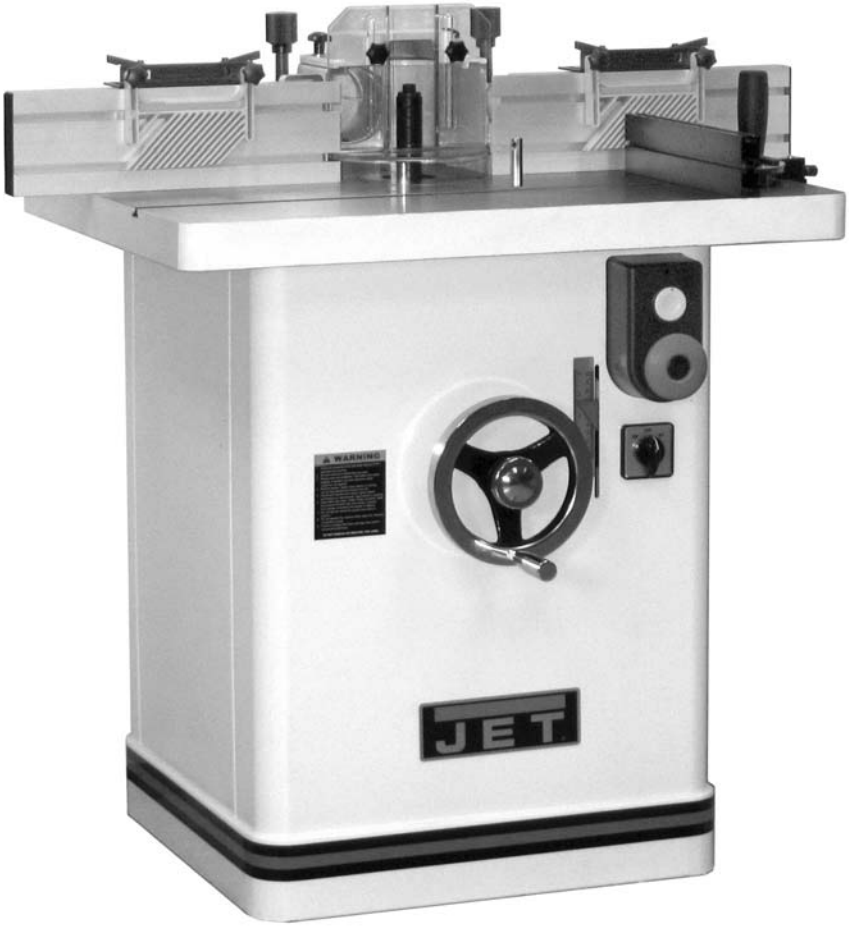
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Operating Instructions and Parts Manual
Model JWS-35X Series Shaper



WALTER MEIER (Manufacturing), Inc.
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www.jettools.com

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Revision D 02/2013
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Warranty and Service

Walter Meier (Manufacturing) Inc., warrants every product it sells. If one of our tools needs service or repair, one of our Authorized Service Centers located throughout the United States can give you quick service. In most cases, any of these Walter Meier Authorized Service Centers can authorize warranty repair, assist you in obtaining parts, or perform routine maintenance and major repair on your JET® tools. For the name of an Authorized Service Center in your area call 1-800-274-6848.

MORE INFORMATION

Walter Meier is consistently adding new products to the line. For complete, up-to-date product information, check with your local Walter Meier distributor, or visit waltermeier.com.

WARRANTY

JET products carry a limited warranty which varies in duration based upon the product (MW = Metalworking, WW = Woodworking).

90 DAY WARRANTY	1 YEAR WARRANTY	2 YEAR WARRANTY	3 YEAR WARRANTY	5 YEAR WARRANTY	LIFE LIFETIME WARRANTY
Lathe Accessories Machine Accessories Mobile Bases Safety Equipment Specialty Items Vise Accessories	Air Tools-Contractor Air Tools-Industrial Air Tools-Light Industrial Lubrication	Body Repair Kits Bottle Jacks Cable Pullers Cold Saws Hoists-Air Hoists-Electric Metal forming Mill/Drills Milling Machines MW Bandsaws MW Drill Presses MW Finishing Equipment MW Lathes MW Precision Vises Palet Trucks Rigging Equip. Service Jacks Stackers Surface Grinders Tapping Trolleys-Air Trolleys-Electric Web Slings Winches-Electric	WW Benchtop Tools	Beam Clamps Chain Hoist-Manual Lever Hoists Pullers-JCH Models Scissor Lift Tables Screw Jacks Trolleys-Geared Trolleys-Plain Winches-Manual WW Air Filtration WW Bandsaws WW Buffers WW Drill Presses WW Dust Collectors WW Dust Filters WW Dust Fittings WW Jointers WW Lathes WW Planers WW Sanders WW Shapers WW Tablesaws	Fastening Tools Mechanics Hand Tools Striking Tools Vises (no -precision) Clamps

Warranty reverts to 1 Year Warranty if woodworking (WW) products listed above are used for industrial or educational purposes.

WHAT IS COVERED?

This warranty covers any defects in workmanship or materials subject to the exceptions stated below. Cutting tools, abrasives and other consumables are excluded from warranty coverage.

WHO IS COVERED?

This warranty covers only the initial purchaser of the product.

WHAT IS THE PERIOD OF COVERAGE?

The general JET warranty lasts for the time period specified in the product literature of each product.

WHAT IS NOT COVERED?

Five Year Warranties do not cover woodworking (WW) products used for commercial, industrial or educational purposes. Woodworking products with Five Year Warranties that are used for commercial, industrial or education purposes revert to a One Year Warranty. This warranty does not cover defects due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and-tear, improper repair or alterations, or lack of maintenance.

HOW TO GET SERVICE

The product or part must be returned for examination, postage prepaid, to a location designated by us. For the name of the location nearest you, please call 1-800-274-6848.

You must provide proof of initial purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, we will repair or replace the product, or refund the purchase price, at our option. We will return the repaired product or replacement at our expense unless it is determined by us that there is no defect, or that the defect resulted from causes not within the scope of our warranty in which case we will, at your direction, dispose of or return the product. In the event you choose to have the product returned, you will be responsible for the shipping and handling costs of the return.

HOW STATE LAW APPLIES

This warranty gives you specific legal rights; you may also have other rights which vary from state to state.

LIMITATIONS ON THIS WARRANTY

WALTER MEIER (MANUFACTURING) INC., LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD OF THE LIMITED WARRANTY FOR EACH PRODUCT. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS ARE EXCLUDED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG THE IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

WALTER MEIER SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY, OR FOR INCIDENTAL, CONTINGENT, SPECIAL, OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Walter Meier sells through distributors only. The specifications in Walter Meier catalogs are given as general information and are not binding. Members of Walter Meier reserve 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. JET® branded products are not sold in Canada by Walter Meier.

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The specifications in this manual are given as general information and are not binding. Walter Meier (Manufacturing), Inc., reserves the right to effect, at any time and without prior notice, changes or alterations to parts, fittings, and accessory equipment deemed necessary for any reason whatsoever.

Warnings

1. Read and understand the entire owner's manual before attempting assembly or operation.
2. Read and understand the warnings posted on the machine and in this manual. Failure to comply with all of these warnings may cause serious injury.
3. Replace the 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 the proper and safe operation of a shaper, do not use until proper training and knowledge have been obtained.
5. Do not use this shaper for other than its intended use. If used for other purposes, Walter Meier (Manufacturing), Inc., disclaims any real or implied warranty and holds itself harmless from any injury that may result from that use.
6. Always wear approved safety glasses/face shields while using this shaper. Everyday eyeglasses only have impact resistant lenses; they are not safety glasses.
7. Before operating this 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 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, cement and other masonry products.
   - Arsenic and chromium from chemically treated lumber.

   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.
10. Do not operate this machine while tired or under the influence of drugs, alcohol or any medication.
11. Make certain the machine is properly grounded.
12. Make all machine adjustments or maintenance with the 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.
13. 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.
14. 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 after maintenance is complete.
15. 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 that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
16. Provide for adequate space surrounding work area and non-glare, overhead lighting.
17. Keep the floor around the machine clean and free of scrap material, oil and grease.
18. Keep visitors a safe distance from the work area. Keep children away.
19. Make your workshop child proof with padlocks, master switches or by removing safety keys.

Warnings

20. Give your work undivided attention. Looking around, carrying on a conversation and “horse-play” are careless acts that can result in serious injury.
21. 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.
22. Use the right tool at the 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.
23. Use recommended accessories; improper accessories may be hazardous.
24. Maintain tools with care. Keep cutter sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.
25. 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.
26. 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.
27. 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.
28. Do not attempt to shape long or wide boards unsupported where spring or weight could cause the board to shift position.
29. Always use safety devices for all operations where they can be used.
30. Be sure to check the direction of spindle rotation before use.
31. Turn off the machine before cleaning. Use a brush or compressed air to remove chips or debris — do not use your hands.
32. Do not stand on the machine. Serious injury could occur if the machine tips over.
33. Never leave the machine running unattended. Turn the power off and do not leave the machine until it comes to a complete stop.
34. 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:

⚠CAUTION This means that if precautions are not heeded, it may result in minor injury and/or possible machine damage.

⚠WARNING This 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 the 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 disconnected, always rotate the spindle by hand with any new set-up to ensure proper clearance with the cutters. At the same time, check to be sure the cutterhead is turning in the 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 the 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 the machine, and mount only safety type cutters on the spindle.

Stock condition – The danger of kicked-back stock can occur when the 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.

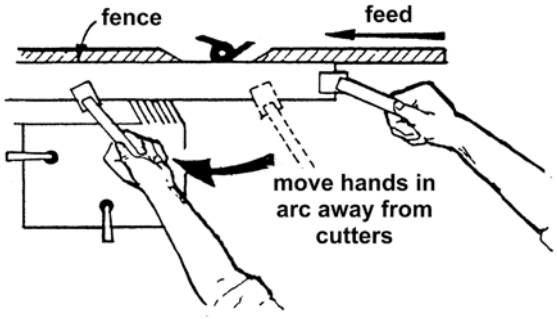


Figure A

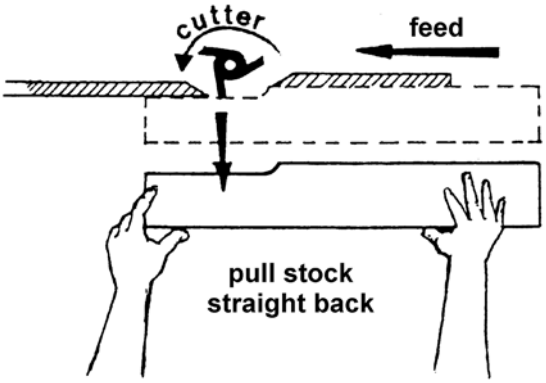


Figure B

Introduction

This manual is provided by Walter Meier (Manufacturing), Inc., covering the safe operation and maintenance procedures for a JET Model JWS-35X Series Shaper. This manual contains instructions on installation, safety precautions, general operating procedures, maintenance instructions and parts breakdown. This machine has been designed and constructed to provide years of trouble free operation if used in accordance with instructions set forth in this manual. If there are any questions or comments, please contact either your local supplier or Walter Meier. Walter Meier can also be reached at our web site: www.waltermeier.com.

Specifications

Model Number	Stock Number
JWS-35X3-1	708323
JWS-35X5-1	708326

Motor	Stock Number
3HP, 230V, 60Hz, 1 Phase	708323
5HP, 230V, 60Hz, 1 Phase	708326

Table Size (L x W)	32-1/4" x 26-3/4"
Table T-slot	3/4"W x 3/8"D
Table Height from Floor	34"
Spindle Size (Standard)	1-1/4" Interchangeable
Router Bit Collet Size (Optional)	1/4", 1/2"
Spindle Capacity Under Nut	1-1/4" Spindle – 4-3/32"
Spindle Travel	4"
Spindle Speeds (RPM)	4000, 6000, 8000, 10000, reversing
Table Opening Diameter	6-19/64"
Insert Opening Diameters	2-9/16", 4-5/16"
Fence Size x 2	4-7/8" (H) x 16" (W)
Dust Collection Minimum CFM Required 4" Port	600
Overall Dimensions	32-1/4" (L) x 28-1/4" (W) x 42-3/8" (H)
Weight	550 lbs (Shipping), 475 lbs (Net)

Optional Accessories

708373	1/4" Router Collet
708374	1/2" Router Collet
708380	1/2" Spindle
708317	3/4" Spindle
708314	1" Spindle
708328	1-1/4" Spindle
708372	30mm Spindle

The above specifications were current at the time this manual was published, but because of our policy of continuous improvement, Walter Meier reserves the right to change specifications at any time and without prior notice, without incurring obligations.

Unpacking

1. Remove box and wood crating completely from around shaper. Check for shipping damage. Report any damage immediately to your distributor and shipping agent. Do not discard any shipping material until the Shaper is assembled and running properly.
2. Unbolt the shaper from the skid.
3. Carefully slide the shaper from the pallet onto the floor.

   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 and rail assemblies, and loading and off-loading stock and general maintenance work.

Shipping Contents

Compare the contents of your container with the parts listings and illustrations on this page to make sure all parts are intact. Missing parts, if any, should be reported to your distributor. Read the instruction manual thoroughly for assembly, maintenance and safety instructions.



Main Shaper Container

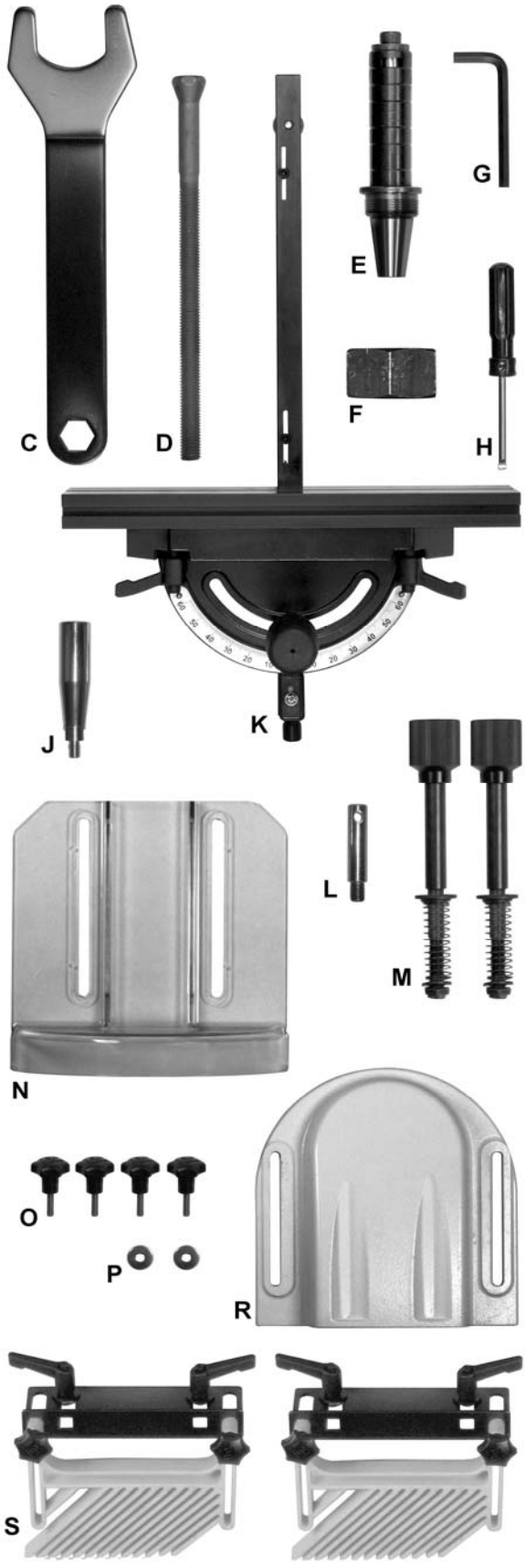
Main Shaper Container

1 Cabinet and Base (A)
1 Fence Assembly (B)

Hardware

Hardware and included tools consist of the following items:

1 Wrench (C)
1 Draw Bar (D)
1 1-1/4" Spindle (E)
1 Spindle Nut(F)
1 Hex Wrench (G)
1 Crosspoint/Flathead Screwdriver (H)
1 Handle (J)
1 Miter Assembly (K)
1 Starting Pin (L)
2 Fence Lock (M)
1 Cutter Guard (N)
4 Lock Knob (O)
2 Flat Washer (P)
1 Safety Guard Holder (R)
2 Feather Board (S)



Hardware

Assembly

Cleaning

Referring to Figure 1:

1. Remove two *hex cap screws* and *flat washers* (A) that secure the *fence assembly* (B) to the table and discard.
2. Set the *fence assembly* (B) aside to permit cleaning of the table.
3. Peel away the *plastic protective wrap* (C) covering the table surface.

