or 230-volt circuits, provides up to 150 amps of welding power, is the size of a lunchbox and weighs only 131/2 lb.,” he says.

Finally, if you’re repairing metal that you’ve welded before, consider adding an additional gusset, chunk of angle iron or strap to reinforce the problem area’s structure.

“There’s obviously a stress problem in that spot, so while you’ve got the welder out, reinforce the area,” he says.

For more practical tips on stick and MIG welding, farm and ranch project ideas and to read a welding blog, visit www.millerwelds.com, and click on the “Industries and Interests” tab.

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