4710 and 4750 Shapers

Owners Manual

(4750 - Sliding Table Shaper Shown)

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M-4710 8/2003

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Warranty

Oliver makes every effort possible to assure that its equipment meets the highest possible standards of quality and durability. All products sold by Oliver are warranted to the original customer to be free from defects for a period of 2 (two) years on all parts, excluding electronics and motors, which are warranted for 1 year. Oliver's obligation under this warranty shall be exclusively limited to repairing or replacing (at Oliver's option) products which are determined by Oliver to be defective upon delivery F.O.B. (return freight paid by customer) to Oliver, and on inspection by Oliver. This warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, unauthorized repairs, alterations, lack of maintenance, acts of nature, or items that would normally be consumed or require replacement due to normal wear. In no event shall Oliver be liable for death, personal or property injury, or damages arising from the use of its products.

Warning

Read this manual thoroughly before operating the machine. Oliver Machinery disclaims any liability for machines that have been altered or abused. Oliver Machinery reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they may deem necessary for any reason whatsoever.

For More Information

Oliver Machinery is always adding new Industrial Woodworking products to the line. For complete, up-to-date product information, check with your local Oliver Machinery distributor, or visit www.olivermachinery.net

WARNING

Read this manual completely and observe all warning labels on the machine. Oliver Machinery has made every attempt to provide a safe, reliable, easy-to-use piece of machinery. Safety, however, is ultimately the responsibility of the individual machine operator. As with any piece of machinery, the operator must exercise caution, patience, and common sense to safely run the machine. Before operating this product, become familiar with the safety rules in the following sections.

- **Always keep guards in place and in proper operating condition**

1. **If you are not properly trained** in the use of a shaper do not use until the proper training has been obtained.
2. **Read, understand and follow** the safety instructions found in this manual. Know the limitations and hazards associated with this machine.
3. **Electrical grounding:** Make certain that the machine frame is electrically grounded and that a ground lead is included in the incoming electrical service. In cases where a cord and plug are used, make certain that the grounding plug connects to a suitable ground. Follow the grounding procedure indicated in the National Electrical Code.
4. **Eye safety:** Wear an approved safety shield, goggles, or glasses to protect eyes. Common eyeglasses are only impact-resistant, they are not safety glasses.
5. **Personal protection:** Before operating the machine, remove tie, rings, watch and other jewelry and roll up sleeves above the elbows. Remove all loose outer clothing and confine long hair. Protective type footwear should be used. Where the noise exceeds the level of exposure allowed in Section 1910.95 of the OSHA Regulations, use hearing protective devices. Do not wear gloves.
6. **Guards:** Keep the machine guards in place for every operation for which they can be used. If any guards are removed for maintenance, DO NOT OPERATE the machine until the guards are reinstalled.
7. **Work area:** Keep the floor around the machine clean and free of scrap material, saw dust, oil and other liquids to minimize the danger of tripping or slipping. Be sure the table is free of all scrap, foreign material and tools before starting to cut. Make certain the work area is well lighted and that a proper exhaust system is used to minimize dust. Use anti-skid floor strips on the floor area where the operator normally stands and mark off machine work area. Provide adequate work space around the machine.
8. **Operator position:** Maintain a balanced stance and keep your body under control at all times.
9. **Before starting:** Before turning on machine, remove all extra equipment such as keys, wrenches, scraps, and cleaning rags away from the machine.
10. **Careless acts:** Give the work you are doing your undivided attention. Looking around, carrying on a conversation, and “horseplay” are careless acts that can result in serious injury.
11. **Disconnect all power sources:** Before performing any service, maintenance, adjustments or when changing cutters. A machine under repair should be RED TAGGED to show it should not be used until the maintenance is complete.
12. **Short stock:** Never shape stock less than 12 inches in length without special fixtures. When practical, shape longer stock and cut to size.
13. **12 inch rule:** When shaping, never allow your hands to come closer than 12 inches to the cutters.
14. **Collars:** When shaping with collars, the collar must have sufficient bearing surface. The work must also be fairly heavy in proportion to the cut being made. Do not use short, lightweight stock when shaping against collars.

15. **The opening** between the fence plates should only be enough space to clear the cutter.

16. **Edge shaping:** Always use the mitre gauge and clamping mechanism when edge shaping stock less than 6" wide.

17. **Feed stock** opposite to the direction of the cutter rotation. Never back stock out of the cutter once the cut has been started. Instead, pull the stock straight back away from cutter and begin the cut again.

18. **Make sure** the spindle and the draw bar are tightened on the arbor.

19. **Safety lock washer:** Never operate the shaper without the safety locking keyed washer located immediately under the spindle nut. This prevents the nut from coming loose when the spindle is running in a counterclockwise direction. Do not substitute any other type washer in place of the safety lock washer.

20. **If you are not** thoroughly familiar with the operation of spindle shapers, obtain advice from your supervisor, instructor or other qualified person.

21. **Maintain cutting tools in top condition:** Keep blades sharp and clean for safe and best performance. Dull tools increase noise levels and can cause kickbacks and glazed surfaces. Check the condition and adjustment of the tools before making any cuts. Never use a tool that is not balanced and rated for the selected RPM.

22. **Hand safety:** Do not clear chips and sawdust with hands; use a brush.

23. **Job completion:** If the operator leaves the machine area for any reason, the shaper should be turned "off" and the cutter should come to a complete stop before their departure. In addition, if the operation is complete, they should clean the shaper and the work area. NEVER clean the shaper with power "on" and never use hands to clear sawdust and debris; use a brush.

24. **Replacement parts:** Use only genuine Oliver Machinery factory authorized replacement parts and accessories; otherwise the warranty and guarantee is null and void.

25. **Misuse:** Do not use this Oliver shaper for other than its intended use. If used for other purposes, Oliver disclaims any real or implied warranty and holds itself harmless for any injury or damage which may result from that use.

26. **Drugs, alcohol and medication:** Do not operate this machine while under the influence of drugs, alcohol, or any medication.

27. **Health hazards:** Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
    - Lead from lead-based paint.
    - Crystalline silica from bricks and cement and other masonry products.
    - Arsenic and chromium from chemically-treated lumber.

    Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area, and work with approved safety equipment, such as those dust masks that are specifically designed to filter out microscopic particles.

