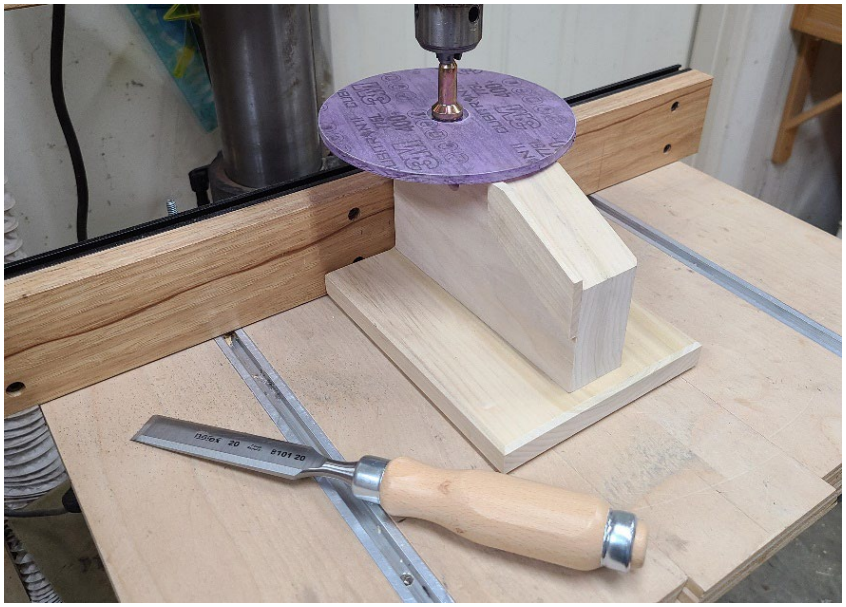
Taytools Drill Press Sharpening System



The Taytools Drill Press Sharpening System is the most cost effective and efficient sharpening approach available. It can sharpen a dull chisel in less than 20 seconds and restore a razor-sharp edge on a very abused chisel or block plane blade in less than 60 seconds. The cutting edge produced with this system will rival the edge produced by any other sharpening system. It can replace much more expensive water-cooled slow speed sharpeners, bench grinders, CBN wheels, belt sanders, honing guides, strops and sharpening stones. Out of the box, this system is perfect for sharpening narrow chisels and block plane blades up to 1-1/2” wide, but requires a different approach when sharpening wider plane blades (2” to 2-5/8”), spoke shave blades and skew paring chisels. The bulk of this manual will focus on narrower blades. Refer to the appendix of this manual for instructions on how to sharpen the wider edge tools.

Warnings:

1. Follow all the drill press safety rules that came with your drill press.
2. Make sure to wear ANSI Z87+ eye protection and to use NIOSH/OSHA respiratory protection.
3. Exposure to dust generated when using this device can result in lung damage and/or other physical injury. Use a dust collection system or local exhaust. Wear government approved respiratory protection and eye and skin protection. Failure to follow these warnings can result in serious lung damage and/or physical injury.
4. Using abrasive discs on metal can cause sparks. Sparks and particles generated when using abrasive discs can cause fire or explosion. Remove all flammable or explosive materials from the area. Do not use in dusty, flammable, or explosive environments. Do not use on flammable or explosive materials. Direct sparks away from face and body.
5. Stop using this system immediately if vibration or wobbling occurs during use. Determine cause and correct before continuing.

Kit components:

Drill Arbor/Acrylic Discs

The drill press arbor is mounted in your drill press chuck and accepts acrylic discs. Acrylic discs are .200" thick cast acrylic and come in two diameters (5" and 6") with a 1/4" countersunk center hole. These are laser cut and have finished edges. They come with protective paper on both sides that will need to be removed before adding abrasive sanding discs or leather strops. Pressure Sensitive Adhesive (PSA) sanding discs can be applied to the top, bottom or both sides of acrylic discs. Using a custom sharpening jig (plans below) with abrasive applied to the underside of discs, you can quickly regrind damaged cutting edges or hone edge tools to precise angles. The top of a disc can be used to flatten chisel backs or to strop with leather, bringing an edge to razor sharpness. The arbor comes with a ¼-20 countersunk machine screw. To assemble, place a machine screw through the countersunk hole in an acrylic disc and tighten in the arbor. The arbor has a maximum diameter (where discs are attached), length of 2-3/8" and a 3/8" diameter universal shank. The maximum recommended speed is 600 RPM.

3M Cubitron PSA discs:

The sanding discs we recommend are the 3M Cubitron Stikit PSA film back discs. They are the fastest cutting and longest lasting abrasive sanding discs on the planet, guaranteed! Cubitron abrasives were developed to grind steel and are the perfect abrasive to sharpen tools. Cubitron can regrind a very damaged tool in just a few seconds and will not generate enough heat to remove the temper in the steel. To remove the temper in steel, temperatures must exceed 400 degrees. In all our testing, we never achieved temperatures above 200 degrees. These discs have a film Pressure Sensitive Adhesive (PSA) backing that is nearly indestructible. They stick well to acrylic discs and are easily removed when dull and will leave no residue behind. Your kit comes with a selection of discs from 80 to 220 grit to allow you to experiment to see which grits work best for your application. Replacement discs can be found HERE at Taytools.com.

Leather Strop with White Rouge Honing Compound.

Leather stropping discs are made from 6-9-ounce horse butt leather that is between 3/32" and 1/8". Horse butt leather is the prefect stropping material due to its hardness and high silicate content. Discs come in 5" or 6" diameter with a 1" center hole to allow mounting to the top of acrylic discs. We supply a piece of Fastcap Speed tape with each disc so they can be firmly affixed to discs but removed when worn out. Leather can be used bare, but for faster cutting we recommend using our white honing compound. This white compound is specially formulated for use on power buffers and designed for honing super hard stainless steel, hardened iron, and chrome. It is a fast-cutting compound that contains the right amount of grease so it will load onto a spinning leather honing wheel and leave minimal residue on tools. One bar weighs in at 1.2 ounces and is 3/4" x 3/4" x 2-3/8". It is important not to apply too much compound to the leather. This will be addressed under "set up".

