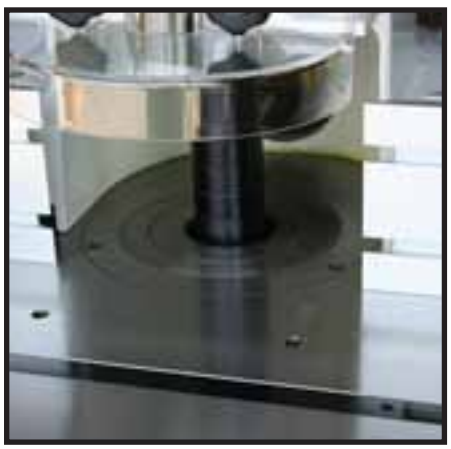
THRIVING ON INNOVATION

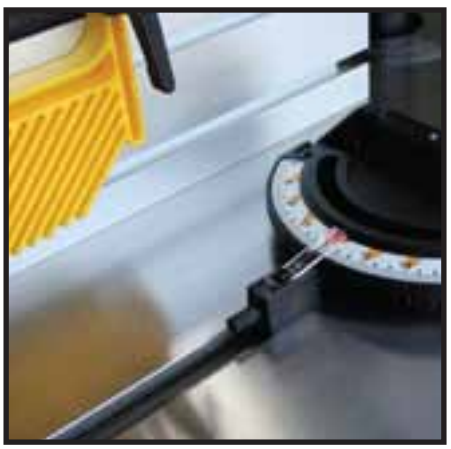
LAGUNA TOOLS®

5HP PRO SHAPER

MSHAP5030-130
MSHAP5010-130

OPERATING MANUAL





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READ CAREFULLY BEFORE OPERATING THE MACHINE

1. Read and understand t he entire owner's manual before attempting assembly or operation.

2. Read and understand t he warnings posted on t he machine and in this manual. Failure to comply with all of these warnings may cause serious injury.

3. Replace t he warning labels if they become obscured or removed.

4. This shaper is designed and intended for use by properly trained and experienced personnel only. If you are not familiar with t he proper and safe operation of a shaper, do not use until proper training and knowledge have been obtained.

5. Do not use t his shaper for other than its intended use. If used for other purposes, WMH Tool Group disclaims any real or implied warranty and holds itself harmless from any injury t hat may result from that use.

6. Always wear approved safety glasses/face shields while using t his shaper. Everyday eyeglasses only have impact resistant lenses; they are not safety glasses.

7. Before operating t his shaper, remove tie, rings, watches and other jewelry, and roll sleeves up past the elbows. Remove all loose clothing and confine long hair. Non-slip footwear or anti-skid floor strips are recommended. Do not wear gloves.

8. Wear ear protectors (plugs or muffs) during extended periods of operation.

9. Some dust created by power sanding, shaping, grinding, drilling and other construction activities contain chemicals know n to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
   - Lead from lead based paint.
   - Crystalline silica from bricks, cement and other masonry products.
   - Arsenic and chromium from chemically treated lumber.

10. Your risk of exposure 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 face or dust masks that are specifically designed to filter out microscopic particles.

11. Do not operate this machine while tired or under the influence of drugs, alcohol or any medication.

12. Make certain the machine is properly grounded.

13. Make all machine adjustments or maintenance with t he machine unplugged from the power source. A machine under repair should be RED TAGGED to show it must not be used until maintenance is complete.

14. Remove adjusting keys and wrenches. Form a habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.

15. Keep safety guards in place at all times when the machine is in use. If removed for maintenance purposes, use extreme caution and replace the guards immediately.

16. Check damaged parts. Before further use of the machine, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting and any other conditions t hat may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

● READ CAREFULLY BEFORE OPERATING THE MACHINE

17. Provide for adequate space surrounding work area and non-glare, overhead lighting.

18. Keep the floor around t he machine clean and free of scrap material, oil and grease.

19. Keep visitors a safe distance from the work area. Keep children away.

20. Make your workshop child proof with padlocks, master switches or by removing safety keys.

21. Keep visitors a safe distance from the work area. Keep children away.

22. Make your workshop child proof with padlocks, master switches or by removing safety keys.

23. Give your work undivided attention. Looking around, carrying on a conversation and “horse-play” are careless acts that can result in serious injury.

24. Maintain a balanced stance at all times so that you do not fall or lean against the blade or other moving parts. Do not overreach or use excessive force to perform any machine operation.

25. Use the right tool at t he correct speed and feed rate. Do not force a tool or attachment to do a job for which it was not designed. The right tool will do the job better and safer.

26. Use recommended accessories; improper accessories may be hazardous.

27. Maintain tools with care. Keep cutter sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.

28. Check the cutter for cracks or missing teeth. Do not use a cracked cutter or one with missing teeth or improper set. Make sure the cutter is securely locked on the arbor.

29. Keep hands clear of the cutter area. Do not reach past the cutter to clear parts or scrap with the shaper running. Avoid awkward operations and hand positions where a sudden slip could cause your hand to contact the cutter.

30. Do not attempt to shape boards with loose knots or with nails or other foreign material, on its surface. Do not attempt to shape twisted, warped, bowed or “in wind” stock unless one edge has been jointed
for guiding purposes prior to shaping.

31. Do not attempt to shape long or wide boards unsupported where spring or weight could cause t he board to shift position.

32. Always use safety devices for all operations where they can be used.

33. Be sure to check the direction of spindle rotation before use.

34. Turn off the machine before cleaning. Use a brush or compressed air to remove chips or debris — do not use your hands.

35. Do not stand on the machine. Serious injury could occur if the machine tips over.

36. Never leave the machine running unattended. Turn the power off and do not leave t he machine until it comes to a complete stop.

37. Remove loose items and unnecessary work pieces from the area before starting the machine.

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

Warning： This is means that if precautions are not heeded, it may result in serious injury or possibly even death.

Safety Rules

Short stock – Never shape stock less than 12 inches in length without special fixtures. Where practical, shape longer stock and cut to size.

12 inch rule – When shaping, never allow your hands to come closer than 12 inches to the cutters.

Hand safety – Never pass the hands directly over, or in front of, the cutters (Figure A). As one hand approaches t he 12 inch radius point, remove it (or the push stick) in an arc motion and reposition hands 12 inches beyond the cutters.

Blind cut – When blind cutting, the workpiece is positioned on top of the template. This keeps the cutter(s) cutting only the underside of the workpiece and provides a "distance" guard for the operator.

Cutter Clearance – With the power disconneected, always rotated the spindle by hand with any new set-up to ensure proper clearance wit h the cutters. At the same time, check to be sure t he cutterhead is turning in t he correct direction.

Stock feed – Feed stock opposite to the direction of the cutter rotation (Figure B). Never back stock out of the cutter once the cut has been started. Instead, pull the stock straight out away from cutter and begin t he cut again.

Guide pin – Whenever possible, use a guide pin when performing pattern shaping and collar shaping operations.

Tool maintenance – Clean and sharp tools give safer and better performance. Dull tools can cause kickbacks and excessive chatter. Before making a cut, always check the condition and adjustment of the tools. Never use a tool that is not balanced and rated for the selected RPM.

Spindle speed – Do not operate tools at speeds higher than rated by the manufacturer.

Cutter selection – Use only those cutters designed to be used on t he machine, and mount only safety type cutters on the spindle.

Stock condition – The danger of kicked-back stock can occur when t he stock has knots, holes, or foreign objects such as nails. Warped or in-wind stock should first be jointed on one surface before attempting to use it on the shaper.

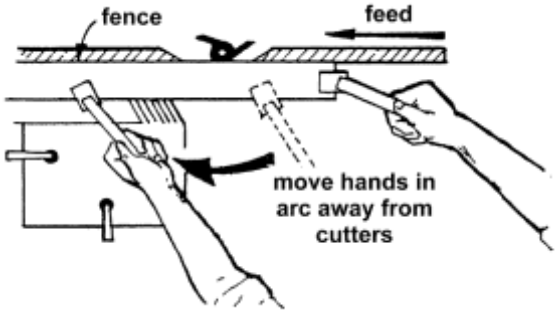


Figure A

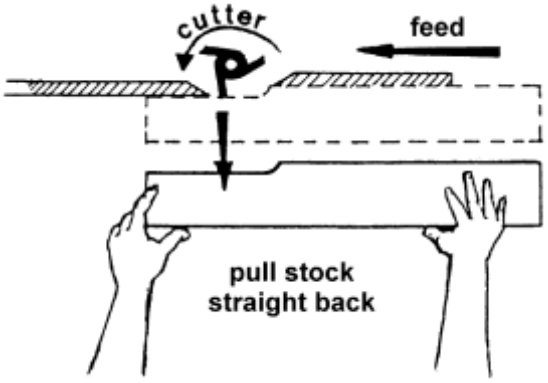


Figure B

Installing

1. Unbolt the shaper from the skid.
2. Carefully slide the shaper from t he pallet onto the floor.

Caution: Make sure that the casters do not get damaged when removing from the skid.

The Shaper should be placed in an area with a sturdy level floor, good ventilation and sufficient lighting. Leave enough space around the machine for mounting extension wings 、rail assembly 、 loading 、off-loading stock and general maintenance work.

Cleaning

Exposed metal surfaces, such as the table top and extension wings, have been given a protective coating at the factory. This should be removed with a soft cloth moistened with kerosene. Do not use acetone, gasoline, or lacquer thinner for this purpose. Do not use solvents on plastic parts, and do not use an abrasive pad because it may scratch the surfaces.

Mounting the Fence

Referring to Figure 1:

1. Place t he fence assembly (A) on t he table (B), lining up t he four mounting holes (C) on t he bracket with the threaded holes (D) on the rear of the table above the dust port (E).

2. Hand fasten wit h 4 each M10 hex socket cap screws (F) and M10 lock washers (G). Do not tighten at this time.

3. Place two M13 flat washers (H) on two lock handles (J). Insert the lock handles through slots (K) on each side of the base. Partially thread the lock handles (J) into two mounting holes (L) on the table. Do not tighten at this time.

4. Turn t he adjust knob on t he bracket to position the fence all the way to the rear.

5. Tighten the lock handles (J) sufficiently to prevent the fence from movement.

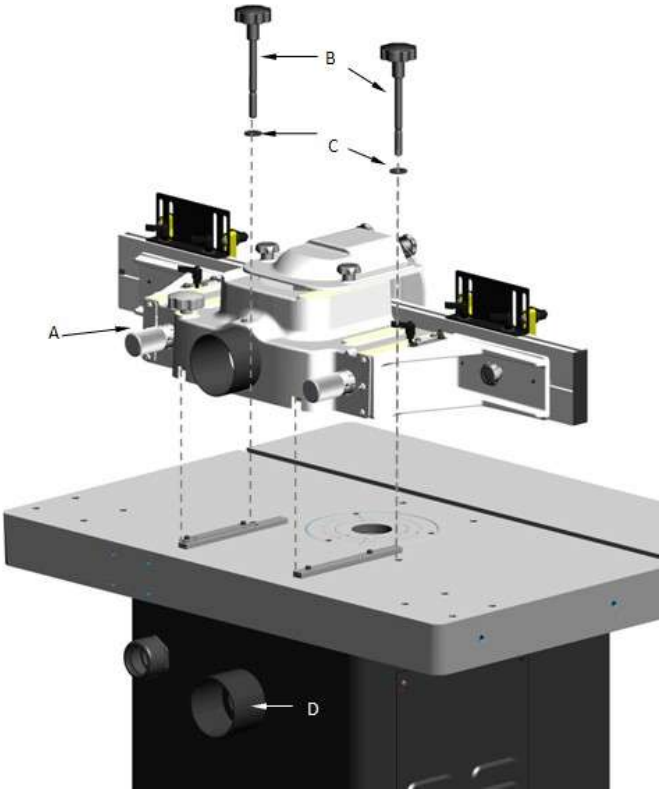


Fig. 1

Electrical Connections

Electrical connections must be made by a qualified electrician in compliance with all relevant codes. This machine must be properly grounded to help prevent electrical shock and possible fatal injury.

General Information

A power plug is not provided with this sharper. You may either connect the proper UL/CSA listed plug or “hardwire” the machine directly to your electrical panel provided there is a disconnect near the machine for the operator.
This machine must be grounded. Grounding provides a path of least resistance to help divert current away from the operator in case of electrical malfunction.

Extension Cords

The use of extension cords is discouraged. Try to position equipment within reach of the power source. If an extension cord becomes necessary, make sure the cord rating is suitable for the amperage listed on the machine's motor plate. An under size cord will cause a drop in line voltage resulting in loss of power and overheating.

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

The Shaper should be connected to a dedicated circuit, and protected by a circuit breaker or time delay fuse, with minimum amp ratings (please check that on the label) . Local codes take precedence over recommendations.

The Table as below is showing the correct size cord to use based on cord length and motor plate amp rating. If in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.

Amps	Extension Cord Length *					
	25 feet	50 feet	75 feet	100 feet	150 feet	200 feet
< 5	16	16	16	14	12	12
5 to 8	16	16	14	12	10	NR
8 to 12	14	14	12	10	NR	NR
12 to 15	12	12	10	10	NR	NR
15 to 20	10	10	10	NR	NR	NR
21 to 30	10	NR	NR	NR	NR	NR

*based on limiting the line voltage drop to 5V at 150% of the rated amperes.
NR: Not Recommended.

Adjustments

When changing tools, making adjustments, or doing clean-up and maint-enance, always turn the machine off and unplug the machine from its power source.

Fence Assembly Movement

Referring to Fig. 2:

The adjustment controls of the fence assembly are as follows:

A – Fence Assembly Lock Knob – to secure fence assembly to table

B – Fence Adjustment Knob – moves fence assembly forward or back

C – Lock Knob – to secure the infeed and outfeed fences

D – Infeed/Outfeed Ram Adjust – fine adjustment for infeed or outfeed fence

E – Lock Knob – loosening permits side to side adjustment of infeed or outfeed fence

F – Lock Knob – loosening permits vertical adjustment of guard (H)

G – Lock Knob – loosening permits backward/forward adjustment of guard (H)

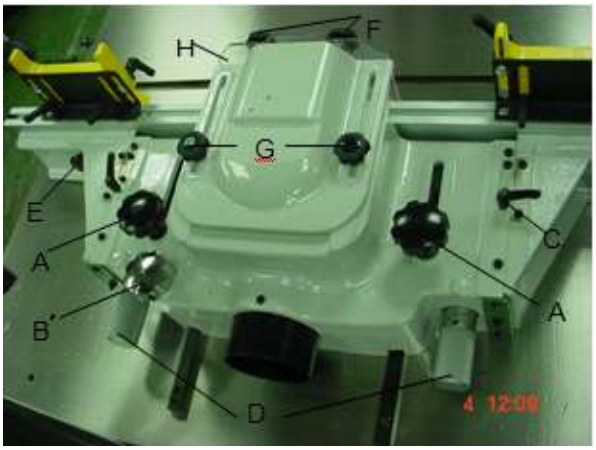


Fig. 2

Coplanar Alignment

Follow steps 1–5 to determine if alignment is necessary. Steps 6–9 will guide you through t he alignment if required.

Verifying that fences are coplanar

1. Remove t he guard and spindle Assy..
2. Adjust the fence (A) assembly so it is positioned approximately at midpoint and lock(B).
3. Place a straightedge (F) on the table pressed against the infeed (E1) and outfeed fences (E2).
4. Unlock the fence lock knobs (D1, D2).
5. With t he ram adjust dials (C1, C2) adjust the position of either fence as required to bring both fences in-line (coplanar alignment) using the straightedge as the point of reference.

No adjustment is required if both fences are flush with the straightedge as shown in Fig. 4. Pro-cede to Ram Dial Calibration.

Adjustment is required if the fences appear skewed (Fig. 5). Continue with Coplanar Adjustment (following steps).

Coplanar Adjustment

Determine which fence is skewed (in this example: G1, Fig. 4), which will require adjustment while the remaining fence (G2) will serve as the reference point.

6. Remove both fences and place the straightedge against the infeed and outfeed fence castings (Fig. 5).
7. Lock the reference fence (D2) and unlock the skewed fence (D1).

