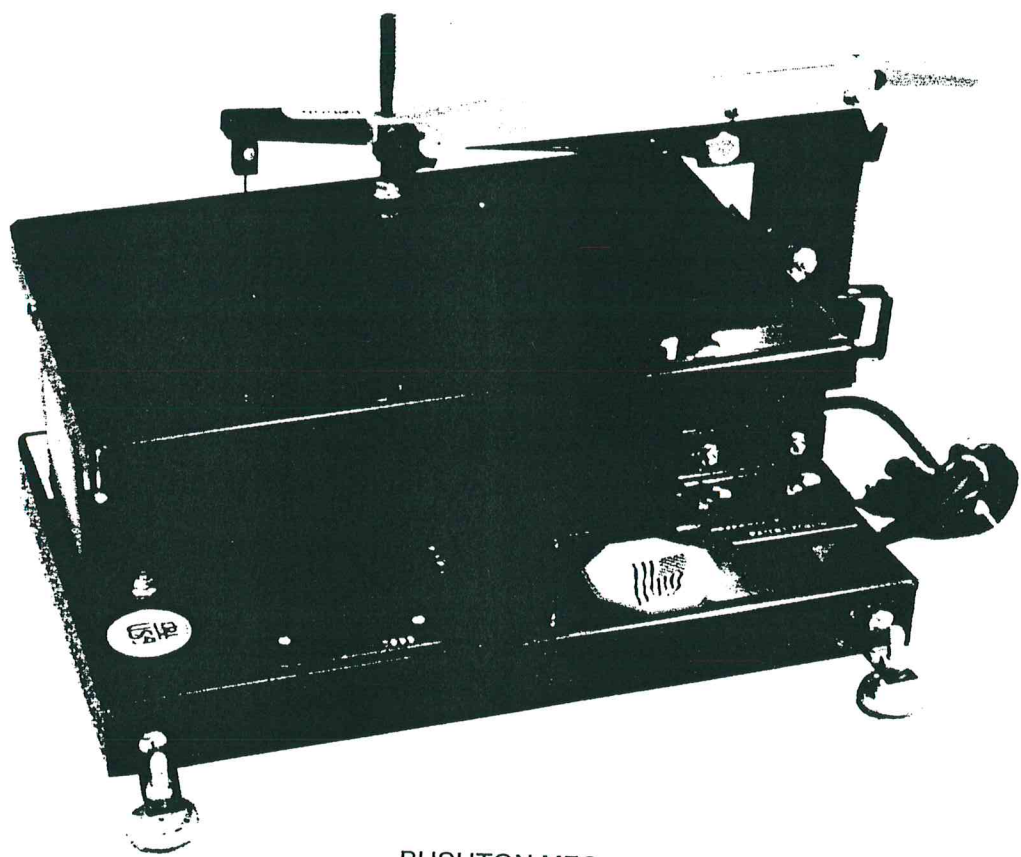




rbi



MODEL 212 HAWK SCROLL SAW OPERATORS MANUAL



BUSHTON MFG
P.O. Box 127, 319 South Main Street
Bushton, KS 67427
620-562-3557
customerservice@hawkwoodworkingtools.com



**READ THOROUGHLY BEFORE
OPERATING**



WARRANTY

We guarantee each Hawk Scroll Saw to be free from defects in material and workmanship for 1 year from date of delivery to original user. This warranty does not cover damage sustained in transit or from misuse of this piece of equipment.

This warranty does not obligate us to bear the cost of labor or transportation charges in connection with the replacement or repair of defective parts, nor shall it apply to any saw upon which repairs or alterations have been made unless authorized by us.

We make no warranty in respect to components, not of our manufacture, including motors, such being subject of their respective manufacturers.

We shall in no event be liable for consequential damages or contingent liabilities arising out of the failure of any saw to operate properly.

No express, implied or statutory warranty other than herein set forth is made or authorized to be made by us.

ENCLOSED WARRANTY REGISTRATION CARD MUST BE RETURNED TO VALIDATE YOUR WARRANTY.

TO VALIDATE WARRANTY, CUSTOMERS MUST MAIL IN WARRANTY CARD ON RECEIPT OF MACHINE.

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SPECIFICATIONS

LENGTH.....	19"	MAX. CUTTING DEPTH	2"
WIDTH	12 3/4"	STROKE	5/8"
HEIGHT	12 1/4"	STROKES PER MINUTE	1725
WEIGHT.....	38 lbs.	MOTOR.....	1/8 H.P. TEFC
THROAT DEPTH	12"	DRIVE	DIRECT

TRAINING

1. Read the operators manual carefully. Be thoroughly familiar with the operation of the equipment.
2. Know where the controls are and how to operate them.
3. Wear safety goggles, ear protection, and mask in dusty operation.
4. Never allow unsupervised children to operate equipment. Never allow adults to operate the equipment without proper instruction.
5. Keep work area clear of other persons.
6. Maintain a clean, uncluttered work area.

OPERATION SAFETY

1. Never make any adjustments to the machine while it is running.
2. Disconnect electrical power supply before performing any adjustments to the machine.
3. Remove all working tools and equipment before starting machine.
4. Wear proper clothing. Avoid loose fitted clothing, long sleeves, long hair, gloves, neck ties, jewelry, watches, rings, etc.
5. Do not operate an electrical device in a damp or wet area to avoid electrical shock.
6. Maintain all safety guards.
7. Do not operate machine while under the influence of medication, alcohol, or drugs.
8. Never allow the machine to run unattended.
9. Do not overload the machine. Follow operators instruction for safe operation.
10. Keep equipment in proper working order. Follow recommended maintenance procedures in the operators manual.

SET-UP

The Hawk 212 Scroll Saw is shipped in one carton. Remove the shipping carton from the saw upon receipt and check to see that all parts were received without damage. After the carton is examined, the hold down brackets may be mounted to the base.

CONTENTS OF HAWK 212 SHIPPING CARTON:

Item	Qty.
1. 212 Saw	1
2. Holddown Brackets And Mounting Hardware ..	4
3. Blade Assortment Pack	1
4. T-Handle Allen Wrench	1
5. Quick Change Hold Rod	1
6. Operators Manual	1
7. Glide With Two Nuts	4

NOTE: Damage and/or missing parts are to be reported to the transportation carrier. MANUFACTURER IS NOT RESPONSIBLE FOR SHIPPING DAMAGE.

