



# Operating Instructions and Parts Manual 20-inch Metalworking Band Saw

Model VBS-2012



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# 1.0 Warranty and Service

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

## Warranty Period

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

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

## Who is Covered

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

## What is Covered

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

## Warranty Limitations

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

## How to Get Technical Support

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

## More Information

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

## How State Law Applies

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

## Limitations on This Warranty

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

JET SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY, OR FOR INCIDENTAL, CONTINGENT, SPECIAL, OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

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

## Product Listing with Warranty Period

90 Days – Parts; Consumable items; Light-Duty Air Tools
1 Year – Motors; Machine Accessories; Heavy-Duty Air Tools; Pro-Duty Air Tools
2 Year – Metalworking Machinery; Electric Hoists, Electric Hoist Accessories; Woodworking Machinery used for industrial or commercial purposes
5 Year – Woodworking Machinery
Limited Lifetime – JET Parallel clamps; VOLT Series Electric Hoists; Manual Hoists; Manual Hoist Accessories; Shop Tools; Warehouse & Dock products; Hand Tools

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### 3.0 Safety warnings

1. Read and understand the entire owner's manual before attempting assembly or operation.
  2. Read and understand the warnings posted on the machine and in this manual. Failure to comply with all of these warnings may cause serious injury.
  3. Replace the warning labels if they become obscured or removed.
  4. This band saw is designed and intended for use by properly trained and experienced personnel only. If you are not familiar with the proper and safe operation of a band saw, do not use until proper training and knowledge have been obtained.
  5. Do not use this band saw for other than its intended use. If used for other purposes, JET disclaims any real or implied warranty and holds itself harmless from any injury that may result from that use.
  6. Always wear approved safety glasses/face shields while using this band saw. Everyday eyeglasses only have impact resistant lenses; they are not safety glasses.
  7. Before operating this band saw, remove tie, rings, watches and other jewelry, and roll sleeves up past the elbows. Remove all loose clothing and confine long hair. Non-slip footwear or anti-skid floor strips are recommended. Do not wear gloves.
  8. Wear ear protectors (plugs or muffs) during extended periods of operation.
  9. Some dust created by power sanding, sawing, grinding, drilling and other construction activities contain chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
    - Lead from lead based paint.
    - Crystalline silica from bricks, cement and other masonry products.
    - Arsenic and chromium from chemically treated lumber.
- Your risk of exposure varies, depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area and work with approved safety equipment, such as face or dust masks that are specifically designed to filter out microscopic particles.
10. Do not operate this machine while tired or under the influence of drugs, alcohol or any medication.
  11. Make certain the switch is in the OFF position before connecting the machine to the power supply.
  12. Make certain the machine is properly grounded.
  13. Make all machine adjustments or maintenance with the machine unplugged from the power source.
  14. Remove adjusting keys and wrenches. Form a habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.
  15. Keep safety guards in place at all times when the machine is in use. If removed for maintenance purposes, use extreme caution and replace the guards immediately after completion of maintenance.
  16. Check damaged parts. Before further use of the machine, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
  17. Provide for adequate space surrounding work area and non-glare, overhead lighting.
  18. Keep the floor around the machine clean and free of scrap material, oil and grease.
  19. Keep visitors a safe distance from the work area. Keep children away.
  20. Make your workshop child proof with padlocks, master switches or by removing starter keys.
  21. Give your work undivided attention. Looking around, carrying on a conversation and "horse-play" are careless acts that can result in serious injury.
  22. Maintain a balanced stance at all times so that you do not fall into the blade or other moving parts. Do not overreach or use excessive force to perform any machine operation.
  23. Use the right tool at the correct speed and feed rate. Do not force a tool or attachment to do a job for which it was not designed. The right tool will do the job better and more safely.
  24. Use recommended accessories; improper accessories may be hazardous.
  25. Maintain tools with care. Keep saw blades sharp and clean for the best and safest

- performance. Follow instructions for lubricating and changing accessories.
26. Turn off the machine before cleaning. Use a brush or compressed air to remove chips or debris — do not use your bare hands.
  27. Do not stand on the machine. Serious injury could occur if the machine tips over.
  28. Never leave the machine running unattended. Turn the power off and do not leave the machine until it comes to a complete stop.
  29. Remove loose items and unnecessary work pieces from the area before starting the machine.
  30. Keep hands out of the line of saw blade.
  31. Always use push sticks when cutting small material.
  32. Raise or lower blade guide only when machine has been turned off and blade has stopped moving.
  33. Always wear leather gloves when handling saw blades. The operator should not wear gloves when operating the band saw.
  34. Do not allow the saw blade to rest against the workpiece when the saw is not running.
  35. The saw must be stopped and the electrical supply must be cut off before any blade replacement, drive belt replacement, or any periodic service or maintenance is performed on the machine.
  36. Remove cut off pieces carefully, keeping hands away from the blade. The saw must be stopped and the electrical supply cut off or machine unplugged before reaching into the cutting area.
  37. Don't use in dangerous environment. Don't use power tools in damp or wet location, or expose them to rain. Keep work area well lighted.

**Familiarize yourself with the following safety notices used in this manual:**

**⚠CAUTION**

This means that if precautions are not heeded, it may result in minor injury and/or possible machine damage.

**⚠WARNING**

This means that if precautions are not heeded, it may result in serious injury or possibly even death.

## 4.0 About this manual

This manual is provided by JET covering the safe operation and maintenance procedures for a JET Model VBS-2012 Band Saw. This manual contains instructions on installation, safety precautions, general operating procedures, maintenance instructions and parts breakdown. Your machine has been designed and constructed to provide years of trouble-free operation if used in accordance with the instructions as set forth in this document.

If there are questions or comments, please contact your local supplier or JET. JET can also be reached at our web site: [www.jettools.com](http://www.jettools.com).

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

**⚠WARNING**

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

## 5.0 Specifications

Model number .....	VBS-2012
Stock number .....	414482
Blade speed .....	variable
Low range .....	65-555
High range.....	390-3280
Capacities:	
Height (max. thickness).....	12"
Throat (max. width) .....	20"
Welder capacity.....	5/16" – 3/4"
Motor .....	TEFC, 2HP(1.5kW), 3PH, 230/460V (prewired 230V), 6.2/3.1A, 60Hz
Table size .....	24" x 22-1/2"
Table height from floor .....	39-1/2"
Table tilt.....	8° F and B; 15°R and 12°L
Blade length (approximate) .....	150-1/2" min.; 156-1/2" max.
Blade width.....	1/8" to 1"
Overall height .....	79"
Floor space required .....	42" x 29"
Weights:	
Net.....	1210 lb
Shipping .....	1310 lb

*The specifications in this manual were current at time of publication, but because of our policy of continuous improvement, JET reserves the right to change specifications at any time and without prior notice, without incurring obligations.*

## 6.0 Uncrating and assembly

1. Finish uncrating the band saw. Contact your distributor if any damage has occurred during shipping.
2. Remove any preservative with kerosene or diesel oil. Do not use gasoline, paint thinner, or any cellulose-based product, as these will damage painted surfaces.
3. Remove two socket head cap screws from left side of vertical column. Attach shear assembly (A, Figure 1) to column by inserting screws.
4. Place rip fence onto table and tighten with locking knob.



Figure 1

## 7.0 Installation

1. Remove four (4) nuts and washers holding band saw to shipping crate bottom.
2. Use the lifting ring to lift band saw into its permanent location. For best performance, band saw should be bolted to floor after a level position has been found.
3. Using a square, adjust table 90 degrees to blade, both front to back and side to side. Loosen the hex cap screws below the table to move it and tighten to hold table in place. If necessary, adjust the pointers to zero should they read different once table is perpendicular to blade in both directions.
4. To level the machine, place a machinist's level on the table and observe in both directions.
5. Use metal shims under the appropriate hold down screw. Tighten screw and recheck for level.
6. Adjust with additional shims, as required, until table is level when all mounting screws (or nuts) are tight.

## 8.0 Electrical connections

**⚠WARNING** All electrical connections must be done by a qualified electrician. All adjustments or repairs must be done with machine disconnected from power source. Failure to comply may cause serious injury.

The VBS-2012 Band Saw is rated at 230/460V and comes from the factory prewired 230V.

You may either connect a proper UL-listed plug suitable for 230 volt operation, or "hard-wire" the machine directly to your electrical panel provided there is a disconnect near the machine for the user.

The band saw must be grounded. A qualified electrician can make the proper electrical connections and confirm the power on site is compatible with the saw.

Before connecting to power source, make sure switch is in off position.

### 8.1 Voltage conversion

To switch to 460V operation:

1. Switch the incoming leads in the motor junction box (follow wiring diagram on inside cover of motor junction box).
2. Switch the jumper wires on the circuit board. Remove control panel from saw body and change the jumper wires according to the list in section 19.0, *Electrical Connections*.
3. If a plug is to be used, install a proper UL-listed plug suitable for 460V operation.

**IMPORTANT:** Consult the diagrams in section 19.0 for any clarification of these changes on 230V to 460V conversion.

### 8.2 Three-phase test run

After wiring the band saw, you should check that the wires have been connected properly. Connect machine to power source and turn it on for an instant to watch direction of blade movement.

If blade runs upward instead of downward, **disconnect machine from power**, and switch any two of the three leads in the motor junction box (see section 19.0, *Electrical Connections*).

## 9.0 Controls

**Low/High Range Shift Lever (B, Figure 2)** – Pull toward front of machine to shift into low speed range. Push toward rear of machine to shift into high speed range. **CAUTION: Do not change speed range while machine is running. Adjust only when machine is stopped.**



Figure 2

**Variable Speed Hand Wheel (C, Figure 2)** – Turn clockwise to increase speed and counterclockwise to decrease speed. **CAUTION: Do not turn handwheel while machine is stopped. Adjust speed only when machine is running.**

**Upper Blade Guide Lock Knob (D, Figure 2)** – Turn counterclockwise to loosen and clockwise to tighten.

**Upper Blade Guide Handwheel (E, Figure 2)** – Turn clockwise to raise blade guide assembly; counterclockwise to lower.

**Work Lamp Switch (F, Figure 2)** – on top of lamp shade; turns lamp on and off.

**Shear Lever (G, Figure 2)** – UP position allows insertion of blade end into shear. Pull lever DOWN to cut blade.

**Main Motor Start Switch (H, Figure 3)** – Press to start band saw.

**Main Motor Stop Switch (I, Figure 3)** – Press to stop band saw.

**Key Lock Switch (J, Figure 3)** – Turn to 12 o'clock position and remove key to lock out power from

control panel. Insert key and turn to 3 o'clock position to turn on power to control panel.

