

POWERMATIC®

Operating Instructions and Parts Manual Model 2700 Shaper



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Warranty and Service

WMH Tool Group, 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 WMH Tool Group Authorized Service Centers can authorize warranty repair, assist you in obtaining parts, or perform routine maintenance and major repair on your POWERMATIC® tools. For the name of an Authorized Service Center in your area call 1-800-274-6848.

MORE INFORMATION

WMH Tool Group is consistently adding new products to the line. For complete, up-to-date product information, check with your local WMH Tool Group distributor, or visit powermatic.com.

WARRANTY

POWERMATIC products carry a limited warranty which varies in duration based upon the product.

| | | |
|--|--|---|
| <p>Industrial Products</p> <p>1 YEAR WARRANTY</p> <p>One Year Standard, option available on select POWERMATIC machines</p> <p>Bandsaws Dust Collectors Jointers Boring Machines Dovetail Machines Planers Sanders</p> <p>Shapers Rip Saws Cut-off Saws Tablesaws Scoring Saws Panel Saws Accessories & Abrasives</p> <p>Brush Sanders Dovetail Machines Drill Presses Drum Sanders Panel Saws Power Feeders Commercial use of Non-Industrial Products</p> | <p>2 YEAR WARRANTY</p> <p>Industrial Products</p> <p>Two Year Option Available on select industrial machines with distributor installation. See your POWERMATIC Industrial Distributor for details.</p> | <p>5 YEAR WARRANTY</p> <p>Non-Industrial Products</p> <p>Visit our distributors or our website for more information.</p> <p><i>Warranty reverts to 1 Year if above products are used for commercial, industrial or educational purposes</i></p> |
|--|--|---|

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 POWERMATIC warranty lasts for the time period specified in the product literature of each product.

WHAT IS NOT COVERED?

The Five Year Warranty does not cover products used for commercial, industrial or educational purposes. Products with a Five Year Warranty 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 handling and shipping 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

WMH TOOL GROUP 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.

WMH TOOL GROUP 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.

WMH Tool Group sells through distributors only. The specifications in WMH catalogs are given as general information and are not binding. Members of WMH Tool Group 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.

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The specifications in this manual are given as general information and are not binding. WMH Tool Group 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, WMH Tool Group 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.
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 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.
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 that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
17. Provide for adequate space surrounding work area and non-glare, overhead lighting.
18. Keep the floor around the 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.



Warnings

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 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.
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 the 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 the 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:

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.

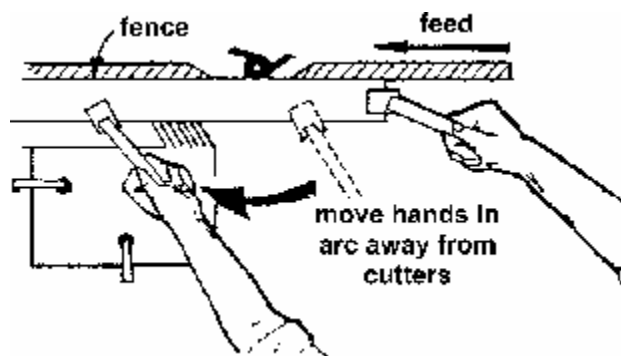


Figure A

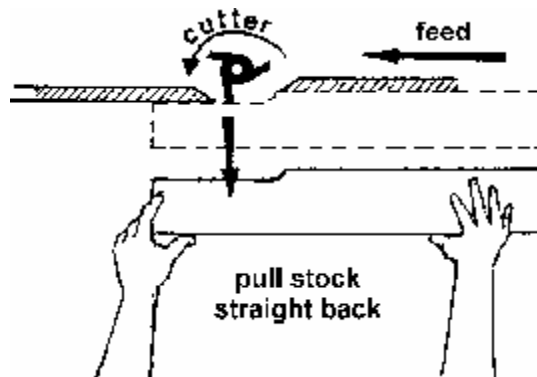


Figure B

Introduction

This manual is provided by WMH Tool Group, Inc. covering the safe operation and maintenance procedures for a Powermatic Model 2700 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 WMH Tool Group. WMH Tool Group can also be reached at our web site: www.wmhtoolgroup.com.

Specifications

| | |
|--|--|
| Model Number..... | 2700 |
| Motor | Stock Number |
| 3HP, 230V, 60Hz, 1 Phase | 1280100C |
| 5HP, 230V, 60Hz, 1 Phase | 1280101C |
| 5HP, 230V/460V-rewired 230V (for 460V see Note below), 60Hz, 3 Phase..... | 1280102C |
| Table Size (L x W)..... | 40" x 30" |
| Spindle Size (Standard) | 3/4", 1-1/4" Interchangeable |
| Router Bit Collet Size (Optional) | 1/4", 1/2" |
| Spindle Capacity Under Nut..... | 3/4" Spindle – 3-3/4", 1-1/4" Spindle – 6" |
| Spindle Travel | 4" |
| Spindle Speeds (RPM)..... | 7500, 10000, reversing |
| Table Opening Diameter | 7.33" |
| Insert Opening Diameters | 2.55", 4.16", 5.75" |
| Fence Size x 2 | 4-7/8" (H) x 18-3/4" (W) |
| Dust Collection Minimum CFM Required 4" Port..... | 600 |
| Overall Dimensions | 40" (L) x 37" (W) x 45" (H) |
| Weight | 690 lbs (Shipping), 664 lbs (Net) |

Note: For 460V operation, magnetic switch (Part No. PM2700-114C) must be purchased separately and installed. A qualified electrician is recommended.

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

⚠WARNING Read and understand the entire contents of this manual before attempting assembly or operation! Failure to comply may cause serious injury

Unpacking

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.

Compare the contents of your container with the parts lists on the following 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.

1. Unbolt the shaper from the skid.
2. Carefully slide the shaper from the 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 and rail assemblies, and loading and off-loading stock and general maintenance work.

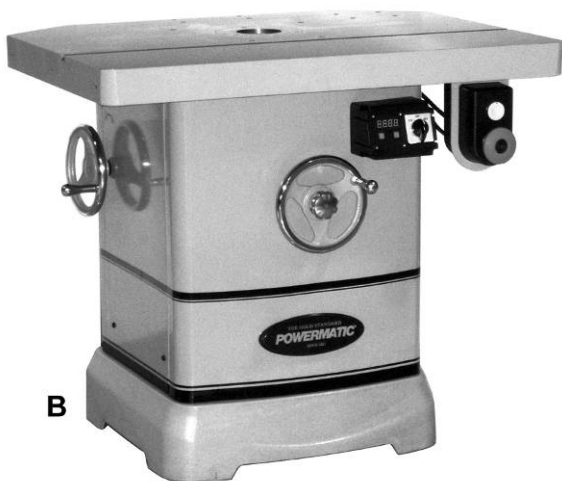
Cleaning

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.

Shipping Contents



A



B

Main Shaper Container

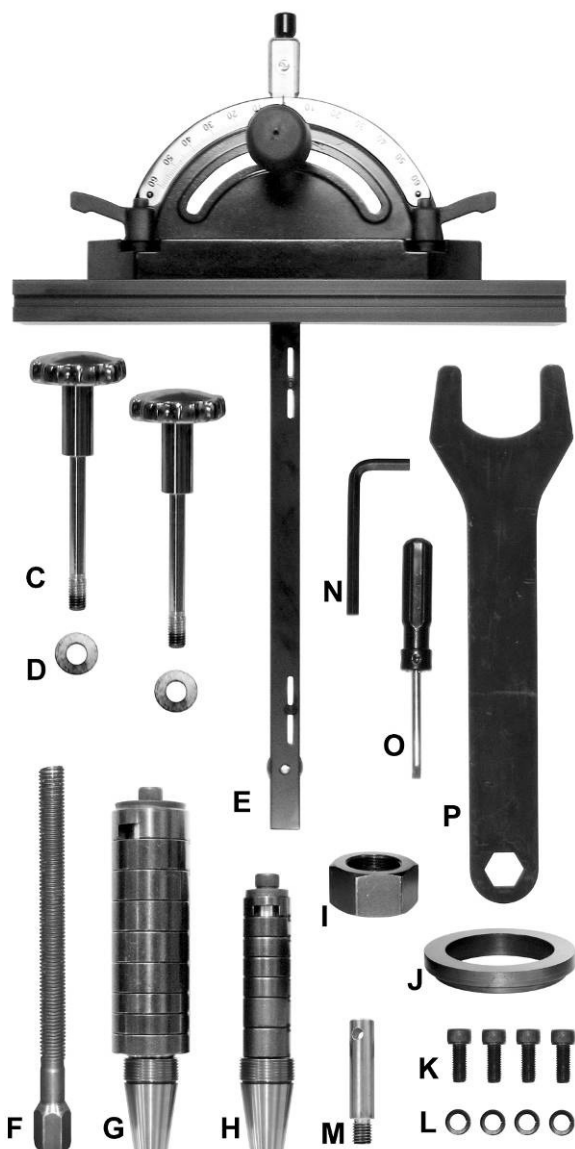
Main Shaper Container

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

Hardware

Hardware and included tools consist of the following items:

- 2 Lock Handle (C)
- 2 M13 Flat Washer (D)
- 1 Miter Assembly (E)
- 1 Draw Bar (F)
- 1 1-1/4" Spindle (G)
- 1 3/4" Spindle (H)
- 2 Spindle Nut (I)
- 1 3-7/8" Insert Ring (J)
- 4 M10 Socket Head Cap Screw (K)
- 4 M10 Lock Washer (L)
- 1 Starting Pin (M)
- 1 8 mm Hex Wrench (N)
- 1 Crosspoint/Flathead Screwdriver (O)
- 1 Wrench (P)



Hardware

Assembly

Mounting the Fence

Referring to Figure 1:

1. Place the *fence assembly* (A) on the *table* (B), lining up the four *mounting holes* (C) on the bracket with the *threaded holes* (D) on the rear of the table above the *dust port* (E).
2. Hand fasten with four 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 the adjust knob on the bracket to position the fence all the way to the rear.
5. Tighten the *lock handles* (J) sufficiently to prevent the fence from movement.

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 2700. 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 47-48 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.

Voltage Conversion (3 Phase Shaper only)

On the 3 phase model, to convert from 230V to 460V, replace the 230V switch with the 460V switch (not included, order part no. PM2700-114C), and re-wire the incoming leads to the motor as shown on the diagram inside the cover of the motor junction box.

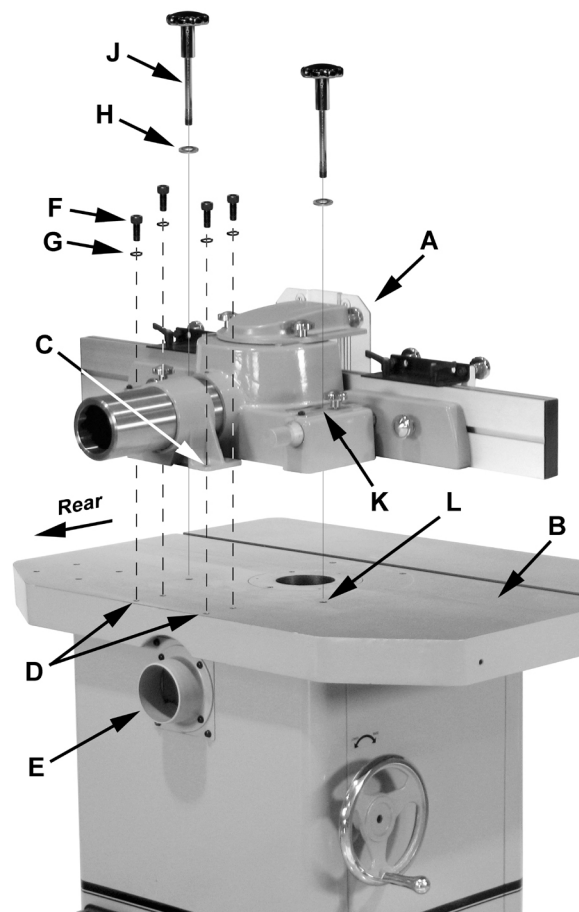


Figure 1

Extension Cords

Makes sure the extension 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.

| 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.

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 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)

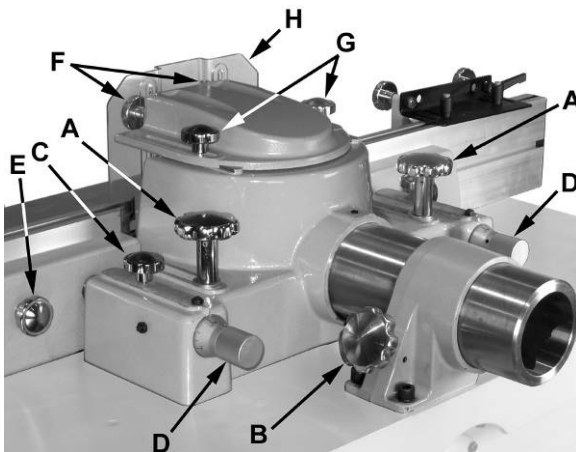


Figure 2

Handwheel Adjustments

Referring to Figure 3:

The *front handwheel* (B) controls the spindle height.

The *side handwheel* (C) controls the *casters*. The Model 2700 has a retractable caster system that can be extended to permit the shaper to be rolled from one location to another.

Spindle height

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

Caster system adjustment

Retractable casters can be extended permitting the shaper to be moved as follows:

1. Turn the *handwheel* (C) clockwise to extend the casters, raising the shaper.

Note: Because of the weight of the machine, both hands may be needed to turn the handwheel. Raise the shaper just enough to permit moving to another location.

When the shaper has been repositioned:

2. Retract the casters by turning the *handwheel* (C) counterclockwise.

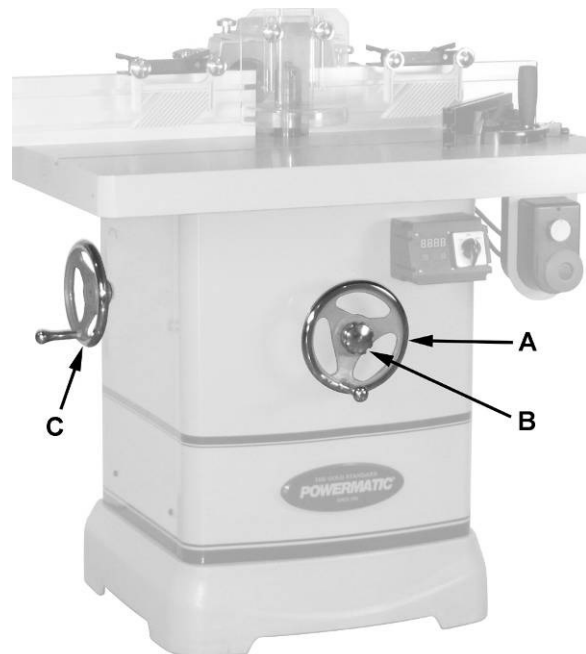


Figure 3

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. Adjust the *fence assembly* (A) 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 the *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 Figure 5. Proceed to *Ram Dial Calibration* (step 00).

