



Joint-Matic® Owner's Manual

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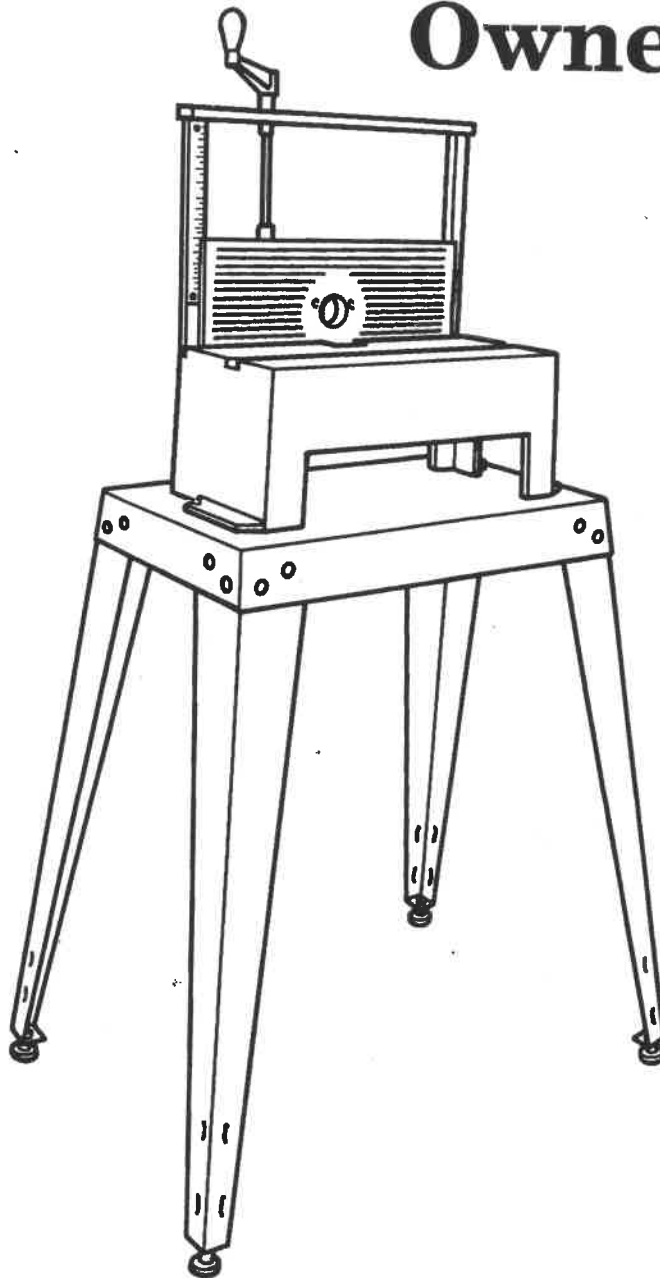


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WARNING

Read the Safety section and then complete the Assembly and Alignments sections before operating the Joint-Matic.

Introduction

Congratulations on choosing the Shopsmith Joint-Matic. With it, you can make everything from simple box joints to complex dovetail joints. You can also use the Joint-Matic and various router bits to mold, shape, groove and dado your projects.

Be sure to thoroughly read and understand this manual before beginning any hands-on tasks. Know the safety rules of your Joint-Matic and use the unit only for jobs for which it is intended. The time you spend now on learning and understanding this manual will help you work safely and efficiently.

You should perform the steps in this owner's manual in sequential order. This means reading through the manual first, then assembling and aligning the Joint-Matic before you begin operating it. After you have read the introduction in the Operations section, go to the joint you want to make for further instructions.

WARNING

Read, understand and follow the Safety sections, then complete the Assembly and Alignment sections before operating your Shopsmith Joint-Matic.

Types of Cuts

Here are some examples of the types of cuts that are used to make joints with the Joint-Matic:

Dado – This cut is a channel formed of 90 degree angles across the width of a board.

End Groove – This is a channel cut across the end grain of a board.

Mortise – A mortise is a channel cut made on one plane only.

Cove – A cove cut is a symmetrical, half-round hollow or dish cut along the edge of a board.

Rabbet – This commonly used cut is a two-sided cut, with sides usually at 90 degrees to each other. It runs lengthwise with, or crosswise to, the board.

Chamfer – A chamfer cut produces a beveled outside edge.

Molding – This cut along the edge or face of a board gives a decorative edge to the workpiece.

Dovetail – A dovetail is a channel cut that has a base which is wider than its point of entry into the wood. Viewed in cross section, it has the shape of a trapezoid (or a bell with straight sides).

Dado



End Groove



Mortise



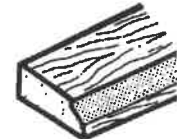
Cove



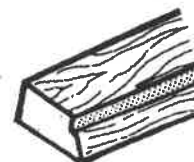
Rabbet



Chamfer



Molding

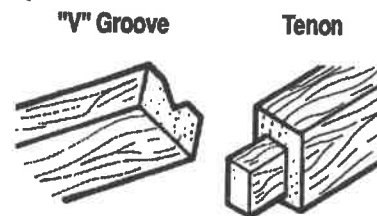


Dovetail



"V" Groove – This is a tapered cut that forms an inside angle along the length of a board.

Tenon – A tenon cut produces a projection in a workpiece that would fit into a mortise.

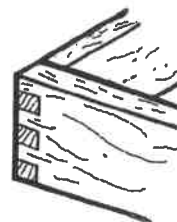


Types of Joints

Here are descriptions of joints which are very useful for everyday projects:

Box Joint – Also called a finger joint, this joint has two workpieces interlocked by "fingers" on their ends. The box joint is often used to make small boxes and drawers.

Box Joint



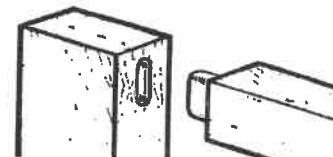
Housed Joint – This joint has one workpiece with a groove cut in it and the other workpiece fitting it with a complementary cut. Housed joints come in several varieties, and dado and dovetail cuts are often used in making them. Shelves are often attached to cupboards with this joint.

Housed Joint



Mortise-and-Tenon Joint – This versatile joint consists of one workpiece with a recessed cut (mortise) and the other workpiece with a matching tongue (tenon) formed on it. Cabinets often use this joint.

Mortise and Tenon Joint

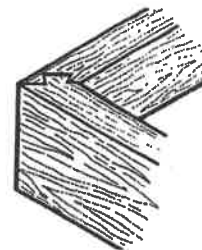


Bevel Joint – The bevel joint is much like the common miter cut, where stock is cut at a pre-selected angle. While it has many uses, it has little inherent strength. When in place of the typical bevel joint you make a housed dovetail joint, the joint becomes much stronger.

WARNING

For illustration purposes only, the router guard has been removed in most instances. Always be sure to perform any routing operations with the guard in place for operations in which part or all of the router bit protrudes above the workpiece.

Bevel Joint



Accessories

Several accessories allow safer and more accurate woodworking with your Joint-Matic and permit fuller use of its features.

Routers – The Joint-Matic is drilled to accommodate these brands of routers with 1 to 1-3/4 h.p. motors and 6" bases: **Porter Cable, Bosch, Black & Decker, Stanley, Rockwell and Milwaukee.** If your router is different, this manual has instructions on how to adapt the mounting plate to your router.

Router Bits – Router bits come in a wide variety of shapes and sizes. Buy only top quality bits, which give you reliable sizing. For Joint-Matic operations, we recommend Shopsmith router bits.

WARNING

Do not attempt to use router bits larger than 1-1/2" in diameter or bits which cannot be adjusted to protrude less than 1-1/4" from the surface of the slide.

Bits usually are of three types: high-speed steel; carbide-tipped; and solid carbide. High-speed steel bits take the sharpest edge and will produce a very clean cut, but they will dull relatively quickly. Carbide-tipped and solid carbide bits, although more expensive, last longer than high-speed steel bits. The carbide bit is not as sharp as the high-speed steel bit, but remain sharp up to ten times longer. Try to use bits with large shank diameters, if possible; because a large shank provides greater stability during the cut. We recommend these six router bits:

- 1/4" spiral bit (HSS- 555449, Solid Carbide- 555453)
- 5/16" spiral bit (HSS- 555450)
- 3/8" spiral bit (HSS-555, Solid Carbide- 555454)
- 1/4" high-speed steel dovetail bit (AK-2030)
- 3/8" carbide-tipped dovetail bit (555235)
- 1/2" carbide-tipped dovetail bit (555237)

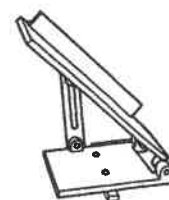
Shopsmith Miter Gauge with Safety Grip (555101) – The Joint-Matic miter channel is designed to accept the Shopsmith Miter Gauge. You need the miter gauge to hold and guide your workpieces accurately and safely.



Miter Gauge with Safety Grip

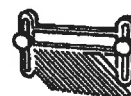
Shopsmith Bevel Miter Gauge (555461) – The Shopsmith Bevel Miter Gauge mounts in the Joint-Matic miter channel and is useful in making a variety of dovetails, spliced miters, and other specialty joints. It adjusts to a variety of angles, including 45 degrees.

Bevel Miter Gauge



Feather Board (513709)– The Joint-Matic accommodates several feather boards, and some operations need more than one.

Feather Board



Joint-Matic Feather Board Kit (555459) – The Joint-Matic Feather Board Kit is designed so that you may mount a feather board vertically above the worktable and directly over the router bit. This makes routing operations such as cutting grooves or rabbets more accurate and safe. The kit consists of one feather board, knobs and mounting channel. Additionally, the Joint-Matic's miter channel will take more than one feather board, which is useful when working with long stock.

Feather Board Kit



Joint-Matic Stop Rod Kit (555460) – The Joint-Matic Stop Rod Kit gives you accurate stops for when you produce joints like the Mortise and Tenon and the Housed/Sliding Dovetail.

Stop Rod Kit



Shopsmith Dust Collector (not shown, 330002) – The Joint-Matic has a dust collection chute built into the unit for use with the Shopsmith DC3300 Dust Collector. Other dust collection systems may also be used. Whatever unit you choose, Shopsmith recommends always using a dust collection system.

Also available, and quite useful, are the **Shopsmith Push Stick (513701)** and the **Shopsmith Push Block (513711)**. You will see them utilized throughout the "Operations" section of this manual.

NOTE

If you do not currently own any of these Shopsmith safety items, please refer to the back cover of this manual for ordering information.

SAFETY

Introduction

Power tool safety requires good common sense in addition to a thorough knowledge of all your equipment. The Shopsmith Joint-Matic has built-in safety features, but the effectiveness of these features depends on you. Misuse of this tool could cause serious injury.

Throughout this manual, we list WARNINGS, CAUTIONS and NOTES. When you come to one of these listings, make sure you read it and fully understand it.

WARNING

A WARNING is given when failure to follow the directions is likely to result in injury or loss of limb or life.

CAUTION

A CAUTION is given when failure to follow the directions is likely to result in damage to the equipment.

NOTE

A NOTE is used to highlight an important procedure, practice or condition.

GENERAL SAFETY RULES

WARNING

- **Protect Your Vision** – Always wear eye protection when you use power tools. Use goggles, safety glasses or a face shield to protect your eyes.
- **Protect Your Hearing** – Prolonged exposure to high intensity noise from high-speed power equipment can damage your hearing. Hearing protectors help screen out noise that can damage your ears. Shopsmith recommends hearing protectors for ALL operations with the Joint-Matic.
- **Protect Your Respiratory System** – Many woodworking operations generate a lot of dust and debris. For your safety and health, wear approved dust masks and use your dust collector whenever you operate your machinery.
- **Wear Proper Clothing** – Loose hair and clothing can be entangled in moving equipment and is hazardous. Tuck long hair under a hat or tie it up. Do not wear ties, gloves, loose clothing, rings or other jewelry. Roll your shirt sleeves up above your elbows. Wear non-slip safety footwear.
- **Use Safety Guard and Other Safety Devices** – Most shop accidents happen when woodworkers fail to follow instructions or fail to use proper guards and safety devices. Always use designated guards and other safety devices when operating your equipment, as specified in each product manual.

- **Follow Electrical Requirements** – Before operating your Joint-Matic, follow the electrical requirements listed in the owner's manual which came with your router. Do not overload your electrical circuits.
- **ALWAYS** feed the workpiece against the rotation of the cutter. **NEVER** feed the workpiece with the rotation of the cutter.
- Ground your router, unless double insulated. If the tool is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle, the green conductor in the cord is the grounding wire. Never connect the green wire to a live terminal.
- Remove all adjusting keys and wrenches before operating equipment.
- Do not operate your equipment if you are tired, taking medication or under the influence of alcohol or drugs.
- Do not use equipment in damp, wet, explosive or otherwise dangerous environments.
- Keep all work areas clean, well lighted and free of clutter.
- Plan the operation before you begin. If you are in doubt about a procedure or safety precautions, do not attempt the procedure.
- Never force a tool or accessory to do a job for which it was not intended. Never use equipment at a rate of speed for which it was not intended.
- Check for any damaged equipment, which should be repaired properly or replaced before you proceed. If any unexplained noises, vibrations or other abnormalities occur while using your equipment, immediately turn off the equipment and unplug it. Inspect it and be sure it is in good repair before continuing. Follow the router manufacturer's recommendations as to replacement or repair of parts. If in doubt, consult your local Shophsmith Showroom. If no Showroom is nearby, contact Customer Services.
- Use proper clamps, fixtures and other devices to secure and control your workpieces suitably, as recommended. Push sticks, push blocks, feather boards and miter gauges with safety grips let you maneuver workpieces into rotating bits so that if kickback occurs, your fingers and hands will be protected.
- When working on narrow workpieces, always use your feather board assembly or other device to hold or guide it past the cutter. Use a long piece of scrap stock to feed a narrow workpiece underneath a guard to complete the cut.
- Operate your equipment with proper footing and balance at all times.
- Never remove workpieces or scraps before turning off the equipment and letting it come to a complete stop.
- Never try to stop the equipment by grabbing the workpiece or any part of the tool. Turn it off and let it come to a complete stop by itself.
- Do not leave any equipment running unattended. Visitors should stay at a safe distance from the equipment and wear protective eye and ear devices.
- Keep children away from equipment and make your workshop child-proof. Use padlocks and master switches and remove starter keys.

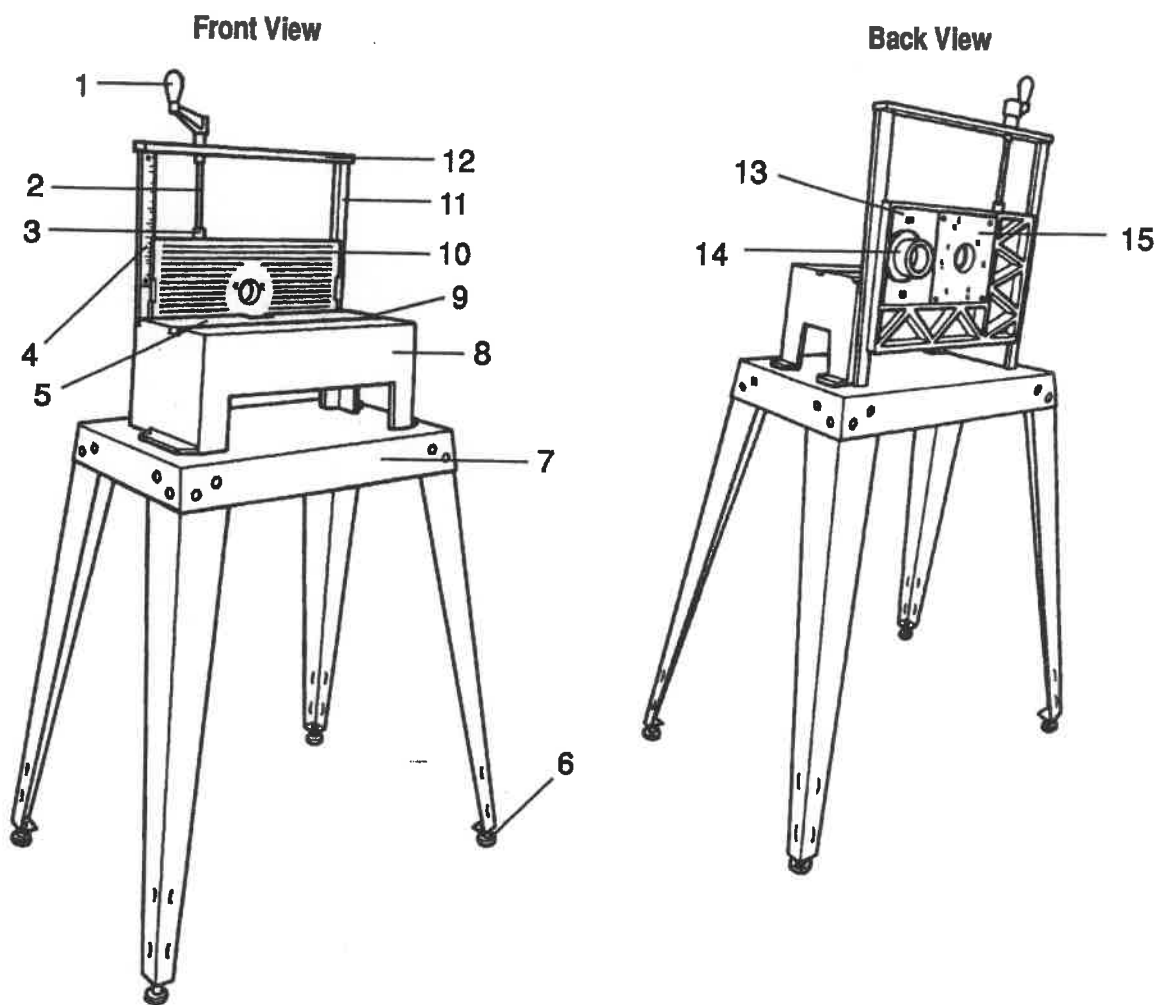
- Do not allow anyone inexperienced to use your equipment without supervision.
- Be sure to check control switches to see they are in the OFF position before plugging in or unplugging equipment.
- Always turn off and unplug equipment before changing accessories and setups, making adjustments and performing maintenance and repair.
- Use only tools which are clean and properly maintained, according to each tool's owner's manual.
- Be sure bits are sharp and in good repair to ensure safe, effective use of your equipment.

SAFETY RULES FOR THE JOINT-MATIC

WARNING

- Be sure that you read, understand and follow this Owner's Manual for the Shopsmith Joint-Matic and every accessory you use with the Joint-Matic.
- Assemble, align and operate the Joint-Matic only as specified in this Owner's Manual.
- Mount a Shopsmith-recommended router on the Joint-Matic only as directed in the Assembly chapter. Read, understand and follow its owner's manual's recommendations for operation, safety, care and maintenance of the router.
- Use the Joint-Matic with only Shopsmith or Shopsmith-recommended accessories, router bits, miter gauge and bevel miter gauge.
- Use only Shopsmith parts and accessories to repair the Joint-Matic. Mounting and using unauthorized parts and accessories could create hazardous conditions and will void your warranty.
- Router bits must not protrude more than 1-1/4" past the front vertical surface of the slide. Also, router bits must be no wider than 1-1/2" in cutting diameter.
- Do not operate damaged or improperly maintained equipment.
- ALWAYS feed stock from left to right as you face the Joint-Matic.
- Keep hands out of the direct projection of the router bit and never place hands directly over the bit.
- Never stand in line with the workpiece being fed into the router bit, as you could be struck if kickback occurs.
- If you wish to mold, shape or dado boards with the Joint-Matic, always make sure the router bit is below the board when making the cut.
- Never attempt to perform operations on a workpiece so small that your hands are placed in jeopardy. Failure to do so could result in serious personal injury.
- Be sure that each router bit is mounted securely in the collet and that it is the recommended bit for that specific task. Cut at the proper speed to assure safety, uniform results and proper operation. Use extra care in routing workpieces that contain figured grain or knots, as these may cause kickback. Store unused bits in a safe place.

- Do not rout secondhand lumber. If you hit a nail, screw or other foreign object, you could be hit by pieces of metal or there could be kickback.
- When stop routing, always use the stop gauge to control the length of cut.
- Support long boards and sheet materials with a roller stand (or stands).
- Do not freehand rout stock less than 12" by 12" or the equivalent.
- Do not work with stock that is too large or too small to handle safely.
- Do not work with stock that is warped, bowed or cupped or that has other defects.
- When using the bevel miter gauge, ALWAYS keep your left hand on its base and your right hand holding the stock against the support fence.
- Never pull the workpiece back through the router bit after making a pass, in order to "clean out" the cut. Instead, after making a cut, immediately make another cut using exactly the same settings.
- Make sure you always use the appropriate safety tools, depending on the operation you are performing. Always follow the procedures specified in the "Operations" section for proper use of a push stick, push block and safety feather boards.

