



**Item# 145765**  
**Automatic Metal-Cutting Band Saw**  
**User's Manual**

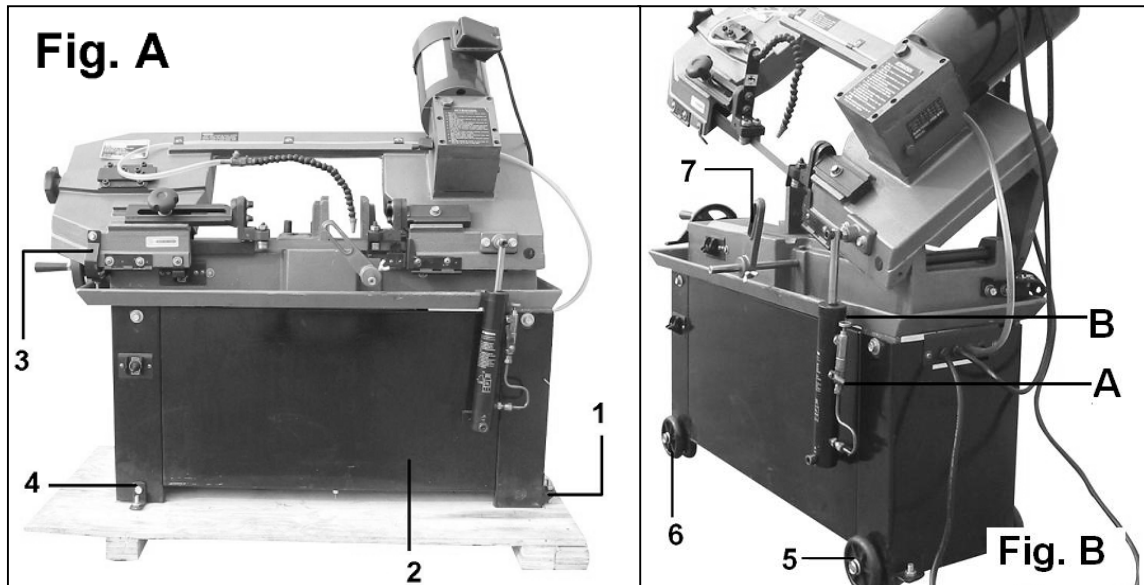


**Assembly and Operation Instructions**

**MADE IN CHINA**

# Quick-Start Guide

**ATTENTION: READ AND FOLLOW UNPACKING & ASSEMBLY GUIDE BEFORE OPERATION.**



- 1. Front Locking Bolt
- 2. Band Saw
- 3. Locking device between saw arch and table
- 4. Rear Locking Bolt
- 5. Front Wheels
- 6. Rear Wheels
- 7. Length-restricting device for workpiece

## UNPACKING

**Step 1.** Snip the carton wrapping belt near the wooden pallet, pull the nails from the carton and pallet, then the carton can be taken away.

**Step 2.** The band saw can be removed from the pallet by removing the bolts and connecting parts (1 & 4 of Fig. A). Remove the bolt and connecting parts of the locking device (3 of Fig. A), then the saw arch can be raised.

## ASSEMBLY

**Step 1.** Assemble the front & rear wheels (5 & 6 of Fig. B).

**Step 2.** By removing the locking device (3 of Fig. A), the saw arch could be raised. The saw arch will stay in position if the hydraulic valve (A & B of Fig. B) is “Off”. The saw arch cannot be pressed down by using external force. You must put the hydraulic valve (A of Fig. B) in “On” position and then switch the flow control (B of Fig. B) to lower the saw arch. The speed of the saw arch going down depends on the range you choose for the flow control valve (B of Fig. B).

**Note:** The hydraulic valve (A of Fig. B) is “Off” when its handle is in horizontal direction, and “On” when its handle is vertical.

For technical questions and replacement parts, please call 1-800-556-7885.

Thank you very much for choosing a Northern Industrial Product! For future reference, please complete the owner's record below:

Model: \_\_\_\_\_ Purchase Date: \_\_\_\_\_

Save the receipt, warranty and these instructions. It is important that you read the entire instruction sheet to become familiar with this product before you begin using it.

This machine is designed for certain applications only. It is strongly recommended that this machine is not modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted your dealer to determine if it can or should be performed on the product.

Before using the Automatic Metal-Cutting band Saw, please read the following instructions carefully.

### **WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY**

**AS WITH ALL MACHINERY, THERE ARE CERTAIN HAZARDS INVOLVED WITH OPERATION AND USE OF THE MACHINE. USING THE MACHINE WITH RESPECT AND CAUTION WILL CONSIDERABLY REDUCE THE POSSIBILITY OF PERSONAL INJURY. HOWEVER, IF NORMAL SAFETY PRECAUTIONS ARE OVERLOOKED OR IGNORED, PERSONAL INJURY TO THE OPERATOR MAY RESULT.**

**THIS MACHINE WAS DESIGNED FOR CERTAIN APPLICATION ONLY. WE STRONGLY RECOMMEND THAT THIS MACHINE NOT BE MODIFIED AND OR USED FOR ANY APPLICATION OTHER THAN FOR WHICH IT WAS DESIGNED. IF YOU HAVE ANY QUESTIONS RELATIVE TO ITS APPLICATION, DO NOT USE THE MACHINE UNTIL YOU HAVE HAD DETAIL INSTRUCTION FROM YOUR DEALER.**

