

# **POWERMATIC®**

## **Operating Instructions and Parts Manual Model PM2700 Shaper**



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# Warranty and Service

Powermatic warrants every product it sells against manufacturers' defects. If one of our tools needs service or repair, please contact Technical Service by calling 1-800-274-6846, 8AM to 5PM CST, Monday through Friday.

## Warranty Period

The general warranty lasts for the time period specified in the literature included with your product or on the official Powermatic branded website.

- Powermatic products carry a limited warranty which varies in duration based upon the product. (See chart below)
- Accessories carry a limited warranty of one year from the date of receipt.
- Consumable items are defined as expendable parts or accessories expected to become inoperable within a reasonable amount of use and are covered by a 90-day limited warranty against manufacturer's defects.

## Who is Covered

This warranty covers only the initial purchaser of the product from the date of delivery.

## What is Covered

This warranty covers any defects in workmanship or materials subject to the limitations stated below. This warranty does not cover failures due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and-tear, improper repair, alterations or lack of maintenance.

## Warranty Limitations

Woodworking products with a Five-Year Warranty that are used for commercial or industrial purposes default to a Two Year Warranty. Please contact Technical Service at 1-800-274-6846 for further clarification.

## How to Get Technical Support

Please contact Technical Service by calling 1-800-274-6846. **Please note that you will be asked to provide proof of initial purchase when calling.** If a product requires further inspection, the Technical Service representative will explain and assist with any additional action needed. Powermatic has Authorized Service Centers located throughout the United States. For the name of an Authorized Service Center in your area call 1-800-274-6846 or use the Service Center Locator on the Powermatic website.

## More Information

Powermatic is constantly adding new products. For complete, up-to-date product information, check with your local distributor or visit the Powermatic website.

## How State Law Applies

This warranty gives you specific legal rights, subject to applicable state law.

## Limitations on This Warranty

POWERMATIC LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD OF THE LIMITED WARRANTY FOR EACH PRODUCT. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

POWERMATIC 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.

Powermatic sells through distributors only. The specifications listed in Powermatic printed materials and on the official Powermatic website are given as general information and are not binding. Powermatic reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they may deem necessary for any reason whatsoever.

## Product Listing with Warranty Period

90 Days – Parts; Consumable items
1 Year – Woodworking Machinery used for industrial or commercial purposes
5 Year – Woodworking Machinery

NOTE: Powermatic is a division of JPW Industries, Inc. References in this document to Powermatic also apply to JPW Industries, Inc., or any of its successors in interest to the Powermatic brand.

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# 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, Powermatic 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. Do not operate this machine while tired or under the influence of drugs, alcohol or any medication.
10. Make certain the machine is properly grounded.
11. 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.
12. 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.
13. 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.
14. 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.
15. Provide for adequate space surrounding work area and non-glare, overhead lighting.
16. Keep the floor around the machine clean and free of scrap material, oil and grease.
17. Keep visitors a safe distance from the work area. Keep children away.
18. Make your workshop child proof with padlocks, master switches or by removing safety keys.
19. Keep visitors a safe distance from the work area. Keep children away.
20. Make your workshop child proof with padlocks, master switches or by removing safety keys.
21. Give your work undivided attention. Looking around, carrying on a conversation and "horse-play" are careless acts that can result in serious injury.
22. 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.
23. 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.

24. Use recommended accessories; improper accessories may be hazardous.
25. Maintain tools with care. Keep cutter sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.
26. 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.
27. 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.
28. 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.
29. Do not attempt to shape long or wide boards unsupported where spring or weight could cause the board to shift position.
30. Always use safety devices for all operations where they can be used.
31. Be sure to check the direction of spindle rotation before use.
32. Turn off the machine before cleaning. Use a brush or compressed air to remove chips or debris — do not use your hands.
33. Do not stand on the machine. Serious injury could occur if the machine tips over.
34. Never leave the machine running unattended. Turn the power off and do not leave the machine until it comes to a complete stop.
35. 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.

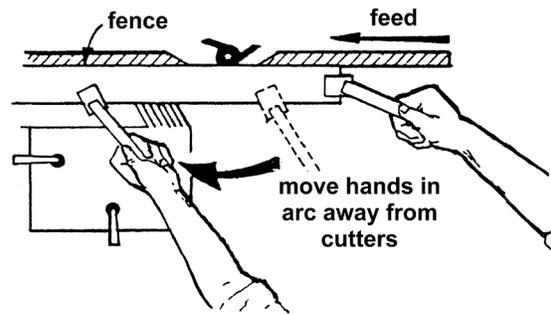


Figure A

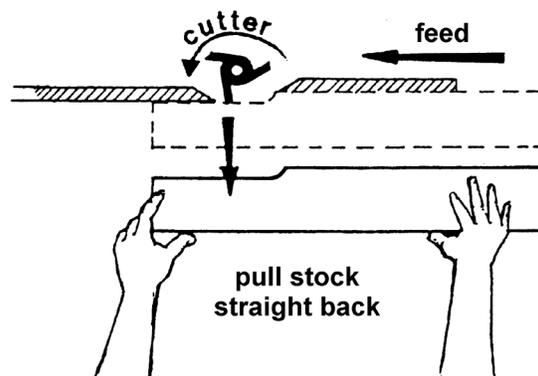


Figure B

## Introduction

This manual is provided by Powermatic covering the safe operation and maintenance procedures for a Powermatic Model PM2700 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 consistent, long-term 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 Powermatic. Powermatic can also be reached at our web site: [www.powermatic.com](http://www.powermatic.com).

Retain this manual for future reference. If the machine transfers ownership, the manual should accompany it.

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

Register your product using the mail-in card provided or register online:

[www.powermatic.com/product-registration](http://www.powermatic.com/product-registration)

To quickly reach the product registration webpage, scan the QR code below.



# Specifications

Model Number .....	PM2700
Motor (TEFC Capacitor Start Induction)	Stock Number
3HP, 1 Phase, 230V, 60Hz, 14A .....	1280100C
5HP, 1 Phase, 230V, 60Hz, 22A .....	1280101C
5HP, 3 Phase, 230V/460V-rewired 230V (for 460V see <b>Note</b> below), 60Hz, 13/6.5A .....	1280102C
Table Size (L x W) .....	40" x 30"
Table Height from Floor .....	35-1/2"
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 (provided) .....	3-27/64"
1-1/4" Spindle (provided) .....	5-5/32"
1" Spindle (optional accessory) .....	4-59/64"
Spindle Travel .....	4"
Spindle Speeds (RPM) .....	7500, 10000, reversible
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 .....	600
Dust Port Diameter .....	4"
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, Powermatic 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 this page to make sure all parts are intact. Missing parts, if any, should be reported to your distributor. Read the instruction manual thoroughly for assembly, maintenance, and safety instructions.

## Shipping Contents

Referring to Figure 1:

Main Shaper Container

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

Hardware and included tools consist of the following items:

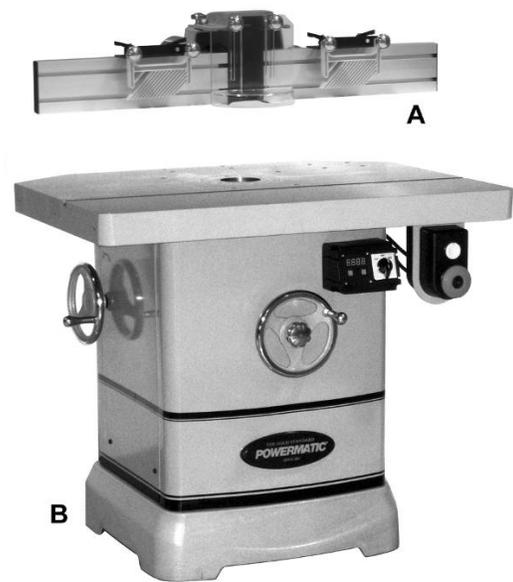
- 2 Lock Handle (C)
- 2 M13 Flat Washer (D)
- 1 Miter Gauge Assembly (E)
- 1 Draw Bar (F)
- 1 1-1/4" Spindle (G)
- 1 3/4" Spindle (H)
- 2 Spindle Nut (I)
- 3 Insert Rings – 2.55", 4.16", 5.75" (J)
- 4 M10 Socket Head Cap Screw (K)
- 4 M10 Lock Washer (L)
- 1 Starting Pin (M)
- 1 8 mm Hex Wrench (N)
- 1 Crosspoint/Flathead Screwdriver (O)
- 1 Wrench (P)

## Installing

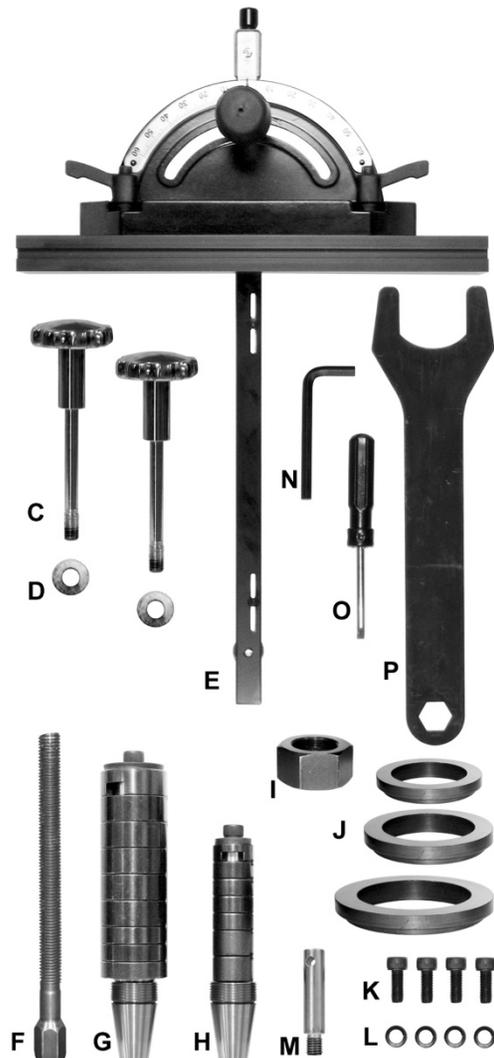
1. Unbolt the shaper from the skid.
2. Carefully slide the shaper from the pallet onto the floor.

**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.



Main Shaper Container



Hardware

Figure 1

## 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.

## Assembly

### Mounting the Fence

Referring to Figure 2:

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.

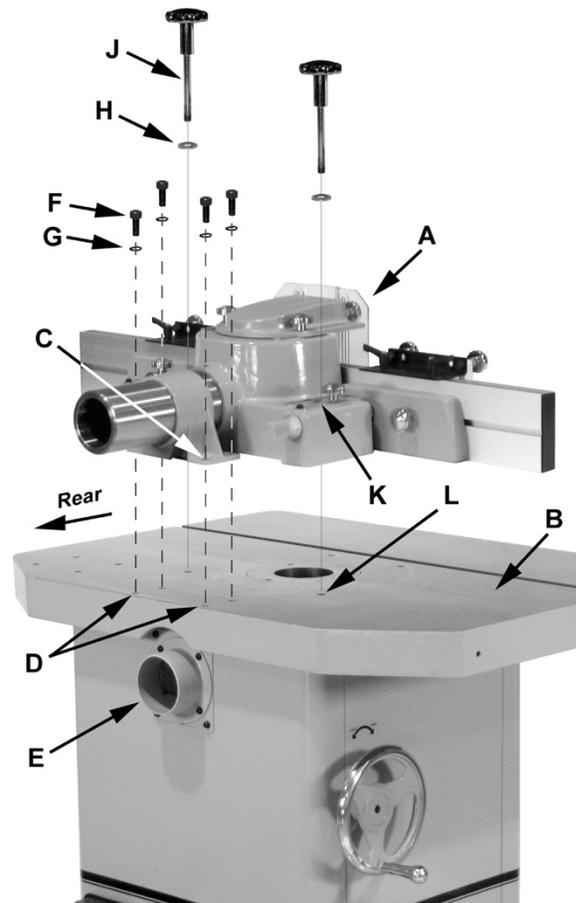


Figure 2

## 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 PM2700. 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 at the back of this manual 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.

The PM2700 Shaper should be connected to a dedicated circuit and protected by a circuit breaker or time delay fuse, with minimum amp ratings as shown in Table 1. **Local codes take precedence over recommendations.**

### 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. A similar diagram is also included in the back of this manual. (Figure 3 shows a summary of the lead changes for 230V to 460V conversion.) Note: In case of discrepancies, the diagram in the motor junction box should take precedence.

### Extension Cords

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

The chart in Table 2 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.

Model	Recommended circuit*
1280100C (3HP 1PH 230V)	30 Amp
1280101C (5HP 1PH 230V)	40 Amp
1280102C (5HP 3PH 230V)	30 Amp
1280102C (5HP 3PH 460V)	15 Amp

\*subject to local codes

Table 1

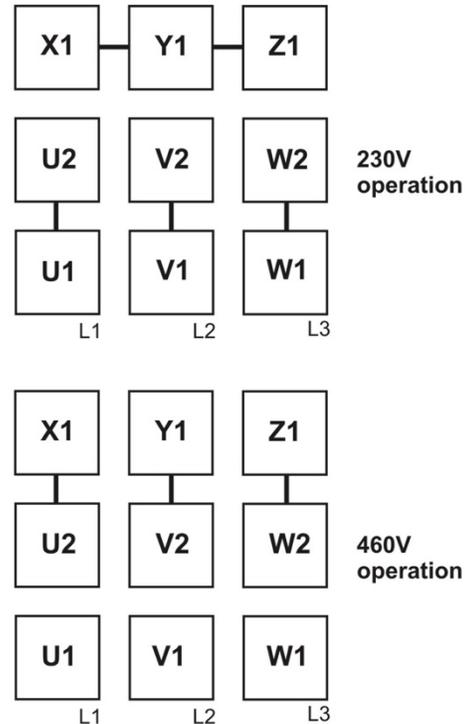


Figure 3

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 2

# Adjustments

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

## Fence Assembly Movement

Referring to Figure 4:

The adjustment controls of the fence assembly are as follows:

- A – Fence Assembly Lock Knob – to secure fence assembly to table
- B – 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)

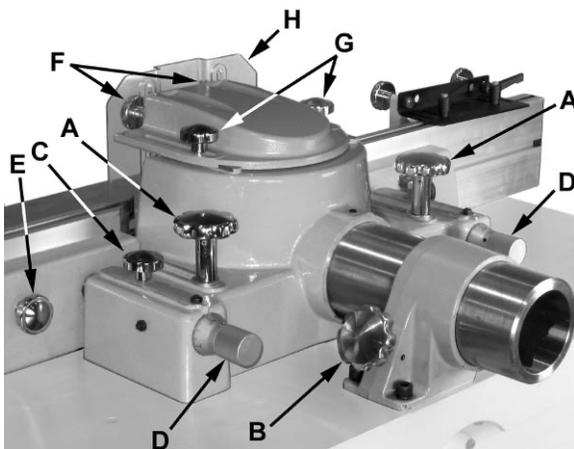


Figure 4

## Handwheel Adjustments

Referring to Figure 5:

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

The *side handwheel* (C) controls the *casters*. The Model PM2700 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.

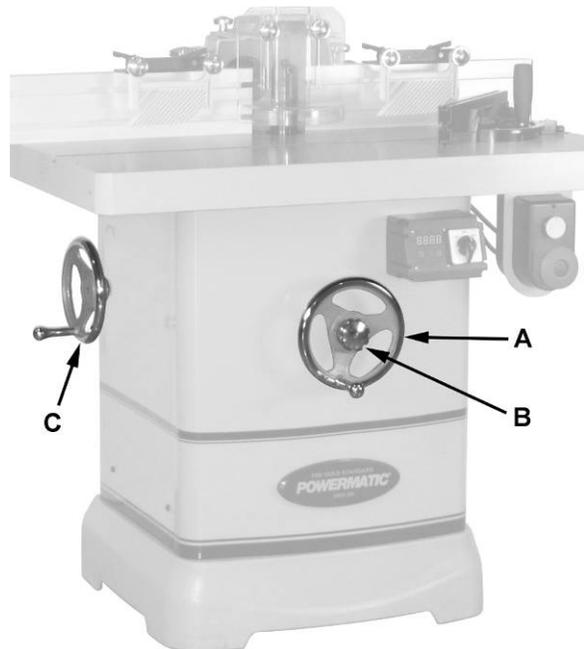


Figure 5

## Coplanar Alignment

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

### Verifying that fences are coplanar

1. Remove the guard and spindle attachment.
2. 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* (E<sub>1</sub>) and *outfeed* fences (E<sub>2</sub>).
4. Unlock the *fence lock knobs* (D<sub>1</sub>, D<sub>2</sub>).
5. With the *ram adjust dials* (C<sub>1</sub>, C<sub>2</sub>) 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 7. Proceed to *Ram Dial Calibration* (step 00).