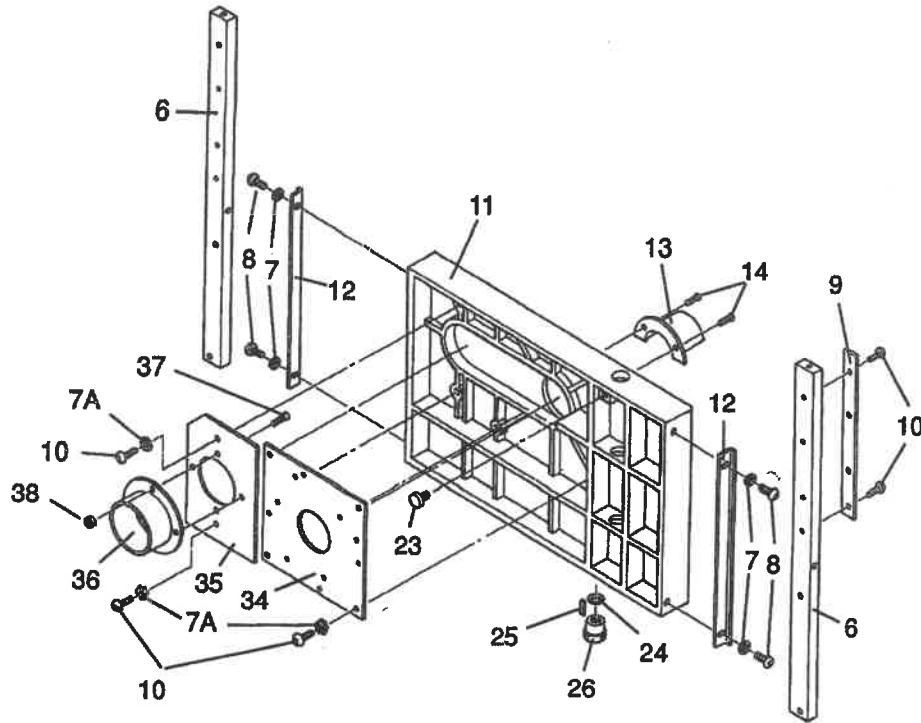


TERMS TO KNOW

Here are some terms frequently used with the Joint-Matic:

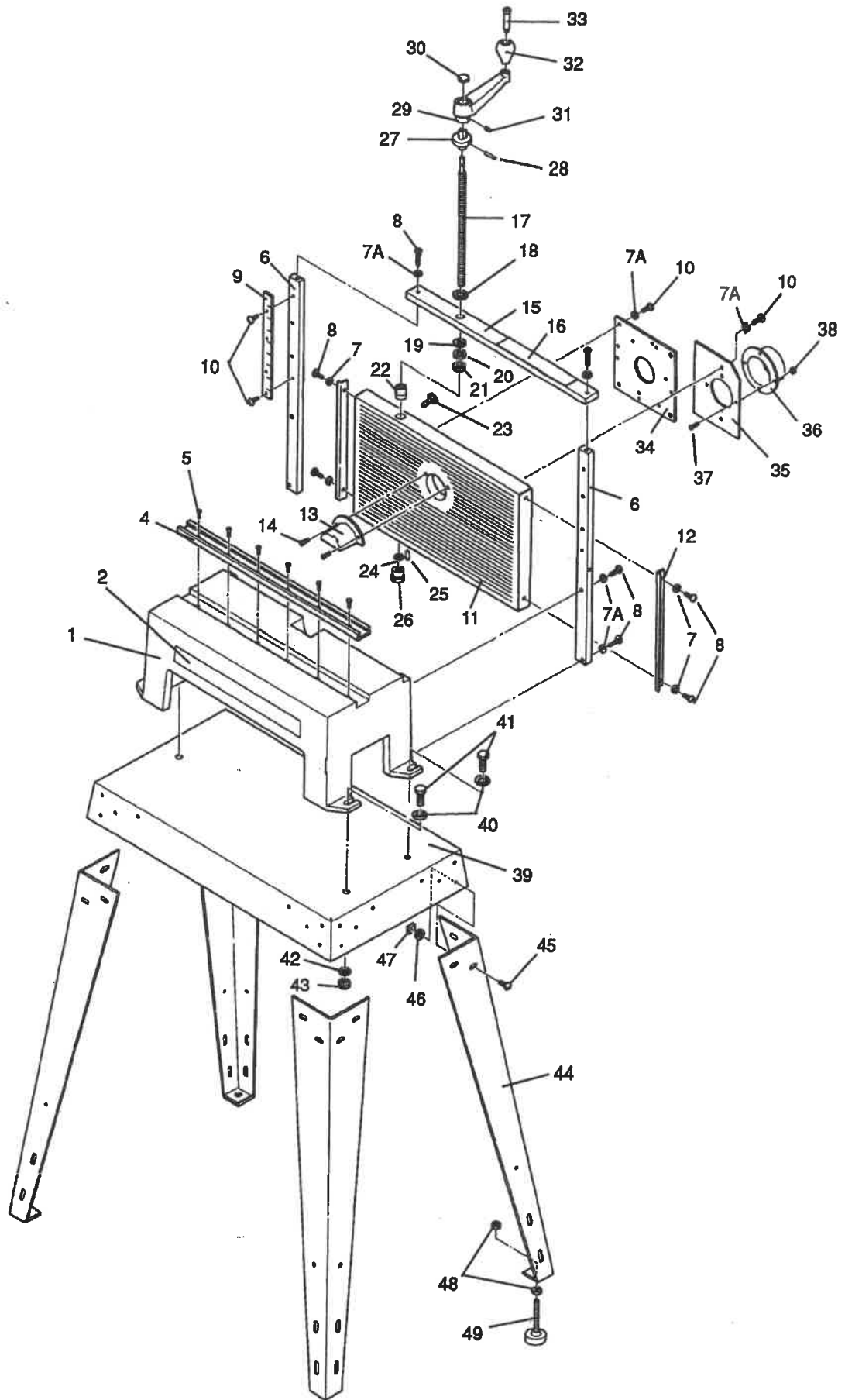
1. **Crank** — One 360-degree turn of this handle moves the slide up or down 1/16".
2. **Slide Screw** — This screw permits accurate vertical movement of the slide assembly.
3. **Adjuster Nut** — This nut is adjustable, ensuring that no backlash occurs in the slide screw. It also enables the crank to line up with the header bar as a point of reference.
4. **Scale** — The scale measures 1/16" increments, and the "lip" on the top, left edge of the slide points how far the center of the router bit is elevated above the work surface. It also acts as a quick reference for when the scale indicates "0", where the center of the bit is level with the top of the work surface.
5. **Work Surface** — The top surface of the base is accurately machined to ensure smooth, accurate operations.
6. **Foot Pads** — Adjustable foot pads reduce stress and vibration. They stabilize the Joint-Matic on its stand.
7. **Stand** — The stand supports the Joint-Matic and is made of sturdy metal. You can purchase optional retractable casters so you can easily move the Joint-Matic around your workshop.
8. **Base** — The cast-aluminum base provides a foundation for the slide and the work surface.
9. **Miter Channel** — The miter channel has an adjustable T-slot extrusion that guides the Shopsmith Miter Gauge and optional Bevel Miter Gauge.
10. **Slide** — Your router mounts on the back of the slide, which moves vertically when the crank is turned. The dust collection channel is an integral part of the slide.
11. **Guide Rails** — The slide moves along these parallel rails.
12. **Header Bar** — The header bar anchors the crank assembly and braces the slide and router support assembly.
13. **Dust Collection Plate** — The Joint-Matic has a dust collection chute built in for use with the Shopsmith 3300 Dust Collector and other dust collection systems. The plate and the back of the slide form a vacuum chamber when a Dust Collector is hooked up and turned on.
14. **Dust Collector Chute** — You may attach a Dust Collector hose or any other 2-1/2" hose to the chute.
15. **Router Mounting Plate** — This steel mounting plate removes from the back of the slide so you can easily attach your router to it.

**BACK VIEW
OF THE
JOINT-MATIC
SLIDE**



PARTS LIST

Ref. No.	Part. No.	Description	Qty.	Ref. No.	Part. No.	Description	Qty.
1	515837	Joint-Matic Base	1	27	515852	Slide sleeve	1
2	515959	Label	1	28	516248	Rollpin	1
3	not used			29	516209	Crank	1
4	515929	Slot extrusion	1	30	514202	Crank assembly decal	1
5	516043	Cap screw, socket head 8-32 x 1/2"	6	31	513994-02	Setscrew, oval pt., #10-24 x 1/4"	1
6	516182	Guide	2	32	513374	Crank knob	1
7	502930	Lock washer	4	33	513373	Knob shaft	1
7A*	515997	Split lock washer	12	34	515878	Router plate	1
8	516273	Cap screw, socket button head, 1/4"-20 x 3/4"	6	35	516176	Dust collection plate	1
9	515843	Scale	1	36	514872	Flange	1
10*	514393	Cap screw, button head,	12	37*	515999	Cap screw, socket head, 10-32 x 1/2"	4
11	515840	Slide	1	38*	515897	Nut, 10-32	4
12	516170	Rail	2	39	515980	Stand base	1
13	515892	Guard	1	40*	513434	Flat washer	3
14	515131	Screw	2	41*	513627	Screw, 3/8 16	3
15	516183	Header bar	1	42*	120382	Split lock washer	3
16	515958	Warning label	1	43*	120377	Hex nut	3
17	515851	Slide screw	1	44	515206	Leg	4
18	515846	Washer, 1/2" nylon	1	-	516083	Hardware Pack	1
19	515847	Washer, 3/8" nylon	1	45	503822	. Truss head screw	16
20	120377	Hex nut, 3/8-16	1	46	115546	. Lock washer	16
21	124829	Jam hex nut	1	47	120372	. Square nut	16
22	516208	Adjuster nut	1	48	120377	. Hex nut, 3/8-16	8
23	515859	Knob	1	49	515230	. Foot	4
24	516210	Spring washer	1	-	513686-03	. Hex nut, 5/32"	1
25	516211	Gib	1	-	513686-05	. Hex nut, 3/32"	1
26	515844	Bushing nut	1	-	513686-07	. Hex nut, 1/8"	1



ASSEMBLY

Please follow the instructions below:

Tools Needed:

- 3/8" wrench
- 7/16" wrench
- Two 9/16" wrenches
- Two adjustable wrenches (optional)
- Medium blade screwdriver
- 3/32" Allen wrench
- 1/8" Allen wrench
- 5/32" Allen wrench

ATTACH THE LEGS TO THE BASE

1. Place the base (1) upside down on a workbench or other convenient surface.
2. Place a leg (44) into position against an inside corner of the base.
3. Insert a truss head screw (45) through both an outside hole in the base and its corresponding hole in the leg, as in Fig. A-1. Secure the bolt with a lock washer (46) and square nut (47), as shown in Fig. A-2. Finger tighten.
4. Insert a truss head screw (45) into the opposite, outside hole in the base and its corresponding leg hole. Secure the bolt with a lock washer (46) and square nut (47). Finger tighten.
5. Repeat Steps 3 and 4 for the remaining two holes in the base and leg. Remember to finger tighten only.
6. Repeat Steps 2-5 for the other three legs.
7. After all the legs are attached to the base, securely tighten all nuts with a medium blade screwdriver and a 7/16" wrench. See Fig. A-3.

ATTACH THE FEET TO THE LEGS

8. Thread a hex nut (48) on the bolt of a foot (49).
9. Insert the foot's bolt in the hole located at the bottom of a leg, as in Fig. A-4.

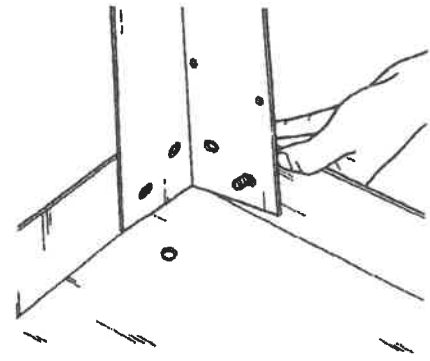


Fig. A-1

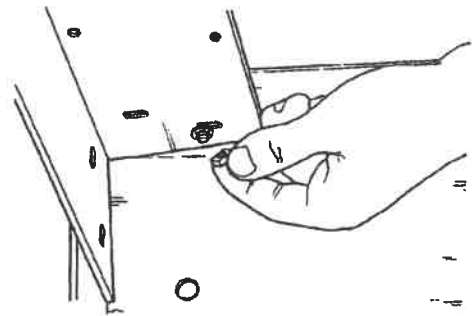


Fig. A-2

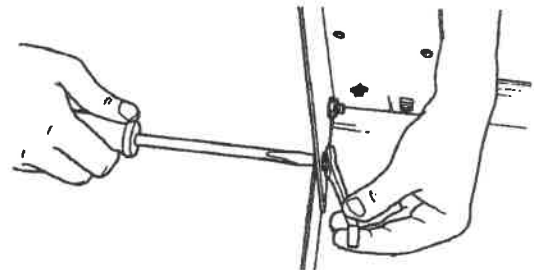


Fig. A-3



Fig. A-4

10. Thread a second hex nut (48) on the foot's bolt.

11. To attach the other three feet to the legs, repeat Steps 8-10.

12. Place the stand upright and in the location you will normally operate the Joint-Matic.

13. Level all four feet (49) by adjusting the hex nuts (48). Securely tighten all hex nuts (48) with two 9/16" wrenches. See Fig. A-5.

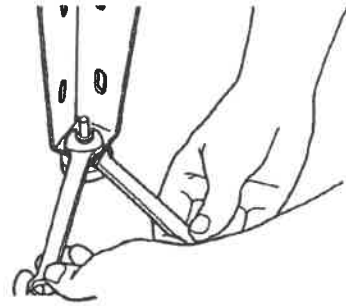


Fig. A-5

ATTACH THE JOINT-MATIC TO THE STAND

14. Set the Joint-Matic on the stand's base, as in Fig. A-6. The three mounting holes in the Joint-Matic base must align with the three mounting holes in the stand's base.

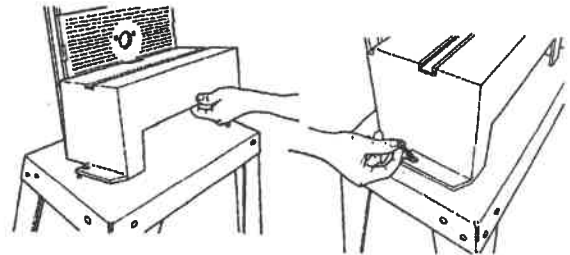


Fig. A-6

Fig. A-7

15. Put a flat washer (40) on a screw (41) and insert it through a mounting hole in the Joint-Matic base and the stand base. See Fig. A-7.

16. From below, secure the screw (41) with a split lock washer (42) and hex nut (43), as shown in Fig. A-8. Finger tighten.

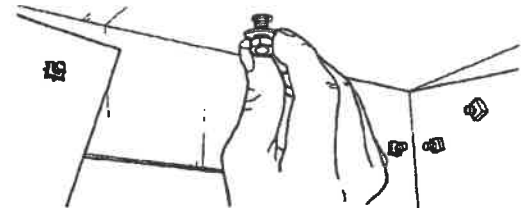


Fig. A-8

17. Repeat Steps 15 and 16 for the two other holes.

18. Use a 9/16" wrench to securely tighten all three nuts.

ATTACH THE CRANK

19. Line up a flat side of the slide screw (17) with the crank's setscrew (31), as in Fig. A-9.

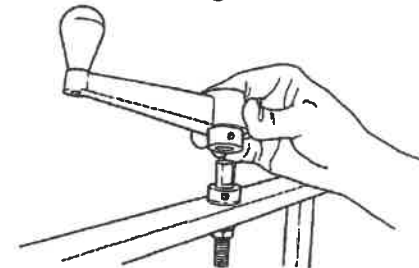


Fig. A-9

20. Place the crank on the slide screw (17).

21. Use a 3/32" Allen wrench to securely tighten the crank's setscrew (31) on the flat portion of the slide screw (17). See Fig. A-10.

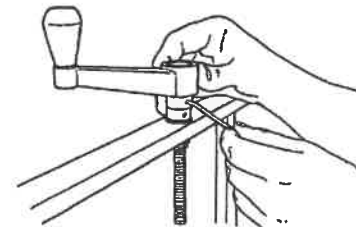


Fig. A-10

INSTALL THE DUST COLLECTOR FLANGE ON THE BACK OF THE SLIDE

22. The dust collector plate (35) has one corner removed. This is the upper left corner (as you are standing behind the Joint-Matic). Place the flange (36) over the big hole on the back of the dust collector plate (35), and align the four holes in the flange with the four holes around the dust collector plate's chute hole. See Fig. A-11.

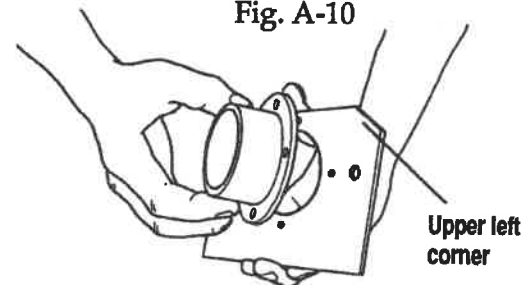


Fig. A-11

Upper left corner

23. Insert a flat head socket cap screw (37) through the plate and then the flange, as shown in Fig. A-12.

24. Secure it with a nut (38), as in Fig. A-13. Finger tighten.

25. Repeat Steps 23 and 24 for the other three holes.

26. Use a 1/8" Allen wrench and a 3/8" wrench to securely tighten all four nuts. See Fig. A-14.

27. Put a split lock washer (7A) on a button head cap screw (10). While holding the flange assembly in place on the back left side of the slide, install the screw (10) and split lock washer (7A) in the upper mounting hole of the plate. Finger tighten. See Fig. A-15.

28. Put a washer (7A) on another cap screw (10) and install it on the lower hole in the plate. Finger tighten.

MOUNT THE ROUTER

WARNING

Never use a router greater than 1-3/4 hp. A router larger than 1-3/4 hp has more power than is needed, and the weight of a motor this size may stress the slide and possibly cause it to go out of alignment during operations.

If you do not own routers referred to on page 3, you may need to adapt the Joint-Matic's router mounting plate which attaches to the rear of the slide.

- To see if your router fits the hole pattern of the Joint-Matic's mounting plate, remove your router's base plate (usually made of composite or plastic material). Hold it on the mounting plate and see if you can match up at least three screw holes AND keep the bit hole centered on the plate hole. If you cannot find a match, then you must drill your own holes in the Joint-Matic mounting plate. Refer to the special instructions, "For Routers NOT Fitting the Mounting Plate Hole Pattern," below.

- If you DO own a recommended router, skip to Step 29 on page 16.

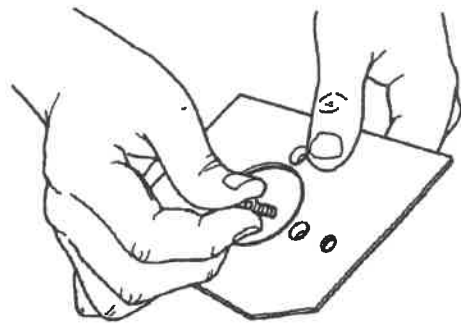


Fig. A-12



Fig. A-13

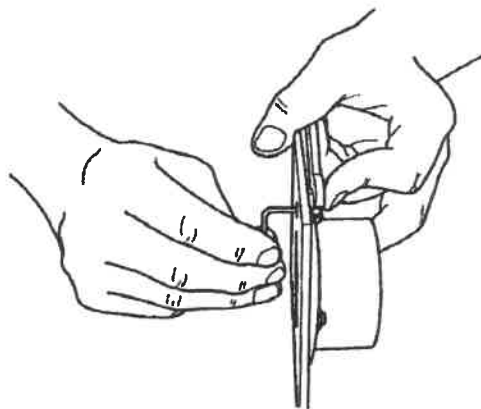


Fig. A-14

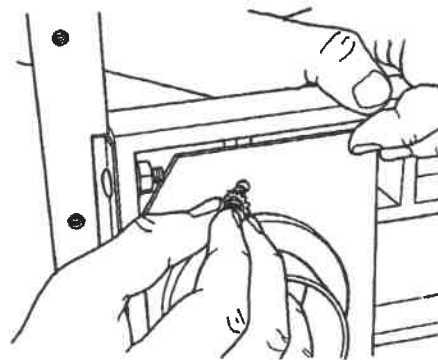


Fig. A-15

For Routers NOT Fitting the Mounting Plate Hole Pattern –

To adapt your router to the mounting plate, do Steps a through j, then go to Step 34.

- a. Remove the composite (or plastic) base plate from your router, as in Fig. A-16.
- b. Center the base plate's hole of your router with the mounting plate hole. It must be accurately centered in order to get a uniform clearing distance for certain bits, and to achieve proper alignment (detailed in the Alignment section.) Also, turn the mounting plate so that your router's handles are not in line with any of the four corner holes of the mounting plate. See Fig. A-17.
- c. Use a pencil to mark at least three drill holes through the base plate's holes on the mounting plate.

WARNING

You must use at least three mounting screws to adequately secure your router to the mounting plate.

- d. Install a drill bit equal to the diameter of the screw shank. (Shopsmith recommends using a drill press for all drilling operations.)
- e. Drill screw holes through the mounting plate.

NOTE

You must only use machine screws with heads which are V-shaped and flat on top. If the screws are otherwise (like round heads), you must purchase the correct ones.

- f. Choose a twist drill bit as wide as, or slightly wider than, the head of each screw used to hold your router's base plate. Install the drill bit in your drill press.
- g. Countersink into the mounting plate ONLY far enough so the screw head will be flush with the surface of the plate. If needed, deburr the holes with a round file.
- h. Place the router on a table with the base up.
- i. Place the Joint-Matic's mounting plate on top of your router's base and finger-start all the screws to see if you had accurately drilled the holes, as in Fig. A-18. If you misjudged either the location of a hole, OR the router's collet is not in the center of the mounting plate's hole, re-do the preceding steps now. If your holes align and the collet is centered, proceed to Step j.
- j. Securely tighten all the screws with an appropriate screwdriver or Allen wrench, shown in Fig. A-19.

NOTE

Each screw holding the plate to the router must engage the router base at least 1/4". If the screws are not long enough to assure this, take the too-short screws to a nearby hardware store to get longer screws, exactly matching threads and type of head. Also, if the handles on your router seem to be in the way of the mounting screws (10) or dust collection hose, remove and store them for later use.

Now go to Step 34.

