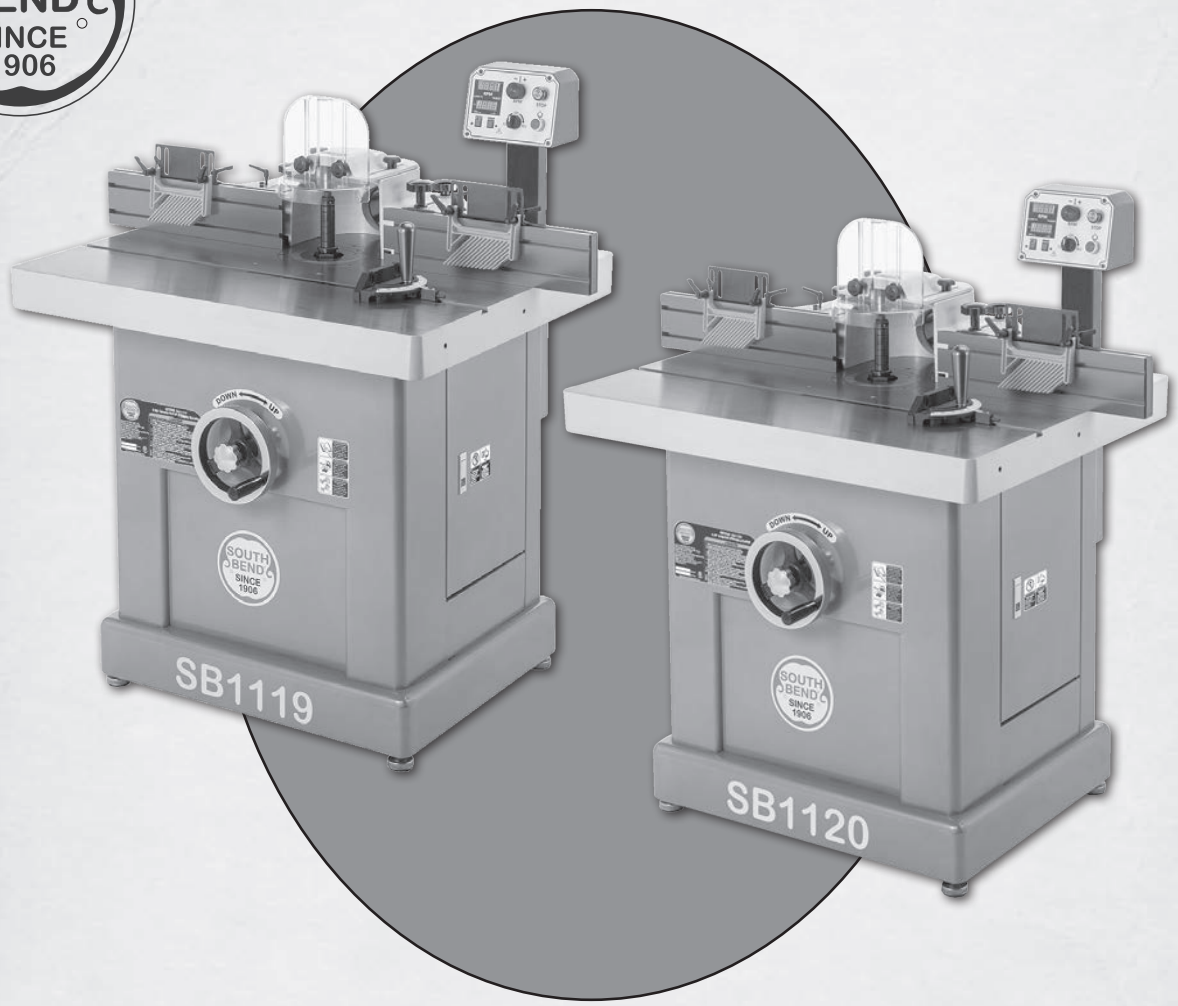
3 HP/5 HP SPINDLE SHAPER

MODEL SB1119/SB1120

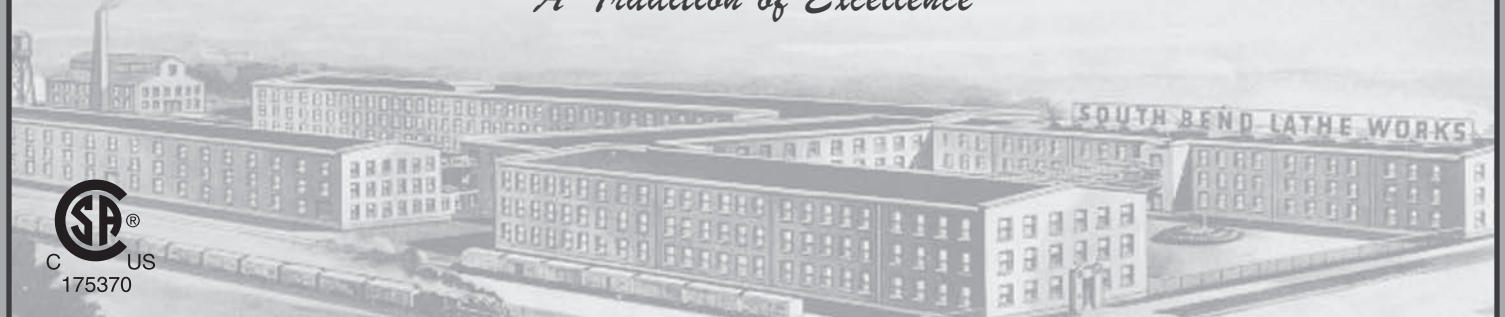


****Keep for Future Reference****

OWNER'S MANUAL

South Bend Tools®

A Tradition of Excellence



C US
175370

For Machines Mfd. Since 04/24 (V3.06.24)

Scope of Manual

This manual helps the reader understand the machine, how to prepare it for operation, how to control it during operation, and how to keep it in good working condition. We assume the reader has a basic understanding of how to operate this type of machine, but that the reader is not familiar with the controls and adjustments of this specific model. As with all machinery of this nature, learning the nuances of operation is a process that happens through training and experience. If you are not an experienced operator of this type of machinery, read through this entire manual, then learn more from an experienced operator, schooling, or research before attempting operations. Following this advice will help you avoid serious personal injury and get the best results from your work.

Manual Feedback

We've made every effort to be accurate when documenting this machine. However, errors sometimes happen or the machine design changes after the documentation process—so the manual may not exactly match your machine. If a difference between the manual and machine leaves you in doubt, contact our customer service for clarification.

We highly value customer feedback on our manuals. If you have a moment, please share your experience using this manual. What did you like about it? Is there anything you would change to make it better? Did it meet your expectations for clarity, professionalism, and ease-of-use?

South Bend Tools
c/o Technical Documentation Manager
P.O. Box 2027
Bellingham, WA 98227
Email: manuals@southbendtools.com

Updates

For your convenience, any updates to this manual will be available to download free of charge through our website at:

www.southbendtools.com

Customer Service

We stand behind our machines. If you have any service questions, parts requests or general questions about your purchase, feel free to contact us.

South Bend Tools
P.O. Box 2027
Bellingham, WA 98227
Phone: (360) 734-1540
Fax: (360) 676-1075 (International)
Fax: (360) 734-1639 (USA Only)
Email: sales@southbendtools.com

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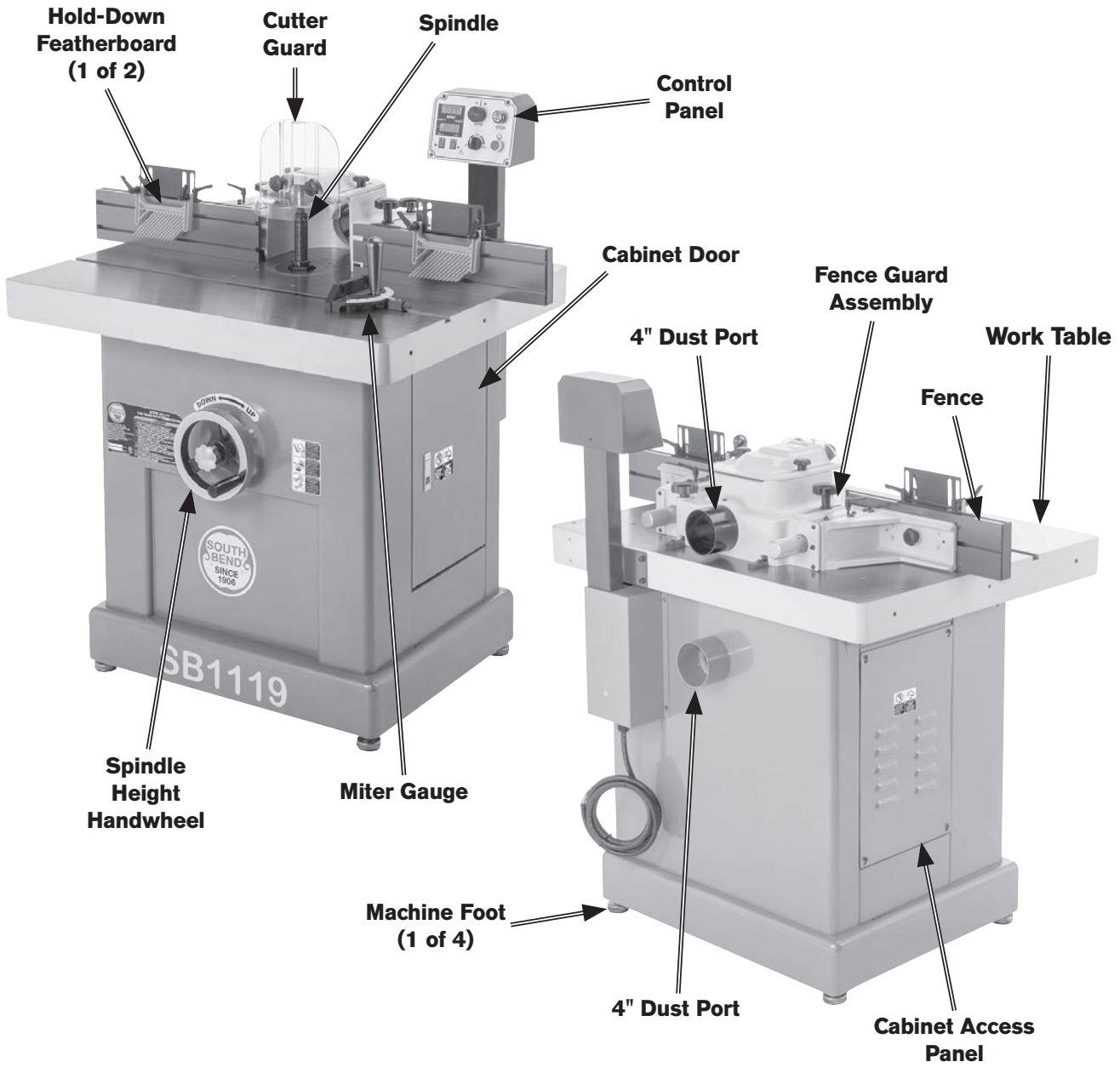
Identification



⚠WARNING

For Your Own Safety Read Instruction Manual Before Operating Shaper

a) Wear eye protection.
b) Be sure two-piece keyed washer is installed directly under cap screw and cap screw is tight.
c) Feed workpiece against rotation of cutter.
d) Do not use awkward hand positions.
e) Keep fingers away from revolving cutter–use fixtures when necessary.
f) Use overhead guard when adjustable fence is not in place.

Description of Controls & Components

⚠WARNING

Serious personal injury could occur if you connect the machine to power before completing the setup process. DO NOT connect power until instructed to do so later in this manual.

⚠WARNING

Untrained users have an increased risk of seriously injuring themselves with this machine. Do not operate this machine until you have understood this entire manual and received proper training.

Refer to **Figures 1–9** and the following descriptions to become familiar with the basic controls and components used to operate this machine.

A. RPM Digital Readout Screen: Displays spindle RPM.

B. RPM Adjustment Knob: Adjusts spindle speed between 5,000–10,000 RPM.

C. STOP Button: Turns machine ***OFF*** and prevents it from starting.

D. ON Button: Turns machine ***ON***.

E. Forward/Reverse (FOR/REV) Switch: Starts, stops, and reverses spindle rotation.

F. Unit (mm/in.) Button: Switches spindle height display to either inches or millimeters.

G. Zeroing (0" Set) Button: Adjusts spindle/cutter height to 0 in./mm.

H. Spindle Height Digital Readout Screen: Displays spindle/cutter height in either inches or millimeters.

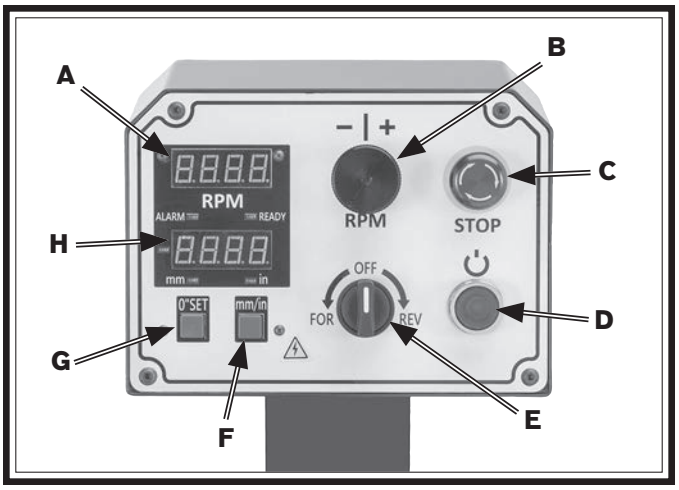


Figure 1. Control panel.

I. Starting Pin: Supports workpiece during freehand cuts until it contacts rub collar (refer to **Page 36**).

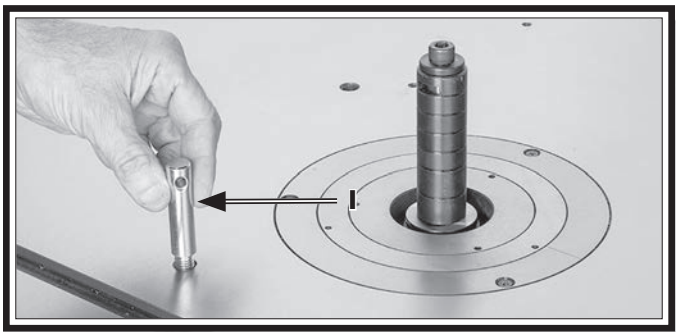


Figure 2. Starting pin.

J. Miter Gauge: Supports workpiece for controlled straight or angled cuts as it slides along the work table miter slot.

K. Spindle Height Handwheel: Raises and lowers spindle and cutter to desired height.

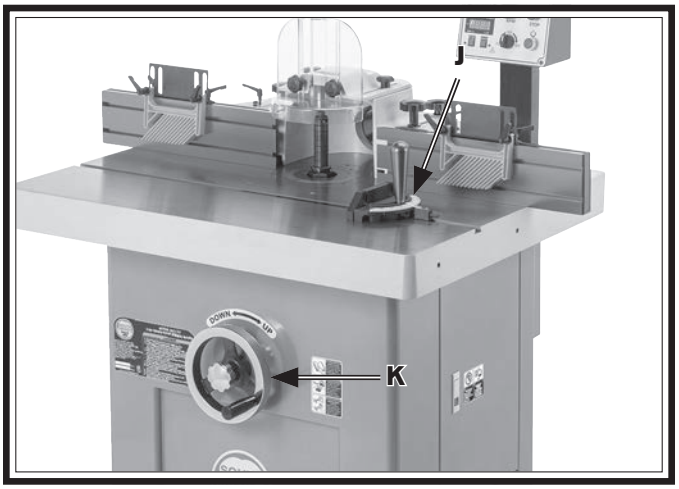


Figure 3. Cabinet components.

L. Guard Height Lock Knobs: Loosen to adjust front cutter guard height and tighten to secure.

M. Cutter Guard: Adjusts to protect user from accidental cutter contact or chips thrown by cutterhead.

N. Guard Position Lock Knob (1 of 2): Loosen to adjust cutter guard forward or backward and tighten to secure.

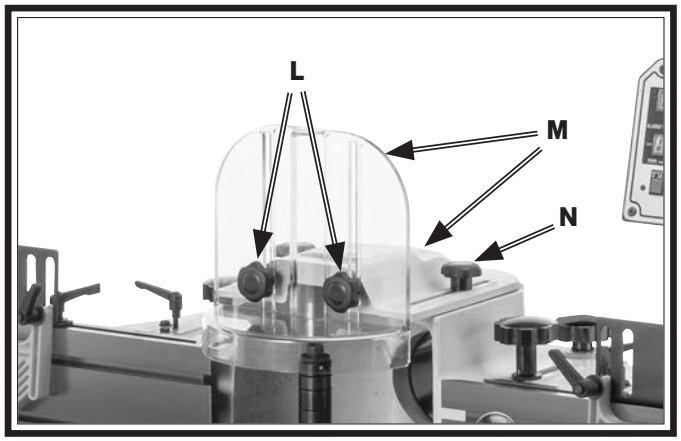


Figure 4. Cutter guard controls and components.

O. Fence: Adjusts side to side and forward and backward to support workpiece during operation. Each fence is independently adjustable and both can be removed and replaced with a zero-clearance or other custom-made fence.

P. Fence Lock Handles: Loosen to allow for independent fence micro-adjustment and tighten to secure.

Q. Fence Lock Knob (1 of 2): Loosens to allow for independent fence adjustment in relation to cutterhead (side to side) and tightens to secure.

R. Fence Micro-Adjustment Knobs: Move each fence independently forward and backward (i.e., cutting depth). One turn moves each fence approximately 1/64" (.015").

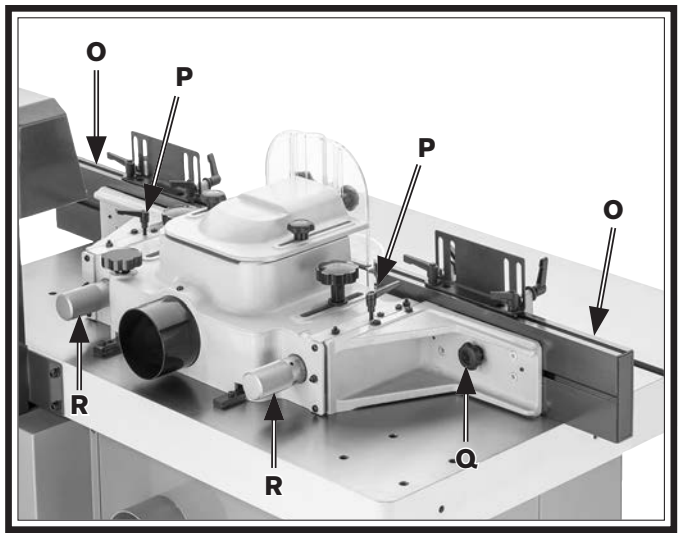


Figure 5. Fence controls and components.

S. Guard/Fence Base Adjustment Knob: Adjusts guard/fence base forward and backward on table using rack and pinion. One turn is approximately 1 5/8" of movement.

T. Guard/Fence Base Lock Knobs: Loosen to allow for guard/fence base adjustment and tighten to secure.

U. Guard/Fence Base: Adjusts forward and backward on table to provide safety and support as required by operation. Assembly can be removed or adjusted to use custom-made box guard for small stock or irregular shaping.

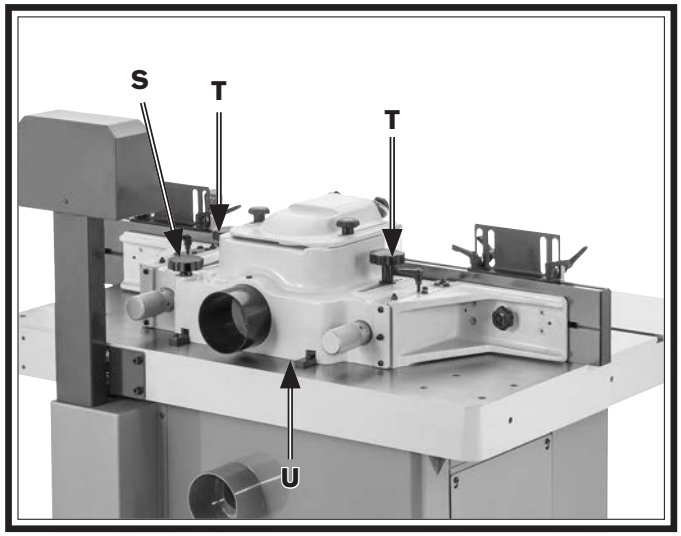


Figure 6. Guard/fence base controls and components.

V. Featherboard Position Lock Handle: Loosen to adjust featherboard closer or farther away from cutterhead along fence (i.e., workpiece length) and tighten to secure.

W. Featherboard Height Lock Handle: Loosen to adjust featherboard closer or farther away from table (i.e., workpiece thickness) and tighten to secure.

X. Featherboard: Guides and supports workpiece as it moves past cutterhead.

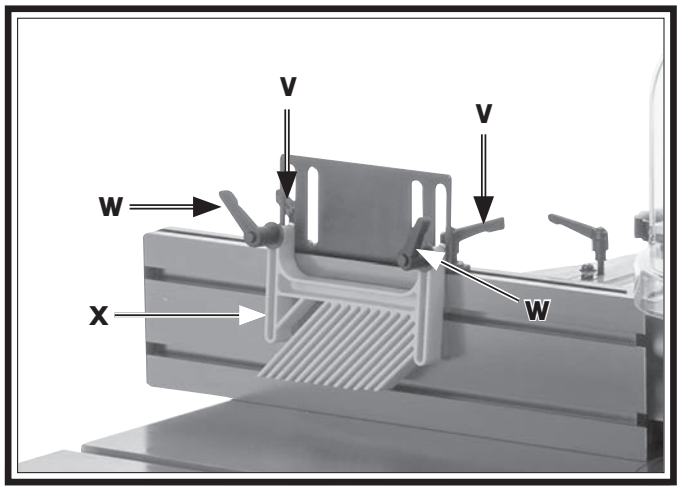


Figure 7. Featherboard controls and components.

Y. Cabinet Door: Allows access to inside cabinet for maintenance, service, or to change spindles.

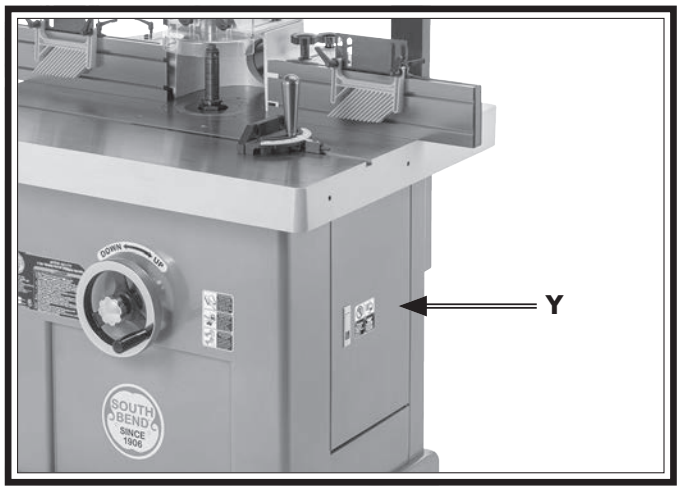


Figure 8. Cabinet door location.

Z. Spindle Assembly Lock Handle: Locks/unlocks spindle seat to change spindles.

AA. Motor Bracket Handle: Engages and releases V-belt tension.

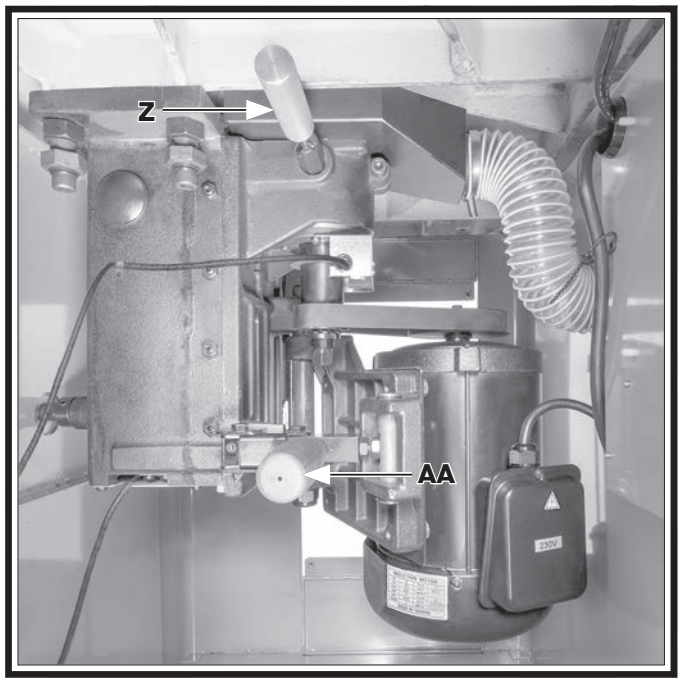


Figure 9. Inside cabinet controls.

SOUTH BEND SINCE 1906

Product Specifications

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SOUTH BEND SINCE 1906

Model SB1119
3 HP Single-Phase Variable-Speed Spindle Shaper

Product Dimensions

Weight	660 lbs.
Width (side-to-side) x Depth (front-to-back) x Height	39-1/2 x 34 x 51-1/2 in.
Footprint (Length x Width)	25-1/2 x 31 in.

Shipping Dimensions

Type	Wood Crate
Content	Machine
Weight	780 lbs.
Length x Width x Height	44 x 39 x 58 in.

Electrical

Power Requirement	230V, Single-Phase, 60 Hz
Full-Load Current Rating	20A
Minimum Circuit Size	20A
Connection Type	Cord & Plug
Power Cord Included	Yes
Power Cord Length	120 in.
Power Cord Gauge	12 AWG
Plug Included	Yes
Included Plug Type	6-20
Switch Type	Control Panel w/Magnetic Switch Protection
Inverter (VFD) Type	Delta ME300
Inverter (VFD) Size	3 HP

Motors

Main

Horsepower	3 HP
Phase	3-Phase
Amps	8A
Speed	3450 RPM
Type	TEFC Induction
Power Transfer	Belt
Bearings	Shielded & Permanently Lubricated

Main Specifications

Operation Info

Max. Cutter Height	5 in.
Max. Cutter Diameter	7 in.
Spindle Sizes	3/4, 1-1/4 in.
Spindle Lengths	3-7/8, 5-7/8 in.
Exposed Spindle Length	3-7/8, 5-7/8 in.
Spindle Cap. Under the Nut	3-1/2, 5-1/8 in.
Spindle Speeds	5000 - 10,000 RPM
Spindle Travel	4 in.
Spindle Openings	2-1/2, 4-1/8, 5-3/4, 7 in.

Table Info

Number of Table Inserts	3
Table Insert Sizes I.D.	2-1/2, 4-1/8, 5-3/4 in.
Table Insert Sizes O.D.	4-5/8, 6-1/4, 8-3/8 in.
Table Counterbore Diameter	8-1/4 in.
Table Counterbore Depth	3/16 in.
Table Size Length	39-1/4 in.
Table Size Width	31-1/2 in.
Table Size Thickness	3-1/4 in.
Floor to Table Height	36-1/4 in.
Table Fence Length	44-1/2 in.
Table Fence Width	1-1/4 in.
Table Fence Height	4-3/4 in.

Miter Gauge Info

Miter Angle	0 - 60 deg. L/R
Miter Gauge Slot Type	T-Slot
Miter Gauge Slot Width	3/4 in.
Miter Gauge Slot Height	3/8 in.

Construction

Table	Precision-Ground Cast Iron
Cabinet	Formed Steel
Fence	Aluminum
Miter Gauge	Aluminum
Guard	Polycarbonate
Spindle Bearings	Sealed & Lubricated
Paint Type/Finish	Enamel

Other

Number of Dust Ports	2
Dust Port Size	4 in.

Other

Country of Origin	Taiwan
Warranty	2 Years
Approximate Assembly & Setup Time	30 Minutes
Serial Number Location	ID Label
Sound Rating	85 dB
ISO 9001 Factory	Yes
Certified by a Nationally Recognized Testing Laboratory (NRTL)	Yes

SOUTH BEND SINCE 1906

Product Specifications

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SOUTH BEND SINCE 1906

Model SB1120
5 HP 3-Phase Variable-Speed Spindle Shaper

Product Dimensions

Weight	682 lbs.
Width (side-to-side) x Depth (front-to-back) x Height	39-1/2 x 34 x 51-1/2 in.
Footprint (Length x Width)	25-1/2 x 31 in.

Shipping Dimensions

Type	Wood Crate
Content	Machine
Weight	800 lbs.
Length x Width x Height	44 x 39 x 58 in.

Electrical

Power Requirement	230V, 3-Phase, 60 Hz
Full-Load Current Rating	16.5A
Minimum Circuit Size	20A
Connection Type	Cord & Plug
Power Cord Included	Yes
Power Cord Length	120 in.
Power Cord Gauge	12 AWG
Plug Included	Yes
Included Plug Type	L15-20
Switch Type	Control Panel w/Magnetic Switch Protection
Inverter (VFD) Type	Delta ME300
Inverter (VFD) Size	5 HP

Motors

Main

Horsepower	5 HP
Phase	3-Phase
Amps	16.5
Speed	3450 RPM
Type	TEFC Induction
Power Transfer	Belt
Bearings	Shielded & Permanently Lubricated

Main Specifications

Operation Info

Max. Cutter Height	5 in.
Max. Cutter Diameter	7 in.
Spindle Sizes	3/4, 1-1/4 in.
Spindle Lengths	3-7/8, 5-7/8 in.
Exposed Spindle Length	3-7/8, 5-7/8 in.
Spindle Cap. Under the Nut	3-1/2, 5-1/8 in.
Spindle Speeds	5000 - 10,000 RPM
Spindle Travel	4 in.
Spindle Openings	2-1/2, 4-1/8, 5-3/4, 7 in.

Table Info

Number of Table Inserts	3
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Table Counterbore Depth	3/16 in.
Table Size Length	39-1/4 in.
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Table Size Thickness	3-1/4 in.
Floor to Table Height	36-1/4 in.
Table Fence Length	44-1/2 in.
Table Fence Width	1-1/4 in.
Table Fence Height	4-3/4 in.

Miter Gauge Info

Miter Angle	0 - 60 deg. L/R
Miter Gauge Slot Type	T-Slot
Miter Gauge Slot Width	3/4 in.
Miter Gauge Slot Height	3/8 in.

Construction

Table	Precision-Ground Cast Iron
Cabinet	Formed Steel
Fence	Aluminum
Miter Gauge	Aluminum
Guard	Polycarbonate
Spindle Bearings	Sealed & Lubricated
Paint Type/Finish	Enamel

Other

Number of Dust Ports	2
Dust Port Size	4 in.

Other

Country of Origin	Taiwan
Warranty	2 Years
Approximate Assembly & Setup Time	30 Minutes
Serial Number Location	ID Label
Sound Rating	85 dB
ISO 9001 Factory	Yes
Certified by a Nationally Recognized Testing Laboratory (NRTL)	Yes

Understanding Risks of Machinery

Operating all machinery and machining equipment can be dangerous or relatively safe depending on how it is installed and maintained, and the operator's experience, common sense, risk awareness, working conditions, and use of personal protective equipment (safety glasses, respirators, etc.).

The owner of this machinery or equipment is ultimately responsible for its safe use. This responsibility includes proper installation in a safe environment, personnel training and usage authorization, regular inspection and maintenance, manual availability and comprehension, application of safety devices, integrity of cutting tools or accessories, and the usage of approved personal protective equipment by all operators and bystanders.

The manufacturer of this machinery or equipment will not be held liable for injury or property damage from negligence, improper training, machine modifications, or misuse. Failure to read, understand, and follow the manual and safety labels may result in serious personal injury, including amputation, broken bones, electrocution, or death.

The signals used in this manual to identify hazard levels are as follows:

⚠DANGER	***Death or catastrophic harm WILL occur.***	**⚠CAUTION**	***Moderate injury or fire MAY occur.***
⚠WARNING	***Death or catastrophic harm COULD occur.***	***NOTICE***	***Machine or property damage may occur.***

Basic Machine Safety

Owner's Manual: All machinery and machining equipment presents serious injury hazards to untrained users. To reduce the risk of injury, anyone who uses THIS item MUST read and understand this entire manual before starting.

Personal Protective Equipment: Operating or servicing this item may expose the user to flying debris, dust, smoke, dangerous chemicals, or loud noises. These hazards can result in eye injury, blindness, long-term respiratory damage, poisoning, cancer, reproductive harm or hearing loss. Reduce your risks from these hazards by wearing approved eye protection, respirator, gloves, or hearing protection.

Trained/Supervised Operators Only: Untrained users can seriously injure themselves or bystanders. Only allow trained and properly supervised personnel to operate this item. Make sure safe operation instructions are clearly understood. If electrically powered, use padlocks and master switches, and remove start switch keys to prevent unauthorized use or accidental starting.

