

MODEL

**1318**

After serial number 5000

# Parts List and

## Manual Bandsaws

Built better to work stronger and last longer

# Operating & Maintenance Manual



**1318**

after serial number 5000

REV 220426



**Wellsaw®**  
Made In The USA

Quality Metal Cutting Bandsaws

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## FORWARD

The Model 1118, 1338 and 1348 Wellsaw bandsaws have been designed and manufactured to conform to Wellsaw's recognized high standards of quality and performance. Each saw must pass a series of final inspection tests, including actual metal cutting operations, before it is shipped. For this saw to provide satisfactory service, it is necessary that it be properly installed, operated and maintained. This manual has been prepared to assist you in carrying out these functions. We urge you to study this manual and follow its suggestions.

## RECEIVING AND INSTALLATION

Carefully remove the wrap and skid so the saw and its parts are not marred or otherwise damaged. In the event of damage in transit, notify the carrier and file a Proof of Loss Claim immediately.

### Shortages

Inspect the complete shipment carefully against the itemized packing list. Make sure that all items are present and in good condition. In the event of any shortage, notify the distributor from whom you purchased the saw and the carrier who made final delivery.

### Utility Hook-Up

The use of a qualified electrician is always recommended when connecting the saw to the main power supply. Electrical codes differ from area to area and it is the customer's responsibility to ensure that their saw complies with applicable codes. Your Wellsaw is pre-wired at the factory for a specified voltage. Always check the motor and electrical panel to ensure that they are both wired to correspond to your electrical power supply.

## One Year Limited Warranty

**This Wellsaw is warranted against defects in material and workmanship installed or performed at our factory. Within one year from the date of purchase, we will, free of charge, at our option, either repair or replace any part of the Wellsaw which our examination discloses to be defective because of workmanship or a defect in material, and to make any necessary service adjustments as required. This warranty does not apply if the Wellsaw has been subject to accident, alteration, abuse, misuse or which fails due to lack of care or as the result of inadequate power supply and specifically does not apply to normal wear of moving parts such as bearings, gears, pinion or blade. *There is no warranties beyond the description on the face hereof.* Wellsaw shall not be liable for consequential or incidental damage suffered or incurred with respect to defective material or workmanship.**

**All transportation costs or parts submitted to Wellsaw under this warranty must be paid by the saw's owner. No products or parts are to be returned to our factory without first obtaining written permission.**

**NOTE: Be sure to fill out and return the Warranty Card provided with this Wellsaw.**

# 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 operator's and parts manual.

## **When setting up machine:**

- Always avoid using machine in damp or poorly lighted work areas.
- Always be sure machine is securely anchored to the floor.
- Always keep machine guards in place.
- Always put start switch in "OFF" position before plugging in machine.

## **When using machine:**

- Never operate with machine guards missing.
- Always wear safety glasses with side shields (See ANSI Z87.1)
- Never wear loose clothing or jewelry.
- Never overreach - you may slip and fall into the machine.
- Never leave machine running while away from it.

- Always shut off the machine when not in use.

## **When servicing the machine:**

- Always unplug machine from electrical power while servicing.
- Always follow instructions in operators and parts manual when changing accessory tools or parts.
- Never modify the machine.

Read and follow these simple rules for best results and full benefits from your machine. Used properly, Wellsaw'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 Operators 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. Special electrics should be used when working on flammable materials.
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. 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.
11. Never brush away chips while the machine is in operation.
12. Keep work area clean. Cluttered areas invite accidents.
13. Remove adjusting keys and wrenches before turning the machine back on.
14. Use the right tool. Don't force a tool or attachment to do a job it was not designed for.
15. Use only recommended accessories and follow manufacturers instructions pertaining to them.
16. Keep hands in sight and clear of all moving parts and cutting surfaces.
17. All visitors should be kept at a safe distance from the work area. Make workshop completely safe by using padlocks, master switches, or by removing starter keys.
18. Know the tool you are using - its application, limitations, and potential hazards.

19. 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

20. 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 a saw blade. The operator shall not wear gloves when operating the machine.

2. All doors shall be closed, all panels replaced, and all 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 to full speed before bringing the workpiece into the saw blade.

4. Keep hands away from the blade area. **See figure A.**

5. Remove any cut off piece carefully while keeping your hands free from 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 all loose items and any unnecessary work pieces from the area before starting machine.

8. Bring adjustable saw guides and guards as close as possible to the work piece.

9. Always wear protective eye wear when operating, servicing or adjusting machinery. Eye wear 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. Non-slip 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 it.

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.

Figure A



Figure B



Figure C



Figure D



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## **Specifications**

### **Capacity:**

|                    |                                                   |
|--------------------|---------------------------------------------------|
| Rectangular        | 13" high x 18" wide                               |
| Round              | 13"                                               |
| at 45°             | 11" high x 10" wide                               |
| blade size         | 1" x .035 x 12'6" (150")                          |
| Blade Speeds       | Infinitely Variable, 70-375 SFPM                  |
| Blade Guides       | Carbide Guides with Rollers                       |
| Blade Tension      | Manual Rite-Tension                               |
| Electrical Options | 3hp - 208-230-460/60/3<br>2hp - 115-208-230/60/1  |
| Coolant System     | 8 gallon tank capacity<br>Submersible pump / 3GPM |
| Vise Control       | Quick Acting Manual Screw                         |
| Swivel Vise        | to 45°                                            |
| Feed Control       | Variable Hydraulic                                |
| Band Wheels        | 15" Diameter Cast Iron                            |
| Floor Area:        | 40" W x 84" L                                     |
| Shipping weight:   | 1050 Lbs.                                         |

## **Standard Features**

- Spring-Loaded Carbide Guides with Rollers
- Combination Reduction Gearbox and Ring & Pinion Blade Drive
- Baldor® Motor
  - 3hp motor 3 phase TEFC
  - 2hp single phase ODP
- Infinitely Variable Blade Speeds
- Rite-Tension® Blade Tensioning Device
- Wet Cutting System
- Powered Blade Brush
- 110 Volts at Controls
- Overload and Undervoltage Protection
- Precision Ground Bed and Vise Jaws
- Quick Acting Vise
- Adjustable Stock Stop
- Auto Shut-Off at End of Cut
- OSHA Blade Guarding
- Tiger-Tooth® Bi-Metal Blade
- Coolant for Initial Start-Up

## **Available Factory Options**

Flush Hose with 8.5 GPM Pump | Powered Frame Raise and/or Powered Vise | Laser Line Pointer | Casters (Set of 4, 2 Locking) | NFPA Electrics (with Disconnect) | Work Light with Transformer | Stock Stand, 18" | 5' Non-Powered Roller Conveyor | 10' Non-Powered Conveyors  
Please Contact Factory for Additional Options

## **Other Models in the 1318 Family**

Model 1338 with 38" Width Capacity  
Model 1316S Swivel Head Miter Saw to 60°  
All Models Available with PLC Controlled Semi-Automatic Operation

## Notes on Sawing

It is widely recognized that a proficient operator is a key to optimum bandsawing. He makes certain the machine is properly maintained and adjusted for dependable operation. He carefully sets up each cutting job to prevent damage to the machine and obtain the best performance from the equipment.

Experienced blade dealers can be very help-ful in selecting the grade and proper tooth blade for each sawing job. All blades should be straight, have sharp teeth with uniform set, and be “broken in” at a reduced feed rate to obtain good cutting performance and blade life.

Every cutting situation has special characteristics requiring some experimentation to determine which blade, speed and feed rate will achieve the most satisfactory result. Cutting charts indicate a good starting point, but must be modified by direct experience if optimum performance is desired.

Here are some helpful pointers for adjusting speed and feed for good cutting performance.

1. Make sure the saw is cutting a good chip from the workpiece.
2. Watch for blue chips or excessive “smoke” indicating heat in the cut which could damage the blade or work harden the material being cut
3. Watch for excessive vibration or chatter marks on the cut-off piece indicating possible damage to the saw teeth by “hammering”.
4. Check the cut-off piece for flatness. A dull blade or excessive feed will produce a “belly” in the cut.
5. Inspect the blade for worn, rounded or shiny cutting edges. Avoid force cutting which will allow chips to “weld” to saw teeth and eventually cause the teeth to be stripped off the blade.
6. When experimenting, start with a slow speed and feed rate. Gradually increase blade speed and then feed pressure by small amounts until adverse effects are noted. You can then set the speed and feed at a reasonable level for continuous cutting. Remember that blade speed and feed pressure must be balanced to keep cutting a good chip.

## Trouble Shooting

### Premature Dulling of Blade Teeth

1. Feed rate too high or low. Check pages 30-31.
2. Blade speed too slow or too fast.
3. Faulty material; heavy scale, hard spots, etc.
4. Verify type of material.
5. If coolant flow is not covering saw teeth, increase coolant flow rate.
6. If saw is vibrating in cut, reduce blade speed or increase feed rate.
7. Chipped or broken tooth may be lodged in cut.
8. “Chip welding” caused by improper feed and speed.
9. Incorrect coolant mixture.
10. Incorrect blade selection
11. Improper break-in of new blade. New blades should be run initially with reduced feed pressure for approximately 50 to 100 square inches.
12. Saw blade teeth may be hitting blade guides. Check for proper blade size.

### Saw Blade Vibration

1. Incorrect blade speed for material.
2. Blade tension insufficient.
3. Back-up bearing may be worn.
4. Incorrect choice of saw tooth pitch.
5. Incorrect coolant mixture.
6. Incorrect feed setting. Increase feed.
7. Workpiece not firmly clamped in vice.
8. Worn or improperly adjusted saw guides. Check and make necessary adjustments.

### Blade Teeth Chipping or Ripping Out

1. Blade pitch too coarse. Use a fine pitch saw blade on thin work sections.
2. Improper break-in of new blade. Do not start a new blade in an old cut.
3. Work piece not held firmly enough. Clamp work securely.
4. Introduce cooling if it is not being used.
5. Faulty material; scale or hard spots.
6. Blade gullets may be loaded. Use higher viscosity lubricant or coolant.
7. Blade speed and feed may need adjustment.

### **Premature Blade Breakage**

1. Poor weld in the blade.
2. Feed rate set too high. Reduce it.
3. Excessive blade speed. Adjust it.
4. Blade guides set too tight or misaligned.
5. Blade tension set too high.
6. Blade running against flange on wheels. Adjust wheel pitch.

### **Blade Squeal**

1. Feed rate too light for blade speed. Increase feed rate and/or reduce blade speed.

### **Blade Slips Off Band Wheels**

1. Blade not tensioned correctly.
2. Wheel pitch not set properly.
3. Guides set too tight.

### **Gullets of Blade Teeth Loading**

1. Blade pitch too fine. Review blade selection.
2. Incorrect blade speed. Consult cutting chart.
3. If not using coolant, apply it.

### **Chips Welding to Blade Teeth**

1. Cutting rate too high.
2. Chip brush may be out of adjustment.
3. Check coolant and application.

### **Blade Becoming Scored**

1. Saw guides may be worn. Check and replace if necessary.
2. Too much pressure on saw guides. Adjust.
3. Guides may be out of alignment.

### **Blade Making Belly-Shaped Cut**

1. Blade tension too light. Increase it.
2. Saw guides too far from work piece.
3. Blade pitch too fine. Use larger pitch and positive rake tooth form.
4. Excessive feed. Decrease it.
5. Dull blade.

### **Inaccurate Cut-Off**

1. Is conveyor or stock stand level with saw bed?
2. Insufficient blade tension.
3. Blade guides too far apart. Always set blade guides as close to the piece as possible.
4. Blade may be dull. Check and replace if

necessary.

5. Feed pressure too high. Reduce it.
6. Blade guides loose, worn or out of alignment.
7. Too many teeth-per-inch. Blade not cutting freely.
8. Chip brush not cleaning teeth properly.
9. Dirty coolant.
10. Check for loose fasteners.

### **Rough Cut / Poor Finish**

1. Excessive feed rate. See recommendations.
2. Blade too coarse. Use finer blade pitch.
3. Inadequate cutting fluid. Replace.

### **Blade Stalls in Work**

1. Insufficient blade tension.
2. Excessive feed pressure.
3. Blade tooth spacing too coarse.
4. Motor worn or defective.
5. Guides too tight against blade.

### **Blade Does Not Track Properly**

1. Set wheel pitch so that blade runs to wheel flange but not against it.
2. Is blade tension correct?
3. Is back of blade riding against backup bearing? If not, adjust it.

### **Motor Overheating**

1. Check for correct voltage supply. Check voltage at motor. Check magnetic starter heaters.
2. Check for loose electrical connections.
3. Does motor amp reading correspond to rating on motor specifications tag?
4. Is internal motor wiring correct?
5. Is drive belt over tightened?

### **Automatic Stop**

When the blade has completed a cut through the material, the saw frame drops onto a limit switch actuator which shuts the motor off.

When changing a blade or doing any other maintenance or repair, *be sure the automatic stop is engaged and disconnect the main power supply.*

It is necessary to raise the saw frame to clear the limit switch actuator before the saw can be started.

## PLACING THE BLADE ON SAW

**WARNING:** When uncoiling a new blade, use gloves and eye protection.

To insert a new blade, turn the Adjusting Knob (item 17 in the parts diagram) on the blade guide Counter Clockwise (CCW) until it stops. Insert the new blade and turn the Adjusting Knob Clockwise (CW) until it stops. The spring loaded carbide guides will then be in proper contact with the sides of the blade. The back of the blade should just touch the carbide back up guide (15 in the parts drawing). The side bearings should have a gap of .038 for the .035 thickness blade.

## Wheel Pitch Adjustment

If the saw blade runs too low, runs off the wheels, or runs too high and rubs the wheel flange, a wheel adjustment must be made.

Loosen the blade before making the following adjustments.

**Idler Wheel:**

Blade running too low or off the wheel- adjust the idler wheel block. Loosen the two cap screws in the block, opposite the take up screw end, one-half turn. Tighten the opposite two cap screws one-half turn. Repeat if necessary.

Blade running too high and against the idler wheel flange- The blade can become distorted, its top edge rolled over and wheel flange will wear excessively.

To correct this, loosen the two cap screws closest to the take up screw one-half turn. Tighten the opposite cap screws one-half turn. Repeat if necessary.

**Drive Wheel:**

Blade running too low or off the drive wheel- Loosen the two cap screws opposite the outside end of the wheel plate one-half turn. Tighten the two set screws on the same end one-half turn. Repeat if necessary.

Blade running too high, and against the drive wheel flange- Loosen the cap screws closest to the outside end of the wheel plate and loosen the two set screws at the same time by the same amount. Repeat if necessary.

*Make certain all screws are tight after adjustments have been made.*

## Variable Speed Drive

Models 1118, 1338, 1348 and 1316S are equipped with variable speed pulleys providing infinite speed selection between 70 and 375 feet-per-minute. See Cutting Speed Chart for settings.

