



Crosscut Saw Tooth-Setting Tool

Bob Beckley, Project Leader

Throughout the Forest Service, fire and trail crews have a long history of using traditional tools to accomplish tasks in the field. One of the most common traditional tools used by the Forest Service is the crosscut saw.

Renewed interest in the use and collection of traditional tools has made it hard to find tools to maintain and sharpen crosscut saws. Many of the tools used by Forest Service crosscut saw filers are worn out from years of use. Replacement parts are unavailable. Most of the tools needed to maintain crosscut saws are no longer manufactured or are of poor quality and do not meet the standards of a professional saw filer.

To help remedy the shortage of tools to maintain crosscut saws, the Missoula Technology and Development Center will test existing tools and build new ones (if necessary). During the coming year, the center will distribute several Tech Tips covering the basic tools needed for proper crosscut saw maintenance.

The first tool in this series is the crosscut saw tooth-setting tool (figure 1). The purpose of setting the teeth on a crosscut saw is to prevent the saw from binding as it cuts through the wood. Only the cutter teeth of the saw are set. Setting the tooth means that each cutter tooth is bent away from the plane of the saw slightly. Just as each tooth is sharpened opposite the tooth next to it, each tooth is also set opposite to its adjoining tooth. The set produces a kerf (cut) that is slightly wider than the thickness of the saw blade. The saw's rakers, which pull wood from the cut, are not set.

The amount of set in the cutting teeth can vary depending on the saw and the type of wood being cut. Vintage and high-quality modern saws are tapered so the cutting edge of the saw is slightly wider than its back edge. Many modern or lower quality saws are

flat ground, meaning the blade's thickness does not vary. A taper-ground saw requires less set than a flat-ground saw. For example, a taper-ground saw cutting dry hardwood requires very little set in the cutting teeth. The same saw cutting soft or rotten wood could require a set of up to 0.030 inch. A tooth set of 0.010 inch is a good place to start. The typical tooth set for most Forest Service applications is in the 0.012- to 0.015-inch range.



Figure 1—A crosscut saw tooth-setting tool. A hammer is used to bend the tooth against the anvil.



Tooth set is measured with a spider (figure 2) that has a specific offset (such as 0.012 inch) or a dial indicator gauge (figure 3).

To set a cutter tooth using the crosscut saw tooth-setting tool, place the blade in a saw vise with the teeth pointing up. Place the cutter tooth in front of the tool's anvil with the tooth's filed edge facing toward the hammer. The bevel on the anvil should be about $\frac{1}{4}$ inch below the tip of the tooth so the hammer's blow will bend the cutter tip over the bevel. Be sure the saw tooth is centered in the tool to evenly distribute the hammer's blow across the cutting tip (figure 4).





Figure 2—A spider gauge measuring the set of cutting teeth on a crosscut saw.



Figure 3—A dial indicator gauge measuring the set of cutting teeth on a crosscut saw.



Figure 4—Setting the tooth with the crosscut saw tooth-setting tool.

Keep the face of the anvil parallel to the plane of the saw when setting the tooth. If the anvil is held at an angle, the tooth could be twisted when set. Use a spider or a dial indicator gauge to check the set of the tooth. If you are using a spider and its vertical legs rock, there is insufficient set and the tooth should be worked again. If the horizontal leg rocks, there is too much set and some must be taken out. The backside of the tool can be used as a hand anvil to remove set. To do so, place the cutting tooth close to the top of the anvil and strike the tooth with light blows until the set is correct.

Testing showed this tooth-setting tool moved the cutter tooth about 0.001 inch per blow from a 1-pound hammer. Results will vary, depending on the weight of the hammer and the force of the blow. Vintage and higher quality saws are made of better steel than many modern or lower quality saws. The better the steel, the more force will be required to set the tooth. Check the set frequently with a spider or dial indicator gauge to ensure the proper tooth set.

Figure 5 (a reduced drawing) shows how to make a crosscut saw tooth-setting tool.

Additional crosscut saw tools will be evaluated and featured in future Tech Tips. For additional information on the use and care of crosscut saws, see Warren Miller's *Crosscut Saw Manual* (7771-2508-MTDC).