Read step 8 completely before attempting.

8. Maintain steady pressure of the straightedge against the fence castings (H, Fig. 5). At the same time, attempt to bring both fences into alignment as shown in Fig. 10. This is accomplished by alternately making incremental adjustments to four setscrews (L, Fig. 7) on t he front face of the casting (K, Fig. 7) with a 2mm hex wrench, followed by repositioning the casting with t he micro adjust dial (J, Fig.7) as required.

   Important : It is recommended that the adjustment setscrews (K, Fig. 7) be rotated in 1/16th increments or less at a time.

Alignment is complete when the skewed and reference fence castings are coplanar (in-line) as shown in Fig. 6.

9. Replace both fences and secure.

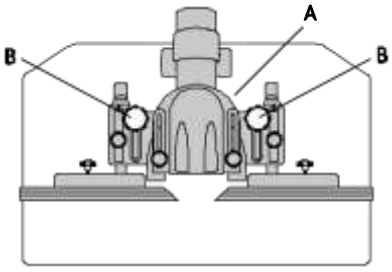


Fig. 2

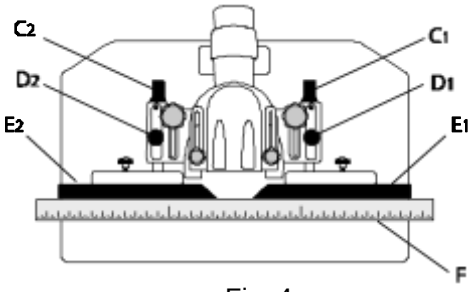


Fig. 4

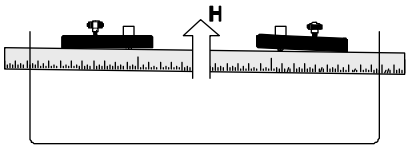


Fig. 5

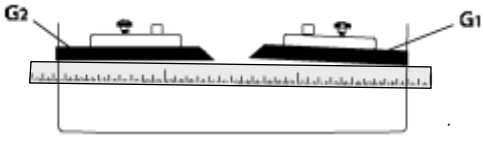


Fig. 6

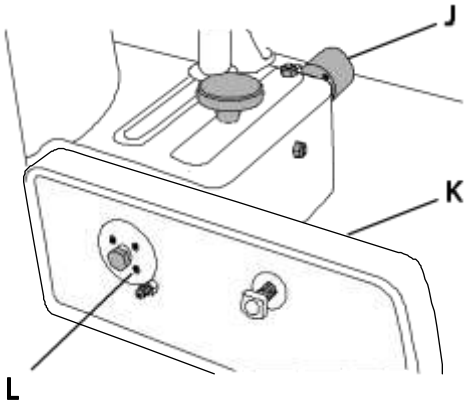


Fig. 7

Ram Dial Calibration

The guard and spindle should be removed.

Referring to Fig. 8 :

1. Loosen the infeed fence lock knob (E), then turn the infeed ram dial (D) counterclockwise to bring t he infeed fence (F) back all t he way until the limiter set screw (P) touches the head casting (M). Then retighten the lock knob (E).
2. If necessary, loosen two setscrews on the infeed ram dial (D) with a 2mm hex wrench and align the zero on the dial with the indicator mark. Then tighten the setscrews.
3. Next, loosen the outfeed fence lock knob (B) and turn the outfeed ram dial (A) counter-clockwise to bring the outfeed fence (C) all the way back.
4. Place a straightedge (G) on the table against both fences.

   If both fences are flush with the straightedge (K) and the outfeed ram dial (A) indicates zero, no further action is necessary.
   If alignment is necessary (J):
5. Slide the outfeed fence (C) aside to reveal the limiting setscrew (P) on the fence casting (N).
6. Loosen the hex locking nut (O) with a 10mm wrench and back out t he limiting setscrew (P) with a 3mm hex wrench to permit a sufficient backward and forward adjustment range for the outfeed fence (C).
7. Slide the outfeed fence (C) back onto the casting and secure.
8. Loosen the outfeed fence lock knob (B).
9. While maintaining pressure (H) on the straightedge (G) against the fences (C, F), adjust the outfeed ram dial (A) until both fences are in-line (K).

After proper alignment is made:

10. Slide t he outfeed fence (C) aside again.
11. Turn t he limiting setscrew (P) in (turn cw) until it comes in contact with the head casting (M)
12. Tighten t he hex locking nut (O) with a 10mm wrench while maintaining the setscrew position with the 3mm hex wrench.
13. Replace t he outfeed fence and secure.
14. Loosen the two set-screws (2mm hex wrench) on t he outfeed ram dial (A) and align the zero on the dial with the indicator mark. Then tighten the setscrews.

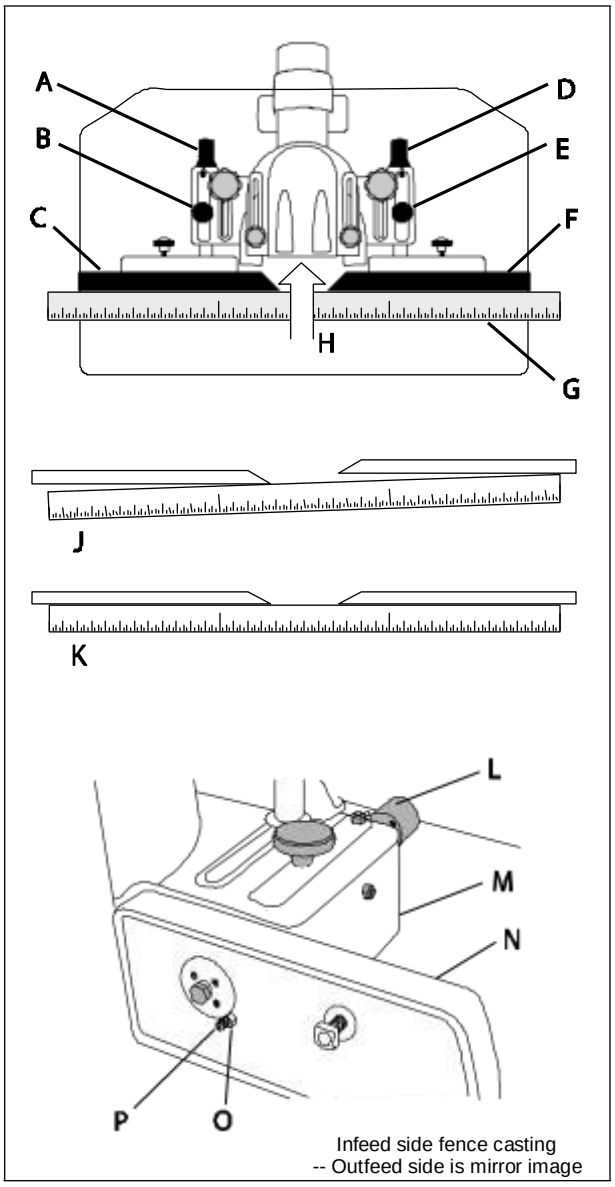


Fig. 8

Handwheel

The handwheel (B) controls the spindle height. Loosen the lock nut (A) then turn the handwheel (B) clockwise to raise and counterclockwise to lower the spindle (C) after adjustment tighten the lock knob (A). Fig 9.

Fig. 9

Spindle Gib Adjustment

Referring to Fig.10 :
The spindle housing gib on your machine is factory adjusted and initially should not require readjust- ment. After a period of use t he gib may wear and become loose, introducing play and potentially causing t he spindle (A) to vibrate. This requires adjustment.

To adjust (refer to Figure 10):

1. With a 12mm wrench, loosen four jam nuts (B) that secure the gib set screws (C).
2. By a 4mm hex wrench, tighten each set screw 1/8 or less turn starting with the lowest one, followed by the uppermost one, then the two middle set screws.

If this is not enough to remove the table play, repeat this step until the play is removed.

Note: If the gibs are too tight the front handwheel (A,) that controls the spindle height will be difficult to turn (Fig.9).

3. When adjustment is complete, hold the set-screws (C) in position with the 4mm hex wrench to maintain the setting while tightening the jam nuts (B) with the 12mm wrench.

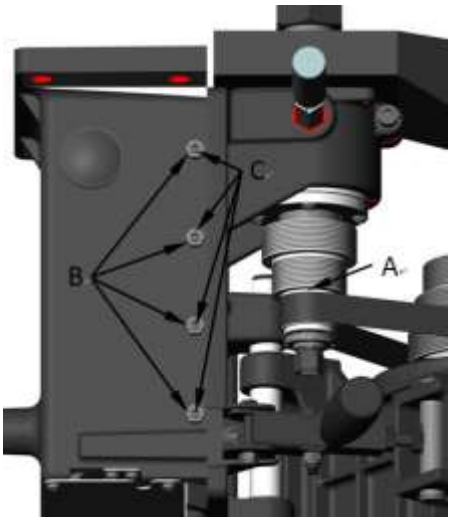


Fig. 10

Featherboard Hold-downs

Referring to Fig. 11 :
The Shaper comes equipped with two feather board hold-downs (A, B) mounted on the infeed and outfeed fences.

1. Loosen lock handles (C) and lock knobs (D).
2. Slide the hold-down guides to the desired position along the fence and tighten the lock handles (C).
3. Place the workpiece (E) on the table against the fence and under the hold-down guide (A).
4. Adjust the feather plate stay to put moderate pressure on the workpiece, then tighten the lock knob (D).

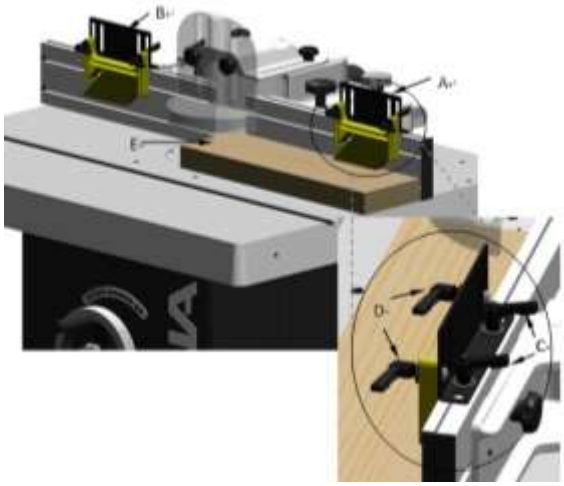


Fig. 11

Spindle Assembly Installation

The fence guard (A) has been removed for clarity. The spindle assembly (B) is mounted to the arbor(C) and secured with a draw bar (J) and nut (E). Use the following procedure to install the spindle assembly. Reverse the order to remove the spindle. (Fig. 12)

Warning : When changing tools, making adjustments, or doing clean-up and maintenance, always turn the machine off and unplug the machine from its power source

1. Raise the arbor (C) all the way using the handwheel located on the front of the cabinet.

Locking the Arbor

2. Locate the spindle lock (F) accessible through the door on the right side of the cabinet. Pull out and rotate 90º right or left resetting the knob into the indent.

Turn the arbor (C) by hand until it locks, then verify that it will not rotate.

Installing the Spindle Assembly

3. Thread the nut (E) onto the threaded end of the spindle (D) in t he direction indicated by arrows (A1, A2). Tighten securely by hand.
4. Thread the spindle assembly (B) and nut (E) onto the arbor (C) and hand tighten only.
5. Insert the draw bar (J) through the opening in the shaft (H) just below the drive belt (G). Turn clockwise, fastening and securing it to the spindle. Tighten the draw bar (J) with the provided wrench (K).
6. Tighten the nut (E) with the wrench (K).

Shaper Cutter installation is described in the following section.

Note：At this time, the spindle holder is still locked.

Spindle Assembly Removal

Referring to Fig. 12 :

The spindle holder must be locked as described in Spindle Assembly Installation, step 2.

1. Remove t he draw bar (J).
2. Loosen the nut (E) then, using the wrench (K) continue to turn until the spindle attachment breaks free of the arbor.

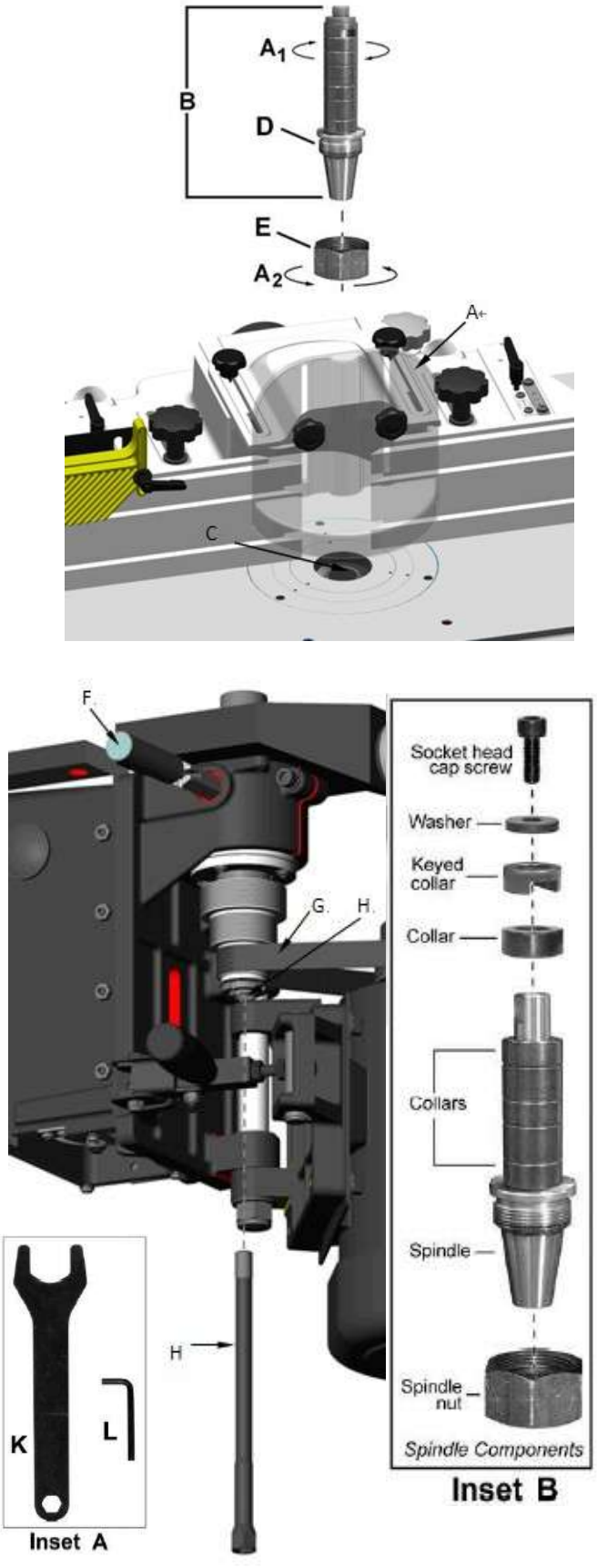


Fig. 12

Shaper Cutter Installation

Note: Spindle installation is described in the previous section.

Warning: When changing tools, making adjustments or doing clean-up and maintenance, always turn the machine off and unplug the machine from its power source.

Locking the Spindle

1. Locate the spindle lock (F) accessible through the door on the right side of the cabinet. Pull out and rotate 90º right or left, resetting the knob into the indent (Fig.12).

Attempt to turn t he spindle (B) by hand to verify that it is locked and will not rotate (Fig.12).

Installing the Shaper Cutter

Referring to Figure 13:

1. Place t he shaper cutter (A) (not included) onto the spindle, oriented in the proper direction.

2. Place the spacers (B) and keyed collar (C) onto the spindle.

Note: Spacers come in several widths and t he stacked selection (B) must be such that the top of the keyed collar (C) sits slightly above the top of the spindle (D). This will ensure sufficient pressure to properly secure the shaper cutter (A) when installation is complete.

3. Install the pronged washer (E) and socket head cap screw (F). Tighten screw with the 8mm hex wrench provided.

Unlocking the Spindle

4. Pull out the spindle lock (F) accessible through the door on the right side of the cabinet. Rotate 90º right or left, resetting the knob into the indent (Fig. 13).