### **SAFETY RULES FOR ALL TOOLS**

1. For your own safety, read instruction manual before operating the tool. Learn the tools application and limitations as well as the specific hazards of operating it.
2. Always keep guards in place and in working order.
3. Ground all tools. If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.
4. Always remove adjusting keys and wrenches before operating machine. Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".
5. Keep work area clean. Cluttered areas and benches invite accidents.
6. Don't use in dangerous environment. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lit.
7. Keep children and visitors away. All children and visitors should be kept a safe distance from work area.
8. Make workshop child-proof with padlocks, master switches, or by removing starter keys.
9. Use the right tool. Don't force tool or attachment to do a job for which it was not designed.
10. Wear proper apparel. No loose clothing, gloves, neckties, rings, bracelets, or other jewelry that can get caught in moving parts. Non-slip foot wear is recommended. Wear protective hair covering to contain long hair.

11. Always wear eye protection, Refer to A.N.S.I Z87.1 Standard for appropriate recommendations. Also use a face or dust mask if cutting operation is dusty.
12. Always secure work with clamps or a vise. It's safer than using your hand and frees both hands to operate tool.
13. Don't overreach - keep proper footing and balance at all times.
14. Maintain tools in top condition. Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
15. Disconnect tools before servicing and when changing accessories such as blades, bits, cutters, etc.
16. Use recommended accessories. Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.
17. Avoid accidental starting. Make sure Switch is in "OFF" position before plugging in power cord.
18. Never stand on the tool. Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
19. Check damaged parts before further use of the tool. A guard or other part that is damaged should be carefully checked to ensure 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.
20. Note direction of feed. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.
21. Never leave the tool running unattended. Turn the power off and do not leave the tool until it comes to a complete stop.
22. Do not operate tool while under the influence of drugs, alcohol or any medication.
23. Make sure tool is disconnected from power supply while motor is being mounted, connected or reconnected.

### **ADDITIONAL SAFETY RULES FOR HORIZONTAL BAND SAWS**

1. Adjust and position the blade guide arm before starting cut.
2. Keep blade guide arm tight. A loose blade guide arm will affect sawing accuracy.
3. Make sure that blade tension and blade tracking are properly adjusted.
4. Re-check blade tension after initial cut with a new blade.
5. To prolong blade life, always release blade tension at the end of each workday.
6. Make sure blade speed is set correctly for material being cut.
7. Check for proper blade size and type based on the material being cut.
8. Stop the machine before putting material in the vise and clamping it well.
9. Always have stock firmly clamped in vise before starting to cut.
10. Always keep hands and fingers away from the blade.
11. Check coolant daily: Low coolant level can cause foaming and high blade temperatures. Dirty or weak coolant can clog pump, cause crooked cut, low cutting rate and permanent blade failure. Dirty coolant can cause the growth of bacteria with ensuing skin irritation.

12. When cutting magnesium never use soluble oils or emulsions (oil-water mix) as water will greatly intensify any accidental magnesium chip fire. See your industrial coolant supplier for specific coolant recommendations when cutting magnesium.

13. To prevent corrosion of machine surface when a soluble oil is used as coolant, pay particular attention to wiping dry the surfaces where fluid accumulates and does not evaporate quickly, such as between the machine bed and vise.

14. Stop the machine before removing chips.

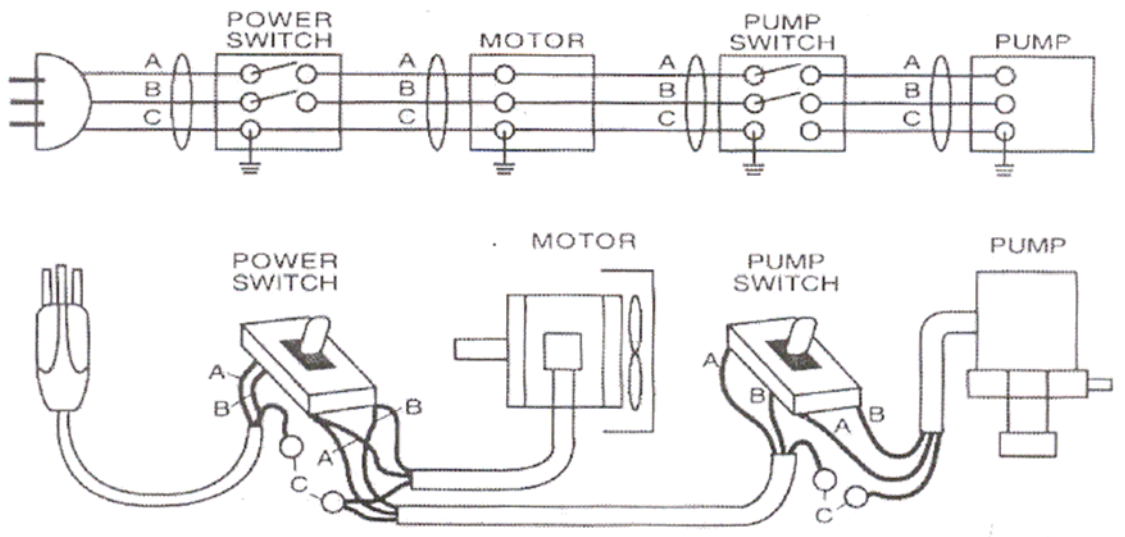
15. Make all adjustments with the power off.

