

**“EXCALIBUR”
24" PRECISION SAW**

Operating and Maintenance Instructions

EXCALIBUR 24" PRECISION SAWS

OPERATING AND MAINTENANCE INSTRUCTIONS

The Excalibur 24" Saw is a quality machine and requires only reasonable care and attention by the operator to ensure perfect performance and accurate work. Please take the time to read over the following instructions and familiarize yourself with the machine.

EXCALIBUR 24" PRECISION SAW - Specifications:

Length:	32 in.
Width	19 in.
Height	18 in.
Weight (with stand):	90 lbs
Throat	24 in.
Max. Cutting depth	2.25 in.
Length of stroke	.75 in.
Motor:	1/4Hp, 3.2A./110V., 60Hz
Speed:	Variable Speed 0 to 1700 Csm*
Worktable	adjustable 45°left, 25°right

*Cutting Strokes per Minute

INSTRUCTIONS FOR ASSEMBLY OF EXCALIBUR SAW STANDS

CAUTION: DO NOT LIFT THE MACHINE BY THE UPPER ARM
Lift the machine by its base and cast frame only.

Unpack the saw stand components from their protective packaging and compare the parts with the exploded view in the manual to become familiar with the different pieces.

(1) Start by standing the back leg(74) in an upright position with the open end up. Put a plastic bag, such as a garbage bag, into the back leg and fill it completely with common sand or something of equivalent weight.

"THE STAND MUST BE BALLASTED WITH SAND OR EQUIVALENT IF THE STAND IS NOT GOING TO BE BOLTED TO THE FLOOR"

(2) Stand one of the front legs(75) up and bolt in a side brace(76, one of the two shorter side braces) between the front and back leg (on the inside) with the bolts (1/4-20, x 1/2" long) provided. The bolts should be made only finger tight to allow for later alignment of the stand.

(3) Repeat this procedure for the other front leg(75) and side brace(76).

(4) Install the lower front brace (77) and tighten the bolts finger tight.

(5) Lay the top braces (73) in place on the top of the stand and install the eight bolts (1/4 - 20, x 1/2" long) into the legs from the sides only and tighten them finger tight.

(6) Carefully lift the saw onto the stand so the rear leg of the saw is directly over the two holes in the top braces (73) and the corresponding holes in the rear leg (74).