Mount a holddown bracket to each corner of the saw with a 1/4" carriage bolt and lock nut. The rounded head of the bolt should be on the outside. Then install a glide on each bracket with the nuts included with them. Level the saw by adjusting the height of the glide nuts. The saw may also be mounted directly to a workbench with the brackets. Leveling a saw mounted in this manner is accomplished by adjusting the height of the hold down brackets. (fig. 1)

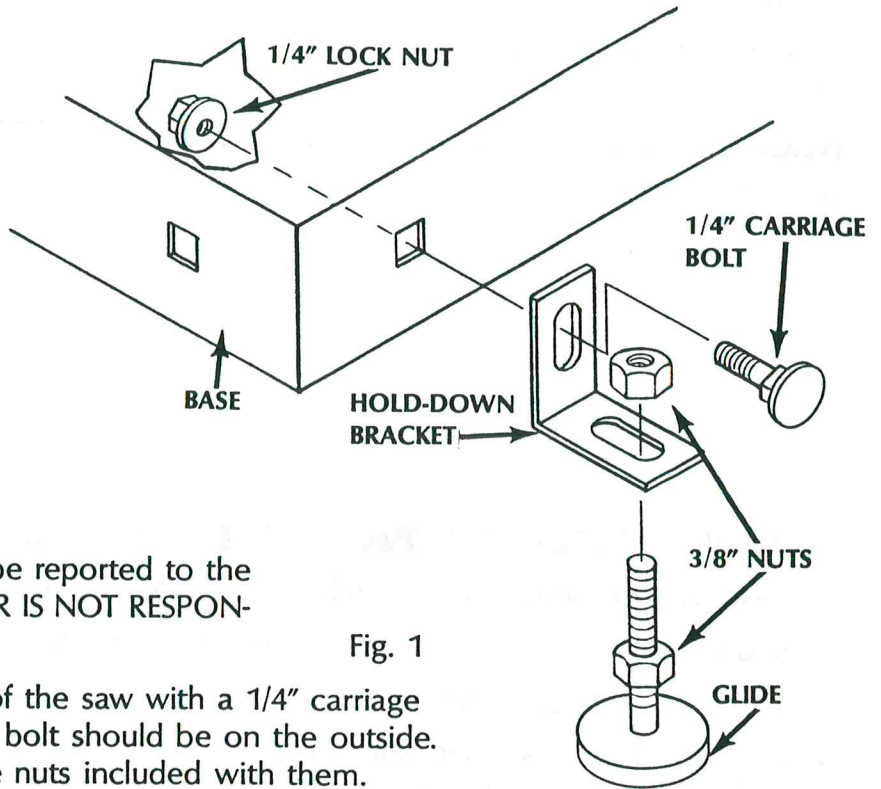


Fig. 1

MAINTENANCE

(fig. 2)

Arm Pivot

Add 3 to 4 drops of light machine oil to each side of the parallel arm pivot bushings on the upper and lower arms every 16 hours of operation.

Tensioning Rod

Add 1 to 2 drops of light machine oil to the threads of the blade tensioning rod at the bottom arm every 16 hours of operation.

Table

Apply paste wax to the working surface of the table to allow easier movement of the wood on the table surface.

Cam Lock Tension Handle

Apply paraffin wax to the sliding surface of the handle to provide easier operation.

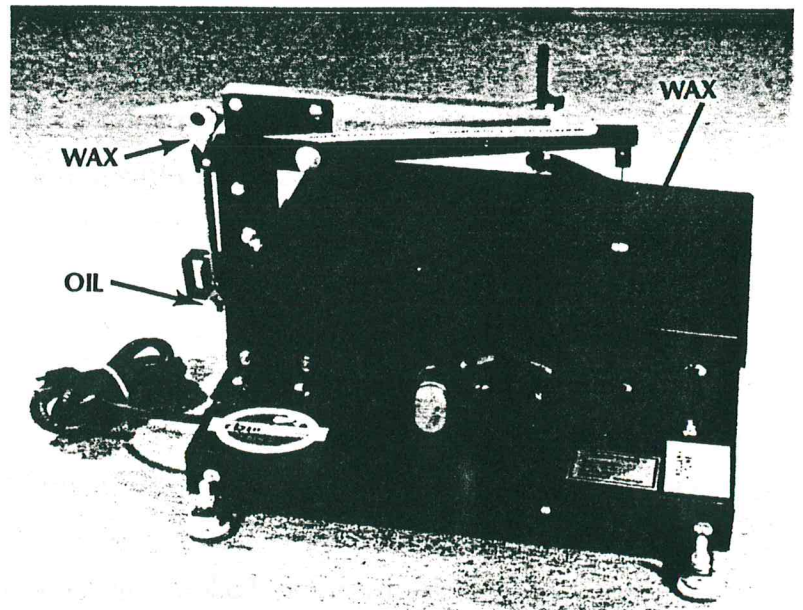


Fig.2

SAWING TECHNIQUES

Starting

It is best to begin the cut at a point or corner because it is difficult to smoothly blend in start and end points when beginning on a side. When sawing circular shapes, saw into the pattern line in a crosscutting (across the grain) direction. If the starting point must be on a curve, make it an outside curve. Burrs and knobs are much easier to sand on an outside curve.

Sawing

Feed the piece to be cut slowly into the saw blade while maintaining downward pressure on it. Do not force it into the blade: let the saw blade do the work. The speed at which you feed the wood into the blade depends on the type of wood you are cutting. Harder wood should be fed more slowly than the softer varieties. Feeding too quickly into the blade may result in the blade burning the wood, bending or twisting of the blade while sawing, a rough edge on the cut, or the wood jumping on the table. Never apply sideways pressure on the blade. The downward pressure on the wood may be applied by hand or by the holddown foot.

Straight-Line Cutting

A small amount of set is formed on one side of most scroll saw blades due to the manufacturing process used to produce them. Because of this, most blades do not cut straight or parallel to the blade. The set causes them to cut a few degrees more to one side than the other. To saw a straight line, the work should be angled approximately 2 to 4 degrees to compensate for this. This may be accomplished freehand or with a guide board. The same technique should be used for straight-line ripping. Be sure that the saw blade is following the layout line and not the grain when ripping.

Turns and Corners

The Hawk Scroll Saws are capable of producing 360° turns while sawing. The kerf left after a turn is approximately 1/2 the width of the saw blade. To saw a point, simply turn the workpiece the desired amount while maintaining downward pressure on it. It is not necessary to saw past the point and restart the cut like the normal procedure for band sawing. When sawing curves, slowly follow the pattern line, turning the workpiece as you cut so the blade teeth follow the line. It may be necessary to install a smaller blade when sawing extremely tight corners or radii to prevent the wood from jumping on the table and to prevent blade breakage.

