



OPERATION, PARTS & MAINTENANCE MANUAL

MODELS HBU48-16 HBS48-16



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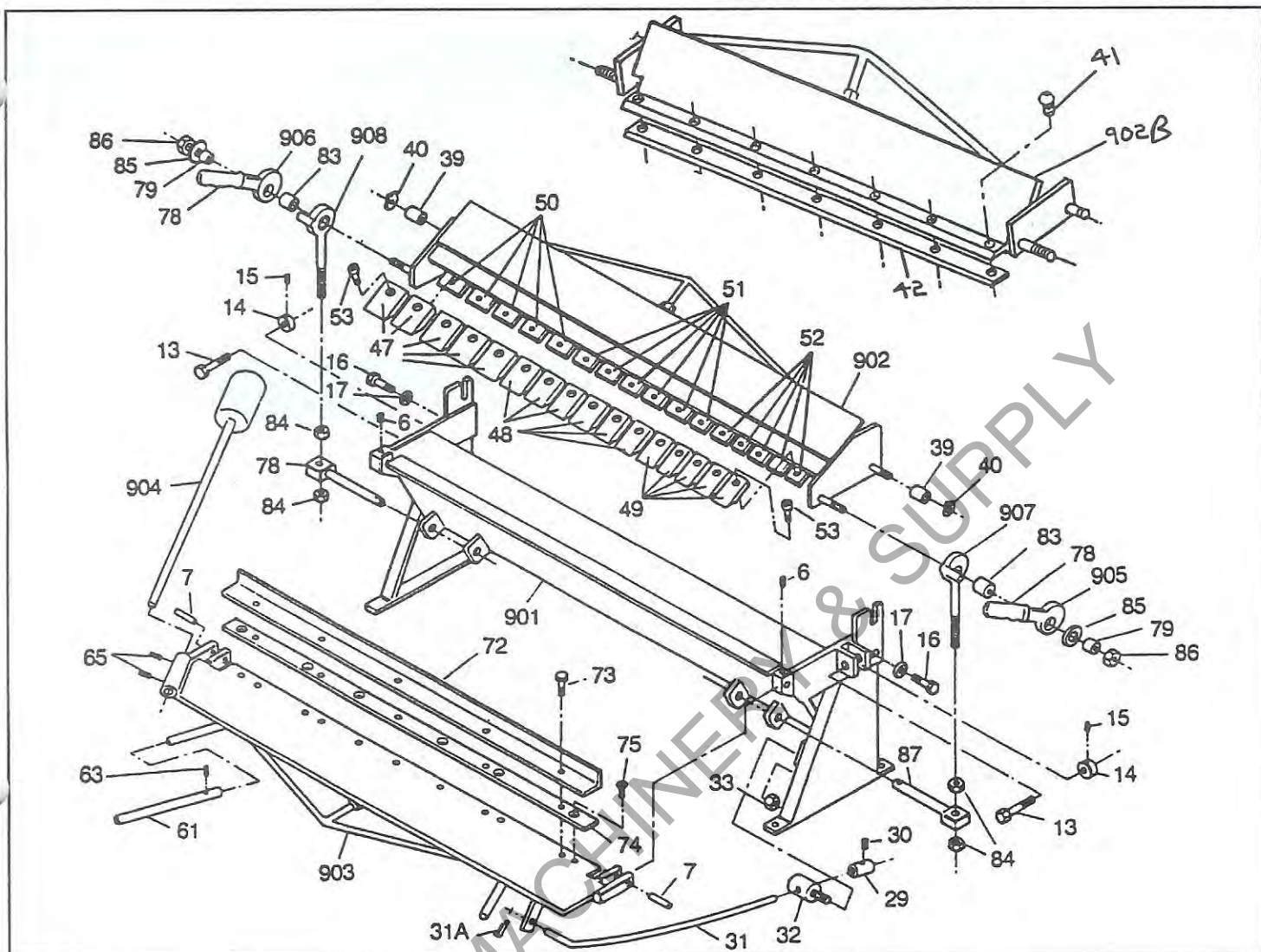
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HBU48-16 and S48-16



