Chapter 8—Sharpening and Shaping an Ax Head

A sharp ax is a safe ax; it is more likely to cut into and not scoop or glance off the wood. Proper filing techniques allow you to shape and sharpen an ax to maximize efficiency and safety.

Many people who sharpen an ax focus on the cutting edge with the intent of bringing the ax back to the condition it was in when it cut well. However, to sharpen an ax properly, you must pay attention to more than just the edge; the area behind the cutting edge is just as, if not more, important.

If you only sharpen the cutting edge as it wears down, you eventually lose the smooth transition you developed while profiling the ax head. As you file the cutting edge down, its relationship to the sides of the ax changes; the sides get thicker and the ax loses some of its efficiency for penetrating wood. Sharpening an ax properly involves maintaining the entire profile of the ax head, not just the cutting edge.

As discussed in "The Mechanics of Chopping" section in chapter 11, an ax should strike a log at a 45-degree angle to penetrate the log safely. A sharp, properly profiled ax can strike at a shallower angle and still penetrate the wood because of the gradual transition between the cutting edge and the sides of the ax. If there is no gradual transition because the sides of the ax are too thick in relation to the cutting edge, the ax requires a steeper angle to penetrate the wood. An angle steeper than 45 degrees leads to poor penetration and inefficient chopping.

An ax head must have a sharp cutting edge to efficiently displace wood. The typical Forest Service double-bit ax has a bevel sharpened to about 18 degrees for the clear wood (knot free) cutting side (known as the keen edge) and up to 28 degrees for the limbing/cutting through knots side (known as the stunt edge). In comparison, a racing ax could have a bevel of 14 degrees. Using an ax gauge is the easiest way to determine if you have the correct angle (figure 8–1).

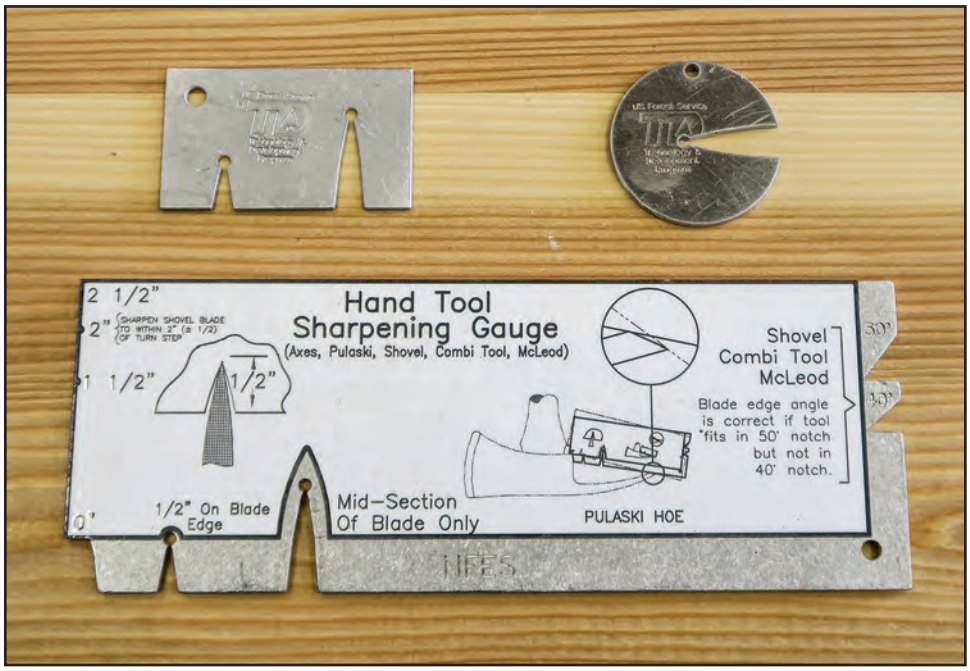
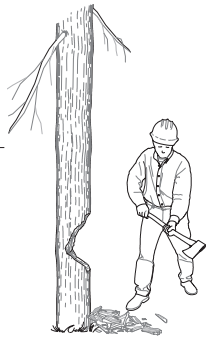


Figure 8–1—National Technology and Development Program sharpening gauges, used for measuring the correct angle of an ax head.



The microbevel and the bevel form the cutting edge of an ax (figure 8–2). The microbevel is an important part of the bevel; it provides strength to help prevent the cutting edge from chipping or breaking. Ideally, the bevel should be about 18 degrees while the microbevel should be about 25 degrees (figure 8–3). Keeping the microbevel to the desired degree can be challenging. This small, fine edge can be difficult to develop properly and can easily change through honing or stropping. Novice axmen may not know about the need for the microbevel.

While the angle of the cutting edge is important, you must remember how the edge blends into the grind—the area right behind the microbevel and bevel.

Many people use powertools to shape or sharpen their ax heads. Motorized sanders or sharpeners can be useful for removing metal to develop an ax's profile and to shape the ax head, but pay close attention so you do not overheat the ax head and ruin the temper or remove too much metal and change the profile. If

Figure 8–2—The microbevel in relation to the bevel. The inset shows a closeup view of the microbevel and bevel.

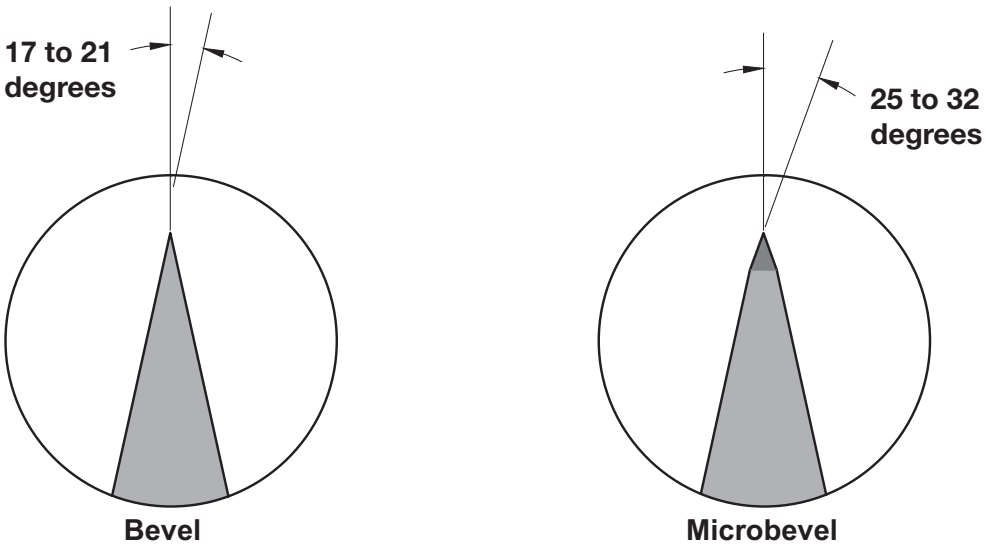


Figure 8–3—The correct angles for a bevel and microbevel.

you use a powertool, use it only to shape the ax head and not to sharpen the cutting edge.