Using gloves to prevent injury from the shaper cutter, turn the spindle (B) by hand to verify that it turns freely.

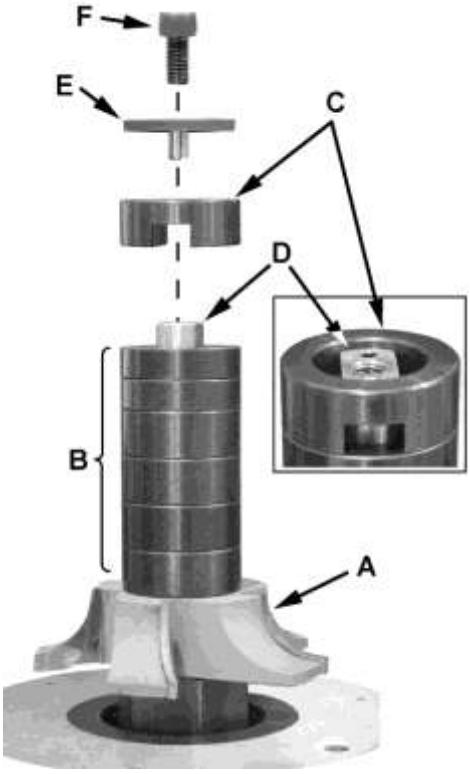


Fig. 13

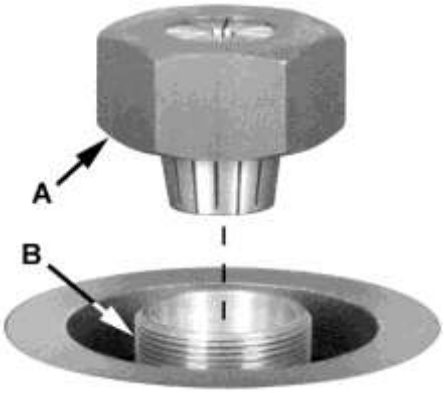


Fig.14

Router Collet (Optional) Installation

1. Locate the spindle lock (F) accessible through the door on the right side of the cabinet. Pull out and rotate 90º right or left, resetting the knob into the indent (Fig. 12).

   Attempt to turn t he spindle (B) by hand to verify that it is locked and will not rotate (Fig. 12).

2. Place the router collet (A)(Fig.14) onto the spindle (B)(Fig.17) and secure with the wrench (K)(Fig.15) provided.

3. Unlock the spindle by pulling out the lock knob (F) accessible through the door on the right side of the cabinet. Rotate 90º right or left, resetting the knob into the indent (Fig. 12).

   Turn the router collet (A) by hand to verify that it turns freely (Fig. 14).

Changing Cutter Speed

Referring to Fig. 18:

The Shaper is equipped with pulleys that allow you to change the spindle speed. The belt (B) placed on the upper pulleys (Fig.16) provides 7,500 RPM spindle speed. Placing the belt on the lower pulleys provides 10,000 RPM spindle speed.

To change speed (refer to Figure 13):

1. Disconnect the machine from the power source.
2. Open the door of the cabinet.
3. Remove the belt tension by moving the belt tension handle (A) to the unlock (left) position. This allows the motor (E) to swivel on its mounting hinge.
4. Move the drive belt (B) to the ot her set of grooves (C).
5. Lock the belt tension handle (A), securing t he motor (E) and placing tension on the drive belt (C).

Drive Belt Tension

Referring to Fig. 15:

The drive belt should have sufficient tension to prevent slippage when the machine is in operation. If the tension on t he belt needs adjustment:

1. Disconnect the machine from the power source.
2. Open the door of the cabinet.
3. With a 17mm wrench, loosen the lock nut (G) on the belt tension assembly (refer to inset for loosening direction).
4. Adjust the hex bushing (F) wit h a 17mm wrench (refer to inset for adjustment direction) for proper tension on t he belt (B). The tension handle (A) must be in t he locked position (right) while performing this step.

Note: Two 17mm wrenches are required for the next step.

5. Maintain the position of the hex bushing (F) with one wrench while tightening the lock nut(G) with the other.

Belt Replacement

Referring to Fig. 15 :

Replace t he drive belt (B) as follows:

1. Disconnect the machine from the power source.
2. Open the door of the cabinet.
3. Remove the belt tension by moving the belt tension handle (A) to the unlock (left) position. This allows the motor (E) to swivel on its mounting hinge.
4. Work the drive belt down all the way past the pulleys.
5. Continue sliding the belt down on the left side until it is free from the spindle (C), then remove the belt over the top of the motor pulley (D).
6. Install the new belt by following these steps in reverse.

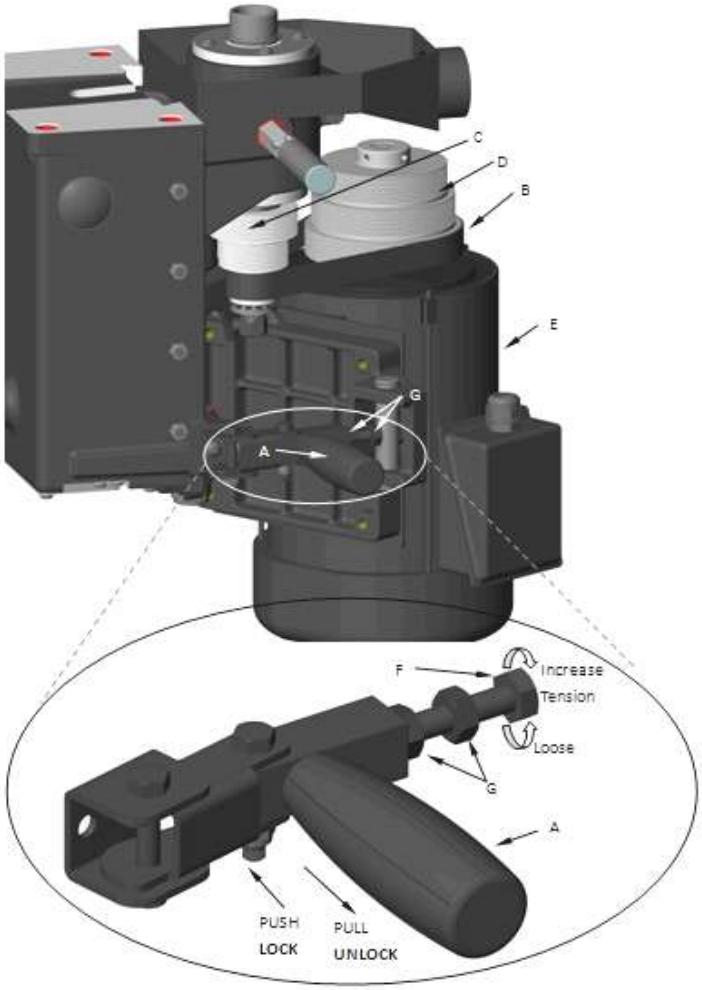


Fig.15

Precision Miter Gauge

Setting the miter gauge angle

Referring to Fig. 16:

The precision miter gauge has a rack and pinion adjustment for setting the angle.

1. Slide the miter gauge into one of t he slots on the table top.
2. Loosen lock handle (A).

To adjust the body (B) of the miter gauge to the he desired angle:

3. Pull the spring-loaded knob (C) out and turn until the body (B) of the miter gauge is at the desired angle as indicated on the scale.
4. Tighten the lock handle (A).

Indent settings

There are indents at the 0º, 30º and 45º right and left positions. At these settings, release the knob (C) to engage the stop rod. Then tighten t he lock handle (A).

Note : Do not rely solely on the indents for an accurate setting. After the stop rod engages at the 0º, 30º and 45º positions, make a fine adjustment with the knob (C), if necessary, setting it against the scale indicator.

Extension plate

The extension plate (D) can be adjusted by sliding to the right or left or removed entirely. To adjust – loosen two lock handles (E), position the extension plate and tighten the lock handles.

To remove – slide t he extension plate completely off and remove t he lock handles (E) and mounting hardware.

Calibrating the miter gauge

1. Place the miter gauge in one of the slots (H) on the table top.
2. Set the miter gauge to 90º (0º setting on the scale) by loosening the lock handle (A), then pulling the spring-loaded knob (C) out and turning t he body (B) until 0º is indicated on t he scale (F).
3. Measure t he accuracy of t he gauge against the slot with a combination square.

If adjustment is necessary:

4. Adjust the body (B) until it is perfectly square (90º) to the miter slot (H).
5. Tighten the lock handle (A).

Verify that the scale indicator (G) reads 0º. If further adjustment is necessary:

6. Loosen the screw (F) and adjust the indicator (G) until it reads 0º
7. Tighten the screw (F).

The miter gauge should fit snugly within the miter slot while still sliding easily. The bar of the miter gauge has two slots, each with a set screw. Rotate one or both of these set screws with a hex wrench as needed to eliminate any play between the miter gauge bar and miter slot.

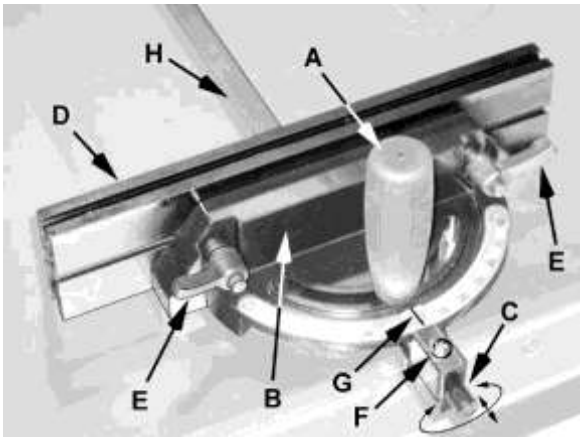


Fig.16

Controls Box

The Shaper is equipped with a control box provided with ON . OFF push buttons 、Reverse switch and Digital Read Out (Fig. 17).

WARNING: Ensure that your workplace is inaccessible to children by closing and locking all entrances when you are away. NEVER allow untrained visitors in workplace when assembling , adjusting or operating equipment.

Digital Readout

The digital readout (Fig. 17) is used for making incremental spindle height adjustments where applicable, if multiple shaping/cutting passes are to be performed on a given work- piece.

Set the digital readout as follows:

1. Set the desired spindle height for the workpiece to be cut.
2. Supply power to the machine so the digital display is lit.
3. Select inch or mm by momentarily depressing the button on the right.
4. Press the 0" SET button for approximately two seconds.

The digital display resets to zero, which is your reference point. When the spindle is raised or lowered (front handwheel), the change is relative to this reference.

If this feature is used, the display should be reset to zero for each new cutting operation.

**This

Fig. 17

Operations

Before applying power to the machine, Check the motor and switch wiring diagrams for proper voltage connections. Check t hat all mounting screws and bolts are tight.

Turn on the motor momentarily to check for proper rotation. The spindle should rotate counter lock- wise when looking down on t he spindle. Correct as required.

Run the machine for a short period of time to ensure that t he moving parts are working properly with no excessive vibration. If a problem develops, correct it before turning t he shaper over for general use.

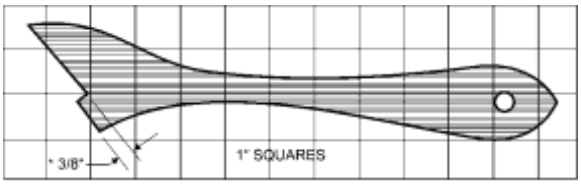
Safety Devices

Safety devices such as guards, fixtures, templates hold-downs, push sticks Fig. 18 feather boards and power feeders should be used whenever possible. Fig. 18 shows a push stick which can be easily made from scrap wood.

Note: For the sake of clarity, the shaper guard has been omitted from most illustrations. All shaper operations must be done with t he proper guard i n place and any other device which insures the safety of the operator.

Grain Direction Considerations

Plan to shape the workpiece in the same direction as the grain when possible. Some open grain woods (such as redwood, fir and oak) will leave a rough, or slightly splintered edge w hen cut against the grain.



**This measurement may vary depending upon thickness of workpiece

Fig. 18

Warning : Deep cuts require excessive horsepower and pushing force to control the cut.

Deep cuts can also cause the wood to splinter or split and may lead to lost control or personal injury. The stock for sharper whenever possible to 1/16" of finished size. When an edge finish is unsatisfactory, take two or more cuts with the final cut no more than 1/16 inch deep.

In the case of shaping across the grain, the trailing board edge will often splinter. To correct this, the best solution is to make the board 1/4 inch oversize in width, shape the board, and simply trim off the excess.

Cutter Rotation

Counterclockwise Setup – With the cutter installed as shown in Fig. 18, feed the workpiece from right to left.

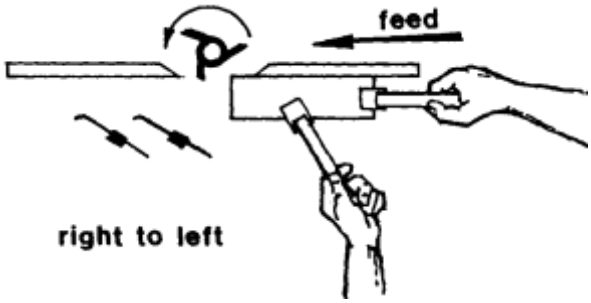


Fig. 18

Clockwise Setup – With the cutter installed as shown in Fig. 19, feed the workpiece from left to right.

Fig.19

Using the Fence

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

For average work, where a portion of t he original edge of the work is not to be touched by t he cutter, both t he front and rear fences are set in a straight line as shown in Figure 25.

When the shaping operation removes the entire edge of the work, 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, Fig. 20. In this case, the stock should be advanced to the position shown in Fig. 21 and stopped. Turn off the machine and move the outfeed fence forward to contact the workpiece, Fig. 22. Remove the workpiece, start the motor, and then continue the operation.

Warning : Always remove workpiece before starting the machine! This will prevent kickback and potential serious injury.

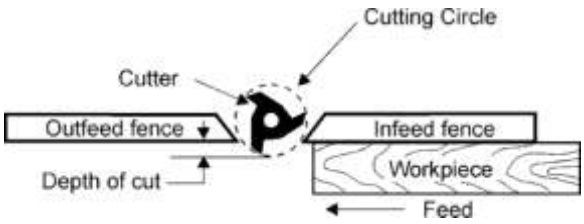


Fig. 20

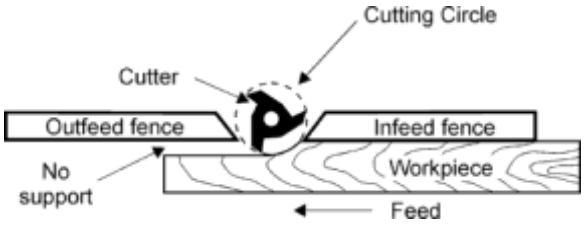


Fig. 21

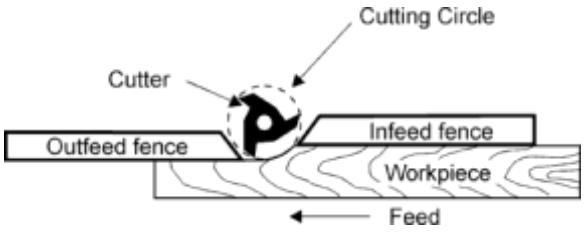


Fig. 22

Z Dimension

Before making a template (or using the edge of the workpiece) for shaper cutting, the "Z" dimension must be established in order to determine the shape and size of the finished stock. The "Z" dimension is the difference between the innermost part of the cutter edge and the outside diameter of the ball bearing follower (collar). See Fig. 23.

Note: The "Z" dimension can be either positive or negative.

The "Z" dimension is positive if t he cutter is larger than the collar bearing.

The "Z" dimension is negative if the cutter is smaller than the collar bearing.

