

TENNSMITH®



OPERATION, PARTS & MAINTENANCE MANUAL

MODEL EBT72-16

TENNSMITH®

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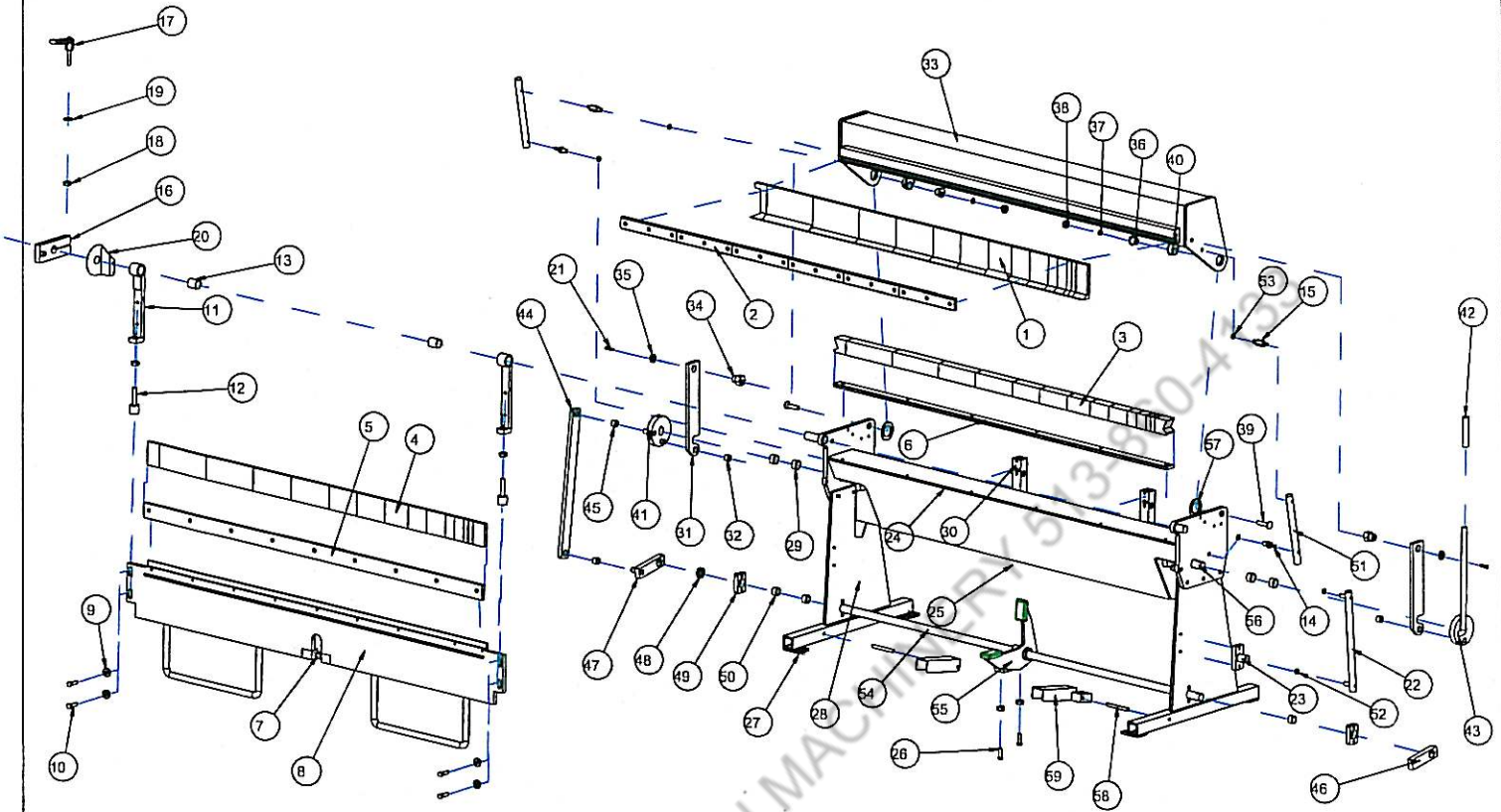
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Proudly Made in the USA
A Family Tradition Since 1928

MODEL EBT7216 UNIVERSAL HAND BRAKE



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FOREWORD

This manual has been prepared for the owner and operators of Tennsmith EBT floor model hand 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.
6. Never use a pipe or bar on the clamp handle or apron for additional leverage.
7. Keep clear of apron swing area while operating the brake.
8. Keep the work area around the brake clear and clean to avoid slipping or tripping.