PART NO.	DESCRIPTION	NO. REQ'D.	PART NO.	DESCRIPTION	NO. REQ'D.
U48-16-901	BASE ASS'Y.	1	U48-16-50	4" FINGER CLAMP	5
U48-16-6	SET SCREW HINGE BRKT.	2	U48-16-51	3" FINGER CLAMP	6
U48-16-7	PIN HINGE	2	U48-16-52	2" FINGER CLAMP	5
U48-16-13	SCREW BRKT. ADJ.	2	U48-16-53	SCREW, CLAMP	16
U48-16-14	NUT, ADJ. BRKT.	2	U48-16-903	APRON ASS'Y.	1
U48-16-15	SET SCREW, ADJ. NUT	2	U48-16-61	HANDLE EXTENSION	2
U48-16-16	SCREW, BRKT. LOCK	2	U48-16-63	SET SCREW, EXT.	2
U48-16-17	WASHER, LOCK SCREW	2	U48-16-65	SET SCREW, HOLDER	2
U48-16-29	STOP	1	U48-16-904	C'WEIGHT ASS'Y.	1
U48-16-30	SET SCREW, STOP	1	U48-16-72	SUPPORT ANGLE	1
U48-16-31	STOP ROD	1	U48-16-73	SCREW, ANGLE	5
U48-16-31A	KEY, ROD	1	U48-16-74	INSERT	1
U48-16-32	STOP, SWIVEL	1	U48-16-75	SCREW, INSERT	8
U48-16-33	NUT, SWIVEL	1	U48-16-905	R.H. CLAMP HANDLE ASS'Y.	1
U48-16-902	HOLDDOWN ASS'Y.	1	U48-16-906	L.H. CLAMP HANDLE ASS'Y.	1
S48-16-902B	HOLDDOWN ASS'Y.	1	U48-16-78	HANDGRIP	2
U48-16-39	BUSHING PIN	2	U48-16-79	BUSHING, CAM	2
U48-16-40	RETAINER RING	2	U48-16-907	R.H. YOKE ASS'Y.	1
S48-16-41	SCREW, INSERT	7	U48-16-908	L.H. YOKE ASS'Y.	1
S48-16-42	INSERT, HOLDDOWN	1	U48-16-83	BUSHING, YOKE	2
U48-16-47	4" FINGER	5	U48-16-84	NUT, YOKE ADJ.	4
U48-16-48	3" FINGER	6	U48-16-85	WASHER, CLAMP	2
U48-16-49	2" FINGER	5	U48-16-86	NUT, CLAMP	2
			U48-16-87	SWIVEL, CLAMP	2

FOREWORD

This manual has been prepared for the owner and operators of Tennsmith HBU48-16 and HBS48-16 model bench brakes. Its purpose, aside from operations instructions, is to promote safety through the use of accepted operating procedures. Read all instructions thoroughly before operating the brake.

Also contained in this manual is the parts list for your brake. It is recommended that only Tennsmith or factory authorized parts be used as replacements.

WARRANTY

Your brake has a three year limited warranty from the date of purchase. The terms of the warranty are stated on the warranty registration card shipped with your machine. Please complete and return this card to activate your warranty.

SAFETY INSTRUCTIONS

1. Know the safety and operating instructions contained in this brochure. Become familiar with and understand the limitations of this machine. Always practice safety.
2. Wear approved eye safety protection such as glasses, goggles, etc., when operating the brake to protect your eyes.
3. Wear protective foot wear or safety shoes.
4. Keep your hands clear of the nose bar and clamping area of the brake. Keep hands clear of the apron area of the brake when making bends.
5. When bending capacity material use your legs and arms for making the bend, similar to lifting a heavy object, to avoid back strain. Maximum length and capacity material is a two person job. Adjust the counterweights to provide maximum assistance on heavy bends.
6. Never use a pipe or bar on the clamp handles or apron handles for additional leverage.
7. Keep clear of the counterweight apron swing area while operating the brake.
8. Keep the work area around the brake clear and clean to avoid slipping or tripping.

RECEIVING THE BRAKE

Upon receipt, closely examine the brake for damage during shipment. Report to your distributor any damage that may have occurred during transit.

USE CAUTION IN HANDLING AND MOVING THIS BRAKE. Please note that brake is top heavy. Lift the brake only from the ends as it is top heavy. Approximate weights for the respective models are as follows:

HBU48-16 495lbs / 224.4 kg HBS48-16 460lbs / 208.7 kg

INSTALLING THE BRAKE

Locate the brake in a well lighted area on a solid workbench capable of supporting the 500 pound weight of the machine. The bench should be generally be secured to the floor by bolts or lags screws. Be certain that you have adequate clearance to swing the apron and that the brake is at a comfortable and convenient working height.