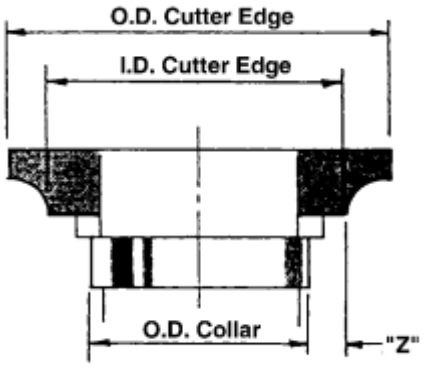


Fig. 23

Depth of Cut

The depth of cut is the distance from the outside circumference edge of the collar (which the work rides against) to the outside edge of the cutter. The depth of cut is determined by the position of the fence relative to the cutterhead and/or by the use of shaper collars (see Fig. 24).

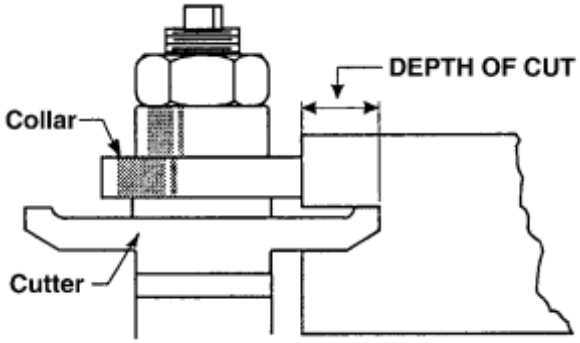


Fig. 24

Straight Edge Shaping

Straight edge shaping is always performed with the workpiece against t he fence. Use only push sticks and hold downs to keep the workpiece on position.

Warning : Do not use a miter gauge to feed material along the fence face. The workpiece can bind and cause kickback. Failure to comply may cause serious injury!

To set up:

1. Disconnect or unplug the machine from its power source.
2. Check to see that the fence faces are parallel, properly in line or offset if necessary and securely tightened.
3. Rotate the cutters and inspect for clearance.
4. Lock the spindle.
5. Install all necessary guards.
6. Reconnect power to the machine.
7. Take a trial cut on a piece of scrap the same thickness as workpiece.

Note: Only a short cut is necessary to determine if the profile, depth, and height of cut is correct.

Edge Shaping

When edge shaping, never attempt to hand guide any stock less than 12 inches long, or narrower than 3 inches without t he use of a special guide as show n in Fig. 25.

Caution : When edge shaping, the work- piece must be at least 12 inches long unless a special guide is used.

1. Use the hold-ins and hold-dow ns as shown in Fig. 30 to firmly hold the workpiece down and against the fence. If workpiece is too wide for the hold-ins to be used, clamp a scrap board to the table to substitute for the hold-ins.

2. Check the rotation of the cutter. Be sure to feed workpiece against rotation of the cutter.

3. Feed the workpiece slowly and steadily with firm, even pressure to make a smooth cut.

Important : The rate of feed depends on depth of cut and experience of operator.

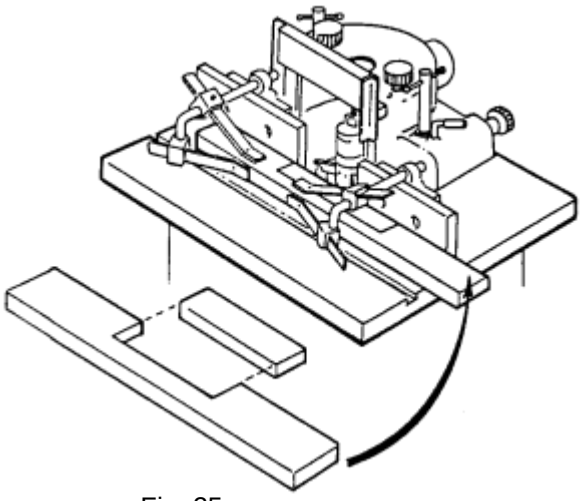


Fig. 25

End Shaping

When end shaping narrow stock, it is important that at least one half of the workpiece end be in contact with either the in-feed or out-feed fence. Use a guide similar to the one shown in Fig. 26 which tightly clamps the scrap piece to the work-piece and provides the necessary width.

Warning : End shaping a narrow workpiece without a special guide could result in the workpiece rocking into the cutterhead, causing personal injury.

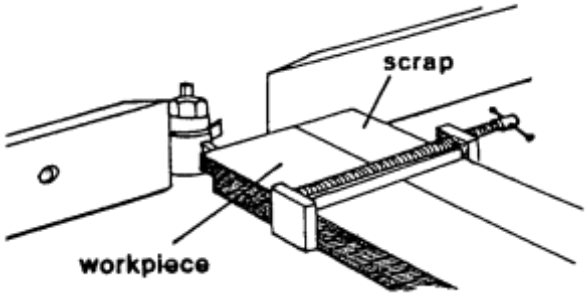


Fig. 26

Shaping All Sides

Because cross grain shaping is more likely to create chipping out and splinters on some woods, it is good practice to first shape the cross-grain sides. Any chipping that does occur is taken care of by the with-grain cuts, as shown in Fig. 27.

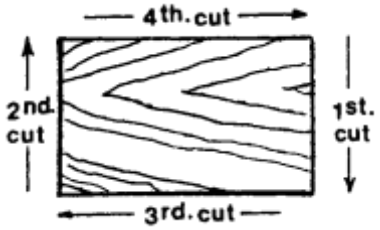


Fig. 27

On-Edge Shaping

If the shaper fence does not firmly support wide stock, use the T-slots in t he fence to attach a special rigid high fence as shown in Fig. 28.

Note: Be sure the screw holes are countersunk in the special fence to avoid interference with the workpiece.

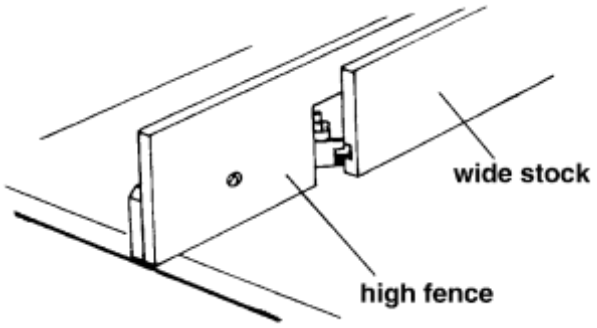


Fig. 28

Straight Line Bevel Shaping

To shape a beveled straight edge, use a bevel-edge shaping jig in combination with the regular fence as show n in Figure 29.

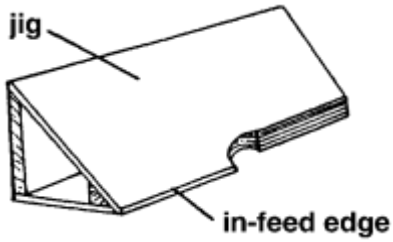


Fig. 29

To perform a bevel-edge cut, the in-feed edge of the jig is placed against the infeed fence and clamped to the table as shown in Figure 30. The outfeed fence is moved forward as necessary to compensate for the cut.

Caution : Never attempt to bevel cut free hand. Always use a bevel-edge fixture.

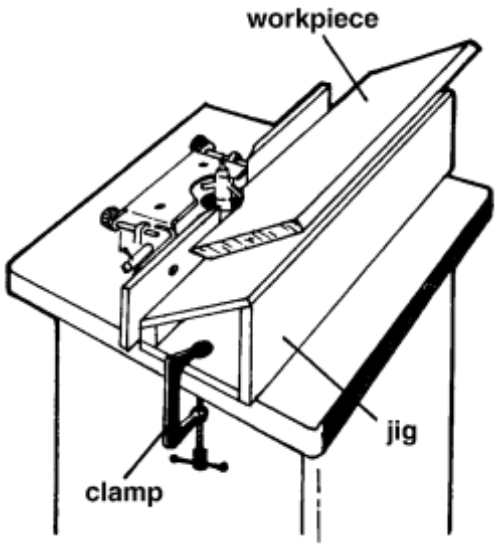


Fig. 30

Contour Edge Shaping With Collar Bearing

To shape contoured edges, the operator must first remove the fence assembly.

In order to control the workpiece and limit the depth-of-cut, the operator must use an anti-friction collar with the cutter(s) as shown in Fig. 31.

The collar may be positioned above or below the cutter(s), and its function is to ride against the workpiece or template. At the same time, the collar will establish the depth-of-cut as shown in Fig. 32. Whenever possible, always use the ring guard or safety collar.

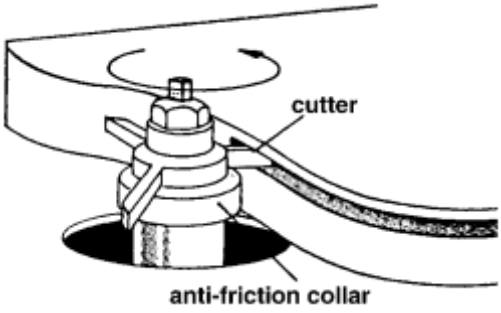


Fig. 31.

Note: Since the collar requires at least 1/8" of surface edge to ride against, the entire edge cannot be shaped as show n in Fig. 33. The added use of a pattern, however, permits the shaping of t he entire contour edge.

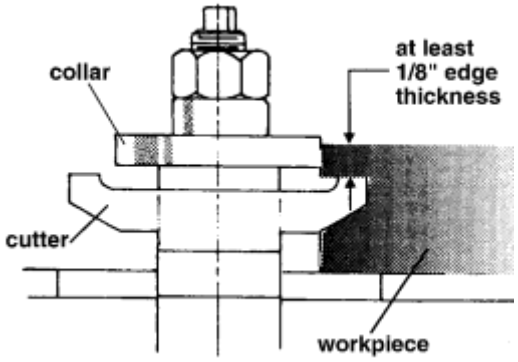


Fig. 33

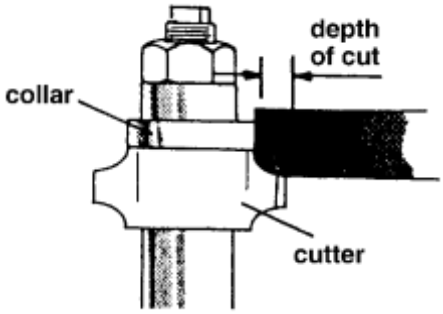


Fig. 32

If the workpiece is to be shaped all around the perimeter, hold it firmly and push t he work straight into the cutter until t he dept h of cut is established by the collar as shown in Fig. 34. Continue to feed the work so that the point of contact on the edge is always 90 degrees to the collar (or directly in line with t he cutter edge) and held firmly against it.

When the workpiece is not contoured all around, start the cut as shown in Fig. 40. With this operation, the workpiece is positioned against the starter pin and the end swung into place to start the cut. When the cut has begun and the workpiece firmly against t he collar, swing the stock away from the pin and proceed with cut.

Warning : Freehand shaping is extremely dangerous. The operator must be aware at all times of the proximity of his hands to the cutter. Hands must never come closer than 12" to the cutter without the proper guard or similar safety device over the cutterhead.

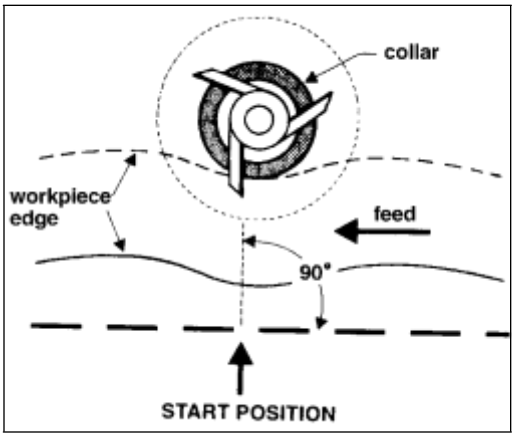


Fig. 34

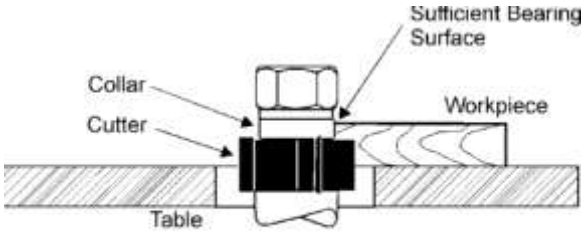
Shaping With Collars

When shaping with collars and starting pin, always adhere to the following rules for good work and safe operation:

The collar must have sufficient bearing surface, as shown in Fig. 35. Also, the stock must be fairly heavy in proportion to the cut being made. Under no circumstances should a short, light workpiece be shaped against the collars, as in Fig. 36.

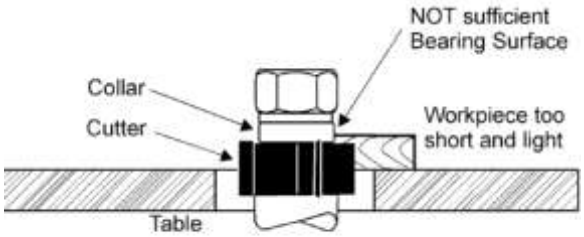
Note: The edge of the work to be shaped must be smooth. Any irregularity on the surface which rides against the collar will be duplicated on the molded surface.

Collars must be smooth and free from pitch and other substances.



RIGHT

Fig. 35



WRONG

Fig. 36

Position of Collars

Collars may be used above, below or between cutterheads.

1. When the collar is used below the cutter, as shown in Fig. 37, 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.

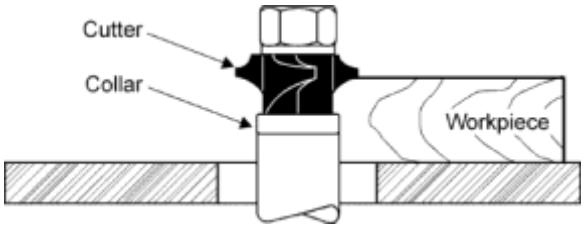


Fig. 37

2. When the collar is used above the cutter, as shown in Fig. 38, the cut cannot 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.

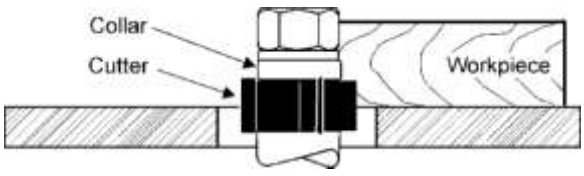


Fig. 38

3. Using the collar between t he two cutters has the advantages and disadvantages of the first two procedures, and is frequently used w here both edges of the work are to be molded, Fig. 39.

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, clean and without dents.

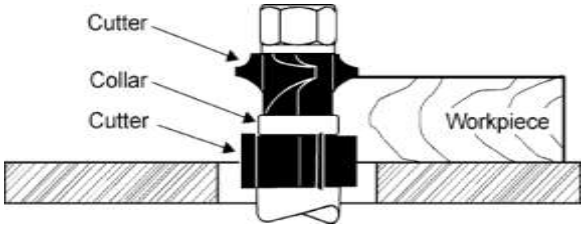


Fig. 39

Starting Pin

Warning : Use of the starting pin should only be attempted by advanced users. If you have never used this method, it is recommended you get training from a qualified person. Failure to comply may result in serious injury.

The starting pin is used to support the work when starting the cut.

1. The work should be placed in the position (Fig. 40), using the starting pin as a support
2. Swing t he work into the cutter as shown in the position 2. The work is now supported by the starting pin and the collar.
3. After the cut has been started, the work is swung free of the starting pin and only rides against the collar (Fig. 41). Always feed against the cutterhead rotation.

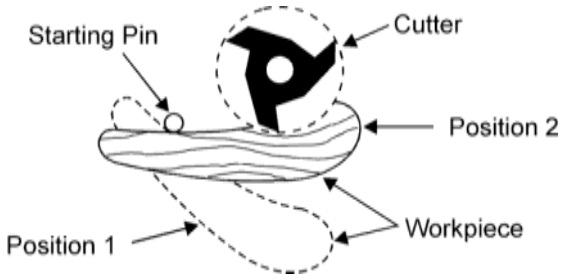


Fig. 40

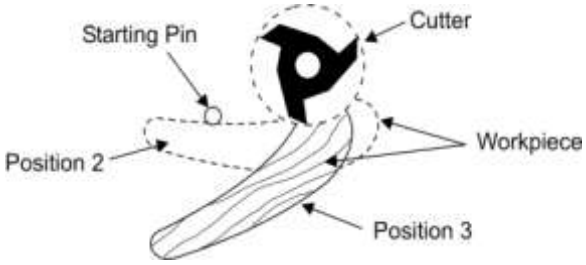


Fig. 41

Arcs and Circles

Large circular and arc-shaped stock can be shaped as described in Contour Edge Shaping on page 17. However, smaller sized stock requires the use of special shaping jigs similar to those shown in Fig. 42.