Stack Cutting

Stack cutting saves time by sawing two or more pieces simultaneously. Simply stack the workpieces on top of each other and lay the pattern out on the top piece. The pieces may be held together with double faced tape or nails may be driven into the scrap areas. Cut out the pattern on the top piece and disassemble the stack. The stack should not exceed 2" in height. (fig. 3)

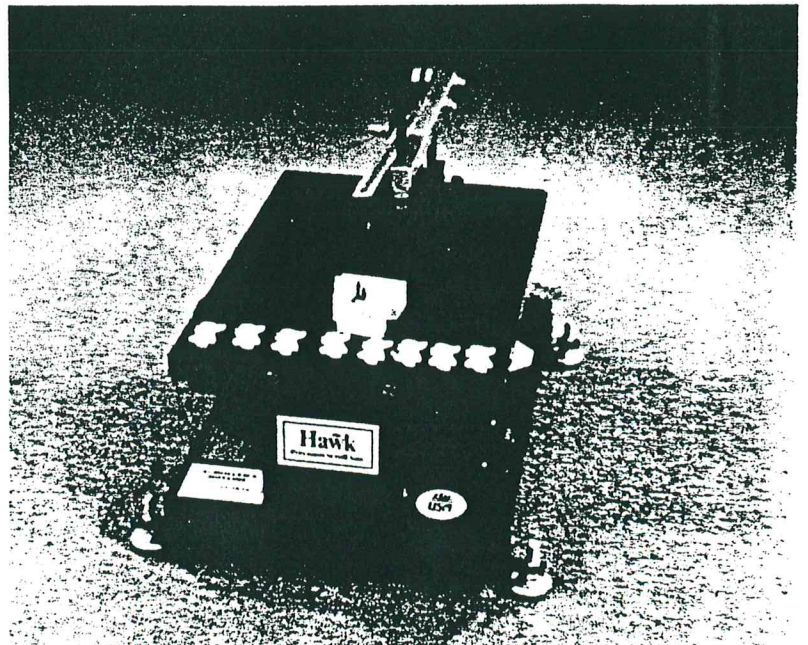


Fig. 3

· Sawing Inside Openings

Sawing inside openings is a common and frequently used process on scroll saws. It is cutting an opening on the inside of the workpiece without sawing through it. To do this, drill a small hole that is large enough for the blade to pass through near the pattern line of the inside opening. Release blade tension by flipping the Cam Lock tension handle to the blade changing position. Remove the top of the blade from the top blade holder (see blade changing). Insert the blade through the drilled hole in the workpiece. Reinstall the top of the blade into the holder. Retension the blade by flipping the blade tension handle to its original position. After the cut has been finished, repeat this procedure to remove the blade from the opening. NOTE: Disconnect the machine from electrical power before performing this procedure. (fig. 4)

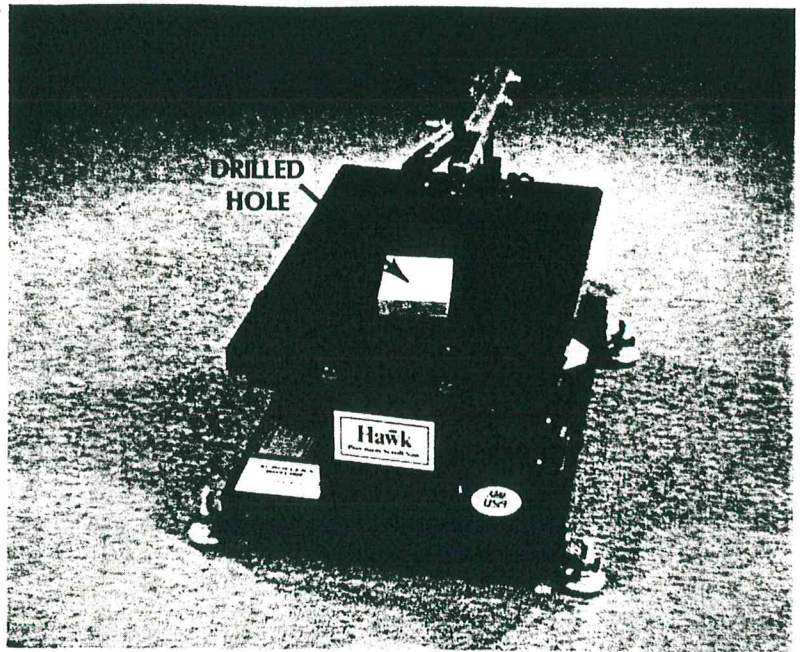


Fig. 4

COMPOUND SAWING

The compound sawing process involves cutting on two or more sides of the workpiece. To do this, simply lay out a pattern on two adjacent surfaces. After the patterns are on the workpiece, decide which surface is to be cut first. The side that will produce the least amount of scrap pieces after it is cut is generally the best side to start on. When one side is cut, return the scrap pieces to their original locations so that you have a prismatic shape to cut out the second side. It may be helpful to nail, tape, or glue these scraps back to the piece. (fig. 5)