The brake should be removed for the skid. Use lag screws or bolts with expandable shields or similar holding devices through mounting feet on the bottom of the lag assemblies to bolt the brake to the bench. The brake must be fastened to the bench for safe operation.

THE BRAKE WILL NOT BEND PROPERLY IF IT IS NOT LEVEL.

ASSEMBLING THE BRAKE

The brake requires only minor assembly for proper operation. Place the counterweight in the tube on the apron assembly's left end so that the apron is balanced. Tighten the two set screws in the tube to secure the counterweight in place. For working capacity material, the apron handle extensions can be slipped on to the apron handles and secured in place by tightening the set screws. Connect the stop rod to the apron assembly's right end by slipping the end of the rod through the hole in the bracket on the apron. Slip the cotter key through the hole in the end of the rod and separate the legs of the key to keep it in place.

OPERATING THE BRAKE

CAPACITY: The capacity of the brake is 16 gauge mild steel or 20 gauge stainless. The minimum recommended flange in capacity material with the apron support angle in place is one inch. The capacity of the brake is reduced by four gauges when the apron support angle is removed; i.e. 20 gauge mild steel or 24 gauge stainless. The capacity of the brake is reduced by seven gauges when the apron insert is removed. By removing the apron support angle and the apron insert, narrow reverse bends are possible in lighter gauge materials.

BENDING AND REPEAT BENDS: This function is accomplished by clamping the work piece under the hold down assembly (3, 4) so that the line of the bend is held at the forward edge of the nose bar or fingers and by elevating the apron assembly (2) until the desired degree of bend is obtained. The maximum degree of bend is approximately 140 degrees. Due to the "spring back" in various materials some over bending maybe required to get the desired bend angle. For repeat bends, adjust the stop on the stop rod to limit the swing of the apron assembly. The stop is secured in place with a set screw.

ADJUSTING FOR METAL THICKNESS: The hold down assembly (3, 4) must be adjusted to allow for clearance of the bend material according to the thickness of the material being worked. This adjustment is made by slightly releasing the clamping pressure and moving the forward edge of the nose bar or fingers back, away from the edge of the clamp block on the base. **This adjustment is made by loosening the bracket lock bolts (16) one on each end of the base assembly and turning the adjustment bracket nuts (14) to move the edge of the fingers / nose bar toward or away from the edge of the clamp block.** For 16 to 20 gauge and lighter material allow a clearance equal to twice the thickness of the material being worked. A larger bend radius can be accomplished by increasing the clearance.

ADJUSTING THE CLAMPING PRESURE: The clamping pressure should be adjusted according to the thickness of the material being worked. A common cause of forming problems is the result of either **inadequate** or **excessive** clamping pressure. Too much clamping pressure on one or both handles typically will result in over bending the material on that particular end or relative to the center portion of the brake. Not enough clamping pressure force will allow the material to slip during the bending process and result in an under bent section. This under bending is often encountered in the center of the brake.

Clamping pressure should be enough to hold the material securely in place but not so great as to require undue effort in locking the clamp handles. Clamping pressure on the ends of the brake is adjusted by turning the nuts (84) on the threaded rod portion of the yoke assembly (907) which is below the clamp swivel (78). The lift of the hold down assembly is adjusted by turning the nut above the clamp swivel. When the clamping pressure is properly adjusted, lock the nuts against the clamp swivel to prevent any change in adjustment.

HBU48-16 BOX AND PAN BENDING: The fingers can be removed and repositioned on the hold down assembly by moving the clamp handle fully to the rear and loosening the finger clamp screws. Reposition the fingers to assemble the desired width and secure the fingers to the hold down by tightening the finger clamp screws. Be certain that the tops of the fingers are flush and parallel with the milled edge on the hold down and the finger clamps are parallel with the bottom edge of the hold down. As a general rule, use the wider finger first and fill in with the narrower fingers. Small gaps between the fingers may be left with no adverse effect to the work piece. The maximum depth of box or pan which can be bent is 4-Inches.

COUNTERWEIGHT ALIGNMENT: The counterweight on this brake can be adjusted to balance the apron for ease of operation. Loosen the set screws and raise or lower the counterweight to achieve the desired degree of balance. Be certain to re-tighten the set screws thus securing the counterweight in place.