**Emergency Stop Switch (K, Figure 3)** – Press to stop all machine functions. Turn 90° to reset.

**Power Lamp (L, Figure 3)** – Illuminated when power is being supplied to band saw.

**Digital Readout (M, Figure 3)** – Indicates blade speed in feet per minute. Note: After saw is first started or the speed has been changed, allow at least a minute for the readout to stabilize the new setting.

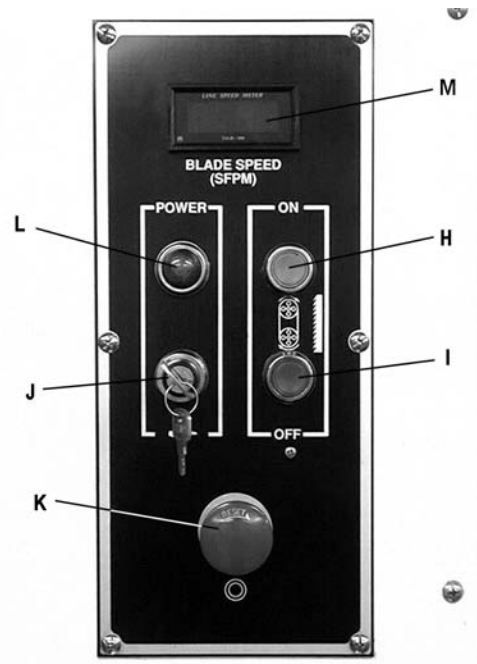


Figure 3

**Grinder Toggle Switch (N, Figure 4)** – located on blade welder panel. Flip switch up to start grinder; flip down to stop grinder.

**Weld Button (O, Figure 4)** – located on blade welder panel. Press and hold to start welding. Shuts off automatically when weld is done. Release when weld is completed.

**Anneal Button (P, Figure 4)** – located on blade welder panel. Press and hold to anneal blade, release to stop.

**Blade Clamp Pressure Knob (Q, Figure 4)** – located on blade welder panel. Sets pressure for different width blades.

**Blade Clamps (R, Figure 4)** – located on blade welder panel. DOWN position allows insertion of blade into clamp. UP position locks blade.



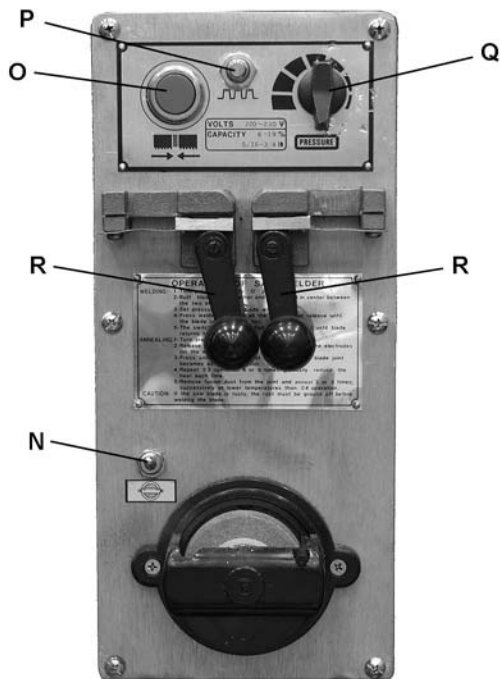


Figure 4

**Blade Tension Handwheel (S, Figure 5)** – located on underside of upper frame. Turn clockwise to tension blade; counterclockwise to release tension on blade.

**Blade Tracking Handwheel (T, Figure 5)** – located at upper rear of saw. Turn clockwise to track blade toward front of blade wheel. Turn counterclockwise to track blade toward rear of blade wheel.

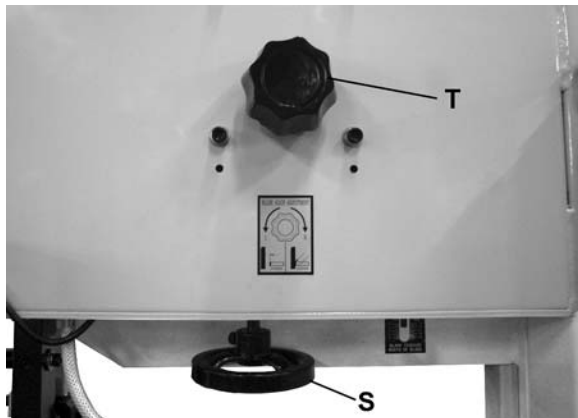


Figure 5

**Table Tilt Mechanism** – located under work table. To tilt table left or right, loosen two socket head cap screws (U, Figure 6) at rear of mechanism. To level table front to back, loosen four socket head cap screws (V, Figure 7) on either side of mechanism.

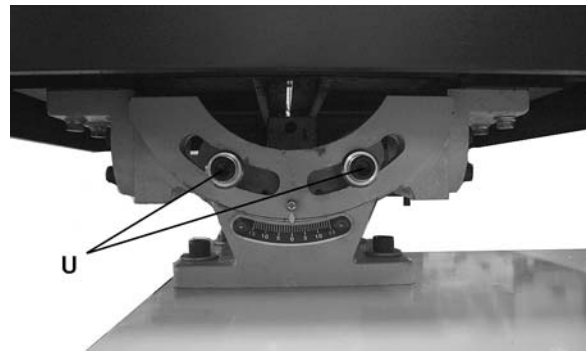


Figure 6

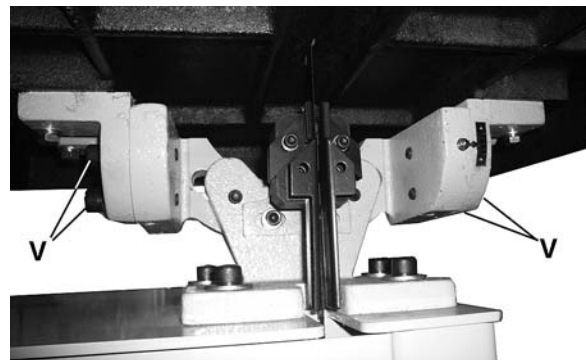


Figure 7

## 10.0 Adjustments

**⚠WARNING** All adjustments or repairs to machine must be done with power off and machine disconnected from power source. Failure to comply may cause serious injury.

### 10.1 Blade tensioning

1. Raise upper blade guide by loosening lock knob (A, Figure 8) and turning blade guide handwheel (B) clockwise until it stops.



Figure 8

2. Apply finger pressure to blade. Travel from vertical should be approximately 3/8" each way.
3. To tighten blade, turn handwheel (C, Figure 8) clockwise. To loosen blade, turn handwheel counterclockwise.

4. Use blade tension indicator (D, Figure 9) as reference only. Blade should be tensioned using the finger pressure method.

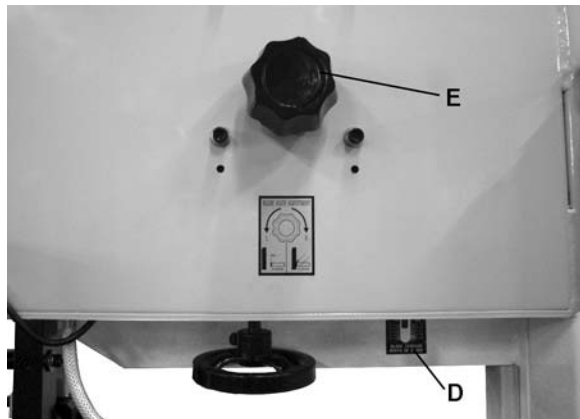


Figure 9

## 10.2 Blade tracking

Blade tracking may be required periodically depending upon blade size and tension. The blade must be tensioned as outlined in *section 10.1 Blade tensioning*. Disconnect machine from power source and open both blade wheel doors. Shift high-low gear box lever into neutral position. Turn upper blade wheel by hand while observing blade position on the upper blade wheel. If adjustment is necessary:

1. Turn blade tracking knob (E, Figure 9) clockwise to track blade toward front of blade wheel.
2. Turn tracking knob counterclockwise to track blade toward rear of blade wheel. Blade should be tracked as close to center of top blade wheel as possible.

Note: Upper and lower blade guides should be moved away and left loose from the blade while tracking adjustments are being made.

## 10.3 Blade guide adjustment

**CAUTION** Blade guides must be properly adjusted or damage may occur to blade and/or guides.

**WARNING** Guard has been removed to show detail. Always operate saw with guard in place and properly adjusted. Failure to comply may cause serious injury.

1. Loosen lock knob (A, Figure 8) and turn blade guide handwheel (B, Figure 8) until blade guide assembly is half way between table and head, then tighten lock knob (A, Figure 8).
2. Loosen screw (F, Figure 10) and slide blade guide assembly away from blade until it stops.

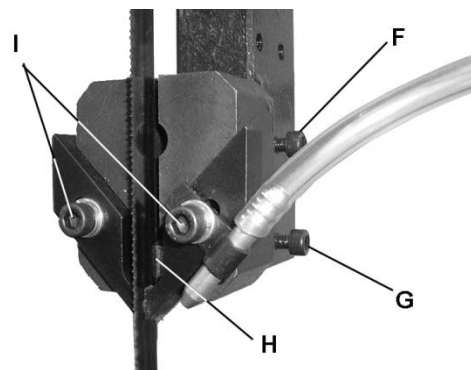


Figure 10

3. Loosen screw (G, Figure 10). Slide blade stop (H, Figure 10) toward blade until a gap of 1/32" remains. Tighten screw (G, Figure 10).
4. Slide blade guide assembly toward blade until blade guides are just behind the gullets as in Figure 10. Tighten screw (F, Figure 10).
5. Open upper access door and rotate blade wheel by hand until weld portion of blade is between the two fingers.
6. Loosen two hex cap screws (I, Figure 10) and adjust each finger toward the blade. They should not touch the blade. Adjust for 0.010" clearance on either side.
7. Tighten two hex cap screws (I, Figure 10) once proper adjustment has been made.
8. Adjust lower blade guides in the same manner.

