

WILTON®

WMH TOOL GROUP

Operating Instructions — Parts Manual 5-Inch x 8-Inch Horizontal Band Saw Models: 3130/3230

Manufactured after Serial no. 946001



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This manual has been prepared for the owner and operators of the Models 3130/3230 Bandsaw. Its purpose, aside from machine operation, is to promote safety using accepted operating and maintenance procedures. To obtain maximum life and efficiency from your Bandsaw and to aid in using it safely, please read this manual thoroughly and follow the instructions carefully.

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WMH Tool Group warrants every product it sells. If one of our tools needs service or repair, one of our Authorized Repair Stations located throughout the United States can provide quick service or information.

In most cases, a WMH Tool Group Repair Station can assist in authorizing repair work, obtaining parts, or perform routine or major maintenance repair on your Wilton product.

For the name of an Authorized Repair Station in your area, please call 1-800-274-6848, or visit our web site at www.wmhtoolgroup.com

More Information

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To take advantage of this warranty, the product or part must be returned for examination, postage prepaid, to an Authorized Repair Station designated by our office. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, we will either repair or replace the product at our discretion, or refund the purchase price if we cannot readily and quickly provide a repair or replacement. We will return the repaired product or replacement at WMH Tool Group's expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of WMH Tool Group's warranty, then the user must bear the cost of storing and returning the product. This warranty gives you specific legal rights; you may also have other rights, which vary from state to state.

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General Specifications

The Wilton 5x8 cutoff bandsaw is available as a dry cutting bandsaw or as a wet cutting bandsaw. If required, a dry cutting bandsaw can be retrofitted with a kit which converts it to use with cutting fluids.

The use of a hydraulic feed delivers consistent accurate cuts and longer blade life.



4

Cutting capacity	5 inch (127mm) round 7 1/2 inch (190.5mm) wide x 5 inch (127mm) high rectangle 8 inch (203.5mm) wide x 1 inch (25.4mm) high flat stock 4 1/2 inch (114.3mm) wide x 5 inch (127mm) high at 45 degrees
Speeds	85,125,200 SFM
Blade drive	Steel, heat treated worm driving a bronze worm gear in an oil bath
Saw guides	Ball bearing mounts on an eccentric shaft, ball bearing rear guide bearings -- all bearings sealed and permanently lubricated
Motor	1/2 HP, 115/230V, 1725RPM capacitor start
Blade wheels	7-3/8 inch (187mm) diameter flanged cast iron
Saw blades	1/2 x .025 x 68 inches
Floor model dimensions	Width 16 inches overall (400mm) Height 38 inches overall with arm horizontal (950mm) Height 58 inches overall with arm vertical (1450mm) Length - 38 inches (950mm)
Optional wet cutting pkg.	1 gallon (4.5L) capacity tank, pump motor: single phase 120V



WARNING

- Misuse of this machine can cause serious injury.
- For safety, machine must be set up, used and serviced properly.
- Read, understand and follow instructions in the Operating Instructions and Parts Manual which was shipped with your machine.

When Setting up Machine:

- Always avoid using machine in damp or poorly lit work areas.
- Always be sure the machine support is securely anchored to the floor or the work bench.

When Using Machine:

- Always wear safety glasses with side shields (See ANSI Z87.1)
- Never wear loose clothing or jewelry.
- Never overreach - you may slip and fall.

When Servicing Machine:

- Always disconnect the machine from its electrical supply while servicing.

- Always follow instructions in Operating Instructions and Parts Manual when changing accessory tools or parts.

- Never modify the machine without consulting Wilton Corporation.

You - the Stationary Power Tool User - Hold the Key to Safety.

Read and follow these simple rules for best results and full benefits from your machine. Used properly, Wilton's machinery is among the best in design and safety. However, any machine used improperly can be rendered inefficient and unsafe. It is absolutely mandatory that those who use our products be properly trained in how to use them correctly. They should read and understand the Operating Instructions and Parts Manual as well as all labels affixed to the machine. Failure in following all of these warnings can cause serious injuries.

Machinery General Safety Warnings

1. Always wear protective eye wear when operating machinery. Eye wear shall be impact resistant, protective safety glasses with side shields which comply with ANSI Z87.1 specifications. Use of eye wear which does not comply with ANSI Z87.1 specifications could result in severe injury from breakage of eye protection.
2. Wear proper apparel. No loose clothing or jewelry which can get caught in moving parts. Rubber soled footwear is recommended for best footing.
3. Do not overreach. Failure to maintain proper working position can cause you to fall into the machine or cause your clothing to get caught pulling you into the machine.
4. Keep guards in place and in proper working order. Do not operate the machine with guards removed.
5. Avoid dangerous working environments. Do not use stationary machine tools in wet or damp locations. Keep work areas clean and well lit.
6. Avoid accidental starts by being sure the start switch is OFF before plugging in the machine.
7. Never leave the machine running while unattended. Machine shall be shut off whenever it is not in operation.
8. Disconnect electrical power before servicing. Whenever changing accessories or general maintenance is done on the machine, electrical power to the machine must be disconnected before work is done.
9. Maintain all machine tools with care. Follow all maintenance instructions for lubricating and the changing of accessories. No attempt shall be made to modify or have makeshift repairs done to the machine. This not only voids the warranty but also renders the machine unsafe.
10. Machinery must be anchored to the floor.
11. Secure work. Use clamps or a vise to hold work, when practical. It is safer than using your hands and it frees both hands to operate the machine.
12. Never brush away chips while the machine is in operation.
13. Keep work area clean. Cluttered areas invite accidents.
14. Remove adjusting keys and wrenches before turning machine on.
15. Use the right tool. Don't force a tool or attachment to do a job it was not designed for.
16. Use only recommended accessories and follow manufacturers instructions pertaining to them.
17. Keep hands in sight and clear of all moving parts and cutting surfaces.
18. All visitors should be kept at a safe distance from the work area. Make the workshop completely safe by using padlocks, master switches, or by removing starter keys.
19. Know the tool you are using - its application, limitations, and potential hazards.

20. Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead based paint
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

21. Your risk from those exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specifically designed to filter out microscopic particles.

General Electrical Cautions

This saw should be grounded in accordance with the National Electrical Code and local codes and ordinances. This work should be done by a qualified electrician. The saw should be grounded to protect the user from electrical shock.

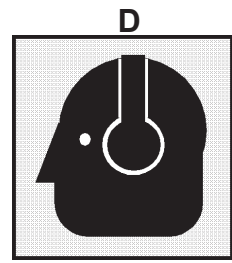
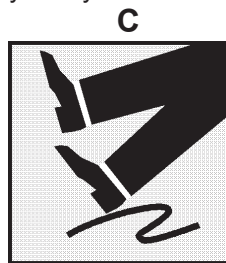
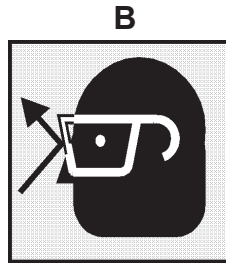
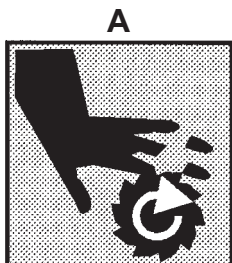
Wire Sizes Caution:

For circuits which are far away from the electrical service box, the wire size must be increased in order to deliver ample voltage to the motor. To minimize power losses and to prevent motor overheating and burnout, the use of wire sizes for branch circuits or electrical extension cords according to the following table is recommended.

Conductor Length	AWG (American Wire Gauge) Number	
	240 Volt Lines	120 Volt Lines
0 - 50 Feet	No. 14	No. 14
50 - 100 Feet	No. 14	No. 12
Over 100 Feet	No. 12	No. 8

Safety Instructions on Sawing Systems

1. Always wear leather gloves when handling saw blade. The operator shall not wear gloves when operating the machine.
2. All doors shall be closed, all panels replaced, and other safety guards in place prior to the machine being started or operated.
3. Be sure that the blade is not in contact with the workpiece when the motor is started. The motor shall be started and you should allow the saw to come up to full speed before bringing the saw blade into contact with the workpiece.
4. Keep hands away from the blade area. **See Figure A.**
5. Remove any cut off piece carefully while keeping your hands free of the blade area.
6. Saw must be stopped and electrical supply must be cut off before any blade replacement or adjustment of blade support mechanism is done, or before any attempt is made to change the drive belts or before any periodic service or maintenance is performed on the saw.
7. Remove loose items and unnecessary workpieces from area before starting machine.
8. Bring adjustable saw guides and guards as close as possible to the workpiece.
9. Always wear protective eye wear when operating, servicing, or adjusting machinery. Eyewear shall be impact resistant, protective safety glasses with side shields complying with ANSI Z87.1 specifications. Use of eye wear which does not comply with ANSI Z87.1 specifications could result in severe injury from breakage of eye protection. **See Figure B.**
10. Nonslip footwear and safety shoes are recommended. **See Figure C.**
11. Wear ear protectors (plugs or muffs) during extended periods of operation. **See Figure D.**
12. The workpiece, or part being sawed, must be securely clamped before the saw blade enters the workpiece.
13. Remove cut off pieces carefully, keeping hands away from saw blade.
14. Saw must be stopped and electrical supply cut off or machine unplugged before reaching into cutting area.
15. Avoid contact with coolant, especially guarding your eyes.



