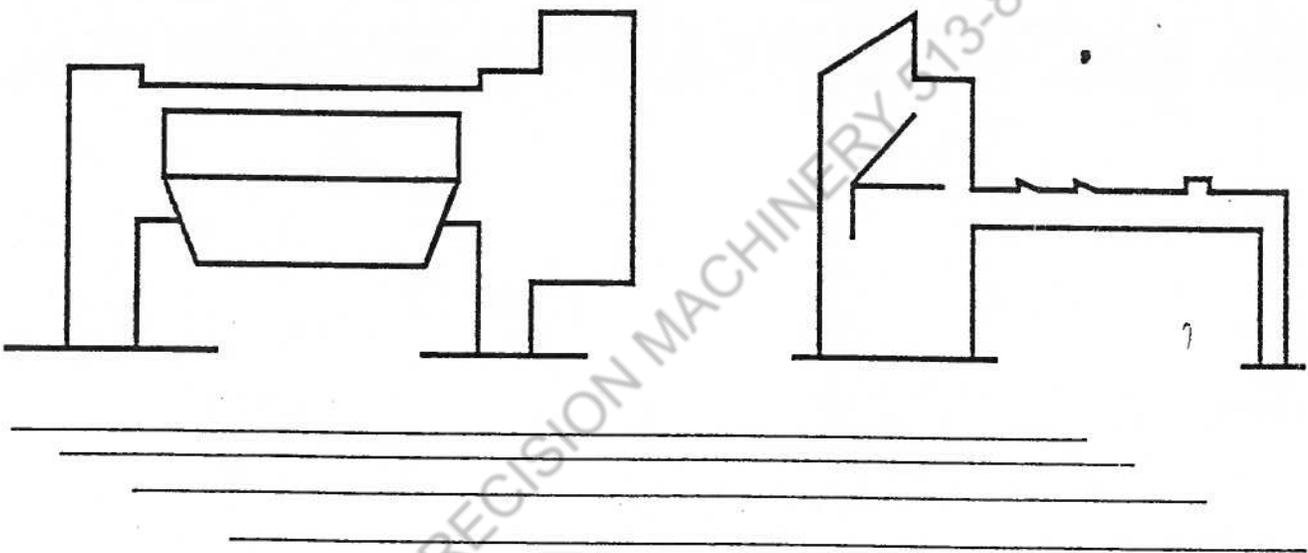




ROPER WHITNEY CO.

OPERATOR'S MANUAL

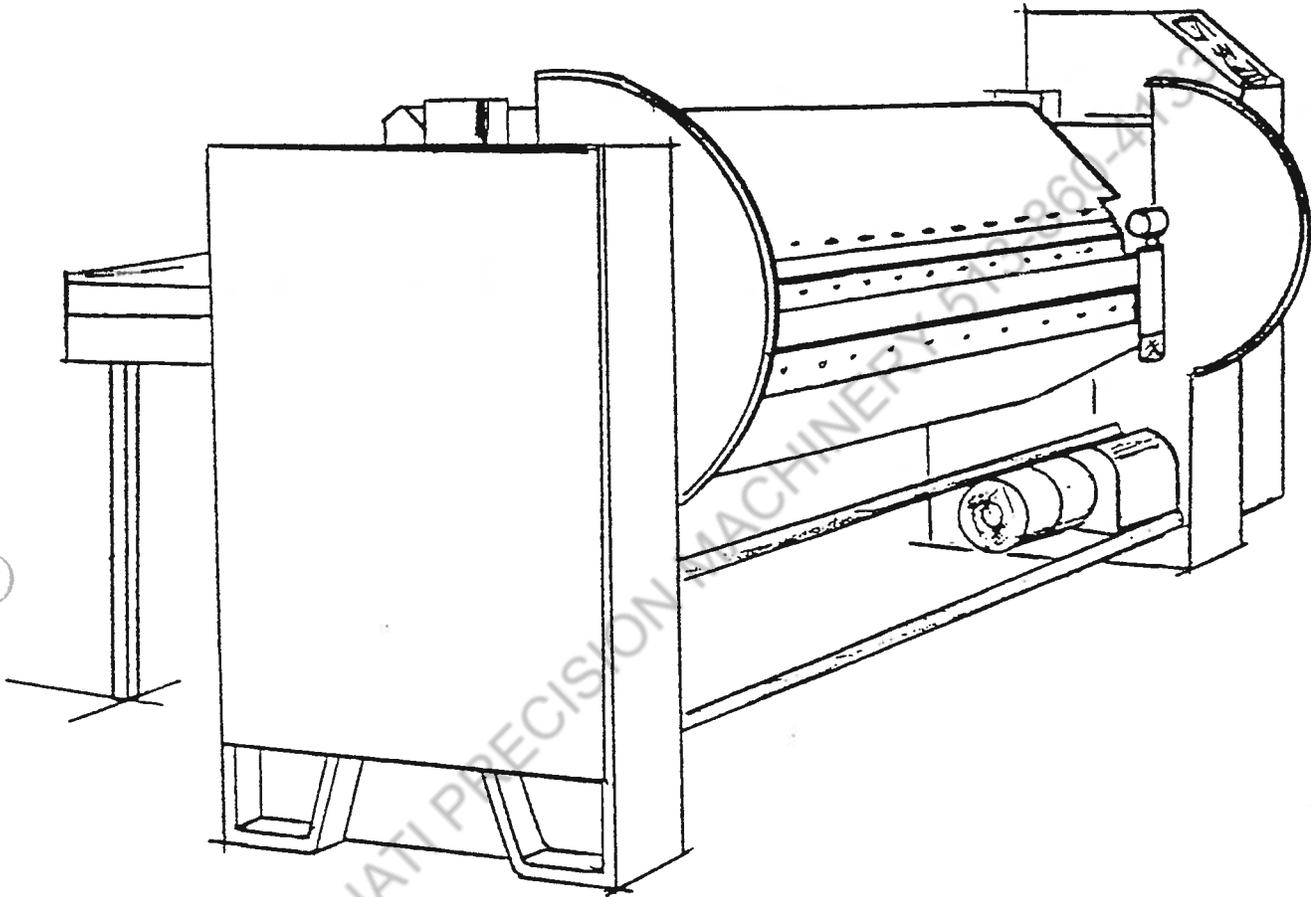


Auto **brake**
 **2000**

MADE IN USA

ROCKFORD, ILLINOIS 61103-3011 USA

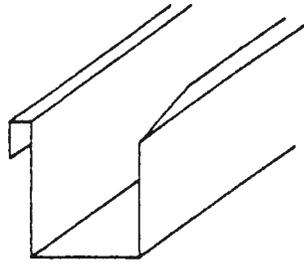
Auto **brake** 2000



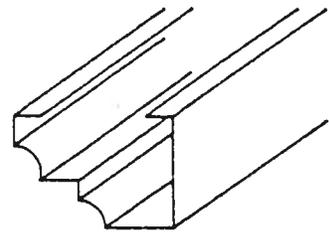
CINCINNATI PRECISION MACHINERY 512-260-4133



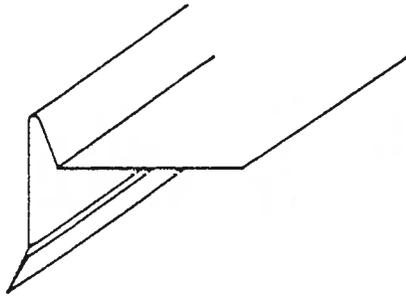
ROPER WHITNEY CO.



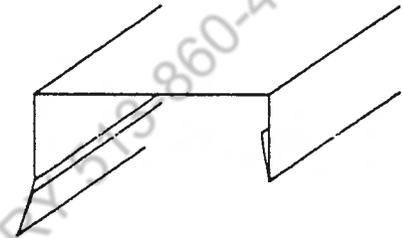
BOX GUTTER



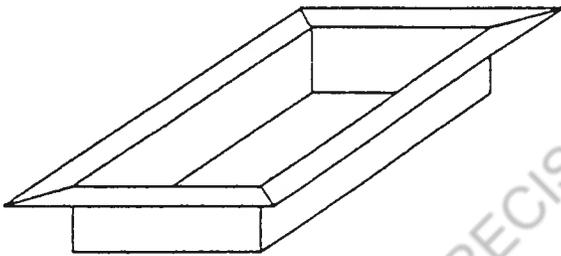
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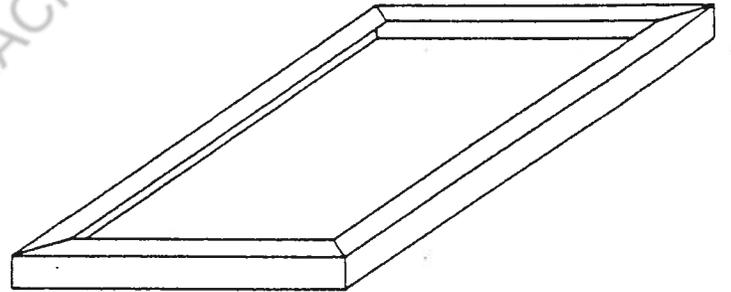
GRAVEL STOP