Note: Even properly adjusted blade guides will show wear after continual use. Readjust as necessary. If the blade guides become difficult to adjust, switch the left and right blade guides.

## 10.4 Top guide adjustment

Always position top guide to within 1/8" of the top surface of workpiece. This minimizes exposure of operator's hands to the saw blade.

## 10.5 Changing saw blades

1. Disconnect saw from power source.
2. Move upper blade guide to its highest position and lock in place.
3. Open both wheel doors. Turn tension adjustment handwheel counterclockwise to loosen tension on blade.
4. Remove blade guard from column. Remove blade from both wheels and maneuver it around protective shield on upper blade guide. **Use gloves when handling blades.**
5. Install new blade by maneuvering around blade shield on upper blade guide.
6. Place it between the fingers of both blade guides and onto both wheels. Position next to both wheel flanges. Make sure teeth point

down toward table. NOTE: If teeth will not point downward regardless of blade orientation, the blade is inside-out. Twist blade outside-in and reinstall.

7. Verify that blade rests against ball bearing (Figure 11), not behind it.

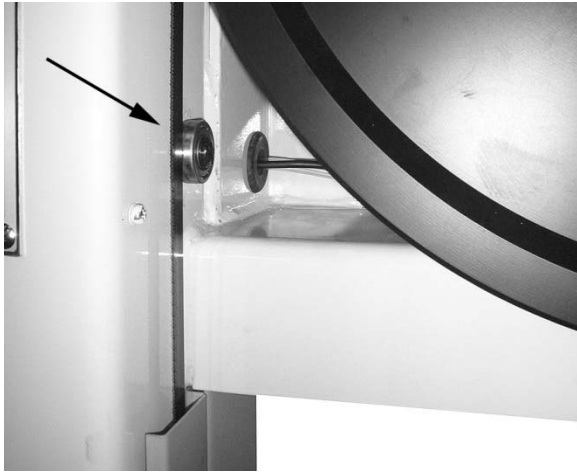


Figure 11

8. Reinstall blade guard on column.
9. Tension blade by turning tension handwheel. Rotate wheel by hand and make sure blade is properly seated in blade guides. Blade guides will have to be adjusted if the replacement blade is a different type and width.
10. Turn on saw and check blade tracking. Adjust tracking if necessary.

## 10.6 Work lamp bulb

The work lamp uses a standard medium-base 60 watt bulb (not provided).

## 11.0 Blade selection

Proper blade selection is just as important to band saw operation as is blade speed and material feed. Proper blade selection will impact blade life, straightness of cut, cut finish, and efficiency of operation. Excessive blade breakage, stripping of teeth, and waviness of cut are some of the results of improper blade selection.

Blades are classified by material composition, tooth shape, tooth pitch, tooth set, gage of the band material, and kerf of the set (width of cut).

### 11.1 Material composition

**Carbon Steel** – low cost, for use with non-ferrous materials, wood, and plastics.

**High Speed Steel** – resists heat generated by dry cutting. Used for ferrous metals.

**Alloy Steel** – tough and wear resistant, cuts faster with longer blade life. Used on hard materials. More expensive than carbon or high speed steel.

**Carbide Tipped** – for cutting unusual materials such as uranium, titanium, or beryllium.

### 11.2 Tooth shape

**Note:** When cutting thin materials, the rule for blade pitch is to have a minimum of two teeth engaging the material being cut at all times.

**Standard Tooth** - generally used to cut ferrous metals, hard bronze, hard brass, and thin metals.

**Skip Tooth** - have better chip clearance (larger gullet) and are used on softer, non-ferrous materials such as aluminum, copper, magnesium, and soft brass.

**Hook Tooth** - provides a chip breaker and has less tendency to gum up in softer materials. Used in the same materials as skip tooth but can be fed faster than standard or skip tooth blades.

### 11.3 Set type

**Straight Set** – used for free cutting non-ferrous materials; i.e., aluminum, magnesium, plastics, and wood.

**Wavy Set** – used on materials of varying thickness (pipe, tubing, and structural shapes).

**Raker Set** – used in large cuts on thick plate and bar stock where finish of cut is not as important as speed.

### 11.4 Gage

Gage is the thickness of material from which the blade is produced. The thicker the material, the stronger the blade.

### 11.5 Kerf

Kerf is the width of a cut. Kerf will vary according to the set of the blade teeth.

### 11.6 Width

The thinner the blade, the tighter will be the minimum radius of cut. Always use widest blade possible for the job.

General rules for blade selection:

- Select coarser pitch blades for thicker or softer material.
- Select finer pitch blades for thinner or harder material.
- Use fine pitch blades to obtain a smooth finish.
- Use coarse pitch blades to obtain faster cutting speeds (thick material).
- To prevent premature blade wear, use fastest practical speed.
- Adjust feed rate to ensure continuous cutting action.

- Run the bandsaw with blade centered in upper and lower guides, and guide fingers adjusted as close as possible without touching the blade or weld joint.

**⚠WARNING** Never adjust guide fingers while blade is running. Failure to comply may cause serious injury.

### 11.7 Blade breakage

Band saw blades are subject to high stresses and breakage may sometimes be unavoidable. However, many factors can be controlled to help prevent most blade breakage. Here are some common causes for breakage:

1. Misalignment of blade guides.
2. Feeding workpiece too quickly.
3. Using a wide blade to cut a short radius curve.
4. Excessive tension.
5. Teeth are dull or improperly set.
6. Upper guides are set too high off the workpiece.
7. Faulty weld on blade.

## 12.0 Welder operation

**⚠WARNING** Wear eye protection while operating welder. Use care when handling blade after welding to avoid burns.

The welding procedure involves the following steps: Shearing the blade, grinding teeth to allow for the weld area, the actual welding, inspection of blade, annealing, grinding and a final inspection of blade. This procedure can be accomplished using the shear and welder assemblies on your band saw. Proceed as follows:

### 12.1 Shearing

Cut blade to longest length needed for band saw. Using the shear to cut your blade will ensure that cut ends are flat, square and smooth.

1. Place handle in upright position.
2. Position blade against back of square cutting guide of shear. See Figure 12. Make sure blade is held square with shear knife, so that cut will be square with blade.
3. Position blade so that cut is made at a place that allows for uniform spacing of teeth. See Figure 13.
4. Bring handle down firmly to cut blade.

**IMPORTANT:** If a blade has been cut by using snips, the ends of the blade must be ground square before welding them together, as shown in Figure 14.

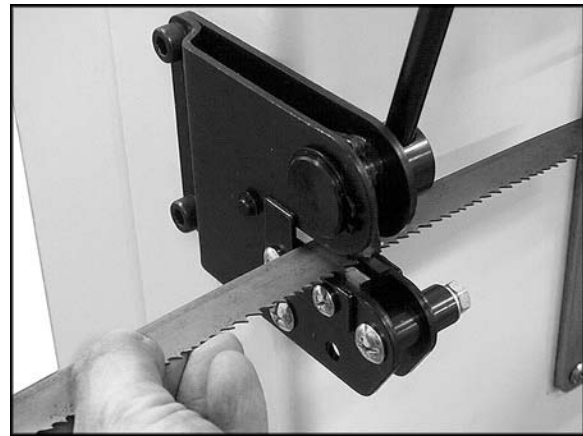


Figure 12

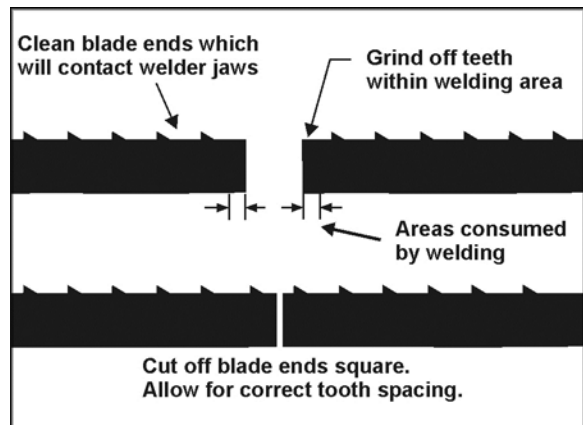


Figure 13

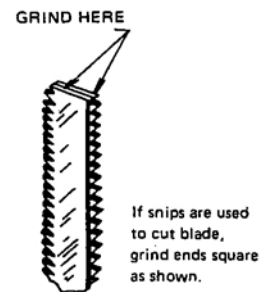


Figure 14

### 12.2 Removing Teeth

In fine pitched blades, one or more of the teeth on each side of the cut may need to be removed by grinding so that the weld area of the blade is uniform and the teeth will be uniformly spaced. See Figure 13, and refer to section 12.5 *Blade grinding*.

### 12.3 Welding

**⚠CAUTION** The welder is designed for intermittent use. Repeated welding within a short period of time may cause welder to overheat.

1. Clean welder jaws and lower jaw inserts.

- Carefully clean ends of blade which will contact welder jaws. Remove any dirt, oil, scale and oxide.

**CAUTION** Any rust (oxide) on blade in vicinity of weld must be ground off before blade can be welded.

- Turn pressure knob (Figure 15) to “0” position (pointed downward). NOTE: There will be some resistance when turning knob.
- Insert one end of blade into left clamp. Position back edge of blade against back edge of left clamp. Then position the end of the blade midway between left and right clamps. Tighten left clamp.
- Insert opposite end of blade into right clamp. Position back edge of blade against back edge of right clamp. Then butt the end of blade against the other end of blade (the blade ends need to be in contact with each other). Tighten right clamp.
- Set pressure selector switch (counterclockwise rotation) to the approximate setting required for the width of the blade being welded.

**WARNING** Keep hands clear of weld area and clamp jaws during welding.

- Press and hold weld button (Figure 15). When weld button is pushed, the left clamp moves to the right to apply pressure to the blade ends. Simultaneously, sparks will be emitted from the blade ends as they are being welded. Do not release weld button until blade joint is “red hot.”