To vary blade speed, rotate handwheel clockwise to increase speed or counter-clockwise to decrease speed. Do not adjust the speed unless the pulley system is in operation (spinning). The handwheel drag is set at the factory during assembly. This drag prevents handwheel “creep” during operation but still permits easy adjustment. Due to normal wear and environment, the drag setting may change. To readjust, tighten set screw in thrust nut.

## Gear Box Repair

1. Remove gear box from saw.
2. Remove four machine screws holding gear box together.
3. Separate gear box by carefully prying castings apart at a location near pulley shaft. *Caution: Do not use excessive force.*
4. Once the gear box is open, the internal parts may be inspected for wear.
5. Liquid plastic gasket is used to seal the gear case, Loctite No. 51580 or equivalent.
6. Grease, Mobilgrease XHP 220 or equivalent is recommended. The grease must have excellent clinging characteristics. (See Lubrication).

## Fixed Vise Jaw

The two pins in the fixed vise jaw should be kept in place in order to ensure square cuts. For cutting angles, the pins must be removed and the turned to the desired position and tightened with clamp bolts. These pins enable operators to quickly relocate the fixed vise jaw for approximate 90 degree cutting. For final, accurate cutting, the fixed vise jaw should be squared with the blade. (See Guide Alignment)

## Sliding Vise Jaw

The sliding vise jaw is fitted with a lift plate and ratchet dog for quick action. A hand wheel tightens the vise on the workpiece. *Excessive pressure is not required to hold workpiece securely.*

## Hydraulic Feed Control

The feed rate is hydraulically controlled with a needle valve located on the side of the saw bed. *Caution: Do not attempt to loosen or remove hoses until the saw frame is supported in its “Down” position.*

## Feed Pressure Adjustment

Maximum feed pressure is obtained with the frame spring adjusted as close to the end of the saw frame as possible. To *decrease* pressure, turn handle on opposite end of frame counterclockwise. To *increase* pressure turn handle in a clockwise direction. Use lighter feed pressure when cutting thin-wall material or irregular shapes.

## Blade Brushes

Brushes should be cleaned frequently in kerosene. For efficient cutting and blade life, keep blade brushes adjusted so they are contacting blade teeth and replace them when worn.

## Motor Switch

The “Start-Stop” motor starter is provided with heater coils to de-energize the circuit if an overload occurs. Allow the coil to cool before trying to restart the motor.

Low/No Voltage Control also de-energizes the circuit and prevents automatic restarts after power is restored. Allow the coil to cool.

*To stop the saw at any time,  
press the stop button or  
press down on the limit switch actuator*

## Servicing the Blade Guides Blade Guide Adjustment

To properly align the saw blade for a straight and accurate cut, do the following:

1. Square the stationary vise jaw. Make sure it is square to the front of the vise slot. Check by placing a combination square against the front of the vise slot in the saw bed. Slide the square toward the stationary vise. Make any necessary adjustment to the vise jaw to bring it into square. Set the combination square so that one leg is along the face of the stationary vise and check to see that the blade is square to the vise jaw. If it is not square, follow the instructions for horizontal adjustment.

2. Vertical Adjustment. The back of the saw blade should just touch the carbide back up guide (item 15 in the parts drawing) when the saw is running but not cutting. To adjust, loosen the two cap screws 8 [A] and move the block up or down as required.

(Before making this adjustment, be sure the back of the blade is properly contacting the flange on both the drive and idle wheels).

3. Horizontal Adjustment. Loosen the two cap screws 8 [B] securing the horizontal adjusting block (items 11 & 12 of the parts drawing). Turn the top adjusting bolt (item 13 of the parts drawing) to move the blade either in, toward the saw bed, or out, away from the saw bed.

Normally, the blade comes off the Drive Wheel with a minimum amount of adjustment needed in the Horizontal Adjusting Block. The Idle End adjusting block is more likely to require adjustment.

4. Blade Tilt. To ensure the blade is perpendicular to the bed of the saw, loosen the two cap screw 8 [C] holding the Guide Support (28 & 29 of the parts drawing) and turn the bottom adjusting bolt (13 of the parts drawing).

Set the combination square on the saw bed with the end of the rule butted against the blade *above the set of the teeth*. Use a 1-1/2 thousandths (.0015”) shim and slide it along the top and bottom edge of the rule where it meets the saw blade. If the shim slides between the blade and the rule at either the top or bottom, the blade guides must be adjusted.

5. Safety. Ensure that all bolts are properly tightened and that all guards are in place before using the saw.

## Recommended Service Kits

1 year

100133-004 Rotary Blade Brush 1 required

2 years

100416-001 bearing 4 required

152153 top carbide guide 2 required

106317 side carbide guide 4 required

105454-005 VS belt 1 required

100133-004 Rotary Blade Brush 1 required

100166-450 Blade brush belt 1 required

## Maintenance

**Caution:** *Disconnect the electrical supply and press emergency STOP button before performing any maintenance. DO NOT service the Frame Hydraulic Cylinder or Down Feed Valve unless the frame is in the DOWN position or resting on a mechanical stop, such as a block of wood.*

### Daily

1. Keep the saw clean and free of chips.
2. Maintain the coolant level and keep the coolant tank and filter clean of chip accumulation or sludge.

### Monthly

1. Check, adjust and replace blade brush as needed.
2. Lubricate drive gears
3. Inspect carbide guides and bearings.
4. Inspect drive belt.
5. Clean coolant tank and filter as needed.

### Annually

1. Check hydraulic oil level.
2. Replace guide rollers and carbide inserts.
3. Inspect gear box. Lubricate as needed.

## Lubrication

Correct and adequate lubrication is a very important factor in determining the life and service of your Wellsaw. It is essential that all dust, dirt, chips, [etc. be](#)

thoroughly removed before lubricating the saw. The following lubrication recommendations cover usual saw applications. Heavy use and hostile environments may indicate more frequent lubrication for best saw performance.

### Vise Screw, Ring Gear, Drive Pinion

1. Inspect Monthly.
2. Use Anti-Seize on Vise Screw.
3. Use Extreme Pressure Open Gear Lube sparingly on Ring Gear and Drive Pinion

### Gear Case

1. Inspect after 3 years (6,000 hours).
2. Use Mobilgrease XHP 220 or equivalent.
3. Viscosity: Heavy Grease, drop point 550EF
4. Military Specification: None

### Hydraulic Cylinder

1. Inspect annually. Fill to top of plug. Drain and replace every 5 years (10,000 hours).
2. Fill with Mobil Velocite Oil #6 or equivalent.
3. Viscosity at 100EF: SUS 57-61.
4. Military Specification: None.

### Motor

1. Inspect annually. Re-lubricate every 2 years (4,000 hours) 1 to 2 full strokes.
2. Use Shell Dolium R or equivalent.
3. Viscosity: Heavy Grease, drop point 219EC.
4. Military Specification: None.

## Parts Ordering

For your convenience:

When contacting your Wellsaw supplier or the Company for parts or service, it is essential that you have your saw Model, Serial Number and Purchase Date available.

Jot them down here for handy reference.

**Model:**

**Serial Number:**

**Purchase Date:**

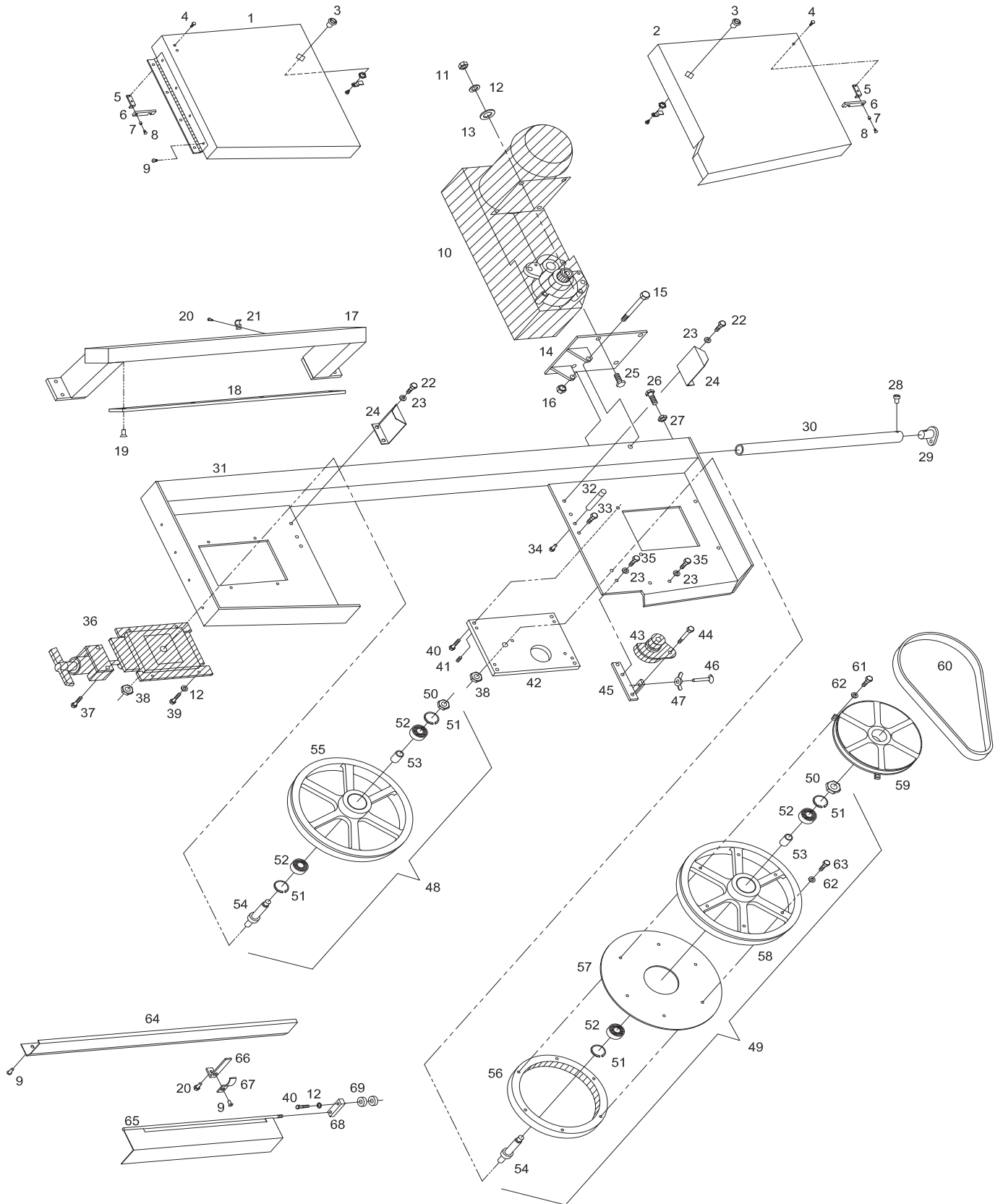
## Wellsaw model 1318

### Sequence of Operation

**Pushbutton Feed Control** for manually raised saws.

1. At the finish of the cut the blade motor will stop. Be sure to wait until the motor has stopped before removing the cut piece.
2. The saw frame can be lifted to the desired height. There is no need to turn the **Cutting Speed** handwheel (feed rate control). The saw will hold in the up position at any point.
3. The vise can now be opened and the next cut can be positioned. The vise can be close.
4. If the blade is quite high above the material the saw frame can be lowered quickly by pressing the **Fast Approach** button. This has a momentary operation. Be careful not to allow the blade to touch the material.
5. Start the blade motor with the green **Start** button.
6. The **Frame Lower** button is used to start the cut. After the blade motor is running the **Frame Lower** button can be pushed and the blade will feed into the cut. If the blade motor is not running the **Frame Lower** button will have a momentary action, the head will drop only while the button is held down and at a slower rate than the **Fast Approach**.
7. The **Cutting Speed** handwheel is used to adjust the rate that the saw head comes down (Feed Rate). It can be adjusted for each job as needed but does not require attention during the sawing cycle. Best results will come when this knob is adjusted only in small amounts and only when needed. Avoid adjusting this knob during the cutting cycle.
8. The red **Stop** button will stop the blade motor and the feed cycle. To resume sawing both the blade **Start** and the **Frame Lower** buttons must be pushed.
9. The saw required electrical power to lower the saw frame. The saw is equipped with a **By-Pass Valve** which allows the saw head to be lowered when there is no electrical power available. The valve is located under the saw bed at the Vise Handwheel end.
10. **NOTE:** The saw is shipped with the **By-Pass Valve** in the **open** position. The valve must be closed before operating the saw. Gently turn the knob clockwise until the valve seats.

