



Operating Instructions and Parts Manual

14-inch Metalworking Band Saw

Model VBS-1408



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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. JET woodworking machinery is designed to be used with Wood. Use of these machines in the processing of metal, plastics, or other materials outside recommended guidelines may void the warranty. The exceptions are acrylics and other natural items that are made specifically for wood turning.

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
1 Year – Motors; Machine Accessories
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; Air Tools

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

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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:



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



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-1408 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.

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



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-1408
Stock number	414483
Blade speed	variable, 82-330 SFPM
Capacities:	
Height (max. thickness)	8"
Throat (max. width)	14"
Welder capacity	1/2"
Motor	TEFC, 1HP (0.75kW), 1PH, 115/230V (prewired 115V), 14/7 A, 60Hz
Table size	20" x 20"
Table height from floor at 90°	39"
Table tilt:	
Front and Back	8 deg.
Right	15 deg.
Left	12 deg.
Blade length (approximate)	114"
Blade width, minimum to maximum	1/8 to 1/2"
Overall height	68-1/2"
Floor space required	34" x 24"
Weights:	
Net	580 lb
Shipping	685 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 hex cap screws.
4. Place rip fence onto table and tighten with locking knob.

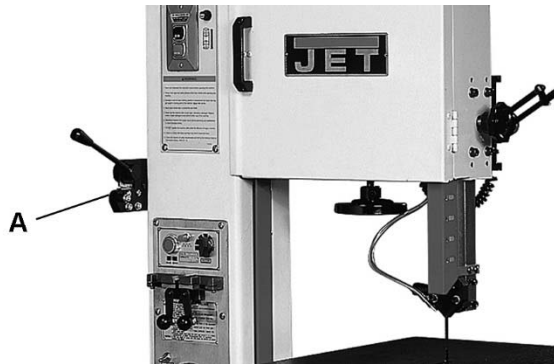


Figure 1

7.0 Installation

1. Remove three (3) 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-1408 Band Saw is rated at 115/230V and comes from the factory prewired 115V.

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 230V 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 section 19.0, *Electrical diagram*.
3. Replace the 115V plug with a proper UL-listed plug suitable for 230V operation.

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

9.0 Controls

Variable Speed Handwheel (B, 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 (C, Figure 2) – Turn counterclockwise to loosen and clockwise to tighten.

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

Main Motor Start Switch (E, Figure 2) – Press to start band saw.

Main Motor Stop Switch (F, Figure 2) – Press to stop band saw.

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

Blade Tension Handwheel (H, Figure 2) – located on underside of upper frame. Turn clockwise to tension blade; counterclockwise to release tension on blade.

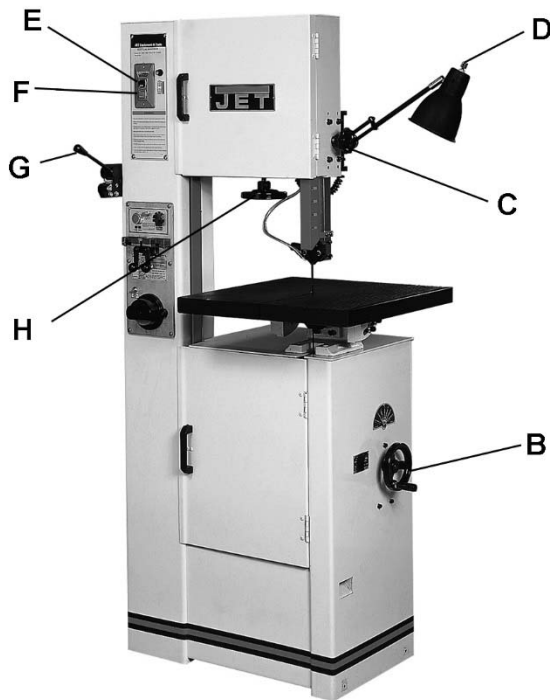


Figure 2

Grinder Toggle Switch (I, Figure 3) – located on blade welder panel. Flip switch up to start grinder; flip down to stop grinder.

Weld Button (J, Figure 3) – 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 (K, Figure 3) – located on blade welder panel. Press and hold to anneal blade, release to stop.

Blade Clamp Pressure Knob (L, Figure 3) – located on blade welder panel. Sets pressure for different width blades. Turn counterclockwise to bring blade clamps closer together, clockwise to separate.

Blade Clamps (M, Figure 3) – located on blade welder panel. DOWN position allows insertion of blade into clamp. UP position locks blade.

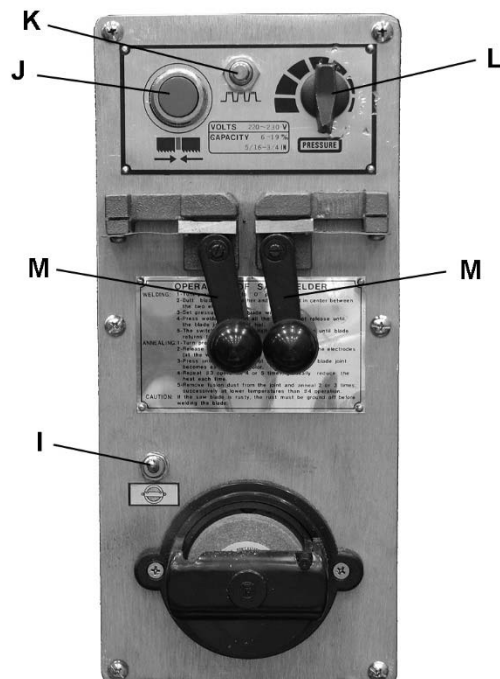


Figure 3

Table Tilt Mechanism (N, Figure 4) – located under work table. To tilt table left or right, loosen two socket head cap screws (N, Figure 4) at rear of mechanism. To level table front to back, loosen four socket head cap screws (O, Figure 5) on either side of mechanism.