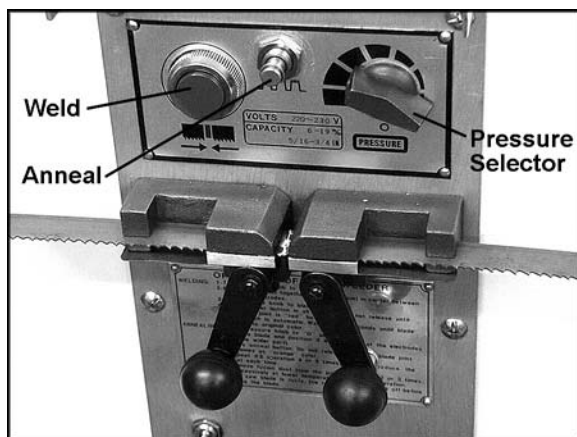


Figure 15

- Release weld button, and wait 3 or 4 seconds until blade returns to original color. Unclamp blade.
- Rotate pressure selector switch back to “0”.
- Remove blade from clamps, and carefully inspect it. The spacing of the teeth should be uniform and the weld should be located in center of gullet. Misalignment is easily noted at

this time from the weld appearance. See Figure 16 for examples of incorrect welds.

- If the weld is imperfect, refer to section 15.3 for possible remedies to any problems. Make corrections before annealing.

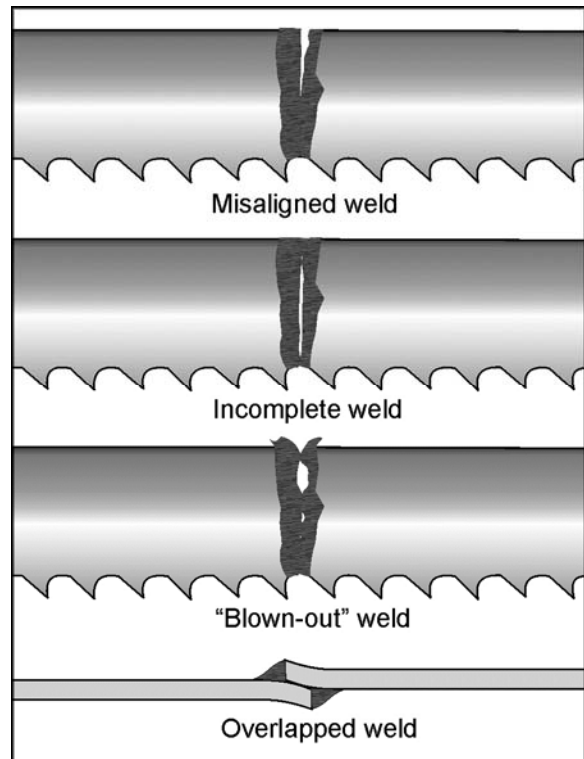


Figure 16

## 12.4 Annealing

The blade must now be annealed, or cooled at a controlled rate to prevent it becoming too brittle.

The general procedure follows. Specific procedure will depend upon blade type, as described in sections 12.4.1 through 12.4.3.

- Turn pressure selector knob all the way to left so clamp jaws are closest to each other.
- Insert blade into clamps so that weld area is centered between clamps. Secure blade in jaws with the clamp handles.
- Quickly press and release (“jog”) the anneal button (Figure 15). Repeat jog process until you see a slightly red glow from weld area.

**CAUTION** Do not press and hold the anneal push button. The weld will be overheated and will fail due to excessive heat.

- Release both blade clamps, allow blade to cool, then remove blade from clamps.
- Check weld integrity. Bend blade to form a radius at point of weld. The size of the radius should be approximately the same as radius of band saw drive wheel. The weld must hold and

not break or crack after forming the radius. If the weld breaks, cut away welded area and repeat welding-annealing process.

6. Check to make sure welded section is same thickness as rest of blade. If not, grind off excess weld material using the grinder. Refer to section 12.5, *Blade grinding*.

**CAUTION** If blade is thicker at the weld than at the rest of the blade, using the blade may damage the guides.

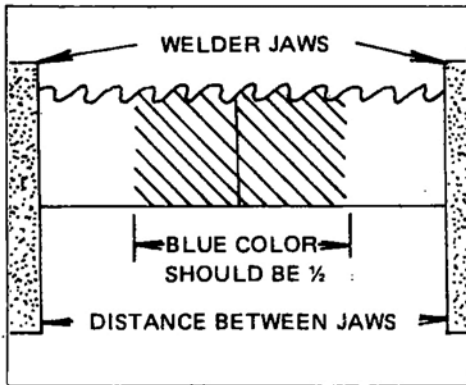
The following are variations of the general procedure, based upon blade type:

#### 12.4.1 Carbon steel blades

1. Press and jog the annealing switch button until weld is a "dull cherry" to "cherry red" color.
2. Allow blade to cool slowly by decreasing jogging frequency.

#### 12.4.2 Carbon steel hard back blades

1. Heat blade slowly until weld becomes a deep blue color.
2. Continue to heat by jogging the anneal button until the width of the blue color is one-half the length of the band exposed between the jaws.
3. Do not overheat or the temper of the band will be damaged. **Caution - Do not heat beyond the "blue" stage.** If the band begins to show any red color, it is too hot. Cool quickly by releasing the anneal button.



Correct annealing of Carbon Steel Hard Back Blades

Figure 17

#### 12.4.3 Bi-Metal blades

1. Heat blade slowly by jogging the annealing switch button until weld just begins to emit light (dull red color). The desired color may not always be visible in normal room light - always shade the weld area with your hand.
2. Cool the weld quickly by releasing the annealing button.

3. Follow this procedure before and after grinding bimetal blades.

### 12.5 Blade grinding

**WARNING** Keep hands away from rotating grinding wheel. Failure to comply may cause serious injury. Always heed the indicator light – when glowing, it warns that the grinder motor is running.

After annealing, the blade must be ground to remove excess metal or flash from the weld. With the teeth facing out, grind the weld carefully (Figure 18). Do not hit the teeth, or grind deeper than the weld, burn, or overheat the weld area. Be sure to remove flash from back edge of blade. Any flash or "stub" teeth which project beyond the normal set or height of the other teeth must be ground off.

Figure 19 illustrates some unacceptable grindings.

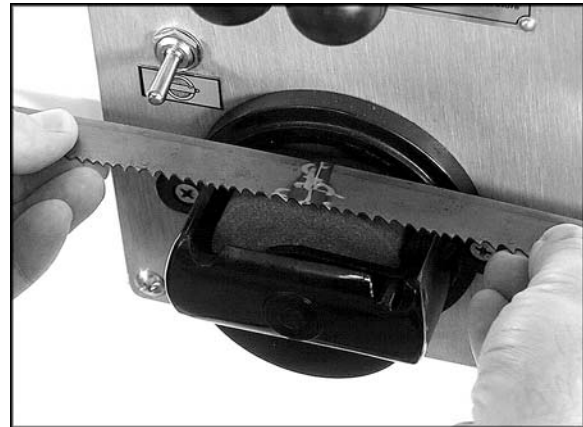


Figure 18

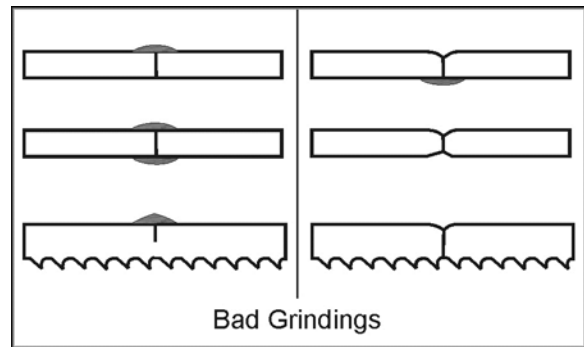


Figure 19

### 12.6 Secondary Annealing

Anneal the weld 2 to 3 times again after grinding.

### 12.7 Welder Clean-Up

It is important that the welder jaws be kept clean at all times. The jaws and inserts must be wiped or scraped clean after every weld. Doing this will ensure better welds by:

1. Holding proper alignment.

2. Preventing flash from becoming embedded in the blade.
3. Preventing shorts or poor electrical contact.

## 13.0 Band saw operation

Consult section 9.0 for identification of the controls.

Unlock the control panel using the provided key.

**⚠WARNING** Never operate band saw without blade and wheel covers in place and secured.

### 13.1 Blade break-in procedure

New blades are very sharp and therefore have a tooth geometry that is easily damaged if a careful break-in procedure is not followed. Consult the blade manufacturer's literature for break-in of specific blades on specific materials. The following procedure will be adequate, however, for break-in of JET-supplied blades on lower alloy ferrous materials.

1. Use a section of round stock.
2. Operate the saw at low speed. Start the cut with a very light feed rate.
3. When the saw has completed about 1/3 of the cut, increase the feed rate slightly and allow the saw to complete the cut.
4. Keep the feed rate at the same setting and begin a second cut on the same or similar workpiece.
5. When the saw has completed about 1/3 of the cut, increase the feed rate while watching the chip formation until cutting is at its most efficient rate (refer to "Evaluating Cutting Efficiency" below). Allow the saw to complete the cut.
6. The blade is now considered ready for use.

### 13.2 Setting blade speed

1. Refer to Speed and Pitch chart in section 16.0. Select speed setting for the material to be cut.
2. While machine is NOT running, move gear shift lever (B, Figure 2) to required speed setting (high or low).

**⚠CAUTION** Move gear shift lever only when machine is NOT running, to prevent damage to gearbox.

3. Start saw using the pushbutton.
4. Turn speed setting handwheel (C, Figure 2) to required speed. Turning handwheel clockwise increases speed; counterclockwise decreases speed.

**⚠CAUTION** Rotate speed setting handwheel only when machine is running.

### 13.3 Evaluating cutting efficiency

The best way to determine whether a blade is cutting efficiently is to observe the chips formed by the cutting.

- If chip formation is powdery, then the feed rate is too light, or blade is dull.
- If the chips formed are curled, but colored – blue or straw colored from heat generated during the cut – then feed rate is excessive.
- If chips are slightly curled and not colored by heat, then the blade is sufficiently sharp and is cutting at its most efficient rate.

## 14.0 Maintenance

**⚠WARNING** Before doing maintenance on the machine, disconnect it from the electrical supply by pulling out the plug or switching off the main switch. Failure to comply may cause serious injury.

Use a brush to loosen accumulated chips and debris. Use a shop vacuum to remove the debris. Make sure the chip brush on the lower band wheel is properly adjusted.

If the power cord is worn, cut, or damaged in any way, have it replaced immediately.

Wipe off the rubber tires, and clean the tables after each day's use.