Operating Instructions

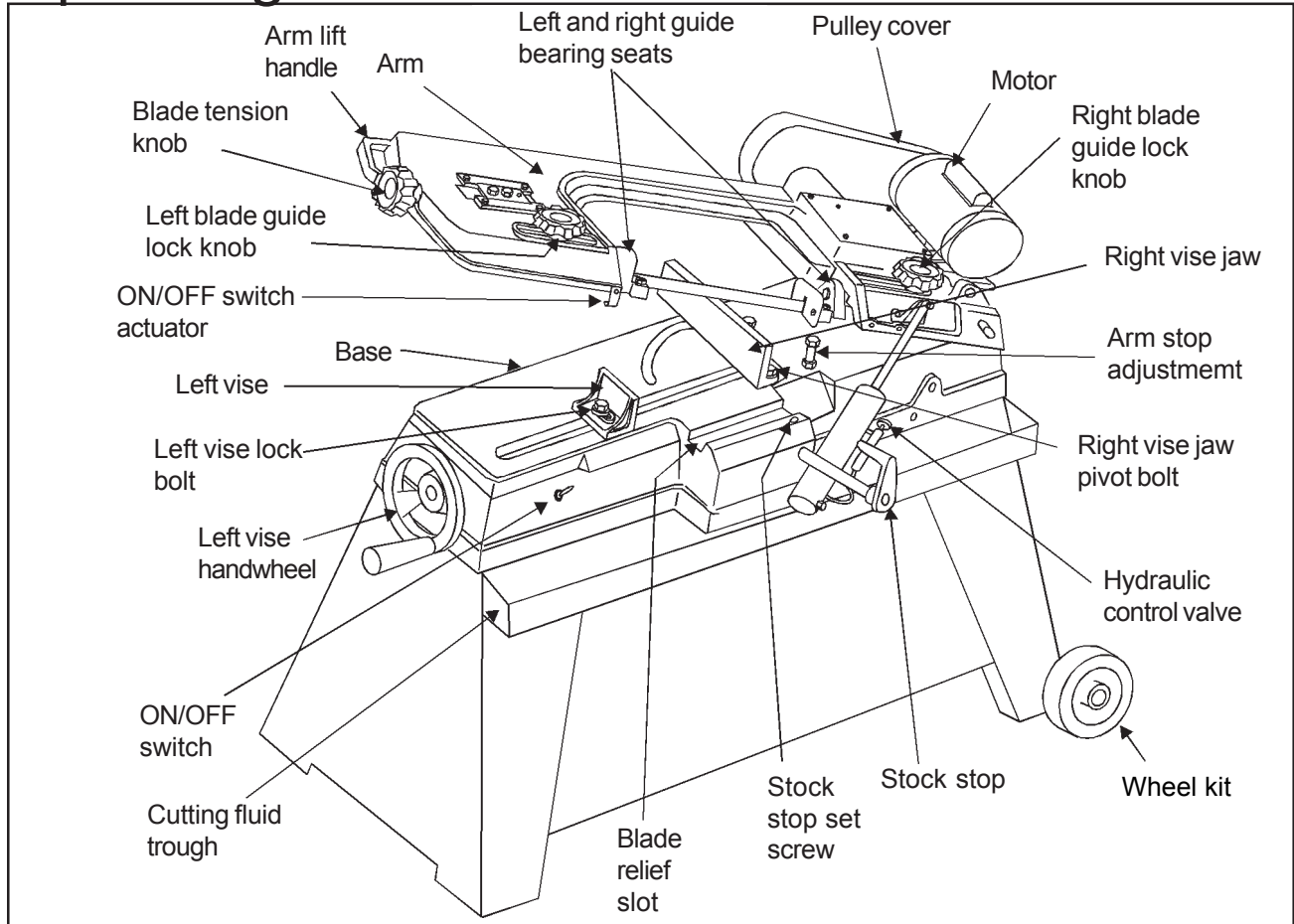


Figure 1: 5x8 saw nomenclature

Clamping materials in the saw vise

Refer to *Figure 1*.

1. Lift the saw arm to its full up position.
2. Lock the arm up using the hydraulic feed control valve.

Note: Use the handle on the arm to lift the arm. Never use any other part of the arm as a lifting method.

3. Open the left vise by turning the vise handwheel counterclockwise.
4. Adjust the vise jaws for the appropriate cutting angle, if required. See sections on *Right angle cutting* and *Angle cutting*.
5. Put the work piece material between the vise jaws.

Note: If the work piece material is long, support both the ends of the material as needed to keep the material level on the saw base.

6. Turn the vise handwheel clockwise until the work piece is securely clamped in the vise.
7. Proceed to cut according to instructions in *Cutting procedure*.

Right angle cutting

Refer to *Figures 1 and 2*.

If you want to be certain the workpiece is being held in the vise at exactly 90 degrees to the blade for cutoff work, use the following procedure to check the blade-to-jaw angle.

1. Disconnect the saw from its electric power source.
2. With the saw arm in its fully lowered position, place a machinist's square, or a machinist's protractor 90 degrees, against the saw blade and right vise jaw. If the jaw is square to the blade, then no adjustment is required.
3. If adjustment is required, see *Angle Cutting*. The procedure for setting the jaw angle with respect to the blade is described in that section.

Angle cutting

Refer to *Figure 2*.

1. Loosen the right jaw pivot and lock bolts.
2. With the arm in its fully lowered position, and using a machinist's protractor between the saw blade and right vise jaw, set the angle of the right jaw to the required angle.
3. Tighten the pivot and lock bolts.
4. Lift the saw arm to its full up position and lock it up using the hydraulic feed control knob.

Note: Use the handle on the arm to lift the arm. Never use any other part of the arm as a lifting method.

5. Loosen the left jaw lock bolt.
6. Use the handwheel to move the left jaw until it touches the right jaw firmly.
7. Snug the left jaw lock bolt. Both vise jaws are now the correct angle for the required cut.

Note: There is a scale on the back of the saw table which allows you to set up for angle cuts without using a protractor. See *Figure 3*. These angles should be considered approximate, and the protractor method should be used where higher accuracy is required.

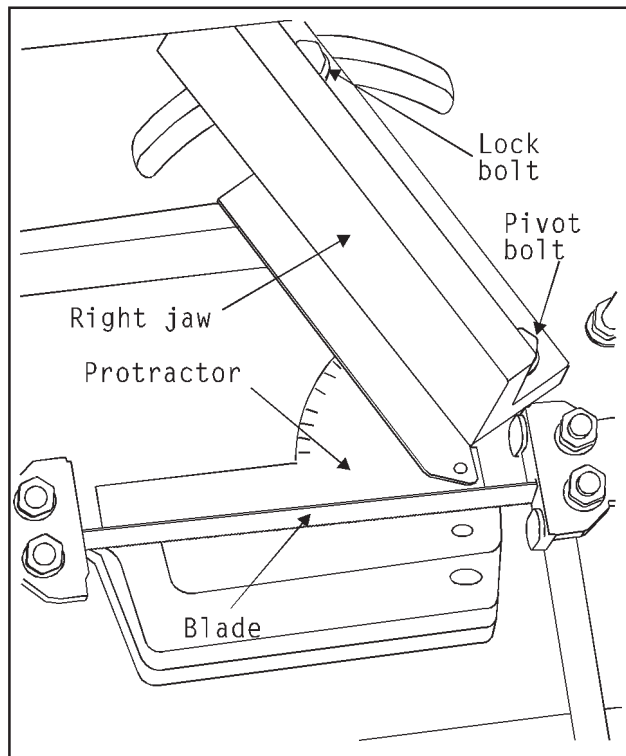


Figure 2: Using a protractor to set the vise jaws at desired angle. By setting the protractor to 90 degrees, or using a machinist's square, the jaws can also be set square with respect to the blade.

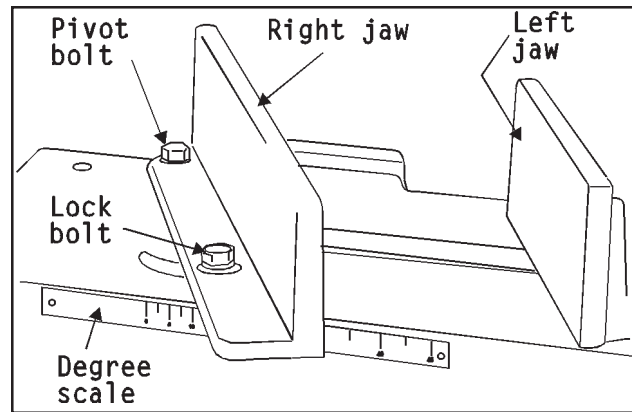


Figure 3: Using the scale on the rear of the saw base to set the jaws for angle sawing. Where the edge of the right jaw crosses the scale an approximate angle cut can be made to the indicated number of degrees on the scale.

Clamping methods

The method for clamping different cross-section work pieces is shown in *Figure 4*.

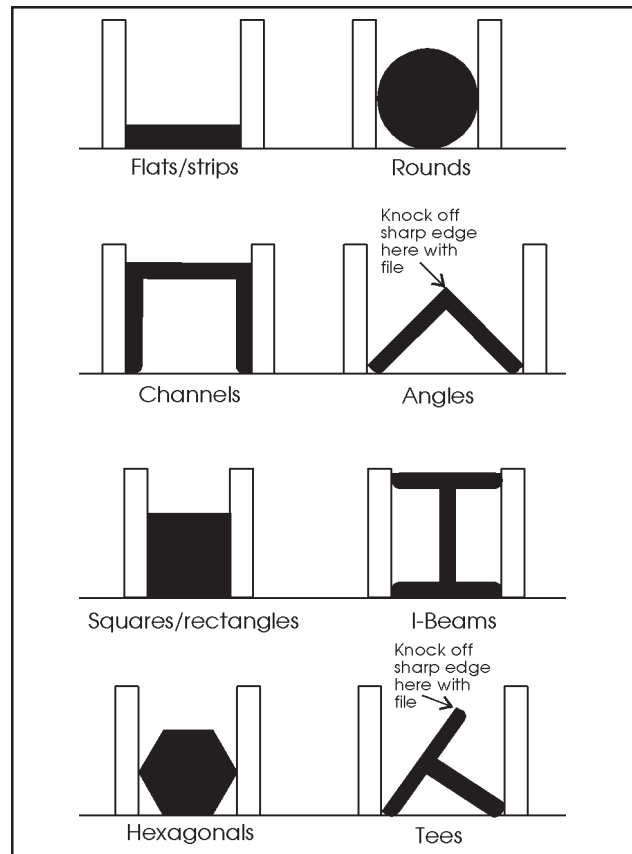


Figure 4: Clamping methods for various cross-sections of stock

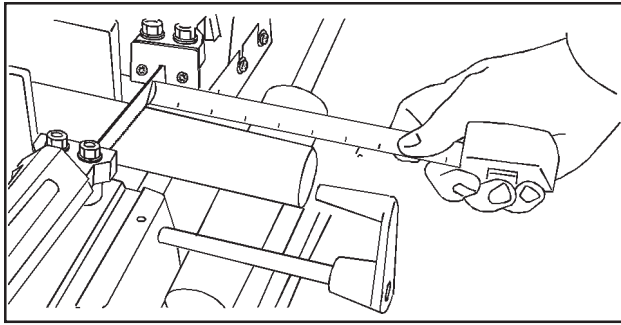


Figure 5: Setting the stock stop cutoff length

Using the stock stop

When cutting a number of identical pieces, the use of the stock stop can speed operations. Refer to *Figures 1 and 5*.