When shaping an ax head, use a felt pen or marker to indicate the areas where you want to remove metal (figures 8–4 and 8–5). Work slowly and check your progress often. Never allow the powertool to contact the cutting edge and frequently check for heat build-up by touching the work surface with your bare hand. Mark the cutting edge with a felt pen and do not sand past this line (figure 8–6). The blade is thin at the cutting edge and it heats up faster than the body of the ax. Competition choppers frequently use powertools to shape and sharpen their axes, but this skill takes years of practice to develop. You should perform the final sharpening of the cutting edge by hand and should hone the microbevel using a fine diamond stone or whetstone (figure 8–7).

Figure 8–4—Marking the head of an ax with a felt pen to indicate where and where not to remove metal.

Figure 8–5—Marking an ax head to indicate high points to file and low points to avoid filing.

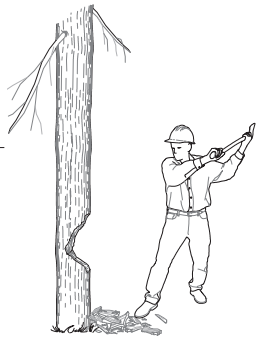


Figure 8–6—A cutting edge marked with a black felt pen. *—This photo was digitally altered.*

Figure 8–7—Using a whetstone to hone the microbevel.

Ax Head Shapes

An ax must do three things to cut efficiently:

- Sever wood fibers
- Displace wood chips
- Release from the wood

These three things depend on the interaction between the ax head cutting edge, profile, and type of grind. The cutting edge severs wood fibers while the profile and grind separate the wood chip and release the head from the wood. Only after an ax head dislodges and removes a wood chip can it sever new wood fibers to make the cut deeper. A sharp cutting edge that does not penetrate into the wood because the ax profile is too thick has little practical value. Likewise, a sharp ax with a cutting edge that is too thin penetrates deeply into the wood but will not easily release. An ax head properly shaped to displace chips and release from the wood is worthless if the cutting edge is not sharp enough to sever fibers (figure 8–8). All parts of the ax must work together.

Too thin
(Will penetrate into the wood but will not remove chips efficiently)

Correct

Too thick
(Will not penetrate the wood efficiently and may glance off the wood, creating a safety hazard)

Figure 8–8—A cutting edge that is too thin (left), a properly sharpened cutting edge (middle), and a cutting edge that is too thick (right).

Ax Head Profiles

The profile (shape) of an ax head determines if it penetrates deeply or shallowly into the wood. The basic shape for a Forest Service work ax is the convex profile (figure 8–9) with a chisel grind. The convex profile enables penetration, splitting force, and ease of release (the chisel grind discussed in the "Ax Head Grinds" section later in this chapter provides strength for the cutting edge).

In comparison, a flat-profiled ax is not only flat across the face of the blade, but also across its length. The flat-profiled ax (figure 8–10) has a steep edge and straight sides that enable the ax to penetrate deeper into wood, but it lacks splitting power, making it more difficult to move chips or release the ax from the wood.

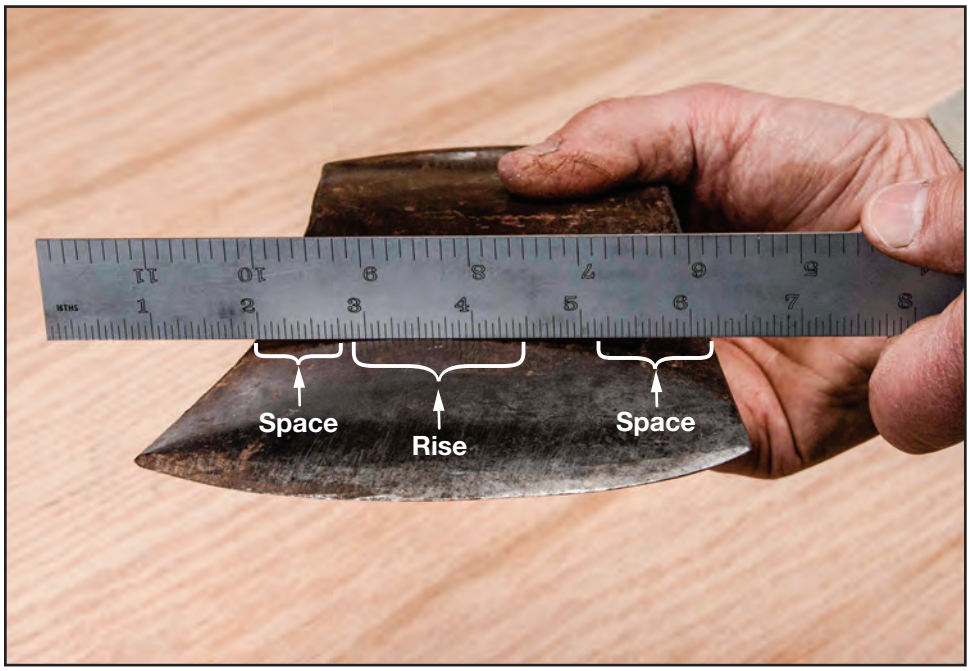


Figure 8–9—A convex ax head with a straightedge lying across the side to show the rise and the spaces to either side of the rise that create the convex profile.

The broadax or broad hatchet profile (figure 8–11) is like a chisel—sharpened only on one side. This chisel profile is for shaping wood rather than for chopping it. Do not confuse a broadax chisel profile with a chisel grind, which many chopping axes have.