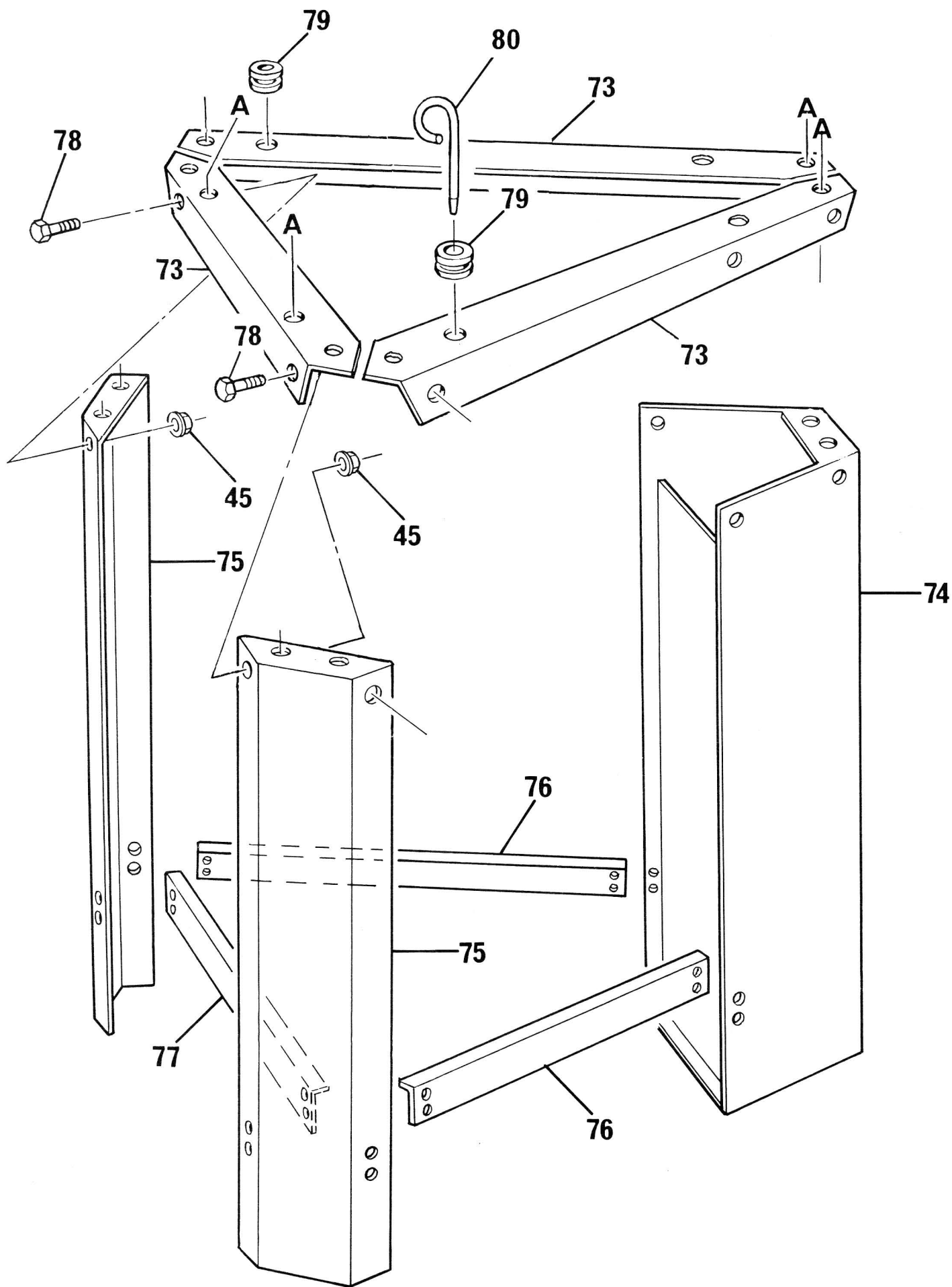
(7) Install the bolts (5/16 x 1 1/2" long) through the two holes in the rear leg of the saw casting and the corresponding holes in the top braces (73) and the rear leg (74). Tighten the nuts finger tight by reaching into the back leg from underneath the top braces.

(8) Install the bolts (5/16 x 1 1/2" long) through the front mount of the saw housing and the front top brace (73) and tighten.

(9) Install the remaining four bolts (1/4-20, x 1/2" long) through the top braces (73) and the front legs (75) and tighten.

(10) Go back and tighten all the previously installed bolts making sure the stand is plumb and level (sitting squarely on the floor).

(11) Now would be a good time to locate the saw and stand where it will be going, and bolt it to the floor. Filling the back leg with sand and bolting the stand to the floor will result in the most vibration-free operation of the unit.



A - saw mounting holes

INSTRUCTIONS FOR MOUNTING THE VARIABLE SPEED MOTOR

Carefully unpack the motor unit from its protective packaging.

Referring to the assembly drawing in this manual, proceed as follows:

(1) Locate the four 5/16"x1" bolts(A), equip them with one each of the washers(B & C) as shown in the diagram. Set them aside for future use.

THE VARIABLE SPEED MOTOR IS MOUNTED ON THE RIGHT SIDE OF THE SAW

(2) On the right side of the saw housing you will see a ball bearing race installed in the center of the motor mounting position. The shaft of the motor will pass through this bearing when the lock screws(F) that are mounted in the crank shaft(E) are lined up with the keyway in the motor shaft(D).