1. Disconnect the saw from its electric power source.
2. With the arm in its fully lowered position, loosen the stock stop set screw.
3. Slide the stock stop to the required distance from the blade.
4. Rotate the stock stop so the stop is at the lowest possible position for stopping the work piece at the required distance. This will help prevent any binding between the work piece and blade when the cut is completed.
5. Tighten the stock stop set screw securely.
6. For best accuracy, make a test cut on a piece of scrap material to verify the length of cut using the stock stop.

Blade selection

The saw is delivered with a blade adequate for a variety of jobs on a variety of common materials. However, Wilton's blades, while appropriate to many shop cutting needs, don't begin to exhaust the wide variety of special blades available for special cutting jobs.

For high production cutting of special materials, or for hard-to-cut materials such as stainless steel, tool steel, titanium, etc., ask your industrial distributor for more specific blade recommendations.

Material	Speed
Steel shapes and low carbon steel	125
Medium and high carbon steel	85
Cr-Moly steel	125
Chromium steel	125
Tool steel	85
Cast iron	85
Aluminum	85-125
Most plastics	200
Wood	200

Table 1: Recommended blade speeds

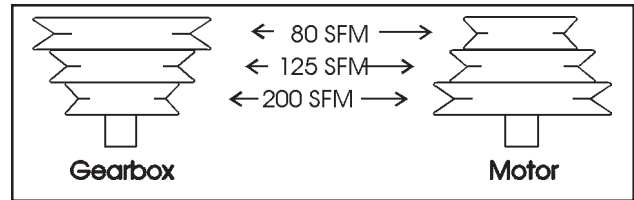


Figure 6: Blade speeds and belt positions

Changing blade speeds

1. Refer to *Table 1* for recommendations on blade speed for various materials.

Note: These are approximate speeds. Different alloys and section materials and the use of cutting fluid may require other speeds. Check your machinists' handbook, or ask for recommendations from your blade, cutting fluid or work piece suppliers for specific recommendations on specific material.

2. Disconnect the saw from its electrical power source.
3. With the arm in its fully lowered position, remove the pulley cover lock screw and open the pulley cover. Refer to *Figure 6* for speeds and belt positions.
4. To change the belt position (and, therefore, the blade speed) first loosen the motor plate adjustment lock nut. Refer to *Figure 8* for the position of the motor plate adjustment screw and locknut.
5. Turn the adjustment screw counterclockwise until the belt can be move to the pulley position required.
6. Turn the adjustment screw clockwise to tension the belt until there is 1/2 inch of play in the belt as shown in *Figure 7*.
7. Tighten the adjustment lock nut.
8. Close the pulley cover and secure it shut with the lock screw.
9. Reestablish electrical power to the saw and proceed with cutting.

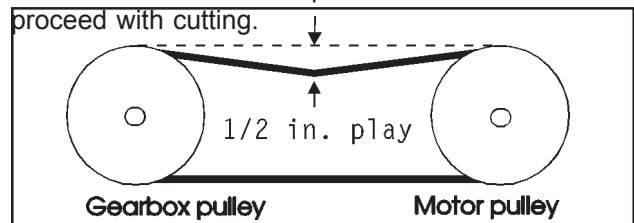


Figure 7: Setting correct play in drive belt

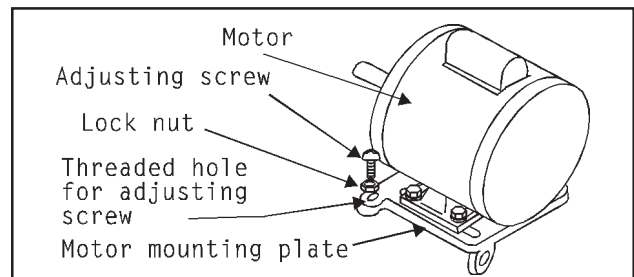


Figure 8: Motor plate adjustment screw

Evaluating cutting efficiency

Is the blade cutting efficiently? The best way to tell is by observing the chips formed by the blade as it cuts.

If the chip formation is powdery, then the feed is much too light or the blade is too dull.

If the chips formed are curled, but straw or blue colored, then the feed rate is too high.

If the chips formed are curled but not colored, then the blade is sharp enough and cutting at an efficient rate.

Cutting procedure

1. Never start a cut with the blade resting on the work piece.
2. Be certain you knock off the sharp corners of any work piece material which might damage the blade. See *Figure 4*.
3. Have the motor ON and running at full speed before lowering the blade into the cut.
4. Use the hydraulic control valve to feed the blade into the work piece.
5. If you use a cutting fluid, turn the valve on before beginning the cut.

Using the hydraulic feed control

Refer to *Figure 9*.

The hydraulic feed control cylinder is a "single action" hydraulic cylinder. This allows you to lift the arm at any time, easily, but controls the downward movement of the arm using a valve on the top of the cylinder.

When the control valve is turned fully clockwise the cylinder is "locked" and the saw arm will not move downward. You can lock the arm, using the valve, at any position in its travel. This allows you to lock the arm in its up position for operations which require it. And it allows you to lock the arm in positions which allow you to adjust work piece length, etc.

Most important, use of the valve allows you to begin any cuts "gently," which can greatly extend the life of the blade. Simply open the valve slightly to begin the cut, then open the valve to effective cutting feed. See *Evaluating cutting efficiency*.

The valve is also important when breaking in any new blades. See *Blade break-in procedures*.

Blade break-in procedures

New blades are very sharp, and therefore have a tooth geometry which is easily damaged if a careful break-in procedure is not followed. You may want to consult manufacturers' literature for break-in of specific blades on specific materials. However, the following break-in procedure will be adequate for break-in of Wilton supplied blades.

1. Clamp a 2 inch or larger work piece in the saw.
2. Set the blade speed to its required speed. See *Changing blade speeds*.
3. If possible, use a cutting fluid during break-in cuts.
4. Set the hydraulic control valve just enough to begin a *very light cut* on the work piece.
5. When the blade has cut 1/3rd of the way through the work piece, increase the feed rate *slightly* and allow the blade to complete the cut.
6. Make another cut on the stock. Begin the cut with the control valve set at the same feed rate you finished the first cut.
7. 1/3rd of the way through the second cut, increase the rate of feed until the blade is cutting at its most efficient rate. See *Evaluating cutting efficiency*.
8. Allow the saw to complete this second cut. The blade can now be considered ready for regular service.

Note: There are flanges on the back face of the drive and idler wheels to prevent the blade from "walking off" the back of the wheels. If these flanges are damaged the wheels must be replaced. Check blade tracking whenever changing a blade to be certain the blade is positioned correctly on the wheels. See *Blade tracking* in the *Maintenance* section of this manual.

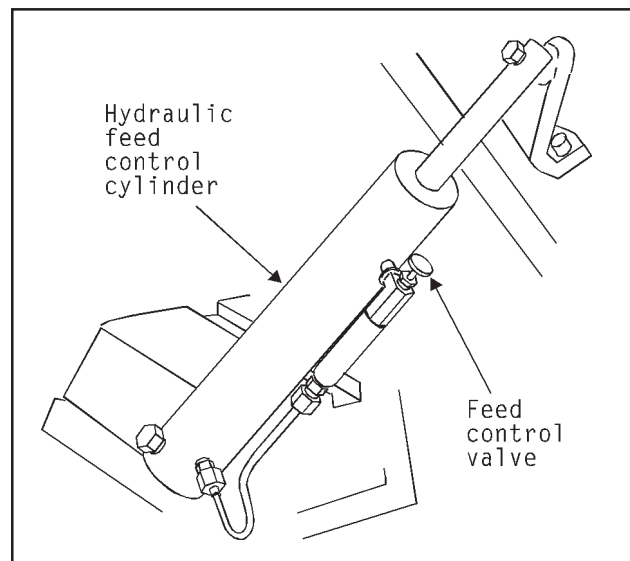


Figure 9: Hydraulic feed control

Changing blades

1. Disconnect the saw from its electric power source.
2. Lift the saw arm to its full up position and lock it up using the hydraulic feed control knob.

Note: Use the handle on the arm to lift the arm. Never use any other part of the arm as a lifting method.

3. Remove the blade guard cover thumb screw and open the cover.
4. Loosen the blade tension knob until the blade comes off of its wheels.
5. Using leather gloves to protect from cuts, slip the blade out of the blade guide bearings and off of the saw.
6. Examine the drive and idler wheels for evidence of wear on the flanges. If the flanges are wearing, the blade is misadjusted. See *Blade tracking* for correcting this condition.
7. Put a replacement blade in the blade guide bearings and loop the ends of the blade over the drive and idler wheels.

Note: The saw blade teeth must point in the direction of travel. See *Figure 10*.

8. Use the blade tension knob to put tension on the blade until it no longer slips on the wheels.

Note: Do not overtighten the blade. Just increase tension until the blade does not slip on the wheels.

9. Close the blade guard cover and replace and tighten the thumb screw.
10. Reconnect the saw to its electrical power source.

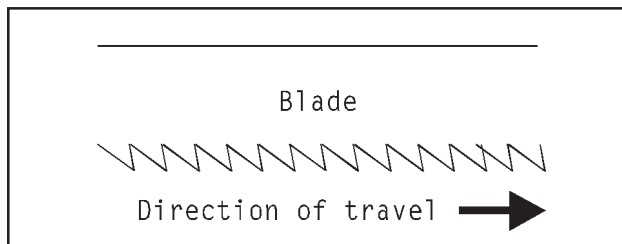


Figure 10: Correct tooth direction when replacing blade.

Adjusting blade guides

Refer to *Figure 1*.

Both the left and right blade guides should be positioned as close as possible to the left and right edges of any work piece being cut. This provides support to the blade so it can make a straight cut.

1. Loosen the blade guide knobs.
2. Slide the blade guides to the correct spacing.
3. Tighten the lock knobs securely.

Maintenance

Note: The following maintenance operation requires the services of a licensed electrician.

Motor replacement

1. Perform steps 2 through 5 in *Changing blade speeds*, page 8.
2. Remove the drive belt.
3. Remove the set screw which retains the motor drive pulley to the motor shaft.
4. Pull the pulley off of the motor drive shaft.
5. BEING CERTAIN THAT THE SAW HAS BEEN SAFELY DISCONNECTED FROM THE SERVICE BRANCH, open the motor terminal cover and remove the three wires which connect it to the power cable.
6. Remove the four nuts, bolts and washers which hold the motor to its mounting plate.
7. Remove the motor from the saw.
8. Reinstall the replacement motor and pulley by reversing steps 7 through 4, above.
9. Loosen the the motor mounting plate adjustment screw so the screw puts no tension on the plate.
10. Adjust the position of the motor so --
 - A. the pulleys are parallel with each other, and
 - B. the drive belt can just be installed over the pulleys (It may be necessary to adjust the drive pulley along the motor shaft to make the pulleys parallel.)
11. Tighten the motor mounting bolts securely.
12. Tighten the pulley set screw securely.
13. Install the drive belt.
14. Tension the drive belt and complete the replacement task by performing instructions 6 through 9 in *Changing blade speeds*.