Figure 8–10—A flat-profiled ax shows relatively little relief when a straightedge lies across the face or along the length of the blade.

Figure 8–11—The front, chisel-shaped, sharpened edge (left) and back, flat, unsharpened edge (right) of an ax head with a broadax profile.

The type of chopping and the type of wood both play a role in determining which ax head profile works best for a particular job. The convex ax head profile works best for general chopping purposes. The sharpened edge severs wood fibers and, as the cutting edge severs the fibers, the main body of the ax enters the wood. With a convex-shaped head, the sides of the ax provide a wedge to split the wood (figure 8–12). The actual cutting edge only starts the cut; the sides of the ax dislodge the wood chips.

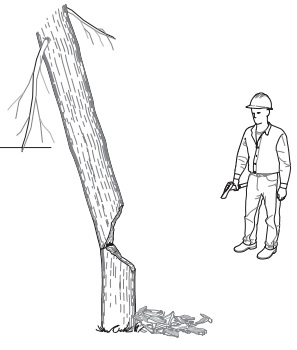
The ax profile also plays a role in edge strength. Convex profiles tend to be thicker and more durable. Flat profiles tend to have sharper angles that provide better depth penetration. The sharper angles could make the blade more susceptible to bending or breaking, especially when striking a hard knot or cutting into frozen wood. Flat profiles penetrate much better than convex profiles. While the flat sides provide better penetration, they can also provide excessive friction, making the ax more difficult to remove from the wood.

Figure 8–12—A convex head in a round of wood. Note that the sides of the ax head spread the round apart well beyond the cutting edge.

Regardless of the profile, all ax heads can get stuck in wood. The types of hollows (figure 8–13), bevels, and relief of the ax head can reduce the friction that binds it to the wood. Cutting or filing relief (figure 8–14) into the sides of an ax head reduces binding or sticking and allows the ax to more easily release from the wood.

Figure 8–13—The straightedge placed on the side of this Snedden ax illustrates the hollow behind the cutting edge.

Figure 8–14—A Tuatahi competition ax showing the additional relief filed into the sides.



Ax Head Grinds

Customizing the cutting edge of an ax with a specific grind can provide more bite, which allows you to remove bigger chips from a log. The grinds discussed in this manual refer to the microbevel and bevel of a cutting edge and how these blend into the ax profile. Adding a microbevel to the ax's grind provides strength and durability.

Grinds can be very specific to the types of wood you cut and are more important to competition choppers than to typical workers in the woods. The grind blends into the ax profile, providing a smooth transition from the cutting edge through the cheeks. The convex ax profile inherently provides this type of relief.

Once you profile the general shape of the ax head, you need to decide what type of cutting edge grind works best for the type of chopping you do. The cutting edge of a chisel grind is uniform from toe to heel. It is probably the most common and popular grind for basic ax use in America. Chisel grinds, in conjunction with a convex profile, are applicable for most types of wood (or most types of chopping).

A banana grind is an asymmetrical version of the chisel grind (figure 8–15). The cutting edge of a banana grind is wider in the center and narrower at the toe and heel. The edge can be either full or half banana. A half-banana edge is only slightly wider in the center than at the toe and heel. A full-banana edge fans up the cheek closer to the eye of the ax. It is considerably wider than a half-banana edge. Banana grinds are useful for chopping softwoods and some hardwoods, but not for very hard or frozen wood.

Figure 8–15—A double-bit ax with a banana grind on one cutting edge and a chisel grind on the other.

A flat grind is a symmetrical wedge from the edge of the ax to about 3½ to 4 inches back from the edge. Usually found on a flat-profiled ax (figure 8–16), flat grinds are the least desirable for general forestry use. Though it provides excellent depth penetration, an ax with a flat grind and flat profile will stick in the wood and not easily release. The cutting edges (bevel and microbevel) of the ax are also more likely to roll, chip, or break.

The chisel and banana grinds are the most common types of grinds. There are other types of ax grinds, depending on the region and country. This manual focuses on practical forest applications. You can search for other ax grinds on the internet. The Tuatahi website <http://www.tuatahiaxes.com/> provides helpful information about other types of grinds.

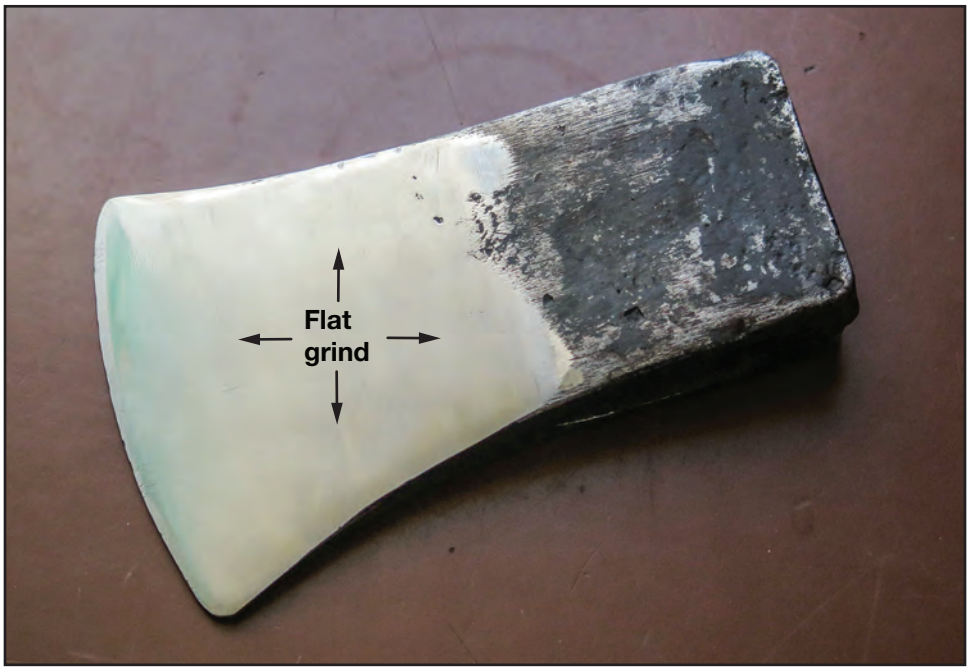
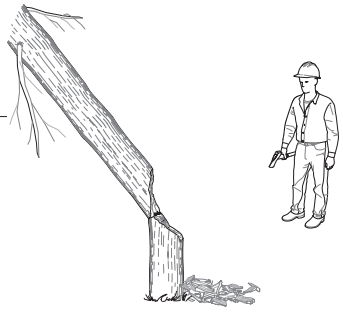


Figure 8–16—A flat grind on a flat-profiled ax.