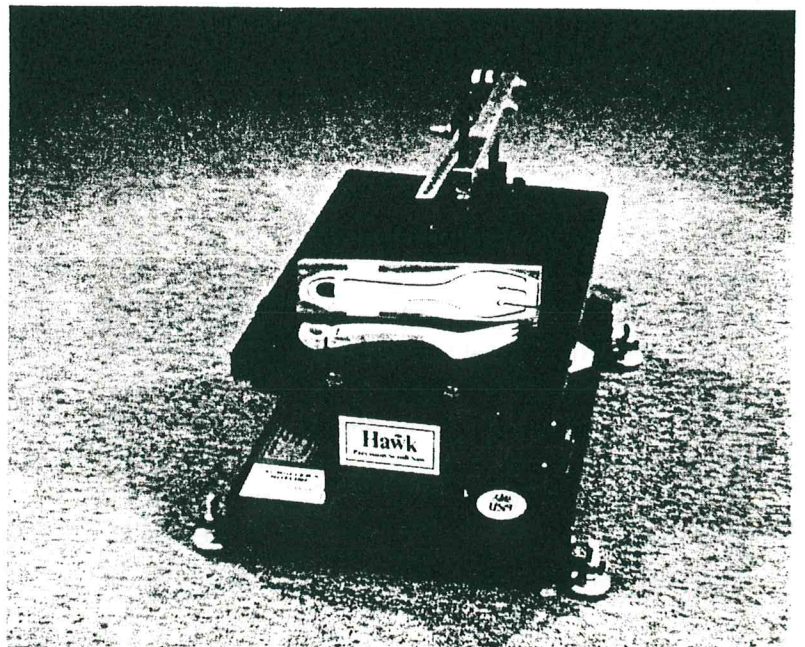


Fig. 5

PROCEDURE FOR BLADE CHANGING

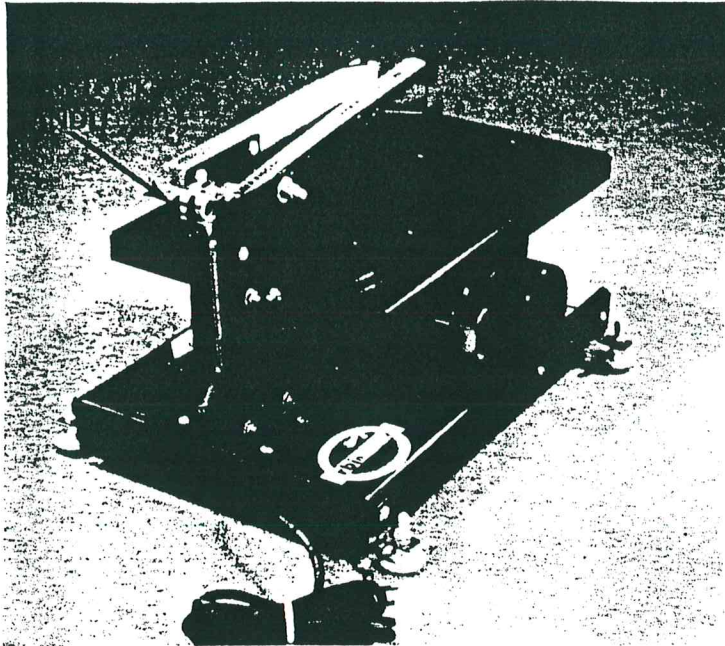


Fig. 6

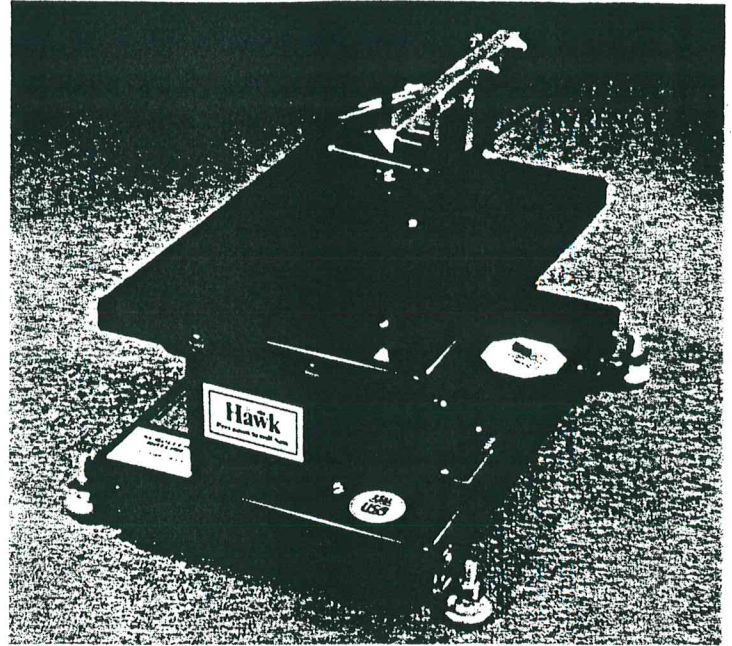


Fig. 7

Step 1

Release blade tension by flipping the HA-74 Cam Lock handle up. (fig. 6) Place the L-shaped HA-65 Quick Change Hold Rod behind the FA-45 upper blade holder by inserting it with the shortest end in the vertical position and the longer end pointing toward the rear of the saw in the opening in the upper arm. This is to help maintain the blade holder in a stationary position. Place the ES-86 T-handle allen wrench into the allen head cap screw on the right side of the upper blade holder and loosen the screw. Remove any piece of the old blade. The blade is now ready to be removed from the bottom blade holder. (fig. 7)

