Bushton Manufacturing Maker Of Hawk Woodworking Tools

MODEL 226-M VARIABLE SPEED PRECISION SCROLL SAW

OPERATORS MANUAL

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SAFETY

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 operations.
- 4. Never allow 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 while the machine is running.
- 2. Keep hands and feet away from rotating parts.
- 3. Disconnect electrical power supply before doing any adjustments on the machine.

- 4. Remove all working tools and equipment before starting machine.
- 5. Wear proper clothing. Avoid loose fitted clothing, long sleeves, long hair, gloves, neck ties, jewelry, watches, rings, etc.
- 6. Do Not operate an electrial device in a damp or wet area to avoid electrical shock.
- 7. Maintain all safety guards.
- 8. Do not operate machine while under the influence of medication, alcohol or drugs.
- 9. Never leave machine running unattended.
- 10. Don't overload machine. Follow operators instruction for safe operation.
- 11. Keep equipment in proper working order. Follow recommended maintenance procedures in the operators manual.



TO VALIDATE WARRANTY

CUSTOMERS Must mail in warranty card on receipt of machine.

HAWK 226-M — SPECIFICATIONS

Length Less Legs: $341/_4$ " Width Less Legs: $161/_2$ " Length Leg at Bottom: 41" Width Leg at Bottom: 24" Height With Legs: 45" Table Height With Legs: 29¹/₄" Weight Saw and Stand: 105 pounds Throat: 26" Drive: Belt, Manual Variable Speed Maximum Cutting Depth: 2" Stroke Length: 11%" Strokes/Minute: 550-1550 Table Adjustment: 0°-45° Right or Left

SET-UP INSTRUCTIONS

NOTE: Damages or shorted parts are to be reported to the transportation carrier. **MANUFACTURER IS NOT RESPONSIBLE FOR SHIPPING DAMAGE.**

SAW CARTON

Box 1

- 1. Saw
- 1. Legs

Box 2

- 2. Operators Manual 3. Extra Blades
- Glides
 Attaching Hardware

Remove your saw from the shipping carton. Check for damage (see note above). The four legs come in a separate carton. Install one leg to each corner of the base using 1/4" carriage bolts and nuts. Install one 3/6" nut on each of the four glides. Insert the glides up through the hole

NOTE: *Optional* Adjustable 6" Leg Extension available. Part #6LE



in the bottom of the leg and install the second $\frac{3}{8}''$ nut to secure. With the legs secure to the base, set the saw upright and adjust the nuts on the glides so each glide supports the saw. Secure (see figure).

BLADE SELECTION (Wood)

All Blades are 5" Long — Order by R.B.I No. (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, pearl. Very good finish with fast cutting. Excellent for tight radius cuts.	.022″	.010″	27
2	For tight radius work in thin materials 3/32" to 1/8" wood veneer, wood, bone, fiber, ivory, plastic. Good finish, fast cutting tight radius.	.029″	.012″	20
5	For close radius cutting in materials 1/8" or thicker. Great for sawing hard/soft wood, bone, horn, plastics. Good general purpose cutting with a medium finish.	.037″	.015″	16
7 9	Popular sizes for cutting hard and soft woods 3/16" up to 2". Also cut plastic, paper, felt, bone. Medium finish may require some sanding.	.043″ .053″	.016″ .018″	14 12
420-R	For smooth splinter-free finish on top and bottom sides. Excellent for hard/soft wood, plywood with thickness of 1/4" or more. Fast cutting.	.100″	.022″	9 with 3 reverse teeth

METAL CUTTING (FINIS) BLADES

[CAUTION: Must be run on slow speed]

Pitch	T.P.I.	Thick	Wide	
#0	50	.011″	.024″	
#1	46	.012″	.025″	
#2	43	.013″	.029″	
#3	41	.014″	.031″	
#4	38	.015″	.034″	
#5	33	.016″	.035″	
#7	28	.019″	.048″	

A. Blade installation in the blade holder

Place the blade holder in the oblong slot in the base (right side of the saw base near the front.) Slide the bottom of the blade (direction the teeth point) between the two halves of the holder to the center screw. (Run your finger across the teeth to determine the direction the teeth point.) Center and secure using a 5/16" open end wrench. (See Figure 1)



B. Blade installation in the saw (See Figure 2) Place the quick change holder rod in the slot of the upper arm behind the quick change blade holder. Slide the blade up from the bottom thru the hole in the center of the table. Pull the blade up until the holder is at the bottom of the lower arm. Slide the blade and holder back in the lower arm slot until the holder rests in the "V" at the bottom of the lower arm between the arm and clip.