Adjustment is required if the fences appear skewed (Figure 6). Continue with *Coplanar Adjustment* (following steps).

Coplanar Adjustment

Determine which fence is skewed (in this example: G₁, Fig. 6), 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 (Figure 7).
7. Lock the reference fence (D₂) and unlock the skewed fence (D₁).

Read *step 7* completely before attempting.

8. Maintain steady pressure of the straightedge against the fence castings (H, Fig. 7). At the same time, attempt to bring both fences into alignment as shown in Figure 8. This is accomplished by alternately making incremental adjustments to four *setscrews* (L, Fig. 9) on the front face of the *casting* (K, Fig. 9) with a 2mm hex wrench, followed by repositioning the casting with the *micro adjust dial* (J, Fig. 9) as required.

Important: It is recommended that the adjustment setscrews (K, Fig. 9) 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 Figure 8.

9. Replace both fences and secure.

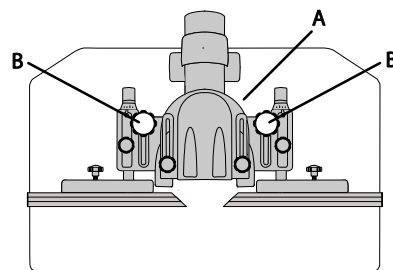


Figure 4

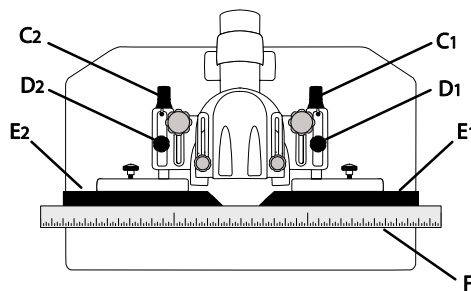


Figure 5

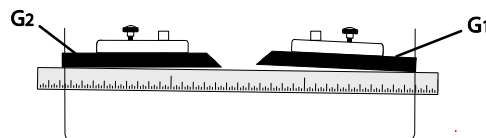


Figure 6

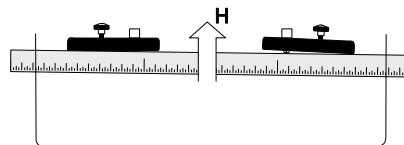


Figure 7

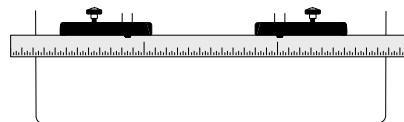


Figure 8

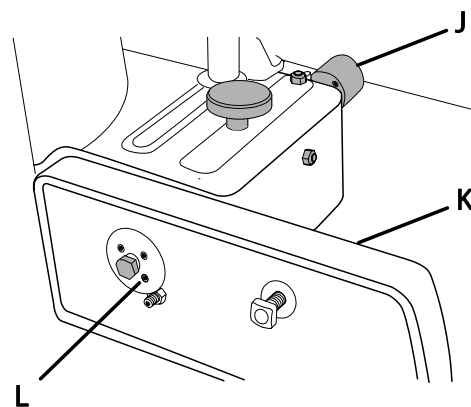


Figure 9

Ram Dial Calibration

The guard and spindle should be removed.

Referring to Figure 10:

1. Loosen the *infeed fence lock knob* (E), then turn the *infeed ram dial* (D) counterclockwise to bring the *infeed fence* (F) back all the way until the *limiter setscrew* (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) counterclockwise to bring the *outfeed fence* (C) all the way back.
4. Place a *straightedge* (G) on the table against the *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 the *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 the *outfeed fence* (C) aside again.
11. Turn the *limiting setscrew* (P) **in** (turn cw) until it comes in contact with the *head casting* (M).
12. Tighten the hex locking nut (O) with a 10mm wrench *while maintaining the setscrew position with the 3mm hex wrench*.
13. Replace the outfeed fence and secure.
14. Loosen the two *set-screws* (2mm hex wrench) on the *outfeed ram dial* (A) and align the *zero* on the dial with the *indicator mark*. Then tighten the setscrews.

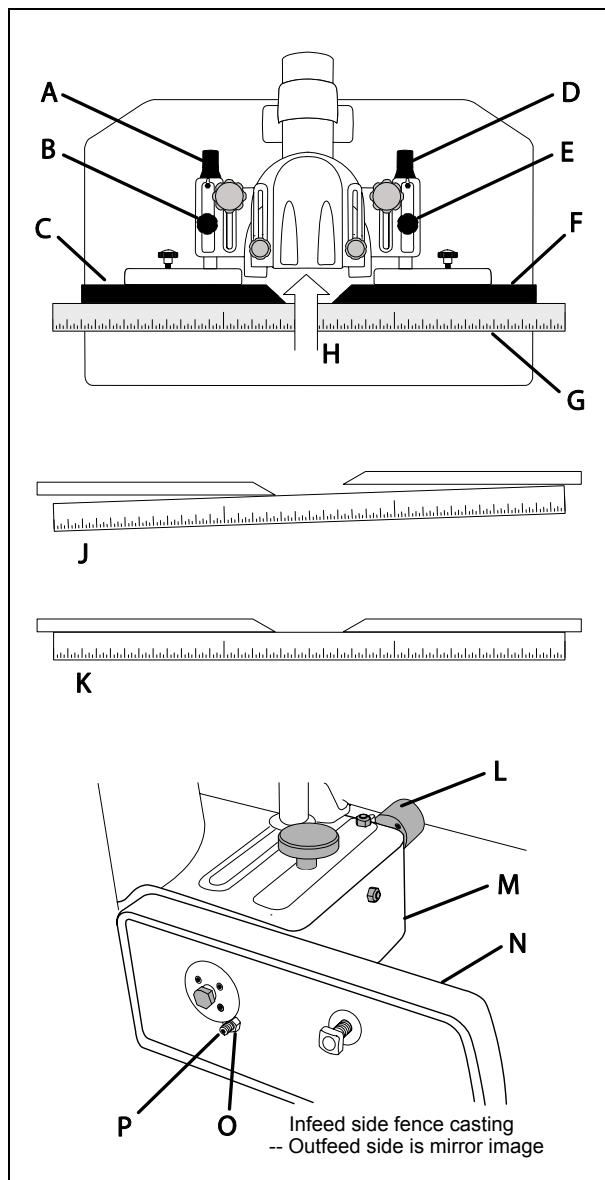


Figure 10

Spindle Gib Adjustment

Referring to Figure 11:

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

To adjust (refer to Figure 11):

1. With a 12mm wrench, loosen four *jam nuts* (B) that secure the *gib setscrews* (C).
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 table play, repeat this step until the play is removed.

Note: If the gibs are too tight the *front handwheel* (A, Fig. 3) that controls the spindle height will be difficult to turn.

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

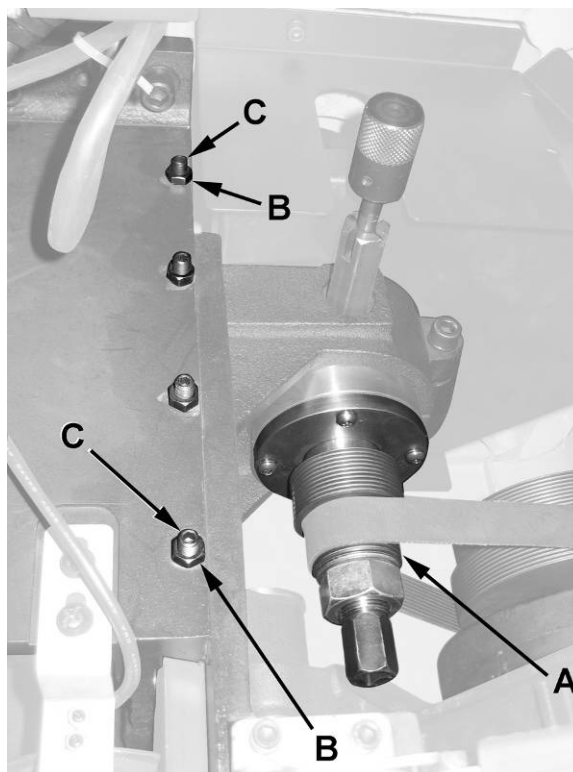


Figure 11

Featherboard Hold-downs

Referring to Figure 12:

The 2700 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).

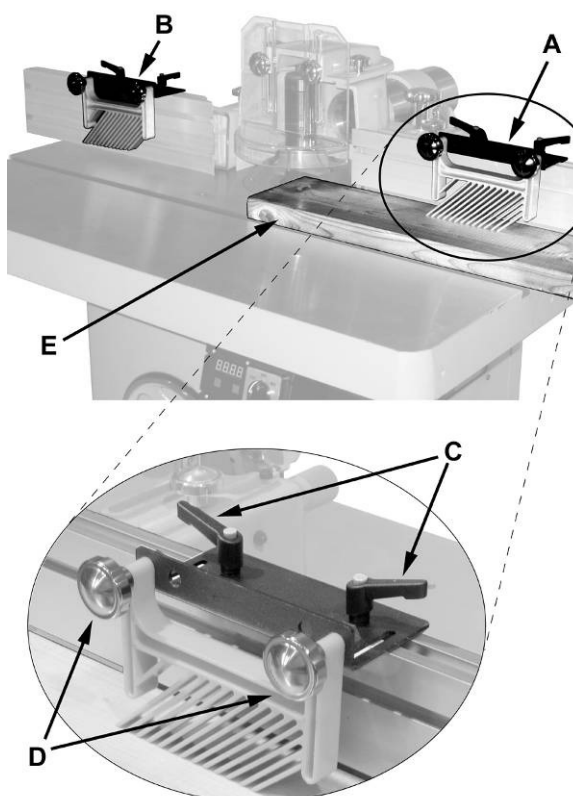


Figure 12

Spindle Attachment Installation

Refer to Figure 13. The *fence guard* (G) has been removed for clarity.

The *spindle attachment* (E₂) is mounted to the *main shaft* (H) with a *draw bar* (M) and *nut* (F). Use the following procedure to install the spindle attachment. 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 *spindle* (H) all the way using the handwheel located on the front of the cabinet

Locking the Arbor

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

Attempt to turn the *spindle* (H) by hand to verify that it is locked and will not rotate.

Installing the Spindle Attachment

3. Disassemble the *spindle assembly* (Inset A). Using the provided 8mm hex wrench (O), loosen and remove the *socket head cap screw* (A). Then remove the *pronged washer* (B), *keyed collar* (C) and all remaining collars (D) from the *spindle attachment* (E₁).
4. Place the *spindle attachment* (E₂) onto the *spindle* (H).
5. Insert the *draw bar* (M) through the opening in the *shaft* (L) just below the *drive belt* (K). Turn clockwise, fastening it to and securing the *spindle attachment* (E₂). Tighten the draw bar with the *wrench* (N) provided.

Spindle Nut

6. Place the *spindle nut* (F) onto the *spindle attachment* (E₂) with the larger (threaded) opening of the nut face down. Initially tighten by hand, threading it through the spindle attachment then continuing onto the *spindle* (H). Tighten the *nut* (F) with the *wrench* (N) provided.

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

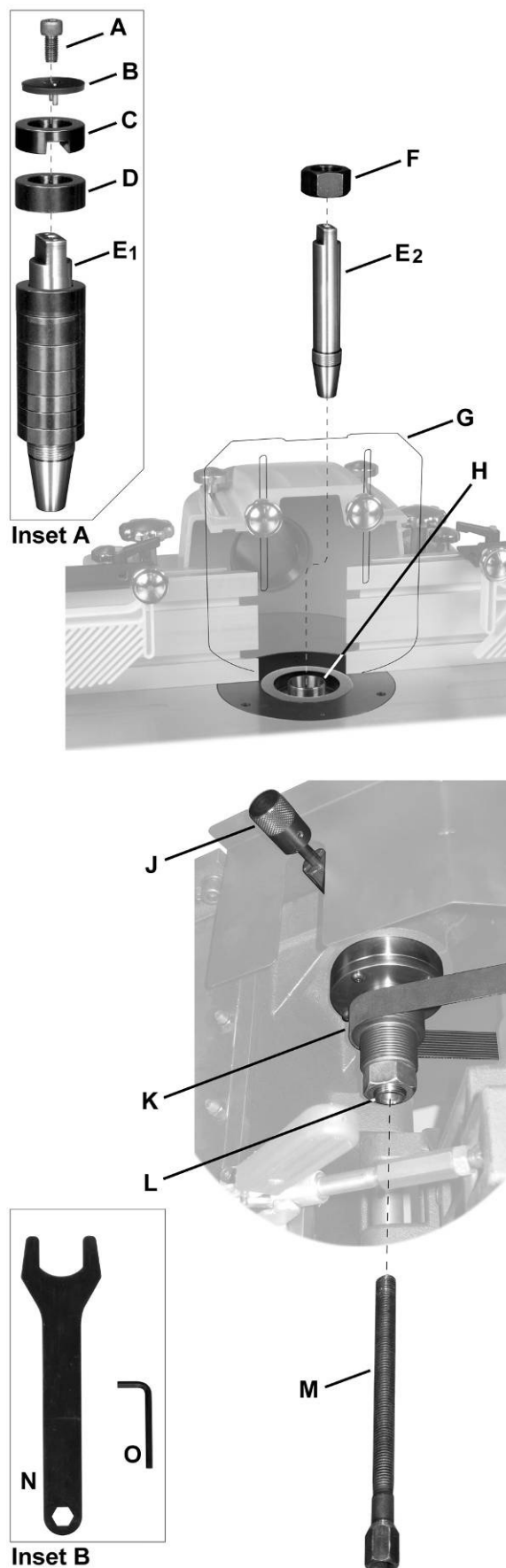


Figure 13

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* (J, Fig. 13) accessible through the door on the right side of the cabinet. Pull out and rotate 90° right or left, resetting the knob into the indent.