SAFETY LABELS

Do not operate the hand brake without the proper safety labels in place. If your machine is missing the following labels please contact Tennsmith Inc. or your authorized Tennsmith distributor to order.



RECEIVING THE BRAKE

Upon receipt, closely examine the brake for damage during shipment. Be certain that you have two each clamp handles, counterweights and counterweight rods. Any loss or damage should be reported to the delivering carrier and to your distributor. Concealed damage should be reported to the delivering carrier immediately to protect your rights to make a claim.

USE CAUTION IN HANDLING AND MOVING THIS BRAKE. It is best to push or pull the brake only from the ends as it is top heavy. Approximate weights for the respective models are as follows:

EBT72-16 1,300lbs

INSTALLING THE BRAKE

Locate the brake in a well lighted area on a solid level floor. Be certain that you have adequate clearance to swing the apron.

NOTE: THE BRAKE SHOULD BE REMOVED FROM THE SHIPPING SKID. Use lag screws or bolts with expandable shields or similar holding devices through the mounting feet on the bottom of the leg assemblies to bolt the brake to the floor.

Place an accurate machinist's level on top of the clamp block on the base assembly. Using the leveling screws, to level the brake front to back and left to right. If necessary, use metal shims (not provided) under the leveling screws to obtain proper elevation. When the brake is leveled, tighten the leveling screw nuts and mounting bolts to secure the brake in place. **THE BRAKE WILL NOT BEND PROPERLY IF IT IS NOT LEVEL.** Install the back gauge and level.

SETTING UP THE BRAKE

When your brake was assembled at the factory it was leveled, adjusted and tested for proper operation. Due to handling and repositioning the brake may require adjustment and alignment.

The brake was adjusted and tested at the factory for bending material at its rated capacity. Adjusted in this manner, the base of the brake is slightly crowned in the center. With the handles pulled forward, viewing through the center of the brake from the rear of the machine will allow you to observe the crown. An equal amount of light should be seen on either end of the brake with the center of the hold down (1) assembly touching the crowned clamp base (34). If one end has less light, the brake is not level and you should shim under the rear of the leg at that end until the amount of light is equal.

In bending lighter gauge material, the crown in the clamp base (34) may cause over bending in the center of the work piece. If this is the case, back off the center truss nut on the base and apron assemblies proportionately to reduce the crown.

The apron assembly (35) has two different areas of adjustment:

1. **Truss nut:** The large nut (7) at the bottom center of the apron raises and lowers the center of the apron.
2. **Apron adjusting screw and lock nut:** These screws and nuts (10, 12), located at the bottom of apron. The hinge mounting screws must be loosened prior to making this adjustment and retightened afterwards.

The apron assembly is adjusted at the factory to form material to the brake's rated capacity. No further adjustments to the apron should be required upon initial installation. However, due to potential shifting during transit, you should visually confirm that the upper edge of the apron is flush to 1/64 low in the center and 1/64 to 1/32 low on the ends with the clamp block on the base (3). Additionally, the gap between the apron and the clamp block should not exceed .012 inches. Follow the steps in the preceding paragraph to make any necessary adjustment.

OPERATING THE BRAKE

ADJUSTING FOR METAL THICKNESS: The apron assembly (8) 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 lowering the apron assembly the thickness of the material being worked lower than the base tooling blocks. **To adjust for clearance, loosen the four bolts holding the apron to the pivot brackets (11). Turn the apron adjusting knobs (12) at each end of the apron assembly to move the top bending edge of the apron higher or lower depending on material thickness.** For material within four gauges of capacity, the clearance should equal twice the thickness of the material being worked. For lighter gauges, allow a clearance equal to one and one half times the thickness of the material. A larger bend radius can be accomplished by increasing the clearance. **(Refer to drawing BEND ANGLE TUNING)**