Exposed (unpainted) metal surfaces, such as the table top and extension wings, have been given a protective coating at the factory.

4. Remove protective coating 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.

Lock Handle Assembly

1. Locate two *fence locks* from the hardware package (Page 9, Item M) and disassemble.

Referring to Figure 1:

2. Place the *large washers* (E) on the shaft of each *lock handle* (D), then insert into the *slotted openings* (O) on the *fence casting* (P).
3. Continue the lock handle re-assembly by placing one *small flat washer* (F_1), followed by the *spring* (G) and second *small flat washer* (F_2) on each shaft protruding from the bottom of the *casting* (P). Place *lock nuts* (H) on the threaded ends and tighten all the way (19mm deep socket required).

   When the *lock nuts* (H) are secured, 1/2" of thread should be visible on the ends of the *lock handle shaft* (D).

Fence Assembly Installation

1. Place the *fence assembly* (N) on the *table* (Q).
2. Line up the threaded ends of the *lock handles* (D) with the *threaded mounting holes* (R) on the *table* (Q) and secure, but allow sufficient slack to permit the fence to be adjusted backward and forward.
3. Place the *safety guard holder* (L) on the *casting* (P) and secure with *lock knobs* (J) and f*lat washers* (K).

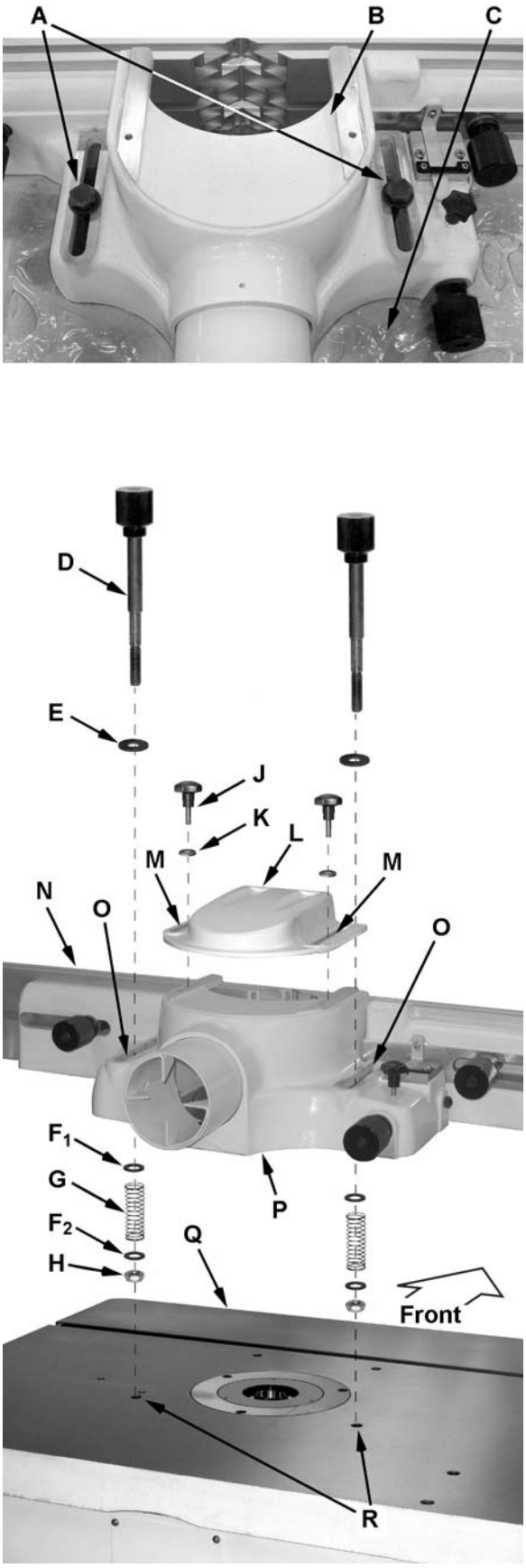


Figure 1

Cutter Guard

Referring to Figure 2:

Mount the *cutter guard* (A) to the *safety guard holder* (H). Insert two *lock knobs* (B) through the cutter guard slots and into the *threaded mounting holes* (J) on the *safety guard holder* (H).

Feather Board

Referring to Figure 2:

Loosen *lock handles* (C) and slide the rail of the featherboard so the squared edges of the *carriage bolt* (D) engages in the *groove* (F) along the top of the fence.

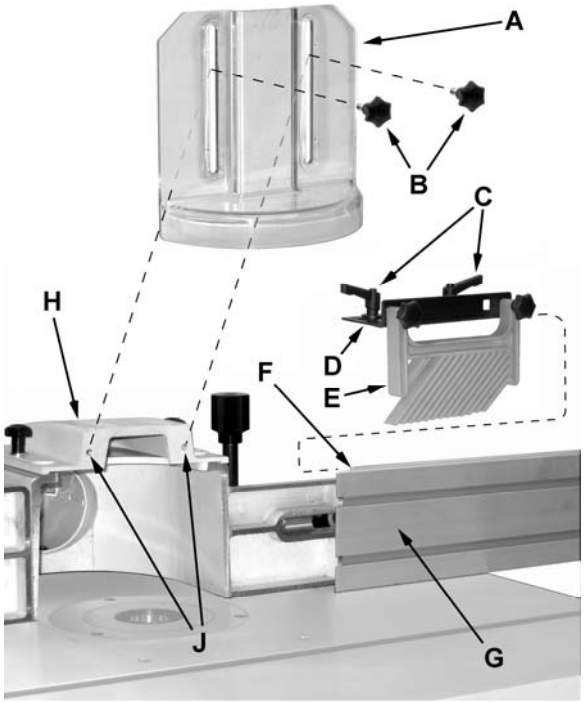


Figure 2

Handwheel Handle

Insert the *handle* (A, Fig. 3) into the *handwheel* (B) and secure with a 14 mm wrench.

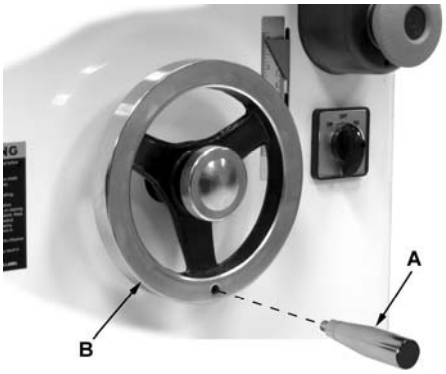


Figure 3

Electrical Connections

⚠WARNING 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 the Model JWS35X. 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. Consult electrical drawings on pages 45-46 for further clarification of wiring setup.

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.

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

Extension Cords

If an extension cord is necessary, make sure the cord rating is suitable for the amperage listed on the machine's motor plate. An undersize cord will cause a drop in line voltage resulting in loss of power and overheating.

The chart in *Table 1* shows 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.

	Extension Cord Length *					
Amps	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.

Table 1

Adjustments

⚠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.

Fence Assembly Movement

Referring to Figure 4:

The adjustment controls of the fence assembly are as follows:

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

B – Lock Knob – to secure the outfeed fence

C – Outfeed Ram Adjust – fine forward/backward adjustment for outfeed fence

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

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

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

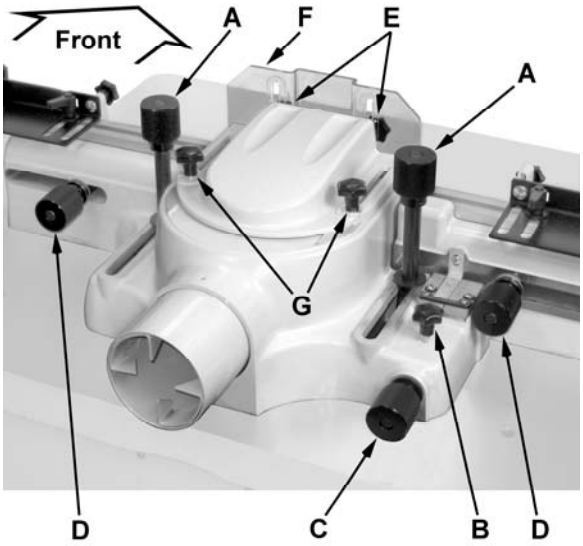


Figure 4

Handwheel

The handwheel controls the spindle height.

Spindle height

Referring to Figure 5:

1. Loosen the *lock knob* (A).
2. Turn the *handwheel* (B) clockwise to raise and counterclockwise to lower the *spindle* (C).
3. Tighten the *lock knob* (A).

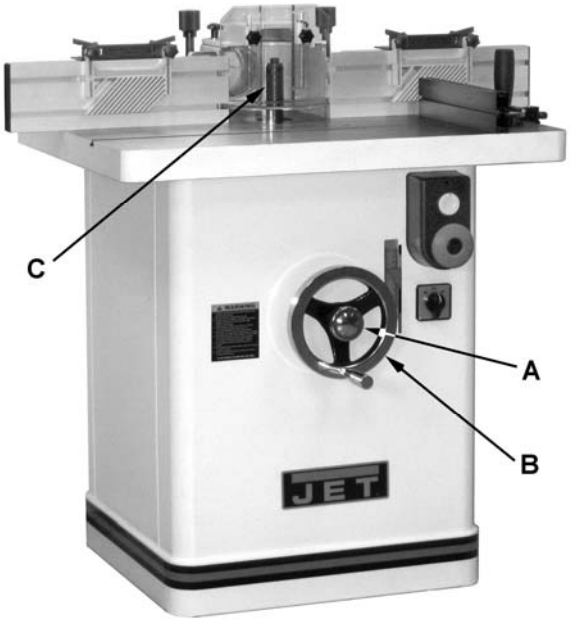


Figure 5

Coplanar Alignment

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

Verifying that fences are coplanar

1. Remove the guard and spindle attachment.
2. Unlock *knobs* D_1, D_2 and adjust the *fence assembly* (A) so it is positioned approximately at midpoint; then secure *lock knobs* D_1, D_2.
3. Place a *straightedge* (H) on the table against the *infeed* and *outfeed fences* (F_1, F_2).
4. Unlock the ram dial *lock knob* (B).
5. With the *ram adjust dial* (C) adjust the position of the *outfeed fence* (G_2) while at the same time pressing against the *straightedge* (H) and attempting to bring both fences (G_1, G_2) in-line with the straightedge.

   Note: The *outfeed fence casting* (F_2) is adjust-able while the *infeed fence casting* (F_1) is stationary and cannot be adjusted.

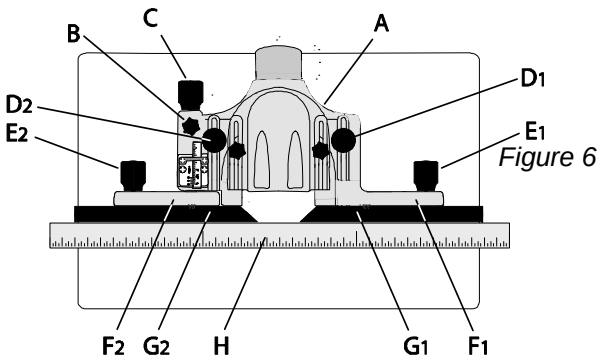


Figure 6

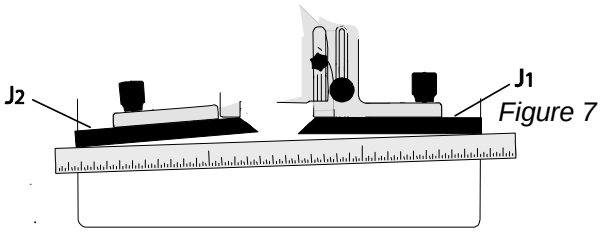


Figure 7

No adjustment is required if both fences (G_1, G_2) *are* flush with the straightedge as shown in Figure 6. Proceed to the *Ram Dial Calibration* section on page 14.

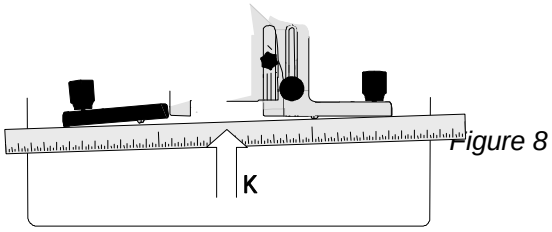
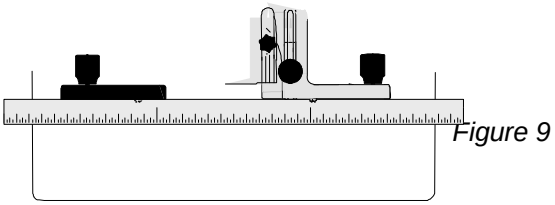


Figure 8

Adjustment is required if the fences appear skewed (Figure 7). Continue with the steps below.


Figure 9

Coplanar Adjustment

6. Remove both fences (J_1, J_2) and place the straightedge against the infeed and outfeed fence castings (Figure 8).

Coplanar Alignment

Read *step 7* completely before attempting.

7. Maintain steady pressure of the straightedge against the fence castings (K, Fig. 8). At the same time, attempt to bring both fences into alignment as shown in Figure 9. This is accomplished by alternately making incremen-tal adjustments to two *setscrews* (M, Fig. 10) on the front face of the *casting* (L, Fig. 10) with a 3mm hex wrench, followed by repositioning the casting with the *ram adjust dial* (Q, Fig. 10) as required.

   Important: It is recommended that the adjustment setscrews (M, Fig. 10) be rotated in 1/16th increments or less at a time.