**Adjustment is required** if the fences appear skewed (Figure 8). Continue with *Coplanar Adjustment* (following steps).

### Coplanar Adjustment

Determine which fence is skewed (in this example: G<sub>1</sub>, Fig. 8), which will require adjustment while the remaining fence (G<sub>2</sub>) will serve as the reference point.

6. Remove both fences and place the straightedge against the infeed and outfeed fence castings (Figure 9).
7. Lock the reference fence (D<sub>2</sub>) and unlock the skewed fence (D<sub>1</sub>).

Read *step 8* completely before attempting.

8. Maintain steady pressure of the straightedge against the fence castings (H, Fig. 9). At the same time, attempt to bring both fences into alignment as shown in Figure 10. This is accomplished by alternately making incremental adjustments to four *setscrews* (L, Fig. 11) on the front face of the *casting* (K, Fig. 11) with a 2mm hex wrench, followed by repositioning the casting with the *micro adjust dial* (J, Fig. 11) as required.

**Important:** It is recommended that the adjustment setscrews (K, Fig. 11) 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 10.

9. Replace both fences and secure.

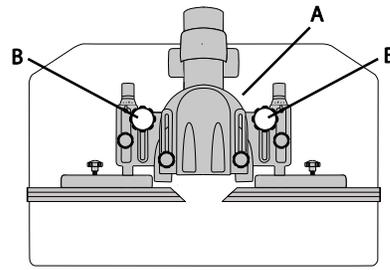


Figure 6

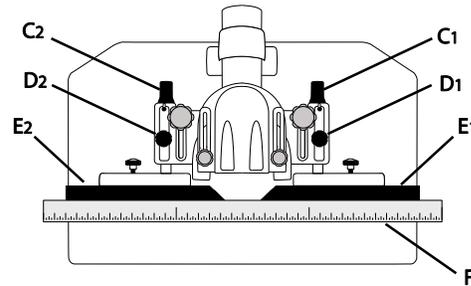


Figure 7

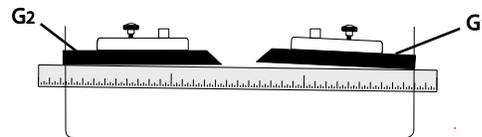


Figure 8

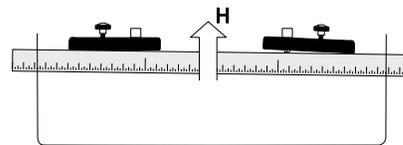


Figure 9

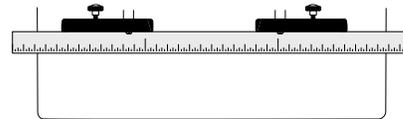


Figure 10

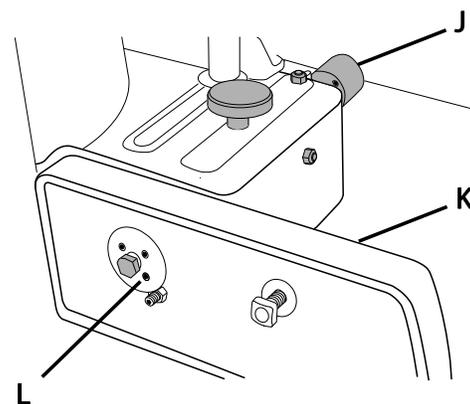


Figure 11

## Ram Dial Calibration

The guard and spindle should be removed.

Referring to Figure 12:

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 *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 *setscrews* (2mm hex wrench) on the *outfeed ram dial* (A) and align the *zero* on the dial with the *indicator mark*. Then tighten the setscrews.

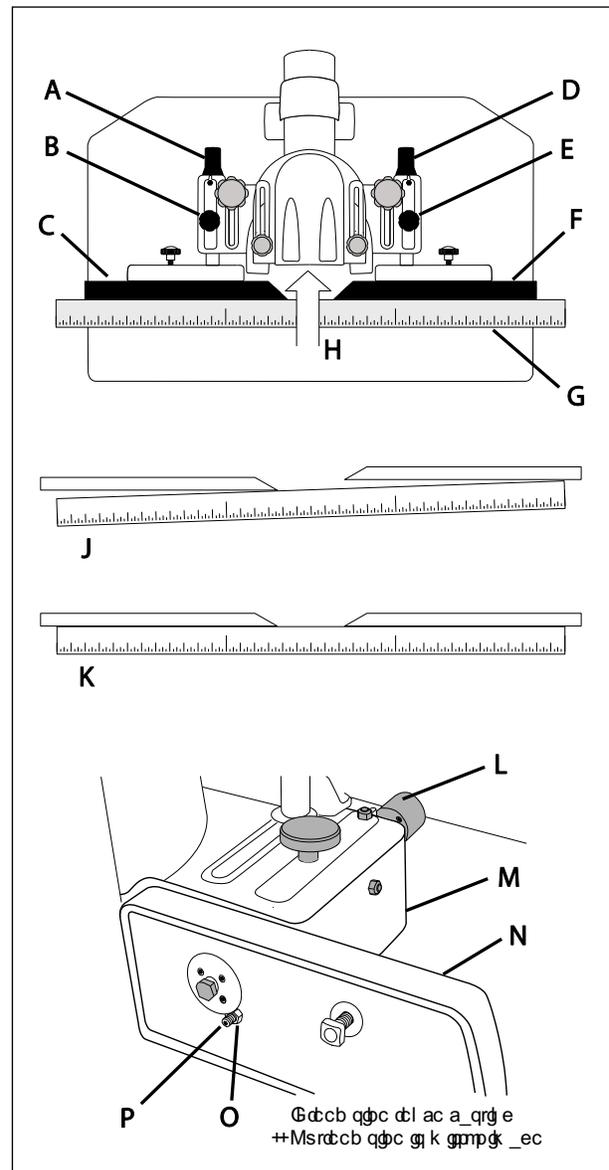


Figure 12

## Spindle Gib Adjustment

Referring to Figure 13:

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 13):

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.

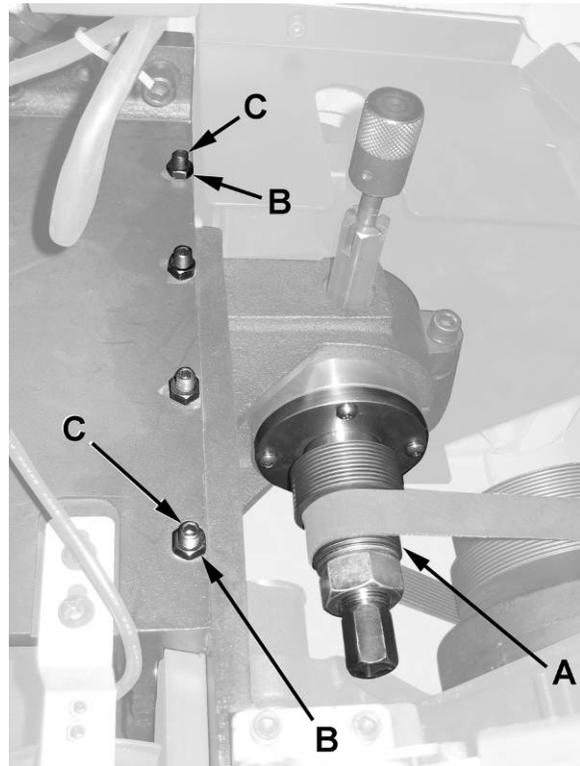


Figure 13

## Featherboard Hold-downs

Referring to Figure 14:

The PM2700 Shaper comes equipped with two *feather board hold-downs* (A, B) mounted on the infeed and outfeed fences.

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

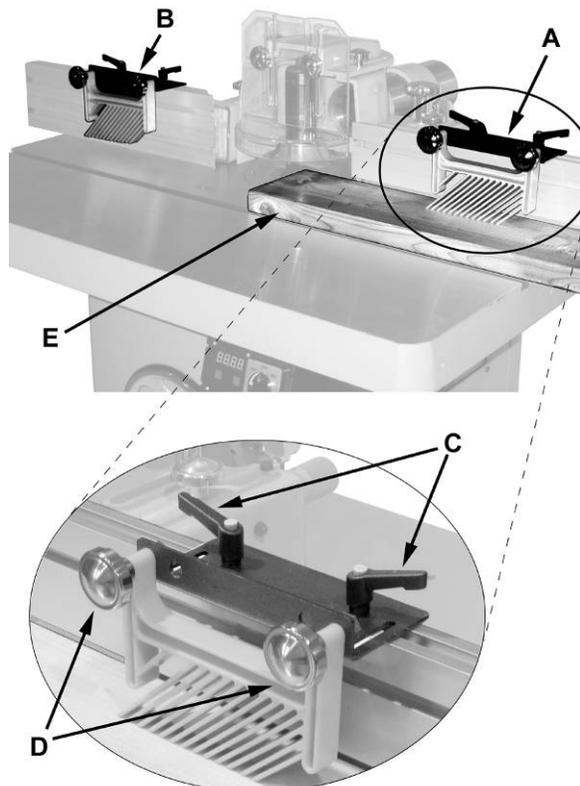


Figure 14

## Spindle Assembly Installation

Refer to Figure 15. The *fence guard* (A) has been removed for clarity.

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

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

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

### Locking the Arbor

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

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

### Installing the Spindle Assembly

3. Thread the *nut* (E) onto the threaded end of the *spindle* (D) in the direction indicated by arrows (A<sub>1</sub>, A<sub>2</sub>). Tighten securely by hand.
4. Thread the *spindle assembly* (B) and *nut* (E) onto the *arbor* (C) and hand tighten only.
5. Insert the *draw bar* (J) through the opening in the *shaft* (H) just below the *drive belt* (G). Turn clockwise, fastening and securing it to the *spindle*. Tighten the draw bar (J) with the provided *wrench* (K).
6. Tighten the *nut* (E) with the *wrench* (K).

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

## Spindle Assembly Removal

Referring to Figure 15:

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

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

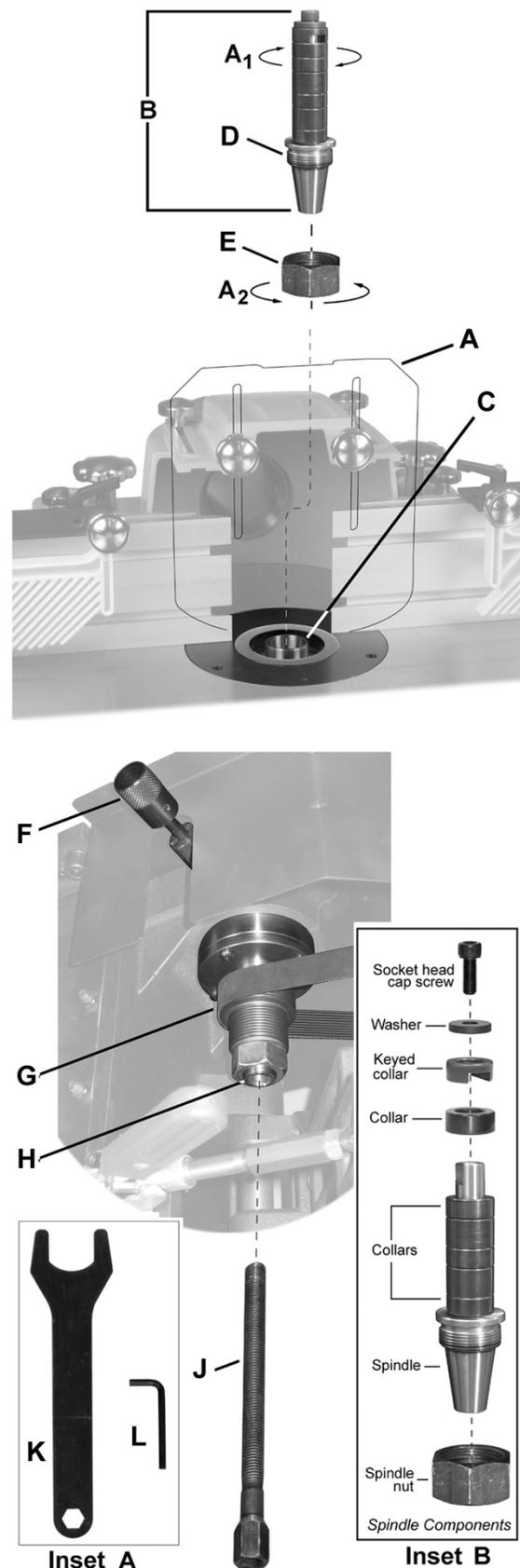


Figure 15

## Shaper Cutter Installation

**Note:** Spindle installation is described in the previous section.

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

### Locking the Spindle

1. Locate the *spindle lock* (F, Fig. 15) 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* (B, Fig. 15) by hand to verify that it is locked and will not rotate.

### Installing the Shaper Cutter

Referring to Figure 16:

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

1. Pull out the *spindle lock* (F, Fig. 15) 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* (B) by hand to verify that it turns freely.

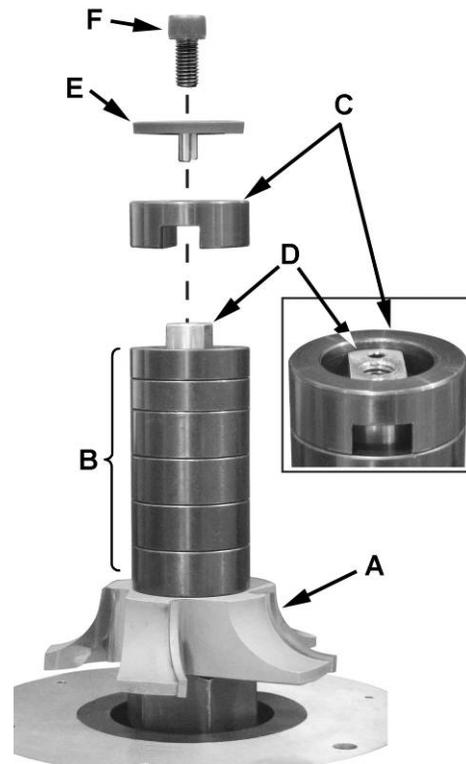


Figure 16

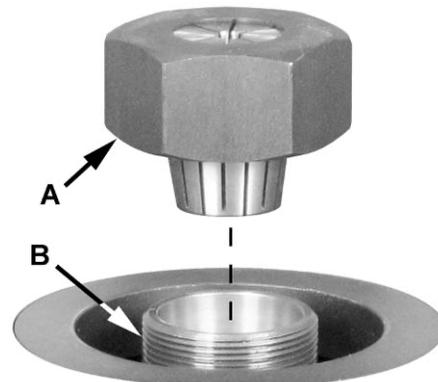


Figure 17

## Router Collet (Optional) Installation

1. Locate the *spindle lock* (F, Fig. 15) 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* (B, Fig. 15) by hand to verify that it is locked and will not rotate.

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

3. Unlock the spindle by pulling out the *lock knob* (F, Fig. 15) 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. 17) by hand to verify that it turns freely.

## Changing Cutter Speed

Referring to Figure 18:

The Model PM2700 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* (B) to the other set of grooves (C).
5. Lock the *belt tension handle* (A), securing the *motor* (E) and placing tension on the *drive belt* (C).