Guards/Covers: Accidental contact with moving parts during operation may cause severe entanglement, impact, cutting, or crushing injuries. Reduce this risk by keeping any included guards/covers/doors installed, fully functional, and positioned for maximum protection.

Entanglement: Loose clothing, gloves, neckties, jewelry or long hair may get caught in moving parts, causing entanglement, amputation, crushing, or strangulation. Reduce this risk by removing/securing these items so they cannot contact moving parts.

Mental Alertness: Operating this item with reduced mental alertness increases the risk of accidental injury. Do not let a temporary influence or distraction lead to a permanent disability! Never operate when under the influence of drugs/alcohol, when tired, or otherwise distracted.

Safe Environment: Operating electrically powered equipment in a wet environment may result in electrocution; operating near highly flammable materials may result in a fire or explosion. Only operate this item in a dry location that is free from flammable materials.

Electrical Connection: With electically powered equipment, improper connections to the power source may result in electrocution or fire. Always adhere to all electrical requirements and applicable codes when connecting to the power source. Have all work inspected by a qualified electrician to minimize risk.

Disconnect Power: Adjusting or servicing electrically powered equipment while it is connected to the power source greatly increases the risk of injury from accidental startup. Always disconnect power BEFORE any service or adjustments, including changing blades or other tooling.

Secure Workpiece/Tooling: Loose workpieces, cutting tools, or rotating spindles can become dangerous projectiles if not secured or if they hit another object during operation. Reduce the risk of this hazard by verifying that all fastening devices are properly secured and items attached to spindles have enough clearance to safely rotate.

Chuck Keys or Adjusting Tools: Tools used to adjust spindles, chucks, or any moving/rotating parts will become dangerous projectiles if left in place when the machine is started. Reduce this risk by developing the habit of always removing these tools immediately after using them.

Work Area: Clutter and dark shadows increase the risks of accidental injury. Only operate this item in a clean, non-glaring, and well-lighted work area.

Properly Functioning Equipment: Poorly maintained, damaged, or malfunctioning equipment has higher risks of causing serious personal injury compared to those that are properly maintained. To reduce this risk, always maintain this item to the highest standards and promptly repair/service a damaged or malfunctioning component. Always follow the maintenance instructions included in this documentation.

Unattended Operation: Electrically powered equipment that is left unattended while running cannot be controlled and is dangerous to bystanders. Always turn the power ***OFF*** before walking away.

Health Hazards: Certain cutting fluids and lubricants, or dust/smoke created when cutting, may contain chemicals known to the State of California to cause cancer, respiratory problems, birth defects, or other reproductive harm. Minimize exposure to these chemicals by wearing approved personal protective equipment and operating in a well ventilated area.

Difficult Operations: Attempting difficult operations with which you are unfamiliar increases the risk of injury. If you experience difficulties performing the intended operation, STOP! Seek an alternative method to accomplish the same task, ask a qualified expert how the operation should be performed, or contact our Technical Support for assistance.

Additional Shaper Safety

⚠WARNING

Serious cuts, amputation, entanglement, or death can occur from contact with rotating cutter. Cutters or other parts improperly secured to spindle can fly off and strike nearby operators with great force. Flying debris can cause eye injuries or blindness. To minimize risk of getting hurt or killed, anyone operating shaper MUST completely heed hazards and warnings below.

Avoiding Cutter Contact: Keep unused portion of cutter below table. Use smallest table insert possible. Adjust fences and guards as close as practical to cutter, or use zero-clearance fence or box guard. Always keep some type of guard or other protective device between your hands and cutter at all times!

Protect Hands/Fingers: While feeding workpiece, avoid awkward hand positions. Never pass hands directly over, or in front of, cutter. As one hand approaches 6-inch radius point from cutter, move it in arc motion away from cutter, and reposition it on outfeed side.

Feeding Workpiece: To reduce risk of accidental cutterhead contact, always use push blocks or some type of fixture, jig, or hold-down device to safely feed workpiece while cutting. Use outfeed support table if shaping long workpieces to ensure proper support throughout entire cutting procedure. ALWAYS feed workpiece AGAINST rotation of cutter. NEVER start shaper with workpiece contacting cutter!

Safety Guards: To reduce risk of unintentional contact with cutter, always ensure included cutter guard, or properly dimensioned box guard, or some other type of guard is installed and correctly positioned before operation.

Workpiece Condition: Shaping workpiece with knots, holes, or foreign objects increases risk of kickback and cutter damage/breakage. Thoroughly inspect and prepare workpiece before shaping. Always "square up" workpiece before shaping or flatten workpiece edges with jointer or planer. Rough, warped, or wet workpieces increase risk of kickback.

Cutter Positioning: Whenever possible, make shaping cuts with cutter on underside of workpiece to reduce operator exposure to cutter.

Small Workpieces: There is a high risk of accidental cutter contact with small workpieces, because they are closer to cutter and more difficult to control. To reduce risk, only feed small workpieces using jigs or holding fixtures that allow hands to stay safely away from cutter. When possible, shape longer stock and cut to size.

Safe Cutter Clearances: Operator or bystanders may be hit by flying debris if cutter contacts fence, guard, or table insert upon startup. Always ensure any cutter setup has proper cutter rotational clearance before startup.

Safe Cutter Installation: Improperly secured knives/inserts, cutters, or rub collars may become dangerous projectiles if they come loose. Always ensure keyed washer is directly under cap screw and cap screw is very secure. If spindle does not use a keyed washer, always tighten two spindle nuts together, and ensure BOTH are very secure. Never use cutters/bits rated for an RPM lower than spindle speed.

Avoiding Climb Cuts: Feeding workpiece in same direction of cutter rotation is a "climb cut." Climb cutting can aggressively pull workpiece—and hands—into cutter. Always first verify direction of cutter rotation before starting, and always feed workpiece AGAINST cutter rotation.

Cutting Depth: Never attempt to remove too much material in one pass. Doing this increases risk of kickback. Instead, make several light passes—this is a safer way to cut and it leaves a cleaner finish.

Contour Shaping: To reduce risk of unintentional cutter contact while freehand shaping or using rub collar as guide, always use overhead or "ring" type guard. To reduce kickback risk, always use starting pin or pivot board when starting cut. NEVER start shaping at a corner!

Preparation Overview

The purpose of the preparation section is to help you prepare your machine for operation. The list below outlines the basic process. Specific steps for each of these points will be covered in detail later in this section.

The typical preparation process is as follows:

1. Unpack the machine and inventory the contents of the box/crate.
2. Clean the machine and its components.
3. Identify an acceptable location for the machine and move it to that location.
4. Level the machine and either bolt it to the floor or place it on mounts.
5. Assemble the loose components and make any necessary adjustments or inspections to ensure the machine is ready for operation.
6. Connect the machine to the power source.
7. Test run the machine to make sure it functions properly and is ready for operation.

⚠WARNING

Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to decrease the risk of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

⚠CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so may result in serious personal injury or property damage.

Required for Setup

The items listed below are required to successfully set up and prepare this machine for operation.

For Lifting

- A forklift or other power lifting device rated for the weight of the machine.
- Lifting Straps or Chain (rated for at least 1000 lbs.)

For Power Connection

- A power source that meets the minimum circuit requirements for this machine. (Refer to the **Power Supply Requirements** section for details.)
- A qualified electrician to ensure a safe and code-compliant connection to the power source.

For Assembly

- Disposable Rags
- Cleaner/Degreaser
- Safety Glasses
- Disposable Gloves
- Straightedge 12"
- Socket or Wrench $^{13}/_{16}$"
- Precision Level
- Dust Collection System
- Dust Hose 4"
- Hose Clamp 4"

Power Supply Requirements

Availability

Before installing the machine, consider the availability and proximity of the required power supply circuit. If an existing circuit does not meet the requirements for this machine, a new circuit must be installed.

To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring must be done by an electrician or qualified service personnel in accordance with applicable electrical codes and safety standards.

⚠WARNING

Electrocution or fire may occur if machine is not correctly grounded and attached to the power supply. Use a qualified electrician to ensure a safe power connection.

Full-Load Current Rating

The full-load current rating is the amperage a machine draws at 100% of the rated output power. On machines with multiple motors, this is the amperage drawn by the largest motor or sum of all motors and electrical devices that might operate at one time during normal operations.

Full-Load Rating (SB1119)..... 20 Amps
Full-Load Rating (SB1120)..... 16.5 Amps

The full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating.

If the machine is overloaded for a sufficient length of time, damage, overheating, or fire may result—especially if connected to an undersized circuit. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements in the following section.

Circuit Information

A power supply circuit includes all electrical equipment between the main breaker box or fuse panel in your building and the incoming power connections inside the machine. This circuit must be safely sized to handle the full-load current that may be drawn from the machine for an extended period of time. (If this machine is connected to a circuit protected by fuses, use a time delay fuse marked D.)

⚠CAUTION

For your own safety and protection of property, consult an electrician if you are unsure about wiring practices or applicable electrical codes.

Note: The circuit requirements in this manual are for a dedicated circuit—where only one machine will be running at a time. If this machine will be connected to a shared circuit where multiple machines will be running at the same time, consult a qualified electrician to ensure the circuit is properly sized.

Grounding Requirements

This machine must be grounded! In the event of certain types of malfunctions or breakdowns, grounding provides a path of least resistance for electric current in order to reduce the risk of electric shock.

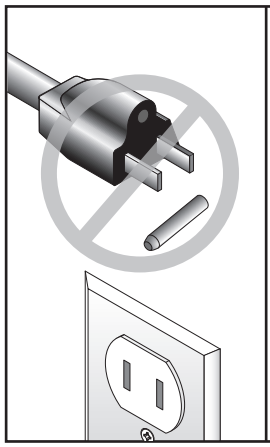
Improper connection of the equipment-grounding wire can result in a risk of electric shock. The wire with green insulation (with or without yellow stripes) is the equipment-grounding wire. If repair or replacement of the power cord or plug is necessary, do not connect the equipment-grounding wire to a live (current carrying) terminal.

Check with an electrician or qualified service personnel if you do not understand these grounding requirements, or if you are in doubt about whether the tool is properly grounded.

If you ever notice that a cord or plug is damaged or worn, disconnect it from power, and immediately replace it with a new one.

⚠WARNING

Serious injury could occur if you connect the machine to power before completing the setup process. DO NOT connect to power until instructed later in this manual.



⚠CAUTION

DO NOT modify the included plug or use an adapter if it will not fit your receptacle. Instead, have a qualified electrician install the proper receptacle on a power supply circuit that is grounded and meets the requirements for this machine.

SB1119 Circuit Requirements

This machine is prewired to operate on a power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage 208V/220V/230V/240V
Cycle ..... 60 Hz
Phase ..... Single-Phase
Circuit Rating ..... 20 Amps
Plug/Receptacle (included) ..... NEMA 6-20

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug (similar to the figure below). The plug must only be inserted into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances.

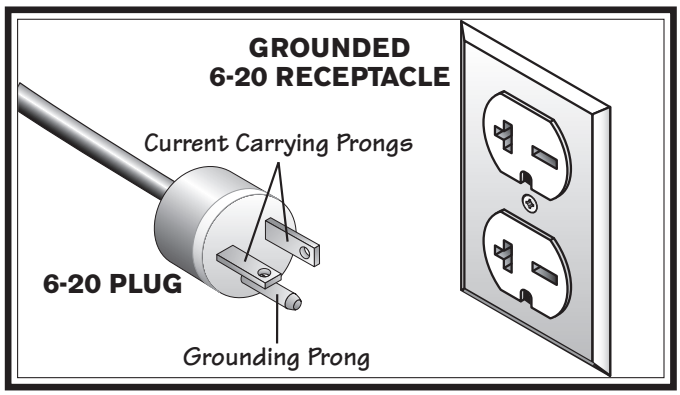


Figure 10. NEMA 6-20 plug and receptacle.

SB1120 Circuit Requirements

This machine is prewired to operate on a power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage 208V/220V/230V/240V
Cycle ..... 60 Hz
Phase 3-Phase
Circuit Rating ..... 20 Amps
Plug/Receptacle (included) ..... NEMA L15-20

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug (similar to the figure below). The plug must only be inserted into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances.

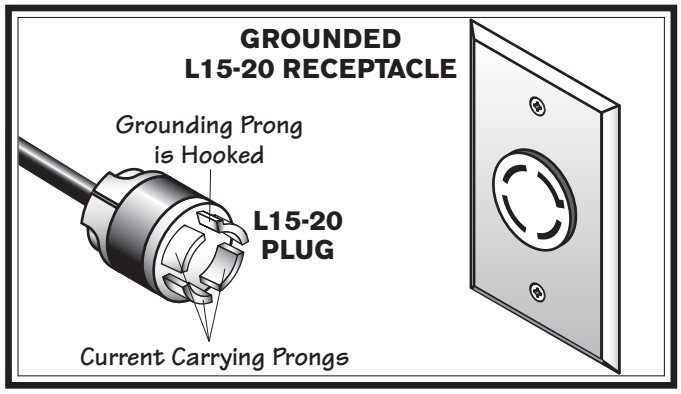


Figure 11. NEMA L15-20 plug and receptacle.

Extension Cords

We do not recommend using an extension cord with this machine. If you must use one, only use it if absolutely necessary and only on a temporary basis.

Extension cords cause voltage drop, which may damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the gauge size gets smaller (higher gauge numbers indicate smaller sizes).

Any extension cord used with this machine must contain a ground wire, match the required plug and receptacle listed in the **Circuit Requirements** for the applicable voltage, and meet the following requirements:

Minimum Gauge Size ..... 10 AWG
Maximum Length (Shorter is Better) ..... 50 ft.

Unpacking

This item was carefully packaged to prevent damage during transport. If you discover any damage, please immediately call Customer Service at (360) 734-1540 for advice. You may need to file a freight claim, so save the containers and all packing materials for possible inspection by the carrier or its agent.

Inventory

Inventory (Figure 12)		Qty
A.	Shaper (Not Shown)	1
B.	Spindle 1¼" w/Spacers	1
C.	Spindle ¾" w/Spacers	1
D.	Drawbar	1
E.	Starting Pin	1
F.	Combo Screwdriver #1, ¼"	1
G.	Hex Wrenches 3, 6mm	1 Ea.
H.	Spindle Wrench 50mm	1
I.	Open-End Wrench 22 x 24mm	1
J.	Open-End Wrench 14 x 17mm	1
K.	Miter Gauge	1

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.

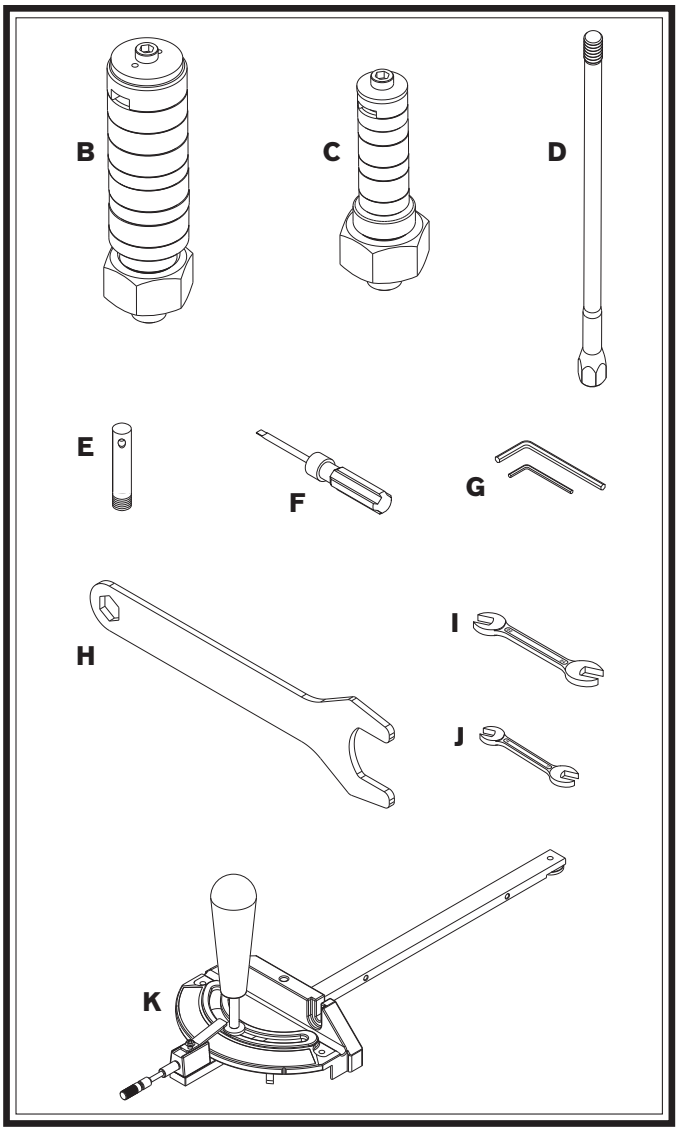


Figure 12. Inventory.

Cleaning & Protecting

The unpainted surfaces are coated at the factory with a heavy-duty rust preventative that prevents corrosion during shipment and storage. The benefit of this rust preventative is that it works very well. The downside is that it can be time-consuming to thoroughly remove.

Be patient and do a careful job when cleaning and removing the rust preventative. The time you spend doing this will reward you with smooth-sliding parts and a better appreciation for the proper care of the unpainted surfaces.

Although there are many ways to successfully remove the rust preventative, the following process works well in most situations.

Before cleaning, gather the following:

- Disposable rags
- Cleaner/degreaser (certain citrus-based degreasers work extremely well and they have non-toxic fumes)
- Safety glasses & disposable gloves

Note: *Automotive degreasers, mineral spirits, or WD•40 can be used to remove rust preventative. Before using these products, though, test them on an inconspicuous area of a painted surface to make sure they will not damage it.*

⚠WARNING

Gasoline and petroleum products have low flash points and can explode or cause fire if used for cleaning. Avoid using these products to remove rust preventative.

⚠CAUTION

Many cleaning solvents are toxic if inhaled. Minimize your risk by only using these products in a well ventilated area.

NOTICE

Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.

Basic steps for removing rust preventative:

1. Put on safety glasses and disposable gloves.

2. Coat all surfaces that have rust preventative with a liberal amount of your cleaner or degreaser and let them soak for a few minutes.

3. Wipe off the surfaces. If your cleaner or degreaser is effective, the rust preventative will wipe off easily.

   Note: *To clean off thick coats of rust preventative on flat surfaces, such as beds or tables, use a PLASTIC paint scraper to scrape off the majority of the coating before wiping it off with your rag. (Do not use a metal scraper or it may scratch the surface.)*

4. Repeat **Steps 2–3** as necessary until clean, then coat all unpainted surfaces with a quality metal protectant or light oil to prevent rust.

T23692—Orange Power Degreaser

A great product for removing the waxy shipping grease from the ***non-painted*** parts of the machine during clean up.

Order online at www.grizzly.com OR Call 1-800-523-4777

Figure 13. T23692 Orange Power Degreaser.

Location

Physical Environment

The physical environment where your machine is operated is important for safe operation and longevity of parts. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous or flammable chemicals, airborne abrasives, or extreme conditions. Extreme conditions for this type of machinery are generally those where the ambient temperature is outside the range of 41°–104°F; the relative humidity is outside the range of 20–95% (non-condensing); or the environment is subject to vibration, shocks, or bumps.

Electrical Installation

Place this machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure to leave access to a means of disconnecting the power source or engaging a lockout/tagout device.

Lighting

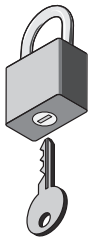
Lighting around the machine must be adequate enough to perform operations safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.

Weight Load

Refer to the **Machine Specifications** for the weight of your machine. Make sure that the surface upon which the machine is placed will bear the weight of the machine, additional equipment that may be installed on the machine, and the heaviest workpiece that will be used. Additionally, consider the weight of the operator and any dynamic loading that may occur when operating the machine.

Space Allocation

Consider the largest size of workpiece that will be processed through this machine and provide enough space around the machine for adequate operator material handling or the installation of auxiliary equipment. With permanent installations, leave enough space around the machine to open or remove doors/covers as required by the maintenance and service described in this manual.



⚠CAUTION

Children or untrained people may be seriously injured by this machine. Only install in an access restricted location.

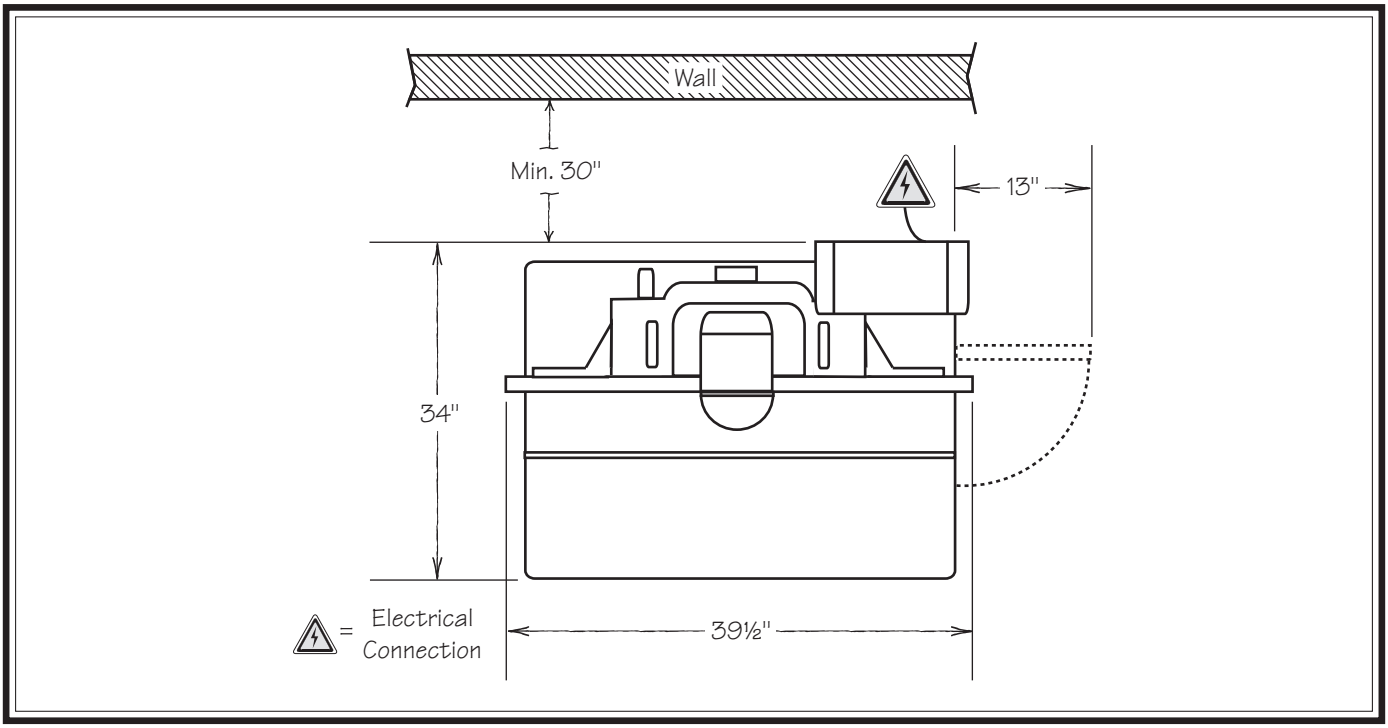
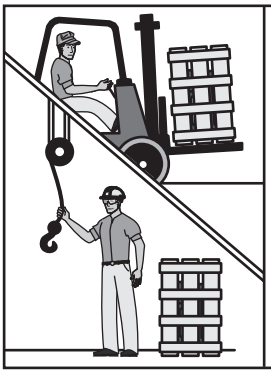


Figure 14. Minimum working clearances.

Lifting & Moving



⚠WARNING

This machine and its parts are heavy! Serious personal injury may occur if safe moving methods are not used. To reduce the risk of a lifting or dropping injury, ask others for help and use power equipment.

The Model SB1119/SB1120 can be lifted with one of the following methods:

- **Lifting Straps & Safety Hooks:** Connect two safety hooks to chains or web straps that are capable of securely hooking underneath the table edge at the locations shown in **Figure 15**. Then attach the chains or web straps to a center safety chain secured to the power lifting equipment.

- **Forklift Forks:** Position the forks under the table and close to the cabinet (see **Figure 15**). Use cardboard to protect the table and cabinet from the forks.

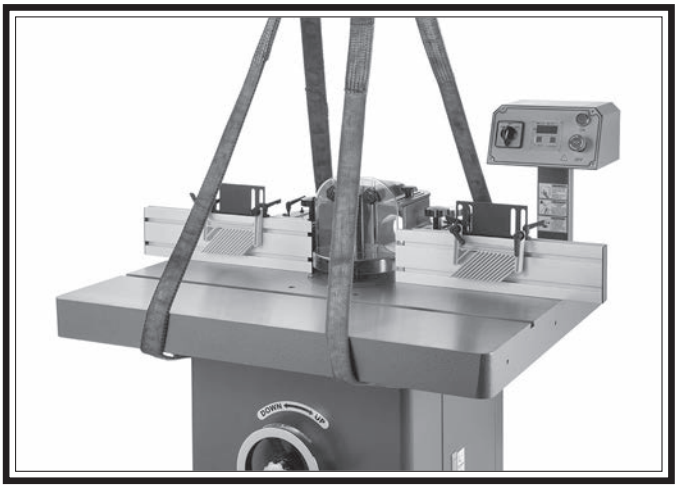


Figure 15. Lifting location example.

Assembly

The machine must be fully assembled before it can be operated. Before beginning the assembly process, refer to **Required for Setup** on **Page 13** and gather all listed items. To ensure the assembly process goes smoothly, first clean any parts that are covered or coated in heavy-duty rust preventative (if applicable).

Assembly of the Model SB1119/SB1120 consists of checking the table insert flushness, assembling the spindle and drawbar, and leveling the machine

⚠WARNING

Incorrect assembly of spindle and drawbar can cause the spindle and cutter to fly off machine, causing injury or death. Make certain spindle is properly assembled before operating machine. If you are uncertain of any aspect of assembly, please review instructions again or contact customer service.

To assemble machine:

1. Remove (2) inner inserts from table opening (see **Figure 16**).

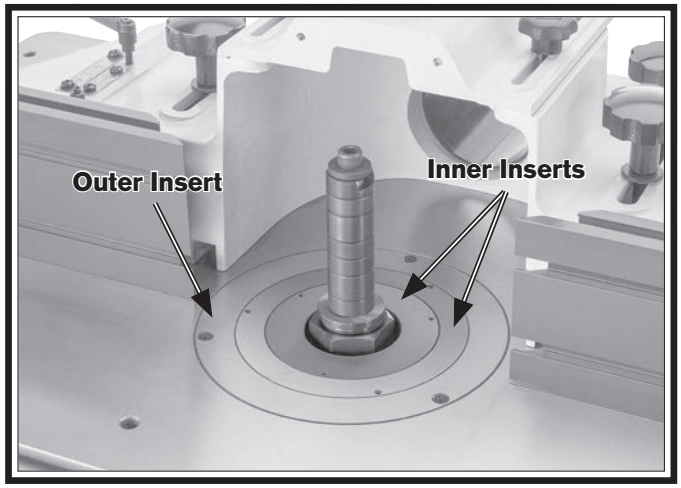


Figure 16. Location of two inner inserts (front cutter guard removed for clarity).

2. Lay straightedge across outer insert and table surface in pattern shown in **Figure 17**.

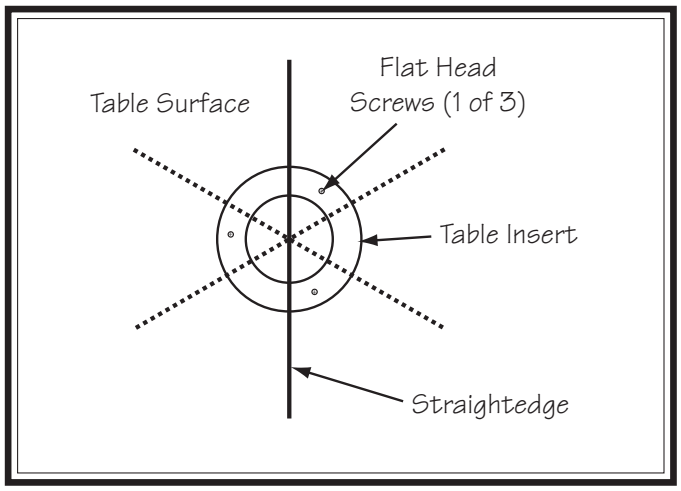


Figure 17. Straightedge and surface pattern.

3. Adjust flat head screws so ends of straightedge lay flat on table surface at all positions of pattern above.

IMPORTANT: *Table insert and surface must be aligned evenly to ensure workpiece does not catch on table insert or surface and kick back.*

4. Open cabinet door.

5. Unlock spindle seat by pulling spindle assembly lock handle and turning $^1/_4$ turn (see **Figure 18**). Turn V-belt and pulleys until you hear a click.

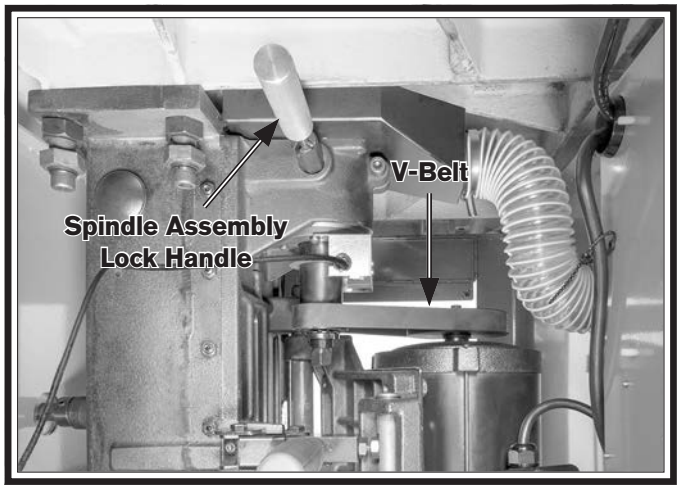


Figure 18. Location of spindle lock components.

6. Insert spindle base into spindle cartridge (see **Figure 19**). Thread spindle nut onto cartridge approximately 1 turn.

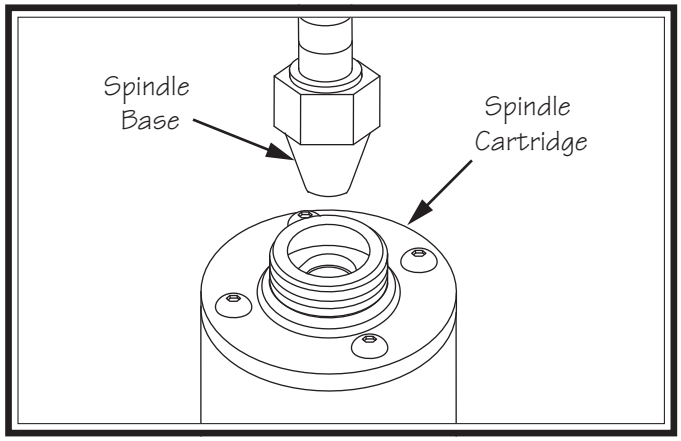


Figure 19. Inserting spindle into place.

7. Insert drawbar into bottom of spindle base assembly, up through spindle pulley and assembled parts, and rotate approximately 10-15 turns (see **Figure 20**).

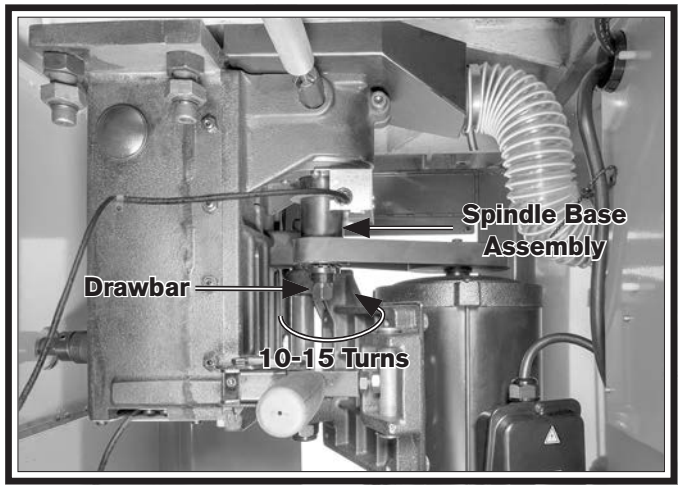


Figure 20. Drawbar inserted into bottom of spindle base assembly.

⚠CAUTION

Make sure spindle and drawbar are aligned and properly seated before tightening drawbar nut. Improper assembly can create an unsafe condition and possible injury to operator and bystanders.

