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1319/1319A

Metal Cutting Band Saw



MODEL: 1319/1319A

INSTRUCTION MANUAL

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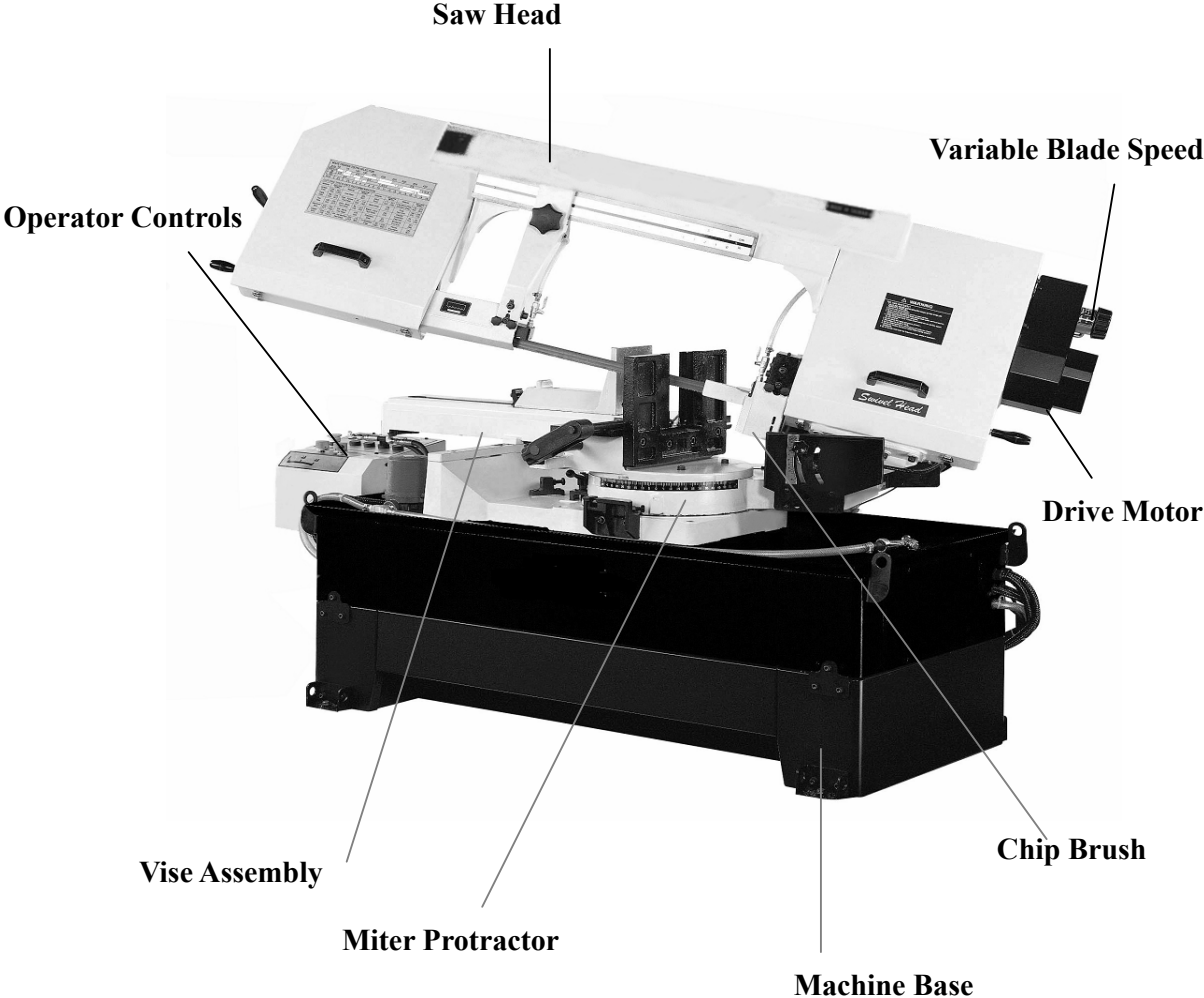
**WARNING: FAILURE TO FOLLOW THESE RULES
MAY RESULT IN SERIOUS PERSONAL INJURY**

As with all machinery there are certain hazards involved with operation and use of this machine. Proper use of the machine will considerably lessen the possibility of personal injury. If normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for specific applications 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 applications DO NOT use the machine until you contact the manufacturer and they have advised you.

Before using this bandsaw, the proper electrical connections specific to this machine must be followed. Trajan Saw Works accepts no responsibility or liability for damages or injuries caused by improper electrical components and/or connections

1. MACHINE OVERVIEW



2. SAFETY

A) OPERATOR SAFETY:

1. WEAR PROPER APPAREL. Avoid loose fitting clothing, jewelry & gloves
2. ALWAYS WEAR EYE PROTECTION
3. NEVER LEAVE THE SAW RUNNING UNATTENDED. TURN POWER OFF.
4. DO NOT OPERATE THE SAW UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR ANY PERSCRPTION MEDICATION
5. ALWAYS KEEP HANDS AWAY FROM THE CUTTING AREA
6. STOP THE SAW BLADE BEFORE CLEANING CHIPS OUT OF THE PAN.
7. KEEP ALL GUARDS IN PLACE & IN WORKING ORDER.

C) MACHINE SAFETY:

1. REMOVE ADJUSTING KEYS AND WRENCHES. Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning it "on".
2. DON'T FORCE THE SAW. It will do the job better and be safer at the rate for which it was designed.
3. PROPER USE OF ATTACHMENTS. Do not use attachment to do a job for which they were not designed.
4. SECURE WORK. Use clamps or the saw vise to hold work.
5. MAINTAIN SAW BLADES IN TOP CONDITION. Keep saw blades sharp & clean for best performance. Follow instructions for lubricating and changing saw blades.
6. AVOID ACCIDENTAL STARTING. Make sure switch is in "OFF" position before plugging in power cord.
7. ADJUST AND POSITION the blade guide arm before starting the cut.
8. KEEP BLADE GUIDE ARM TIGHT, A loose blade guide arm aill affect sawing accuracy.
9. MAKE SURE blade speed is set correctly for the material being cut.
10. CHECK for proper blade size and type.
11. STOP the machine before putting material in the vise. ALWAYS have stock firmly clamped in vise before starting cut.