Is Your Ax Head Worth Shaping and Sharpening?

It may not be worth your time or energy to shape and sharpen an ax head that has too much damage (figure 8–17). Begin by visually examining the ax head. Obvious defects can include a severely chipped or broken edge. If the cutting edge of the ax has minor or shallow chips, you may be able to file them out. A major chip in the edge may require you to file past the hard-tempered cutting edge and into the softer metal of the cheeks. Filing a cutting edge past the temper line produces an inferior edge. The softer metal does not hold an edge and does not stand up to hard use.

An over-filed head also may not be worth sharpening. Typically, the toe (figure 8–18), and sometimes the heel, of the cutting edge is filed so far back that you need to reprofile the entire edge to get it back into proper shape. Extensive filing sometimes brings the cutting edge out of the tempered zone and into the softer metal of the cheeks.

Figure 8–17—This ax had a manufacturing defect; it cannot be restored.

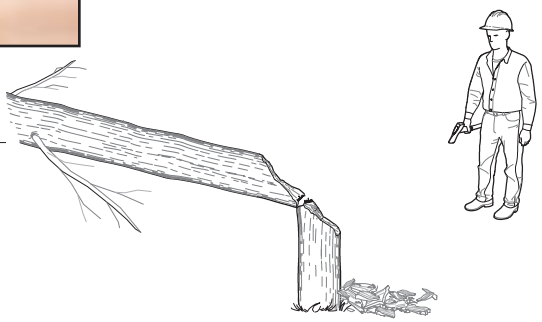
Figure 8–18—An ax head with a rounded toe.

Visual inspection of single-bit ax heads may reveal a severely damaged or mushroomed poll (figure 8–19). Driving metal wedges with the nontempered poll often causes this type of damage. You may be able to grind the poll back into shape, but could lose a lot of metal and weight from the back of the ax. The poll helps provide balance and a driving force while chopping.

Examine the eye of the ax. It should be symmetrical. The head may not fit the handle securely if the sides of the eye bulge or are otherwise deformed. This could indicate that the ax has been misused. With use, the bulge could continue to change shape and may break. An ax with a mushroomed poll often also has a bulging eye (figure 8–20).

Figure 8–19—An ax head with a mushroomed poll.

Figure 8–20—An ax head with a mushroomed poll and bulging eye.



Cracks or splits in the metal of the ax head are less obvious but serious defects to look for. These defects can be hairline cracks that are difficult to see, especially if the head is dirty. Clean the ax head thoroughly and examine closely for any cracks or splits, particularly in and around the eye. A cracked ax head (figure 8–21) could potentially break apart during use. You may be able to weld minor cracks, but cracks that extend into the cheeks of the ax can cause serious problems. Discard any ax head with these types of cracks.

The "Restoring a Vintage Ax Head" section in chapter 13 contains more information about defects in an ax head.

If a visual inspection confirms that an ax head is in good shape and worth the time and effort to sharpen, the next step is to examine the ax sides and cutting edge with your fingers (figure 8–22). Running your fingers across the ax sides and cutting edge reveals variations on both sides of the ax and helps you develop a filing plan.

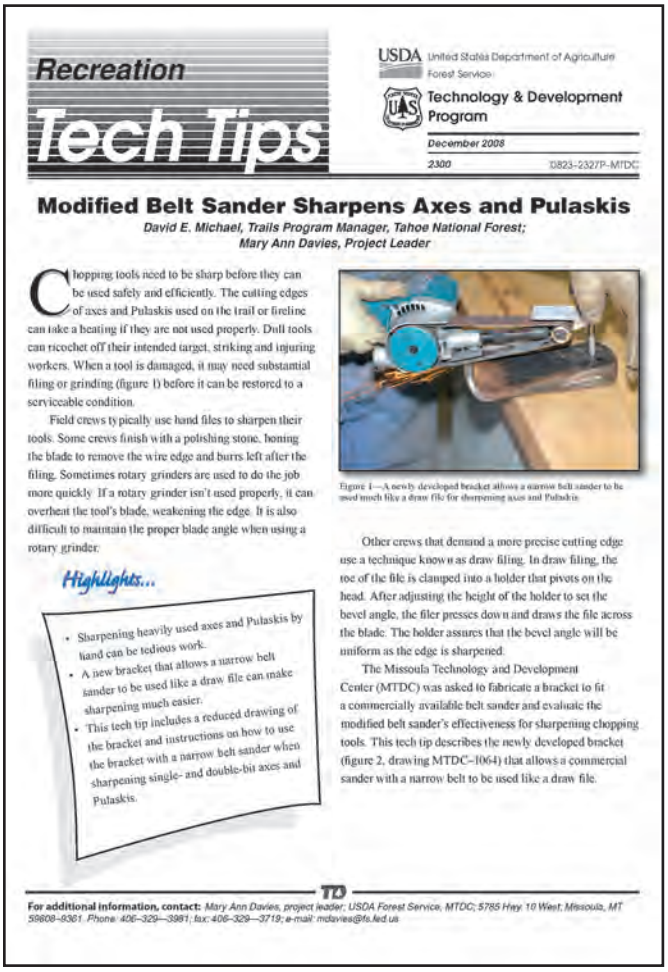
Figure 8–21—A crack in an ax head. When you see a mushroomed poll, check carefully around the eye for cracks.

Figure 8–22—Feeling the sides and cutting edge of an ax head can reveal high and low spots and can help you develop a filing plan.

