

Lay the flat face of the cutter or bit on the flat top surface of the hone with the rest of the cutter overhanging the edge. Rub the cutter or bit up and down the hone (Figure 24-44). Be sure to hold the cutter flat against the surface of the hone while working it back and forth.

Count your honing strokes and hone each wing of the cutter or leading flat face of the bit an equal amount. This will assure equal metal removal and keep the cutter or bit properly balanced. The slight burr that may be created

after the grinding burr is removed from the cutter will be knocked off when the cutter first contacts the wood.

HONING MOLDER KNIVES

Warning: Molder knives should be honed only. Start with a coarse hone (of any type), then progress to fine. Lay the flat face of the molder knife cutting profile on the surface of the hone with the rest of the knife overhanging the edge.

To avoid changing the cutter's profile, do not hone its curved or beveled edges. Hold the knife flat against the surface of the hone while working it back and forth. (Figure 24-45). **Warning: Honed ONLY the area of the knife that cuts the wood. Do not hone the part of the knife that is held inside the molder head. If the surface of the knife inside the molder head is thinned, the knife holding system will be weakened and the knife may break.**

Count your honing strokes and hone each molder knife an equal amount. This will assure equal metal removal from each knife and keep the assembled molder head properly balanced. The slight burrs that may be created by honing will be knocked off the cutting edges when the molder knives first contact the wood.

HONING LATHE DUPLICATOR CUTTERS

Warning: Lathe duplicator cutters should be honed only. To hone the solid carbide cutters (round, triangle, square or diamond), you must use a diamond hone. **Warning: DO NOT attempt to grind the solid carbide cutters. The carbide dust is hazardous and may cause health problems.**

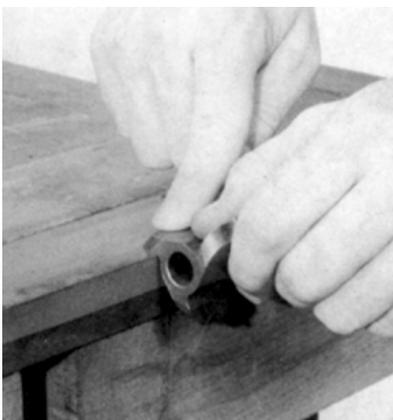


Figure 24-44. Lay the flat face of the cutter on the surface of the hone and rub the cutter across it.

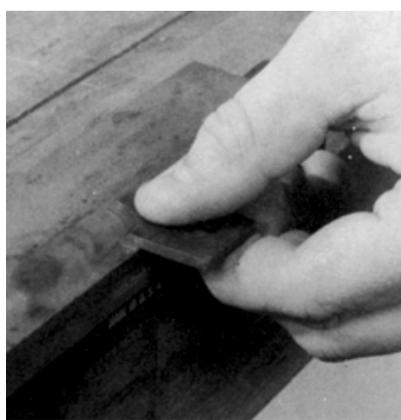


Figure 24-45. Lay the flat face of the molder knife on the surface of the hone and rub the knife back and forth.

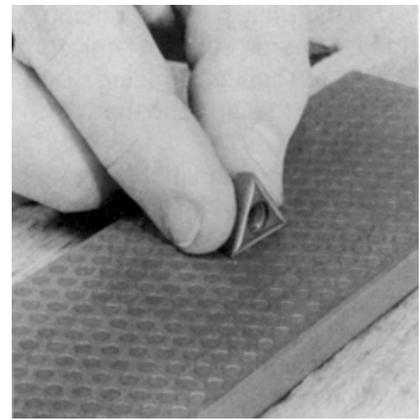


Figure 24-46. Lay the flat side of the cutter on the surface of the hone and rub it across the hone.

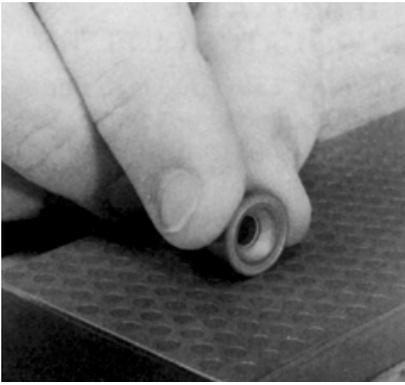


Figure 24-47. To avoid honing a flat spot in the round cutter, roll it while honing.