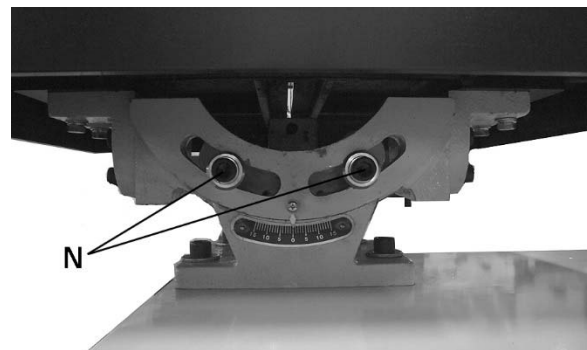


Figure 4

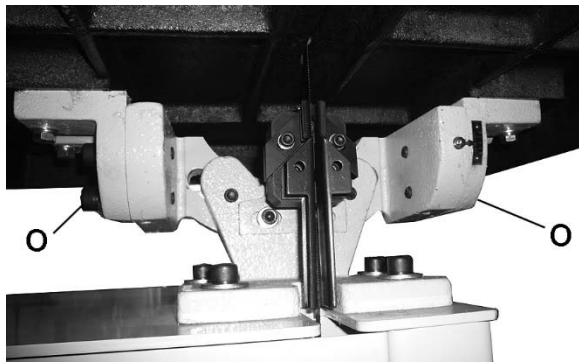


Figure 5

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 6) and lifting blade guide handle (B, Figure 6) to its highest position.

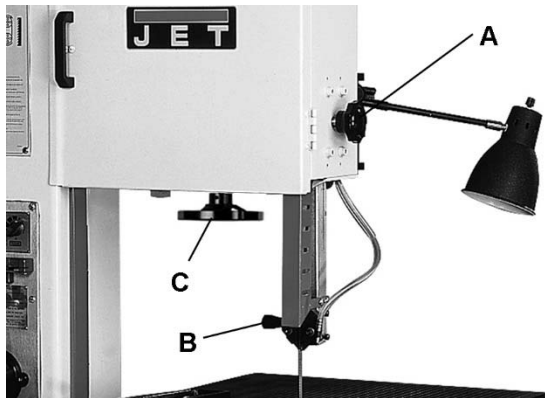


Figure 6

2. Apply finger pressure to blade. Travel from vertical should be approximately 3/8" each way.
3. To tighten blade, turn handwheel (C, Figure 6) clockwise. To loosen blade, turn handwheel counterclockwise.
4. Use blade tension indicator as reference only. Blade should be tensioned using the finger pressure method.

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 upper blade wheel door. Turn upper blade wheel by hand while observing blade position on upper blade wheel. Blade should run

next to, but not against, the flange at the rear. If adjustment is needed:

1. Slightly loosen all four socket head cap screws (D, Figure 7).
2. Tighten two top set screws (E, Figure 7) slightly to shift blade toward front. Conversely, tighten two lower set screws (F, Figure 7) to shift blade toward rear.
3. Once blade is tracking properly, slightly tighten the other two set screws.
4. Tighten all four socket head cap screws (D).

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

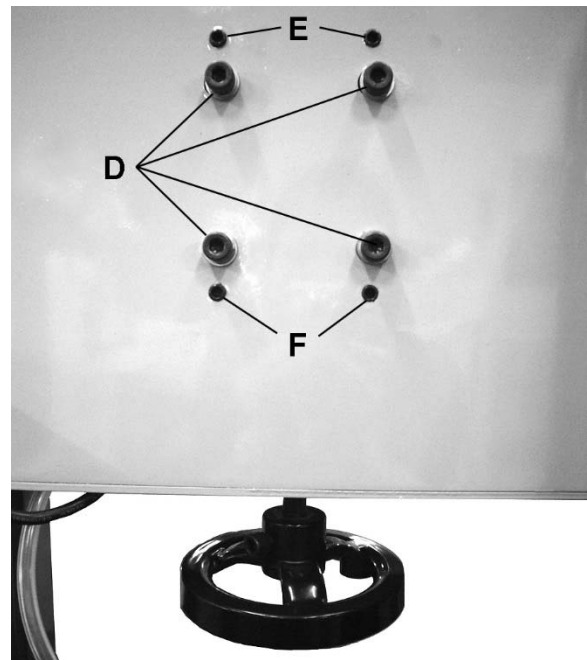


Figure 7

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.

Blade guide adjustment has been set by the manufacturer. Should future adjustment be needed, proceed as follows.

1. Loosen upper blade guide lock knob and raise guide assembly to half-way between table and head, then tighten lock knob
2. Loosen two set screws (G, Figure 8) and adjust guide so that blade guides are in back of saw teeth. Blade guides must be adjusted

far enough back to clear saw blade even during cutting operation when the blade is deflected toward the rear.