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D) WORK ENVIRONMENT SAFETY:

1. KEEP WORK AREA CLEAN. Cluttered, dirty work areas invite accidents.
2. DON'T USE IN DANGEROUS ENVIRONMENTS. Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well-lighted.
3. DON'T install & use this machine in explosive, dangerous environment.

E) PROPER MAINTENANCE:

1. DISCONNECT machine from power source when making repairs.
2. CHECK FOR DAMAGED PARTS. Before further use of the saw, a guard or other part that is damaged should be carefully inspected to ensure that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, broken parts, mountings, and any other conditions that may affect the saw's operation. Any guard or other part that is damaged should be properly repaired or replaced.
3. DISCONNECT TOOLS before servicing and when changing accessories

such as blades, bits, cutters, etc.

4. MAKE SURE that blade tension and blade tacking are properly adjusted.
5. RE-CHECK blade tension after initial cut with a new blade.
6. CHECK COOLANT DAILY Low coolant level can cause foaming and high blade temperatures. Dirty or weak coolant can clog the pump, cause crooked cuts, rust, low cutting rate and permanent blade failure. Dirty coolant can cause the growth of bacteria with ensuing skin irritation.
7. 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.
8. TO PREVENT CORROSION of machined surfaces 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.

F) SPECIFIED USAGE:

1. This machine should be used only for general metal cutting within the range of cutting capacity..

H) SAFETY FEATURES:

1. Interlock switch on pulley cover.
2. As soon as the pulley cover is open, machine will stop with the function of this switch. Do not remove this switch from machine for any reason, and check it's function frequently.

Interlock switch on cutting area as soon as the cover of cutting area is open, machine will stop at once with the function of this switch. Do not remove this switch from machine for any reason, and check it's function frequently.

3.SPECIFICATIONS

MOTOR		2HP	
Saw Blade Speed	Variable Speed	60Hz	98 ~ 393 FPM
		50Hz	81 ~ 327 FPM
Blade Size(mm)		27x0.9x3810	
Dimension LxWxH (mm)		2030x700x1100	
Packing	N.W / G.W (kgs)		550 / 600
	Measurement		2223x990x1150
	Sets per 20' CTNR		10 sets
Cutting Capacity	0°	○ (mm/inch)	330 / 13 "
		□ (mm/inch)	127x483 / 5"x19"
	+/- 45°	○ (mm/inch)	305 / 12 "
		□ (mm/inch)	229x305 / 9"x12"
	- 60°	○ (mm/inch)	204 / 8"
		□ (mm/inch)	178x204 / 7"x8"

4.FEATURES

1. This machine is ideal for cutting normal steel, steel pipe, and provides opposable miter cutting at + 60 degrees and -45 degrees through the utilization of a swiveling saw head.
2. Variable speed control gives convenient selection of speeds.
3. Hydraulic cylinder controls feeding volume and provides stable cutting (1319A only).
4. Easy sliding the working table back and forth by loosening and fixing only two bolts.
5. Quick positioning vise for clamping all sizes of work piece.
6. Chip pan underneath the working table prevents coolant fluid leaking and helps keep the work area clean.
7. Hydraulic unit is to rise up the saw arm automatically for easy handling. (1319A only)
8. Self contained coolant system.

5. TRANSPORTATION & INSTALLATION

5-1. Unpacking

1. Transportation to desired location before unpacking; use powered lifting jack. (Fig. B)
2. Transportation after unpacking; please use heavy duty fiber straps to lift the machine.

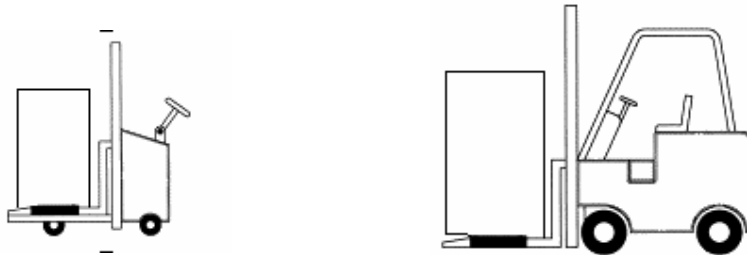


Fig. B

ALLWAYS KEEP PROPER FOOTING & BALANCE WHILE MOVING THIS MACHINE.

5-2. TRANSPORTATION OF MACHINE

As this machine weights 470kgs(1036lbs) it is recommended that the machine be transported with help of lifting jack.

Transportation Recommendation:

1. Tighten all locks before operation.
2. Always keep proper footing & balance while moving this machine, and only use a heavy duty of fiber belt to lift the machine as per Fig. 1.
3. TURN OFF the power before wiring & be sure machine is properly grounded. Overload & circuit breaker are recommended for safety wiring.
4. Tighten 4 bolts to base holes after machine is balanced.
5. Check carefully if the saw blade is running in counter-clockwise direction if not, reverse the wiring per circuit diagram, then repeat the running test.
6. Keep out of direct intense sunlight, excessively dusty areas and exposure to rain.

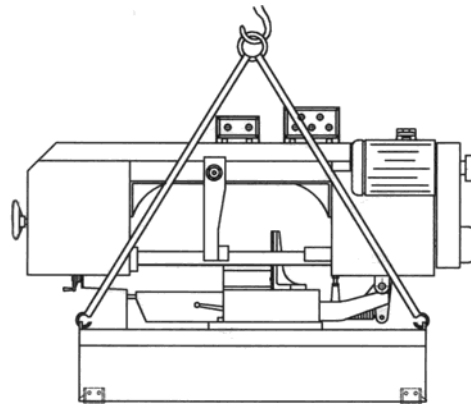
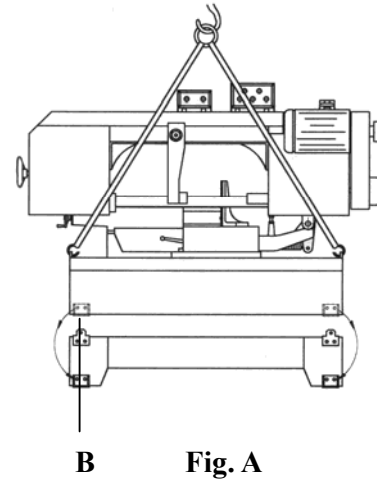