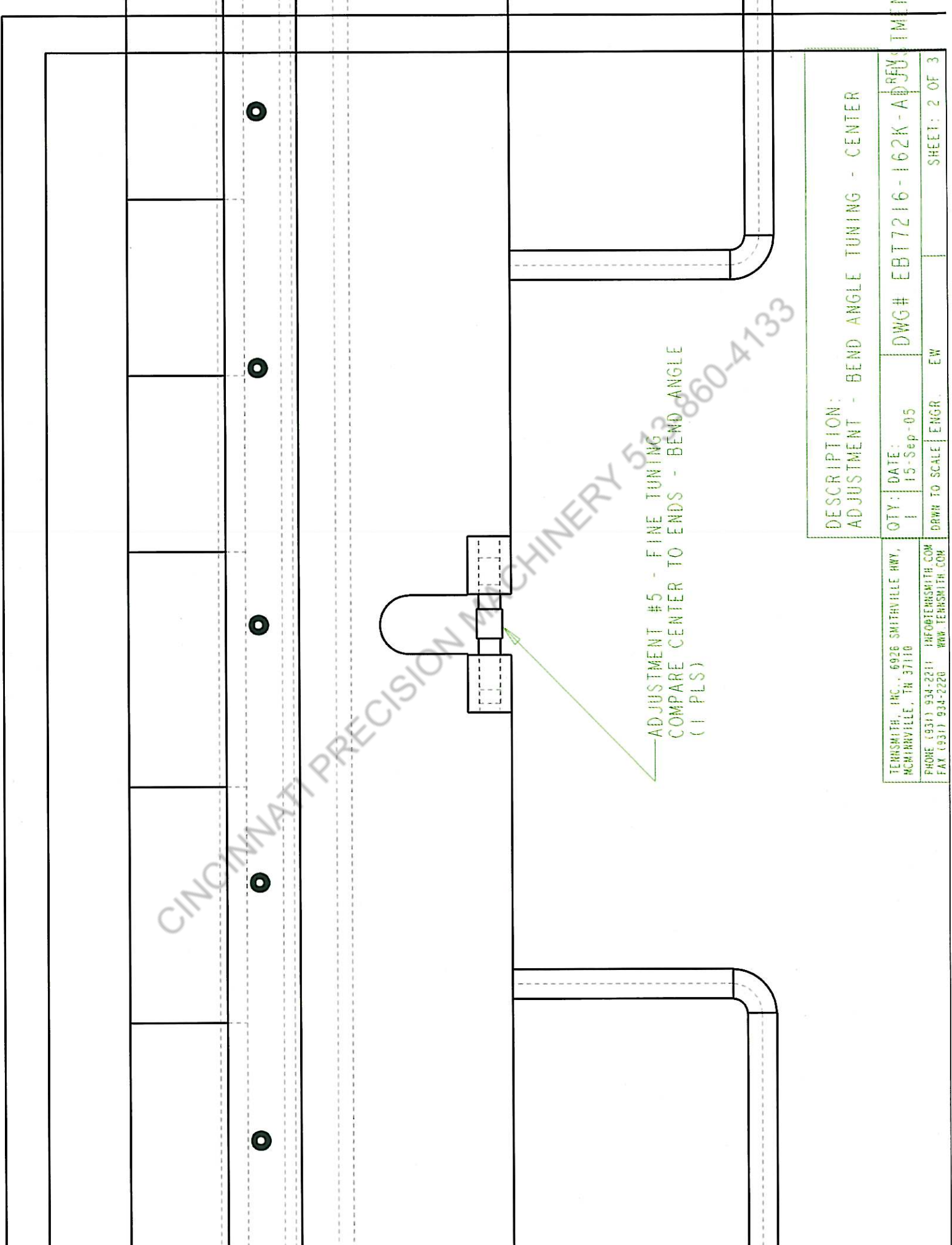
ADJUSTING THE CLAMPING PRESURE: The clamping pressure should be adjusted according to the thickness of the material being worked. A common cause of forming problems is the result of either **inadequate** or **excessive** clamping pressure. Too much clamping pressure on one or both handles typically will 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 handle. Clamping pressure on the ends of the brake is adjusted by turning the nuts (34) on the clamp link located on both sides of the brake. To set the clamping pressure loosen the locking bolt (21) then adjust the eccentric bushing (34). Adjusting the eccentric will raise or lower the clamping head. The clamping pressure should be equivalent to the pressure which was set at either end of the machine. When clamping pressure is properly adjusted, lock the nuts (21) on the crank link assembly (31) together to prevent any change in adjustment. **(Refer to drawing Adjustment Hold down Pressure)**

CAPACITY: The capacity of the brake is 16 gauge mild steel. The stainless steel equivalent is 20 gauge. The minimum recommended flange in capacity material is one inch.