8. Secure spindle nut with spindle wrench and tighten drawbar nut (see **Figure 21**). **DO NOT** use excessive force.

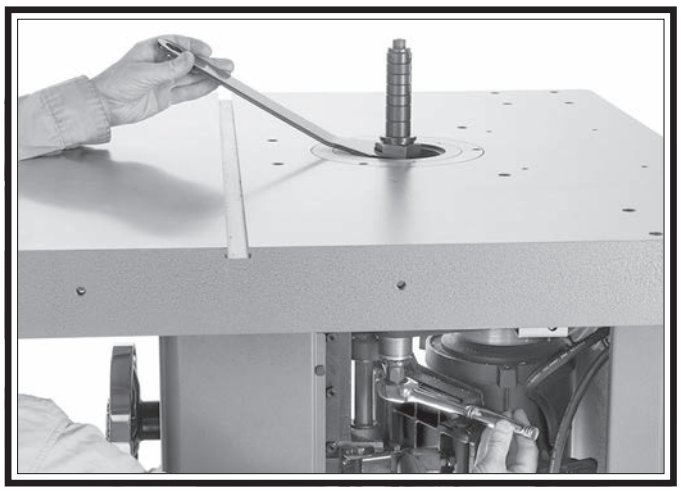


Figure 21. Tightening drawbar nut (guard/fence assembly removed for clarity).

9. Lock spindle seat by returning spindle assembly lock handle to original position. Spindle should rotate freely in both directions.

10. Using precision level, adjust machine feet until table is level (see **Figure 22**).

Figure 22. Location of machine feet.

Dust Collection

⚠CAUTION

This machine creates a lot of wood chips/ dust during operation. Breathing airborne dust on a regular basis can result in permanent respiratory illness. Reduce your risk by wearing a respirator and capturing the dust with a dust-collection system.

Recommended CFM: 400 CFM at Each Port
Do not confuse this CFM recommendation with the rating of the dust collector. To determine the CFM at the dust port, you must consider these variables: (1) CFM rating of the dust collector, (2) hose type and length between the dust collector and the machine, (3) number of branches or wyes, and (4) amount of other open lines throughout the system. Explaining how to calculate these variables is beyond the scope of this manual. Consult an expert or purchase a good dust collection "how-to" book.

To connect dust collection system to machine:

1. Fit 4" dust hose connected to dust collector over each dust port and secure each in place with hose clamp (see **Figure 23**).

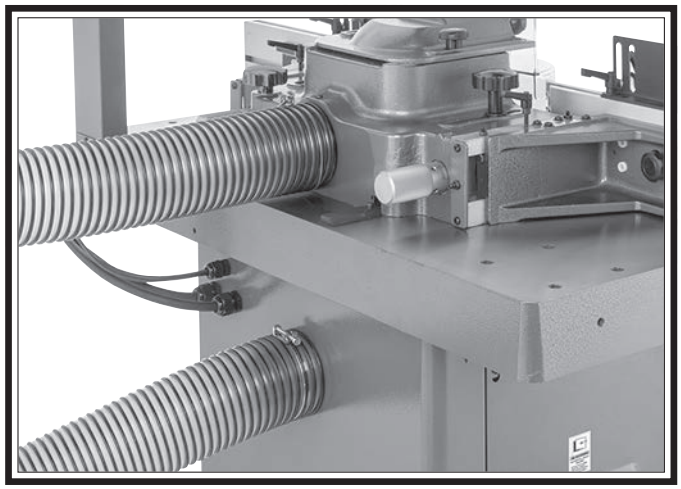


Figure 23. Example of dust hoses attached to ports.

2. Tug hoses to make sure they do not come off.

Note: *A tight fit is necessary and ensures proper performance during operation.*

Test Run

After all preparation steps have been completed, the machine and its safety features must be tested to ensure correct operation. If you discover a problem with the operation of the machine or its safety components, do not operate it further until you have resolved the problem.

Note: *Refer to* ***Troubleshooting*** *on* ***Page 59*** *for solutions to common problems that may occur. If you need additional help, contact our Tech Support at (360) 734-1540.*

The test run consists of verifying the following:

- Motor powers up and runs correctly.
- Spindle rotates in correct direction (SB1120 only).
- STOP button disables the machine properly.

⚠WARNING

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, machine until the information is understood.

⚠WARNING

DO NOT start machine until all preceding setup instructions have been performed. Operating an improperly set up machine may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

To test run machine:

1. Clear away all tools and objects used during preparation and assembly.

2. Press STOP button (see **Figure 24**).

3. Turn RPM adjustment knob all the way counterclockwise (see **Figure 24**).

4. Turn FOR/REV switch to OFF position (see **Figure 24**).

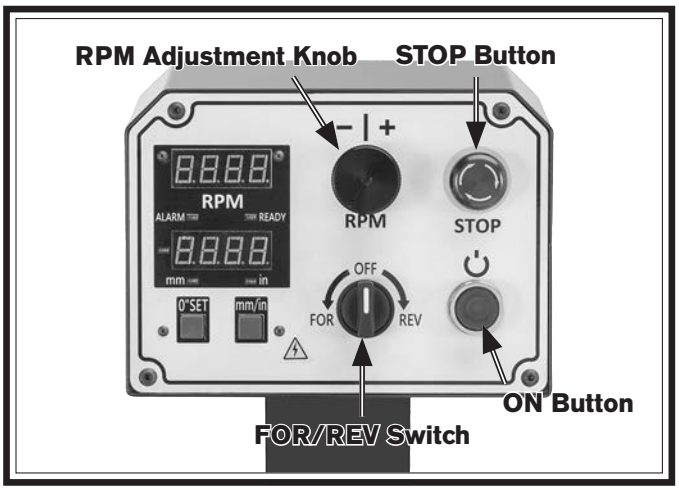


Figure 24. Control panel controls.

5. Connect machine to power.

6. Twist STOP button clockwise until it springs out (see **Figure 25**). This resets the switch so machine can start.

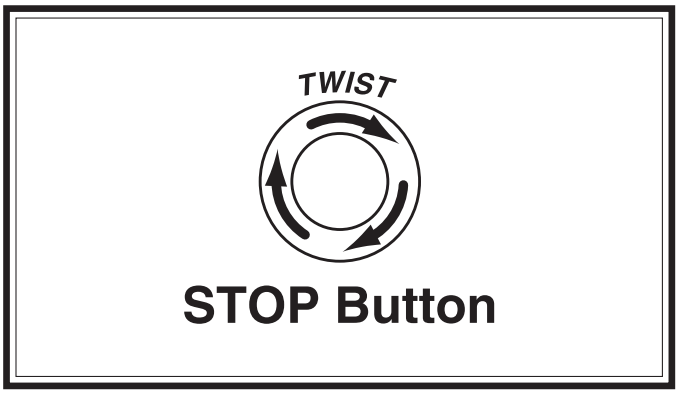


Figure 25. Resetting the switch.

7. Press ON button to turn machine ***ON*** (see **Figure 24**).

8. Turn FOR/REV switch to FOR position (see **Figure 24**). Verify motor starts up and runs smoothly without any unusual problems or noises.

   — **For SB1119:** Proceed to **Step 14**.

— **For SB1120:** Verify spindle rotates counterclockwise when viewed from above. If spindle rotates counterclockwise, power supply polarity is correct, proceed to **Step 14**. If spindle rotates clockwise, proceed to **Step 9** to correct polarity.

9. Turn FOR/REV switch to OFF position and allow spindle to come to a complete stop (see **Figure 24**).

10. DISCONNECT MACHINE FROM POWER!

11. Remove (4) Phillips head screws and electrical box shown in **Figure 26**).

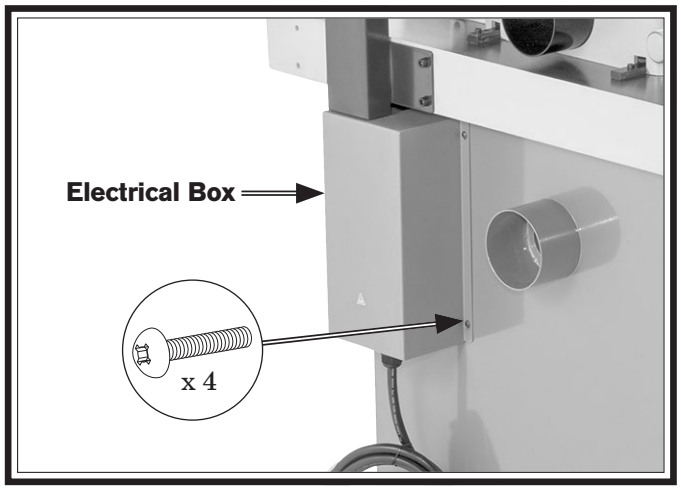


Figure 26. Location of electrical box and Phillips head screws.

12. Swap red wire connected to L1/1 terminal with blue wire connected to L2/3 terminal on contactor (see **Figure 27**).

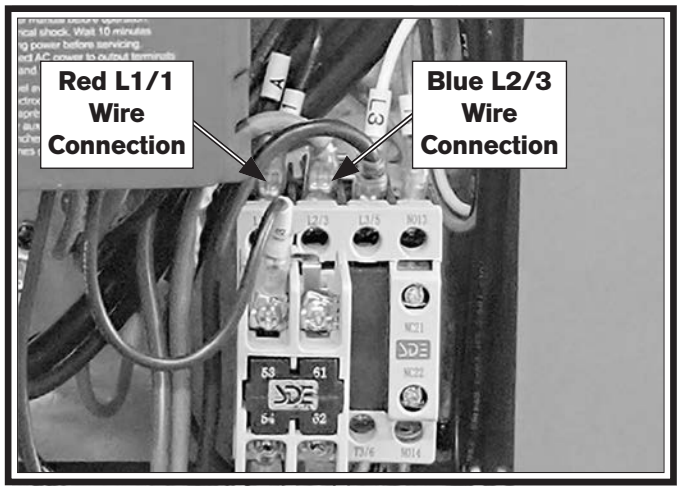


Figure 27. Power supply wire terminals.

13. Install electrical box and screws removed in **Step 10**, and reconnect machine to power before proceeding to **Step 15**.

14. Turn FOR/REV switch to OFF position and allow spindle to come to a complete stop (see **Figure 28**).

15. Turn FOR/REV switch to REV position. Verify motor starts up and runs smoothly without any unusual problems or noises (see **Figure 28**).

16. Verify speed controls by slowly turning RPM adjustment knob clockwise (see **Figure 28**). Rotate dial back and forth to test variable-speed function.

17. Press STOP button to turn machine ***OFF*** (see **Figure 28**).

18. WITHOUT resetting STOP button, try to start machine by pressing the ON button (see **Figure 28**). The machine should not start.

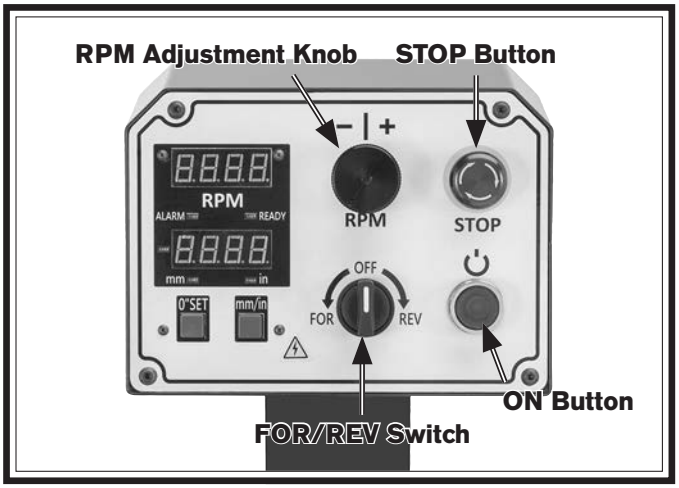


Figure 28. Control panel controls.

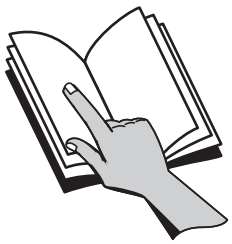
— If machine *does not* start, safety feature of STOP button is working correctly. Congratulations! Test run is complete.

— If machine *does* start, immediately turn it ***OFF*** and disconnect power. Safety feature of STOP button is NOT working properly and must be replaced before further using machine. Contact Technical Support.

Operation Overview

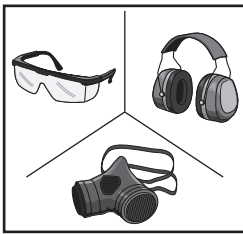
The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so they can more easily understand the controls discussed later in this manual.

Note: *Due to the generic nature of this overview, it is not intended to be an instructional guide for performing actual machine operations. To learn more about specific operations and machining techniques, seek training from people experienced with this type of machine, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.*



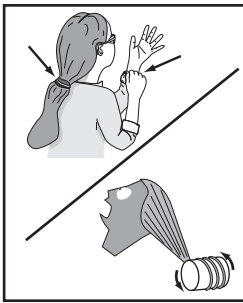
⚠WARNING

To reduce the risk of serious injury when using this machine, read and understand this entire manual before beginning any operations.



⚠WARNING

To reduce risk of short and long term injury, wear eye, ear, and lung protection when using this machine.



⚠WARNING

Keep hair, clothing, and jewelry away from moving parts at all times. Entanglement can result in death, amputation, or severe crushing injuries!

NOTICE

If you are not experienced with this type of machine, WE STRONGLY RECOMMEND that you seek additional training outside of this manual. Read books/magazines or get formal training before beginning any projects. Regardless of the content in this section, South Bend Tools will not be held liable for accidents caused by lack of training.

To complete a typical operation, the operator does the following:

1. Examines the workpiece to make sure it is suitable for cutting.
2. Installs cutter onto spindle and adjusts spindle height for operation.
3. Correctly adjusts cutter guard and fence for operation and locks them in place.
4. Checks outfeed side of machine for proper support and to make sure workpiece can safely move past cutter without interference.
5. Places workpiece on infeed side of machine and stabilizes it with featherboards, jigs, or other safety workpiece holding devices.
6. Removes any clothing, apparel, or jewelry that may become entangled in shaper.
7. Ensures RPM adjustment knob is turned all the way counterclockwise and FOR/REV switch is in the OFF position.
8. Turns machine ***ON***.
9. Verifies cutter rotation and feed directions.
10. Sets spindle speed for operation.
11. Feeds workpiece through cut while maintaining firm pressure on workpiece against both table and fence, while always keeping hands and fingers out of the cutting path.
12. Turns machine ***OFF***.

Workpiece Inspection

Some workpieces are not safe to cut or may require modification before they are safe to cut.

Before cutting, inspect all workpieces for the following:

- **Material Type:** This machine is intended for cutting natural and man-made wood products, laminate covered wood products, and some plastics. Cutting drywall or cementitious backer board creates extremely fine dust and may reduce the life of the bearings. This machine is NOT designed to cut metal, glass, stone, tile, etc.; cutting these materials may lead to injury.

- **Foreign Objects:** Nails, staples, dirt, rocks and other foreign objects are often embedded in wood. While cutting, these objects can become dislodged and hit the operator, cause kickback, or break the blade, which might then fly apart. Always visually inspect your workpiece for these items. If they cannot be removed, DO NOT cut the workpiece.

- **Large/Loose Knots:** Loose knots can become dislodged during the cutting operation. Large knots can cause kickback and machine damage. Choose workpieces that do not have large/loose knots or plan ahead to avoid cutting through them.

- **Wet or "Green" Stock:** Cutting wood with a moisture content over 20% causes unnecessary wear on the blades, increases the risk of kickback, and yields poor results.

- **Excessive Warping:** Workpieces with excessive cupping, bowing, or twisting are dangerous to cut because they are unstable and often unpredictable when being cut. DO NOT use workpieces with these characteristics!

- **Minor Warping:** Workpieces with slight cupping can be safely supported if the cupped side is facing the table or the fence. On the contrary, a workpiece supported on the bowed side will rock during a cut and could cause kickback or severe injury.

Using Featherboards

Featherboards are used to hold the workpiece flat on the table and snug against the fence. The Model SB1119/SB1120 includes two fence featherboards: one for infeed and one for outfeed. An arrow on each featherboard indicates the direction of workpiece travel.

Using Fence Featherboards

Fence featherboards come pre-installed, allowing table clearance between 1" and 5¾". Position infeed and outfeed featherboards to fully support the workpiece throughout the cut.

To adjust featherboards closer to or farther from the cutter, loosen position lock handles, adjust, then tighten (see **Figure 29**).

To adjust featherboards closer to or farther from the table, loosen height lock handles, adjust, then tighten (see **Figure 29**).

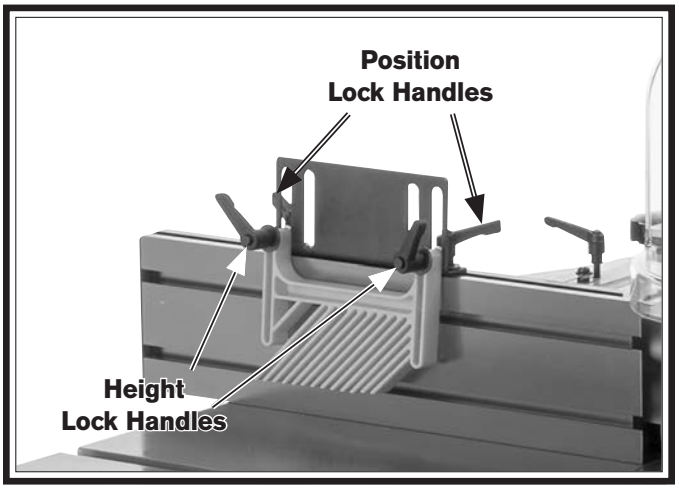


Figure 29. Featherboard controls and components.

Changing Featherboard Clearance Range

For 0"–2¾" clearance, you can remove the featherboard from the L-bracket it comes installed on and install it directly on the fence face.

To change featherboard clearance range:

1. Remove hardware securing featherboard to L-bracket (see **Figure 30**).

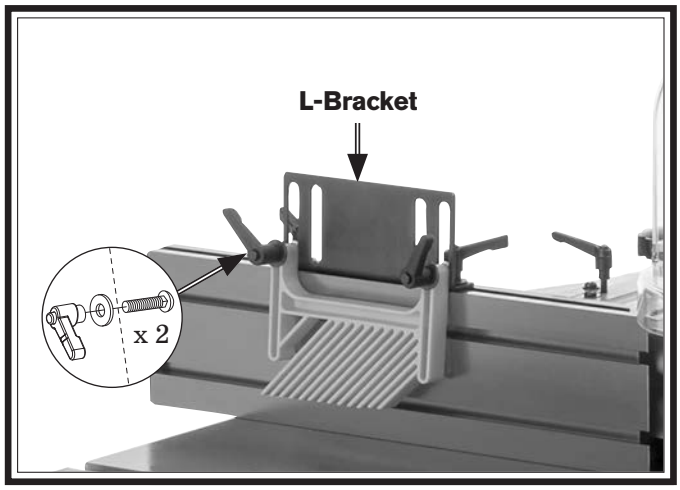


Figure 30. L-bracket and securing hardware.

2. Install hardware removed in **Step 1** to featherboard, then slide carriage bolts into upper T-slot on fence face (see **Figure 31**).

Figure 31. Example of featherboard installed on fence face.

Changing Cutter Rotation

The Model SB1119/SB1120 is equipped with a FOR/REV (forward/reverse) switch, as shown in **Figure 32**. In most cases, the shaper should run in the FOR direction.

Figure 32. Location of FOR/REV switch.

⚠CAUTION

Incorrectly feeding stock—feeding WITH rotation of cutter—creates potentially uncontrollable feed situation that may pull stock from hands and draw hands into cutter. Always check direction of cutter rotation before any shaping operation. Always feed stock opposite to cutter rotation.

Most cutters are designed to rotate counterclockwise and mill the stock from underneath, keeping the cutter away from the operator and preventing tearout.

Some cutters are designed to shape the top of the workpiece. However, this method creates a hazard to the operator. Using the FOR/REV switch, you can mount the cutter upside down, reverse the feed direction and cutter rotation, and mill the workpiece safely from the bottom.

Changing Spindle Speed

The spindle speed on your shaper is controlled by the RPM adjustment knob and displayed on the digital readout screen (see **Figure 33**). Turning the knob clockwise will increase the speed while turning it counterclockwise will decrease the speed.

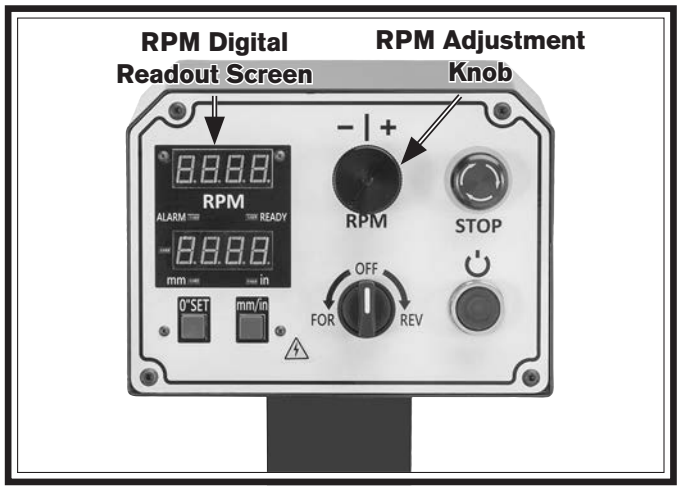


Figure 33. Location of RPM adjustment knob.

Here are some tips to keep in mind when selecting a speed for your workpiece:

- Use scrap stock to find the right cutter speed and feed rate so the resulting cut is smooth and requires very little sanding to finish.
- Reduce cutter speed or feed rate if your workpiece becomes glazed or burned.
- Increase cutter speed or feed rate if your workpiece shows a rough or washboard-like surface.
- Use slower speeds for larger cutters because the knives on the outside of the cutter rotate faster on larger cutters than on smaller cutters for the same spindle speed (see **Figure 34**).

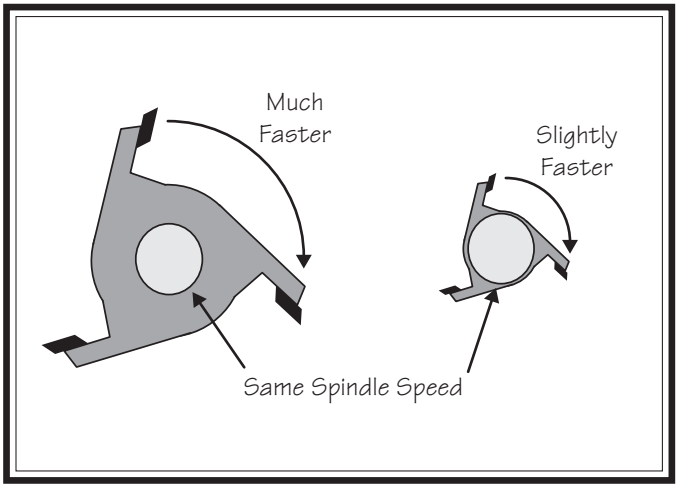


Figure 34. Relative speeds of cutter knives at the same spindle speed.

Note: *Since the cutter is mounted on the spindle, the terms "spindle speed" and "cutter speed" are often used interchangeably.*

Adjusting Cutterhead Guard

The cutterhead guard protects the user from exposure to the cutter and chips thrown by it. To minimize the risk of injury, the guard must be adjusted so it encloses as much of the spindle area as possible, while still allowing the workpiece to pass through the cut. Typically, this means the guard is positioned to just clear the top of the workpiece.

To adjust cutterhead guard:

1. DISCONNECT MACHINE FROM POWER!
2. Loosen guard position lock knobs, adjust guard forward or backward as needed, and tighten knobs (see **Figure 35**).
3. Loosen guard height lock knobs, adjust front guard up or down, and tighten knobs (see **Figure 35**).

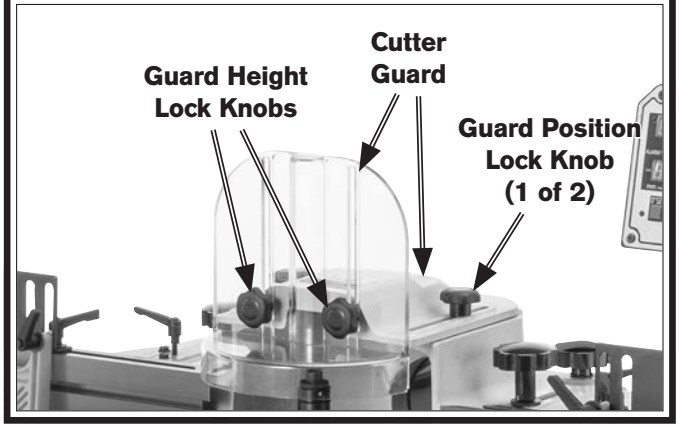


Figure 35. Guard position adjustment components.

⚠WARNING

All guards MUST be installed on shaper before operation. Shapers can quickly cause serious injury if some kind of guard is not used. To reduce risk of injury, read and follow entire Owner's Manual carefully and do research on shop-made guards and safety jigs.

Note: *To make your own box guard, see **Making Box Guards** on **Page 43** to find instructions and tips.*

Installing Cutters

Large cutters (3½" or greater) must be operated at a lower speed than smaller cutters. Cutters are advertised with and should not exceed their rated RPM. Always use the largest spindle size possible, and never use a cutter bore more than one size larger than the spindle size.

Tools Needed	Qty
Spindle Wrench 50mm	1
Hex Wrench 8mm	1

To install a cutter:

1. DISCONNECT MACHINE FROM POWER!
2. Raise cutter guard out of the way, and raise spindle to maximum height.
3. Remove spindle cap screw, two-piece keyed washer, and any unneeded spacers (see **Figure 36**).
4. Place cutter on spindle (see **Figure 36**). Make sure cutter rotation will be correct for application.
5. Use spacers to suit your particular application (see **Figure 36**).
6. Place spindle two-piece keyed washer above cutter and spacers, and secure with cap screw (see **Figure 36**).

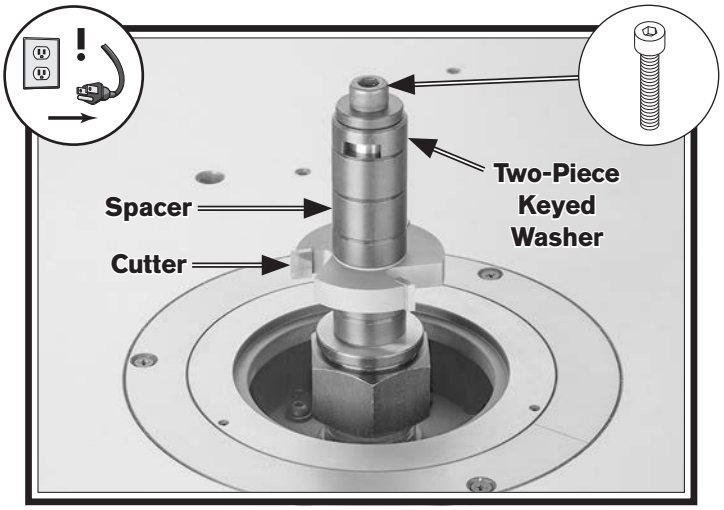


Figure 36. Typical cutter and fasteners installed.

7. Tighten cap screw with hex wrench while holding spindle stationary with spindle wrench (see **Figure 37**).

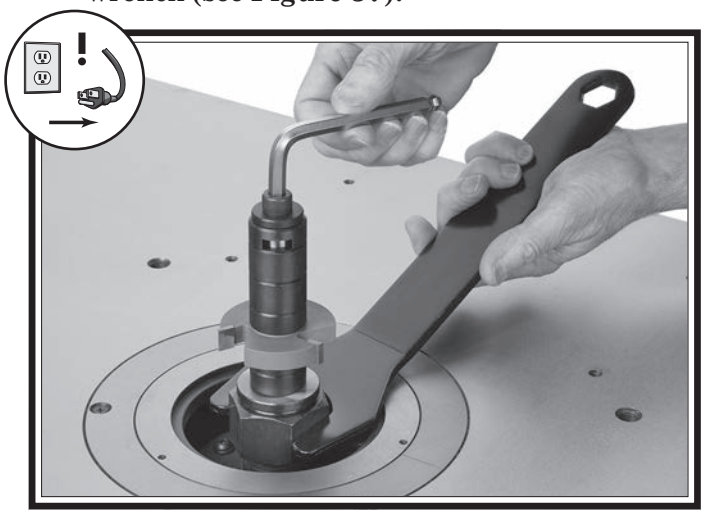


Figure 37. Tightening spindle cap screw.

8. Lower spindle to desired height and adjust cutter guard for operation.

Using Push Sticks

When used correctly, push sticks reduce the risk of injury by keeping hands away from the cutter. In the event of an accident, a push stick can absorb damage that would have otherwise happened to hands or fingers. Use push sticks whenever your hands will get within 12" of the cutter. To make your own push sticks, refer to **Making Push Sticks** on **Page 42**. To maintain control when shaping large workpieces, start by feeding with your hands then use push sticks to finish the operation, so your hands are not on the end of the workpiece as it passes through the cutter.

Feeding: Place the notched end of the push stick against the end of the workpiece (see **Figure 38**), and move the workpiece into the cutter with steady downward and forward pressure.

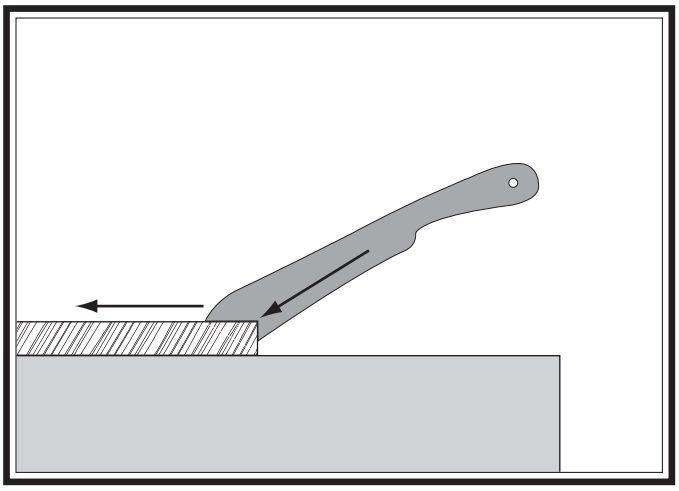


Figure 38. Side view of push stick in use.

Supporting: A second push stick can be used to keep the workpiece firmly against the fence while cutting (see **Figure 39**). When using this method, only apply pressure against the fence before the cutter; otherwise, pushing the workpiece against or behind the cutter will increase the risk of kickback (see "Supporting Push Stick Prohibition Zone" in **Figure 39**).

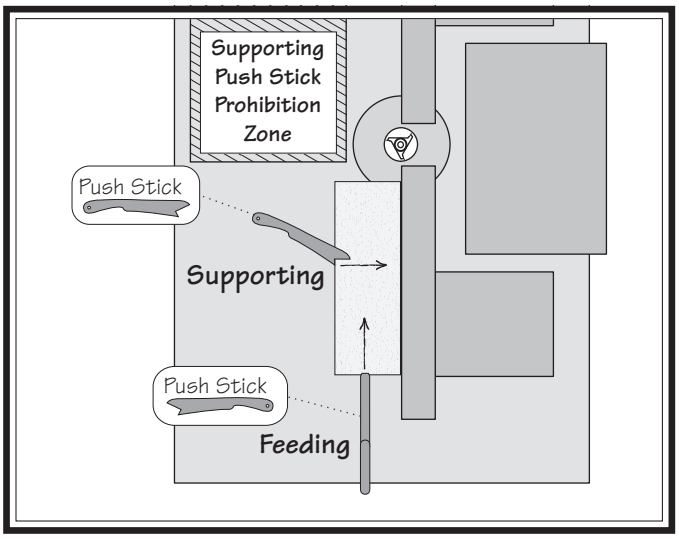


Figure 39. Supporting with second push stick.

Using Table Inserts

Your shaper includes three table inserts with inside openings of 2½", 4⅛", and 5¾" (see **Figure 40**). The table counterbore with all three inserts removed is 8¼" in diameter.

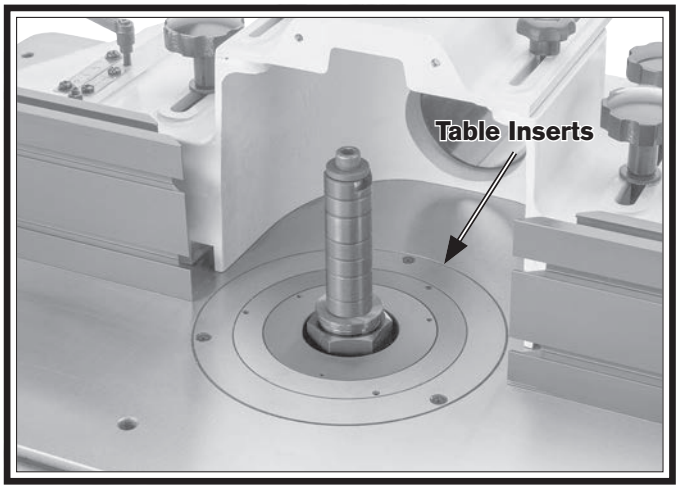


Figure 40. Table inserts (front of cutter guard removed for clarity).

Use the smallest opening that the cutter will allow without interfering with its rotation. This offers more support for the workpiece and reduces the amount of chips that can fall into the machine. Also, make sure the spindle is large enough to allow any unused portion of the cutter to remain below the table surface, which increases operator protection.