Fig. 1

5-3.Installation

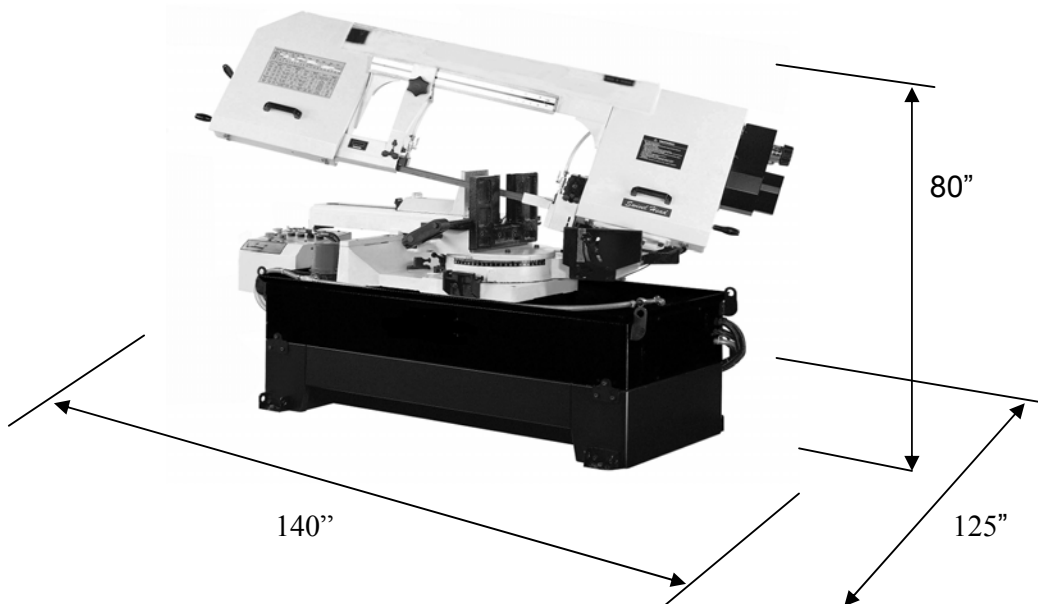
- (1) Always Keep proper footing & balance while moving this 470kgs machine. And only use heavy-duty fiber belt to lift the machine as per Fig. (A).
- (2) Hang the machine up, away from the floor, take away the 4 pads and assemble them on the auxiliary stand. Fix the machine on the auxiliary stand and lock the connection nut.
- (3) Finish removing this wooden case/crate from the machine. Unbolt the machine from the crate bottom.
- (4) Position & tighten 4 bolts into base holes properly after machine in balance.
- (5) Turn off the power before wiring & be sure machine is in proper grounding. Overload & circuit breaker is recommended for safety wiring.
- (6) Keep machine always out from sun, dust, wet, raining area.



5-4.CLEANING & LUBRICATING

- (1) Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.
- (2) After cleaning, coat all bright work with a light lubricant

6.MINIMUM SPACE FOR MACHINE OPERATION



7. PROPER TOOTH SELECTION

For maximum cutting efficiency and lowest cost per cut, it is important to select the blade with the right number of teeth per inch (TPI) for the material being cut. The material size and shape dictate tooth selection.

You need to consider: The width of the cut - That is, the distance in the cut that each tooth must travel from the point it enters the work-piece until it leaves the work-piece, and

1. The shape of the work-piece.

- Squares, Rectangles, Flats (Symbol : ■)

Locate the width of cut on the chart. (Inches on the outer circle and millimeters on the inner circle.)

Select the tooth pitch on the ring marked with the square shape which aligns with the width of cut.

EXAMPLE: 6" (150mm) square, use a 2/3 Vari-Tooth.

- Round Solids (Symbol : ●)

Locate the diameter of your work-piece on the chart. Select the tooth pitch on the ring marked with the round shape which aligns with the size of stock you are cutting.

EXAMPLE: 4" (100mm) round, use a 3/4 Vari-Tooth.

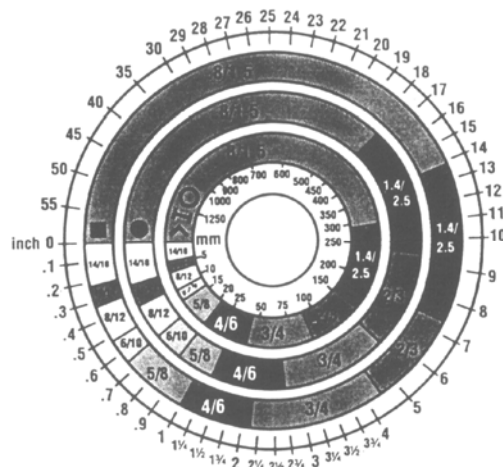
- Tubing, Pipe, Structural (Symbol : O H ^)

Determine the average width of cut by dividing the area of the work-piece by the distance the saw blade must travel to finish the cut. Locate the average width of cut on the chart. Select the tooth Ditch on the ring marked with the tubing and structural shape, which aligns with the average width you are cutting.

EXAMPLE: 4"(100mm) outside diameter, 3"(75mm) inside diameter tubing.

$$\begin{array}{r} 4"(100\text{mm}) \text{ OD} = 12.5 \text{ sq.in. } (79\text{cm}^2) \\ 3"(75 \text{ mm}) \text{ ID} = 7.0 \text{ sq.in. } (44\text{cm}^2) \\ \hline \text{Area} = 5.5 \text{ sq.in. } (35\text{cm}^2) \end{array}$$

$5.5 \text{ sq.in. } (35\text{cm}^2) / 4" (100\text{mm}) \text{ distance} = 1.38(35\text{mm}) \text{ average width}$
 1.38" (35mm), use a 4/6 Vari-Tooth



NOTE: The band speed and cutting rate recommendations presented on this chart are approximations and are to be used as a starting point for most applications. For exact sawing parameters' consult your saw blade supplier.

8. BI-METAL SPEEDS AND FEEDS

These figures are a guide to cutting 4"(100mm) material (with a 314 Vari-Tooth) when using a cutting fluid.