The Chisel Sharpening Jig

The Chisel Sharpening Jig is used to hold edge tools at the correct bevel angle and at a 90-degree angle to the edge of the tool. The Sharpening Jig is fabricated by the end user per the plans below. It is important that the jig is calibrated to your drill press so it can grind/sharpen edge tools to a perfect 90-degree angle. See Jig plans for instructions on how to do this.

Set Up:

Mount Acrylic Disc to Arbor

Secure an acrylic disc to an arbor using the included countersink screw. Install the arbor in a vise or in the drill press chuck to prevent it from slipping while you fully torque the screw tight. Use a drop of thread locker to prevent the screw from coming loose.

Apply PSA discs to acrylic discs.

Apply PSA discs to acrylic discs in a clean work area. Remove the protective paper from the acrylic discs and keep dust and contaminants from coming in contact with the acrylic discs while applying the PSA sanding discs. If the acrylic does become contaminated, clean it with alcohol or lacquer thinner. Do not use dish soap or mineral spirits, as these contain chemicals that can prevent PSA discs from fully adhering. Apply a full disc to the bottom side of each acrylic disc. Using a utility knife, cut a 1" hole in the center of the sanding discs that will be applied to the top of each acrylic disc. Apply sanding discs by starting on one side and smoothing the discs as you go to prevent bubbles from forming. If air bubbles develop under a sanding disc, try to smooth them out and if necessary, pierce with a sharp knife or needle to squeeze out any remaining air. On one acrylic disc apply a coarse 80 grit PSA disc on the bottom side and a 220 grit fine disc on the top. On another disc apply a fine 220 grit disc on the bottom and the leather stropping disc on the top with the rough side facing up.

Install Acrylic Disc in Drill Press

Install the arbor assembly in your drill press, making sure to use the chuck key to fully tighten all 3 holes in your drill chuck. Turn your drill press speed down to approx. 400-500 RPM and no more than 600. Make sure to refer to your drill press owner's manual and to follow all the safety rules that apply to that machine. Make sure to wear ANSI Z87+ eye protection and to use NIOSH/OSHA respiratory protection.

Set the height of the acrylic disc approx. 1/16" higher than the sharpening jig. Adjust your drill press fence so you are grinding a chisel on the outermost edge of the spinning acrylic disc. As your abrasive dulls you can change your fence position to move the sharpening jig inward to expose tools to new, sharp abrasives. When grinding, push the sharpening jig against your drill press fence to minimize movement of the jig. If your drill press does not have a fence, secure the sharpening jig to your drill press table with two Magjig 95 magnets. See Jig plan for details.

Flatten Chisel Back

Start by flattening the back of your chisel. You can do this using PSA Cubitron discs stuck to a flat, hard surface, e.g., table saw, float lass or granite plate or you can us the Taytools Chisel Back Preparation Kit. Start with 320 grit and progress to 400, 600 and finally 1000 grit. If you have a very damaged or rusty chisel that needs more work, you can use the top of a spinning acrylic disc with a 220 grit PSA disc attached. This method is more aggressive and will take considerably less time. However, if not done correctly, it can severely damage a chisel. Flattening using the spinning disc will require you to use a freehand approach. Cup a chisel in your right hand with your thumb, middle, ring and little finger wrapped around the chisel handle with your palm down. The chisel handle should be facing right and the cutting-edge facing left. With the disc spinning away from the cutting edge, touch the heel portion of the chisel back to the spinning disc first and then bring the cutting-edge portion in contact with the disc. Apply light pressure to the back using your right index finger towards the middle of the chisel and your left index and middle fingers putting pressure toward the chisel edge. See below under the stropping section for pictures of the correct hand position while flattening the back. Check every few seconds to assess your progress. Remember you do not need to flatten the entire back but just ½" or so back from the cutting edge. If a chisel back is relatively flat, you will not need to use more than 320 grit to start and can finish with 1000 grit.

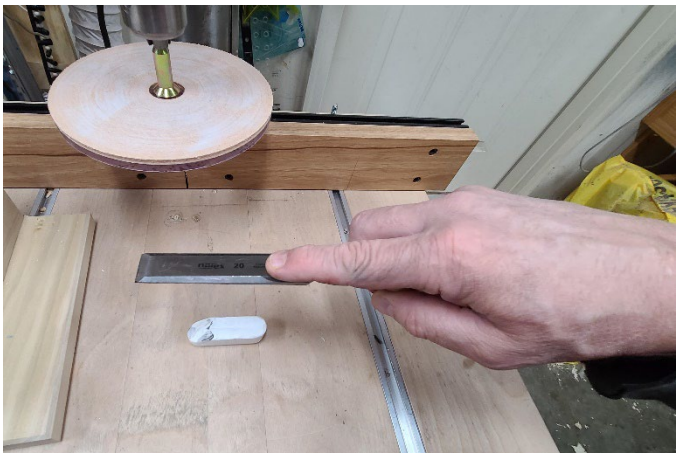
Sharpen and Hone the Cutting Edge

Make a sharpening jig with the plans below. Install an acrylic disc in your drill press with the appropriate grit abrasive disc attached to the bottom, 80 grit for regrinding damaged edges and 220 grit for sharpening a dull edge. Align the Sharpening Jig so the center of your chisel is on the center of the acrylic disc. Place a chisel on the jig with bevel edge facing upward and the left side of the chisel pressed against the jig fence. Push the jig back against your drill press fence with your left hand, push the chisel down against the jig with your left thumb and plunge the chisel into the spinning disc with your right hand. Plunge the chisel into the spinning disc applying mild to moderate pressure and hold for 1-2 seconds. Pull the chisel back from the abrasive and check your progress. You are looking for a bevel edge with no defects and an even ground surface. A damaged chisel may take several 1-2 second plunges using 80 grit. If you are just refreshing a dulled edge, it will generally take 1-2 plunges using 220 grit. You will know when a dull edge is fully ground when you can feel a small wire bur along the entire chisel back. Next you can progress to stropping to get a razor-sharp edge.