If necessary, refer to **Adjusting Table Inserts** on **Page 51** for detailed instructions on leveling the inserts with the table.

Adjusting Spindle Height

The spindle height is adjusted with the spindle height handwheel and can be quickly returned to 0" by pressing the zeroing button on the control panel.

To adjust spindle height:

1. Move spindle up or down with height handwheel until desired position is achieved and displayed on spindle height digital readout screen (see **Figure 41**).

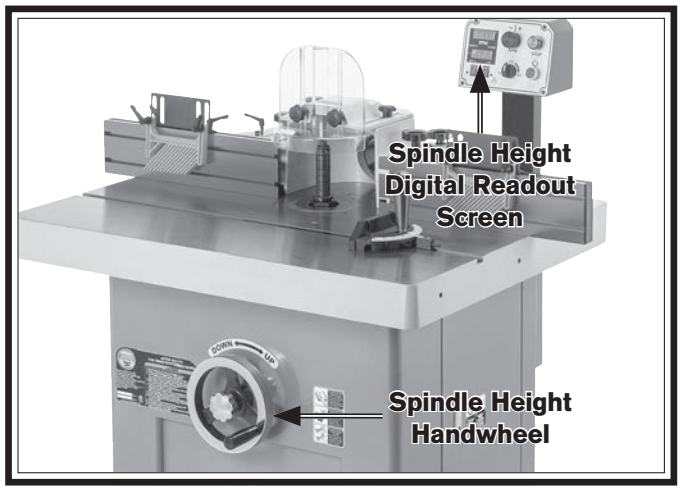


Figure 41. Location of spindle height handwheel.

2. Return spindle height to 0" by pressing zeroing (0" Set) button on control panel (see **Figure 42**).

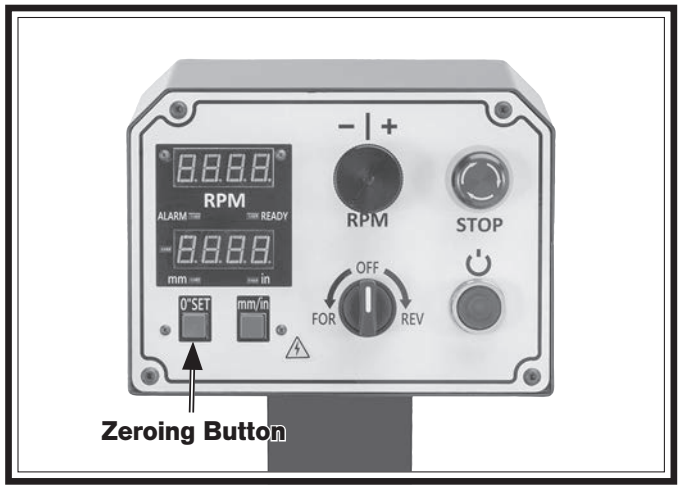


Figure 42. Location of zeroing button.

Operating Spindle Height Digital Readout

The Model SB1119/SB1120 is equipped with a readout for spindle height which, unlike the speed readout, has interactive controls. The zeroing button will return the spindle height to zero while the unit button will change to display either inches or millimeters.

To operate spindle height digital readout:

1. Use zeroing (0" Set) button to precisely return spindle elevation height to 0" (see **Figure 43**).

2. Press unit (mm/in.) button to display height in either inches or millimeters (see **Figure 43**). Unit indicator light will illuminate over selected unit.

3. Use spindle height handwheel to change spindle height, observing spindle height digital readout screen until desired height is achieved (see **Figure 43**).

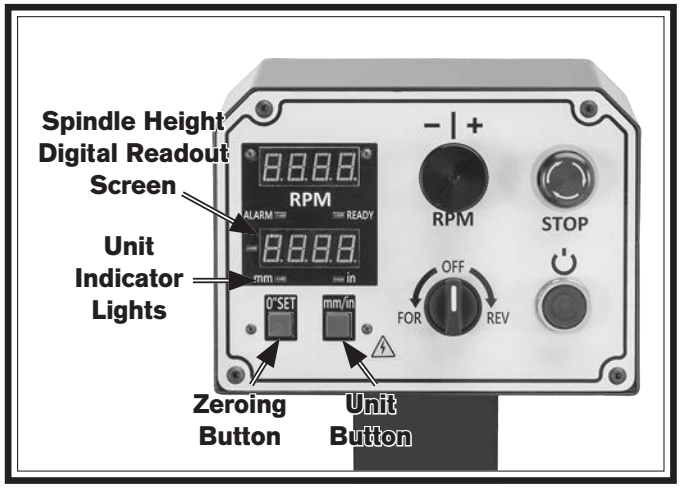


Figure 43. Spindle height digital readout components.

Adjusting Fence

The fence is a two-piece adjustable system. Each fence is independently adjustable to compensate for different cutting thicknesses and special shaping applications. One full turn of the knurled micro-adjustment knob moves the split fence approximately 1/64" (.015"). The guard/fence assembly can also be adjusted as a whole by turning the guard/fence base adjustment knob, with each full revolution equalling approximately 1 5/8" of movement.

Adjusting Individual Fence

1. Loosen fence lock handle (see **Figure 44**).

2. Turn fence micro-adjustment knob on same side (see **Figure 44**) until fence is set to desired position.

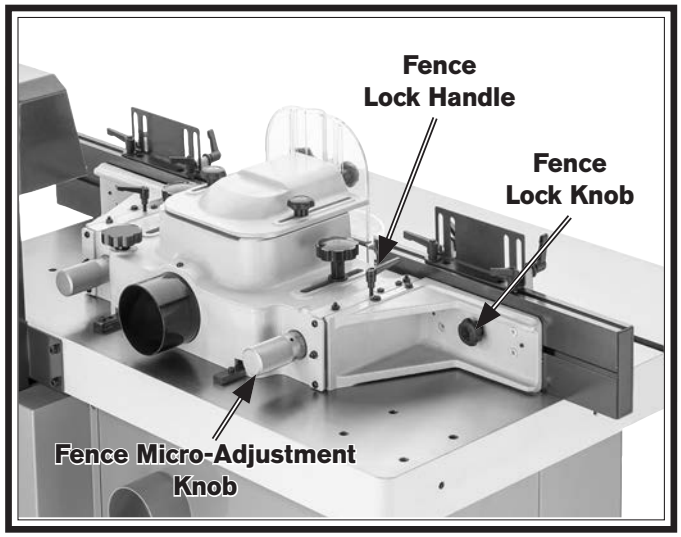


Figure 44. Individual fence controls.

3. Tighten fence lock handle.

4. Loosen fence lock knob (see **Figure 44**) to move fence closer to or further from cutter. Tighten when desired position is achieved.

Adjusting Guard/Fence Base

1. Loosen guard/fence base lock knobs (see **Figure 45**).

2. Turn guard/fence base adjustment knob (see **Figure 45**) until assembly is set to desired position.

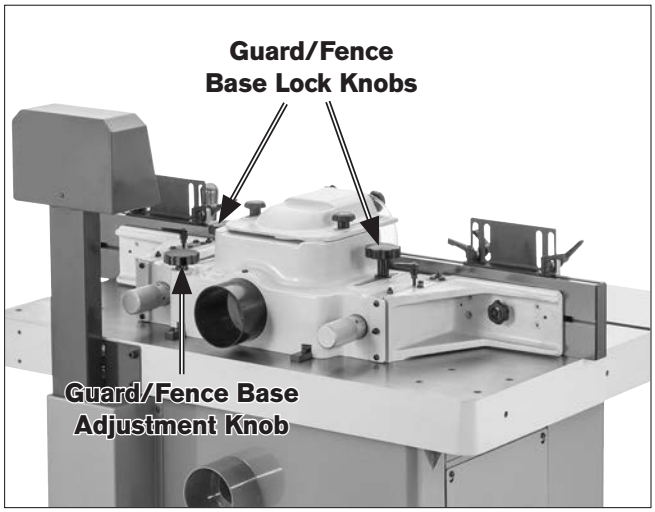


Figure 45. Guard/fence base control components.

3. Tighten guard/fence base lock knobs.

Note: *More detailed information concerning fence adjustments is covered in* ***Straight Shaping****.*

Straight Shaping

Since the fence is a two-piece adjustable system, the outfeed fence can be adjusted to provide support for the workpiece as it passes over the cutter when removing material from the whole face of your workpiece, or it can be set up for partial face removal.

⚠WARNING

Attempting to operate shaper without proper knowledge of machine could cause serious injury or death! Read entire manual carefully before attempting to make any cuts.

⚠WARNING

All guards MUST be installed on shaper before operation. Shapers can quickly cause serious injury if some kind of guard is not used. To reduce risk of injury, read and follow entire Owner's Manual carefully and do research on shop-made guards and safety jigs.

⚠WARNING

Shapers are often quieter than other machines in the shop (e.g., dust collector), which may be running at the same time. Because of this, it may be difficult to determine if machine is ON merely by listening. Verify machine is OFF before attempting any setup or adjustments. Otherwise, serious personal injury could occur.

NOTICE

Always cut end grain first when putting an edge around perimeter of workpiece to minimize tearout (see Figure 46).

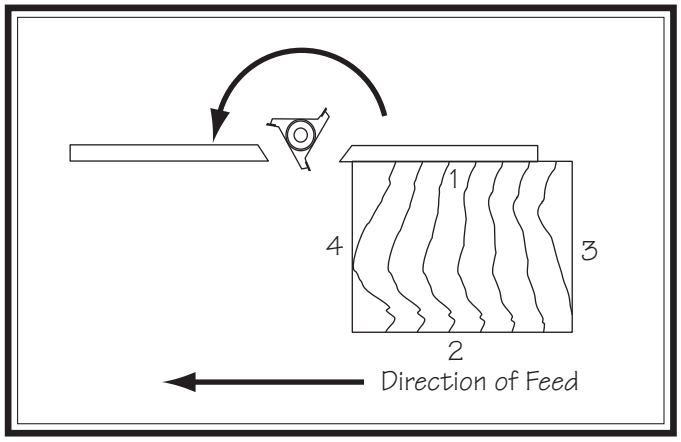


Figure 46. Cut end grain first.

Removing Material from Entire Board Face

1. DISCONNECT MACHINE FROM POWER!
2. Loosen both fence lock handles (see **Figure 47**).
3. Set both infeed and outfeed fences to 0" by turning micro-adjustment knob all the way counterclockwise (see **Figure 47**).

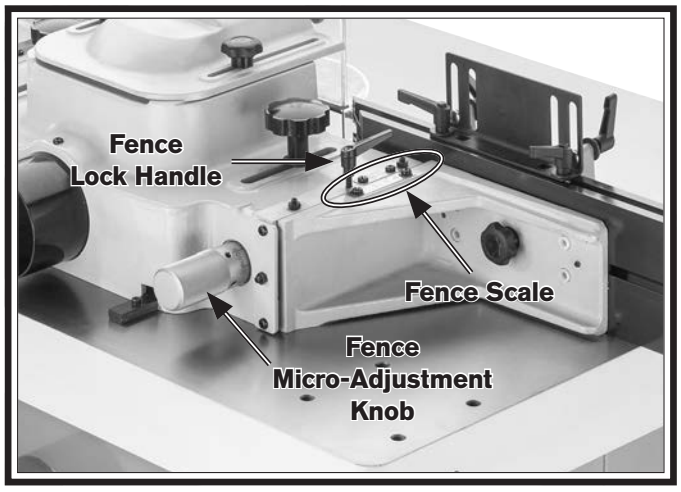


Figure 47. Fence zeroing components.

4. Tighten both fence lock handles to secure.
5. Loosen both guard/fence lock knobs (see **Figure 48**).
6. Adjust infeed fence by turning guard/fence base adjustment knob (see **Figure 48**) until workpiece contacts cutter in desired location when pressed against infeed fence.

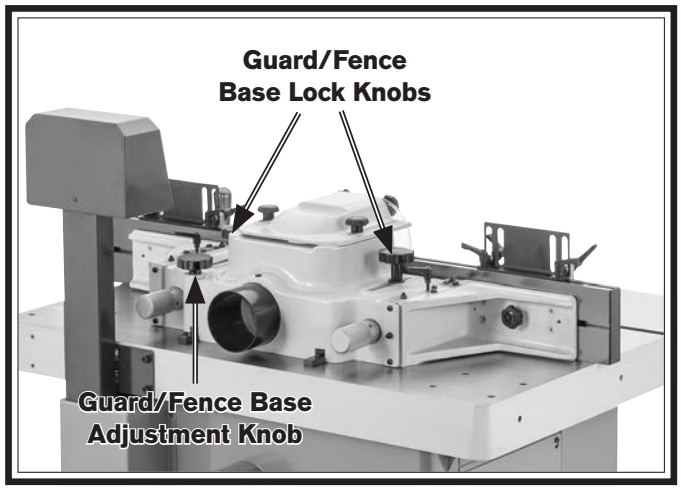


Figure 48. Guard/fence base adjustment components.

7. Tighten both guard/fence lock knobs to secure.
8. Turn machine ***ON*** and advance a test sample (at least 24" long) of desired cut about 8", then stop. Swing test piece away from cutter and turn machine ***OFF***.

⚠WARNING

Miter gauge should not be used to feed material along fence face when edge shaping. Use push stick and featherboards to keep workpiece in position. Fence may not always be perfectly parallel to miter slot; therefore, using miter gauge can cause binding and possible kickback of workpiece towards operator. Serious personal injury could occur if this happens.

9. When cutter comes to complete stop, adjust outfeed fence using technique used in **Steps 2–4** to support new profiled edge (see **Figure 49**).

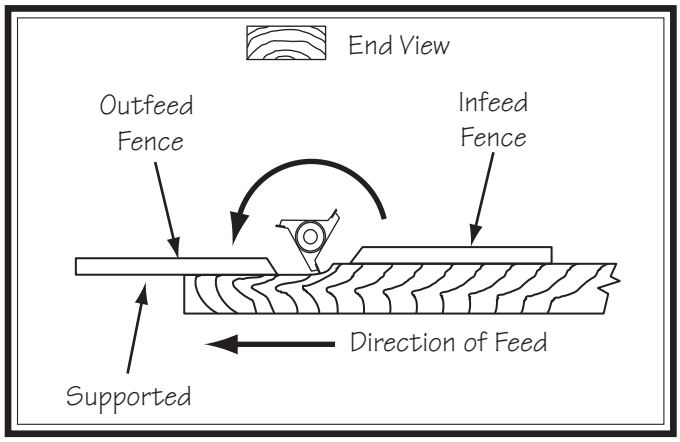


Figure 49. Support workpiece as it is fed through cut.

Removing Material from Part of Board Face

1. Follow **Steps 1–5** of **Removing Material from Entire Board Face** on **Page 33**.

2. Loosen fence lock knobs to move fence faces so they barely clear cutter on each side (see **Figure 50**). This allows maximum support possible for workpiece when passing cutter.

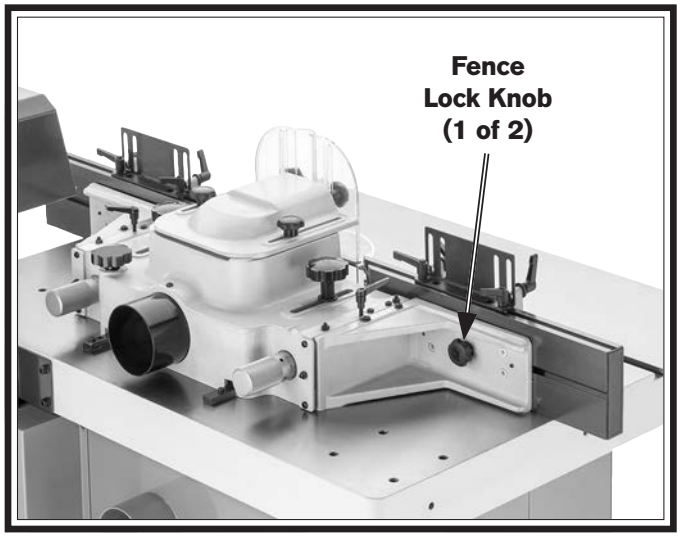


Figure 50. Fence clearance controls.

3. Tighten lock knobs when fence faces will best support workpiece.

4. Adjust outfeed fence face to same plane as infeed face.

5. Turn shaper ***ON***.

6. Run a test piece through shaper (see **Figure 51**).

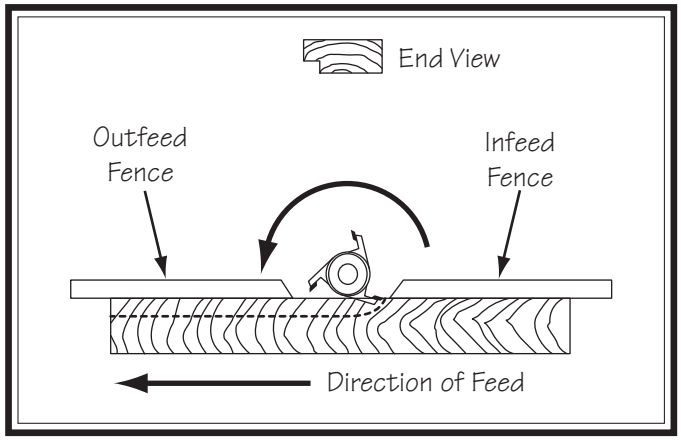


Figure 51. Partial feed fence adjustment.

7. Turn machine ***OFF***.

Using Rub Collars

Rub collars are used when shaping curved or irregular workpieces, such as arched doors or round table tops, and to limit the depth of your cut.

There are two types of rub collars—solid and ball-bearing. We recommend using ball bearing collars and our exclusive dealer, Grizzly Industrial, Inc., carries an extensive line that is designed for use with South Bend shapers. See Grizzly's current catalog or website for listings.

Rub collars may be used in any of the following positions:

1. **Rub collar below cutter:** When rub collar is placed below cutter, as shown in **Figure 52**, progress of the cut can be observed. However, any unintentional movement may lift workpiece into the cutter, damaging your work and creating a dangerous situation. We DO NOT recommend using rub collar in this position.

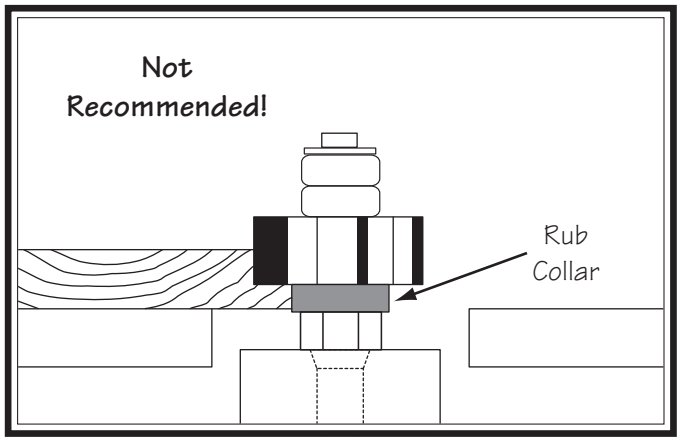


Figure 52. Cutting with rub collar below cutter.

2. **Rub collar above cutter:** When rub collar is used above cutter, cut cannot be seen (see **Figure 53**). This offers some advantage—stock is not affected by slight variations in thickness and accidental lifting will not damage workpiece. Simply correct any change in height by repeating operation.

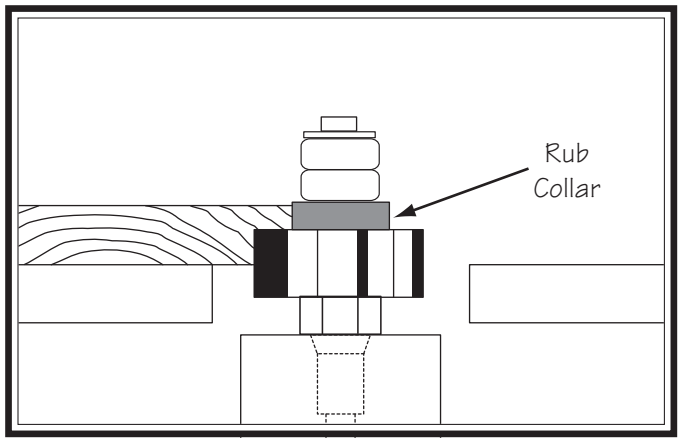


Figure 53. Cutting with rub collar above cutter.

3. **Rub collar between two cutters:** Using a rub collar between two cutters has the distinct advantage of performing two cuts at once or eliminating the need to change cutters for two different operations (see **Figure 54**). Notice that part of the edge is left uncut. The uncut portion rides on the rub collar.

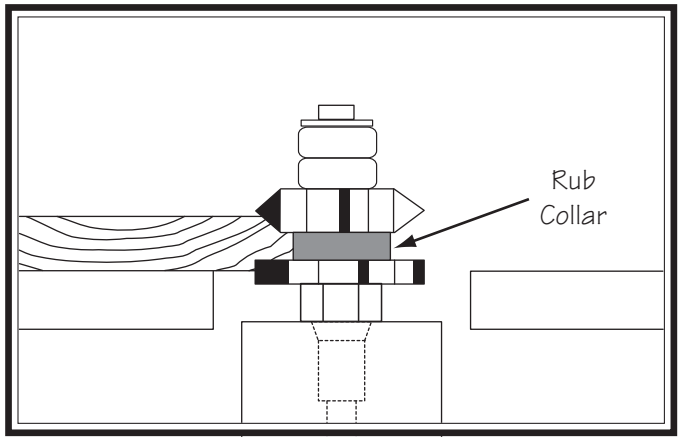


Figure 54. Cutting with rub collar between cutters.

Irregular Shaping

Irregular or freehand shaping takes a high degree of skill and dexterity. The fence assembly is not used in irregular shaping, so rub collars must be used (see **Using Rub Collars** on **Page 35**).

When doing freehand work, a starting pin must be used. The purpose of the starting pin is to support the workpiece during the beginning of the cut. Your shaper is supplied with a starting pin that can be placed in one of the holes located in the shaper table. The work should be placed in the starting position using the starting pin for support, as shown in **Figure 55**.

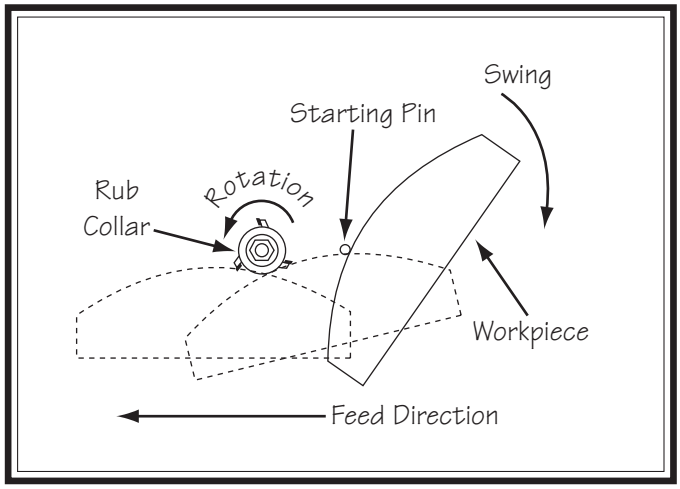


Figure 55. Using starting pin for irregular shaping.

Next, swing the work into the cutter while holding the workpiece firmly against the starting pin. After the cut has been started, the workpiece should be swung away from the starting pin and is supported just by the rub collar, as shown by the broken line positions shown in **Figure 55**.

⚠WARNING

Freehand shaping greatly increases chance that operator may lose control of workpiece, which could result in serious personal injury. Therefore, starting pin or support MUST be used to start irregular shaping operation.

⚠WARNING

All guards MUST be installed on shaper before operation. Shapers can quickly cause serious injury if some kind of guard is not used. To reduce risk of injury, read and follow entire Owner's Manual carefully and do research on shop-made guards and safety jigs.

Using Starting Pin

1. DISCONNECT MACHINE FROM POWER!
2. Remove fence assembly.
3. Install appropriate cutter for your application (see **Installing Cutters** on **Page 28**).
4. Check cutter rotation (see **Changing Cutter Rotation** on **Page 26**).

⚠CAUTION

Incorrectly feeding stock—feeding WITH rotation of cutter—creates potentially uncontrollable feed situation that may pull stock from hands and draw hands into cutter. Always check direction of cutter rotation before any shaping operation. Always feed stock opposite to cutter rotation.

5. Adjust spindle height to align cutter to workpiece (see **Adjusting Spindle Height** on **Page 30**).

6. Insert starting pin into table surface, using pin location that best supports your work (see **Figure 56**).

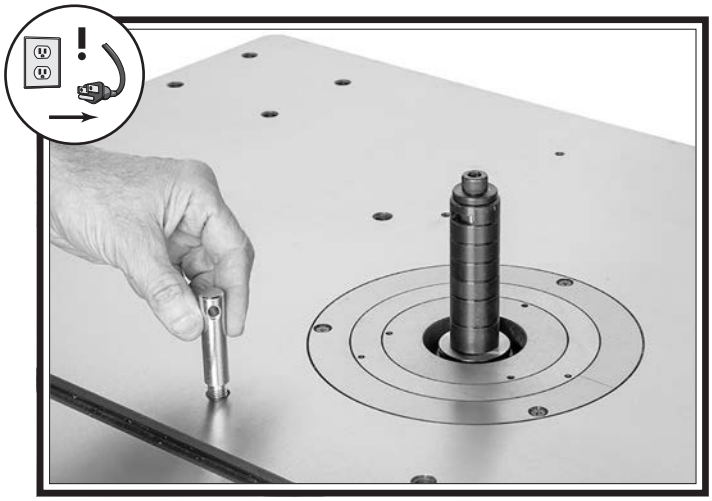


Figure 56. Inserting starting pin.

7. Use some type of hold-down fixture and guard when doing freehand work (see **Figure 57**).

Figure 57. Example of using guard when doing freehand work (portion of guard removed for clarity).

8. Make a sample cut on a piece of scrap wood.

9. If everything is correct, feed workpiece along cutter, using firm pressure to keep work against rub collar. Only feed against cutter rotation.

Using Clamped Board

Sometimes the starting pin will not be in the most advantageous position. If so, firmly clamp a board in the desired position to act as a starting pin (see **Figure 58**). Some type of pivot point must be used. Notice in **Figures 57–58** the operator is not exposed to the cutting edge of the cutter. Cutters are removing material from the bottom of the workpiece.

Figure 58. Example of using starting pin substitute when needed (guard removed for clarity).

Pattern Work

When using a pattern, a rub collar or ball bearing can be positioned either above, below, or between cutters.

The pattern is usually used when the entire edge is to be shaped or when many duplicate pieces are needed. Pattern work is particularly useful when rough cutting irregular shapes oversize and then shaping the edge in a simple two-step operation. A pattern, when attached to a workpiece by adding toggle clamps, hand-holds, or other safety devices, make a fixture. **Figure 59** shows the proper setup of a pattern and bearing rub collar.

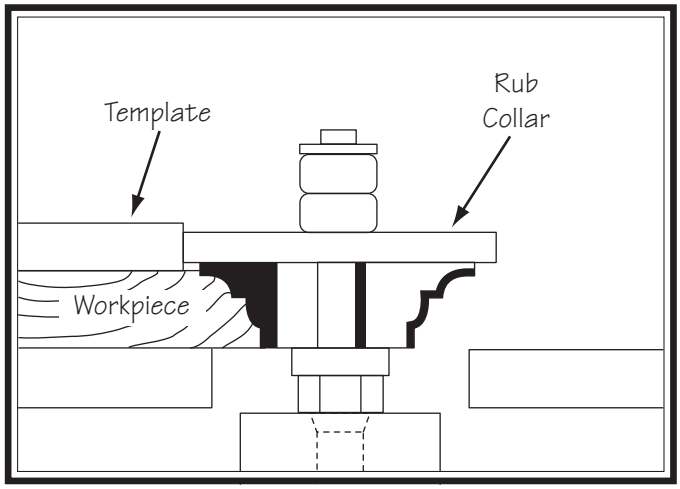


Figure 59. Position of pattern on workpiece and bearing size determine depth of cut.

You have greater flexibility when choosing the correct diameter rub collar for pattern work than for non-pattern work. If you look at **Figure 59**, you will notice that the position of the pattern determines the depth of cut. In other words, your pattern size is dependent upon the inter-relationship of the rub collar cutting diameter and the desired amount of material removed. Changing either the cutter or the rub collar will change the amount of material removed. Planning ahead, you can best decide which rub collars are best suited for your application.

Always perform test cuts on scrap stock to ensure the pattern works as required.

Things to consider when making a pattern or fixture:

- Use a material that will smoothly follow rub collar, ball bearing, or fence.
- Secure workpiece to a pattern (on sides that will not be cut) with toggle clamps, or fasten with wood screws.
- Make your fixture stable! Use proven methods and materials, and attach hand-holds for operator comfort and safety.
- Ensure clamps and hidden screws do not come into contact with cutter.
- Design your fixture so that all cutting occurs beneath workpiece.
- Always consider rub collar diameter for correct depth-of-cut when designing your pattern.
- Make sure your workpiece rests flat on work table, not on work fixture.
- Remember, there are tremendous cutting forces involved. Fixtures must be solid and stable, and any workpiece must be firmly secured.

NOTICE

Use care in designing and making fixtures. Clamps and screws cannot touch cutter, and fixtures must be stable in use, with workpiece resting on shaper table, not on fixture. Workpiece must be fixed securely to the jig.

Shaping Small Stock

Feeding small stock through a shaper is always dangerous. If you must shape small stock, use a zero-clearance fence. This will provide greater protection for the operator, better workpiece support, and reduced tearout on narrow or fragile stock.

⚠CAUTION

ALWAYS use hold-downs or featherboards and push sticks when shaping small or narrow stock. These devices keep hands away from spinning cutter and sufficiently support stock to allow a safe and effective cut, reducing risk of personal injury.

To shape small stock:

1. DISCONNECT MACHINE FROM POWER!

2. Create zero-clearance fence suitable for your application (see **Making a Zero Clearance Fence** on **Page 40**) and install on shaper.

3. Position safety guard as low as possible while still clearing cutter or create custom box guard (see **Making Box Guards** on **Page 43**).

4. Adjust infeed and outfeed table featherboards to width of workpiece, positioning them as close to cutter as possible to support workpiece against fence through cut.

   Note: *When using zero-clearance fence, fence-mounted featherboards that come with Model SB1119/SB1120 must either be clamped/mounted to zero-clearance fence or appropriate featherboards must be constructed. Please refer to* ***Making Featherboards*** *on* ***Page 41*** *for instructions on making shop-made featherboards.*

5. Mount/clamp shop-made or included fence featherboards to zero-clearance fence. Adjust to width of workpiece, positioning them as close to cutter as possible to support workpiece against fence through cut.

6. Connect machine to power.

7. Use push sticks to push workpiece through cut (see **Making Push Sticks** on **Page 42** to make your own).

Shop-Made Safety Accessories

Shop-made safety accessories provide support and various options for different operations. These accessories can reduce the risk of kickback and keep fingers and hands away from the cutter rotation.

Making a Zero-Clearance Fence

A shop-made zero-clearance fence provides more support than a standard fence and reduces tearout on narrow or fragile stock. Using a zero-clearance fence is the best way to reduce the risk associated with shaping inherently dangerous small stock.

Tool Needed	Qty
Hex Wrench 5mm	1
Straight, Smooth Stock 30"	1
Marker or Pencil	1
Straight, Smooth Stock 30"	1
Wood Cutting Tool	1
Drill & Drill Bits for Countersinking	As Needed
Fence Mounting Hardware	As Needed

To make a zero-clearance fence:

1. DISCONNECT MACHINE FROM POWER!

2. Remove fence faces and mounting brackets from guard/fence base by loosening fence lock knobs (see **Figure 60**).

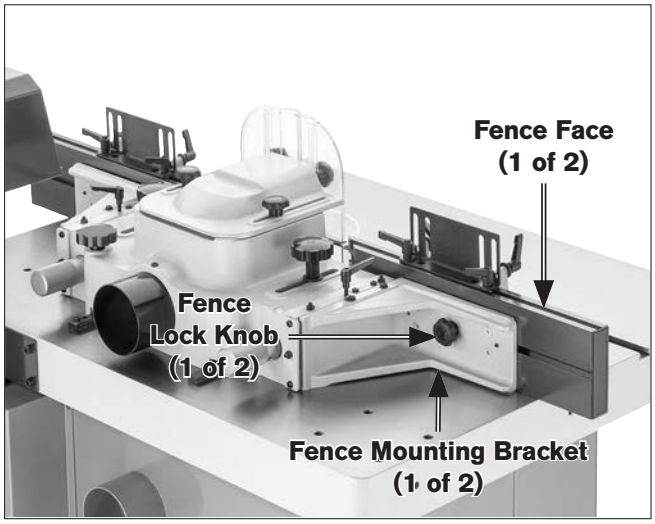


Figure 60. Fence face removal components.