Shaping an Ax Head

The publication "Modified Belt Sander Sharpens Axes and Pulaskis" (0823–2327P–MTDC) <http://www.fs.fed.us/t-d/php/library_card.php?p_num=0823%202327P> (figure 8–23) provides instructions for making a sharpening jig for a 1-inch belt sander to assist with shaping an ax head. The publication explains how to mark an ax head so that the sharpening jig has a fixed point from which to swing. If you prefer not to put a small indentation in the ax head to serve as a pivot point, you can use rare earth magnets. These powerful magnets are available with a center hole and remain affixed to the ax head during use.

Before shaping, properly prepare the ax head by cleaning it and ensuring that it is free of dirt, oils, and rust. To begin shaping, properly secure the ax to a workbench so that it is stable and does not shift or move. Once you secure the ax, use a hand file or electric sander (figure 8–24) to begin removing metal from the ax head to achieve the desired profile and grind.



Recreation Tech Tips

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Technology & Development Program
December 2008
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Modified Belt Sander Sharpens Axes and Pulaskis

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Chopping tools need to be sharp before they can be used safely and efficiently. The cutting edges of axes and Pulaskis used on the trail or fireline can take a beating if they are not used properly. Dull tools can ricochet off their intended target, striking and injuring workers. When a tool is damaged, it may need substantial filing or grinding (figure 1) before it can be restored to a serviceable condition.

Field crews typically use hand files to sharpen their tools. Some crews finish with a polishing stone, honing the blade to remove the wire edge and burrs left after the filing. Sometimes rotary grinders are used to do the job more quickly. If a rotary grinder isn't used properly, it can overheat the tool's blade, weakening the edge. It is also difficult to maintain the proper blade angle when using a rotary grinder.

Figure 1—A newly developed bracket allows a narrow belt sander to be used much like a draw file for sharpening axes and Pulaskis.

Other crews that demand a more precise cutting edge use a technique known as draw filing. In draw filing, the toe of the file is clamped into a holder that pivots on the head. After adjusting the height of the holder to set the bevel angle, the filer presses down and draws the file across the blade. The holder assures that the bevel angle will be uniform as the edge is sharpened.

The Missoula Technology and Development Center (MTDC) was asked to fabricate a bracket to fit a commercially available belt sander and evaluate the modified belt sander's effectiveness for sharpening chopping tools. This tech tip describes the newly developed bracket (figure 2, drawing MTDC–1064) that allows a commercial sander with a narrow belt to be used like a draw file.

Highlights...

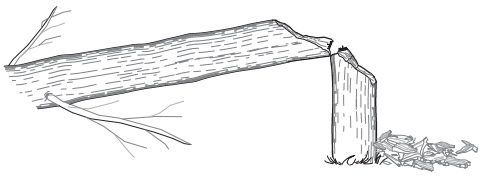
- Sharpening heavily used axes and Pulaskis by hand can be tedious work.
- A new bracket that allows a narrow belt sander to be used like a draw file can make sharpening much easier.
- This tech tip includes a reduced drawing of the bracket and instructions on how to use the bracket with a narrow belt sander when sharpening single- and double-bit axes and Pulaskis.

TD

For additional information, contact: *Mary Ann Davies, project leader; USDA Forest Service, MTDC; 5785 Hwy 10 West; Missoula, MT 59808–9361. Phone: 406–329–3981; fax: 406–329–3719; e-mail: mdavies@fs.fed.us*

Figure 8–23—The publication "Modified Belt Sander Sharpens Axes and Pulaskis."

Figure 8–24—Using an electric sander to remove metal from behind the cutting edge. A rare earth magnet provides an excellent pivot point for the sanding jig (inset).



When using an electric sander, frequently lift the sander off the ax head to check for heat buildup and to allow the head to cool as necessary (figure 8–25). The ax head should not be so hot that you cannot touch or hold it. Be especially careful around the cutting edge; this area is thin and heat can quickly build up and ruin the temper. The metal changes color if it starts to get too hot. If you notice the metal changing to shades of blue or purple, you are changing the temper of the steel and should stop immediately to prevent more damage. Never allow the sander to contact the cutting edge.

Although this manual discusses the use of powertools to profile and sharpen an ax head, it is extremely important to understand and learn the nuances of hand filing and stoning. Do not use powertools for the final steps of sharpening an ax head. Learning to use hand files and stones will give you a new appreciation for the effort required to shape and sharpen an ax head.