3. Tighten the two screws (G, Figure 8).
4. Open upper access door and rotate blade wheel by hand until weld portion of blade is between the two fingers.
5. Loosen two socket head cap screws (H, Figure 8) and adjust each finger toward the blade. They should not touch the blade. Adjust for 0.010" clearance on either side.
6. Retighten the two screws (H, Figure 8) once proper adjustment has been made. Be sure that adjustment for air nozzle has not changed and it directs the flow of air to the cut.

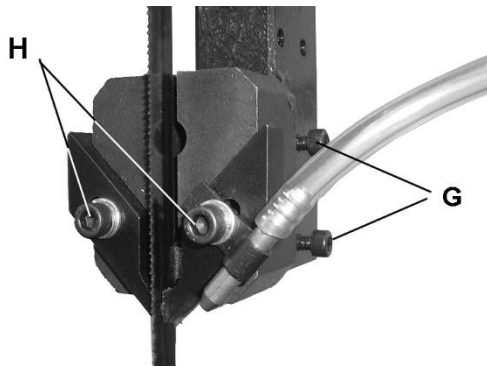


Figure 8

7. Adjust lower blade guides in similar 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 from both wheels and maneuver it around blade guard on column and protective shield on upper blade guide. **Use gloves when handling blades.**
5. Install new blade by maneuvering around blade guard on column and protective 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. 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.
8. 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 9. Make sure blade is held square with shear knife, so that cut will be square with blade.

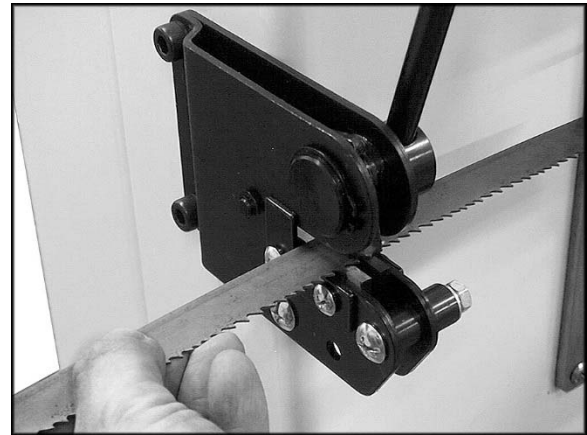


Figure 9

3. Position blade so that cut is made at a place that allows for uniform spacing of teeth. See Figure 10.
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 11.

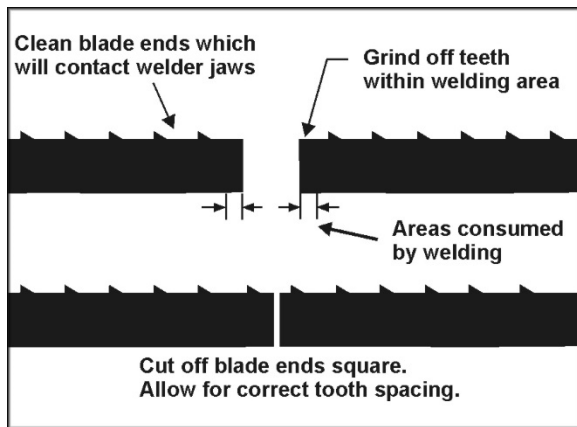


Figure 10

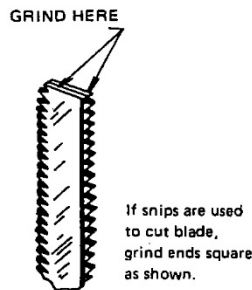


Figure 11

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 10, 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.
2. 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.

3. Turn pressure knob (Figure 12) to "0" position (pointed downward). NOTE: There will be some resistance when turning knob.
4. 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.

5. 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.
6. 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.

7. Press and hold weld button (Figure 12). 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."

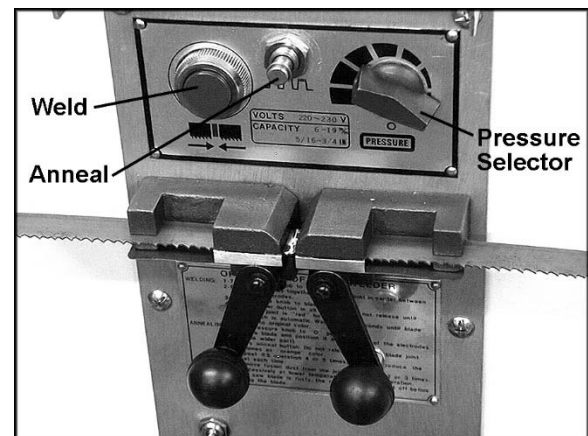


Figure 12

8. Release weld button, and wait 3 or 4 seconds until blade returns to original color. Unclamp blade.
9. Rotate pressure selector switch back to "0".
10. 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 13 for examples of incorrect welds.
11. If the weld is imperfect, refer to section 15.3 for possible remedies to any problems. Make corrections before annealing.