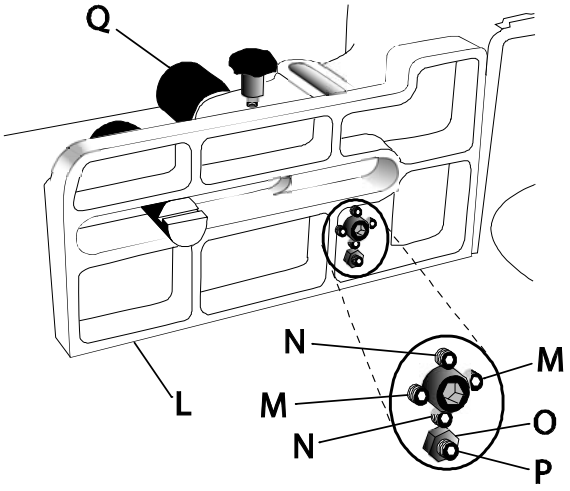


Figure 10

Fence perpendicular to table

The outfeed fence must also be perpendicular to the table. This can be checked as follows:

8. Place a square against the *casting* (L, Fig. 10) and table.
9. If adjustment is required, adjust *setscrews* N (Fig. 10).

Alignment is complete when both fence castings are coplanar (in-line) as shown in Figure 9 and the outfeed fence is perpendicular to the table.

10. Replace both fences and secure.

Ram Dial Calibration

The cutter guard should be removed or raised to provide clearance.

Referring to Figure 11:

1. Loosen the *ram dial lock knob* (B).
2. Adjust the *outfeed ram dial* (A) fully clockwise.
3. With a *straightedge* (F) pressed against both *infeed* and *outfeed fences* (D, E, G) as reference, both fences should be in-line as shown and the *scale* (C) should indicate zero.

If step 3 can be successfully achieved, no calibration is required.

If the fences cannot be brought into alignment (L), adjust as follows:

4. Remove *fences* (D, E).
5. Using a 10mm wrench, loosen the *lock nut* (O, Fig. 10) that secures the *zero stop set-screw* (P, Fig, 10) on the *casting* (L, Fig. 10).
6. Loosen or tighten the *setscrew* (P, Fig. 10), as required, to bring fence castings into alignment as shown in M.

   Note: *Ram Dial Adjust* (A) is fully clockwise (from step 2).
7. Tighten *lock nut* (O, Fig. 10).

If the *scale* (C) does not indicate zero:

8. Loosen two *screws* (J) that secure the *indicator* (H) and adjust until the zero on the *indicator* (H) is lined up with the zero on the *scale* (K).
9. Tighten *screws* (J).

Repeat steps 2 and 3 to verify that calibration is successful.

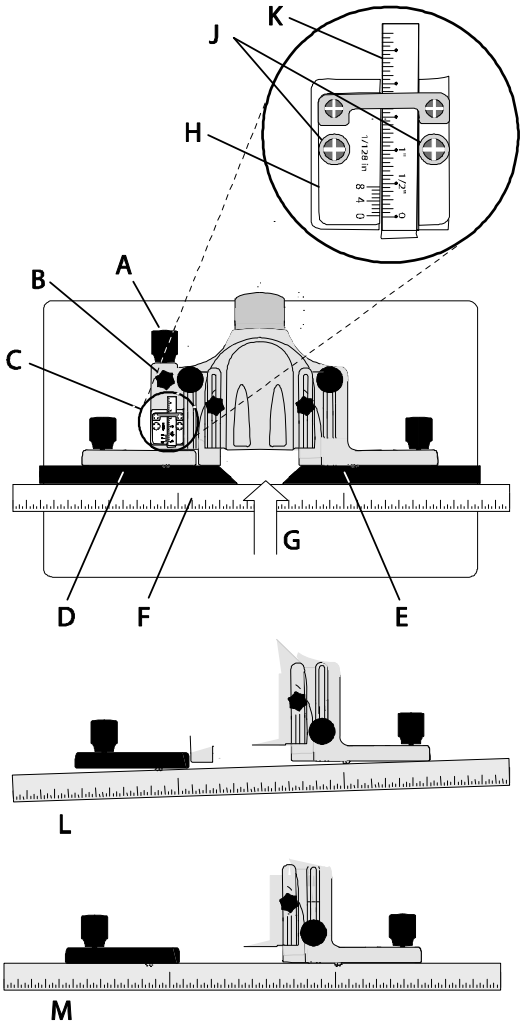


Figure 11

Spindle Gib Adjustment

Referring to Figure 12:

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

To adjust:

1. With a 12mm wrench, loosen *jam nuts* that secure the gib *setscrews* in four places (A).
2. With a 4mm hex wrench, tighten each setscrew 1/8 or less turn starting with the lowest one, followed by the uppermost one, then the two middle setscrews.

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

Note: If the gibs are too tight the *front handwheel* that controls the spindle height will be difficult to turn.

When adjustment is complete:

3. Hold the *set-screws* in position with the 4mm hex wrench to maintain the setting while tightening the *jam nuts* with the 12mm wrench.

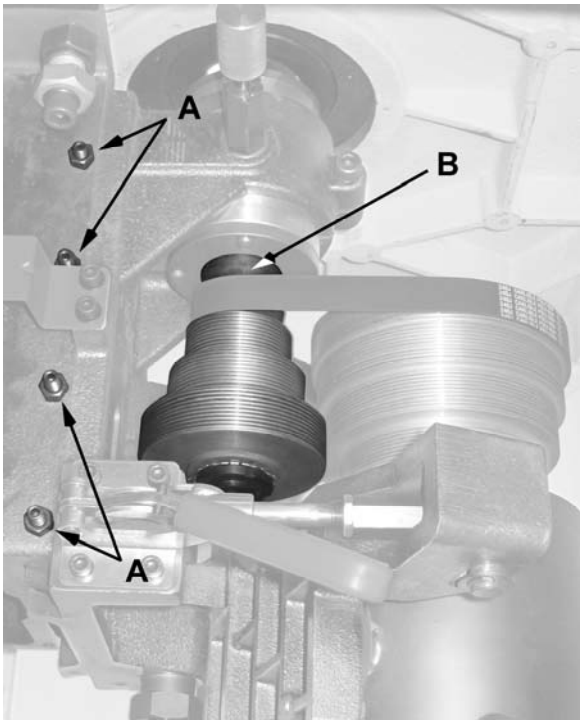


Figure 12

Featherboard Hold-downs

Referring to Figure 13:

The JWS-35X Shaper comes equipped with two *featherboard 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 *featherboard stay* to put moderate pressure on the workpiece, then tighten the *lock knob* (D).

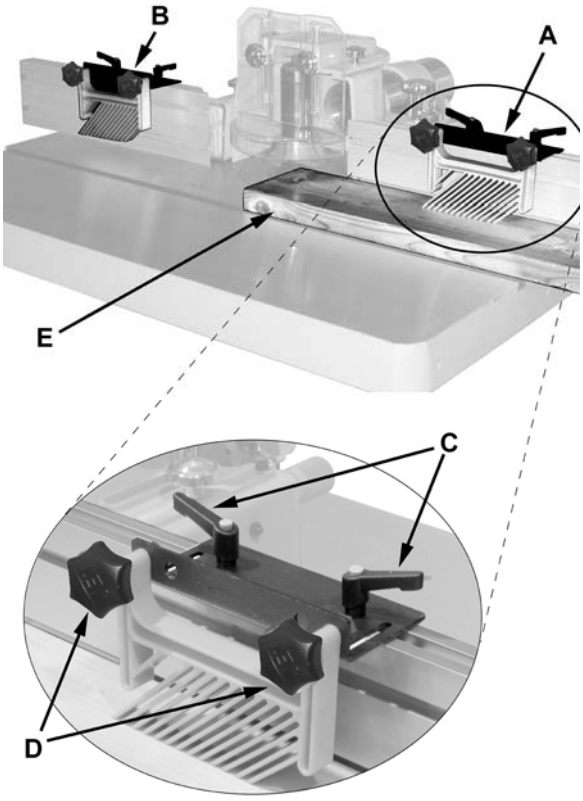


Figure 13

Spindle Assembly Installation

Referring to Figure 14:

The *spindle assembly* (B) is mounted to the *arbor* (H) and secured with a *draw bar* (O) and *spindle nut* (D). Use the following procedure to install the spindle assembly. Reverse the order to remove the spindle.

⚠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* (H) all the way using the handwheel located on the front of the cabinet. Loosen two *lock knobs* (E) and slide *fence* (J) to rear. Remove *cutter guard* (K). Loosen two *lock knobs* (F) and slide *guard cover* (G) back.

Locking the Arbor

2. Locate the *spindle lock* (L) which is 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* (H) by hand until it locks, then verify that it will not rotate.

Installing the Spindle Assembly

3. Thread the *spindle nut* (D) onto the threaded end of the *spindle* (C) in the direction indicated by arrows (A_1, A_2). Tighten securely by hand.
4. Thread the *spindle assembly* (B) and *nut* (D) onto the *arbor* (H) and hand-tighten only.
5. Insert the *draw bar* (O) through the opening in the *shaft* (N) just below the *drive belt* (M). Turn clockwise, fastening and securing it to the *spindle*. Tighten the *draw bar* (O) with *spindle wrench* (Inset A).
6. Tighten the *nut* (D) with the *spindle wrench* provided (Inset A).

Shaper Cutter installation is described on the following page. **Note that at this time the arbor is still locked.**

Spindle Assembly Removal

Referring to Figure 14:

The arbor must be locked as described in *Spindle Attachment Installation,* step 2.

1. Remove the draw bar (O).

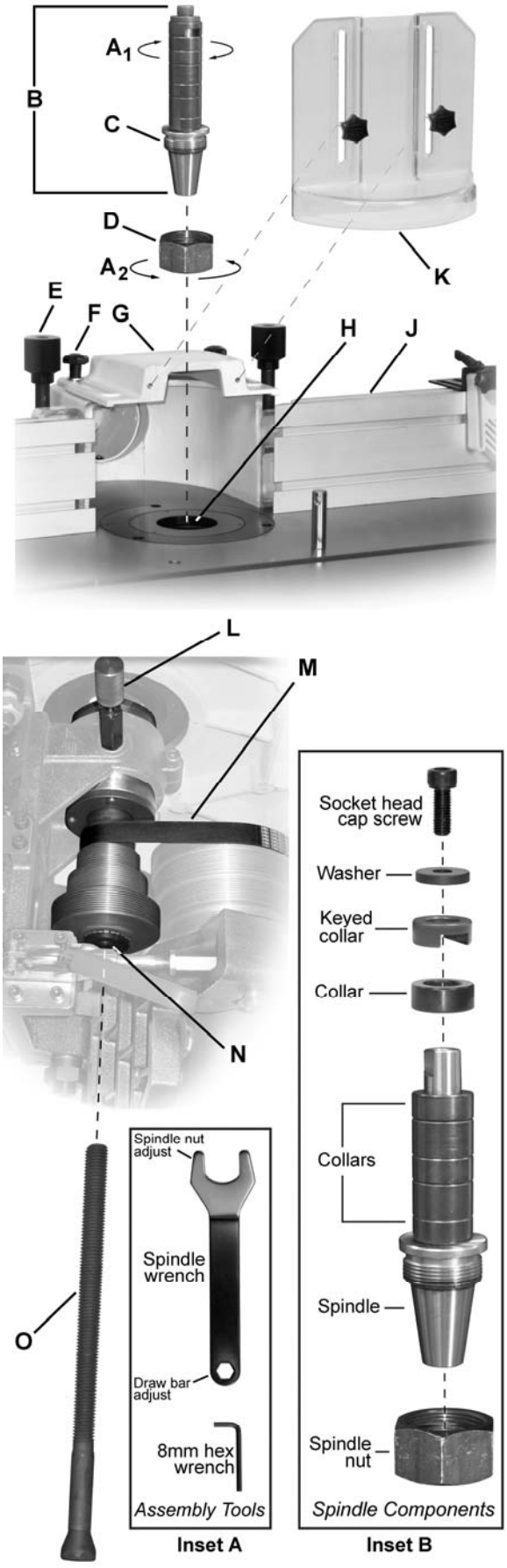


Figure 14

2. Loosen the *spindle nut* (D) then, using the *spindle wrench* (Inset A) continue to turn until the spindle breaks free of the arbor.

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* (L, Fig. 14) 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.

   Attempt to turn the *spindle assembly* (B, Fig. 14) by hand to verify that it is locked and will not rotate.

Installing the Shaper Cutter

Referring to Figure 15:

2. Using an 8mm hex wrench (provided), remove the *socket head cap screw* (F).
3. Remove the *washer* (E), *keyed collar* (C) and all or as many *collars* (B) as necessary.
4. Place the *shaper cutter* (A) (not included) onto the spindle, oriented in the proper direction.
5. Place the *collars* (B) and *keyed collar* (C) onto the spindle.

   Note: *Collars* come in several widths and the 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.
6. Replace the *washer* (E) and *socket head cap screw* (F). Tighten screw with the *8mm* hex wrench provided.

Unlocking the Spindle

7. Pull *out* the *spindle lock* (L, Fig. 14) accessible through the door on the right side of the cabinet. Rotate 90º right *or* left, resetting the knob into the indent.

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

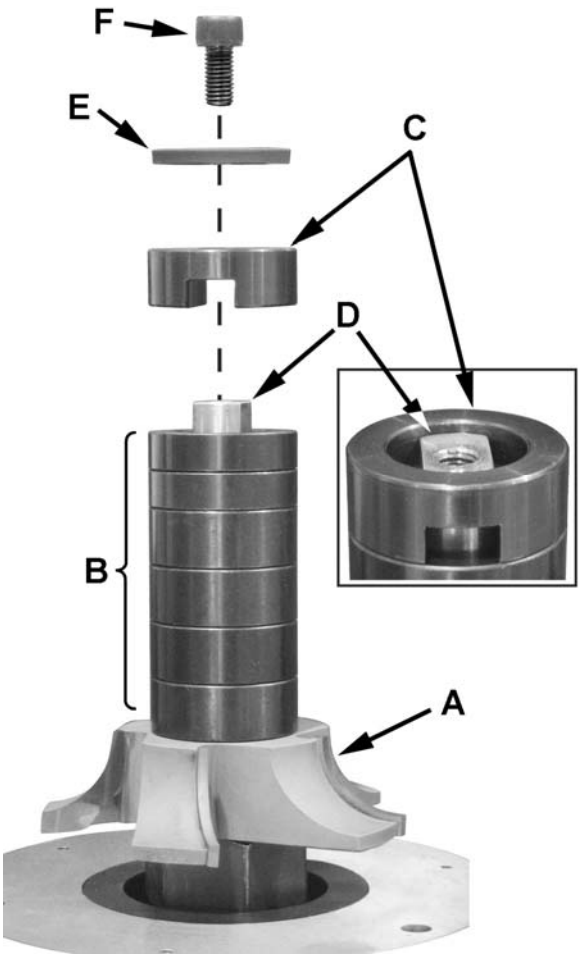


Figure 15

Changing Spindle Speed

The JWS-35X Shaper is equipped with pulleys that allow you to change the spindle speed. The belt placed on the upper pulleys as shown in position B (Fig. 16) provides a 10,000 RPM spindle speed. Spindle speed for all belt positions are listed in Table 2 below.

*Belt Position	Spindle Speed
B	10,000 RPM
C	8,000 RPM
D	6,000 RPM
E	4,000 RPM

* Refer to Figure 14

Table 2

To change speed (refer to Figure 16):

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* position. This allows the *motor* (G) to swivel on its mounting hinge.
4. Move the *drive belt* (shown in the B position) to the C, D, or E positions for the spindle speed desired as determined in Table 2.
5. Lock the *belt tension handle* (A) which secures the *motor* (G) and places tension on the *drive belt* (K).