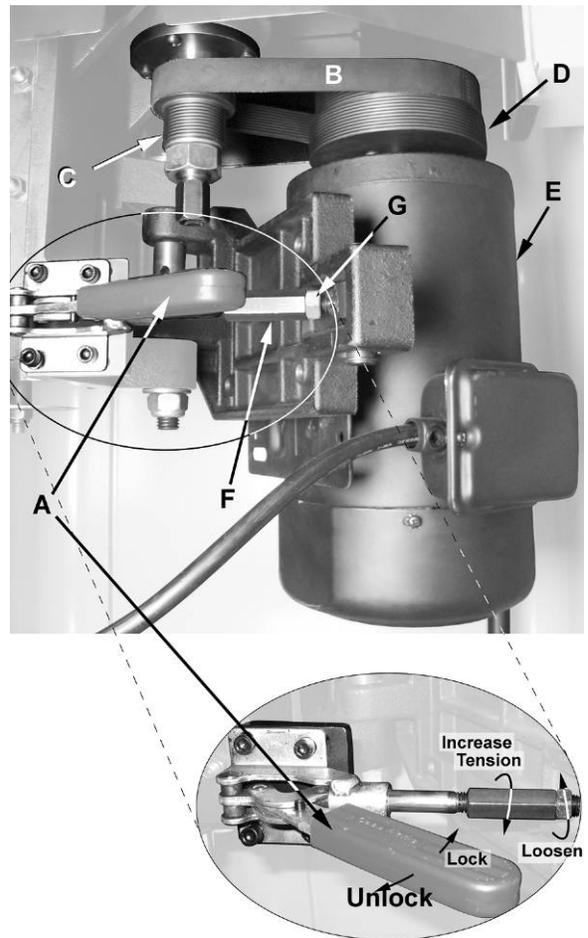


Figure 18

## Drive Belt Tension

Referring to Figure 18:

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 18:

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.

## Miter gauge

### Adjusting miter gauge angle for operations (see Figure 19A)

1. Unscrew handle (D) just enough to loosen it.
2. Press black tab (E) to release it from stop 0°.
3. Rotate gauge body until red pointer (C) lines up with desired angle on scale.
4. Tighten handle (D).
5. There are 13 stops at 0°, 15°, 22.5°, 30°, 45°, 60°, and 67.5° left and right. Each of these can be adjusted to by allowing the spring stop to lock into each location. Press black tab (E) to move past each stop location.

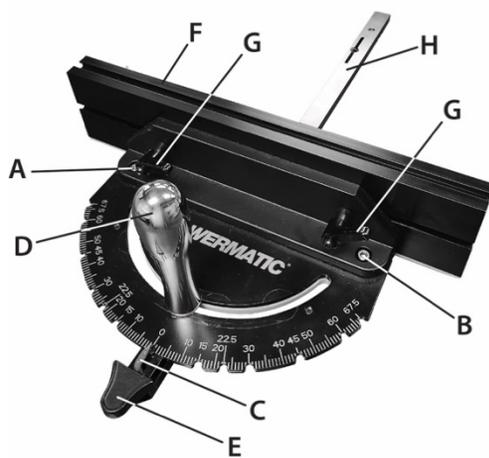


Figure 19A

### Extension plate (see Figure 19A)

The *extension plate* (F) can be adjusted by sliding to the right or left or removed entirely.

To adjust, loosen two *lock handles* (G), position the extension plate and retighten lock handles. **Make sure end of extension plate is not in the blade's path.**

NOTE: The lock handles (G) are adjustable. Pull out on a handle, rotate it to different position, then release, making sure it seats itself upon the pin.

To remove extension plate, slide it completely off and remove lock handles (G) and mounting hardware.

### Squaring Miter Gauge (see Figures 19A & 19B)

1. Place a square against miter gauge face, and against shaper infeed fence.
2. Loosen screws A and B.
3. Adjust the miter gauge fence to make it square to the shaper infeed fence. Tighten screws A and B.
4. After squaring, if the red pointer (C) is not pointing at 0°, loosen the pointer setscrew (see Figure 19B), rotate the pointer to 0°, and retighten the pointer setscrew.

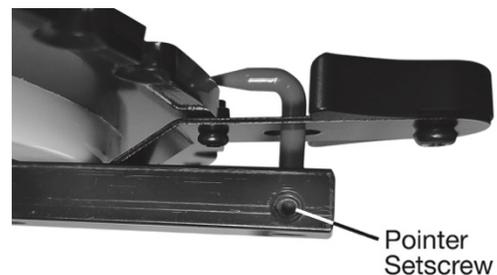


Figure 19B

# 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 be 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 20:

**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.

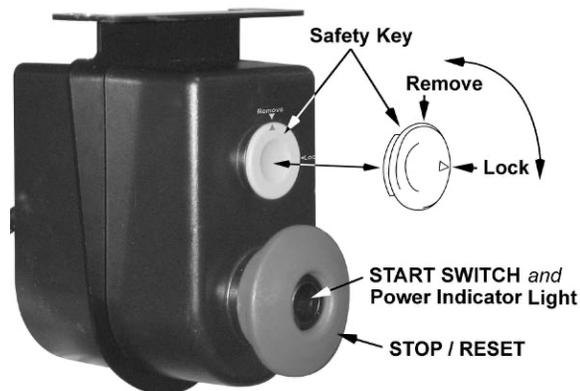


Figure 20

## Safety Key

The start/stop switch on the Model PM2700 comes equipped with a magnetic safety key. When in place on the switch as shown in Figure 20 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 21) 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 21

# 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.

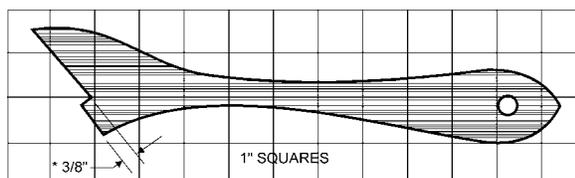
## Safety Devices

Safety devices such as guards, fixtures, templates hold-downs, push sticks (Figure 22), feather boards and power feeders should be used whenever possible. Figure 22 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 22

## 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 23, feed the workpiece from *right to left*.

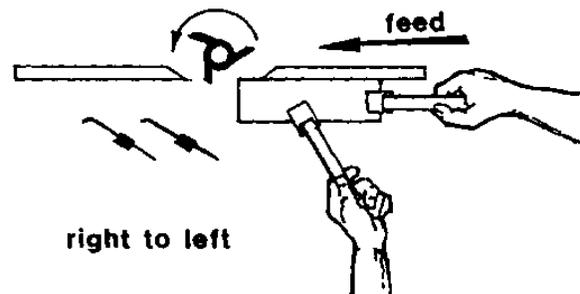


Figure 23

*Clockwise Setup* – With the cutter installed as shown in Figure 24, feed the workpiece from *left to right*.

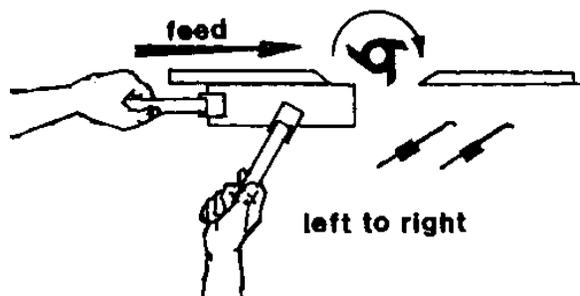


Figure 24

## 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 25.

When the shaping operation removes the entire edge of the work, e.g. in jointing or making a full bead, the shaped edge will not be supported by the outfeed fence when both fences are in line, Figure 26. In this case, the stock should be advanced to the position shown in Figure 26 and stopped. Turn off the machine and move the outfeed fence forward to contact the workpiece, Figure 27. Remove the workpiece, start the motor, and then continue the operation.

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

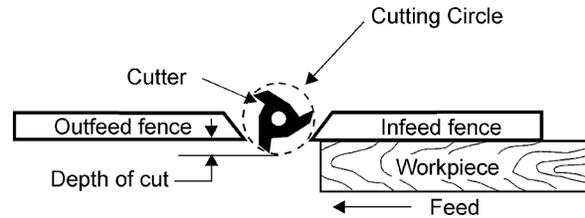


Figure 25

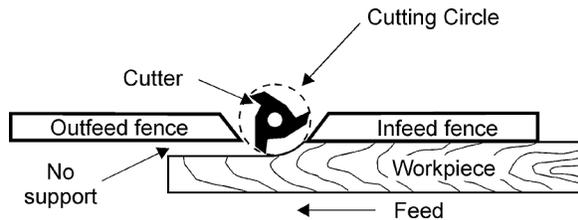


Figure 26

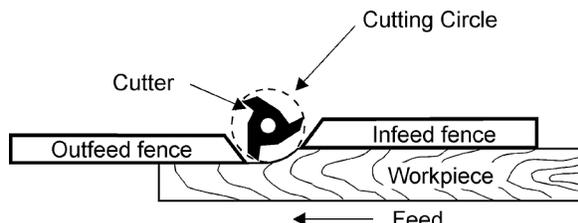


Figure 27

## "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 28.

**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.

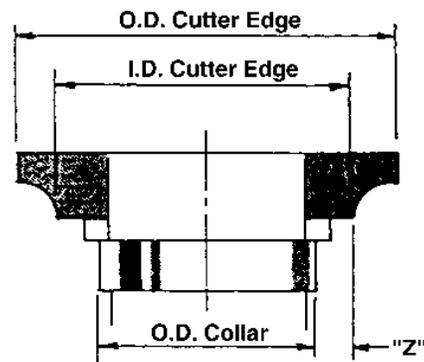


Figure 28

## 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 29).

## 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.

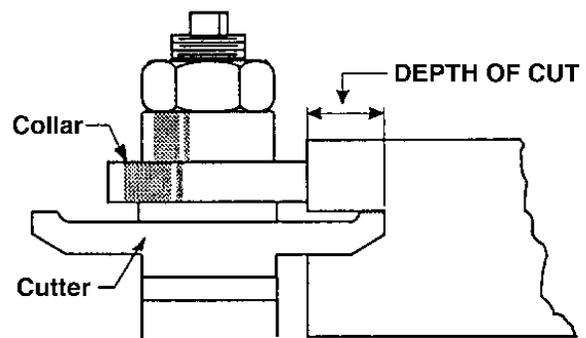


Figure 29

## 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 30.

**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 30 to firmly hold the workpiece down and against the fence. If workpiece is too wide for the hold-ins to be used, clamp a scrap board to the table to substitute for the hold-ins.
2. Check the rotation of the cutter. Be sure to feed workpiece against rotation of the cutter.
3. Feed the workpiece slowly and steadily with firm, even pressure to make a smooth cut.

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

## 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 31 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 32.

## 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 33.

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

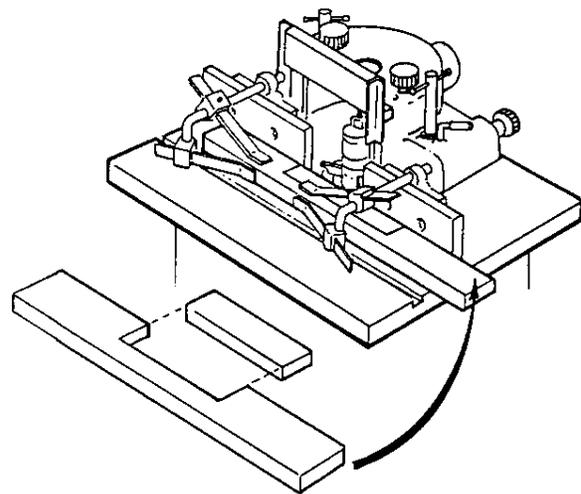


Figure 30

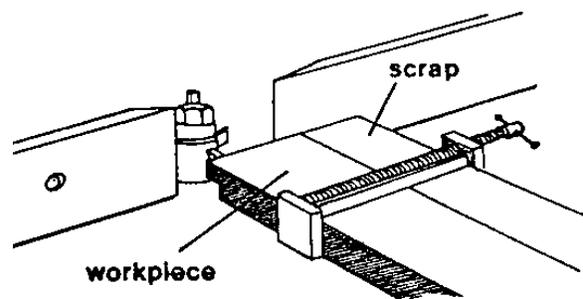


Figure 31

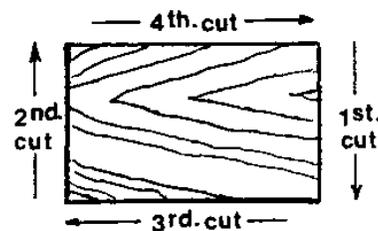


Figure 32

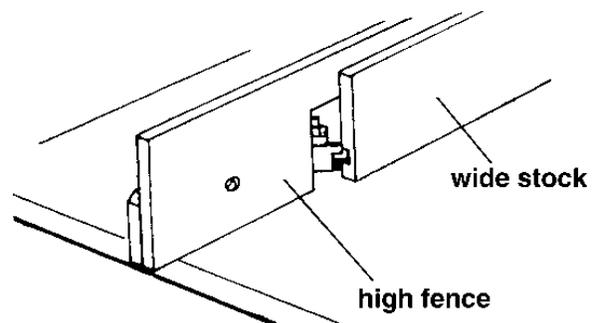


Figure 33

### 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 34.

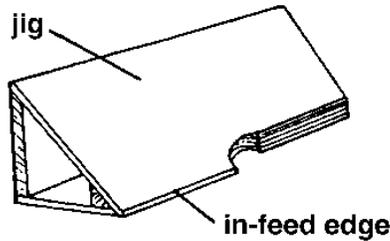


Figure 34

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

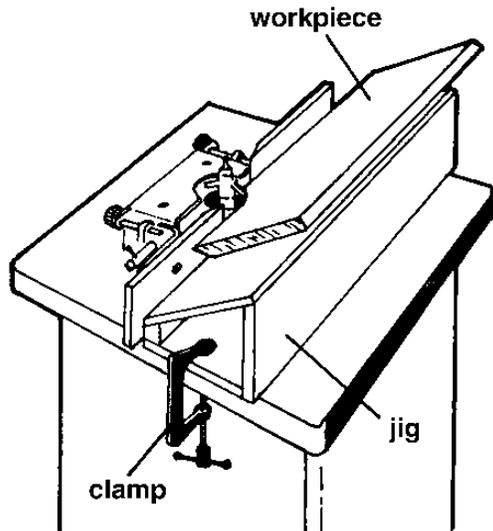


Figure 35

**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 36.

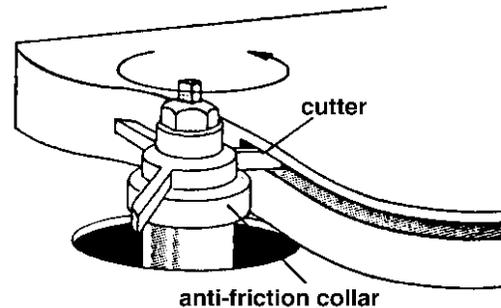


Figure 36

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

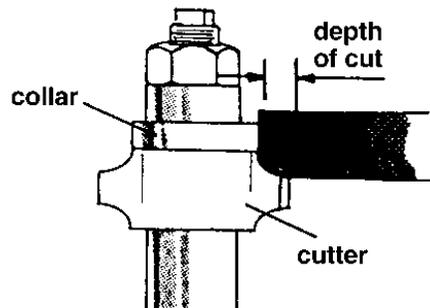


Figure 37

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

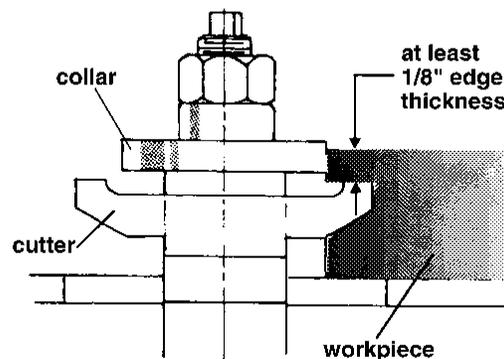


Figure 38

If shaping the workpiece 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 39. 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 45. 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. Be aware at all times of the proximity of your 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 40. Also, the stock must be heavy in proportion to the cut being made. Under no circumstances should a short, light workpiece be shaped against the collars, as in Figure 41.

**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 42, 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 43, 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.