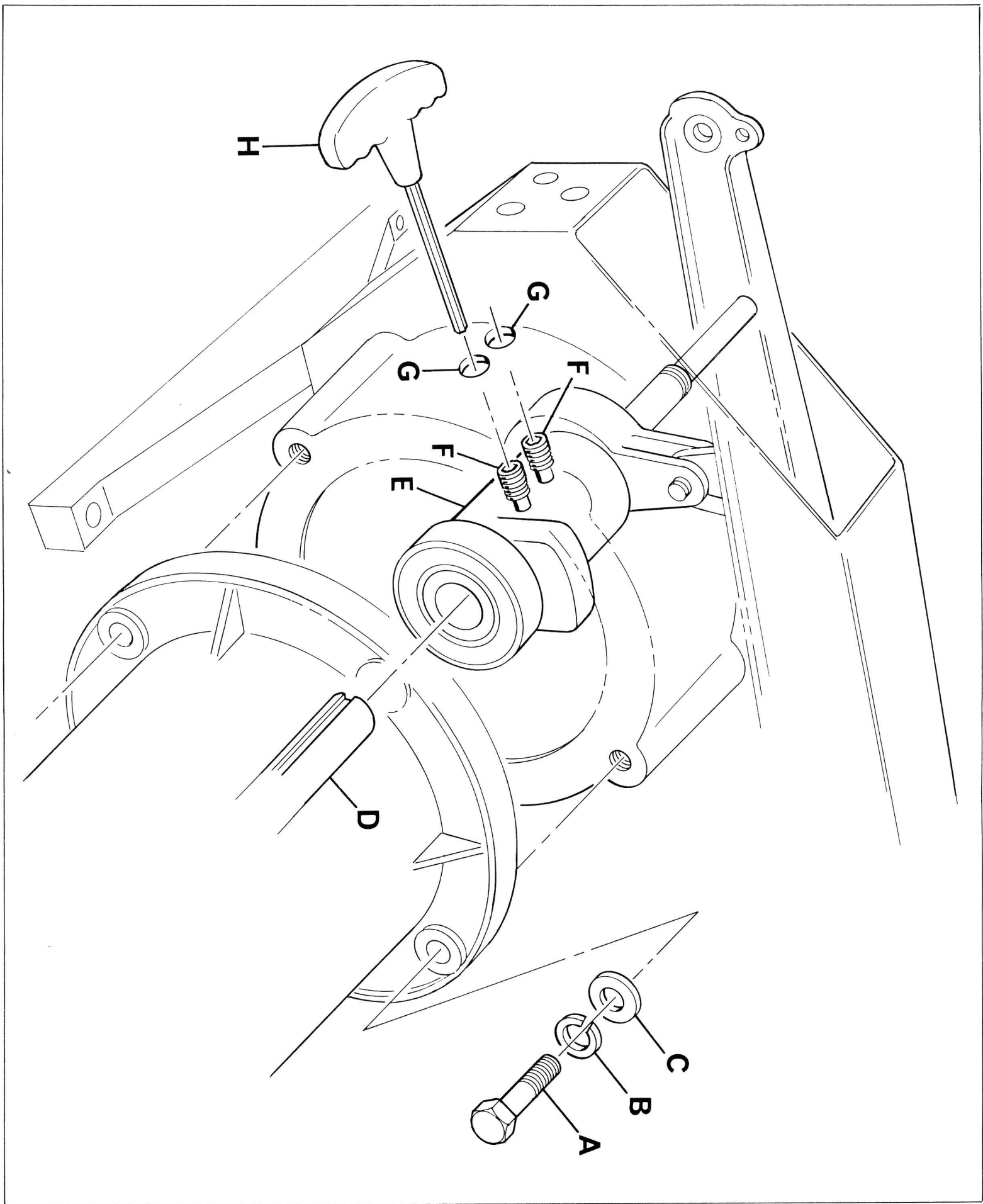
(3) Use the "T" handle Allen key(H) supplied with the machine to align the lock screws(F) in the crank shaft(E) to accept the motor shaft. Do this by inserting the T-handled Allen key through one of the two holes(G) in the front of the motor mount. Then by slowly rotating the power take-off shaft at the left hand side of the machine, locate one of the two lock screws. Leave the Allen Key in the lock screw to maintain the position of the crank shaft.