Familiarize yourself with the following safety notices used in this manual:

CAUTION: (This means that if precautions are not heeded, it may result in minor or moderate injury and/or possible machine damage)

WARNING: (This means that if precautions are not heeded, it could result in serious injury or possibly even death).

Table of Contents

Specifications

Model (Stationary Table)	**4710**
Stock No. 4710.001	5 HP, 1 Ph, 220V Only
Stock No. 4710.002	5 HP, 3 Ph, 220/440V Prewired 220V
Table Dimensions	41 1/2" x 29 1/2"
Table Height	34-1/4"H
Spindle Speed (RPM)	3,000, 4,000, 6,000, 8,000, 10,000
Spindle Direction	Reversible
Maximum Tool Diameter Below Table	7"
Maximum Tool Diameter Above Table	10"
Vertical Spindle Travel	6"
Spindle Diameter	1/2", 3/4", 1", 1-1/4"
Dust Collector Port	4"
Minimum CFM Required	800
Shipping Dimensions	45"L x 38"W x 42"H
Gross Weight	850 lbs.

Model (Sliding Table)	**4750**
Stock No. 4750.001	5 HP, 1 Ph, 220V Only
Stock No. 4750.002	5 HP, 3 Ph, 220/440V Prewired 220V
Table Dimensions	41 1/2" x 29 1/2"
Table Height	34-1/4"H
Sliding Table Travel	39-1/2"
Sliding Table Size	9"W x 41-1/2"L
Spindle Speed (RPM)	3,000, 4,000, 6,000, 8,000, 10,000
Spindle Direction	Reversible
Maximum Tool Diameter Below Table	7"
Maximum Tool Diameter Above Table	10"
Vertical Spindle Travel	6"
Spindle Diameter	1/2", 3/4", 1", 1-1/4"
Dust Collector Port	4"
Minimum CFM Required	800
Shipping Dimensions	45"L x 38"W x 42"H
Gross Weight	850 lbs.

Contents of the Shipping Container

Oliver Shaper

1. Shaper (sliding table or stationary table)
1. Fence Assembly
1. Fence Assembly Cover
1. Miter Gauge Assembly

Toolbox Contents

4. Spindle (1-1/4")
1. Grease Gun
6. Open End Wrenches
10. Hex Angle Wrenches
1. Spindle Nut Wrench
3. Spindle Wrenches

Fence and Guard Assembly Box

1. Hexagonal Support Rod
3. Hexagonal Supports
1. Hold Down Guard
1. Spring Guard
1. Clear Plastic Guard
1. Stop Block
2. Small Knobs
2. Fence Supports
1. Draw Bar
2. T-Handles
1. Large Knob
2. Fence Handles
2. Fences

* There is a stop support rod (not shown) that is packed loose in the cabinet located on the lip where the stand meets the base.

Uncrating the Machine

Uncrate the machine and inspect the unit for signs of shipping damage. If damage is found, contact your dealer immediately. For protection against shifting during transport, the base of the shaper was bolted to the shipping pallet. Remove these bolts. Retain all packaging materials in case it becomes necessary to ship the machine to another site.

Machine Preparation and Setup

Clean all rust protected surfaces with a good commercial solvent. Do not use acetone, gasoline, lacquer thinner or any type of flammable solvent, or a cleaner that may damage paint. Cover cleaned surfaces with WD-40 or a 20W machine oil.

Lifting the Shaper

A forklift can be used to lift the machine from underneath, or with a sling underneath the table.

The shaper must be positioned on a smooth, level surface leaving enough room for maintenance and feeding stock into the machine.

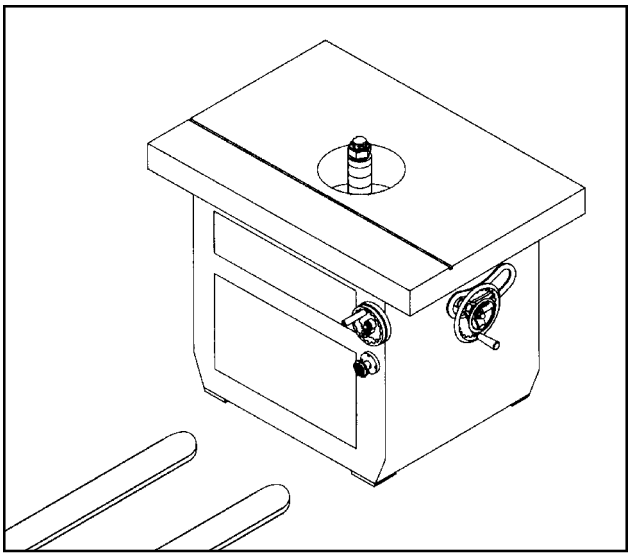


Figure 1

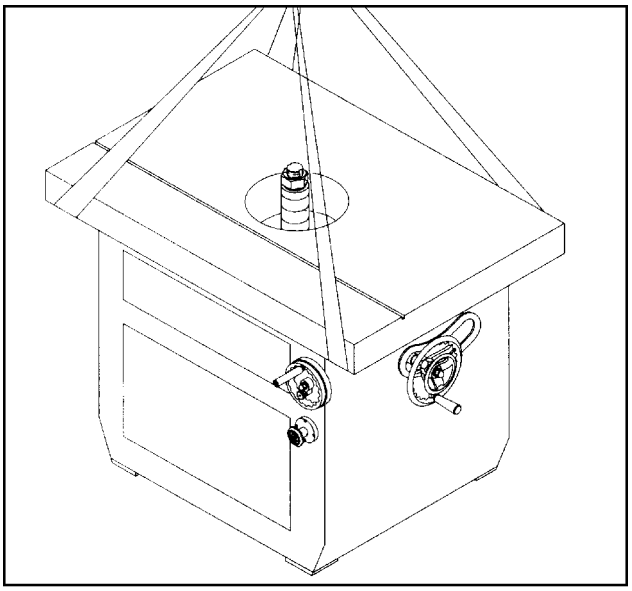


Figure 2

! WARNING

Disconnect machine from the power source before any maintenance, service or assembly is performed. Failure to comply may cause serious injury!

Fence Assembly

1. Place fence assembly (A, Figure 3) on the table.

2. Secure fence with two T-handles and washers (B, Figure 3).

   Note: There are two sets of holes on the table available for securing the fence.