Increase Band Speed: 15% When cutting 1/4"(6.4mm) material (10/14 Vari-Tooth)
 12% When cutting 3/4"(19 mm) material (6/10 Vari-Tooth)
 10% When cutting 1-1/4"(32 mm) material(5/8 Vari-Tooth)
 5% When cutting 2-1/2" (64 mm) material(4/6 Vari-Tooth)
 Decrease Band Speed:12% When cutting 8"(200mm) material(2/3 Vari-Tooth)

MATERIAL	ALLOY ASTM NO.	BAND SPEED	
		FT./MIN	M/MIN
Copper Alloy	173,932	314	96
	330,365	284	87
	623,624	264	81
	230,260,272	244	74
	280,264,632,655	244	74
	101,102,110,122,172	234	71
	1751,182,220,510	234	71
	625,706,715,934	234	71
	630	229	70
	811	214	65
Carbon Steel	1117	339	103
	1137	289	88
	1141,1144	279	85
	1141 HI STRESS	279	85
	1030	329	100
Carbon Steel	1008,1015,1020,1025	319	97
	1035	309	94
	1018,1021,1022	299	91
	1026,1513	299	91
	A36(SHAPES),1040	269	82
	1042,1541	249	76
	1044,1045	219	67
	1060	199	61
	1095	184	56
Ni-Cr-Mo Alloy Steel	8615,8620,8622	239	73
	4340,E4340,8630	219	67
	8640	199	61
	E9310	174	53
Tool Steel	A-6	199	61

	A-2	179	55
	A-10	159	49
	D-2	90	27
	H-11,H-12,H-13	189	58
Stainless Steel	420	189	58
	430	149	46
	410,502	140	43
	414	115	35
	431	95	29
	440C	80	24
	304,324	120	36
	304L	115	35
	347	110	33
	316,316L	100	30
	416	189	58

TELL TALE CHIPS

Chips are the best indicators of correct feed force. Monitor chip information and adjust feed accordingly.

Thin or powdered chips – increase feed rate or reduce band speed.

Burned heavy chips – reduce feed rate and/or band speed.

Curly silvery and warm chips – optimum feed rate and band speed.



9.USE OF MAIN MACHINE PARTS

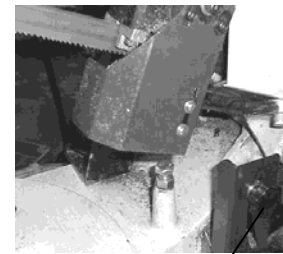
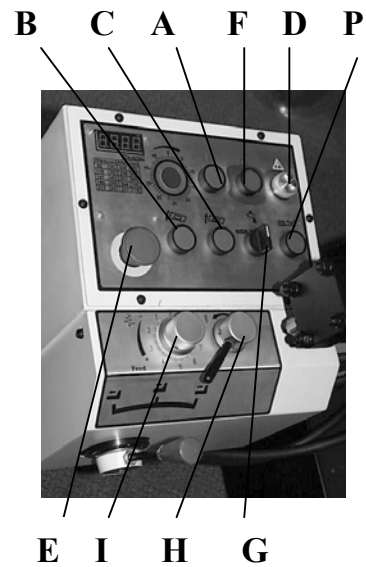
9-1.POWER SYSTEM AND CONTROL PANEL

Before connecting your machine to an electrical power system, be sure the motor rotation is in the proper direction.

We recommend that 1.5mm² fused with a 10 amp, dual element, time lag fuse, to be used to supply power to all machines regardless of their electrical rating. Refer to the electrical wiring diagram supplied with your machine for instructions on how to connect saw to power source. Power must be cut off when wheel cover is opened or during repairing.

9-2.STARTING AND STOPPING MACHINE

1. Light (D) will be on when power is connected. Please open the Hydraulic Unit System button before any operation to make sure all machines' operation is in the right procedure. Open hydraulic feed valve (I) when in operation.
2. Button (C) raises the saw head away from the saw base. If saw head can not be raised, please check for proper power connection.
3. Start the motor by pushing the start button (A), Coolant switch (G) (0-close,1-open) to open the coolant system when saw blade is approaching work piece. When the cut is complete, turn off the coolant system (G)
4. Check if the upper limit switch is in proper position. Adjust handle (J) to move the up-down position.
5. Push button (B) to begin descent of the saw head and control the descent rate by adjusting feed valve (I).
6. To begin sawing start the blade motor, then depress button (B), saw head will automatically begin it's descent and start cutting the work piece. When the cutting is finished, saw head will return to the upper position. The motor will stop when saw head makes contact with the upper limit switch. Push button (F) to stop the machine, if needed.
7. When stopping a cut or resetting the saw is necessary, close the cylinder feeding valve (H), then push the stop button (F)
8. Press emergency button (E) to shut-off the motor when in an emergency situation.
9. An automatic shut-off limit switch is provided to stop the motor when the cut is completed. The limit switch (K) is controlled by button (L)(figure 3),



K L M J

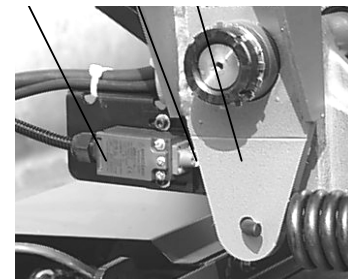
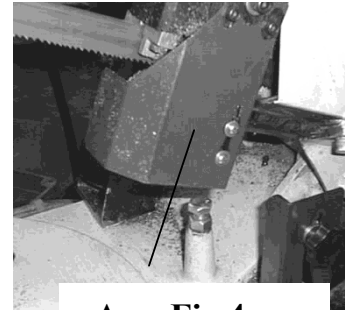


Fig. 3

which contacts the rear arm (M) for shutting off the motor and coolant system.

9-3.ADJUSTING SAW HEAD LOWER STOP

The downward travel of the saw head should be adjusted so that when the saw arm is in the bottom position, the teeth of the blade will not touch the table surface. The stop screw (A) (Fig.4) is used to adjust the distance between blade and table surface. After the distance is adjusted, tighten lock nut.



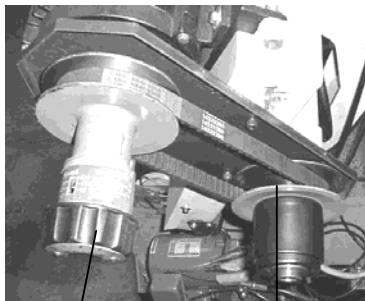
A Fig.4

9-4.CHANGING SPEEDS AND ADJUSTING BELT TENSION

If the belt (B) (Fig 6) is too loose, Loosen screw nut (A)(Fig5) adjust the screw to proper tension and lock the screw nut.