Pull the upper arm down until the upper arm blade holder assembly will slide over the blade (it may be necessary to loosen the adjusting handle at the rear of the saw to allow the upper arm to come down). Center the blade in the blade holder and slide upward to the screw. (See Figures 1, 2 & 3)



Using the Allen wrench supplied, left side in the rubber grommet, secure the blade at the top.

Remove the quick change blade holder rod. Center the tension adjusting rod and lock cam handle. Blade has a ring like a guitar string when plucked.

For different blade length adjustments, hold the tension adjusting rod with a pair of pliers and tighten or loosen the nut at the lower end of the rod. When the blade is tensioned the rod should be to the top of the round handle pivot at the top. (See Figure 3)



C. Sawing (Remember, let the saw blade do the work) Feed the material to be cut slowly into the saw blade while maintaining downward pressure. (This may be done by hand or by adjusting the holddown foot on the material.) Note: Always keep hands away from the saw blade and out from under the moving arm.

D. Using a guide board to saw a straight line (See Figure 4)

It is necessary to angle your guide board approx. 4° from right to left. This is necessary due to the manufacture of all scroll saw blades with a small amount of set on one side of the blade only.



E. Sawing inside cuts (See Figure 5)

To saw inside cuts, drill a hole in the board, in the area to be cut out, slightly larger than the blade you are using. Remove the blade from saw top arm. Loosen the handle at the rear of the arms and capscrew holding blade in holders. Insert the blade up through the hole drilled in your board and back into the blade holder. (See blade installation for more details). This allows quick and easy inside cuts to be made.

BLOWER TUBE ADJUSTMENT

Adjust the end bracket to approx 20° and secure to the holddown arm. Slide tubing thru the plastic clip 1" and point the tube at a point where the saw blade comes thru the table and secure. It may be necessary to bend the attaching bracket to get the proper location.



VARIABLE SPEED ADJUSTMENT

CAUTION: SAW MUST BE RUNNING TO CHANGE SPEED.

To increase the strokes/minute, turn the adjusting knob (on the right side of the saw base) counter clockwise. To reduce the strokes/minute, turn the adjusting knob clockwise. **NOTE:** Saw must be running to change speed. Your saw was pre-set at the factory at 550 strokes/minute minimum and 1550 strokes/minute maximum. (Figure 6)





After a period of use the belt may stretch and the slow strokes/minute cannot be attained. It will then be necessary to adjust the belt drive. To check first, turn on the machine and turn the adjusting knob clockwise until the adjustable pulley is together. Turn off the machine and disconnect the electrical source. Take hold of the top and bottom of the V-Belt and squeeze them together. If it spreads the two halves of pulley on the motor, the motor needs to be adjusted rearward to take up this slack and retightened. This will again have the proper belt pulley relationship for the minimum strokes/minute. There are four bolts holding the motor which must be loosened to slide the motor for the belt adjustment, then retightened. (Figure 7, 8)