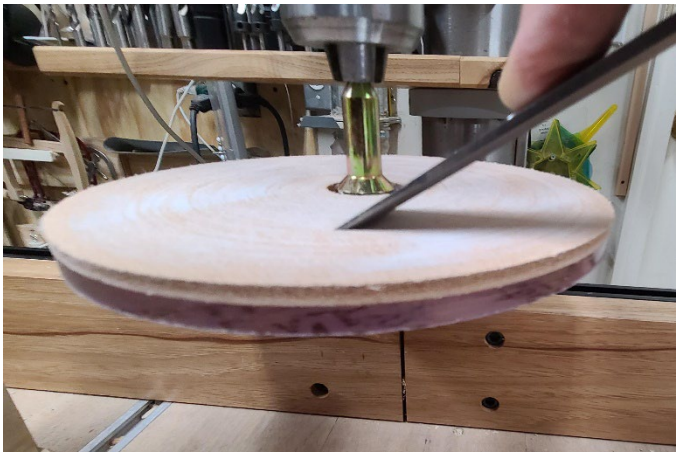
Stropping the Back and Creating a Secondary Polished Bevel

Install in your drill press the acrylic disc with leather strop attached to the top. We recommend applying the leather to an acrylic disc with the rough facing side up as this will better hold the honing compound. Turn your drill press on and apply a thin even coat of white honing compound to the entire disc. It is easy to apply more compound than is necessary. You know you have applied too much when residue builds up on a tool. If too much was applied, use a small scrap of wood to scrape away the excess.

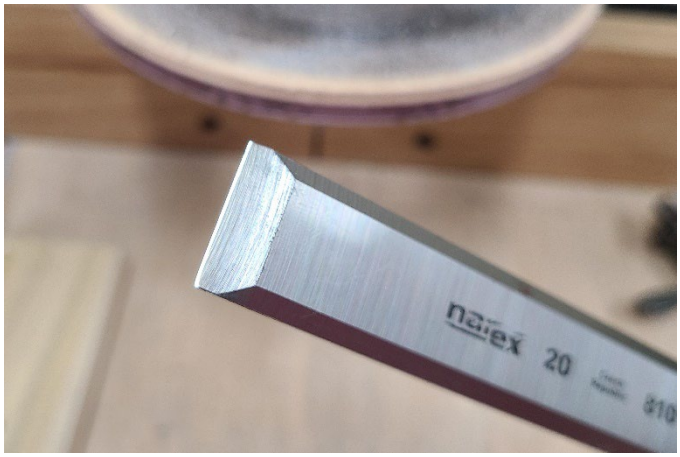
Stropping the back and bevel will require a freehand approach. Cup a chisel in your right hand with your thumb, middle, ring and little finger wrapped around the bottom of the handle with your palm down. The chisel handle should be facing right and the cutting-edge facing left. With the disc spinning away from the cutting edge, touch the heel portion of the chisel back to the spinning disc first and then bring the cutting-edge portion in contact with the disc. Apply light pressure to the back using your right index finger toward the middle of the chisel and your left index and middle fingers directing pressure toward the chisel edge. Hold for 1- 2 seconds only and check for a polished edge near the tip of the chisel.



Flip the chisel over and place the heel of the cutting edge on the spinning strop with the cutting-edge facing left away from the spinning disc and the handle facing right. Raise the handle until the entire cutting edge is flat against the spinning disc. Finally, create a secondary polished micro bevel by raising the handle end of the chisel approximately 1/4”. The wire edge should be gone, and you should be able to see a small mirror polished bevel on the very tip of the cutting edge. It is also critical not to raise the chisel more than necessary or apply too much downward pressure as you risk rounding and dulling the cutting edge. All it takes is a light touch.



You should now have a chisel that is razor sharp and ready for use. Add new honing compound about every 10 stroppings.



Appendix

Sharpening Wider Bench Plane Irons

Sharpening wider plane irons 2” and wider using this system requires a slightly different approach than used for narrower chisels and block plane blades. Our testing has found that edges produced on wider blades can be a few thousandths out of straight. This is not a problem with narrower chisels or block plane blades, but this can be an issue for smoothing planes that make shavings one thousandth of an inch thick. Our testing found that the edge on wider blades (2” to 2-3/8”) were within two thousandths of an inch. This is caused by the abrasive discs wearing at different rates at different parts of the disc. More abrasive is exposed per revolution at the outer perimeter the disc causing the abrasive to wear slightly faster than the inner portion. This leaves the abrasive at slightly different heights at different parts of a disc, causing edges produced on wider blades to be less than perfectly straight across.

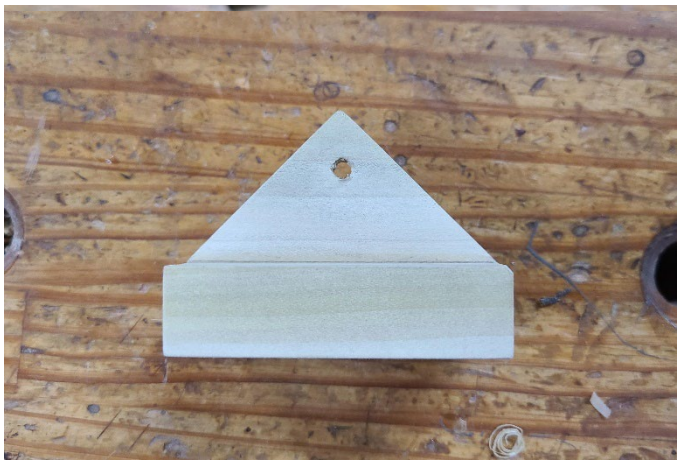
To compensate for this, all that is needed is to hone a 30-degree secondary bevel on the cutting edge and then polish the back and bevel on the leather strop as outlined above in this manual. This produces an edge that is perfectly straight and razor sharp. This 30-degree secondary bevel is easily made on a 400 grit PSA disc stuck to float glass using a honing guide to keep the blade at the correct angle. The Taytools Chisel Back Preparation Kit also works very well for this step. When sharpening blades up to 2” wide, the 5” kits will suffice. If wider blades need sharpening, the 6” kit is needed.

