

## How to Make a Rotary Hammer

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Rotary hammers are neat tools you can make yourself that are useful for rapid burnishing. They are particularly good for burnishing out surface porosity in castings. Here's how to do it:

1. Begin with a piece of 3/16" diameter round annealed tool steel, or a used or broken drill bit of similar diameter.



2. If your tool steel is not annealed or you are using an old drill bit, you must first anneal it. Ready an annealing pan (heavy aluminum pie pans work just fine) and be certain it is nearby on a flame-proof and heat resistant surface. Cover the bottom of the pan with pumice or clay. I used clay kitty litter in a 5-gallon bucket. With your torch, heat the steel until it is red hot, then cover it with pumice or clay litter while still red hot. Do not quench. Quenching at this point will harden the metal, and you want it soft.



This will allow the steel to cool very slowly, perhaps as long as an hour. Be patient. I heated my piece in the Vise Grips until it was as you see in the above photo, and then plunged it into the litter. The additional heat from the pliers helped keep it from cooling too quickly. Allow to cool until you can safely touch it with your hands.

3. Now that it has been annealed, it is time to make the bend. Mark or scribe the steel about 3/4" from one end, like this:



4. Clamp the steel into a vise or a pair of locking pliers, such as Vise Grips at the point where you marked it  $\frac{3}{4}$ " from the end. With your torch, play a small, focused flame at that same point, just above the pliers or vise. Using a pair of pliers, make the bend at approximately 35 – 45 degrees:



Experience and personal preference will help you decide the best angle for you, as well as the length you will cut it to in the next step.

5. Next, mark or scribe a new line approximately  $\frac{1}{4}$ " from the bend on the end you will use for the hammer's face. This is the opposite end from where the tool will be chucked into your flex-shaft:



6. Place into a ring clamp or vise and cut at the line you just made,  $\frac{1}{4}$ " from the end, like this:



7. Now you can begin grinding this short end into the hemispherical shape needed. Use files, grinding wheels, sanding sticks, sandpaper, etc.



8. Once you have the desired hemispherical shape, polish the surface to a high shine with progressively finer abrasives. After filing, I used 3M radial bristle discs:



9. After a final swipe on a buffer, I got a mirror finish:



10. Finally, after polishing to a high shine, heat the face of the hammer again, this time to draw a temper on it and make it hard enough to use as a rotary hammer. Heat the face evenly and watch for the surface to begin to change color. This is best done in subdued lighting. First, you'll see a light yellow color, then, a straw yellow color. This is what you want. Remove the heat and allow it to cool at room temperature. If you continue heating past the straw yellow color you will see it go through bluish/blackish colors. This is too hard and brittle, and will not make a good hammer. If you make a mistake and go too far, you'll have to anneal, polish and temper it all over again.

Here's how it looks in the flex shaft handpiece:



Looks a lot like a bent nail, right? You could make one from a nail, but it won't harden as well as tool steel. Before using your new rotary hammer, make absolutely *certain* that the handpiece's chuck is **TIGHT!** The last thing anybody wants is for one of these to go flying around the shop and break something...such as your eye.

The idea of the tool is that it provides many *glancing* blows to the surface of the metal you use it on. It work-hardens and lightly forges/burnishes the *surface* with which you are working. This is very handy when you have a casting with surface porosity, and you don't want to forge the entire piece with a regular hammer because it will thin the piece out.