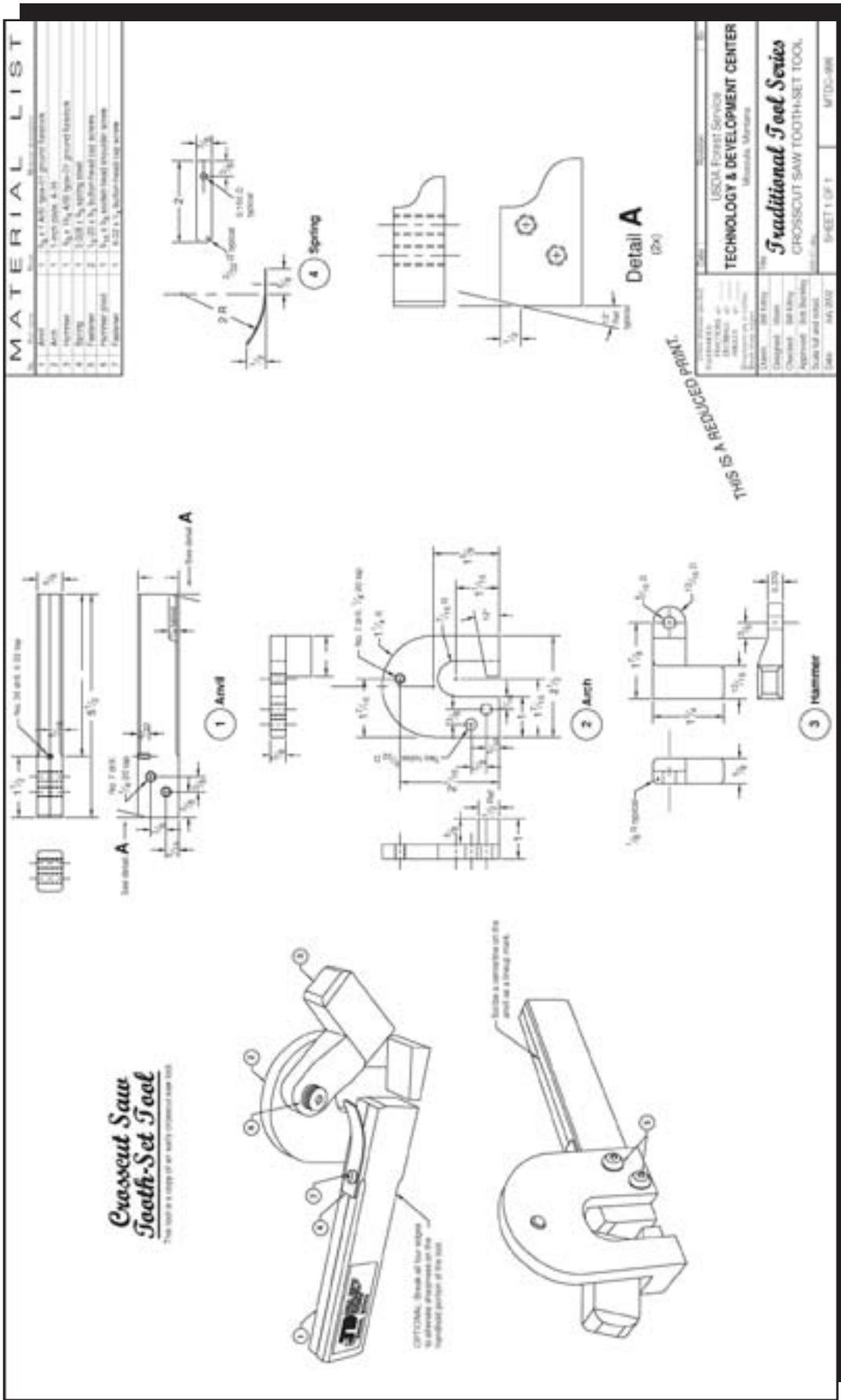


Figure 5—How to make a crosscut saw tooth-setting tool.

About the Author

Bob Beckley works as a project leader in the fire, recreation, and health and safety programs. He also serves as a photographer and videographer. He has a bachelor's degree in political science from the University of Montana. He began his Forest Service career as a forest technician on the Nez Perce National Forest in the Northern Region. Beckley was a smokejumper when he came to the Missoula Technology and Development Center in 1990.

Library Card

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Describes a tool used to set (slightly bend) a tooth on a crosscut saw. A crosscut saw's teeth are set alternately to the right and left away from the plane of the saw blade. The set produces a kerf or cut that is wider than the saw blade, helping to prevent the blade from getting stuck. The raker teeth that pull wood from the cut are not set. The tooth-setting tool allows a hammer to be used to bend a tooth against the tool's anvil. During a test, each blow from a 1-pound hammer moved the cutter tooth about 0.001 inch. A spider or dial indicator gauge is used to make sure the set is correct for the type of wood being cut and the type of saw being used. The typical tooth set for Forest Service applications is about 0.012 to 0.015 inch.

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