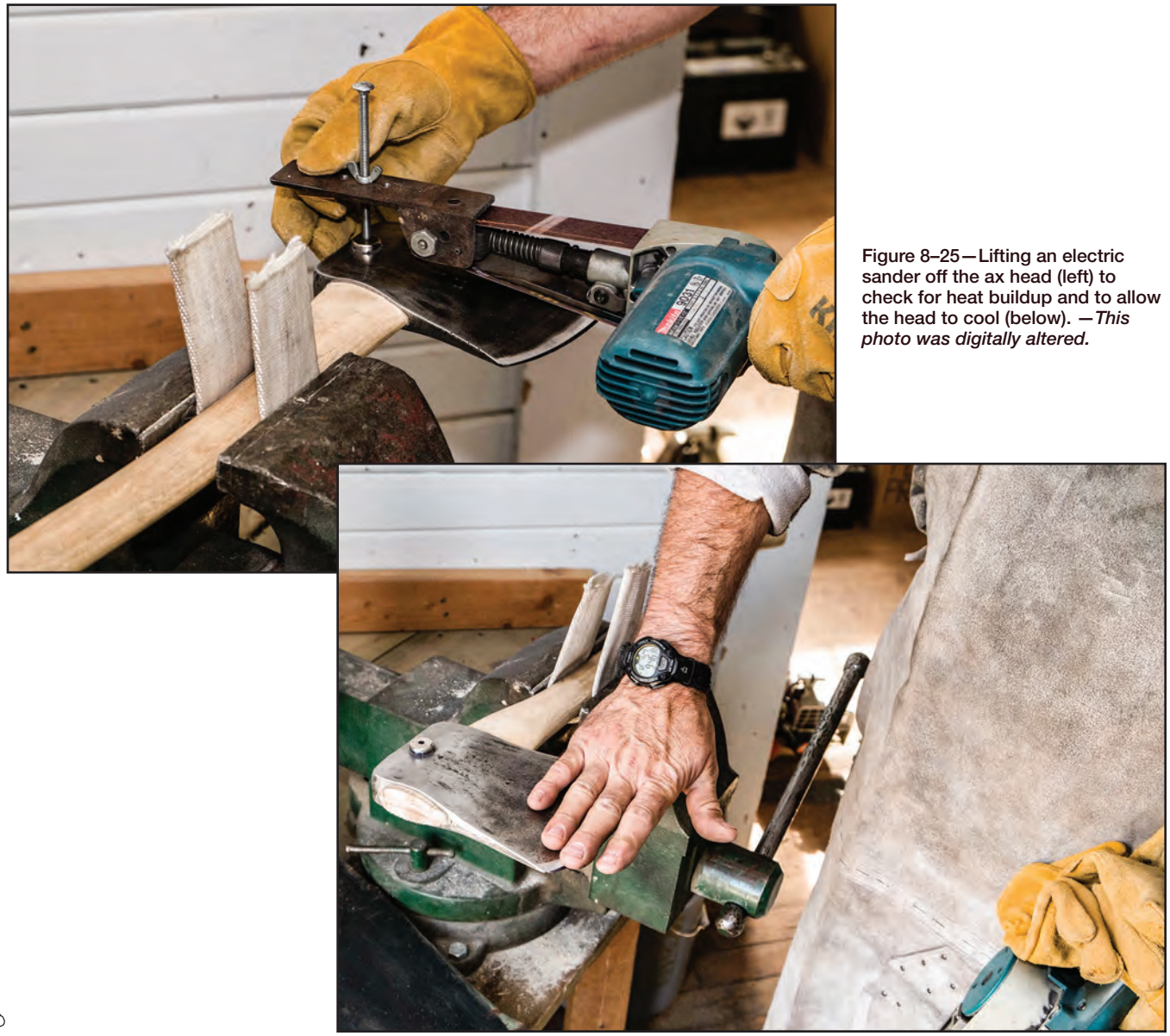


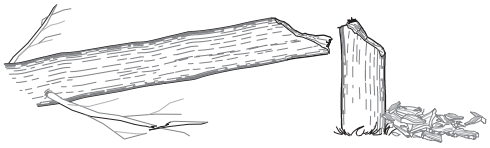
Figure 8–25—Lifting an electric sander off the ax head (left) to check for heat buildup and to allow the head to cool (below). —*This photo was digitally altered.*

Sharpening an Ax Head

To begin hand filing, secure the ax to a workbench with the head protruding over the edge. Ensure that the work area has adequate lighting to enable you to work safely and to monitor the progression of the filing. Begin by making long push strokes with the file toward the center of the ax head (figure 8–26). Do not file from the back side of the head toward the cutting edge; this can roll (bend) the edge of the ax head over. The file should have a handle with a guard on it for your protection. You should also wear good, cut-resistant or leather gloves, at least on the hand that may contact the cutting edge. The handle, file guard, and gloves protect your hands from cuts. Use both hands to file. Use firm, even strokes and lift the file at the end of each stroke (figure 8–27). Return to the point at which you started and repeat the process. Do not run the file back and forth across the ax head in a sawing motion; this will not produce the desired effect because the bastard file only cuts as you push it. Frequently tap the file to remove loose metal filings. If shavings clog or pin the file, stop and clean the file with a file card.

Figure 8–26—Using a push stroke on an ax head secured to a workbench.

Figure 8–27—Lifting the file off the ax head at the end of the push stroke.



The condition of the file and the pressure you apply determine the amount of metal you remove with each stroke. The more pressure you put on the file the faster it cuts. Stop frequently to examine the work visually and with your fingers (to identify high and low spots that your eyes may not see). Rotate the ax head as needed to file both sides evenly. Try to achieve a fan shape across the blade as you file. Leave the corners (tips) of the toe and heel a little bit thicker than the rest of the cutting edge (figure 8–28). The fan-shape filing helps to reinforce the toe and heel of the cutting edge.

Forming the Cutting Edge

As the ax head begins to take shape, use a draw stroke to begin forming the cutting edge (figure 8–29). Draw filing removes steel from just behind the cutting edge, helps shape the area, and provides a smoother finish to the ax head.

As you work, tip the file slightly so that the back edge cuts (see figure 7–6). Proper draw filing forms long curls of steel rather than just shavings. When filing close to the cutting edge, a thin metal wire or burr