The cutting speed is controlled by speed change C (Fig 6). Turn it clockwise to decrease the blade speed and increase the blade speed by turning counter-clockwise.

Always be sure the motor is running before changing blade speed.



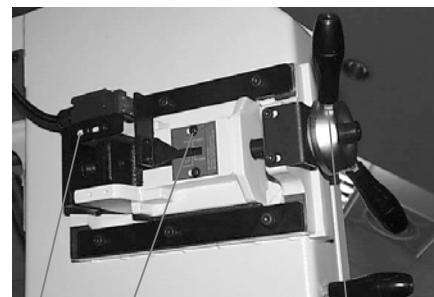
C Fig.6 B



A Fig.5

9-5.ADJUSTING BLADE TENSION AND BLADE TRACKING

To tension the blade, turn the blade tension handle (A) (fig. 7) clockwise. A pointer and tension scale (B) is located underneath the wheel. The scale is graduated to indicate blade tension of 20,000, 30,000 and 35,000 pounds per square inch (psi). For carbon blades, the blade should be tensioned at 20,000 psi. For bi-metal blades (similar to the one supplied with the machine), the blade should be tensioned at 30,000 or 35,000 psi. Always release blade tension at the end of each working day to prolong blade life. Make sure the



C B Fig.7 A

blade is tensioned correctly before checking or adjusting tracking. The blade is tracking correct when the back of the blade just lightly touches the wheel flanges of both wheels while the machine is running. If the blade is not touching the wheel flanges, tighten or loosen screw C (fig. 7) until the blade tracks properly.

9-6.ADJUSTING CUTTING WIDTH

First loosen clamp knob (A) (fig. 8). Move the left blade guide bar to the suitable position. Then tighten clamp knob (A).

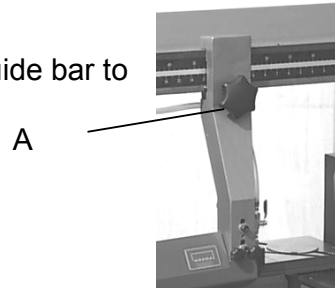


Fig.8

9-7.ADJUSTING BLADES AND CLEARING THE CUTTING CHIP

Before making the following adjustments, make sure the blade is tracking and tensioned properly:

1. The back of the blade (A) (fig. 9) should ride against the backup bearing (B)
2. To adjust, loosen set screw (C) and move the guide block (D) up or down, until it lightly touches the back of the blade. The saw blade (A) should also ride between and lightly touch the two blade guide roller bearings (E) and (F) (fig. 9) The front bearing (E) (fig. 9) is mounted C on an eccentric, and can easily be adjusted to suit blade thickness by loosening setscrew (G) and turning shaft (E).
3. The carbide blade guides (H) (fig 9) should also be adjusted so they lightly touch the blade by loosening screw (K).
4. The blade guide roller bearings, carbide guides and backup bearing on holder (fig 9 and 10) should be adjusted in the same manner.
5. Cutting chips on the blade will be cleared by the steel brush.

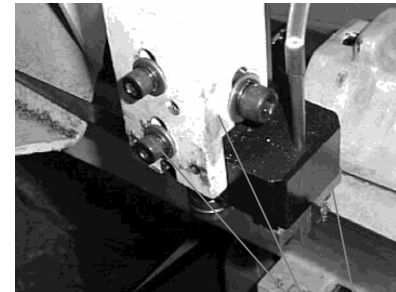
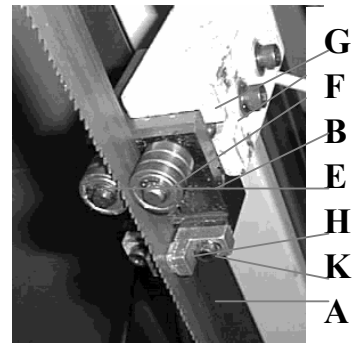
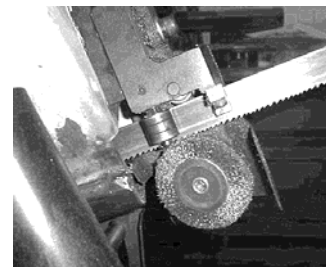


Fig.10 C D

9-8.CLEARING THE CUTTING CHIP

Please use steel brush to clear the chip on the blade teeth (fig 11)



9-9. BLADE AND COOLING SYSTEM

The use of proper cutting fluid is essential to obtain maximum efficiency from a band saw blade. The main cause of tooth failure is excessive heat build-up. This is the reason that cutting fluid is necessary for long blade life and high cutting rates. cutting area and blade wheels should be kept clean at all times.

The rate of coolant flow is controlled by the stop valve lever (A) (fig 12), which directs the coolant on to the blade. The lever (A) is shown in the off position.



A Fig.12 A

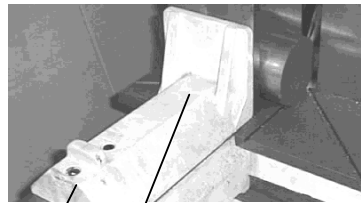
9-10. OPERATING AND ADJUSTING VISE

The work-piece 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) (fig, 14).

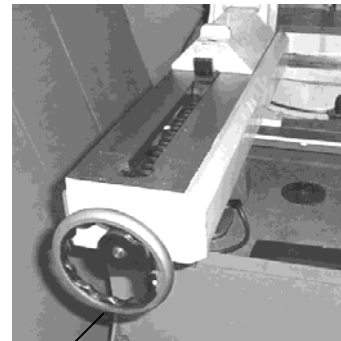
Simply turn the hand-wheel (A) counterclockwise 1/2 turn and move the vise jaw(B) to the desired position. Lift the rack hook (C) to open the vise jaw (B).