16. Disconnect machine from power source when making repairs.

17. Shut off power and clean the Band Saw and work area before leaving the machine.

## WIRING DIAGRAM

### TOGGLE SWITCH SINGLE PHASE



COLOR \ REFNO	A	B	C
50 HZ	BLUE	BROWN	YELLOW, GREEN
60 HZ	RED	BLACK	GREEN

## ASSEMBLY

A 1 HP, 1725 motor, split phase or capacitor-start, is recommended for best economical performance.

### The characteristics of this machine:

1. If you want to shift the speed, you may shift the speed directly by operating the handle beside the gearbox. And you may choose the appropriate speed in accordance with the material of the workpiece.
2. After the cut processing is completed, the power will turn off automatically.

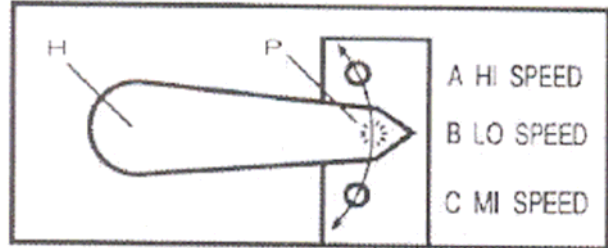
3. Quick-set vise clamp.
4. Low noise level during operating.

**Note:**

If you want to shift the speed of the gear box, you have to wait till the machine stops running. Then you may operate the shifting. Please make sure that you do not shift the speed while cutting.

Please check the engine oil of the gearbox regularly.

Change the #80-#90 engine oil every 500 working hours.



**Steps for operating the gearbox:**

1. Before you shift the speed, you have to cut off the source of the electricity, then you may check if the motor stops running completely. After that, remove the saw blade from the piece of work.
2. To insert the location pin smoothly, move the saw blade back and forth, bringing the shifting handle to a suitable location where you can insert the location pin into the locate hole.

## OPERATION

**WORK SET UP**

1. Raise the saw arch to a 45° position with the table and built-in steady rest locks.
2. Open the vise to clamp the workpiece to be cut securely by rotating the handle.
3. Use a sliding bracket to keep balance if the workpiece is too long.
4. Select the adequate speed for the material you are cutting.
5. Switch on the power and lift the saw arch to the top and lower with the hydraulic flow control.
6. Adjust the coolant & lubricant switch to the appropriate level.
7. Turn off the power supply after you finish work.

**NOTE:** Never turn off the motor when blade is cutting.

**WORK STOP ADJUSTMENT**

1. Loosen the thumb screw holding the work stop casting to the shaft.
2. Adjust the work stop casting to the desired position.
3. Rotate the work stop to as close to the bottom of the cut as possible.
4. Tighten thumb screw.
5. DO NOT ALLOW the blade to rest on the work while the motor is shut off.

**CONVERTING FOR VERTICAL USE**

Notching slitting, contour work may be done with the saw in the vertical position in the following manors:

1. Rotate the head to the vertical position.
2. Assemble a 10"x10" table (an option that may be purchased from your dealer) to the guide bar using the screws provided and the guide bar knob.

## BLADE SPEEDS

When using your band saw always change the blade speed to best suit the material being cut. The Material Cutting Chart gives suggested settings for several materials.

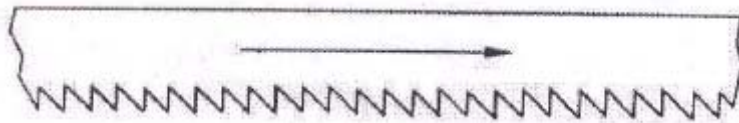
**MATERIAL CUTTING CHART**

Material	Speed F.P.M	
	60Hz	50Hz
Tools, Stainless Alloy Steel Bearing Bronze	100	83
Medium or High Carbon Steels Hard Brass or Bronze	180	150
Aluminum Plastic	235	195

## BLADE DIRECTION OF TRAVEL

Be sure the blade is assembled to the pulleys, such that the vertical edge engages the workpiece first.

## BLADE MOVEMENT



## STARTING SAW

**CAUTION: NEVER OPERATE SAW WITHOUT BLADE GUARDS IN PLACE.**

Be sure the blade is not in contact with the work when the motor is started. Start the motor, allow the saw to come to full speed, and then begin the cut by letting the head down slowly onto the work. **DO NOT DROP OR FORCE.** Let the weight of the saw head provide the cutting force. The saw automatically shuts off at the end of the cut.

## BLADE SELECTION

A 8-tooth per inch, general-use blade is furnished with this Metal-Cutting Sand Saw. Additional blades in 4, 6, 8, and 10 tooth sizes are available. The choice of blade pitch is governed by the thickness of the work to be cut: the thinner the workpiece, the more teeth advised. A minimum of three (3) teeth should engage the workpiece at all times for proper cutting. If the teeth of the blade are too far apart that they straddle the work, severe damage can be done to the workpiece and to the blade.