Attempt to turn the *spindle* (H, Fig. 13) by hand to verify that it is locked and will not rotate.

Installing the Shaper Cutter

Referring to Figure 14:

1. Place the *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 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.

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 *lock knob* (J, Fig. 13) accessible through the door on the right side of the cabinet. Rotate 90° right or left, resetting the knob into the indent.

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

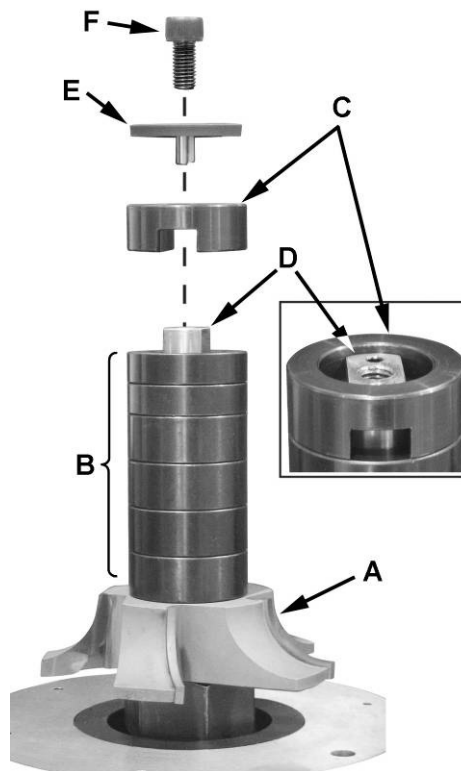


Figure 14

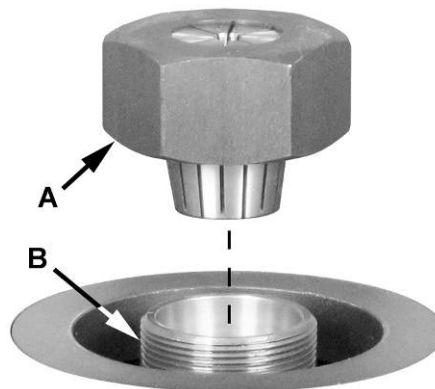


Figure 15

Router Collet (Optional) Installation

1. Locate the *lock knob* (J, Fig. 13) accessible through the door on the right side of the cabinet. Pull out and rotate 90° right or left, resetting the knob into the indent.

Attempt to turn the *spindle* (H, Fig. 13) by hand to verify that it is locked and will not rotate.

2. Place the *router collet* (A, Fig. 15) onto the *spindle* (B, Fig. 15) and secure with the *wrench* (N, Fig. 13) provided.

3. Unlock the spindle by pulling out the *lock knob* (J, Fig. 13) accessible through the door on the right side of the cabinet. Rotate 90° right or left, resetting the knob into the indent.

Turn the *router collet* (A, Fig. 15) by hand to verify that it turns freely.

Changing Cutter Speed

Referring to Figure 16:

The Model 2700 Shaper is equipped with pulleys that allow you to change the spindle speed. The *belt* (B) placed on the upper pulleys (as shown in Figure 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 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* (left) position. This allows the *motor* (E) to swivel on its mounting hinge.
4. Move the *drive belt* (C) to the other set of grooves.
5. Lock the *belt tension handle* (A), securing the *motor* (B) and placing tension on the *drive belt* (C).

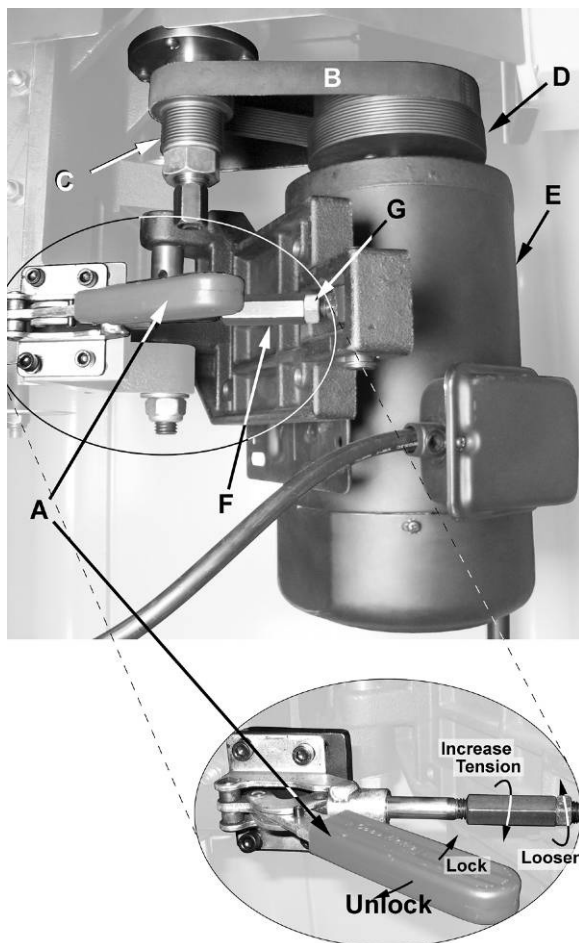


Figure 16

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. 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) 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* (F) with one wrench while tightening the *lock nut* (G) with the other.

Belt Replacement

Referring to Figure 16:

Replace the *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.

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 0°, 30° and 45° 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 0°, 30° and 45° 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 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 90° (0° setting on the scale) by loosening the *lock handle* (A), then pulling the *spring-loaded knob* (C) out and turning the *body* (B) until 0° 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 (90°) to the *miter slot* (H).

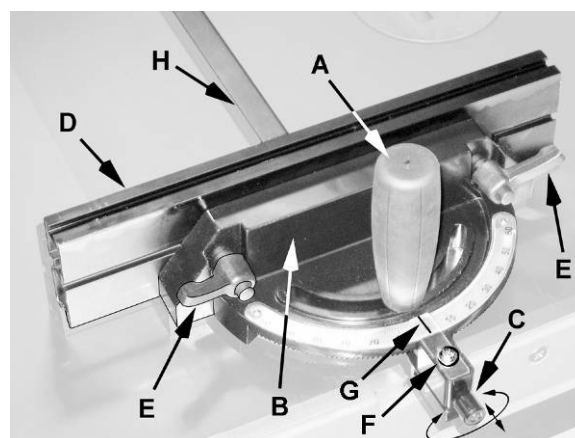


Figure 17

5. Tighten the lock handle (A).

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

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

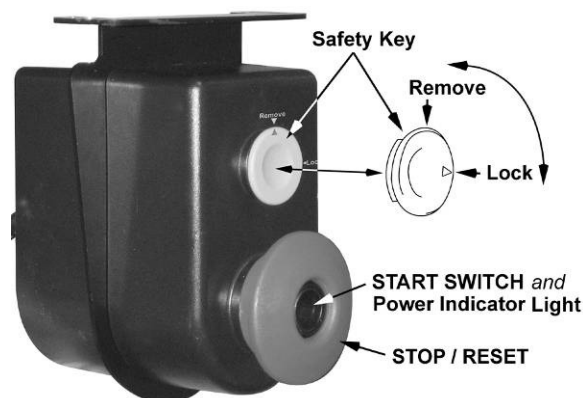


Figure 18

Safety Key

The start/stop switch on the Model 2700 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.

Digital Readout

The digital readout (Figure 19) is used for making incremental spindle height adjustments where applicable if multiple shaping/cutting passes are to be performed on a given workpiece.

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.

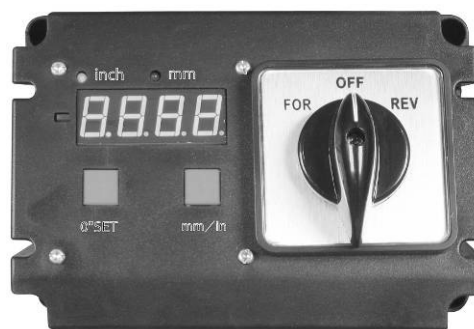


Figure 19

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.

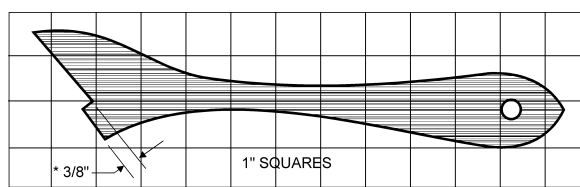
Safety Devices

Safety devices such as guards, fixtures, templates hold-downs, push sticks (Figure 20), feather boards and power feeders should be used whenever possible. Figure 20 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 20

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 21, feed the workpiece from *right to left*.

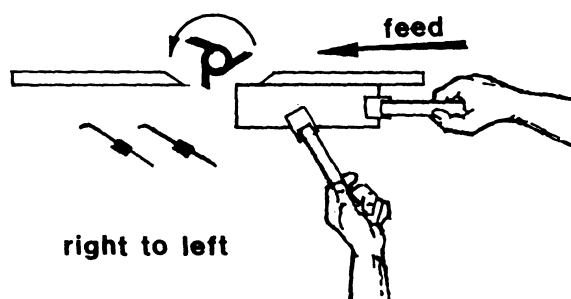


Figure 21

Clockwise Setup – With the cutter installed as shown in Figure 22, feed the workpiece from *left to right*.

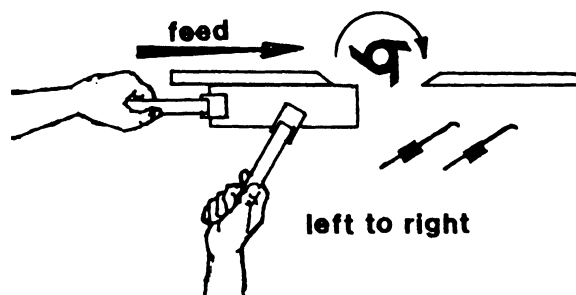


Figure 22

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 23.

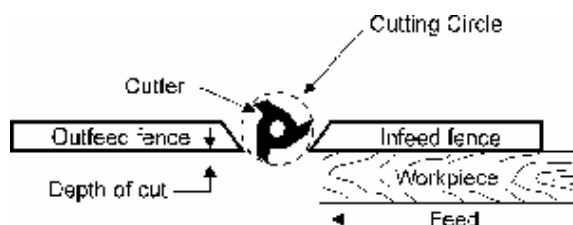


Figure 23

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 24. In this case, the stock should be advanced to the position shown in Figure 24 and stopped. Turn off the machine and move the outfeed fence forward to contact the workpiece, Figure 25. Remove the workpiece, start the motor, and then continue the operation.

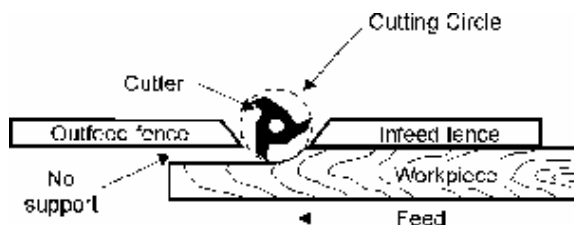


Figure 24

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

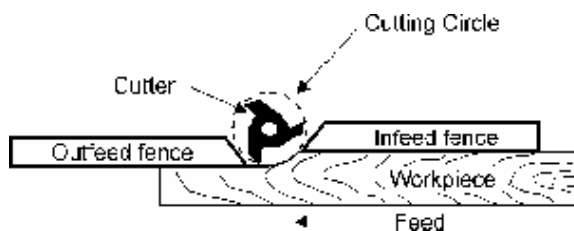


Figure 25

"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 26.

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.

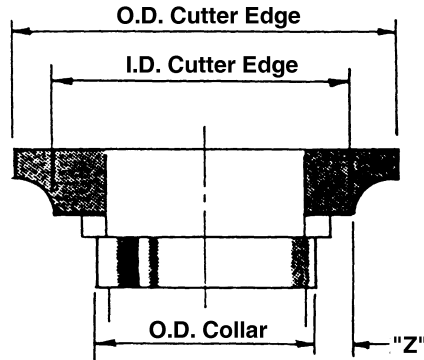


Figure 26

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 27).

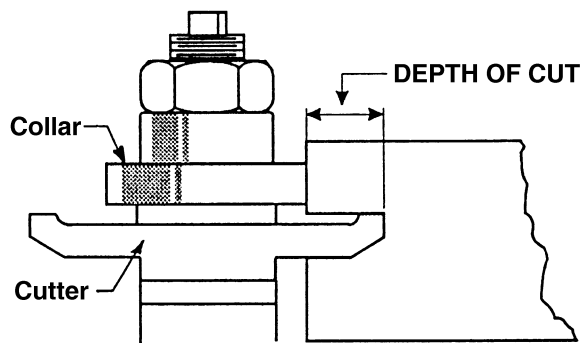


Figure 27

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 28.

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 28 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.

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 29 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.

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 30.

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 31.

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

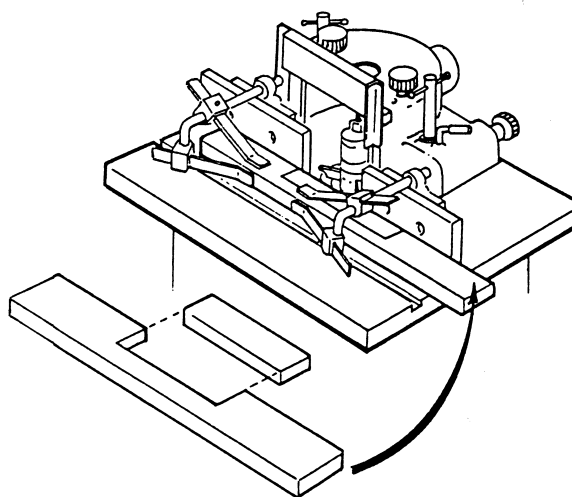


Figure 28

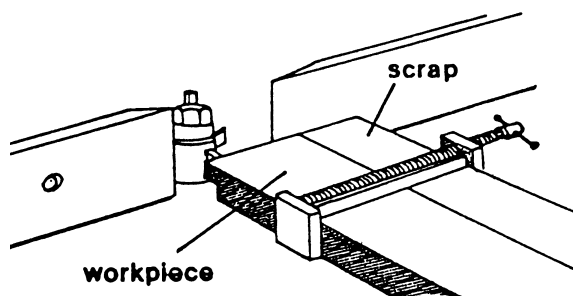


Figure 29

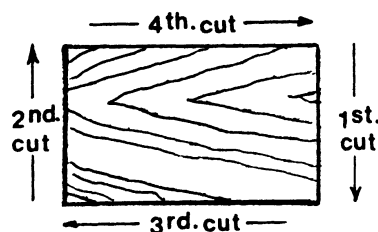


Figure 30

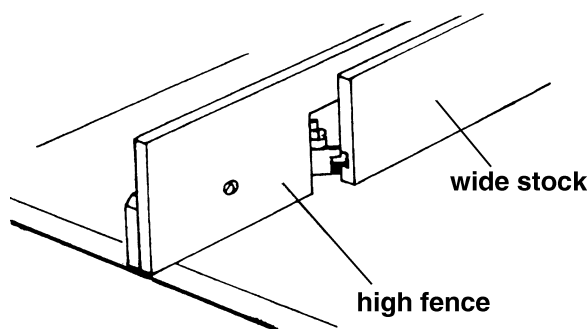


Figure 31

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 32.