Adjusting guide bearings

The outside guide bearing on each of the bearing seats is mounted on an eccentric shaft to allow adjustment of the bearing clearance between bearings and blade, as follows:

1. Loosen the guide bearing shaft lock nut.
2. Use an open end wrench on the hex flats underneath the guide seat to adjust the eccentric shaft so the bearing holds the blade vertically against its opposing bearing. Overtightening the blade between the bearings will only shorten bearing life. Adjust the bearings so the blade is just held firmly in a vertical position.
3. While holding the shaft from turning, tighten the lock nut on the upper side of the bearing seat.

Maintenance chart

Item	Action	Interval	Comments
Wheel, guide or back-up bearings	Inspect for leakage	Daily	All bearings are sealed -- any leaking bearing must be replaced
Lead screw	Wipe on lubricant	Weekly	Gear oil* (see note, below)
Drive belt	Inspect and replace when glazed or worn	When changing blade speeds	
Gearbox	Inspect for leakage -- repair if leaking	Daily	
	Replace lubricant	Annually	Gear oil*(see note, below)
Drive and idler wheels	Inspect flange and blade surfaces	When changing blades	Replace wheels if flanges are worn
Hydraulic cylinder assembly	Clean control rod with a clean rag	Daily	Dirt on the control rod can damage the seal and cause leakage -- resulting in replacement of the cylinder assembly, complete

* **Note:** Gearbox and lead screw lubrication
Lubricate the vise lead screw and gearbox with Shell Valvata Oil No. J-78 or Macoma 72 or its equivalent.

The gearbox gears run in an oil bath and will not require lubricant change more than once a year unless the lubricant is accidentally contaminated or leakage occurs due to improper replacement of the gearbox cover or gasket. During the first few days of operation the drive gears will run hot. Unless the temperature exceeds 200 degrees F., there is no cause for concern.

Blade tracking

1. If the blade is fully tensioned, release tension slightly while performing the tracking operation.
2. If the blade is not on slow speed, change to the slowest speed according to instructions in *Changing blade speeds*.
3. Lift the saw arm to its full up position and lock it using the hydraulic feed control knob.

Note: Use the handle on the arm to lift the arm. Never use any other part of the arm as a lifting method.

4. Remove the thumb screw and open the blade guard cover. Prop it open so you can have access to the idler wheel.
5. Refer to *Figure 11*. Use a wrench to loosen bolt **A**, a small amount.
6. Turn the saw motor ON.
7. Insert a hex wrench into the set screw, **B**, and turn it slightly while observing the tracking action of the blade on the idler wheel. Turning the hex wrench clockwise will make the blade track toward the wheel flange. Turning the

wrench counterclockwise will make the blade track away from the flange.

8. Adjust the set screw in *very small amounts* until the blade just starts to track toward the flange.

9. As you adjust the blade toward the flange, insert a strip of paper between the blade and wheel as shown in *Figure 12* at the top of the next page.

CAUTION: Use a strip of paper six inches long or longer so your hands stay clear of the moving parts of the saw.

10. Keep using *small amounts* of adjustment to move the blade toward the flange... testing with the paper strips... until the paper is cut between the blade and flange.

11. When the paper is cut, turn the hex wrench *slightly* in the opposite direction so the blade does not track while touching the flange.

12. Tighten bolt **A**.

13. Check with a paper strip to be certain the blade has not moved back into contact with the flange.

Readjust, if necessary.

14. Using the blade tension knob, reapply tension to the blade so it does not slip on the wheels.

15. Turn the saw OFF.

16. Close the blade guard cover and install and tighten the thumb screw.

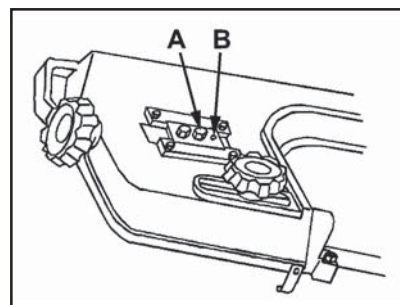


Figure 11: Blade tracking mechanism

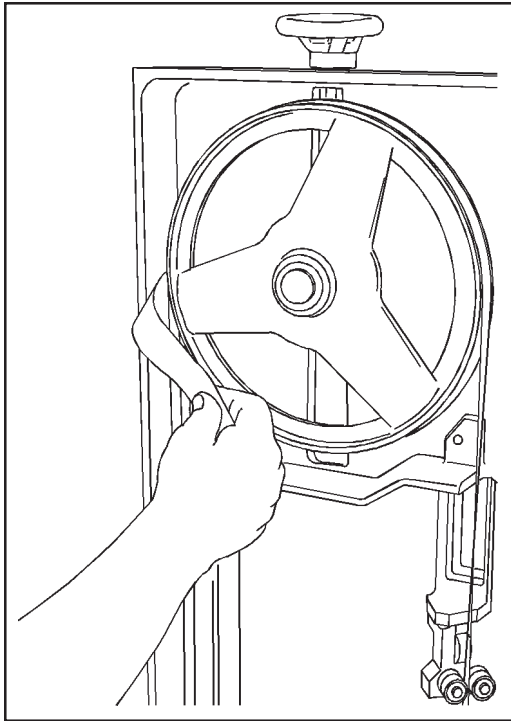


Figure 12: Checking blade tracking

Replacing guide bearings

1. Remove the blade according to instructions 1 through 5 in *Changing blades, page 11*
2. Remove the snap ring which holds the bearing to the shaft.
3. Press off the bearing.
4. Press on the new bearing and secure it with the snap ring.
5. Reinstall the blade according to instructions 6 through 10 in *Changing blades*.
6. Adjust the bearing spacing according to instructions in *Adjusting guide bearings*.

Adjusting back-up bearings

Refer to *Figure 13*.

1. Disconnect the saw from its electrical power source.
2. Loosen the guide bearing seat retaining bolt.
3. Slide the bearing seat as necessary until the back-up bearing just touches the back edge of the saw blade.
4. Tighten the guide bearing seat retaining bolt.
5. Restore electrical power to the saw.

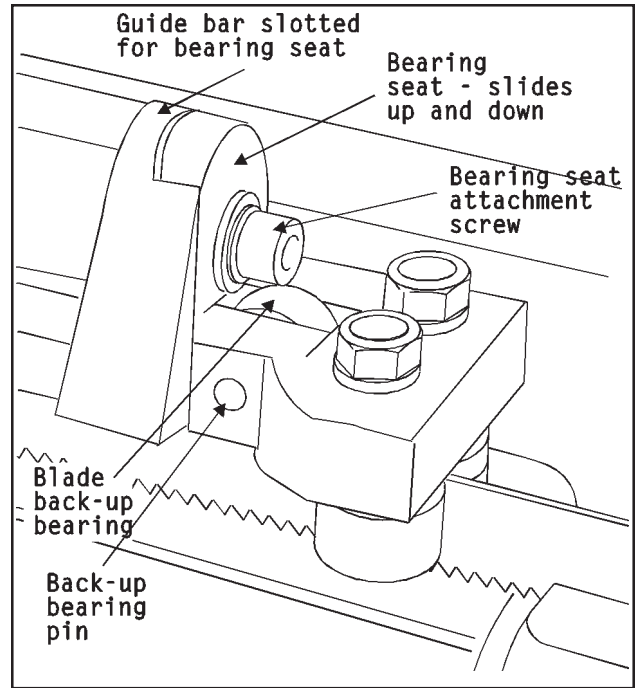


Figure 13: Adjusting back-up bearings

Adjusting the arm stop adjustment bolt

Refer to *Figure 1*.

1. Lower the arm to its fully lowered position. The saw blade should be level and the cutting edge of the blade should be in the relief slot, *below* the level surface of the saw base. If this is not the case, adjust the arm height as follows:
2. Loosen the leveling bolt lock nut.
3. Adjust the leveling bolt until it supports the arm and blade correctly as described above -- level and below the top of the saw base.
4. Tighten the leveling bolt lock nut.

Adjusting motor switch actuator

This task should be performed whenever the arm stop adjustment is corrected or whenever the saw is turning off incorrectly.

Refer to *Figure 1*.

1. Raise the arm until the switch actuator is not in contact with the switch.
2. Turn the switch ON.
3. Open the hydraulic control valve so the arm moves slowly downward.
4. The motor switch should shut off just as the arm contacts its horizontal stop bolt and the blade is fully below the blade relief in the saw base. If the motor shuts off too soon, or not at all, adjust the switch actuator by bending it, as required, to correct the fault condition.

Replacing a back up bearing

1. Remove the blade according to instructions 1 through 5 in *Changing blades*.
2. Remove the guide bearing assembly from the

- saw arm by removing the guide lock knob and sliding the assembly from the arm.
- Use a drift to knock out the pin until the bearing can be removed.
 - Replace the bearing and press the shaft back into the seat.
 - Reinstall the bearing assembly in the arm.
 - Reinstall the blade according to instructions 6 through 9 in *Changing blades*.
 - Adjust the back up bearing spacing according to instructions in *Adjusting back up bearing clearance*.

Adjusting the bearing guide seats for blade vertical

- Install a new blade according to instructions in *Changing blades*.
- Adjust the guide bearings according to instructions in *Adjusting guide bearings*.
- Adjust the back-up bearing according to instructions in *Adjusting back-up bearings*.
- With the arm in its full horizontal position and the blade guides moved apart to clear the widest possible cutting area, clip a scale to the blade, to provide a vertical reference surface.
- Place a machinist's square on the saw base, against the scale. See *Figure 14*.
- Loosen the guide bearing seat attachment bolt slightly and, using a wrench on the bearing seat, adjust the angle of the seat so the blade is vertical. (There is a small amount of side relief between the seat and guide bar to allow for this adjustment.)
- Tighten the seat attachment bolt.
- Move the scale and square to the other side of the exposed blade and repeat steps 4, 5, 6 and 7, above.