3. Mount the cover plate (C, Figure 3) using the two locking knobs (D, Figure 3) and flat washers.

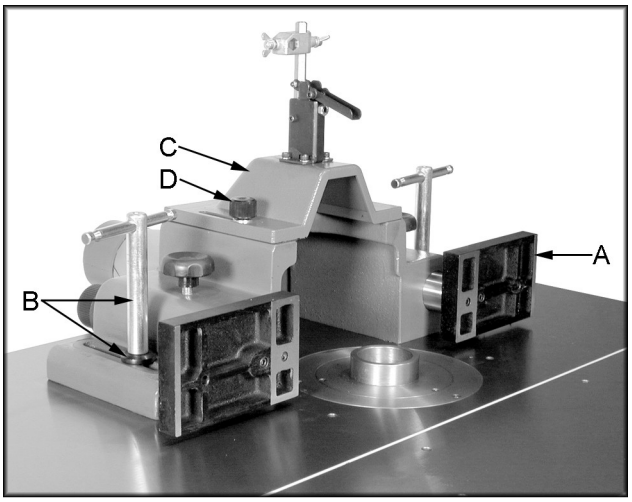


Figure 3

4. Fasten bar (A, Figure 4) to the front of the fence support (B, Figure 4) using one locking handle and washer (C, Figure 4).

5. Slide aluminum fence (D, Figure 4) onto the bar.

6. Repeat for opposite side.

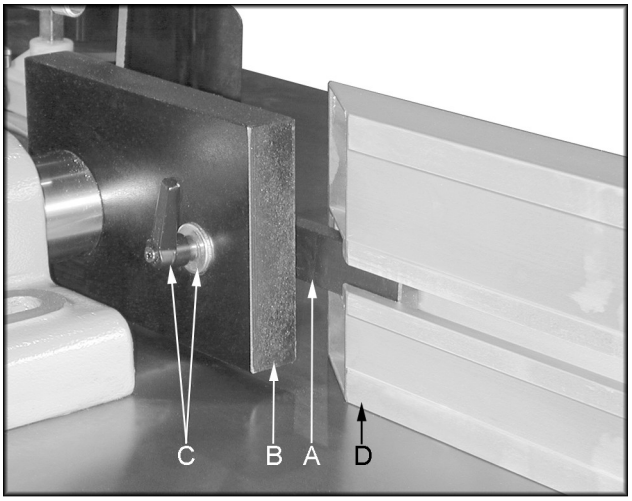


Figure 4

Mitre Gauge

1. Mount the miter gauge (E, Figure 5) to the sliding table by threading the rod (F, Figure 5) and handle (G, Figure 5) into one of the three sets of available threaded holes.

   Note: The rod and handle supplied with the stationary table mount to the mitre bar not the table.

2. Insert stop rod (H, Figure 5) into the miter gauge and secure in place with two knobs (I, Figure 5). Slide the stop on to the rod and secure in place with knob (J, Figure 5).

   Note: The miter gauge supplied with the stationary table does not bolt to the table. It slides along the mitre slot.

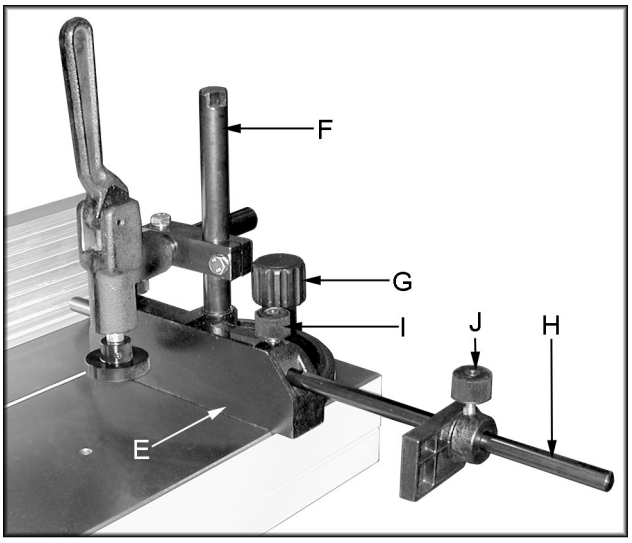


Figure 5

Guard and Hold Down Assembly

1. Slide hexagonal rod (K, Figure 6) into the clamp and secure in place with wing nut (L, Figure 6).

2. Slide two clamps (M, Figure 6) onto the hold-down (N, Figure 6).

3. Slide the clear shield (O, Figure 6) into the lower clamp and slide the hold-down assembly onto the hexagonal rod (K, Figure 6) though the upper clamp.

4. Slide clamp (P, Figure 6) onto spring guard (Q, Figure 6) and slide assembly onto the hexagonal rod (K, Figure 6).

Note: The guard assembly can be pivoted out of the way by raising the locking lever (R, Figure 6). It is shown in the locked position.

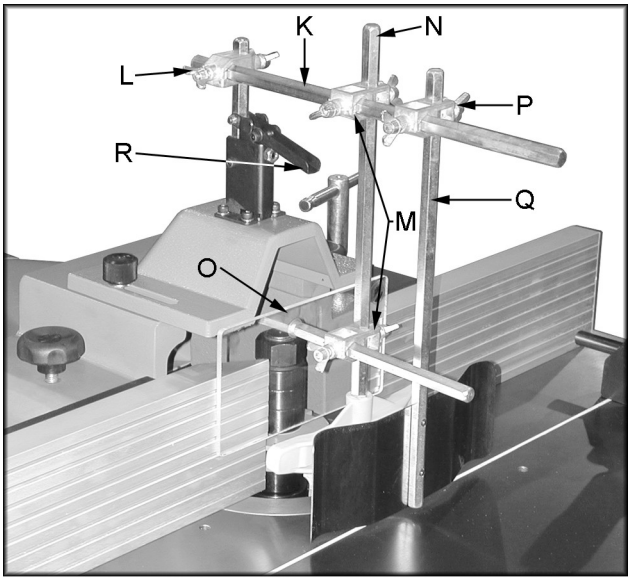


Figure 6

Installing Spindles

! WARNING

Disconnect machine from the power source before any maintenance, service or assembly is performed. Failure to comply may cause serious injury!

1. Remove the three socket head cap screws holding the smaller table insert in place.

2. Raise the spindle shaft by turning the handwheel (A, Figure 7) until the insert can be removed.

3. Thoroughly clean the taper of the spindle (B, Figure 8) and the internal taper of the shaft (C, Figure 8) using a soft cloth moistened with kerosene or mineral spirits.

