

Anvil Repair By Robb Gunter

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The Forgery School of Blacksmithing published in *ANVIL Magazine*, April 1998 (Used with Permission)

This process works well on wrought iron base anvils and cast iron base anvils with a good tool steel top. It was developed with the help of several metallurgists and welding engineers at Sandia National Laboratories.

Grind all surfaces to be welded.

Expose good, clean material. Grind through all folds or fractured chips.

Chamfer any holes or severe depressions in preparation for welding.

Preheat a wrought iron base anvil to 400 degrees and a cast iron base anvil to 450 degrees. The temperature can be verified with a Tempil Stick crayon available at Your welding supply store, which melts at a given temperature. (i. e., 350 degrees, 400 degrees, 450 degrees. A propane-fired weed burner works well to preheat the anvil. A wood fire call also be used if care is taken to wire brush off all carbon and smoke deposits before welding. Be careful to not overheat the anvil, particularly the heel and hardy hole area, as it's a thinner cross-section and heats faster than the more massive parts.

What You'll Need

If your anvil has a wrought iron base and the damaged area goes through the tool plate so that You have to begin the repair by welding to the wrought base material, use Stoodly 2110 (or equal) 3/16" rod (DC reverse works best; however, it will run AC); Unlimited passes. Expect 45 Rockwell C as welded. When you can finish building up the repair area **in no more than three passes** (or layers thick), use Stoodly 1105 (or equal) 1/8" rod (DC reverse, or AC); expect 50 to 52 Rockwell C as welded, which should be consistent with the original hardness of the tool plate. The Stoodly 1105 is a particularly good match for the W-1 tool steel tops of most anvils and is designed to be impact resistant.

When welding to a cast iron base anvil and on to the cast iron base, a layer of NI rod (high nickel) must be Put down first. Build Lip over the NI rod with Stoodly 2110 (or equal); Unlimited passes (DC reverse); expect 45 Rockwell as welded. **The last three passes** (or layers thick), use Stoodly 1105 (or equal) 1/8" rod (DC reverse); expect 50 to 52 Rockwell C as welded if you don't exceed three passes thick.

Cast steel anvils repair well using the combination of the Stoodly 2110 and the Stoodly 1105 (last three passes).

Repair to the Horn

Repair to the horn of a wrought iron base anvil can be accomplished with 6010 welding rod as needed. If the point of the horn is blunted or slightly broken off, we usually Put the end of the horn in a coal forge, heat it to bright orange and forge it out to the desired shape using a 12-lb. sledge to back it up and a 2-lb. rounding hammer on top. Repairs to the horn of cast iron anvils is usually done by welding with the NI rod and grinding.

If the area around the hardy hole or pritchel hole needs repair, weld using the above detailed process; however, inserting a chill (or form) made of 1/16" sheet copper into the respective hole before welding will save you a lot of grinding and filing to true up the hole.

These hard surfacing rods used here to repair anvils are quite gravity sensitive during the welding process. If you can lean the anvil at 445 degrees against a cinder block while welding on the edges, you will have more of the somewhat expensive welding rod on the anvil and less on the floor.

After all welding repair is complete and you are sure that there is sufficient buildup to allow for grinding to the desired finish (check with a straightedge), post heat back to 400 degrees or verify with the Tempil Stick that the anvil is still that hot from welding. Pack the anvil in vermiculite (crushed mica), available at most nurseries, to allow it to slow cool for a minimum of eight hours. This will mini-

mize the potential for stress cracking from welding.

Obtaining the Desired Finish

Grind the anvil to the desired finish. We start the grinding process with a 24-grit cup stone on a large-body grinder It is quite aggressive at quickly removing metal. Be careful to keep it running flat (sparks coming off both sides of the cup stone). Continue the grinding process using flex back metal sanding discs, starting with 24 grit and working down to 240 grit, in five or six steps. Until now, all edges should be kept sharp and square. With 100 grit or finer sanding disc, radius the edges to your desired shapes. Near the anvil step the radii are typically ground to a 3/16" or 1/4" radius and tapering to nearly no radius at the heel of the anvil. The edge of the step and the heel are usually left rather sharp and only broken with a file. A final polish call be done with a *Scotch Brite* disc and you can usually see your face in the anvil top.

This anvil restoration process has been used on several hundred anvils around the country with great success.