Selection of band saw blades:

1. Bi-metal band saw blade is suitable for metal workpiece such as carbon steel, alloy steel, and stainless steel.
2. Hardback carbon band saw blade is suitable for low-rigidity small metal workpieces and hard plastic.
3. Flexback carbon band saw blades are suitable for wood, fiber glass and plastic.
4. Carbide grit edge band saw blades are suitable for plumbago, carbon product and alveolate material, etc.

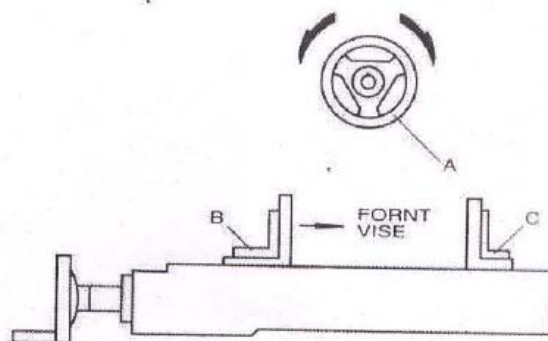
## CHANGING THE BLADE

Raise the saw arch to vertical position and open the blade guards. Loosen tension screw knob to sufficiently allow the saw blade to slip off the wheels. Install the new blade with teeth slanting toward the motor as follows:

1. Place the blade in between each of the guide bearings.
2. Slip the blade around the motor pulley (bottom) with the left hand and hold in position.
3. Hold the blade taut against the motor pulley by pulling the blade upward with the right hand which is placed at the top of the blade.
4. Remove left hand from bottom pulley and place it at the top side of the blade to continue the application on the upward pull on the blade.
5. Remove right hand from blade and adjust the position of the top pulley to permit left hand to slip the blade around the pulley using the thumb, index and little finger as guides.
6. Adjust the blade tension knob clockwise until no blade slippage occurs, Do not tighten excessively.
7. Replace the blade guards.
8. Place 2-3 drops of oil on the blade.

## USAGE OF THE QUICK VISE

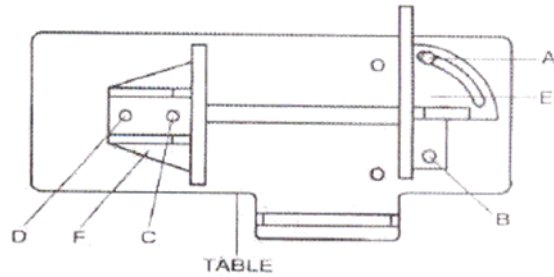
The workpiece is placed between the vise jaws with the amount to be cut off extending out past the blade. Your machine is equipped with a "quick-action" vise jaw which allows you to instantly position the moveable vise jaw (B). Simply turn hand-wheel (A) counterclockwise 1/2 turn and move the vise jaw (B) to the desired position. Then tighten the vise jaw (B) against the workpiece by turning hand-wheel clockwise.





## QUICK VISE ADJUSTMENT FOR ANGLE CUT

1. Loosen the A, B, C and D screws.
2. Adjust rear vise to the threaded hole position.  
(E)
3. Set the scale to the desired angle.
4. Adjust the front vise (F) to parallel the rear vise  
(E).
5. Tighten the A, B, C and D screws.



## BLADE GUIDE BEARING ADJUSTMENT

**ATTENTION:** This is the most important adjustment on your saw. It is impossible to get satisfactory work from your saw if the blade guides are not properly adjusted. The blade guide bearings on your Metal-Cutting Band Saw are adjusted and power-tested with several test cuts before leaving the factory to insure proper setting. The need for adjustment should rarely occur when the saw is used properly. If the guides do get out of adjustment, it is extremely important to readjust immediately. If improper adjustment is maintained, the blade will not cut straight, and if the situation is not corrected it will cause serious blade damage.

Because guide adjustment is a critical factor in the performance of your saw, it is always best to try a new blade to see if this corrects poor cutting before beginning to adjust. If a blade becomes dull on one side sooner than the other, for example, it will begin cutting crooked. A blade change will correct this problem while the guide adjustment will not. If a new blade does not correct the problem, check the blade guides for proper spacing.

**NOTE:** There should be from 000 (just touching) to 001 clearance between the blade and guide bearings. To obtain this clearance adjust as follows:

1. The inner guide bearing is fixed and cannot be adjusted.
2. The outer guide bearing is mounted to an eccentric bushing and can be adjusted.
3. Loosen the nut while holding the bolt with an Allen wrench.
4. Position the eccentric bushing by turning the bolt to the desired position of clearance.
5. Tighten the nut.