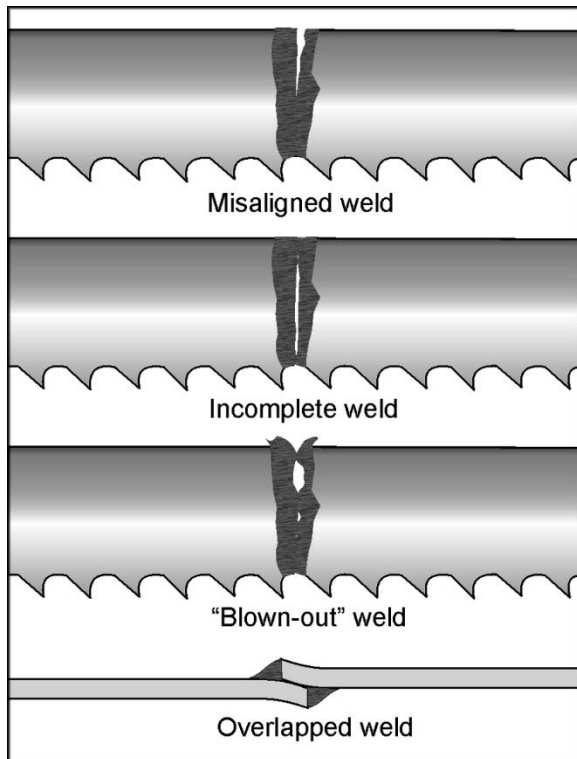


Figure 13

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.

1. Turn pressure selector knob all the way to left so clamp jaws are closest to each other.
2. Insert blade into clamps so that weld area is centered between clamps. Secure blade in jaws with the clamp handles.
3. Quickly press and release ("jog") the anneal button (Figure 13). 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.

4. Release both blade clamps, allow blade to cool, then remove blade from clamps.
5. 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.

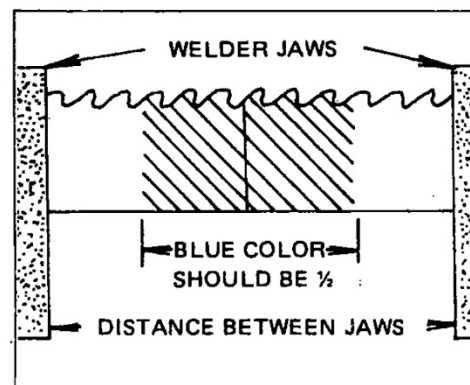
The following are variations of the general procedure, based upon blade type:

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 14

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 15). 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 16 illustrates some unacceptable grindings.



Figure 15

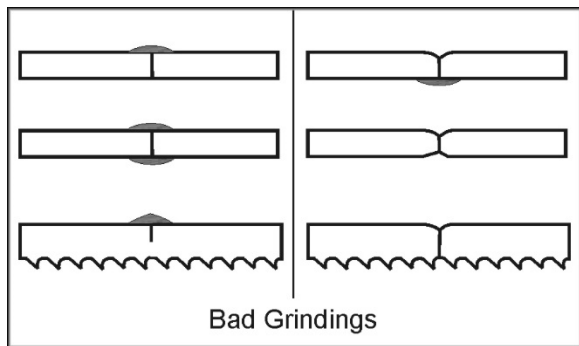


Figure 16

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. Start saw using the pushbutton.
3. 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

Table 5

Thickness	Sawing speed (M/min) for specified Material & thickness					Pitch (No. of teeth / inch)				
Material	~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