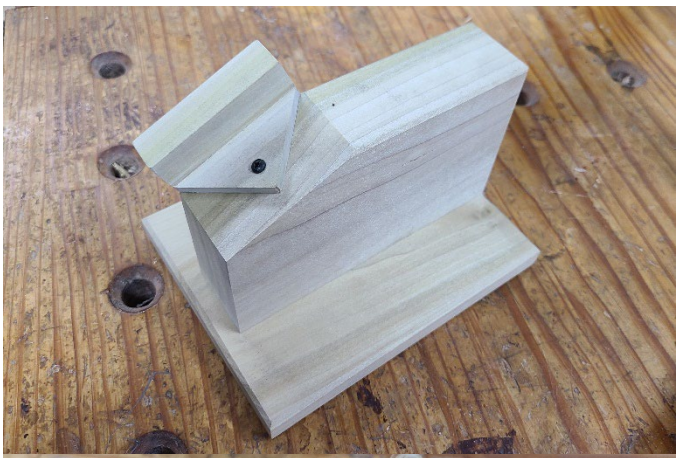
Spokeshave Blades

Spoke shave blades can be sharpened in the same manner as a chisel but need an added safety feature due to their small size. When grinding/sharpening the primary bevel, affix a Magswitch Magjig 95 to the back to create an easy to grip handle. Keep this Magjig in place when grinding the bevel and when polishing the back. It can be removed when honing the secondary bevel.

Skew Chisels

Skew Chisels can be a challenge to sharpen due to their dual angles (bevel edge and skew angles). To sharpen both bevels at the same time, make a jig with a removable fence and remove the fence. Make a small removable attachment with a ¾" thick fence that extends to both sides of a ¼" thick blade cut at the same angle as the skew chisel. This attachment can be attached to either side of the jig ramp via a center screw hole. This attachment ensures the chisel will be sharpened at the correct skew angle while the ramp keeps the bevel at the correct angle.





The attachment is the length of the ramp and ¾" thick by 1-3/4" wide with a ¼" wide groove down the center that holds the blade cut at the skew angle. To allow the attachment to be flipped and used on both sides of the ramp to sharpen right and left skew chisels, the center attachment hole is drilled half the thickness of the ramp away from the fence. A corresponding hole is drilled in the center of the ramp to accept the attachment.

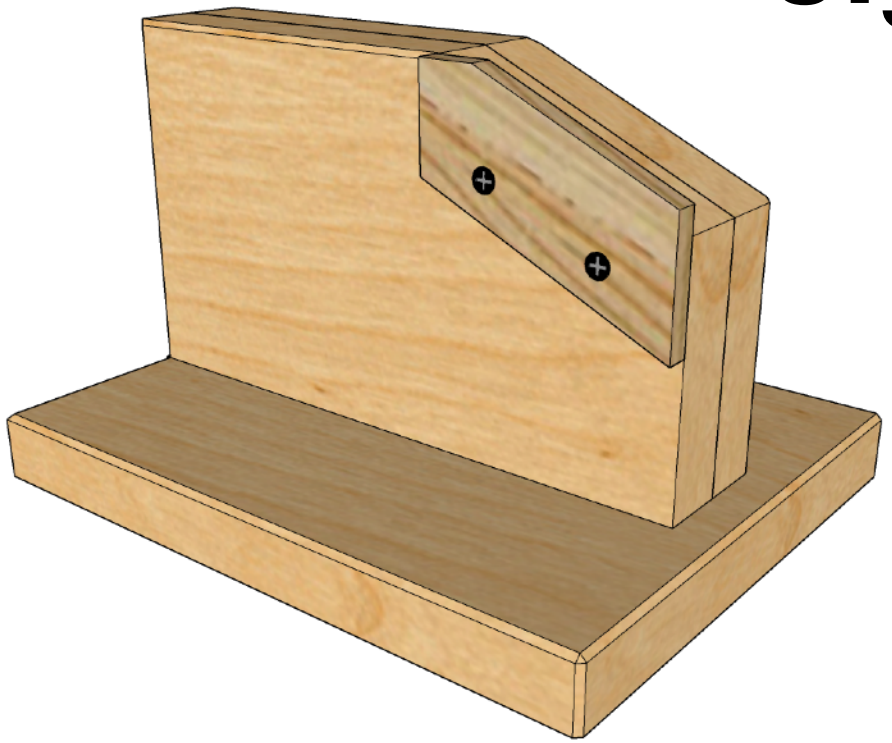
To sharpen a left skew chisel (see below), align the right-most side of the body (not including the attachment) with the center of the disc. Align the front edge of the attachment with the outermost edge of the disc (see below). Plunge the chisel into the disc in short 1-2 second bursts to sharpen.

To sharpen the right skew chisel (see below), align the left-most side of the body (not including the attachment) with the center of the disc. Align the front edge of the attachment with the outermost edge of the disc (see above). Plunge the chisel into the disc in short 1-2 second bursts to sharpen.

Hone the back and secondary bevel as described for standard bench chisels.

There is no better, more consistent or faster way to sharpen skew chisels.

Drill Press Sharpening Jig



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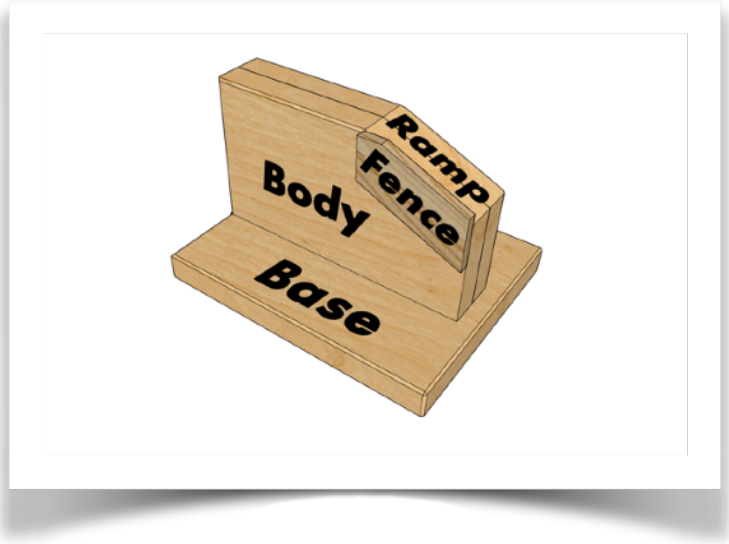
Introduction

Make sure to read through this build guide **BEFORE** cutting any wood. Familiarize yourself with the tools, techniques, and your approach to building this project.