4. Thread the shorter threaded end of the draw bar (D, Figure 8) into the threaded hole in the bottom of the spindle. Remove the two lock nuts and the special bevel washer from the other end of the draw bar.

5. Carefully insert the draw bar and spindle down through the shaft as shown in Figure 8. Make sure the tang on the spindle is engaged with the notch, and thread spindle nut (E, Figure 8) onto threads.

6. Turn the spindle lock knob (F, Figure 7) counter-clockwise and push in to engage the spindle lock.

   Note: you may need to rotate the spindle by hand until the lock engages.

7. Use the supplied spanner wrench (G, Figure 9), to tighten the spindle nut (H, Figure 9).

Figure 7

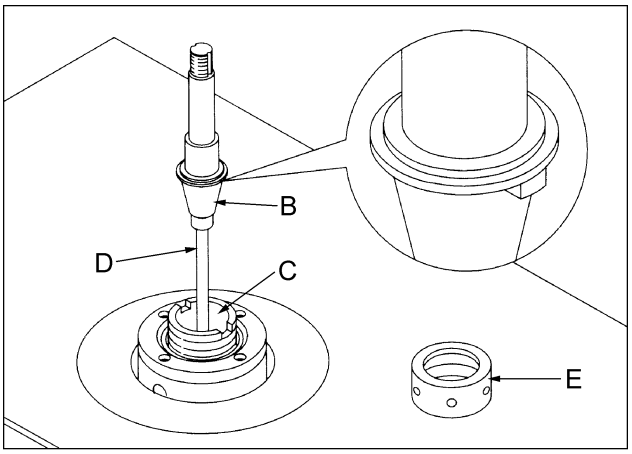


Figure 8

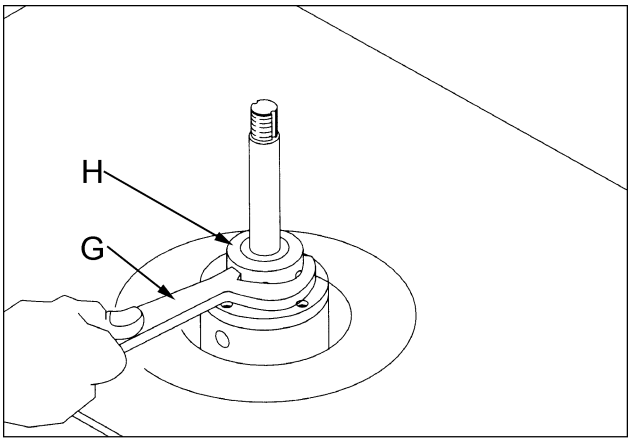


Figure 9

8. Open the cabinet door and place the special bevel washer (A, Figure 10) on the bottom of the draw bar as shown in Figure 10.

9. Assemble and securely tighten the hex nut (B, Figure 10) with a 19mm wrench. Tighten the second hex nut (C, Figure 10) against the upper nut while holding the upper nut in place.

10. Disengage the spindle lock.

Electrical Connections

! WARNING

Electrical connections and wiring must be done by a qualified electrician. The machine must be properly grounded. Failure to comply may cause serious injury!

This shaper is available in both 1-Phase and 3-Phase versions.

Electrical Connections for a 3-Phase Unit

This shaper is 3-Phase, 220V/440V **pre-wired 220V**. If you need to switch the shaper from 220V to 440V have a qualified electrician make the changes.

Make sure the voltage of your power supply matches the specifications on the motor plate of the machine.

1. **Disconnect machine from power source!**

2. Remove the screws that secure the cover to the connection box.

3. Insert the power cable through strain relief, and attach the wires to the terminals.

4. Re-install the connection box cover. With 3Ph power verify the motor is turning in the proper direction. Turn the machine on and make sure the direction of the shaft rotation is correct. Looking down on the top of the spindle, the spindle should be turning counterclockwise when the rotation switch is in the forward position. If it is not, disconnect the machine from the power source and reverse any two incoming power leads.

5. When wiring is completed, tape all power box joints to keep out dust.

Electrical Connections for a 1-Phase Unit

This shaper is 1-Phase, 220V only. Oliver Machinery recommends using a dedicated circuit.

Make sure the voltage of your power supply matches the specifications on the motor plate of the machine.

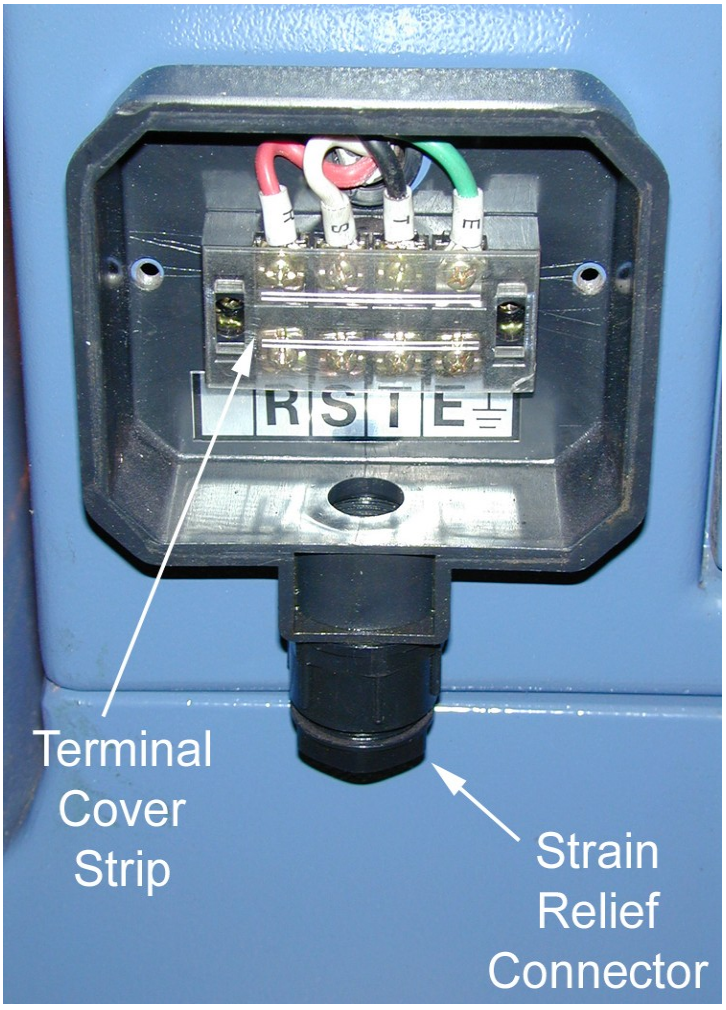
1. **Disconnect machine from power source!**

2. Remove the screws that secure the cover to the connection box.

3. Insert the power cable through strain relief, and attach the wires to the terminals.

4. Re-install the connection box cover.

5. When wiring is completed, tape all power box joints to keep out dust.



Controls

A. **Emergency Stop:** Stops all electrical functions of machine, but the saw still has power. To reset rotate switch clockwise until the button pops out.