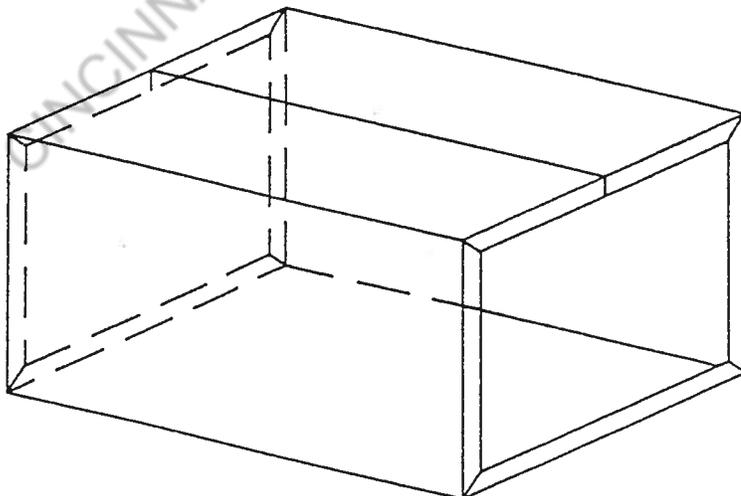
COPING



FLANGED COVER



FLANGED PANEL



6' WRAPPER

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AUTOBRAKE 2000

The Autobrake 2000 is a mechanical powered cnc bending and folding machine designed to handle light gauge mild steels. There are three models shown in Table 1.

Table 1

<u>Model</u>	<u>Length</u>	<u>Mild Steel Thickness</u>	
		<u>Standard Jaw</u>	<u>Box Jaw</u>
AB816K	8 feet	16 ga	18 ga
AB1018K	10 feet	18 ga	20 ga
AB1014K	10 feet	14 ga	16 ga

Sequential Bending

Sequential bending is mechanically accomplished in Figure 1. After positioning the work material at the backgauge, the clamping beam moves into position to clamp the work material. There upon, the bending beam rotates to a programmed angle to bend the work material. The process is repeated for any number of required bends to complete a part. The machine operator is required to handle and position the material.

Shown in Figure 1 is the kombi rotating beam for tool changes. A standard bending jaw and special jaws or box tooling are always in position ready for use. Rotating the kombi beam is done by manually actuating a one horsepower motor gear box. Positioning is accurately repeatable with fixed stops as the kombi beam comes to rest through a torque limiting slip clutch between the gear box and kombi beam.

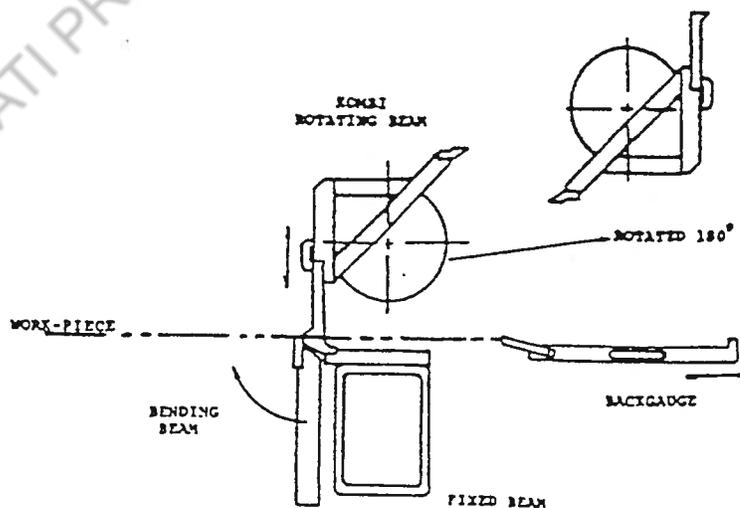


Figure 1: Sequential Bending

CNC Control and Gauging

The bending process is programmable with a CNC control to manage the sequential bends of angle and position that eventually forms a completed part. Programming is very simple that begins with entering the bend angle (if required, hem), and then entering the gauging distance. Also programmable are specialty requirements as reduced pressure to prevent marring the work material, and over bend to compensate for material "spring back". The memory capacity can hold approximately 200 programs of 6-bend steps per program with another 99 steps available for complex shapes.

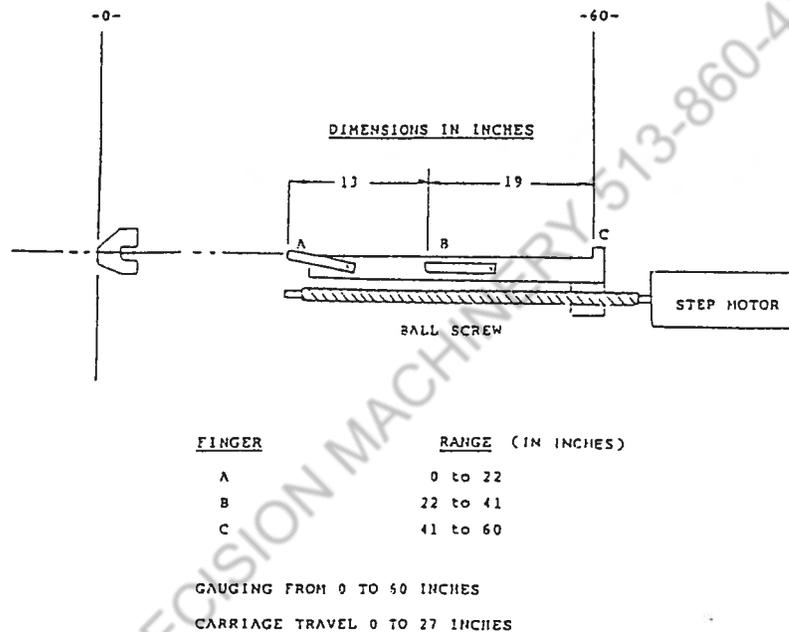


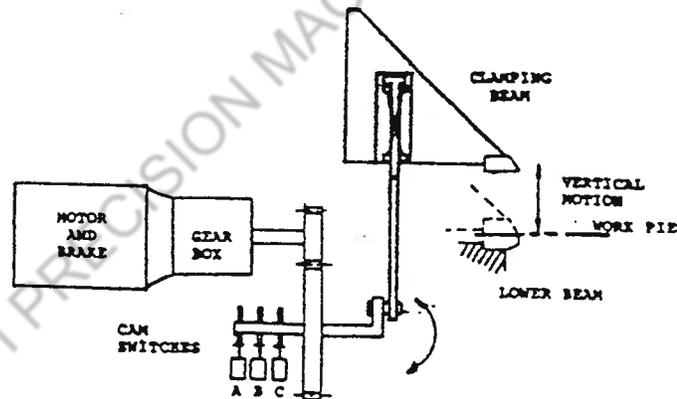
Figure 2: Rear Power Gauging

Figure 2 shows the powered gauging (backgauge) for optimized material positioning. There are three gauging fingers whereby only one is called upon by the CNC-control for gauging. Fingers A and B can flip-up; and depending upon the required position and the last bend position, one of these fingers is actuated. The fixed finger C is used when the gauging distance exceeds the capability of finger B. The fingers are assembled in a common carriage and moved by a step-motor and ball screw. The total traveled distance is 27 inches while gauging to 59 inches. The moveable fingers A and B are individually rotated by a fulcrum lever attached to a solenoid.

Clamping and Bending

Clamping and bending functions are mechanically actuated from 3-phase integral horsepower motors. There is a separate power train for each of these mechanical systems, see Figure 3 and 4. The motors only operate when the foot-switch is actuated, thus reducing continuous electrical power drain in comparison to an "always on" running motor. The Autobrake is very quiet as a result of the motor actuation system. Limit switches, actuated from precise rotating cams, trigger the motor on, off, or reverse.

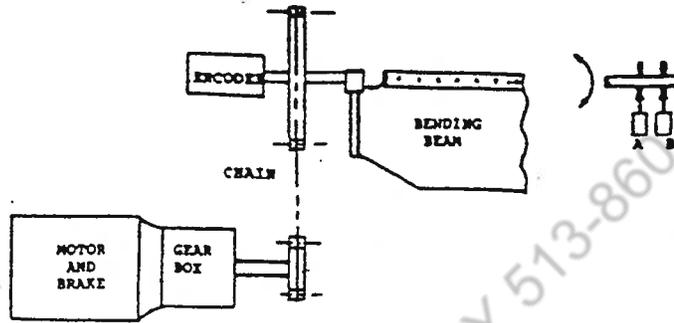
The clamping assembly shown in Figure 3 moves the kombi beam vertically, either up or down. A pre-set safety gap stops the downward motion of the clamp at .230 inches. The following sequential bends always returns the clamp beam to a .160 inch gap, which acts as a barrier for the operator's hands. The actual clamping uses a shock absorbing spring effect to prevent damage to any moving component. After a bend is made, the clamp beam automatically moves to the .160 inch gap; allows positioning of the material for the next sequential bend. Rotating the kombi gear for tool changes is accomplished by a separate 1 hp worm-gear motor.