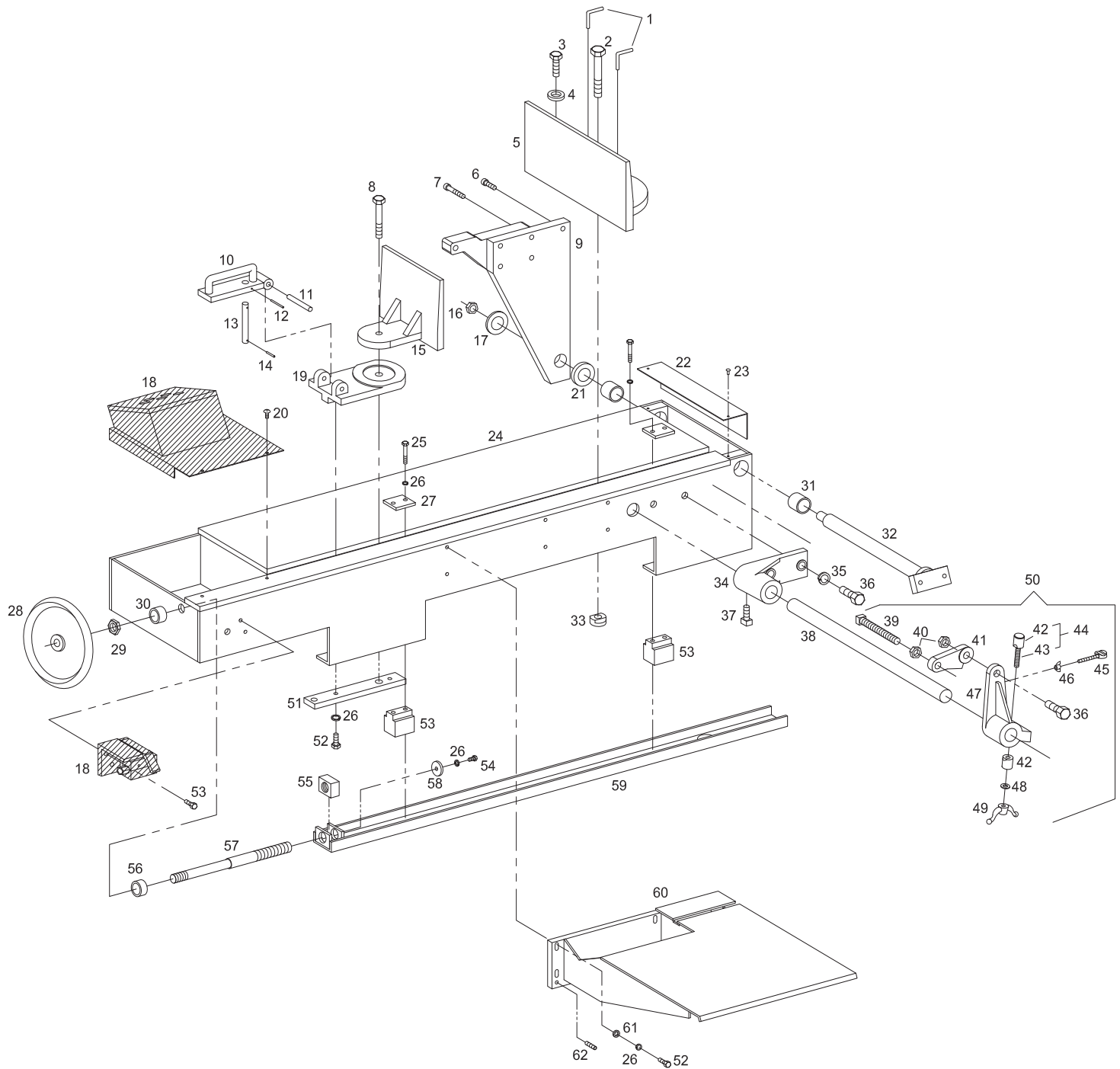
# Frame Assembly



|    |               |                                                                                |
|----|---------------|--------------------------------------------------------------------------------|
| 1  | 150146SERV    | Idle Wheel Guard                                                               |
| 2  | 150147SERV    | Drive Wheel Guard                                                              |
| 3  | 100135-002    | 1/4 Turn Fastener w/cam                                                        |
| 4  | 100013-008    | Machine Screw, Button Head 1/4-20 x 3/8                                        |
| 5  | 150095        | Door Catch Mtg Block                                                           |
| 6  | 150096        | Door Catch                                                                     |
| 7  | 150182        | Door Catch Sleeve                                                              |
| 8  | 100013-006    | Machine Screw, BH 10-32 x 1/2                                                  |
| 9  | 100013-006    | Machine Screw, BH 1/4-20 x 1/2                                                 |
| 10 |               | <b>Motor &amp; Gear Box Assy. (page26)</b>                                     |
| 11 | 100017-002    | Hex Nut, 5/16-18                                                               |
| 12 | 100025-002    | Lock Washer, 5/16                                                              |
| 13 | 100029-003    | Flat Washer, 5/16                                                              |
| 14 | 150248        | Motor Mount Bracket                                                            |
| 15 | 100004-116    | Cap Screw, HH 1/2-13 x 4-1/2                                                   |
| 16 | 100023-004    | Nylon Lock Nut, 1/2-13                                                         |
| 17 | 150280        | Guide Beam Ass'y                                                               |
| 18 | 150124        | Guide Arm Track                                                                |
| 19 | 100009-013    | Cap Screw, FH 5/16-18 x 1/2                                                    |
| 20 | 100013-005    | Machine Screw, BH 10-32 x 3/8                                                  |
| 21 | 100218-010    | Clamp                                                                          |
| 22 | 100004-076    | Cap Screw, HH 3/8-16 x 1                                                       |
| 23 | 100025-003    | Lock Washer, 3/8                                                               |
| 24 | 155152        | Door Catch Support                                                             |
| 25 | 100004-016    | Cap Screw, HH 5/16-18 x 7/8                                                    |
| 26 | 100004-030    | Cap Screw, HH 3/8-16 x 1-1/2                                                   |
| 27 | 100019-004    | Hex Nut, 3/8-16                                                                |
| 28 | 100008-018    | Cap Screw, Soc Hd 5/16-18 x 3/4                                                |
| 29 | 150411        | Counter Balance Spring Attach                                                  |
| 30 | 150105        | Counter Balance Tube                                                           |
| 31 | 150281-005    | Saw Frame                                                                      |
| 32 | 150160-002    | Door Latch Stud                                                                |
| 33 | 100165-007    | Shoulder Bolt, 3/8 x 3/8                                                       |
| 34 | 100004-015    | Cap Screw, HH 5/16-18 x 3/4                                                    |
| 35 | 100004-076    | Cap Screw, HH 3/8-16 x 1                                                       |
| 36 |               | <b>Rite Tension® Blade Tension &amp; Slide Block Ass'y (see page 18)</b>       |
| 37 | 100004-055    | Cap Screw, HH 3/8-16 x 2-1/4                                                   |
| 38 | 100065-007    | Hex Nut, 5/8-18                                                                |
| 39 | 100004-013    | Cap Screw, HH 5/16-18 x 5/8                                                    |
| 40 | 100004-020    | Cap Screw, HH 5/16-18 x 1-1/4                                                  |
| 41 | 100034-005    | Set Screw, 5/16-18 x 3/4                                                       |
| 42 | 150022        | Wheel Plate, Drive End                                                         |
| 43 |               | <b>Blade Brush Ass'y (page 21)</b>                                             |
| 44 | 100165-011    | Shoulder Bolt, 3/8-16 x 1-3/4                                                  |
| 45 | 150369        | Blade Brush Arm                                                                |
| 46 | 100042-003    | Thumb Screw, 1/4-20 x 2                                                        |
| 47 | 100024-002    | Wing Nut, 1/4-20                                                               |
| 48 | <b>150088</b> | <b>Idle Wheel Ass'y for 1" Blades (includes 38 &amp; 51-55)</b>                |
| 49 | <b>150087</b> | <b>Drive Wheel Ass'y for 1" Blades (includes 38, 50-54, 56-58 &amp; 61-63)</b> |
| 50 | 100019-016    | Hex Jam Nut, 5/8-18                                                            |
| 51 | 100068-002    | Snap Ring (2 req'd/ wheel)                                                     |
| 52 | 100414-003    | Ball Bearing (2 req'd/ wheel)                                                  |
| 53 | 105415        | Spacer (1 req'd/ axle)                                                         |
| 54 | 105420        | Wheel Axle                                                                     |

|    |                   |                                                          |
|----|-------------------|----------------------------------------------------------|
| 55 | <b>150060-001</b> | <b>Idle Wheel for 1" Blade (includes items 50 - 53)</b>  |
| 56 | B-086             | Internal Ring Gear                                       |
| 57 | 150405            | Shield                                                   |
| 58 | <b>150059-001</b> | <b>Drive Wheel for 1" Blade (includes items 50 - 53)</b> |
| 59 | 150144            | Pulley, Large                                            |
| 60 | 100166-450        | V- Belt                                                  |
| 61 | 100004-094        | Cap Screw, HH 1/4-20 x 1-1/2                             |
| 62 | 100025-001        | Lock Washer, 1/4                                         |
| 63 | 100004-068        | Cap Screw, HH 1/4-20 x 1-1/4                             |
| 64 | 150273            | Blade Guard, upper                                       |
| 65 | 150157            | Blade Guard Lower                                        |
| 66 | 150154            | Blade Guard Support                                      |
| 67 | 150414            | Clamp                                                    |
| 68 | 150158            | Blade Guard Mounting Block                               |
| 69 | 105537            | Spacer (2 req'd)                                         |

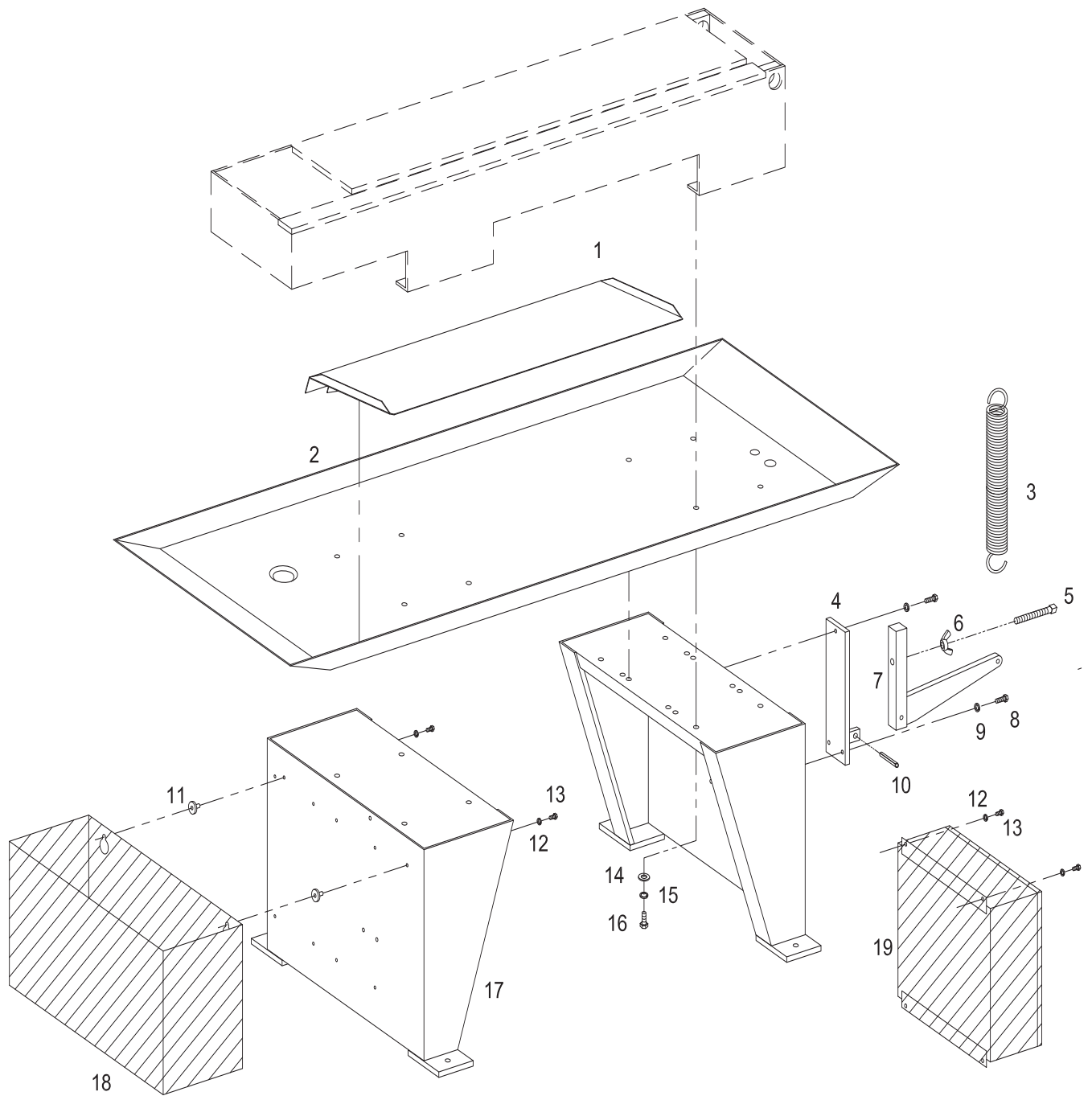
# Bed Assembly



## Bed Assembly

|    |               |                                                                         |    |                                                                                    |
|----|---------------|-------------------------------------------------------------------------|----|------------------------------------------------------------------------------------|
| 1  | M-065         | Locating Pin                                                            |    |                                                                                    |
| 2  | 100004-043    | Cap Screw, HH 5/8 x 2-1/2                                               | 46 | 100024-002 Wing Nut, 1/4-20                                                        |
| 3  | 100004-070    | Cap Screw, HH 1/2-13 x 1-3/4                                            | 47 | M-451SERV Stock Stop Arm (fixed)                                                   |
| 4  | 155107        | Washer                                                                  | 48 | 100030-005 Washer, 3/8                                                             |
| 5  | B-215         | Stationary Vise Jaw                                                     | 49 | 155205-002 Wing Nut                                                                |
| 6  | 100008-006    | Cap Screw, SH, 3/8-16 x 1                                               | 50 | <b>B-344 Stock Stop Ass'y</b><br><b>(includes items 36, 39 - 43 &amp; 45 - 49)</b> |
| 7  | 100008-016    | Cap Screw, SH, 3/8-16 x 1-3/4 (4 req'd)                                 | 51 | 150099-001 Slide Block Plate                                                       |
| 8  | 100004-044    | Cap Screw, HH 5/8 x 3                                                   | 52 | 100004-022 Cap Screw, HH 5/16-18 x 1-1/2                                           |
| 9  | 150517        | Pivot Arm                                                               | 53 | 150098-001 Slide Block                                                             |
| 10 | 150091        | Lift Plate                                                              | 54 | 100004-015 Cap Screw, HH 5/16-18 x 3/4                                             |
| 11 | 100053-002    | Roll Pin, 3/8 x 2-1/2                                                   | 55 | M-061B Vise Screw Nut                                                              |
| 12 | 100053-008    | Roll Pin, 1/8 x 1-3/8                                                   | 56 | 100402 Thrust Collar                                                               |
| 13 | 150094-001    | Vise Drive pin                                                          | 57 | 150286 Vise Screw                                                                  |
| 14 | 100053-009    | Roll Pin, 1/8 x 5/8                                                     | 58 | M-041 Vise Ratchet Spacer                                                          |
| 15 | B-003         | Movable Vise Jaw                                                        | 59 | 150285 Vise Push Channel                                                           |
| 16 | 100017-007    | Hex Nut, 5/8-11                                                         | 60 | 150284-001 Tip Off Table                                                           |
| 17 | 100029-008    | Flat Washer, 5/8                                                        | 61 | 100029-002 Flat Washer, 1/4                                                        |
| 18 |               | <b>Control Switch Ass'y (see page28)</b>                                | 62 | 100039-004 Set Screw, Half Dog 3/8-16 x 1<br>(5 req'd- use w/tip-off table)        |
| 19 | B-077-001     | Vise Slide Block                                                        |    |                                                                                    |
| 20 | 100000-018    | Machine Screw, Rd Hd, 10-32 x 3/8                                       |    |                                                                                    |
| 21 | 150021-001    | Pivot Bar Collar                                                        |    |                                                                                    |
| 22 | 150539        | Cover                                                                   |    |                                                                                    |
| 23 | 100049-001    | #4 Drive Screw                                                          |    |                                                                                    |
| 24 | 150305        | Saw Bed                                                                 |    |                                                                                    |
| 25 | 100004-024    | Cap Screw, HH 5/16-18 x 2-1/2                                           |    |                                                                                    |
| 26 | 100025-002    | Lock Washer, 5/16                                                       |    |                                                                                    |
| 27 | 150097        | Clamp Plate                                                             |    |                                                                                    |
| 28 | B-093         | Hand Wheel                                                              |    |                                                                                    |
| 29 | 100019-008    | Hex Jam Nut, 3/4-10                                                     |    |                                                                                    |
| 30 | 102886        | Set Collar                                                              |    |                                                                                    |
| 31 | 100419-041    | Bushing (2 req'd)                                                       |    |                                                                                    |
| 32 | 150276        | Pivot Bar                                                               |    |                                                                                    |
| 33 | B-151         | Clamp Nut                                                               |    |                                                                                    |
| 34 | B-082         | Stop Bar Bracket                                                        |    |                                                                                    |
| 35 | 100025-007    | Lock Washer, 5/8                                                        |    |                                                                                    |
| 36 | 100004-041    | Cap Screw, HH 5/8-11 x 1-1/2                                            |    |                                                                                    |
| 37 | 100033-015    | Set Screw, Sq Hd 5/8-11 x 1                                             |    |                                                                                    |
| 38 | B-460         | Stock Stop Bar                                                          |    |                                                                                    |
| 39 | 100033-016    | Sq. Hd. Set Screw, 5/8-11 x 4                                           |    |                                                                                    |
| 40 | 100019-007    | Hex Jam Nut, 5/8-11 (2 req'd)                                           |    |                                                                                    |
| 41 | M-452         | Stock Stop Arm (hinged)                                                 |    |                                                                                    |
| 42 | 155190        | Wedge                                                                   |    |                                                                                    |
| 43 | 155204        | Carriage Bolt, Ribbed Neck                                              |    |                                                                                    |
| 44 | <b>155203</b> | <b>Wedge &amp; Bolt Assembly</b><br><b>(includes items 42 &amp; 43)</b> |    |                                                                                    |
| 45 | 100042-003    | Thumb Screw, 1/4-20 x 2                                                 |    |                                                                                    |