B. **Power Switch:** Stops and starts the spindle. Will not work when "Emergency Stop" is engaged, or if the spindle rotation switch is in the "Off" position. **Caution!** make sure the spindle lock is disengaged, or damage to the machine may occur.

C. **Spindle Rotation Switch:** Changes the spindle rotation from "Forward", to "Stop" to "Reverse". **Caution!** only change the spindle rotation after the spindle has come to a complete stop, or damage to the machine may occur.

D. **Spindle Rotation Lock:** Turn the knob counter-clockwise and push in to lock the spindles rotation. You may need to rotate the spindle by hand until the lock engages. **Caution!** never engage the spindle lock while it is moving.

E. **Spindle Vertical Travel Lock:** Turn the handle clockwise to lock the "Up-Down" spindle travel

F. **Spindle Vertical Travel Handwheel:** Raises and lowers the spindle. One revolution of the handwheel equals 2.5 mm or 0.1 inch.

G. **Spindle Vertical Travel Dial Indicator:** Use as a reference when micro-adjusting the spindle.

H. **Handwheel Lock:** Tighten the knob to lock the handwheel in place.

I. **Fence Micro-Adjust:** Turn the micro-adjust knob to position the fences individually.

J. **Table Lock:** To lock the table in place rotate the lock until the pin engages the table. Pull the lock and rotate to disengage the pin, (found only on the 4750 sliding table shaper).

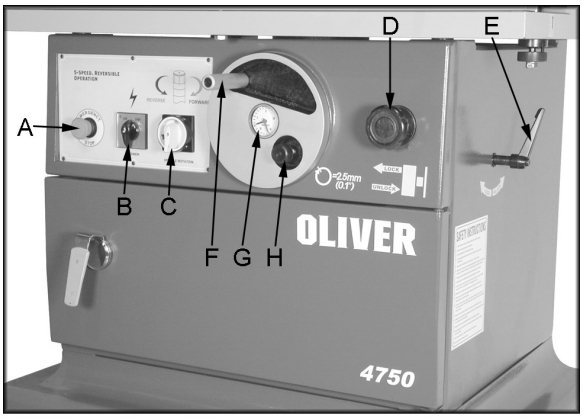


Figure 11

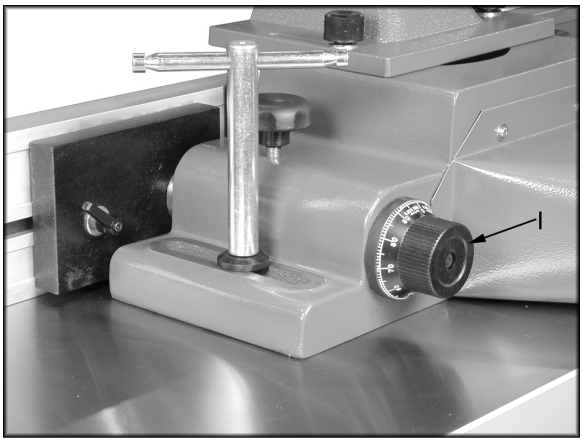


Figure 12

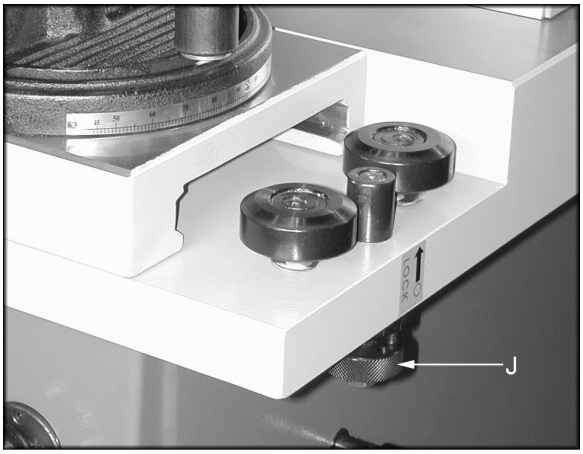


Figure 13

Speed Change and Belt Adjustment

Your machine is supplied with a 5-step pulley system that provide spindle speeds of 3000, 4000, 6000, 8000 and 10000 RPM.

A speed chart, shown in Figure 14, is located on the inside of the front cabinet door for easy reference of the belt position on the pulleys for the five speeds available.

Check machine speed setting before operating. Make sure cutter meets or exceeds speed rating of tool.

To change the speed and adjust the proper belt tension, proceed as follows:

1. **Disconnect machine from power source.**

2. Open front cabinet door and pull belt tension lever (A, Figure 15) towards you to loosen belt tension.

3. Move the belt (B, Figure 15) to the desired position on the pulleys.

4. When the belt is positioned properly, move the tension lever to the left.

Proper belt tension is achieved when the belt midway between the pulleys can be deflected using moderate finger pressure.

Installing Cutters

! WARNING

Always place the "keyed" washer on the spindle before threading the nut! Failure to comply may cause serious injury!