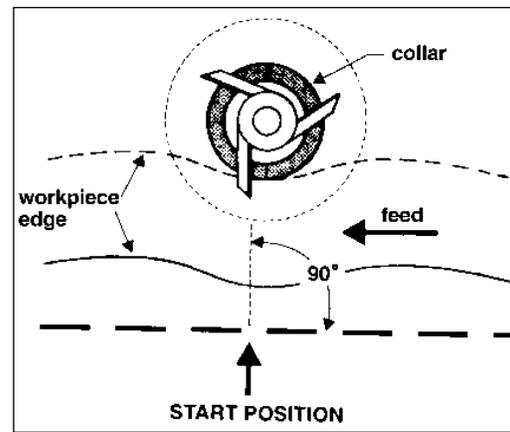
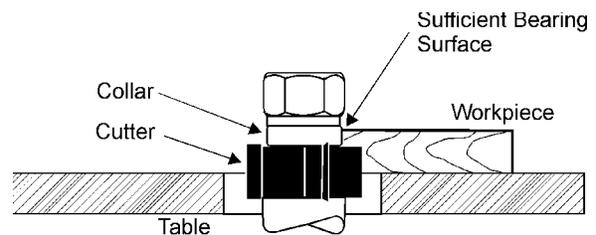
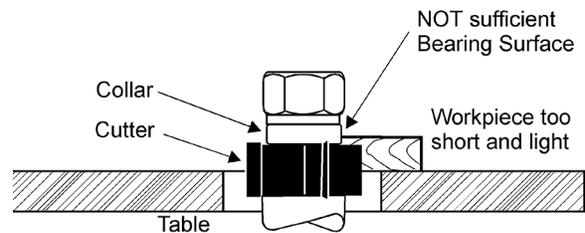


Figure 39



**RIGHT**

Figure 40



**WRONG**

Figure 41

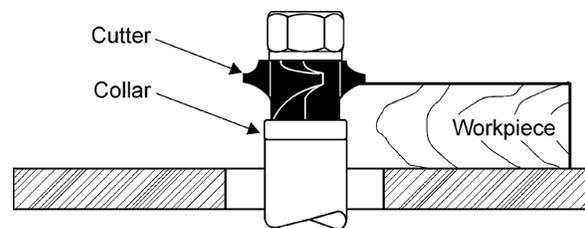


Figure 42

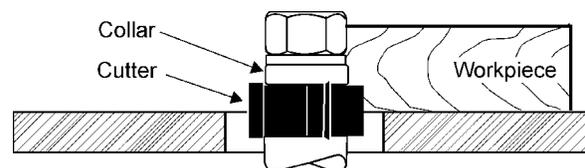


Figure 43

- 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 44.

**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 45), 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 46). Always feed against the cutterhead rotation.

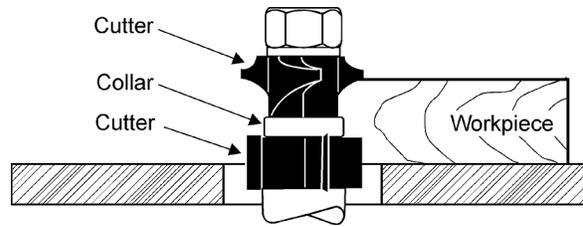


Figure 44

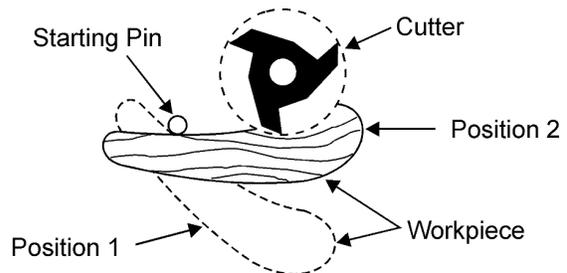


Figure 45

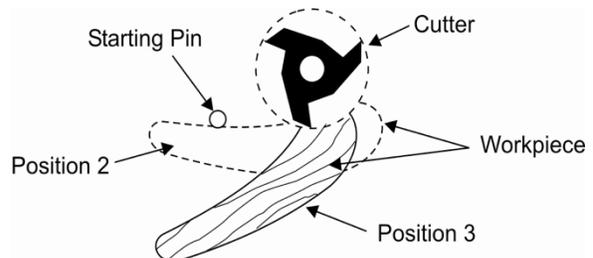


Figure 46

## 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 47.

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 of 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 48.

**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 48.

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).

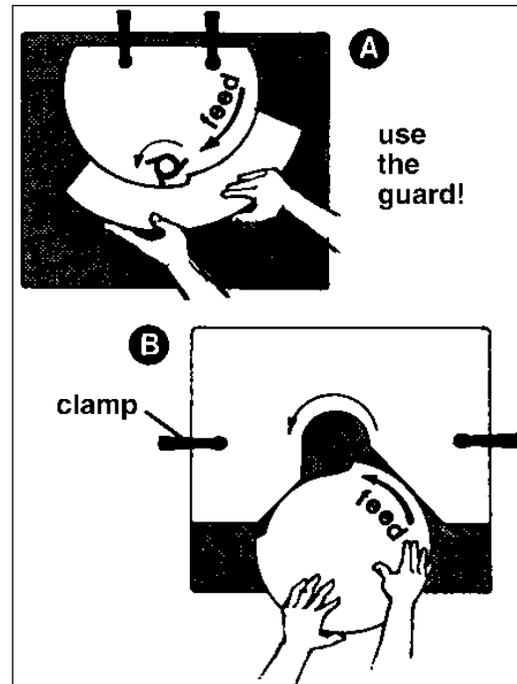


Figure 47

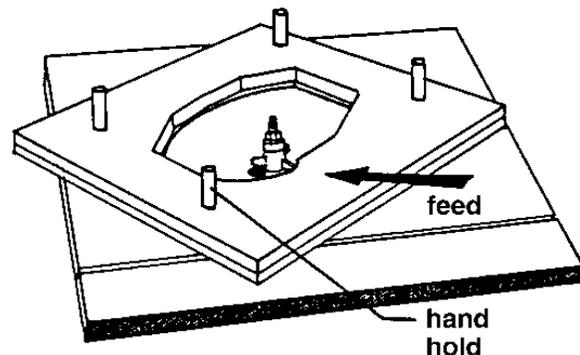


Figure 48

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

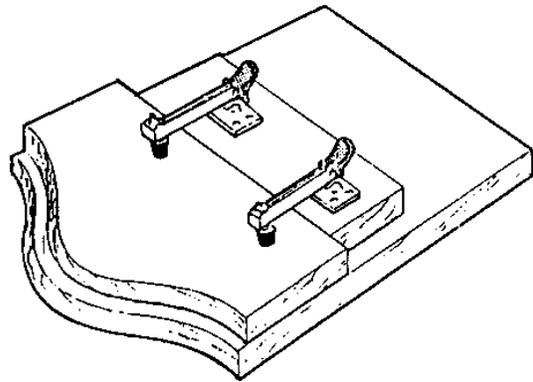


Figure 49

If the workpiece requires all-around shaping, the template can be constructed from several sections pieced together as shown in Figure 50.

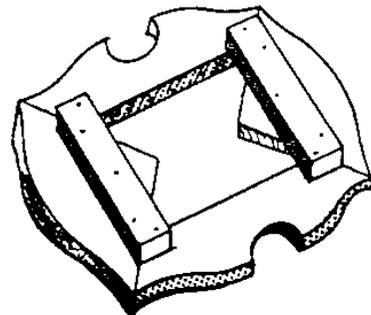


Figure 50

## 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 51.

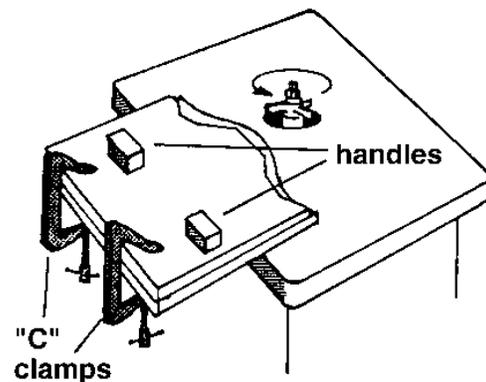


Figure 51

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 workpiece through the cut as shown in Figure 52.

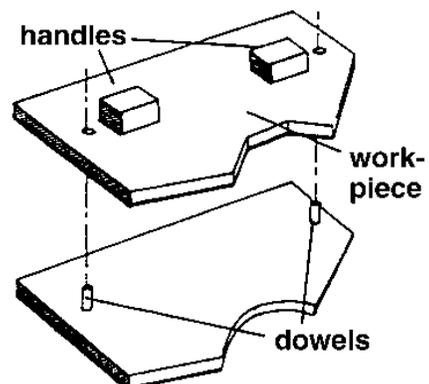


Figure 52

## 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.

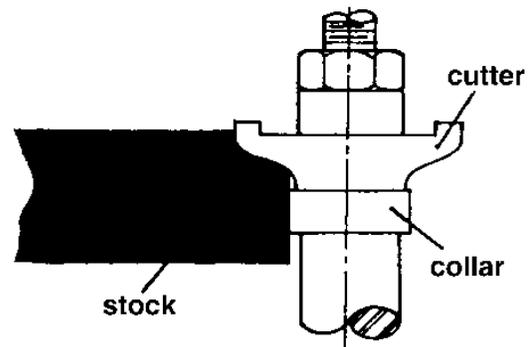


Figure 53

## 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.

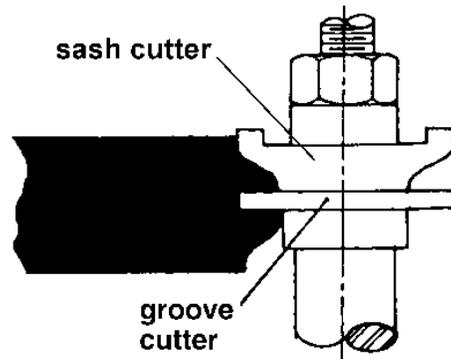


Figure 54

## Sash and Door Shaping

Shaping a door requires two operations.

Figure 53 shows the sash cut for the first operation.

Figure 54 shows the stock flipped over and the sash cutter used with a 1/4-inch groove cutter to complete the cut.

Figure 55 shows the first shaping cut with the sash cutter for the matching door stile sash.

Figure 56 shows the same cut with the stock flipped over.

Figure 57 shows the first shaping cut for a window sash stile utilizing a sash cutter, collar, and a 1/2-inch groove cutter.

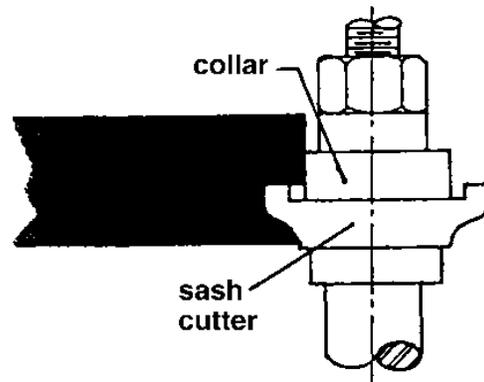


Figure 55

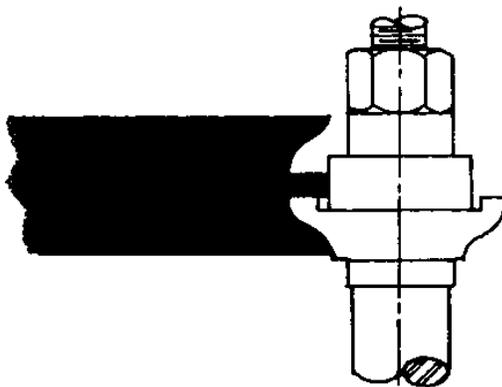


Figure 56

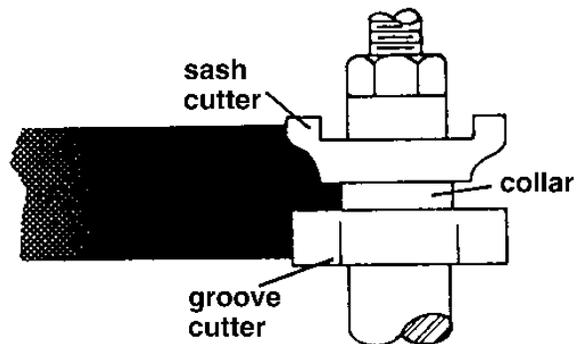


Figure 57

Figure 58 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.

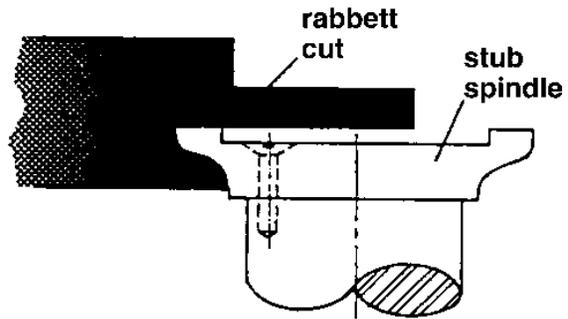


Figure 58

### Butt Joints

All butt-type joints require both workpieces 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 59).

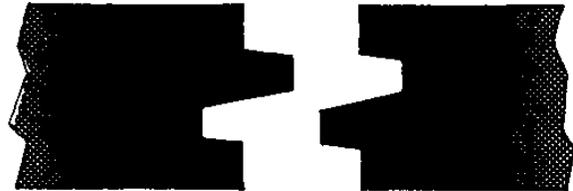


Figure 59

The cuts on both workpieces 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.

### 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 workpieces are fed with the same side up as shown in Figure 60.



Figure 60

### Drop Leaf Joint

When shaping a drop-leaf joint as shown in Figure 61, the leaf workpiece is shaped with a Drop-Leaf Bead cutter; the table workpiece is shaped with a Drop-Leaf Cove cutter.



Figure 61

With this type of 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.

### 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 62.

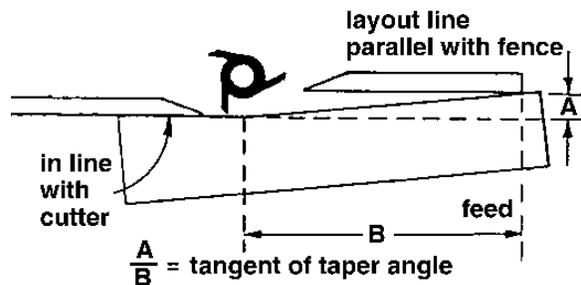


Figure 62

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.

**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 63 shows a miter gauge equipped with a hold-down for shaping the ends of narrow workpieces.

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 64.

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 65.

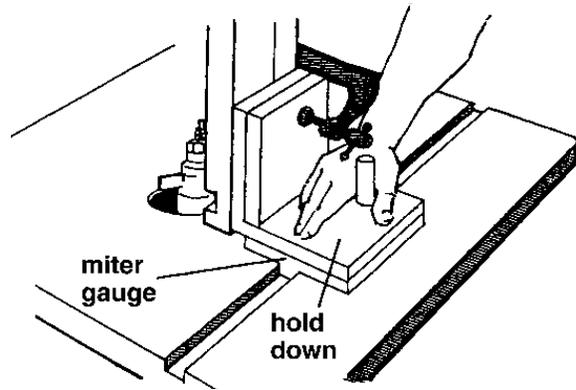


Figure 63

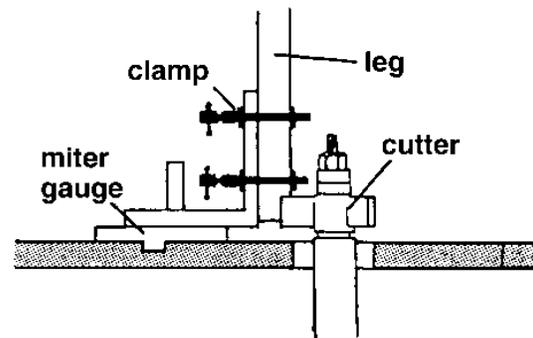


Figure 64

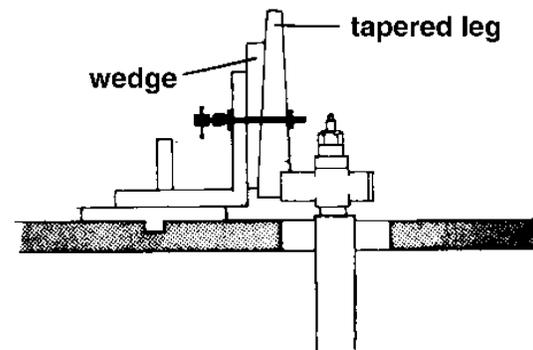


Figure 65

## Troubleshooting for PM2700 Shaper

Trouble	Possible Cause	Remedy
Shaper will not start.	<ol style="list-style-type: none"> <li>1. Cord unplugged from the power source.</li> <li>2. Fuse blown or circuited breaker tripped.</li> <li>3. Cord damaged.</li> <li>4. Reversing switch is in the Off position.</li> <li>5. Overload tripped.</li> <li>6. Cabinet door is open.</li> </ol>	<ol style="list-style-type: none"> <li>1. Plug in power cord.</li> <li>2. Replace fuse or reset circuit breaker.</li> <li>3. Replace cord.</li> <li>4. Turn switch to forward of reverse.</li> <li>5. Reset overload by depressing red stop button.</li> <li>6. Close cabinet door.</li> </ol>
Overload kicks out frequently.	<ol style="list-style-type: none"> <li>1. Extension cord or wiring inadequate size.</li> <li>2. Feeding stock too fast.</li> <li>3. Cutter needs cleaning or replacing. See also <i>Unsatisfactory Cuts</i> below.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cord or wiring with proper gauge wire.</li> <li>2. Reduce feed stock rate.</li> <li>3. Clean or replace cutter.</li> </ol>
Cuts are unsatisfactory.	<ol style="list-style-type: none"> <li>1. Dull cutter.</li> <li>2. Cutterhead rotating in wrong direction.</li> <li>3. Feeding work in wrong direction.</li> <li>4. Gum or pitch on cutter.</li> <li>5. Gum or pitch on table causing erratic feed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace cutter.</li> <li>2. Check for proper rotation at startup.</li> <li>3. Feed work <i>against</i> the cutter rotation.</li> <li>4. Remove cutter and clean with solvent.</li> <li>5. Clean table with solvent.</li> </ol>
Cutter does not come up to full speed.	<ol style="list-style-type: none"> <li>1. Shop wire gauge is too small.</li> <li>2. Extension cord or wiring inadequate size.</li> <li>3. Power source is not adequate.</li> <li>4. Motor not wired for correct voltage.</li> <li>5. Spindle is locked with madrel lever.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace wiring with proper gauge wire.</li> <li>2. Replace wit adequate size cord.</li> <li>3. Contact your electric utility.</li> <li>4. Refer to motor name place and wiring diagram for correct wiring.</li> <li>5. Unlock spindle – see label next to lover on base.</li> </ol>
Machine vibrates.	<ol style="list-style-type: none"> <li>1. Stand on uneven surface.</li> <li>2. Cutterhead damaged.</li> <li>3. Defective V-belt.</li> <li>4. V-belt incorrectly tensioned.</li> <li>5. Bent pulley.</li> <li>6. Motor mounted improperly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Stand must rest solidly on level surface. Fasten to floor if necessary.</li> <li>2. Replace cutterhead.</li> <li>3. Replace V-belt.</li> <li>4. Apply proper tension.</li> <li>5. Replace pulley.</li> <li>6. Motor must be properly mounted with snug nuts and bolts.</li> </ol>
Edge splits off on cross grain cut.	<ol style="list-style-type: none"> <li>1. Characteristic of this type of cut.</li> </ol>	<ol style="list-style-type: none"> <li>1. Make cross grain cuts first, then finish cut with the grain. Use scrap block to support end of cut.</li> </ol>