<u>CAM SWITCHES</u>	<u>DESCRIPTION</u>
A	MAXIMUM OPENING
B	.230 INCH OPENING
C	.160 WORK OPENING

Figure 3: Clamping Assembly

Figure 4, shows the bending assembly that rotates the bending beam through a required angle. Any bend angle up to 146 degrees can be programmed. The accuracy is controlled from the feedback of an encoder. The bending beam rotates only after the work-piece is firmly clamped by the clamp beam. If excessive bending loads occur, the machine has a sensing system to stop the bending sequence. The overload protection is integrated with the rotational power train.



<u>CAM SWITCHES</u>	<u>DESCRIPTION</u>
A	MAXIMUM ROTATION LIMIT SWITCH
B	0-DEGREE LIMIT SWITCH

Figure 4: Bending Assembly

INSTALLATION AND PREVENTIVE MAINTENANCE

Receiving

Immediately upon receiving your Autobrake 2000, check it very carefully for damage or loss of parts in transit. Report any loss or damage to the delivering carrier promptly to insure proper handling of your claim. Also contact your Roper Whitney Company Dealer. Prior to uncrating your Autobrake, read these instructions to remove and lift the Autobrake.

WARNING: NOTIFY ROPER WHITNEY IMMEDIATELY TO SPECIFY YOUR DOCK FACILITIES. IT IS VERY IMPORTANT AS WE NEED TO KNOW WHETHER TO SHIP THE MACHINE ON AN OPEN FLAT BED TRAILER OR ENCLOSED VAN TRAILER. FAILURE TO INFORM ROPER WHITNEY MAY LEAD TO CRITICAL UNLOADING PROBLEMS FOR YOU.

WARNING: REMOVE THE AUTOBRAKE FROM THE SKID BY LIFTING ONLY AT THE CENTER OF THE KOMBI BEAM. DO NOT LIFT FROM ANY OTHER STRUCTURAL MEMBER OF THE MACHINE. The means of lifting is either by an over head "lift" with a sling, or using a "fork-truck" having the lifting tangs properly spread apart. Use protective wood material placed between the upper jaw and fork-truck lifting tangs. If a sling is used, place sling in the far ends of the kombi beam as shown in Figure 5.

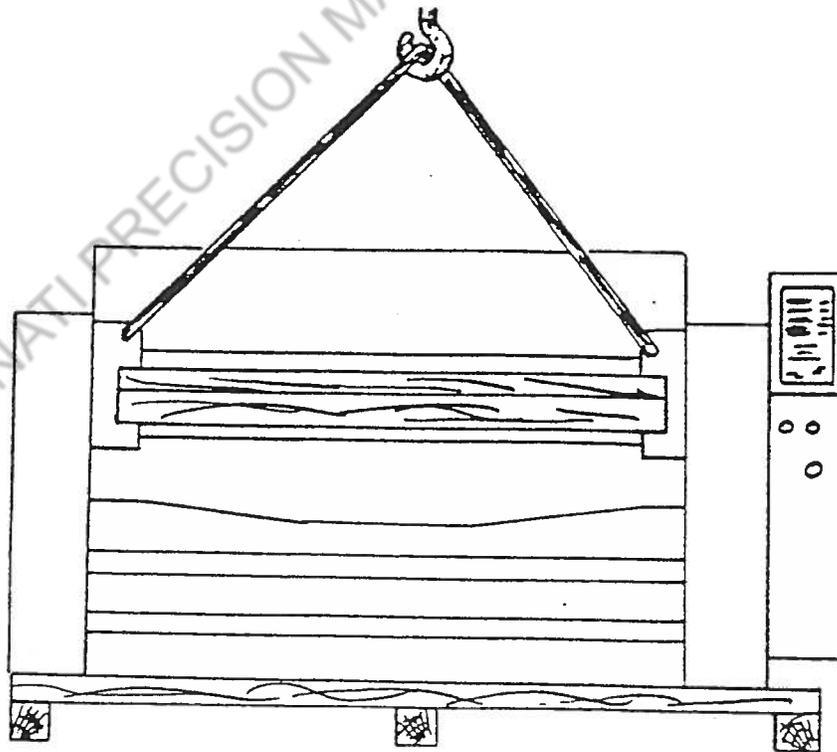


Figure 5: Lifting with a sling

Anchoring and Leveling

WARNING: MACHINE MUST BE CORRECTLY INSTALLED TO ACHIEVE THE SPECIFIED PERFORMANCE; MUST BE REMOVED FROM THE SKID, AND MUST BE DIRECTLY ANCHORED TO THE FLOOR, AS RECOMMENDED.

- 1.) All Autobrake 2000 machines should be installed on a cement floor at least six inches thick.
- 2.) Customer should follow "footprint" sketch SP1.1 or SP1.2.
- 3.) Ample adjustment is necessary to acquire proper hold down location.
- 4.) Customer should review sketches SK1.1 & SK1.2 before preparation for machine. There are several alternatives which will be acceptable.
- 5.) Hold down bolts shall be 3/4-10 threads.
- 6.) Six inch deep holes are recommended in the customers floor.
- 7.) Customer is required to furnish:
 - a.) 2 Gallon mix-Norbak #69-9907-52 fast set grout. Call 1-800-992-9799 for nearest distributor in your area, or Expandable Floor Anchors.
 - b.) 4 - 3/4-10 bolts with nuts and washers (choose per sketches SK1.1 or SK1.2).
- 8.) All questions regarding machine installation should be made directly to Roper Whitney Company.

The Autobrake lower fixed beam jaw must be leveled with .0015 inches per two feet. Level machine using mild steel shim stock. If leveling screws are furnished with the machine, be sure to lay mild steel shim stock under leveling screw & then adjust to level.

Check the gap at the gibs which must be at least .002 inch; less than .002 inch is not acceptable. Adjustment is made by slight adjustment at the anchoring screws through additional or less shim. See Figure 6 for areas to check gib clearance.

WARNING

If any of the above specifications are not met, the machine will be out of alignment, the gibs and bearings will wear prematurely and bending accuracy will deteriorate.

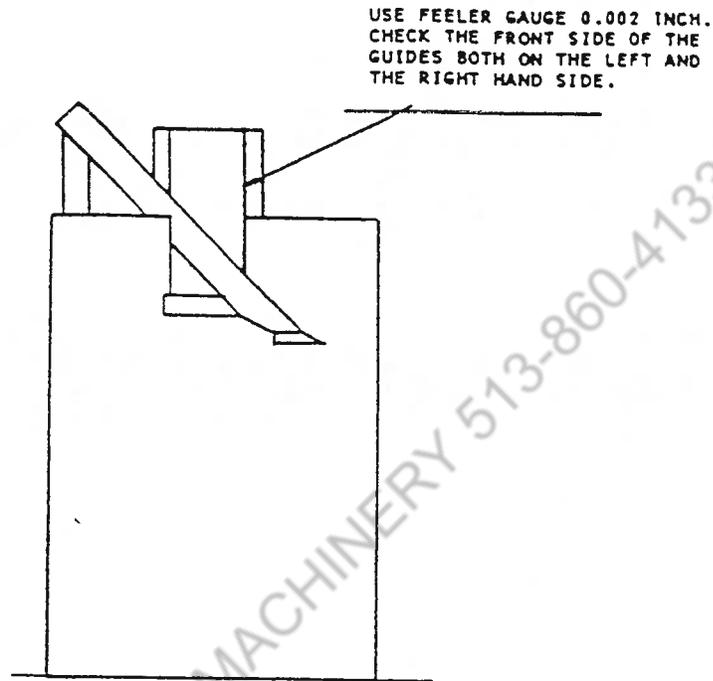


Figure 6: Gib Measurement and Requirements

CLEANING

In spite of precautions taken in preparing the Autobrake for shipment, dirt and foreign material may accumulate on machine and other parts during transit, and can cause considerable damage unless thoroughly cleaned. It is extremely important to inspect and thoroughly clean off any dirt and foreign material that may have accumulated. DO NOT attempt to blow dirt out with an air hose as this may force some foreign material into undesirable areas. Remove rustproofing compound with an acceptable solvent.

WARNING: Machine electrical power must not be connected when cleaning transit shipment dirt. Clean machine thoroughly prior to connecting electrical power, and prior to running the Autobrake.

POWERED BACKGAUGE

Refer to Figure 7 to align the backgauge trunions with the housing bores located at the rear of the machine. After the rear gauge fingers are aligned with the lower jaw, tighten the jam nuts on the aligning studs. Use aligning screws to achieve the required gauging alignment. Level backgauge and anchor to the floor with 1/2 inch diameter bolts with heavy duty floor anchors in concrete. Install the backgauge covers (13 each) in the respective areas. The final installation requirement is to connect the motor, solenoids, and home switch power leads to the control by attaching the three Cannon plugs at the rear of control enclosure.