1. **Disconnect machine from power source.**

2. Engage the spindle lock.

3. Place desired cutter (C, Figure 16) and spindle collars (D, Figure 16) on the spindle as shown in Figure 16.

4. Install keyed washer (E, Figure 16) and tighten nut (F, Figure 16) using supplied wrench.

Dust Collection

The dust port is located at the back of the fence assembly. The dust port has a 4" diameter. Make sure the dust collection system has sufficient capacity and suction for your shaper. Always use dust collection

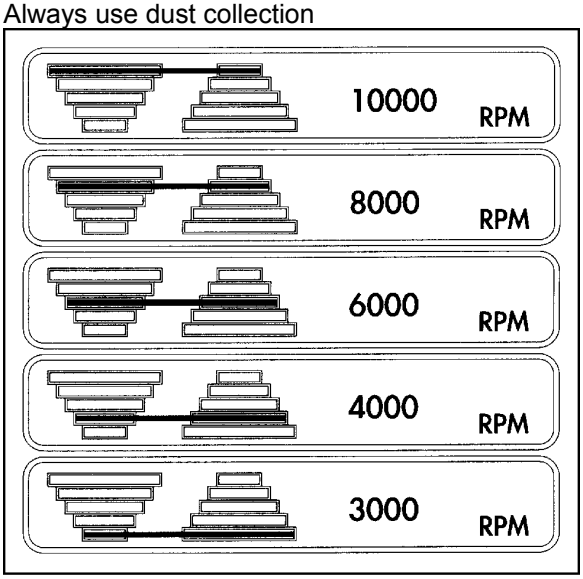


Figure 14

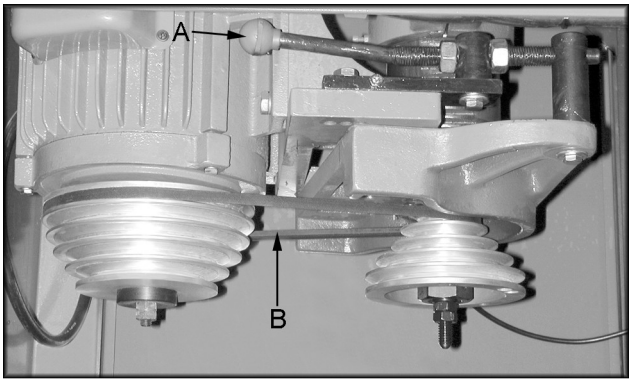


Figure 15

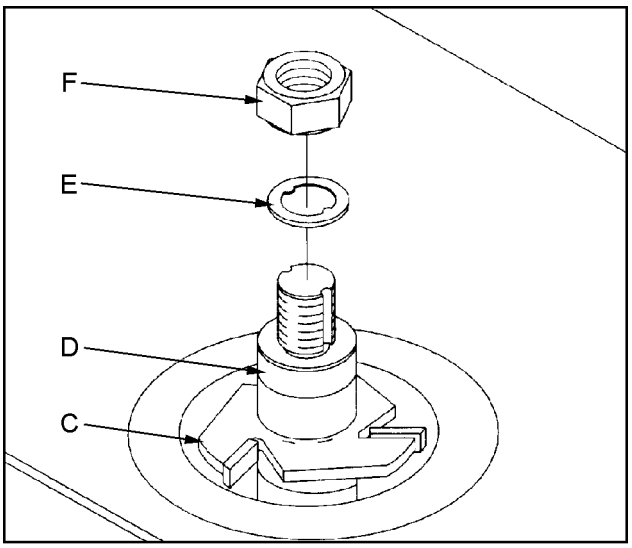


Figure 16

Straight Work

! WARNING

Keep guards in place and in working order. Always use fence assembly when the work permits. Failure to comply may cause serious injury!

Using the fence is the safest and most satisfactory method of shaping, and it should always be used when the work permits. Almost all straight work can be done with the fence.

1. For normal work, where a portion of the original edge of the stock is not touched by the cutter, both the infeed and outfeed fences are in a straight line, as shown in Figure 17.

2. When the shaping operation removes the entire edge of the stock, e.g. in jointing or making a full bead, the shaped edge will not be supported by the outfeed fence when both fences are in line, as shown in Figure 18. In this case, the stock should be advanced to the position shown in Figure 18 and stopped. The outfeed fence should then be moved forward to contact the work, as shown in Figure 19. The outfeed fence will then be in line with the cutting circle, and the operation can continue.

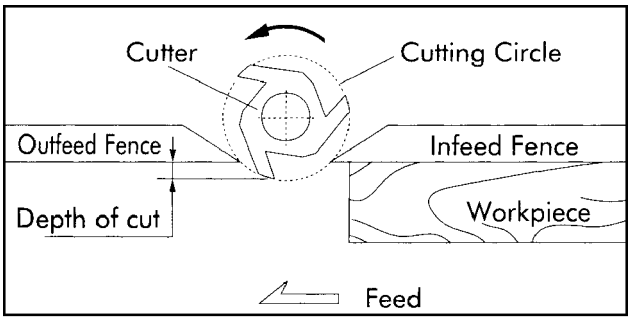


Figure 17

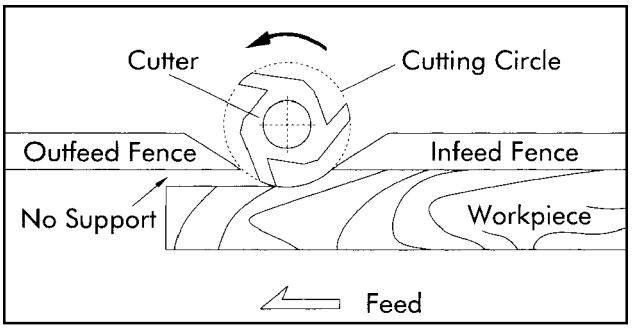


Figure 18

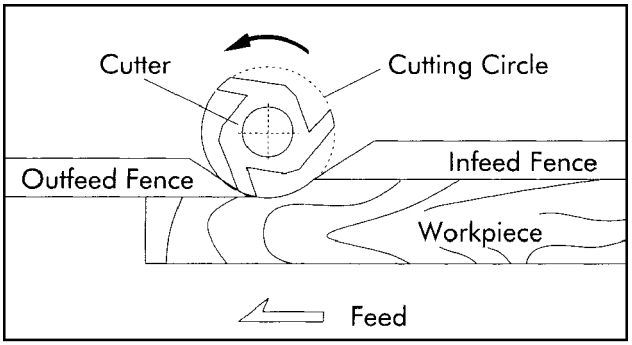


Figure 19

Position of Collars

When shaping with collars, the collar must have sufficient bearing surface, as shown in Figure 20. Also the work must be fairly heavy relative to the cut being made. Under no circumstances should a short, light workpiece be shaped against the collars, as shown in Figure 21.

The collars may be used in any of the following positions: above, below, or between the cutters.

1. When the collar is used below the cutter, as shown in Figure 22, the progress of the cut can be seen throughout the operation. However, any accidental lifting of the work will gouge the wood and ruin the workpiece.