BENDING REPEAT BENDS: Bending is accomplished by clamping the work piece under the hold down assembly (33) so that the line of the bend is held at the forward edge of the fingers (1) and by elevating the apron assembly (8) until the desired degree of bend is obtained. The maximum degree of bend is approximately 145 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 (16) on left side on the apron assembly (8) to limit the swing. Lock the stop at the desire location by tightening the locking handle (17).

Adjust the Apron for under bending at the center. To adjust for under bending simply tighten the center bow adjustment nut (7) located at the center of the apron. This adjustment will raise the center of the apron up. This will allow for more force at the center to compensate for any deflection. For over bending problems simply reverse the process. **(Refer to drawing Bend Angle Tuning)**

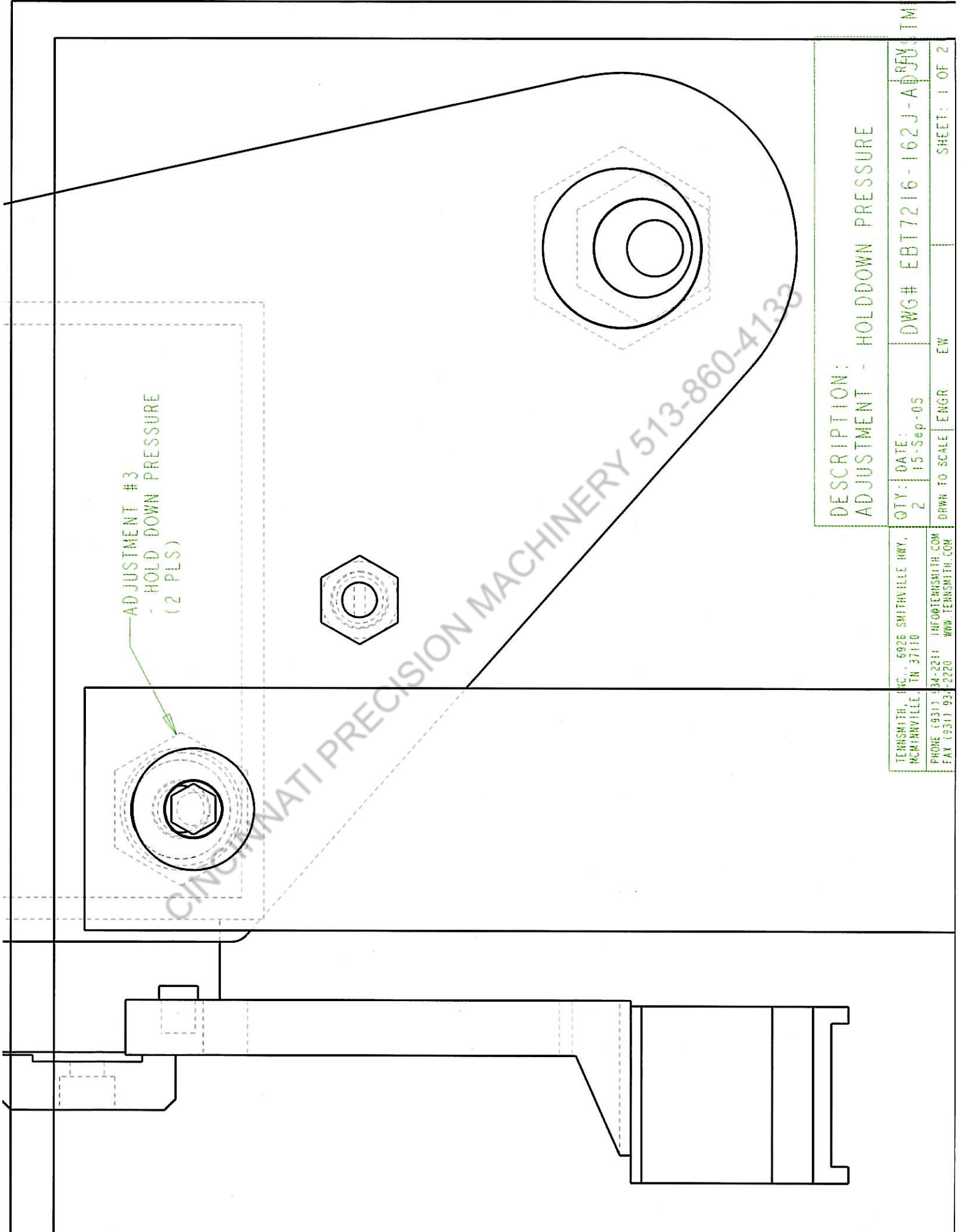
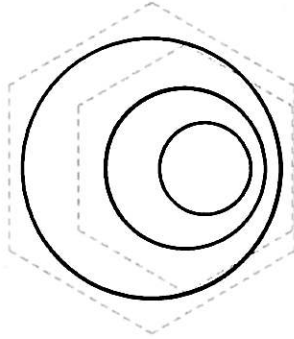
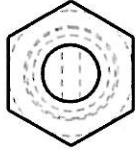