With the entire fence assembly removed, carefully position the jig for desired depth-of-cut and securely clamp to the table.

It is important with the arc and circle shapes that the workpiece, prior to being shaped, must be roughly cut to the desired size and curve of the finished piece. Make sure that the jig curve matches exactly the workpiece curve. At all times keep the workpiece firmly in contact with the jig while the cutter is cutting the stock.

Caution : Never perform this type operation without a ring guard, safety collar or similar safety device over the cutterhead.

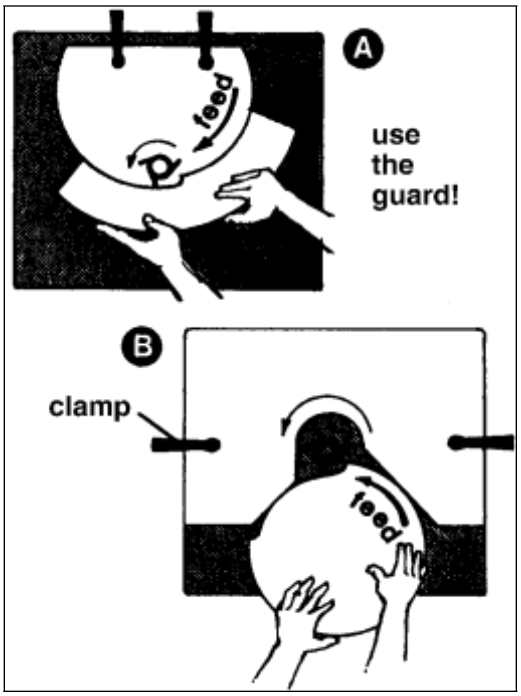


Fig. 42

Enclosed Edge Shaping

An enclosed workpiece edge is shaped in the same manner as an outside contoured edge except that a starting pin is not required as shown in Fig. 43.

Note: If the whole edge is to be shaped, the operator must use a pattern.

Position the workpiece on the table before starting the motor. The operator must do the entire shaping cut by pushing (feeding) the workpiece into the cutter(s).

Warning : Enclosed edge shaping is extremely dangerous. The operator must be aware at all times of the direction of feed. Never perform this type operation without a ring guard, safety collar or similar safety device over the cutterhead.

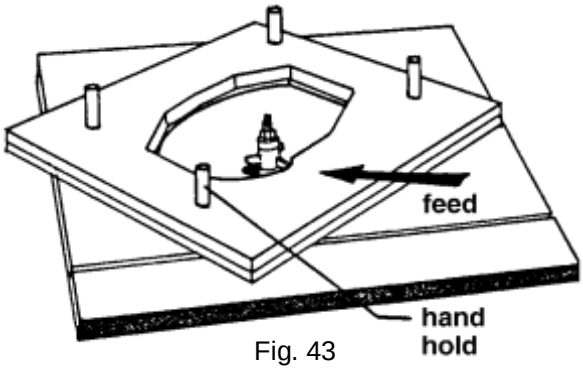


Fig. 43

With a firm grip, ease the edge into the cutter(s) until stopped by the collar as show n in Fig. 43.

Continue to push straight in while feeding and turning the workpiece at the same time until the cut is finished. Turn off the motor and do not remove workpiece until the cutters have completely stopped.

Caution : Never perform enclosed edge shaping if there is less than two inches of workpiece material all around the opening. Never perform enclosed edge shaping if the workpiece opening is smaller, in any direction, than twice the diameter of the cutter(s).

Templates

The template must be thick enough to provide a solid bearing edge against a collar. When constructing a template similar to the one shown in Fig. 44, keep in mind that it serves only as a guide for the cutter.

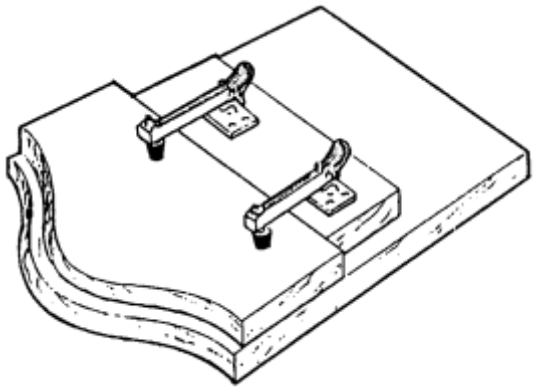


Fig. 44

If the workpiece requires all-around shaping, the template can be constructed from several sections pieced together as show n in Fig. 45.

Fig. 45

Securing the Template

There are various met hods used to secure the template to the workpiece. The experienced operator will choose the most appropriate according to the shape, size and type construction of the template. For example, if t he workpiece is large enough to extend beyond the front of the table and still leave room for the desired cut, it can be securely held to the template with "C" clamps as shown in Fig. 46.

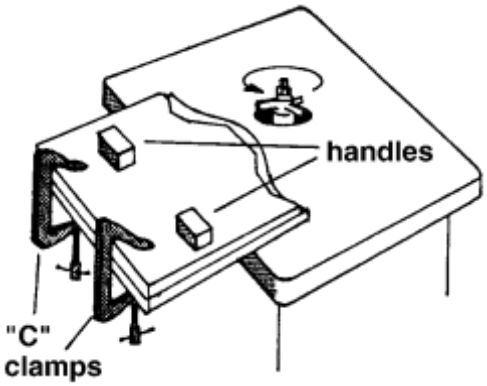


Fig. 46

In many situations the workpiece is positioned against the template using dowels as anchor points and handles (wood blocks) to assist the operator in guiding the work-piece through the cut as shown in Fig. 47.

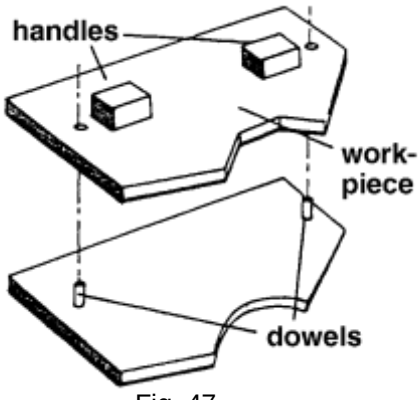


Fig. 47

Special Cuts

The illustrations in this section show the profile, or section, views made by the cutter(s). The most efficient cutters are carbide tipped to ensure clean and long-term cutting. Small cutters may be solid carbide, and some use inserts. Since there are such a wide variety of choices, the operator is limited only by his experience and imagination.

Stacked Cutters

A variety of interesting and timesaving cuts can be made in a single set up by stacking the cutters. When the operator stacks the cutters, extra care should be taken to see t hat all parts are clean, free of nicks and flaws, and perfectly balanced in the stacked position.

Sash and Door Shaping

Shaping a door requires two operations.

Fig. 48 shows the sash cut for the first operation.

Fig. 49 shows the stock flipped over and the sash cutter used with a 1/4” groove cutter to complete the cut.

Fig. 50 shows the first shaping cut with the sash cutter for the matching door stile sash.

Fig. 51 shows the same cut with the stock flipped over.

Fig. 52 shows the first shaping cut for a window sash stile utilizing a sash cutter, collar, and a 1/2” groove cutter.

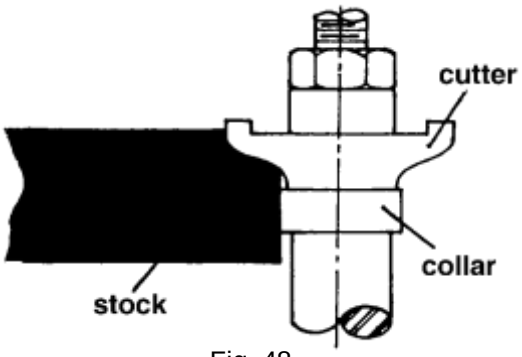


Fig. 48

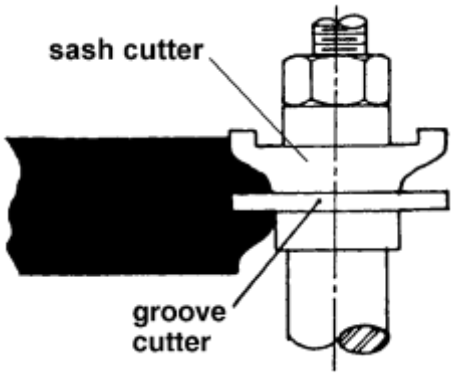


Fig. 49

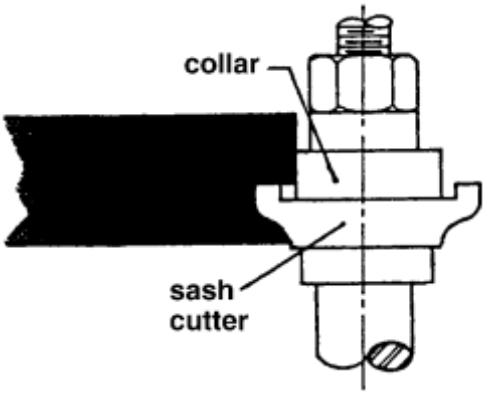


Fig. 50

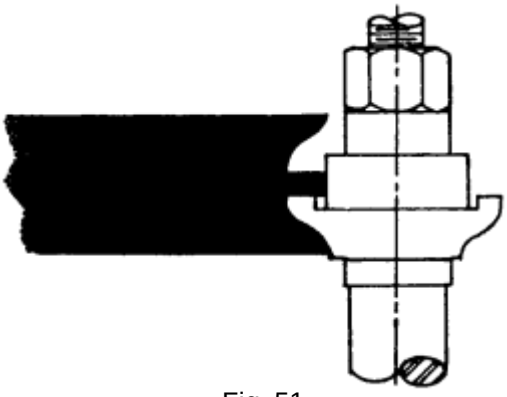


Fig. 51

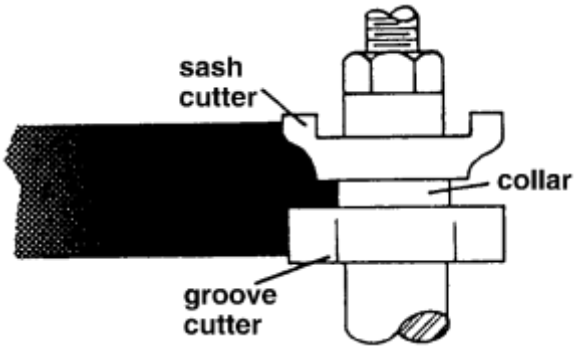


Fig. 52

Fig. 53 shows both cuts required for a window sash rail end. The first operation at top is a rabbet cut made with a groove cutter. The second operation is performed with a stub spindle and buttonhead screw.

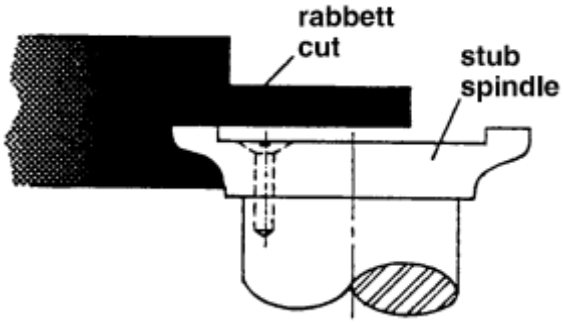


Fig. 53

Butt Joints

All butt-type joints require both work-pieces to be perfectly square and straight-edged.

Glue Butt Joint

To perform a glue butt joint, both fences are kept inline and adjusted for a depth of cut (Fig.54).

The cuts on both work-pieces are part-edge cuts which do not reduce the stock width during the cutting procedure. When shaping the two workpieces, one is fed top-side up; the other is fed bottom-side up.

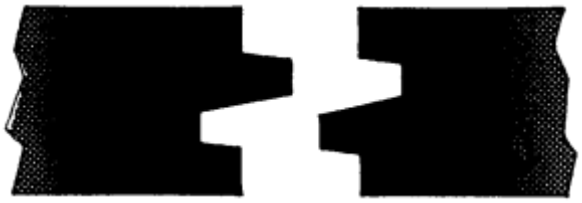


Fig. 54

T ongued Joint

Similar to the glue joint, both fences are kept in-line for the tongued joint and adjusted for a 1/4" depth of-cut with no reduction in stock width. With this joint, however, both work-pieces are fed with the same side up as shown in Fig. 55.


Fig. 55

Drop Leaf Joint

When shaping a drop-leaf joint as shown in Fig. 56, the leaf workpiece is shaped with a Drop-Leaf Bead cutter; the table workpiece is shaped with a Drop-Leaf Cove cutter.


Fig. 56

With this type joint, the whole edge of both workpieces is shaped, same-side up, and allowance made for a 1/16" reduction in width. Adjust the in-feed fence to reduce the workpiece width by 1/16", and adjust the out-feed fence to compensate for stock removed.

Taper Cuts

Taper cuts can be made by offsetting the fences for the amount of taper desired, or with a layout line on the stock which can be paralleled to the infeed fence as show n in Fig. 57.

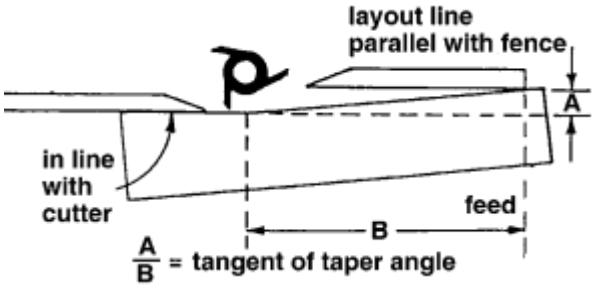


Fig. 57

Start the cut by holding the stock against the infeed fence and swinging it into contact with the outfeed fence just past the cutterhead. As t he cut is started, transfer pressure to hold t he workpiece against the outfeed fence, and continue feeding the workpiece t hrough. After the first cut, the fences will have to be readjusted in order for the second cut (parallel cut) and the final dept h-of-cut to remain true wit h the taper.

Caution : Do not use the standard fence for short work (12" or less in length on the side to be cut). Instead, use a miter gauge or special fixture to avoid losing control of the workpiece.

Tenon

The tenon fixture illustrated in Fig. 58 shows a miter gauge equipped with a hold-down for shaping the ends of narrow work-pieces.

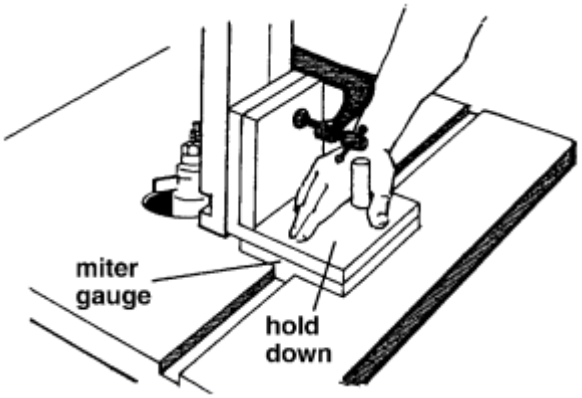


Fig. 58

The miter gauge can also be adapted to cut square and centered tenons at the ends of legs for tables, chairs, etc. Secure the leg to jig and position for cut as shown in Fig. 59.

Make all first cuts with the same jig setting and spindle height. When the first series of cuts have been made, reposition leg on the jig for each succeeding cut.

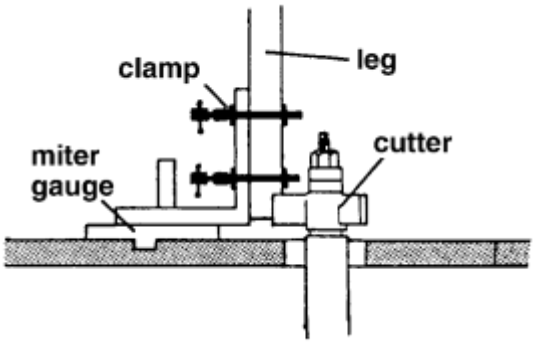


Fig. 59

Note: If the leg is tapered, use a wedge to place the side facing t he cutter into a 90 degree vertical position as show n in Fig. 60.