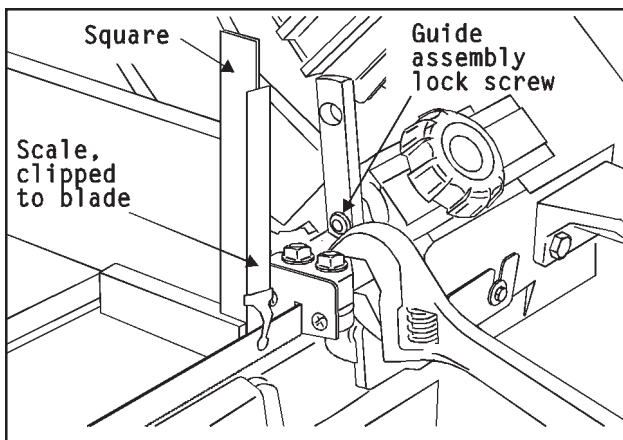


Figure 14: Adjusting the saw blade for vertical. Be sure to do this operation on both of the bearing guide seats so the blade is perfectly vertical along its entire exposed cutting surface.

Test cutting to verify adjustment accuracy

Test cuts can be used to determine whether or not you have adjusted the blade accurately. Use 2 inch bar stock to perform these test cuts, as follows:

- With the bar stock securely clamped in the vise, make a cut through the bar stock. (See *Figure 15*.)
- Mark the top of the bar stock.
- Move the bar stock about 1/4 inch past the blade so you can begin a second cut.
- Rotate the bar stock 180 degrees so the mark you made is now at the bottom of the cut.
- Make a cut through the bar stock.
- Use a micrometer to measure the thickness variation between the top and bottom of the disc you have cut from the bar stock. Unless things are truly perfectly aligned, there is almost certain to be a certain amount of "wedge" to the shape of the disc you have cut. The saw blade can be considered correctly adjusted when the variation measured is no more than .012 inch across the face of the disc. If you do not have a 2 inch bar stock available for a test cut, use a larger diameter test work piece rather than a smaller one. The maximum thickness variation on any test piece should be no more than .003 inches, per side, per inch of stock diameter.

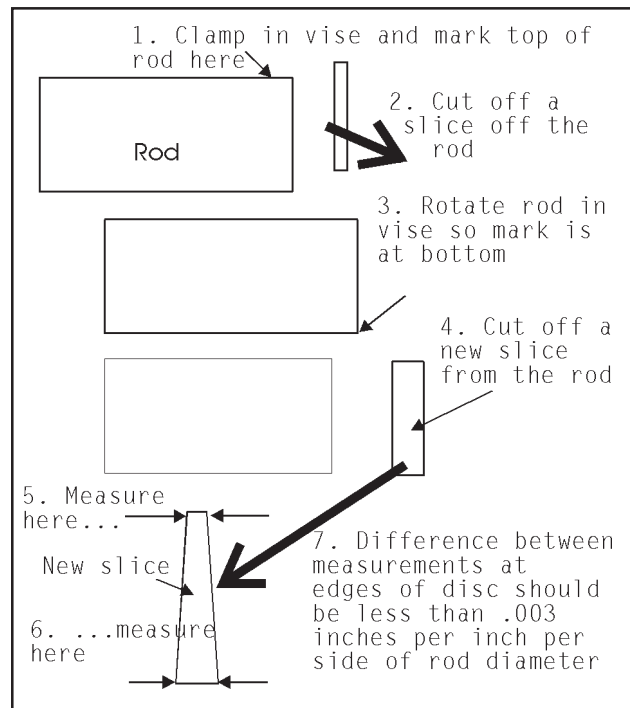


Figure 15: Step-by-step method to produce a test disc which can be measured for "wedge" - a measurement for testing cutting accuracy.

Machine set-up

Uncrating and spotting the saw

The saw was operated and adjusted by Wilton. Therefore no saw adjustment should be required, and the only set-up procedures are as follows:

1. Remove the saw from the box .
2. Remove the rubber shipping plug on the top of the gearbox and replace it with the permanent metal breather plug supplied.
3. Plug the saw into a suitable service branch. The saw is a 120V single phase motor and the motor cable has a standard 3-prong grounded plug installed.

Caution

Always connect the plug to a grounded branch circuit.

If local regulations required that the saw be permanently wired, or if the environment in which the saw is used makes this advisable, the connection should only be made by a licensed electrician who is familiar with all national and local electrical codes.

The service disconnect should have an external ON/OFF switch or lever which permits the saw operator to disconnect branch power to the saw during set-up and maintenance operations as described in this manual.

Wiring diagram

The motor standard on the saw is a 120V single phase, 1750RPM motor which can also be reconfigured for 240V operation. If the saw will be used on a 240V single phase branch circuit, the electrician will find a diagram for reconfiguring the motor wiring underneath the motor terminal plate.

The wiring diagram here is included for reference when replacing the motor, ON/OFF switch or cable. These operations should be performed only by a licensed electrician.

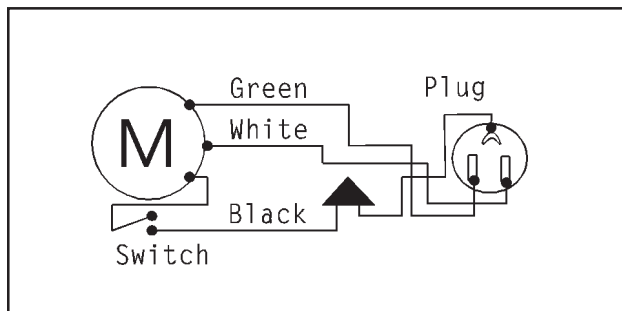


Figure 16: Wiring diagram

Installing the coolant kit

Refer to *Page 25* for a complete view of the components in the coolant kit, and refer to *Figure 17* for the attachment of the valve to the valve bracket on the guide bearing seat.

1. Install the baffle in the tank so the pump is held at one end.
2. Install the 90 degree elbow and one of the hose fittings in the bottom of the coolant pump.
3. Install one end of the coolant hose on the pump fitting.
4. Put the pump in the tank and put the assembly into the tray underneath the saw base. Flanges are on the tray to keep the coolant tank in position.
5. Put the valve into the holder on the right blade guide assembly and secure it with the set screw on the holder. Position the valve so the handle is easy to operate.
6. Install the nozzle into the valve.
7. Install the hose fitting into the valve.
8. Route the hose to the hose fitting on the valve and install it on the fitting.
9. Fill the tank with enough coolant to flow over the baffle in the tank.
10. Put the valve handle in OFF position -- at right angle to the direction of flow through the valve.
11. Install the coolant return hose and fitting to the trough and route the return hose to the tank.
12. Connect the pump to its electrical source.

Note: The pump cable is supplied with a standard plug for a 120V single phase grounded branch receptacle. Always use a grounded receptacle for this purpose.

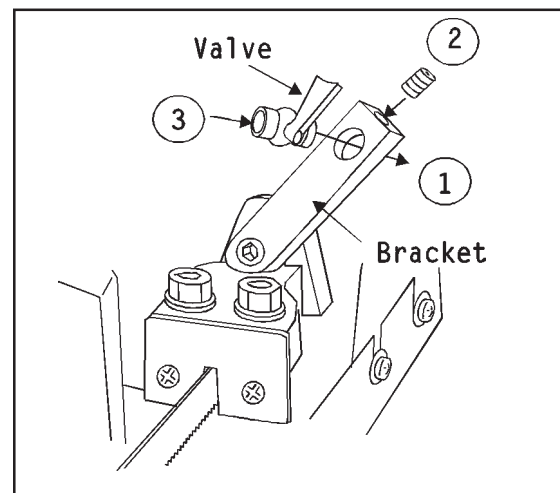


Figure 17: Installing the valve in the valve bracket --
1: Install the valve, back end first, into the bracket.
2: Secure it with the set screw after being sure the handle can turn its full 1/4 turn.
3: Install the nozzle on the front of the valve, then install the hose fitting and hose on the back end of the valve.

Troubleshooting

Problem	Probable cause	Potential solutions
Excessive blade breakage	Material loose in the vise	<ol style="list-style-type: none"> 1. Use more pressure to tighten vise. 2. Check right jaw pivot and lock bolts for tightness. 3. Check left jaw pivot bolt for looseness -- be certain the jaw is not tilting upward when you apply pressure to the work in the vise. 4. If you are stacking multiple pieces in the vise, be sure all of the pieces are captured by the vise pressure.
	Incorrect feed or speed	<ol style="list-style-type: none"> 1. Check technical literature for recommended feeds and speeds for the material and blade you are using. 2. Check chip formation to adjust speed and feed to correct rate when sawing.
	Incorrect blade tension	<ol style="list-style-type: none"> 1. Adjust blade tension to where it just does not slip on the wheel.
	Teeth in contact with work before saw is started	<ol style="list-style-type: none"> 1. Be sure the saw motor has come fully up to speed before beginning a cut and be sure the blade is not resting on the workpiece before the motor has come up to full speed.
	Blade rubs on wheel flange	<ol style="list-style-type: none"> 1. Use paper cutting method of adjusting blade tracking. See <i>Blade Tracking</i>. 2. Check drive and idler wheels for looseness in mounting parts or worn/damaged bearings.
	Misadjusted blade guides	<ol style="list-style-type: none"> 1. Adjust blade guides.
	Blade too thick for wheel diameter	<ol style="list-style-type: none"> 1. Use a thinner blade. Check with your blade supplier for recommendations on blade thickness for a specific wheel diameter.
	Cracking at weld	<ol style="list-style-type: none"> 1. Replace blade.
Premature blade dulling	Teeth too coarse	<ol style="list-style-type: none"> 1. Use finer tooth blade.
	Too much blade speed	<ol style="list-style-type: none"> 1. Try next lower speed or check technical literature for specific recommendations regarding speeds for specific blade and material being cut. 2. Check with materials supplier for recommendations on the workpiece material supplied. 3. If using coolant, check with supplier regarding correct coolant for the job.
	Inadequate feed pressure	<ol style="list-style-type: none"> 1. Increase pressure while observing chip formation to be sure you are cutting efficiently.
	Hard spot or scale on material	<ol style="list-style-type: none"> 1. Reduce speed of blade. 2. Increase feed pressure in scale or hard spots.
	Work hardening of material (especially stainless steel)	<ol style="list-style-type: none"> 1. Work hardening materials such as stainless require a heavy, continuous cut. Be sure you are using a sharp blade, then, if necessary, release some counterbalance spring pressure by loosening the tension nut if work hardening of the material is a problem.
	Blade installed backwards	<ol style="list-style-type: none"> 1. Reinstall blade so teeth point toward right end of saw.
	Incorrect coolant or no coolant	<ol style="list-style-type: none"> 1. Check with materials supplier and/or blade supplier for coolant recommendations. 2. Check with coolant supplier for specific recommendations on the blade and material you are using.
	Insufficient blade tension	<ol style="list-style-type: none"> 1. Increase tension so blade is above the slipping point.
Crooked cuts	Work not square	<ol style="list-style-type: none"> 1. Adjust the right vise jaw so it is at right angles to the blade. 2. Clamp work tightly in the vise. 3. Check blade for vertical and adjust, if necessary. 4. Move guide bearings as close as possible to work while still completing the cut. 5. Check guide bearings, seats and brackets for possible looseness or wear.