DESCRIPTION: BEND ANGLE TUNING - CENTER
 ADJUSTMENT - BEND ANGLE TUNING - CENTER

QTY: 1
 DATE: 15-Sep-05
 DWG# EBT7216-162K-ADJUSTMENT
 DRAWN TO SCALE ENGR. EW
 SHEET: 2 OF 3

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ADJUSTMENT #3
- HOLD DOWN PRESSURE
(2 PLS)

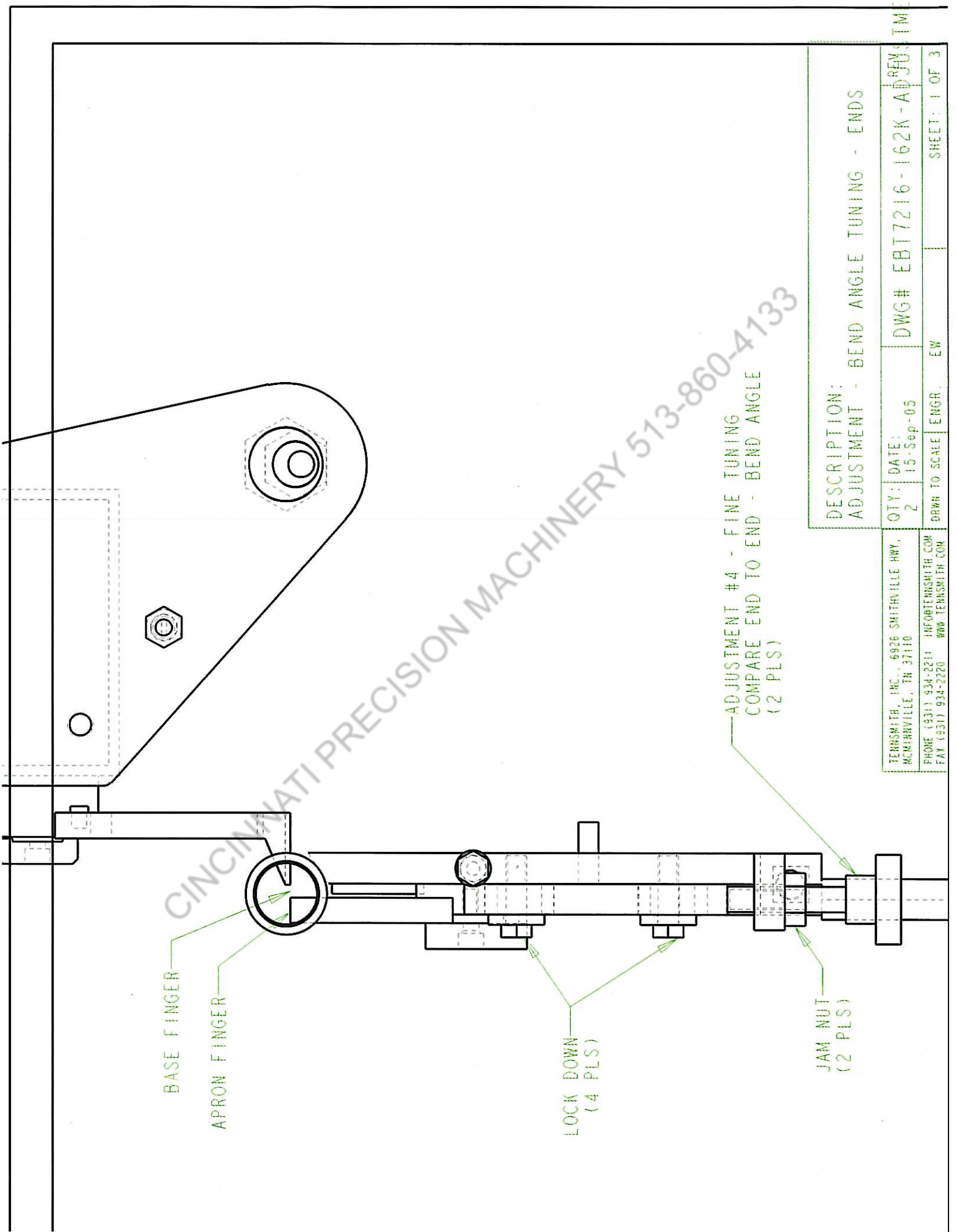


DESCRIPTION:
ADJUSTMENT - HOLDDOWN PRESSURE

QTY:	DATE:	DWG#	REV
2	15-Sep-05	EBT7216-162J-ADJ	01
DRWN TO SCALE:	ENGR:	SHEET: 1 OF 2	
	EW		

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CINCINNATI PRECISION MACHINERY 513-860-4133



CINCINNATI PRECISION MACHINERY 513-860-4133

DESCRIPTION: ADJUSTMENT - BEND ANGLE TUNING - ENDS	
QTY: 2	DATE: 15-Sep-05
DWG# EBT7216-162K-ADJUSTMENT	ENGR. EW
DRAW TO SCALE	
SHEET: 1 OF 3	

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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 (33) 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.

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 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 CUASE 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.

MAINTENANCE

Set up a weekly maintenance program for your brake. Check all nuts, bolts and set screws for tightness. Examine all moving parts for adequate lubrication.

The moving parts of the brake should be lubricated periodically and as necessary to maintain ease of operation and prolong the life of your brake. The clamp handles, yokes and hinges should be greased with MOBIL GREASE HP or an equivalent grade of lubricating grease at the designated fittings. The hold down pivot pins, hold down adjusting screws and clamp swivels should be kept lightly grease as well.

TROUBLESHOOTING

OVERBENDING ON ONE END

1. Excessive clamping pressure.
2. Nose bar adjusted too close to pivot point on that end.

UNDER BENDING IN THE CENTER

1. Insufficient crown in apron.