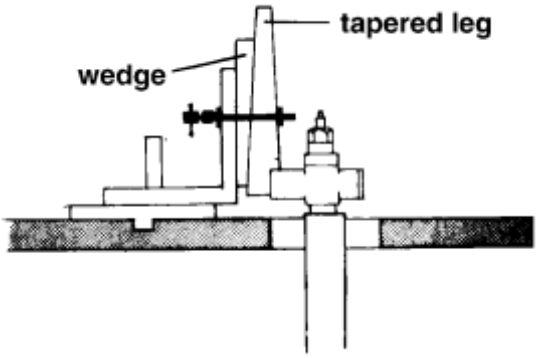


Fig. 60

Trouble shooting

Trouble	Possible Cause	Remedy
Shaper will not start.	1. Cord unplugged from the power source. 2. Fuse blown or circuited breaker tripped. 3. Cord damaged. 4. Reversing switch is in t he Off position. 5. Overload tripped. 6. Cabinet door is open.	1. Plug in power cord. 2. Replace f use or reset circuit breaker. 3. Replace cord. 4. Turn switch to forward of reverse. 5. Reset overload by depressing red stop button. 6. Close cabinet door.
Overload kicks out frequently.	1. Extension cord or wiring inadequate size. 2. Feeding stock too fast. 3. Cutter needs cleaning or replacing. See also Unsatisfactory Cuts	1. Replace cord or wiring with proper gauge wire. 2. Reduce feed stock rate. 3. Clean or replace cutter.
Cuts are unsatisfactory.	1. Dull cutter. 2. Cutterhead rotating in wrong direction. 3. Feeding work in wrong direction. 4. Gum or pitch on cutter. 5. Gum or pitch on table causing erratic feed.	1. Replace cutter. 2. Check for proper rotation at startup. 3. Feed work against the cutter rotation. 4. Remove cutter and clean with solvent. 5. Clean table with solvent.
Cutter does not come up to full speed.	1. Shop wire gauge is too small. 2. Extension cord or wiring inadequate size. 3. Power source is not adequate. 4. Motor not wired for correct voltage. 5. Spindle is locked with madrel lever.	1. Replace wiring with proper gauge wire. 2. Replace with adequate size cord. 3. Contact your electric utility. 4. Refer to motor name place and wiring diagram for correct wiring. 5. Unlock spindle – see label next to lover on base.
Machine vibrates.	1. Stand on uneven surface. 2. Cutterhead damaged. 3. Defective V-belt. 4. V-belt incorrectly tensioned. 5. Bent pulley. 6. Motor mounted improperly.	1. Stand must rest solidly on level surface. Fasten to floor if necessary. 2. Replace cutterhead. 3. Replace V-belt. 4. Apply proper tension. 5. Replace pulley. 6. Motor must be properly mounted with snug nuts and bolts.
Edge splits off on cross grain cut.	1. Characteristic of this type of cut.	1. Make cross grain cuts first, then finish cut with the grain. Use scrap block to support end of cut.

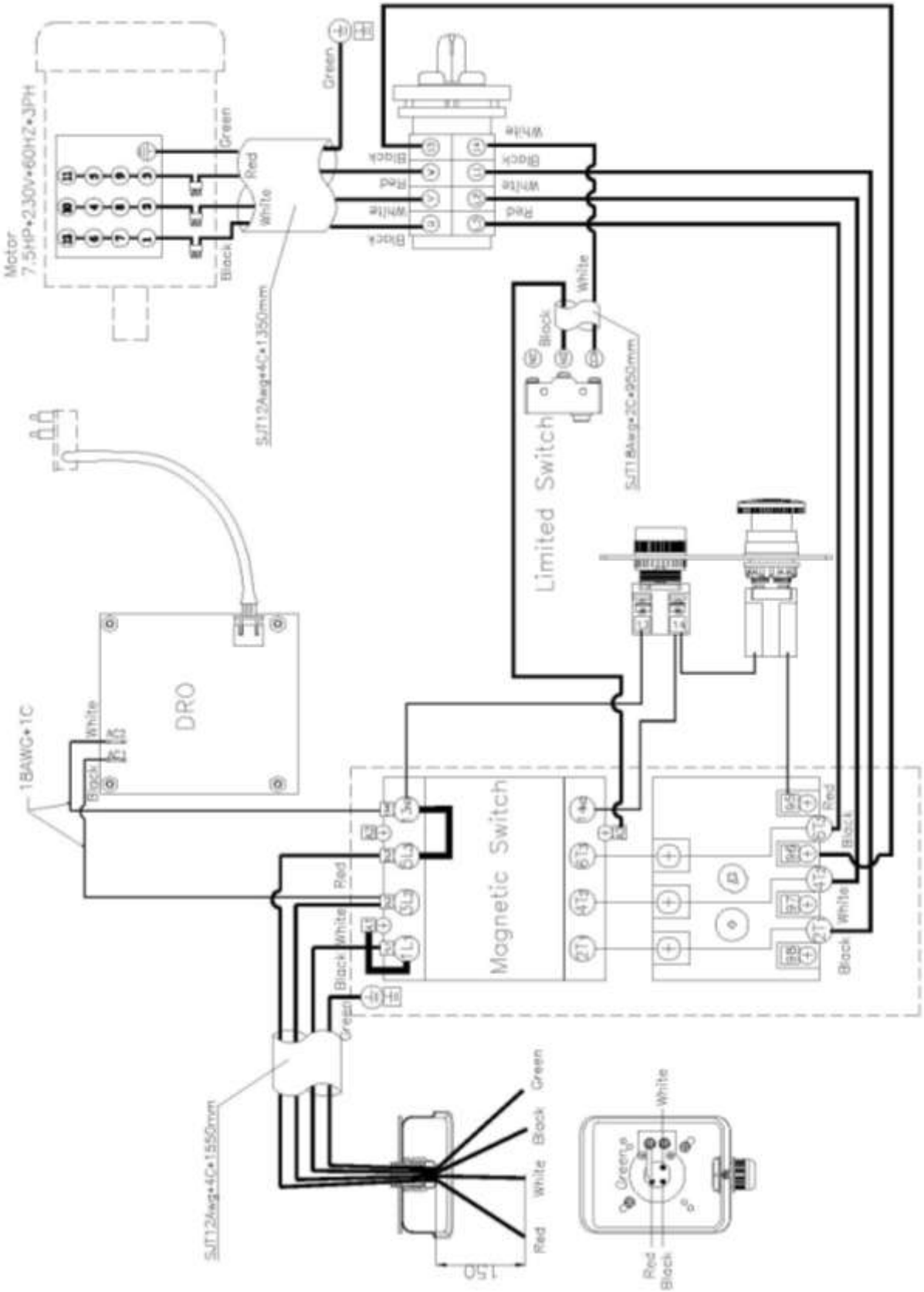
Trouble	Possible Cause	Remedy
Raised areas on shaped edge.	1. Variation of pressure holding work against cutter.	1. Hold work firmly against table and fence. Use hold-downs and push sticks.
Work pulled from hand.	1. Feeding in wrong direction.	1. Always feed work against the rotation of the cutterhead.
Depth of cut not uniform.	1. Fence misalignment. 2. Side pressure not uniform.	1. Align outfeed fence. 2. Use hold-downs; keep constant pressure against fence and use push sticks.
Work burns.	1. Cutting too deep on one pass. 2. Forcing work.	1. On hardwoods take light cuts; attain full depth with several passes. 2. Feed work slowly and steadily.
Cut height not uniform.	1. Variation in pressure holding work to table.	1. Keep pressure from throughout pass. Use hold-downs. Make pass slowly and steadily. Keep work under cutter whenever possible.
Cuts not smooth.	1. Wrong R.P.M. 2. Feed too fast. 3. Working against the grain. 4. Cutting too deep on one pass.	1. Use faster speed. 2. Slow feed speed. 3. Work with the grain henever possible. 4. Take several passes on very deep cuts.
Spindle does not raise freely.	1. Shaper dust and dirt in raising mechanism.	1. Brush or blow out loose dust and dirt.

Optional Accessories

1/2" Spindle
1" Spindle
30mm Spindle
1/4" Collet
1/2" Collet

Wiring Diagrams

MSHAP5030-0130



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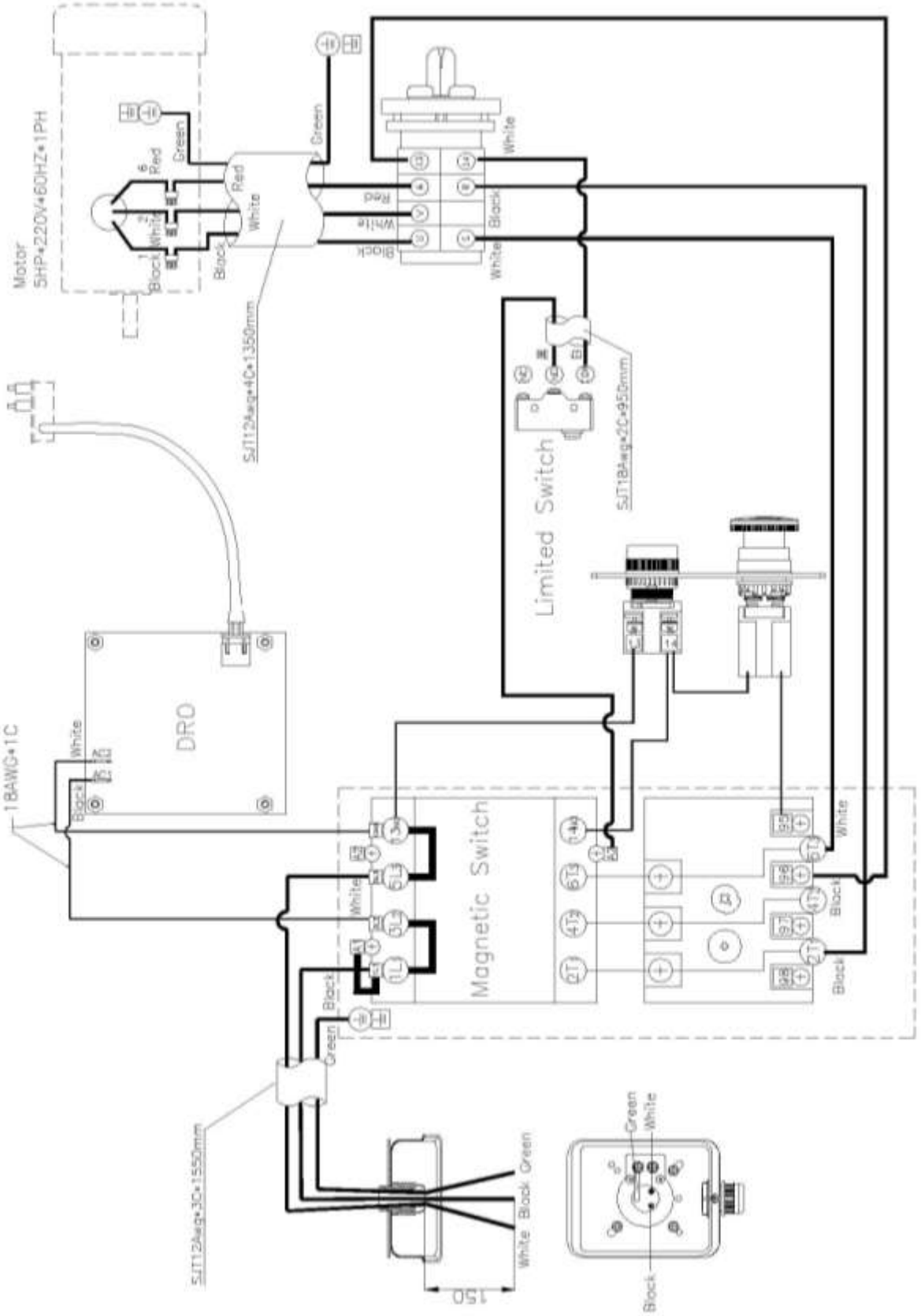

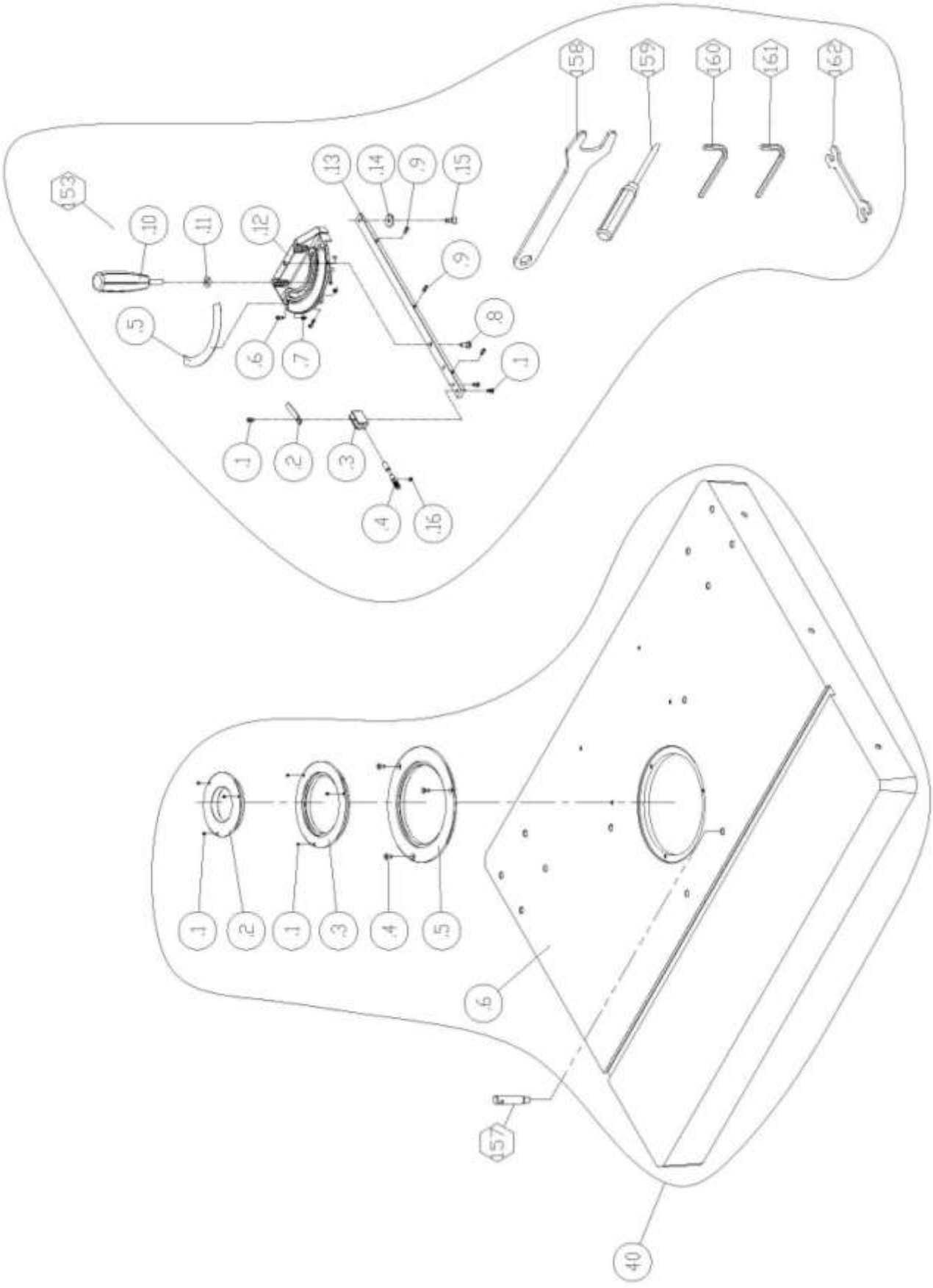
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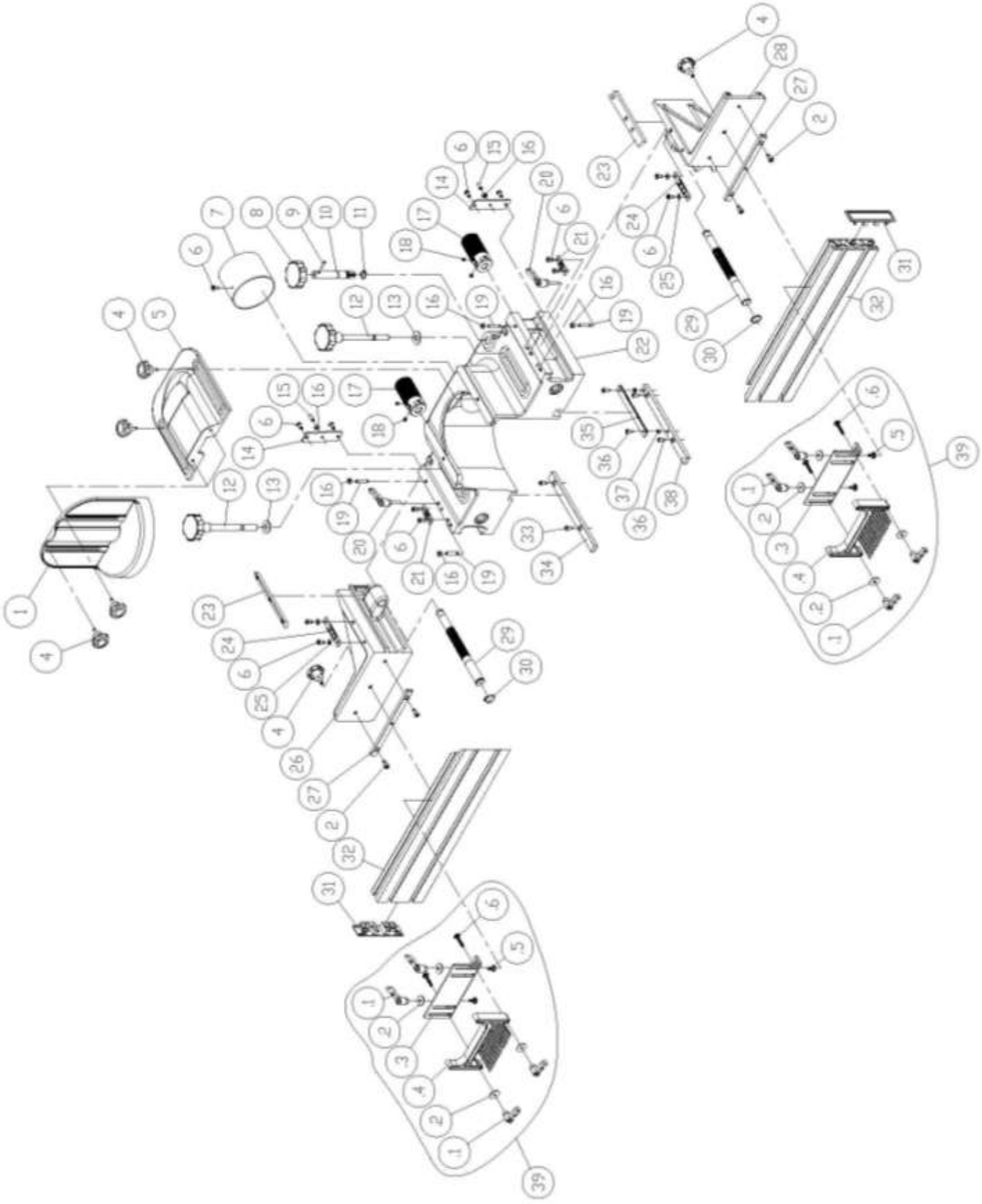