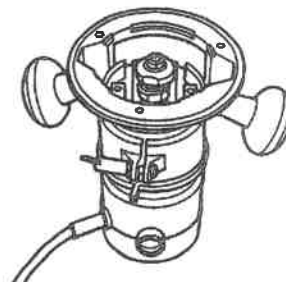


Fig. A-16

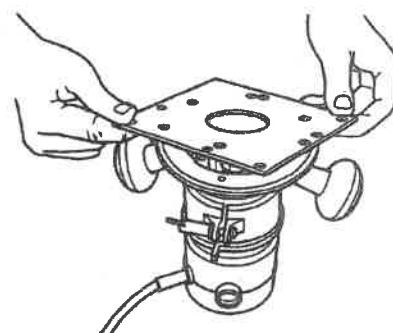


Fig. A-17

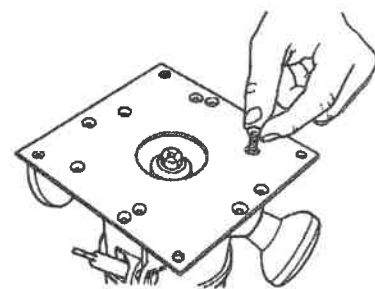


Fig. A-18

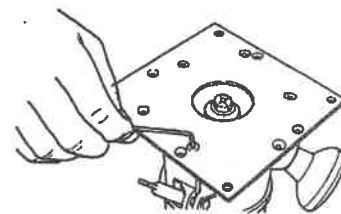


Fig. A-19

29. Place your router on a table with the base up.

30. Remove the screws holding the composite (or plastic) base to the router base. See Fig. A-20.

31. Place the Joint-Matic's mounting plate (34) on your router's base and line up the screw holes in the mounting plate with those in the router's base. See Fig. A-21.

32. Start the screws in the mounting plate and router base, as in Fig. A-22.

33. Use a screwdriver or Allen wrench to securely tighten the screws. The screw heads must be flush with, or a little below, the surface of the mounting plate.

NOTE

If your router's handles get in the way of the dust collector hose or the mounting screws (10) located in the corners or the plate (see Steps 34-37 below), do one of two things:

a. Remove the handles and store them for later use.

b. – If you mounted your router to the mounting plate using the pre-drilled holes, re-mount your router to the mounting plate and turn the router base to match up with different holes.

– If you drilled your own holes in the mounting plate and you cannot re-mount it as described above, then drill new holes (be careful to avoid drilling too close to previously drilled holes).

INSTALL THE MOUNTING PLATE AND ROUTER ON THE BACK OF THE SLIDE

34. Put a split lock washer (7A) on a button head cap screw (10).

35. With one hand, hold the router and plate assembly against the rear of the slide, shown in Fig. A-23, and insert the screw through the top hole of the plate, and in its matching hole in the slide, as in Fig. A-24. Finger tighten.

36. Repeat Steps 34 and 35 for the other three screws.

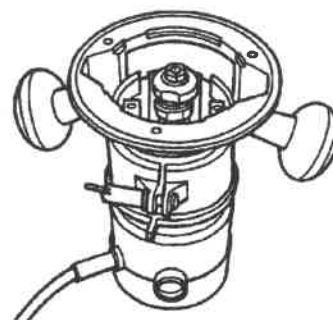


Fig. A-20

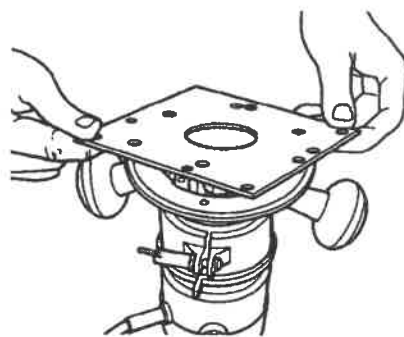


Fig. A-21

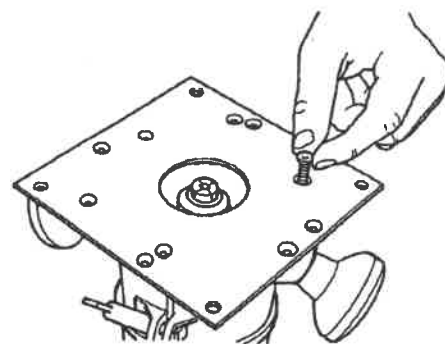


Fig. A-22

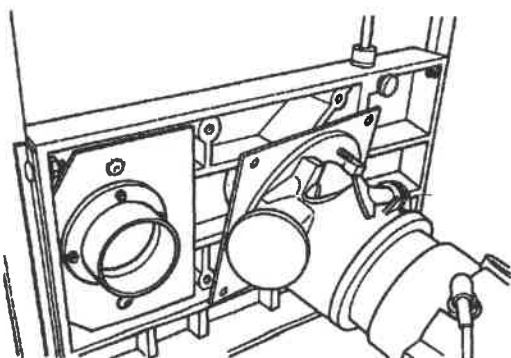


Fig. A-23

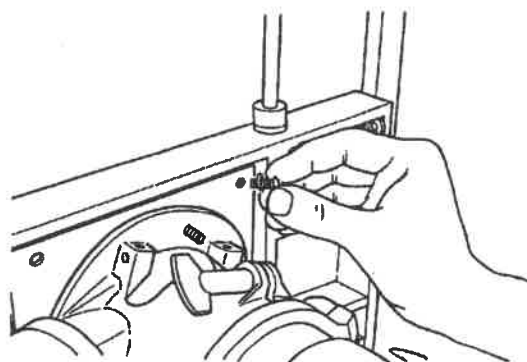


Fig. A-24

37. Use a 5/32" Allen wrench to securely tighten all button head cap screws (10) on both the dust collection plate and the router mounting plate. **Do not over-tighten.** Fig. A-25 shows tightening the router mounting plate and Fig. A-26 shows tightening the dust collection plate.

(OPTIONAL) INSTALL THE GUARD ON THE SLIDE



Use the guard (13) when the router bit is exposed while making a cut at the top of the workpiece. For example, when cutting the top of a tenon.

38. Attach the Joint-Matic router bit guard with two socket head cap screws, using a 5/32" Allen wrench, as shown in Fig. A-27.

The guard will be used in limited cuts during certain operations. Be sure to follow the specific joint's instructions for using the guard.

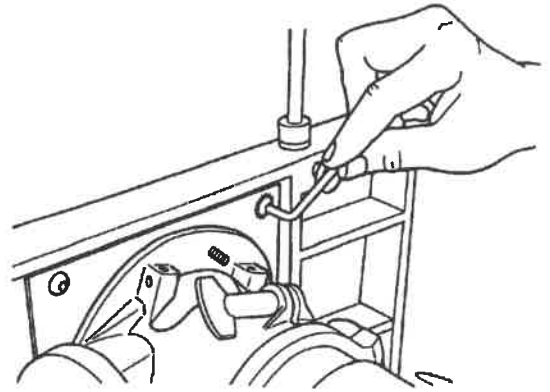


Fig. A-25

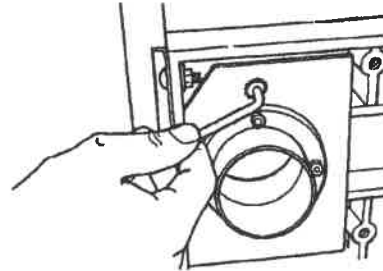


Fig. A-26

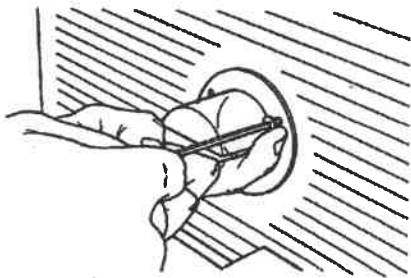


Fig. A-27

Assembly of Optional Accessories

Bevel Miter Gauge (555461)

The bevel miter gauge comes fully assembled. To set the angle you want, place the guide bar (6) in the Joint-Matic's miter channel, shown in Fig. A-28. Loosen the knob (4), adjust the angle to either the pre-cut workpiece or a measuring device (such as a sliding T-bevel square), and then re-tighten the knob.

NOTE

Periodically, wax the guide bar (10) of the bevel miter gauge with furniture paste wax. This will help it move more smoothly in the miter channel.

PARTS FOR BEVEL MITER GAUGE

Ref. No.	Part No.	Description	Qty.
1	515863	Base	1
-	516271	Set Screw, 3/8"-16 x 3/4"	2
-	516272	Socket Jam Screw, 3/8"-16 x 1/4"	2
2	515866	Angle Plate	1
3	516055	Angle Plate Fence	1
-	516027	Button Head Screw, 1/4"-20 x 5/8"	4
-	502930	Lock Washer	2
4	515868	Knob (hidden from view)	1
-	102394	Flat Washer	1
5	502996	Slide	1
-	502997	Stud	1
6	514231	Guide Bar	1
-	515632	Glide	4

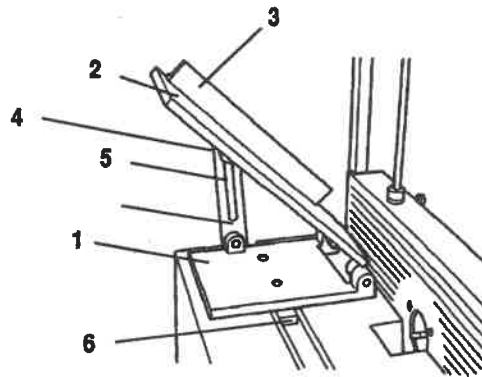


Fig. A-28

Stop Rod Kit (555460)

To assemble the stop rod kit:

1. Put a flat washer (4) on the shaft of a knob (3). Screw the knob (3) a few turns into the hole located in the side of the body's (2) rod hole, as in Fig. A-30.

2. Insert the stop rod (1) in the body's (2) rod hole, shown in Fig. A-31.

3. Put a flat washer (4) on the shaft of the other knob (3). Insert the knob (3) through the slot in the body. See Fig. A-32.

4. Place the nylon washer (5) and then the remaining flat washer (4) on the knob shaft, as in Fig. A-33.

5. Install the stop rod kit on the Joint-Matic by screwing the knob into the threaded hole located in the right slide guide. See Fig. A-34.

PARTS LIST FOR STOP ROD KIT

Ref. No.	Part No.	Description	Qty.
1	515858	Stop Rod	1
2	515857	Body	1
3	515859	Knob	2
4	120392	Flat Washer	3
5	514537	Nylon Washer	1

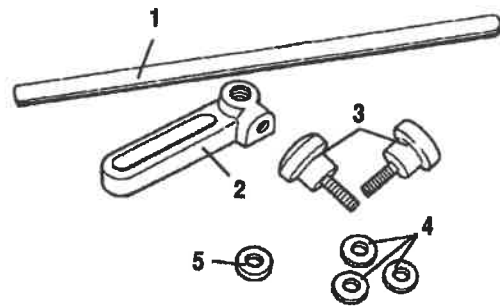


Fig. A-30

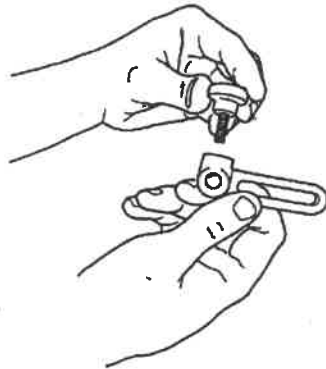


Fig. A-31

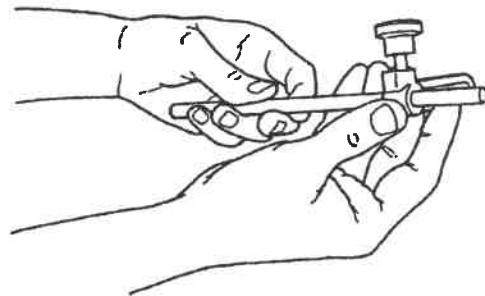


Fig. A-32

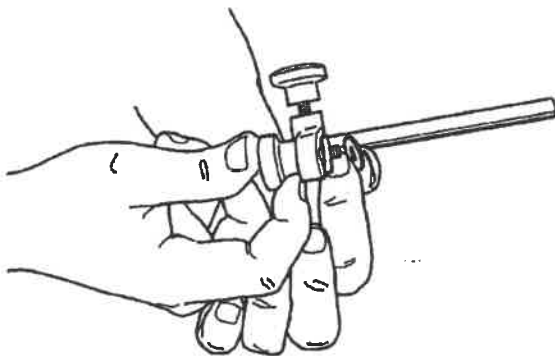


Fig. A-33

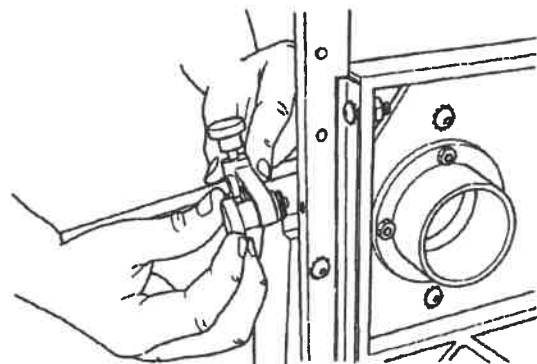


Fig. A-34

Feather Board Kit (555459)

To assemble the feather board kit:

1. Put a spacer (2) on the knob (3) threads and insert the shaft through the slot extrusion (1), as shown in Fig. A-36.
2. For the other knob, repeat Step 1.
3. Put another spacer (2) on the other side of the extrusion (1), as in Fig. A-37.
4. Attach the feather board kit to the Joint-Matic guide bars by screwing in both knobs into holes located in front of the slide guides, shown in Fig. A-38.

Fig. A-39 shows the feather board kit used with the one feather board included with the kit. Fig. A-40 shows the feather board kit being used with three optional feather boards. You should use extra feather boards whenever possible, since they help control the workpiece and prevent it from kicking back.

PARTS LIST FOR FEATHER BOARD KIT

Ref. No.	Part No.	Description	Qty.
1	516016	Slot Extrusion	1
2	516017	Spacer	4
3	516032	Knob	2
4	513709	Feather Board Assembly	1

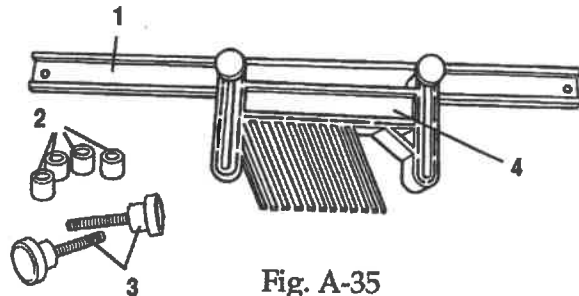


Fig. A-35

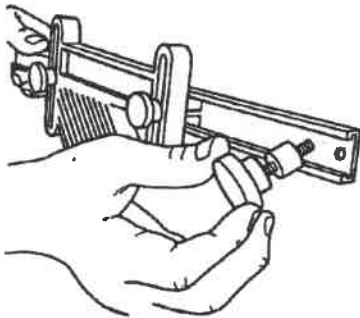


Fig. A-36

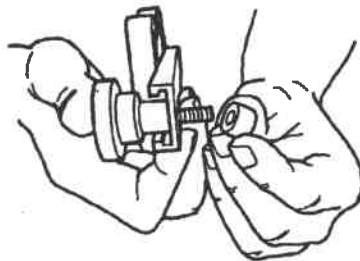


Fig. A-37

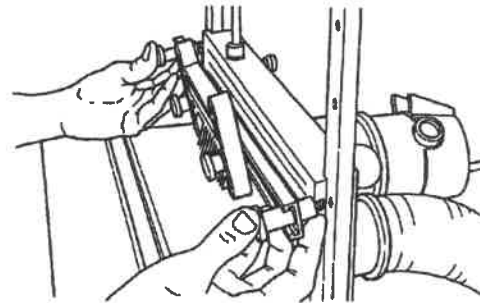


Fig. A-38

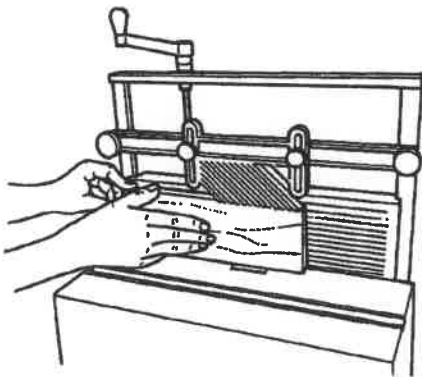


Fig. A-39

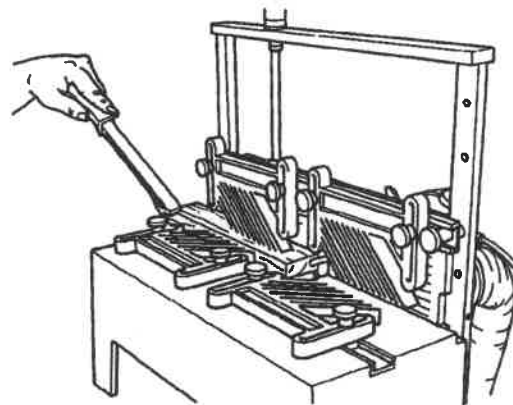


Fig. A-40

How to Make the Sliding Table Jig

The sliding table jig attaches to the miter gauge. Together they give a board extra stability and support when making dado, groove or dovetail socket cuts across the board's width. Fig. A-41 illustrates the sliding table jig holding a board during a dado cut. The board can now be cut smoothly without possibly catching the lip of the hole in the Joint-Matic work surface. Follow these instructions:

1. Obtain and prepare these materials:

Ref. No.	Description	Qty.
1	hardwood board, 1-1/2" Thick x 2-1/4" Wide x 7" Long	1
2	hardwood board, 3/4" Thick x 4x" Wide x 7" Long	1
3	board (ply, hard or particle), 1/2" Thick x 7" Wide x 7" Long	1
-	carriage bolts, 1/4"-20 x 3" Long	2
-	wing nuts, 1/4"-20	2
-	flat washers, 1/4"	2
-	80 or 100 grit sandpaper, 1-1/2" Wide x 2-1/4" Long	1
-	wood screws, 1/8" x 1-1/2"	2

2. Place your miter gauge in the Joint-Matic's miter channel.

3. Place all three boards in the same positions as illustrated in Fig. A-48.

4. Use a pencil to mark board 2 at each of the miter gauge's jig slots, located on top of the miter gauge fence. Remove board 2 and drill a 1/4" hole through each of the marks.

5. Move board 3 against the miter gauge fence and also board 1. Mark board 1 at each of the miter gauge's jig slots, just like you did on board 2. Using the pencil marks as position guides, make a 6" long counterbore 1/4" deep x 5/8" wide along the length of board 1, leaving 1/2" at each end. Then cut a 1/4" slot through the middle of the counterbore for the counterbore's entire 6" length. This can be done on the Joint-Matic, as it is similar to a mortising operation. Refer to the "Mortise and Tenon Joint" section on page 30.

6. Insert the two machine screws through the slot cut in board 1 and through the holes drilled in board 2, as shown in Fig. A-44. Place flat washers on the screws and secure them with wing nuts, as in Fig. A-45.

7. Place board 2 perpendicular along the back edge of board 3. Using board 1 as additional bracing, drill and countersink two 1/8" holes 1/-1/2" deep where the two boards meet to accept the 1-1/2" wood screws.

8. Attach boards 2 and 3 with the two wood screws, as in Fig. A-47.

9. Glue the sandpaper (or use PSA backed paper) to the end of board 1 closest to the Joint-Matic slide. The sandpaper will help hold the workpiece.

10. Attach the sliding table jig to the miter gauge by tightening the two wing nuts. See Fig. A-48.

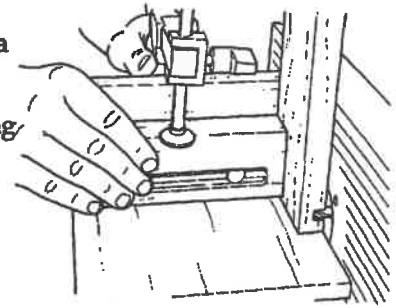


Fig. A-41

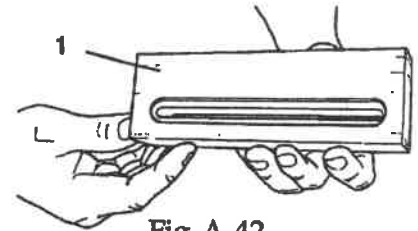


Fig. A-42

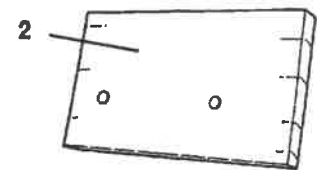


Fig. A-43

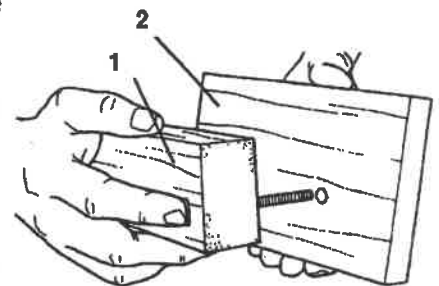


Fig. A-44

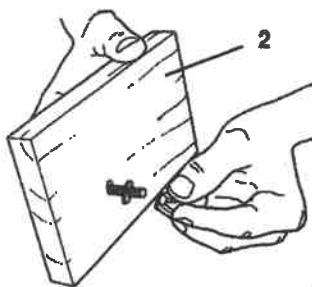


Fig. A-45

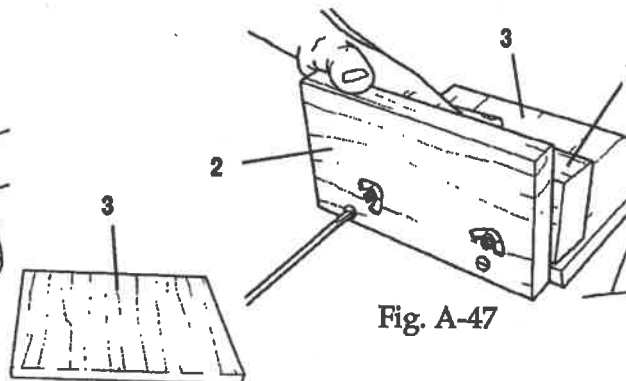


Fig. A-47

Fig. A-46

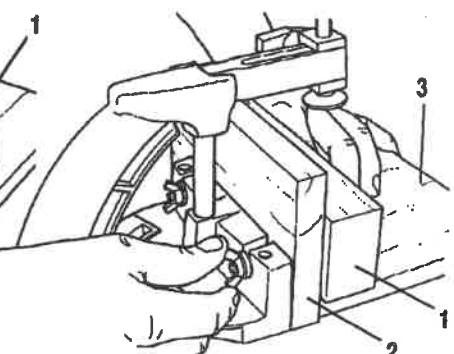


Fig. A-48

ALIGNMENT

Introduction

Before beginning any routing operations with your Joint-Matic, you must precisely align the router to the work surface. This procedure should not have to be repeated unless you remove the router base from the router mounting plate. However, you should periodically re-check alignment, as vibration and other factors could cause the router to go out of alignment with the worktable.