## BLADE TRACK ADJUSTMENT

1. Open the blade guard.
2. Remove the blade guide assemblies (top and bottom).
3. Loosen the hex head screw in the tilting mechanism to a point where it is loose but still snug.
4. With the machine running, adjust both the set screw and blade tension knob simultaneously to keep constant tension on the blade. The set screw and blade tension knob are always turned in opposite directions, i.e., when one is turned clockwise, the other is turned counterclockwise. The blade is tracking properly when the backside just touches the shoulder of pulley or a slight gap appears near the center line of the pulley. Care should be taken not to over tighten the saw blade since this will give a false adjustment and limit life of the blade.
5. Tighten the hex head screw in tilting mechanism. **IMPORTANT:** Sometimes in trying to make this critical adjustment, it is possible to cause the basic setting to be misaligned. Should this occur, proceed as follows:
  - a. Loosen the set screw and back it out as far as it can go and still remain in the threaded hole.

- b. Turn the hex head screw clockwise until it stops (do not tighten).
  - c. Turn the set screw clockwise until it bottoms, then continue for half a turn and check the tracking by turning on the machine,
  - d. If further adjustment is required, go back to step 4.
6. Turn off power to the machine.
  7. Replace blade guide assemblies (it may be necessary to loosen the blade tension slightly).
  8. Adjust the vertical position of blade guide bearing assemblies so that the backside of the blade just touches the ball bearing.
  9. Make a final run to check tracking. If necessary to adjust, go back to step 4.
  10. Replace the blade guards.

## **MAINTENANCE**

**CAUTION: MAKE CERTAIN THAT THE UNIT IS DISCONNECTED FROM THE POWER SOURCE BEFORE ATTEMPTING TO SERVICE OR REMOVE ANY COMPONENT.**

## **LUBRICATION**

Lubricate the following components using SAE-30 oil as noted:

1. Ball-bearing: None.
2. Driven pulley bearing: 6-8 drops a week.
3. Vise lead screw as needed.
4. The drive gears run in an oil bath and will not require a lubricant change more often than once a year, unless the lubricant is accidentally contaminated or a leak occurs because of improper replacement of the gear box cover. During the first few days of operation, the worm gear drive will run hot. Unless the temperature exceeds 200 degrees, there is no cause for alarm.

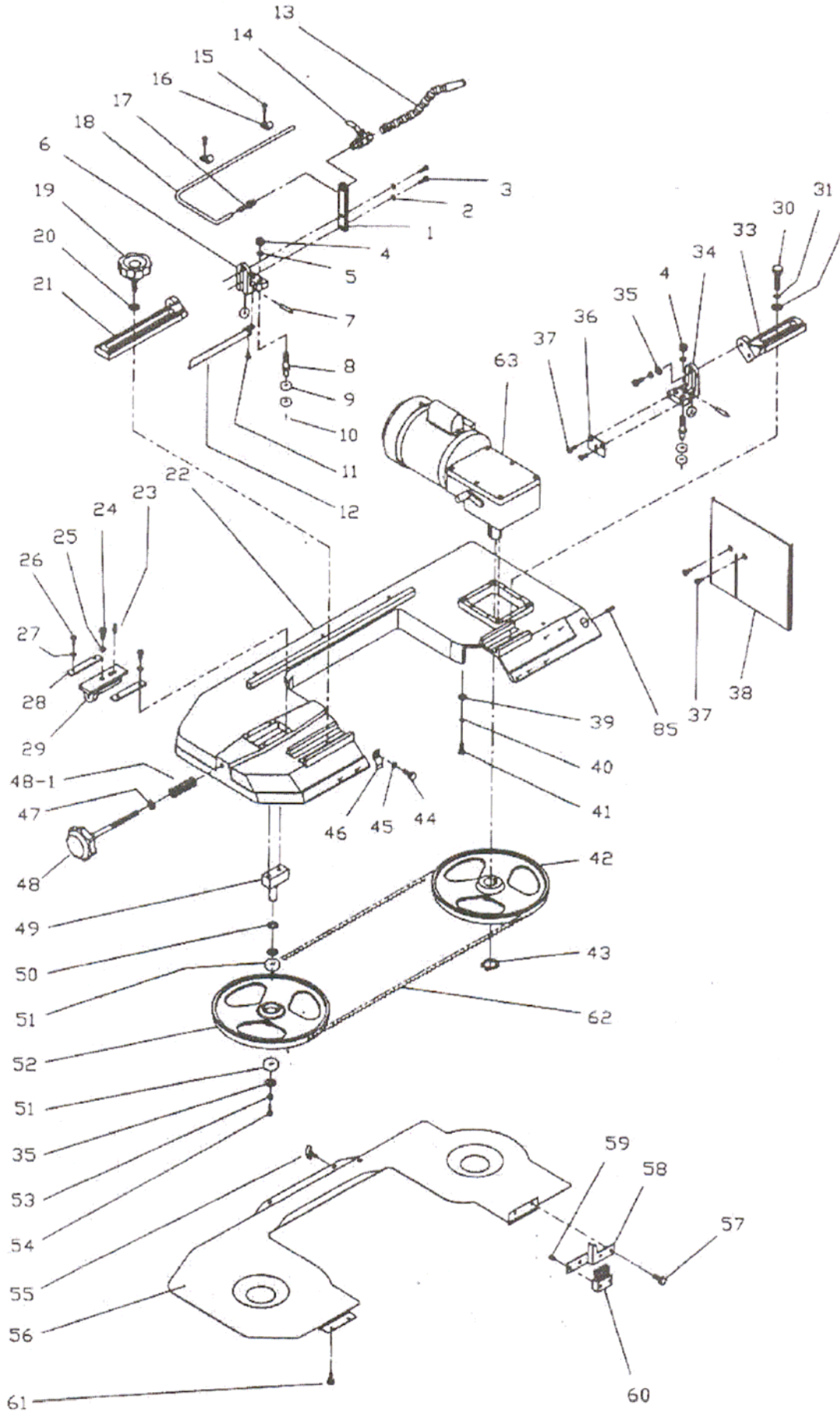
Following lubricants may be used for the gearbox:

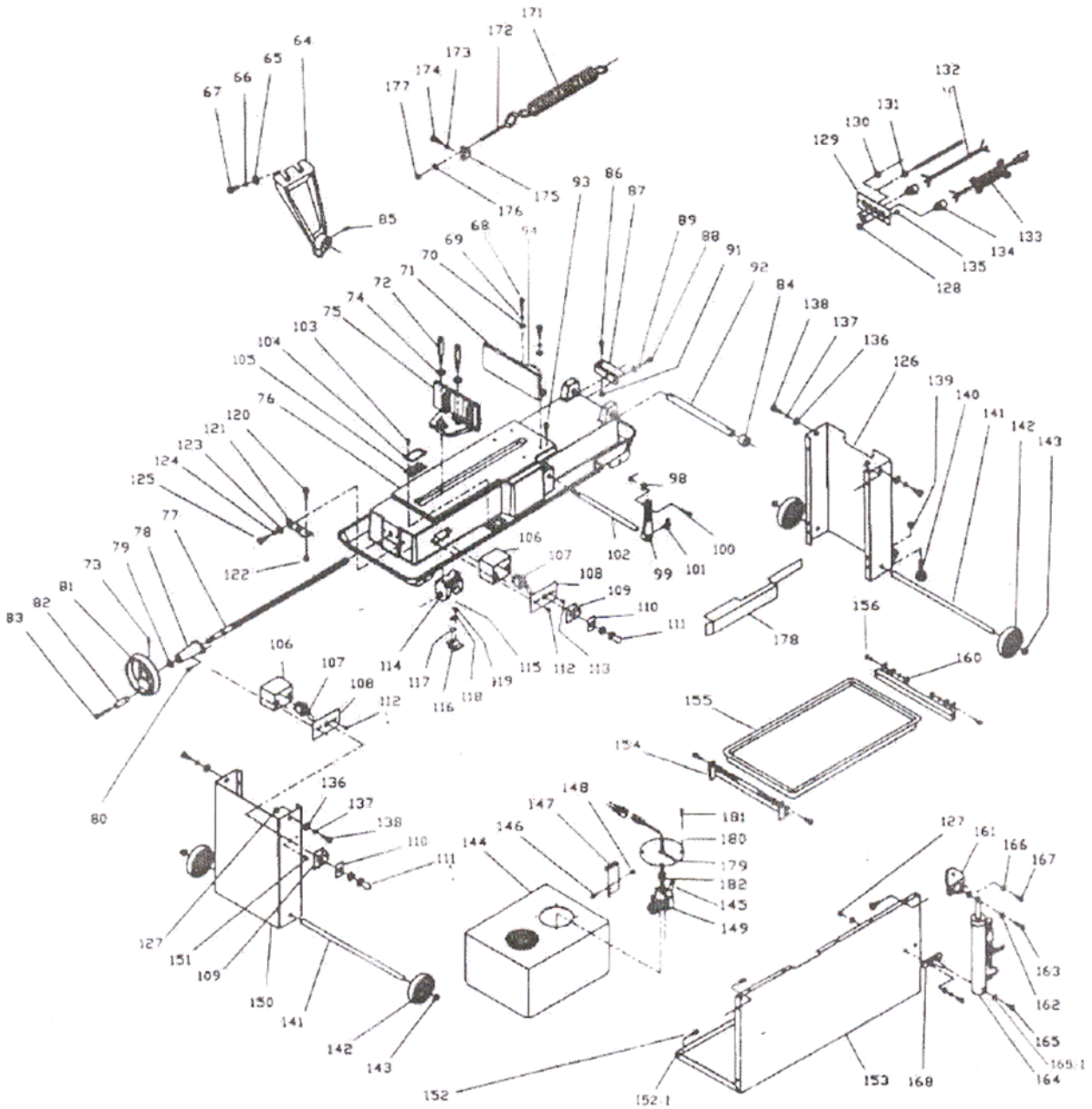
Atlantic Refinery Co. Mogul Cyl. Oil  
Cities Service Optimus No. 6  
Gulf Refinery Co Medium Gear Oil  
Pure Oil Co. Park Clipper