### 14.1 Lubrication schedule

- **Upper Blade Guide Shaft** – lightly grease weekly. Clean after each day's use.
- **Speed Change Handle** – grease monthly with a light film on teeth and threads.
- **Variable Pulley** - insert a light weight grease into the grease fitting located on end of pulley shaft.
- **Blade Tension Screw** – grease monthly.

## 15.0 Troubleshooting

### 15.1 Operating problems

Table 1

Trouble	Probable Cause	Remedy
Saw blade is twisted.	Blade has been improperly welded.	Re-weld blade. See section 12.3
	Blade not installed properly.	Set guide inserts closer, and increase blade tension.
	Feeding workpiece too forcefully.	Decrease feed rate.
	Incorrect choice of blade.	Use proper width blade for radius or wavy line cutting.
Cuts not straight.	Blade tooth has improper set.	File to proper set or replace blade.
	Inadequate blade tension.	Increase tension.
	Guide post too high.	Set guide post closer to workpiece.
	Feed rate too strong.	Decrease feed rate.
Blade slips off wheel(s).	Inadequate blade tension.	Increase tension.
	Wheels not aligned properly.	Contact technical service for adjustment of wheel alignment.
Blade quickly becomes dull.	Blade speed too fast.	Use slower speed.
	Wrong blade for the job.	Use proper blade for workpiece.
	Feed rate excessive.	Decrease feed rate.
Blade warps.	Dull blade.	Sharpen or replace blade.
	Guide post not fixed properly.	Fix guide post in position.
	Blade not tensioned enough.	Increase tension.
	Blade not 90° to table.	Adjust table perpendicular to blade.
Band Saw is noisy, or vibrates too much.	Band Saw not resting on level surface.	Floor must be flat.
	Variable speed pulley is damaged.	Replace pulley.
Blade teeth keep breaking.	Incorrect blade for the job.	Select proper blade pitch and style.
	Blade is of inferior material.	Use better quality blade.
Blade becomes damaged easily.	Blade has been over-annealed.	Decrease annealing temperature.
	Too large a gap between blade guides and blade.	Adjust proper gap between guides and blade. See section 10.3
	Blade too wide for short radius cutting.	Select narrower blade appropriate to the job.



## 15.2 Mechanical and electrical problems

Table 2

Trouble	Probable Cause	Remedy
Machine will not start/restart or repeatedly trips circuit breaker or blows fuses.	No incoming power.	Verify machine is connected to power source. Make sure START button is pushed in completely, and STOP button is disengaged.
	Cord damaged.	Replace cord.
	Overload automatic reset has not reset.	When the band saw overloads on the circuit breaker built into the motor starter, it may take time for the machine to cool down before restart. Allow unit to adequately cool before attempting restart. If problem persists, check amp setting on the motor starter.
	Band Saw frequently trips.	One cause of overloading trips which are not electrical in nature is too heavy a cut. The solution is to reduce feed pressure into the blade. If too heavy a cut is not the problem, then check the amp setting on the overload relay. Match the full load amps on the motor as noted on the motor plate. If amp setting is correct then there is probably a loose electrical lead.
	Building circuit breaker trips or fuse blows.	Verify that band saw is on a circuit of correct size. If circuit size is correct, there is probably a loose electrical lead.
	Switch or motor failure (how to distinguish).	If you have access to a voltmeter, you can separate a starter failure from a motor failure by first, verifying incoming voltage at 220+/-10% and second, checking the voltage between starter and motor at 220+/-10%. If incoming voltage is incorrect, you have a power supply problem. If voltage between starter and motor is incorrect, you have a starter problem. If voltage between starter and motor is correct, you have a motor problem.
	Motor overheated.	Clean motor of dust or debris to allow proper air circulation. Allow motor to cool down before restarting.
Machine will not start/restart or repeatedly trips circuit breaker or blows fuses (cont.)	Motor failure.	If electric motor is suspect, you have two options: Have a qualified electrician test the motor for function or remove the motor and take it to a qualified electric motor repair shop and have it tested.
	Miswiring of the unit.	Double check to confirm all electrical connections are correct. Refer to appropriate wiring diagrams to make any needed corrections.
	Switch failure.	If switch is suspect, you have two options: Have a qualified electrician test the switch for function, or purchase a new start switch and establish if that was the problem on changeout.
Band Saw does not come up to speed.	Extension cord too light or too long.	Replace with adequate size and length cord.
	Low current.	Contact a qualified electrician.

### 15.3 Welded blade inspection

Table 3

Trouble	Probable Cause	Remedy
Weld is misaligned.	Dirt or scale on clamp jaws or blade.	Always keep jaws clean. Clean blade before welding.
	Blade ends not square.	Before welding, grind cut edges of blade until they are square. Use the shear on the band saw for square cuts.
	Blade ends not correctly aligned when clamped in jaws.	Align ends properly before clamping.
	Worn clamp jaws	Replace clamp jaws.
	Clamp jaws not aligned correctly.	Align jaws correctly.
Misaligned weld: Blade ends are overlapped.	Pressure knob is set for wider blade than the one used.	Adjust pressure knob correctly for particular blade width.
	Blade ends or clamp jaws not aligned correctly.	Make corrections as needed.
Weld breaks when used.	Weld is weak and incomplete; possible "blow holes" (see Figure 16).	Cut and re-weld blade ends.
	Weld has been ground too thin.	Cut and re-weld blade ends.
	Weld incorrectly annealed.	Follow annealing instructions in section 12.4.
Incomplete weld.	Pressure knob not set correctly.	Make appropriate adjustment
	Improper clamping procedures.	Use proper procedures. See section 12.0.
	Limit switch not adjusted correctly.	Adjust limit switch correctly.
	Defective limit switch; doesn't break circuit at end of welding operation.	Replace limit switch.
	Clamp jaw movement obstructed by kinked jaw cable or tangled wires.	Bend cable and untangle wires.
Brittle weld.	Incorrect annealing heat.	Bring weld up to correct color. See section 12.4
	Scale or oil on weld caused poor annealing.	Keep clamp jaws and blade clean.

## 15.4 Welder mechanical problems

Table 4

Trouble	Probable Cause	Remedy
Weld could not be made. Jaws do not move.	Wire connection is poor; connecting point of welding switch is bad.	Change switch, or grind the connecting port with a file.
	Transformer burned out.	Change transformer, or rewire it.
	Blade has oil on it.	Wipe off any oil.
	Blade ends have rust.	Grind off rust.
Weld area melts when weld switch is pushed.	Welding switch is cutting off late.	Screw welding switch connecting nut tighter.
	Welding press too weak.	Rotate pressure selector knob accordingly.
	Jaw movement too slow.	Put some oil on rear side of welding lever and the two jaws.
Blade cannot be tightly clamped with the clamp jaws.	Clamp jaws are out of order, or decayed.	Replace clamp jaws.
	Lower jaw inserts are out of order.	Replace lower jaw inserts.
Annealing doesn't occur when annealing button is pushed.	Annealing switch connection is poor.	Replace annealing switch.
	Fuse blown.	Replace fuse.
Annealing button will not return to correct position after release.	Annealing button has dust or debris around it.	Remove annealing button housing and clean out any dust or debris.
Grinder will not run when Grinder switch is pushed.	Grinder motor is burnt out.	Change grinder motor or rewire it.
	Grinder switch is bad.	Replace grinder switch.

## 16.0 Speed and pitch chart

Material	Thickness	Sawing speed (M/min) for specified Material & thickness					Pitch (No. of teeth / inch)				
		~1/4	1/4~1	1~3	3~6	6~	~1/4	1/4~1	1~3	3~6	6~
High carbon steel		70	60	60	45	45	18	14	10	6	4
Free cutting steel		60	45	40	30	30	18	14	12	6	4
Ordinary tool steel		40	30	30	25	20	24	18	14	8	4
High speed steel		30	25	20	20	20	24	14	12	8	4
Stainless steel		25	20	20	20	20	18	14	10	8	4
Thick iron plate		45	30	20	20	20	18	14	10	8	4
Cast iron		45	40	30	25	20	18	14	12	8	4
Aluminum 108,A108		365	275	180	120	60	18	10	6	3	3
A132,C133		365	275	180	120	60	18	10	6	3	3
13,43,85,4032,6151		550	425	245	150	90	18	10	6	3	3
113,138,152,B-195		550	380	275	180	90	18	10	6	3	3
B-214,312,333		550	380	275	180	90	18	10	6	3	3
212,355,356,360,380		550	380	275	180	90	18	10	6	3	3
142,195,750		915	825	735	670	610	18	10	6	3	3
2014,2018,2025		915	825	735	670	610	18	10	6	3	3
6053,7075		915	825	735	670	610	18	10	6	3	3
6061,6063		1500	1220	1065	915	770	18	10	6	3	3
122,214,218,220		1500	1385	1220	1065	915	18	10	6	3	3
1100,2011,2017,3003,3004		1500	1500	1500	1385	1220	18	10	6	3	3
2024,5052		1500	1500	1500	1500	610	18	10	6	3	3
Magnesium bronze		125	75	40	25	20	14	8	6	3	3
Leaded commercial branze		915	610	450	305	150	14	8	6	3	3
Commercial branze		150	105	60	30	20	14	8	6	3	3
Free cutting brass		1220	915	610	450	300	14	8	6	3	3
Forging brass		610	460	335	245	150	14	8	6	3	3
High leaded brass		1065	825	565	410	260	14	8	6	3	3
Leaded brass		610	460	275	215	150	14	8	6	3	3
Low loaded brass		455	305	150	60	20	14	8	3	3	3
Leaded copper		765	550	360	240	120	14	8	3	3	3
Cadmium copper		90	60	30	25	20	14	8	3	3	3
Magnesium		1500	1385	1220	915	610	14	8	3	3	3
Cadmium		1220	1065	915	915	760	14	8	6	3	3
Manganese		60	45	30	25	20	24	14	6	3	3
Nickel		55	40	30	25	20	18	14	6	3	3
Bdenum		55	45	40	35	25	18	14	6	3	3
Chrome		50	40	25	20	20	18	14	6	3	3
Silicon		55	30	30	20	20	18	14	6	3	3
Carbon (8~35)		1220	1065	915	765	610	10	6	3	3	3
Carbon (35~65)		615	245	90	45	20	14	10	6	3	3
Carbon (1008~ 1095)		60	45	30	25	20	24	14	6	3	3
Rubber		460	155	90	60	45	18	14	10	8	6
Plastics		1500	1065	765	550	455	10	8	3	3	3