Then tighten the vise jaw (B) against the work-piece by turning hand-wheel clockwise. If the same cutting length can be used repeatedly on many work-pieces, distance set rod can be used to set a fix cutting length. Proceed as follows:

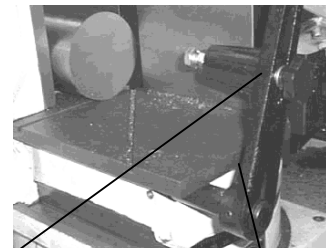
1. Pull the length setting rod (H) (fig 15) to a desired position. Loosen the fix screw. (K)
- 2 Let the top of the work-piece touch the length setting rod. Lock the fix screw.(K)



C B Fig.14



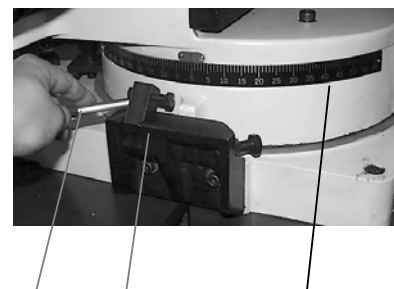
A Fig.13



K Fig.15 H

9-11. VARIABLE CUTTING ANGLE SELECTION

Please proceed as follows to obtain desired cutting angle. The swivel range is from 60 degrees clockwise to 45 degrees counter-clockwise. Before swinging the base, make sure there is nothing in the way, or any interference.

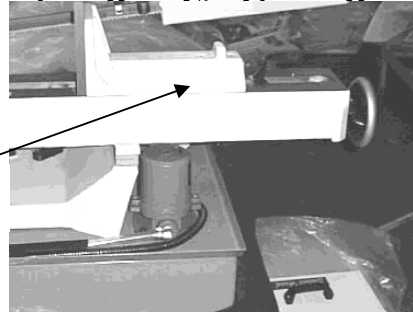


1. Loosen grip (A) (fig. 16). Pull out the bar (B) (fig. 16) swing and hold the bar.
2. Push to turn the swivel base to desired angle.
Refer to scale on (D) for degree.
3. Lock the grip (A), then start the cutting.

The swivel range is from 60 degrees clockwise to 45 degrees counter-clockwise.

For front or rear cutting, move the sliding vise table by direct pushing. Be sure to put your hand on top of (C) to prevent injury by contact with the coolant pump.

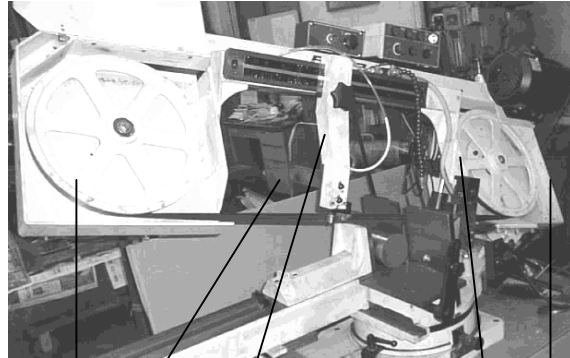
Fig.17 C



9-12.REMOVING AND INSTALLING THE BLADE

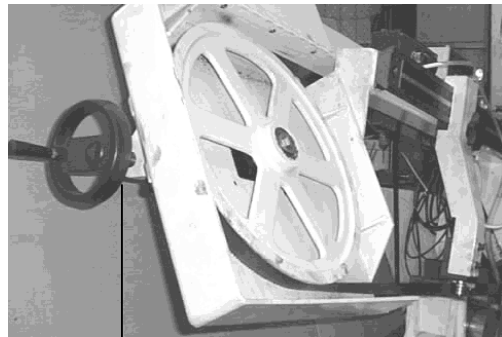
When it is necessary to change the blade, proceed as follows:

1. Raise the saw frame about 6" and close the feed on/off knob by turning it clockwise as far as it will go (fig 18).
2. Move the blade guide arm to the right.
3. Loosen cover screw, remove cover (A), open the cover (B), remove cover (C) and (D), then clean the chips and dirt inside the machine.
4. Release blade tension (F) (fig 19) by turning the blade tension hand-wheel counterclockwise.



B D E Fig.18 C A

5. Remove the blade from both wheels and out of each blade guide. But remove side (B) saw blade. When totally released, then remove the side (A).
6. Make sure the teeth of the new blade are pointing in the right direction. If necessary, turn the blade inside out.
7. Place the new blade on the wheels. In the blade guides and adjust blade tension and blade guides.



F Fig.19

9-13.HYDRAULIC SYSTEM (OPTIONAL FOR 1PH)

A). The hydraulic system on the 1319A consists of a hydraulic cylinder, which is operated by a needle valve. The saw frame is raised automatically by the hydraulic cylinder, and as this is done, oil passes to the underside of the piston. The feed valve (D) regulates the feed rate control knob and governs the descent of the saw head. (fig 20) To stop the descent of the head the operator can turn the stop valve (E).



D Fig.20 E G

9-14.GEAR BOX

The gearbox should be drained and refilled after the first 50 hours of use and thereafter every 5 months, with Mobil Synthetic Gear Oil, SHC-636, ISO Viscosity Grade 680. This oil meets or exceeds American Gear Manufacturers Association (AG.M.A.) #8 compounded Cylinder Oil specifications. This oil is available through Grainger's in 1 quart bottles as number SW061.

To change the gear oil, proceed as follows:

1. Run the machine for 10 minutes to warm up the gearbox.
2. Raise the saw arm to its maximum position and close the feed rate control knob.
3. Drain the gearbox by removing the screw away from the oil-out hole (A) (fig. 21).
4. Replace a screw and lower the saw arm to its lowest position.
5. Open the oil-in hole and fill the gearbox with oil
6. Close the oil-in hole.

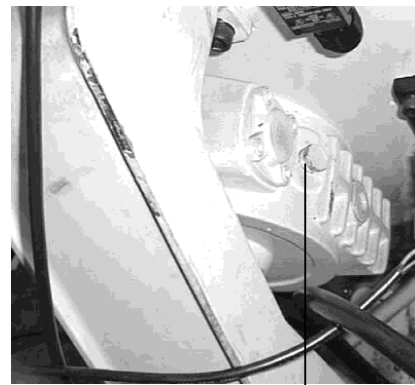


Fig.21 A

9-15.PIVOT

Occasionally lubricate the pivot using waterproof grease at the fittings (C) (fig 22)

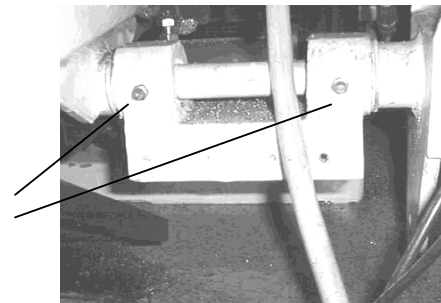


Fig.22

9-16. HOW TO OPERATE HYDRAULIC UNIT (FOR 330A)

1. This hydraulic unit is using (Esso,H15) oil. Change first oil after 50 hours use. Then change oil every 6 months after.
2. Run the hydraulic unit for at least 10 minutes before changing oil, this will let the oil flow smoother and easier to change.
3. Open the oil outpour door with tool when changing the oil. Let the used oil out completely.
4. Close the outpour door firmly, open the input door (A) and pour in the oil by 3 liter (will be 80%full).