The sharpening jig is used to hold chisels and other edge tools at the correct bevel angle and at a 90- degree angle to the edge of the tool. This ramp has a wide base, vertical body with a ramp cut at your desired grinding angle and a small fence to prevent the tool from moving out of position. This grinding jig is fabricated by the end user per the instructions in this guide.

Familiarize yourself with the names of the major parts of this jig:



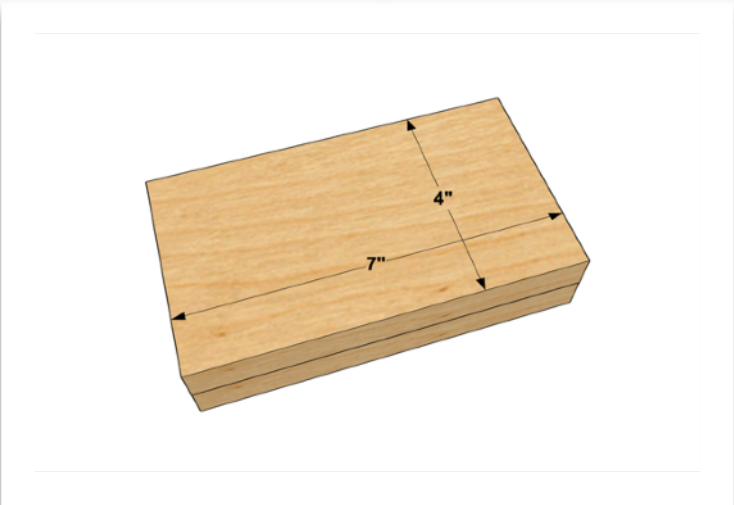
The Ramp can be at whatever angle you need it to be. These instructions will show how to make both 25° and 30° angled jigs.

Cut list

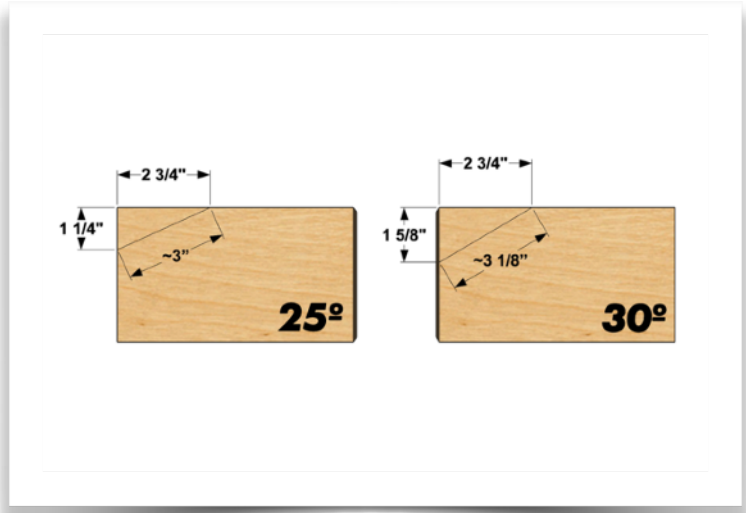
Item	Quantity	Sizes needed	Material
Body	2 per jig	5” x 8”	3/4” Hardwood
Fence	1 per jig	1 1/4” x 4 1/2”	1/4” Hardwood
Base	1 per jig	6” x 7 1/2”	3/4” Hardwood

Body

- Cut two pieces of hardwood at approximately 5” x 8”.
- Glue these two pieces together, and let the glue dry completely.
- When the glue has dried, cut this assembly to 4” x 7”.

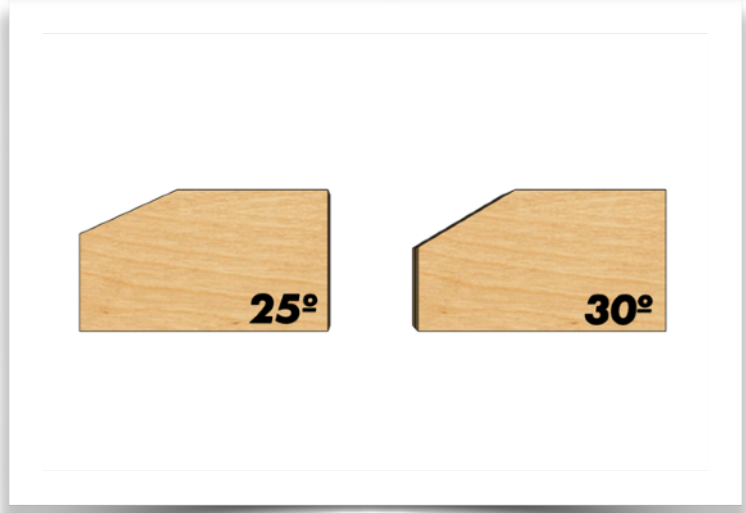


Body (continued)



- Mark the Body block with these measurements according to the desired angle for your jig.

  If you have a precise protractor, use it to mark the 25º and/or 30º angles with the Ramp length being at least 3”.