Table 5

# 17.0 Typical Band Saw Operations

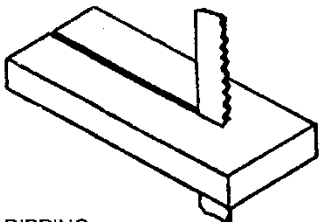
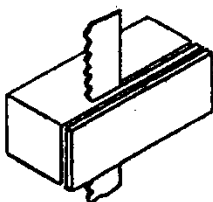
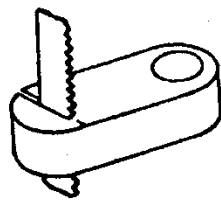
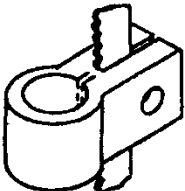
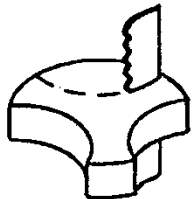
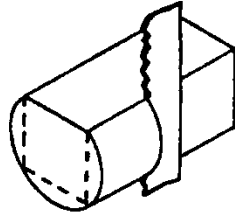
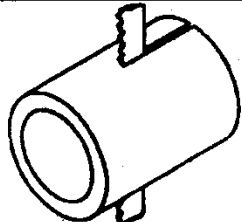
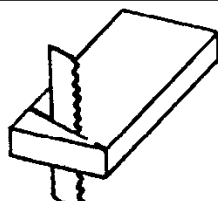
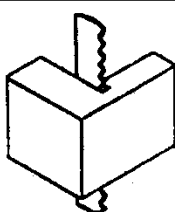
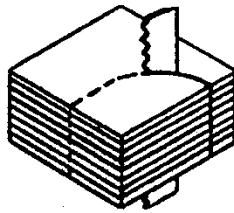
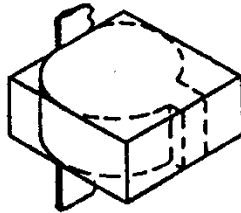
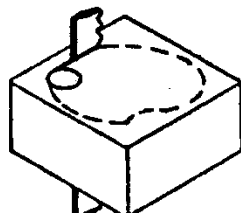
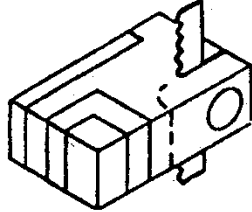
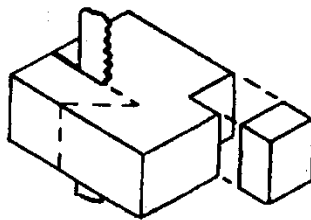
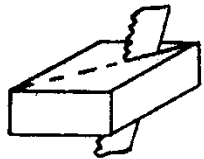
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 <p>SLOTTING</p>	 <p>SEGMENTING</p>	 <p>SHAPING CUT</p>
 <p>SPLITTING</p>	 <p>ANGULAR CUT</p>	 <p>GRINDING RELIEF</p>
 <p>STACK CUTTING</p>	 <p>EXTERNAL CONTOUR</p>	 <p>INTERNAL CONTOUR</p>
 <p>THREE-DIM. CUTTING</p>	 <p>SHAPING</p>	 <p>COMPOUND ANGLE CUT</p>

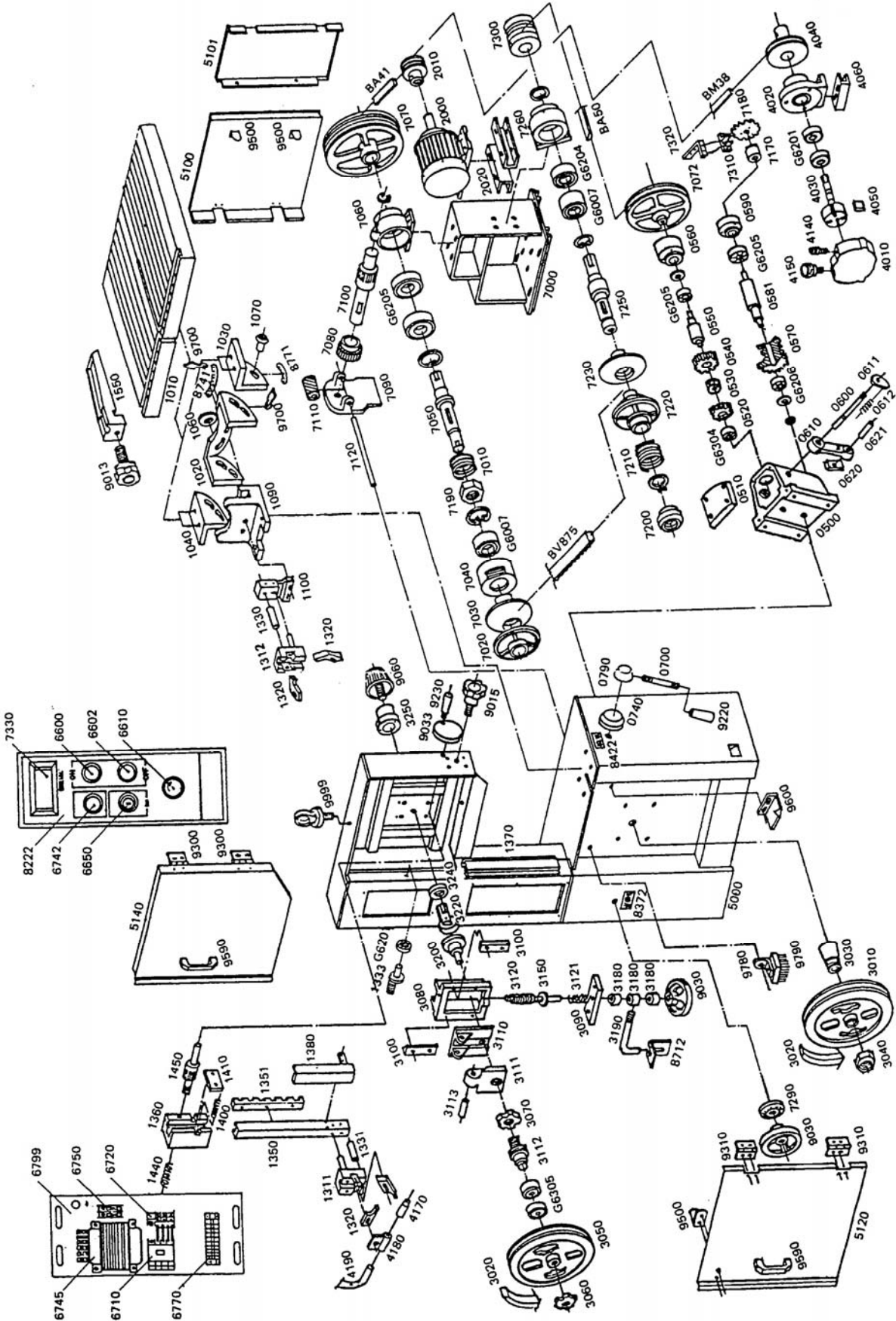
Figure 20

# 18.0 Replacement Parts

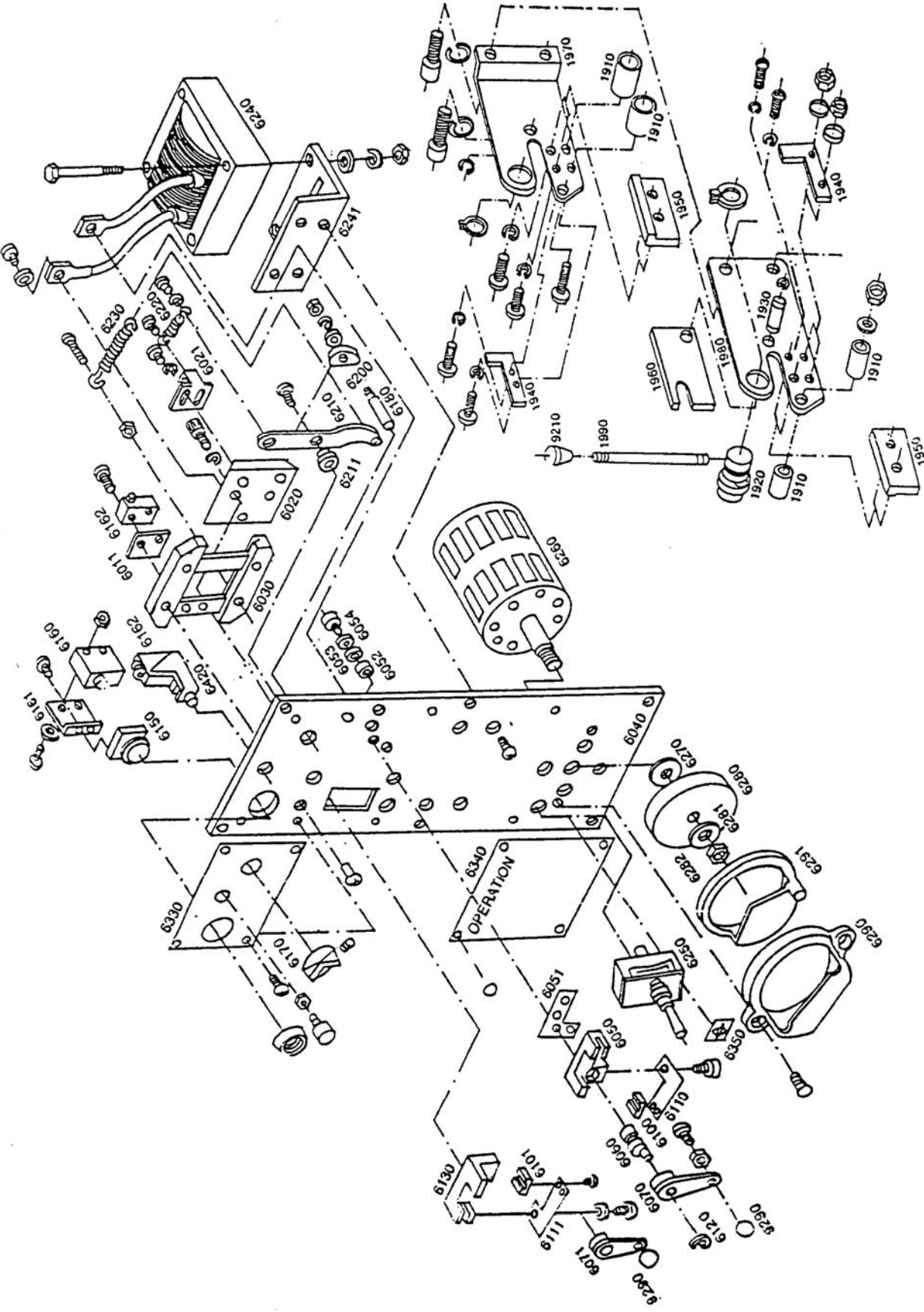
Replacement parts are listed on the following pages. To order parts or reach our service department, call 1-800-274-6848 Monday through Friday (see our website for business hours, [www.jettools.com](http://www.jettools.com)). Having the Model Number and Serial Number of your machine available when you call will allow us to serve you quickly and accurately.