(Continued next page)

Troubleshooting (Continued)

Problem	Probable cause	Potential solutions
	Feed pressure too great	1. Observe chip formation to be sure cutting is efficient.
	Guide bearings not adjusted properly	1. Adjust guide bearings according to instructions in this manual.
	Inadequate blade tension	1. Increase blade tension so blade does not slip on the wheels.
	Blade guides incorrectly spaced	1. Move guide brackets until they just clear the workpiece while making a complete cut. 2. For small section pieces, be sure the blade is sharp and correctly tensioned. Use less feed pressure.
	Dull blade	1. Replace blade when it dulls. 2. Consider using a coolant, if not already used.
	Incorrect speed	1. Check technical literature for recommended speeds and blade type for material being cut -- observe chip formation to verify efficient cutting.
	Blade guide assembly loose	1. Tighten guide bracket.
	Blade guide bearing assembly loose	1. Check tightness of bearing seat bolt.
	Blade tracking too far away from wheel flanges	1. Use paper cutting method of setting blade tracking.
	Worn upper wheel bearings	1. Replace bearings if worn.
Loose upper wheel mounting assembly	1. Tighten all bolts securing wheel to arm.	
Rough cuts	Too much feed or speed	1. Try one step lower speed and observe chip formation for efficient cutting/feed rate.
	Blade too coarse	1. Use finer blade. Check with suppliers for recommendations for the material you are cutting.
	Incorrect blade for material	1. Check with blade suppliers for recommendations for exotic or unusual materials or specifications.
Blade twisting	Cut is binding blade	1. Be sure workpiece is flat on saw base. 2. Decrease feed pressure.
	Too much blade tension	1. Reduce tension to just above point where blade slips.
	Loose guide bearing eccentrics	1. Check eccentric jam nuts for tightness.
	Worn guide bearings	1. Check guide bearings for wear. Replace if necessary.
	Incorrect guide bearing adjustment	1. Adjust guide bearings according to instructions in this manual.
	Loose guide bearing bracket	1. Tighten bracket on saw arm.
Unusual wear on side/back of blade	Loose bearing seat attachment screw	1. Tighten bearing seat attachment screw -- adjust bearing clearance.
	Blade guides worn	1. Replace.
	Blade guide bearings not adjusted properly	1. Check and adjust for proper clearance.
	Blade guide bearing bracket loose	1. Tighten bracket to saw arm.
Breaking teeth	Blade running on wheel flange	1. Adjust blade tracking using the paper cutting method.
	Teeth too coarse for work	1. Use blade with finer pitch.
	Too heavy feed	1. Decrease feed rate -- observe chip formation to verify efficient cutting.
	Too slow speed	1. Increase blade speed. Check technical literature or blade or workpiece supplier for blade speed recommendations.
	Vibrating work piece	1. Be sure vise is tight. 2. Support slender cross section or long workpieces with appropriate in feed and out feed supports. 3. If stacking pieces in the vise, be sure all workpieces are securely captured by the vise.
	Tooth gullets loading	1. Use coarser blade or one with a tooth geometry more appropriate to the workpiece being cut.
	Blade in contact with workpiece before motor is started	1. Always allow motor to come fully up to speed before beginning cut.
Motor running too hot	Blade tension too high	1. Decrease blade tension to just above slip point.
	Worn transmission and worm gear	1. Replace gears in transmission gearbox.
	Gears need lubrication	1. Check gearbox and add oil as required.

Replacement Parts

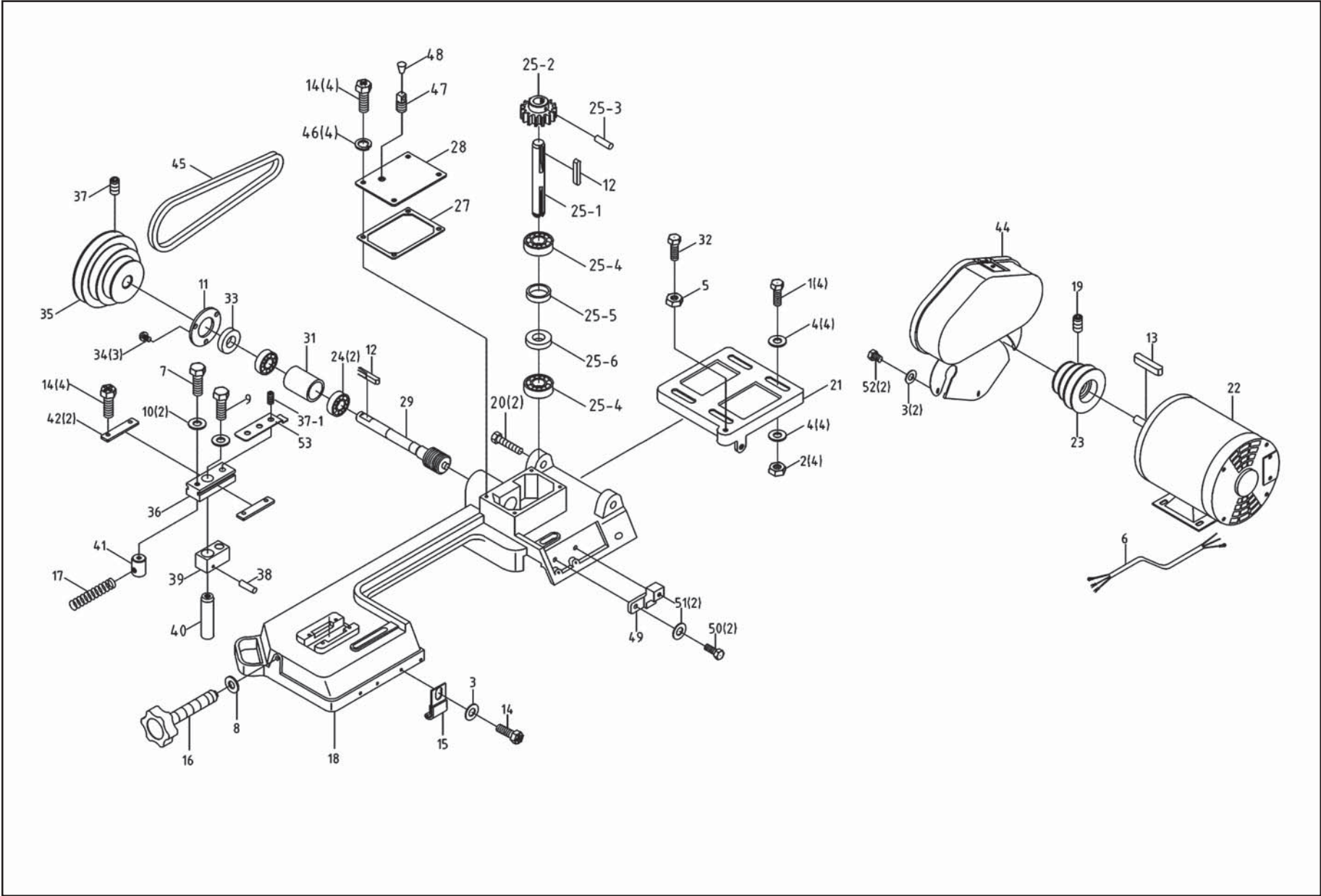
This section provides exploded view illustrations that show the replacement parts for the Wilton model 3130 and 3230, 5-inch x 8-inch Horizontal Band Saw. Also provided are parts listings that provide part number and description. The item numbers shown on the illustration relate to the item number in the facing parts listing.

WMH TOOL GROUP

2420 Vantage Drive
Elgin, IL 60123
Phone: 800-274-6848

Identify the replacement part by the part number shown in the parts listing. Be sure to include the model number and serial number of your machine when ordering replacement parts to assure that you will receive the correct part.