226-M PARTS BREAKDOWN

	Part #		QUANT.		PART #		QUANT.
1	BB-107	10-32 Hex Nut.	2	48.	ES-41	1/4-20 X 3/4" Carriage Bolt	2
2	ES-81	Clamp	2	49.	HA-65	Quick Change Hold Rod	1
3.	CD-35	Tubina	1	50.	HA-16	Rubber Grommet	4
4.	ES-08	Shaft (Foot to arm)	1	51.	CD-34	Serial Tag	1
5.	ES-10	Foot Seat Pod	1	52.	FA-12	#7 Drive Screw	2
6.	RB-106	Machine Screw	1	53.	ES-86	%44" ''T'' Allen Wrench	1
7.	RZ-83	1/4-20 X 1/4 S/S	5	54.	HA-63	Cable Clamp	1
8.	ES-09	Foot	1	55.	HA-61	Switch	1
9.	FA-40	Arm insert	1	56.	HA-60	Cord Set	1
10.	ES-35	10-32 X 1⁄2″	1	57.	RB-99	1/4-20 X 5/8" Carriage Bolt	13
11.	FA-41	Blade Holder (Side)	1.	58.	CD-29	Base	1
12.	FA-43	Roll pin 1/8" X 1/2"	1	59.	HA-24	Rubber Bellows	1
13.	FA-42	Roll Pin 1/8" X 3/4" Lg	1	60.	HA-25	Bellows Holddown Bracket	1
14.	ES-40	Knob	1	61.	HA-14	Spacer	3
15.	RB-150	5∕16″ F/W	5	62.	HA-13	Shoulder Bolt	1
16.	CD-36	Spacer	4	63.	HA-69	Pitman	1
17.	PS-07	Brg	10	64.	HA-68	1⁄2-13 Nut	1
18.	HA-77	Round handle pivot	1	65.	ES-57	Glides (4) with (8) Nuts	1
19.	CD-31	Handle	1	66.	CD-07	Leg	4
20.	HA-75	Connector Rod Pivot	2	67.	HA-55	Motor 1140 R.P.M.	1
21.	FA-36	Spring	1	68.	RZ-179	5/16" X 3/4" Carriage	4
22.	HA-78	1/4-20 Neoprene insert nut	1	69.	HA-58	V/S Sheave Spring	1
23.	HA-80	Rod	1	70.	ES-12-Z	Pitman Shaft	1
24.	HA-71	Shoulder bolt	2	71.	ES-15	Collar	3
25.	CD-02	L.H. Arm Support	1	72.	ES-96	Cover	1
26.	CD-03	R.H. Arm Support	. 1	73.	RBZ-211	1/4-20 X 11/4" Carriage	2
27.	PS-52	1/4-20 X 1" Hex Hd. Bolt	10	74.	ES-95	Housing Weldment	1
28.	RB-177	1⁄4″ F/W	14	75.	ES-97	Shaft	1
29.	RZ-178	5⁄16″ L/W	5	76.	ES-92	Gear	2
30.	RZ-181	5⁄ ₁₆ " X 1 1⁄₄" Hex Hd. Bolt	1	77.	ES-35	10-32 X 1/2" Socket Hd. Cap Screw	8
31.	CD-05	Lower Arm	1	78.	CD-33	Counter Wt.	2
32.	CD-13	Rear Table Support	1	79.	HA-56	V/S Pulley Manual	1
33.	CD-30	Base Reinforcement	1	80.	HA-57	V/S Control Assy	1
34.	RB-517	Spacer Slide Nylon	1	81.	FA-35	10-32 X 1/4" Rd Hd Slotted Screw	1
35.	CD-01	Table	1	82.	HA-29	Pointer	1
36.	RZ-182	1/4" Socket Flat Head 3/4" Lg	2	83.	HA-31	Stop	1
37.	HA-20	Table tilt table bracket	1	84.	HA-32	Screw	1
38.	HA-33	Screw	3	85.	HA-21		1
39.	ES-49	1/4-28 Hex Nut	2	86.	FA-08	$\frac{3}{8}$ " Nut neoprene insert	2
40.	HA-36	Washer	1	87.	CD-04	Top Arm	1
41.	ES-42		17	00.			11
42.	KB-223	1/4" WNIZ INUT	1/	δ9. 00	HDZ-20/	74 L/W	2
43.	ES-22	Blade Holders	2	90.	49-90		۲ ۲
44.	ES-68	1/4-20 X 3/4" Allen Hd S/S	1	୬୮. ୦୦		Opalita Burr	т Я
45.	KZ-81	%16″ HEX NUT	4	92.			1
46.	ES-65	Saw Blade Holder	1	93.	ПА-39 ЦА 70	1/ 20 V 2/ Hay Hd Palt	2
47.	RB-150	୬⁄16″ F/W	4	94.	ПА-73	74-20 A Z THEX THU DUIL	2



MAINTENANCE

TABLE — Keep the table work surface waxed to prevent rust and allow easier movement of the wood on the table surface. **TENSIONING ROD** — Add 1 or 2 drops of oil (light machine oil) to the blade tensioning rod pivots at the arms.