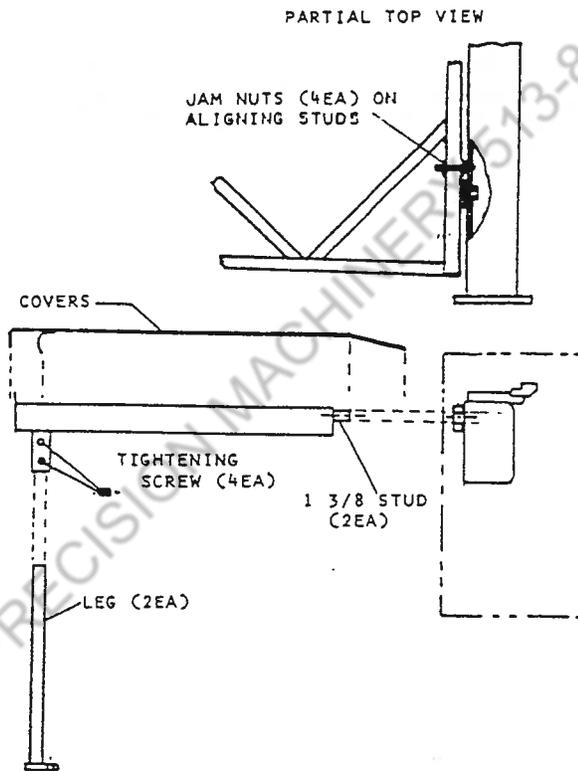


Figure 7: Rear Gauging Assembly

ELECTRICAL CONNECTIONS

WARNING:

Electrical Danger -- Misuse or improper installation of machinery connected to a source of electricity may result in accidental shock that could cause injury or death. Installation must conform to National Electric Code (Article 250) - Grounding, etc.

Electrical connections must be made by a trained and qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

A fusible electric "disconnect" panel box must be installed for the incoming three-phase electrical power. CAUTION: Motor direction must match the motor arrows. Switch any two single-phase leads to reverse the motor rotation -- WARNING: Incoming three-phase electrical power must be turned off at the fusible "disconnect" panel box before reversing leads to reverse the motor direction.

MAINTENANCE

Your Autobrake 2000 requires a minimum maintenance schedule. All rotating bearings are self-lubricated which require no maintenance.

The ram gib-guides must be lubricated ONCE A WEEK with a good grade of machine mineral oil.

The chains and gears must be greased EVERY 6 MONTHS -- An example is Shell 1029 or similar.

The backgauge guide shafts and ball screw should be lubricated with thin mineral oil (Shell Valvanta Oil J460 or similar) EVERY 30 DAYS.

WARNING: The cooling fan for the electronics must be cleaned EVERY 30 DAYS OR SOONER if in a very dirty environment.

ROPER WHITNEY COMPANY
SAFETY RULES - AUTOBRAKE 2000

1. Warning:

Electrical Danger -- Misuse or improper installation of machinery to a source of electricity may result in accidental shock that could cause injury or death. Installation must conform to National Electric Code (Article 250 - Grounding, etc.)

Electrical connections must be made by a trained and qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

2. Warning:

Mechanical Danger -- Stand away from rotating beam while forming a bend.

Mechanical Danger -- Keep hands and fingers away from the forming jaws while upper clamp beam (kombi) is descending downward from top "at rest" position.

Mechanical Danger -- Keep hands and fingers away from the moving gauging (backgauge) fingers.

3. Machine to be operated by authorized personnel who have been trained by their supervisor with the working and safety features of the machine, and by reading and understanding the Operator's Manual.
4. Do not operate Autobrake without reading Operator's Manual and without proper supervisory instructions.
5. Perform all installation and set-up operations before applying power for electrical start-up.
6. Never operate machine with any guard removed; i.e., all required guarding to be installed and effective.
7. Never leave machine running unattended. When not in use, turn off electrical power.
8. Never adjust machine with power on.
9. Avoid accidental start-up.
10. Do not use machine if servicing is required.

11. Use safety glasses and required protective tools.
12. Keep work areas clean and in proper order.
13. Be alert to all potential hazards.

CINCINNATI PRECISION MACHINERY 513-860-4133

AUTOBRAKE SPECIFICATIONS

	<u>AB816K</u> <u>8' 16 ga</u>	<u>AB1018K</u> <u>10' 18 ga</u>	<u>AB1014K</u> <u>10' 14 ga</u>
Capacity, Std Jaw	16 ga MS	18 ga MS	14 ga MS
Capacity, Box Jaw	18 ga MS	20 ga MS	16 ga MS
Bend Width	98.4 inches	122.4 inches	122.4 inches
Bend Max Angle	146°	146°	146°
Jaws Max Opening	4.3 inches	4.3 inches	5.5 inches
Back Gauge Depth	59 inches	59 inches	59 inches
Material Adjustment	Yes	Yes	Yes
Motor HP			
Bending	1.0	1.0	2.0
Clamping	1.0	1.0	2.0
Kombi Beam	1.0	1.0	1.0
Standard Voltages	230vac 3ph 60hz	230vac 3ph 60hz	230vac 3ph 60
Approximate Weight	4000 lb	4400 lb	6600 lb

The machine features and electrical components are shown in Figure 8, machine dimensions in Figure 9, and mounting dimensions in Figure 10. Figure 11 shows the operator's control panel. The wiring diagrams are shown on pages 34, 35, and 36.

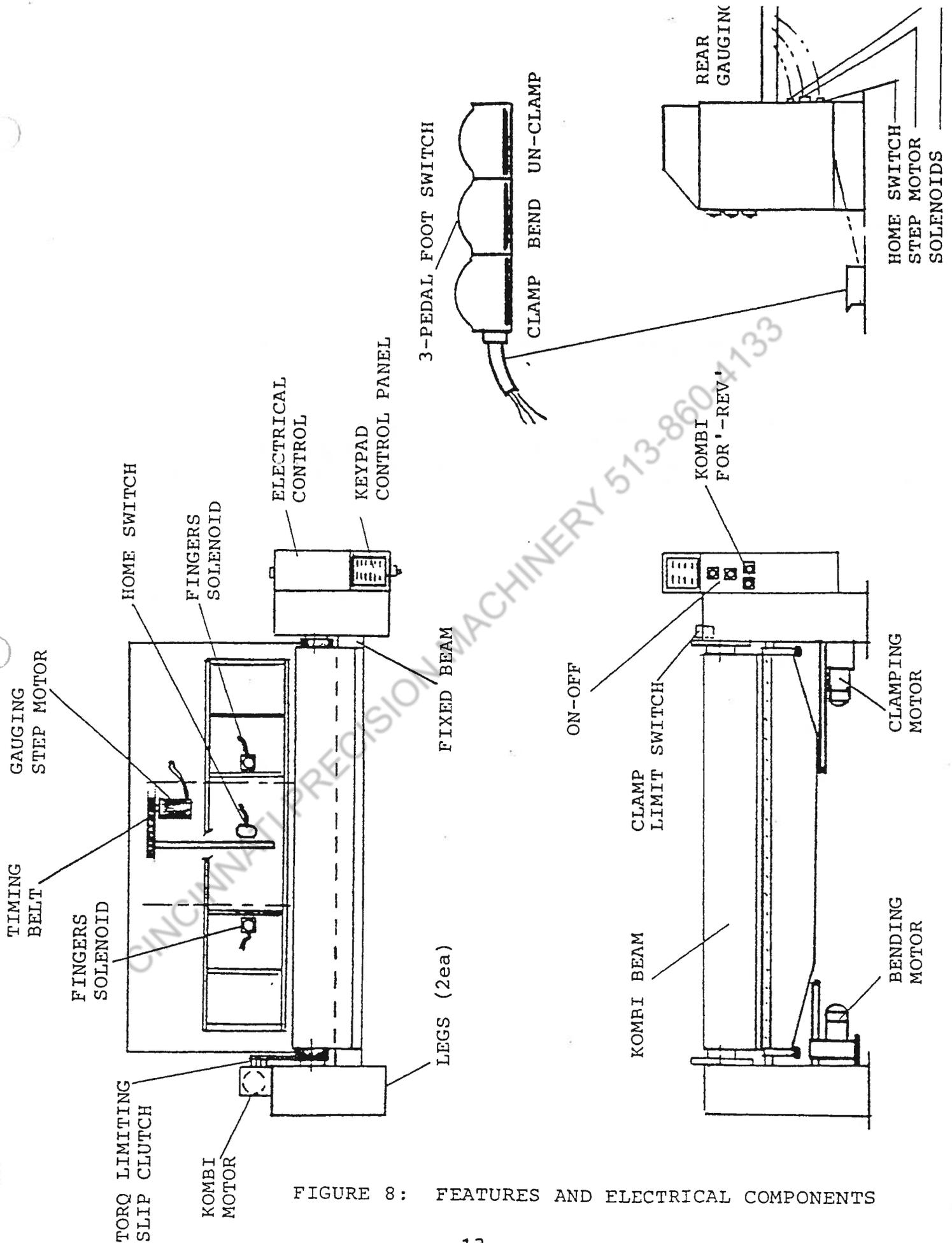
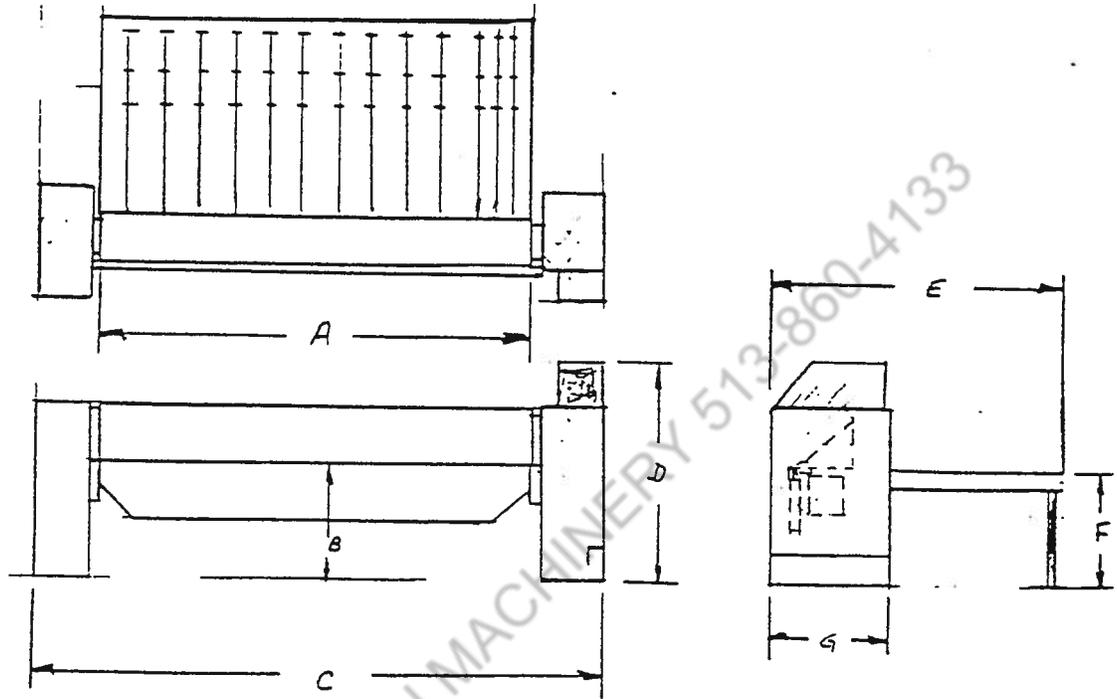