3. Remove (2) cap screws shown in **Figure 61** from each fence mounting bracket.

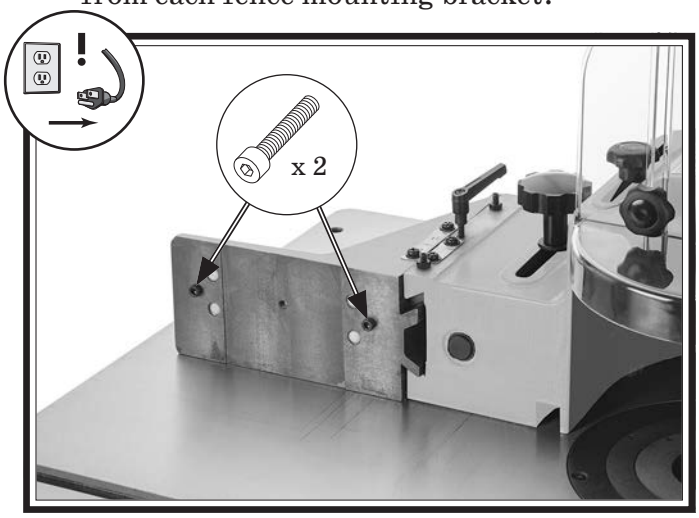


Figure 61. Fence mounting bracket cap screw location.

4. Select piece of straight and smooth stock that is same height and thickness as fence faces and approximately 30" long.

5. Position board over length of guard/fence assembly and mark mounting holes and outline cutter and spindle profile.

6. Cut an outline of spindle and cutter from center of stock, as illustrated in **Figure 62**.

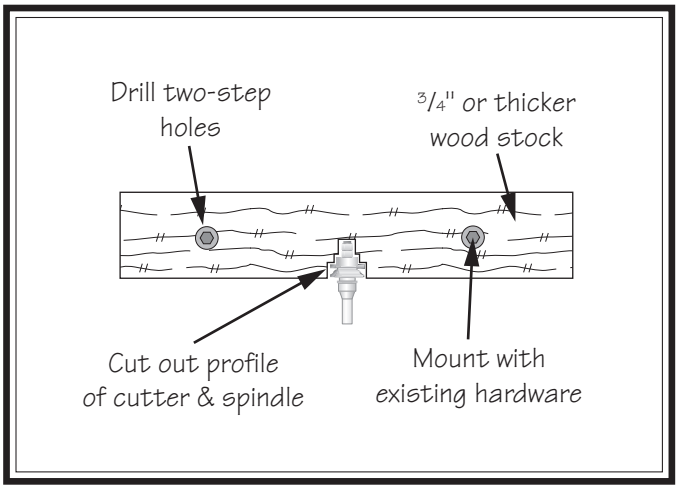


Figure 62. Example of a zero-clearance fence.

Note: *Make outline as close as possible to cutter and spindle without interfering with rotation.*

7. Drill countersunk mounting holes in zero-clearance fence so fasteners from split fences can be used to secure it to fence supports in the same manner.

Note: *Drilling these holes is a two-step process. Drill first holes all the way through board with a diameter little larger than shaft of mounting screw. Drill second holes halfway through boards with a diameter little larger than screw head. Drill these second holes deep enough that screw heads will be well below surface of board.*

8. Secure zero-clearance fence to fence mounting brackets, check for proper clearance, then run test piece through cutter to verify results.

Making Featherboards

Featherboards flex with minor height or width variations from stock as it passes through. Because of the consistent pressure featherboards place on the stock, cuts are more consistent, the risk of kickback is greatly reduced, and the operator's hands do not need to get near the cutter to maintain feeding pressure. If a kickback does occur, featherboards will also slow down or stop the workpiece.

Figure 63 shows the dimensions of a basic featherboard. The ultimate size is flexible and should be built around the size of stock you are shaping. The fingers can be cut with a bandsaw or table saw.

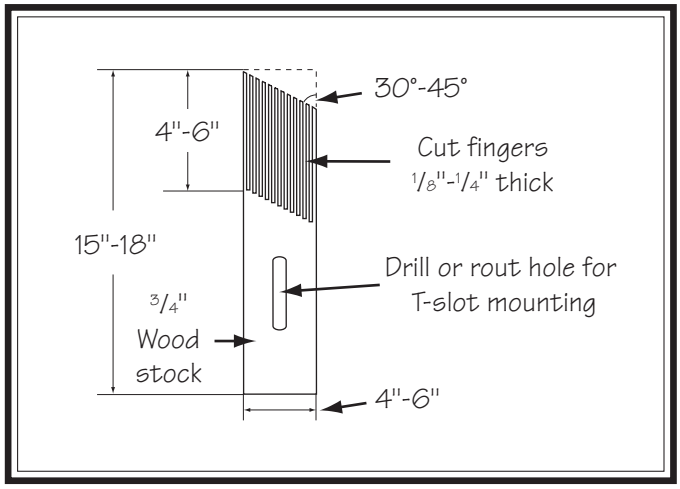


Figure 63. Basic featherboard construction.

To install a featherboard, feed a piece of stock halfway through the machine, then turn the machine ***OFF***. Place the featherboard against the stock so all the fingers touch the edge of the stock, then use T-slot mounting hardware to secure the featherboard. For best results, place featherboards just before and just after the cutter.

IMPORTANT: *Cuts made across the grain result in weak fingers that easily break when flexed. When made correctly, the fingers should withstand flexing from moderate pressure. To test the finger flexibility, push firmly on the ends with your thumb. If the fingers do not flex, they are likely too thick (the cuts are too far apart).*

Making Push Sticks

When used correctly, push sticks reduce the risk of injury by keeping hands away from the cutter. In the event of an accident, a push stick can absorb damage that would have otherwise happened to hands or fingers. Use push sticks whenever your hands will get within 12" of the cutter. To maintain control when shaping large workpieces, start by feeding with your hands then use push sticks to finish the operation, so your hands are not on the end of the workpiece as it passes through the cutter.

Feeding: Place the notched end of the push stick against the end of the workpiece (see **Figure 65**), and move the workpiece into the cutter with steady downward and forward pressure.

Supporting: A second push stick can be used to keep the workpiece firmly against the fence while cutting. When using this method, only apply pressure before the cutter; otherwise, pushing the workpiece against or behind the cutter will increase the risk of kickback.

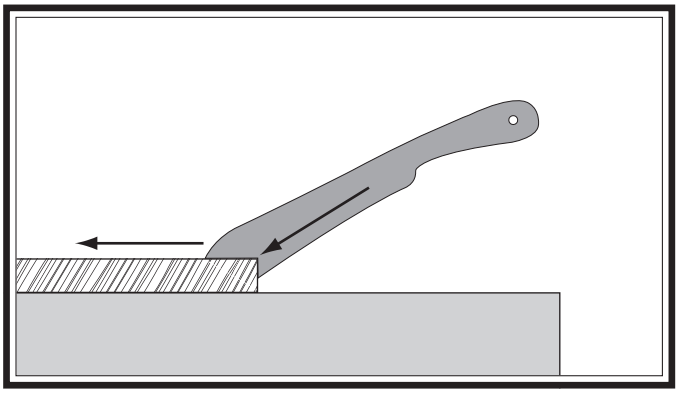


Figure 64. Side view of push stick in use.

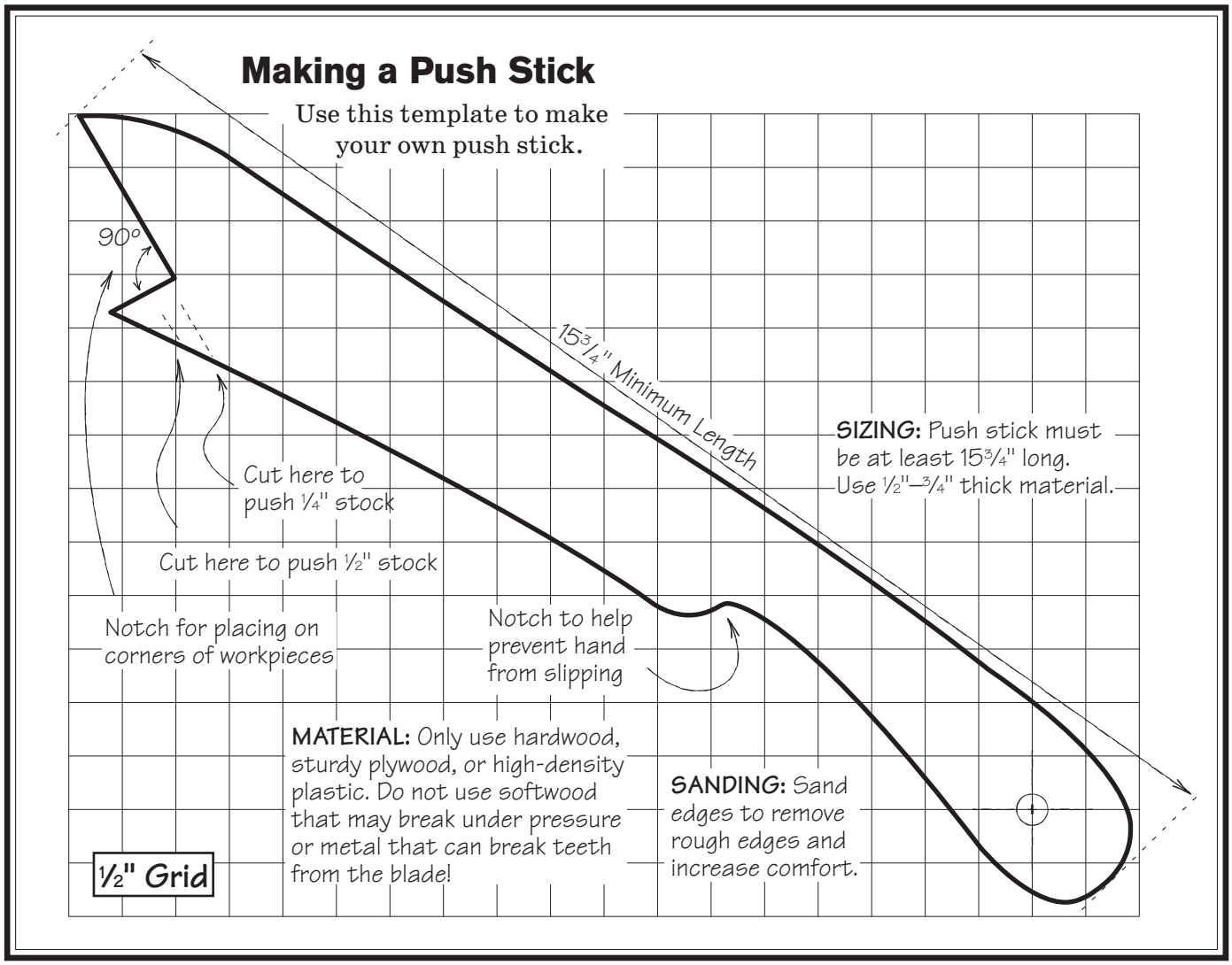


Figure 65. Template for a basic shop-made push stick (not shown at actual size).

Making Box Guards

Shop-made box guards are an excellent way to enclose the cutter to virtually eliminate accidental contact with the cutter during operation. Having the cutter enclosed also helps increase the efficiency of dust collection. The drawback to box guards is that one size does not fit all. Often, professional woodworkers who use box guards make multiple guards that are different sizes.

Figure 66 shows one way to make and attach a box guard to the Model SB1119/SB1120. This guard replaces the vertical clear plastic guard that is included with the shaper. For durability and strength, use a hardwood when making box guards. When installing the box guard, adjust the box guard approximately ¼" above the stock you will shape and use featherboards on both sides.

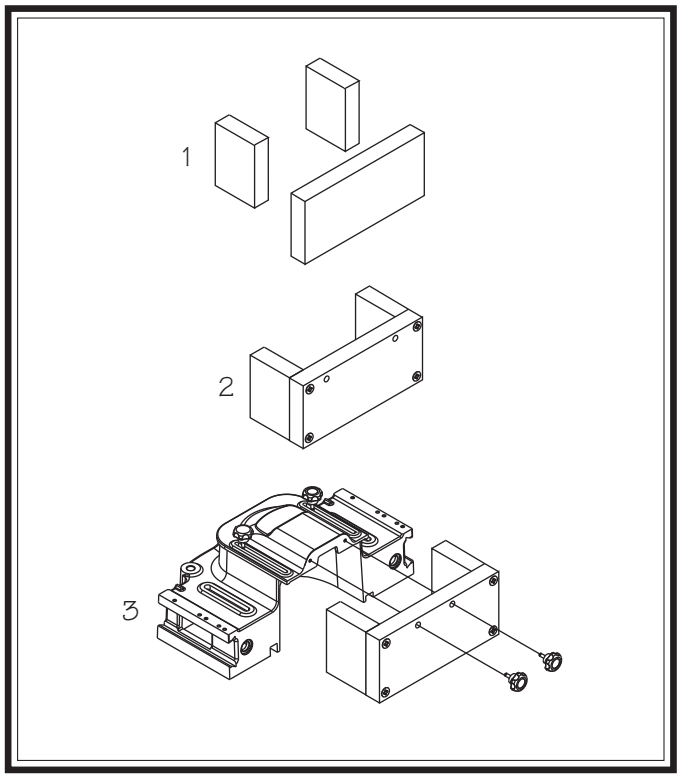


Figure 66. Box guard attached instead of included clear plastic guard (fence and guard components removed for clarity).

Note: *DO NOT use the box guard as a hold-down or featherboard; instead, use the provided featherboard that has the ability to flex with the minor height variations of your stock.*

Tips for making a custom box guard:

The thickness of your workpiece will determine the height of the box guard. Therefore, you will need to build a separate box guard for each workpiece of a different thickness. A box guard can be used with or without a zero-clearance fence (see **Making Zero-Clearance Fence** on **Page 40** for instructions).

The box guard can either attach directly to wooden fence boards (or board) with screws (as shown in **Figure 67**) or attach directly to the guard fence assembly with the plastic guard hardware (as shown in **Figure 66**). In either case, featherboards should also be used on either side to support the workpiece. Construct the box guard in a way that it extends out over the cutter area while leaving enough distance between the guard and the table for the workpiece to easily pass by the cutter. Refer to **Figure 67** for an example.

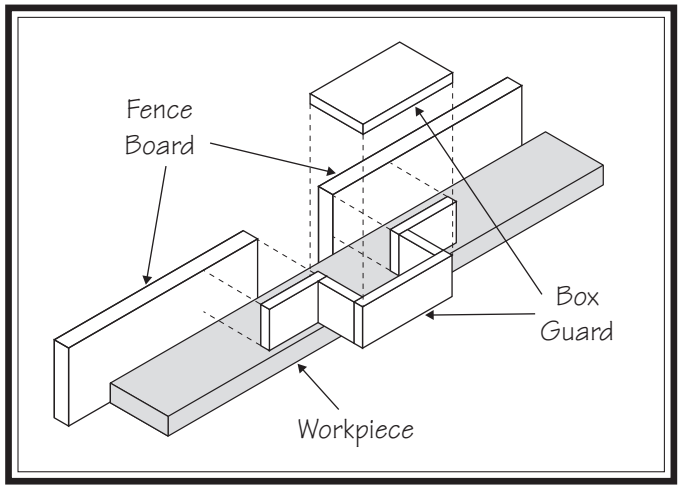


Figure 67. Example of custom box guard attached to wooden fence boards.

Other Accessories

This section includes the most common accessories available for your machine, which are available through our exclusive dealer, **Grizzly Industrial, Inc.**, at **grizzly.com**.

⚠WARNING

Installing unapproved accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended by South Bend or Grizzly.

NOTICE

Refer to Grizzly's website or latest catalog for additional recommended accessories.

G0826—Easy Feeder Power Feeder
This all-purpose power feeder boasts a ⅔ HP motor that provides high-torque from a single-phase power supply. It has 7-72 FPM variable-speed control and automatically compensates for variations in workpiece thickness up to ¾" via a roller spring mechanism.

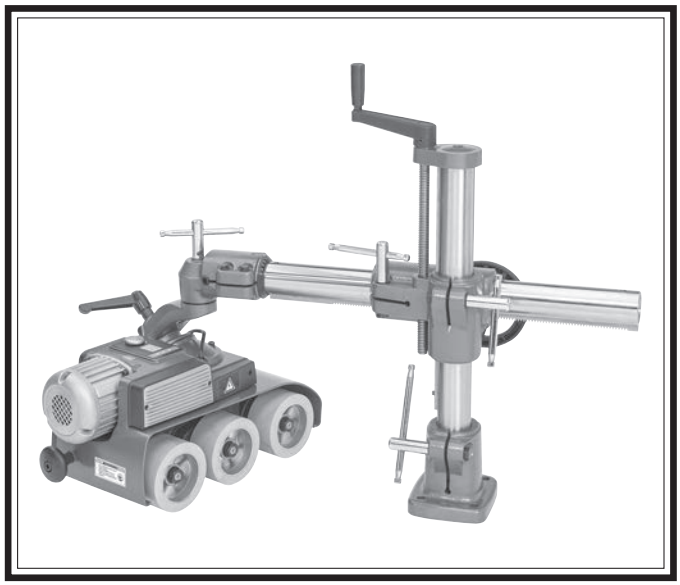


Figure 68. Model G0826 Easy Feeder Power Feeder.

W1164—Spacer ¾" Bore, 1¼" OD, ¼" High
W1165—Spacer ¾" Bore, 1¼" OD, ⅜" High
W1166—Spacer ¾" Bore, 1¼" OD, ½" High
W1167—Spacer ¾" Bore, 1¼" OD, ¾" High
W1168—Spacer ¾" Bore, 1¼" OD, 1" High
Spacers allow you to position your shaper cutter anywhere on the spindle. Use them between cutters or stack them above the cutter to bear against the spindle nut. Every shaper owner needs a set of these on-hand.

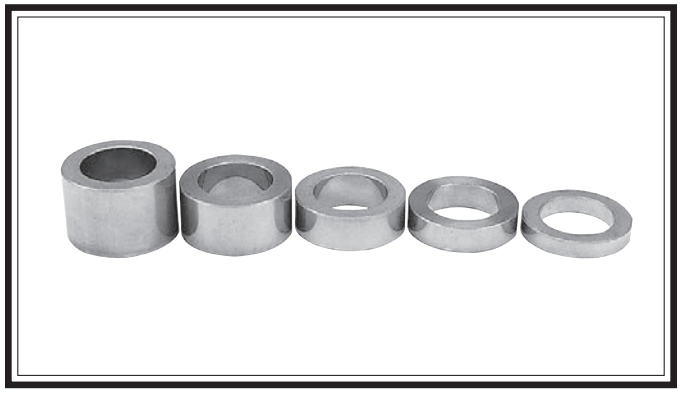


Figure 69. Shaper spindle spacers.

W1114—¾" Rub Collar, 1⅝" OD
W1116—¾" Rub Collar, 1¾" OD
W1118—¾" Rub Collar, 1⅞" OD
W1119—¾" Rub Collar, 2" OD
W1120—¾" Rub Collar, 2⅛" OD
W1122—¾" Rub Collar, 2⅝" OD
If you do any kind of irregular shaping, rub collars are a must! Rub collars are used for shaping curved work such as cathedral doors, as well as many custom shapes. They are also used for limiting depth-of-cut, like guide bearings on router bits.

Figure 70. Ball bearing rub collars.

SB1092—2 HP Cyclone Dust Collector
The Model SB1092 features a 2 HP motor, a whopping 1132 CFM of airflow capacity at 1.1" static pressure, and a 28-gallon collection capacity. It's packed with features like a built-in sound muffler, an automatic filter paddle brush for easy cleaning, a remote-controlled magnetic switch, and a quick-release lift handle for easy sawdust disposal.

Figure 71. Model SB1092 2 HP Cyclone Dust Collector.

T28923—Bear Crawl "Papa Bear" Mobile Base
We took years of input and months of testing and design to come out with the Grizzly "Bear Crawl" Mobile Base. Its 1200 lb. capacity, steel and rubber heavy-duty ball bearing wheels, and toe flip-stops are only a few of the features that will make this mobile base a staple under your machines for years to come. Adjusts from 19" x 26" to 29½" x 34½"!

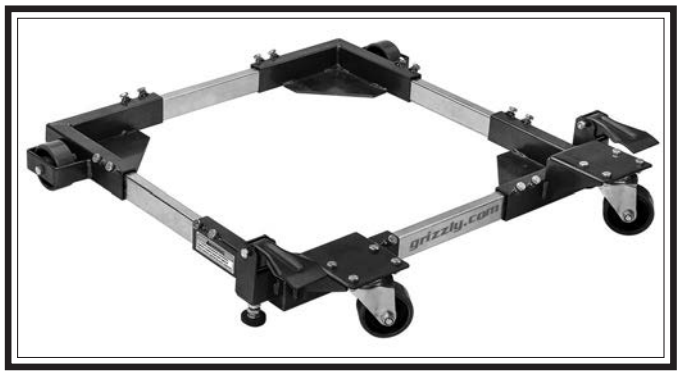


Figure 72. Model T28923 Bear Crawl "Papa Bear" Mobile Base.

T28172—14" x 39" Heavy-Duty Roller Table
T28369—14" x 78" Heavy-Duty Roller Table
T28370—14" x 118" Heavy-Duty Roller Table
Increase material handling and processing efficiency with one or more of these heavy-duty roller tables.

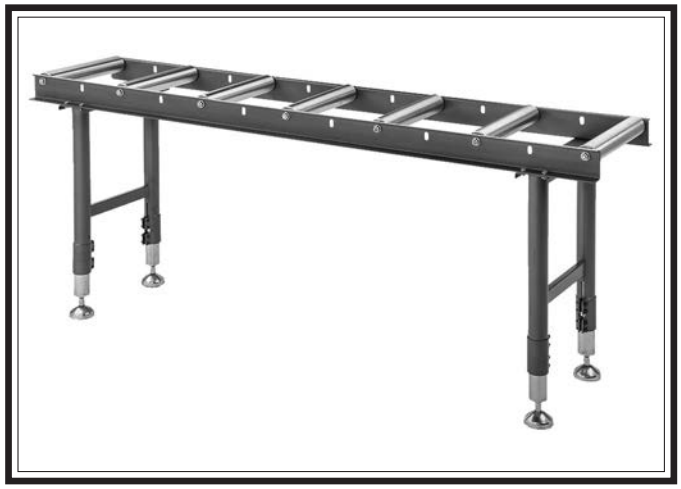
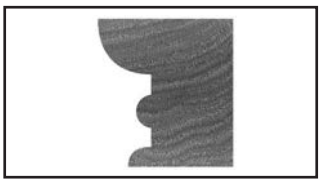


Figure 73. Model T28369 Heavy-Duty Roller Table.

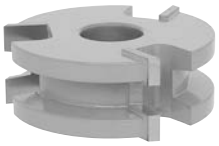
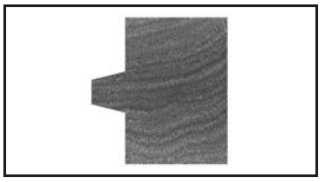
D4206—Clear Flexible Hose 4" x 10'
D4256—45° Elbow 4"
D4199—Black Flexible Hose 4" x 50'
W1007—Plastic Blast Gate 4"
W1053—Anti-Static Grounding Kit
W1317—Wire Hose Clamp 4"
W1017—90° Elbow 4"
Hand-picked selection of commonly used dust collection components for 4" dust ports.

Figure 74. Dust collection accessories.

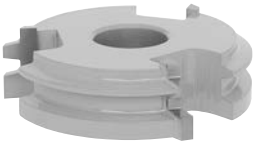
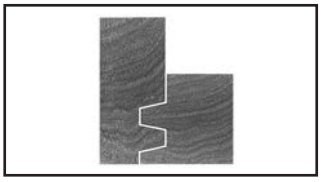
C2026—⅛" & ⅜" Quarter Round & ¼" Bead
¾" Bore, 2⅝" Diameter, 1" Cutter Height

C2028—Tongue
¾" Bore, 2⅝" Diameter, 1" Cutter Height

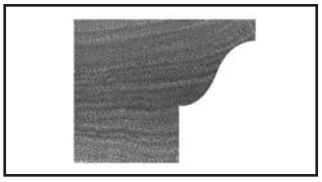



C2042—Drawer Joint
¾" Bore, 2⅝" Diameter, ¾" Cutter Height

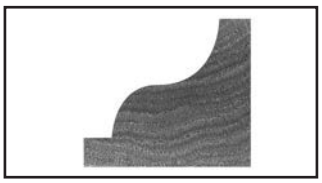



C2083—Vertical Panel Raising
¾" Bore, 2⅝" Diameter, 1½" Cutter Height

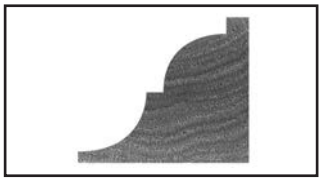

C2085—Female Sash
¾" Bore, 2⅝" Diameter, ⅝" Cutter Height

C2097Z—Ogee Moulding
1¼" Bore, 4" Diameter, ⅝" Cutter Height

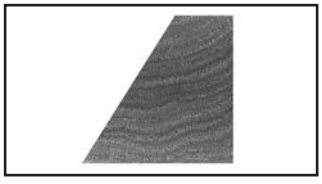



C2091Z—Bead & Cove
1¼" Bore, 4" Diameter, ⅞" Cutter Height

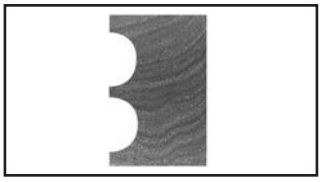



C2204Z—Crown Moulding
1¼" Bore, 4" Diameter, 3½" Cutter Height

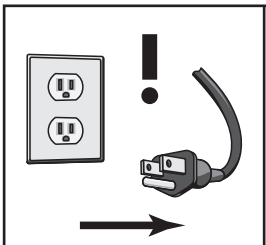

C2089Z—30° Bevel
1¼" Bore, 4" Diameter, 1" Cutter Height

C2092Z—Double Flute
1¼" Bore, 4" Diameter, ⅞" Cutter Height

Maintenance Schedule



⚠WARNING

Always disconnect machine from power before performing maintenance or serious personal injury may result.

For optimum performance from this machine, this maintenance schedule must be strictly followed.

Ongoing

To minimize your risk of injury and maintain proper machine operation, shut down the machine immediately if you ever observe any of the items below, and fix the problem before continuing operations

- Loose mounting bolts.
- Worn or damaged cutters.
- Clean/lubricate/protect table and miter gauge.
- Worn or damaged wires.
- Any other unsafe condition.

Weekly

- Clean/vacuum dust buildup from in and around cabinet and off of motor.

Monthly

- Check/lubricate spindle slide, leadscrew, and fence rack & pinion **(Page 48)**.
- Check V-belt tension and condition **(Page 50)**.

Cleaning & Protecting

Cleaning the Model SB1119/SB1120 is relatively easy. Vacuum excess wood chips and sawdust, and wipe off the remaining dust with a dry cloth. Blow out any hard-to-reach areas with compressed air, and keep the spindle clear of wood dust and chips. If any resin has built up, use a resin dissolving cleaner to remove it.

Protect the unpainted cast iron table by wiping it clean after every use—this ensures moisture from wood dust does not remain on bare metal surfaces. Keep the table rust-free with regular applications of products like SLIPIT®.

Recommended Metal Protectants

G5562—SLIPIT® 1 Qt. Gel
G5563—SLIPIT® 11 Oz. Spray

Figure 75. Recommended products for protecting unpainted cast iron/steel parts on machinery.

Machine Storage

All machinery will develop serious rust problems and corrosion damage if it is not properly prepared for storage. If decommissioning this machine, use the steps in this section to ensure that it remains in good condition.

To store machine:

1. Disconnect all power sources to machine.

2. Thoroughly clean all unpainted, bare metal surfaces, then coat them with light weight grease or rust preventative. Take care to ensure surfaces are completely covered but that grease or rust preventative is kept off of painted surfaces.

   Note: *If machine will be out of service for only short period of time, use way oil or good grade of medium-weight machine oil (not auto engine oil) in place of grease or rust preventative.*

3. Loosen or remove V-belt so it does not become stretched while machine is not in use.

4. Completely cover machine with tarp or plastic sheet that will keep out dust and resist liquid or moisture. If machine will be stored in/near direct sunlight, use cover that will block sun's rays.

Lubrication

Since all bearings on the Model SB1119/SB1120 are sealed and permanently lubricated, simply leave them until they need to be replaced. DO NOT lubricate them.

Below is a list of components that require periodic lubrication. Do not over-lubricate these components. Large amounts of lubricant will attract sawdust, causing the metal components to gum up and bind.

T26419—Syn-O-Gen Synthetic Grease
Formulated with 100% pure synthesized hydrocarbon basestocks that are compounded with special thickeners and additives to make Syn-O-Gen non-melt, tacky, and water-resistant. Extremely low pour point, extremely high temperature oxidation, and thermal stability produce a grease that is unmatched in performance.

Figure 76. Model T26419 Syn-O-Gen Synthetic Grease (NLGI#2 equivalent).

Elevation Leadscrew & Spindle Slides

Lubrication Type ..... T26419 or NLGI#2 Equiv.
Amount..... Thin Coat
Frequency..... As Needed

Items Needed	Qty
Mineral Spirits	As Needed
Shop Rags	As Needed
Wire Brushes	2
NLGI#2 Grease	As Needed

Lower spindle housing assembly fully by turning handwheel counterclockwise. Clean the leadscrew threads and slides with a wire brush, rag, and mineral spirits (see **Figure 77**). Brush new grease on slides and leadscrew with a clean wire brush and move the spindle assembly up and down a few times to evenly distribute the grease.

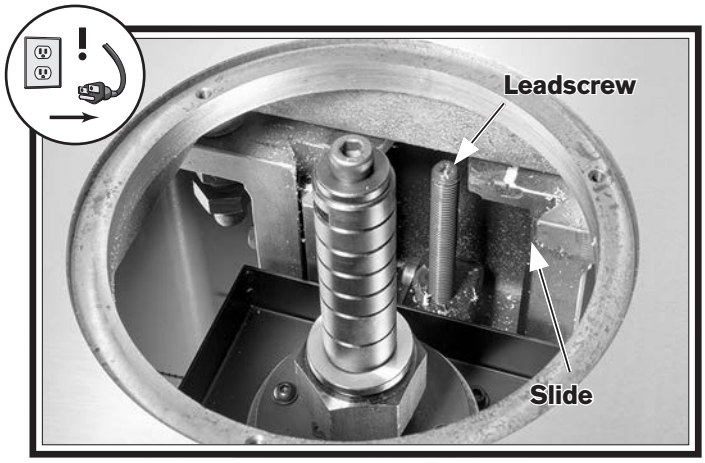


Figure 77. Location of spindle slides and leadscrew.

Fence Rack & Pinion

Lubrication Type .....T26419 or NLGI#2 Equiv.
Amount..... Thin Coat
Frequency..... As Needed

Items Needed	Qty
Mineral Spirits	As Needed
Shop Rags	As Needed
Wire Brushes	1
NLGI#2 Grease	As Needed

Adjust guard/fence base fully forward then push the assembly forward off the front end of the fence racks to fully reveal the racks (see **Figure 78**). Use a rag and mineral spirits to wipe off any built-up grease and saw dust. Apply a thin coat of lubricant to the racks using a wire brush before replacing the guard/fence assembly. Adjust the assembly forward and back to distribute the grease.

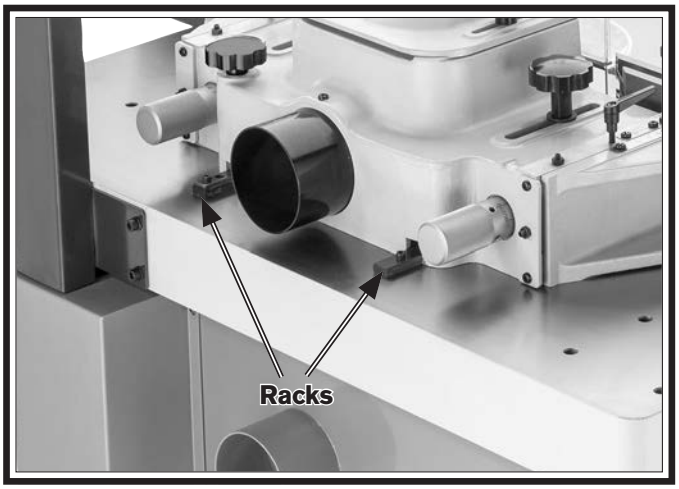


Figure 78. Location of fence racks.

Checking & Replacing V-Belt

The V-belt transfers power from the motor to the spindle. If the V-belt does not have the proper tension or is damaged in any way, the shaper will not operate optimally, and unnecessary wear on the moving parts will occur. Regularly check the V-belt tension and replace it when necessary.