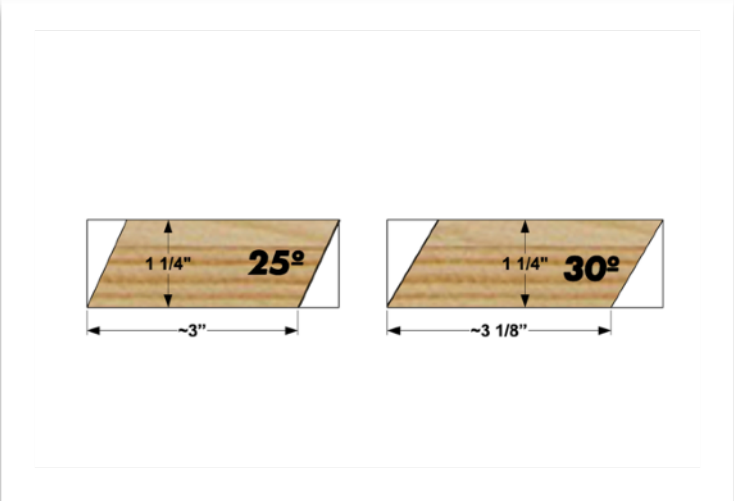
- Remove the corners that you marked with a miter saw (with a sacrificial fence), or a sled on your table saw.

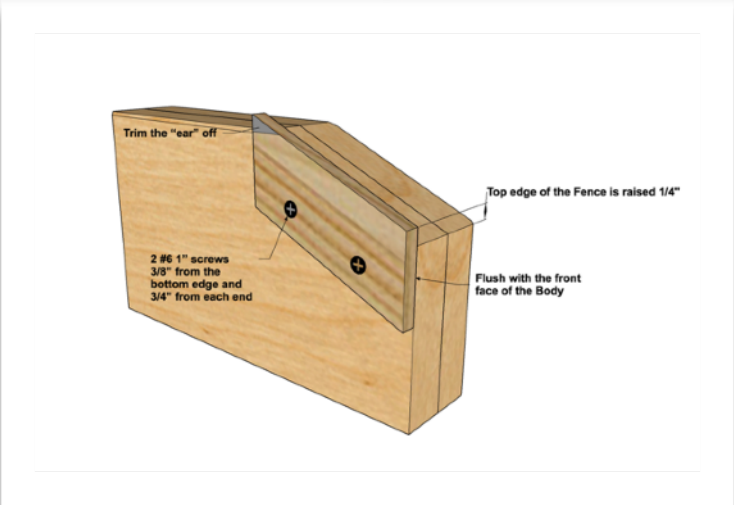
Body (continued)

- Using a 1/4" round-over or chamfer bit in your router, or by sanding, ease the edges shown here of the Body.

Note: Do not ease the edges of the Ramp as to leave as wide as possible.

Fence

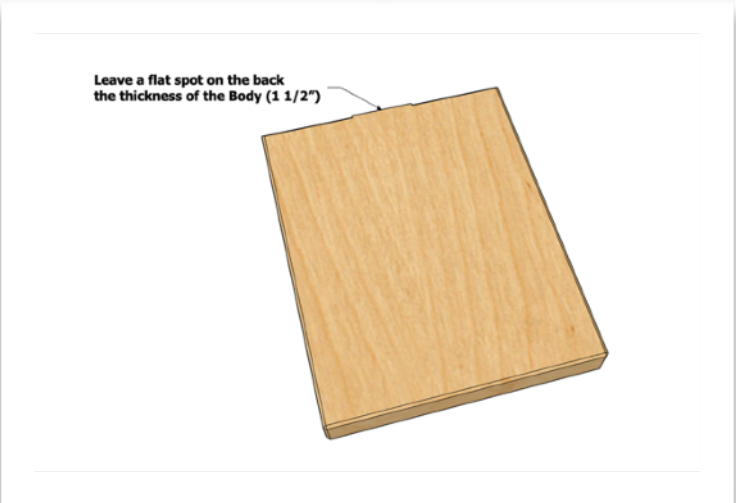




- Cut a piece of hardwood, 1 1/4" wide x about 4 1/2" long for the Fence(s).
- Mill the Fence material to about 1/4" thick.
- Cut both ends to the same angle as your ramp (25º or 30º) and the same length as the ramp
- With two #6 x 1" long countersink wood screws (no glue, so it can removed if you need to), attach the Fence on the left side of the Body with it raised 1/4" above the Ramp. Put screws 3/8" from the bottom and 3/4" in from each end. Make sure the front edge of the Fence is flush with the front edge of the Body.
- Trim off the corner of the Fence ("ear") level with the top of the Body.

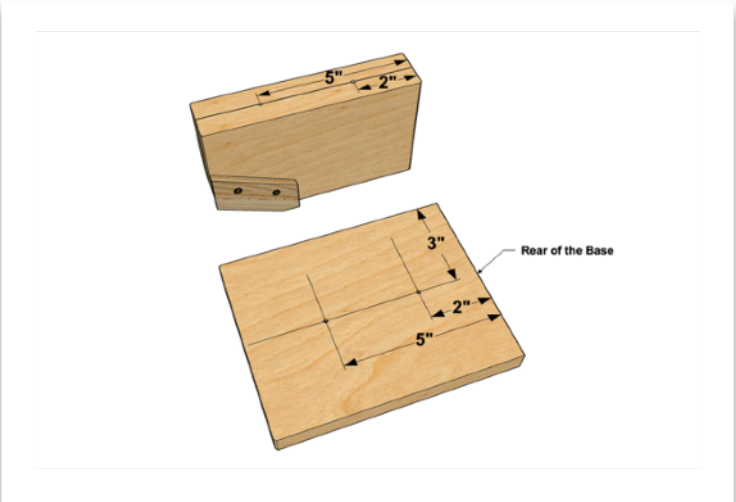
Base

- Cut a piece of hardwood at 6” x 7 1/2”.