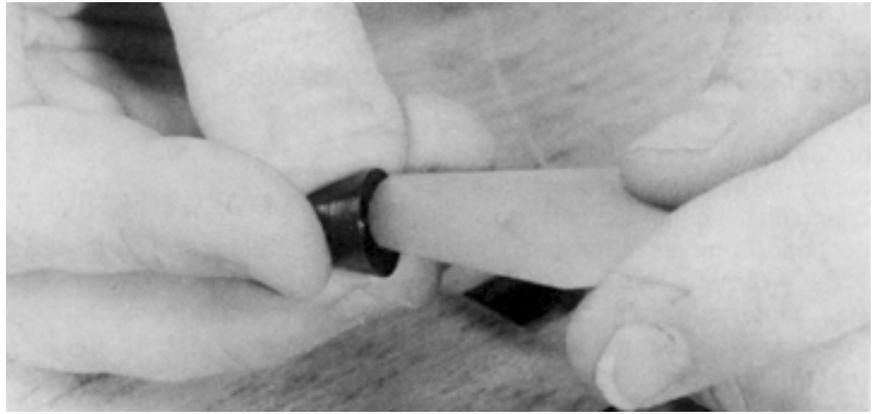


Figure 24-48. Use the edge of a curved slip stone to hone the inside edge of the cone cutter.

Lay the flat side of the **square or triangle** cutter on the surface of the hone. Hold the edge of the cutter flat against the surface while working it up and down the hone (Figure 24-46). Count your honing strokes and hone each side of the multi-sided cutters an equal amount. This will assure equal stock removal from each side of the cutter.

To avoid honing a flat spot in the **round** cutter's profile, roll the cutter as it is honed (Figure 24-47).

To hone the **cone** (steel) cutter, start with a medium hone (of any type). Hone the cutter progressing from medium to ultra-fine. Use the edge of a curved slip stone to remove the burr on the inside of the cutter and produce a razor sharp edge (Figure 24-48).

Each cutter can only be honed a few times before its size and profile are reduced so that it will not match the follower. When this happens, the cutter may be discarded or the follower can be sanded (by hand) with fine sandpaper to match the cutter.

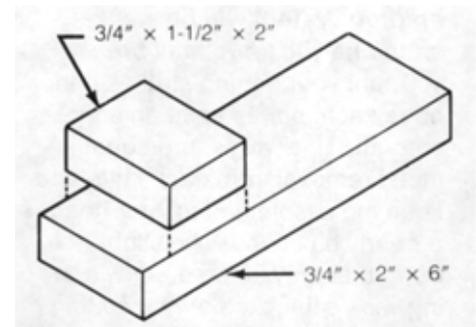


Figure 24-49. Construction details of a mortising chisel support fixture.

SHARPENING MORTISING CHISELS

The inside of the mortising chisels are ground and honed with special cone-shaped grinding stones mounted in the drill chuck. The outside is then honed on a flat bench stone.

Grinding Mortising Chisels

Even when new the chisels will usually need to be ground or at least honed. All four corners as well as the edges **MUST** be razor sharp. This is critical to the accurate operation of the mortising accessory.

Use the white conical grinding stone to sharpen the 1/4" chisel, and the red conical grinding stone to sharpen the 3/8" and the 1/2" chisels.

To properly grind mortising chisels, a support fixture must first be made (Figure 24-49). The fixture will be mounted to the miter gauge. Set up the Mark V in the horizontal boring mode. Instead of mounting a drill bit in the chuck, install the proper grinding stone for the size chisel being ground.