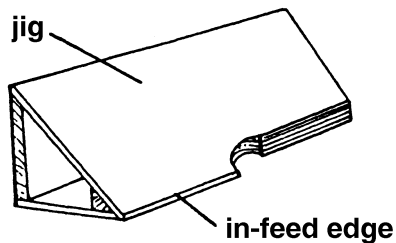


Figure 32

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

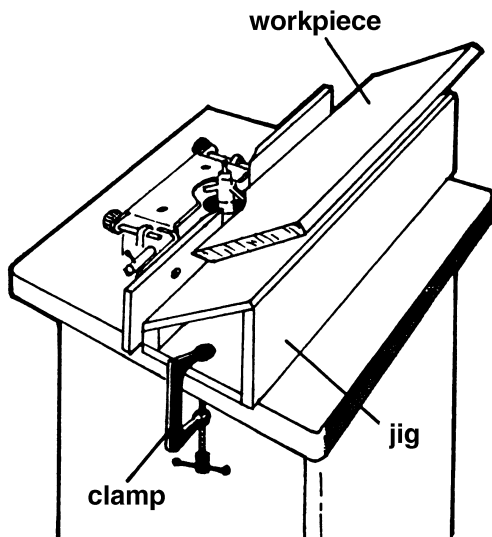


Figure 33

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 34.

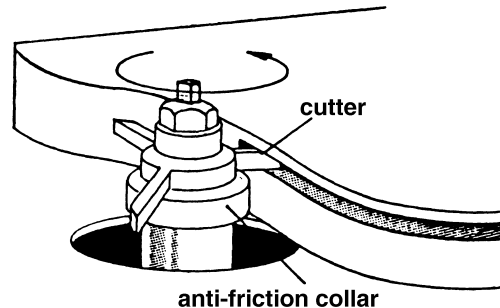


Figure 34

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

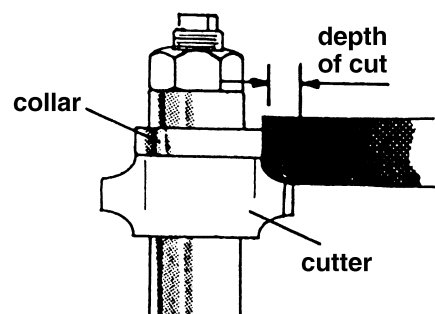


Figure 35

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 36. The added use of a pattern, however, permits the shaping of the entire contour edge.

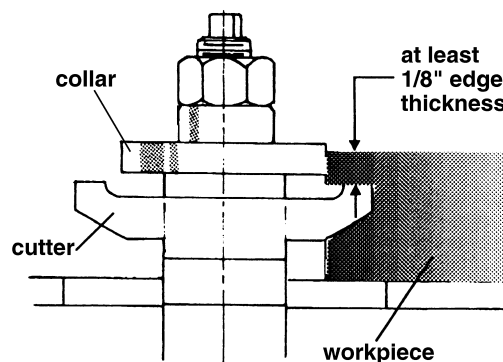


Figure 36

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 37. 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 43. 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.

⚠ 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 38. 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 39.

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.

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 40, the progress of the cut can be seen throughout the operation. However, any accidental lifting of the work will gouge the wood and ruin the workpiece.
2. When the collar is used above the cutter, as shown in Figure 41, 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.

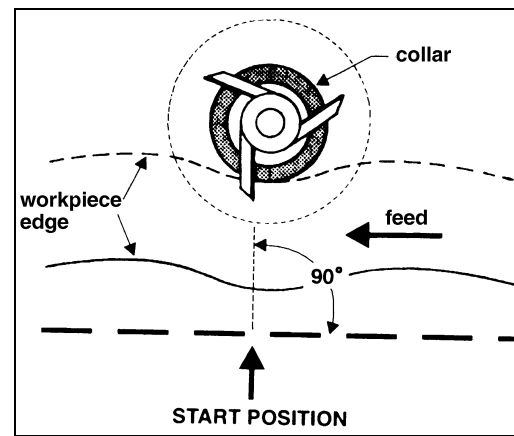
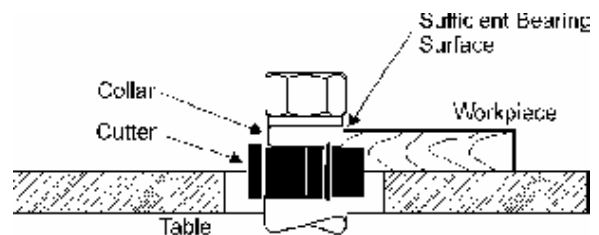
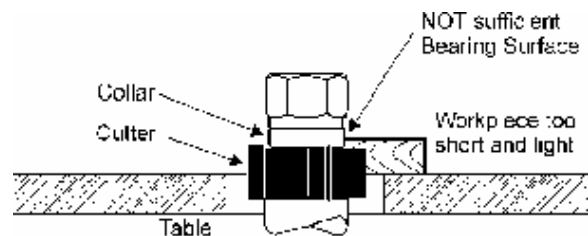


Figure 37



RIGHT

Figure 38



WRONG

Figure 39

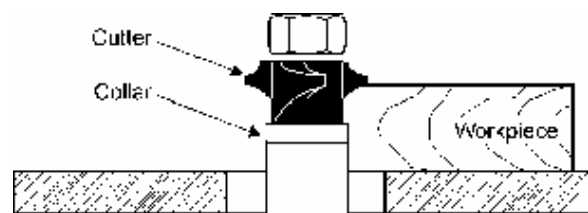


Figure 40

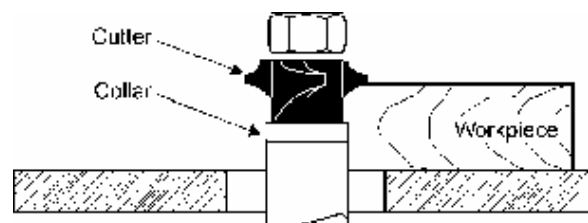


Figure 41

- 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 42.

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.

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.

- The work should be placed in the *position 1*, (Figure 43), using the starting pin as a support
- Swing the work into the cutter as shown in the *position 2*. The work is now supported by the starting pin and the collar.
- After the cut has been started, the work is swung free of the starting pin and only rides against the collar (Figure 44). Always feed against the cutterhead rotation.

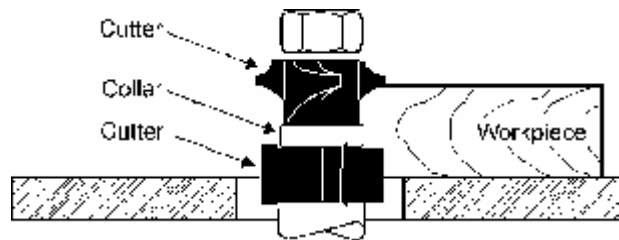


Figure 42

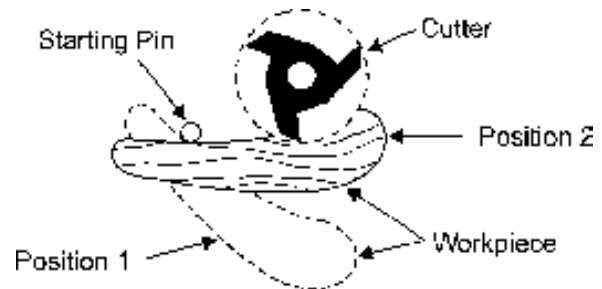


Figure 43

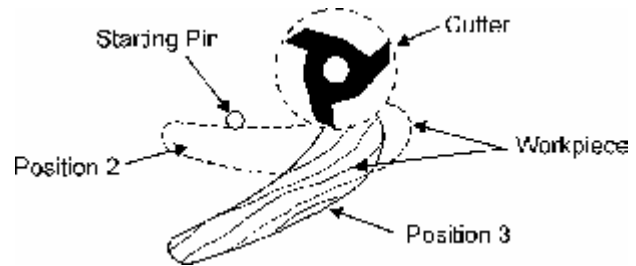


Figure 44

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 45.

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.

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 46.

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.

With a firm grip, ease the edge into the cutter(s) until stopped by the collar as shown in Figure 46.

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).

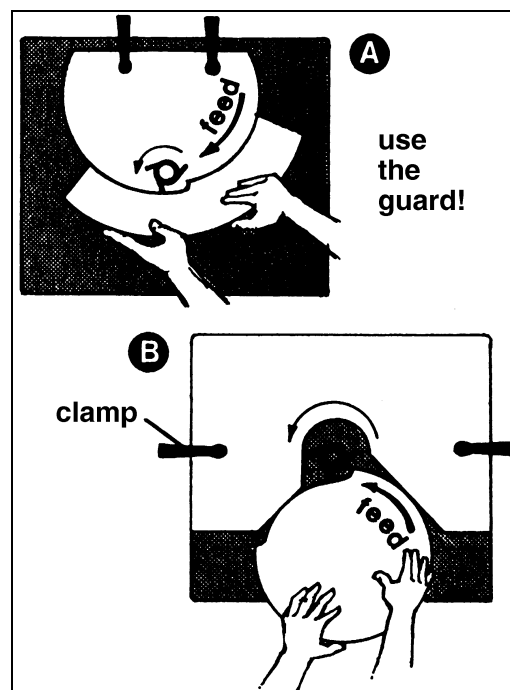


Figure 45

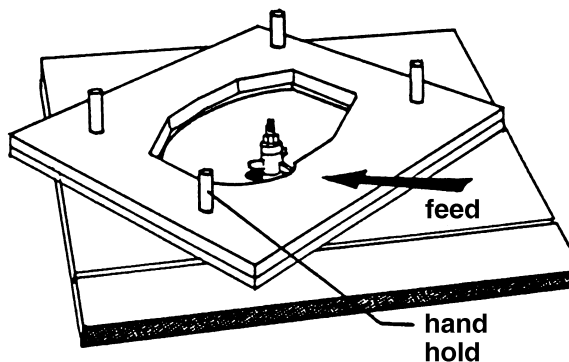


Figure 46

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

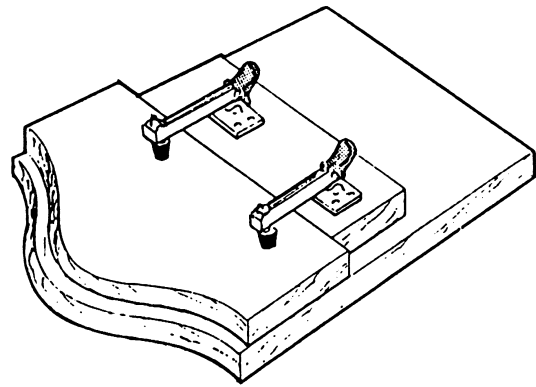


Figure 47

If the workpiece requires all-around shaping, the template can be constructed from several sections pieced together as shown in Figure 48.

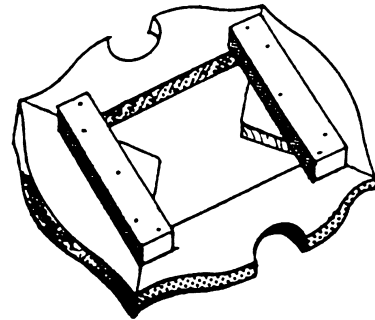


Figure 48

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 49.

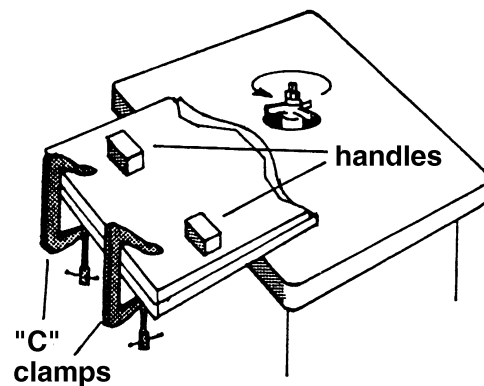


Figure 49

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 50.

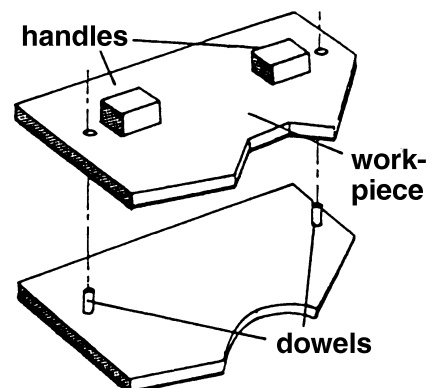


Figure 50

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 51 shows the sash cut for the first operation.

Figure 52 shows the stock flipped over and the sash cutter used with a 1/4 inch groove cutter to complete the cut.

Figure 53 shows the first shaping cut with the sash cutter for the matching door stile sash.

Figure 54 shows the same cut with the stock flipped over.

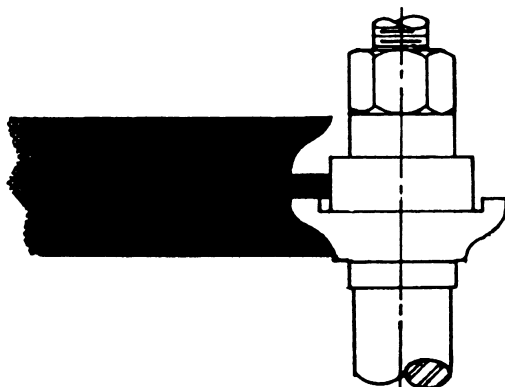


Figure 54

Figure 55 shows the first shaping cut for a window sash stile utilizing a sash cutter, collar, and a 1/2 inch groove cutter.