17.0 Typical Band Saw Operations

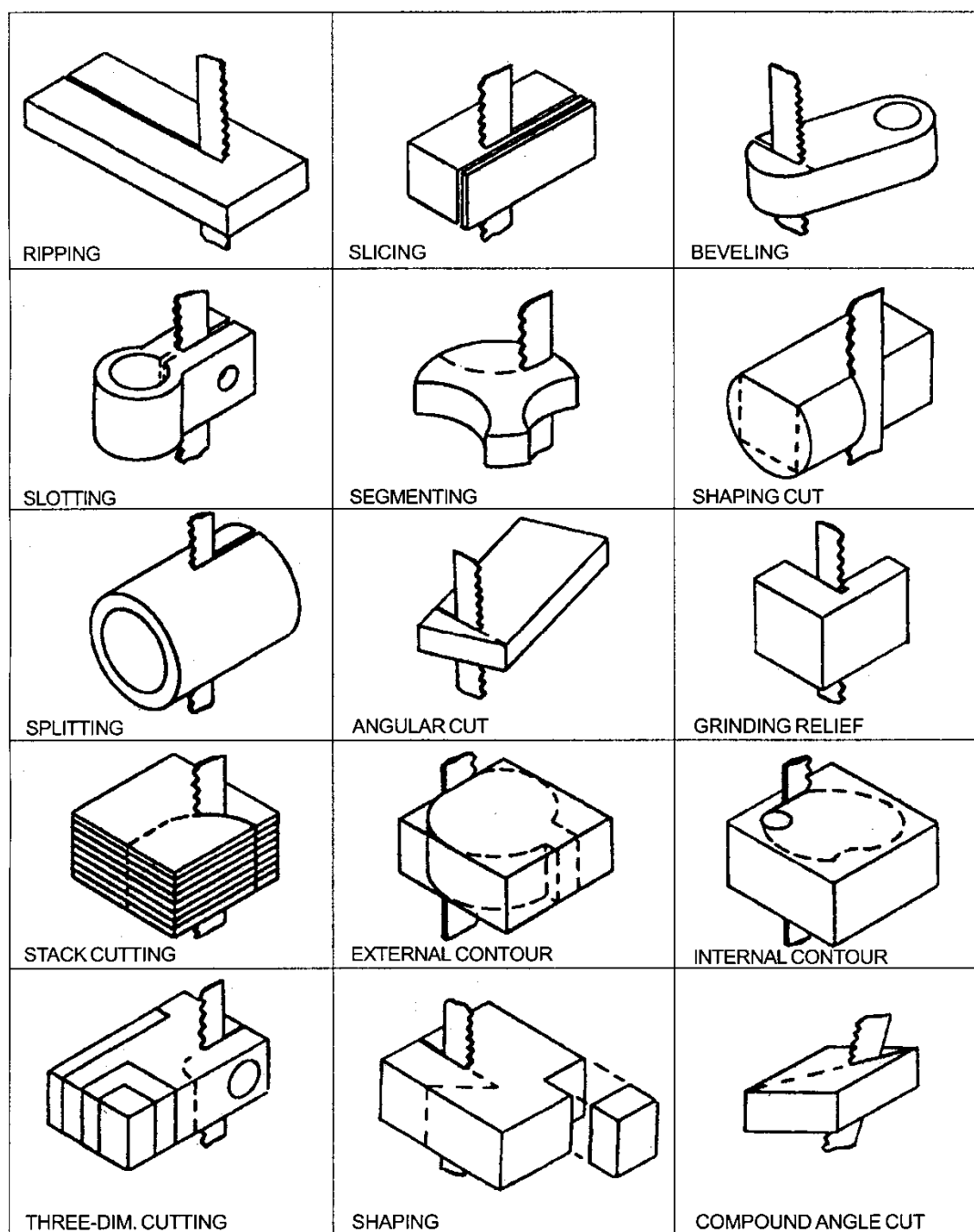
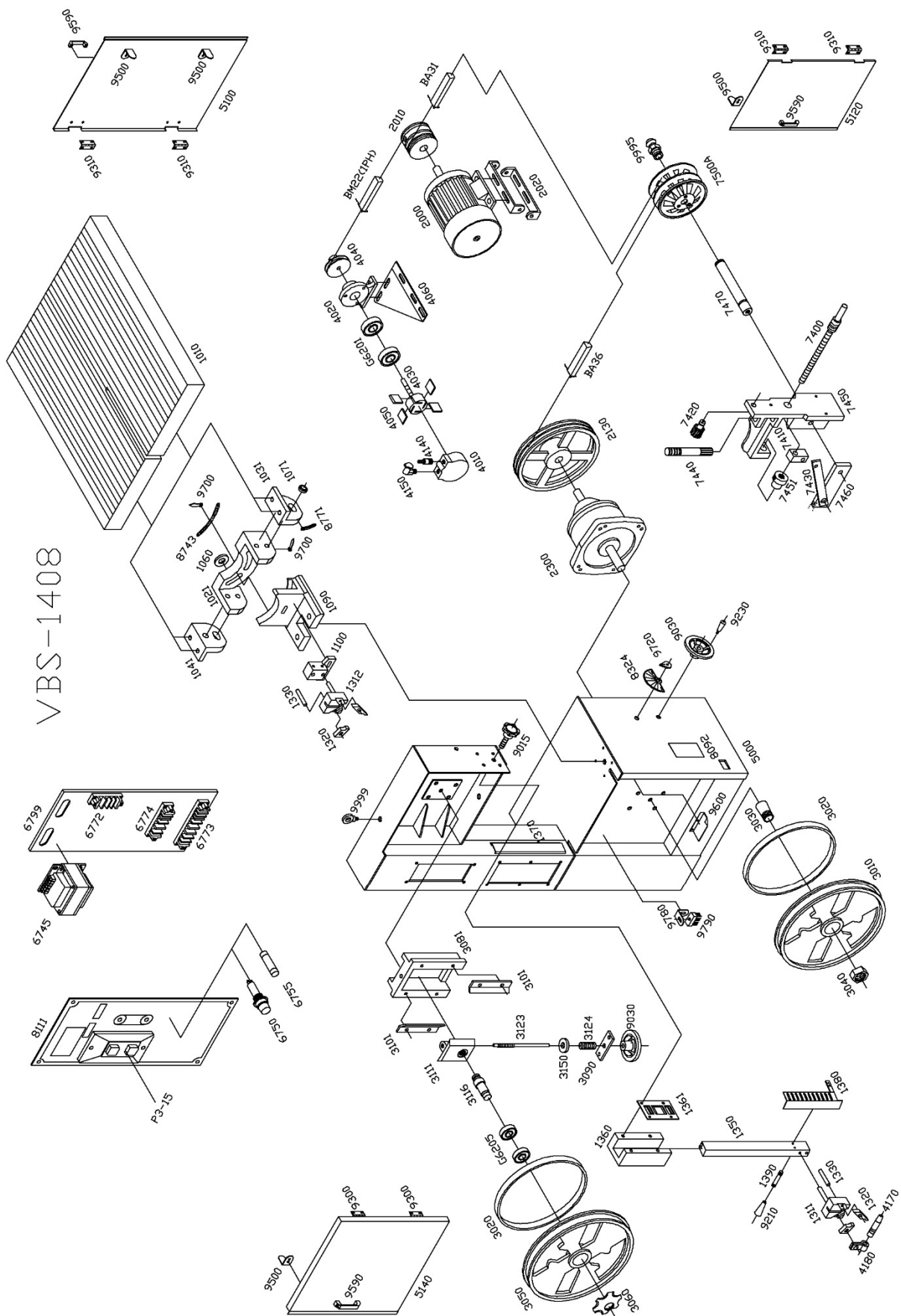