Items Needed	Qty
Wrench or Socket 19mm	1
Replacement V-Belt (#PSB1119122)	1

To check & replace V-belt:

1. DISCONNECT MACHINE FROM POWER!

2. Open cabinet door and examine V-belt for wear or cracks (see **Figure 79**).

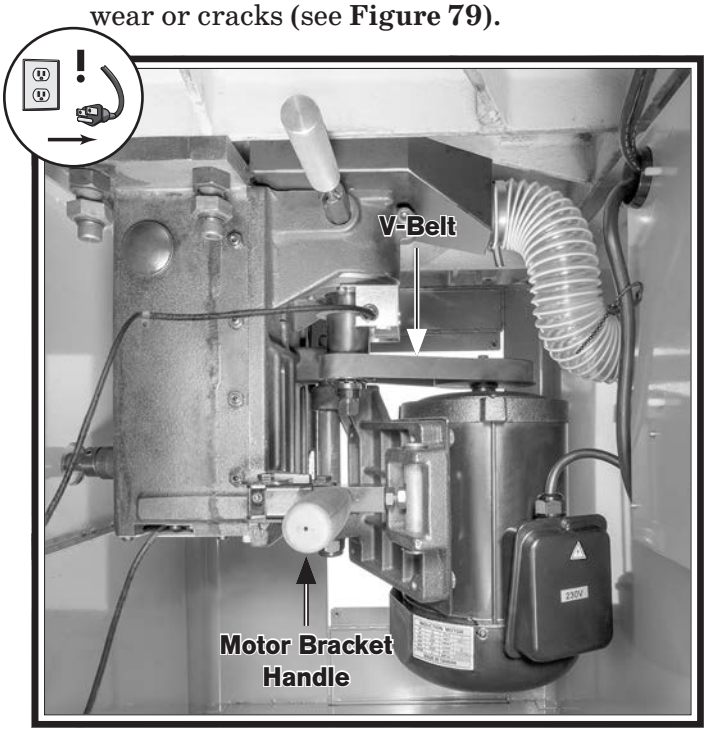


Figure 79. Location of V-belt and motor bracket handle.

— If belt *is not* worn or cracked, belt does not need to be replaced. Proceed to **Step 5**.

— If belt *is* worn or cracked, belt needs to be replaced. Proceed to **Step 3**.

3. Release V-belt tension by pulling motor bracket handle (see **Figure 79**).

4. Replace old V-belt with a new one and use motor bracket handle to tension belt.

5. Check V-belt tension by pressing center of belt with your thumb (see **Figure 80**).

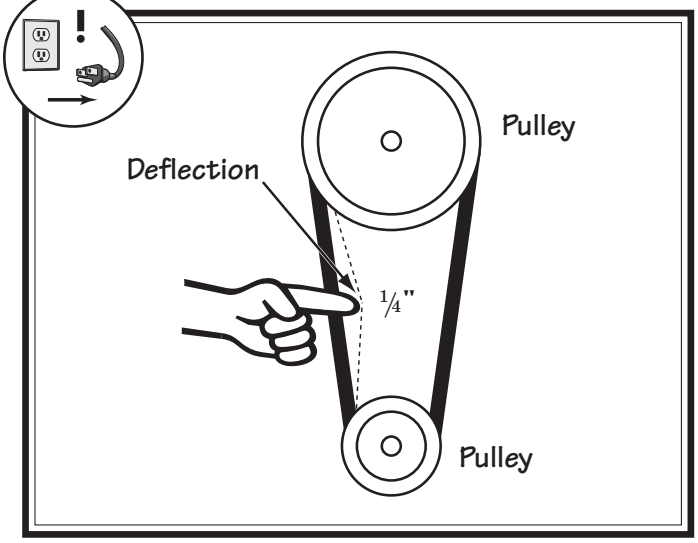


Figure 80. Checking V-belt tension.

— If there *is* ¼" deflection when belt is pressed, no adjustment is required. Proceed to **Step 7**.

— If there *is not* ¼" deflection when belt is pressed, proceed to **Step 6**.

6. Loosen hex nut on motor tension block and adjust hex bolt until there is ¼" belt deflection, then tighten hex nut to secure (see **Figure 81**).

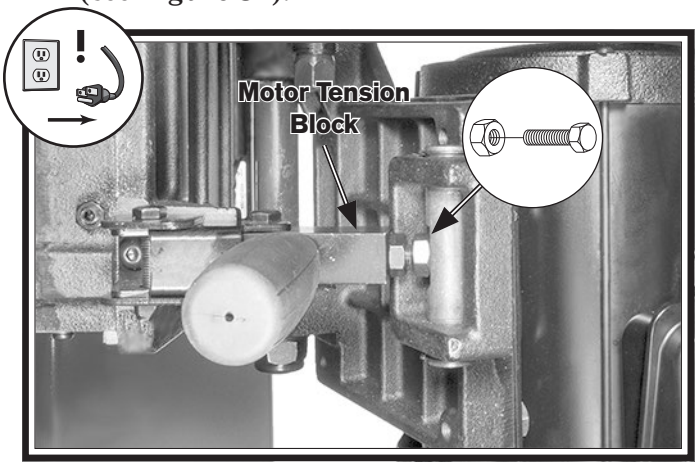


Figure 81. Location of belt tension adjustment hardware.

7. Spin pulley by hand to ensure proper tracking before closing cabinet door.

Replacing Spindle Bearings

Should a bearing fail, your shaper will develop a noticeable rumble, worse so when the machine is put under load. If the bad bearing is not replaced, it will eventually seize—possibly doing damage to the machine. Bearings are standard sizes and can be replaced through our exclusive dealer, Grizzly Industrial, Inc.

Items Needed	Qty
Hex Wrench 8mm	1
Towel or Protective Pad	1
Flat Head Screwdriver (¼" or Smaller)	1

To replace spindle bearings:

1. DISCONNECT MACHINE FROM POWER!

2. Open cabinet door and remove V-belt (see **Checking & Replacing V-Belt** on **Page 50**).

3. Place pad or towel beneath spindle housing, then loosen cap screw on spindle housing (see **Figure 82**).

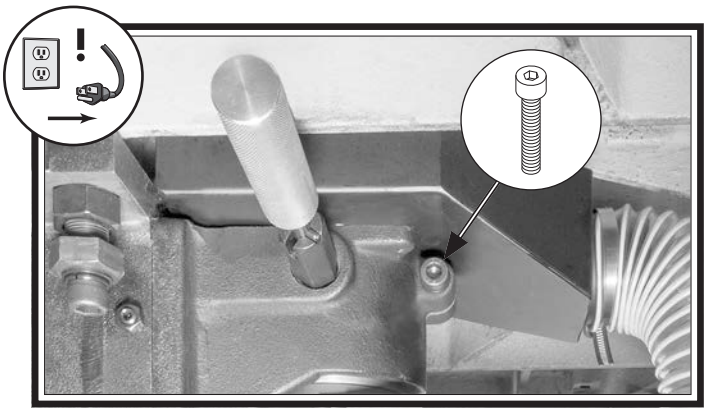


Figure 82. Location of spindle housing cap screw.

⚠CAUTION

Carefully spread the casting to reduce the risk of the bearing housing falling and pinching fingers. The casting will break if too much pressure is applied in the next step.

4. If bearing housing does not drop down when spindle housing is loosened, carefully spread housing casting with flat head screwdriver.

5. Remove spindle and replace bearings inside bearing housing. If you need pointers regarding bearing replacement, call Technical Support.

6. Slide spindle into spindle housing and tighten in place with cap screw from **Step 3**.

7. Rotate spindle by hand to test bearings. If spindle does not rotate smoothly, repeat **Steps 5–7**.

8. Close cabinet door.

Adjusting Table Inserts

The two inner table inserts are held in place by a large, outer insert ring, which should be adjusted level with the table top. This is necessary to avoid the workpiece catching on the insert rings during operation, causing an unsafe condition and poor cutting results.

Tools Needed	Qty
Phillips Head Screwdriver #2	1
Hex Wrench 2mm	1
Precision Straightedge 12"	1

To adjust table inserts:

1. DISCONNECT MACHINE FROM POWER!

2. Remove (2) inner inserts from table opening (see **Figure 83**).

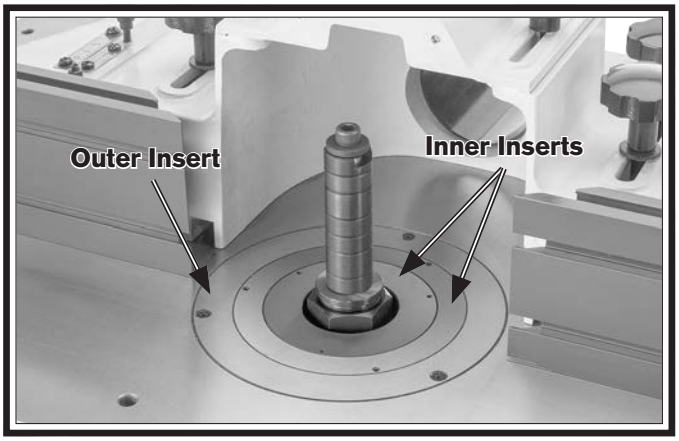


Figure 83. Location of inner two inserts (front cutter guard removed for clarity).

3. Lay straightedge across outer insert and table surface in pattern shown in **Figure 84**.

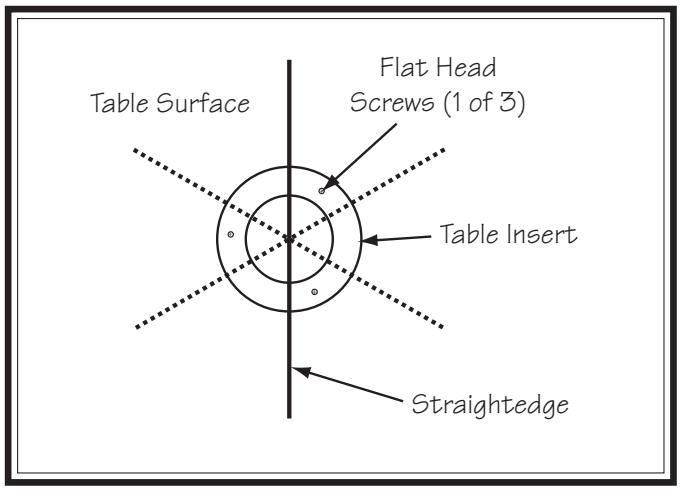


Figure 84. Straightedge and surface pattern.

4. Adjust flat head screws so ends of straightedge lay flat on table surface at all positions of pattern above (see **Figure 85**).

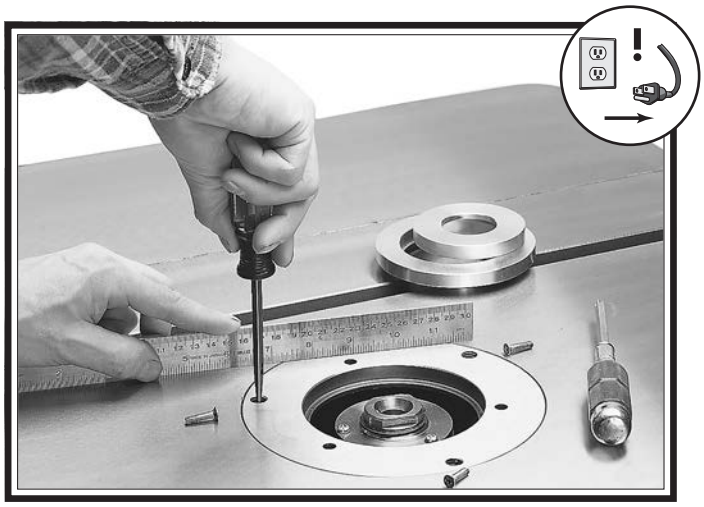


Figure 85. Example of adjusting table inserts.

IMPORTANT: *Table insert and surface must be aligned evenly to ensure workpiece does not catch on table insert or surface and kick back.*

5. Replace inner table inserts, one at a time, then use straightedge to re-check inserts. If necessary, adjust set screws in inner inserts to seat them level with table in all directions using technique from **Step 3**.

Calibrating Fence Scales

The Model SB1119/SB1120 features forward and reverse spindle rotation; either fence face can function as the infeed or outfeed fence. However, the scales indicating the fence face placement on the fence assembly need to be accurately calibrated to allow for accurate micro-adjusting. The factory made these adjustments during production, but you may need to adjust the settings if they have been altered.

Tools Needed	Qty
Hex Wrench 3mm	1
Wrench or Socket 10mm	1

To calibrate fence scales:

1. DISCONNECT MACHINE FROM POWER!

2. Unlock both fence lock handles and turn micro-adjustment knobs fully counterclockwise (see **Figure 86**).

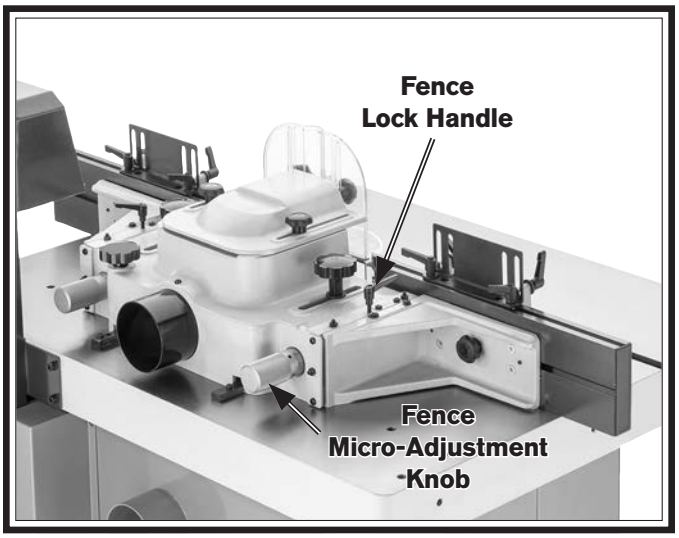


Figure 86. Fence adjustment components.

— If fence scales both indicate 0", no calibration is required.

— For each fence scale that does not indicate 0", perform **Steps 3–6** before proceeding to **Aligning Fence Faces** to ensure fence faces are parallel before resuming operation.

3. Loosen (2) gib lock set screws shown in **Figure 87**.

Figure 87. Location of fence gib lock set screws.

4. Loosen gib jam nut shown in **Figure 88**.

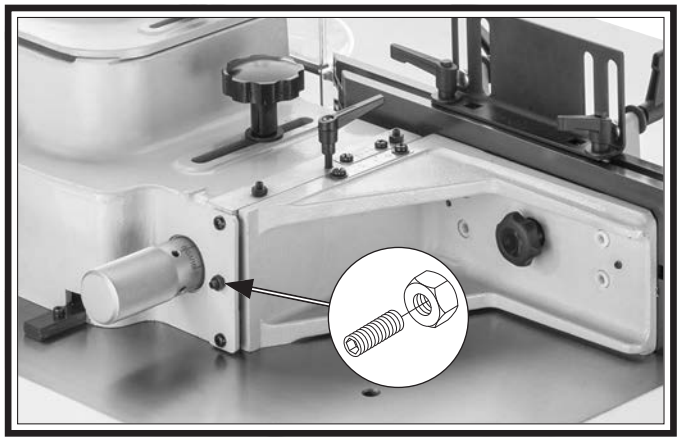


Figure 88. Location of gib adjustment hardware.

5. Adjust fence gib until scale displays 0".

— If fence is too far forward on table, manually push fence toward back of table until scale displays 0".

— If fence is too far backward on table, tighten gib set screw until scale displays 0".

6. Tighten gib jam nut from **Step 4** and gib lock set screws from **Step 3**.

Aligning Fence Faces

For safe and accurate shaping, the fence faces must be parallel with one another so that they properly support the workpiece through the entire cutting operation.

Tools Needed	Qty
Hex Wrench 6mm	1
Precision Straightedge 24"	1

To align fence faces:

1. DISCONNECT MACHINE FROM POWER!

2. Raise and lock cutter guard so it is out of the way.

3. Unlock both fence lock handles and turn micro-adjustment knobs fully counter-clockwise (see **Figure 89**).

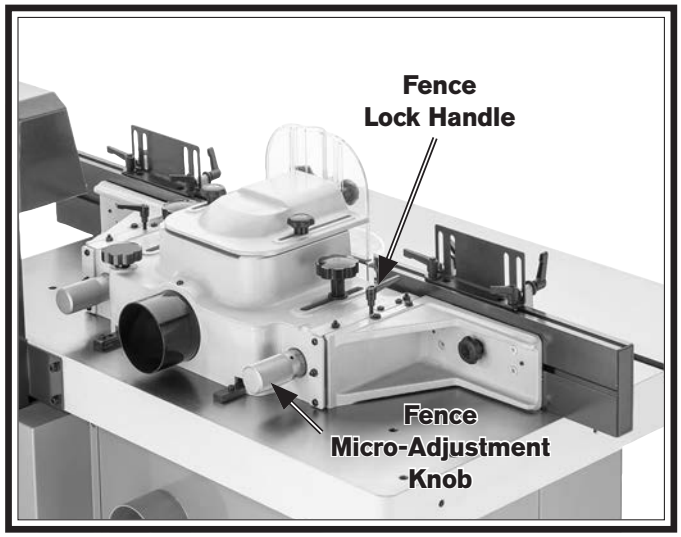


Figure 89. Fence adjustment components.

4. Place straightedge against both fence faces (see **Figure 90**).

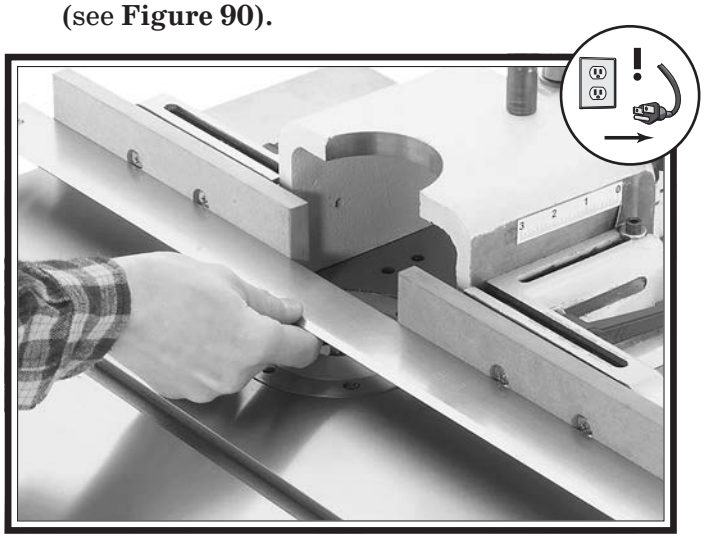


Figure 90. Example of aligning fence faces.

— If there *are no* gaps anywhere between straightedge and fence faces, no adjustment is necessary.

— If there *is a* gap between straightedge and fence faces, proceed to **Step 5**.

5. With straightedge against fence faces, adjust fence set screws in small increments until any gaps are bridged (see **Figure 91**).

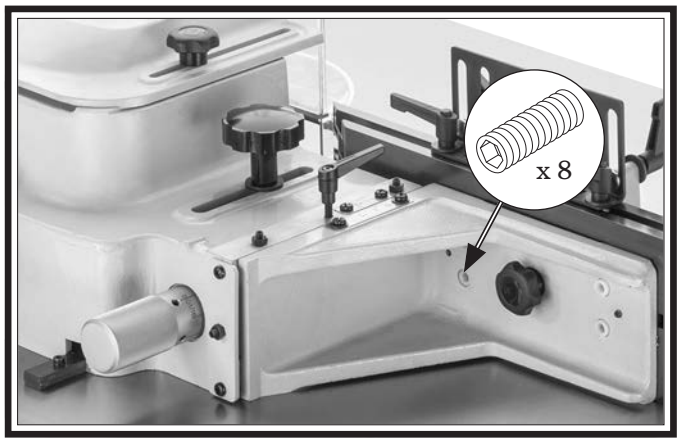


Figure 91. Location of fence face set screws.

Truing Wooden Fences

A flat and properly aligned fence creates a safer, smoother cutting operation. A damaged or worn fence should be replaced. If choosing to replace or use wooden boards as fence faces, follow the instructions below to ensure each is properly flattened and aligned correctly.

Items Needed	Qty
Hex Wrench 5mm	1
Straight, Smooth Stock 30"	1
Marker or Pencil	1
Straight, Smooth Stock 30"	1
Wood Cutting Tool	1
Drill & Drill Bits for Countersinking	As Needed
Fence Mounting Hardware	As Needed
Precision Straightedge 12"	1
Jointer	1

To true wooden fences:

1. Refer to **Making a Zero-Clearance Fence** on **Page 40** for instructions on replacing aluminum fence faces with wood.

2. DISCONNECT MACHINE FROM POWER!

3. Ensure bolts through wood fence facing on each side are tight and adequately countersunk.

4. Follow **Steps 2–3** of **Aligning Fence Faces** on **Page 53**.

5. Place straightedge against both fence faces (see **Figure 92**).

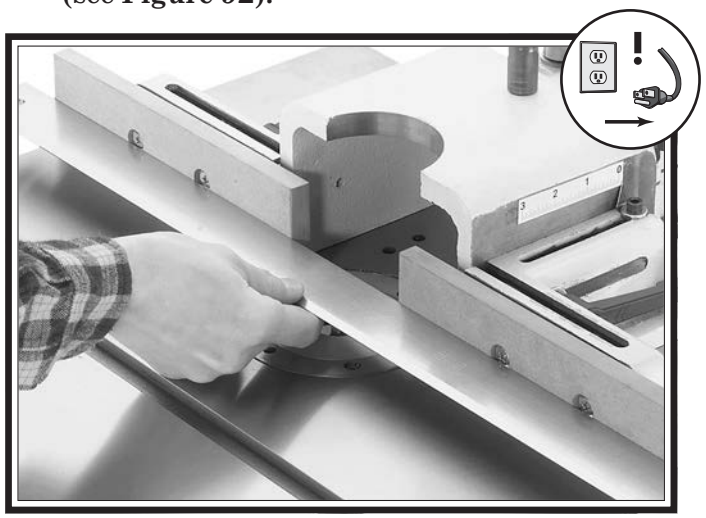


Figure 92. Example of aligning fence faces.

— If there *are no* gaps anywhere between straightedge and fence faces, no truing is necessary.

— If there *is a* gap between straightedge and fence faces, proceed to **Step 6**.

6. Remove both fences and resurface as one unit. You can perform this operation on a jointer as shown in **Figure 93**.

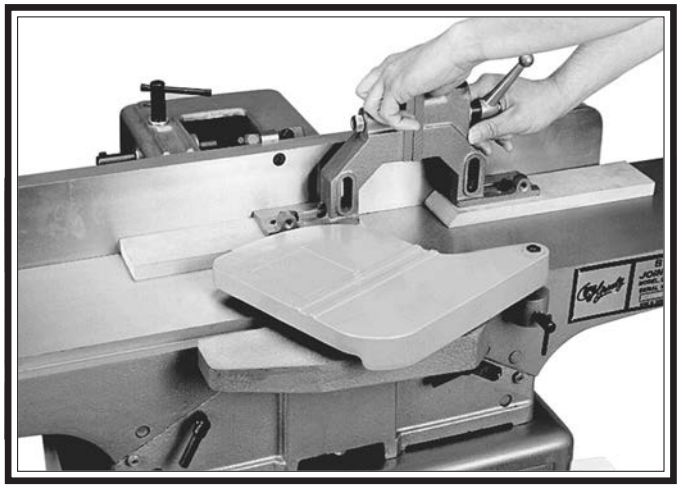


Figure 93. Example of resurfacing fences on a jointer.

⚠CAUTION

Make sure screws are countersunk deep enough so cutter will not come in contact with heads of screws! Check screw depth after each pass to ensure that screws will not contact cutter!

Aligning Pulleys

Pulley alignment is important to the performance of your shaper. If the pulleys are just slightly out of alignment, the shaper may suffer from power loss and decreased V-belt life. When the pulleys are parallel and aligned with each other, they are said to be coplanar—in the same plane.

Tools Needed	Qty
Precision Straightedge	1
Precision Level	1
Wrench or Socket 16mm	1

To align pulleys:

1. DISCONNECT MACHINE FROM POWER!

2. Open cabinet door.

3. Hold straightedge up to pulleys to determine if they are both aligned and parallel, as shown in **Figure 94**.

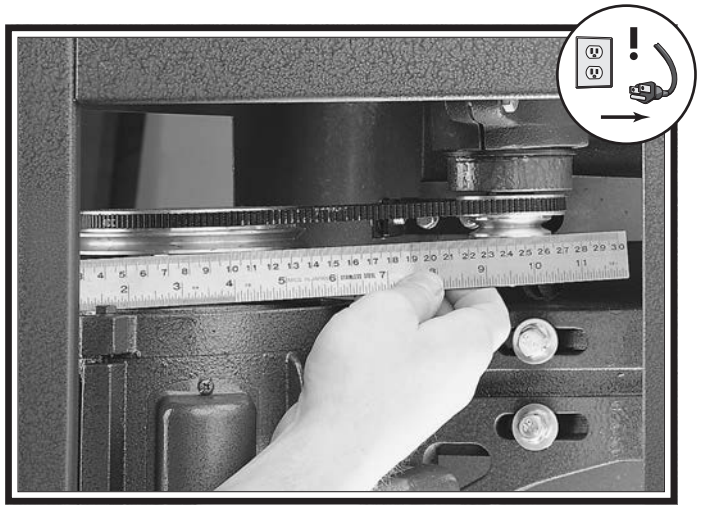


Figure 94. Example of checking pulley alignment with straightedge.

— If pulleys *are* aligned and parallel, no adjustment is necessary.

— If pulleys *are not* aligned and parallel, proceed to **Step 4**.

4. Loosen (4) Phillips head screws enough to remove motor access panel (see **Figure 95**).

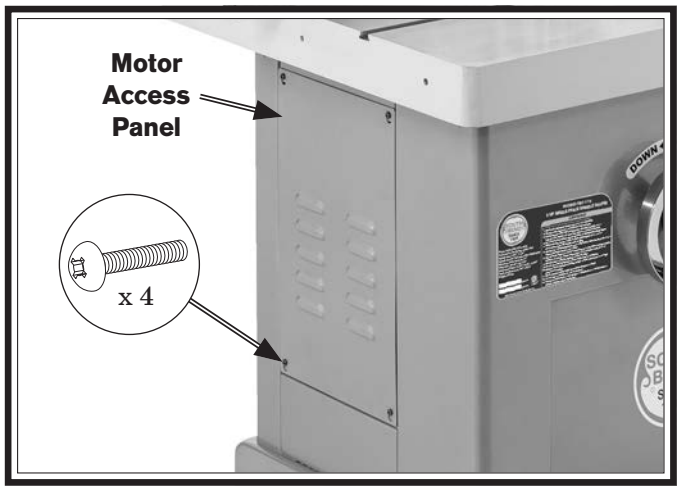


Figure 95. Location of motor access panel and securing screws.

5. Loosen (4) hex bolts securing motor mount to bracket (see **Figure 96**). It may be easier to access back bolts from cabinet door.

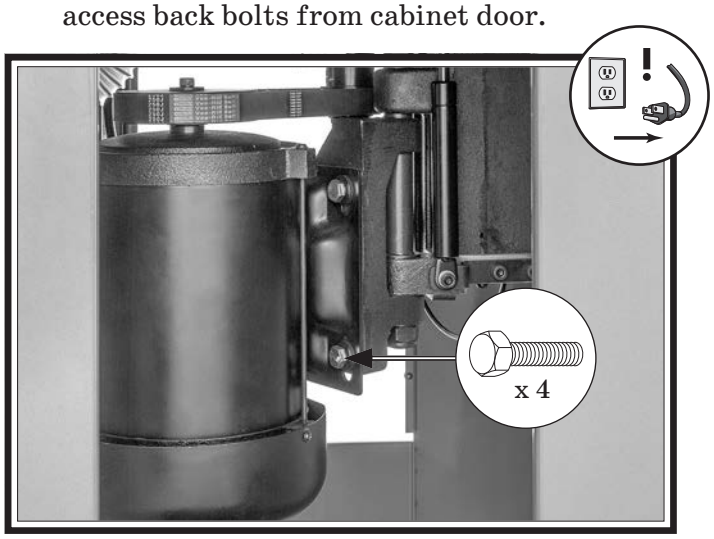


Figure 96. Location of motor mounting bolts.

6. Using straightedge as guide, adjust height/angle of motor until pulleys are aligned, then re-tighten hex bolts.

7. Install motor access panel and tighten screws loosened in **Step 4**.

Adjusting Spindle Gib

The gib controls the smoothness of the slide movement, as well as the run-out or end play of the spindle. Tightening the gib too much will make it hard to adjust the height of the spindle and cause excessive wear on the slide. Loosening the gib too much will introduce spindle end play and cause poor cutting results and excessive wear on the spindle bearings.

Tools Needed	Qty
Open-End Wrench 30mm	1
Hex Wrench 10mm	1

To adjust spindle gib:

1. DISCONNECT MACHINE FROM POWER!

2. Use spindle height handwheel to raise spindle to its highest position.

— If it is difficult to turn handwheel or you feel resistance from spindle slide, gib may need to be loosened. Proceed to **Step 4**.

3. Attempt to wiggle top of spindle.

— If there is movement, proceed to **Step 4**.

— If there is no movement, no adjustment is necessary.

4. Open cabinet door.

5. Loosen (4) jam nuts on gib set screws (see **Figure 97**).

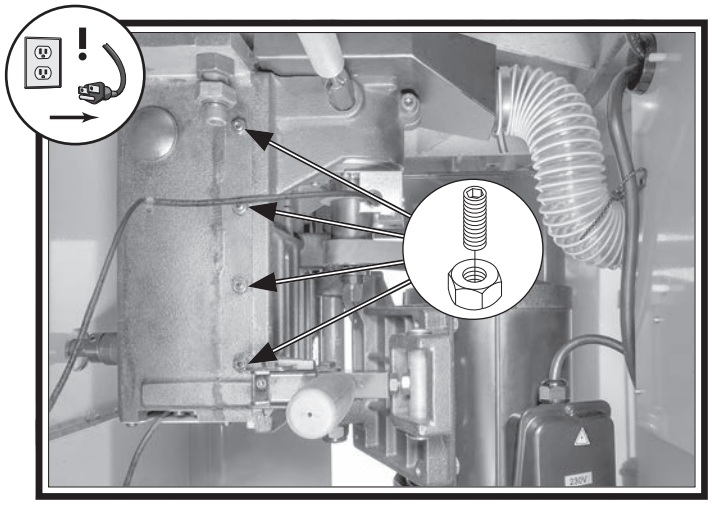


Figure 97. Location jam nuts on gib set screws.

6. Evenly adjust set screws in small amounts then test results using methods in **Steps 2–3**.

7. When you are satisfied with gib adjustment, tighten jam nuts without turning set screws.

8. Repeat **Steps 2–3** to confirm gib adjustment. If necessary, repeat **Steps 5–8**.

9. Close cabinet door.

Squaring Spindle

To reduce the risk of kickback and to increase the quality of cuts, it is important to make sure the spindle and table are perpendicular, or "square", to each other in all directions. This process will require taking measurements at many different positions.

To get a perpendicular alignment between the table and spindle, it will be necessary to take multiple readings and make multiple adjustments to the adjusting hex bolt at each corner of the spindle housing.

Tools Needed	**Qty**
Machinist's Square	1
Open-End Wrench 30mm	1

To square spindle:

1. DISCONNECT MACHINE FROM POWER!

2. Remove guard/fence assembly from table.

3. Remove any cutters or spacers from spindle.

4. Use spindle height handwheel to raise spindle to its highest position.

5. Position machinist's square against spindle and table to check squareness (see **Figures 98–99**).

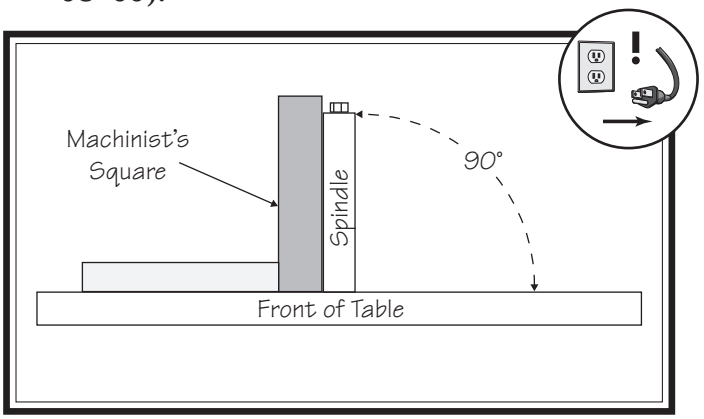


Figure 98. Illustration of using machinist's square to square spindle to table.

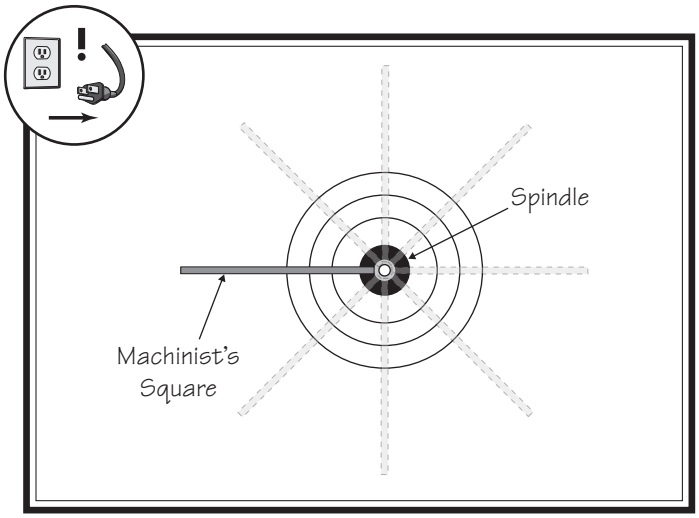


Figure 99. Illustration of machinist's square measuring spindle squareness at different directions.