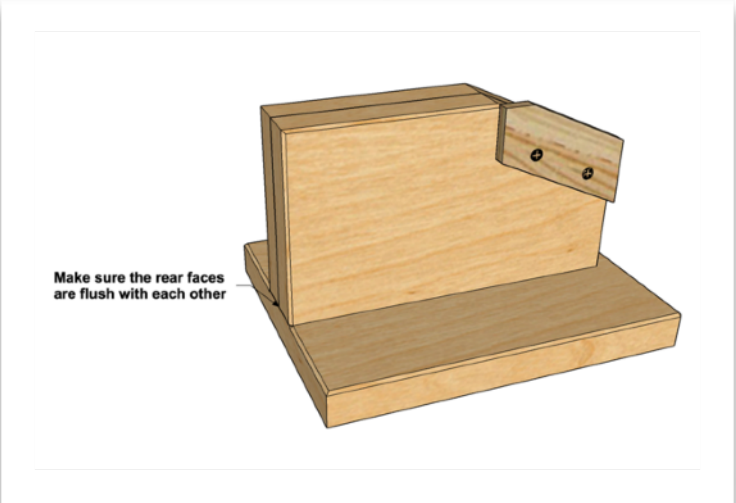


- Using a 1/4” round-over or chamfer bit in your router, or by sanding, ease all the edges of the Base, except leave a flat spot on the back edge of the Base the thickness of the Body (1 1/2”).

Attach Body to the Base



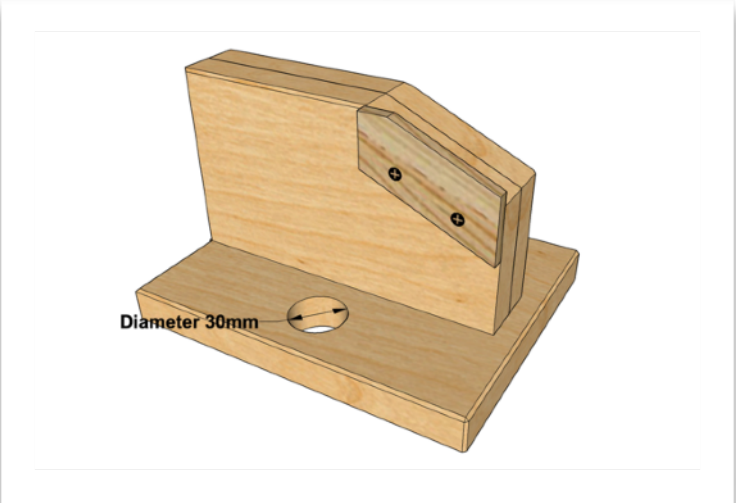
- Drill countersink holes in the bottom of the Base at 2” and 5” on center.
- Drill small pilot holes in the bottom of the Body also at 2” and 5” on center.



- With screws, attach the Body to the Base, making sure to line up the rear faces together against a fence of some sort.

  This alignment is important as the back of the jig will be pressed against your drill press fence preventing movement while using.

Optional Magswitch Magnetic Clamps

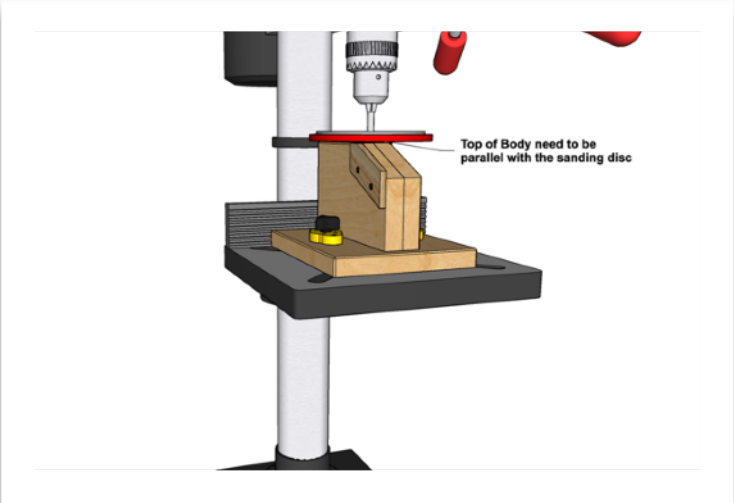


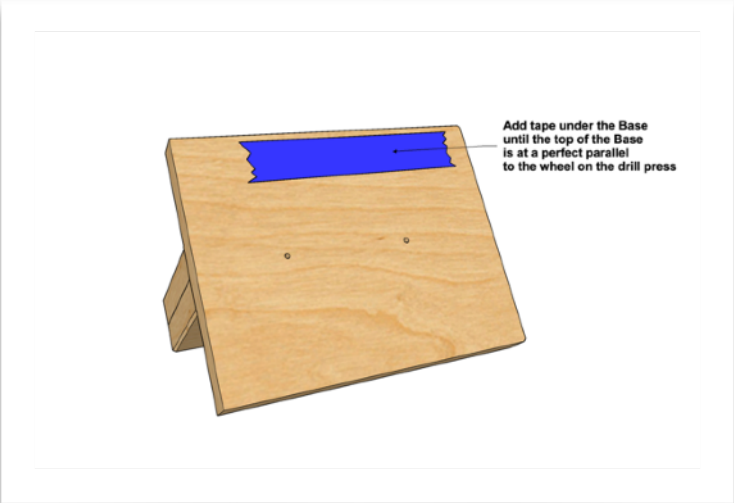
If your drill press does not have a fence, you can use the Magswitch MagJig 95 Magnetic Clamps to hold the jig to a metal drill press table.

- Drill 30 mm holes to accept the Magswitch MagJig 95 Magnetic Clamps.

- Secure the Magswitch MagJig 95 Magnetic Clamps to the Base with the screws as per the instructions.