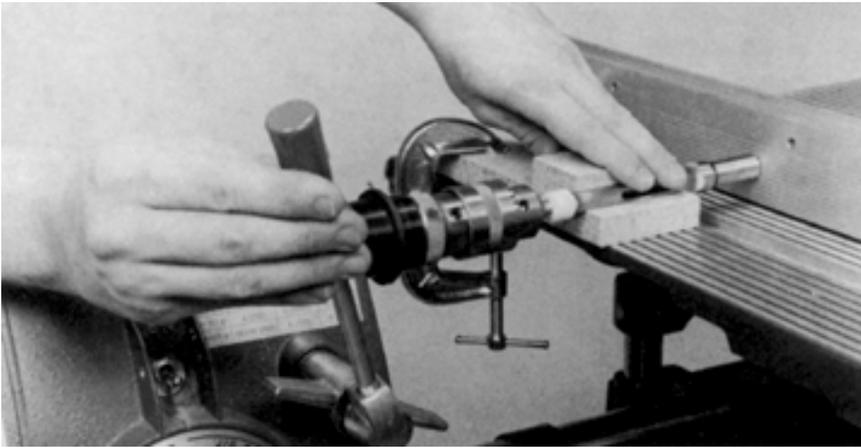


Figure 24-50. Grind a mortising chisel as shown. Retract the quill and repeat until the stone stops removing metal.

Clamp the support fixture on the table. Set the chisel on the fixture and back up the chisel with the rip fence. Hold the chisel against the fixture and the fence, and center the chisel on the grinding stone and lock the table in position.

Position the power plant, with the stone mounted in the chuck, so that the stone is 2" from the chisel. Extend the quill until the stone touches the chisel and set the depth stop to "0" and allow the quill to retract. **Warning: Be sure that the speed dial is set to "Slow," then turn on the machine.** Extend the quill until it contacts the chisel momentarily then allow it to retract (Figure 24-50). Repeat this until the stone ceases to remove any more metal.

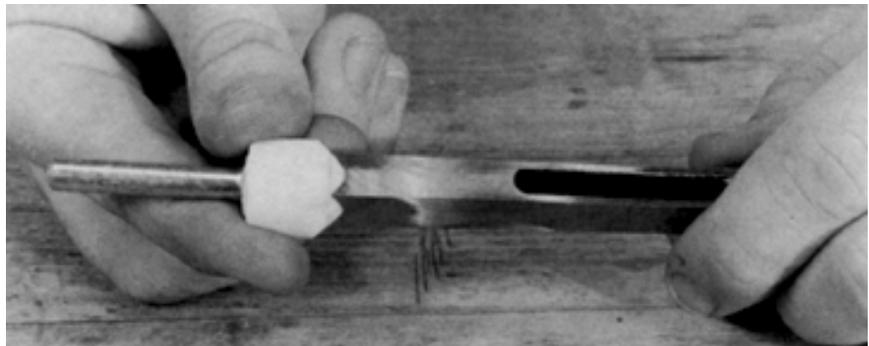


Figure 24-52. Use the cone-shaped grinding stone to remove the internal burr.

Inspect the tips and the edges of the chisel. Look for the grinding burr on all edges and the four tips. If there are still unground surfaces or tips, repeat the above steps to remove additional metal.

If the stone becomes loaded with metal particles, it can be cleaned. Turn off the Mark V and apply a generous amount of oil to the stone. Rub the oil into the stone to lift out the metal particles.

Honing Mortising Chisels

After grinding is complete or the chisel has become slightly dull, hone the mortising chisel on a flat bench stone and the cone-shaped grinding stone.

Lay the chisel flat on a bench stone and move it back and forth to remove the grinding burr from the outside (Figure 24-51). Count the strokes and hone each side of the chisel an equal amount.

To remove the burr from the inside of the chisel, hand-hold the cone-shaped stone straight in the end of the chisel and rotate the chisel back and forth several times (Figure 24-52).

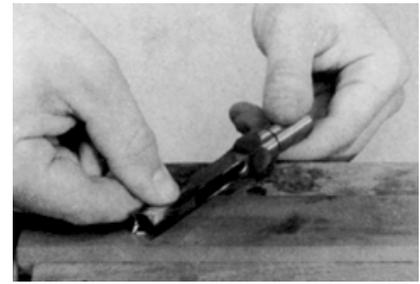


Figure 24-51. Lay the chisel on a flat stone and move it back and forth to remove the grinding burr.

Repeat the honing on the bench stone with progressively finer stones along with the internal honing with the cone-shaped stones until the tips and edges are razor sharp.

SHARPENING MORTISING BITS

Along with the chisels, the bits must be periodically sharpened. They can be honed with contoured slips when only slightly dull, but must be filed and then honed after they become extremely dull. Clean the bit thoroughly before attempting to file or hone it.