HEMMING:

Note: Forming hems is a secondary operation for a hand brake. If you adjust the brake to close a hem in the center of the work piece, the brake most likely will not bend straight. A hem is formed by making an acute (reverse) bend in the work piece and then clamping the bent flange in the hold down (1) to press the flange closed (to 180 degrees). Often the hem will not fully close in the center of a long work piece due to fact that the outer ends of the brake are more rigid than the center. Here it is especially important that the brake is sufficiently crowned and that there is proper clamping pressure at the center of the brake. Also the situation can be improved by inserting a strip of material (of the same thickness as the work piece) between the work piece and the clamp block slightly longer than the open portion of the hem. Re-clamp the hold down to close the hem. A tinner's mallet or hammer is also useful for closing hems. Be cautious not to use excessive force on the clamp handles to close the hem.

ADJUSTING THE BRAKE

When your brake was assembled at the factory it was adjusted for proper operation. Due to handling and repositioning, the brake may require adjustment and alignment. Read the adjustment and operating instructions completely before making any adjustments. Operate the brake and bend some material first before attempting any major adjustments.

BASIC ALIGNMENT: The clamp block on the base of the brake should be straight. This is the reference point for all of the other alignment operations in adjusting the brake. Raise or lower the center of the brake by adjusting the center of the brake by adjusting the center truss rod. **NOTE:** Your brake has four truss rods which facilitate adjustment of the brake's three primary weldments. Adjustments are accomplished through rotation of the nut located on the studs mounted perpendicular to the weldments.

HOLD DOWN ALIGNMENT: The forward edge of the fingers / nose bar on the hold down assembly should be even and parallel to the edge of the clamp block on the base. Release any clamping pressure on the hold down assembly by pushing the clamp handles slightly to the rear. Loosen the set screw located on each end of the hold down assembly and turn the eccentric to move the forward edge of the clamp block. Check to see that the edge of the hold down is flush with the edge of the block throughout the entire length of the brake. The central portion of the hold down assembly can be adjusted forward / backward and up or down via truss rod adjustment.

OVERBENDING: The hold down assembly should be moved back on the end where the over bending occurs by slightly unclamping the clamp handles, loosening the set screw and turning the eccentric pin. When the correction is made retighten the set screw.

PRECAUTIONS

DO NOT USE THE BRAKE TO BEND RODS, NAILS OR WIRE. THIS WILL CAUSE DAMAGE TO THE EDGE OF THE NOSE BAR AND APRON.

ALWAYS ADJUST THE CLEARANCE AND CLAMPING PRESSURE FOR DIFFERENT THICKNESSES OF MATERIAL.

DO NOT EXCEED THE CAPACITY OF THE BRAKE. MAKE CERTAIN THAT APRON SUPPORT ANGLE AND APRON INSERT IS ATTACHED TO THE APRON ASSEMBLY WHEN MAKING CAPACITY BENDS. OTHERWISE PERMANENT DAMAGE TO THE APRON MAY RESULT.

DO NOT bend seams, hems or locks unless the material is notched or the clearance is adjusted to double the seam/hem thickness. The capacity of this brake is 16 gauge (0.063). Multiple layers of material which exceed this dimension are beyond the capacity of the brake.

DO NOT USE PIPE EXTENSIONS TO GAIN ADDITIONAL LEVERAGE ON THE CLAMP HANDLES.

ALWAYS USE MATERIAL WITH SQUARE SHEARED EDGES FOR BEST RESULTS. ROLLED EDGES, BENT OR WARPED MATERIAL WILL CAUSE THE MATERIAL TO BOW WHEN BENT. KEEP SHEAR BLADES AND SLITTER KNIVES SHARP.

ALWAYS BEND SHORT PIECES OF MATERIAL IN THE CENTER OF THE BRAKE IN ORDER TO EQUALIZE THE STRESS.

ORDERING PARTS

When ordering parts please furnish both the model and serial number of your machine. Part's can be obtained directly from Tennsmith Inc.



Bench Model Bending Brakes Specification

Models	HBU48-16	HBS48-16
Capacity, mild steel	16ga / 1,6mm	16ga / 1,6mm
Capacity, bending support angle removed	20ga / 1,0mm	20ga / 1,0mm
Bending length	48-1/4in / 1225mm	48-1/4in / 1225mm
Maximum depth of box	4 in / 101.7	N/A
Maximum lift of beam	1-1/4in / 31.75mm	1-3/4in / 44mm
Front to rear adjustment	5/8in / 16mm	5/8in / 16mm
Minimum reverse bend	1/4in / 6mm	1/4in / 6mm
Minimum flange in capacity material	1 in / 25 mm	1 in / 25 mm
Dimensions, LxWxH		
Weight	495 lbs / 224.5 kg	460 lbs / 208.7 kg



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