<b>Trouble</b>	<b>Possible Cause</b>	<b>Remedy</b>
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 uniform 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

1791205 1" Spindle

1791207 1/4" Collet

1791208 1/2" Collet

# Parts

## Ordering Replacement Parts

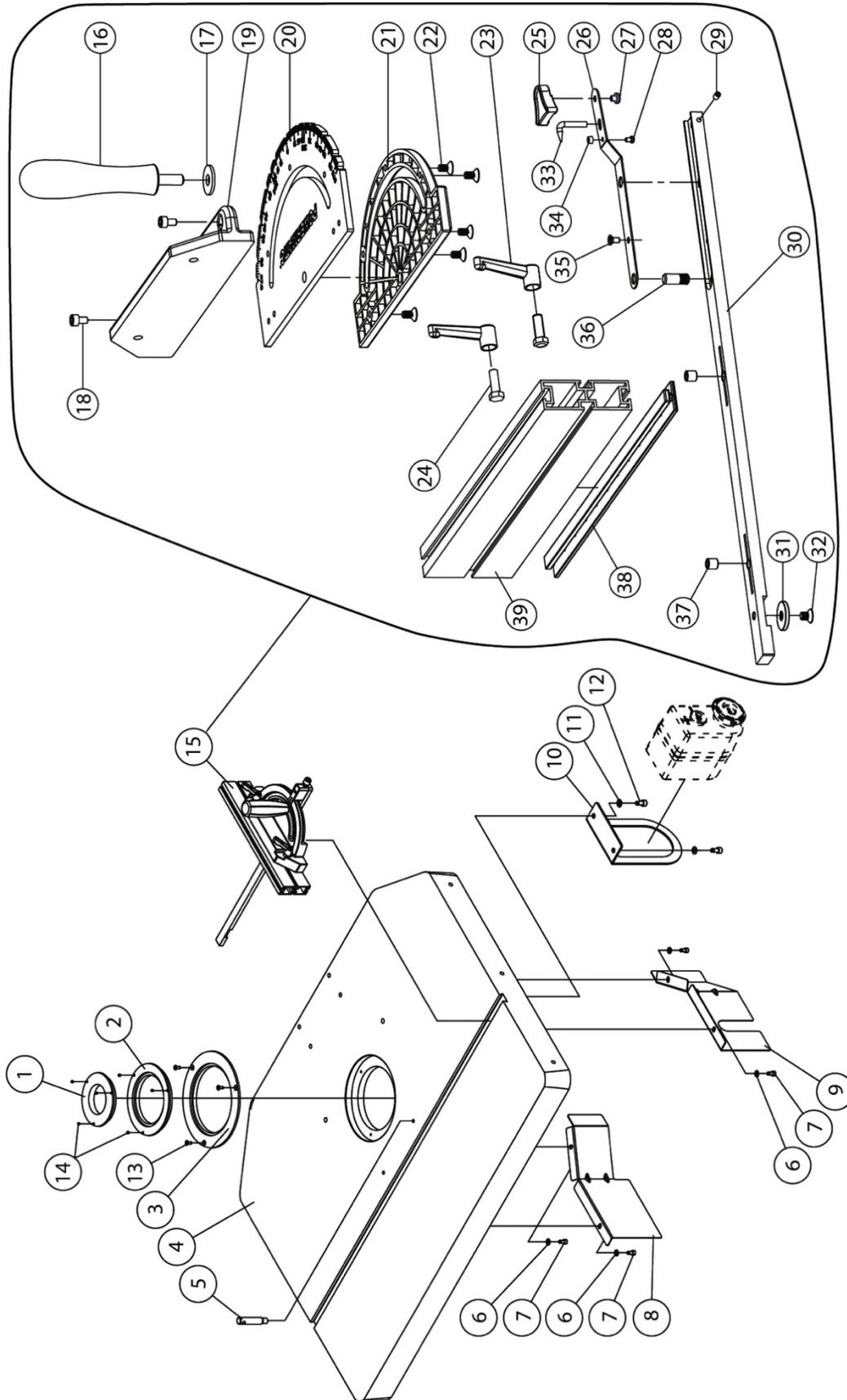
Replacement parts are listed on the following pages. To order parts or reach our service department, call 1-800-274-6848 Monday through Friday, 8:00 a.m. to 5:00 p.m. CST. Having the Model Number and Serial Number of your machine available when you call will allow us to serve you quickly and accurately.

Non-proprietary parts, such as fasteners, can be found at local hardware stores, or may be ordered from Powermatic. Some parts are shown for reference only and may not be available individually.

**Table – Parts List**

Index No.	Part No.	Description	Size	Qty
1	PM9-PM2700-101N	Insert Ring	2.55" I.D.	1
2	PM9-PM2700-102N	Insert Ring	4.16" I.D.	1
3	PM9-PM2700-103N	Insert Ring	5.75" I.D.	1
4	PM9-PM2700-104N	Table		1
5	PM9-PM2700-105	Starting Pin		1
6	CM9-TS-2361061	Lock Washer	M6	4
7	CM9-TS-1503031	Socket Head Cap Screw	M6x12mm	4
8	PM9-PM2700-108	Left Dust Deflector		1
9	PM9-PM2700-109	Right Dust Deflector		1
10	PM9-PM2700-110	Switch Plate		1
11	JT9-TS-1550061	Flat Washer	M8	2
12	JT9-TS-1504041	Socket Head Cap Screw	M8x20mm	2
13	JT9-TS-1513021	Flat Head Socket Screw	M5x12mm	3
14	JT9-TS-1521011	Set Screw	M4x4mm	7
15	PM1-96	Miter Gauge Assembly (includes #16 thru 39)		1
16	PM1-79	Gauge Plate Locking Handle		1
17	JT9-TS-1550061	Flat Washer	8.5 x 23 x 2T	1
18	JT9-TS-1502011	Socket Head Cap Screw	M5 x 0.8P x 8L	2
19	PM1-97	Fence Rest		1
20	PM1-98	Gauge Plate		1
21	PM1-99	Non-Marring Bottom Plate		1
22	JT9-TS-1533042	Phillips Flat Head Screw	M5 x 0.8P x 12L	5
23	PM1-100	Fence Locking Handle		2
24	JT9-TS-0050031	Hex Cap Screw	1/4"-20 x 3/4"	2
25	PM1-84	Thumb Tab		1
26	PM1-101	Bracket		1
27	PM1-85	Phillips Pan Head Screw	M4 x 0.7P x 5L	1
28	PM1-86	Phillips Pan Head Screw	M3 x 0.5P x 4L	1
29	PM1-87	Socket Heat Set Screw	M4 x 0.7P x 6L	1
30	PM1-102	Guide Bar		1
31	PM1-89	Guide Disc		1
32	PM1-90	Phillips Flat Head Screw	M6 x 1.0P x 8L	1
33	PM1-91	Pointer		1
34	PM1-92	Positive Tab		1
35	JT9-TS-2284081	Phillips Flat Head Screw	M4 x 0.7P x 8L	1
36	PM1-94	Pivot Shaft		1
37	PM1-95	Socket Head Set Screw	M8 x 1.25P x 6L	2
38	PM1-103	Non-Marring Bottom Plate for Fence		1
39	PM1-104	Fence		1

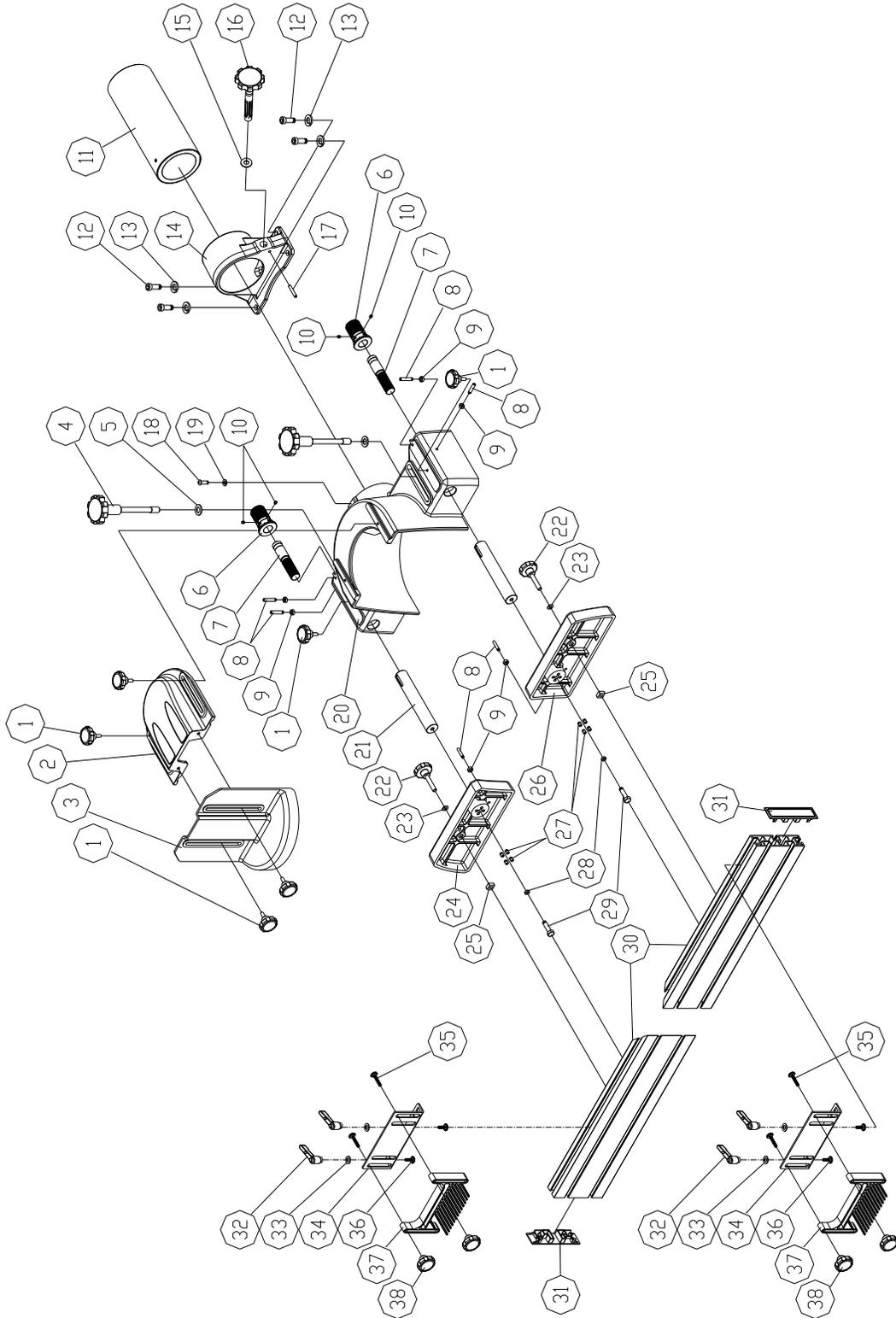
Table – Assembly Drawing



## Fence – Parts List

Index No.	Part No.	Description	Size	Qty
1	PM9-PM2700-201	Knob		6
2	PM9-PM2700-202	Guard Holder		1
3	PM9-PM2700-203	Cutter Guard		1
4	PM9-PM2700-204	Lock Knob		2
5	PM9-PM2700-205	Flat Washer	M13	2
6	PM9-PM2700-206	Adjustment Knob		2
7	PM9-PM2700-207	Adjustment Lead Screw		2
8	JT9-TS-1523071	Socket Set Screw	M6x25mm	6
9	CM9-TS-2311061	Hex Nut	M6	6
10	JT9-TS-1522011	Socket Set Screw	M5x6mm	4
11	PM9-PM2700-211	Column		1
12	JT9-TS-1505031	Socket Head Cap Screw	M10x25mm	4
13	JT9-TS-2361101	Lock Washer	M10	4
14	PM9-PM2700-214	Fence Column Bracket		1
15	CM9-TS-155010	Flat Washer	M16	1
16	PM9-PM2700-216	Geared Knob		1
17	PM9-PM2700-217	Spring Pin	Ø5x32mm	1
18	JT9-TS-2246202	Button Head Socket Screw	M6x20mm	1
19	CM9-TS-2361061	Lock Washer	M6	1
20	PM9-PM2700-220	Fence Body		1
21	PM9-PM2700-221	Shaft		2
22	PM9-PM2700-222	Lock Knob		2
23	PM9-PM2700-223	Washer		2
24	PM9-PM2700-224	Left Fence Plate		1
25	PM9-PM2700-225	Square Nut	M8	2
26	PM9-PM2700-226	Right Fence Plate		1
27	JT9-TS-2276081	Socket Set Screw	M6x8mm	8
28	PM9-PM2700-228	Bushing		2
29	JT9-TS-1490051	Hex Cap Screw	M8x30mm	2
30	PM9-PM2700-230	Fence		2
31	PM9-PM2700-231	End Cap		2
32	PM9-PM2700-232	Lock Handle		4
33	JT9-TS-1550061	Flat Washer	M8	4
34	PM9-PM2700-234	Bracket		2
35	PM9-PM2700-235	Carriage Bolt	M5x30mm	4
36	PM9-PM2700-236	Carriage Bolt	M5x16mm	4
37	PM9-PM2700-237	Feather Board		2
38	PM9-PM2700-238	Knob		4
	CM9-PM2700-FBA	Feather Board Assembly (index # 32 through 38)		1
	PM9-PM2700-FA	Fence – Complete Assembly (index # 1 through 38)		1