Filing Mortising Bits

Before the bits can be filed you must make a filing block that fits in a vise (Figure 24-53). Use drill bits, not mortising bits, to drill the holes in the filing block. Mortising bits flair out at the tip and will drill an oversized hole.

Attach the filing block to the inside of the vise jaws with double-sided tape. Close the vise to within 1/16". Slide the mortising bit in the proper hole with the cutting flutes of the bit parallel to the vise jaws and no more than 1/4" above the top of the wooden blocks. Close the vise to clamp the bit in position (Figure 24-54).

Use a small square or rectangular fine single or double cut file to sharpen the cutting edges of the mortising bit. Filing should take only a couple of strokes. Start with the inside surface of the two side cutters. Follow the "factory ground" angle on the inside of the bit.

File from the back of the cutting edge to the front on one of the side cutters. Count your strokes and repeat the same number of strokes on the inside surface of the other side cutter (Figure 24-55). In a similar manner, hold the file on the "factory ground" bevel forming the bottom relief angle of the bit and file this surface. Count the strokes and repeat the same number of strokes on the other bottom relief angle (Figure 24-56).

The final filing steps are performed on the front of the cutting edge. This will remove the burrs created by the previous filing steps. Hold the file almost vertical against the front cutting bevel and push the file

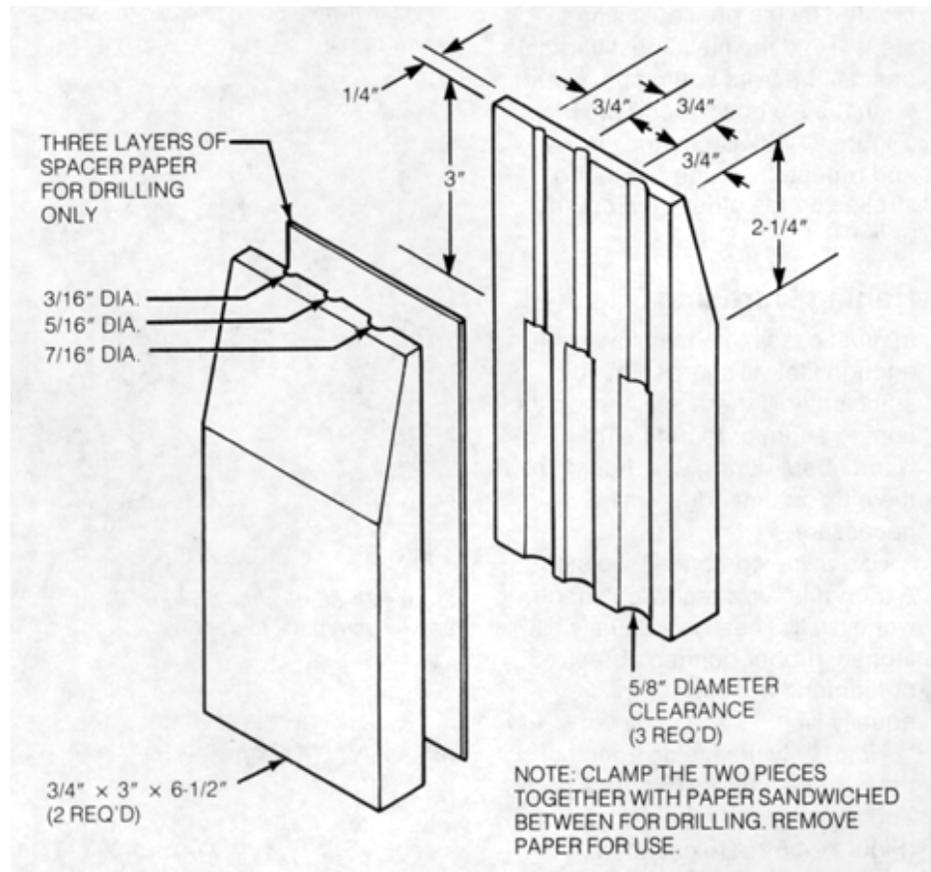


Figure 24-53. Construction details of a filing block for filing and honing mortising bits.

down along the bevel (Figure 24-57). Count the strokes and repeat the same number of strokes on the other front cutting bevel.