Belt Replacement

Referring to Figure 16:

Replace the *drive belt* (K) 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* position. This allows the *motor* (G) 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 of the bottom *pulley* (E), then remove the belt over the top of the *motor pulley* (B).
6. Install the new belt by following these steps in reverse

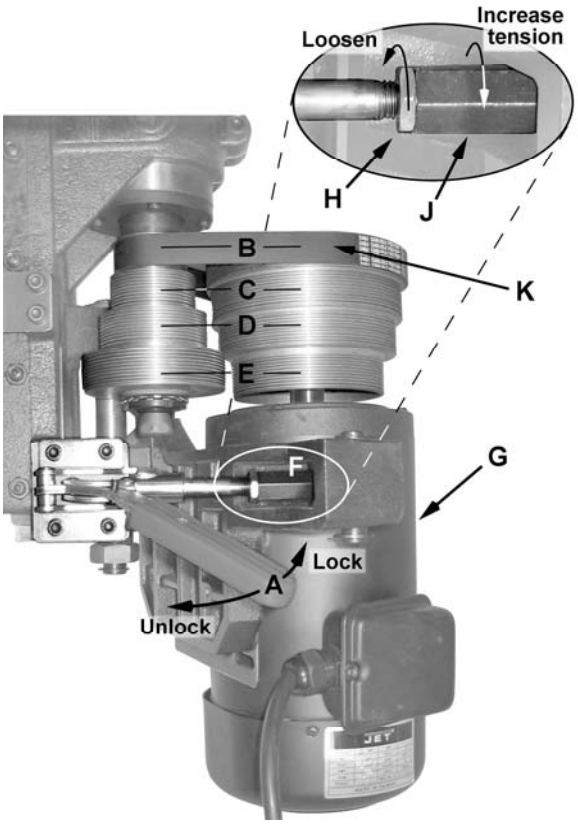


Figure 16

Drive Belt Tension

Referring to Figure 16:

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

1. Disconnect the machine from the power source.
2. Open the door of the cabinet.
3. Locate the *belt tension assembly* (F) and loosen the *lock nut* (H, inset) with a 17mm wrench.
4. Adjust the *hex bushing* (J) with a 17mm wrench (refer to inset for adjustment direction) for proper tension on the *belt* (B). The *tension handle* (A) must be in the 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* (J) with one wrench while tightening the *lock nut* (H) with the other.

Precision Miter Gauge

Setting the miter gauge angle

Referring to Figure 17:

The precision miter gauge has a *rack and pinion adjustment* for setting the angle. To operate:

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

To adjust the *body* (B) of the miter gauge to the 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 the *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) by pulling out and rotating, 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 the extension plate completely off and remove the 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 the *body* (B) until 0º is indicated on the *scale* (F).
3. Measure the accuracy of the 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).

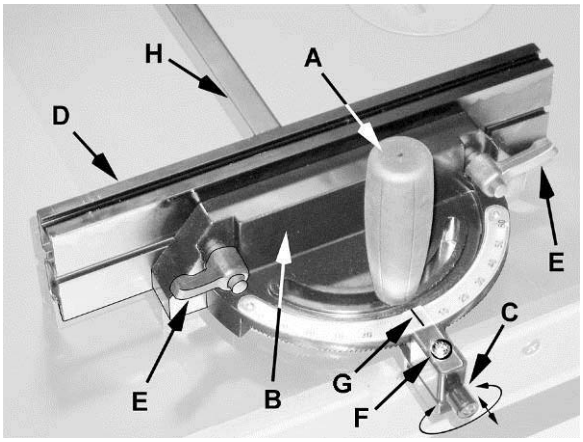


Figure 17

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).

Operating Controls

Start/Stop

Power Indicator Light – The *start switch* has a power indicator lamp which is *on* ***whenever there is power connected*** to the shaper, not just when the shaper is running. *Do not assume that no light means there is no power to the machine.* If the bulb is bad, there will no indication. Always check before use.

⚠WARNING **Do not rely that no light means no power to the machine. Always check for power first. Failure to comply may cause serious injury!**

Referring to Figure 18:

Start – Press the green start switch (see **Note**).

When power is connected to the machine, the green light is always on regardless of whether the shaper is running or not.

Note: In addition, the switch on the digital readout must be set to forward (or reverse) and the cabinet door *must* be closed.

Stop – Press the red switch to stop.

Reset – In the event that the shaper stops without pressing the stop button, as the result of a tripped fuse or circuit breaker, etc.:

1. Press red button to reset
2. Press the green button to restart the machine.

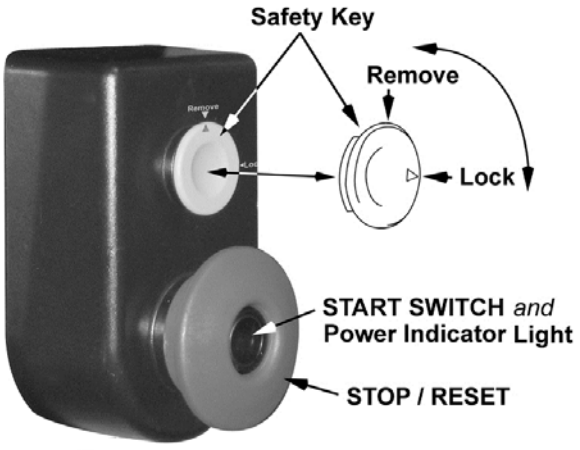


Figure 18

Safety Key

The start/stop switch on the JWS-35X Shaper comes equipped with a magnetic safety key. When in place on the switch as shown in Figure 18 the magnetic safety key trips a relay which will allow the machine to start and stop when the respective switches are pressed. Being magnetic, the lock can be removed to make the machine inoperable and can be hidden for safe storage by attaching it underneath the rail or another magnetic surface.

When using the shaper, place the key on the switch cover lining up the arrow on the key with the REMOVE arrow on the cover. Then rotate the key so the arrow lines up with the LOCK arrow. This will prevent the safety key from coming loose from vibration when the machine is in use.

Operations

Overview

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

Turn on the motor momentarily to check for proper rotation. The spindle should rotate counterclockwise when looking down on the spindle. Correct as required.

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

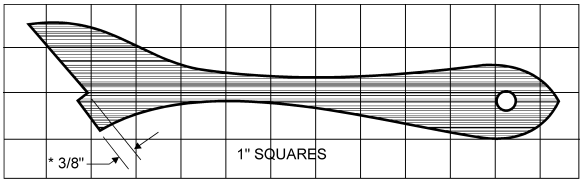
Safety Devices

Safety devices such as guards, fixtures, templates hold-downs, push sticks (Figure 19), feather boards and power feeders should be used whenever possible. Figure 19 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 the proper guard in 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 when cut against the grain.



* This measurement may vary depending upon thickness of workpiece.

Figure 19

⚠CAUTION **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. Preband shaper the stock whenever possible to 1/16 inch 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 Figure 20, feed the workpiece from *right to left.*

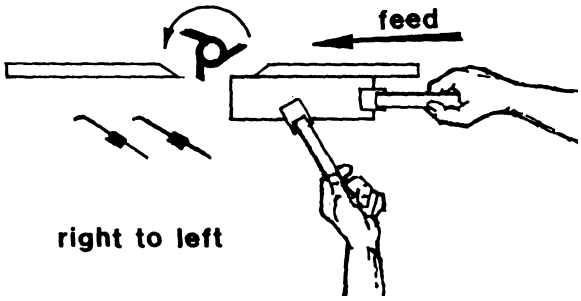


Figure 20

Clockwise Setup – With the cutter installed as shown in Figure 20, feed the workpiece from *left to right.*

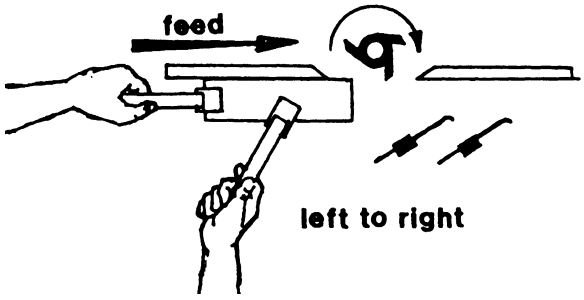


Figure 21

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 the original edge of the work is not to be touched by the cutter, both the front and rear fences are set in a straight line as shown in Figure 22.

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, Figure 23. In this case, the stock should be advanced to the position shown in Figure 21 and stopped. Turn off the machine and move the outfeed fence forward to contact the workpiece, Figure 24. 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.**

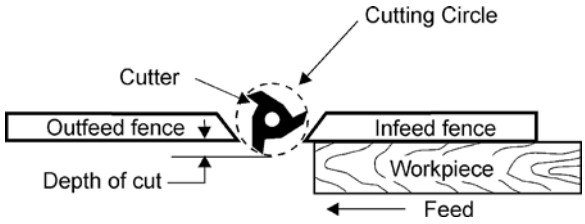


Figure 22

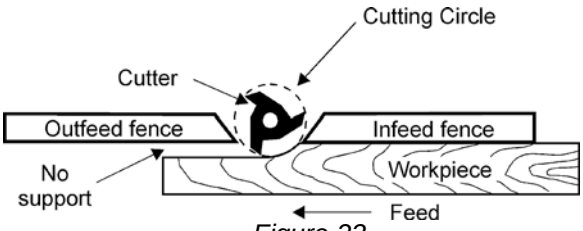


Figure 23

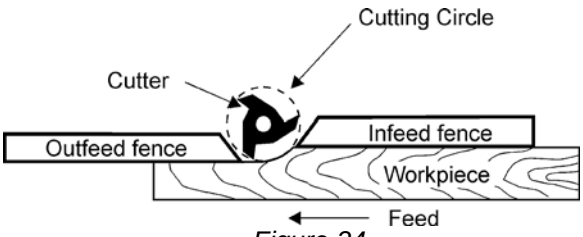


Figure 24

"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 Figure 25.

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

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

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

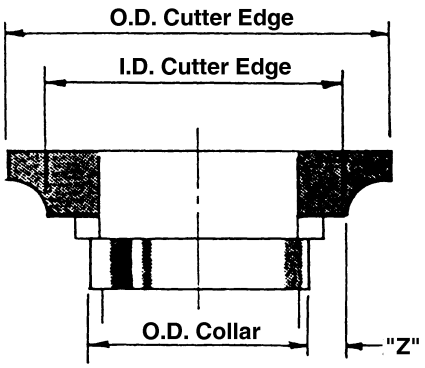


Figure 25

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 Figure 26).

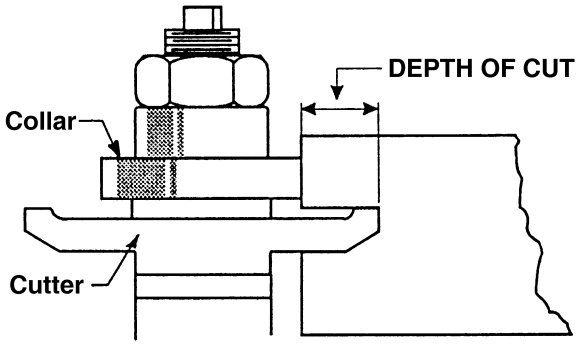


Figure 26

Straight Edge Shaping

Straight edge shaping is always performed with the workpiece against the 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 the use of a special guide as shown in Figure 27.

⚠CAUTION When edge shaping, the workpiece must be at least 12 inches long unless a special guide is used.

1. Use the hold-ins and hold-downs as shown in Figure 27 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.

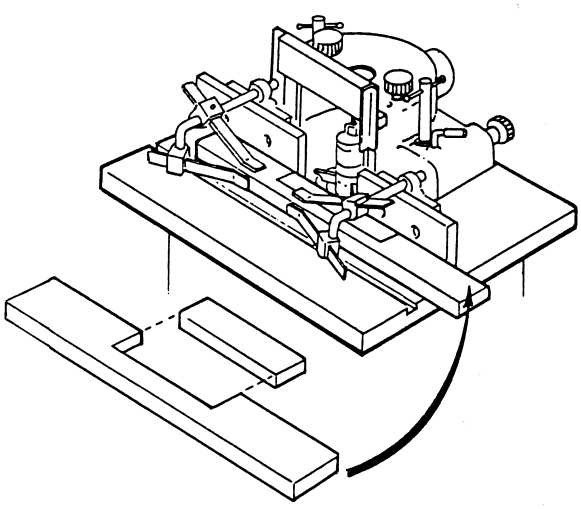


Figure 27

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 Figure 28 which tightly clamps the scrap piece to the workpiece 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.

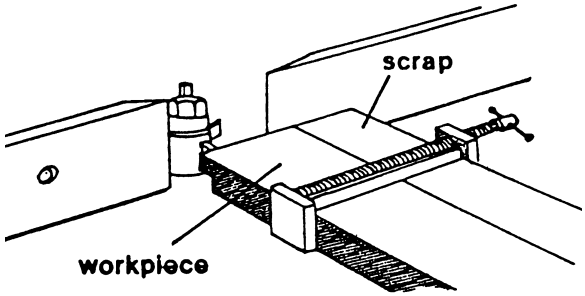


Figure 28

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 Figure 29.

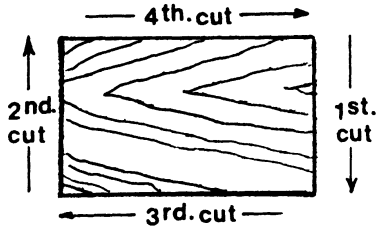


Figure 29

On-Edge Shaping

If the shaper fence does not firmly support wide stock, use the T-slots in the fence to attach a special rigid high fence as shown in Figure 30.

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

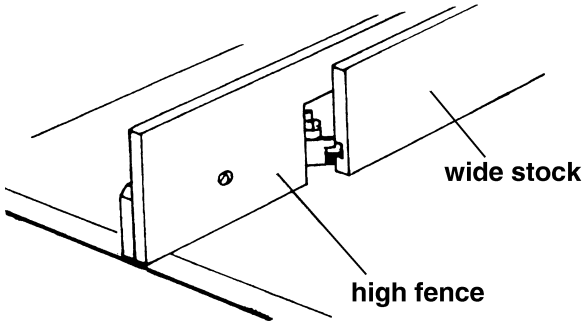


Figure 30

Straight Line Bevel Shaping

To shape a beveled straight edge, use a bevel-edge shaping jig in combination with the regular fence as shown in Figure 31.

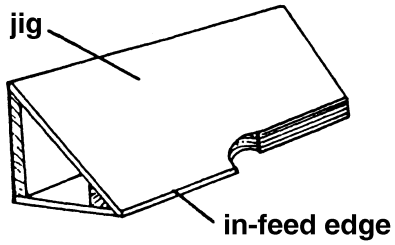


Figure 31

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 32. The outfeed fence is moved forward as necessary to compensate for the cut.

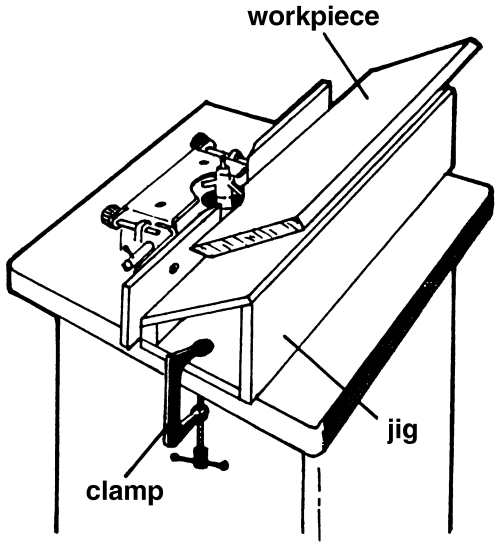


Figure 32

⚠CAUTION Never attempt to bevel cut free hand. Always use a bevel-edge fixture.