Figure 17

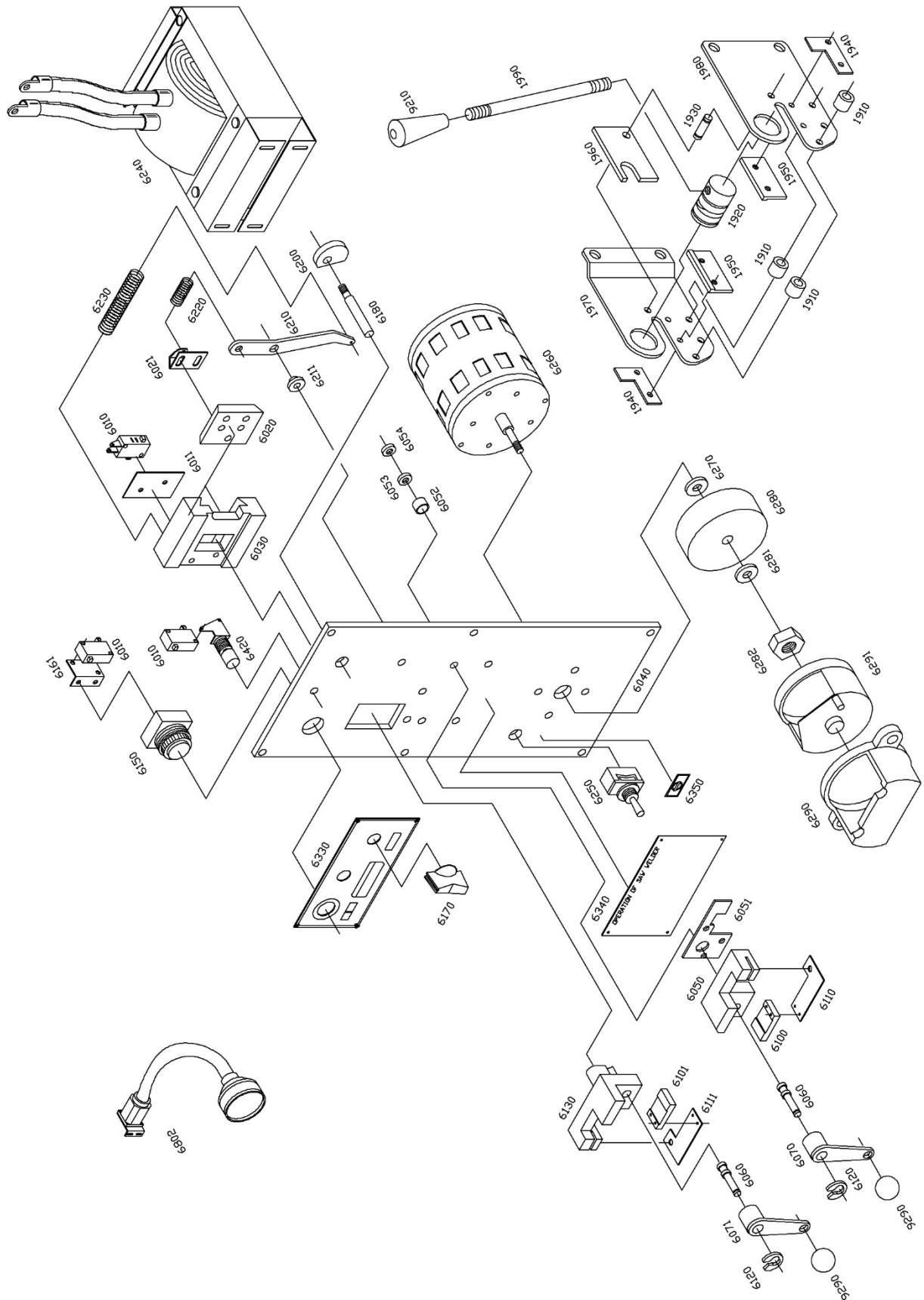
18.0 Replacement Parts

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

18.1.1 VBS-1408 Band Saw – Exploded View



18.1.2 VBS-1408 Band Saw (Welder Assembly) – Exploded View



18.1.3 VBS-1408 Band Saw – Parts List

Index No	Part No	Description	Size	Qty
1010	VBS1408-1010	Work Table		1
1020	VBS14-102	Table Support Frame (s/n previous to 7011501)		1
	VBS14-1021	Table Support Frame (s/n 7011501 and higher)		1
1030	1030	Table Bracket – Right (s/n previous to 7011501)		1
	VBS14-1031	Table Bracket – Right (s/n 7011501 and higher)		1
1040	1040	Table Bracket – Left (s/n previous to 7011501)		1
	VBS14-1041	Table Bracket – Left (s/n 7011501 and higher)		1
1060	TS-0680061	Washer	1/2"	2
1070	1070	Tube Screw		2
1090	1090	Table Support Housing		1
1100	1100	Guide Support Housing		1
1311	VBS16-1311	Blade Guide Upper Support		1
1312	VBS16-1312	Blade Guide Lower Support		1
1320	VBS1220A-132	Blade Guide		4
1330	VBS16-133	Blade Stopper		2
1350	1350	Blade Guide Post		1
1360	1360	Guide Post Housing		1
1361	1361	Post Clamp Spring		1
1370	1370	Blade Guard (left)		1
1380	1380	Blade Guard (right)		1
1390	1390	Post Holding Pin		1
	VBS1610-BS	Blade Shear Assembly Complete		1
1910	1910	Bushing (re: VBS1610-BS)		3
1920	1920	Lift (re: VBS1610-BS)		1
1930	1930	Blade Shaft (re: VBS1610-BS)		1
1940	1940	Vaned Iron Plate (re: VBS1610-BS)		2
1950	1950	Lower Blade (re: VBS1610-BS)		2
1960	1960	Upper Blade (re: VBS1610-BS)		1
1970	1970	Plate (re: VBS1610-BS)		1
1980	1980	Joint (re: VBS1610-BS)		1
1990	1990	Handle Bar (re: VBS1610-BS)		1
2000	VBS14-009	Drive Motor		1
2010	VBS1408-2010	Motor Pulley		1
2020	2020	Motor Suspension Arm		2
2130	2130	Reducer Pulley	8"	1
2300	2300	Speed Reducer		1
3010	VBS1408-3010	Lower Wheel		1
3020	VBS14-302	Rubber Tire		2
3030	VBS1408-3030	Taper Sleeve		1
3040	VBS1408-3040	Wheel Locking Nut		1
3050	VBS1408-3050	Upper Wheel		1
3060	VBS1408-3060	Upper Wheel Lock		1
3081	3081	Slide Block Housing		1
3090	VBS14-309	Slide Block Seat		2
3101	3101	Slide Block Guide		2
3111	3111	Upper Wheel Slide		1
3116	3116	Slider Screw Shaft		1
3123	VBS1408-3123	Wheel Shaft		1
3124	3124	Spring		1
3150	3150	Washer	ø13/ø24 mm	1
	VBS1610-AP	Air Pump Assembly Complete		1