— If there *are no* gaps anywhere between square and table or spindle, no adjustment is necessary.

— If there *is* a gap anywhere between square and table or spindle, proceed to **Step 6**.

6. Open cabinet door and loosen (4) Phillips head screws enough to remove motor access panel (see **Figure 100**).

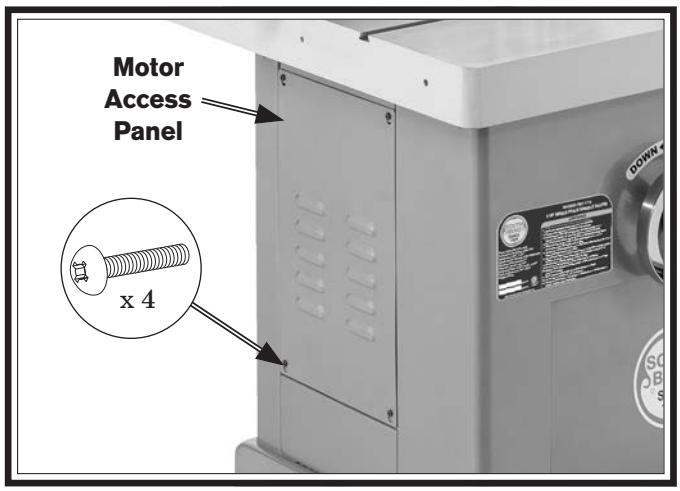


Figure 100. Location of motor access panel and securing screws.

7. Loosen (4) jam nuts shown in **Figure 101**.

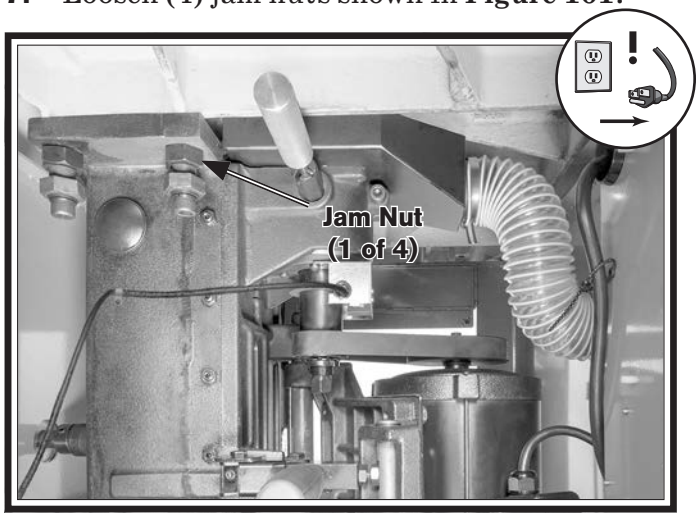


Figure 101. Location of spindle tilt jam nuts.

8. Adjust hex stand-offs shown in **Figure 102** by small increments until spindle is square to table in all directions.

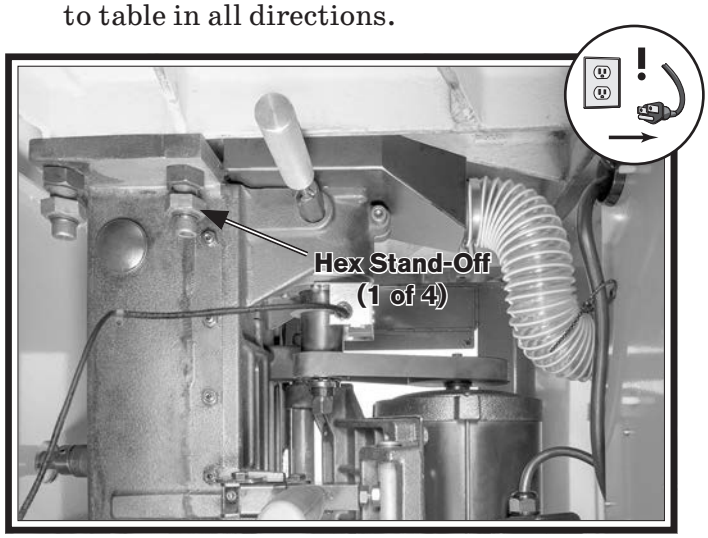


Figure 102. Location of spindle tilt hex stand-offs.

9. When spindle is squared to table, re-tighten jam nuts without turning hex stand-offs.

10. Repeat **Step 5** to confirm squareness. If necessary, repeat **Steps 7–9**.

11. Install motor access panel and close cabinet door.

If you need replacement parts, or if you are unsure how to do any of the solutions given here, feel free to call us at (360) 734-1540.

Symptom	Possible Cause	Possible Solution
Machine does not start or power supply breaker trips immediately after startup.	1. STOP button depressed/at fault.	1. Rotate STOP button to reset. Replace if at fault.
	2. Incorrect power supply voltage or circuit size.	2. Ensure correct power supply voltage and circuit size **(Page 14)**.
	3. Cabinet door open/door limit switch at fault.	3. Close door/replace limit switch.
	4. Power supply circuit breaker tripped or fuse blown.	4. Ensure circuit is free of shorts. Reset circuit breaker or replace fuse.
	5. Motor wires connected incorrectly.	5. Correct motor wiring connections **(Pages 62–63)**.
	6. Contactor not energized/at fault.	6. Test all legs for power; replace if necessary.
	7. Wiring broken, disconnected, or corroded.	7. Fix broken wires or disconnected/corroded connections **(Pages 62–63)**.
	8. ON button at fault.	8. Test/replace button.
	9. FOR/REV switch at fault.	9. Test/replace switch.
	10. Potentiometer/circuit board at fault.	10. Inspect/test/replace if at fault.
	11. VFD at fault.	11. Inspect VFD; replace if at fault.
	12. Motor or motor bearings at fault.	12. Replace motor.
Machine stalls or is underpowered.	1. Workpiece material unsuitable for machine.	1. Only cut wood/ensure moisture is below 20% **(Page 25)**.
	2. Feed rate/cutting speed too fast.	2. Decrease feed rate/cutting speed **(Page 27)**.
	3. Workpiece crooked; fence loose or misadjusted.	3. Straighten or replace workpiece; adjust fence **(Page 31)**.
	4. Machine undersized for task.	4. Use sharp cutter/reduce feed rate or depth of cut.
	5. Belt slipping/pulleys misaligned.	5. Clean/tension/replace belt **(Page 50)**; ensure pulleys are aligned.
	6. Motor wires connected incorrectly.	6. Correct motor wiring connections **(Pages 62–63)**.
	7. Pulley/sprocket slipping on shaft.	7. Tension/replace loose pulley/shaft.
	8. Motor overheated.	8. Clean motor, let cool, and reduce workload.
	9. Extension cord too long.	9. Move machine closer to power supply; use shorter extension cord.
	10. Contactor not energized/at fault.	10. Test all legs for power; repair/replace if at fault.
	11. FOR/REV switch at fault.	11. Test/replace switch.
	12. Potentiometer/circuit board at fault.	12. Inspect/test/replace if at fault.
	13. Motor or motor bearings at fault.	13. Replace motor.
Machine has vibration or noisy operation.	1. Motor or component loose.	1. Replace damaged or missing bolts/nuts or tighten if loose.
	2. Machine feet not adjusted properly.	2. Adjust machine feet to stabilize machine.
	3. V-belt worn, loose, pulleys misaligned or belt slapping cover.	3. Inspect/replace belt **(Page 50)**. Align pulleys if necessary **(Page 55)**.
	4. Cutter, spindle, or spindle bearings at fault.	4. Replace cutter; tighten loose spindle; replace defective spindle or spindle cartridge; replace spindle bearings **(Page 51)**.
	5. Elevation housing loose or damaged.	5. Tighten elevation housing gibs **(Page 56)**; replace cracked elevation housing.

Symptom	Possible Cause	Possible Solution
Machine has vibration or noisy operation. (Cont.)	6. Pulley loose. 7. Motor mount loose/broken. 8. Workpiece loose. 9. Motor fan rubbing on fan cover. 10. Motor bearings at fault.	6. Secure pulley on shaft. 7. Tighten/replace. 8. Use correct holding fixture; support workpiece. 9. Fix/replace fan cover; replace loose/damaged fan. 10. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.
Workpiece is burned when cut.	1. Dull cutter. 2. Too slow of feed rate. 3. Pitch build-up on cutter. 4. Feeding workpiece in same direction as cutterhead rotation. 5. Taking too deep of cut.	1. Replace cutter, or have it professionally sharpened. 2. Increase feed speed. 3. Clean cutter with blade and bit cleaning solution. 4. Reverse direction of cutter rotation **(Page 26)**/ reverse feed direction. 5. Make several passes of light cuts. (Always reduce cutting depth when working with hard woods.)
Divots in edge of cut.	1. Inconsistent feed speed. 2. Inconsistent workpiece pressure against fence and/or rub collar. 3. Fence not adjusted correctly.	1. Move smoothly or use a power feeder. 2. Apply constant, even pressure to workpiece throughout cut and use featherboards/power feeder. 3. Adjust fence **(Page 31)**.
Fuzzy grain.	1. Wood may have high moisture content or surface wetness. 2. Dull cutter.	1. Check moisture content and allow to dry if moisture is more than 20% **(Page 25)**. 2. Replace cutter, or have it professionally sharpened.
Chipping.	1. Cutting against grain of wood. 2. Nicked or chipped cutter. 3. Feeding workpiece too fast. 4. Taking too deep of cut. 5. Knots in wood.	1. Cut with grain of wood. 2. Replace cutter, or have it professionally sharpened. 3. Decrease feed rate. 4. Make several passes of light cuts. (Always reduce cutting depth when working with hard woods.) 5. Inspect workpiece **(Page 25)**; use a different workpiece if necessary.
Workpiece kicks back toward operator.	1. Taking too deep of cut. 2. Workpiece is warped, rough, has high moisture content, or loose/ large knots. 3. Workpiece pinched between cutter and table or cutter and guard.	1. Make several passes of light cuts. (Always reduce cutting depth when working with hard woods.) 2. Inspect workpiece **(Page 25)**; only use smooth, dry stock without loose/large knots. 3. Ensure proper clearance between cutter, guard, and table.
Workpiece pulls forward/ejects from operator's hands.	1. Feeding workpiece in same direction as cutterhead rotation.	1. Reverse direction of cutter rotation **(Page 26)**/ reverse feed direction.
Workpiece hits outfeed fence.	1. Fence not adjusted correctly.	1. Adjust fence to support workpiece as it passes cutterhead **(Page 31)**. Align fence boards with straightedge, verify parallelism **(Page 53)**.
Excessive snipe (gouge in end of board that is uneven with rest of cut).	1. Fence not adjusted correctly. 2. Incorrect workpiece pressure against fence and/or rub collar.	1. Adjust fence to support workpiece as it passes cutterhead **(Page 31)**. Align fence boards with straightedge, verify parallelism **(Page 53)**. 2. Apply constant, even pressure to workpiece through cut and use featherboards/power feeder.

Electrical Safety Instructions

These pages are accurate at the time of printing. In the constant effort to improve, however, we may make changes to the electrical systems of future machines. Study this section carefully. If you see differences between your machine and what is shown in this section, call Technical Support at (360) 734-1540 for assistance BEFORE making any changes to the wiring on your machine.

Shock Hazard: It is extremely dangerous to perform electrical or wiring tasks while the machine is connected to the power source. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. For your own safety, disconnect machine from the power source before servicing electrical components or performing any wiring tasks!

Wire Connections: All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.

Modifications: Using aftermarket parts or modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire.

Motor Wiring: The motor wiring shown in these diagrams is current at the time of printing, but it may not match your machine. Always use the wiring diagram inside the motor junction box.

Circuit Requirements: Connecting the machine to an improperly sized circuit will greatly increase the risk of fire. To minimize this risk, only connect the machine to a power circuit that meets the minimum requirements given in this manual.

Capacitors/Inverters: Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

Wire/Component Damage: Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components before completing the task.

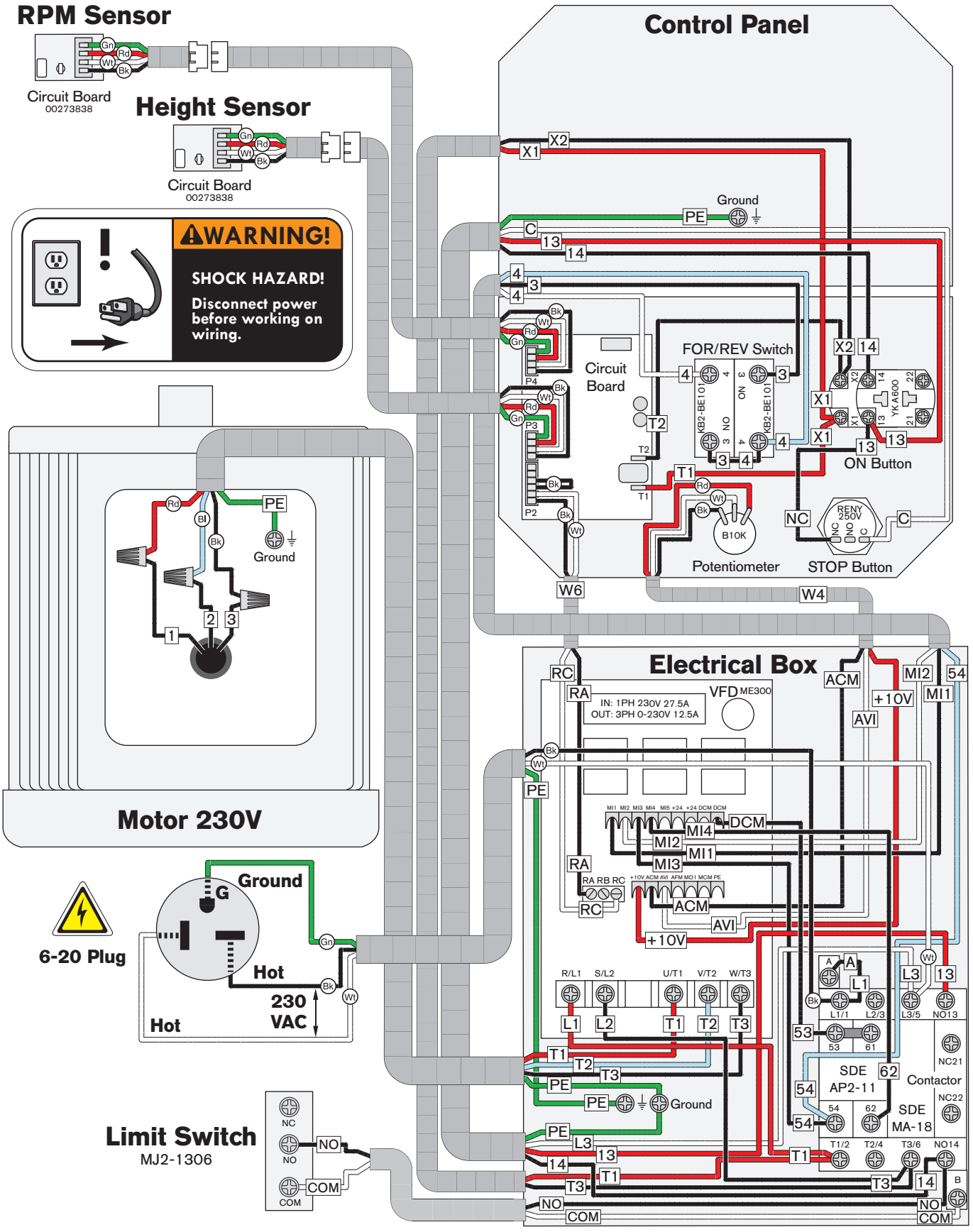
Experiencing Difficulties: If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (360) 734-1540.

WIRING DIAGRAM COLOR KEY

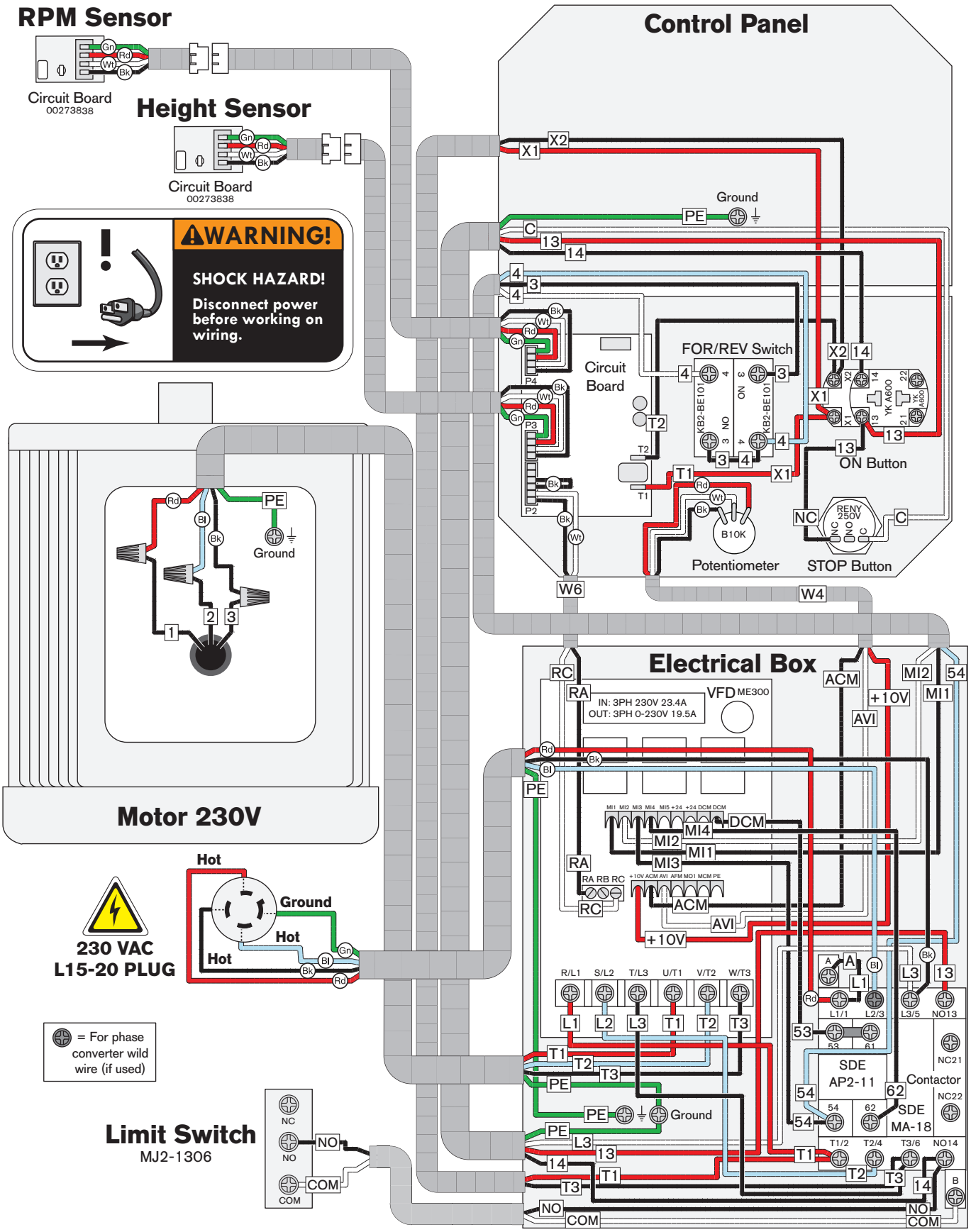
BLACK	Bk	BLUE WHITE	Bw	RED	Rd	PINK	Pk	WHITE	Wt
BLUE	Bl	GREEN	Gn	LIGHT BLUE	Lb	PURPLE	Pu	YELLOW GREEN	Yg
BROWN	Br	GRAY	Gy	ORANGE	Or	TUR-QUIOSE	Tu	YELLOW	Yl

NOTICE: **The photos and diagrams included in this section are best viewed in color. You can see them in color at www.southbendtools.com.**

SB1119 Wiring Diagram



SB1120 Wiring Diagram



Electrical Component Photos

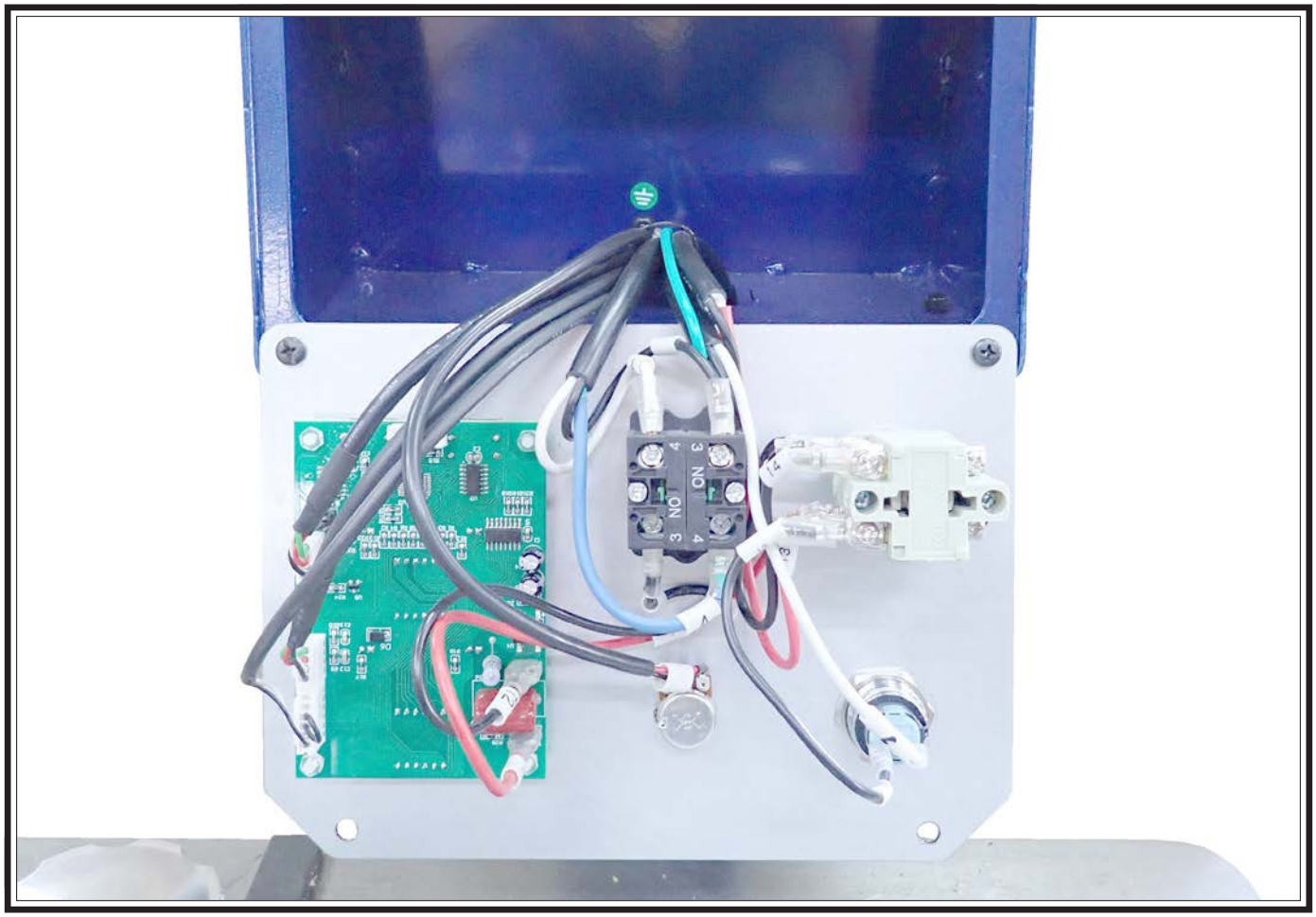


Figure 103. Control panel wiring.

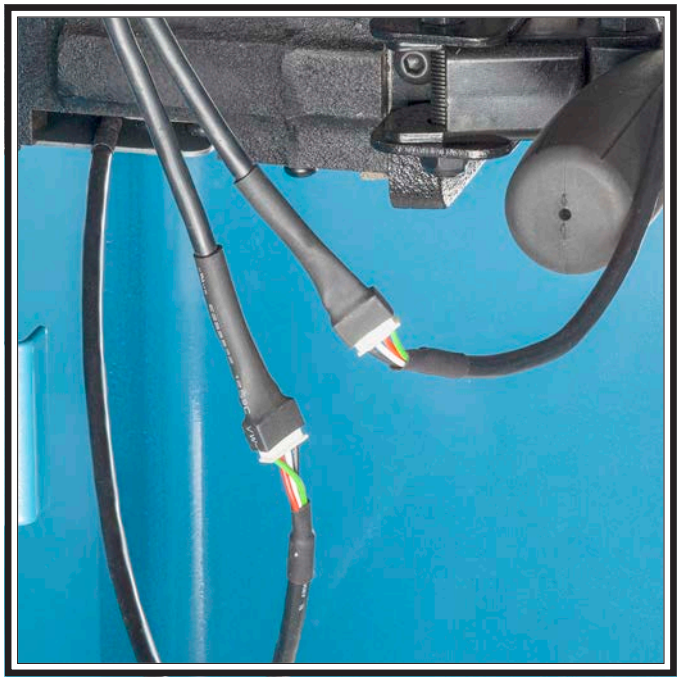


Figure 104. Spindle RPM and height sensors.

Figure 105. Cabinet door limit switch.

Electrical Component Photos (Cont.)

Figure 106. SB1119 electrical box wiring.

Figure 108. SB1120 electrical box wiring.

Figure 107. Motor junction box wiring.

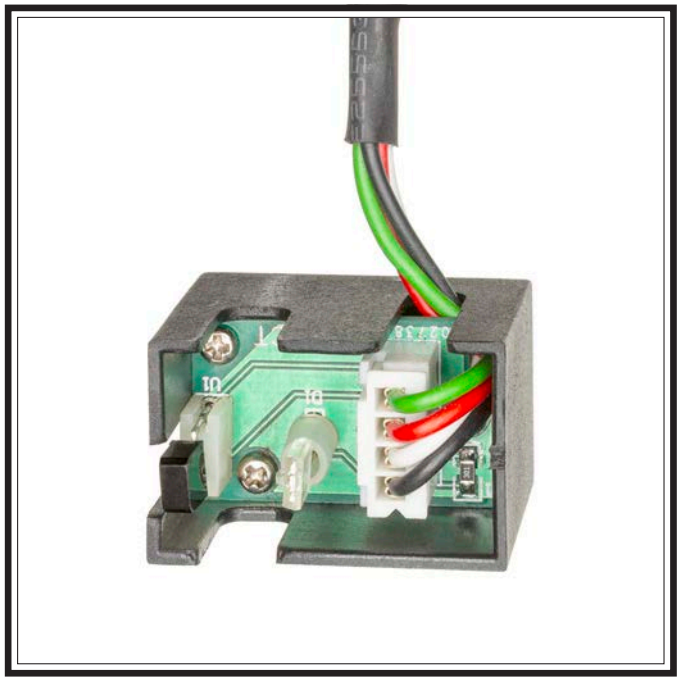


Figure 109. RPM and height sensor wiring.

Table

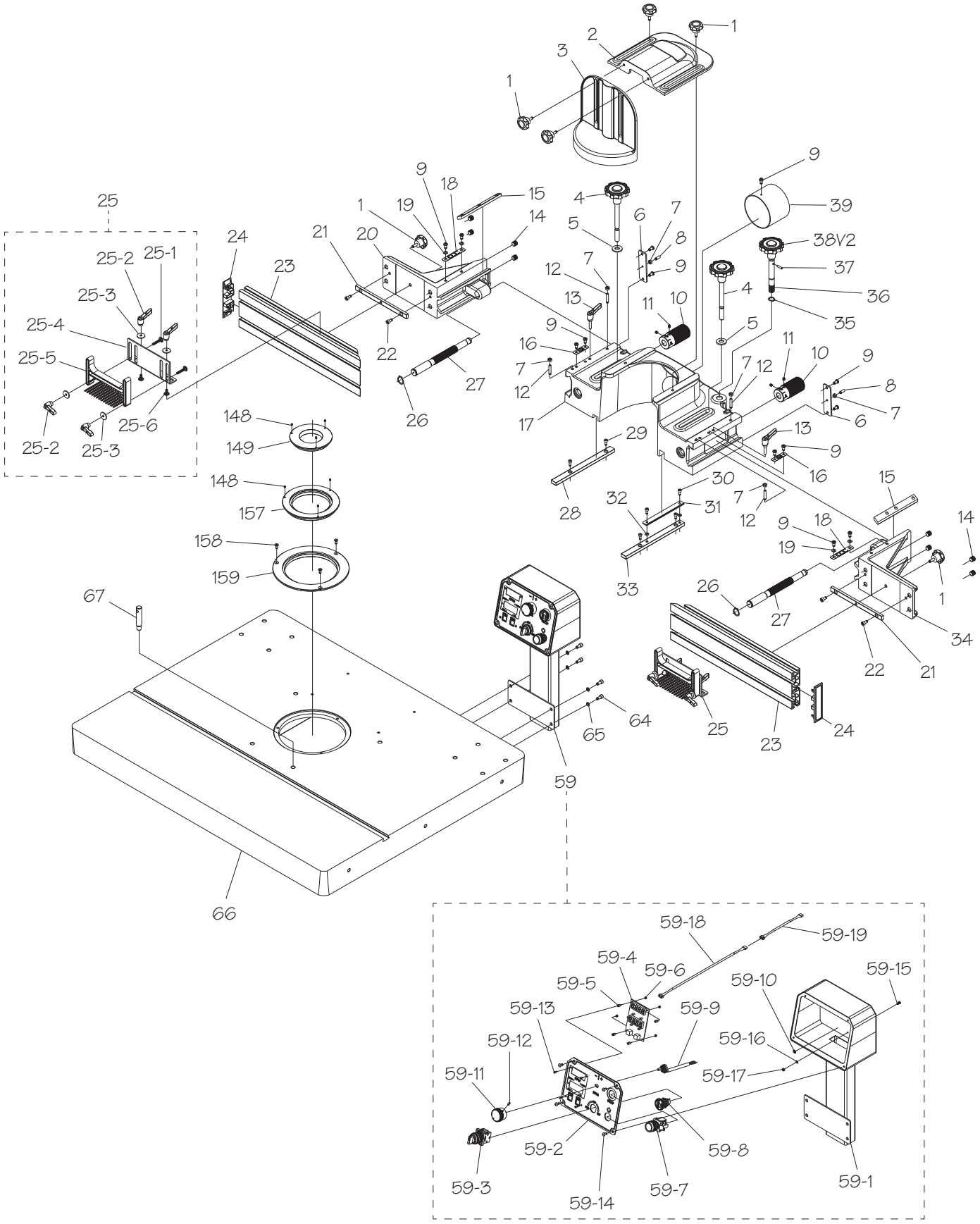

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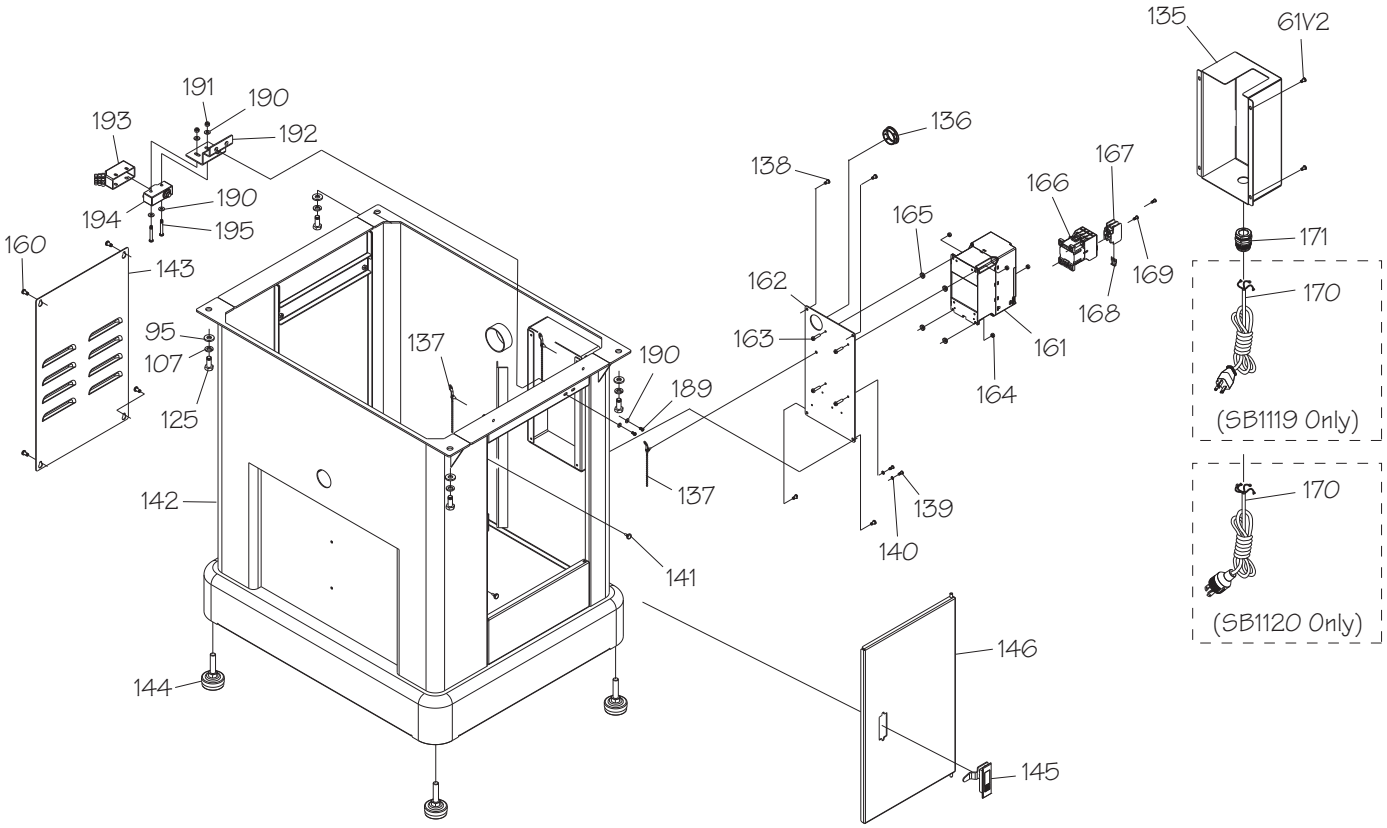
Table Parts List