(4) Slide the motor shaft(D) through the bearing(67) making sure that the keyway in the motor shaft lines up with the lock screws(F). Using the four bolts(A) with washers(B & C) fasten the motor to the saw housing, tightening the bolts(A) securely.

IMPORTANT! THE MOTOR MOUNTING BOLTS(A) MUST BE TIGHTENED PRIOR TO TIGHTENING THE LOCK SCREWS(F) OR UNNECESSARY PRELOADING OF THE CRANKSHAFT(E) MAY OCCUR.

(5) Now tighten the two lock screws(F) by using the T-handled Allen Key(H) through the access holes(G) in the saw housing. These lock screws(F) are equipped with Nylock inserts to stop them from vibrating loose. As such, tightening them will require that you supply sufficient torque when using the T-handled wrench.

(6) Test the alignment of this assembly by turning the power take-off shaft by hand and observing that the upper and lower arms of the saw move up and down through several revolutions.



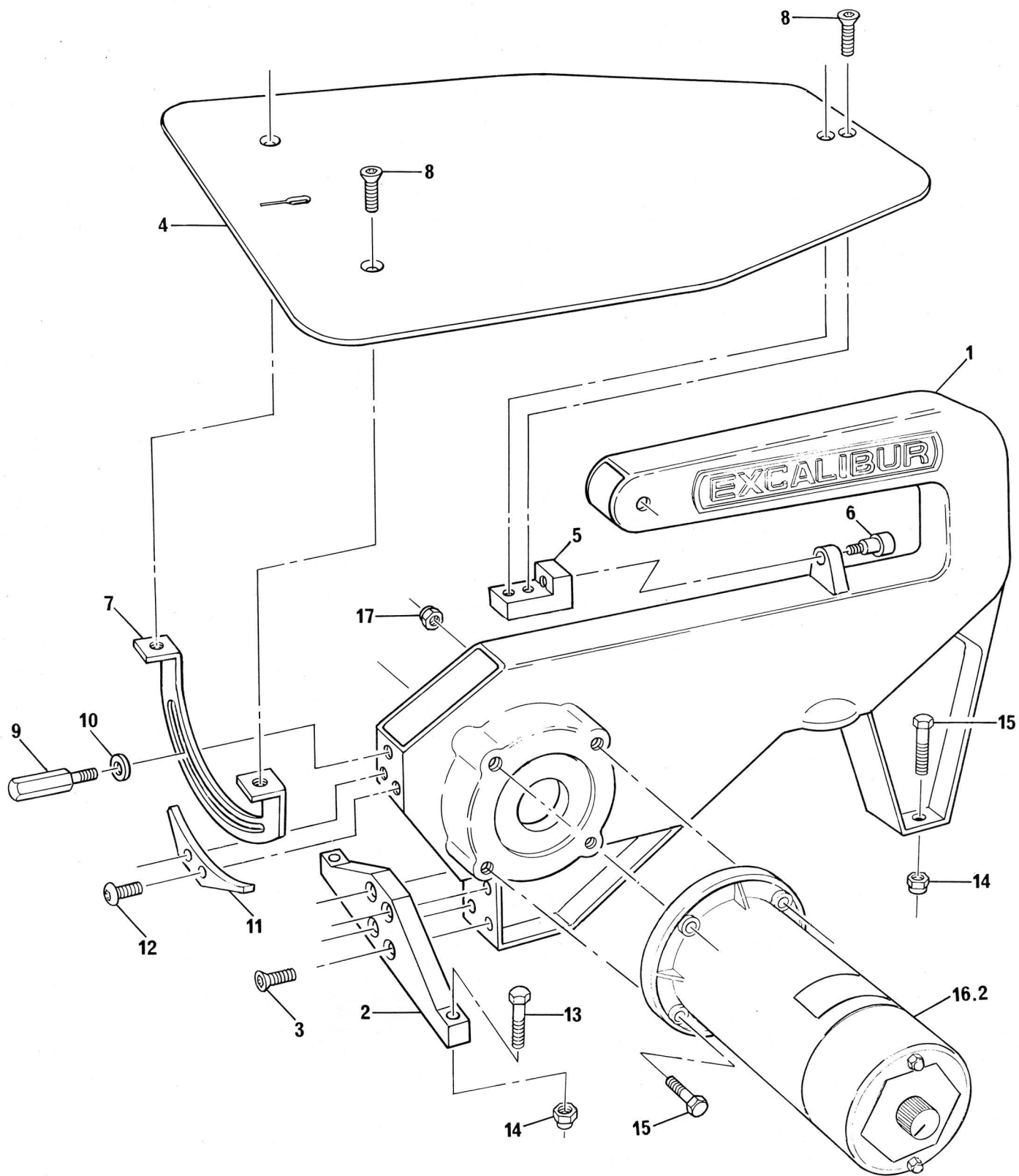
**PARTS LISTING For Excalibur
24" Scroll Saws:**