## **TROUBLE SHOOTING**

SYMPTOM	POSSIBLE CAUSE (S)	CORRECTIVE ACTION
<b>Excessive Blade Breakage</b>	<ol style="list-style-type: none"> <li>1. Incorrect blade tension</li> <li>2. Incorrect speed or feed</li> <li>3. Material loose in vise</li> <li>4. Blade rubs on wheel flange</li> <li>5. Teeth too coarse for material</li> <li>6. Teeth in contact with work before saw is started</li> <li>7. Misaligned guides</li> <li>8. Blade too thick for wheel diameter</li> <li>9. Cracking at weld</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust to where blade just does not slip on wheel</li> <li>2. Check Machinist Handbook</li> <li>3. Clamp work securely</li> <li>4. Adjust wheel alignment</li> <li>5. Check Machinist Handbook for recommended blade</li> <li>6. Place blade in contact work after motor is started</li> <li>7. Adjust</li> <li>8. Use thinner blade</li> <li>9. Make longer annealing cycle</li> </ol>
<b>Permanent Blade Dulling</b>	<ol style="list-style-type: none"> <li>1. Teeth too coarse</li> <li>2. Too much speed</li> <li>3. Inadequate feed pressure</li> <li>4. Hard spots or scale in/on material</li> <li>5. Work hardening of material (especially stainless steel)</li> <li>6. Blade installed backwards</li> <li>7. Insufficient blade tension</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer tooth blade</li> <li>2. Try next lower speed</li> <li>3. Decrease spring tension on side of saw</li> <li>4. Reduce speed increase feed pressure (Scale) increase feed pressure (Hard Spots)</li> <li>5. Increase feed pressure by reducing spring tension</li> <li>6. Remove blade twist inside out and reinstall blade.</li> <li>7. Increase tension to proper level</li> </ol>
<b>Bad Cuts (Crooked)</b>	<ol style="list-style-type: none"> <li>1. Work not square</li> <li>2. Feed pressure too great</li> <li>3. Guide bearing not adjusted properly</li> <li>4. Inadequate blade tension</li> <li>5. Blade guides spaced out too much</li> <li>6. Dull blade</li> <li>7. Speed incorrect</li> <li>8. Blade guide assembly loose</li> <li>9. Blade guide bearing assembly loose</li> <li>10. Blade tracks too far away from wheel flanges</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust vise to be square with blade. Always clamp Work tightly in vise.</li> <li>2. Reduce pressure by increasing spring tension on side of saw.</li> <li>3. Adjust guide bearings to 001 greater than max. thickness, including weld of the saw.</li> <li>4. Increase blade tension a little at a time</li> <li>5. Move guides as close to work as possible</li> <li>6. Replace blade</li> <li>7 Check manual for recommended speeds</li> <li>8. Tighten</li> <li>9. Tighten</li> <li>10. Retrack blade according to operating instructions</li> </ol>
<b>Bad cuts (Rough)</b>	<ol style="list-style-type: none"> <li>1. Too much speed of feed</li> <li>2. Blade is too coarse</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce speed and feed</li> <li>2. Replace with finer blade</li> </ol>
<b>Blade is twisting</b>	<ol style="list-style-type: none"> <li>1. Cut is binding blade</li> <li>2. Too much blade tension</li> </ol>	<ol style="list-style-type: none"> <li>1. Decrease feed pressure</li> <li>2. Decrease blade tension</li> </ol>
<b>Unusual Wear on Side/Back of Blade</b>	<ol style="list-style-type: none"> <li>1. Blade guides worn</li> <li>2. Blade guide bearings not adjusted properly</li> <li>3. Blade guide bearing bracket is loose</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Adjust as per operators' manual</li> <li>3. Tighten</li> </ol>
<b>Teeth Ripping from blade</b>	<ol style="list-style-type: none"> <li>1. Tooth too coarse for work</li> <li>2. Too heavy feed : too slow feed</li> <li>3. Vibrating work piece</li> <li>4. Gullets loading</li> </ol>	<ol style="list-style-type: none"> <li>1. Use finer tooth blade</li> <li>2. Increase feed pressure and/or speed</li> <li>3. Clamp work securely</li> <li>4. Use coarse tooth blade or brush to remove chips</li> </ol>
<b>Motor Running too slow</b>	<ol style="list-style-type: none"> <li>1. Blade tension too high</li> <li>2. Drive belt tension too high</li> <li>3. Blade is too coarse for work (Pipes especially)</li> <li>4. Blade is too fine for work (Heavier, softer material)</li> <li>5. Gear not aligned properly</li> <li>6. Gears need lubrication</li> <li>7. Idler wheel needs lubrication</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce tension on blade</li> <li>2. Reduce tension on drive belt</li> <li>3. Use finer blade</li> <li>4. Use coarser blade</li> <li>5. Adjust gears so that worm is in center of gear</li> <li>6. Check oil bath</li> <li>7. Oil bearing/shaft on idler wheel</li> </ol>

# ASSEMBLY DRAWING





## PARTS LIST

Ref #	Description	Ref #	Description
1	Valve Cock Support	10	C-Ring S8
2	S. Washer M8	11	Bolt M5x8
3	Set Screw Soc. Hd. M8x30mm	12	Blade Cover (Front)
4	Nut 3/8NF	13	Water Nozzle
5	S.Washer 3/8"x2.2mm	14	Valve 1/4"
6	Blade AK justable (Front)	15	Bolt 3/16"x1/4"
7	Pin	16	Hose Button
8	Eccentric Shaft	17	Hose Plug 1/4"
9	Bearing 608ZZ	18	Hose