FIGURE 8: FEATURES AND ELECTRICAL COMPONENTS

AUTOBRAKE MACHINE DIMENSIONS

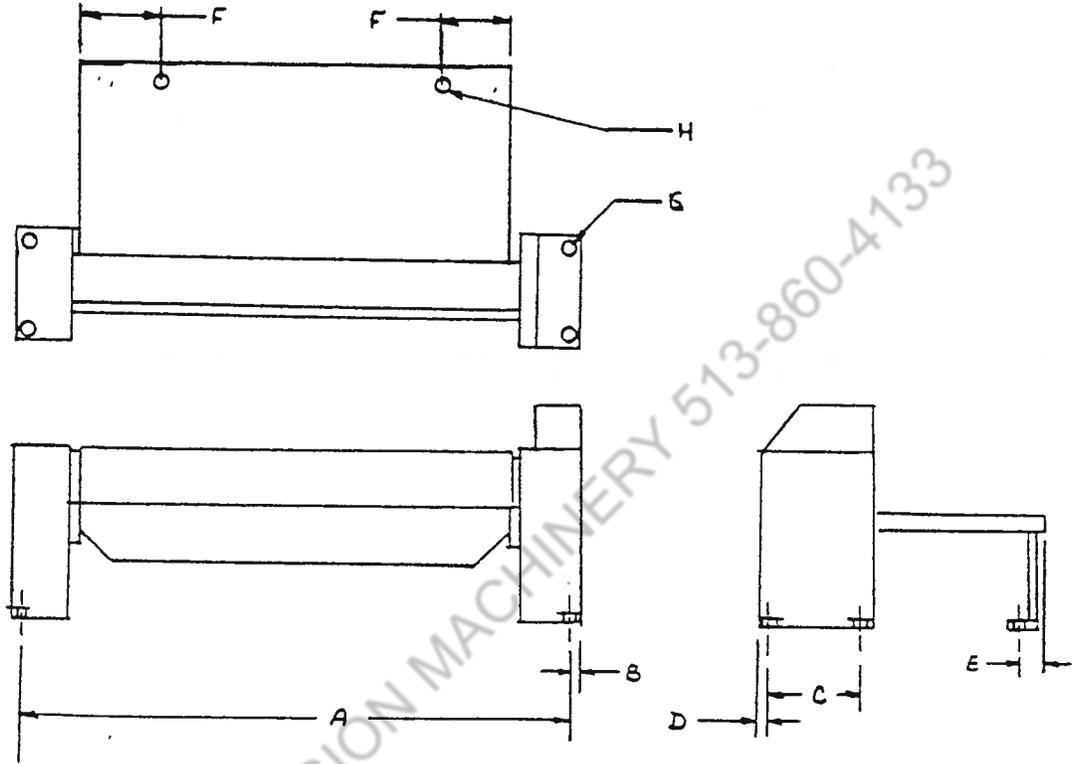


Dimensions in inches

Model	Size	A	B	C	D	E	F	G	WT-LB
AB816K	8'-16ga	98	35	131	54	64	35	26	4000
AB1018K	10'-18ga	122	35	155	54	64	35	26	4400
AB1014K	10'-14ga	122	35	159	57	69	35	29	6600

Figure 9

AUTOBRAKE FLOOR MOUNTING DIMENSIONS



Dimensions in inches

Model	Size	A	B	C	D	E	F	G	H
AB816K	8'-16ga	112	1.5	20"	3.1	4.0	24.75	7/8 ϕ	9/16 ϕ
AB1018K	10'-18ga	132.5	1.5	20"	3.1	4.0	24.75	7/8 ϕ	9/16 ϕ
AB1014K	10'-14ga	146.4	1.8	22.55	3.1	4.0	24.75	7/8 ϕ	9/16 ϕ

Figure 10

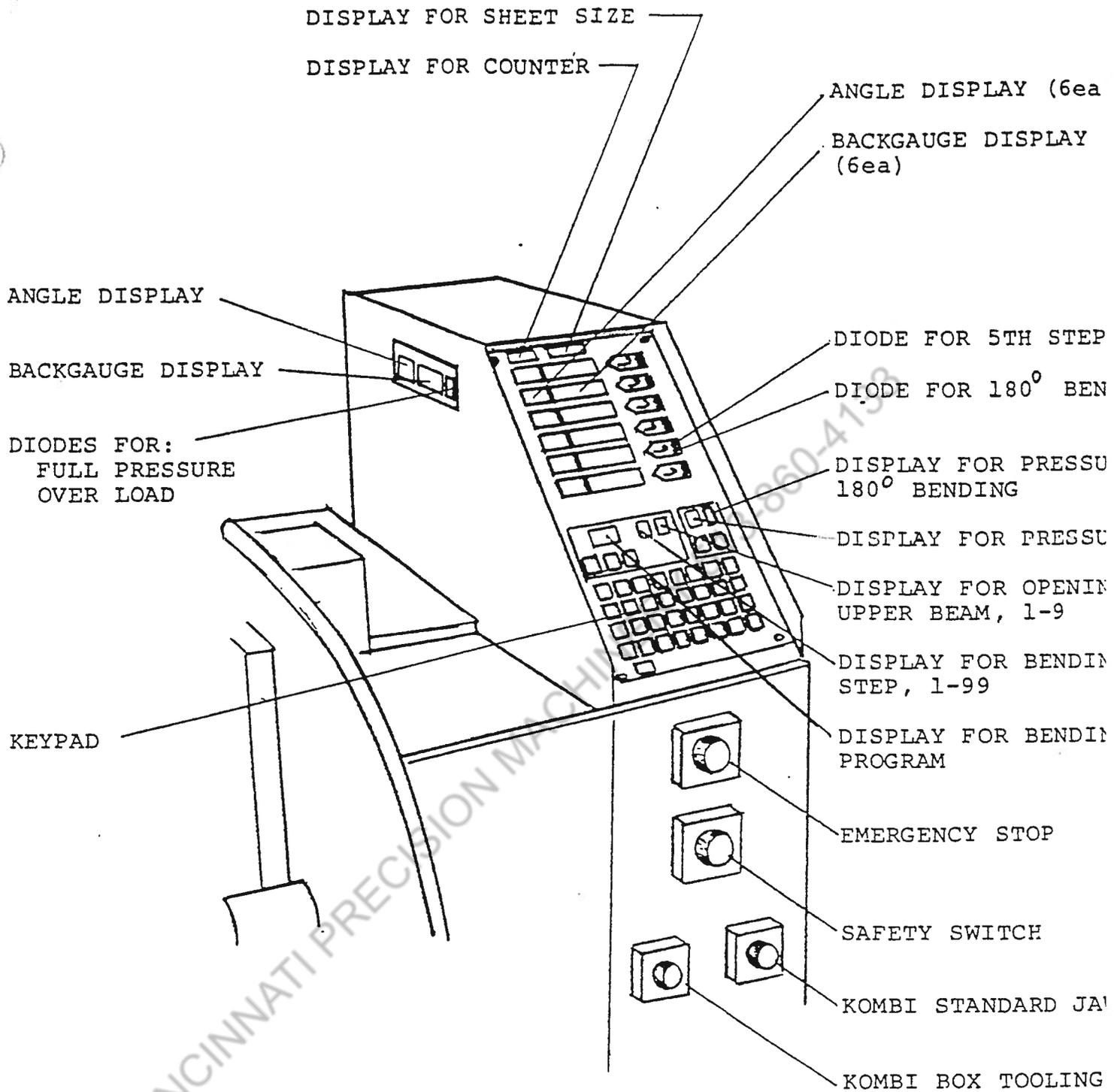


FIGURE 11: OPERATOR'S CONTROL PANEL

OPERATING INSTRUCTIONS

WARNING: NEVER OPERATE OR PERFORM MAINTENANCE ON YOUR AUTOBRAKE WITHOUT PROPER SUPERVISION AND INSTRUCTIONS, AND WITHOUT FIRST READING AND UNDERSTANDING THIS OPERATOR'S MANUAL.