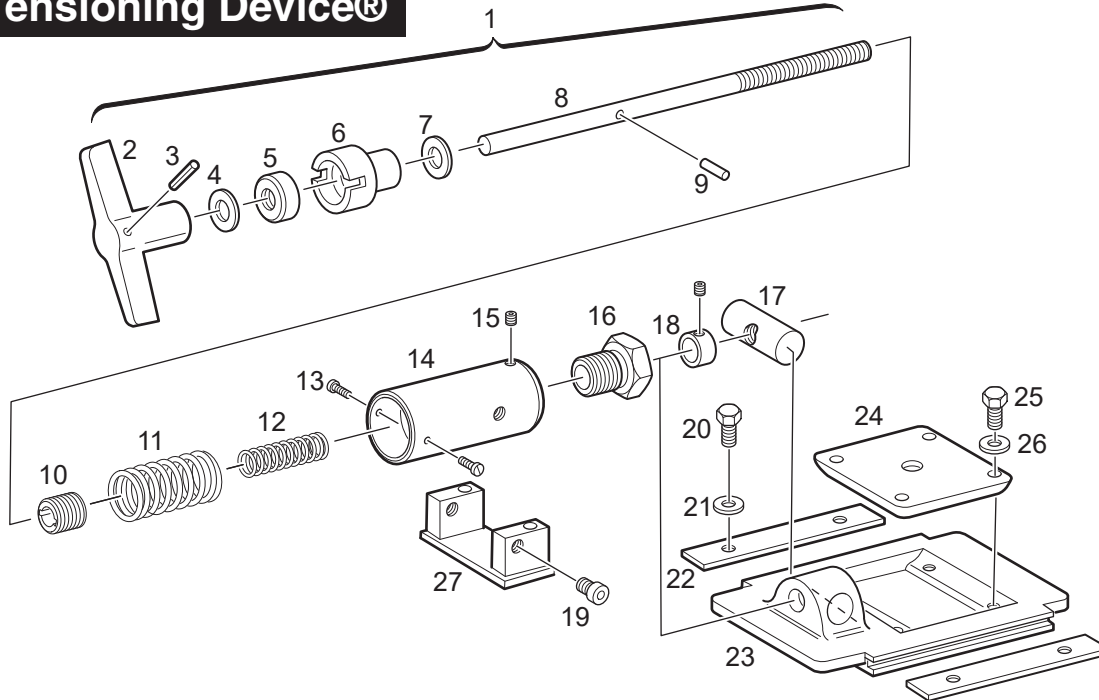
## Leg & Chip Pan



## Leg & Chip Pan

- 1 F-228 SPLASH GUARD
- 2 150077 CHIP PAN
- 3 150119 COUNTER BALANCE SPRING
- 4 155016-001 SPRING ANCHOR WELDMENT
- 5 100033-025 SQ Hd SET SCREW 1/2-13 X 4"
- 6 100024-004 WING NUT 1/2-13
- 7 155019-001 SPRING ADJUSTER WELDMENT
- 8 100004-018 CAP SCREW, HH 5/16-18 X 1 (3 REQ'D)
- 9 100025-002 LOCK WASHER 5-16 (3 REQ'D)
- 10 100053-040 ROLL PIN 3/8 X 1-3/4
- 11 150078 COOLANT TANK HANGER (2 REQ'D)
- 12 100025-001 LOCK WASHER 1/4 (2 REQ'D)
- 13 100004-003 CAP SCREW, HH 1/4-20 X 1/2
- 14 100029-004 FLAT WASHER 3/8
- 15 100025-003 LOCK WASHER 3/8
- 16 100004-027 CAP SCREW, HH 3/8-16 X 1
- 17 155106 LEG (2 REQ'D)
- 18 COOLANT TANK ASSEMBLY (SEE PAGE 20)
- 19 ELECTRICAL CONTROL ASSEMBLY (SEE PAGE 28)

# Rite Tensioning Device®



## Calibrating the WELLSAW RITE-TENSION® Blade Tensioning Device

The Rite-Tension® device is a simple turn counter that is activated by blade tension and can be easily adjusted in the field.

*Please review the operation instructions before making any adjustment:*

### 1. LOOSENING

When replacing a worn or broken blade always turn the "T" handle out at least six (6) turns (counter-clockwise).

This will reset the device. **Always push-in** on the handle when loosening, this will insure that the internal counter is engaged.

### 2. TIGHTENING

**Always pull out** on the "T" handle when tightening the device (clockwise). After a number of turns the "T" handle will come to a hard stop.

At this point the blade will be properly tensioned. Do not force the unit beyond this point.

*Note:* If the mechanism does not seem to come to a hard stop but continues to tighten, stop and repeat steps one and two.

Check to make sure the blade is properly positioned on the band wheels and is not binding in the guides during the tightening process.

### Calibration

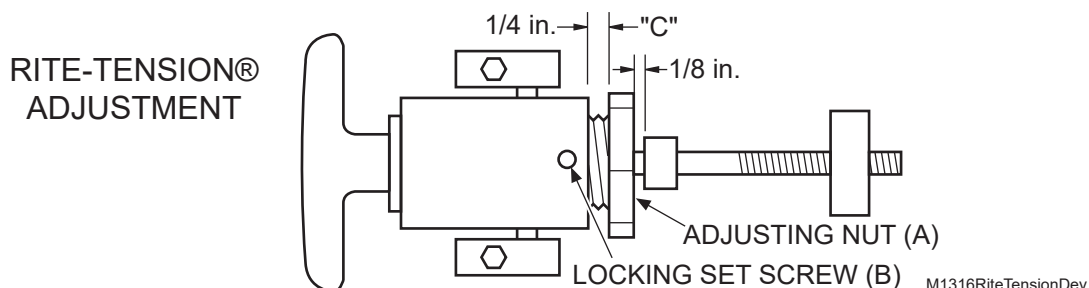
The final tension is determined by the Adjusting Nut, pn 150070 (see "A" in drawing). The "rough" position can be checked by measuring the clearance between the nut and the Tensioning Housing, pn 150067, (see "C").

A clearance of 1/4" will be within a safe range of the correct tension. When a tension guage becomes available the device should be calibrated as follows: Loosen the set screw (B) one turn.

-If the band tension needs to be *increased* the adjusting nut should be turned out, one flat at a time, then the set screw tightened and the device rechecked.

-If the tension needs to be *decreased* the adjusting nut should be turned in, one flat at a time and rechecked.

*The device must be in the "loosened" or "open" position to make this adjustment.*



## Rite Tensioning Device®

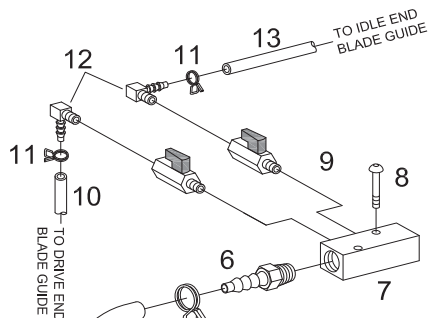
### Caution:

The Rite Tension ® blade tensioning device has been factory calibrated for your saw.

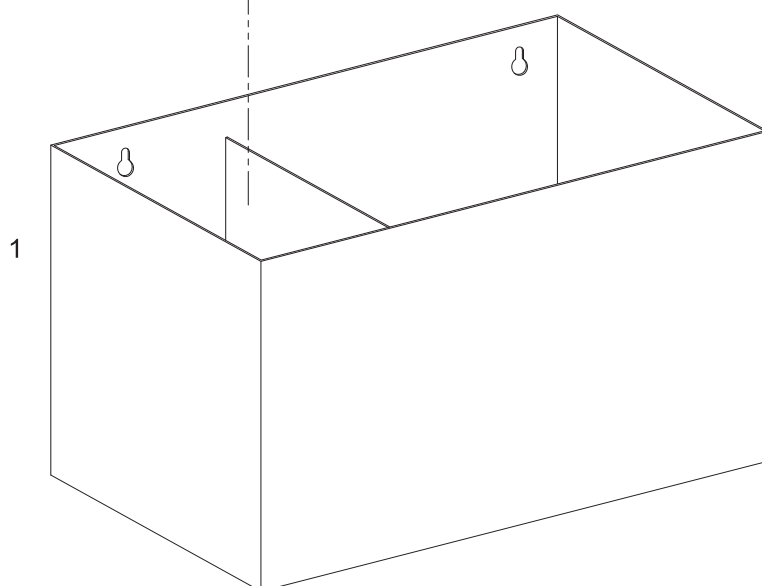
When re-tightening or replacing a blade, the 'T' handle must be turned counter-clockwise at least six turns to reset the Rite Tension ® mechanism.

|          |               |                                                          |
|----------|---------------|----------------------------------------------------------|
| <b>1</b> | <b>150075</b> | <b>Blade Tensioning Ass'y (includes items 2 thru 18)</b> |
| 2        | 101184        | Take Up Screw Handle                                     |
| 3        | 100053-005    | Roll Pin, 3/16 x 1                                       |
| 4        | 100030-007    | Flat Washer, 1/2                                         |
| 5        | 100410-001    | Thrust Bearing                                           |
| 6        | 150068        | Bearing Housing                                          |
| 7        | 100116-007    | Belleville Washer (2 req'd)                              |
| <b>8</b> | <b>150074</b> | <b>Take Up Screw (includes items 2 &amp; 9)</b>          |
| 9        | 100052-026    | Dowel Pin, 3/16 x 11/16                                  |
| 10       | 150069        | Turn Counter                                             |
| 11       | 100136-006    | Spring, Large Diameter                                   |
| 12       | 100136-001    | Spring, Small Diameter                                   |
| 13       | 100000-010    | Machine Screw, 8-32 x 5/16 (2 req'd)                     |
| 14       | 150067        | Blade Tension Housing                                    |
| 15       | 100034-008    | Set Screw, 1/4-20 x 1/4                                  |
| 16       | 150070        | Tension Adjuster                                         |
| 17       | 155068        | Swivel Nut                                               |
| 18       | 098030-004    | Collar, w/set screw                                      |
| 19       | 100008-072    | Cap Screw, HH 5/16-18 x 3/8 (2 req'd)                    |
| 20       | 100004-013    | Cap Screw, HH 5/16-18 x 5/8 (4 req'd)                    |
| 21       | 100025-002    | Lock Washer, 5/16 (4 req'd)                              |
| 22       | B-046         | Slide Block Guide, (2 req'd)                             |
| 23       | 101164        | Slide Block                                              |
| 24       | B-010         | Wheel Adjusting Block                                    |
| 25       | 100004-019    | Cap Screw, HH 5/16-18 x 1-1/8 (4 req'd)                  |
| 26       | 102360        | Spacer (4 req'd)                                         |
| 27       | 150190        | Tensioner Support                                        |