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 Figure 33.

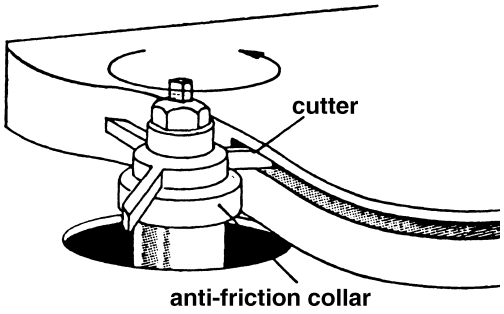


Figure 33

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 Figure 34. Whenever possible, always use the ring guard or safety collar.

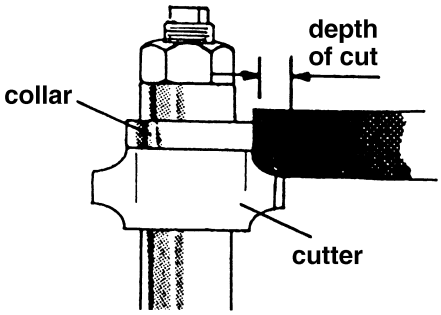


Figure 34

Note: Since the collar requires at least 1/8" of surface edge to ride against, the entire edge cannot be shaped as shown in Figure 35. The added use of a pattern, however, permits the shaping of the entire contour edge.

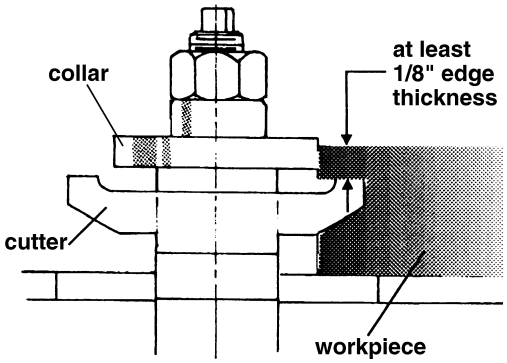


Figure 35

If the workpiece is to be shaped all around the perimeter, hold it firmly and push the work straight into the cutter until the depth of cut is established by the collar as shown in Figure 36. 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 the cutter edge) and held firmly against it.

When the workpiece is not contoured all around, start the cut as shown in Figure 42. 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 the collar, swing the stock away from the pin and proceed with cut.

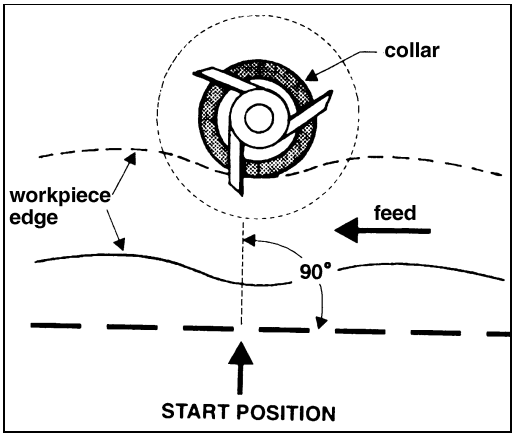


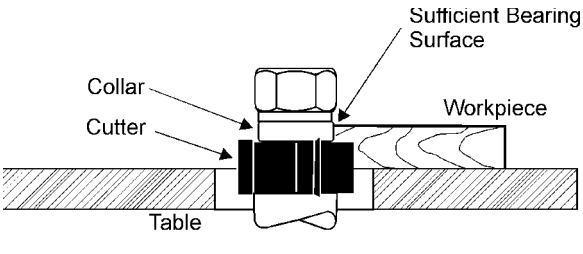
Figure 36

⚠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 inches to the cutter without the proper guard or similar safety device over the cutterhead.

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 Figure 37. 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 Figure 38.

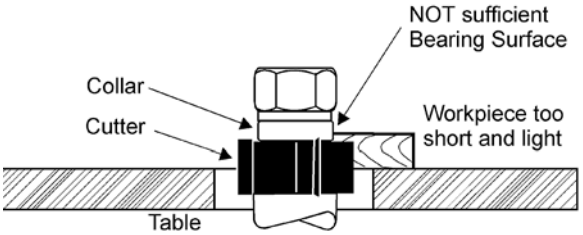


RIGHT

Figure 37

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.



WRONG

Figure 38

Position of Collars

Collars may be used above, below or between cutterheads.

1. When the collar is used below the cutter, as shown in Figure 39, 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.

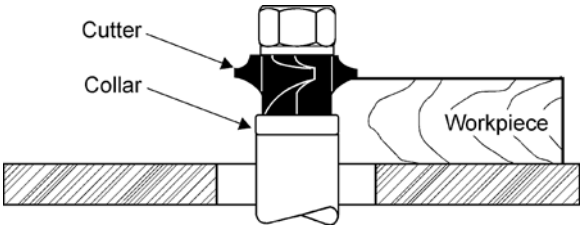


Figure 39

2. When the collar is used above the cutter, as shown in Figure 40, 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.

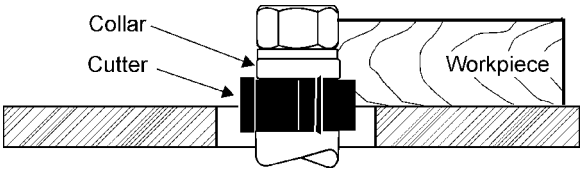


Figure 40

3. Using the collar between the 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, Figure 41.

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.

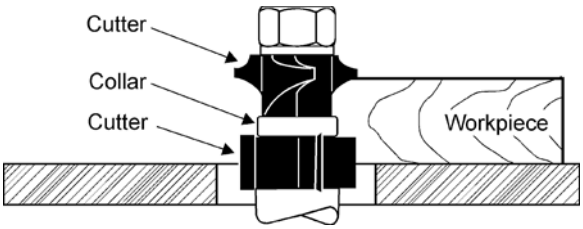


Figure 41

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 1*, (Figure 42), using the starting pin as a support
2. Swing the 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 (Figure 43). Always feed against the cutterhead rotation.

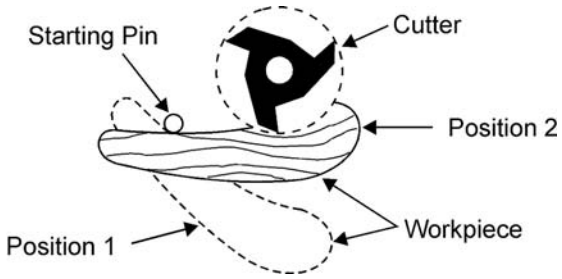


Figure 42

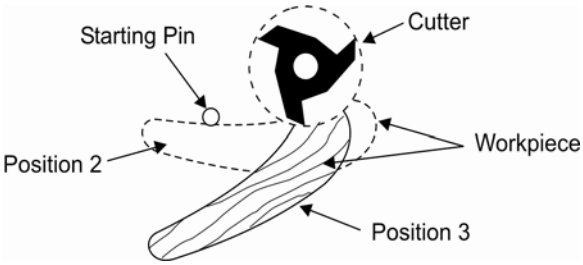


Figure 43

Arcs and Circles

Large circular and arc-shaped stock can be shaped as described in *Contour Edge Shaping* on page 24. However, smaller sized stock requires the use of special shaping jigs similar to those shown in Figure 44.

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.**

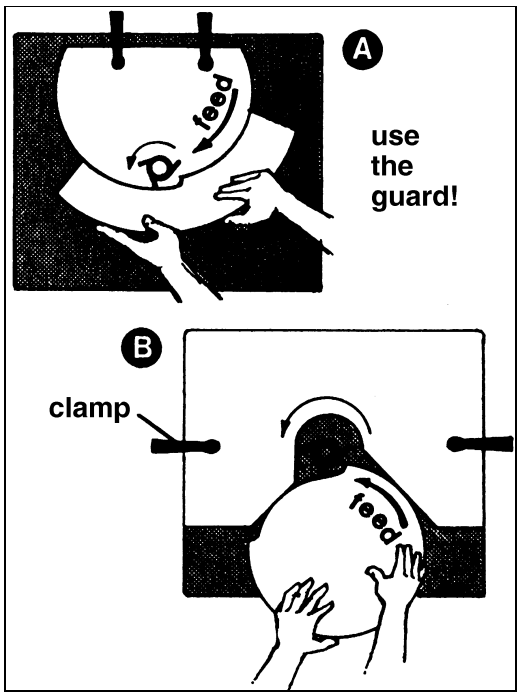


Figure 44

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 Figure 45.

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.**

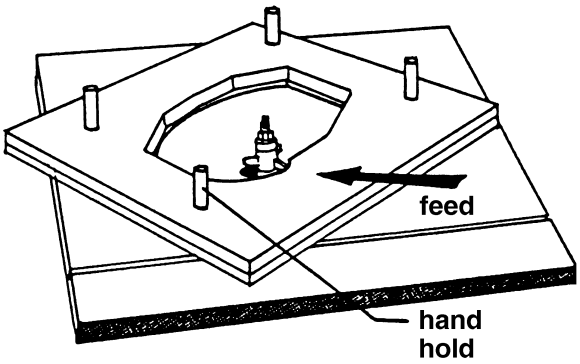


Figure 45

With a firm grip, ease the edge into the cutter(s) until stopped by the collar as shown in Figure 45.

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 Figure 46, keep in mind that it serves only as a guide for the cutter.

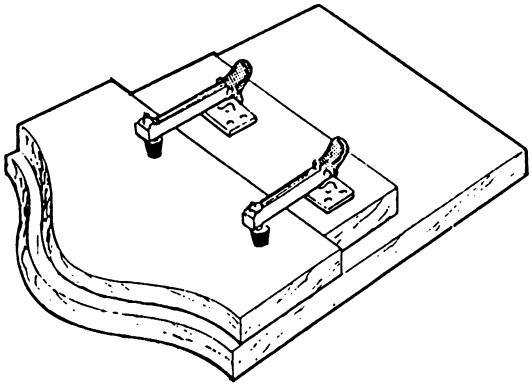


Figure 46

If the workpiece requires all-around shaping, the template can be constructed from several sections pieced together as shown in Figure 47.

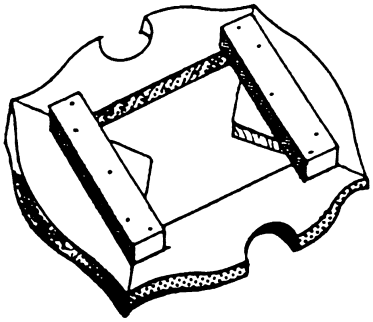


Figure 47

Securing the Template

There are various methods 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 the 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 Figure 48.

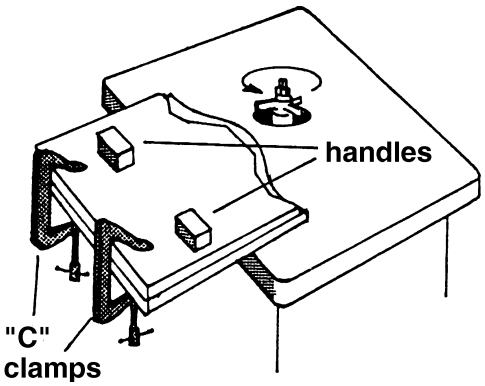


Figure 48

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 Figure 49.

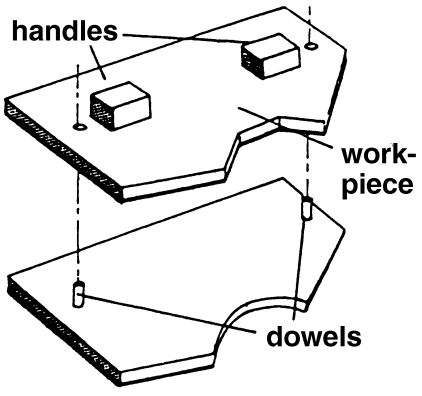


Figure 49

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 setup by stacking the cutters. When the operator stacks the cutters, extra care should be taken to see that 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.

Figure 50 shows the sash cut for the first operation.

Figure 51 shows the stock flipped over and the sash cutter used with a 1/4 inch groove cutter to complete the cut.

Figure 52 shows the first shaping cut with the sash cutter for the matching door stile sash.

Figure 53 shows the same cut with the stock flipped over.

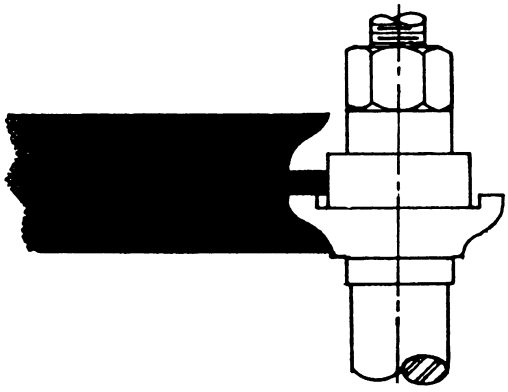


Figure 53

Figure 54 shows the first shaping cut for a window sash stile utilizing a sash cutter, collar, and a 1/2 inch groove cutter.

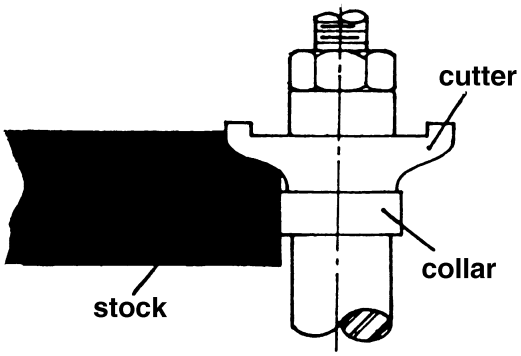


Figure 50

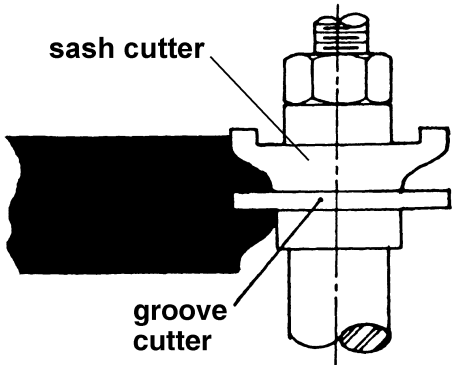


Figure 51

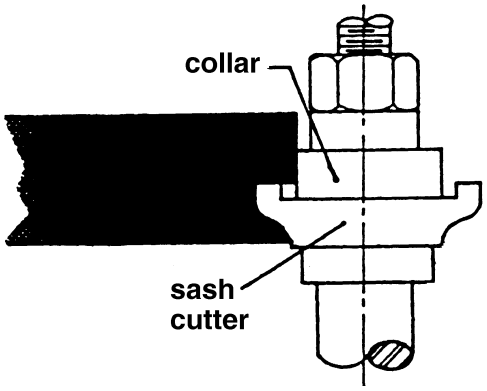


Figure 52

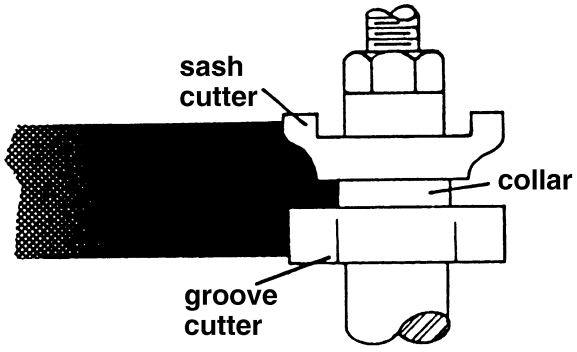


Figure 54

Figure 55 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.