Note: An asterisk in the parts list indicates the part belongs to a complete assembly.

18.1.1 VBS-2012 Band Saw – Exploded View



18.1.2 VBS-2012 Band Saw (Welder Assembly) – Exploded View



### 18.1.3 VBS-2012 Band Saw – Parts List

Index No	Part No	Description	Size	Qty
<b>Control Panel Assembly</b>				
6600	VBS2012-6600	Push Button - On		1
6602	VBS2012-6602	Push Button – Off		1
6610	VBS2012-6610	Emergency Off Switch		1
6650	VBS2012-6650	Key Switch		1
6710	VBS2012-6710	Magnetic Switch		2
6720	VBS2012-6720	Starter Overload		1
6742	VBS2012-6742	Power On Indicator Light		1
6745	VBS2012-6745	Voltage Reducer		1
6750	VBS2012-6750	Fuse		2
6799	VBS2012-6799	Wiring Plate		1
<b>Guide Post Assembly</b>				
1310	VBS1220A-131	Blade Guide Support		2
1320	VBS16-132	Blade Guide		4
1330	VBS1220M-133	Blade Stop		2
1333	VBS2012-1333	Eccentric Shaft		1
G6201	BB-6201V	Ball Bearing		2
1350	VBS2012-1350	Blade Guide Post		1
1351	VBS2012-1351	Gear Bar		1
1360	VBS2012-1360	Guide Post Housing		1
1370	VBS2012-1370	Blade Guard – Left		1
1380	VBS2012-1380	Blade Guard – Right		1
1400	VBS2012-1400	Spring		2
1410	VBS2012-1410	Spring Housing		1
1450	VBS2012-1450	Post Elevating Gear		1
9015	VBS2012-9015	Guide Post Lock		1
9033	VBS2012-9033	Post Elevating Handwheel		1
9230	VBS2012-9023	Handle		1
<b>Work Table Assembly</b>				
1010	VBS2012-1010	Work Table		1
1020	VBS1220M-102	Table Support Frame (s/n prior to 0709140)		1
	VBS1220M-1021	Table Support Frame (s/n 0709140 and higher)		1
1030	VBS1220M-103	Table Bracket – Right (s/n prior to 0709140)		1
	VBS1220M-1031	Table Bracket – Right (s/n 0709140 and higher)		1
1040	VBS1220M-104	Table Bracket – Left (s/n prior to 0709140)		1
	VBS1220M-1041	Table Bracket – Left (s/n 0709140 and higher)		1
1060	TS-0680061	Washer	1/2"	2
1070	VBS2012-1070	Tube Screw		4
1080	VBS2012-1080	Blade Guard (not shown)		2
1090	VBS1220M-109	Table Support Housing		1
1100	VBS1220M-1100	Guide Support Housing		1
1550	VBS2012-1550	Rip Fence		1
8741	VBS2012-8741	Tilt Indicator – L&R		1
8771	VBS2012-8771	Tilt Indicator – F&B		1
9013	VBS2012-9013	Rip Fence Lock		1
9700	VBS2012-9700	Indicating Needle		2
<b>Motor Assembly</b>				
2000	VBS2012-2000	Motor		1
2010	VBS2012-2010	Motor Pulley		1
BA41	VB-A41	V-Belt		2
BA50	VB-A53	V-Belt		2
2020	VBS2012-2020	Motor Suspension Arm		2



### Lower Wheel Assembly

3010	VBS1220A-301	Lower Wheel	1
3020	VBS-1220A-302	Rubber Tire	1
	VBS2012-301	Lower Wheel with Tire	1
3030	VBS2012-3030	Taper Sleeve	1
3040	VBS2012-3040	Wheel Lock Nut	1

### Upper Wheel Assembly

3050	VBS1220A-305	Upper Wheel	1
3020	VBS-1220A-302	Rubber Tire	1
G6305	BB-6305	Ball Bearing	2
	VBS2012-305	Upper Wheel w/ Tire and Bearings	1
3060	VBS2012-3060	Upper Wheel Lock	1
3070	VBS2012-3070	Upper Wheel Nut	2

### Blade Tracking Assembly

3080	VBS2012-3080	Slide Block Housing *	1
3090	VBS2012-3090	Slide Block Seat *	1
3100	VBS2012-3100	Slide Block Guide *	2
	VBS2012-3110A	Upper Wheel Slide Assembly (includes #3110,3111,3113)	1
3110	VBS2012-3110	Upper Wheel Slide *	1
3111	VBS2012-3111	Slide Cover *	1
3112	VBS2012-3112	Slide Screw Shaft *	1
3113	VBS2012-3113	Slide Pin *	1
3120	VBS2012-3120	Wheel Elevating Shaft *	1
3121	VBS2012-3121	Spring *	1
3150	VBS2012-3150	Washer *	ø16/Ø30mm 1
3180	VBS2012-3180	Indicator Ring *	3
*	VBS2012-3080CP	Slide Housing Complete	1
3190	VBS2012-3190	Tension Indicator	1
9030	VBS2012-9030	Handwheel	1
8712	VBS2012-8712	Indicator Plate	1
3200	VBS2012-3200	Wheel Tracking Adjuster	1
3220	VBS2012-3220	Wheel Tracking Connector	1
3240	VBS2012-3240	Connector Washer	1
3250	VBS2012-3250	Connector Housing	1
9060	VBS2012-9060	Tracking Handwheel	1
9780	VBS2012-9780	Brush Bracket	1
9790	VBS2012-9790	Chip Brush	1

### Gear Box Assembly

0500	VBS2012-0500	Gear Box *	1
0510	VBS2012-0510	Gear Box Cover *	1
0520	VBS2012-0520	Gear *	1
0530	VBS2012-0530	Screw Nut *	35mm 1
0540	VBS2012-0540	Gear *	1
0550	VBS2012-0550	Gear Shaft *	1
0560	VBS2012-0560	Shaft Cover *	1
0570	VBS2012-0570	Gear *	1
0581	VBS2012-0580	Main Shaft * (s/n 6045651 and higher)	1
	VBS2012-0581	Main Shaft * (previous to s/n 6015660)	1
0590	VBS2012-0590	Main Shaft Cover *	1
0600	VBS2012-0600	Speed Changing Shaft *	1
0610	VBS2012-0610	Speed changing Arm *	1
0611	VBS2012-0611	Shaft Stop *	1
0612	VBS2012-0612	Spring *	1
0620	VBS2012-0620	Slide Block *	1
0621	VBS2012-0621	Slide Block Pin *	1
0624	VBS2012-0624	Key (not shown) *	1
0700	VBS2012-0700	Speed Change Lever *	1
0740	VBS2012-0740	Shaft Housing *	1
0790	VBS2012-0790	Speed Housing Ring *	1
9220	VBS2012-9220	Speed Lever Knob *	1

G6205	BB-6205	Ball Bearing *	3
G6206	BB-6206	Ball Bearing *	1
G6304	BB-6304	Ball Bearing *	1
*	VBS2012-0550CP	Gear Box Assembly Complete	1
8422	VBS2012-8422	Gear Box Warning Label	1

### Air Pump Assembly

4010	VBS2012-4010	Air Pump Housing *	1
4020	VBS2012-4020	Air Pump Cover *	1
4030	VBS2012-4030	Air Pump Shaft *	1
G6201	BB-6201	Ball Bearing *	2
4040	VBS2012-4040	Air Pump Pulley *	1
4050	VBS2012-4050	Air Pump Leaves *	4
4060	VBS2012-4160	Air Pump Housing *	1
4140	VBS2012-4140	Air Outlet *	1
4150	VBS2012-4150	Air Inlet *	1
4170	VBS2012-4170	Air Nozzle *	1
4180	VBS2012-4180	Air Nozzle Clip *	1
BM38	VB-M39	V-Belt *	1
*	VBS16-401CP	Air Pump Assembly Complete	1

### Main Body

5000	VBS2012-5000	Main Body	1
5100	VBS2012-5100	Rear Door – Larger	1
9310	VBS2012-9310	Hinge	6
9500	VBS2012-9500	Spring Plate	6
9590	VBS2012-9590	Handle	3
5101	VBS2012-5101	Rear Door – Smaller	1
5120	VBS2012-5120	Lower Door – Front	1
5140	VBS2012-5140	Upper Door – Front	1
9300	VBS2012-9300	Upper Door Hinge	2
9999	VBS2012-9999	Eye Bolt	1
	STRIPE-1-3/4	JET Stripe (not shown)	1-3/4" per ft.