2. When the collar is used above the cutter, as shown in Figure 23, the cut can not be seen, but this method offers an advantage in that the cut is not affected by slight variations in the thickness of the stock. Also, accidental lifting of the workpiece will not gouge the workpiece; simply repeat the operation to correct the mistake.

3. Using the collar between two cutters has the advantages and disadvantages of the first two procedures, and is frequently used where both edges of the work are to be molded.

   Note: It is advisable to place the cutter as low as possible on the spindle to reduce spindle deflection and ensure the best possible finish. Also, make sure that the contacting surfaces of the cutter are smooth, sharp, clean and without dents.

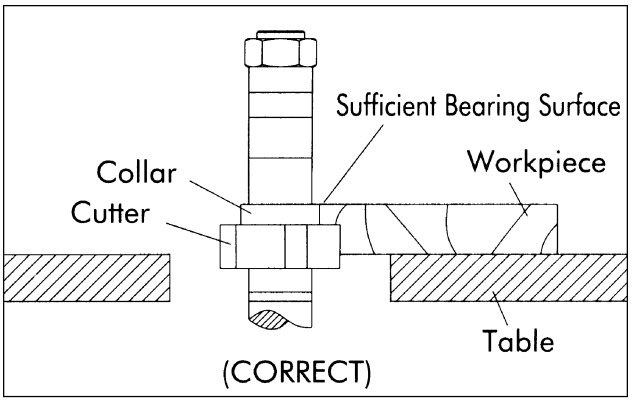


Figure 20

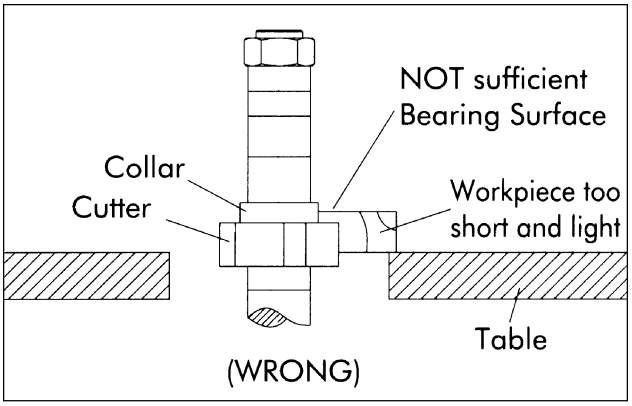


Figure 21

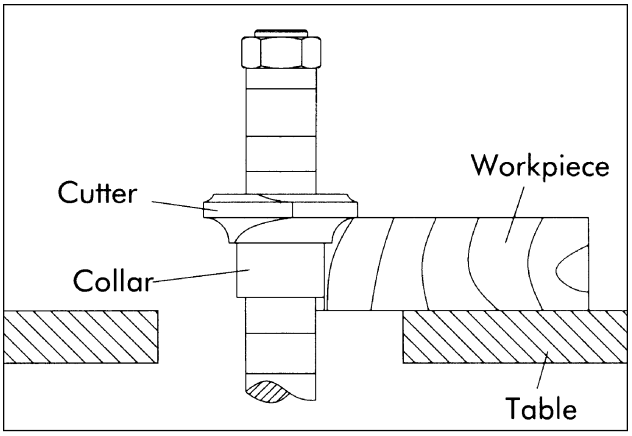


Figure 22

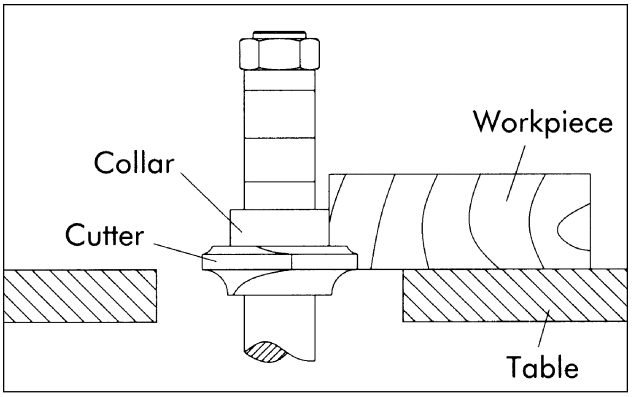


Figure 23

Copying (Shaping with a Jig)

When using the same procedure on multiple workpieces, a jig or template can be made to facilitate the operation:

1. Prepare the jig (A, Figure 24) to accommodate your original workpiece.

2. Place the jig against the table ring guide shoulder (B, Figure 24).

3. Fasten the new workpiece (C, Figure 24) on the jig with the clamp (D, Figure 24) and push the assembly past the cutter.

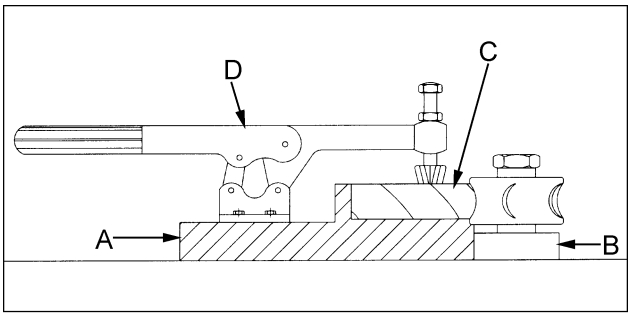


Figure 24

Belt Adjustment

Adjust the belt tension by loosening or tightening the hex nuts (E, Figure 25). With a minor amount of force the belt should deflect about a half inch.

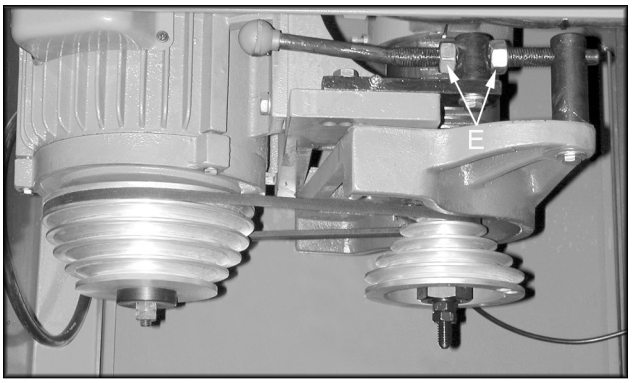


Figure 25

Maintenance

Periodically clean the inside of the machine of shavings and dust. This will increase machine performance and extend its life.