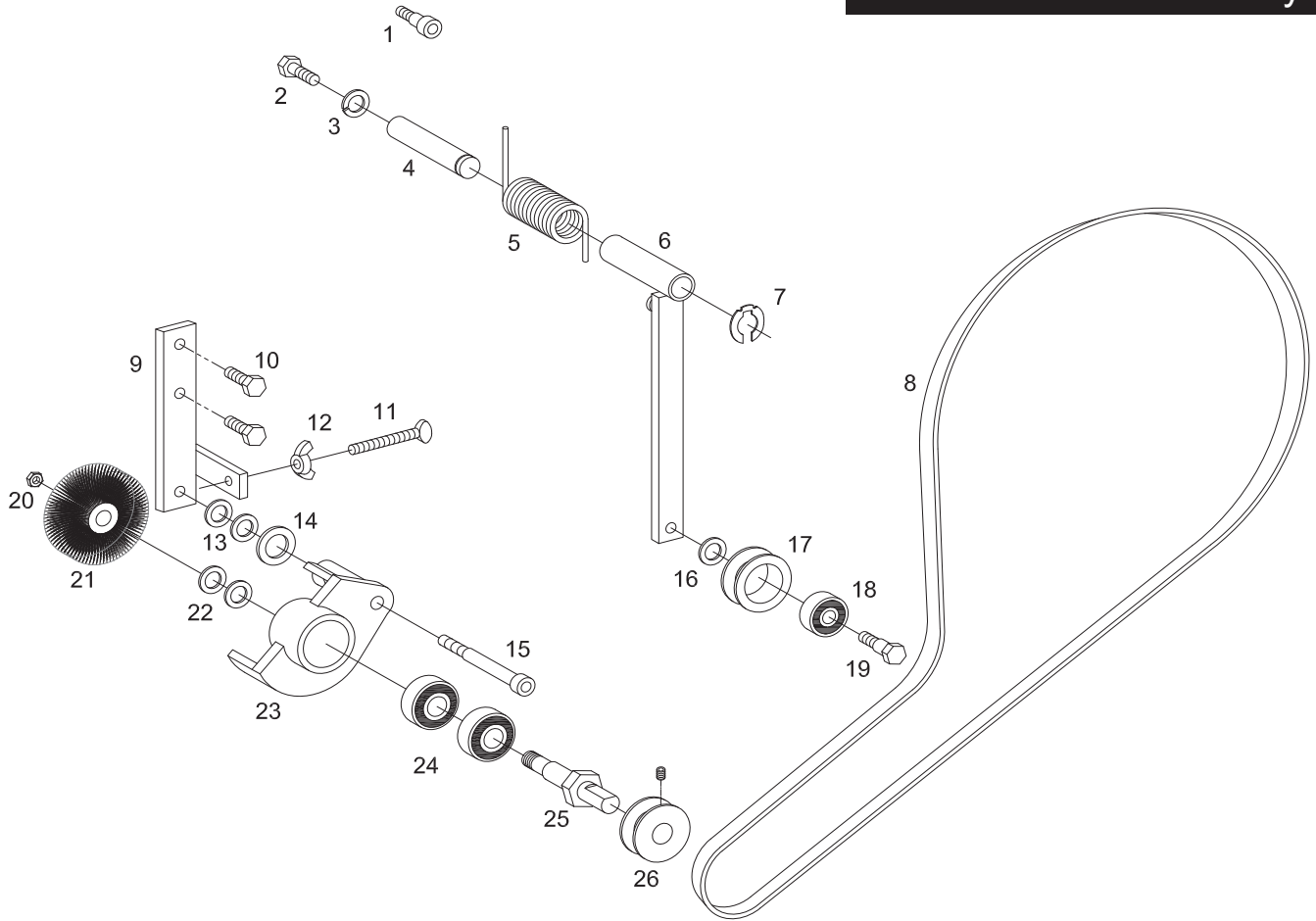
## Coolant System



- |    |                   |                                                                    |
|----|-------------------|--------------------------------------------------------------------|
| 1  | 150066            | Coolant Tank w/Filter                                              |
| 2  | 100249-010        | Coolant Pump                                                       |
| 3  | 102617            | Adapter                                                            |
| 4  | 100219-001        | Tubing Clamp                                                       |
| 5  | 100220-041        | Coolant Hose, $\frac{3}{8}$ " X 124"                               |
| 6  | 100324-003        | Hose Barb Fitting                                                  |
| 7  | 152167            | Coolant Manifold                                                   |
| 8  | 100008-068        | Cap Screw, BH, 10-32 X 1-1/4                                       |
| 9  | 100226-004        | Miniature Ball Valve                                               |
| 10 | 100350-018        | Coolant Hose, D.E. $\frac{1}{4}$ " X 18"                           |
| 11 | 100219-002        | Tubing Clamp                                                       |
| 12 | 100324-009        | Hose Barb Fitting, 90°                                             |
| 13 | 100350-040        | Coolant Hose, I.E. $\frac{1}{4}$ " X 40"                           |
| 14 | <b>152177-002</b> | <b>Coolant Manifold Assembly</b><br>(includes items 6, 7, 9, & 12) |



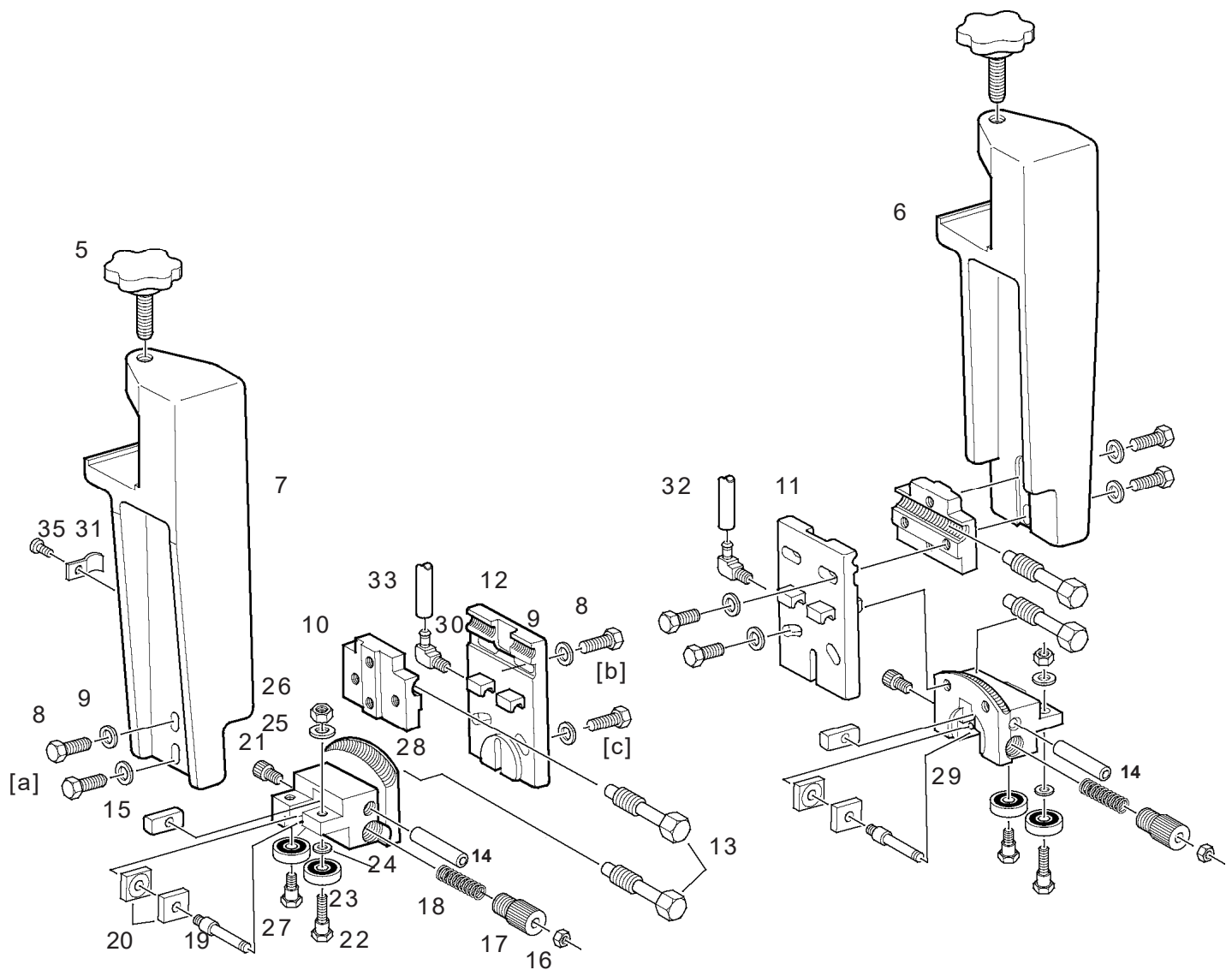
## Blade Brush Assembly



Note: Adjust thumb screw (11) so that the brush makes light contact with the blade. This avoids dulling the blade and prevents premature brush wear.

|    |            |                                  |    |            |                                  |
|----|------------|----------------------------------|----|------------|----------------------------------|
| 1  | 100165-007 | Shoulder bolt, 3/8 x 3/8         | 15 | 100165-015 | Shoulder bolt 3/8 x 1-3/4        |
| 2  | 100004-018 | Cap screw HH, 5/16-18 x 1        | 16 | 100097-001 | Washer                           |
| 3  | 100025-002 | Lockwasher 5/16                  | 17 | 150361     | Pulley, belt idler               |
| 4  | 150160-002 | Door latch stud                  | 18 | 100416-001 | Bearing                          |
| 5  | 150360     | Spring                           | 19 | B-043      | Axle                             |
| 6  | 150364     | Belt tension arm                 | 20 | 100019-005 | Hex jam nut 1/2-20               |
| 7  | 100069-003 | Snap Ring                        | 21 | 100133-004 | Brush                            |
| 8  | 100166-450 | V-belt                           | 22 | 100030-007 | Flat washer 1/2 USS (2 required) |
| 9  | 150369     | Blade brush arm                  | 23 | 150257     | Brush housing                    |
| 10 | 100004-015 | Cap screw hh 5/16-18 x 3/4       | 24 | 100404-001 | Bearing (2 required)             |
| 11 | 100042-003 | Thumb screw 1/4-20 x 2           | 25 | 150126     | Brush arbor                      |
| 12 | 100024-002 | Wing nut 1/4-20                  | 26 | 100167-003 | Small Pulley w/ set screw        |
| 13 | 100029-002 | Flat washer 1/4 USS (2 required) | 27 | 150272     | BLADE BRUSH ASSEMBLY             |
| 14 | 100030-005 | Flat Washer 3/8 SAE              |    |            | (includes items 20-26)           |

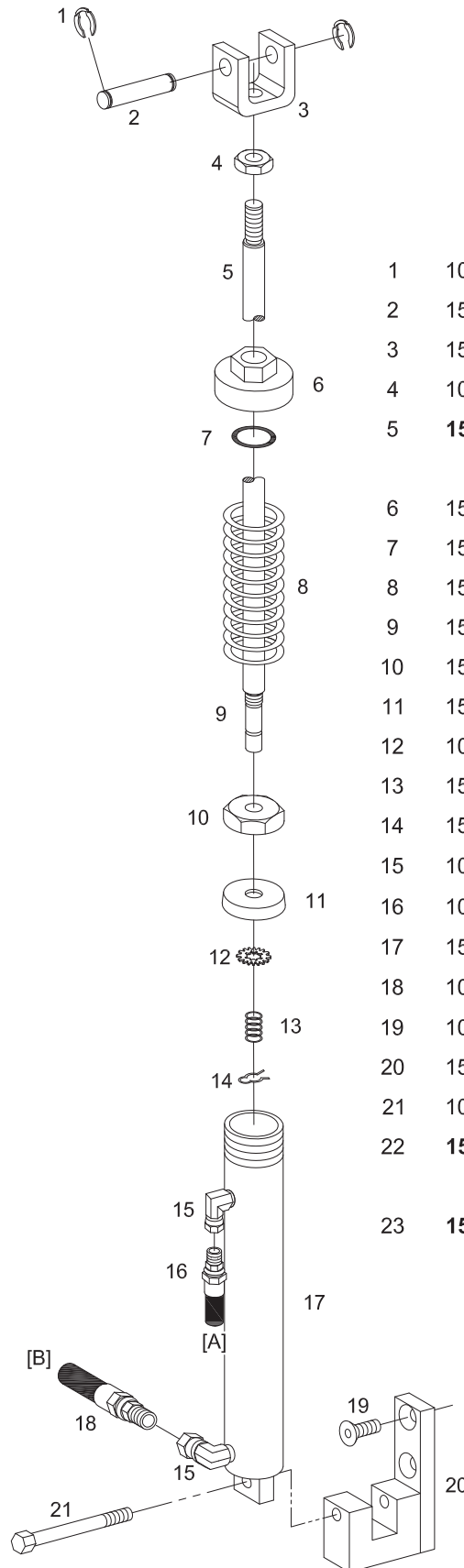
# Blade Guides for 1" Blades



## Blade Guides for 1" Blades

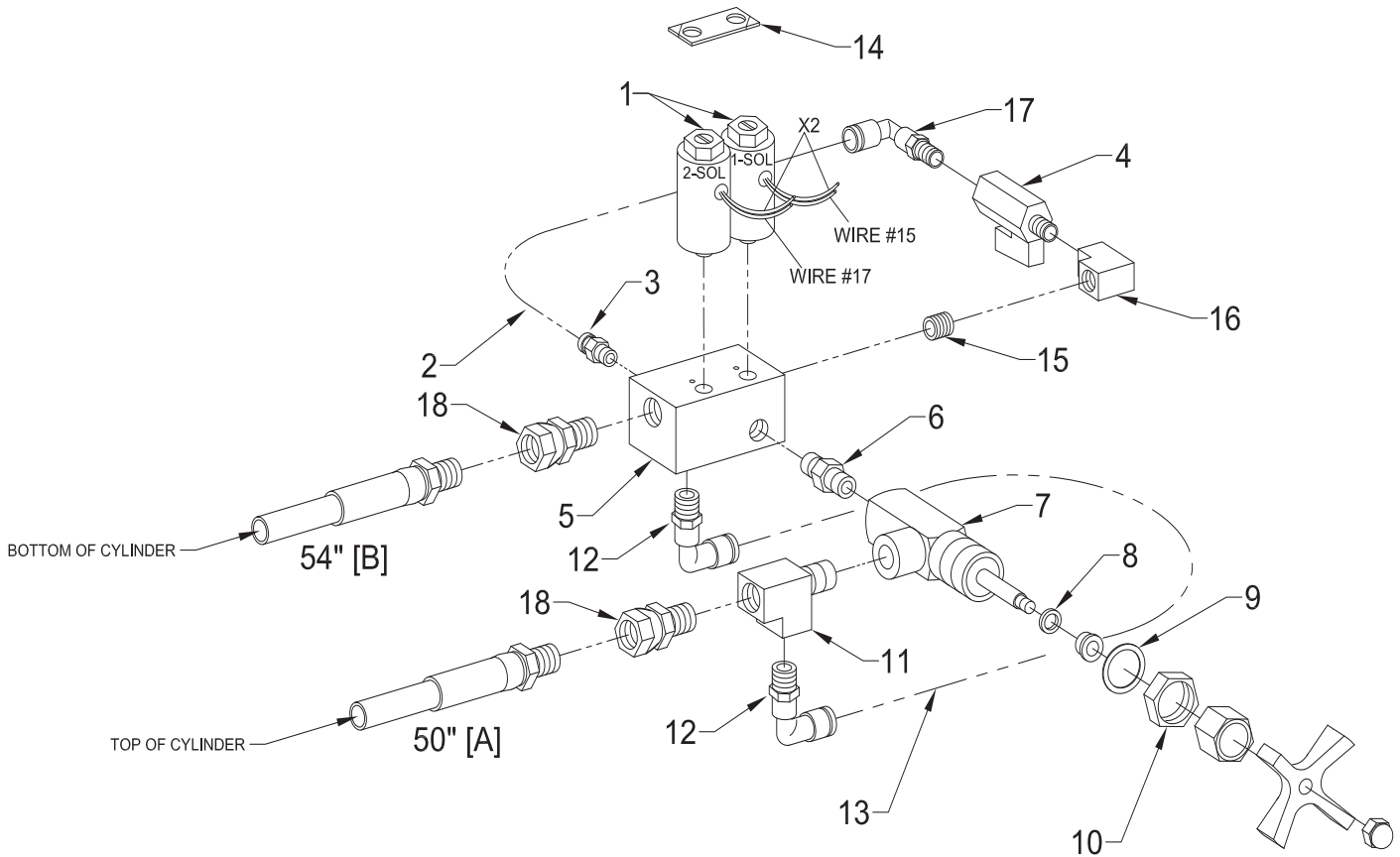
|    |                   |                                                                                       |
|----|-------------------|---------------------------------------------------------------------------------------|
| 1  | <b>152158-001</b> | <b>Blade Guide Ass'y, D.E.</b><br>(includes items 5 - 31& 35 - 37, minus 7,12,& 28)   |
| 2  | <b>152159-001</b> | <b>Blade Guide Ass'y, I. E.</b><br>(includes items 5 thru 31& 35 - 37 minus 6,11& 29) |
| 3  | <b>152160-001</b> | <b>Guide Support Ass'y, D.E.</b><br>(includes items 13 - 27 plus 29)                  |
| 4  | <b>152161-001</b> | <b>Guide Support Ass'y, I.E.</b><br>(includes items 13 - 28)                          |
| 5  | 105335-001        | Hand Wheel & Screw                                                                    |
| 6  | 152117            | Roller Guide Bracket, D.E.                                                            |
| 7  | 152118            | Roller Guide Bracket, I.E.                                                            |
| 8  | 100004-018        | Cap Screw, HH 5/16-18 x 1                                                             |
| 9  | 100029-002        | Flat Washer, 1/4                                                                      |
| 10 | 152155            | Vertical Adjusting Block                                                              |
| 11 | 152121-003        | Horizontal Adjusting Block, D.E.                                                      |
| 12 | 152121-002        | Horizontal Adjusting Block, I.E.                                                      |
| 13 | 152151            | Adjusting Bolt                                                                        |
| 14 | 100053-036        | Roll Pin, 1/4 x 2                                                                     |
| 15 | 152153            | Carbide Back up Guide Block                                                           |
| 16 | 100023-006        | Nylon Lock Nut, 1/4-20                                                                |
| 17 | 152156            | Adjusting Knob                                                                        |
| 18 | 100136-009        | Spring                                                                                |
| 19 | 152157            | Stud                                                                                  |
| 20 | 106317            | Fixed Carbide Guide                                                                   |
| 21 | 100008-004        | Cap Screw, HH 5/16-18 x 5/8                                                           |
| 22 | B-109             | Eccentric Roller Axle                                                                 |
| 23 | 100416-001        | Bearing                                                                               |
| 24 | 100097-001        | Roller Guide Washer                                                                   |
| 25 | 100027-005        | Lock Washer, Shakeproof                                                               |
| 26 | 101300            | Hex Nut, 5/16-18                                                                      |
| 27 | B-043             | Roller Axle                                                                           |
| 28 | 152120            | Guide Support, I.E.                                                                   |
| 29 | 152119            | Guide Support, D.E.                                                                   |
| 30 | 100324-009        | Hose Barb, 1/4" hose, 90 deg                                                          |
| 31 | 100218-018        | Tubing Clamp, 3/8                                                                     |
| 32 | 100350-018        | Coolant Hose, 1/4" X 18" D.E.                                                         |
| 33 | 100350-040        | Coolant Hose, 1/4" X 40" I.E.                                                         |
| 34 | 100013-005        | Machine Screw, BH 10-32 x 3/8                                                         |