### Variable Speed Assembly

7000	VBS2012-7000	Motor Spring Housing *	1
7010	VBS2012-7010	Spring *	1
7020	VBS2012-7020	Variable Speed Disk – Upper Outside *	1
7030	VBS2012-7030	Variable Speed Disk – Upper Inside *	1
7040	VBS2012-7040	Variable Speed Housing Tube *	1
G6007	BB-6007	Ball Bearing *	1
7050	VBS2012-7050	Variable Speed Disk Shaft *	1
G6205	BB-6205	Ball Bearing *	2
7060	VBS2012-7060	Variable Speed Housing *	1
*	VBS2012-7000CP	Variable Speed Housing Assembly Complete	1
7070	VBS2012-7070	Pulley	9"
7080	VBS2012-7080	Worm Gear	1
7090	VBS2012-7090	Worm Gear Housing	1
7100	VBS2012-7100	Gear Shaft	1
7120	VBS2012-7120	Arm	1
7170	VBS2012-7170	Detector Disk Housing	1
7180	VBS2012-7180	Detector Disk	1
7190	VBS2012-7190	Screw Nut	1
8372	VBS2012-8372	Variable Speed Instruction Label	1

### Variable Speed Shaft Assembly

7200	VBS2012-7200	Spring Housing *	1
7210	VBS2012-7210	Spring *	1
7220	VBS2012-7220	Variable Speed Disk – Lower Outside *	1
7230	VBS2012-7230	Variable Speed Disk – Lower Inside *	1
7250	VBS2012-7250	Variable Speed Shaft *	1
G6007	BB-6007	Ball Bearing *	1
G6204	BB-6204	Ball Bearing *	1

7260	VBS2012-7260	Shaft Housing *	1
*	VBS2012-7200CP	Variable Speed Housing Assembly Complete	1
7290	VBS2012-7290	Wheel Seat	1
7300	VBS2012-7300	Pulley	1
7310	VBS2012-7310	Speed Readout Detector	1
7320	VBS2012-7320	Detector Housing	1
7330	VBS1220M-661	Digital Tachometer	1
9030	VBS2012-9030	Handwheel	1
BV875	VBS2012-BV875	Cog Belt	1
BA41	VB-A41	V-Belt	A41 2

### Work Lamp Assembly

6810	VBS2012-6810	Light Shield *	1
6820	VBS2012-6820	Shield Joint *	1
6830	VBS2012-6830	Brass Nut *	1
6840	VBS2012-6840	Lamp Arm *	1
6850	VBS2012-6850	Arm Joint *	1
6860	VBS2012-6860	Arm Tube *	2
6870	VBS2012-6870	Tube Holder *	1
6880	VBS2012-6880	Arm Nut *	4
6890	VBS2012-6890	Tube Locker *	2
6900	VBS2012-6900	Arm Housing Adjuster *	1
6910	VBS2012-6910	Housing Adjust Screw *	1
6920	VBS2012-6920	Lamp Arm Housing *	1
6930	VBS2012-6930	Upper Arm Holder (RE:VBS2012-6920) *	1
6940	VBS2012-6940	Lower Arm Holder (RE:VBS2012-6920) *	1
6950	VBS2012-6950	Lamp Socket *	1
9040	VBS2012-9040	Brass Handwheel *	1
*	VBS2012-6950CP	Work Lamp Assembly Complete	1

### Welder/Grinder Assembly

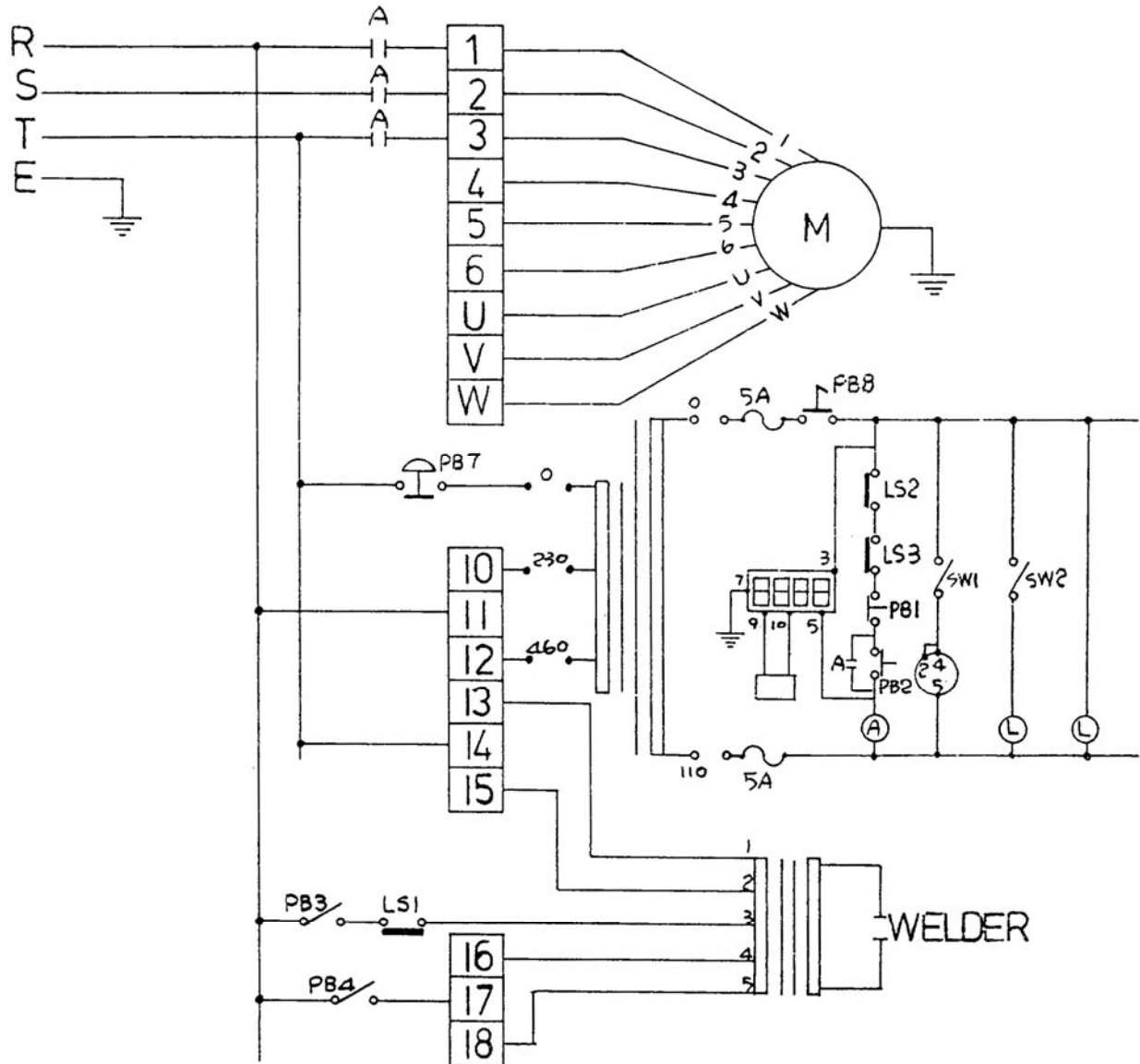
6010	JWG34-601	Limit Switch *	2
6011	PR-EV-6011	Insulator *	1
6020	PR-EV-6020	Guide Block *	1
6021	PR-EV-6021	Spring Bracket *	1
6030	PR-EV-6030	Guide Casting *	1
6040	PR-EV-6040	Housing *	1
6050	PR-EV-6050	Stationary Jaw *	1
6051	PR-EV-6051	Insulator *	1
6052	PR-EV-6052	Insulating Tube *	3
6053	PR-EV-6053	Insulating Washer *	3
6054	PR-EV-6054	Spacer *	3
6060	PR-EV-6060	Eccentric Shaft *	2
6070	PR-EV-6070	Clamp Lever – Right *	1
6071	PR-EV-6071	Clamp Lever – Left *	1
9290	PR-EV-9290	Knob *	1
6100	PR-EV-6100	Clamp Support – Right *	1
6101	PR-EV-6101	Clamp Support – Left *	1
6110	PR-EV-6110	Clamp Plate – Right *	1
6111	PR-EV-6111	Clamp Plate – Left *	1
6120	PR-EV-6120	Cam *	2
6130	PR-EV-6130	Moving Jaw *	1
6150	JWG34-615	Weld Button *	1
6160	PR-HV-6160	Micro Switch *	1
6161	PR-EV-6161	Switch Bracket *	1
6170	PR-EV-6170	Pressure Adjust Knob *	1
6180	PR-EV-6180	Shaft *	1
6200	PR-EV-6200	Cam *	1
6210	PR-EV-6210	Weld Tension Arm *	1
6211	PR-EV-6211	Bushing *	1
6220	PR-EV-6220	Spring – Short *	1
6230	PR-EV-6230	Spring – Long *	1
6240	VBS1220M-624	Transformer *	1
6241	PR-HV-6241	Mounting Bracket *	1

6250	PR-EV-6250	Switch *	1
6260	PR-EV-6260	Grinder Motor *	1
6270	PR-EV-6270	Spacer *	1
6280	PR-EV-6280	Grinding Wheel *	1
6281	TS-0680021	Washer *	1/4"
6282	TS-1540041	Nut *	6mm
6290	VBS1220M-629	Grinder Guard *	1
6291	PR-EV-6291	Grinder Cover *	1
6330	PR-HV-6330	Name Plate *	1
6340	PR-EV-6340	Instruction Label *	1
6350	PR-EV-6420	Grinder Label *	1
6420	PR-HV-6420	Anneal Switch *	1
*	VBS2012-WCP	Welder Assembly Complete	1

### Shear Assembly

1910	PR-EV-1910	Spindle Bushing *	4
1920	PR-EV-1920	Spindle Lift *	1
1930	PR-EV-1930	Blade Shaft *	1
1940	PR-EV-1940	Vaned Iron Plate (Blade Stop) *	2
1950	PR-EV-1950	Lower Blade *	2
1960	PR-EV-1960	Upper Blade *	2
1970	PR-EV-1970	Joint Plate – Left *	1
1980	PR-EV-1980	Joint Plate – Right *	1
1990	PR-EV-1990	Handle Bar *	1
9210	PR-EV-9210	Knob *	1
*	VBS2012-SCP	Shear Assembly Complete	1

# 19.0 Electrical Connections



- PB1 - Saw Stop Switch
- PB2 - Saw Start Switch
- PB3 - Weld Switch
- PB4 - Anneal Switch
- PB7 - Emergency Stop
- PB8 - Main Power Key
- LS1 - Auto Weld Stop Switch
- LS2 - Safety Switch
- LS3 - Safety Switch
- SW1 - Grinder On-Off Switch
- SW2 - Work Lamp On-Off Switch

### Jumper Wire Settings

220V	440V
1 - U	4 - U
2 - V	5 - V
3 - W	6 - W
4 - 5 - 6	11 - 12
10 - 11	13 - 14
14 - 15	17 - 18
16 - 17	

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