Honing Mortising Bits

In most cases the use of a fine enough file will sharpen the bit sufficiently. If there is a burr on the cutting edge, or tearing of the wood fibers during use, honing of the bit's cutting edge will be necessary.

Use a fine contoured slip stone. A triangular or a tear-drop shape works well. These are usually oil stones, rubber bonded abrasives, or diamond hones. All work equally well.

Hone only the inside edges of the two side cutters (Figure 24-58) and the two front cutting bevels (Figure 24-59). Do not attempt to hone the bottom relief angle on the bottom of the bit. Honing is done in the same manner as filing. Remember to count your strokes and hone each surface equally.

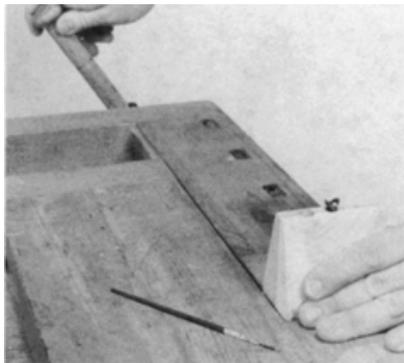


Figure 24-54. Position the mortising bit in the filing block and close the vise.

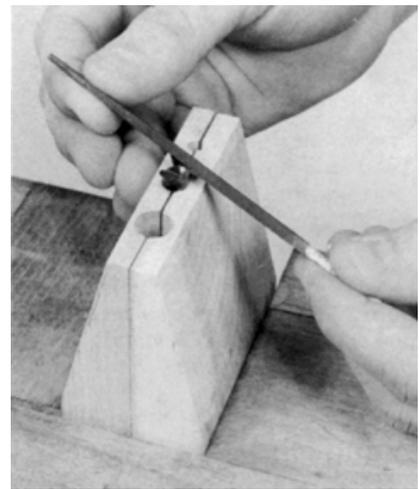


Figure 24-55. File from the back of the cutting edge to the front on the side cutters.

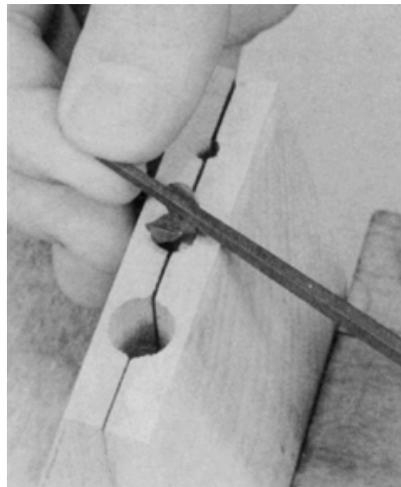


Figure 24-56. File the bottom relief angles from back to front

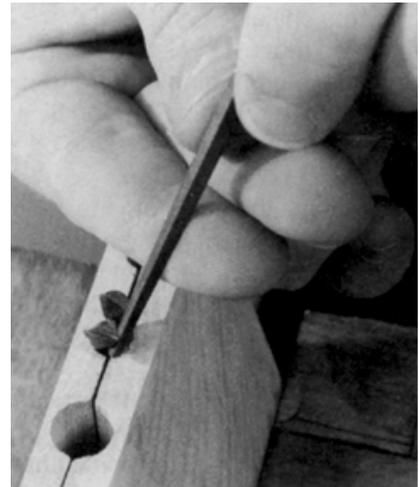


Figure 24-57. File vertically to sharpen the front cutting bevel.



Figure 24-58. Hone only the inside edges of the two side cutters.

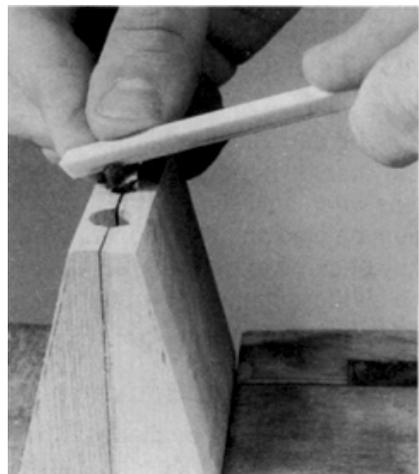


Figure 24-59. Hone the two front cutting bevels.