NEVER INSTALL JAWS, BENDING BLADES, BOX TOOLS WITHOUT TURNING OFF ELECTRICAL POWER TO THE AUTOBRAKE.

NEVER PERFORM ANY MAINTENANCE WITHOUT TURNING OFF ELECTRICAL POWER TO THE AUTOBRAKE.

This Autobrake has been inspected and tested at the factory to bend full length material of capacity gauge thickness. **WARNING:** AUTOBRAKE WILL AUTOMATICALLY TURN OFF IF EXCESSIVE MATERIAL THICKNESS OVER LOADS THE AUTOBRAKE. RESET CONTROL BY TURNING-ON POWER.

Operating Procedure:

- A. Turn on electrical power by rotating on-off button--see Figure 11. Be aware that the motors will not turn on. Initial machine check-out:

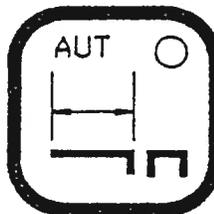
Depress left pedal of the foot switch and upper beam (Kombi) must move down. If not, reverse two of the 3-phase power leads.

WARNING

TURN OFF ELECTRICAL POWER AT DISCONNECT FUSE-BOX (supplied by Autobrake owner) PRIOR TO REVERSING THE POWER LEADS.

- B. INITIAL MACHINE CHECKOUT--Depress left pedal and upper beam goes down. Then depress right pedal and upper beam will now go up.

The backgauge is next to be checked out. At the key pad, depress the automatic backgauge button



and the backgauge will automatically establish the "HOME" reference point.

The final checkout is to depress the manual bending beam button at the key pad



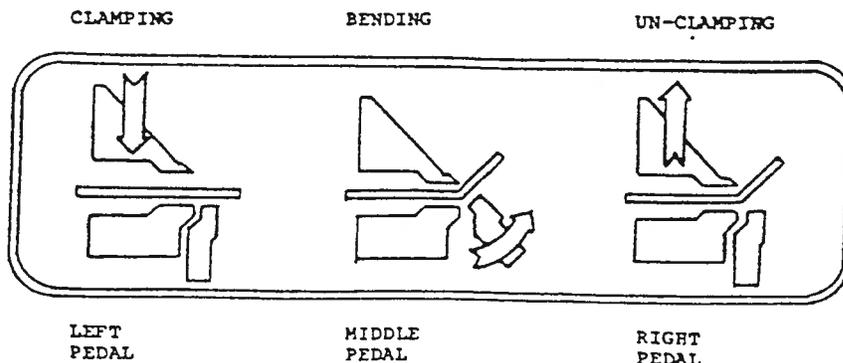
and the bending beam will rotate upon depressing the middle foot pedal. The right foot pedal must now be depressed to return the bending beam and upper beam to their starting position. **WARNING:** While in the automatic modes, the rotating beam and upper beam will automatically return to their starting position, whereby the operator does not need to use the right foot pedal in the automatic mode.

C. FOOT PEDAL FUNCTIONS--See Diagram.

1. Depress the left pedal. Upper beam moves to a .24 inch clearance. This is preset from factory according to safety regulations.
2. Depress the left pedal again. Upper beam clamps the sheet. Diode light, on the left hand side of the control enclosure, indicates programmed pressure obtained.
3. Depress the middle pedal to make a bend. Bending beam and upper beam will return to the starting position only when in the automatic modes.
4. RIGHT PEDAL - UPPER BEAM ALWAYS MOVES UP.

NOTE! To allow the back gauge to move to the next position the upper beam must have .16 to .24 inch clearance.

NOTE! If you wish to stop the bending, press the right pedal.



WARNING

DO NOT PLACE HAND OR FINGERS IN OPEN AREA BETWEEN UPPER BEAM (KOMBI) AND LOWER (FIXED) BEAM WHILE ACTUATING LEFT FOOT PEDAL TO DESCEND THE UPPER BEAM.

AUTOBRAKE IS DESIGNED TO AUTOMATICALLY RETURN TO .16 INCH GAP AFTER A BEND OPERATION.

- D. If for any reason the operator needs to immediately shut down the Autobrake in a bending cycle, depress the "EMERGENCY STOP" BUTTON--see Figure 11. Restart is accomplished by rotating the on-off button (same button as used to emergency shut down).
- E. BENDING BLADES--The Autobrake is equipped with two bending blades that allows close in bending for a reverse flange. Figure 12 shows the three available widths that are available on your Autobrake.

14 GA .074 .056 .046
 16 GA .060 .045 .036
 18 GA .047 .035 .028

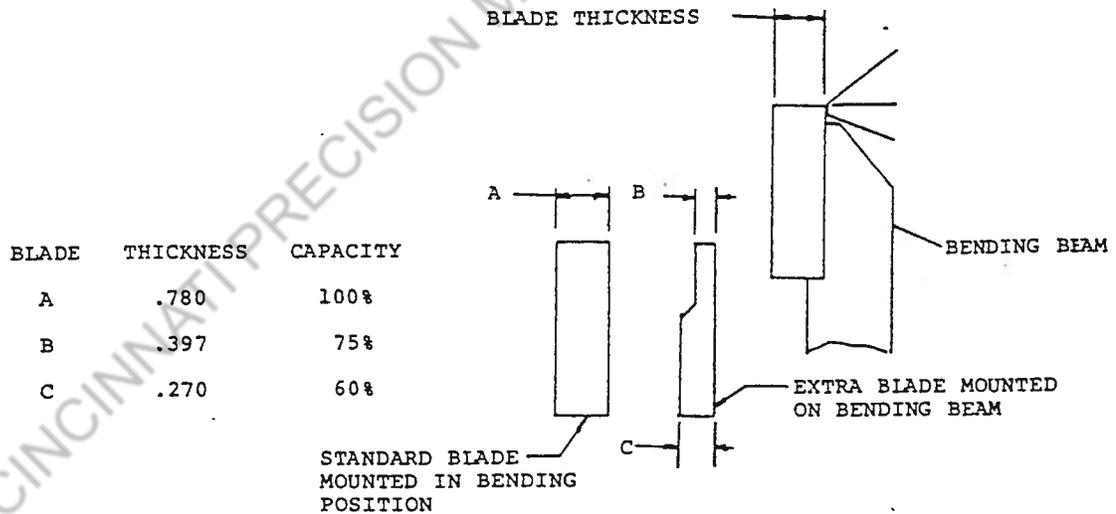
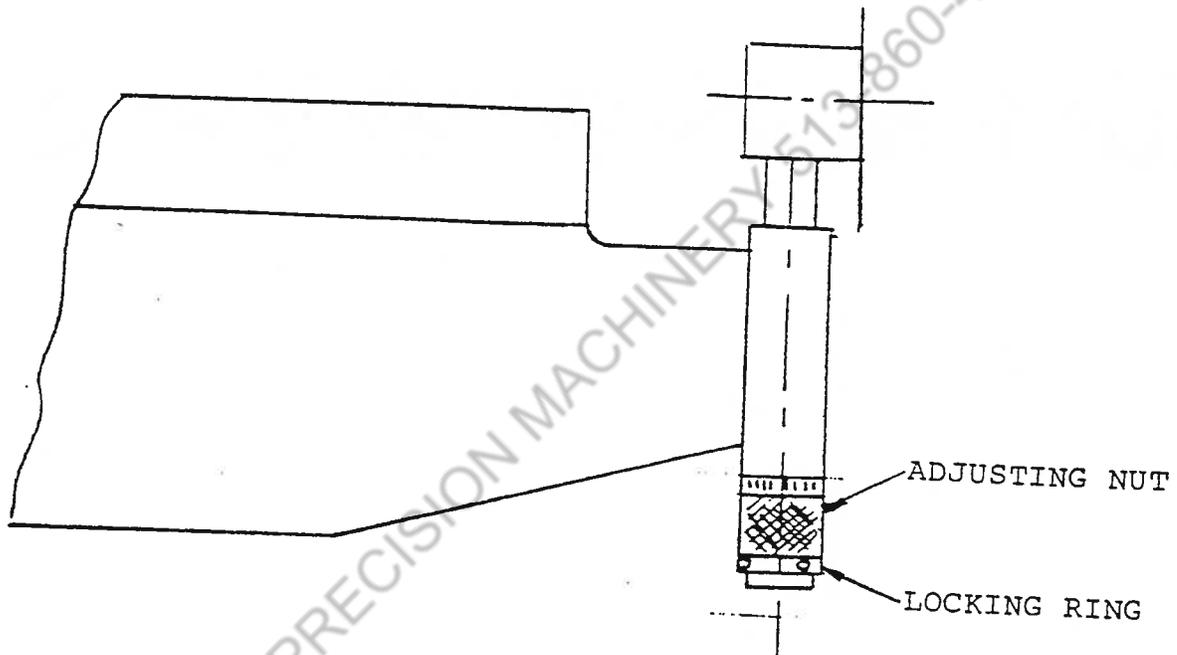


Figure 12: Bending Blade Widths

F. MATERIAL ADJUSTMENT--It is very important to make material thickness adjustments as shown in Figure 13. This enables the highest quality in achieving consistent angular bends. Upon making the adjustment, loosen locking ring and rotate adjusting ring. Check material clearance between fixed beam jaw and bending beam blade to allow thickness of material. Lock the locking ring when adjustment is completed. For any setting larger than one material thickness, there is a possibility that large bend radii will occur. WARNING: Settings less than one material thickness may damage the gibs of the upper beam and bearings of the rotating beam.