2. Exceeding capacity of the brake.

APRON HARD TO LIFT

1. The brake is not level.
2. The apron gas cylinder rod is binding. Insure rod is not bent. Check that alignment is square to the apron

APRON MAKES CLICKING SOUND

1. Too much crown in base / apron. Adjust the center truss nut to reduce.

NOSEBAR INDENTATIONS

1. Locks and seams are being bent without providing proper hold down clearance.
2. Locks and seams are being clamped with excessive hold down pressure.
3. Material formed has rough plasma cut edge.

HANDLE WORKS LOOSE OFTEN

1. Handle pin (10) has backed off. Remove handle and realign milled slot of pin with set screw position (9) and lock in place.

HANDLES ARE HARD TO MOVE

1. The brake is not level.
2. The lock nuts (29) are too tight.
3. Insufficient lubrication.
4. The top jam nuts (30) of the yoke assembly are locked against the clamp swivel (31). Back off $\frac{1}{4}$ turn and retighten.
5. Hold down gas shifted to one side. Check clamp swivel washer (32) spacing.

BOWED WORKPIECE

1. Excessive crown in base / apron.
2. Material cut on a slitter.
3. The brake is not level.

ORDERING PARTS

When ordering parts please furnish both the model and serial number of your machine.



HB Floor Model Bending Brakes Specification

Models	EBT72-16
Capacity, mild steel	16ga / 1,6mm
Capacity with bending support angle removed , mild steel	20ga /1,0mm
Bending length	72-1/4in / 1842mm
Maximum lift of beam	4n / 102
Bending Beam adjustment	1n /25mm
Maximum depth of box	4-1/8 in. / 105 mm
Minimum reverse bend	5/8in / 16mm
Segmented tooling width	10,8,6,6,4,2.5,2,1
Max Transverse bend	2-1/4in / 57mm
Minimum flange in capacity material	1 in / 25mm
Dimensions, counterweights in place, LxWxH	84 x 46 x 32in 2150 x 1175 x 815mm
Weight	1,300 lbs / 590 kg



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