# Hydraulic Cylinder



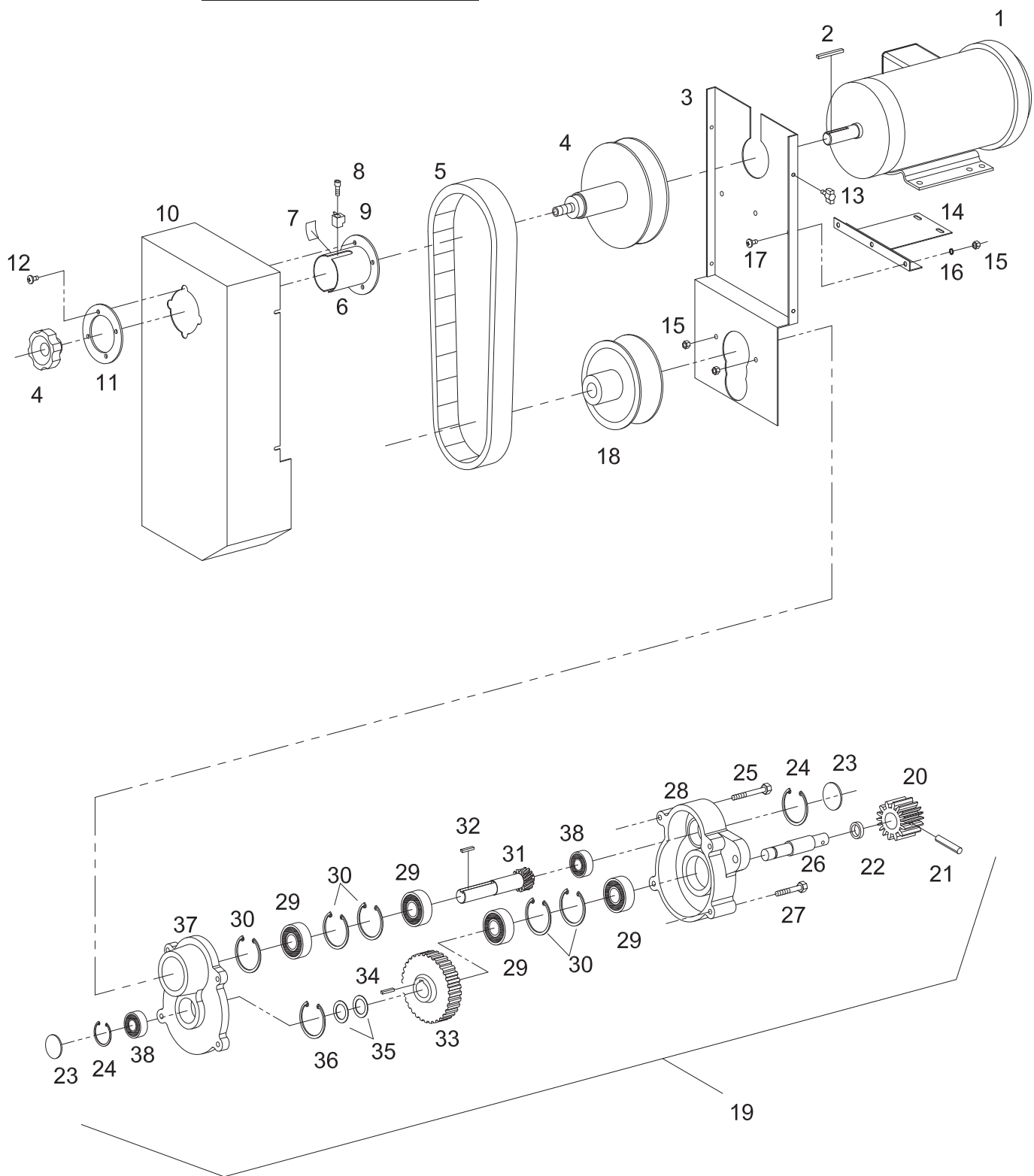
|    |               |                                                                         |
|----|---------------|-------------------------------------------------------------------------|
| 1  | 100069-019    | Snap Ring (2 required)                                                  |
| 2  | 150279        | Clevis Pin                                                              |
| 3  | 150218        | Clevis                                                                  |
| 4  | 100019-026    | Heavy Hex Jam Nut, 1/2-20                                               |
| 5  | <b>155221</b> | <b>Piston Rod Assembly</b><br>(includes Rod and items 9 - 14)           |
| 6  | 155157        | Cylinder Cap                                                            |
| 7  | 155156        | O-Ring, Buna N2-208                                                     |
| 8  | 155159        | Spring                                                                  |
| 9  | 155182        | Piston Rod                                                              |
| 10 | 155160        | Aluminum Washer                                                         |
| 11 | 155161        | Piston Cup                                                              |
| 12 | 100028-006    | Shake Proof Washer                                                      |
| 13 | 155163        | Spring                                                                  |
| 14 | 155164        | External Hitch Pin                                                      |
| 15 | 100313-001    | 90° Swivel Fitting, $\frac{1}{4}$ "                                     |
| 16 | 100331-034    | Hose Assembly, top $\frac{1}{4}$ x 50"                                  |
| 17 | 155181        | Cylinder                                                                |
| 18 | 100331-052    | Hose Assembly, $\frac{1}{4}$ x 54"                                      |
| 19 | 100008-006    | Socket Head Cap Screw, 3/8-16 x 1                                       |
| 20 | 150277        | Lower Cylinder Mount                                                    |
| 21 | 100004-052    | Cap Screw, Hex Head, 3/8-16 x 3-1/2                                     |
| 22 | <b>155256</b> | <b>Hydraulic Cylinder Field Service Kit</b><br>(Includes Items 7,11-14) |
| 23 | <b>155180</b> | <b>Hydraulic Cylinder Assembly</b><br>(includes Items 5-15 & 17)        |

# Flow Control Assembly



|    |            |                           |
|----|------------|---------------------------|
| 1  | 100673-044 | SOLENOID VALVE            |
| 2  | 100358     | TUBING FLEXIBLE NYLON     |
| 3  | 100357-002 | PUSH IN FITTING, STRAIGHT |
| 4  | 100226-004 | MINIATURE BALL VALVE      |
| 5  | 150530     | MANIFOLD                  |
| 6  | 100332-001 | 1/4 NPT HEX PIPE NIPPLE   |
| 7  | 100238-005 | FEED CONTROL VALVE ASSY   |
| 8  | 107065     | NYLON WASHER              |
| 9  | 100238-003 | WASHER                    |
| 10 | 100238-004 | PANEL NUT                 |
| 11 | 100359-001 | 1/4 NPT STREET "T"        |
| 12 | 100357-003 | PUSH IN FITTING 90°       |
| 13 | 100358     | TUBING, FLEXIBLE NYLON    |
| 14 | 150541     | LOCKING TAB               |
| 15 | 100203-001 | PIPE NIPPLE 1/8" CLOSE    |
| 16 | 100335-003 | 90° FEMALE ELBOW 1/8"     |
| 17 | 100357-007 | PUSH IN FITTING 90°       |
| 18 | 100329-001 | SWIVEL FITTING, STRAIGHT  |
|    | 155216-004 | FLOW CONTROL ASSY         |