WARNING

You must read and understand the Safety section of this manual, and you must have completed all the instructions in the section on Assembly, before proceeding with Alignment. Make sure the router switch is in the OFF position and the unit is unplugged.

Tools Needed:

- Accurate straightedge
- 5/32" Allen wrench
- Phillips screwdriver

ALIGN THE BIT

1. Remove the router motor (if removable). Insert a straight bit into a collet in the router motor until the shank of the bit can go in no further. See Fig. B-1. Back out the bit slightly, then securely tighten the collet, as in Fig. B-2.

NOTE

If the router motor is not removable from its base, insert the bit into the collet with the motor in place while it is mounted to the Joint-Matic. You will have less room in which to work, but this will be necessary to install the bit.

2. Adjust the router so the bit protrudes at least 1/2" past the face of the slide. See Fig. B-3.
3. Lower the slide by turning the crank counter-clockwise until the top of the bit is below the work surface on the base.
4. Place a straightedge on the worksurface and across the bit opening in the base, as in Fig. B-4.



Fig. B-1

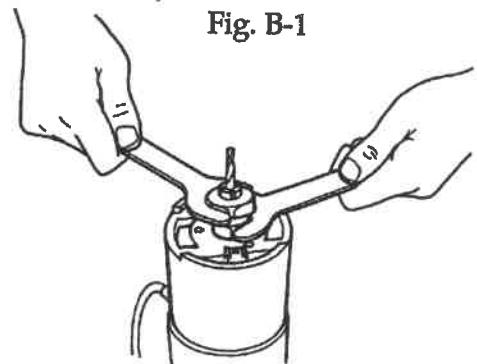


Fig. B-2

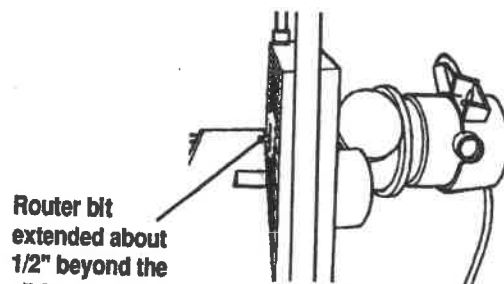


Fig. B-3

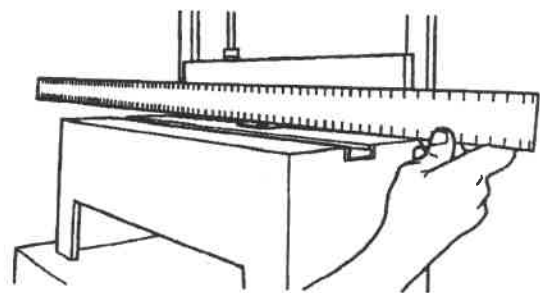


Fig. B-4

5. Hold the right end of the straightedge down against the work surface with your right hand, as in Fig. B-5. Then slowly turn the crank, demonstrated in Fig. B-6, clockwise to raise the slide until the top of the bit just touches the ruler. The top of the bit should now be flush with the work surface.

NOTE

You may have to practice raising and lowering the slide so to get the highest point of the bit to meet the ruler. Also check the left end of the ruler where it meets the work surface to see if the bit lifts the ruler.

Be careful that the ruler rests on the cutting edge of the bit and not across a groove, as this will give you a false reading of the diameter of the bit. Be especially careful with a spiral bit in this instance. It is helpful to rotate the bit to see if it comes in contact with the bottom of the straightedge.

ALIGN THE CRANK

6. Loosen the knob (23) located below the adjuster nut (22), as in Fig. B-7.

7. If the crank is oriented in any position other than parallel with the header bar, it needs to be moved. Turn the crank clockwise so that it is parallel to the header bar (15) and it is oriented in the position you desire. This can be with the crank pointing to either the left or right guide rail. Fig. B-9 shows the knob pointing to the right guide rail.

8. Notice the left edge of the straightedge. It will be raised again from the working surface. This gap needs to be eliminated.

9. Insert the long end of the 5/32" Allen wrench into the lower bushing nut in the back of the slide assembly, as in Fig. B-8.

10. Move the Allen wrench clockwise or counter-clockwise to adjust the slide, as demonstrated in Fig. B-9. (Do NOT unscrew the setscrew in the nut.) As you perform this adjustment, you will see the gap disappear. Again, you want to adjust the slide so that the top of the bit is even- or flush- with the working surface. Make sure the crank does not move when making this adjustment.

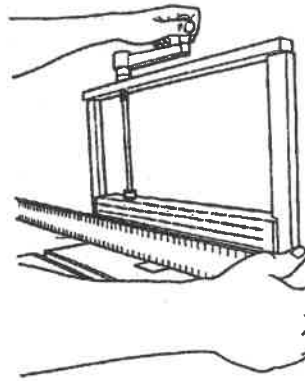


Fig. B-5

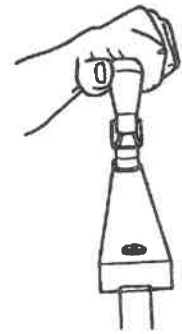


Fig. B-6

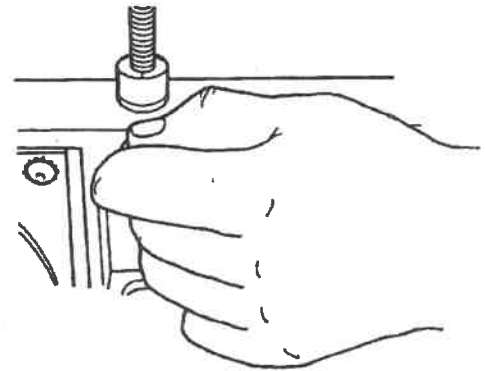


Fig. B-7

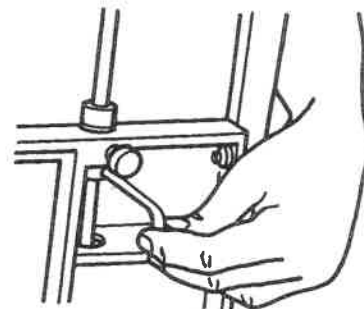


Fig. B-8

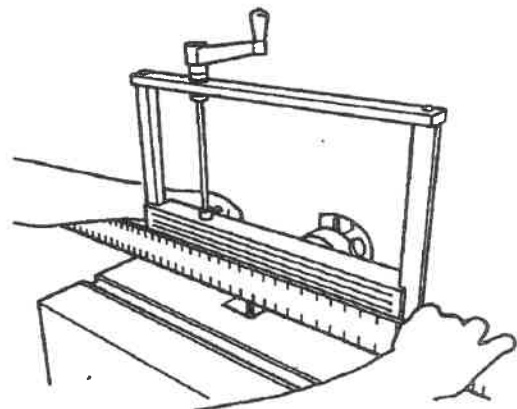


Fig. B-9

11. Once you have re-adjusted the top of the bit to be level with the work surface, finger tighten the adjuster nut (22) on the slide screw (17). Make sure the crank does not move out of parallel with the header bar (15). Make a pencil mark on top of the nut in line with the knob in the top bushing (shown in Fig. B-10), then back it off (turn it counter-clockwise) exactly 1/2 turn. Tension will be maintained by a spring under the nut. See Fig. B-11.

12. Finger tighten the knob (23) in the slide (11). Do not over-tighten.

CENTER THE BIT

13. Turn the crank to raise the slide up one half the diameter of the bit. If you are using a 1/4" diameter bit, this will be 1/8" up, or 2 turns (remember, each turn = 1/16".) A 3/8" diameter bit means 3 turns, and a 1/2" diameter means 4 turns.

NOTE

The center of the bit is now even with the work surface. This alignment holds true for any size bit in any operation. This is very important, because nearly all Joint-Matic operations start by placing the center of the bit level with the work surface. You will almost always work from the center of the bit.

CALIBRATE THE SCALE

14. With the bit centered to the work surface (shown in Fig. B-12), use a 5/32" Allen wrench to loosen the two button head cap screws (10) holding the scale (9) on the left guide bar (6). See Fig. B-13.

15. Carefully adjust the scale so that the "0" mark is aligned with the top edge of the slide.

16. Tighten the two button head cap screws (10) holding the scale in place. See Fig. B-13.

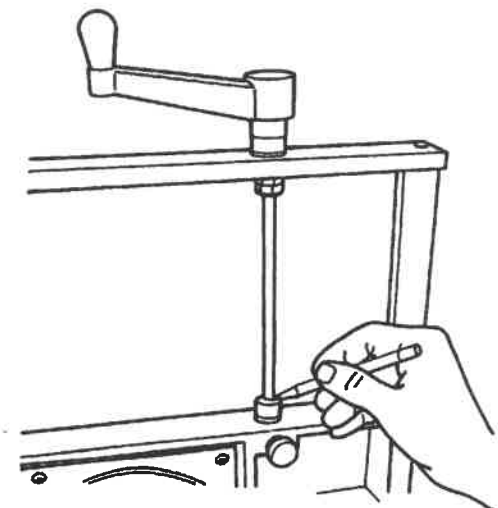


Fig. B-10

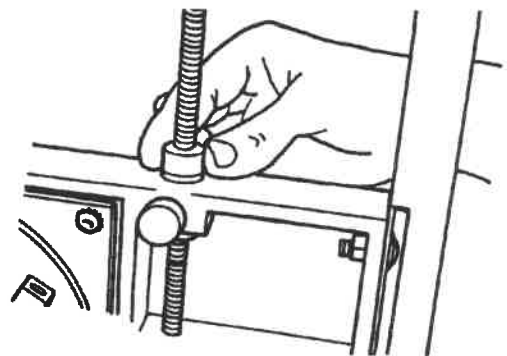


Fig. B-11

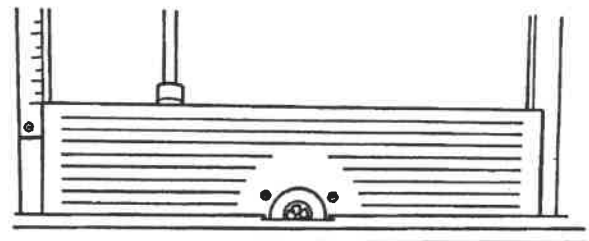


Fig. B-12

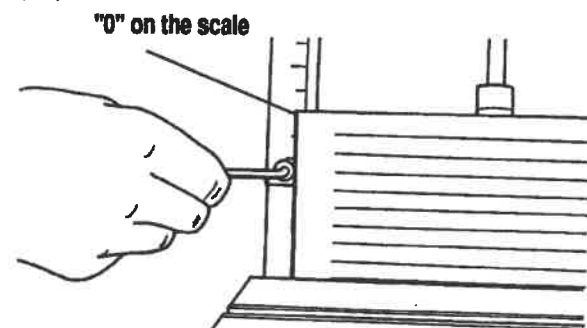


Fig. B-13

ADJUST THE TENSION OF THE T-SLOT EXTRUSION

17. Insert the miter gauge into the miter channel.
18. Use a 5/32" Allen wrench to remove the adjusting screw from the center of the miter bar, as in Fig. B-14.
19. Insert a Phillips screwdriver through the empty screw hole. See Fig. B-15.
20. To adjust the tension of the T-slot extrusion (4) on the miter gauge bar, do this:

Tighten or loosen each of the six flat socket cap screws (5) used to attach the T-slot extrusion to the base, according to the "side-play" of the miter gauge bar in the T-slot extrusion, tighten the cap screws. This will "pull in" the T-slot extrusion's sides tighter against the miter gauge bar.

If the miter gauge bar will not slide in the T-slot extrusion, loosen the cap screws. The miter gauge bar must slide smoothly. Wax the work surface, T-slot extrusion and the left and right slide guides.

You have completed Alignment of the Joint-Matic. Now go to the Operations section.

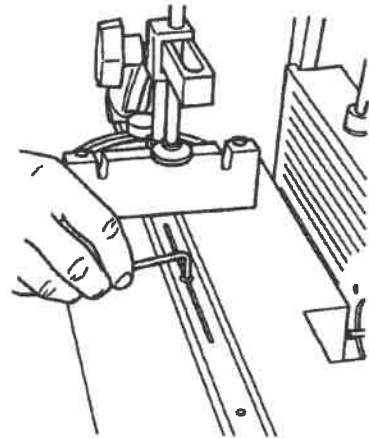


Fig. B-14

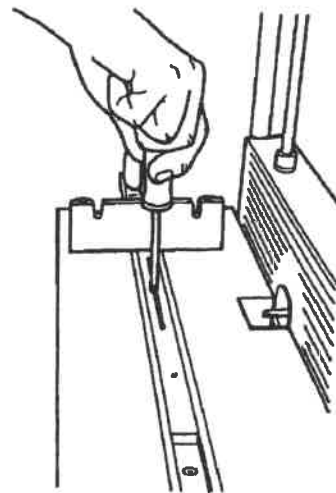


Fig. B-15

OPERATIONS

Introduction

Every skilled woodworker takes pride in creating a fine joint. It could be a simple box joint found in a decorative jewelry box, a mortise-and-tenon joint used in crafting a table, or a sophisticated housed dovetail in any number of projects. With your Joint-Matic you should be able to create almost any joint your woodworking projects demand. You can also use the Joint-Matic and various router bits to mold, shape, groove and dado your projects, as described in the section following the nine joints included in this manual.

There are several facts you must know which apply to all the joints made with the Joint-matic:

1. Know diameters of the router bit you are using.

- If it is a *straight* bit, divide the diameter in half and you will know the center of the bit. The center of the bit should be the "0" point on the Joint-Matic's scale. The slide should be positioned at "0" before you begin any joint.
- If it is a *dovetail* bit, you must know both it's widest diameter and the diameter at the point of entry into the workpiece (or, the bottom of the cut and the top, or mouth, of the cut).

2. Know the dimensions of each workpiece.

The thickness and width measurements are essential for almost every joint. Lengths of the workpieces are significant in how the workpiece fits with the other pieces of the project. For some joints, you must know how much stock length to remove with the Joint-Matic.

3. Translate all measurements into 1/16th fractions, or multiples of 1/16.

For example, if your workpiece is 3/4" thick and 2" wide, think of it as 12/16" thick and 32/16" wide. The same applies to router bits.

4. Each complete revolution of the crank raises or lowers the slide by 1/16."

This also means that all your measurements will translate into how many turns (or partial turns) of the crank you must make. One turn = 1/16", 1/2 turn = 1/32", 1/4 turn = 1/64".

5. Work on only one face or edge of the workpiece.

After you make the first pass with the Joint-Matic, always present the same side or edge of the workpiece to the bit in subsequent passes. For example, mark a workpiece with an "x." If the "x" faces toward the bit as you make the first pass for a box joint, the "x" should face the bit for each of the remaining passes.

Be sure to follow the directions for each type of joint you want to make. As your confidence grows through use of the Joint-Matic, you will want to experiment with the other joints. Just remember to always follow the **General Safety Rules** and the **Safety Rules for the Joint-Matic** found in this owner's manual.

The instructions for each of the following joints are "general" instructions, so that you can successfully execute the joint using the sizes of wood stock unique to your own project. The "specific" instructions are in the type style used in this sentence (when different from the general instructions), and are for an example for you to teach yourself how to make the joint.

Using Dovetail Bits with the Joint-Matic

You must always know all three of the bit measurements below, since you can make any kind of dovetail joint knowing:

- The diameter of the bit (bottom of the cut).
- The width of the bit's entry into the stock (top, or mouth, of the cut).
- The depth of the cut (the measurement from the top of the cut to the bottom of the cut).

If you are using dovetail bits, prepare your Joint-Matic and router according to this chart:

If the section of the stock receiving a dovetail socket is no less than:	Use Bit Dia.	Entry	Depth
3/4"	1/4"	3/16"	5/16"
1"	3/8"	1/4"	3/8"
1-1/2"	1/2"	5/16"	3/8"

NOTE

The entry of cut measurements are based on recommended Shopsmith high speed steel and carbid-tipped dovetail bits. to obtain these settings, install your dovetail bit in the router and set the depth of cut with a depth gauge you can make yourself.

To make a gauge, shown being used in Fig. C-1, cut into a squared piece of scrap hardwood. Measure the bits entry of cut and depth of cut. They should correspond to the above chart. Adjust the bit in or out and continue making cuts and measuring them, until you reach the correct settings. However, if you use other brands of bits, you may have to perform trial and error cuts in order to discover the correct settings for the non-Shopsmith bits.

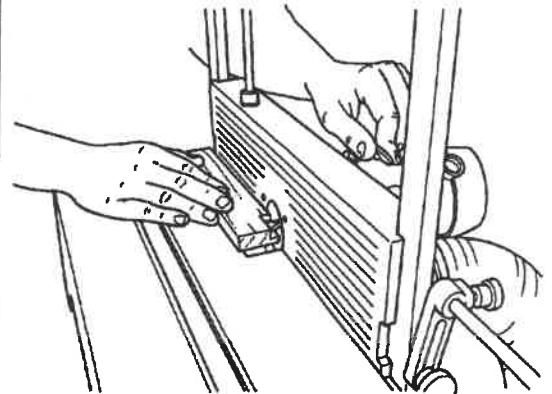


Fig. C-1

Pre-Operations Checklist

Before you actually begin any routing operations, make sure that the following tasks are completed:

- ✓ You performed the Assembly and Alignment sections.
- ✓ You have read and understood your router's owner's manual.
- ✓ You have a Shopsmith Miter Gauge.
- ✓ You have a Shopsmith DC3300 Dust Collector or other dust collection system.
- ✓ You have other safety devices (like push stick, push block and feather board(s) ready for use.

WARNING

ALWAYS feed stock into the router bit from the left side of the work surface, against the rotation of the bit. Also, every time you adjust the bit for a cutting operation, be sure the router is turned off and unplugged.

Box Joint

Introduction

The size of the bit you decide to use depends on the width of your wood and your sense of proportion. If you have relatively narrow, thin stock, use the 1/8" or 1/4" spiral bit as in the example. If your stock is wider and thicker (use your own sense of proportion), install a larger bit.

Your strategy for this joint is to make "fingers" on the end of each workpiece. The "fingers" alternate to form the joint. No "finger" on the top or bottom of a workpiece should be so thin that it could easily break; so with the box joint, shave off the thin "finger" to get the clean look you need for the joint.

Since a joint is usually only part of a project, you must know where to measure for the exact length of each workpiece. This is simple when using box joints. If you are working from the inner dimension, the exact length of workpiece "A", for instance, will be determined from the "shoulder" of the finger, PLUS the length of the finger. The length of the finger usually is the thickness of workpiece "B" (the other board forming the joint) PLUS a little extra (1/32" or your option) material left over for sanding. Try making the box joint in scrap wood with the same dimensions as your project's stock according to the following instructions:

NOTE

Consistently feed a workpiece with the same side and edge presented to the router bit while making a joint with the Joint-Matic.

MAKE THE JOINT

1. Install a spiral bit in your router. (Shopsmith recommends spiral router bits for all straight cuts because of their superior cutting qualities.)

Install a 1/4" spiral bit in your router.

2. Select two squared boards. Label one workpiece "A" and the other "B."

Select two matching workpieces of 3/4"-thick stock that are square on the ends. Mark one piece "A" and the other piece "B".

3. Set the router bit deep enough to remove the thickness of the thickest workpiece, plus a little extra (about 1/32") for sanding. If "A" is a different thickness than "B," you may compensate for that difference by cutting a rabbet in the thicker of the two boards equal to the length of the fingers.

4. Attach the Dust Collector hose to the dust chute.

5. With the bit centered to the work surface (the "0" setting on your gauge), place the "A" workpiece on its edge at 90 degrees to the bit and against the miter gauge.

6. Turn on the Dust Collector and router. Make the first cut on workpiece "A", then set it aside. See Fig. C-3.

7. Turn off the router and the Dust Collector.

8. Raise the slide the number of turns which equals the diameter of the bit.

Raise the slide the number of turns which equals the diameter of the bit. The diameter of the bit is 1/4" (or 4/16"), so raise the slide 4 turns.

9. Turn on the Dust Collector and the router. Place workpiece "B" on edge against the miter gauge, then make the first cut on "B." See Fig. C-4.

10. Turn off the router and Dust Collector, then repeat Step 8.

Raise the slide the width of the bit, or 4 turns.

11. Turn on the Dust Collector and the router. Place workpiece "A" against the miter gauge, then make the second cut on "A." Set aside workpiece "A".

12. Turn off the router and Dust Collector, then repeat Step 8. Make the cut on "B". Continue alternating the workpieces until you run out of wood to cut on either workpiece, as in Fig. C-5. Notice that the guard is installed when the cutting bit is exposed.

13. When you have reached the top of the last workpiece and the final cut is complete, assemble the two workpieces. See Fig. C-6.

NOTE

Softwoods and some hardwoods can "sponge"— meaning the wood fibers tend to lay down in the direction of the rotating router bit. Then when you try to assemble the workpieces, the fibers "stand up" and make the joint too tight. This may also happen if the cuts are performed too quickly, not allowing the router bit to completely clean out all of the wood.

To help solve this, let the bit cut at its own pace and do not force the workpiece. Also, you can make duplicate passes for each cut. This will not require much extra time and will help you obtain a good fitting joint with enough space for glue.