<u>Model</u>	<u>Material Thickness</u>
AB816K	16 gauge
AB1018K	18 gauge
AB1014K	14 gauge

Make necessary adjustments on both ends of the bending (rotating) beam, and always adjust for every material thickness.

Figure 13: Material Thickness Adjustment

G. KOMBI OPERATION--Always raise kombi upper beam to maximum up position prior to rotating the beam. **WARNING:** An electrical interlock will prevent rotation of the kombi beam if the beam is not raised to the maximum elevation. Proceed as follows and refer to Figure 14:

1. Remove the two locking bolts that hold down the kombi. There is one at each end of the beam.

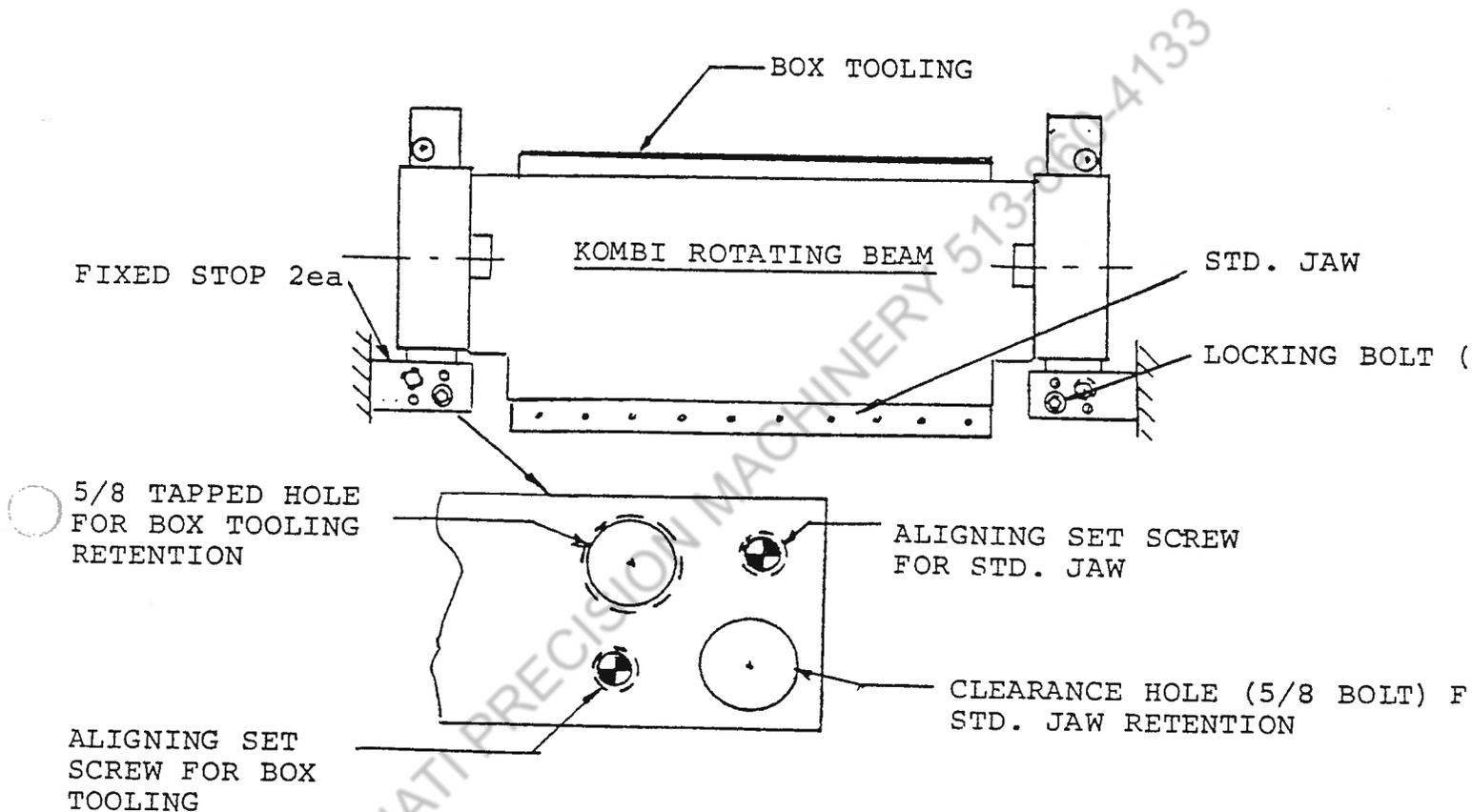


Figure 14: Kombi Beam Retention and Alignment

2. Depress the related push button at the operator's control (see Figure 11) panel to rotate the desired jaw into position. Hold push button in depressed position until rotating beam hits the fixed stop. Do not continue to drive the kombi motor after the rotation is completed, because continuous rotation will shorten the life of the torque-limiting slip clutch.

3. Check the alignment of the kombi jaw (on box tool) edges to the edge of the lower fix beam jaw. There should be no offset. If a slight offset exists, use the appropriate aligning set-screws for the corrective adjustment. This adjustment is now fixed for future rotational tool changes and/or returning to the original tool.

WARNING: The alignment is related to the upper jaw either overhanging the lower jaw or underlaying with the lower jaw. For quality bends make the appropriate adjustment with the aligning set-screws.

4. Install the 5/8 inch locking bolt and tightly pre-load with an Allen wrench. The kombi beam is now ready for bending.

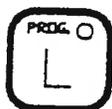
The .780 inch blade is mounted in the bending position on the bending beam. Another blade having two bending edges is mounted in a holding position on the bending beam. WARNING: Upon replacing or exchanging these blades it is critical to properly "seat" the blade into the bending beam blade seat prior to final torquing the blade 1/2-20 bolts (13 ea). A 2 X 4 or 4 X 4 inch wooden timber four feet long can be used as a forcing lever to seat the blade. Place the lever under the raised upper beam jaw and force the blade downward.

WARNING

ELECTRICAL POWER MUST BE TURNED OFF AT THE DISCONNECT BOX PRIOR TO SERVICING, EXCHANGING, OR REPLACING THE BENDING BLADES.

PROGRAMMING

Shown in Figure 15 (page 27) is the control panel for the key pad and display. All displays have LED's of high intensity for easy viewing. All the keys are tactile that require a slight touch for actuation. Following are graphic descriptions of each key and typical displays, and an example to program your Autobrake.



PUSH FOR PROGRAMMING MODE: WHEN PROGRAMMING THE DIODE WILL BE ON.
NOTE! DO NOT FORGET TO RESET AFTER PROGRAMMING, OTHERWISE THE MACHINE DOES NOT FUNCTION.



SEARCH FOR FREE PROGRAM.



PUSH FOR HEM (180°) BENDING, RED DIODE LIGHT IS ON. CLEARING OF THIS FUNCTION, PUSH BUTTON ONCE MORE, THE DIODE GOES OUT.
WHEN HEM BENDING IS PROGRAMMED THE BACK GAUGE DOES NOT MOVE FOR NEXT OPERATION BEFORE THE UPPER BEAM HAS CLAMPED THE SHEET.



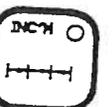
PUSH FOR PROGRAMMING ANGLE AND SET THE REQUIRED DEGREES ON THE KEYBOARD (AS AN EXAMPLE 90°).



PUSH FOR PROGRAMMING BACK GAUGE. SET THE REQUIRED POSITION IN INCHES ON THE KEYBOARD (AS AN EXAMPLE 15 INCHES).

PUSH  FOR DECIMALS AND THEN THE NUMBER, 

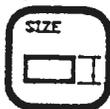
AS AN EXAMPLE 15.5.



1. PUSH FOR INCREMENTAL PROGRAMMING, THE DIODE IS ON.

2. THEN PUSH  AND PROGRAM FULL LENGTH OF SHEET
AND THEN  . NOW YOU CAN SET THE FIRST
INCREMENTAL MEASURE ETC.

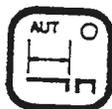
WHEN  OR  IS OUT, DISPLAY INDICATES
THE CORRECT SETTINGS.



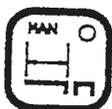
PUSH FOR SHEET SIZE AND PROGRAM ACTUAL LENGTH ON
KEYBOARD.