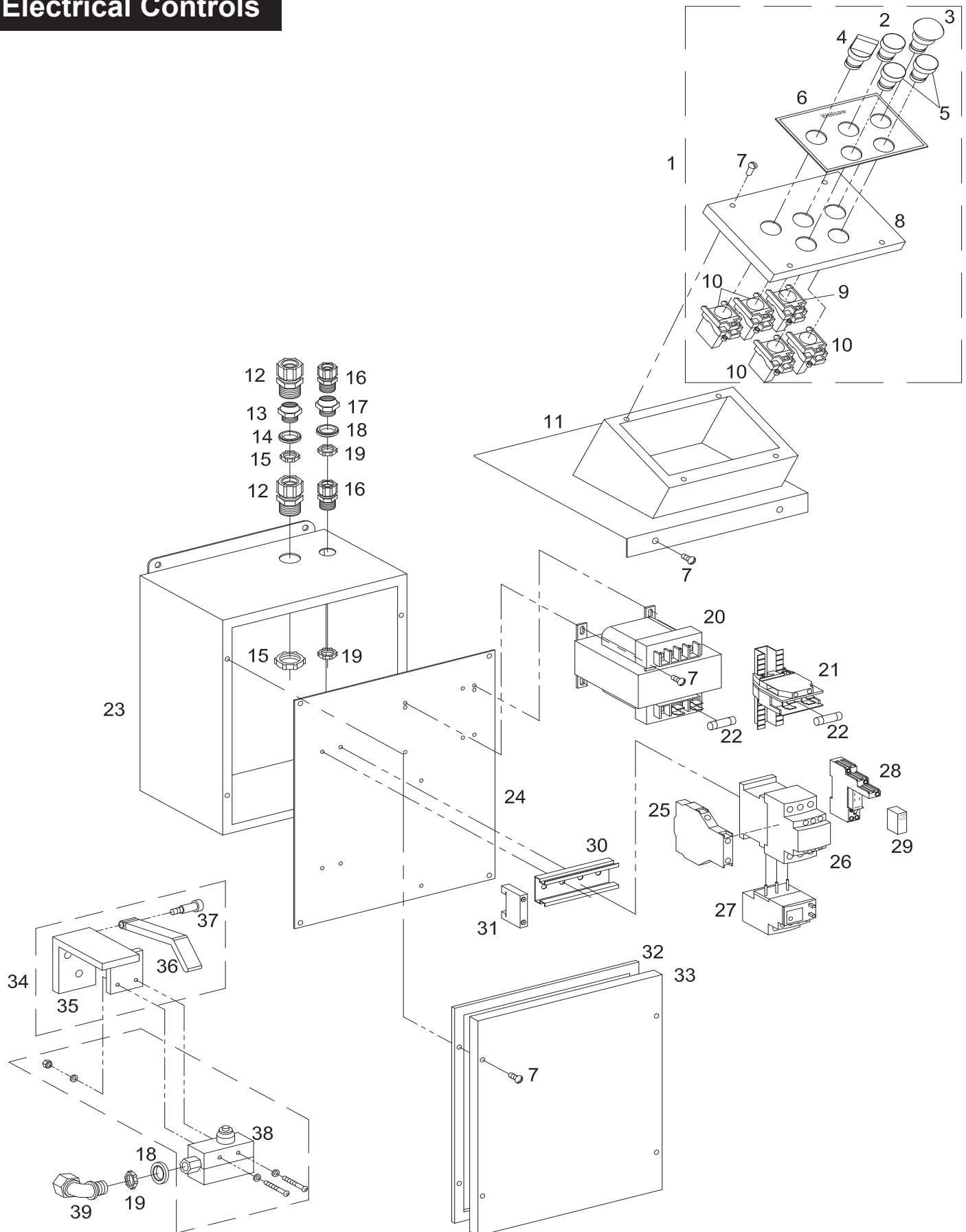
# Motor & Gear Box



## Motor & Gear Box

|    |                   |                                                                  |
|----|-------------------|------------------------------------------------------------------|
| 1  | 100835-037        | Motor, 3 HP TEFC, 3/4" shaft, 230/460 3ph                        |
|    | 100836-030        | Motor, 2 HP, ODP, 115-220/60/1phase 5/8 Shaft                    |
| 2  | 100056-037        | Key                                                              |
| 3  | 150250            | Belt Guard, Bottom Plate                                         |
| 4  | 105451-021        | VS 3 Phase Motor Pulley, 3/4" bore (includes hand wheel 407-712) |
|    | 105451-005        | VS 1Phase Motor Pulley, 5/8" bore, (includes hand wheel 407-712) |
|    | 407-712           | Handle / knob only (without pulley)                              |
| 5  | 105454-005        | Variable Speed Belt                                              |
| 6  | 150252            | Sleeve                                                           |
| 7  | 105688            | Blade Speed Label                                                |
| 8  | 100008-087        | Cap Screw, SH 1/4-28 x 3/4                                       |
| 9  | 150256            | Blade Speed Indicator                                            |
| 10 | 150251            | Belt Guard                                                       |
| 11 | 150255            | Flange Clamp                                                     |
| 12 | 100013-008        | Cap Screw, BH 1/4-20 x 3/8                                       |
| 13 | 100063            | Thumb Screw (4 req'd)                                            |
| 14 | 150249            | Belt Guard Support                                               |
| 15 | 100017-001        | Hex Nut, 1/4-20                                                  |
| 16 | 100026-004        | Shake Proof Washer, 1/4                                          |
| 17 | 100155-001        | Machine Screw, 1/4-20 x 1/2                                      |
| 18 | 105451-015        | VS Driven Pulley w/step key, 3/4" bore                           |
| 19 | <b>150423SERV</b> | <b>Gear Box Ass'y ( includes items 20-38)</b>                    |
| 20 | 101645-FP         | Drive Pinion                                                     |
| 21 | 100180-001        | Coiled Spring Pin                                                |
| 22 | 150416            | Spacer                                                           |
| 23 | 100072-001        | Expansion Plug                                                   |
| 24 | 100068-001        | Snap Ring                                                        |
| 25 | 100008-086        | Cap Screw, SH 1/4-20 x 2                                         |
| 26 | 150426            | Drive Shaft                                                      |
| 27 | 100008-061        | Cap Screw, SH 1/4-20 x 1-1/2                                     |
| 28 | 150424            | Gear Case (housing only)                                         |
| 29 | 100414-003        | Bearing                                                          |
| 30 | 100068-002        | Snap Ring                                                        |
| 31 | 150234            | Pulley Shaft & Pinion                                            |
| 32 | 105451-017        | Step Key (used w/105451-015)                                     |
| 33 | 101286S           | Driven Gear (Available in Phenolic or Steel)                     |
| 34 | 100056-001        | Key                                                              |
| 35 | 100097-003        | Washer (shim as needed)                                          |
| 36 | 100069-003        | External Snap Ring                                               |
| 37 | 150425            | Gear Case Cover                                                  |
| 38 | 100404-002        | Ball Bearing                                                     |
| 39 | 100318-005        | MobilGrease XHP 220 (not shown)                                  |
| 40 | 100146-005        | Loctite 609 Liquid Sealant (not shown)                           |

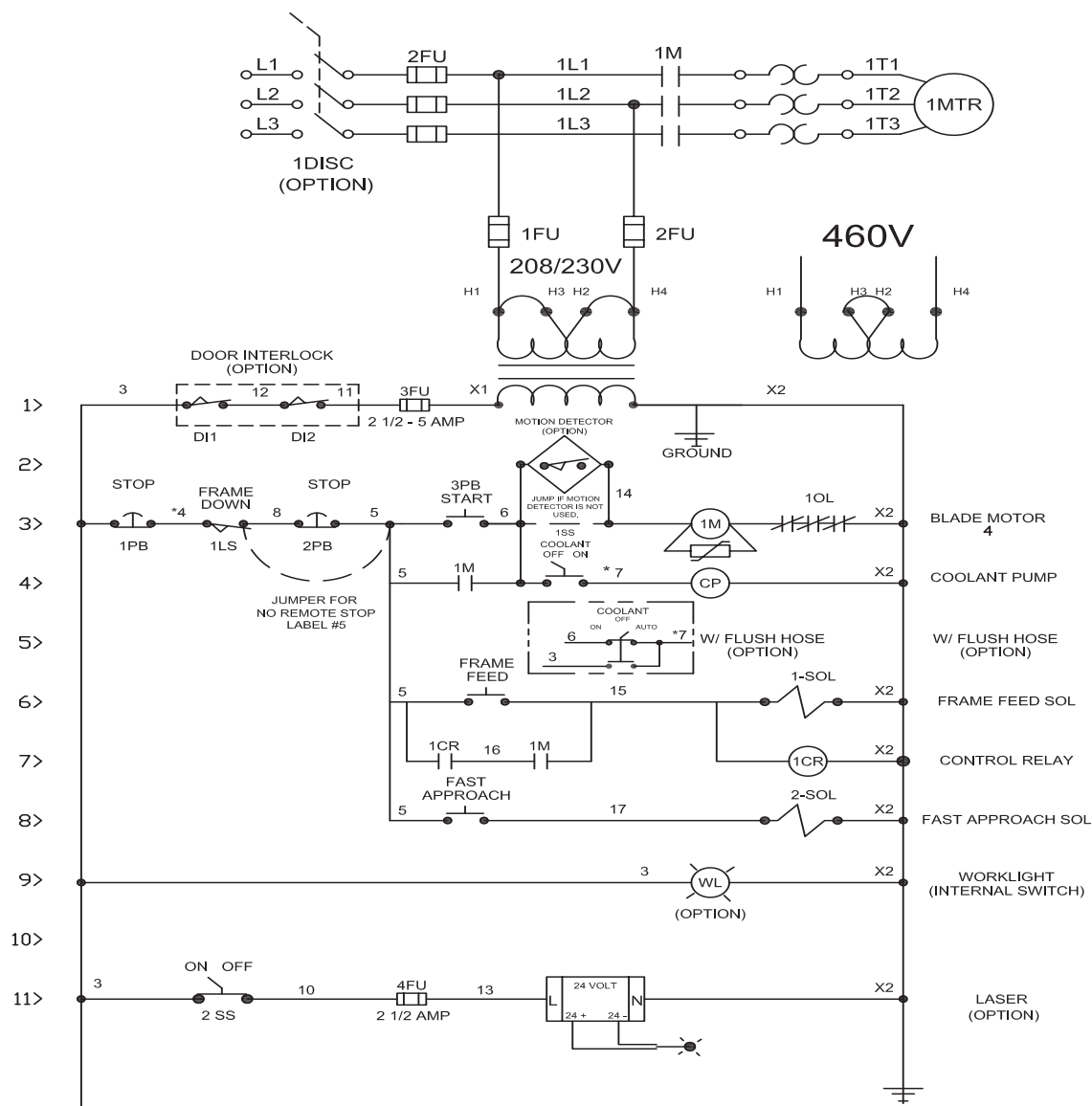
# Electrical Controls



## Electrical Controls

|    |                   |                                                             |
|----|-------------------|-------------------------------------------------------------|
| 1  | <b>155330</b>     | <b>Control Switch Assembly<br/>(includes 2-10, minus 7)</b> |
| 2  | 100871-001        | Push Button Start                                           |
| 3  | 100871-013        | Push Button Stop **                                         |
| 4  | 100871-003        | Selector Switch, Coolant **                                 |
| 5  | 100871-019        | Push Button                                                 |
| 6  | 150230-001        | Legend Plate                                                |
| 7  | 100000-019        | Machine Screw, RH 10-32 x 1/2                               |
| 8  | 150236-001        | Switch Box Cover                                            |
| 9  | 100871-005        | Switch Block, Normally Closed                               |
| 10 | 100871-004        | Switch Block, Normally Open                                 |
| 11 | 150235-002        | Switch Box                                                  |
| 12 | 100612-004        | Connector, TB-2534                                          |
| 13 | 100796-024        | Hub Connector, TB-371                                       |
| 14 | 100606-002        | Sealing Ring                                                |
| 15 | 100240-003        | Conduit Lock Nut                                            |
| 16 | 100612-002        | Connector, TB-2523                                          |
| 17 | 100796-019        | Hub Connector, TB-370                                       |
| 18 | 100606-001        | Sealing Ring                                                |
| 19 | 100240-001        | Conduit Lock Nut                                            |
| 20 | 100869-005        | Transformer, 230/460 Volts                                  |
|    | 100869-007        | Transformer, 208 Volts                                      |
|    | 100869-006        | Transformer, 575 Volts                                      |
| 21 | 155115            | Fuse Block Ass'y                                            |
| 22 | 100628-017        | Fuse, FNA 2-1/2 Amp                                         |
| 23 | 100870            | Electrical Enclosure                                        |
| 24 | 100893            | Back Panel                                                  |
| 25 | 100867-016        | Auxiliary Contact                                           |
| 26 | 100867-023        | Magnetic Starter for 115V                                   |
|    | 100867-029        | Magnetic Starter for all other voltages                     |
| 27 | 100867-012        | Adjustable Overload, 4-6 amps 440-460V                      |
|    | 100867-014        | Adjustable Overload, 7-10 amps 208-230V (3 phase)           |
|    | 100867-027        | Adjustable Overload, 9-13 amps 208-230v (1 phase)           |
|    | 100867-022        | Adjustable Overload, 16-24 amps 110-120V                    |
| 28 | 100866-008        | Relay Socket                                                |
| 29 | 100866-007        | Relay                                                       |
| 30 | 100717-016T4      | Mounting Rail                                               |
| 31 | 100717-017T       | End Clamp                                                   |
| 32 | 098048-050        | Gasket, 1/8 x 3/4 x 50"                                     |
| 33 | 100892            | Enclosure Cover                                             |
| 34 | <b>155118-001</b> | <b>Frame Rest w/Trip Bar<br/>(includes 33-35)</b>           |
| 35 | 105977            | Frame Rest                                                  |
| 36 | 150344            | Switch Bar Weldment                                         |
| 37 | 100165-005        | Shoulder Bolt, 5/16 x 3/4                                   |
| 38 | 100782-012        | Limit Switch, 115v w/ screws                                |
| 39 | 100612-006        | Elbow, 90 deg, TB-2268                                      |

## Electrical Schematic



NOTE : TRANSFORMER UPGRADE REQUIRED FOR  
FLUSH HOSE OPTION.



## Procedure to check gear backlash on Wellsaw bandsaws.

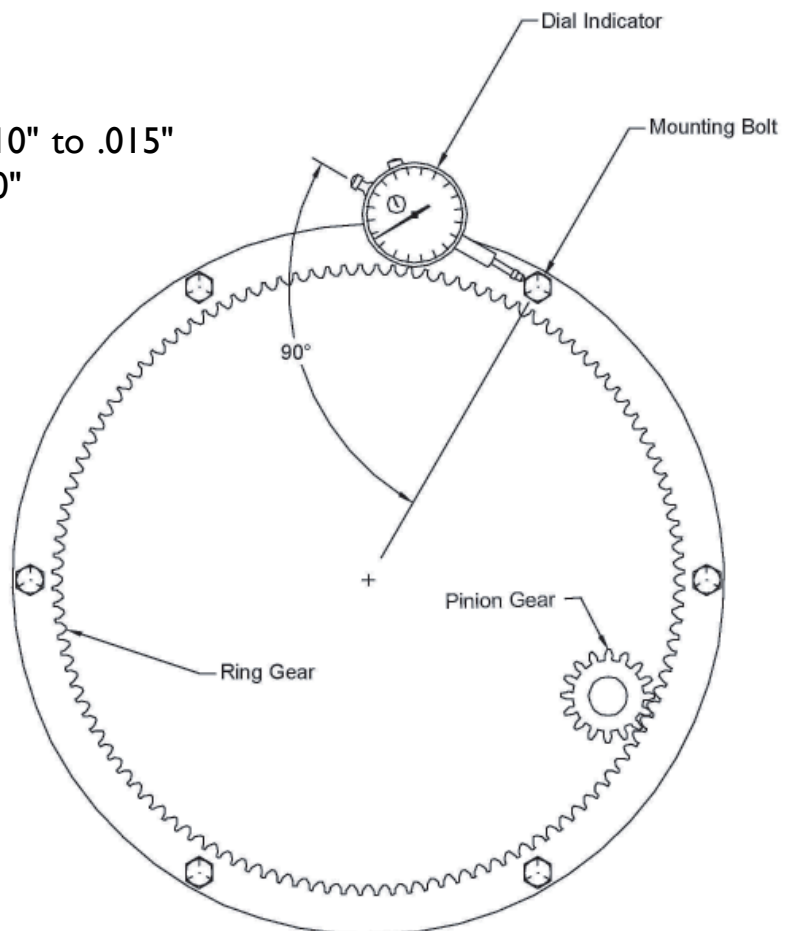
*The applies to saw models with spur type ring & pinion final drive.*

- Find the six bolts that hold the Ring Gear to the Bandwheel.
- Using a dial indicator with a magnetic mount, position the indicator so that the point will contact one of the bolt heads. The indicator must be 90° to the gear (see illustration).
- The Pinion Gear must be held stationary. This can be done by holding a screwdriver in the teeth and prying against the saw frame.
- Rock the bandwheel slightly by hand and note the travel on the indicator. See specifications.
- To adjust the backlash the gearbox must be repositioned. The gearbox mounting holes are oversized for this purpose. Slightly loosen the bolts that hold the gearbox to the wheel plate and push the gearbox in the desired direction. Tighten the bolts and recheck the backlash.
- If you chose to use another method to check the recommended clearance please note that too much or too little clearance will cause damage to the ring and pinion gears.