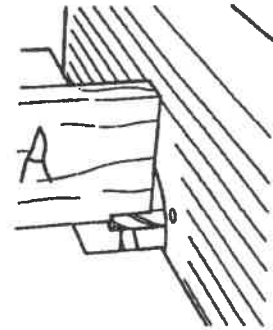


Fig. C-3

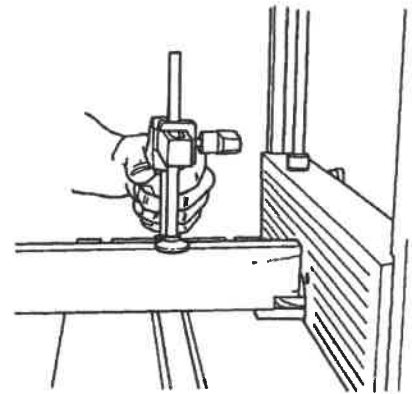


Fig. C-4

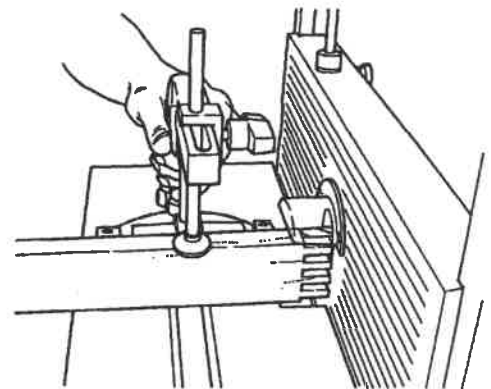


Fig. C-5

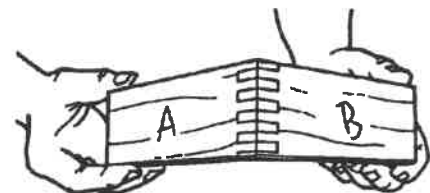


Fig. C-6

Mortise and Tenon Joint

Introduction

The instructions below should give you information to make the mortise and tenon joint with varying thicknesses and widths of stock. The example given makes the joint from the same dimension of stock. The thickness of the tenon and width of the mortise will be the diameter of the router bit.

The exact length of the tenon workpiece will be measured from the "shoulders" of the tenons, assuming you make a tenon on each end of the workpiece. Make a mortise and tenon joint according to the following instructions:

NOTE

Consistently feed a workpiece with the same side and edge presented to the router bit while making a joint with the Joint-Matic. Also, before you make the first cut, determine which side of the workpiece you want exposed in your project.

PREPARE THE JOINT-MATIC

1. Select the tenon stock (label it "A") and the mortise stock (label it "B").

Select 3/4"-thick stock, as in the Box Joint example.

2. Install a spiral bit in the router. The depth of the mortise and the length of the tenon are determined by how much bit you expose beyond the slide surface.

Install a 5/16" spiral bit in the router.

3. Position the slide at "0," where the center of the bit is level with the work surface. Install the guard (13) on the slide.

NOTE

Do NOT flip the workpieces over in cutting one side and then the other side.

MAKE THE TENON

4. Measure the thickness of the workpiece "A". Half the thickness will be the center of the tenon. Translate the center measurement into 16ths.

The tenon stock is 3/4" thick, or 12/16". Therefore, the center of the stock is 6/16".

5. Raise the slide the correct number of turns to position the center of the bit at the center of the stock.

Raise the slide 6 turns.

6. Now raise the slide the number of turns which equal the diameter of the bit you are using.

Raise the slide 5 turns.

7. Attach the Dust Collector to the dust chute. Turn on the Dust collector and the router.

8. Hold the "A" workpiece against the miter gauge and make the first cut. This cut forms the first shoulder of the tenon. See Fig. C-7.

9. Turn off the router and Dust Collector, and remove the guard (13). Lower the slide TWICE the number of turns you had raised the slide in Step 6.

Lower the slide twice the distance you raised it in Step 6, or 10 turns.

10. Turn on the Dust Collector and router. Make a pass with the same workpiece in the same position as before. Turn off the router and Dust Collector. This cut forms the second shoulder of the tenon. See Fig. C-8.

11. (This step is optional.) To make a hidden tenon, cut a shoulder on each edge of the tenon. Turn on the Dust Collector and router. Without changing the bit setting from its positions in Step 10, place the workpiece on its edge and against the miter gauge. Then make the cut on one edge of the workpiece. Flip the workpiece on its opposite edge and make the cut. This will form the last shoulders of the tenon. See Fig. C-9.

MAKE THE MORTISE

NOTE

Do NOT flip the workpieces over in cutting one side and then the other side.

12. Hold the tenon against the side of mortise workpiece "B" exactly where you want to place the mortise along the length of "B".

13. With a sharp pencil, mark the width of the tenon on the face of the mortise stock, as in Fig. C-10. The depth of the mortise is already set by the bit's depth of cut.

14. If the tenon stock is a different thickness than the mortise stock (for example, if a table's rail-tenon is 3/4" thick and the table leg's mortise is 2" thick), now is the time to determine where on workpiece "B" you wish to position the mortise. Position the center of the bit at the center of the desired mortise location.

15. Starting with the "0" gauge setting, raise the slide half the thickness of the stock. This will position the center of the bit at the center of the stock.

Starting with the "0" gauge setting, raise the slide 6 turns.

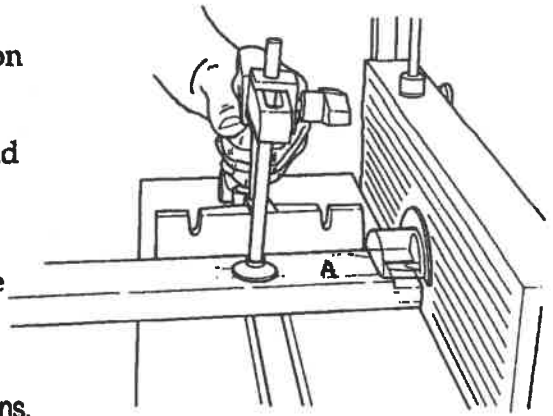


Fig. C-7

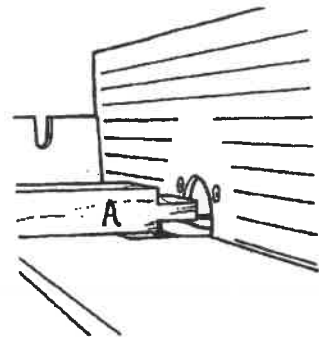


Fig. C-8

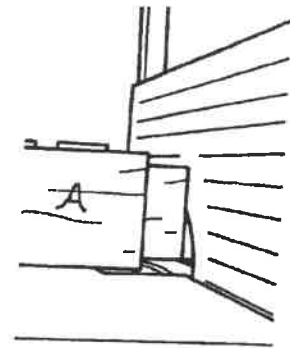


Fig. C-9

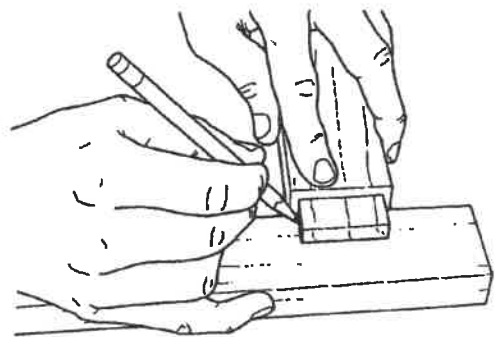


Fig. C-10

16. Install the Shopsmith Stop Rod on the right guide rail (6). See Fig. C-11.

17. You will be plunging the bit into the stock at the start of the mortise and using the stop rod to stop the cut at the end of the mortise.

Place the mortise stock in front of the bit where the infeed (left) edge of the bit lines up with the outside edge of the mortise, as in Fig. C-12. Then place the tenon between the end of the workpiece "B" and the stop rod, shown in Fig. C-13. Touch the tenon with the stop rod and lock it. This will assure the length of the mortise, providing the beginning cut is started accurately, will exactly match the width of the tenon. See Fig. C-14.

18. Turn on the Dust Collector and the router.

19. Use a push stick and push block to hold the left end of workpiece "B" against the slide and right end in front of the bit, but not touching it, as in Fig. C-15. Do not move the workpiece with the rotation of the bit, because kickback may occur. When you plunge workpiece "B" into the bit, it will give you a straight plunge cut by the time the the right end contacts the slide. Finish the mortise cut by moving workpiece "B" until it touches the stop rod.

20. Turn off the router, then pull workpiece "B" from the bit, once the bit has stopped rotating. Turn off the Dust Collector.

NOTE

It is important to accurately cut to the tenon line you scribed **WITHOUT** trying to move the mortise stock to the left with the rotation of the bit.

Also, do **NOT** move the workpiece back to the left to "clean up" the slot. The workpiece may kick out, since it is moving in the wrong direction.

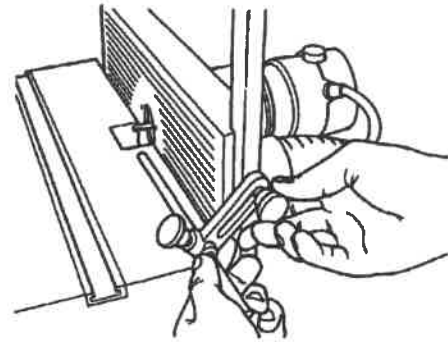


Fig. C-11

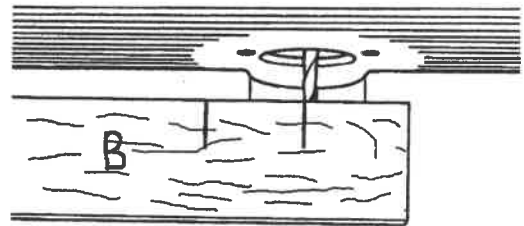


Fig. C-12

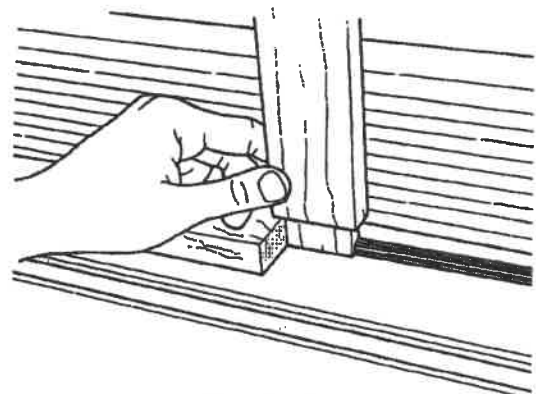


Fig. C-13

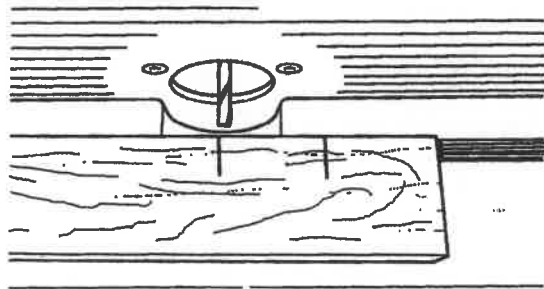


Fig. C-14

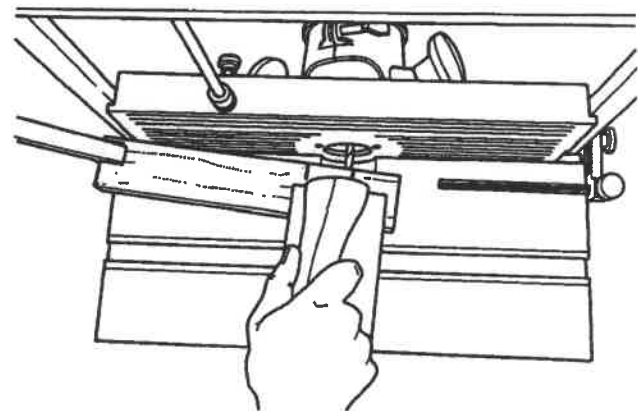


Fig. C-15

21. Use a file, rasp or chisel to slightly round off the tenon's edges to match the mortise— or use a chisel to square up the mortise to match the tenon. See Fig. C-16.

22. With the matching sides of each workpiece facing up, insert the tenon into the mortise to complete the joint, shown in Fig. C-17.

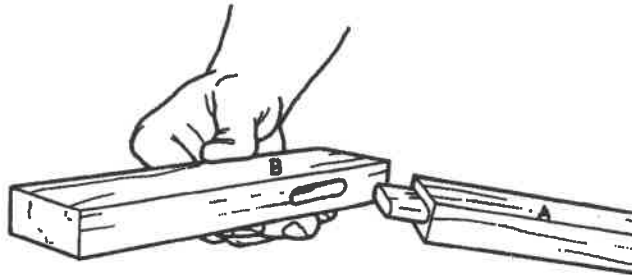


Fig. C-16

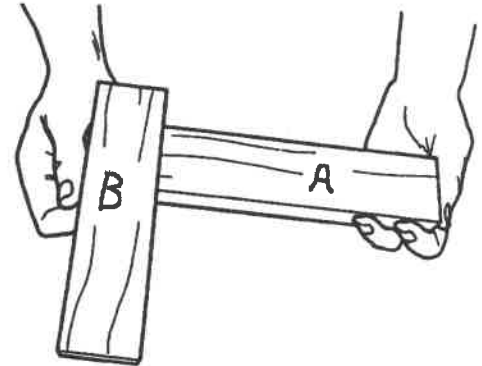


Fig. C-17

Tongue and Groove Joint

Introduction

This joint is excellent for making the rails and styles in panelled doors and cabinets. You will note some similarities with the mortise and tenon joint. Both joints have a tenon, but the mortise becomes a groove running the entire length of the board in the tongue and groove joint. Different thicknesses of wood can be used for this joint. Just be careful where you place the groove so that the surface of the tenon workpiece is located where you wish.

Be sure to keep your marked, or good, surfaces facing the work surface for all operations. This will ensure that the good surfaces will be flush, or even. Then any differences in stock thickness will show up on the back side, where they are hidden.

NOTE

Consistently feed a workpiece with the same side and edge presented to the router bit while making a joint with the Joint-Matic. Also, before you make the first cut, determine which side of the workpiece you want exposed in your project.

PREPARE THE JOINT-MATIC

1. Select the tenon stock (label it "A") and the groove stock (label it "B").

Select 3/4" thick stock, as in the Mortise and Tenon example above.

2. Install a spiral bit in the router. The depth of the groove and length of the tenon are determined by how much bit you expose through the slide.

Install a 5/16" spiral bit.

3. Install the optional feather board kit and *three additional feather guards* on the Joint-Matic. See fig. C-18.

4. Position the slide at "0", where the center of the bit is level with the work surface.

MAKE THE GROOVE

5. Measure the thickness of workpiece "A". The center of the groove will be half the thickness of "A". Raise the bit half the thickness of the workpiece "A".

Since workpiece "A" is $\frac{3}{4}$ " ($\frac{12}{16}$ ") raise the bit $\frac{1}{2}$ of $\frac{12}{16}$ ", or $\frac{6}{16}$ " = 6 turns.

6. Adjust the feather boards to slightly press the workpiece down on the work surface and into the cutter. Turn on the Dust Collector and router.

7. Use a push stick and make the groove cut the entire length of workpiece "B". See Fig. C-18. Fig. C-19 shows the finished groove cut.

8. Turn off the router and Dust Collector. Remove the feather boards from the work surface.

MAKE THE TENON

9. Raise the bit the diameter of the bit.

Since the bit is $\frac{5}{16}$ " in diameter, raise it 5 turns.

10. Install the guard (13) on the slide and place the miter gauge in the miter channel. Place workpiece "A" against the miter gauge and adjust its hold down clamp. See Fig. C-20.

11. Turn on the Dust Collector and the router and make the first cut. This forms the top shoulder of the tenon. If there is any wood remaining on the top side of the tenon, raise the bit 2 or more turns and clean up the cut. Then lower the bit to return it to its original setting.

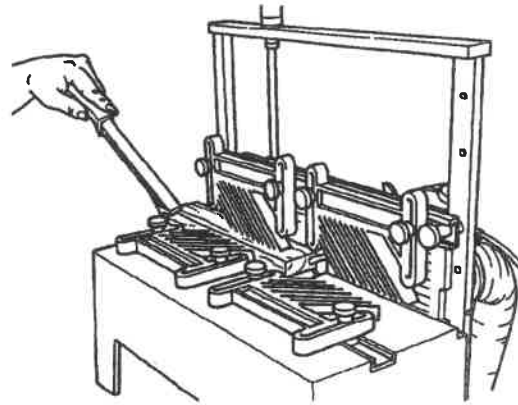


Fig. C-18

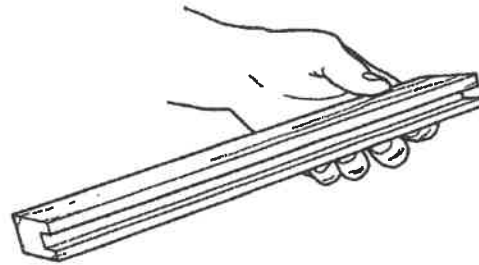


Fig. C-19

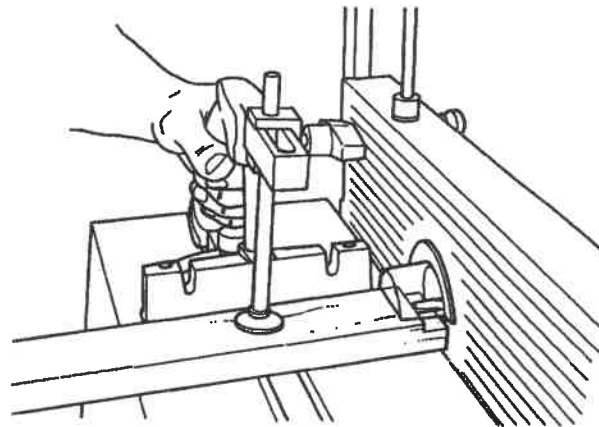


Fig. C-20

12. Turn off the router and Dust Collector. Remove the guard from the slide.

13. Lower the bit TWICE the number of turns you went up in Step 9.

Lower the bit 10 turns.

14. Turn on the Dust Collector and router and make the cut. This form the bottom shoulder of the tenon. If there is any wood remaining on the bottom side, lower the bit 2 or more turns to clean up the cut. See Fig. C-21.

15. Assemble workpieces "A" and "B", shown in Fig. C-22. Fig. C-23 illustrates the completed tongue and groove joint.

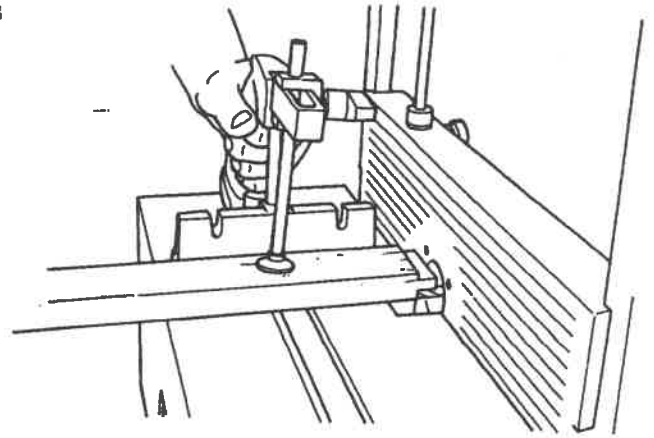


Fig. C-21

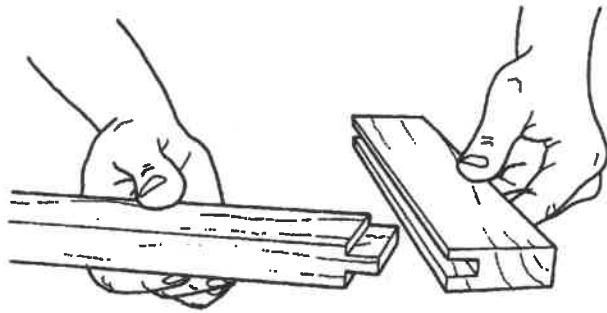


Fig. C-22

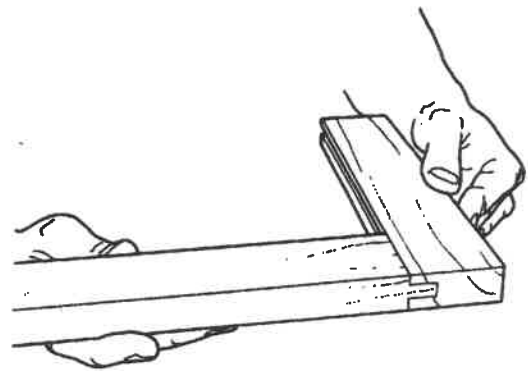


Fig. C-23

Bevel Sliding Dovetail Joint

Introduction

To make a bevel sliding dovetail joint fit into your project, first cut the stock to length. For workpiece "A" in which you will cut the socket, cut the workpiece to exact inside length (measured from heel to heel assuming a bevel sliding dovetail socket on each end), just as you would for a regular 45 degree bevel joint.

For the workpiece "B", its length will be the exact, inside length PLUS the depth the dovetail bit cuts into the stock on the first pass. For example: If you are making a shadow box and its internal dimension is to be 14", and your Joint-Matic's dovetail bit is set to a depth of cut of $3/8$ ", you will need to cut workpiece "B" to : $14" + 3/8"$ + another $3/8"$ to account for the dovetail pin on the other end of the board, for a total of $14-3/4"$ total length. This is measured from heel to heel on the 45 degree bevel.

Use scrap stock to make test cuts for measurement adjustments before you cut "good" stock. Also, if you are making a shadow box as in the example, you can make the first joint and derive length measurements to make the other three joints.

The thickness of both workpieces "A" and "B" are very important. Stock thickness determines which diameter bit is best. For instance, if your stock is $3/4"$ it can accommodate a dovetail made with a $1/4"$ dovetail bit, set at $5/16"$ depth of cut. These are dimensions you will find in the example included in the instructions below (in this type style, if different than the general instructions).

A general guideline for making bevel sliding dovetail joints is to use a dovetail bit no more than one third the thickness of the desired workpiece. For example, if both workpieces "A" and "B" are $3/4"$ thick, use a $1/4"$ dovetail bit. If "A" and "B" are at least 1" thick, a $3/8"$ bit can be used. $1-1/2"$ or thicker stock means you can use a $1/2"$ bit.

Please follow the instructions below:

1. Cut to length both the workpieces "A" and "B", as described in the introduction. The Joint-Matic should already be prepared with the bit installed and set at the proper depth of cut. You should have also tested cuts in scrap wood to make sure your measurements are accurate.