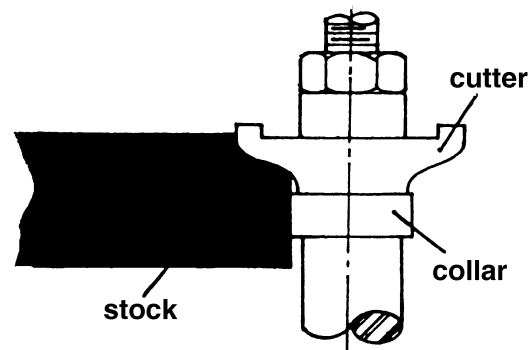


Figure 51

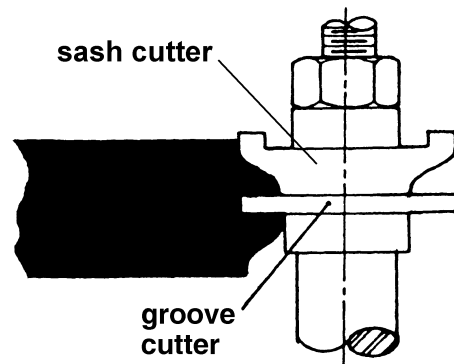


Figure 52

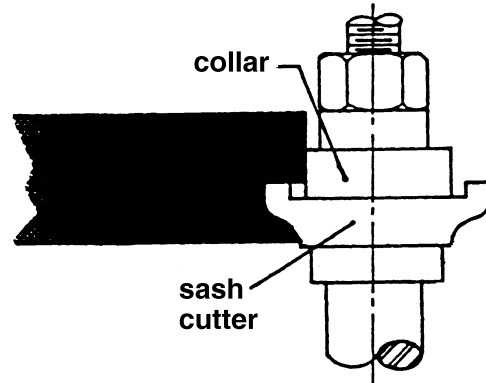


Figure 53

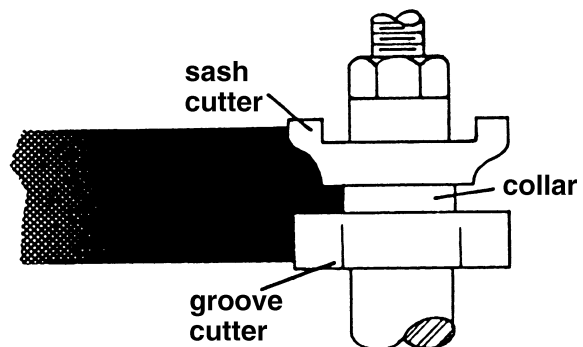


Figure 55

Figure 56 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.

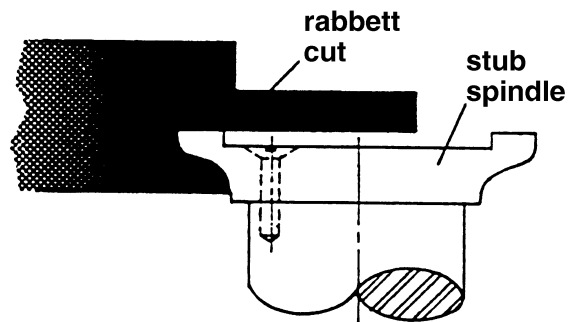


Figure 56

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 57).

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.

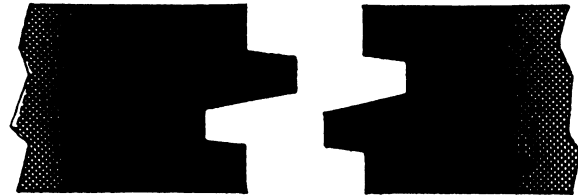


Figure 57

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 58.

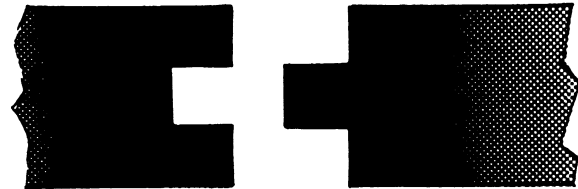


Figure 58

Drop Leaf Joint

When shaping a drop-leaf joint as shown in Figure 59, 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 59

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 60.

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.

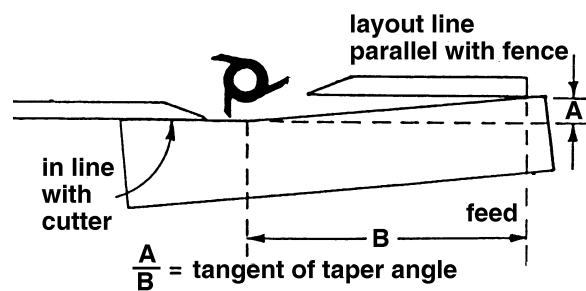


Figure 60

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 61 shows a miter gauge equipped with a hold-down for shaping the ends of narrow work-pieces.

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 62.

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.

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 63.

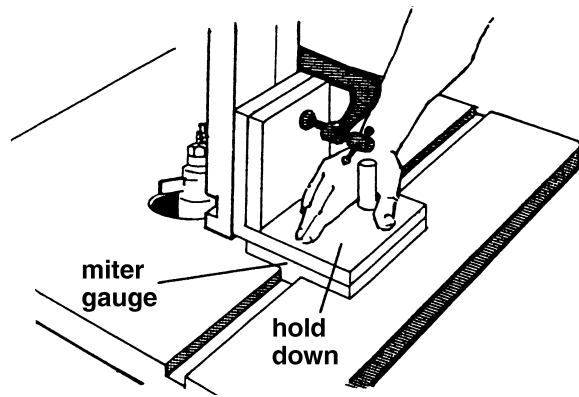


Figure 61

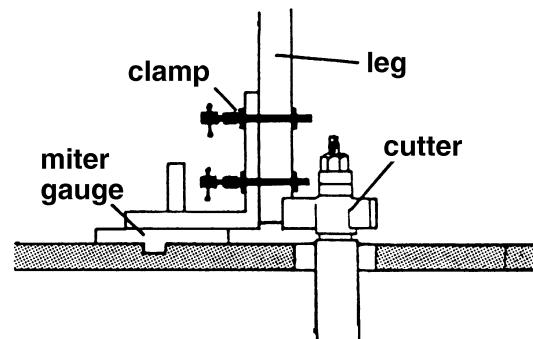


Figure 62

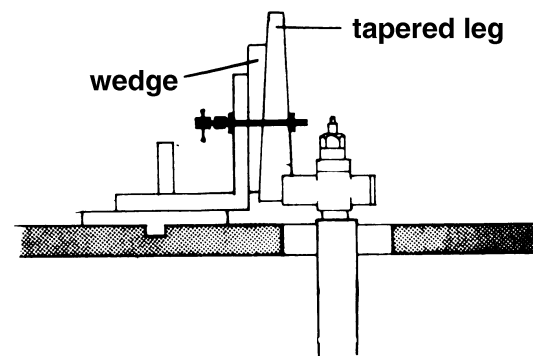


Figure 63

Troubleshooting

| Trouble | Possible Cause | Remedy |
|--|--|---|
| Shaper will not start. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Extension cord or wiring inadequate size. 2. Feeding stock too fast. 3. Cutter needs cleaning or replacing. See also <i>Unsatisfactory Cuts</i> below. | <ol style="list-style-type: none"> 1. Replace cord or wiring with proper gauge wire. 2. Reduce feed stock rate. 3. Clean or replace cutter. |
| Cuts are unsatisfactory. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Replace cutter. 2. Check for proper rotation at startup. 3. Feed work <i>against</i> the cutter rotation. 4. Remove cutter and clean with solvent. 5. Clean table with solvent. |
| Cutter does not come up to full speed. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Stand on uneven surface. 2. Cutterhead damaged. 3. Defective V-belt. 4. V-belt incorrectly tensioned. 5. Bent pulley. 6. Motor mounted improperly. | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 1. Characteristic of this type of cut. | <ol style="list-style-type: none"> 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 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. |

Optional Accessories

| | |
|---------|--------------|
| 1791204 | 1/2" Spindle |
| 1791205 | 1" Spindle |
| 1791206 | 30mm Spindle |
| 1791207 | 1/4" Collet |
| 1791208 | 1/2" Collet |

Parts

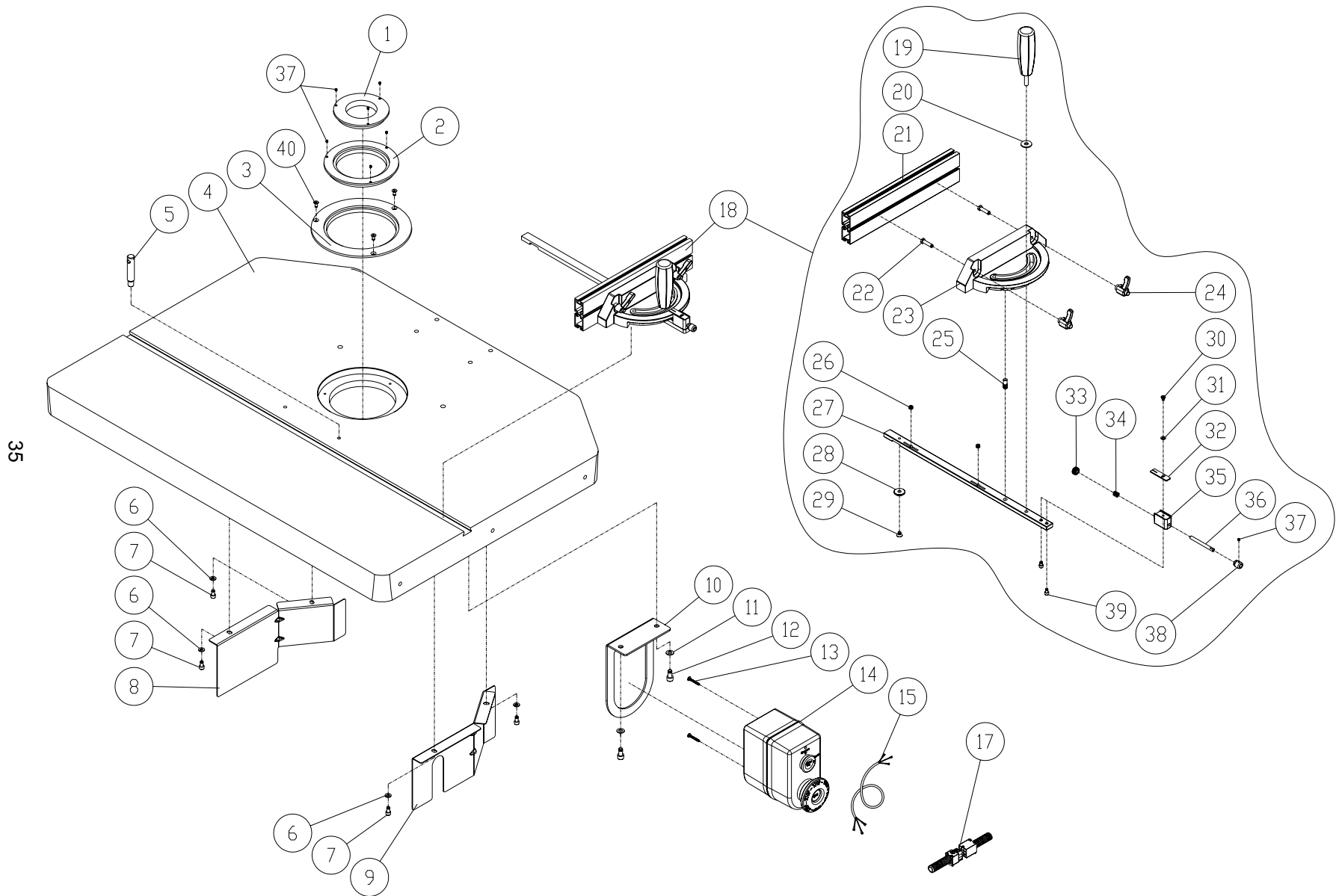
Ordering Replacement Parts

To order parts or reach our service department, call 1-800-274-6848 between 7:30am and 5:30pm (CST), Monday through Friday. 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 | PM2700-101N | Insert Ring (Small) | | 1 |
| 2 | PM2700-102N | Insert Ring (Medium) | | 1 |
| 3 | PM2700-103N | Insert Ring (Large) | | 1 |
| 4 | PM2700-104N | Table | | 1 |
| 5 | PM2700-105 | Starting Pin | | 1 |
| 6 | TS-2361061 | Lock Washer | M6 | 4 |
| 7 | TS-1503031 | Socket Head Cap Screw | M6x12 | 4 |
| 8 | PM2700-108 | Left Dust Deflector | | 1 |
| 9 | PM2700-109 | Right Dust Deflector | | 1 |
| 10 | PM2700-110 | Switch Plate | | 1 |
| 11 | TS-1550061 | Flat Washer | M8 | 2 |
| 12 | TS-1504041 | Socket Head Cap Screw | M8x20 | 2 |
| 13 | PM2700-113 | Tapping Screw | M5-2.12Px25 | 2 |
| 14 | PM2700-114 | Magnetic Switch | 3HP, 230V, 1Ph | 1 |
| | PM2700-114A | Magnetic Switch | 5HP, 230V, 1Ph | 1 |
| | PM2700-114B | Magnetic Switch | 5HP, 230V, 3Ph | 1 |
| | PM2700-114C | Magnetic Switch | 5HP, 460V, 3Ph | 1 |
| 15 | PM2700-115 | Power Cord | 3HP, 1Ph | 1 |
| | PM2700-115A | Power Cord | 5HP, 1Ph | 1 |
| | PM2700-115B | Power Cord | 5HP, 3Ph | 1 |
| 17 | PM2700-117 | Power Connector (Male & Female) | | 1 |
| 18 | 1791789 | Miter Gauge Assembly (Index #19 thru #39) | | 1 |
| 19 | PM2000-340 | Handle | | 1 |
| 20 | TS-0680031 | Flat Washer | 5/16" | 1 |
| 21 | PM2000-342 | Fence | | 1 |
| 22 | TS-0050051 | Hex Cap Screw | 1/4"-20x1" | 2 |
| 23 | PM2000-323 | Miter Gauge Body | | 1 |
| 24 | PM2000-333 | Locking Handle | | 2 |
| 25 | PM2000-324 | Pin | | 1 |
| 26 | PM2700-126 | Socket Set Screw | M8x5 | 2 |
| 27 | PM2000-325 | Miter Bar | | 1 |
| 28 | PM2000-326 | Guide Washer | | 1 |
| 29 | PM2000-327 | Flat Head Machine Screw | M6x9 | 1 |
| 30 | TS-0810012 | Round Head Screw | #10-24x1/4" | 1 |
| 31 | TS-1550031 | Flat Washer | M5 | 1 |
| 32 | PM2000-335 | Pointer | | 1 |
| 33 | PM2700-133 | Gear | | 1 |
| 34 | PM2000-336 | Spring | | 1 |
| 35 | PM2000-330 | Support Base | | 1 |
| 36 | PM2000-337 | Gear Shaft | | 1 |
| 37 | TS-1521011 | Socket Set Screw | M4x4 | 7 |
| 38 | PM2000-331 | Knob | | 1 |
| 39 | PM2000-329 | Socket Head Cap Screw | M5x8 | 2 |
| 40 | TS-1513021 | Flat Head Socket Screw | M5x12 | 3 |