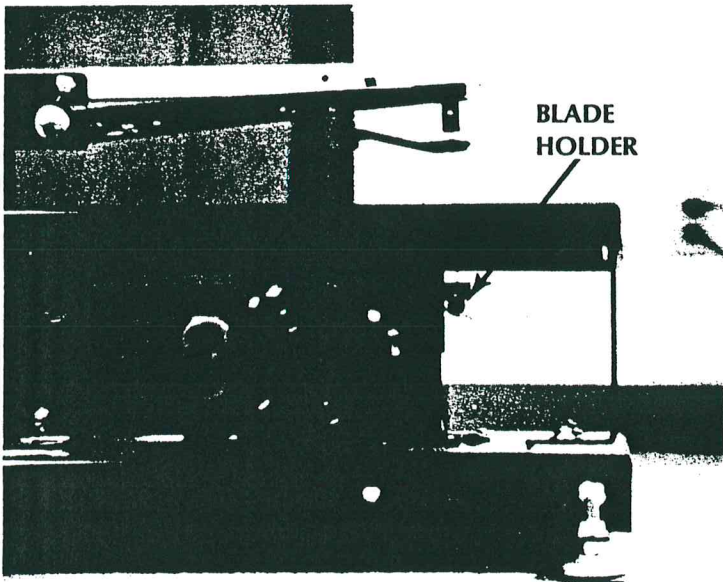


Fig. 8

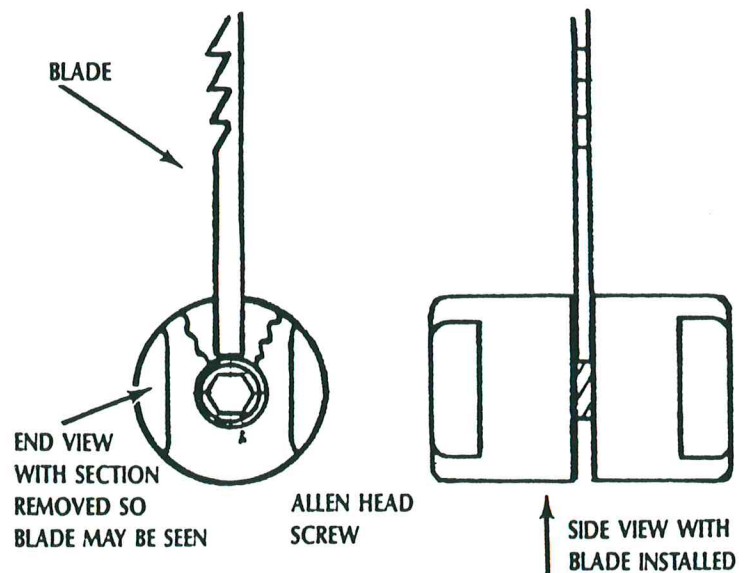


Fig. 9

Step 2

Located in the V-notch of the lower arm is the small, barrel shaped FA-46 blade holder. (fig. 8) Remove it by sliding the blade holder forward and turning it slightly toward the front of the saw. This allows the blade to slide forward out of the notch in the arm. When the blade is free from the notch, slide it to the left or right to remove it from the table slot. Place the saw blade holder on end in the oblong slot located in the

saw base. Using a 5/16" open end wrench on the flats of the FA-46 blade holder, loosen the holder and remove the old blade. Insert the new blade, teeth pointing down, between the two halves of the FA-46 blade holder. The bottom of the blade should rest on top of the center screw in the holder. (fig. 9) Tighten the holder with the 5/16" open end wrench.

Step 3

The FA-46 bottom blade holder with the blade installed is now ready to be placed back into the V-notch of the lower arm. While holding the FA-46 holder in one hand, feed the top of the blade through the table slot from underneath. Be sure the teeth are facing the front of the saw. Position the blade holder in front of the lower arm so that the blade may slide through the slot in the arm. Slide the holder back into the V-notch. Pull upward on the blade with the thumb and first finger of your left hand to seat the blade holder in the V-notch. Place the ES-86 T-handle allen wrench into the allen head cap screw in the FA-45 upper blade holder. Pull the upper arm downward with your right hand while holding the ES-86 T-handle allen wrench.

Lower the the upper blade holder over the top end of the blade until the top of the blade is touching the center of the allen head cap screw and the back of the blade is touching the roll pin in the middle of the holder. (fig. 10) Tighten the allen head cap screw securely with the ES-86 T-handle allen wrench. Remove the T-handle allen wrench and quick change hold rod from the upper arm.

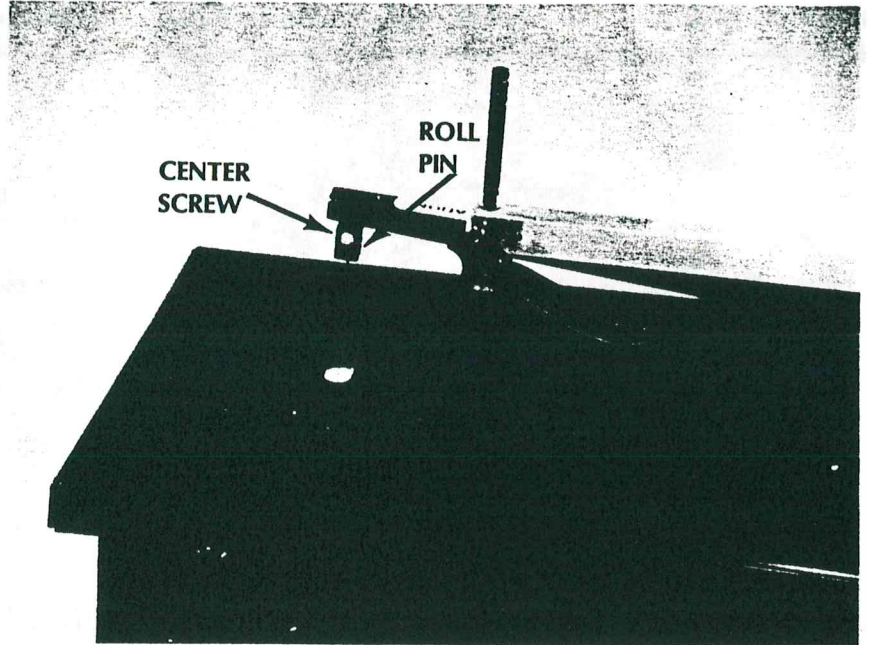


Fig. 10

Step 4

Retension the blade by flipping the HA-74 Cam Lock handle to its original position. Check the blade tension by plucking the blade like a guitar string. A properly tensioned blade will produce a crisp, pinging sound. Another method of determining if the blade is tensioned correctly is to check the distance from the back edge of the blade to the back edge of the table slot. Visually inspect this distance while the saw is at rest. Push the blade back with a scrap piece of wood, applying approximately the same amount of pressure as applied when sawing. A properly tensioned blade will not deflect more than approximately 1/2 of the distance described above. If blade tension is not correct, release tension by flipping the Cam Lock handle to blade changing position and turn it like a knob. Hold the blade tension rod while turning the Cam Over handle to prevent the rod from turning also. Turning the Cam Lock handle clockwise will increase blade tension. If the blade does not produce a crisp ping when plucked or if it deflects more than 1/2 of the distance described above, increase tension. Do not adjust the handle more than 1/2 turn at a time. Flip the Cam Lock handle to its original position and recheck blade tension. Tension adjustments may be necessary when changing blade sizes. Small changes in blade size, for example, changing from a #5 to a #7 or a #7 to a #9, will probably require little if any adjustment. However, to change from a #5 to a #9, increase blade tension approximately 2 1/2 turns of the Cam Lock handle; to change from a #5 to a #2, decrease blade tension approximately 2 turns; and to change from a #2 to a #2/0, decrease tension by approximately 1/2 turn.

ADJUSTMENT AND REPAIR

Disconnect machine from electrical power supply before performing any of the following adjustments to it.

ADJUSTING THE HA-104 HOLDDOWN FOOT

1. Release blade tension by flipping the HA-74 Cam Lock handle up.
2. Loosen knob at the top of holddown arm.
3. Rotate foot counter-clockwise to the blade. Slide the blade through the cutout at the end of the foot and center in it.
4. Adjust to desired height.
5. Tighten threaded knob.
6. Tension the blade with the blade tension handle.