Select $3/4"$ -thick stock, as in previous examples, and make sure both boards have been accurately beveled on the ends to 45 degrees.

Install a $1/4"$ dovetail bit. Adjust the bit to a $5/16"$ depth of the cut, which yields a $3/16"$ entry of cut.

2. Put the (optional) bevel miter gauge in the miter channel. Place workpiece "A" in the bevel miter gauge. Adjust the bevel miter gauge so that the stock is flat against both the slide and the miter gauge. Double check for 45 degrees by using a combination square or drafting triangle.

3. Position the bit to a little below the center of the beveled face of workpiece "A".

4. Turn on the Dust Collector and router, then make the socket cut across the bevel end. Turn off the router and Dust Collector. See Fig. D-1.

WARNING

Do not make a return pass with the workpiece, as you will be moving the stock in the wrong direction to the bit. You may experience kickback.

5. Here is the formula for making the first cut in workpiece "B":

1/2 of the bit diameter,
plus
1/2 of the entry of the cut
plus
the depth of cut
equals
the number of turns up (clockwise).

Turn the crank clockwise the number of turns calculated from the above formula. Turn on the router and dust collector. Make the cut, then turn off the router and dust collector. See Fig. D-2.

Measurements for the example are:

- Bit Diameter = 1/4" (or 4/16")
- Entry of Cut = 3/16"
- Depth of Cut = 5/16"

The formula calculation is:

$$\begin{aligned} \frac{4/16"}{2} + \frac{3/16"}{2} + 5/16" &= 2/16" + (1-1/2)/16 + 5/16 \\ &= \frac{2 + 1-1/2 + 5}{16} \\ &= \frac{(8-1/2)}{16} \\ &= 8-1/2 \text{ turns up.} \end{aligned}$$

Turn the crank 8-1/2 turns clockwise to raise the slide. Turn on the router and Dust Collector, then make the cut. Turn off the router and Dust Collector.

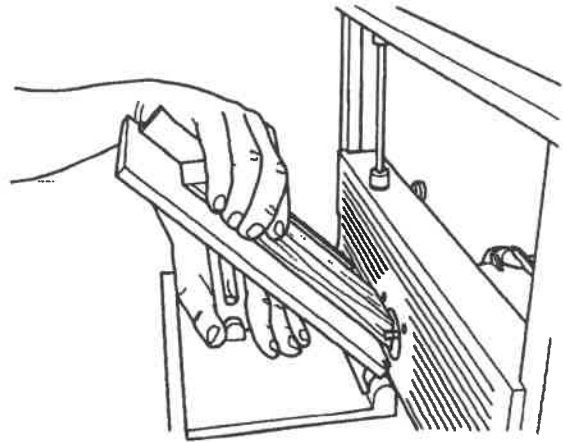


Fig. D-1

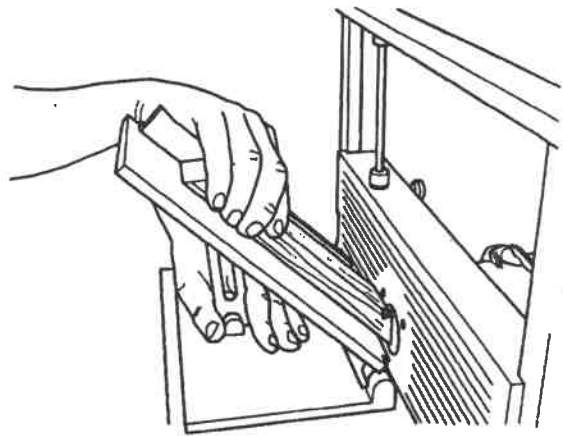


Fig. D-2

NOTE

After you make the first cut in workpiece "B", you may need to clean up the remaining stock above the cut. Remember to bring the bit back to exactly the same position in Step 5. For instance, if you raise the slide another three turns to clean up the remaining wood, remember to lower the slide three turns after removing the remaining wood.

6. Move the slide down according to this formula:

Diameter of the bit
plus

Entry of the cut
equals

the number of turns **down** (counter-clockwise).

Turn the crank counter-clockwise the number of turns calculated with the above formula. Turn on the Dust Collector and router. Make the cut, then turn off the router and Dust Collector. See Fig. D-3.

The example's calculation is:

$$4/16" + 3/16" = 7/16"$$

$$= 7 \text{ turns down (counter-clockwise).}$$

Turn on the Dust Collector and router. Make the cut. Go down another 3-1/2 turns to clean up the cut. When you have finished, turn off the router and Dust Collector.

8. Remove the remaining wood from workpiece "B" by lowering the slide (in increments no more than the diameter of the bit), then making a cut. Repeat this process until there is about 1/8" of wood remaining at the "toe". Then go down in 1/2 turn increments until only a thin sliver is left. When you reach this point, remove the workpiece and gently snap it off, as in Fig. D-4. This will give you a nice, crisp edge on the tip of the workpiece.

9. Assemble the two workpieces, shown in Fig. D-5, to form the bevel sliding dovetail joint. Fig. D-6 illustrates the finished joint.

NOTE

This joint will fit together more readily if you assemble the workpieces in the same direction that you made the cuts.

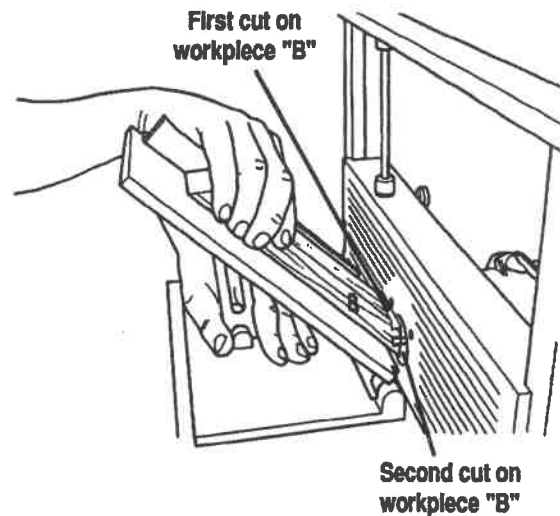


Fig. D-3

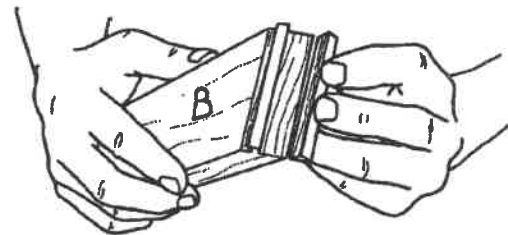


Fig. D-4

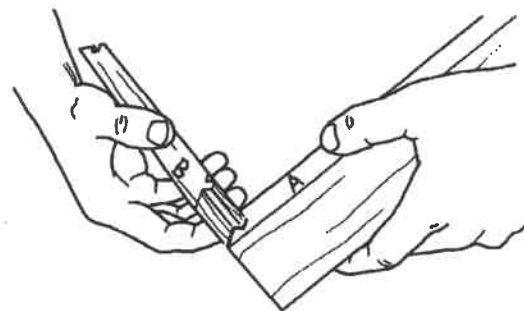


Fig. D-5

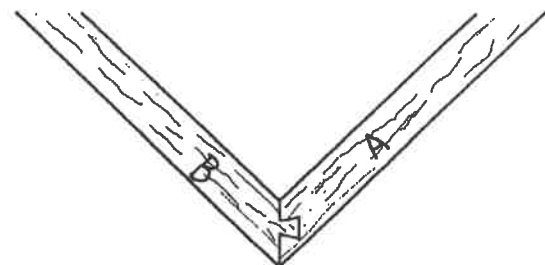


Fig. D-6

Spliced Dovetail Joint

Introduction

The spliced dovetail joint gives great strength to a normal mitered joint, and dovetails give a crafted look to furniture and picture frames. Workpiece "A" is cut to length differently than "B". Since there is an "A" and "B" workpiece for each joint in a picture frame, for example, you should carefully plot which end of each board will be an "A" or "B".

Here are some guidelines for making a picture frame with spliced dovetails on each joint:

- a. Take great care in installing the dovetail bit and precisely setting its depth of cut. Use the depth gauge described in the "Operations" introduction.
- b. If the board is workpiece "A" on one end, it should be workpiece "A" on the other end. This will give a more balanced look, since the resulting joints on each side will look the same.
- c. Cut workpiece "A" to exact inside length (as you would to make a regular miter joint), PLUS your dovetail bit's depth of cut on both ends of the workpiece. The addition of the bit depth compensates for the first cut on each end which removes material from the inside length.
- d. When you cut the miters for each joint, try to match one miter with the other as complementary, fitted pieces. You can achieve these complementary miter cuts with the Shopsmith Miter Pro.

Please follow the instructions below:

1. Prepare the Joint-Matic by installing and adjusting the desired dovetail bit, according to specifications listed in the "Operations" introduction. Also prepare your stock by cutting a 45 degree miter on all ends.

Select 3/4" thick stock, as in the previous examples. Be sure each workpiece is cut at a 45-degree angle.

Install a 1/2" dovetail bit. Adjust the bit so the end of it is out 3/8" from the face of the slide. This will give an entry of cut of 5/16".

2. Place workpiece "A" in the bevel miter gauge and position the bit to where the bottom of the bit just meets the heel of the workpiece.

NOTE

This will be a very critical cut, so if you have scrap stock exactly the same dimensions as workpiece "A", make some practice cuts on the scrap stock before actually cutting workpiece "A".

It is important to not cut the heel off. Start trial cuts higher than needed, then gradually lower the slide until the appropriate cut location is accomplished.

3. Turn on the Dust Collector and router, then make the first cut on workpiece "A". Turn off the Dust Collector and router. See Fig. D-7.

4. Place workpiece "B" in the bevel miter gauge beside workpiece "A".

5. Move the slide down according to this formula:

Diameter of the bit
plus
Entry of cut
equals
the number of turns down (counter-clockwise).

For our example, since our bit settings are:

- 1/2" diameter of bit
- 5/16" entry of cut
- 3/8" depth of cut

Calculate the number of turns to move the bit down:

$$\begin{aligned} 1/2" \text{ (or } 8/16") + 5/16" &= 13/16" \\ &= 13 \text{ turns down} \\ &\text{(counter-clockwise)} \end{aligned}$$

6. You will be cutting both workpieces at the same time. Turn on the Dust Collector and router, and make the cut.

7. Turn off the router and Dust Collector.

8. Lower the bit the same number of turns you calculated in Step 5. Turn on the Dust Collector and router. Make another cut, just like you did in Step 6. See Fig. D-8.

Lower the bit another 13 turns, turn on the Dust Collector and router, then complete another pass with both workpieces. Turn off the router and Dust Collector.

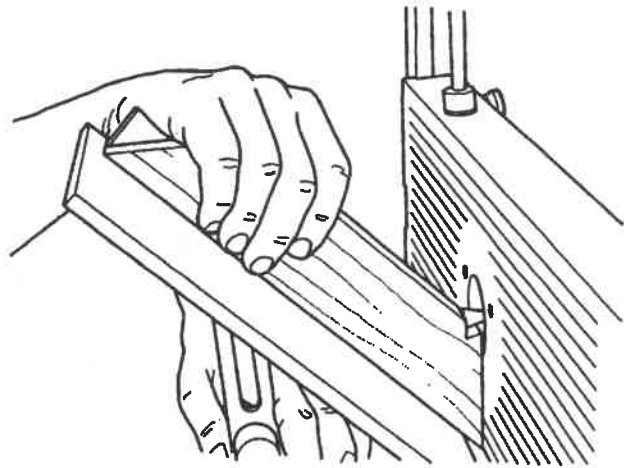


Fig. D-7

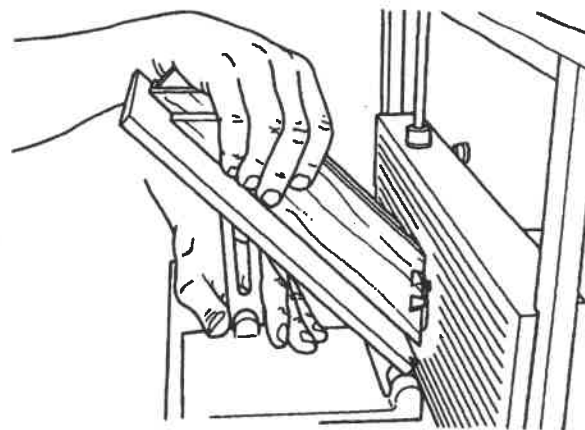


Fig. D-8

9. Turn off the router and Dust Collector. If there is no room for another dovetail in the remaining wood, as demonstrated in Fig. D-9, then workpiece "B" is finished—so set it aside.

10. For workpiece "A", clean off the remaining wood (pointed to in Fig. D-9) by lowering the slide in increments less than the diameter of the bit. See Fig. D-10. When there is about 1/8" wood left to remove at the "toe", lower the slide in 1/2 turn increments until a very thin sliver remains at the tip of the workpiece. When you reach this point, gently snap it off to get a nice, sharp edge.

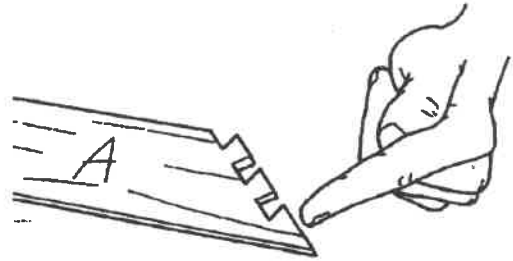


Fig. D-9

NOTE

As a rule of thumb in making this joint with a 1/2" dovetail bit, you will make one dovetail in your workpiece for each 1" width of stock. For example, a workpiece 2" wide could have two dovetails, and a workpiece 3" wide could have three dovetails. Or you can make the joint with a larger dovetail bit. Use your own experience and sense of proportion to determine what is best for your project.

11. Assemble the workpieces, as shown in Fig. D-11. They go together easier if you slide the workpieces in the same direction as the dovetail bit pass through the wood. Fig. D-12 illustrates the completed spliced dovetail joint.

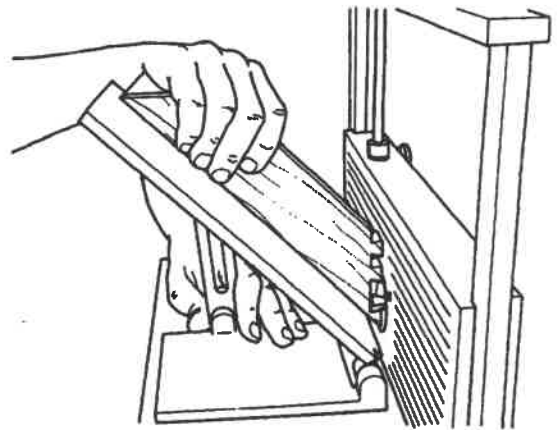


Fig. D-10

NOTE

If you are using a 1/4" or 3/8" dovetail bit, you will need to "shim up" workpiece "B" on the bevel miter gauge. Make the first cut in workpiece "A" as described in Steps 1-3. Then use a 1/16" shim (for a 3/8" bit) or a 1/8" shim (for a 1/4" bit) under workpiece "B", when making the cuts in both workpieces together.

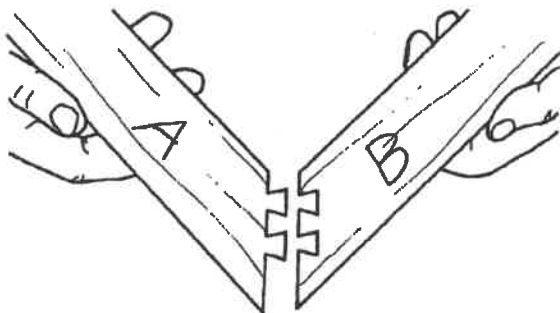


Fig. D-11

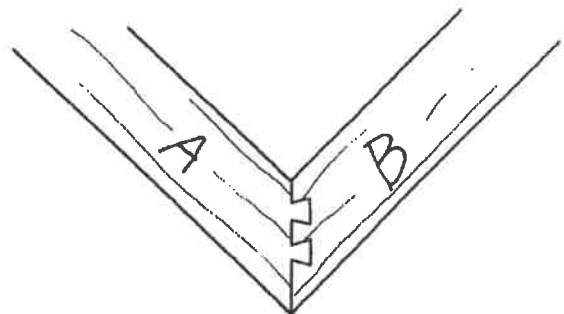


Fig. D-12

Housed/Sliding Dovetail Joint

Introduction

The housed/sliding dovetail joint has a dovetailed pin and socket. The pin is exposed on one end, giving this strong joint a look of craftsmanship—especially when contrasting woods are used. A general guideline for making housed/sliding dovetail joints is to use a dovetail bit no more than one third the thickness of the desired workpiece. For example, if both workpieces "A" and "B" are 3/4" thick, use a 1/4" dovetail bit.

Please follow the instructions below:

PREPARE THE JOINT-MATIC

1. Install the feather board kit and the stop rod kit.
2. Install an appropriate sized dovetail bit in your router. Set the bit depth according to specifications described in the "Operations" introduction.

Install a 1/4" dovetail bit in your router.

3. Set the bit to "0" on the scale, where the center of the bit is level with the work surface,

MAKE THE SOCKET

4. Label the socket workpiece "A" and the pin workpiece "B".
5. Place workpiece "A" against the slide and router bit as in Fig. D-13. Raise the bit to the center of the board. Do this by going up 1/2 the thickness of workpiece "A".

Since workpiece "A" is 3/4" thick, raise the bit $1/2 \times 12/16$ = 6/16", or 6 turns.

6. Place workpiece "B" against the end of workpiece "A", as in Fig. D-14, and put the stop rod against workpiece "B". Tighten the stop rod knob.
7. Install an extra feather board on the work surface. Adjust the feather boards so they have slight pressure down and into the workpiece.
8. Turn on the Dust Collector and router. Use a push stick, as shown in Fig. D-15, and make the cut.
9. Turn off the router and Dust Collector. Remove workpiece "A" from the Joint-Matic. Also remove the feather boards and the stop rod.

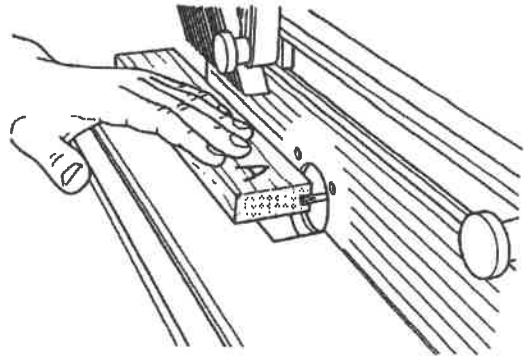


Fig. D-13

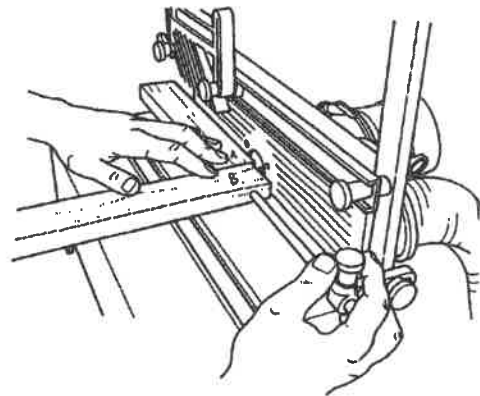


Fig. D-14

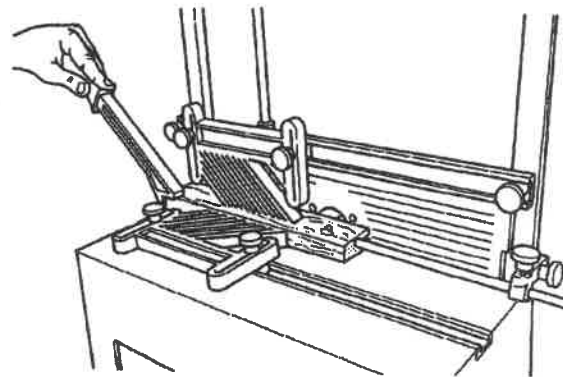


Fig. D-15

MAKE THE PIN

10. Since the bit is now at the center of workpiece "B" (assuming "A" and "B" are of the same thickness), raise the bit:

$1/2$ (bit diameter + entry of cut)

Raise the bit:

$1/2 (4/16" + 3/16") = 1/2 (7/16") = 3-1/2$ turns up.

11. Place the miter gauge in the miter channel and install the guard (13) on the slide, as in Fig. D-16.

12. Turn on the Dust Collector and router. Make the cut. Turn off the router and Dust Collector. If any material remains on top of the first cut, raise the bit 2 or more turns and clean up the cut, then lower the bit back to its original position for the first cut.

13. Remove the guard (13) from the slide. Lower the bit twice the number of turns calculated in Step 10.

Lower the bit:: $2 \times 3-1/2 = 7$ turns down.

14. Turn on the Dust Collector and router. Make the cut. Turn off the router and Dust Collector. If any material remains below the second cut, lower the bit 2 or more turns and clean up the cut, then lower the bit to "0" on the scale. See Fig. D-17.

15. To get the pin in workpiece "B" flush with the end of workpiece "A" when assembled, you must trim off the underside of the pin. The router bit is already set at the proper height to do this. So turn on the Dust Collector and router, make the cut on the underside of the pin, as shown in Fig. D-18.

Fig. D-19 shows the completed workpieces ready for assembly, and Fig. D-20 shows the assembled housed/sliding dovetail joint.