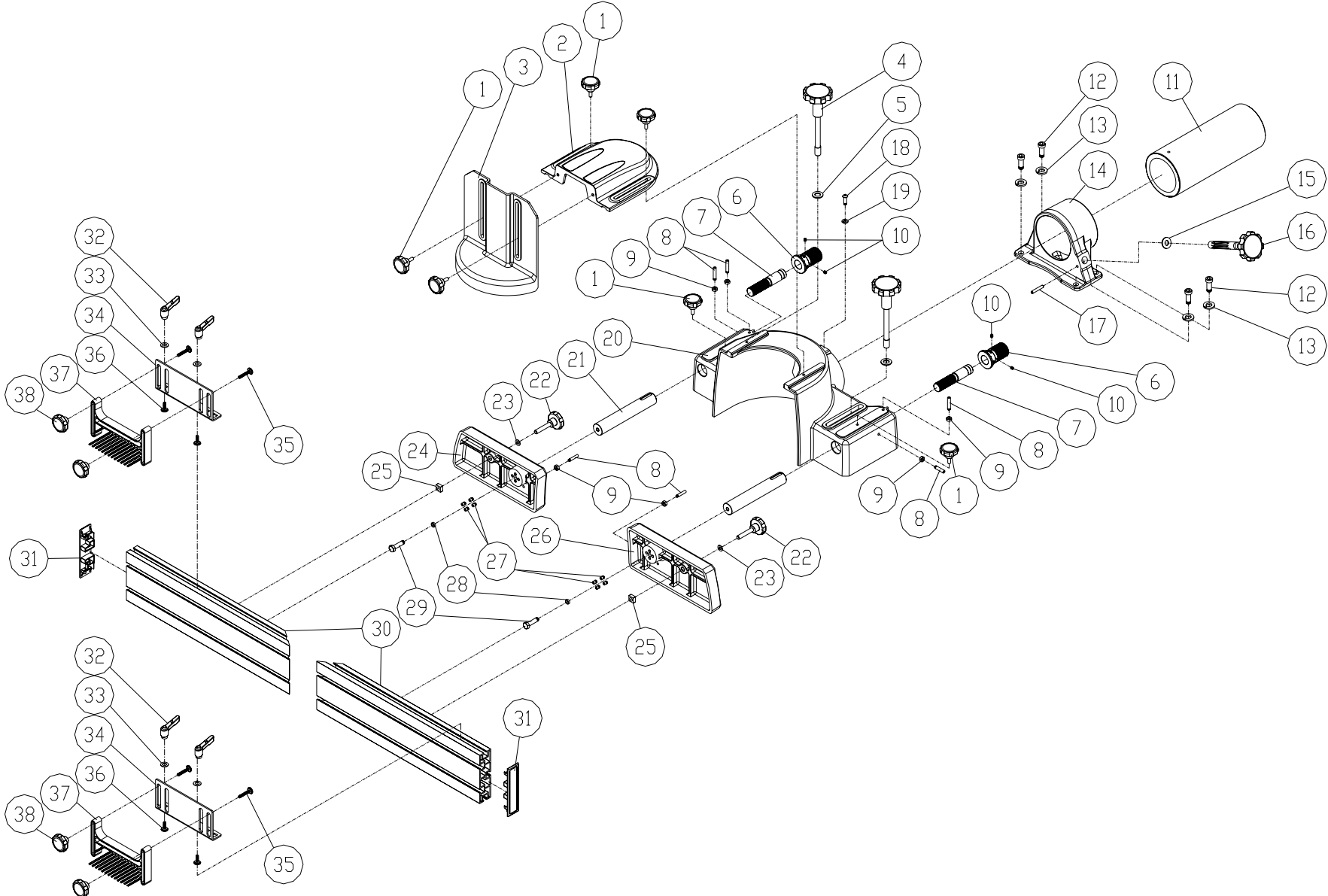
Table – Assembly Drawing



Fence – Parts List

| Index No. | Part No. | Description | Size | Qty |
|-----------|------------|---------------------------|--------|-----|
| 1 | PM2700-201 | Knob | | 6 |
| 2 | PM2700-202 | Guard Holder | | 1 |
| 3 | PM2700-203 | Cutter Guard | | 1 |
| 4 | PM2700-204 | Lock Knob | | 2 |
| 5 | PM2700-205 | Flat Washer | M13 | 2 |
| 6 | PM2700-206 | Adjustment Knob | | 2 |
| 7 | PM2700-207 | Adjustment Lead Screw | | 2 |
| 8 | TS-1523071 | Socket Set Screw | M6x25 | 6 |
| 9 | TS-1540041 | Hex Nut | M6 | 6 |
| 10 | TS-1522011 | Socket Set Screw | M5x6 | 4 |
| 11 | PM2700-211 | Column | | 1 |
| 12 | TS-1505031 | Socket Head Cap Screw | M10x25 | 4 |
| 13 | TS-2361101 | Lock Washer | M10 | 4 |
| 14 | PM2700-214 | Fence Column Bracket | | 1 |
| 15 | TS-155010 | Flat Washer | M16 | 1 |
| 16 | PM2700-216 | Geared Knob | | 1 |
| 17 | PM2700-217 | Spring Pin | Ø5x32 | 2 |
| 18 | TS-2246202 | Button Head Socket Screw | M6x20 | 1 |
| 19 | TS-2361061 | Lock Washer | M6 | 1 |
| 20 | PM2700-220 | Fence Body | | 1 |
| 21 | PM2700-221 | Shaft | | 2 |
| 22 | PM2700-222 | Lock Knob | | 2 |
| 23 | PM2700-223 | Washer | | 2 |
| 24 | PM2700-224 | Left Fence Plate | | 1 |
| 25 | PM2700-225 | Square Nut | M8 | 2 |
| 26 | PM2700-226 | Right Fence Plate | | 1 |
| 27 | TS-1523021 | Socket Set Screw | M6x8 | 8 |
| 28 | PM2700-228 | Bushing | | 2 |
| 29 | TS-1490051 | Hex Cap Screw | M8x30 | 2 |
| 30 | PM2700-230 | Fence | | 2 |
| 31 | PM2700-231 | End Cap | | 2 |
| 32 | PM2700-232 | Lock Handle | | 4 |
| 33 | TS-1550061 | Flat Washer | M8 | 4 |
| 34 | PM2700-234 | Bracket | | 2 |
| 35 | PM2700-235 | Carriage Bolt | M5x30 | 4 |
| 36 | PM2700-236 | Carriage Bolt | M5x16 | 4 |
| 37 | PM2700-237 | Feather Board | | 2 |
| 38 | PM2700-238 | Knob | | 4 |
| | PM2700-FA | Fence – Complete Assembly | | 1 |

Fence – Assembly Drawing

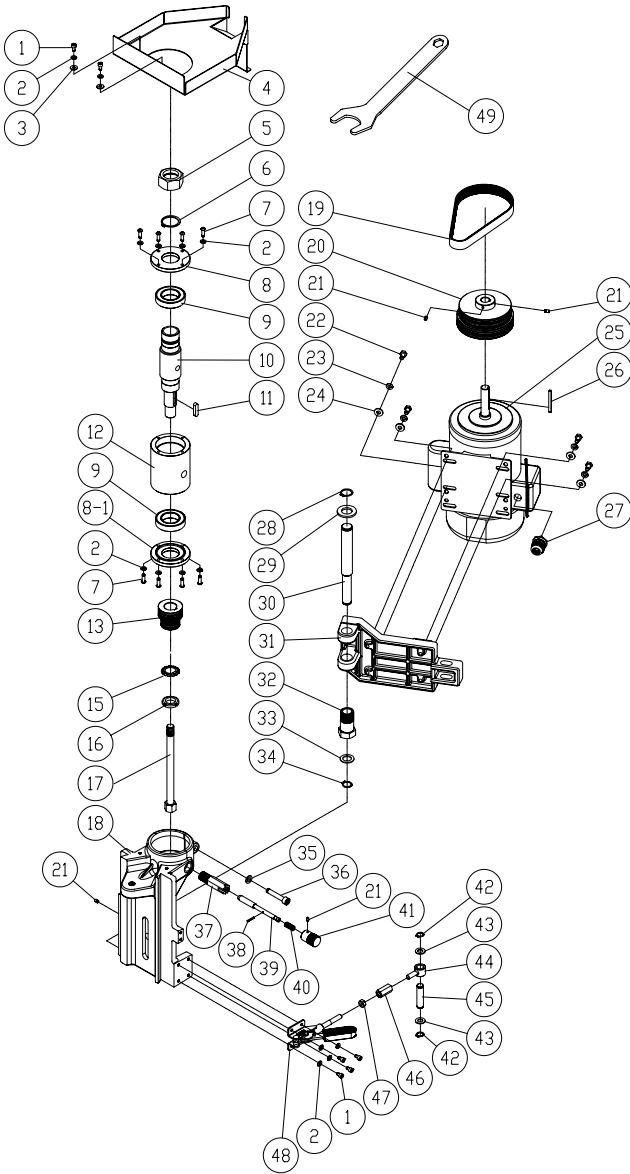


Frame and Motor – Parts List

| Index No. | Part No. | Description | Size | Qty |
|-----------|---------------|---|--------------------|-----|
| 1 | TS-1503031 | Hex Socket Cap Screw | M6x12 | 6 |
| 2 | TS-2361061 | Lock Washer | M6 | 14 |
| 3 | TS-1550041 | Flat Washer | M6 | 2 |
| 4 | PM2700-304 | Dust Deflector | | 1 |
| 5 | PM2700-305A | Spindle Nut | M40x2.5p | 1 |
| 6 | PM2700-306 | Retaining Ring | STW-40 | 1 |
| 7 | TS-2246202 | Button Head Socket Screw | M6x20 | 8 |
| 8 | PM2700-308 | Shaft Top Bearing Cover | | 1 |
| 8-1 | PM2700-308-1 | Shaft Lower Bearing Cover | | 1 |
| 9 | BB-6008VV | Bearing | 6008VV | 2 |
| 10 | PM2700-310 | Spindle Holder | | 1 |
| 11 | PM2700-311 | Key | 8x7x35 | 1 |
| 12 | PM2700-312 | Quill | | 1 |
| | PM2700-312A | Quill (#2, #6 ~#16) | | 1 |
| 13 | PM2700-313 | Spindle Pulley | | 1 |
| 15 | PM2700-315 | Locking Washer | M25 | 1 |
| 16 | PM2700-316 | Locking Nut | M25-1.5P | 1 |
| 17 | PM2700-317 | Draw Bar | | 1 |
| 18 | PM2700-318 | Spindle Housing | | 1 |
| 19 | PM2700-319 | Belt (3HP / 5HP) | 230J | 1 |
| 20 | PM2700-320 | Motor Pulley | 1 | |
| 21 | TS-1523021 | Socket Set Screw | M6x8 | 4 |
| 22 | TS-1490031 | Hex Cap Screw | M8x20 | 4 |
| 23 | TS-2361081 | Lock Washer | M8 | 4 |
| 24 | TS-1550061 | Flat Washer | M8 | 4 |
| 25 | PM2700-325 | Motor | 3HP, 230V, 1Ph | 1 |
| | PM2700-325A | Motor | 5HP, 230V, 1Ph | 1 |
| | PM2700-325B | Motor | 5HP, 230/460V, 3Ph | 1 |
| | PM2700-325CS | Centrifugal Switch (not shown) | | 1 |
| | PM2700-325FC | Fan Cover (not shown) | | 1 |
| | PM2700-325MF | Motor Fan (not shown) | | 1 |
| | PM2700-325SC | Starting Capacitor (not shown) - for 3HP, 1Ph motor | | 1 |
| | PM2700-325RC | Running Capacitor (not shown) - for 3HP, 1Ph motor | | 1 |
| | PM2700-325ASC | Starting Capacitor (not shown) - for 5HP, 1Ph motor | | 1 |
| | PM2700-325ARC | Running Capacitor (not shown) - for 5HP, 1Ph motor | | 1 |
| 26 | PM2700-326 | Key | 5x5x60 | 1 |
| 27 | PM2700-327 | Strain Relief Bushing | | 1 |
| 28 | PM2700-328 | Retaining Ring | STW-25 | 1 |
| 29 | PM2700-314 | Washer | M25 | 1 |
| 30 | PM2700-330 | Shaft | | 1 |
| 31 | PM2700-331 | Motor Mount | | 1 |
| 32 | PM2700-332 | Adjustment Bolt | | 1 |
| 33 | TS-1550111 | Flat Washer | M20 | 1 |
| 34 | PM2700-334 | Retaining Ring | STW-20 | 1 |
| 35 | TS-2361101 | Lock Washer | M10 | 1 |
| 36 | TS-2239551 | Socket Head Cap Screw | M10x55 | 1 |
| 37 | PM2700-337 | Connector | | 1 |
| 38 | PM2700-338 | Pin | Ø3 x 20 | 1 |
| 39 | PM2700-339 | Rod | | 1 |
| 40 | PM2700-340 | Spring | | 1 |
| 41 | PM2700-341 | Knob | | 1 |
| 42 | PM2700-342 | Retaining Ring | STW-15 | 2 |
| 43 | PM2700-343 | Flat Washer | M15 | 2 |
| 44 | PM2700-344 | Connector | | 1 |
| 45 | PM2700-345 | Shaft | | 1 |