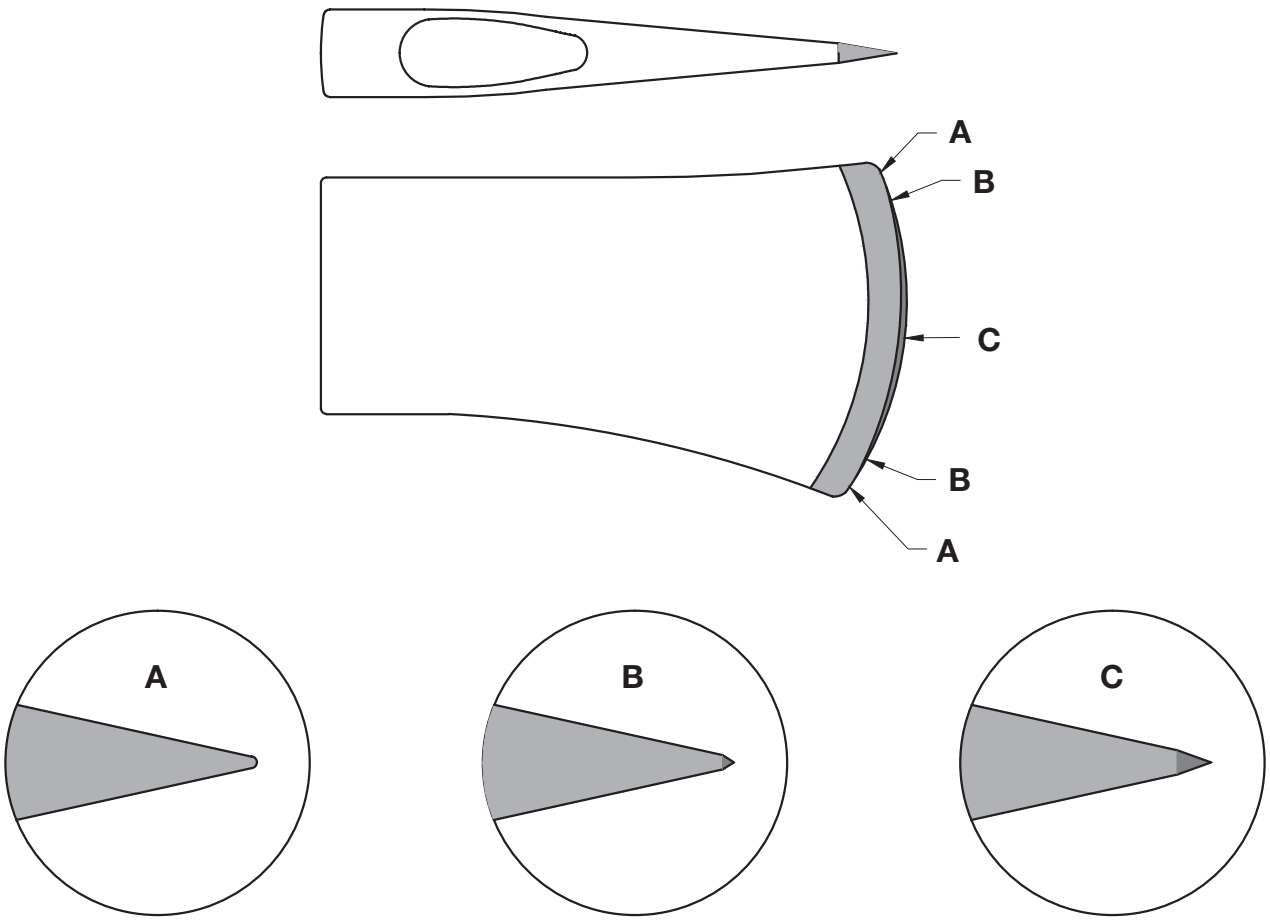


Figure 8–28—The ends of the ax head (the toe and heel) are unsupported edges. Leave the toe and heel slightly thicker to prevent the cutting edge from chipping.

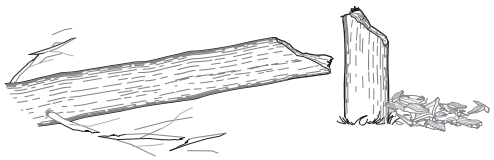
appears on the opposite side of the ax head. Use a whetstone to remove the burr. Beginners commonly make the mistake of applying more pressure midstroke, which can cause a hollow spot to form in the center of the ax head. Be aware of the tendency to apply more pressure midstroke and try to keep even pressure throughout the entire process.

Remove the ax from the workbench, rotate the head to the opposite side, and resecure the ax to the workbench. Do not focus on completing one side before working on the opposite side. Work both sides of the ax head with the file, using push and draw strokes until the sides are symmetrical and smooth. Use an ax gauge to confirm that you have shaped the ax head properly (figure 8–30).

As the ax head begins to take shape, the visual variations become less pronounced. A strong light source reflecting across the steel can pick up irregularities. As you work those areas down to the point where the ax head has a consistent finish, you will again need to rely on your sense of touch. While you may no longer be able to see the minute variations in the ax head, your fingertips will feel variations in thickness and will help identify areas where you need to concentrate to transform the ax head into an efficient cutting tool.

Figure 8–29—Using a draw stroke on an ax head secured to a workbench.

Figure 8–30—Using an ax gauge to ensure an ax head is symmetrical. Note that the tip of the cutting edge fits into the circle and the sides of the ax head are flush with the gauge.



Honing the Bevel

At this stage, you can also switch to using an ax stone or a diamond sharpening stone to begin honing the bevel (figure 8–31). Ax stones are round, carborundum sharpening stones that typically have a coarse and a fine side. Similar stones are available, but an ax stone fits nicely in your hand. Some ax stones have a grooved center that provides protection for your fingertips (figure 8–32). Ax stones in general require a lubricant to work efficiently. That lubricant is typically water, saliva, or an oil. The lubricant floats away metal filings as you sharpen the ax. Apply the lubricant and then work the coarse side of the stone in a circular motion along the side and up to the cutting edge of the ax. Once you create a burr on the opposite side of the ax, turn the head over and repeat the process. Repeat the entire process using the fine side of the ax stone.

Figure 8–31—Using an ax stone to hone the bevel.

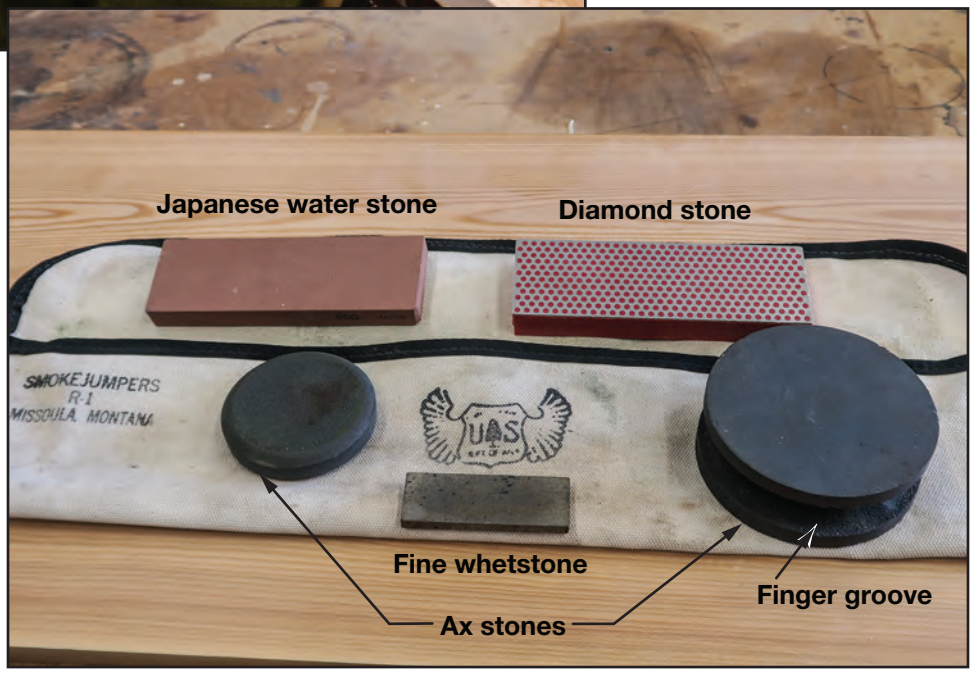


Figure 8–32—A Japanese water stone, a diamond stone, and three different ax stones. The ax stone on the bottom right has a finger groove.