Right Side View

#	Qty.	Part No.	Desc.
1	1	S24001	Housing
2	1	S24002	Front Mount
3	4	FBFH3118150	Front Mounting Bolts
4	1	S24004	Table
5	1	S24005	Rear Table Mount
6	1	FBSB0516050	Rear Table Mounting Bolt
7	1	S24007	Trunnion
8	4	FBFH3118075	Table Mounting Bolt
9	1	S24008	Table Lock
10	5	FWF31	Washer
10.1	4	FWSL31	Lockwasher
11	1	S24011	Trunnion Support
12	2	FBBH3118075	Mounting Bolts
13	2	FBHH3118150	Front Mounting Bolt
14	4	FNFL3118	Mounting Nut
15	2	FBHH3118100	Rear Mounting Bolt
16.2	1	S24017	Motor - Variable Speed

Left Side View

#	Qty.	Part No.	Desc.
22	1	S24022	Top Arm
23	1	S24023	Bottom Arm
24	4	S24024	Pivot Bearing
25	4	S24025	Spacer
26		S24026	Shim (as required)
27	2	FBHH3118300	Pivot Bolt
28	2	FNNI3118	Nylock Nut
29	6	S24029	Bearing
30	2	FWSL15	Lock Washer
31	2	FBBH0832037	Bolt
32	1	S24032	Arm Trunnion
33	1	S24033	Tension Rod with Knob
35	1	FSS1024018	Set Screw
37	1	S24037	Lower Spacer Tube
38	1	S24038	Clevis
39	1	S24039	Cotter Pin
40	1	FBSH2520075	Bolt