Frame and Motor – Assembly Drawing

| Index No. | Part No. | Description | Size | Qty |
|-----------|------------|---------------------|------|-----|
| 46 | PM2700-346 | Hex Bushing | | 1 |
| 47 | TS-1540071 | Hex Nut | M10 | 1 |
| 48 | PM2700-348 | Belt Tension Handle | | 1 |
| 49 | PM2700-349 | Spindle Nut Wrench | | 1 |

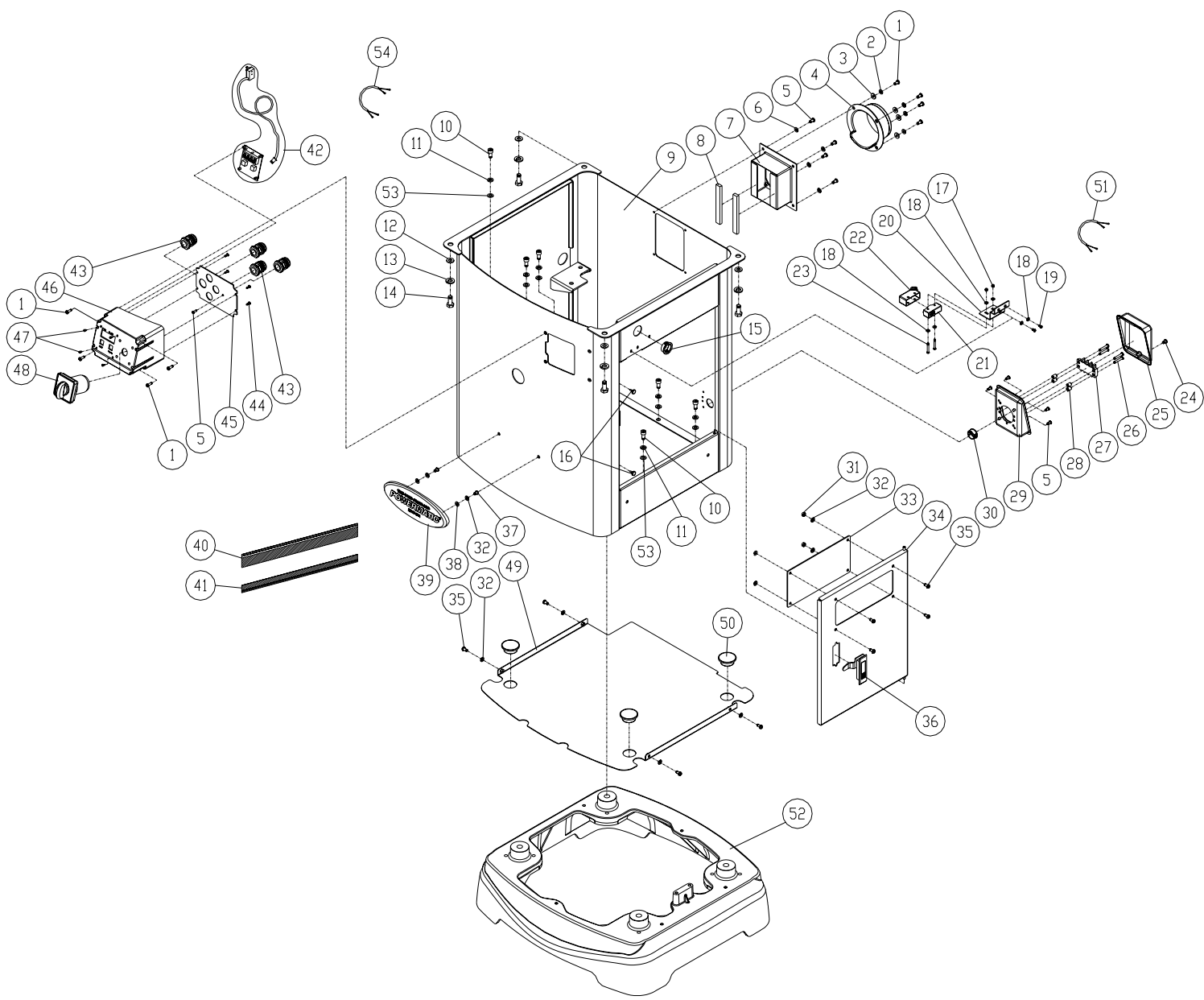


Cabinet and Base – Parts List

| Index No. | Part No. | Description | Size | Qty |
|-----------|-------------|------------------------|--------------|-----|
| 1 | TS-1533052 | Pan Head Screw | M5x16 | 8 |
| 2 | TS-2361051 | Lock Washer | M5 | 4 |
| 3 | TS-1550031 | Flat Washer | M5 | 4 |
| 4 | PM2700-404 | Dust Chute | | 1 |
| 5 | TS-1533032 | Pan Head Screw | M5x10 | 9 |
| 6 | TS-2361051 | Lock Washer | M5 | 4 |
| 7 | PM2700-407 | Dust Deflector | | 1 |
| 8 | PM2700-408 | Padding | | 2 |
| 9 | PM2700-409 | Cabinet | | 1 |
| 10 | TS-1504041 | Socket Head Cap Screw | M8x20 | 6 |
| 11 | TS-2361081 | Lock Washer | M8 | 6 |
| 12 | TS-1550071 | Flat Washer | M10 | 4 |
| 13 | TS-2361101 | Lock Washer | M10 | 4 |
| 14 | TS-1491031 | Hex Cap Screw | M10x25 | 4 |
| 15 | PM2700-415 | Strain Relief | | 1 |
| 16 | PM2700-416 | Bumper | | 2 |
| 17 | TS-1541001 | Nylon Insert Lock Nut | M4 | 2 |
| 18 | TS-1550021 | Flat Washer | M4 | 6 |
| 19 | TS-2284082 | Pan Head Screw | M4x8 | 2 |
| 20 | PM2700-420 | Bracket | | 1 |
| 21 | PM2700-421 | Limit Switch | | 1 |
| 22 | PM2700-422 | Limit Switch Cover | | 1 |
| 23 | TS-2284352 | Pan Head Screw | M4x35 | 2 |
| 24 | TS-0810012 | Round Head Screw | #10-24x1/4" | 1 |
| 25 | PM2700-425 | Junction Box Cover | | 1 |
| 26 | TS-2285302 | Pan Head Screw | M5x30 | 4 |
| 27 | PM2700-427 | Plate | | 1 |
| 28 | PM2700-428 | Bushing | | 4 |
| 29 | PM2700-429 | Junction Box | | 1 |
| 30 | PM2700-430 | Strain Relief | | 1 |
| 31 | TS-1540041 | Hex Nut | M6 | 4 |
| 32 | TS-2361061 | Lock Washer | M6 | 10 |
| 33 | PM2700-433 | Window | | 1 |
| 34 | PM2700-434 | Door | | 1 |
| 35 | TS-1534042 | Pan Head Screw | M6x12 | 8 |
| 36 | PM2700-436 | Door Latch | | 1 |
| 37 | TS-0813022 | Round Head Screw | 1/4"-20x3/8" | 2 |
| 38 | TS-0680021 | Flat Washer | 1/4" | 2 |
| 39 | PM2000-105 | POWERMATIC Name Plate | | 1 |
| 40 | PM2700-440 | Wide Stripe | | 2 |
| 41 | PM2700-441 | Narrow Stripe | | 2 |
| 42 | PM2700-442 | DRO Sensor Assembly | | 1 |
| 43 | PM2700-443 | Strain Relief | | 4 |
| 44 | PM2700-444 | Tapping Screw | M4x12 | 4 |
| 45 | PM2700-445 | Switch Plate | | 1 |
| 46 | PM2700-446 | DRO Cover | | 1 |
| 47 | TS-1531012 | Pan Head Screw | M3x6 | 4 |
| 48 | PM2700-448 | Forward/Reverse Switch | 3HP/1Ph | 1 |
| | PM2700-448A | Forward/Reverse Switch | 5HP/1Ph | 1 |
| | PM2700-448B | Forward/Reverse Switch | 5HP/3Ph | 1 |
| 49 | PM2700-449 | Plate | | 1 |
| 50 | PM2700-450 | Cap | | 3 |
| 51 | PM2700-451 | Limit Switch Cord | | 1 |
| 52 | PM2700-452 | Base | | 1 |
| 53 | TS-1550061 | Flat Washer | M8 | 6 |
| 54 | PM2700-454 | Motor Cable | 3HP, 1Ph | 1 |

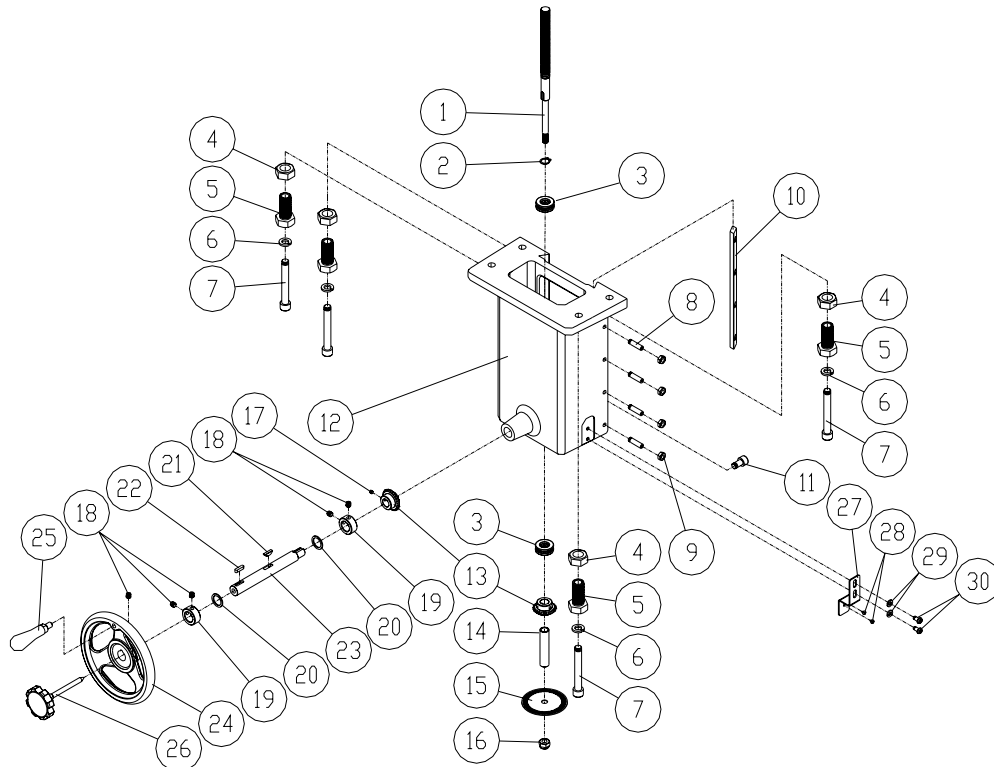
Cabinet and Base – Assembly Drawing

| Index No. | Part No. | Description | Size | Qty |
|-----------|-------------|-------------|----------|-----|
| | PM2700-454A | Motor Cable | 5HP, 1Ph | 1 |
| | PM2700-454B | Motor Cable | 5HP, 3Ph | 1 |