### Backlash Specification:

9.5" and 11.5" Ring Gears = .010" to .015"

13.5" Ring Gear = .015" to .020"





| Stock Dimensions<br>Tooth Pitch  | 0 - 1"<br>10/14, 8/12    |                           | 1" - 3"<br>8/12, 6/10, 5/8 |                           | 3" - 6"<br>5/8, 4/6, 3/4, 3 Sabre |                           | 6"+<br>3/4, 2/3, 2 Sabre,<br>1 Tooth, 3/4" T.S. |                           |
|----------------------------------|--------------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|-------------------------------------------------|---------------------------|
| Material (Annealed)              | Blade<br>Speed<br>(SFPM) | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)   | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)          | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)                        | Cutting<br>Rate<br>(SIPM) |
| <u>Carbon Steels</u>             |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 1008-1013                        | 250                      | 8 - 10                    | 275                        | 9 - 12                    | 280                               | 12 - 15                   | 250                                             | 9 - 12                    |
| 1015-1018                        | 250                      | 8 - 10                    | 275                        | 9 - 12                    | 250                               | 12 - 15                   | 230                                             | 9 - 12                    |
| 1048-1065                        | 200                      | 5 - 7                     | 200                        | 5 - 7                     | 175                               | 8 - 10                    | 150                                             | 6 - 8                     |
| 1065-1095                        | 200                      | 4 - 6                     | 200                        | 5 - 7                     | 150                               | 6 - 8                     | 120                                             | 6 - 8                     |
| <u>Free Machining Steels</u>     |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 1108-1111                        | 300                      | 9 - 11                    | 330                        | 12 - 14                   | 275                               | 13 - 15                   | 220                                             | 11 - 14                   |
| 1112-1113                        | 300                      | 8 - 11                    | 330                        | 11 - 13                   | 275                               | 12 - 15                   | 220                                             | 12 - 15                   |
| 1115-1132                        | 300                      | 7 - 11                    | 330                        | 10 - 13                   | 275                               | 13 - 16                   | 220                                             | 11 - 14                   |
| 1137-1151                        | 275                      | 6 - 8                     | 250                        | 8 - 10                    | 250                               | 8 - 11                    | 200                                             | 7 - 10                    |
| 1212-1213                        | 300                      | 8 - 10                    | 320                        | 11 - 13                   | 300                               | 13 - 15                   | 255                                             | 11 - 14                   |
| <u>Manganese Steels</u>          |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 1320-1330                        | 250                      | 5 - 7                     | 250                        | 5 - 8                     | 200                               | 8 - 11                    | 175                                             | 7 - 10                    |
| 1335-1345                        | 250                      | 5 - 7                     | 225                        | 5 - 7                     | 200                               | 7 - 9                     | 175                                             | 5 - 8                     |
| <u>Nickel Chrome Steels</u>      |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 3115-3130                        | 260                      | 4 - 6                     | 260                        | 5 - 7                     | 230                               | 5 - 7                     | 225                                             | 5 - 7                     |
| 3135-3150                        | 220                      | 4 - 6                     | 200                        | 4 - 7                     | 180                               | 6 - 8                     | 150                                             | 5 - 8                     |
| 3310-3315                        | 200                      | 3 - 4                     | 180                        | 4 - 5                     | 180                               | 5 - 7                     | 160                                             | 4 - 6                     |
| <u>Molybdenum Steels</u>         |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 4017-4024                        | 300                      | 3 - 5                     | 270                        | 4 - 7                     | 250                               | 6 - 8                     | 220                                             | 5 - 8                     |
| 4032-4042                        | 300                      | 3 - 5                     | 270                        | 4 - 7                     | 250                               | 6 - 8                     | 230                                             | 5 - 8                     |
| 4047-4068                        | 250                      | 3 - 5                     | 220                        | 4 - 6                     | 200                               | 5 - 7                     | 180                                             | 3 - 5                     |
| <u>Chrome Moly Steels</u>        |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 4130-4140                        | 280                      | 4 - 6                     | 250                        | 5 - 8                     | 250                               | 8 - 10                    | 220                                             | 6 - 8                     |
| 4142-4150                        | 230                      | 3 - 5                     | 200                        | 4 - 6                     | 200                               | 5 - 7                     | 170                                             | 4 - 6                     |
| <u>Nickel Chrome Moly Steels</u> |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 4317-4320                        | 250                      | 3 - 5                     | 225                        | 4 - 6                     | 200                               | 5 - 7                     | 170                                             | 4 - 6                     |
| 4337-4340                        | 230                      | 3 - 4                     | 200                        | 4 - 5                     | 200                               | 4 - 6                     | 170                                             | 4 - 5                     |
| 8615-8627                        | 250                      | 4 - 5                     | 230                        | 6 - 7                     | 230                               | 6 - 8                     | 200                                             | 6 - 7                     |
| 8630-8645                        | 250                      | 3 - 5                     | 230                        | 4 - 6                     | 230                               | 5 - 7                     | 180                                             | 4 - 6                     |
| 8647-8660                        | 220                      | 2 - 4                     | 200                        | 3 - 5                     | 200                               | 4 - 6                     | 150                                             | 3 - 5                     |
| 8715-8750                        | 250                      | 3 - 5                     | 220                        | 4 - 6                     | 220                               | 5 - 7                     | 180                                             | 4 - 6                     |
| 9310-9317                        | 200                      | 1 - 3                     | 160                        | 2 - 3                     | 160                               | 2 - 4                     | 150                                             | 2 - 3                     |
| 9437-9445                        | 250                      | 4 - 5                     | 230                        | 4 - 5                     | 230                               | 5 - 6                     | 180                                             | 4 - 5                     |
| 9747-9763                        | 250                      | 2 - 4                     | 230                        | 3 - 5                     | 200                               | 4 - 6                     | 180                                             | 3 - 5                     |
| 9840-9850                        | 240                      | 4 - 5                     | 220                        | 4 - 6                     | 200                               | 5 - 7                     | 180                                             | 4 - 6                     |
| <u>Nickel Moly Steels</u>        |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 4608-4621                        | 250                      | 3 - 5                     | 220                        | 5 - 6                     | 220                               | 6 - 7                     | 200                                             | 5 - 6                     |
| 4640                             | 220                      | 3 - 5                     | 200                        | 4 - 6                     | 200                               | 5 - 7                     | 170                                             | 4 - 6                     |
| 4812-4820                        | 200                      | 3 - 5                     | 180                        | 3 - 5                     | 180                               | 4 - 6                     | 160                                             | 4 - 5                     |
| <u>Chrome Steels</u>             |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 5045-5046                        | 280                      | 4 - 6                     | 250                        | 5 - 7                     | 250                               | 8 - 10                    | 200                                             | 7 - 8                     |
| 5120-5135                        | 280                      | 4 - 6                     | 250                        | 6 - 7                     | 240                               | 7 - 8                     | 180                                             | 5 - 8                     |
| 5140-5160                        | 250                      | 3 - 5                     | 230                        | 4 - 6                     | 230                               | 5 - 7                     | 200                                             | 4 - 6                     |
| 50100-52100                      | 180                      | 2 - 4                     | 160                        | 3 - 5                     | 150                               | 4 - 6                     | 100                                             | 3 - 5                     |
| <u>Chrome Vanadium Steels</u>    |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 6117-6210                        | 225                      | 4 - 5                     | 225                        | 5 - 7                     | 200                               | 6 - 8                     | 170                                             | 5 - 7                     |
| 6145-6152                        | 225                      | 3 - 4                     | 200                        | 4 - 5                     | 200                               | 5 - 6                     | 150                                             | 4 - 5                     |
| <u>Die Steels</u>                |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| A-2                              | 210                      | 2 - 3                     | 200                        | 3 - 4                     | 190                               | 3 - 4                     | 180                                             | 2 - 3                     |
| D-2, D-3                         | 110                      | 1 - 2                     | 100                        | 1 - 2                     | 90                                | 1 - 2                     | 80                                              | 1 - 2                     |
| D-7                              | 90                       | 1                         | 80                         | 1                         | 70                                | 1                         | 70                                              | 1                         |
| O-1, O-2                         | 240                      | 3 - 4                     | 210                        | 4 - 5                     | 190                               | 5 - 6                     | 170                                             | 4 - 5                     |
| O-6                              | 230                      | 3 - 4                     | 200                        | 4 - 6                     | 180                               | 5 - 7                     | 150                                             | 4 - 6                     |

| Stock Dimensions<br>Tooth Pitch    | 0 - 1"<br>10/14, 8/12    |                           | 1" - 3"<br>8/12, 6/10, 5/8 |                           | 3" - 6"<br>5/8, 4/6, 3/4, 3 Sabre |                           | 6"+<br>3/4, 2/3, 2 Sabre,<br>1 Tooth, 3/4" T.S. |                           |
|------------------------------------|--------------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|-------------------------------------------------|---------------------------|
| Material (Annealed)                | Blade<br>Speed<br>(SFPM) | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)   | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)          | Cutting<br>Rate<br>(SIPM) | Blade<br>Speed<br>(SFPM)                        | Cutting<br>Rate<br>(SIPM) |
| <u>Silicon Steels</u>              |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 9255-9260                          | 200                      | 2 - 4                     | 180                        | 3 - 5                     | 180                               | 3 - 5                     | 150                                             | 3 - 5                     |
| 9261-9262                          | 200                      | 1 - 3                     | 160                        | 2 - 3                     | 160                               | 2 - 4                     | 150                                             | 2 - 3                     |
| <u>High Speed Tool Steels</u>      |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| T-1, T-2                           | 130                      | 1 - 2                     | 110                        | 2 - 3                     | 100                               | 2 - 4                     | 90                                              | 2 - 3                     |
| T-4, T-5                           | 110                      | 1 - 2                     | 100                        | 1 - 2                     | 90                                | 2 - 3                     | 80                                              | 1 - 2                     |
| T-6, T-8                           | 110                      | 1 - 2                     | 100                        | 1 - 2                     | 80                                | 1 - 2                     | 70                                              | 1 - 2                     |
| T-15                               | 80                       | 1                         | 80                         | 1                         | 70                                | 1                         | 50                                              | 1                         |
| M-1                                | 150                      | 1 - 3                     | 140                        | 2 - 4                     | 130                               | 3 - 5                     | 110                                             | 2 - 4                     |
| M-2, M3                            | 120                      | 1 - 2                     | 110                        | 2 - 3                     | 100                               | 3 - 4                     | 80                                              | 2 - 3                     |
| M-4, M-10                          | 100                      | 1 - 2                     | 90                         | 1 - 2                     | 80                                | 1 - 3                     | 60                                              | 1 - 2                     |
| <u>Hot Work Steels</u>             |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| H-12, H-13, H-21                   | 150                      | 2 - 4                     | 125                        | 3 - 5                     | 125                               | 2 - 4                     | 125                                             | 2 - 4                     |
| H-22, H-24, H-25                   | 150                      | 1 - 3                     | 125                        | 1 - 3                     | 125                               | 1 - 3                     | 125                                             | 1 - 3                     |
| <u>Shock Resisting Tool Steels</u> |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| S-1                                | 220                      | 2 - 4                     | 180                        | 3 - 5                     | 165                               | 3 - 5                     | 150                                             | 2 - 4                     |
| S-2, S-5                           | 170                      | 1 - 3                     | 150                        | 3 - 5                     | 120                               | 2 - 4                     | 100                                             | 1 - 3                     |
| <u>Special Purpose Tool Steels</u> |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| L-6                                | 200                      | 2 - 4                     | 180                        | 3 - 5                     | 170                               | 3 - 5                     | 150                                             | 2 - 4                     |
| L-7                                | 200                      | 2 - 4                     | 180                        | 3 - 5                     | 150                               | 3 - 5                     | 100                                             | 2 - 4                     |
| <u>Stainless Steels</u>            |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| 201, 202, 302, 304                 | 120                      | 2 - 4                     | 100                        | 2 - 4                     | 100                               | 2 - 4                     | 100                                             | 1 - 3                     |
| 303, 303F                          | 140                      | 2 - 4                     | 120                        | 2 - 4                     | 100                               | 3 - 5                     | 100                                             | 2 - 4                     |
| 308, 309, 310, 330                 | 90                       | 1                         | 70                         | 1                         | 60                                | 2                         | 60                                              | 1                         |
| 314, 316, 317                      | 90                       | 1                         | 80                         | 1                         | 70                                | 2                         | 60                                              | 1                         |
| 321, 347                           | 130                      | 1 - 3                     | 110                        | 1 - 3                     | 100                               | 2 - 4                     | 80                                              | 1 - 3                     |
| 410, 420, 420F                     | 150                      | 1 - 3                     | 130                        | 1 - 3                     | 120                               | 2 - 4                     | 100                                             | 1 - 3                     |
| 416, 430F                          | 200                      | 3 - 5                     | 180                        | 4 - 6                     | 170                               | 5 - 7                     | 150                                             | 4 - 6                     |
| 430, 446                           | 100                      | 1 - 3                     | 90                         | 2 - 4                     | 80                                | 2 - 4                     | 80                                              | 1 - 3                     |
| 440 A,B,C                          | 120                      | 1 - 3                     | 10                         | 1 - 3                     | 90                                | 2 - 4                     | 70                                              | 1 - 3                     |
| 440F, 443                          | 150                      | 1 - 3                     | 130                        | 1 - 3                     | 120                               | 2 - 4                     | 100                                             | 1 - 3                     |
| 17-4PH, 17-7PH                     | 100                      | 2 - 3                     | 90                         | 2 - 4                     | 80                                | 3 - 4                     | 80                                              | 2 - 3                     |
| A-7                                | 100                      | 1 - 2                     | 100                        | 1 - 2                     | 100                               | 2 - 3                     | 100                                             | 2 - 3                     |
| <u>Beryllium Copper #25</u>        |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| BHN 100-120                        | 350                      | 4 - 6                     | 300                        | 5 - 7                     | 275                               | 6 - 8                     | 225                                             | 5 - 7                     |
| BHN 220-250                        | 250                      | 2 - 4                     | 225                        | 3 - 5                     | 200                               | 3 - 4                     | 175                                             | 3 - 5                     |
| BHN 310-340                        | 200                      | 1 - 2                     | 160                        | 1 - 2                     | 140                               | 2 - 3                     | 100                                             | 1 - 2                     |
| <u>Nickel Base Alloys</u>          |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| Monel                              | 100                      | 1 - 2                     | 100                        | 1 - 2                     | 80                                | 1 - 2                     | 60                                              | 1                         |
| R Monel                            | 140                      | 2 - 3                     | 140                        | 2 - 4                     | 125                               | 2 - 4                     | 75                                              | 2 - 3                     |
| K Monel                            | 100                      | 1                         | 80                         | 1                         | 60                                | 1                         | 60                                              | 1                         |
| KR Monel                           | 100                      | 1 - 3                     | 90                         | 1 - 3                     | 80                                | 1 - 3                     | 60                                              | 1 - 2                     |
| Inconel                            | 110                      | 1 - 2                     | 100                        | 1 - 3                     | 80                                | 1 - 3                     | 80                                              | 1 - 2                     |
| Inconel X                          | 90                       | 1                         | 80                         | 1                         | 70                                | 1                         | 60                                              | 1                         |
| Hastelloy A                        | 120                      | 1 - 2                     | 100                        | 1 - 2                     | 85                                | 2 - 3                     | 75                                              | 1 - 2                     |
| Hastelloy B                        | 110                      | 0 - 1                     | 100                        | 1 - 2                     | 90                                | 1 - 2                     | 75                                              | 0 - 1                     |
| Hastelloy C                        | 100                      | 0 - 1                     | 90                         | 0 - 1                     | 70                                | 0 - 1                     | 60                                              | 0 - 1                     |
| Rene 41                            | 90                       | 1                         | 90                         | 1                         | 90                                | 1 - 2                     | 90                                              | 1 - 2                     |
| Udimit                             | 100                      | 1                         | 90                         | 1 - 2                     | 90                                | 1 - 2                     | 90                                              | 1 - 2                     |
| Waspalloy                          | 90                       | 1                         | 90                         | 1 - 2                     | 90                                | 1 - 2                     | 90                                              | 1 - 2                     |
| Titanium                           | 100                      | 1 - 2                     | 100                        | 2 - 3                     | 100                               | 2 - 3                     | 100                                             | 2 - 3                     |
| <u>Titanium Alloys</u>             |                          |                           |                            |                           |                                   |                           |                                                 |                           |
| TI-4AL-4MO                         | 100                      | 0 - 1                     | 90                         | 0 - 1                     | 80                                | 0 - 1                     | 70                                              | 0 - 1                     |
| TI-140A2CR-2MO                     | 100                      | 0 - 1                     | 90                         | 0 - 1                     | 80                                | 0 - 1                     | 60                                              | 0 - 1                     |





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