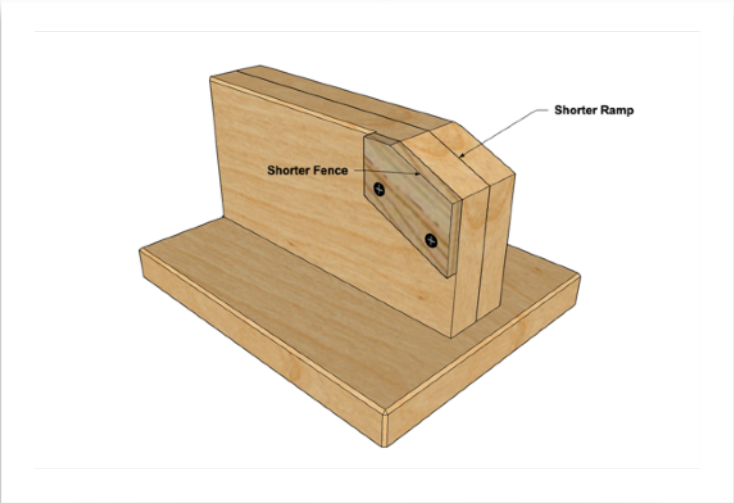
Calibration





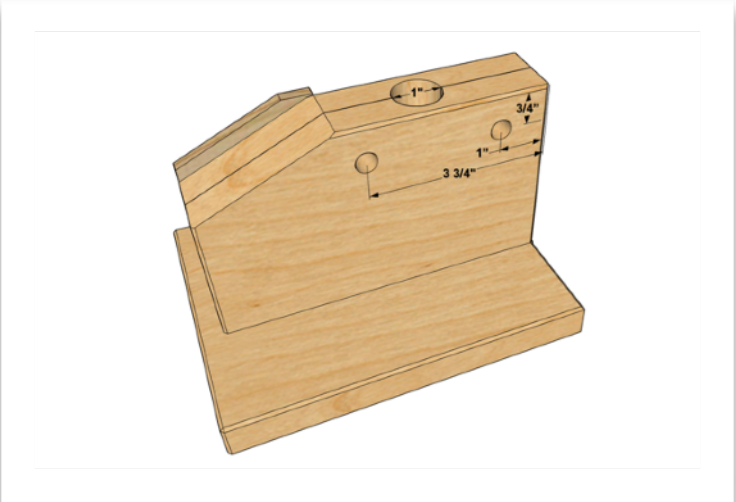
The jig will need to be calibrated to your drill press. Check to see that the edge of your chisels are ground to 90 degree. If not, calibrate jig to grind a perfect 90 degree edge on chisels by selectively applying blue tape to the bottom of one edge of the base.

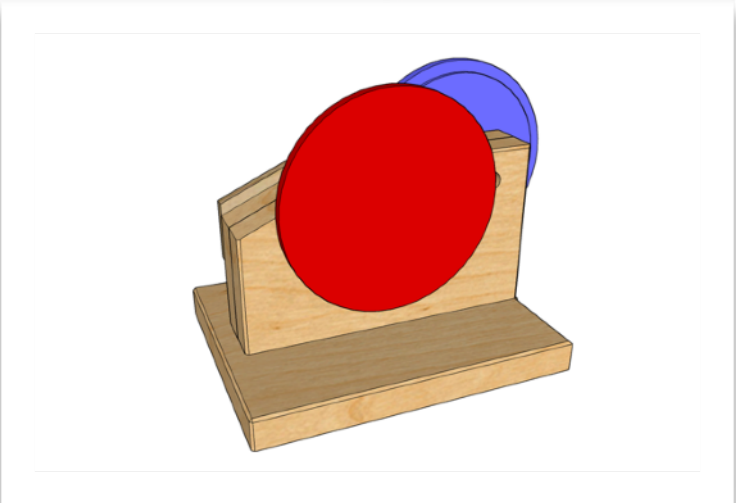
Shorter Chisels



For chisels with shorter blades, make a jig with a shorter body. The example above has a body that is just 3” tall with a ramp that is at 25 degrees and just 1-3/4” long to accommodate a butt chisel with a 2-1/2” long blade.

Disc Storage



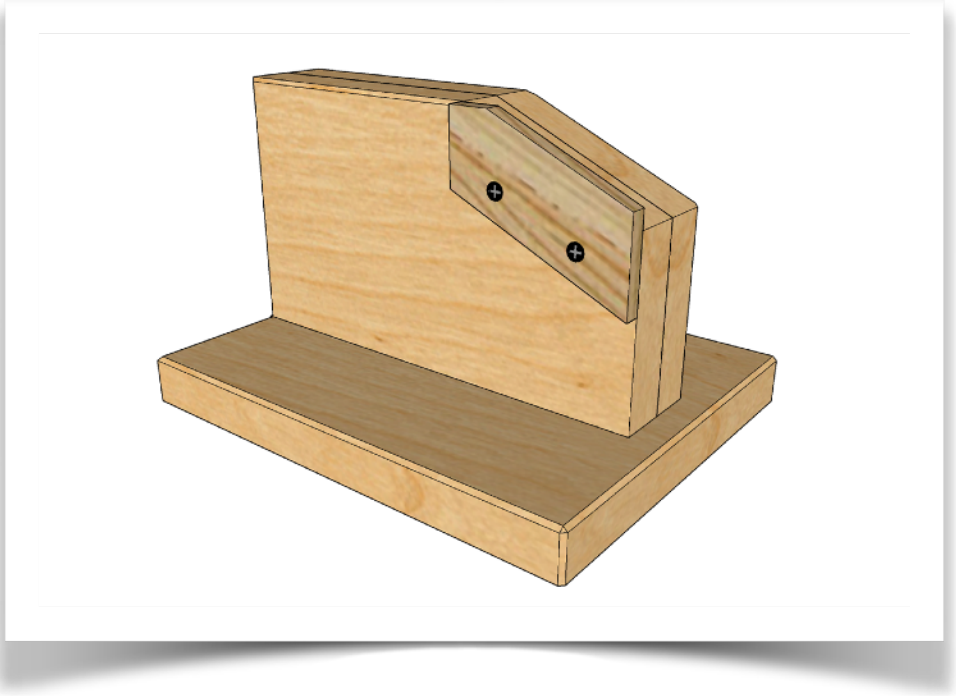


If you'd like a convenient way to store the sanding discs, you can drill $^{9}/_{16}$" holes in the side of the Body opposite the Fence, and store the discs with the jig.

You could also drill a 1" diameter x 2 $^{5}/_{8}$" deep hole in the top to store your stick of honing paste.

Finished!

And with that, you are finished!



If you have any questions, please reach out via email at support@taytools.com

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