# Fence – Assembly Drawing

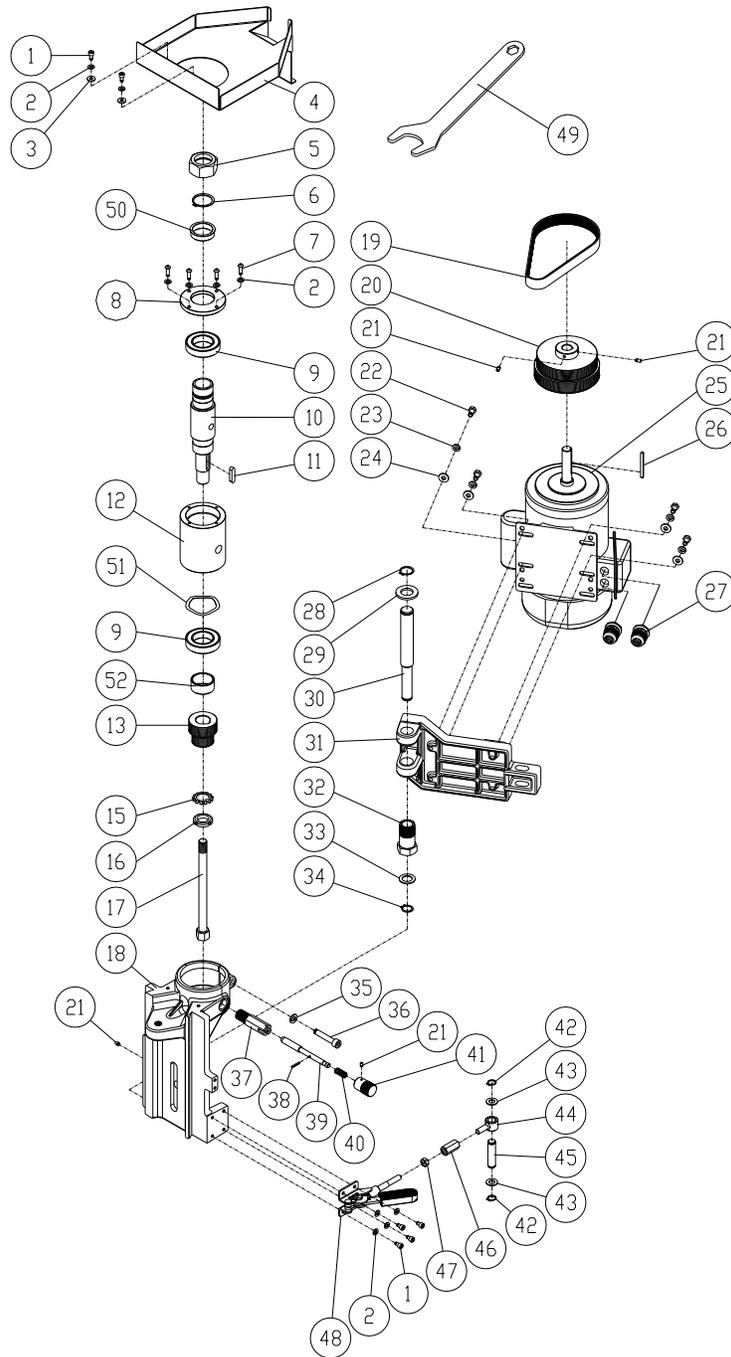


## Frame and Motor – Parts List

Index No.	Part No.	Description	Size	Qty
1	CM9-TS-1503031	Hex Socket Cap Screw	M6x12mm	6
2	CM9-TS-2361061	Lock Washer	M6	10
3	CM9-TS-1550041	Flat Washer	M6	2
4	PM9-PM2700-304	Dust Deflector		1
5	PM9-PM2700-305A	Spindle Nut	M40x2.5p	1
6	PM9-PM2700-306	Retaining Ring	STW-40	1
7	JT9-TS-2246202	Button Head Socket Screw	M6x20mm	4
8	PM9-PM2700-308N	Shaft Top Bearing Cover		1
9	JT9-BB-6008VV	Bearing	6008VV	2
10	PM9-PM2700-310N	Spindle Holder		1
11	PM9-PM2700-311	Key	8x7x35mm	1
12	PM9-PM2700-312N	Quill		1
	PM9-PM2700-312QAN	Quill Complete Assembly (index #2, 6-16, 50-52)		1
13	PM9-PM2700-313	Spindle Pulley		1
15	PM9-PM2700-315	Locking Washer	M25	1
16	PM9-PM2700-316	Locking Nut	M25-1.5P	1
17	PM9-PM2700-317	Draw Bar		1
18	PM9-PM2700-318	Spindle Housing		1
19	PM9-PM2700-319	Belt (3HP / 5HP)	584J	1
20	PM9-PM2700-320	Motor Pulley		1
21	JT9-TS-2276081	Socket Set Screw	M6x8mm	4
22	JT9-TS-1490031	Hex Cap Screw	M8x20mm	4
23	CM9-TS-2361081	Lock Washer	M8	4
24	JT9-TS-1550061	Flat Washer	M8	4
25	PM9-PM2700-325	Motor for 3HP, 1PH	3HP, 230V, 1Ph	1
	PM9-PM2700-325A	Motor for 5HP, 1PH	5HP, 230V, 1Ph	1
	PM9-PM2700-325B	Motor for 5HP, 3PH	5HP, 230/460V, 3Ph	1
	JT9-JI-X04-AA	Centrifugal Switch (not shown)		1
	PM9-PM2700-325FC	Fan Cover (not shown)		1
	PM9-PM2700-325MF	Motor Fan (not shown)		1
	PM9-PM2700-325SC	Starting Capacitor (not shown) for 3HP, 1PH	600MFD, 125V	1
	PM9-PM2700-325ASC	Starting Capacitor (not shown) for 5HP, 1PH	400MFD, 250V	1
	PM9-PM2700-325RC	Running Capacitor (not shown) for 3HP, 1PH	40mF, 3000V	1
	JT9-PM2700-325ARC	Running Capacitor (not shown) for 5HP, 1PH	35mF, 450V	1
26	PM9-PM2700-326	Key	5x5x60mm	1
27	PM9-PM2700-327	Strain Relief Bushing	3HP, 1Ph	1
	PM9-PM2700-327-1	Strain Relief Bushing	5HP, 1Ph	1
	PM9-PM2700-327-2	Strain Relief Bushing	5HP, 3Ph	1
28	PM9-PM2700-328	Retaining Ring	STW-25	1
29	PM9-PM2700-329	Washer	M25	1
30	PM9-PM2700-330	Shaft		1
31	PM9-PM2700-331	Motor Mount		1
32	PM9-PM2700-332	Adjustment Bolt		1
33	JT9-TS-1550111	Flat Washer	M20	1
34	PM9-PM2700-334	Retaining Ring	STW-20	1
35	JT9-TS-2361101	Lock Washer	M10	1
36	JT9-TS-2239551	Socket Head Cap Screw	M10x55mm	1
37	PM9-PM2700-337	Connector		1
38	PM9-PM2700-338	Pin	Ø3 x 20mm	1
39	PM9-PM2700-339	Rod		1
40	PM9-PM2700-340	Spring		1
41	PM9-PM2700-341	Knob		1
42	PM9-PM2700-342	Retaining Ring	STW-15	2
43	PM9-PM2700-343	Flat Washer	M15	2
44	PM9-PM2700-344	Connector		1

Index No.	Part No.	Description	Size	Qty.
45	PM9-PM2700-345	Shaft		1
46	PM9-PM2700-346	Hex Bushing		1
47	JT9-TS-1540071	Hex Nut	M10	1
48	PM9-PM2700-348	Belt Tension Handle		1
49	PM9-PM2700-349	Spindle Nut Wrench		1
50	PM9-PM2700-350	Upper Bushing		1
51	PM9-PM2700-351	Wave Washer		1
52	PM9-PM2700-352	Lower Bushing		1

### Frame and Motor – Assembly Drawing

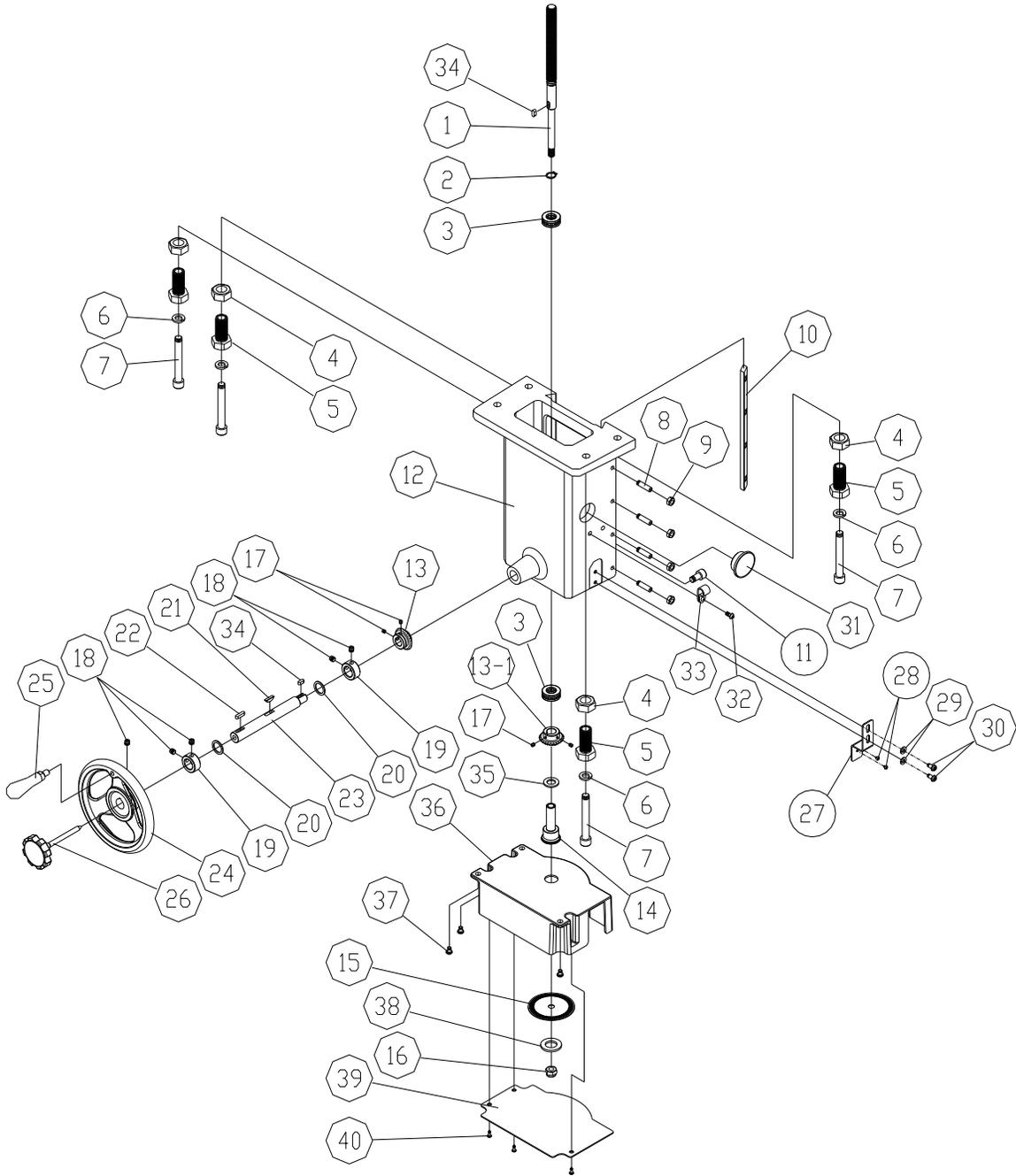


## Elevator – Parts List

Index No.	Part No.	Description	Size	Qty
1	PM9-PM2700-501	Lead Screw		1
2	PM9-PM2700-342	Retaining Ring	STW-15	1
3	PM9-PM2700-503	Thrust Bearing	51202	2
4	PM9-PM2700-504	Hex Nut	M20-1.5P	4
5	PM9-PM2700-505	Adjusting Bolt		4
6	JT9-TS-2361121	Lock Washer	M12	4
7	**	Socket Head Cap Screw	M12x90mm	4
8	PM9-PM2700-508	Socket Set Screw	M8x30mm	4
9	JT9-TS-1540061	Hex Nut	M8	4
10	PM9-PM2700-510	Gib		1
11	JT9-TS-1505021	Socket Head Cap Screw	M10x20mm	1
12	PM9-PM2700-512	Housing		1
13	PM9-PM2700-513	Right Worm Gear		1
13-1	PM9-PM2700-513-1	Left Worm Gear		1
14	PM9-PM2700-514	Bushing		1
15	PM9-PM2700-515	Sensor Plate		1
16	JT9-TS-2342102	Nylon Insert Lock Nut	M10-1.25P	1
17	JT9-TS-1522011	Socket Set Screw	M5x6mm	4
18	JT9-TS-0270021	Socket Set Screw	5/16"-18x5/16"	5
19	PM9-PM2700-519	Fixing Ring		2
20	PM9-PM2700-520	Washer	M19	2
21	PM9-PM2700-521	Woodruff Key		1
22	PM9-PM2700-522	Key	5x5x20mm	1
23	PM9-PM2700-523	Shaft		1
24	PM9-PM2000B-283	Hand Wheel		1
25	PM9-PM2700-525	Handle		1
26	PM9-PM2700-526	Knob		1
27	PM9-PM2700-527	Bracket		1
28	PM9-PM2700-528	Tapping Screw	M3-1.06Px6mm	2
29	CM9-TS-2361061	Lock Washer	M6	2
30	JT9-TS-1534042	Phillips Pan Head Machine Screw	M6x12mm	2
31	PM9-PM2700-531	Cap		1
32	JT9-15S-318	Round Head Screw	M4x8mm	1
33	PM9-PM2700-533	Cord Clamp		1
34	PM9-PM2700-534	Key	5x5x12mm	2
35	JT9-5051911	Flat Washer	M10	1
36	PM9-PM2700-536	Cover		1
37	PM9-PM2700-537	Slotted Round Head Machine Screw	M6-1.0P x 12mm	3
38	PM9-PM2700-538	Flat Washer		1
39	PM9-PM2700-539	Plate		1
40	PM9-PM2700-540	Slotted Round Head Machine Screw	M6-1.0P x 25mm	3

\*\* These parts are shown for reference only and are not available for order individually. Non-proprietary parts, such as fasteners, can usually be found at local hardware stores.