LEVELLING THE FA-20-Z TABLE

1. Place a small 90° square on the table with the back edge of the beam against the blade. (fig. 11)
2. Inspect the blade and square. The square should fit perfectly against the blade with no openings between them. If there is an opening, proceed to the next step.
3. Loosen the four lock nuts on the 1/4" carriage bolts located at the front and rear of the table (two at each end). (fig. 12)
4. Move the left or right side of the table until there is no gap between the square and the blade.
5. Tighten all lock nuts and inspect again with the square.

REMOVING THE FA-20-Z TABLE

1. Remove the blade from the saw (see blade changing procedure).
2. Loosen and remove the four 1/4" carriage bolts located at the front and rear of the table (two at each end). (fig. 12)
3. Lift table off of machine.
4. Reverse procedure to install.

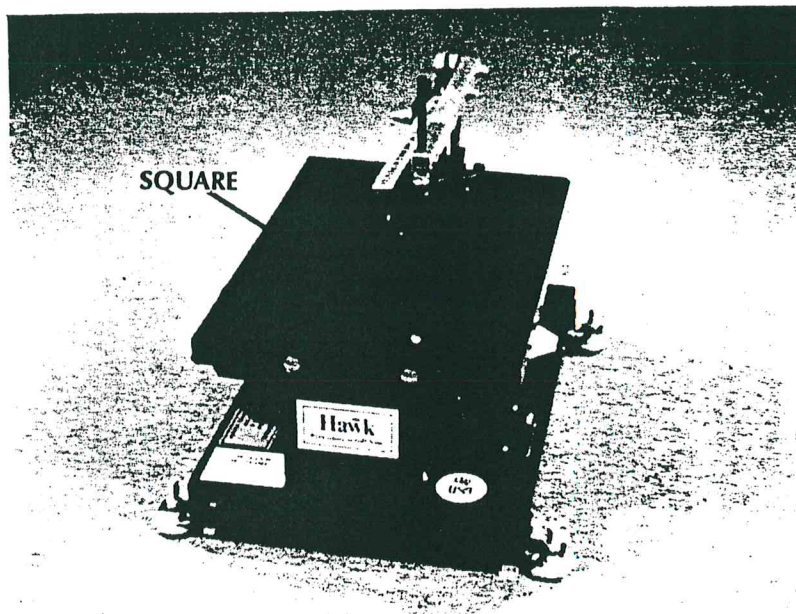


Fig. 11

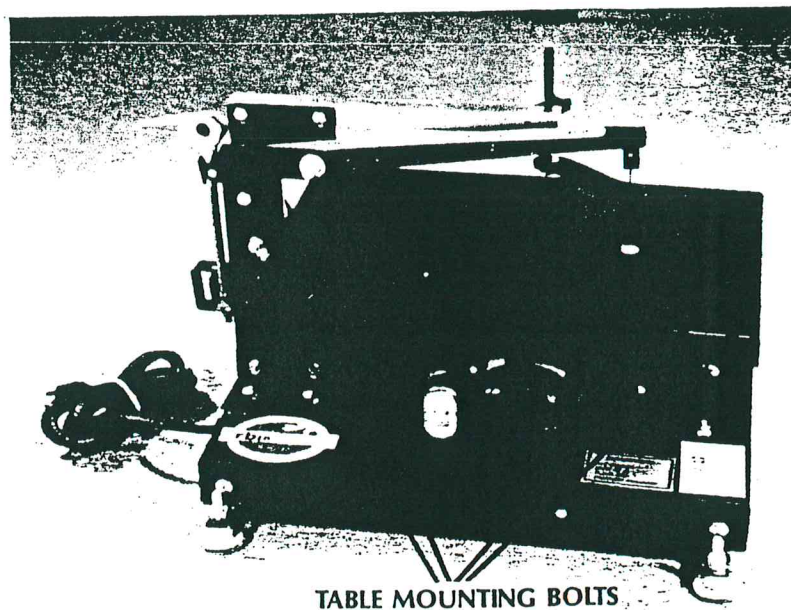


Fig. 12

REMOVING THE ES-44-Y MOTOR

1. Loosen and remove all bolts holding the FA-29 crank guard assembly. Remove the guard assembly. (fig. 13)
2. Loosen the set screw that secures the FA-17 pin and remove the pin.
3. Loosen and remove the four 1/4" motor mounting carriage bolts. Remove the motor from the base.
4. Unplug the motor power cord underneath the saw. Remove the plastic grommet that holds the cord in the base.
5. Pull the cord through the base.
6. Reverse procedure to install.