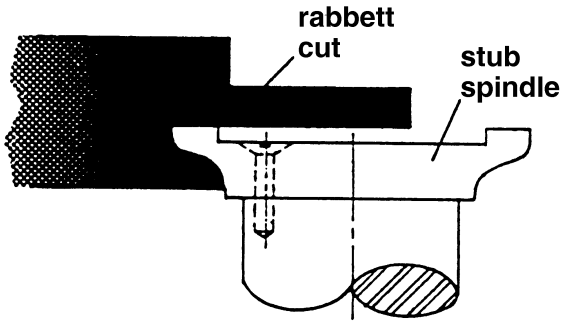


Figure 55

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 (Figure 56).

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.

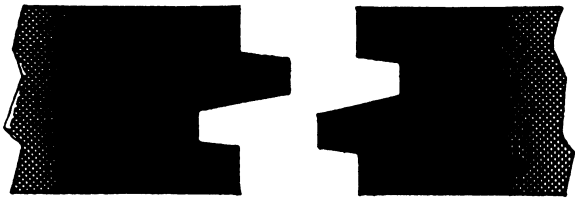


Figure 56

Tongued Joint

Similar to the glue joint, both fences are kept in-line for the tongued joint and adjusted for a 1/4 inch 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 Figure 57.

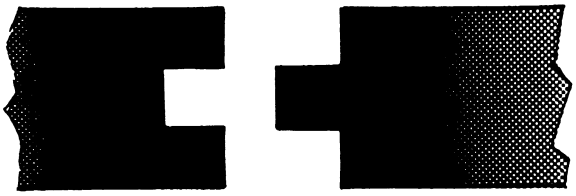


Figure 57

Drop Leaf Joint

When shaping a drop-leaf joint as shown in Figure 58, the leaf workpiece is shaped with a Drop-Leaf Bead cutter; the table workpiece is shaped with a Drop-Leaf Cove cutter.

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



Figure 58

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 shown in Figure 59.

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 the cut is started, transfer pressure to hold the workpiece against the outfeed fence, and continue feeding the workpiece through. After the first cut, the fences will have to be readjusted in order for the second cut (parallel cut) and the final depth-of-cut to remain true with the taper.

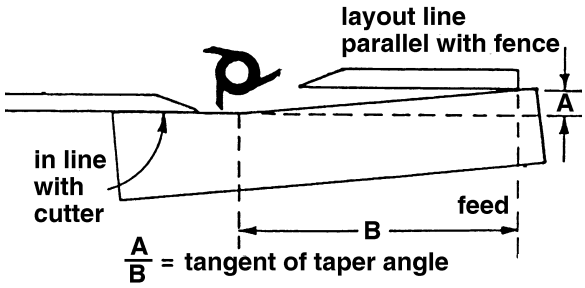


Figure 59

⚠CAUTION Do not use the standard fence for short work (12 inches 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.

Tenoning

The tenoning fixture illustrated in Figure 60 shows a miter gauge equipped with a hold-down for shaping the ends of narrow work-pieces.

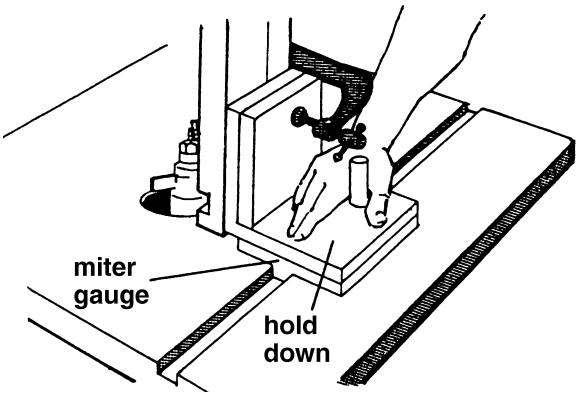


Figure 60

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 Figure 61.

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.

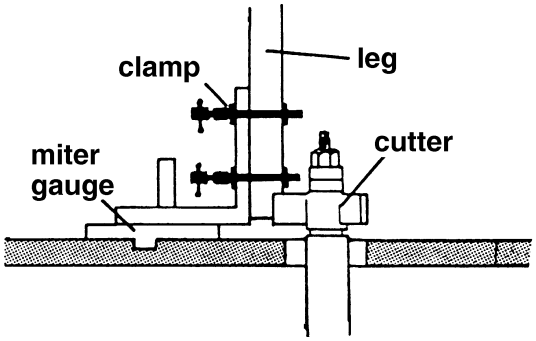


Figure 61

Note: If the leg is tapered, use a wedge to place the side facing the cutter into a 90 degree vertical position as shown in Figure 62.

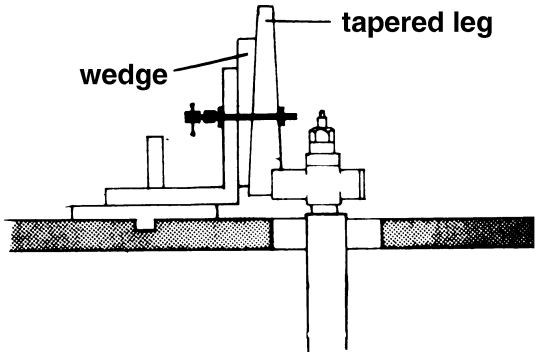


Figure 62

Troubleshooting

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 the Off position. 5. Overload tripped. 6. Cabinet door is open.	1. Plug in power cord. 2. Replace fuse 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* below.	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 wit 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.

Trouble	Possible Cause	Remedy
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.
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 form 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 whenever 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.

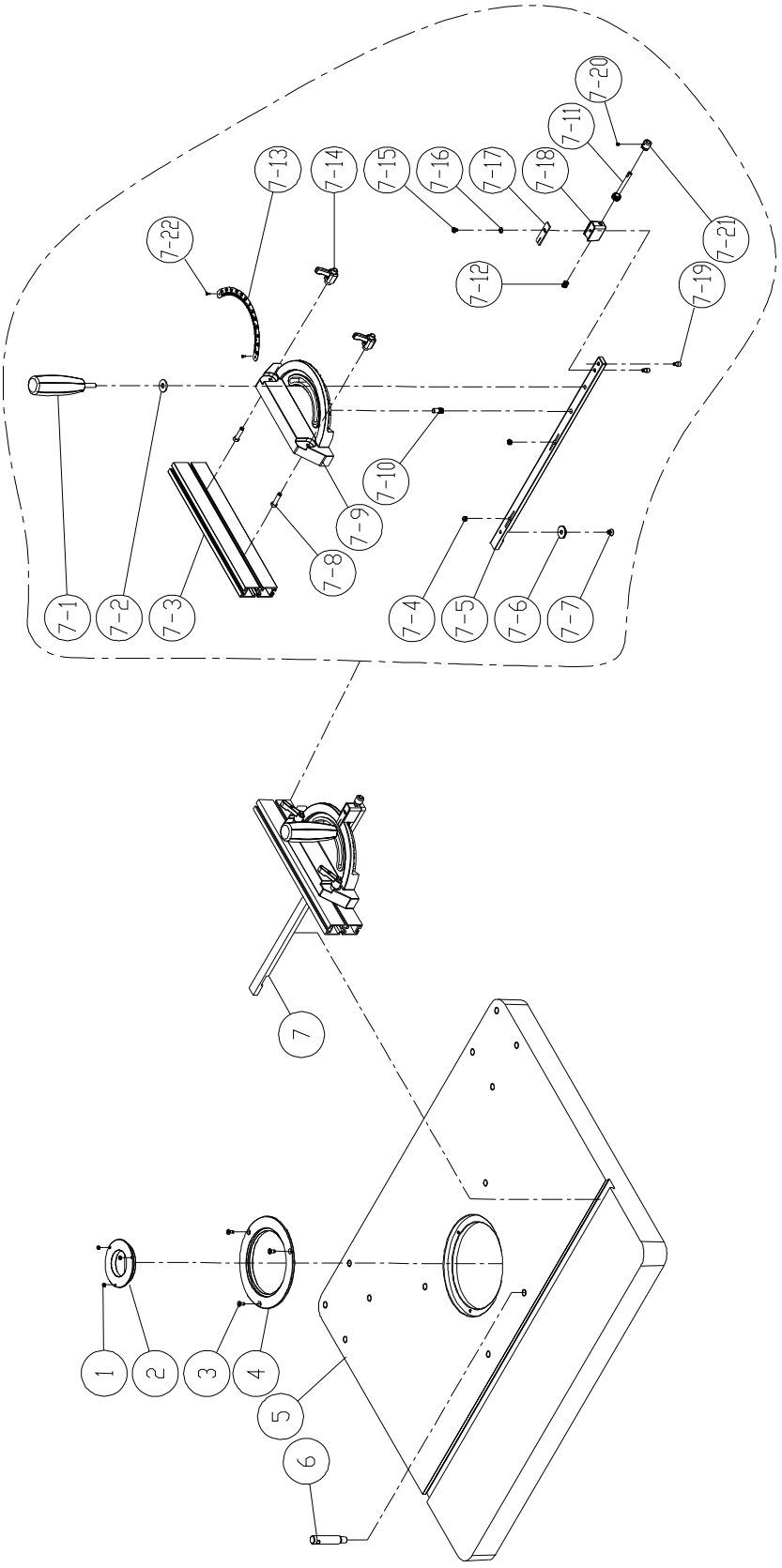
Parts

Replacement parts are listed on the following pages. To order parts or reach our service department, call 1-800-274-6848, Monday through Friday (see our website for business hours, www.waltermeier.com). Having the Model Number and Serial Number of your machine available when you call will allow us to serve you quickly and accurately.

Table – Parts List

Index No.	Part No.	Description	Size	Qty
1	TS-1521011	Socket Set Screw	M4x4	3
2	JWS35X-102	Insert Ring (Small)		1
3	TS-2285121	Flat Head Machine Screw	M5x12	3
4	JWS35X-104	Insert Ring (Large)		1
5	JWS35X-105	Table		1
6	PM2700-105	Starting Pin		1
7	1791789	Miter Gauge Assembly (Index # 7-1 thru # 7-22)		1
7-1	PM2000-340	Handle		1
7-2	TS-0680031	Flat Washer	5/16”	1
7-3	PM2000-342	Fence		1
7-4	PM2000-343	Socket Set Screw	M8x6	2
7-5	PM2000-325	Miter Bar		1
7-6	PM2000-326	Guide Washer		1
7-7	PM2000-327	Flat Head Machine Screw	M6x9	1
7-8	TS-0050051	Hex Cap Screw	1/4”-20x1”	2
7-9	PM2000-323	Miter Gauge Body		1
7-10	PM2000-324	Pin		1
7-11	PM2000-337	Gear Shaft		1
7-12	PM2000-336	Spring		1
7-13	PM2000-338	Scale		1
7-14	PM2000-333	Locking Handle		2
7-15	TS-0810012	Round Head Screw	#10-24x1/4”	1
7-16	TS-1550031	Flat Washer	M5	1
7-17	PM2000-335	Pointer		1
7-18	PM2000-330	Support Base		1
7-19	PM2000-329	Socket Head Cap Screw	M5x8	2
7-20	TS-1521011	Socket Set Screw	M4x4	1
7-21	PM2000-331	Knob		1
7-22	PM2000-339	Rivet		2

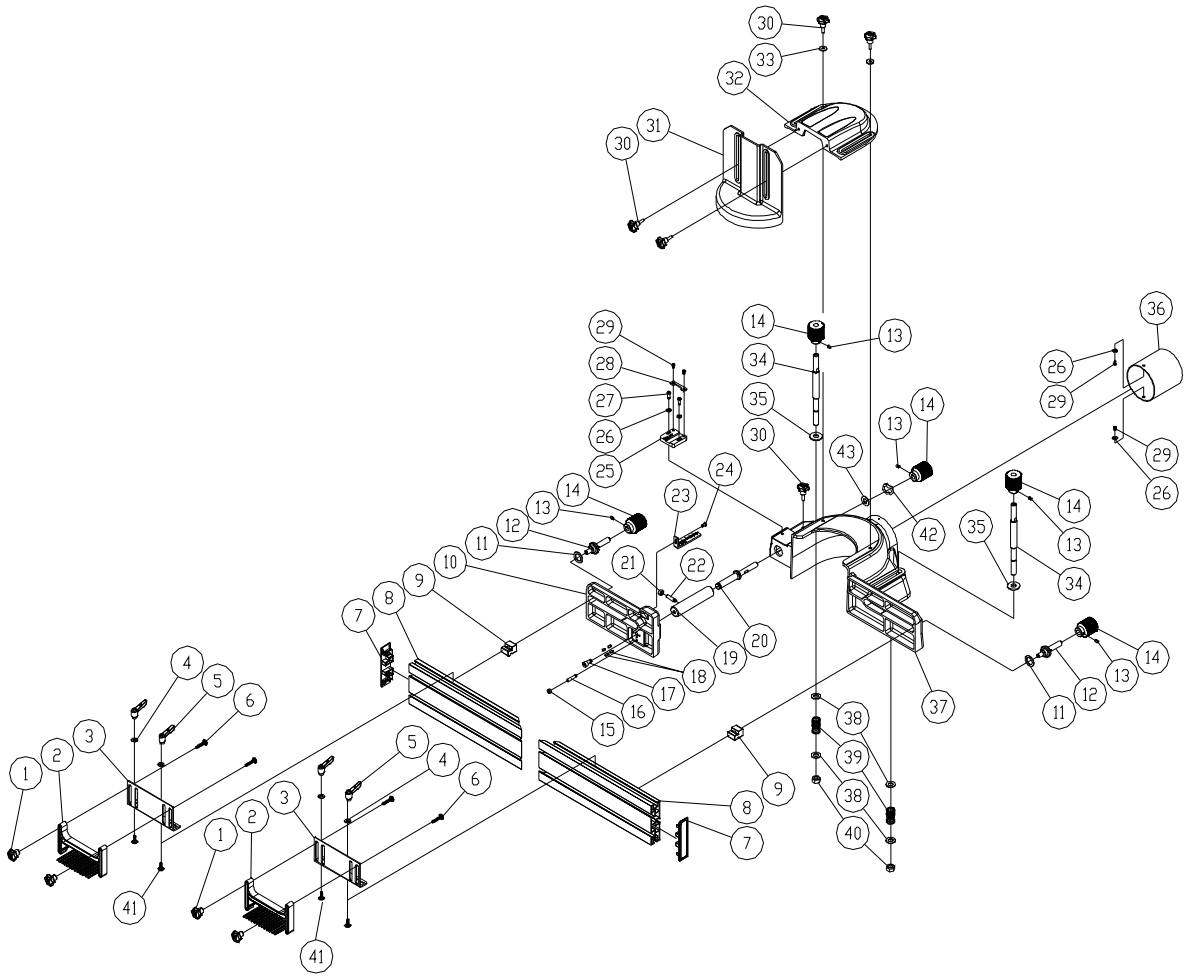
Table – Assembly Drawing



Fence – Parts List

Index No.	Part No.	Description	Size	Qty
1	JWS35X-201	Knob		4
2	PM2700-237	Feather Board		2
3	PM2700-234	Bracket		2
4	TS-1550061	Flat Washer	M8	4
5	PM2700-232	Lock Handle		4
6	PM2700-235	Carriage Bolt	M5x30	4
7	PM2700-231	End Cap		2
8	JWS35X-208	Fence		2
9	JWS35X-209	Slide		2
10	JWS35X-210	Left Fence Plate		1
11	JWS35X-211	Plastic Flat Washer		2
12	JWS35X-212	Leader Screw		2
13	TS-1523021	Socket Set Screw	M6x8	5
14	JWS35X-214	Knob		5
15	TS-1540041	Hex Nut	M6	1
16	JWS35X-216	Socket Set Screw	M6x30	1
17	TS-1504031	Socket Head Cap Screw	M8x16	1
18	TS-1523041	Socket Set Screw	M6x12	4
19	JWS35X-219	Shaft		1
20	JWS35X-220	Adjustment Leader		1
21	TS-1540061	Hex Nut	M8	1
22	JWS35X-222	Socket Set Screw	M8x30	1
23	JWS35X-223	Scale		1
24	TS-1533032	Pan Head Machine Screw	M5x10	1
25	JWS35X-225	Bracket		1
26	TS-1550031	Flat Washer	M5	4
27	TS-1533052	Pan Head Machine Screw	M5x16	2
28	JWS35X-228	Fixing Plate		1
29	TS-2284082	Pan Head Machine Screw	M4x8	4
30	JWS35X-230	Knob		5
31	PM2700-203	Cutter Guard		1
32	JWS35X-232	Safety Guard Holder		1
33	TS-1550041	Flat Washer	M6	2
34	JWS35X-234	Shaft		2
35	TS-155009	Flat Washer	M14	2
36	JWS35X-236	Dust Chute		1
37	JWS35X-237	Fence Body		1
38	PM2700-205	Flat Washer	M13	4
39	JWS35X-239	Spring		2
40	JWS35X-240	Lock Nut	1/2”-12	2
41	PM2700-236	Carriage Bolt	M5x16	4
	JWS35X-FA	Fence – Complete Assembly (Index #1 - #42)		1
42	JWS35X-242	Wave Washer		1
43	JWS35X-243	Flat Washer		1