Ref #	Description	Ref #	Description
19	Adjusting Knob 3/8"	58	Brush Holder
20	Plate Washer 3/8"x2x23	59	Bolt Screw 3/16"x1/2"
21	Adjustable Bracket (Front)	60	Brush
22	Bow-Saw	61	Bolt 1/4"x1/2"
23	Set Screw Soc. Hd. M8x16mm	62	Blade
24	Bolt M8x40mm	63	Gear Box & Motor
25	S. Washer 8.3x2	64	Piver Bracket
26	CAP M6x16	65	Place Washer M12X3x28
27	S.Washer M6x1.5mm	66	S. Washer M12x2.5
28	Slide	67	Bolt M12x40mm
29	Blade Tension Sliding Block	68	Bolt M12x40mm
30	Bolt 3/8"x1-1/2"	69	S. Washer M12 x2.5
31	S.Washer 10.5x2.3	70	Plate Washer M12x5
32	Plate Washer 3/8"x3	71	Foxed Vise
33	Adjustable Bracker (Rear)	72	Bolt M10x50
34	Blade Adjustable (Rear)	73	Set M8x8
35	S.Washer 5/16X23X3	74	Plate Washer 3/8x24x3
36	Deflector Plate	75	Free Vise
37	Bolt 1/4x1/2"	76	Table
38	Vertical Cutting Plate	77	Acme Screw
39	Plate Washer M8x2x18	78	Screw Servile
40	S. Washer M8 x2	79	C-Ring S 15
41	CAP M8x40mm	80	CAP Screw Soc. Hd. M6x1.0x25
42	Blade Wheel (Real)	81	Acme Screw Wheel
43	C-Ring S 25	82	Lever Knob
44	Bolt 1/4x1/2	83	Handle Screw
45	Plate 1/4x19x1.5	84	Bushing
46	Switch Hip	85	Set Screw Soc Hd M8x16
47	Plate Washer 3/8"x2x27	86	Bolt 3/8"x1-1/2"
48	Blade Adjustable Knob	87	Support Plate
48-1	Spring	88	Bolt M10x25mm
49	Blade Wheel Shaft (Front)	89	S. Washer M10x2.2
50	Interval Ring	91	CAP 3/8x2 1/2
51	Bearing 6202ZZ	92	Support Rod
52	Blade Wheel (Front)	93	Bolt M8x15mm
53	Washer M8x18x2	94	Diaraph
54	Bolt M8x12mm	95	/
55	Adjusting Knob 1/4"x1/2"	96	/
56	Blade Back Cover	98	Nut M10
57	Bolt 1/4"x1/2"	99	Length Fixing Plate

Ref #	Description	Ref #	Description
100	Bolt M10x40mm	140	Bolt 1/2"x2-1/2"
101	Fixed Bolt	141	Wheel Shaft
102	Stock Stop Rod	142	Wheel
103	Bolt 3/16"x1/4"	143	Wheel Button
104	Filter Net Plate	144	Coolant Tank
105	Filter Net	145	Drain Plug
106	Switch Cover	146	Bolt 3/16"x3/8"
107	Toggle Switch	147	Pung Mount
108	Switch Cover Plate	148	Nut 3/16"
109	Switch Cover	149	Cooling Pump
110	Switch Brand	150	Front Support
111	Waterproof Cap	151	Bolt 3/16"x3/8"
112	Bolt 3/16"x3/8"	152	Bolt M6x10mm
113	Bolt 3/16"x3/8"	152-1	NUT M6
114	Bracket	153	Fuselage Plate
115	Pin 6x20	154	Water Frough Shelf
116	Stop Collar	155	Water Trough
117	Steet Balls	156	Bolt M6x30mm
118	Sheel Fragment	160	Nut M6
119	Bolt M5x8	161	Cylinder Support
120	Bolt 3/8x1-1/2	162	Plate Washer M10
121	Support	163	CAP M10x50mm
122	Nut 3/8x23x3	164	Cylinder
123	Plate Washer M8 x18x2	165	Bolt M12x60
124	S Washer M8	165-1	Washer M12
125	Bolt M8x25mm	166	Plate Washer M8x18x12
126	Rear Support	167	Bolt M6X20mm
127	Bolt MBx16mm	168	Cylinder Support
128	Cable Fixture	171	Spring
129	Wrie Flate	172	Spring Adjustable Rod
130	Plug	173	Plate Washer M10
131	Wrie Button	174	Bolt M10x25mm
132	Motor Wire	175	Spring Handle Bracket
133	Power Cable	176	Plate Washer3/8x2x23
134	Cabre Fixture	177	Nut 3/8
135	Bolt 3/16"x3/8"	178	Water Baffle
136	Washer M10x3x26	179	Cover
137	S Washer M10x22	180	Washer 1/4"x1.5x16
138	Bolt M10x25mm	181	Screw 1/4"x1/2
139	Nut 1/2"	182	Cord Push

# **WARNING!**

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

- Lead from lead-based paints.
- Crystalline silica from bricks, cement and other masonry products.
- Arsenic and chromium from chemically-treated lumber.

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