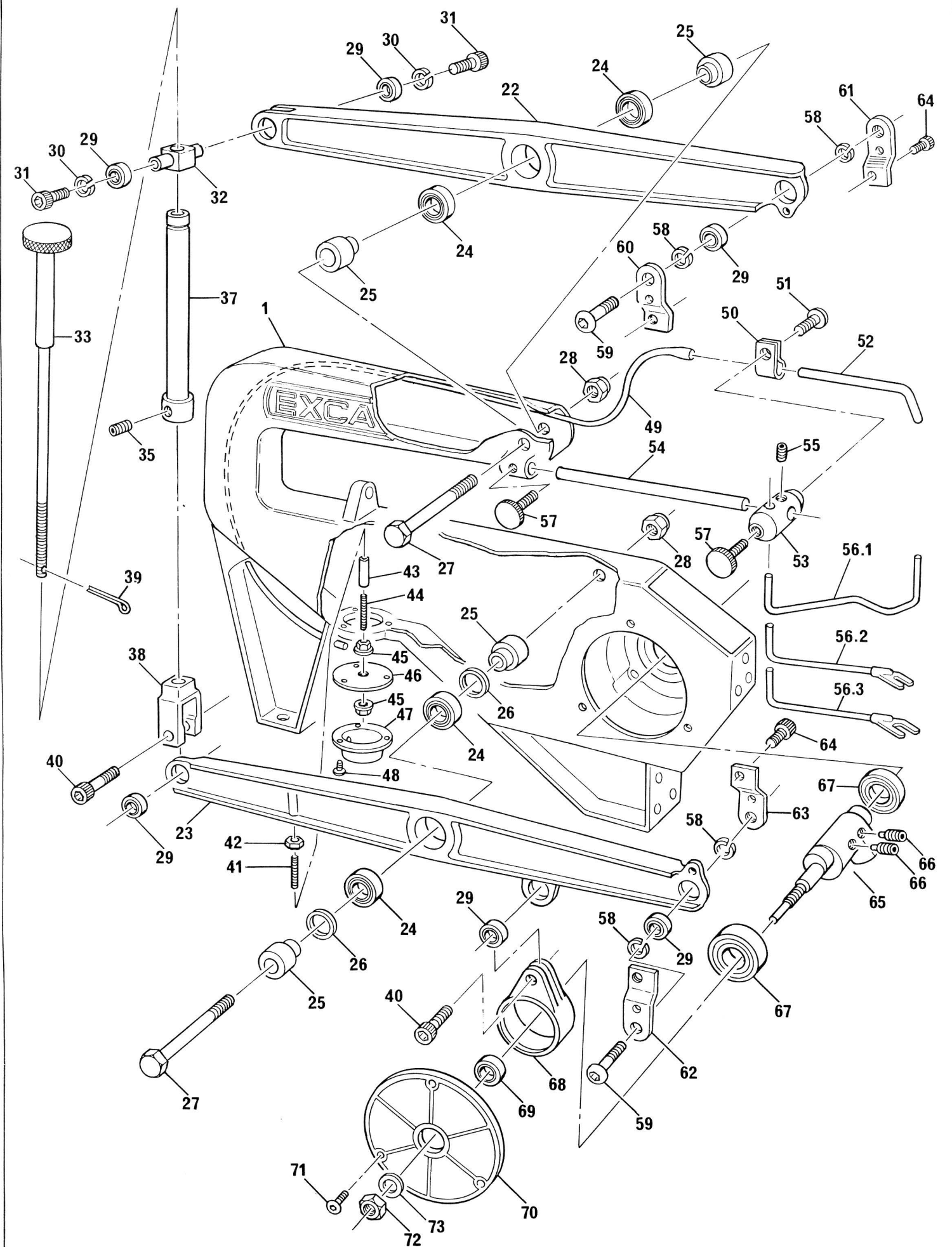
**PARTS LISTING For Excalibur
24" Scroll Saws:**

Left Side View (cont.)

#	Qty.	Part No.	Desc.
41	1	FTS2520100	Stud
42	2	FNFL25	Nut
43	1	S24043	Coupling
44	1	FTS2520300	Blower Stud
45	1	FNHH25	Lock Nut
46	1	S24046	Diaphragm
47	1	S24047	Air Pump Cap
48	3	FBH1024050	Screw
49	1	S24049	Air Hose
50	1	S24050	Hose Mounting Clip
51	1	FBSH1024037	Hose Clip Bolt
52	1	S24052	Air Tube
53	1	S24053	Arm Barrel
54	1	S24054	Mounting Bar
55	1	FSS252025	Set Screw
56A	1	S24056	Work Hold Down with Guard
56B	1	S24056B	Marquetry Hold Down
56C	1	S42056C	General Purpose Hold Down
57	2	S24057	Thumbscrew
58	4	FWSL25	Lockwashers
59	2	FBH620	Bolt
60	1	S24060	Top Left Blade Clamp
61	1	S24061	Top Right Blade Clamp
62	1	S24062	Bottom Left Blade Clamp
63	1	S24063	Bottom Right Blade Clamp
64	2	FBSH1024037	Lockscrew
65	1	S24065	Crankshaft
66	2	FSS3118	Lock Screws
67	1	S24067	Con Rod Bearing
68	1	S24068	Con Rod
69	1	S24069	Crankshaft Outer Bearing
70	1	S24070	Side Cover Plate
71	3	FBH2520050	Bolt
72	1	FNJN4320	Outer Bearing Locknut
73	1	FEF43	Washer