Developing the Microbevel

Once you properly shape the ax head, you need to focus on the microbevel. The microbevel is an extremely important part of the ax head; it provides strength and durability to the cutting edge (figure 8–33).

Use a fine diamond stone or whetstone, such as a Hard Arkansas (or similar type) stone to develop the microbevel (see figure 8–7). As usual, axmen have their preferred techniques for developing a microbevel. These preferences may include the type and size of stone they use and the motion in which they move the stone. The author prefers to move the stone vertical to the edge, from toe to heel. This action helps to develop and establish the angle of the microbevel and its relationship to the rest of the cutting edge. Once you establish the microbevel, move the stone horizontally back and forth along the cutting edge. The microbevel itself is slight, perhaps 1/16 of an inch along the entire length of the cutting edge. Because the microbevel is so small, it is difficult to measure the angle accurately, but it should be about 25 degrees. You will determine through trial and error what angle and grinds work best for your ax and your cutting style.

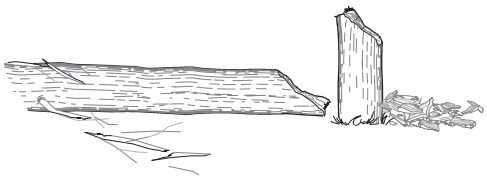
Whetstone or Wet Stone?

The proper term and spelling is whetstone. The word "whet" means to sharpen, so a "whetstone" is a stone used to sharpen edged tools.

To get the most out of a whetstone, keep the stone lubricated with water or oil. Mineral oil, a light machine oil, or automatic transmission fluid are acceptable oils. The lubricant helps carry away particles of metal—known as swarf—released through the stoning process that could otherwise cause the stone to clog and reduce its effective cutting power.

With few exceptions, the author uses only water on his sharpening stones. Oil permeates the porous texture of a whetstone, while water dries out and leaves the stone in its natural state. Once you put oil on a whetstone, you should continue to use only oil as a lubricant for that whetstone.

Figure 8–33—The microbevel adds strength and durability to the cutting edge.



Natural Sharpening Stones

With reduced demand, the cost of mining and producing high-quality, natural sharpening stones has risen dramatically over the last several decades. This is especially true for Soft Arkansas and Hard Arkansas stones. If you have a good sharpening stone, take care of it and it will last a lifetime.

Do not confuse the traditional whetstone with a water stone. Similar to a whetstone, water stones can be made of both natural and synthetic materials. Most water stones are synthetic and are made of aluminum oxide.

A water stone is softer than a whetstone. Because it is softer, the top, abrasive material wears away more quickly, constantly exposing fresh, sharp, abrasive material. This enables you to sharpen an ax faster. This may seem like an advantage, but it does have drawbacks.

Water stones can be expensive. Because they are softer, they wear out more quickly and are more prone to uneven wear. This requires you to flatten the stone regularly to maintain its shape. The author considers water stones best suited for sharpening smaller-edged tools, such as knives, chisels, and wood plane blades, rather than axes.

Putting the Final Cutting Edge on an Ax Head

Use a leather strop to put a truly sharp final edge on an ax head (figure 8–34). The strop hones and polishes the cutting edge to razor sharpness. A polished cutting edge has less friction as it enters wood, penetrating deeper and severing wood fibers better. Even more important than honing the edge, stropping an ax head removes any super fine thread or burr of steel (also known as feather or wire edges). It is possible to remove these threads or burrs with careful honing, but stropping does a better job.

Figure 8–34—Using a leather strop to sharpen a cutting edge.

A Leather Strop: Suede versus Smooth

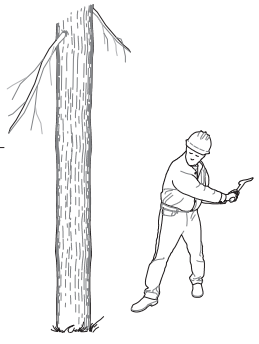
Suede (the flesh side of a leather hide) or smooth (the grain side of a leather hide) both work well for a strop. Suede may be a little better for heavier-edged tools, such as axes, while smooth may be better for finer-edged tools, such as knives and razors. Using honing compounds (figure 8–35) eventually makes both the flesh and grain sides of a leather hide nearly indistinguishable.

If you make your own strop, choose leather that is 1/8-inch thick or thicker and accepts a honing compound without becoming too slick or too thick.

Figure 8–35—Rubbing honing compound into a leather strop attached to a board.

Strop a cutting edge by moving the ax head backward against the leather so that the leather contacts the back side of the cutting edge. Always move an ax in the direction that does not cut into the leather. The proper angle is 35 to 40 degrees. Keep the cutting edge slightly elevated so that the ax head moves across the leather. Apply pressure on the back of the ax head and not on the cutting edge.

Because of the size and weight of an ax, the common barbershop strop is not appropriate for honing an ax head. For safety reasons, it is best to secure a piece of leather to a wooden board. The author uses a strop secured to a piece of hardwood that is 3-inches wide by 12-inches long. If you use a dedicated sharpening station, you can secure this board to your workbench. You can carry a small honing strop (about 1 inch by 3 inches) on a ½-inch piece of



plywood for honing in the field. Honing compounds are fine, abrasive materials that you can apply to a strop to assist with the final sharpening and polishing of your ax.

After spending so much time shaping and sharpening an ax head, it is important to keep it sharp. Experienced axmen carry a small sharpening stone to rehone their cutting edge throughout the day. Clean the ax head at the end of a day to remove any pitch. Hone the cutting edge and rub light machine oil or furniture or car wax over the ax head to protect it from rusting.

The publication "An Ax to Grind: A Practical Ax Manual" (9923–2823P–MTDC) <http://www.fs.fed.us/t-d/php/library_card.php?p_num=9923%202823P> provides additional information about sharpening axes.