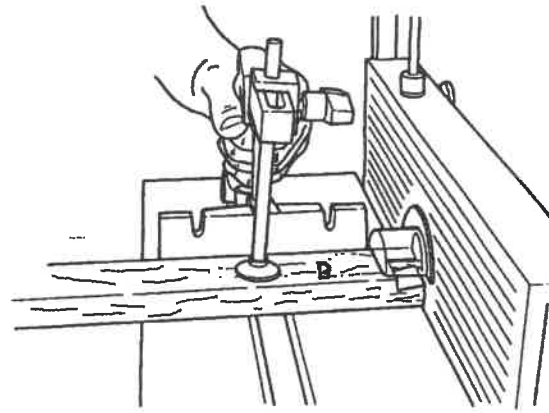


Fig. D-16

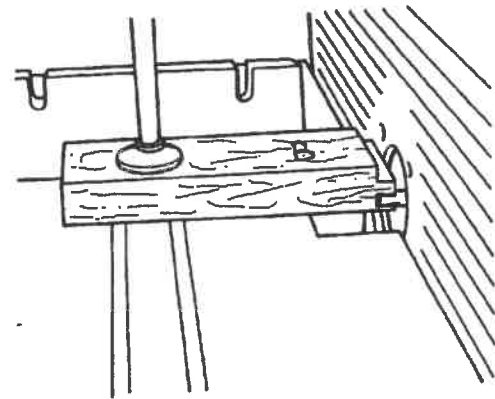


Fig. D-17

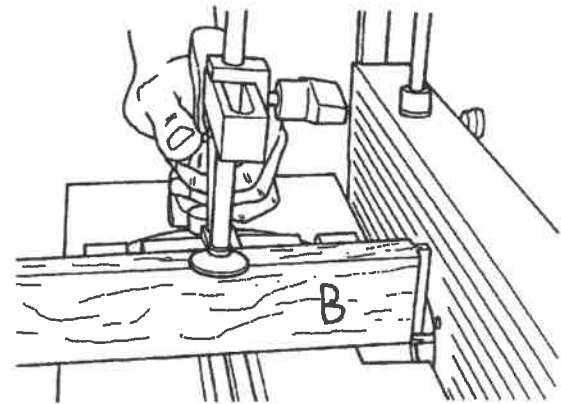


Fig. D-18

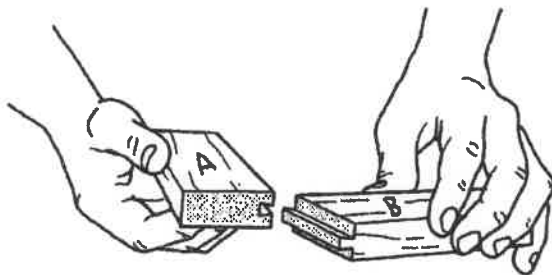


Fig. D-19

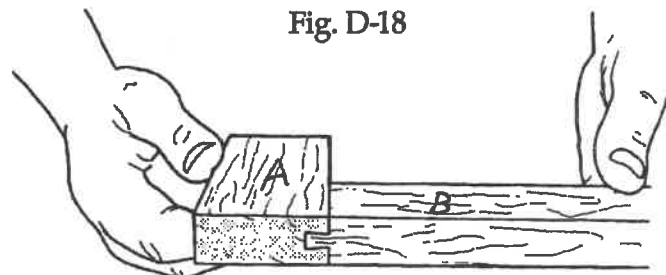


Fig. D-20

Half-Blind Dovetail Joint

Introduction

The half-blind dovetail joint is often used in drawer construction. The Joint-Matic lets you make this joint easily. You can adapt the instructions for whatever dimensions of wood you will use.

Please follow these instructions:

PREPARE THE JOINT-MATIC

1. Install the appropriate dovetail bit in the router, and set the depth to the specifications listed in the "Operations" introduction. Also install the feather board kit and stop rod kit.

Install a 3/8" dovetail bit in the router.

2. Set the scale to "0", where the center of the bit is level with the work surface.

3. Mark the board that gets pins "A" and the board that gets sockets "B".

4. Place workpiece "B" against the slide and the infeed side of the bit, as in Fig. D-21.

5. Place workpiece "A" against the end of workpiece "B", clearing the bit. See Fig. D-22.

6. Touch workpiece "A" with the stop rod and lock it. Loosen the knob attaching the stop rod to the slide guide, lift the stop rod from the feed path, then re-tighten the knob.

NOTE

You can also use a stop collar on the stop rod. If you choose to do this, simply loosen the stop rod knob, slide the rod out of the way for when you are cutting pins. Then when you make socket cuts, slide the stop rod back into position – as gauged by the stop collar.

MAKE THE CUTS

7. Place a miter gauge in the miter channel and secure workpiece "A" in it with the clamp, as in Fig. D-23.

NOTE

Though the feather board kit is not shown attached in Fig. D-23, simply loosen the feather board knobs and move it up and out of the way during all cuts on workpiece "A".

8. Turn on the Dust Collector and router. Make the cut in workpiece "A", shown in Fig. D-23. Turn off the router and Dust Collector.

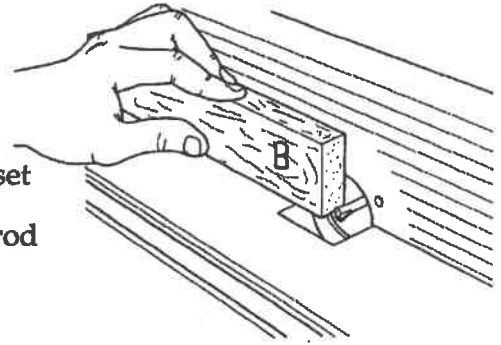


Fig. D-21

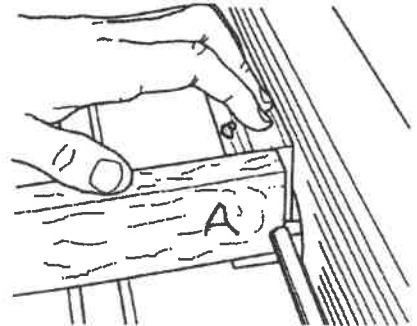


Fig. D-22

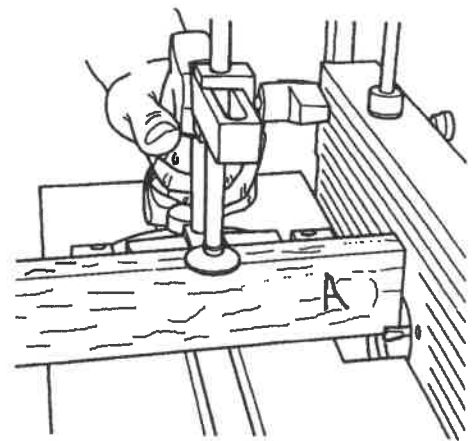


Fig. D-23

9. Remove workpiece "A" and the miter gauge. Lower the stop rod into position. Re-install and adjust the feather board on the work surface, and adjust the feather board kit.

10. Raise the bit according to this formula:

$$1/2 (\text{bit diameter} + \text{entry of cut})$$

Raise the bit: $1/2 (3/8" + 1/4")$

$$1/2 (6/16" + 4/16")$$

$$1/2 (10/16) = 5 \text{ turns up.}$$

11. Adjust both feather boards against workpiece "B", as in Fig. D-24.

12. Turn on the Dust Collector and router. Use a push stick to feed workpiece "B", as in Fig. D-24. Fig. D-25 shows the completion of the cut.

13. Turn off the router and Dust Collector. Remove workpiece "B" and the feather board from the work surface.

14. Loosen the knob attaching the stop rod to the slide guide (or, if using a stop collar on the rod, loosen the stop rod knob and move the rod out of the way, and lock it), lift up the stop rod from the feed path, then re-tighten the knob. Also, raise the vertical feather board (on the feather board kit) and secure it.

15. Raise the bit the same number of turns calculated in Step 10.

Raise the bit 5 turns.

16. Place the miter gauge in the miter channel holding workpiece "A". Turn on the Dust Collector and router. Make the second cut, which will complete the first pin in workpiece "A". Turn off the router and Dust Collector.

17. Continue alternating workpieces "A" and "B" as described in Steps 11- 16 until there is no wood remaining to form a pin or socket.



Install the guard (13) to make the last pin cut on workpiece "A".

18. When you have completed making pins and sockets, fit the two workpieces together. Notice that in Fig. D-26 the pins in workpiece "A" are not flush with workpiece "B". Lower the bit back to "0" on the scale.

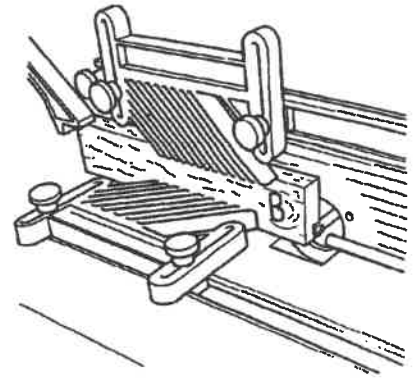


Fig. D-24

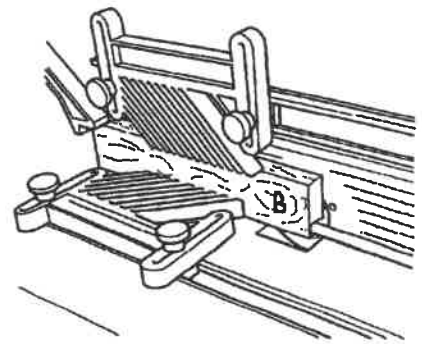


Fig. D-25

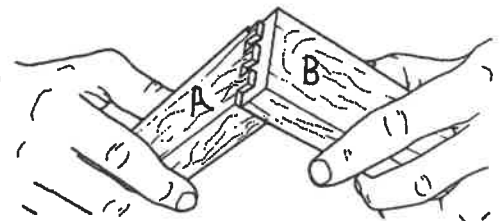


Fig. D-26

19. Turn on the Dust Collector and router. Use the miter gauge to undercut the pins in workpiece "A", as demonstrated in Fig. D-27.

Fig. D-28 shows the finished workpieces, and Fig. D-29 shows the assembled half-blind dovetail joint.

NOTE

Once you become more proficient with cutting half-blind dovetails on the Joint-Matic, you may wish to save time by cutting all pins on workpiece "A" at one time, and all sockets on workpiece "B" at one time. To do this, simply raise the crank in increments which would equal the bit diameter plus the entry of cut (in our example, this would be 10 turn increments). You will receive the same accurate results, but you should save time.

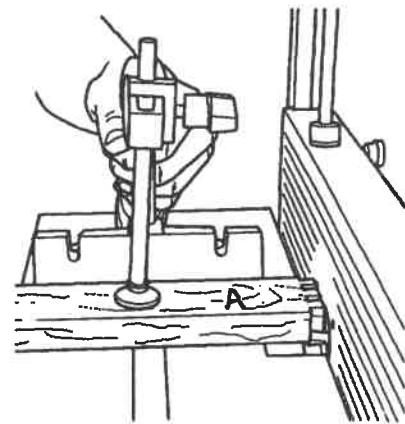


Fig. D-27

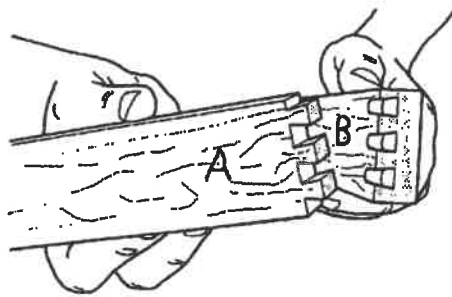


Fig. D-28

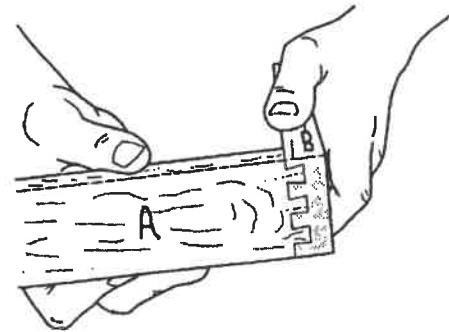


Fig. D-29

Dado Box Corner Joint

Introduction

The instructions below tell you how to make a dado box corner joint with varying thickness of stock, although the joint usually made from stock of the same dimensions. This joint is best made with a sliding table jig. Instructions on how to make it are on page 21.

The exact length of the dadoed workpiece will be measured from the inside "shoulder" of the dado. Normally, if you are making a box from four boards of the same thickness and width, the dados are cut on each end of the two side boards, and the rabbets are made on each end of the remaining two end boards.

Please follow these instructions:

PREPARE THE JOINT-MATIC

1. Install the sliding table jig on the miter gauge. Install the appropriate sized spiral bit in the router. The depth of the bit should be $1/2$ the thickness of the board which gets a rabbet.

Install a $3/8$ " spiral bit at a depth of $1/2$ ($3/4$ ") = $3/8$ ".

2. Set the scale to "0", where the center of the bit is level with the work surface.

3. Raise the center of the bit level with the sliding table of the sliding table jig, as in Fig. E-1.

Since the recommended thickness of the sliding table is 1/2" (or 8/16"), raise the bit 8 turns.

4. Mark the board that gets the dado "A" and the board that gets the rabbet "B".

5. Raise the bit according to this formula:

$1/2$ (diameter of bit + thickness of "B")

Raise the bit: $1/2$ ($3/8$ " + $3/4$ ")

$1/2$ ($6/16$ " + $12/16$)

$1/2$ ($18/16$) = 9 turns up.

6. Place the miter gauge/sliding table jig in the miter channel and secure workpiece "A", as demonstrated in Fig. E-2.

7. Turn on the Dust Collector and router. Make the dado cut in workpiece "A". Turn off the router and Dust Collector.

8. Install the guard (13) on the slide.

9. Place workpiece "B" in the sliding table jig. Turn on the Dust Collector and router. Make the rabbet cut on workpiece "B".

Fig. E-3 shows the two completed workpieces. Fig. E-4 shows the assembled dado box corner joint.

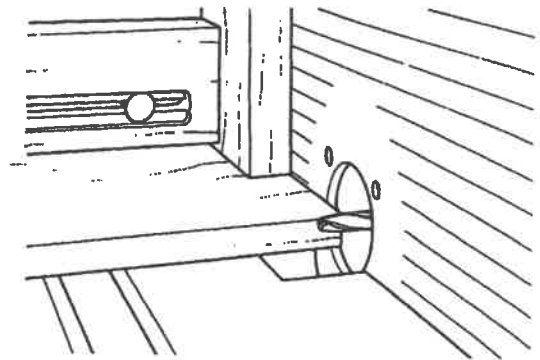


Fig. E-1

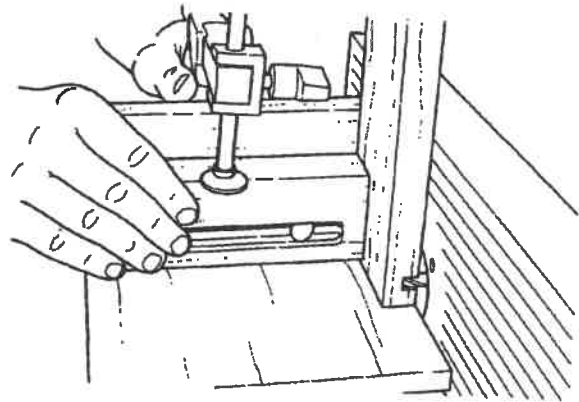


Fig. E-2

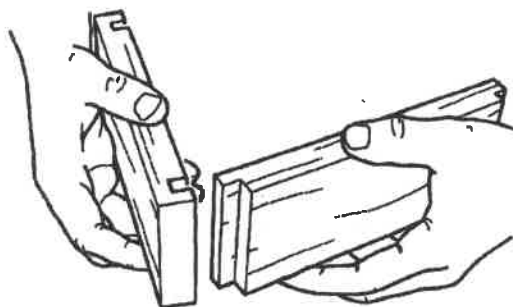


Fig. E-3

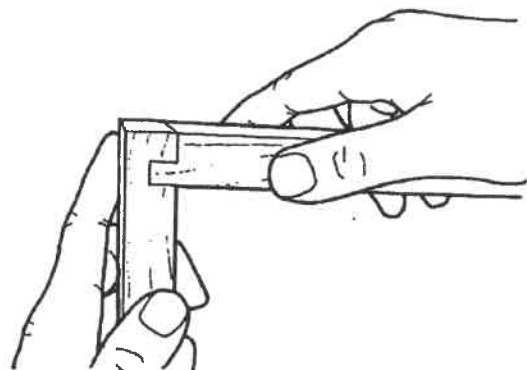


Fig. E-4

Dovetail Corner Bracket Joint

Introduction

The dovetail corner bracket joint appears to be the most difficult one included in this manual. However, most of its steps are similar to two joints— the bevel sliding dovetail and the housed/sliding dovetail. This joint illustrates how you can learn the basic principles of the joints described in this manual and create your own combinations and applications. The dovetail corner bracket joint not only looks impressive, especially in tables, but it also is very strong, since all four component joints are dovetails.

The thickness of the braces and rails is important, since they must receive the full profile of a dovetail— either as a pin or a socket. We recommend using boards at least $3/4$ " thick for the cross braces and rails.

Please follow these instructions:

PREPARE THE JOINT-MATIC

1. Install the feather board kit, another feather board on the working surface, and the stop rod kit.

2. Install an appropriate sized dovetail bit in the router, and set its depth of cut according to the specifications listed in the "Operations" introduction.

Install a $1/2$ " dovetail bit and set its depth of cut at $3/8$ ". This will give you an entry of cut of $5/16$ ".

MAKE TWO SOCKETS IN THE LEG STILE

3. Mark the leg with X's where you want to place the two rails. See Fig. E-6.

4. Place the leg against the infeed side of the bit, as in Fig. E-7. Place a rail between the stop rod and the leg. Make sure the rail does not touch the bit. Adjust the stop rod so that it touches the rail, then lock it, shown in Fig. E-7.

5. Turn on the Dust Collector and router. Use a push stick to make the socket cut in the leg, shown in Fig. E-8. Turn off the router and Dust Collector and remove the leg.

6. Assuming that the X's are located in the exact middle each side of the stile, simply rotate the leg a $1/4$ turn, and repeat Step 5. This will give you two equal dovetail sockets.

7. Remove the feather board kit, feather board and stop rod.

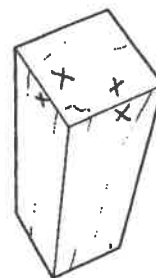


Fig. E-6

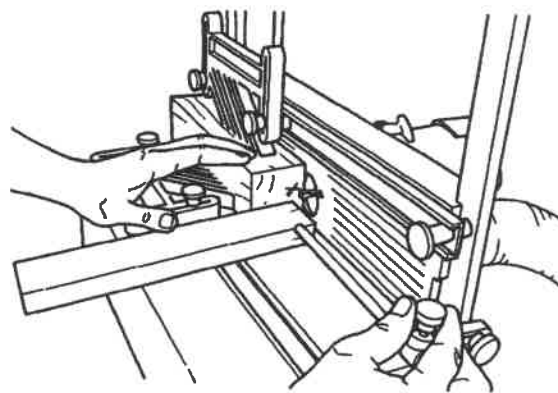


Fig. E-7

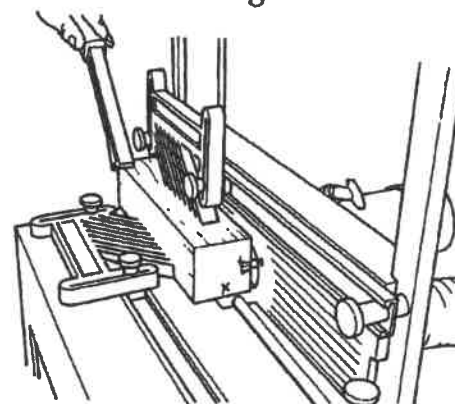


Fig. E-8

MAKE PINS IN THE RAILS

8. Lower the bit to "0" on the scale, where the center of the bit is level with the working surface.

9. Raise the bit to the center of the rail's thickness.

Since the rails in the example are $3/4"$ (or $12/16"$) thick, raise the bit $1/2 (12/16) = 6$ turns.

10. Now raise the bit according to this formula:

$1/2 (\text{bit diameter} + \text{entry of cut})$

Raise the bit:

$$\begin{aligned} 1/2 (1/2" + 5/16") &= 1/2 (8/16" + 5/16") \\ &= 1/2 (13/16) = 6-1/2 \text{ turns.} \end{aligned}$$

11. Install the guard (13) on the slide. Place the miter gauge in the miter channel. See Fig. E-9.

12. Turn on the Dust Collector and router. Make cut for the top of the pin. If there is material remaining on the top of the cut, raise the bit 2 or more turns, clean off this excess, then return the bit to its original position. Turn off the router and Dust Collector.

13. Repeat Step 12 for the other rail.

14. Remove the guard (13) from the slide. Lower the bit TWICE the number of turns calculated in Step 10.

Lower the bit $2 (6-1/2 \text{ turns}) = 13$ turns down.

15. Turn on the Dust Collector and router. Make the cut for the bottom of the pin, as shown in Fig. E-10. If there is material remaining below the cut, lower the bit 2 or more turns, clean off this excess, then return the bit to its original position. Turn off the router and Dust Collector.

16. Fit the rails in the leg, as illustrated in Fig. E-11. Notice that the two rails are not flush with the top of the leg.

17. Set the bit to "0" on the scale, where the center of the bit is level with the work surface.

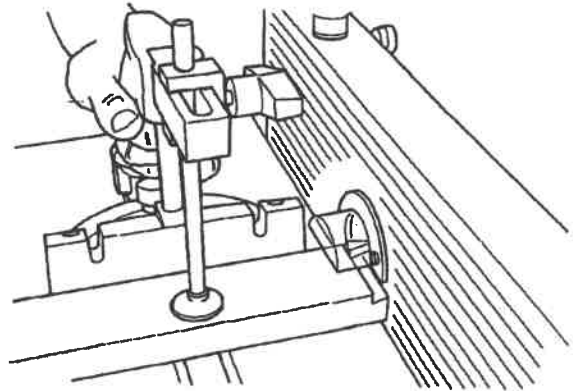


Fig. E-9

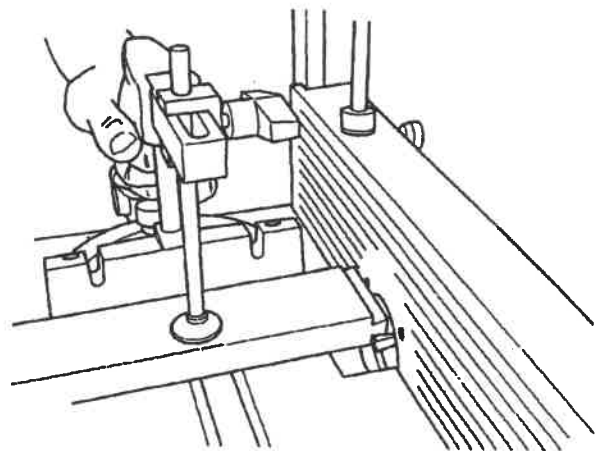


Fig. E-10

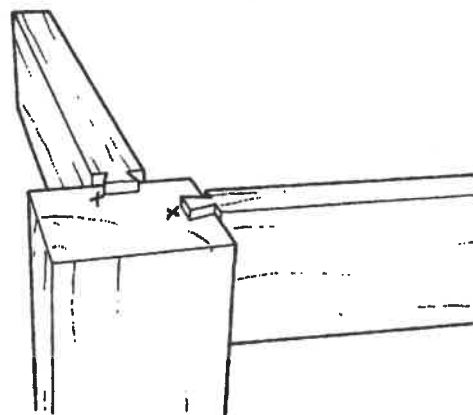


Fig. E-11

18. Turn on the Dust Collector and router. Make a cut on the bottom of each rail's pin, as in Fig. E-12. Turn off the router and Dust Collector.