Elevator – Parts and Assembly

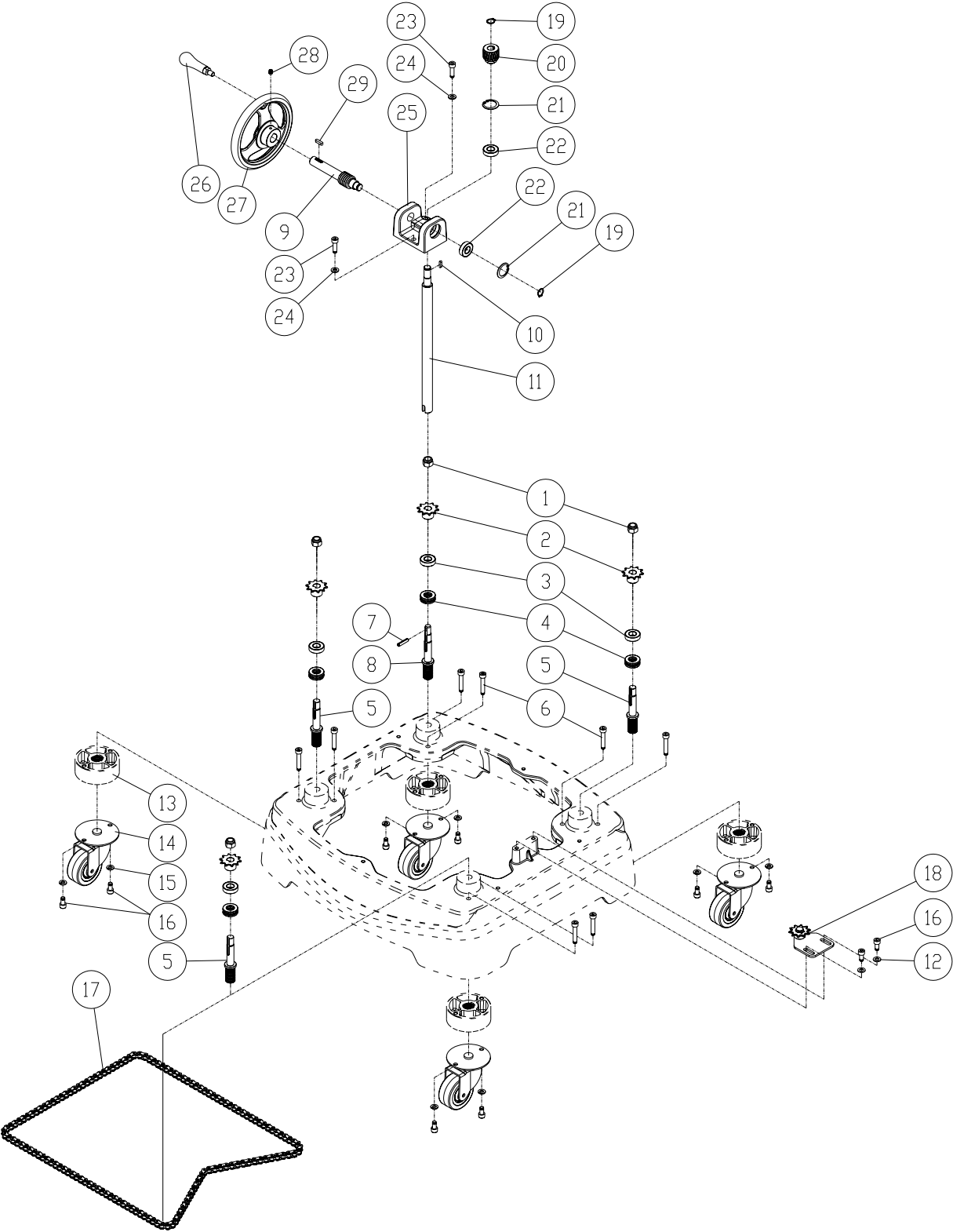
| Index No. | Part No. | Description | Size | Qty |
|-----------|------------|-----------------------|----------------|-----|
| 1 | PM2700-501 | Lead Screw | | 1 |
| 2 | PM2700-342 | Retaining Ring | STW-15 | 1 |
| 3 | PM2700-503 | Thrust Bearing | 51202 | 1 |
| 4 | PM2700-504 | Hex Nut | M20-1.5P | 4 |
| 5 | PM2700-505 | Adjusting Bolt | | 4 |
| 6 | TS-2361121 | Lock Washer | M12 | 4 |
| 7 | TS-1506141 | Socket Head Cap Screw | M12x90 | 4 |
| 8 | PM2700-508 | Socket Set Screw | M8x30 | 4 |
| 9 | TS-1540061 | Hex Nut | M8 | 4 |
| 10 | PM2700-510 | Gib | | 1 |
| 11 | TS-1505021 | Socket Head Cap Screw | M10x20 | 1 |
| 12 | PM2700-512 | Housing | | 1 |
| 13 | PM2700-513 | Worm Gear | | 2 |
| 14 | PM2700-514 | Bushing | | 1 |
| 15 | PM2700-515 | Sensor Plate | | 1 |
| 16 | TS-2342102 | Nylon Insert Lock Nut | M10-1.25P | 1 |
| 17 | TS-1522011 | Socket Set Screw | M5x6 | 1 |
| 18 | TS-0270021 | Socket Set Screw | 5/16"-18x5/16" | 5 |
| 19 | PM2700-519 | Fixing Ring | | 2 |
| 20 | PM2700-520 | Washer | M19 | 2 |
| 21 | PM2700-521 | Woodruff Key | | 1 |
| 22 | PM2700-522 | Key | 5x5x20 | 1 |
| 23 | PM2700-523 | Shaft | | 1 |
| 24 | PM2000-202 | Hand Wheel | | 1 |
| 25 | PM2700-525 | Handle | | 1 |
| 26 | PM2700-526 | Knob | | 1 |
| 27 | PM2700-527 | Bracket | | 1 |
| 28 | PM2700-528 | Tapping Screw | M3-1.06Px6 | 2 |
| 29 | TS-2361061 | Lock Washer | M6 | 2 |
| 30 | TS-1534042 | Pan Head Screw | M6x12 | 2 |



Caster Assembly – Parts List

| Index No. | Part No. | Description | Size | Qty |
|-----------|------------|-----------------------|----------------|-----|
| 1 | TS-2342141 | Nylon Insert Lock Nut | M14 | 4 |
| 2 | PM2700-602 | Sprocket | | 4 |
| 3 | BB-6002ZZ | Ball Bearing | 6002ZZ | 4 |
| 4 | PM2700-503 | Thrust Bearing | 51202 | 4 |
| 5 | PM2700-605 | Shaft | | 3 |
| 6 | TS-1504101 | Socket Head Cap Screw | M8x50 | 8 |
| 7 | PM2700-217 | Spring Pin | Ø5 x 32 | 1 |
| 8 | PM2700-608 | Shaft | | 1 |
| 9 | PM2700-609 | Gear Shaft | | 1 |
| 10 | PM2700-610 | Key | 4x4x16 | 1 |
| 11 | PM2700-611 | Shaft | | 1 |
| 12 | TS-1550061 | Flat Washer | M8 | 2 |
| 13 | PM2700-613 | Elevating Block | | 4 |
| 14 | PM2700-614 | Caster | | 4 |
| 15 | TS-2361081 | Lock Washer | M8 | 8 |
| 16 | TS-1504041 | Socket Head Cap Screw | M8x20 | 10 |
| 17 | PM2700-617 | Chain | | 1 |
| 18 | PM2700-618 | Sprocket Bracket | | 1 |
| 19 | PM2700-342 | Retaining Ring | STW-15 | 2 |
| 20 | PM2700-620 | Gear | | 1 |
| 21 | PM2700-621 | Retaining Ring | RTW-32 | 2 |
| 22 | BB-6002ZZ | Ball Bearing | 6002ZZ | 2 |
| 23 | TS-1504061 | Socket Head Cap Screw | M8x30 | 2 |
| 24 | TS-1550061 | Flat Washer | M8 | 2 |
| 25 | PM2700-625 | Gear Housing | | 1 |
| 26 | PM2700-626 | Handle | | 1 |
| 27 | PM2000-202 | Hand Wheel | | 1 |
| 28 | TS-0270021 | Socket Set Screw | 5/16"-18x5/16" | 1 |
| 29 | PM2700-522 | Key | 5x5x20 | 1 |

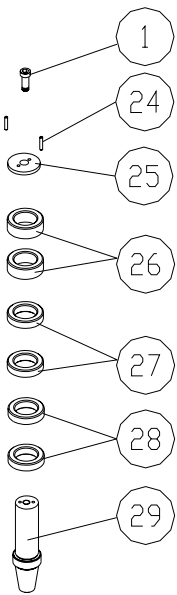
Caster Assembly Drawing



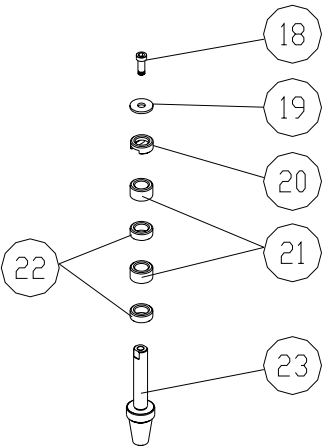
Spindle Assembly – Parts

| Index No. | Part No. | Description | Size | Qty |
|-----------|-------------|--|---------------------|-----|
| 1 | TS-1505031 | Socket Head Cap Screw | M10x25 | 4 |
| 2 | PM2700-702 | Pin | | 2 |
| 3 | PM2700-703 | Special Washer | | 1 |
| 4 | PM2700-704 | Keyed Collar | | 1 |
| 5 | PM2700-705 | Collar | I.D. 1-1/4" x 3/4"T | 5 |
| 6 | PM2700-706 | Collar | I.D. 1-1/4" x 1/2"T | 3 |
| 7 | PM2700-707 | Spindle | 1-1/4" | 1 |
| | PM2700-707A | Spindle Assembly (#1 thru #7, #32) | 1-1/4" | 1 |
| 8 | PM2700-708 | Special Washer | | 1 |
| 9 | PM2700-709 | Keyed Collar | | 1 |
| 10 | PM2700-710 | Collar | I.D. 3/4" x 1/2"T | 4 |
| 11 | PM2700-711 | Collar | I.D. 3/4" x 3/4"T | 2 |
| 12 | PM2700-712 | Spindle | 3/4" | 1 |
| | PM2700-712A | Spindle Assembly (#1, #8 thru #12, #32) | 3/4" | 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 | 4 |
| 17 | PM2700-717 | Spindle | 1" | 1 |
| | 1791205 | Spindle Assembly (#1, #13 thru #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 |
| | 1791204 | Spindle Assembly (#18 thru #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 |
| | 1791206 | Spindle Assembly (#1, #24 thru #29, #32) | M30 | 1 |
| 30 | 1791207 | Collet | 1/4" | 1 |
| 31 | 1791208 | Collet | 1/2" | 1 |
| 32 | PM2700-305A | Spindle Nut (not shown) | M40x2.5p | 5 |

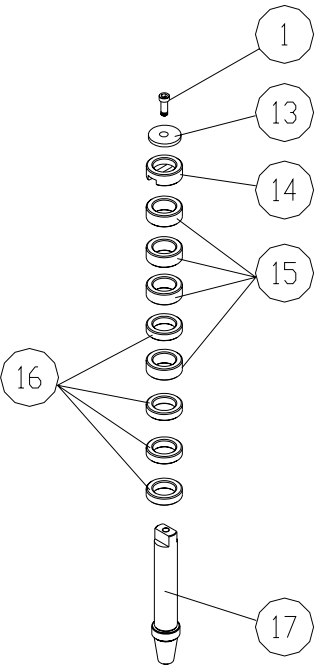
Spindle Assembly Drawing



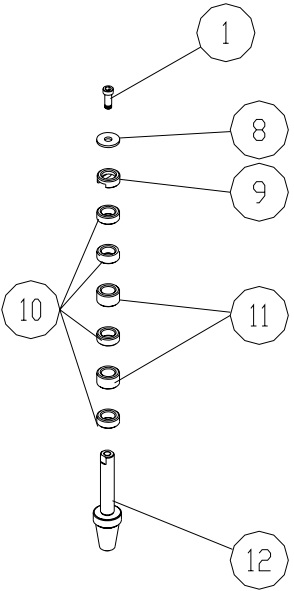
30mm Spindle



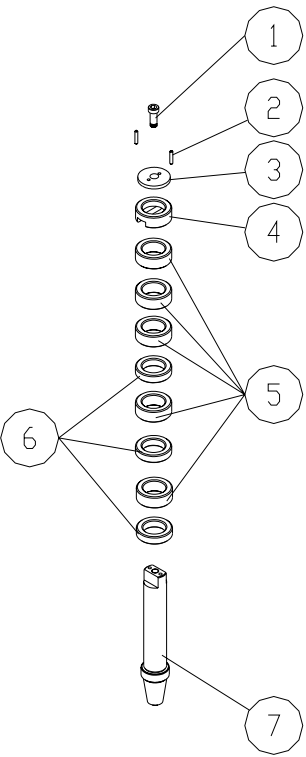
1/2" Spindle



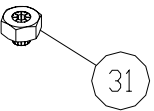
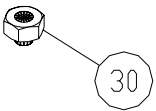
1" Spindle



3/4" Spindle

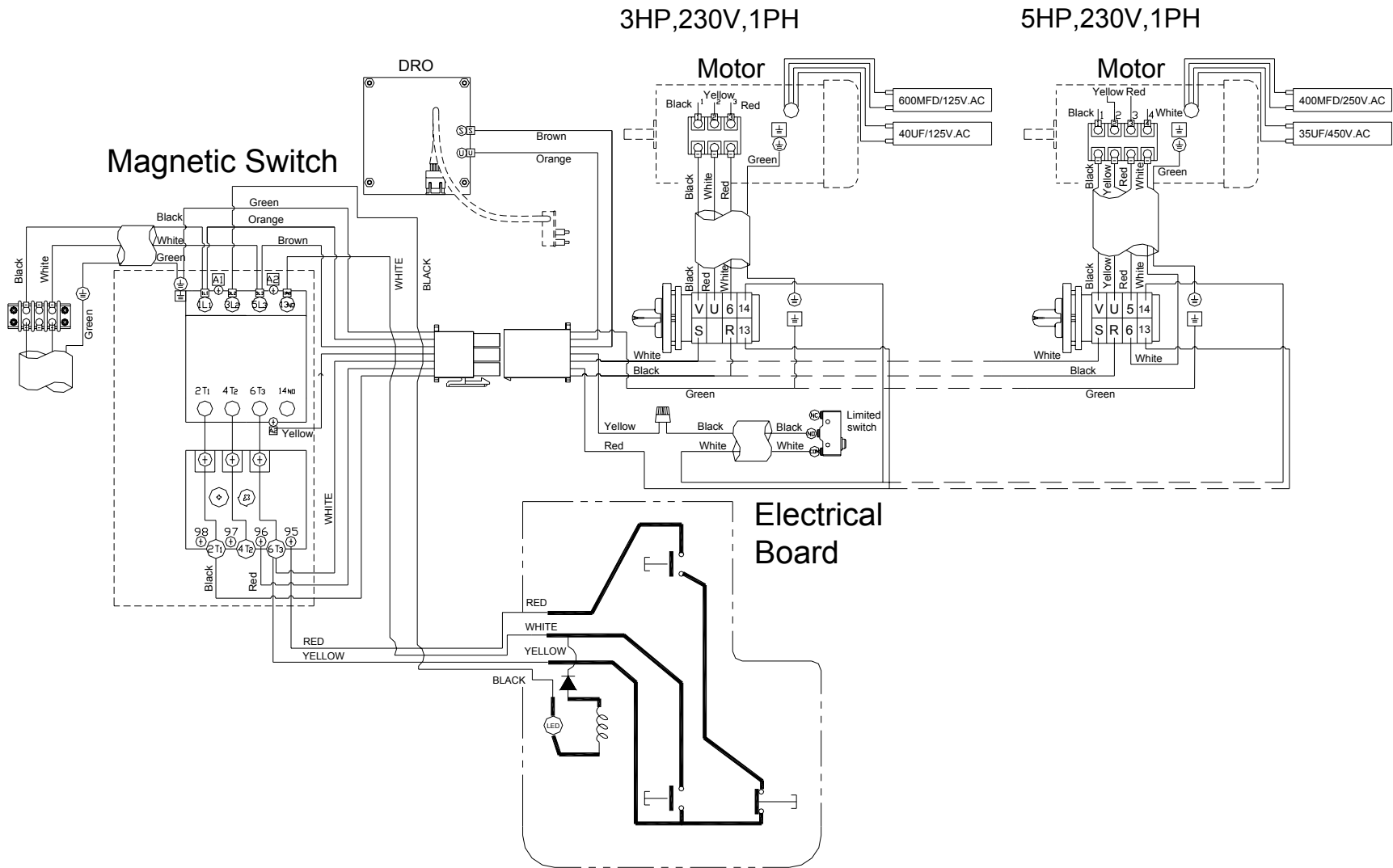


1-1/4" Spindle



Wiring Diagrams

3HP/5HP, 230V, 1Phase



5HP, 230V-460V, 3Phase

5HP, 230/460 V, 3PH