Stand

#	Qty.	Part No.	Desc.
45	24	FNFL2520	Nut
73	3	SB24001B	Stand Top Rails
74	1	SB24002	Back Leg
75	2	SB24003	Front Leg
76	2	SB24004	Side Braces
77	1	SB24005	Front Brace
78	24	FBH2520075	Bolt
79	2	SB24009	Grommet
80	1	SB24010	Blade Clamp Locking Key
81	1	SB24011	T-Handle Wrench



BLADE SELECTION:

The Excalibur saw is shipped with an assortment of 5" blank end blades. Blade selection relative to the material being cut will be important in achieving good performance and results. It is suggested that you try sample cutting with one of each of the blades provided to determine the best blade applicable to work to be performed. As a general rule, the smaller blades having a finer set on the teeth will produce smoother cuts and allow tighter turns when operating the saw.

Here are some basic rules:

- Have at least 2 teeth in the material at all times. For example, 1/8" wood will be best cut with a blade having at least 16 teeth per inch.
- More teeth per inch = a slower cut imparting a finer finish.
- Always select the narrowest blade recommended for intricate radius (scroll) cutting and the widest blade for straight and large contour cutting.

Scroll Blades

i.e.	Blade	Width	Thickness	TPI
	#405	.110	.020	20
For wood.				
	#409F	.070	.020	7
For cutting Bakelite, ivory imparting a smooth cut.				
	#411	.110	.022	15
For cutting wall board, pressed wood, wood, lead, bone, felt and paper.				
	#412	.110	.022	10
For cutting hard & soft wood, plastic.				
	#423F	.070	.010	14
For cutting wood.				
	#427	.070	.010	25
For cutting wood imparting a smooth cut.				

Fret Blades - are made with little or no set. They have "skip tooth" type teeth with a slight hook designed for fast cutting and positive chip clearance, aiding in sawing plastics, bone, fiber and composition board, which tend to clog the teeth in conventional "regular tooth" blades.

i.e.	Blade	Width	Thickness	TPI
440F	#2/0	.022	.010	27
For extremely intricate sawing. Very tight cuts in 1/16" materials. Excellent for cutting wood veneer, plastic, hard rubber, pearl etc.				
443F	#2	.029	.010	20
For tight radius work in thin materials 3/32". Wood veneer, wood, bone, fiber, ivory, plastic etc.				
446F	#5	.037	.015	16
For close radius cutting in materials in 1/8" or thicker. Great for sawing hard and soft woods, bone, horn, plastic, etc.				

NOTE! Due to their availability at time of shipping, the blades shipped with your Excalibur saw may differ from those listed in this manual.

i.e.	Blade	Width	Thickness	TPI
448F	#7	.043	.016	14

A popular size for cutting hard and soft woods 3/16" up to 2".
Also, cuts plastic, paper, felt, bone etc.

450F	#9	.053	.018	11
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Same as above only faster cutting (coarser teeth).

Metal Piercing Saw Blades are made of hardened and tempered steel for sawing all metals and other hard substances.

i.e.	Blade	Width	Thickness	TPI
470J*	#8/0	.012	.006	96
472J*	#6/0	.014	.007	80
474J*	#4/0	.018	.009	65
476J*	#2/0	.020	.010	57
479J	#1	.023	.012	46
481J	#3	.029	.014	39
483J	#5	.033	.015	33
487J	#9	.051	.022	27
490J	#12	.070	.023	17

*NOTE: Blades numbered 470 to 477 are not for use with single speed machines.