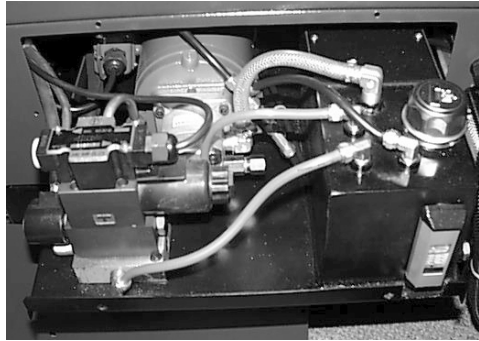


Fig.23

9-17. HOW TO USING CLEAN EQUIPMENT

When you have finished cutting, you can clean the chips by using wash down hose. Adjust the screw (on the end of spray nozzle) to control the volume of coolant fluid.

Clean the work area floor immediately when coolant fluid leaks on the floor.



Fig. 24

Always keep the floor around the saw dry to prevent slipping.

10.MAINTAINING

That's easier to keep machine in good condition or best performance by means of maintaining it at any time than remedy it after it is out of order.

- (1) Daily Maintenance (by operator)
 - (a) Check lubricant before starting the machine everyday.
 - (b) If the temperature of the spindle begins over-heating or making strange noises, stop machine immediately to check for damage.
 - (c) Keep work area clean; clean chips from machine and follow instructions for lubrication and rust proof oil before leaving.
- (2) Weekly Maintenance
 - (a) Clean and coat the cross leading screw with oil.
 - (b) Check to see if sliding surface and turning parts lack lubricant. If lubricant is insufficient, fill it.
- (3) Monthly Maintenance

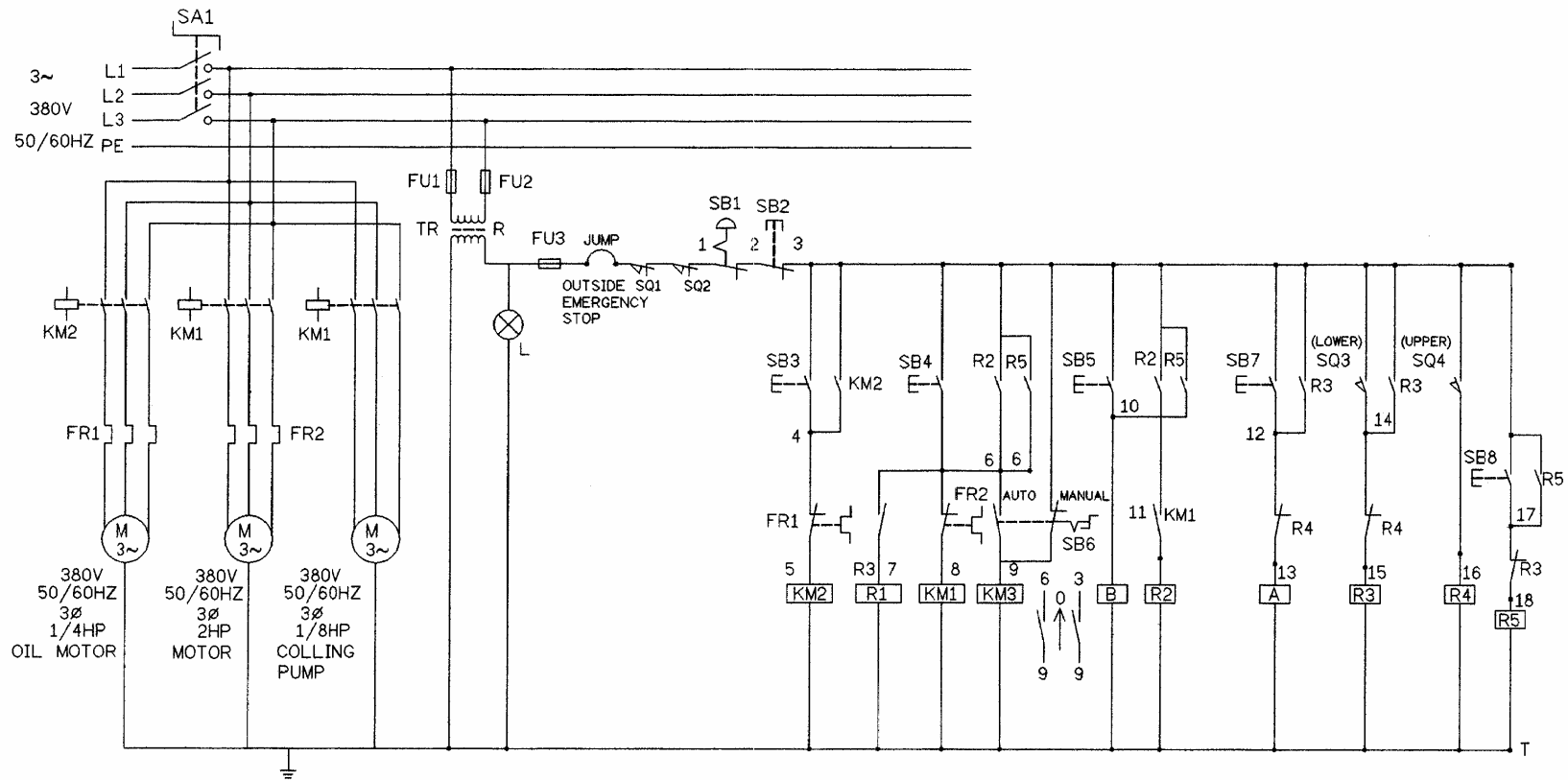
- (a) Check all machine parts for proper adjustment and function.
 - (b) Lubricate bearing worm, and worm shaft to avoid the wear.
- (4) Yearly Maintenance
- (a) Adjust table to horizontal position for accuracy.
 - (b) Check electric cord, plugs, switch, at least once a year to avoid chance of electrical damage.