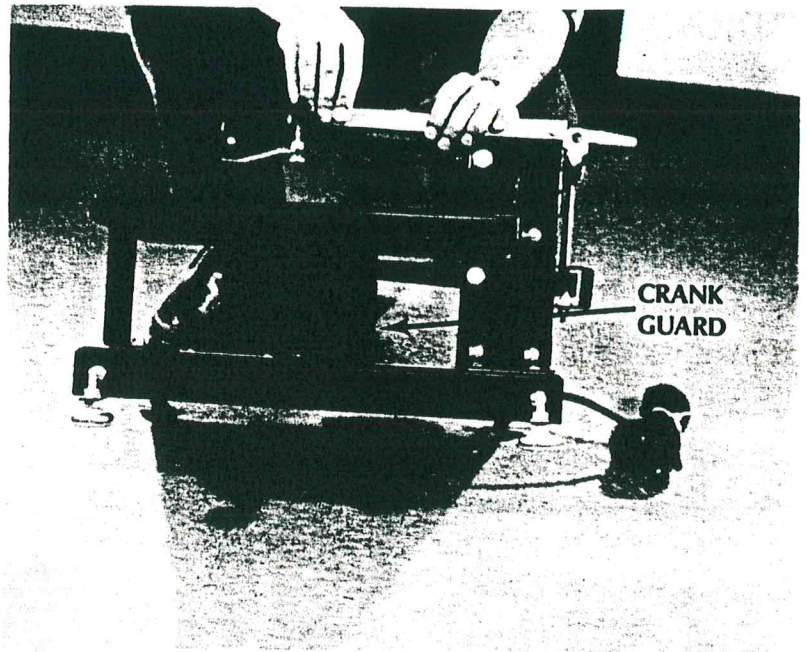
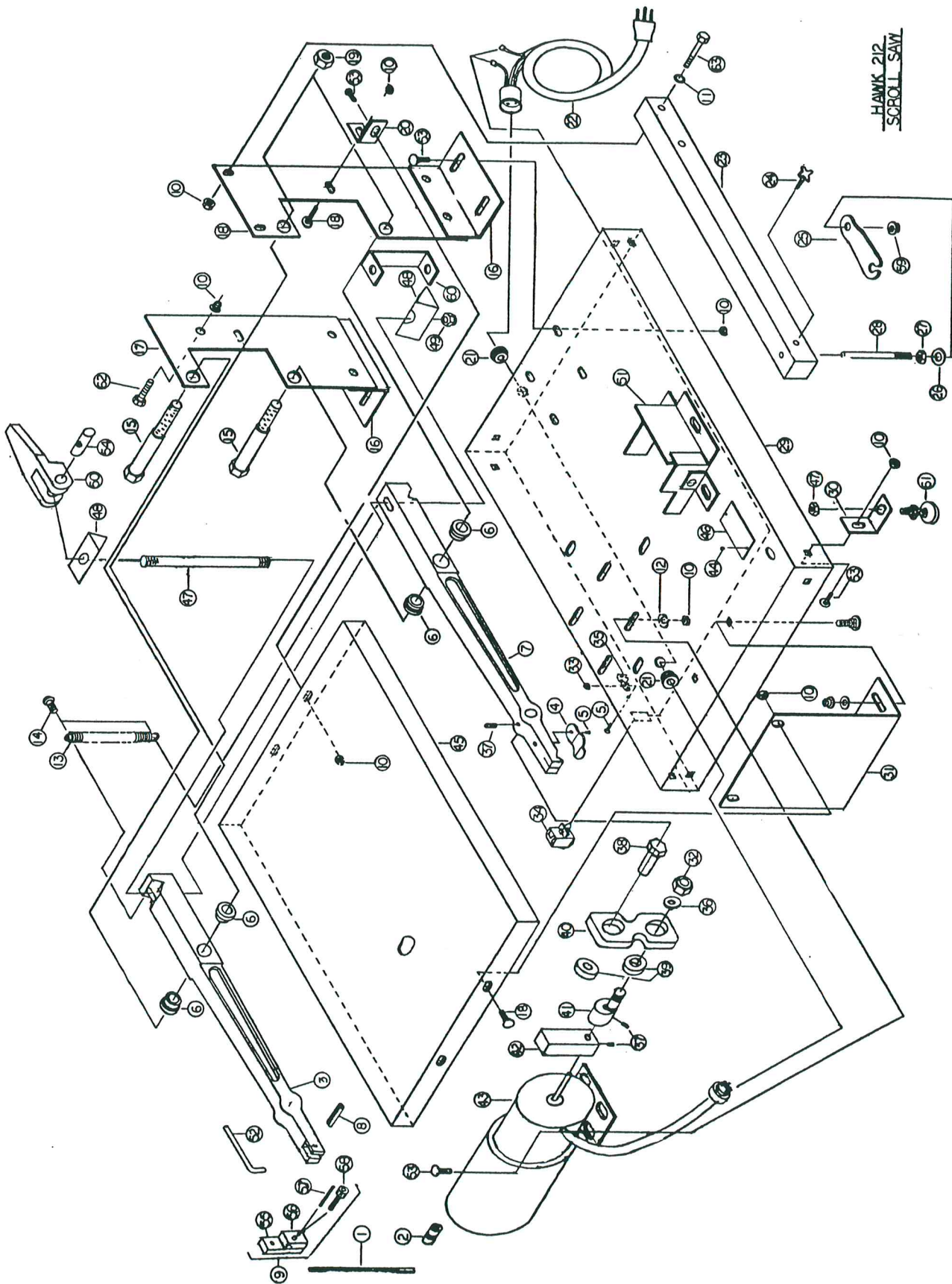


Fig. 13

HAWK 212 PART BREAKDOWN LIST

Key No.	Part No.	Part Description	Qty.	Key No.	Part No.	Part Description	Qty.
1		Blade	1	32	HA-68	1/2" Jam Nut	1
2	FA-46	Bottom Blade Holder	1	33	RB-107	10-32 Hex Nut	1
3	FA-44	Top Arm	1	34	HA-61	Switch	1
4	HA-99	Plastic Clip	1	35	HA-63	Clip	1
5	RB-106	10-32 x 1/2" Machine Screw	2	36	HA-14	Spacer	1
6	R-368	Bronze Bushing	4	37	RZ-83	1/4"-20 x 1/4" Set Screw	3
7	FA-30	Bottom Arm	1	38	FA-17	Connecting Pin	1
8	FA-42	1/8" x 3/4" Roll Pin	1	39	PS-07	Bearing	2
9	FA-45	Top Blade Holder Assembly	1	40	ES-16	Pitman Arm	1
10	RB-223	1/4"-20 Lock Nut	31	41	FA-18	Crank	1
11	RBZ-207	Split Lock Washer	2	42	FA-19	Counter Weight	1
12	RB-177	1/4" Flat Washer	6	43	ES-44-Y	1/8 H.P Motor	1
13	FA-36	Spring	1	44	FA-12	Drive Screw	2
14	FA-35	10-32 x 1/4" Machine Screw	2	45	FA-20-Z	Table	1
15	RZ-84	1/2" x 2 1/4" Shoulder Bolt	2	46	FA-49	Serial Tag	1
16	FA-37	Rear Arm Support Bracket	2	47	HA-98	Blade Tension Rod	1
17	FA-48	R.H Rear Arm Support	1	48	HA-75	Tension Rod Pivot	2
18	FA-38	L.H Rear Arm Support	1	49	HA-78	1/4"-20 x 5/8" Carriage Bolt	29
19	RZ-51	3/8" Lock Nut	2	50	HA-74	Cam Lock Tension Handle	1
20	FA-09	Rear Table Mounting Bracket	2	51	FA-29	Crank Guard Assembly	1
21	RB-152	Strain Relief Bushing	2	52	HA-65	Quick Change Hold Rod	1
22	HA-60	Electrical Cord Set	1	53	RB-99	1/4"-20 x 5/8" Carriage Bolt	29
23	FA-10	Hold Down Arm	1	54	HA-77	Round Handle Pivot	1
24	ES-40	Threaded Knob	1	55	FA-40-Z	Blade Holder Arm Insert	1
25	HA-104	Hold Down Foot	1	56	FA-41-Z	Blade Holder Side	1
26	RB-150	5/16" Flat Washer	1	57	FA-43	1/8" x 1/2" Roll Pin	1
27	RZ-81	5/16"-18 Hex Nut	1	58	ES-90	8-32 x 1/2" Cap Screw	1
28	SA-11	Hold Down Foot Rod	1	59	FA-47	5/16" Whiz Lock Nut	1
29	FA-13-Y	Base	1	60	HA-97	Wedge Hold Bracket	1
30	FA-14	Bracket	4	61	ES-57	Glide With 2 Nuts	4
31	FA-15	Table Front Support	1	62	RBZ-206	1/4" x 3/4" Hex Head Bolt	1
				63	PS-80	1/4"-20 x 1 1/4" Hex Head Bolt	2