INSTALLING SAW BLADES:

Begin by turning the tensioning knob counter clockwise until a slight resistance is felt. This will establish the position of the upper and lower blade clamps to accept 5" blades. Secure the blade in the upper blade clamp with the teeth pointing down towards the table. When doing this, make sure that the blade is inserted the full depth of the jaws of the clamp. Also that the blade is centered and is in-line with the body of the clamp. Use the T-handled Allen Wrench (with the Locking Key to hold the blade clamp steady) and tighten the clamp screw securely after taking-up the slack in the blade. The lower end of the blade can now be aligned and inserted the full depth of the jaws of the lower blade clamp. Tighten the clamp screw. To facilitate holding the blade clamps steady while inserting blades and tightening the jaws, a blade clamp locking key has been provided with the saw. DO NOT FORGET TO REMOVE THE LOCKING KEY BEFORE USING THE SAW.

TENSIONING THE BLADE:

Whereas 5" flat end saw blades up to .25" can be used in the Excalibur saw, the amount of tension which should be applied to any given blade will be determined by the operator who must become familiar with the saw and the cutting effect desired. In general terms, blades should be tensioned until they give off a clear high pitched tone when plucked with the finger. Extremely fine blades i.e. for jewelry and marquetry work will perform well and last much longer when the saw is run at the slowest speed possible in line with the material being cut. Over tensioning will result in premature blade failure and breakage.

SPEEDS:

The Ex-1 single speed saw has a fixed rate of 1650 CSM (cutting strokes per minute), and is controlled by the Off-On switch located on the motor. The Ex-2 variable speed saw provides the operator with 60 to 1700 CSM via the variable speed control knob.

SPEEDS: (cont.)

The variable speed motor used in the Ex-2 saw develops 1/4 HP with a constant torque (delivering full power) at all speeds. This design feature allows the operator to match the speed of the saw to the type of blade and material to be cut.

CUTTING:

The principal reason for the excellent performance of the Excalibur saw is that when cutting the saw blade is under high tension and is pulled, never pushed, on both its up and down stroke. This movement of the blade has a tendency to lift the material being cut. When the blade guard hold-down is not being used, the operator must exert a slight downward pressure onto the workpiece to keep it from lifting from the table surface, particularly when cutting sharp turns. The feed rate will vary with material being cut and the result desired. The different Hold Downs supplied are as described in the parts listing.

When cutting various metals, different cutting speeds and the use of cutting fluids may be required. Always use the hold-down. Generally, soft metals such as brass can be cut dry with sharp blades, Aluminum and steel should be cut using sharp blades and a cutting fluid to cool and help maintain the sharpness of the blade. Use the largest blade that will allow the detail and finish of cut desired.

When making an inside cut (i.e. the interior of a letter), first drill small holes that will accept the blade size being used into each area of the workpiece where an interior cut is to be made. For stability of the workpiece it is good practice to make interior cuts before outside cuts. Loosen the tension on the blade with tension control knob. Remove the upper end of the blade from the upper blade clamp. With the upper end of the blade loose, the blade can be inserted through the pre-drilled hole in the work piece and refastened into the blade clamp.

When cutting small or thin pieces of material, there is the possibility of the workpiece material bending or tearing. This can be avoided by utilizing a smooth surfaced auxiliary work table with a blade slot cut the same size as the blade being used. Fastened to the saw table by means of double faced tape, the auxiliary table will support the work piece, and can be easily removed from the saw table when no longer required.

The orbital action of the saw blade can be accentuated by positioning and clamping the upper end of the saw blade more forward (towards the front of the machine) than the lower end of the saw blade. This will cause the blade to cut more aggressively.

MAINTENANCE:

The Excalibur saws have been designed to require the minimum of maintenance. Both the upper and lower arms of the saw pivot on two bearings mounted on a steel shaft supported at both ends. This design eliminates wear resulting from over tensioning the blade. However, it is recommended that when the saw is not in use, that the tension be slackened-off to relieve any stress on the blade. The saw should be kept clean of sawdust build-up inside the frame.

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