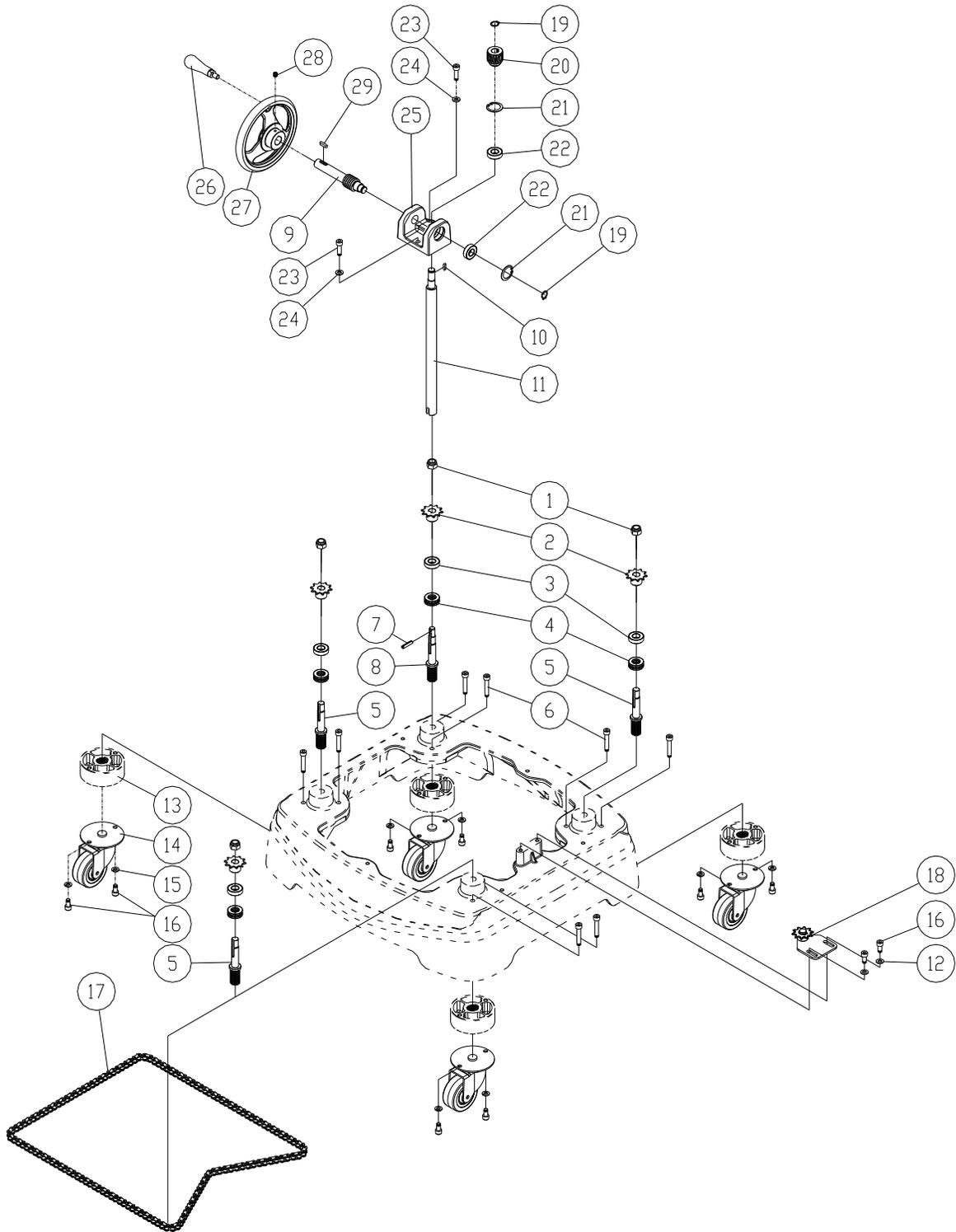
# Elevator – Assembly Drawing



## Caster Assembly – Parts List

Index No.	Part No.	Description	Size	Qty
1	JT9-TS-2342141	Nylon Insert Lock Nut	M14	4
2	PM9-PM2700-602	Sprocket		4
3	JT9-BB-6002ZZ	Ball Bearing	6002ZZ	4
4	PM9-PM2700-503	Thrust Bearing	51202	4
5	PM9-PM2700-605	Shaft		3
6	JT9-TS-1504101	Socket Head Cap Screw	M8x50mm	8
7	PM9-PM2700-217	Spring Pin	Ø5 x 32mm	1
8	PM9-PM2700-608	Lead Screw Shaft		1
9	PM9-PM2700-609	Gear Shaft		1
10	PM9-PM2700-610	Key	4x4x16mm	1
11	PM9-PM2700-611	Lead Shaft		1
12	JT9-TS-1550061	Flat Washer	M8	2
13	PM9-PM2700-613	Elevating Block		4
14	PM9-PM2700-614	Caster		4
15	CM9-TS-2361081	Lock Washer	M8	8
16	JT9-TS-1504041	Socket Head Cap Screw	M8x20mm	10
17	PM9-PM2700-617	Chain		1
18	PM9-PM2700-618	Sprocket Bracket		1
19	PM9-PM2700-342	Retaining Ring	STW-15	2
20	PM9-PM2700-620	Gear		1
21	PM9-PM2700-621	Retaining Ring	RTW-32	2
22	JT9-BB-6002ZZ	Ball Bearing	6002ZZ	2
23	JT9-TS-1504061	Socket Head Cap Screw	M8x30mm	2
24	JT9-TS-1550061	Flat Washer	M8	2
25	PM9-PM2700-625	Gear Housing		1
26	PM9-PM2700-626	Handle		1
27	PM9-PM2000B-283	Hand Wheel		1
28	JT9-TS-0270021	Socket Set Screw	5/16"-18x5/16"	1
29	PM9-PM2700-522	Key	5x5x20mm	1

# Caster Assembly Drawing

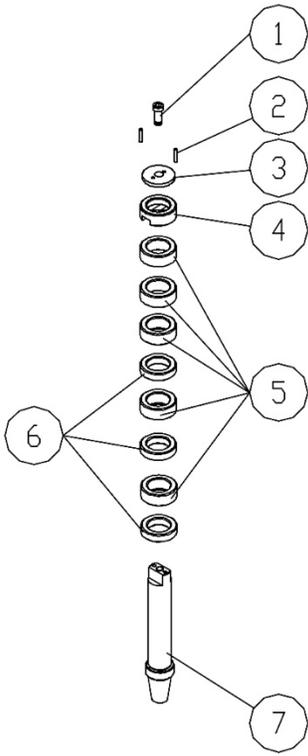


## Spindle Assembly – Parts List

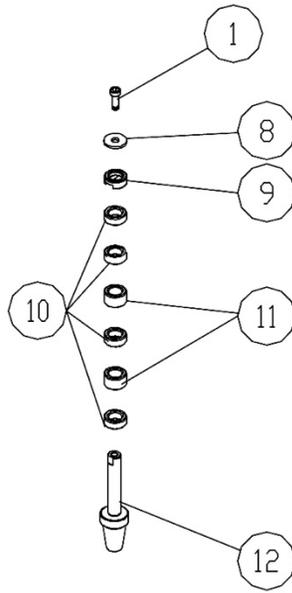
Index No.	Part No.	Description	Size	Qty
1	JT9-TS-1505031	Socket Head Cap Screw	M10x25mm	4
2	PM9-PM2700-702	Pin		2
3	PM9-PM2700-703	Special Washer		1
4	PM9-PM2700-704	Keyed Collar		1
5	PM9-PM2700-705	Collar	I.D. 1-1/4" x 3/4" T	5
6	PM9-PM2700-706	Collar	I.D. 1-1/4" x 1/2" T	3
7	PM9-PM2700-707	Spindle	1-1/4"	1
	PM9-PM2700-707A	Spindle Assembly (#1 thru #7, #32)	1-1/4"	1
8	PM9-PM2700-708	Special Washer		1
9	PM9-PM2700-709	Keyed Collar		1
10	PM9-PM2700-710	Collar	I.D. 3/4" x 1/2" T	4
11	PM9-PM2700-711	Collar	I.D. 3/4" x 3/4" T	2
12	PM9-PM2700-712A	Spindle	3/4"	1
	PM9-PM2700-712A	Spindle Assembly (#1, #8 thru #12, #32)	3/4"	1
13	PM9-PM2700-713	Special Washer		1
14	PM9-PM2700-714	Keyed Collar		1
15	PM9-PM2700-715	Collar	I.D. 1" x 3/4" T	4
16	PM9-PM2700-716	Collar	I.D. 1" x 1/2" T	4
17	PM9-PM2700-717	Spindle	1"	1
	PM9-1791205	Spindle Assembly (#1, #13 thru #17, #32)*	1"	1
30	PM9-1791207	Collet*	1/4"	1
31	PM9-1791208	Collet*	1/2"	1
32	PM9-PM2700-305A	Spindle Nut	M40x2.5p	1

\* Optional accessory

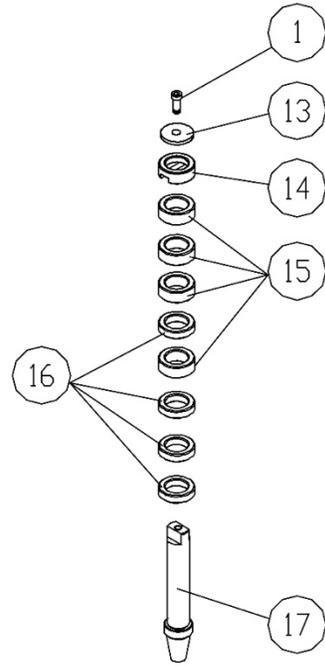
# Spindle Assembly Drawing-



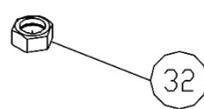
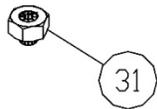
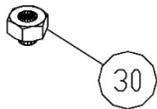
1-1/4" Spindle



3/4" Spindle



1" Spindle

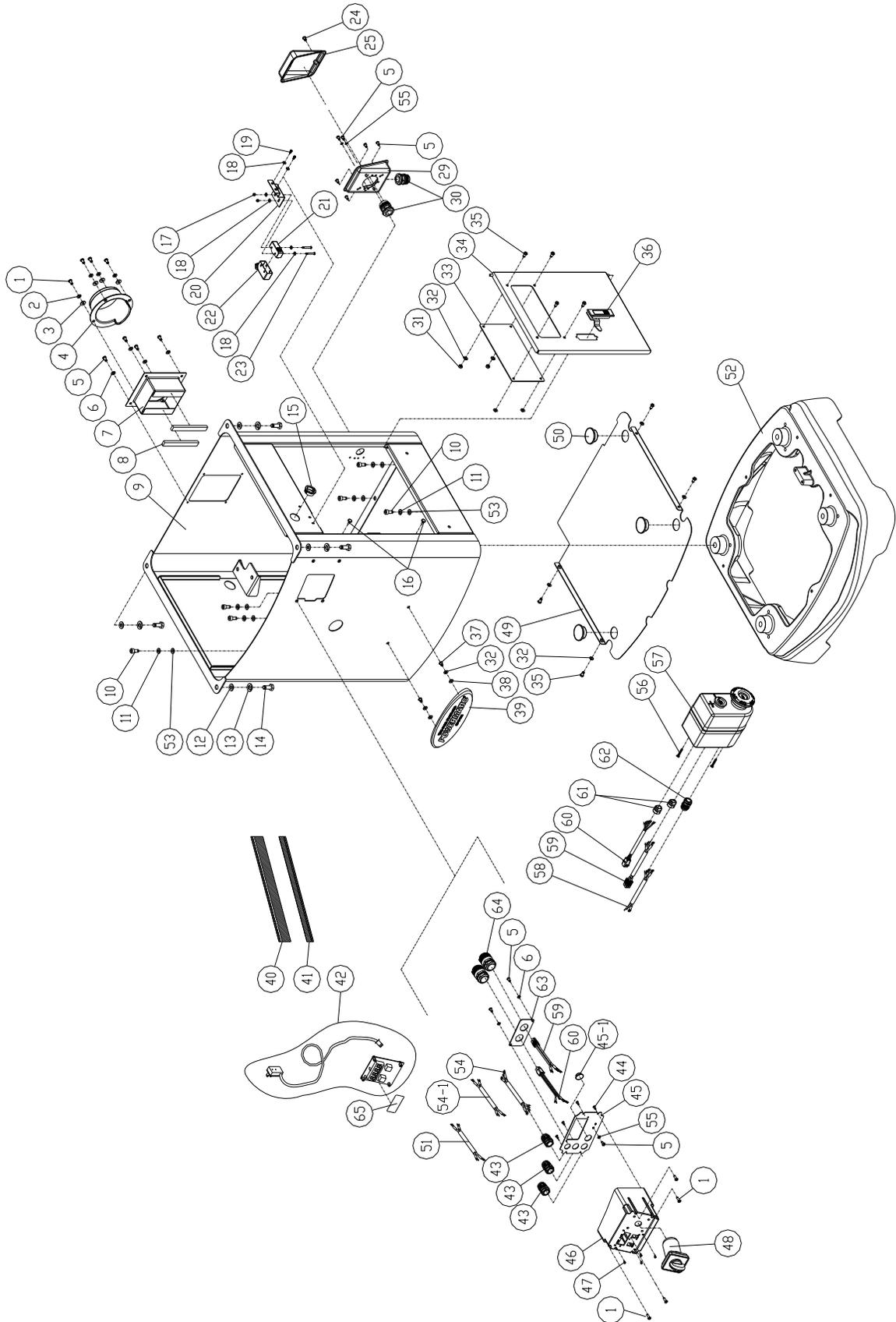


## Cabinet and Base – Parts List

Index No.	Part No.	Description	Size	Qty
1	JT9-TS-1533052	Phillips Pan Head Machine Screw	M5x16mm	8
2	JT9-TS-2361051	Lock Washer	M5	4
3	JT9-TS-1550031	Flat Washer	M5	4
4	PM9-PM2700-404	Dust Chute		1
5	JT9-TS-1533032	Phillips Pan Head Machine Screw	M5x10mm	13
6	JT9-TS-2361051	Lock Washer	M5	6
7	PM9-PM2700-407	Dust Deflector		1
8	PM9-PM2700-408	Padding		2
9	PM9-PM2700-409	Cabinet		1
10	JT9-TS-1504041	Socket Head Cap Screw	M8x20mm	6
11	CM9-TS-2361081	Lock Washer	M8	6
12	JT9-5051911	Flat Washer	M10	4
13	JT9-TS-2361101	Lock Washer	M10	4
14	CM9-TS-1491031	Hex Cap Screw	M10x25mm	4
15	PM9-PM2700-415	Strain Relief		1
16	PM9-PM2700-416	Bumper		2
17	JT9-TS-1541001	Nylon Insert Lock Nut	M4	2
18	CM9-TS-1550021	Flat Washer	M4	6
19	JT9-TS-2284082	Pan Head Screw	M4x8mm	2
20	PM9-PM2700-420	Bracket		1
21	PM9-PM2700-421	Limit Switch		1
22	PM9-PM2700-422	Limit Switch Cover		1
23	JT9-TS-2284352	Pan Head Screw	M4x35mm	2
24	JT9-TS-0810012	Slotted Round Head Machine Screw	#10-24x1/4"	1
25	PM9-PM2700-425	Junction Box Cover		1
29	PM9-PM2700-429	Junction Box		1
30	PM9-PM2700-430	Strain Relief	3HP, 1Ph; 5HP, 1Ph	2
	JT9-PM2700-430-1	Strain Relief	5HP, 3Ph	2
31	CM9-TS-2311061	Hex Nut	M6	4
32	CM9-TS-2361061	Lock Washer	M6	10
33	PM9-PM2700-433	Window		1
34	PM9-PM2700-434	Door		1
35	JT9-TS-1534042	Phillips Pan Head Machine Screw	M6x12mm	8
36	PM9-PM2700-436	Door Latch		1
37	JT9-TS-0813022	Slotted Round Head Machine Screw	1/4"-20x3/8"	2
38	JT9-TS-0680021	Flat Washer	1/4"	2
39	PM1-442	POWERMATIC Name Plate		1
40	PM9-PM2700-440	Wide Stripe		2
41	PM9-PM2700-441	Narrow Stripe		2
42	PM9-PM2700-442	DRO Sensor Assembly		1
	CM9-PM2700-442SC	Sensor Cord w/ Sensor		1
	PM9-PM2700-442ICBN	DRO IC Board (225K/630V Capacitor)		1
43	PM9-PM2700-443	Strain Relief	3HP, 1Ph	3
	PM9-PM2700-443-1	Strain Relief	5HP, 1Ph	4
	PM9-PM2700-443-2	Strain Relief	5HP, 3Ph	3
44	PM9-PM2700-444	Tapping Screw	M4x12mm	4
45	PM9-PM2700-445N	Switch Plate	3HP 1Ph, 5HP 1Ph	1
	PM9-PM2700-445N-1	Switch Plate	5HP 3Ph	1
45-1	PM9-PM2700-445-1	Cap		1
46	PM9-PM2700-446	DRO Cover		1
47	JT9-TS-1531012	Phillips Pan Head Machine Screw	M3x6mm	4
48	PM9-PM2700-448	Forward/Reverse Switch	3HP/1Ph	1
	PM9-PM2700-448A	Forward/Reverse Switch	5HP/1Ph	1
	PM9-PM2700-448B	Forward/Reverse Switch	5HP/3Ph	1