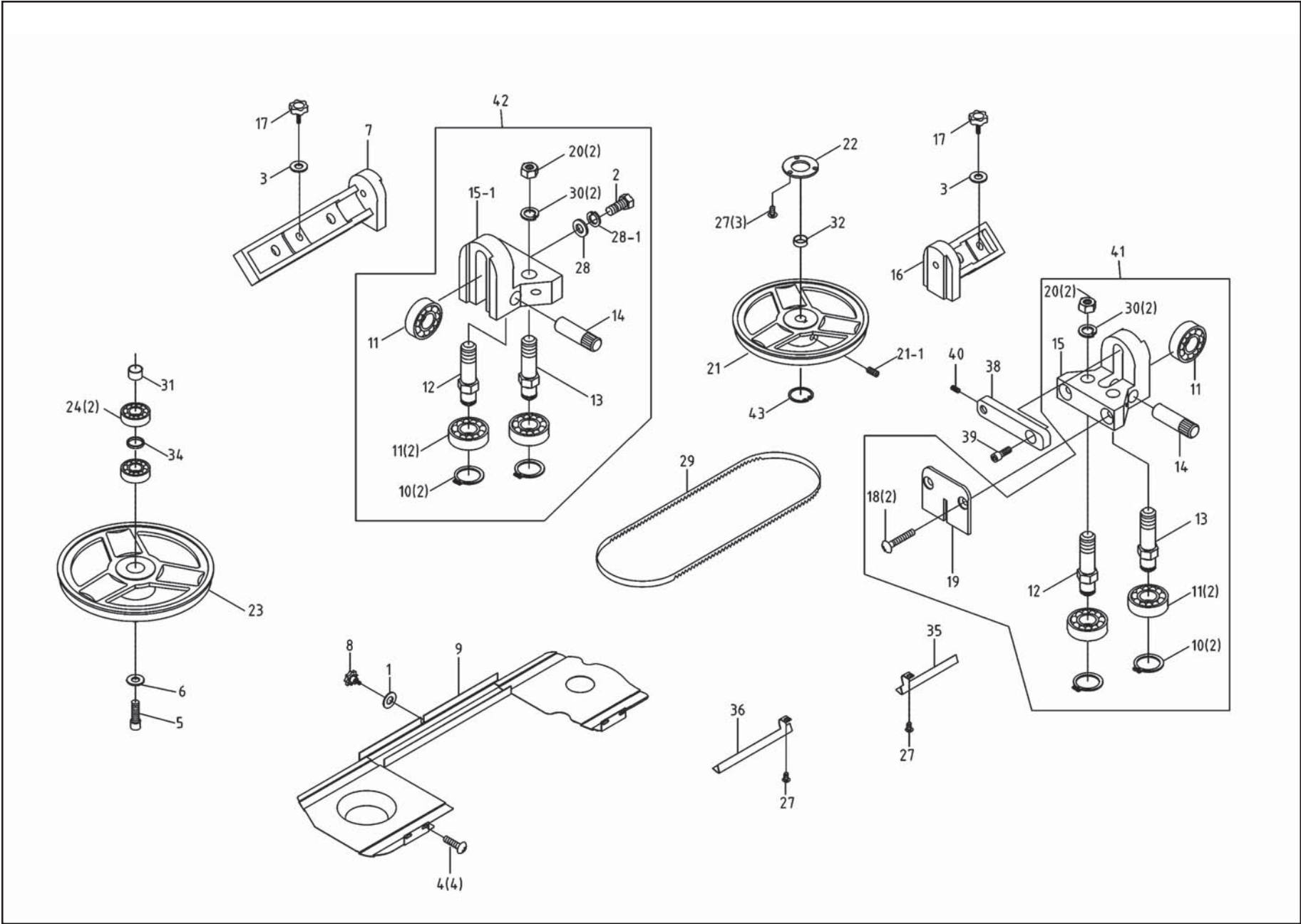
Exploded View - Lower Saw Head



Parts List - Lower Saw Head

ITEM NO.	PART NO.	DESCRIPTION	QTY	ITEM NO.	PART NO.	DESCRIPTION	QTY
01	5631421	HH Screw 1/4"-20x3/4"	4	29	5630921	Worm gear & shaft assy.	1
02	5631431	Hex nut 1/4"-20	4	31	5630911	Bearing bushing	1
03	5630221	Washer 1/4"x5/8xt1.5mm	3	31	5630911R	Bearing bushing	1
04	5631451	Washer 5/16"x23xt2	8	32	563093A	Belt tension adj. screw 5/16"-18x1-1/2"L	1
05	5630061	Hex nut 5/16"-18	1				
06	5631161	Motor cable	1	33	5630941	Oil Seal TC15x35x7	1
07	5630471	HH screw 5/16"-18x1-1/4"L	1	34	5632031	RH Phillips screw 5/32"-32x3/8"L	1
							3
08	5630301	Washer 3/8"x27xt3	1	34	5632031R	FH Screw 5/32"-32x1/4"	3
09	5631481	HH screw 5/16"-18x3/4"L	2	35	5630961	Worm gear pulley	1
10	5630461	Washer 5/16"x23xt3	2	36	5630971	Blade tension guide block	1
11	5630661	Wheel bearing Cover	1	37	5630981	Set Screw M8-P1.25x15mmL	1
11	5630661R	Wheel bearing Cover	1				
12	5630671	Key 5x5x25mm	2	37-1	5630981R	Set Screw 5/16"-18x5/8"L	1
13	5632011	Motor key 5x5x30mm	1				
14	5632021	HH screw 1/4"-20x1/2"L	9	38	5630991	Spiral pin 4x20L	1
14	5632021R	Cross HH screw 1/4"-20x1/2"L	9	39	5631001	Sliding plate draw block	1
				40	5631011	Blade wheel shaft	1
15	5630701	Switch activator bracket	1	41	5631021	Tension block	1
16	5630731	Blade tension adj. knob 3/8"-16UNCx94mmL	1	42	5631031	Guide block holder	2
				43	5631041	Guard plate	1
17	5630741	Spring	1	44	5631051	Pulley guard	1
18	5630751	Head casting	1	45	5631061	V-belt, A22	1
18	5630751R	Head casting	1	46	5631151	Lock washer 1/4"	1
19	5630681	Set screw M8-P1.25x8L	1	47	5631311	Vent plug	1
20	563077A	HH screw 3/8"-16x1-1/4"L	2	48	5632081	Rubber plug	1
20	5630771R	HH screw 1/2"-12x1-1/2"L	2	49	5521944	Cylinder Upper Bracket	1
21	563078A	Motor mounting plate	1	50	TS-2248162	Socket HD button screw M8X16	2
21	5630781R	Motor mounting plate	1				
22	5630791	Motor, 1/2HP, 1ph., 115V	1	50	5521951	HH screw 5/16"-18x7/8"L	2
22	5630791R	Motor, 1/2HP, 1ph., 115V	1	51	TS-1550061	FLAT WASHER M8	2
23	5630811	Motor pulley	1	51	5521952	Lock Washer 5/16"	2
24	5630821	Ball bearing 6202Z	2	52	5632021	HH screw 1/4"-20x1/2"L	2
25	5633121	Transmission gear shaft	1	53	5521945	Tension guard	1
25	5633121R	Transmission gear shaft	1				
25-1	5521940	Transmission Wheel Shaft	1				
25-2	5521941	Transmission Gear	1				
25-3	5521942	Pin 4x22mmL	1				
25-4	5630821	Ball Bearing (6202ZZ)	2				
25-5	5521943	Bushing	1				
25-6	5630941	Oil Seal TC15x35x7	1				
27	5630871	Gearbox gasket	1				
28	5630881	Gearbox cover	1				
28	5630881R	Gearbox cover	1		xxxxxxxR	Parts were changed since S/N:03010002	