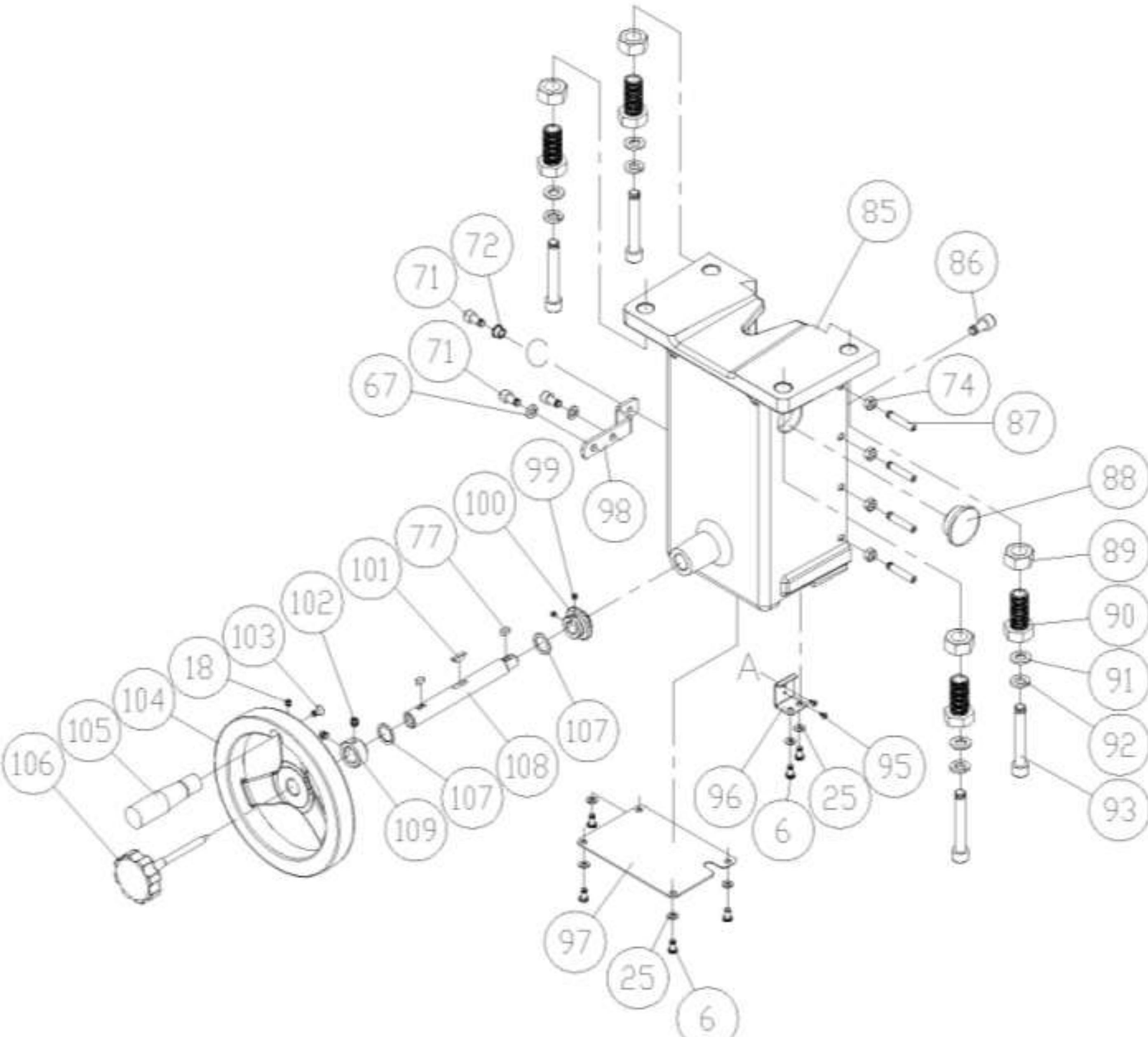
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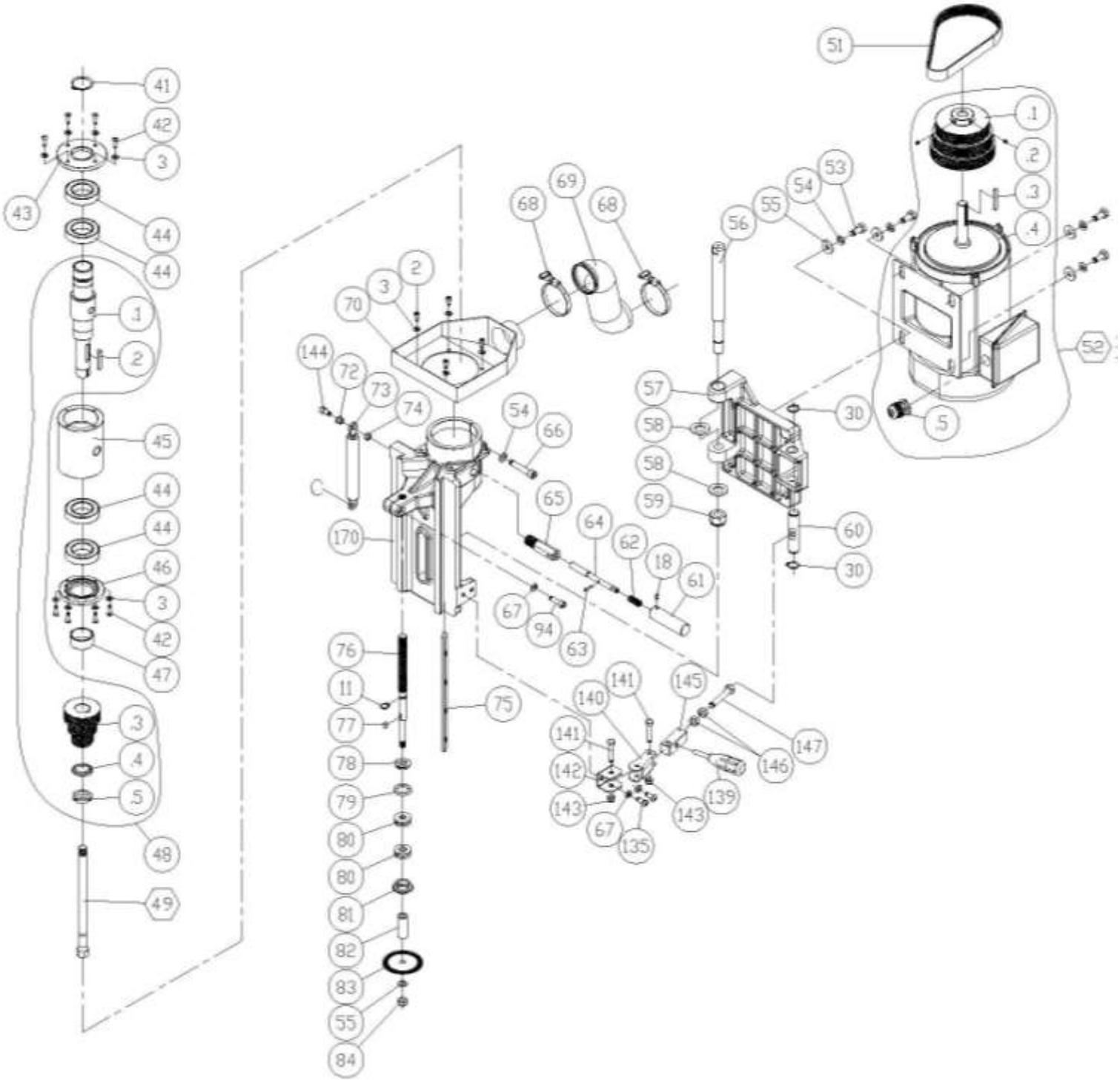
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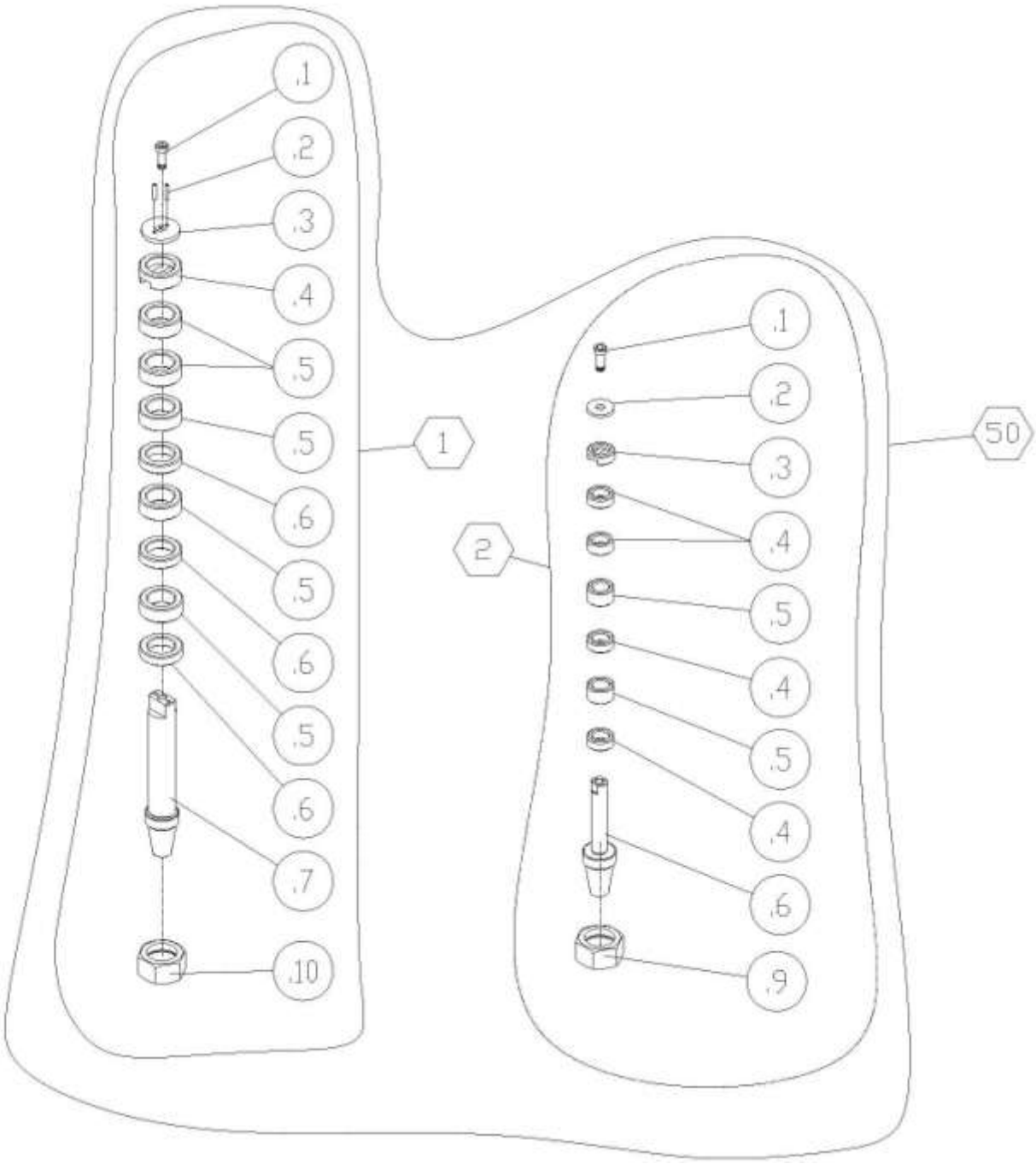
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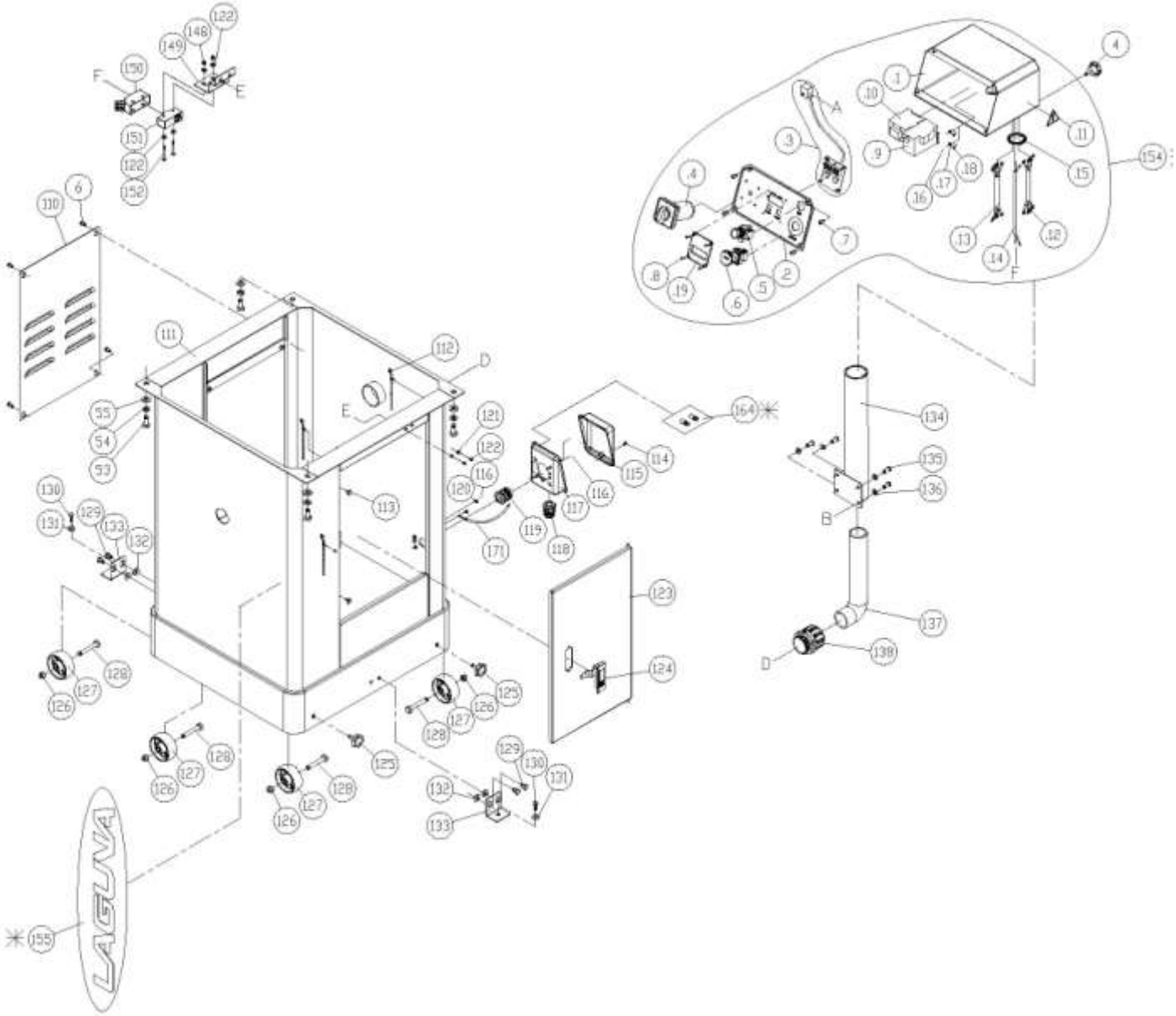
LAGUNA