4010	4010	Air Pump Housing (re: VBS1610-AP)		1
4020	4020	Pump Cover (re: VBS1610-AP)		1
4030	4030	Pump Shaft (re: VBS1610-AP)		1
4040	4040	Air Pump Pulley		1
4050	4050	Air Pump Vane		4
4060	4060	Bracket		1
4140	4140	Air Outlet (re: VBS1610-AP)		1
4150	4150	Air Inlet (re: VBS1610-AP)		1
4170	4170	Air Nozzle		1

Index No	Part No	Description	Size	Qty
4180	4180	Air Nozzle Clip		1
4190	4190	Air Tube (not shown)		1
5000	VBS1408-5000G	Main Body	gray	1
5100	VBS1408-5100G	Rear Door	gray	1
5120	VBS1408-5120G	Lower Door	gray	1
5140	VBS1408-5140G	Upper Door	gray	1
6010	VBS14-601	Limit Switch		3
6011	6011	Insulator		1
6020	6020	Guide Block		1
6021	6021	Spring Bracket		1
6030	6030	Guide Casting		1
6040	6040	Housing		1
6050	6050	Stationary Jaw		1
6051	6051	Insulator		1
6052	6052	Insulator Tube		3
6053	6053	Insulator Washer		3
6054	6054	Spacer		3
6060	6060	Eccentric Shaft		2
6070	6070	Clamp Lever (right)		1
6071	6071	Clamp Lever (left)		1
6100	6100	Clamp Support (right)		1
6101	6101	Clamp Support (left)		1
6110	6110	Clamp Plate (right)		1
6111	6111	Clamp Plate (left)		1
6120	6120	Cam		2
6130	6130	Moving Jaw		1
6150	6150	Weld Button		1
6161	VBS1610-6161	Bracket		1
6170	VBS16-617	Pressure Adjust Switch		1
6180	VBS16-618	Shaft		1
6200	VBS16-620	Cam		1
6210	VBS16-621	Weld Tension Arm		1
6211	6211	Bushing		1
6220	6220	Spring (short)		1
6230	6230	Spring (long)		1
6240	VBS14-624	Transformer		1
6250	VBS16-625	Switch		1
6260	VBS14-626	Grinder Motor		1
6270	6270	Spacer		1
6280	JWG12-628	Grinder Wheel		1
6281	TS-0680021	Washer	1/4	1
6282	TS-1540041	Nut	6MM	1
6290	VBS16-629	Grinder Guard		1
6291	6291	Grinder Cover		1
6330	6330	Welder Name Plate		1
6340	6340	Instruction Plate		1
6350	6350	Grinder Label		1
6420	6420	Anneal Switch Button		1
6745	6745	Voltage Reducer		1
6750	6750	Fuse Seat		1
6755	6755	Fuse	2A	1
6772	6772	Wiring Housing		1
6773	6773	Wiring Housing		1
6774	6774	Wiring Housing		1
6799	6799	Wiring Plate		1
6802	VBS3612-WL	Work Lamp Assembly (s/n 14091370 and higher)	110V/12V/20W	1
7400	VBS16-7400	Speed Change Shaft		1
7410	VBS16-7410	Shaft Block		1
7420	VBS16-7420	Speed Indicating Shaft		1
7430	VBS16-7430	Gear Shaft Arm		1
7440	7440	Indicate Gear Shaft Arm		1
7450	VBS16-7450	Speed Shaft Housing		1