Fence – Assembly Drawing



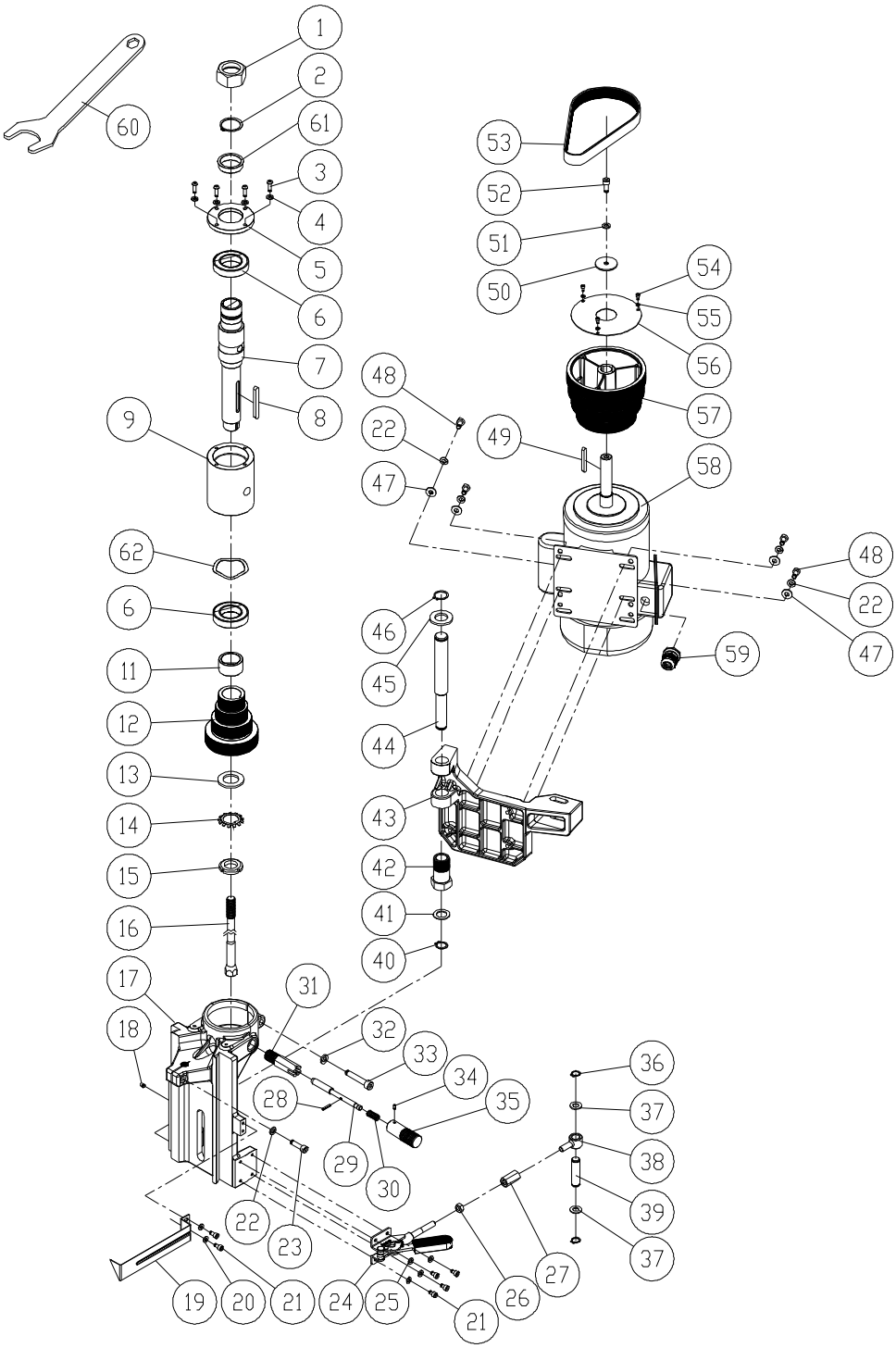
Frame and Motor – Parts List

Index No.	Part No.	Description	Size	Qty
1	PM2700-305A	Spindle Nut	M40x2.5p	1
2	PM2700-306	Retaining Ring	STW-40	1
3	TS-2246202	Button Head Socket Screw	M6x20	4
4	TS-2361061	Lock Washer	M6	4
5	PM2700-308N	Shaft Top Bearing Cover		1
6	BB-6008VV	Bearing	6008VV	2
7	JWS35X-307N	Spindle Holder		1
8	JWS35X-308	Key	8x7x72	1
9	PM2700-312N	Quill		1
	JWS35X-QAN	Quill Assembly (Index #2 –15, 61, 62) *(for JWS-35X3-1, serial no. 8080001 and higher)* *(for JWS-35X5-1, serial no. 8080021 and higher)*		1
11	JWS35X-311	Bushing		1
12	JWS35X-312	Spindle Pulley		1
13	JWS35X-313	Flat Washer	M30	1
14	JWS35X-314	Locking Washer	M30	1
15	JWS35X-315	Locking Nut	M30-1.5P	1
16	JWS35X-316	Draw Bar		1
17	PM2700-318	Spindle Housing		1
18	TS-1523021	Socket Set Screw	M6x8	1
19	JWS35X-319	Pointer		1
20	TS-1550041	Flat Washer	M6	2
21	TS-1503031	Socket Head Cap Screw	M6x12	6
22	TS-1551061	Lock Washer	M8	5
23	TS-1504061	Socket Head Cap Screw	M8x30	1
24	PM2700-348	Belt Tension Handle		1
25	TS-2361061	Lock Washer	M6	4
26	TS-1540071	Hex Nut	M10	1
27	PM2700-346	Hex Bushing		1
28	PM2700-338	Pin	Ø3 x 20	1
29	PM2700-339	Rod		1
30	PM2700-340	Spring		1
31	PM2700-337	Connector		1
32	TS-2361101	Lock Washer	M10	1
33	TS-2239551	Socket Head Cap Screw	M10x55	1
34	TS-1523021	Socket Set Screw	M6x8	1
35	PM2700-341	Knob		1
36	PM2700-342	Retaining Ring	STW-15	2
37	PM2700-343	Flat Washer	M15	2
38	PM2700-344	Connector		1
39	PM2700-345	Shaft		1
40	PM2700-334	Retaining Ring	STW-20	1
41	TS-1550111	Flat Washer	M20	1
42	PM2700-332	Adjustment Bolt		1
43	JWS35X-343	Motor Bracket		1
44	PM2700-330	Shaft		1
45	PM2700-314	Flat Washer	M25	1
46	PM2700-328	Retaining Ring	STW-25	1
47	TS-1550061	Flat Washer	M8	4
48	TS-1490031	Hex Cap Screw	M8x20	4
49	JWS35X-349	Key	6x6x55	1
50	JWS35X-350	Special Flat Washer	M8	1
51	TS-1551061	Lock Washer	M8	1
52	TS-1504041	Socket Head Cap Screw	M8x20	1
53	JWS35X-353	Belt (3HP / 5HP)	240J	1
54	TS-1501021	Socket Head Cap Screw	M4x8	3

Frame and Motor – Parts List

Index No.	Part No.	Description	Size	Qty
55	TS-1551021	Lock Washer	M4	3
56	JWS35X-356	Cover		1
57	JWS35X-357	Motor Pulley		1
58	JWS35X-358	Motor	3HP, 230V, 1Ph	1
	JWS35X-358A	Motor	5HP, 230V, 1Ph	1
	JWS35X-358CS	Centrifugal Switch (not shown)		1
	JWS35X-358FC	Fan Cover (not shown)		1
	JWS35X-358MF	Motor Fan (not shown)		1
	JWS35X-358SC	Starting Capacitor (not shown) for 3HP,1PH	600MFD 125VAC	1
	JWS35X-358RC	Running Capacitor (not shown) for 3HP,1PH	40μF 300VAC	1
	JWS35X-358ASC	Starting Capacitor (not shown) for 5HP,1PH	400MFD 250VAC	1
	JWS35X-358ARC	Running Capacitor (not shown) for 5HP,1PH	35μF 350VAC	1
59	JWS35X-359	Strain Relief Bushing	PGA16-14B	1
60	PM2700-349	Spindle Nut Wrench		1
61	PM2700-350	Upper Bushing		1
62	PM2700-351	Wave Washer		1