PARTS LIST FOR MSHAP5010-0130 & MSHAP5030-0130

Key	Part No.	Descriptions		Q'ty
1	250838-620	Cutter Guard		1
2	000103-103	Cap Screw	M6*1.0P*12	8
3	006303-100	Spring Washer	6.1*12.3	12
4	230131-000	Bolt		7
5	090240-000	Cutter Guard Bracket		1
6	000304-103	Pan Head Screw	M6*1.0P*12	23
7	190175-904	Dust Chute		1
8	230331-916	Knob		1
9	011002-209	Spring Pin	4*18	1
10	320309-902	Shaft Gear		1
11	010006-000	Retaining Ring	STW-15	2
12	230329-904	Knob		2
13	006001-091	Flat Washer	13*28*3.0t	2
14	172839-000	Adjust Bracket		2
15	000203-106	Set Screw	M6*1.0P*16	2
16	008005-100	Hex Nut	M6*1.0P	6
17	360941-910	Micro Adjust Handle		2
18	001902-102	Set Screw	M6*1.0P*8	6
19	000203-109	Set Screw	M6*1.0P*30	4
20	230251-000	Lock Handle		2
21	172836-000	Scale		2
22	090239-000	Fence Bracket		1
23	051064-000	Gib		2
24	172834-000	Scale		2
25	006001-022	Flat Washer	6.3*13*1.0t	10
26	051059-000	Fence Plate - Left		1
27	380966-902	Gib		2
28	051063-000	Fence Plate - Right		1
29	360942-902	Shaft		2
30	010010-000	Retaining Ring	STW-20	4
31	250593-615	End Cap		2
32	310109-909	Fence		2
33	000102-105	Cap Screw	M5*0.8P*16	2
34	380968-902	Location Plate		1
35	380967-902	Micro Adj. Gear Rack		1
36	000102-104	Cap Screw	M5*0.8P*12	4

Key	Part No.	Descriptions		Q'ty
37	006001-131	Flat Washer	5.3*10*2.0t	2
38	380971-902	Location Plate		1
39	922670-000	Feather Board Assy.		2
39.1	230178-000	Lock Handle		4
39.2	006001-127	Flat Washer	5.5*22*2.0t	4
39.3	172031-901	Bracket		1
39.4	250608-000	Feather Board	TS-35	1
39.5	001004-202	Carriage Bolt	M5*0.8P*16L	2
39.6	001004-203	Carriage Bolt	M5*0.8P*30L	2
40	922652-000	Table Assy.		1
40.1	001904-102	Set screw	M4*0.7P*4	6
40.2	050693-902	Insert Ring (small)		1
40.3	050688-902	Insert Ring		1
40.4	000402-104	Flat Head Screw	M5*0.8P*12	3
40.5	050832-902	Insert Ring (Large)		1
40.6	051057-000	Table		1
41	010025-000	Retaining Ring	STW-40	1
42	000801-104	Round Head Screw	M6*1.0P*20	8
43	051062-902	Bearing Cover (Top)		1
44	030410-000	Ball Bearing	6008-2NK	4
45	051065-000	Cartridge		1
46	050892-901	Bearing Cover		1
47	190165-901	Bushing		1
48	922651-000	Arbor Shaft Assy.		1
48.1	360939-901	Arbor Shaft		1
48.2	012005-011	Key	8*7*43	1
48.3	090242-000	Pulley		1
48.4	006802-100	Lock Washer	25	1
48.5	008201-100	Lock Nut	M25*1.5P	1
49	380969-902	Connect Bar		1
50	922473-000	Arbor Assy.	1-1/4” & 3/4”	1
50-1	922193-000	1-1/4" Arbor Assy.		1
50-1.1	000105-103	Cap Screw	M10*1.5P*30	1
50-1.2	011102-103	Pin	4.0*20	2
50-1.3	171848-902	Arbor Washer	10.5*45*5t	1
50-1.4	380531-901	Arbor Bushing		1
50-1.5	380039-901	Spacer		5
50-1.6	380038-901	Spacer		3

Key	Part No.	Descriptions		Q'ty
50-1.7	220105-000	1-1/4" Arbor		1
50-1.10	380818-901	Arbor Nut		1
50-2	922194-000	3/4" Arbor Assy.		1
50-2.1	000105-103	Cap Screw	M10*1.5P*30	1
50-2.2	380691-902	Arbor Washer		1
50-2.3	380530-901	Arbor Bushing		1
50-2.4	380042-901	Spacer		4
50-2.5	380043-901	Spacer		2
50-2.6	220107-000	3/4" Arbor		1
50-2.9	380818-901	Arbor Nut		1
51	014341-000	Poly V-Belt	250 J10	1
52	900735-000	Motor Assy.	7.5HP*220V/440V*60HZ*3PH	1
52	900754-000	Motor Assy.	5HP*220V*60HZ*1PH	1
52.1	090241-000	Motor Pulley		1
52.2	001902-102	Set screw	M6*1.0P*8	2
52.3	012202-006	Key	5*5*50	1
52.4	606106-008	Motor	7.5HP*220V/440V*60HZ*3PH	1
52.4	603066-008	Motor	5HP*220V*60HZ*1PH	1
52.5	021306-000	Strain Relief Bushing	PGA16-14B	1
53	000004-102	Hex. screw	M10*1.5P*25	8
54	006307-100	Spring Washer	10.2*18.5	9
55	006003-080	Flat Washer	10*25*3.0t	9
56	360946-902	Shaft		1
57	051060-008	Motor Bracket		1
58	006001-142	Flat Washer	21*38*3t	2
59	008314-100	Lock Nut	M20*1.5P	1
60	360943-902	Shaft		1
61	300013-000	Handle		1
62	280151-905	Spring		1
63	011002-105	Spring Pin	4*20	1
64	360724-901	Rod		1
65	380511-901	Connector		1
66	000105-106	Cap Screw	M10*1.5P*55	1
67	006305-100	Spring Washer	8.2*15.4	4
68	042608-000	Clamp	60-80mm (I. D.)	2
69	042611-000	Tube	300mm	1
70	172835-008	Dust Collect		1
71	000104-104	Cap Screw	M8*1.25P*16	3

Key	Part No.	Descriptions		Q'ty
72	160076-000	Bushing Sleeve		2
73	660147-000	Nitrogen Cylinder		1
74	008006-100	Hex Nut	M8*1.25P	5
75	050696-000	Gib		1
76	360945-902	Lead Screw		1
77	012003-003	Key	5*5*12	3
78	160073-000	Bushing		1
79	660144-000	Packing		1
80	031006-000	Bearing	51202	2
81	380767-000	Bevel Gear		1
82	360944-902	Bushing		1
83	171985-000	Sensor Plate		1
84	008307-100	Lock Nut	M10*1.25P	1
85	051061-008	Support		1
86	002604-101	Pan Head Lock Screw	M10*1.5P*20	1
87	000204-108	Set screw	M8*1.25P*35	4
88	250159-615	Plug		1
89	008017-100	Hex Nut	M20*1.5P	4
90	380647-902	Adjust Screw	M20*1.5P	4
91	006001-136	Flat Washer	12.2*23*2.0t	4
92	006308-100	Spring Washer	12.2*21.6	4
93	000106-112	Cap Screw	M12*1.75P*80	4
94	002604-103	Pan Head Lock Screw	M10*1.5P*40	1
95	001101-203	Round Head Screw	M3*1.06P*08L	2
96	172992-000	Bracket		1
97	172838-000	Plate		1
98	172982-901	Bracket		1
99	001901-101	Set screw	M5*0.8P*5	2
100	380768-000	Bevel Gear		1
101	130061-000	Key		1
102	004403-103	Set screw	5/16"-18NC*5/16"	2
103	000702-102	Socket Hex. Screw	M6*1.0P*12	1
104	240077-000	Handwheel		1
105	230046-000	Handle		1
106	230171-916	Lock Handle		1
107	006006-106	Flat Washer	19.1*25.4*1.6	2
108	360940-902	Lead Screw		1
109	360376-901	Fix Ring		1

Key	Part No.	Descriptions		Q'ty
110	172837-000	Left Cover		1
111	172987-000	Cabinet		1
112	230297-615	Tie		3
113	340007-615	Spacer		2
114	003303-102	Pan Head Screw	3/16"-24NC*1/4"	1
115	490124-008	Cover		1
116	000303-103	Pan Head Screw	M5*0.8P*10	4
117	490609-008	Cover		1
118	021306-000	Strain Relief Bushing	50-1PGA16-14B	1
119	021315-000	Strain Relief Bushing	50-1MG25A-16B	1
120	006502-100	Tooth Washer	5.3*10	2
121	000302-102	Pan Head Screw	M4*0.7P*8	2
122	006001-001	Flat Washer	4.3*10*1.0t	6
123	172841-000	Door		1
124	230134-000	Latch		1
125	004001-101	Knob	5/16"-18NC*3/4"	2
126	003005-106	Hex. Screw	3/8"-16NC*2-1/2"	4
127	051068-000	Wheel		4
128	009102-100	Lock Nut	3/8"-16NC	4
129	000003-101	Hex. Screw	M8*1.25P*12	4
130	002201-201	Wood Screw	M6*2.6P*24	2
131	006001-036	Flat Washer	6.7*19*2.0t	2
132	006007-065	Flat Washer	9.2*20*2.0t	4
133	170448-901	Fence Block		2
134	172983-000	Switch Bracket		1
135	000802-102	Round Head Screw	M8*1.25P*20	6
136	006001-049	Flat Washer	8.5*16*2.0t	4
137	022231-000	Wave Tube	NFE-16B*300mm	1
138	023207-000	Connector	N-MGQ50-48B	1
139	230301-615	Handle		1
140	172991-904	Bracket		1
141	000003-109	Hex. Screw	M8*1.25P*45	2
142	172990-904	Brace		1
143	008306-100	Lock Nut	M8*1.25P	2
144	000104-110	Cap Screw	M8*1.25P*30	1
145	381002-904	Shaft		1
146	008007-100	Hex Nut	M10*1.5P(17B*8H)	2
147	000004-113	Hex. Screw	M10*1.5P*65	1

Key	Part No.	Descriptions		Q'ty
148	008301-100	Lock Nut	M4*0.7P	2
149	171901-901	Limit Switch Plate		1
150	490229-000	Cover	KSSCB-2	1
151	490227-000	limit Switch	MJ2-1306	1
152	000302-107	Pan Head Screw	M4*0.7P*35	2
153	921574-000	Miter Gauge Assy..		1
153.1	003303-105	Pan Head Screw	3/16"-24NC*3/8"	3
153.2	250193-620	Pointer		1
153.3	130053-901	Spacer		1
153.4	360381-901	Angle Set Bar		1
153.5	571151-000	Miter Scale		1
153.6	003305-106	Pan Head Screw	5/32"-32NC*5/8"	3
153.7	009001-100	Hex Nut	5/32"-32NC	3
153.8	290017-901	Shoulder Screw		1
153.9	230222-901	Ball		3
153.1	230300-615	Handle		1
153.11	006002-051	Flat Washer	8.5*18*3t	1
153.12	090067-008	Miter gauge body		1
153.13	380614-904	Slot Bar		1
153.14	380069-901	Ring		1
153.15	000403-105	Flat Head Screw	M6*1.0P*6	1
153.16	043311-000	O-Ring	P5	1
154	937524-000	Switch Assy.	7.5HP*220V*60HZ*3PH	1
154	937573-000	Switch Assy.	5HP*220V*60HZ*1PH	1
154.1	172833-000	Control Box		1
154.2	300036-000	Plate		1
154.3	950479-000	Sensor Assy.		1
154.4	490341-000	FWD/REV Switch	AC-3/25A 250V	1
154.4	490342-000	FWD/REV Switch	AC-3/25A 250V	1
154.5	490040-000	Start Switch		1
154.6	490591-000	Stop Switch		1
154.7	000304-203	Pan Head Screw	M6*1.0P*12	4
154.8	000301-202	Pan Head Screw	M3*0.5P*12	4
154.9	490640-000	Over Load	NTH-21 (17~21A)	1
154.10	490692-000	Connector	C-18D10 (220V)	1
154.11	571227-000	Label		1
154.12	473004-035	Connect Wire	SJT12Awg*3C*1550mm	1
154.12	474004-021	Connect Wire	SJT12Awg*4C*1550mm	1

Key	Part No.	Descriptions		Q'ty
154.13	474004-022	Connect Wire	SJT12Awg*4C*1350mm	1
154.14	472001-027	Connect Wire	SJT18Awg*2C*950mm	1
154.15	021702-000	Relief Bushing	AMB-2	1
154.16	000303-202	Pan Head Screw	M5*0.8P*8	2
154.17	006502-200	Tooth Washer	5.3*10	2
154.18	570695-000	Grounding Label		2
154.19	250839-620	Cover		1
157	360735-905	Draw Bar		1
158	171895-904	Spanner	50mm	1
159	040401-000	Screw Driver		1
160	040003-000	Hex. Wrench	3mm	1
161	040006-000	Hex. Wrench	6mm	1
162	040205-000	Open Wrench	14*17	1
164	021203-000	Connector	SW-P6H	2
170	051058-000	Arbor Shaft Bracket		1
171	471004-012	Connect Wire	SJT12AWG*1C*150mm	1