11.TROUBLE SHOOTING

Symptom	Possible Cause(s)	Corrective Action
Excessive Blade Breakage	<ul style="list-style-type: none"> 1. Materials loosen in vise. 2. Incorrect speed or feed 8. Blade teeth spacing too large 9. Material too coarse 5. Incorrect blade tension 6. Teeth in contact with material before saw is started 7. Blade rubs on wheel flange 8. Miss-aligned guide bearings 9. Blade too thick 10 Cracking at weld 	<ul style="list-style-type: none"> 1. Clamp work securely 2. Adjust speed or feed 3. Replace with a small teeth spacing blade 4. Use a blade of slow speed and small teeth spacing 5. Adjust to where blade just does not slip on wheel 6. Place blade in contact with work after motor is started 7. Adjust wheel alignment 8. Adjust guide bearings 9. Use thinner blade 10. Weld again, note the weld skill.
Premature Blade Dulling	<ul style="list-style-type: none"> 1. Teeth too coarse 2. Too much speed 3. Inadequate feed pressure 4. Hard spots or scale on material 5. Work hardening of material. 6. Blade twist 7. Insufficient blade 8. Blade slide 	<ul style="list-style-type: none"> 1. Use finer teeth 2. Decrease speed 3. Decrease spring tension on side of saw 4. Reduce speed, increase feed pressure 5. Increase feed pressure by reducing spring tension 6. Replace with a new blade, and adjust blade tension 7. Tighten blade tension adjustable knob 8. Tighten blade tension
Unusual Wear on Side/Back of Blade	<ul style="list-style-type: none"> 1. Blade guides worn. 2. Blade guide bearings not adjust properly 3. Blade guide bearing bracket is loose 	<ul style="list-style-type: none"> 1. Replace. 2. Adjust as per operators manual 3. Tighten.
Teeth Ripping from	<ul style="list-style-type: none"> 1. Tooth too coarse for work 2. Too heavy pressure; too slow speed. 	<ul style="list-style-type: none"> 1. Use finer tooth blade. 2. Decrease pressure, increase speed

Blade.	<ul style="list-style-type: none"> 3. Vibrating work-piece. 4. Gullets loading 	<ul style="list-style-type: none"> 3. Clamp work piece securely 4. Use coarser tooth blade or brush to remove chips.
Motor running too hot	<ul style="list-style-type: none"> 1. Blade tension too high. 2. Drive belt tension too high. 3. Blade is too coarse for work 4. Blade is too fine for work 5. Gears aligned improperly 6. Gears need lubrication 7. Cut is binding blade 	<ul style="list-style-type: none"> 1. Reduce tension on blade. 2. Reduce tension on drive belt. 3. Use finer blade. 4. Use coarse blade. 5. Adjust gears so that worm is in center of gear. 6. Check oil path. 7. Decrease reed anti speed
Bad Cuts (Crooked)	<ul style="list-style-type: none"> 1. Feed pressure too great. 2. Guide bearings not adjusted properly 3. Inadequate blade tension. 4. Dull blade. 5. Speed incorrect. 6. Blade guides spaced out too much 7. Blade guide assembly loose 8. Blade truck too far away from wheel flanges 	<ul style="list-style-type: none"> 1. Reduce pressure by increasing spring tension on side of saw 2. Adjust guide bearing, the clearance can not greater than 0.001. 3. Increase blade tension by adjust blade tension 4. Replace blade 5. Adjust speed 6. Adjust guides space. 7. Tighten 8. Re-track blade according to operating instructions.
Bad Cuts (Rough)	<ul style="list-style-type: none"> 1. Too much speed or feed 2. Blade is too coarse 3. Blade tension loose 	<ul style="list-style-type: none"> 1. Decrease speed or feed. 2. Replace with finer blade. 3. Adjust blade tension.
Blade is twisting	<ul style="list-style-type: none"> 1. Cut is binding blade. 2. Too much blade tension. 	<ul style="list-style-type: none"> 1. Decrease reed pressure. 2. Decrease blade tension.

12. CIRCUIT DIAGRAM



330		SCHEDULE OF ELECTRICAL EQUIPMENT			Sheet:	
Item.	Designation and function	Technical data	QTY	Supplier	Supplier's reference	REMARK
FU1	FUSE	WAGO 281	1	WAGO		CE
FU2	FUSE	WAGO 281	1	WAGO		CE
FU3	FUSE	WAGO 281	1	WAGO		CE
SQ1	LIMIT SWITCH		1			CE
SQ2	LIMIT SWITCH		1			CE
SB1	EMERGENCY STOP	XB7-ES542	1	TE		CE
SB2	OFF SWITCH	XB7-EA42	1	TE		CE
SB3	OIL PUMP START SWITCH	XB7-EA31	1	TE		CE
SB4	MAIN MOTOR START SWITCH	XB7-EA31	1	TE		CE
SB5	DOWN SWITCH	XB7-EA31	1	TE		CE
SB6	COOLING PUMP SWITCH	XB7-ED21	1	TE		CE
SB7	UP SWITCH	XB7-EA31	1	TE		CE
SB8	FOOT SWITCH		1			CE
R1	RELAY		1			CE
R2	RELAY		1			CE
R3	RELAY		1			CE
R4	RELAY		1			CE
R5	RELAY		1			CE
KM1	CONTACTOR	LCID 1810B7	1	TE		CE
KM2	CONTACTOR	LCIK 0910B7	1	TE		CE
KM3	CONTACTOR	LCIK 0910B7	1	TE		CE
L	LIGHT	XB7-EV61	1	TE		CE
TR	TRANSFORMER	380V/24V 50VA	1	SUENLIAG		CE
FR1	OVERLOAD FOR OIL	LR2K 0.54~0.8A	1	TE		CE
FR2	OVERLOAD FOR MOTOR	XB7-EV61	1	TE		CE
SQ3	LOWER LIMIT SWITCH		1			CE
SQ4	UPPER LIMIT SWITCH		1			CE
B	LOWER MAGNETIC VALVE		1			CE
A	UPPER MAGNETIC VALVE		1			CE
SA1	MAIN POWER SWITCH		1	KONCAR		CE

7		Milling and Drilling Machine type 330	Drawn
6			
5			Checked
4			
3		Part lists	Diagram No.
2			
1			

13 Parts Lists