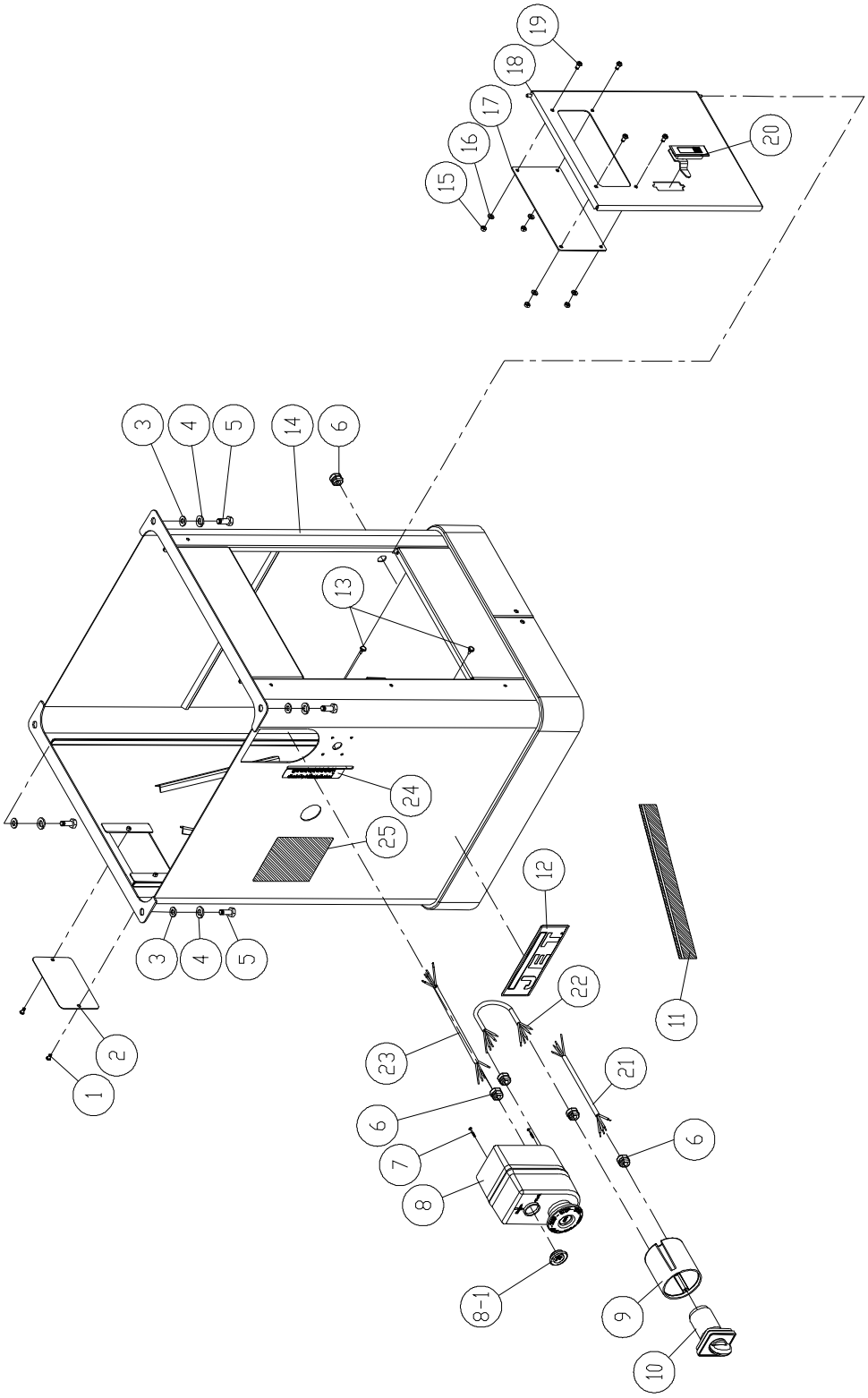
Frame and Motor – Assembly Drawing



Cabinet and Base – Parts List

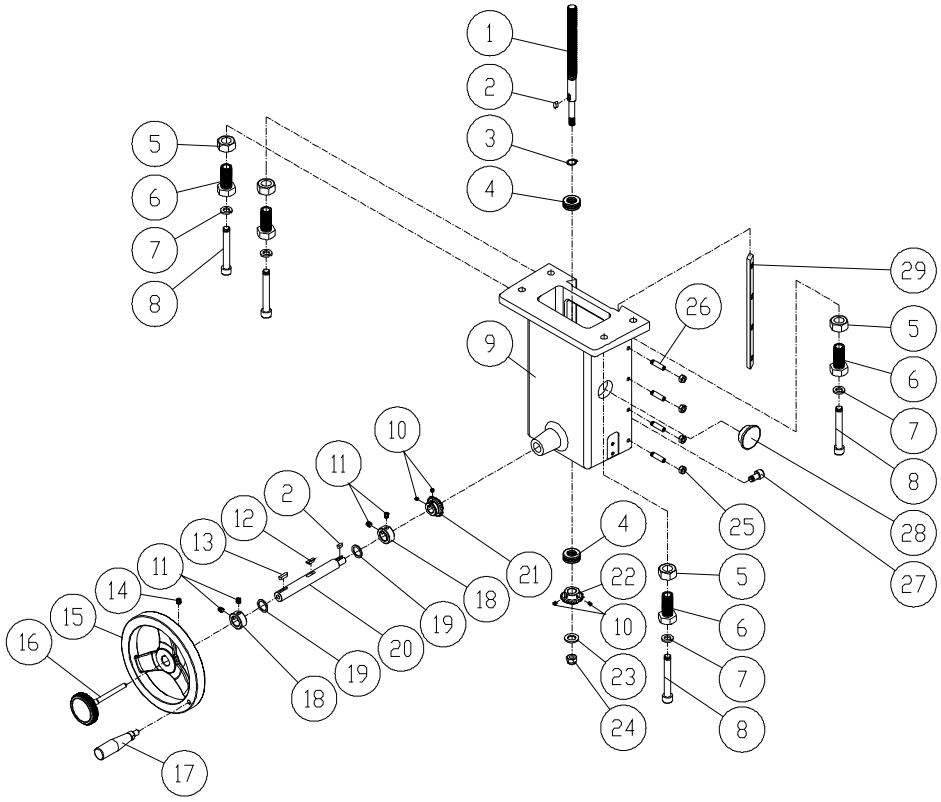
Index No.	Part No.	Description	Size	Qty
1	TS-1533032	Pan Head Machine Screw	M5x10	2
2	JWS35X-402	Cover		1
3	TS-1550071	Flat Washer	M10	4
4	TS-2361101	Lock Washer	M10	4
5	TS-1491031	Hex Cap Screw	M10x25	4
6	JWS35X-406	Strain Relief		5
7	PM2700-113	Tapping Screw	M5-2.12P x 25	2
8	PM2700-114	Magnetic Switch (C-09D_{10} 1Ø & NTH-14)	3HP, 230V, 1Ph	1
	PM2700-114A	Magnetic Switch (C-18D_{10} 1Ø & NTH-21)	5HP, 230V, 1Ph	1
8-1	PM2000-298	Safety Key for Magnetic Switch		1
9	JWS35X-409	Switch Cover		1
10	PM2700-448	Forward/Reverse Switch (AC-3/16A 250V)	3HP/1Ph	1
	PM2700-448A	Forward/Reverse Switch (AC-3/25A 250V)	5HP/1Ph	1
11	JWS35X-411	Stripe		1
12	JWS35X-412	JET Logo		1
13	PM2700-416	Bumper		2
14	JWS35X-414	Cabinet		1
15	TS-1540041	Hex Nut	M6	4
16	TS-2361061	Lock Washer	M6	4
17	PM2700-433	Window		1
18	JWS35X-418	Door		1
19	TS-1534042	Pan Head Machine Screw	M6x12	4
20	PM2700-436	Latch		1
21	JWS35X-421	Motor Cable (3HP/1Ph)	SJT 14AWG x 4C x 1200mm	1
	JWS35X-421A	Motor Cable (5HP/1Ph)	PVC 3.5mm^2 x 5C x 1200mm	1
22	JWS35X-422	Switch to Switch Cable (3HP/1Ph)	PVC 2.0mm^2 x 5C x 480mm	1
	JWS35X-422A	Switch to Switch Cable (5HP/1Ph)	PVC 3.5mm^2 x 5C x 480mm	1
23	JWS35X-423	Power Cable (3HP/1Ph)	SJT 14AWG x 3C x 3300mm	1
	JWS35X-423A	Power Cable (5HP/1Ph)	SJT 12AWG x 3C x 3300mm	1
24	JWS35X-424	Scale		1
25	JWS35X-425	Warning Label		1

Cabinet and Base – Assembly Drawing



Elevator – Parts and Assembly

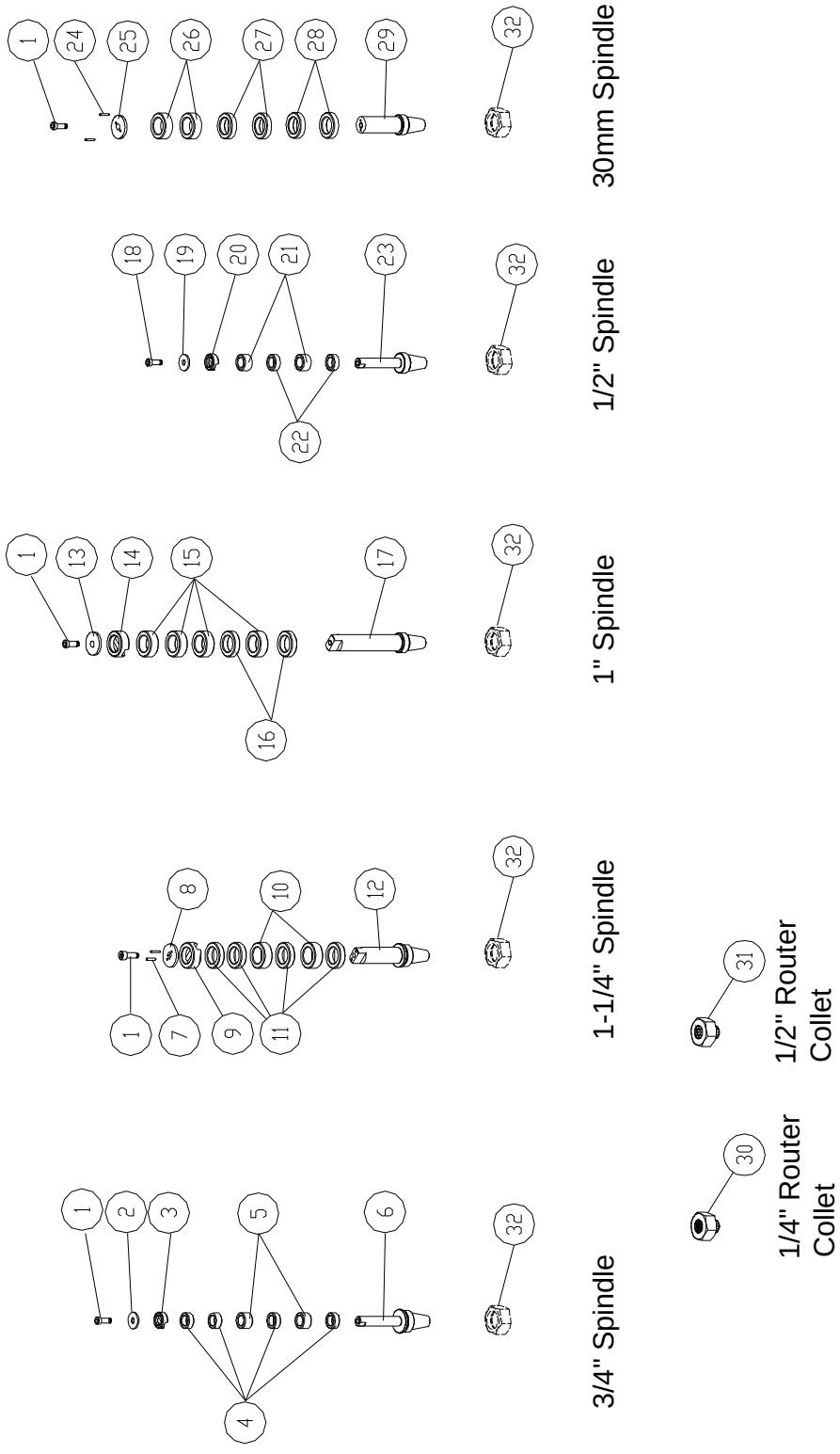
Index No.	Part No.	Description	Size	Qty
1	JWS35X-501	Lead Screw		1
2	JWS35X-502	Key	5x5x12	2
3	PM2700-342	Retaining Ring	STW-15	1
4	PM2700-503	Thrust Bearing	51202	2
5	PM2700-504	Hex Nut	M20-1.5P	4
6	PM2700-505	Adjusting Bolt		4
7	TS-2361121	Lock Washer	M12	4
8	TS-1506141	Socket Head Cap Screw	M12x90	4
9	PM2700-512	Housing		1
10	TS-1522011	Socket Set Screw	M5x6	4
11	TS-0270021	Socket Set Screw	5/16”-18x5/16”	4
12	PM2700-521	Key		1
13	PM2700-522	Key	5x5x20	1
14	TS-1523021	Socket Set Screw	M6x8	1
15	JWS35X-515	Hand Wheel		1
16	JWS35X-516	Knob		1
17	JWS35X-517	Handle		1
18	PM2700-519	Fixing Ring		2
19	PM2700-520	Washer	M19	2
20	PM2700-523	Shaft		1
21	PM2700-513	Worm Gear (Right rotation)		1
22	JWS35X-522	Worm Gear (Left rotation)		1
23	TS-1550071	Flat Washer	M10	1
24	TS-2342102	Nylon Insert Lock Nut	M10-1.25P	1
25	TS-1540061	Hex Nut	M8	4
26	PM2700-508	Socket Set Screw	M8x30	4
27	TS-1505021	Socket Head Cap Screw	M10x20	1
28	PM2700-450	Plug		1
29	PM2700-510	Gib		1



Spindle Assembly – Parts

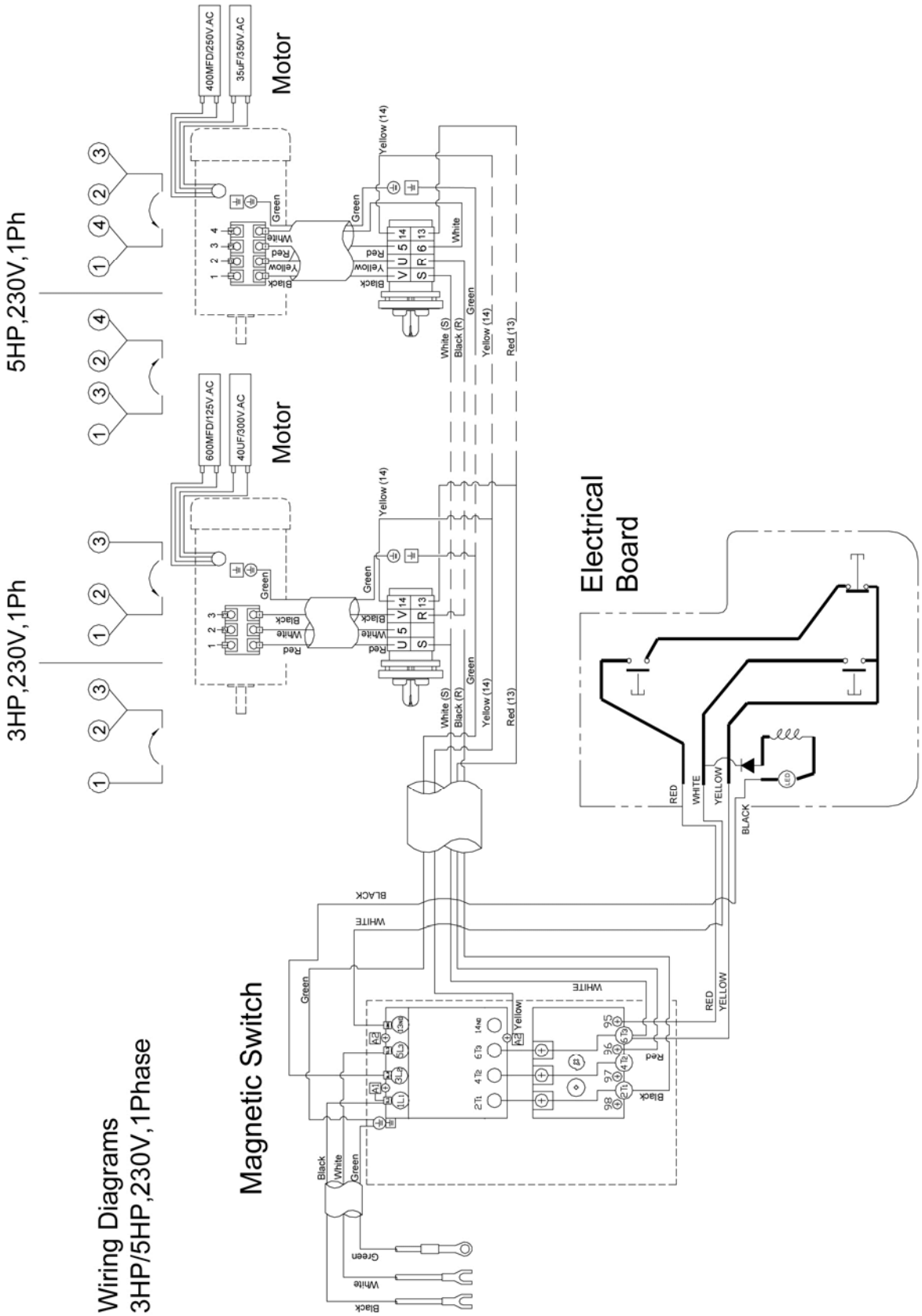
Index No.	Part No.	Description	Size	Qty
1	TS-1505031	Socket Head Cap Screw	M10x25	4
2	PM2700-708	Special Washer		1
3	PM2700-709	Keyed Collar		1
4	PM2700-710	Collar	I.D. 3/4” x 1/2”T	4
5	PM2700-711	Collar	I.D. 3/4” x 3/4”T	2
6	PM2700-712	Spindle	3/4”	1
	708317	Spindle w/Nut Assembly (#1 - #6, #32)	3/4”	1
7	PM2700-702	Pin		2
8	PM2700-703	Special Washer		1
9	PM2700-704	Keyed Collar		1
10	PM2700-705	Collar	I.D. 1-1/4” x 3/4”T	2
11	PM2700-706	Collar	I.D. 1-1/4” x 1/2”T	4
12	JWS35X-612	Spindle	1-1/4”	1
	708328	Spindle w/Nut Assembly (#1, #7 - #12, #32)	1-1/4”	1
13	PM2700-713	Special Washer		1
14	PM2700-714	Keyed Collar		1
15	PM2700-715	Collar	I.D. 1” x 3/4”T	4
16	PM2700-716	Collar	I.D. 1” x 1/2”T	2
17	JWS35X-617	Spindle	1”	1
	708314	Spindle w/Nut Assembly (#1, #13 - #17, #32)	1”	1
18	TS-1504051	Socket Head Cap Screw	M8x25	1
19	PM2700-719	Special Washer		1
20	PM2700-720	Keyed Collar		1
21	PM2700-721	Collar	I.D. 1/2” x 3/4”T	2
22	PM2700-722	Collar	I.D. 1/2” x 1/2”T	2
23	PM2700-723	Spindle	1/2”	1
	708380	Spindle w/Nut Assembly (#18 - #23, #32)	1/2”	1
24	PM2700-724	Pin		2
25	PM2700-725	Special Washer		1
26	PM2700-726	Collar	M30 x 20mmT	2
27	PM2700-727	Collar	M30 x 8mmT	2
28	PM2700-728	Collar	M30 x 10mmT	2
29	PM2700-729	Spindle	M30	1
	708372	Spindle w/Nut Assembly (#1, #24 - #29, #32)	30mm	1
30	708373	Collet	1/4”	1
31	708374	Collet	1/2”	1
32	PM2700-305A	Spindle Nut	M40x2.5p	5

Spindle Assembly Drawing



Wiring Diagrams

3HP/5HP, 230V, 1Phase





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