Clean the spindle with compressed air.

Do not get oil on the pulleys and belts. If they are dirty, use a soft rag to clean and dry them. Never place the v-belt under excessive strain, as this can overload the motor and damage the bearings, spindle or belt.

The table surface must be kept clean and free of rust for best results.

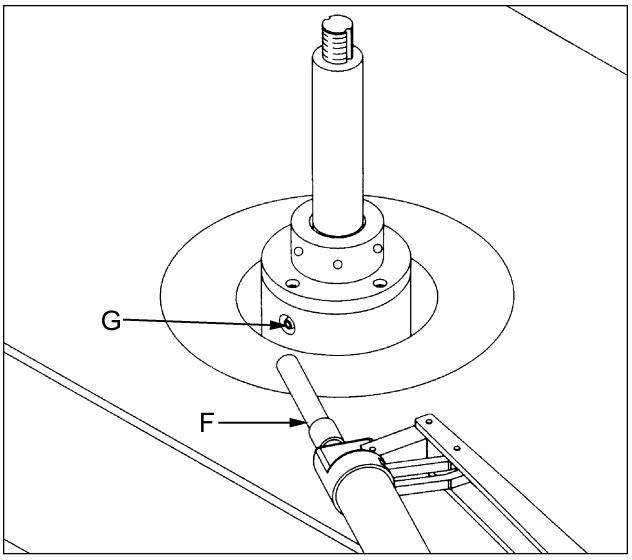


Figure 26

Lubrication

Apply a drop of light machine oil occasionally on the ledge and wall of the table opening to facilitate the changing of table inserts.

The bearings in the motor are sealed for life and do not require lubrication.

The spindle bearing should be lubricated every 200 hours of use by using the supplied grease gun (F, Figure 26). Two grease fittings, one of which (G, Figure 26) is shown, are found on the spindle housing for this purpose. The other grease fitting is directly opposite. Before lubricating, clean grease fittings thoroughly and then lubricate the spindle bearings with two pumps of a good quality, non-hardening grease.

Sliding Table Adjustment

Whenever the table is not traveling properly loosen the socket head cap screw (A, Figure 27) and turn the eccentric (B, Figure 27) with a wrench. Adjust until the table is traveling properly and tighten the socket head cap screws while holding eccentric.

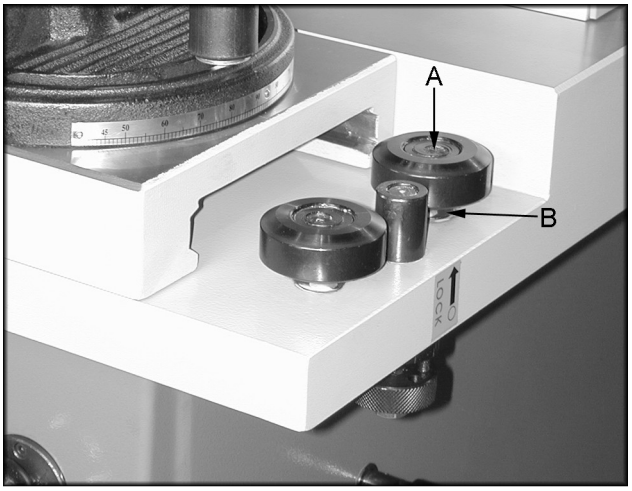


Figure 27

Troubleshooting

Description of Symptoms	Possible Cause	Corrective Action
Machine will not start	1. Fuse blown or circuit breaker tripped 2. Cord Damaged 3. Faulty switch 4. Not connected to power source 5. Connected to wrong voltage	1. Replace fuse or reset circuit breaker 2. Have cord replaced 3. Replace switch 4. Check connection 5. Check voltage
Overload kicks out frequently	1. Extension cord too light or too long 2. Feeding stock too fast 3. Cutter is dull or dirty	1. Replace with adequate size cord 2. Feed stock more slowly 3. Clean or replace cutter
Tool does not come up to speed	1. Extension cord too light or too long 2. Low current 3. Motor not wired for correct voltage 4. Spindle is locked	1. Replace with adequate size cord 2. Contact local electric company 3. Refer to motor nameplate for correct voltage 4. Release spindle lock
Machine makes unsatisfactory cuts	1. Dull cutter 2. Gum or pitch on cutter 3. Gum or pitch on table causing erratic feed 4. Feeding work in wrong direction	1. Replace cutter 2. Remove cutter and clean with turpentine and steel wool 3. Clean table with turpentine and steel wool 4. Feed work against cutter rotation

Stock burns	1. Dull cutter 2. Cutter too deep 3. Forcing work	1. Sharpen by honing on flat side 2. On hardwoods take light cuts; attain full depth of cut with several passes 3. Feed slowly and steadily
Machine vibrates excessively	1. Damaged cutter 2. Stand on uneven floor 3. Bad v-belt 4. V-belt not tensioned correctly 5. Bent pulley 6. Improper motor mounting	1. Replace cutter 2. Reposition on flat, level surface 3. Replace v-belt 4. Adjust belt tension 5. Replace pulley 6. Check and adjust motor mounting
Edge splits off on cross-grain cut	1. Characteristic of cut	1. Make cross-grain cuts first then finish with grain 2. Use scrap block to support at end of cut
Raised areas on shaped edge	1. Variation in pressure which holds work against cutter	1. Keep work firmly against fence or collars throughout pass 2. Use hold-downs
Work pulled from hand	1. No support	1. Use mitre gauge with clamp or hold down to start cut when shaping freehand; hold work firmly against fence 2. Adjust the spring plate
Depth of cut not uniform	1. Misalignment 2. Side pressure not uniform	1. Adjust outfeed fence 2. Use hold-downs or feeder; keep pressure against fence or collars consistent.
Variation in height of cut	1. Variation in pressure which holds work down on table	1. Keep pressure firm throughout pass, use hold-downs; make pass slowly and steadily. Whenever possible, keep cutter under stock.
Cuts not smooth	1. Wrong R.P.M. 2. Feeding too fast 3. Working against grain 4. Cutting too deep	1. Use faster speed 2. Pass stock more slowly 3. Work with grain whenever possible 4. On deep cuts make several passes
Spindle does not raise freely	1. Sawdust and dirt in raising mechanisms	1. Brush or blow out loose dust and dirt