REF	PART #	DESCRIPTION
1	PSB1119001	KNOB BOLT M6-1 X 20, 6-LOBE, D40
2	PSB1119002	TOP CUTTER GUARD
3	PSB1119003	FRONT CUTTER GUARD
4	PSB1119004	KNOB BOLT M12-1.75 X 42, 9-LOBE, D80
5	PSB1119005	FLAT WASHER 12MM
6	PSB1119006	FENCE BRACKET STOP PLATE
7	PSB1119007	HEX NUT M6-1
8	PSB1119008	SET SCREW M6-1 X 20
9	PSB1119009	PHLP HD SCR M6-1 X 12
10	PSB1119010	KNOB 3/4-16, 1-5/8D, ROUND KD
11	PSB1119011	SET SCREW M6-1 X 8
12	PSB1119012	SET SCREW M6-1 X 30
13	PSB1119013	ADJUSTABLE HANDLE M6-1 X 32, 50L
14	PSB1119014	SET SCREW M12-1.75 X 12
15	PSB1119015	GIB
16	PSB1119016	SCALE INDICATOR
17	PSB1119017	GUARD/FENCE BASE
18	PSB1119018	FENCE SCALE
19	PSB1119019	FLAT WASHER 6MM
20	PSB1119020	FENCE BRACKET (L)
21	PSB1119021	SLIDING BLOCK
22	PSB1119022	CAP SCREW M6-1 X 12
23	PSB1119023	FENCE
24	PSB1119024	FENCE SIDE COVER
25	PSB1119025	FEATHERBOARD ASSEMBLY
25-1	PSB1119025-1	CARRIAGE BOLT M5-.8 X 30
25-2	PSB1119025-2	ADJUSTABLE HANDLE M5-.8, 44L
25-3	PSB1119025-3	FENDER WASHER 5MM
25-4	PSB1119025-4	FEATHERBOARD MOUNTING BRACKET
25-5	PSB1119025-5	FEATHERBOARD
25-6	PSB1119025-6	CARRIAGE BOLT M5-.8 X 16
26	PSB1119026	EXT RETAINING RING 20MM
27	PSB1119027	FENCE ADJUSTMENT SHAFT
28	PSB1119028	FENCE BASE SLIDE BLOCK
29	PSB1119029	CAP SCREW M5-.8 X 16
30	PSB1119030	CAP SCREW M5-.8 X 12
31	PSB1119031	RACK

REF	PART #	DESCRIPTION
32	PSB1119032	FLAT WASHER 5MM
33	PSB1119033	FENCE BASE RACK SLIDE BLOCK
34	PSB1119034	FENCE BRACKET (R)
35	PSB1119035	EXT RETAINING RING 15MM
36	PSB1119036	FENCE BASE LOCK SHAFT
37	PSB1119037	ROLL PIN 4 X 18
38V2	PSB1119038V2	KNOB M12-1.75, 9-LOBE, D63 V2.04.24
39	PSB1119039	SPINDLE DUST PORT 4"
59	PSB1119059	CONTROL PANEL ASSEMBLY
59-1	PSB1119059-1	CONTROL PANEL BOX
59-2	PSB1119059-2	CONTROL PANEL
59-3	PSB1119059-3	FOR/REV SWITCH KEYON KB2-ED33(2A)
59-4	PSB1119059-4	DRO LCM CIRCUIT BOARD
59-5	PSB1119059-5	STANDOFF-HEX MF M3-.5 X 8, M3-.5 PLASTIC
59-6	PSB1119059-6	HEX NUT M3-.5 PLASTIC
59-7	PSB1119059-7	ON BUTTON YK A600 22MM GRN
59-8	PSB1119059-8	E-STOP BUTTON RENY 250V, 22MM
59-9	PSB1119059-9	POTENTIOMETER W/CORD 10K OHM 24G 3W 45"
59-10	PSB1119059-10	GROUND LABEL
59-11	PSB1119059-11	SPEED CONTROL DIAL, D33.5, ROUND KD
59-12	PSB1119059-12	SET SCREW M4-.7 X 8
59-13	PSB1119059-13	BUTTON HD CAP SCR M3-.5 X 8
59-14	PSB1119059-14	BUTTON HD CAP SCR M5-.8 X 10
59-15	PSB1119059-15	PHLP HD SCR M4-.7 X 8
59-16	PSB1119059-16	EXT TOOTH WASHER 4MM
59-17	PSB1119059-17	HEX NUT M4-.7
59-18	PSB1119059-18	SENSOR EXTENSION CORD 22G 5W 57"
59-19	PSB1119059-19	SENSOR CORD 22G 5W 18"
64	PSB1119064	CAP SCREW M8-1.25 X 16
65	PSB1119065	LOCK WASHER 8MM
66	PSB1119066	TABLE
67	PSB1119067	STARTING PIN
148	PSB1119148	SET SCREW M4-.7 X 4
149	PSB1119149	TABLE INSERT RING 2-1/2" ID
157	PSB1119157	TABLE INSERT RING 4-1/8" ID
158	PSB1119158	FLAT HD SCR M5-.8 X 12
159	PSB1119159	TABLE INSERT RING 5-3/4" ID

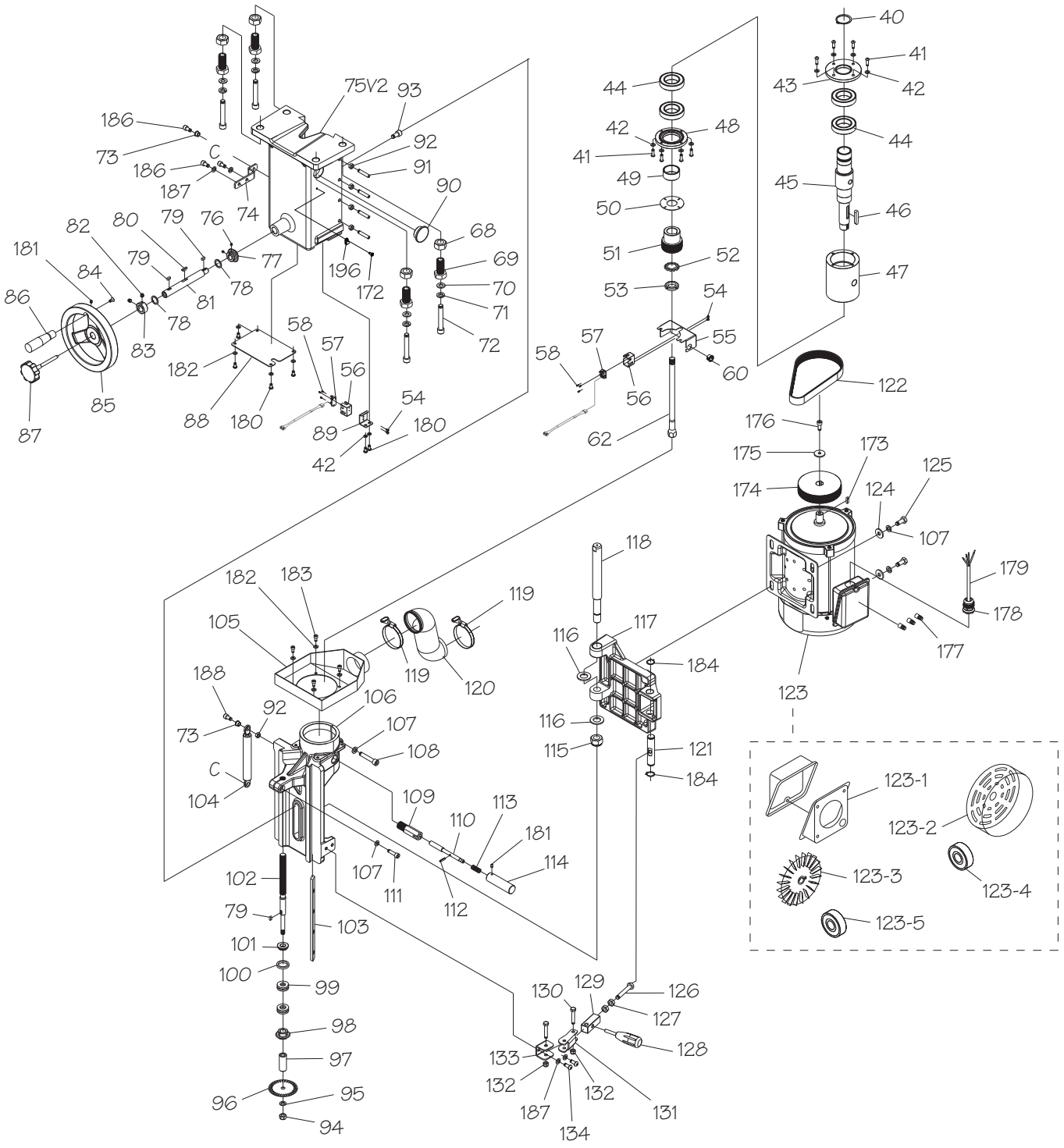
Cabinet



REF	PART #	DESCRIPTION
61V2	PSB1119061V2	PHLP HD SCR M5-.8 X 10 V2.07.22
95	PSB1119095	FENDER WASHER 10MM
107	PSB1119107	LOCK WASHER 10MM
125	PSB1119125	HEX BOLT M10-1.5 X 25
135	PSB1119135	ELECTRICAL BOX
136	PSB1119136	GROMMET 29 X 38.1 X 11.4MM
137	PSB1119137	CABLE CHAIN
138	PSB1119138	PHLP HD SCR M5-.8 X 10
139	PSB1119139	PHLP HD SCR M4-.7 X 8
140	PSB1119140	EXT TOOTH WASHER 4MM
141	PSB1119141	DOOR STOP
142	PSB1119142	CABINET
143	PSB1119143	MOTOR ACCESS PANEL
144	PSB1119144	FOOT M12-1.75 X 50
145	PSB1119145	LATCH
146	PSB1119146	CABINET DOOR
160	PSB1119160	PHLP HD SCR M6-1 X 12
161	PSB1119161	INVERTER/VFD 11AME21ANNAA (SB1119)
161	PSB1120161	INVERTER/VFD 17AME23ANNAA (SB1120)

REF	PART #	DESCRIPTION
162	PSB1119162	INVERTER MOUNTING BOARD
163	PSB1119163	PHLP HD SCR M5-.8 X 20 PLASTIC
164	PSB1119164	HEX NUT M5-.8
165	PSB1119165	FLAT WASHER 6.1 X 12.5 X 3.5MM
166	PSB1119166	CONTACTOR SDE MA-18 230V
167	PSB1119167	AUX CONTACTOR SDE AP2-11
168	PSB1119168	JUMPER M919
169	PSB1119169	PHLP HD SCR M4-.7 X 10
170	PSB1119170	POWER CORD 12G 3W 138" 6-20P (SB1119)
170	PSB1120170	POWER CORD 12G 4W 138" L15-20P (SB1120)
171	PSB1119171	STRAIN RELIEF TYPE-3 M25-1.5
189	PSB1119189	PHLP HD SCR M4-.7 X 8
190	PSB1119190	FLAT WASHER 4MM
191	PSB1119191	LOCK NUT M4-.7
192	PSB1119192	LIMIT SWITCH MOUNTING BRACKET
193	PSB1119193	LIMIT SWITCH COVER
194	PSB1119194	LIMIT SWITCH MOUJEN MJ2-1306
195	PSB1119195	PHLP HD SCR M4-.7 X 35

Motor & Handwheel



REF	PART #	DESCRIPTION
40	PSB1119040	EXT RETAINING RING 40MM
41	PSB1119041	BUTTON HD CAP SCR M6-1 X 20
42	PSB1119042	LOCK WASHER 6MM
43	PSB1119043	BEARING RETAINING PLATE (UPPER)
44	PSB1119044	BALL BEARING 6008-2RS
45	PSB1119045	SPINDLE BASE

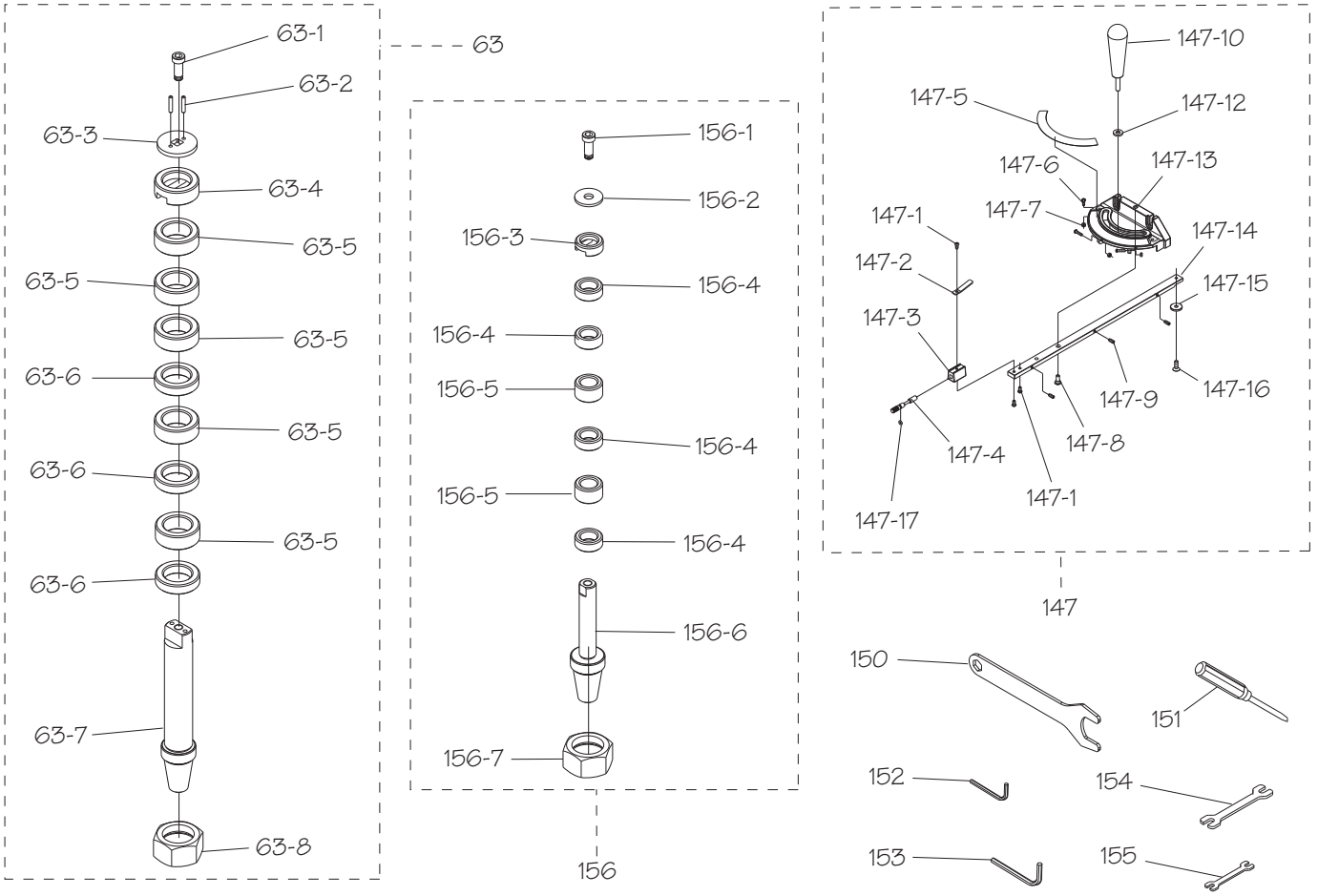
REF	PART #	DESCRIPTION
46	PSB1119046	KEY 8 X 7 X 43 RE
47	PSB1119047	QUILL
48	PSB1119048	BEARING RETAINING PLATE (LOWER)
49	PSB1119049	SPACER 40 X 46 X 30
50	PSB1119050	RPM SENSOR PLATE
51	PSB1119051	SPINDLE PULLEY

Motor & Handwheel Parts List (Cont.)

REF	PART #	DESCRIPTION
52	PSB1119052	EXT TOOTH WASHER 25MM
53	PSB1119053	BEARING RETAINING NUT M25-1.5
54	PSB1119054	TAP SCREW M3 X 6
55	PSB1119055	DUST COVER
56	PSB1119056	SENSOR BOX
57	PSB1119057	MAGNETIC HEAD
58	PSB1119058	TAP SCREW M2 X 6
60	PSB1119060	GROMMET 12.3 X 18 X 10.4MM
62	PSB1119062	DRAWBAR 5/8-11 X 10-5/16
68	PSB1119068	HEX NUT M20-1.5
69	PSB1119069	STANDOFF-HEX MF M20-1.5 X 44, M12-1.75
70	PSB1119070	FLAT WASHER 12MM
71	PSB1119071	LOCK WASHER 12MM
72	PSB1119072	CAP SCREW M12-1.75 X 80
73	PSB1119073	BUSHING
74	PSB1119074	GAS STRUT BRACKET
75V2	PSB1119075V2	ELEVATION HOUSING V2.07.22
76	PSB1119076	SET SCREW M5-.8 X 5
77	PSB1119077	BEVEL GEAR
78	PSB1119078	FLAT WASHER 19.1 X 25.4 X 1.6MM
79	PSB1119079	KEY 5 X 5 X 12 RE
80	PSB1119080	WOODRUFF KEY 5 X 20
81	PSB1119081	HANDWHEEL SHAFT
82	PSB1119082	SET SCREW 5/16-18 X 5/16
83	PSB1119083	COLLAR
84	PSB1119084	FLAT HD CAP SCR M6-1 X 12
85	PSB1119085	HANDWHEEL TYPE-24 200D X 20B-N X M10-1.5
86	PSB1119086	FOLDING HANDLE 30 X 90, M6-1 X 12
87	PSB1119087	KNOB BOLT M10-1.5 X 25, 8-LOBE, D60
88	PSB1119088	ELEVATION HOUSING PLATE
89	PSB1119089	SENSOR MOUNTING BRACKET
90	PSB1119090	CAP
91	PSB1119091	SET SCREW M8-1.25 X 35
92	PSB1119092	HEX NUT M8-1.25
93	PSB1119093	CAP SCREW M10-1.5 X 20
94	PSB1119094	LOCK NUT M10-1.25
95	PSB1119095	FENDER WASHER 10MM
96	PSB1119096	HEIGHT SENSOR PLATE
97	PSB1119097	SPACER 10.8 X 20 X 50
98	PSB1119098	BEVEL GEAR
99	PSB1119099	THRUST BEARING 51202
100	PSB1119100	GASKET
101	PSB1119101	BUSHING
102	PSB1119102	ELEVATION LEADSCREW
103	PSB1119103	ELEVATION GIB
104	PSB1119104	GAS STRUT
105	PSB1119105	DUST TRAY
106	PSB1119106	SPINDLE HOUSING
107	PSB1119107	LOCK WASHER 10MM
108	PSB1119108	CAP SCREW M10-1.5 X 55
109	PSB1119109	SPINDLE LOCK SHAFT SEAT
110	PSB1119110	SPINDLE LOCK SHAFT

REF	PART #	DESCRIPTION
111	PSB1119111	CAP SCREW M10-1.5 X 40
112	PSB1119112	ROLL PIN 4 X 20
113	PSB1119113	COMPRESSION SPRING 1 X 12 X 38
114	PSB1119114	FIXED HANDLE 25 X 90
115	PSB1119115	LOCK NUT M20-1.5
116	PSB1119116	FLAT WASHER 20MM
117	PSB1119117	MOTOR BRACKET
118	PSB1119118	MOTOR BRACKET PIVOT SHAFT
119	PSB1119119	HOSE CLAMP 3"
120	PSB1119120	DUST CHUTE 3" X 11-3/4"
121	PSB1119121	TENSION PIVOT SHAFT
122	PSB1119122	POLY V-BELT 10V X 25L RIBBED
123	PSB1119123	MOTOR 3HP 230V 3-PH (SB1119)
123-1	PSB1119123-1	MOTOR JUNCTION BOX (SB1119)
123-2	PSB1119123-2	MOTOR FAN COVER (SB1119)
123-3	PSB1119123-3	MOTOR FAN (SB1119)
123-4	PSB1119123-4	BALL BEARING 6206-2NSE (FRONT) (SB1119)
123-5	PSB1119123-5	BALL BEARING 6204-2NSE (REAR) (SB1119)
123	PSB1120123	MOTOR 5HP 230V 3-PH (SB1120)
123-1	PSB1120123-1	MOTOR JUNCTION BOX (SB1120)
123-2	PSB1120123-2	MOTOR FAN COVER (SB1120)
123-3	PSB1120123-3	MOTOR FAN (SB1120)
123-4	PSB1120123-4	BALL BEARING 6206-2NSE (FRONT) (SB1120)
123-5	PSB1120123-5	BALL BEARING 6204-2NSE (REAR) (SB1120)
124	PSB1119124	FENDER WASHER 10MM
125	PSB1119125	HEX BOLT M10-1.5 X 25
126	PSB1119126	HEX BOLT M10-1.5 X 55
127	PSB1119127	HEX NUT M10-1.5
128	PSB1119128	FIXED HANDLE 38 X 110, M10-1.5 X 15
129	PSB1119129	TENSION BLOCK
130	PSB1119130	HEX BOLT M8-1.25 X 45
131	PSB1119131	TENSION BRACKET
132	PSB1119132	LOCK NUT M8-1.25
133	PSB1119133	TENSION ASSEMBLY MOUNTING BRACKET
134	PSB1119134	BUTTON HD CAP SCR M8-1.25 X 20
172	PSB1119172	PHLP HD SCR M5-.8 X 10
173	PSB1119173	KEY 5 X 5 X 25 RE
174	PSB1119174	MOTOR PULLEY
175	PSB1119175	FENDER WASHER 8MM
176	PSB1119176	CAP SCREW M8-1.25 X 20
177	PSB1119177	WIRE NUT 10-22 AWG
178	PSB1119178	STRAIN RELIEF TYPE-3 M25-1.5
179	PSB1119179	MOTOR CORD 14G 4W 35"
180	PSB1119180	PHLP HD SCR M6-1 X 12
181	PSB1119181	SET SCREW M6-1 X 8
182	PSB1119182	FLAT WASHER 6MM
183	PSB1119183	CAP SCREW M6-1 X 12
184	PSB1119184	EXT RETAINING RING 20MM
186	PSB1119186	CAP SCREW M8-1.25 X 30
187	PSB1119187	LOCK WASHER 8MM
188	PSB1119188	CAP SCREW M8-1.25 X 30
196	PSB1119196	CORD LOOP CLAMP

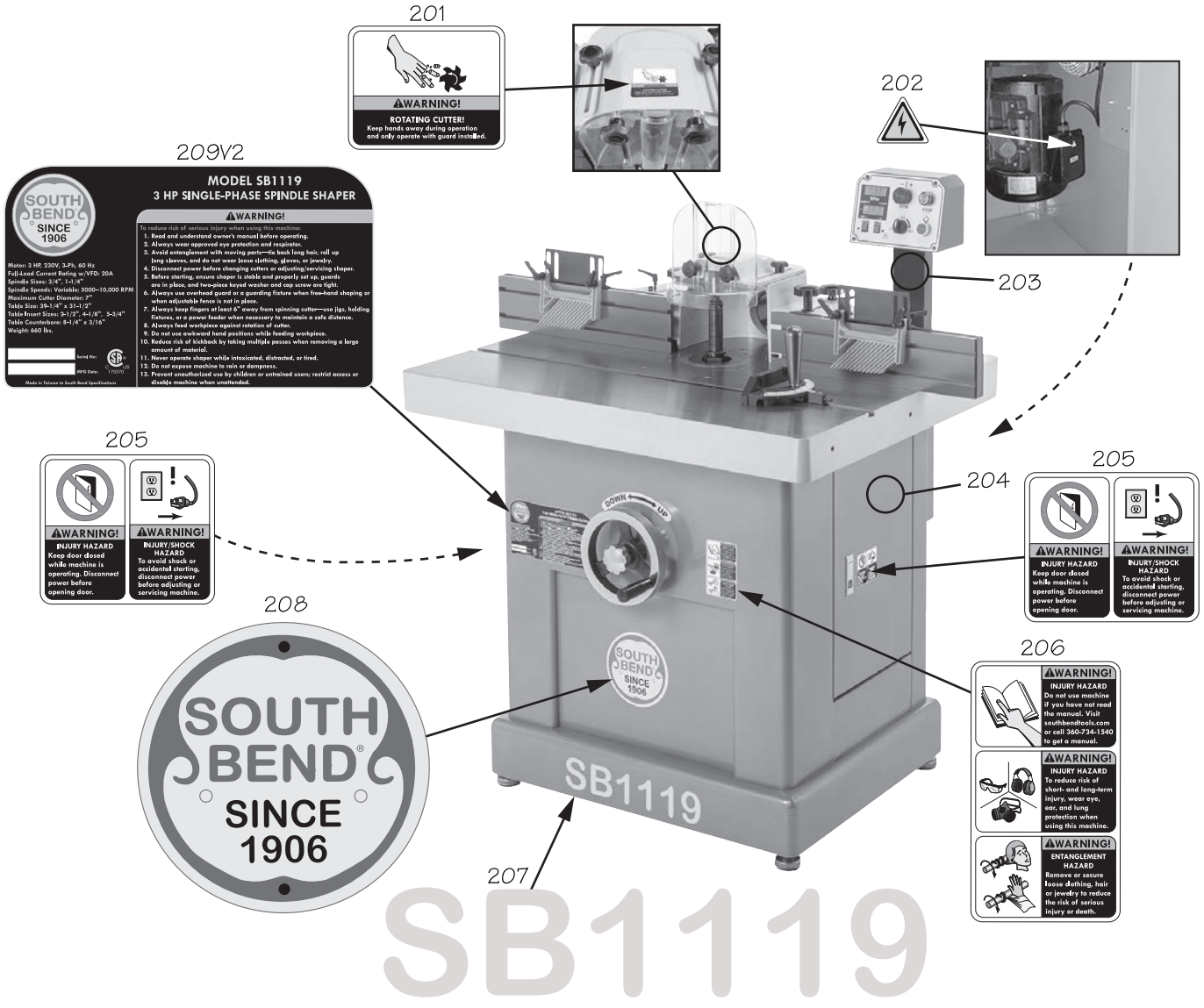
Accessories



REF	PART #	DESCRIPTION
63	PSB1119063	SPINDLE ASSEMBLY 1-1/4"
63-1	PSB1119063-1	CAP SCREW M10-1.5 X 30
63-2	PSB1119063-2	ROLL PIN 4 X 20
63-3	PSB1119063-3	SPINDLE WASHER 10.5 X 45 X 5
63-4	PSB1119063-4	SPINDLE LOCK COLLAR
63-5	PSB1119063-5	SPACER 1-1/4"ID X 2"OD X 3/4"L
63-6	PSB1119063-6	SPACER 1-1/4"ID X 2"OD X 1/2"L
63-7	PSB1119063-7	SPINDLE 1-1/4"
63-8	PSB1119063-8	HEX NUT M42-2, M40-2.5
147	PSB1119147	MITER GAUGE ASSEMBLY
147-1	PSB1119147-1	PHLP HD SCR 10-24 X 3/8
147-2	PSB1119147-2	POINTER
147-3	PSB1119147-3	POINTER MOUNTING BLOCK
147-4	PSB1119147-4	POINTER SHAFT
147-5	PSB1119147-5	SCALE
147-6	PSB1119147-6	PHLP HD SCR 8-32 X 5/8
147-7	PSB1119147-7	HEX NUT 8-32
147-8	PSB1119147-8	SHOULDER SCR 1/4-20 X 7/16, 5/16 X 3/16
147-9	PSB1119147-9	SET SCREW M5-.8 X 12
147-10	PSB1119147-10	FIXED HANDLE 38 X 115, M8-1.25 X 45

REF	PART #	DESCRIPTION
147-12	PSB1119147-12	FLAT WASHER 8 X 18 X 3MM
147-13	PSB1119147-13	MITER GAUGE BODY
147-14	PSB1119147-14	MITER BAR
147-15	PSB1119147-15	T-SLOT WASHER 7.8 X 22.5 X 3MM
147-16	PSB1119147-16	FLAT HD SCR M6-1 X 8
147-17	PSB1119147-17	O-RING 4.8 X 1.9 P5
150	PSB1119150	SPINDLE WRENCH 50MM
151	PSB1119151	COMBO SCREWDRIVER #1 X 1/4"
152	PSB1119152	HEX WRENCH 3MM
153	PSB1119153	HEX WRENCH 6MM
154	PSB1119154	WRENCH 22 X 24MM OPEN-ENDS
155	PSB1119155	WRENCH 14 X 17MM OPEN-ENDS
156	PSB1119156	SPINDLE ASSEMBLY 3/4"
156-1	PSB1119156-1	CAP SCREW M10-1.5 X 30
156-2	PSB1119156-2	SPINDLE WASHER 10.1 X 28 X 5MM
156-3	PSB1119156-3	SPINDLE LOCK COLLAR
156-4	PSB1119156-4	SPACER 19ID X 31.30D X 12.7MM
156-5	PSB1119156-5	SPACER 19ID X 31.30D X 19MM
156-6	PSB1119156-6	SPINDLE 3/4"
156-7	PSB1119156-7	HEX NUT M42-2, M40-2.5

Machine Labels



REF	PART #	DESCRIPTION
201	PSB1119201	CUTTER WARNING LABEL
202	PSB1119202	ELECTRICITY LABEL
203	PSB1119203	TOUCH-UP PAINT, SB DARK BLUE
204	PSB1119204	TOUCH-UP PAINT, SB LIGHT BLUE
205	PSB1119205	DISCONNECT POWER COMBO LABEL
206	PSB1119206	OPERATIONAL WARNING COMBO LABEL

REF	PART #	DESCRIPTION
207	PSB1119207	MODEL NUMBER LABEL (SB1119)
207	PSB1120207	MODEL NUMBER LABEL (SB1120)
208	PSB1119208	SOUTH BEND NAMEPLATE 152MM
209V2	PSB1119209V2	MACHINE ID LABEL V2.04.24 (SB1119)
209V2	PSB1120209V2	MACHINE ID LABEL V2.04.24 (SB1120)

⚠WARNING

The safety labels provided with your machine are used to make the operator aware of the machine hazards and ways to prevent injury. The owner of this machine MUST maintain the original location and readability of these safety labels. If any label is removed or becomes unreadable, REPLACE that label before using the machine again. Contact South Bend Tools at (360) 734-1540 or www.southbendtools.com to order new labels.

Warranty

This quality product is warranted by South Bend Tools to the original buyer for **2 years** from the date of purchase. This warranty does not apply to consumable parts, or defects due to any kind of misuse, abuse, negligence, accidents, repairs, alterations or lack of maintenance. We do not reimburse for third party repairs. In no event shall we be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our products.

We do not warrant or represent that this machine complies with the provisions of any law, act, code, regulation, or standard of any domestic or foreign government, industry, or authority. In no event shall South Bend's liability under this warranty exceed the original purchase price paid for this machine. Any legal actions brought against South Bend Tools shall be tried in the State of Washington, County of Whatcom.

This is the sole written warranty for this machine. Any and all warranties that may be implied by law, including any merchantability or fitness, for any purpose, are hereby limited to the duration of this warranty.

Thank you for your business and continued support.

For further information about this warranty, visit **https://www.grizzly.com/forms/warranty**, or scan the QR code below to be automatically directed to our warranty page.

WARRANTY

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