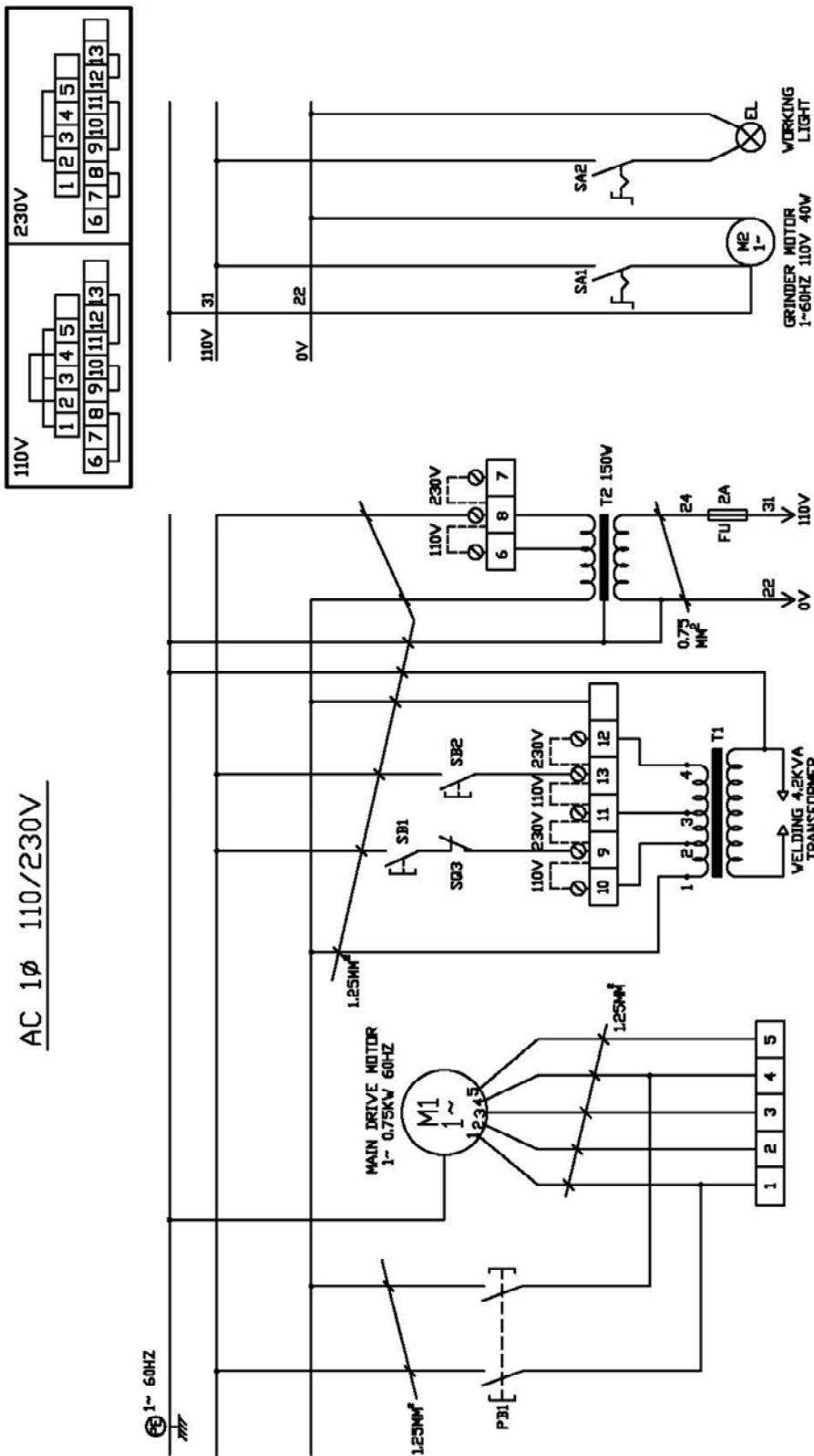
Index No	Part No	Description	Size	Qty
7451	VBS16-7451	Washer Tube		1
7460	VBS16-7460	Pulley Shaft Arm		1
.....	VBS1610-VP	Variable Pulley Assembly Complete.....		1
7470	VBS16-7470.....	Variable Pulley Shaft *		1
7500A.....	7500A.....	Pulley Assembly		1
8092	8092	Label		1
8111	8111A.....	Name Plate		1
8324	8324	Label		1
8743	8743	Tilt Indicator (left and right)		1
8771	8771	Tilt Indicator (front and back)		1
9015	9015	Guide Post Lock		1
9030	9030	Handwheel.....		2
9210	9210	Handle Knob		2
9230	9230	Handwheel Knob		1
9290	VBS14-609.....	Knob		2
9300	9300	Upper Door Hinge.....		2
9310	9310	Hinge		4
9500	9500	Spring Plate		4
9590	9590	Handle		3
9600	9600	Chip Stopper.....		1
9700	9700	Indicate Pointer		2
9720	9720	Pointer		1
9780	9780	Brush Bracket		1
9790	9790	Chip Brush.....		1
9995	9995	Grease Nozzle.....		1
9999	9999	Eye Bolt		1
BA31	VB-A31.....	V-Belt.....		1
BA36	VB-A36.....	V-Belt.....		1
BM22	VB-M22	V-Belt		1
G6201	BB-6201	Ball Bearing		2
G6205	BB-6205	Ball Bearing		2
P3-15.....	P3-15.....	On-Off Switch		1
.....	JET-203.....	JET Logo (not shown).....	203 x 84mm	1

* Included in VBS1610-VP Variable Pulley Assembly Complete

19.0 Electrical diagram (VBS-1408)

WIRING DIAGRAM

AC 1Ø 110/230V



SBI	WELD ON	PBI	MAIN MOTOR OFF/ON	EL	LAMP	20V, 110V
SB2	ANNEAL ON	SA1	GRINDER MOTOR ON	T1	TRANSFORMER	
SB3	WELD AUTO STOP	SA2	WORK LAMP ON	T2	TRANSFORMER	



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