TROUBLE SHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
EXCESSIVE BLADE BREAKAGE	IMPROPER BLADE SIZE TO WOOD THICKNESS	SELECT PROPER BLADE SIZE
	CUTTING TOO TIGHT OF A	INCREASE RADIUS SIZE OR
	RADIUS FOR BLADE SIZE	REDUCE BLADE SIZE
	IMPROPER BLADE INSTALLATION	INSTALL BLADE PROPERLY, SEE BLADE INSTALLATION
BLADE BURNS THE WOOD	WRONG BLADE SIZE CUTTING TOO SMALL A RADIUS IMPROPER FEEDING PUSHING SIDE WAYS ON THE BLADE FEEDING TOO FAST IMPROPER BLADE TENSION	INCREASE BLADE SIZE INCREASE RADIUS OR DECREASE BLADE SIZE FEED MATERIAL AT 4° R. TO L. FEED STRAIGHT SO AS NOT TO BEND BLADE L. OR R. REDUCE FEED RATE INCREASE BLADE TENSION
BLADES BEND BACK EXCESSIVELY OR TWISTS WHILE SAWING	IMPROPER BLADE TENSION IMPROPER BLADE SIZE FEEDING TOO FAST	INCREASE BLADE TENSION INCREASE BLADE SIZE SLOW FEED RATE
BLADE CUTTING TOO LARGE A RADIUS	BLADE TOO LARGE BLADE TENSION LOW IMPRCPER FEEDING	USE SMALLER BLADE INCREASE BLADE TENSION TURN BOARD PROPERLY
BOARD SPLINTERING ON		LISE SMALLER BLADE
ВОТТОМ	WOOD GRAIN STRINGY OR KNOTTY	USE MASKING TAPE ON THE BOTTOM AT THE SAW LINE
ROUGH CUT ON THE	BLADE TOO LARGE	USE SMALLER BLADE
SAWED EDGE	BLADE TENSION LOW	INCREASE BLADE TENSION
	POOR QUALITY WOOD	USE BETTER QUALITY WOOD
	FEEDING TOO FAST	SLOW FEED RATE
BLADE DOESN'T FOLLOW PATTERN LINE	IMPROPER FEEDING (FEED AT AN ANGLE R. TO L. OF APPROX 4° STRAIGHT INTO THE BLADE	PRACTICE
	BLADE DULL	REPLACE BLADE
	BLADE TOO SMALL	INCREASE BLADE SIZE
	IMPROPER BLADE TENSION	INCREASE TENSION
	FORCING MALERIAL INTO THE BLADE	REDUCE FEED SPEED
WOOD JUMPS ON THE TABLE	IMPROPER HOLDDOWN ADJUSTMENT	ADJUST THE HOLDDOWN TO APPLY PRESSURE TO THE BOARD.
	BLADE INSTALLED UPSIDE DOWN	INSTALL BLADE PROPERLY TEETH POINTING DOWN
	TURNING TOO TIGHT OF A RADIUS	INCREASE RADIUS SIZE
	NOT USING HOLDDOWN AND NOI HOLDING BOARD DOWN FIRMLY	HOLD BOARD FIRMLY ON THE TABLE ESPECIALLY WHEN TURNING FEED PROPERLY (FEED AT AN ANGLE R. TO L. OF APPROX. 4° & STRAIGHT INTO THE BLADE.)
	SAWING TOO FAST	REDUCE FEED SPEED
	PRESSING SIDEWAYS ON THE BLADE	FEED AT 4° ANGLE R. TO L. AND STRAIGHT