HAWK 212
SCROLL SAW

TROUBLE-SHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Excessive blade breakage	Improper blade size for wood thickness	Select proper blade size. Increase size for thick wood. (see blade selection chart)
	Cutting too small a radius for blade size	Increase radius size or reduce blade size. Refer to Sawing section
	Improper table installation	Install table properly
Blade burns the wood	Wrong blade size	Increase blade size. Refer to blade selection chart.
	Cutting too small a radius for blade size	Increase radius or decrease blade size. See Sawing section
	Improper feeding	Feed material at 4° right to left. Refer to Sawing section
	Pushing sideways on the blade	Feed straight so not to bend blade left or right. Refer to Sawing section
	High resin content in wood	Saw against grain when possible or use new blade.
	Feeding too fast	Reduce feed rate. Refer to sawing section
	Improper blade tension	Increase blade tension. Refer to Blade Installation
Blades bend back excessively while sawing	Improper blade tension	Increase blade tension. Refer to Blade Installation
	Improper blade size	Increase blade size. See Blade Selection
	Feeding too fast	Slow feed rate. Refer to Sawing section
Blade cutting too large a radius	Blade too large	Use smaller blade. See Blade Selection
	Improper blade tension	Increase blade tension. See Blade Changing
	Improper feeding	Turn board properly. See Sawing section
Board splintering on the bottom	Wrong blade size	Use smaller blade. See Blade Selection
	Wood grain stringy or knotty	Use masking tape on the bottom at the saw line
Rough cut on bottom	Blade too large	Use smaller blade. See Blade Selection
	Improper blade tension	Increase blade tension. See Blade Changing
	Poor quality wood Feeding too fast	Use better quality wood Slow feed rate. See Sawing section
Blade doesn't follow pattern line	Improper feeding	Feed at a rate of 4° left to right. See Sawing section
	Blade too small	Increase blade size. See Blade Selection
	Blade dull	Replace blade. See blade changing
	Improper blade tension Forcing the material into the blade	Increase tension. See Blade Tension Reduce feed rate. See Sawing section
Wood jumps on table	Improper hold down adjustment	Adjust the hold down foot to apply pressure to board.
	Blade installed upside down	Install blade properly with teeth pointing down. See Blade Changing
	Turning too small a radius for blade size	Increase radius size. See Sawing section
	Not using hold down foot or not holding wood firmly on table	Hold board firmly on table, especially when turning. See sawing section
	Sawing too fast	Reduce feed speed
	Applying sideways pressure on blade	Feed properly. See Sawing section

BLADE SELECTION

WOOD CUTTING BLADES

All blades are 5" long. Order by R.B.I. number (blade pitch).

R.B.I. NO.	MATERIAL CUT/USAGE	WIDTH	THICKNESS	TPI
2/0	For extremely intricate sawing. Very thin cuts in 1/16" to 3/32" materials. Excellent for cutting wood veneer, plastics, hard rubber, and pearl. Very good finish with fat cutting. Excellent for cutting small radii.	.024"	.009"	33
2	For small radius in thin materials 3/32" to 1/8" thick like wood veneer, wood, bone, fiber, ivory, and plastic. Good finish and fast cutting.	.028"	.012"	28
5	For small radius cutting in 1/8" or thicker material. Great for sawing hard and soft wood, bone, fiber, ivory, and plastics. Good general purpose cutting with a medium finish.	.039"	.016"	20
7	Popular sizes for cutting hard and soft woods 3/16" to 2" thick. Also cuts plastic, paper, felt, and bone. Medium finish may require some sanding.	.048"	.019"	18
9		.055"	.021"	15
11		.066"	.022"	13

METAL CUTTING BLADES

Metal cutting blades must be used at slow speeds.

R.B.I. NO.	WIDTH	THICKNESS	TPI
0	.022"	.011"	51
1	.024"	.012"	48
2	.028"	.013"	43
3	.030"	.014"	41
4	.031"	.015"	38
5	.033"	.016"	36
7	.041"	.019"	30

ACCESSORIES

The following is a list of accessories that are available for use with the R.B.I. Hawk 212 Scroll Saw. For prices and additional information, consult your nearest R.B.I. equipment dealer or the factory. These accessories are not included in the basic Hawk 212 package.

2LK STANDARD LIGHT

Heavy duty light with 16" flexible arm that utilizes a 60 watt incandescent bulb with metal globe. May be placed close to the work and will maintain any position. Shipped complete with everything necessary to mount it to your saw.

2MK MAGNIFIER LIGHT

Light with flexible arm that features a 2 to 1 magnifying lens. Brackets are included that will mount the light to the saw or work bench edge. Uses a 60 watt incandescent bulb.

HA-84 FOOT SWITCH

Switch enables the operator to turn the saw on and off by foot, leaving the hands free. Plugs directly into switch cord and requires no wiring.

HA-85 BLADE ALIGNMENT FIXTURE

Fixture that holds the bottom blade holder and aligns the blade to the center screw. Ensures proper blade installation in the bottom holder.

2BK ELECTRIC BLOWER KIT

Kit includes an air pump, tubing, and mounting hardware to install the unit to the saw. Maintains an area approximately the size of a quarter around the saw blade free of dust so pattern lines do not become hidden.

HOW TO ORDER REPLACEMENT PARTS AND ACCESSORIES

To speed delivery and reduce errors of replacement parts and accessories, always include the following information with your orders.

1. Completely Identify The Machine.

A. Machine Name _____

B. Model Number _____

C. Serial Number _____

2. Completely Identify The Part.

A. Part Number _____

B. Part Name _____

C. Return Old Part As A Sample, If Necessary

3. Give A Return Address To Ship The Part To.

Ship To _____

Your Name (please print)

Address _____

Street

P.O. Box

Rural Route

City _____

State _____ Zip _____

Country _____

4. Send Order To:

rbindustries

BUSHTON MFG

P.O. Box 127, 319 South Main Street

Bushton, KS 67427

620-562-3557

customerservice@hawkwoodworkingtools.com