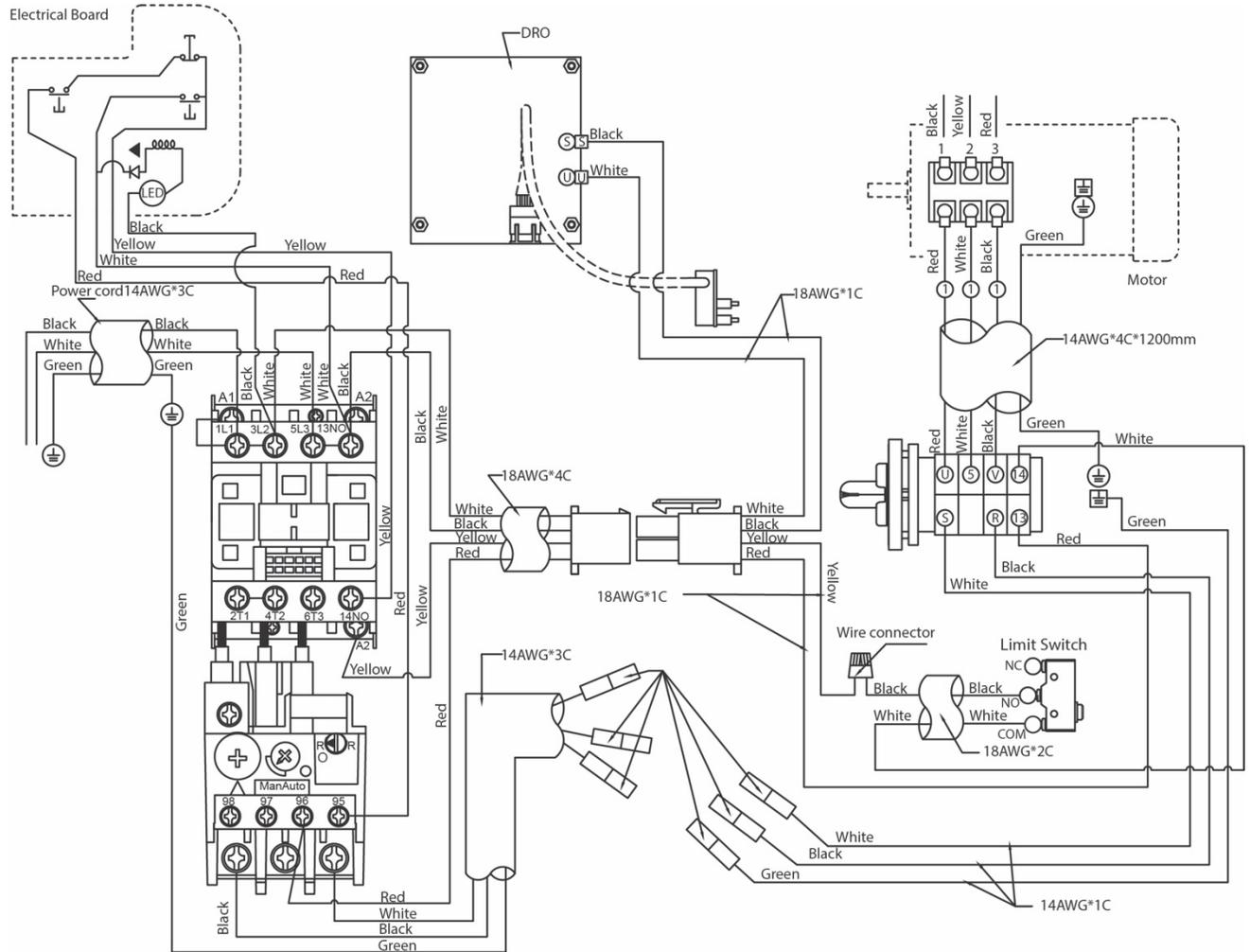
Index No.	Part No.	Description	Size	Qty
49	PM9-PM2700-449	Plate		1
50	PM9-PM2700-450	Cap		3
51	PM9-PM2700-451	Limit Switch Cord		1
52	PM9-PM2700-452	Base		1
53	JT9-TS-1550061	Flat Washer	M8	6
54	PM9-PM2700-454	Motor Cable 3HP, 1Ph	14AWG x 4C	1
	PM9-PM2700-454A	Motor Cable 5HP, 1Ph	12AWG x 3C	1
	PM9-PM2700-454B	Motor Cable 5HP, 3Ph (600V, ST,CSA/UL)	14AWG x 4C	1
54-1	PM9-PM2700-454-1A	Motor Cable 5HP, 1Ph	12AWG x 2C	1
55	PM9-PM2700-455	Star Washer	M5x10	3
56	PM9-PM2700-113	Tapping Screw	M5-2.12Px25mm	2
57	PM9-PM2700-114	Magnetic Switch	3HP, 230V, 1Ph	1
	PM9-PM2700-114A	Magnetic Switch	5HP, 230V, 1Ph	1
	PM9-PM2700-114B	Magnetic Switch	5HP, 230V, 3Ph	1
	PM9-PM2700-114C	Magnetic Switch	5HP, 460V, 3Ph	1
58	PM9-PM2700-115	Power Cord	3HP, 1Ph 14AWGx3C	1
	PM9-PM2700-115A	Power Cord	5HP, 1Ph 12AWGx3C	1
	PM9-PM2700-115B	Power Cord (600V, ST,CSA/UL)	5HP, 3Ph 14AWGx4C	1
59	PM9-PM2700-159	Cable & Connector, (KST Male & Female)	3HP 1PH, 14AWGx3C	1
	PM9-PM2700-159A	Cable & Connector, (KST Male & Female)	5HP 1PH, 12AWGx3C	1
	PM9-PM2700-159B	Cable & Connector, (KST Male & Female)	5HP 3PH, 14AWGx4C	1
60	PM9-PM2700-160	Cable & Connector, (2000 Male & Female)	3HP 1PH, 18AWGx4C	1
	PM9-PM2700-160A	Cable & Connector, (2000 Male & Female)	5HP 1PH, 18AWGx4C	1
	PM9-PM2700-160B	Cable & Connector, (2000 Male & Female)	5HP 3PH, 18AWGx4C	1
61	PM9-PM2700-461	Strain Relief	KSS SR-7R3	2
62	PM9-PM2700-462	Strain Relief (for all models)	KSS PG11	1
62-1	PM9-PM2700-462-1	Strain Relief (for 5HP, 3PH)	MG25A-16B	1
63	PM9-PM2700-463	Plate		1
64	PM9-PM2700-464	Strain Relief	AVC MG25A-16	2
65	PM9-PM2700-465	PC Sticker		1

# Cabinet and Base

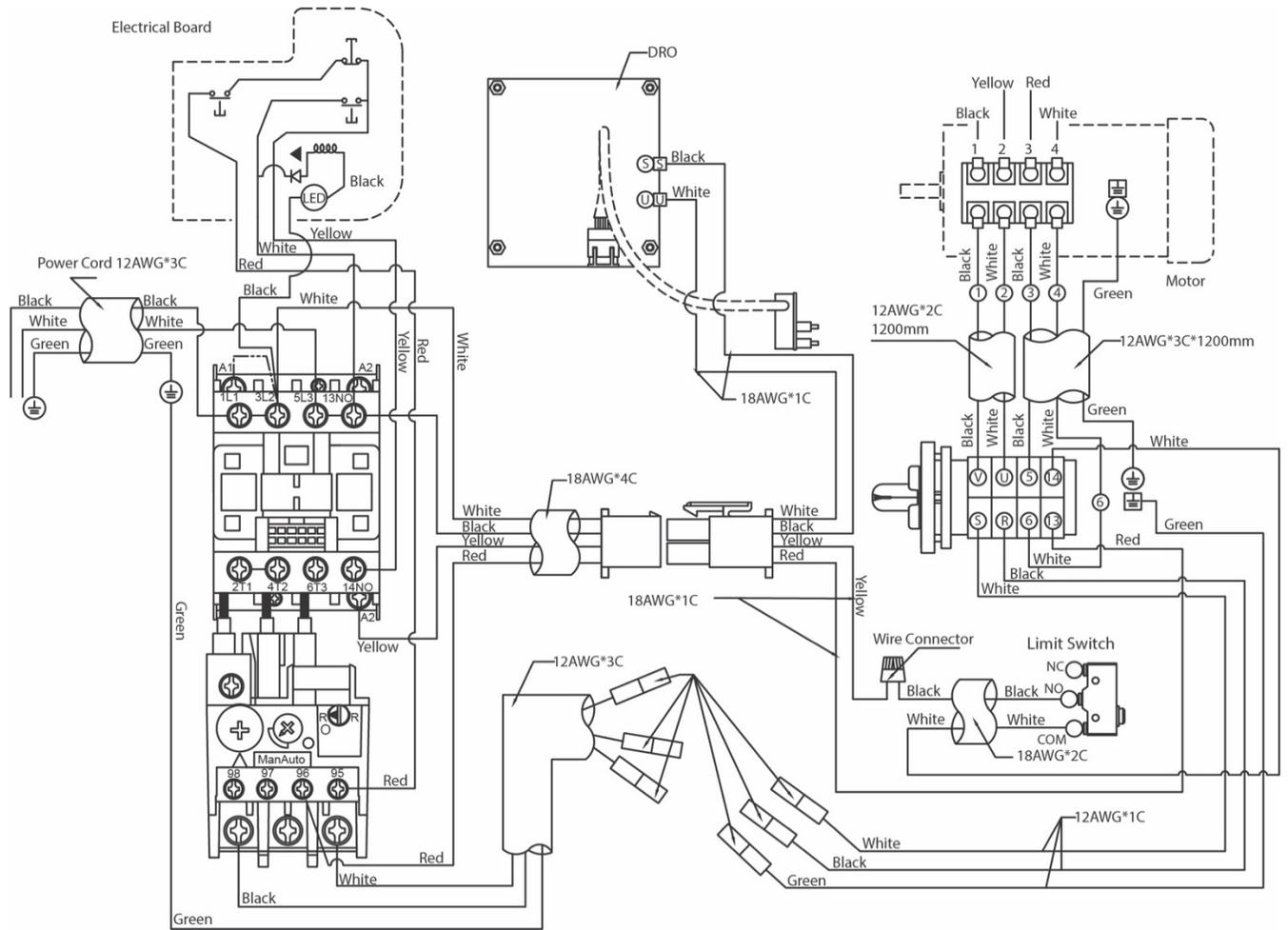


# Wiring Diagrams

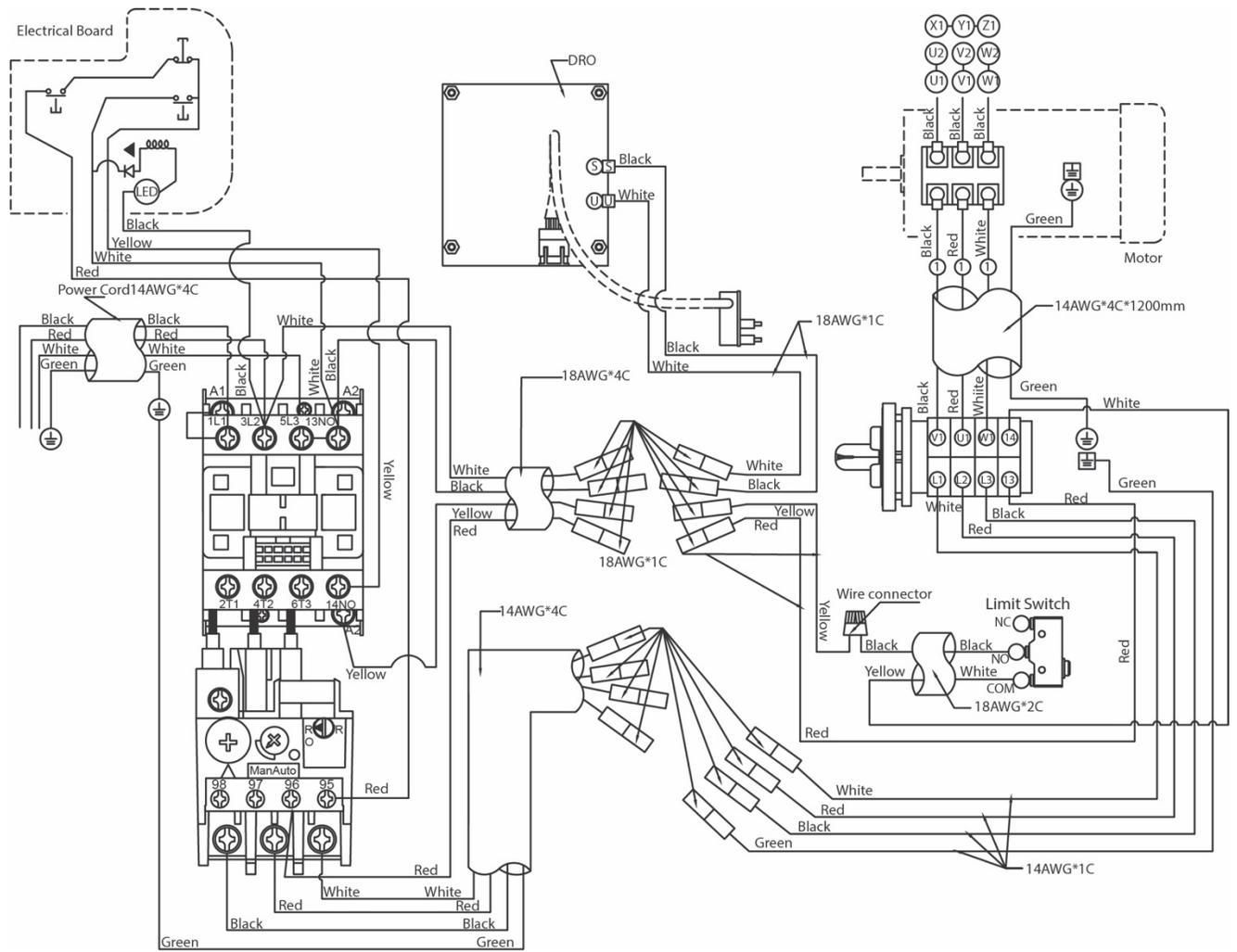
## 3HP, 230V, 1Phase



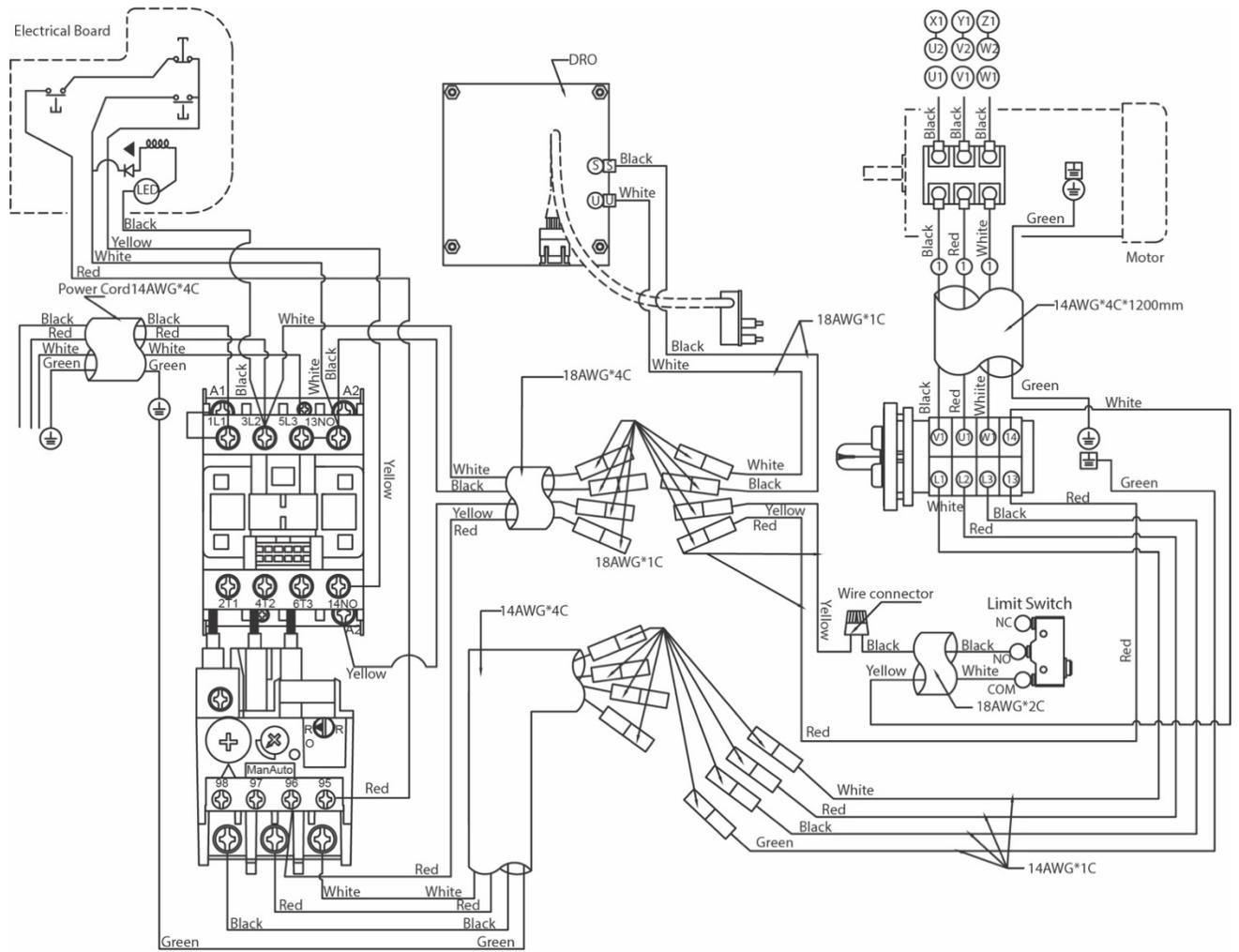
# 5HP, 230V, 1Phase



# 5HP, 230V, 3Phase



# 5HP, 460V, 3Phase









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