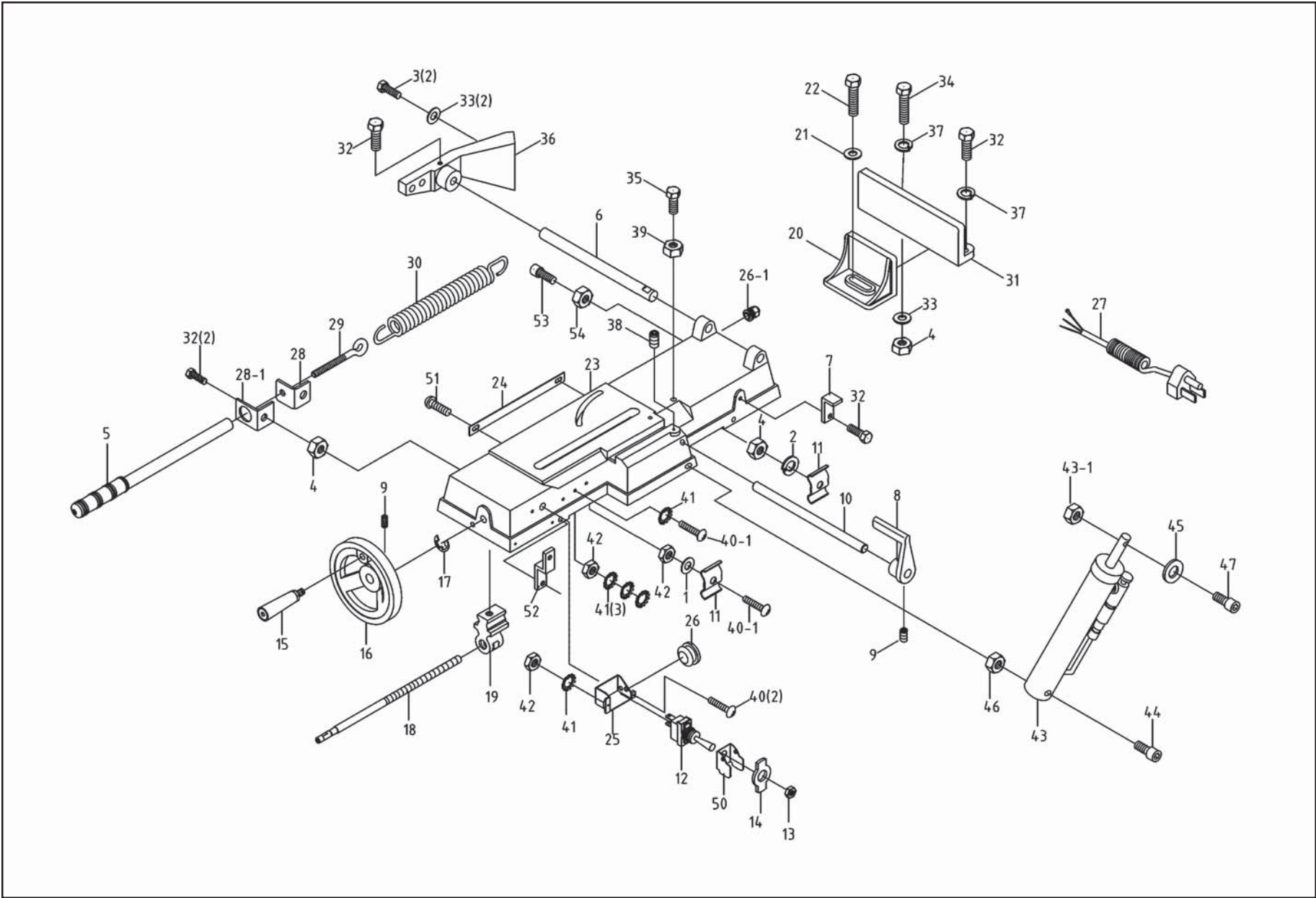
Exploded View - Upper Saw Head



Parts List - Upper Saw Head

ITEM NO.	PART NO.	DESCRIPTION	QTY	ITEM NO.	PART NO.	DESCRIPTION	QTY
01	5630221	Washer 1/4"x16xt1.5	1	28-1	TS-0720081	Lock washer, MEDIUM, 5/16"	1
02	5630051	HH screw 5/16"-18x1-1/4"L	2	29	5631241	Std. blade 14Tx1/2x.025x68	1
03	5630301	Washer 3/8"x27xt3	3	29	5631241R	Std. blade 12Tx1/2x.025x68	1
04	5631471	RH Phillips screw 3/16"-24x3/8"L	4	29	5631261	Opt. blade 8Tx1/2x.025x68	1
05	5631481	HH screw 5/16"-18x3/4"L	3	29	5631071	Opt. blade 10Tx1/2x.025x68	1
06	5630461	Washer 5/16"x23xt3	1	30	5631081	Split lock washer 3/8"	4
07	563051A	Top guide bar	1	31	5631121	Bushing	1
07	5630511R	Top guide bar	1	32	5632051	Drive wheel bushing	1
08	5630521	Knob	1	33	5631341	Retainer ring	1
09	5630531	Blade guard cover	1	34	5630721	Bushing	1
09	5630531R	Blade guard cover	1	35	563120A	Bottom blade guard	1
10	5630541	Retaining ring 5/16"x0.040	4	36	5631211	Upper blade guard	1
10	5630541R	Retaining ring S10	4	38	5631231	Bracket	1
11	563055A	Bearing 608 and 629	6	39	5630261	Aluminum hd. screw 5/16"-18x1-1/4"L	1
11	5630551R	Bearing 6000ZZ	6	40	5632131	Set screw 1/4"-20x3/8"L	1
12	563056A	Straight shaft	2	41	5631371	Bottom blade guide assy	1
12	5630561R	Straight shaft	2	42	5631361	Top blade guide assy	1
13	563050A	Eccentric shaft	2	43	5518413	C-Ring, S15	1
13	5630501R	Eccentric shaft	2				
14	563057A	Bearing pin shaft	2				
14	5630571R	Bearing pin shaft	2				
15	563129A	Bearing bracket, right	1				
15	5631291R	Bearing bracket, right	1				
15-1	5521954	Bearing bracket, left	1				
16	563059A	Bottom guide bar	1				
16	5630591R	Bottom guide bar	1				
17	5630601	Hand knob 3/8"-16x31L	1				
18	5630621	FH screw 1/4"-x20x1/2"L	1				
19	5630631	Deflector plate	1				
20	5630641	Hex Nut 3/8"-16UNC	4				
20	5630641R	Hex Nut 3/8"-24UNF	4				
21	5630651	Drive wheel	1				
21-1	TS-0270021	SOCKET SET SCREW 5/16"-18x5/16"L	1				
22	5630661	Wheel bearing Cover	1				
22	5630661R	Wheel bearing Cover	1				
23	5630711	Idler wheel	1				
24	5630821	Ball bearing (6202ZZ)	2				
27	5632031	RH Phillips screw 5/32"-32x1/4"L	5				
27	5632031R	FH screw 5/32"-32x1/4"L	5				
27	5632031R	FH screw 5/32"-32x1/4"L	3				
28	5632041	Washer 5/16"x2mm	1		xxxxxxxR	Parts were changed since S/N:03010002	

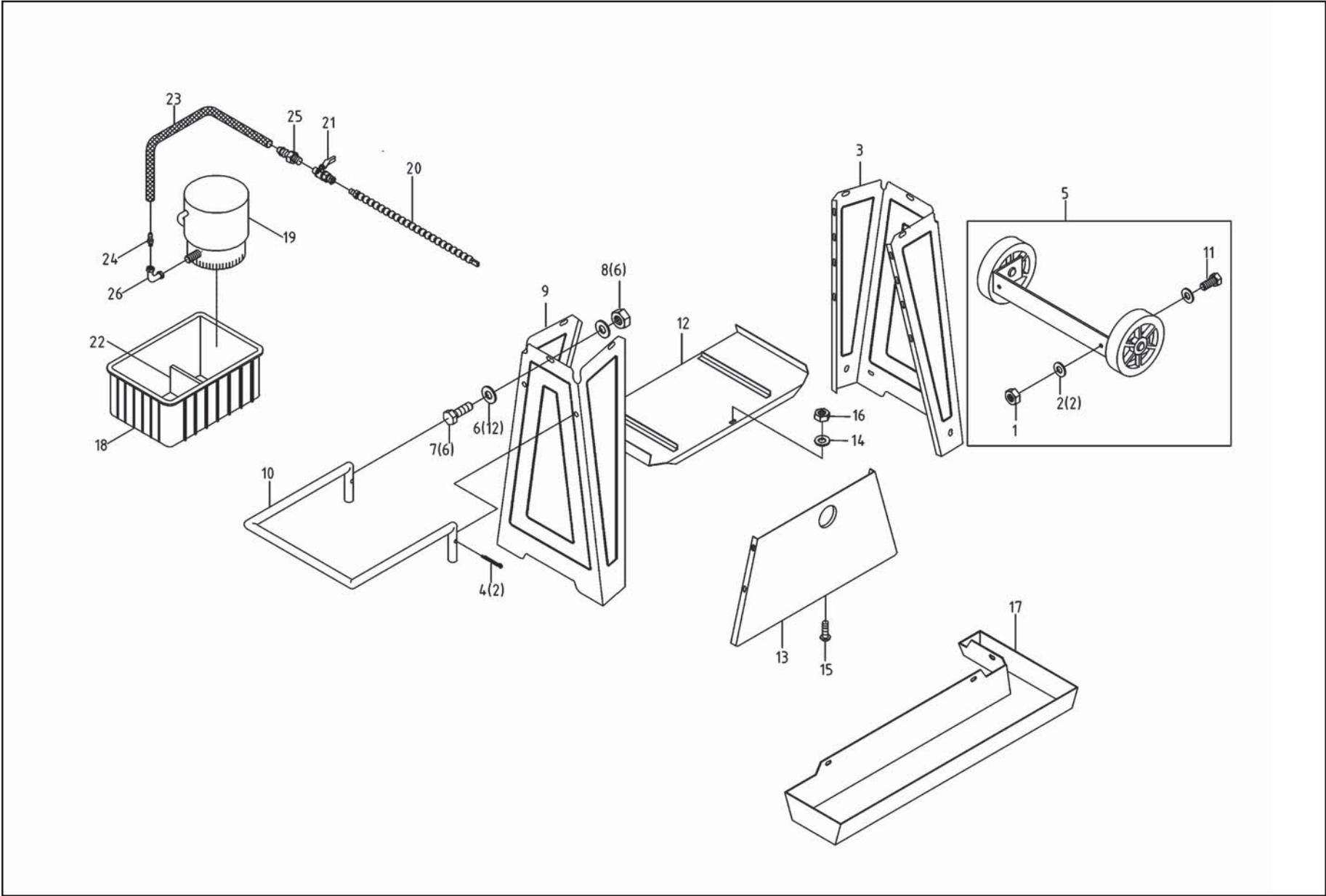
Exploded View - Saw Base



Parts List - Saw Base

ITEM NO.	PART NO.	DESCRIPTION	QTY	ITEM NO.	PART NO.	DESCRIPTION	QTY
01	5630221	Washer 1/4"x16xt1.5	1	37	5630611	Spring Washer 5/16"x3/4"x1/8"	2
02	5630031	Washer 5/16"	1				
03	5630051	HH screw 5/16"-18x1"L	2	38	5630981	Set screw 5/16"-18x5/8"L	1
04	5630061	Hex nut 5/16"-18	8	39	5632061	Hex nut 7/16"-14	1
05	5630081	Adjust rod	1	40	5632091	RH Phillips screw 3/16"-24x3/8"L	2
06	5630111	Pivoting rod	1				
07	5630121	Support plate	1	40-1	5521947	RH Phillips screw 3/16"-24x3/4"L	2
08	5630131	Stock stop	1				
09	5630241	Set screw 5/16"-18x5/16"L	2	41	5632101	Star Washer 3/16"	3
10	5630151	Stock stop rod 1/2"x216L	1	42	5632111	Hex nut 3/16"-24	1
11	5630111	Electric wire restrainer	2	43	5521948	Cylinder	1
12	5630171	Toggle switch	1	43-1	TS-1540061	HEX NUT, FULL M8	1
13	5630181	T.S. hex nut	1	44	TS-1505081	Socket HD cap screw M10-P1.5x50	1
14	5630211	ON/OFF plate	1	44	TS-0209011	Socket HD cap screw 3/8"-16x2-1/2	1
15	5631091	Handle grip	1				
16	5630231	Hand wheel	1	45	TS-1550061	FLAT WASHER M8	1
17	5630251	Retaining ring E10	1	46	TS-1540071	HEX NUT, FULL M10	1
18	5630271	Lead screw	1	46	5521953	Hex nut 3/8"-16	1
19	5630281	Vise nut	1	47	TS-1504091	Socket HD cap screw M8x45	1
20	5630291	Vise jaw, left	1				
21	5630301	Washer 3/8"x27xt3	3	50	5521949	Switch Cover	1
22	5630311	HH screw 5/16"-18x1-1/4"L	1	51	5632091	RH Phillips screw 3/16"-24x3/8"L	2
23	5630321	Base casting	1	52	5521950	Fixed Plate	1
23	5630321R	Base casting	1	53	TS-0208061	Socket HD cap screw 5/16"-18x1	1
24	5630341	Scale	1				
24	5630341R	Scale	1	54	TS-0561021	HEX NUT, FULL 5/16"-18	1
25	5630351	Switch enclosure	1				
26	563038A	Wire restrainer	1				
26-1	5630381R	Wire restrainer PG9	1				
27	5630391	Power supply cable	1				
28	5630401	Feed spring bracket, right	1				
28-1	5521946	Feed spring bracket, left	1				
29	5630411	Eye bolt	1				
30	5630421	Spring	1				
31	5630441	Vise jaw, right	1				
32	5631481	HH screw 5/16"-18x1"L	6				
33	5630461	Washer 5/16"x23xt3	3				
34	5630451	HH screw 5/16"-18x1-1/2"L	1				
35	5631491	HH screw 7/16"-14x2"L	1				
36	5630491	Pivot	1				
36	5630491R	Pivot	1		xxxxxxxR	Parts were changed since S/N:0301002	

Exploded View - Stand & Coolant System



Parts List - Stand and Coolant System

ITEM NO.	PART NO.	DESCRIPTION	QTY
01	5631431	Hex nut 1/4"-20	2
02	5630221	Washer 1/4"x16xt1.5	4
03	5630041	Right floor stand	1
04	5631441	Cotter pin 1/8"x1"L	2
05	5633021	Wheel assy.	1
06	5630031	Washer 5/16"x23xt2	12
07	5630051	HH screw 5/16"-18x1-1/4"L	6
08	5630061	Hex nut 5/16"-18	6
09	5630071	Left floor stand	1
10	5631461	Handle	1
11	5632021	HH screw 1/4"-20x1/2"L	2
12	5631191	Tray	1
13	5631181	Skirt	1
14	5631151	Lock washer 1/4"	1
14	5631151R	Lock washer M6	1
15	5632071	Carriage bolt 1/4"-20x1/2"	1
15	5631151R	Carriage bolt M6-P1x16mm	1
16	5630021	Hex nut 1/4"-20	1
16	5630021R	Hex nut M6-P1	1
17	5631171	Trough	1
18	5042291	Tank	1
19	5042281	Coolant pump	1
20	5042341	Nozzle	1
21	5042351	Valve	1
22	5049361	Divider	1
23	9307291	Hose	1
24	5042331	Nipple	1
25	5042321	Nipple	1
26	5042981	Elbow	1
	xxxxxxxR	Parts were changed since S/N:03010002	



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