19. Re-fit the rails in the leg. If they still protrude above the leg, raise the bit in 1/2 turn increments, then repeat Step 18 until the rails are level with the top of leg, as shown in Fig. E-13.

MAKE SOCKETS IN THE RAILS

20. Determine how far out on the rails you want to cut sockets and place the brace. This is your preference. See Fig. E-14. Mark this location, and place an "X" on the inside of each rail (this will help you remember on which side to cut the sockets).

Measure 5" from the stile on each rail.

NOTE

The further out the brace is on the rails, the more stable the joint will be. It is also easier to cut the brace. Where the brace is located is up to you.

21. Install the sliding table jig on the miter gauge. Place the miter gauge/sliding table jig in the miter channel. See Fig. E-15.

22. Place a rail in the sliding table jig, pin end down, with the inside "X" toward the bit.

23. Raise the bit to where you wish to place the socket.

24. Turn on the Dust Collector and router. Make the socket cut. Turn off the router and Dust Collector.

25. Repeat Step 24 for the other rail.

26. Re-fit the rails in the leg.

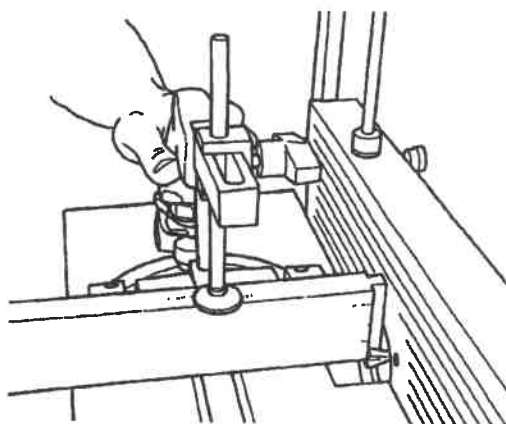


Fig. E-12

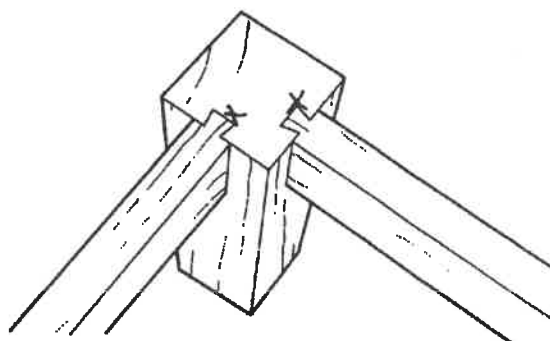


Fig. E-13

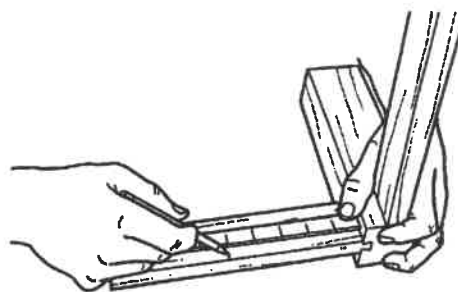


Fig. E-14

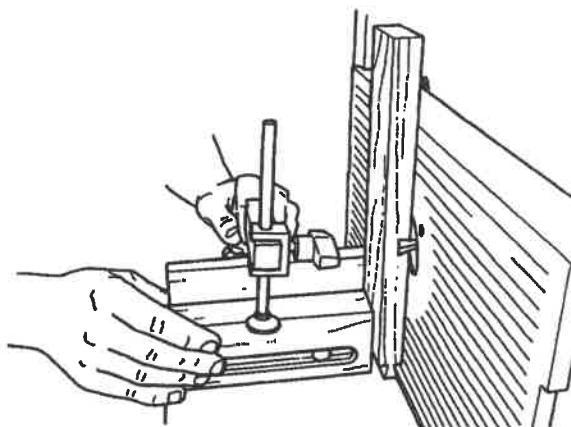


Fig. E-15

27. Use a precision square to assure both rails are squared with the leg. See Fig. E-16.

MAKE THE BRACE

28. Measure the distance between the inside bottom of each socket, as illustrated in Fig. E-17.

29. Cut your brace to the exact length measured in Step 28. The dimension measured in Step 28 will be the length of the brace from heel to heel. Make sure you have an accurate 45 degree bevel cut. Measure with an accurate combination square.

30. Install the bevel miter gauge in the miter channel. Set the bevel miter gauge with your stock. Use a precision 45 degree angle gauge to check the bevel miter gauge to 45 degrees from the slide, and to check your brace cuts.

31. Place the brace board in the bevel miter gauge, as in Fig. E-18. Raise the bit so that when it cuts, the bottom of the bit will cut exactly at the bottom edge (or heel) of the brace. If you are not sure you have the proper setting, you can set the bit to cut just a little above the edge (or heel), then lower the bit in 1/2 turn increments and make additional passes.

32. Turn on the Dust Collector and router. Make the cut as in Fig. E-18. If you have the correct height of the bit, make a cut on the other end of the brace. After cutting both ends of the brace, turn off the router and Dust Collector. Fig. E-19 illustrates the top of the pin cut on both ends of the brace.

33. Lower the bit according to this formula:

bit diameter + entry of cut

Lower the bit: $1/2" + 5/16"$

$8/16" + 5/16"$

$13/16 = 13$ turns down.

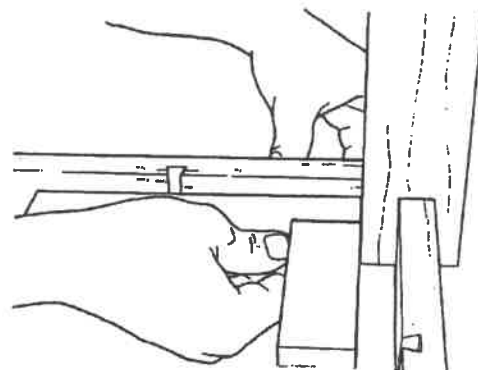


Fig. E-16

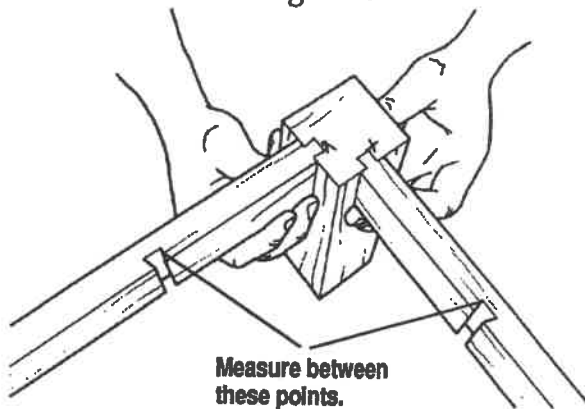


Fig. E-17

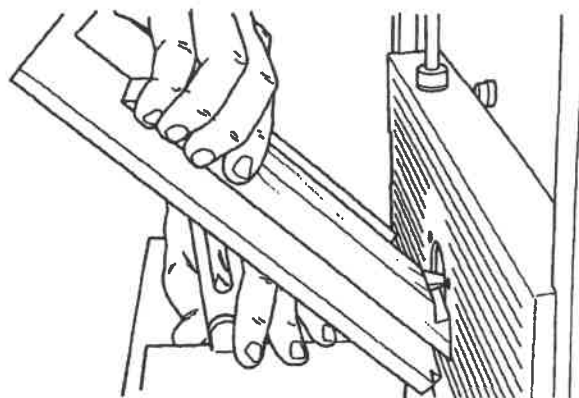


Fig. E-18

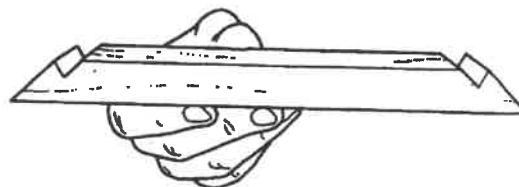


Fig. E-19

34. Turn on the Dust Collector and router. Make the cut, as shown in Fig. E-20 on both ends of the brace. If there is material remaining below the bit, lower the bit 2 or more turns and clean off the wood on both ends. Fig. E-21 illustrates the completed pins on each end of the brace.

Fig. E-22 shows the assembled dovetail corner bracket joint.

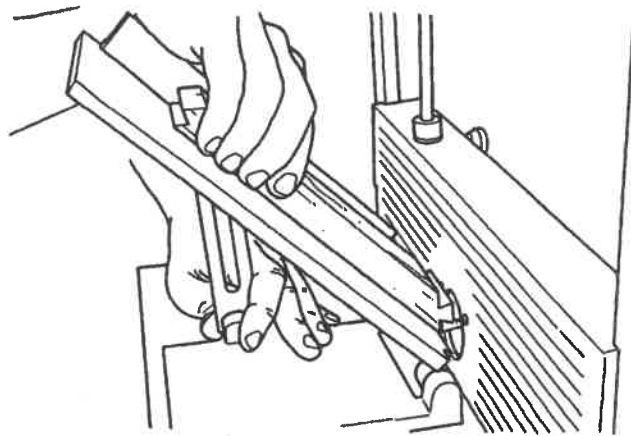


Fig. E-20

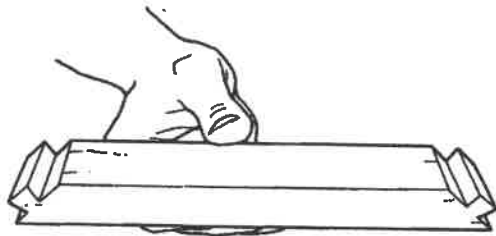


Fig. E-21

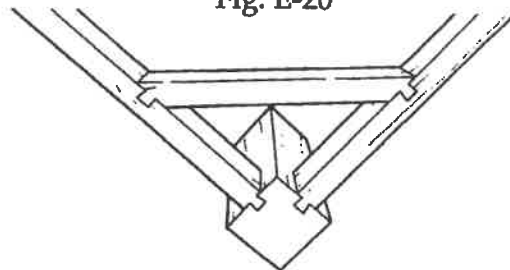


Fig. E-22

Other Uses for the Joint-Matic

This manual describes nine joints you can make with the Joint-Matic. You probably have noticed that many of the steps taken in making the joints have use in other applications. For example, the dado box corner joint shows the Joint-Matic cutting dados and rabbets. The tongue and groove joint illustrates how the Joint-Matic can make grooves and splines.

Other joints can give you other ideas how to use the Joint-Matic for various projects. Fig. E-23 shows the Joint-Matic making a profile cut on a picture frame. Fig. E-24 demonstrates how to mold a board edge, and Fig. E-25 shows an end grain cut.

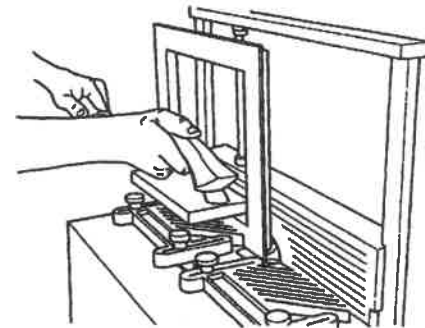


Fig. E-23

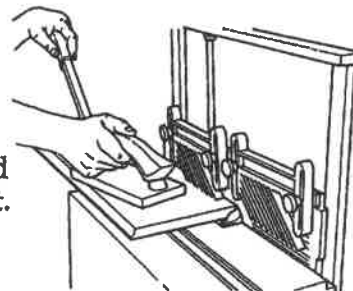


Fig. E-24

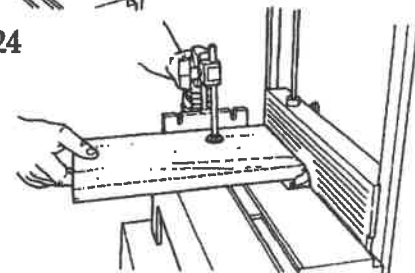


Fig. E-25

However many uses the Joint-Matic has for woodworking projects, you must always follow the Safety Rules, including stock and bit size limits listed in the front of this manual.

If you wish to use piloted router bits, the pilot must not be above the Joint-Matic work surface. To make sure that it is flush or below the work surface, place a straightedge over the pilot and on the work surface. If the pilot touches the straightedge, lower the slide until the pilot no longer touches it.

MAINTENANCE

Regular maintenance will help ensure the continued reliable and safe use. If you have any questions about maintenance procedures, visit your local Shopsmith Showroom. If no Showroom is in your area, contact Customer Services.

WARNING

Turn off and unplug your Joint-Matic before attempting any maintenance procedures.

CAUTION

Remove the router bit, fences, fixtures, miter gauges, the dust collector hose and any other accessories mounted on the Joint-Matic before beginning maintenance operations.

CLEAN YOUR EQUIPMENT

- Sawdust and other wood particles accumulate on the Joint-Matic as you work with the equipment. This residue can affect its performance. Clean the Joint-Matic, router assembly and stand daily or more often, depending on use, with your shop vacuum.
- After vacuuming, clean all major metal parts of your equipment — except the router motor and slide screw. Use a clean, slightly damp cloth to wipe all residue from the miter gauge, feather boards, stop gauges and other accessories.
- Clean the router motor as instructed in the owner's manual for it.
- Clean the slide screw with a dry, clean cloth daily, or as often as needed.
- Check the dust collector housing daily for an accumulation of dust and debris. As necessary, remove this housing and clear away any residue.

LUBRICATE YOUR EQUIPMENT

- The Joint-Matic needs infrequent lubrication. Heavy use of the equipment warrants greater attention to both cleaning and lubricating demands, however.
- The slide screw and guides should be lubricated monthly (or more often, with heavy use) with a dry lubricant, wax or silicon. Do not use machine oil or other liquid lubricants, as these attract sawdust and dirt.

WAX YOUR EQUIPMENT

After you thoroughly clean your Joint-Matic, wax the worktable and miter rail. Apply wax sparingly and buff thoroughly, so no leftover wax mixes with sawdust and other debris and impedes the movement of the miter gauge or workpieces or leaves residue on the stock.



Use only paste floor wax or paste furniture wax. Do NOT use car wax, spray furniture wax or silicone. Do NOT use wax or solvents on plastic parts.

INSPECT THE ROUTER

Refer to your router's owner's manual for interval maintenance of the router and bits. Generally, sharpen bits as needed. After every five hours of running time, the router should be thoroughly cleaned and all alignments should be checked. Also, make sure all hardware is secure. These procedures should be done more often under hard-use conditions.

INSPECT ALL OTHER HARDWARE

Each time that you use your Joint-Matic you should inspect it, the mounting stand and all accessories to see that they are clean and in good repair and that all screws, nuts and other fasteners are secure.

STORAGE

If the equipment is to be stored for an extended period or under unusually humid or corrosive conditions, spray or wipe all ferrous parts with a rust-inhibiting light oil. Remove this oil with mineral spirits and re-wax the equipment before using it again.

TROUBLESHOOTING

This Troubleshooting Guide will help you determine problem areas and solve them. For more help, visit your local Shoptsmith Showroom. If none is in your area, call Customer Services. See the back cover for how to contact Shoptsmith.

TROUBLESHOOTING GUIDE

Problem	Possible Causes	Solution
Excessive vibration	<ul style="list-style-type: none"> • Loose hardware or router. • Loose or improper bit. • Wrong feed rate. • Substandard workpiece. 	<ul style="list-style-type: none"> • Properly tighten all hardware & fasteners, plus secure the router. • Check bit to see that it's recommended for this task. Secure bit in collet. • Feed workpiece smoothly at moderate rate. • Discard substandard workpiece.
Router motor overheats	<ul style="list-style-type: none"> • Dull, defective or improper bits. • Improper feed rate. • Too deep a cut. 	<ul style="list-style-type: none"> • Inspect & sharpen dull bits; discard defective bits; check to see if correct bit is being used. • Reduce feed rate. • Reduce depth of cut.
Inaccurate routing	<ul style="list-style-type: none"> • Assembly hardware loose. • Bit loose in the collet. • Bit defective. • Too deep a cut. • Miter gauge not properly seated. • Defective workpiece. • Improper alignment. • Improper setup for Operations. 	<ul style="list-style-type: none"> • Properly tighten hardware, router collet. • Inspect & correct or replace bit or collet. • Replace bit. • Reduce depth of cut for each pass. • Adjust miter slot extrusion for smooth operation. • Reduce depth of cut & slow rate of feed. • Inspect workpiece for irregularities. Discard it if any are seen or suspected. • Refer to Alignment section in this manual.
Miter gauge sticks or is inaccurate	<ul style="list-style-type: none"> • Incorrect miter gauge. • Slot extrusion adjusted too snug/ too loose. • Dust or debris in the miter channel. 	<ul style="list-style-type: none"> • Inspect miter gauge to see if it is a Shoptsmith miter gauge. • Adjust slot extrusion to a proper & secure fit for miter gauge. • Clean miter channel & slot extrusion.

Serving Your Needs

Your Shopsmith equipment is covered by the **Shopsmith Gold Medal Buyer Protection Plan**.

This plan includes a 30-day money-back guarantee, a full one-year warranty, and a lifetime reconditioning program.

30-Day Money-Back Guarantee

We guarantee your complete satisfaction! You can try the equipment for 30 days at no risk before you decide whether to keep it or not. Use it to make as many projects as you like. Compare it, feature for feature, with other equipment. Then, if the equipment isn't everything we say, go to your nearest Shopsmith Showroom or call Customer Services and we'll advise you how to return it for a prompt and complete refund. We'll even pay for shipping.

Full On-Year Warranty

Your equipment is guaranteed against all defects in parts and workmanship for a period of ONE FULL YEAR from the date of receipt. Here are the details:

Shopsmith warrants to the owner of Shopsmith woodworking equipment that the equipment will be free of manufacturing defects in materials and workmanship for a period of one year from the date of receipt. All claims must be submitted in writing within one month after expiration of the one-year warranty period. Shopsmith shall, by repair of, or at its option replacement, remedy any defect or malfunctions covered by this warranty. This warranty excludes and does not cover defects, malfunctions, or failures of your Shopsmith equipment which are caused by damage while in your possession or that of a previous owner or by unreasonable use, including your failure or the failure of any previous owner to provide reasonable and necessary maintenance.

Personal injury or property damage may result if equipment is interchanged with non-Shopsmith brand equipment. Therefore, Shopsmith, Inc. disclaims all liability and excludes all warran-

ties of merchantability and fitness for a particular purpose if this equipment is used with a non-Shopsmith brand unit.

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IN NO EVENT SHALL SHOPSMITH BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES. Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above limitation of consequential or incidental damages may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Lifetime Reconditioning Program

Our equipment is designed for years of constant, rugged, uninterrupted operation. However, to ensure the continued usefulness of your unit, we offer a unique **Lifetime Reconditioning Program**.

If at any time, regardless of the age of your equipment, you can take it to a Shopsmith Showroom or send it to us (round trip shipping at owner's expense), and we'll re-build it and touch up the paint. We'll replace wearing parts such as bearings, seals, and belts. Your reconditioned equipment will come back to you with a new 90-day full warranty. Reconditioning or repair will be done for a cost that will not exceed one-third of the current list price of the equipment at the time of repair. If parts other than normal wearing parts need replacement, an estimate will be submitted to the owner for approval.

Warranted Service

To repair or replace a part in the equipment while it's still under warranty, go to your nearest Shopsmith Showroom or Customer Services. They will instruct you where to send the part of your equipment. If the warranty is applicable, the part will be repaired at no charge.

Out-of-Warranty Service

If your equipment is out of warranty and needs service, see your Shopsmith Showroom or call Customer Services for instructions how you can have the part repaired at our Showroom or Factory for a

fee. We will help you diagnose the problem, give you an estimate of the cost, and instruct you where to send the part or equipment for repair.

Shopsmith Showrooms carry a limited number of replacement parts and can perform some repairs. Call ahead to see if they can provide the part or the service you need.

How to Order Parts

To order replacement parts, first consult the Parts List in this manual. Then write or call for current price information.

How to Return Parts

Should you need to return the equipment, see your Shopsmith Showroom or call Customer Services for packing and shipping information.

Customer Services

Where to Write—Send inquiries to: Shopsmith, Inc.
Customer Services
3931 Image Drive
Dayton, Ohio 45414

Where to Phone—Shopsmith maintains toll-free telephone numbers during normal business hours.

For service, call:
1-800-762-7555 (Continental U.S., Hawaii, Alaska, Puerto Rico and U.S. Virgin Islands)
1-800-268-3998 (Canada)
1-513-898-6070 (Dayton, Ohio area)

To place an order, call:
1-800-543-7586 (Continental U.S., Hawaii, Alaska, Puerto Rico and U.S. Virgin Islands)
1-800-268-3998 (Canada)
1-513-989-6070 (Dayton, Ohio area)

When you write or call, tell us your **Customer Number** and the **Date Code** of your equipment. (Your customer number appears on the invoice and the mailing labels of the literature we send you. The date code is stamped on the equipment.) Please write the numbers in the space provided here.

Customer No. _____

Date Code _____



Shopsmith Inc.
3931 Image Drive
Dayton, Ohio 45414

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