THE OPENING HEIGHT OF THE UPPER BEAM IS PRESET (0 =
NORMAL HEIGHT). PROGRAMMABLE FROM 0-9. HIGHER FIGURE,
HIGHER HEIGHT. DURING HEMMING OPERATION, BEAM MOVES
TO 6MM POSITION INSTEAD OF 4MM POSITION WHEN VALUE IS
SET AT "0".



PUSH FOR AUTOMATIC MODE.
ALWAYS PUSH THIS BUTTON WHEN THE MACHINE HAS BEEN
SWITCHED OFF (TO HOME BACKGAUGE), AND THE BACKGAUGE
WILL NOW TRAVEL TO THE REFERENCE POINT.



PUSH FOR MANUAL MODE, THEN  AND SET WANTED
POSITION. THE DISPLAY INDICATES SET POSITION.

PUSH  AND THE BACK GAUGE TRAVELS TO THE CORRECT
POSITION. PUSH  TWICE, AND THE BACK GAUGE
TRAVELS TO THE MAXIMUM POSITION, 59 INCHES.



ALWAYS ON WHEN BACK GAUGE IS IN USE FOR AUTOMATIC MODE.



PUSH THIS BUTTON FOR MANUAL MODE OF BENDING BEAM. DIODE ON. PRESS THE LEFT PEDAL TO CLAMP AND THEN THE MIDDLE PEDAL FOR BENDING. DISPLAY INDICATES ACTUAL ANGLE.



DECIMAL.



READY.



STROKE COUNTER

PUSH FOR SET TO "0" ZERO.



TO CLEAR THE PROGRAM PUSH  AND THEN 



PUSH  AND  IF YOU WISH TO AVOID THE

AUTOMATIC OPERATION ADVANCE THAT IS NORMALLY EXECUTED AFTER A COMPLETED APPLICATION.

PUSH  TO RESUME NORMAL OPERATION.



MOVING TO NEXT OPERATION.



MOVING TO NEXT OPERATION.



PUSH FOR ANGLE COMPENSATION. AS LONG AS THE DIODE IS ON, ALL PROGRAMS ARE COMPENSATED 1°. IF YOU NEED MORE COMPENSATION LET THE DIODE BE ON AND PUSH THE BUTTON AGAIN.

ANGLE IS INCREASED BY 1° EACH TIME UP TO MAX. +5°. REPEAT FOR EACH 1°. CORRECTED ANGLE WILL BE INDICATED ON THE DISPLAY.

COMPENSATION WHEN BENDING HEMS (180°)



PUSH THE BUTTON, THE DIODE IS ON. BACK GAUGE RETRACTS .08 INCHES AND ALLOWS THE SHEET TO COME FURTHER IN BETWEEN THE BLADES (FOR CLOSED HEMS).

FOR OPEN HEMS, DO NOT PUSH THIS BUTTON.

NO LIGHT ON DIODE = NO COMPENSATION.

"EVERYTHING PROGRAMMED WILL AUTOMATICALLY BE STORED UNTIL ERASED."



MOVING TO ANOTHER PROGRAM CAN BE MADE IN TWO WAYS IF YOU KNOW WHICH PROGRAM YOU ARE LOOKING FOR:



ALT.1: PUSH  OR  AND KEEP BUTTON PRESSED

DOWN UNTIL THE RIGHT PROGRAM TURNS UP.



ALT.2: PUSH  AND SET WANTED PROGRAM ON

KEYBOARD.

IF YOU SET LESS THAN 3 FIGURES YOU MUST END THE PROGRAM

BY PUSHING



NOTE!



MUST NOT BE ON WHEN SELECTING PROGRAM.

PRESSURE



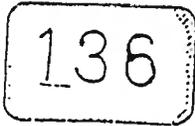
THE PRESSURE IS PRESET TO "0". CAN BE INCREASED BY PUSHING THIS BUTTON. HIGHER FIGURE - HIGHER PRESSURE.

HEMMING (180°)



THE PRESSURE FOR THIS OPERATION IS PRESET TO "3".
 PUSH THIS BUTTON TO INCREASE PRESSURE.
 HIGHER FIGURE - LESS OPENING.
 "3" SHOULD LEAVE HEM SUFFICIENTLY OPEN.

PROGRAM DISPLAYS



PROGRAM

THE DISPLAY INDICATES ACTUAL PROGRAM.

A1200 HAS 200 PROGRAMS = 1200 STEPS + 100 STEPS RESERVED.

EACH PROGRAM CONTAINS 6 STEPS BUT CAN BE INCREASED UP TO 99 BY USING THE 100 RESERVED.

IF LESS THAN 3 FIGURES YOU MUST END THE PROGRAMING BY

PUSHING



OPERATION

THE DISPLAY INDICATES THE ACTUAL STEP, 1-99.



UP

INDICATES THE OPENING HEIGHT OF THE UPPER BEAM, 0-9.

CINCINNATI PRECISION MACHINERY 513-860-4133

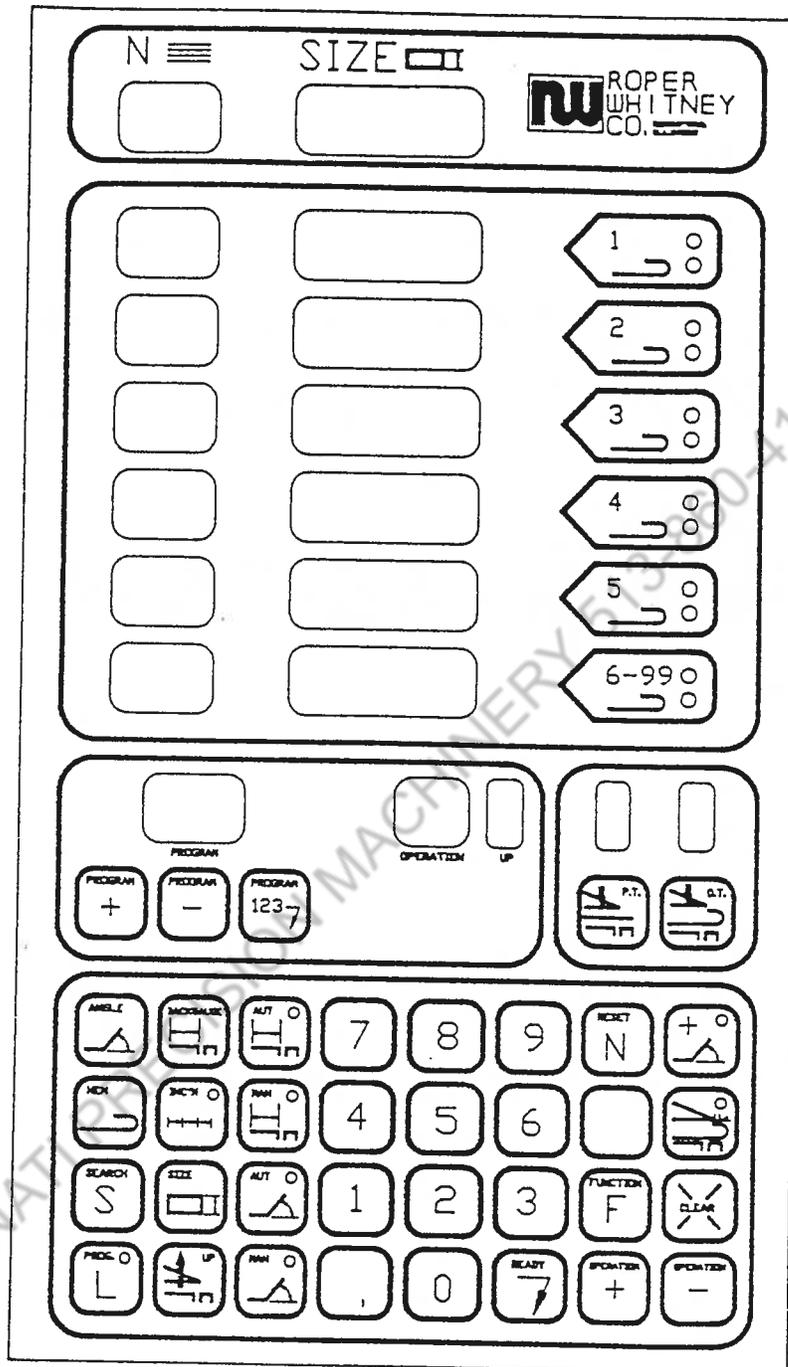


Figure 15: Operators Display and Keypad

AUTOBRAKE 2000 SOFTWARE REVISION (AUG 91)

1. The Autobrake 2000 has 200 programs + 100 steps reserve. One of the new functions is to see how many remaining reserved steps are available after doing some programming. This can be accomplished by depressing

F - 0 . The remaining number of reserved steps is shown in the "N" display.

2. The Autobrake 2000 has a program copy function. This function allows the operator to copy any program 002-200 and place it into the 001 location (1st program). All values, clamp pressure, hem pressure, up values, etc. are transferred with the copied program. The copied program stays unaffected in its location but any program previously located in location 001 is lost. With this function, an operator can run any program, possibly making changes to the program as he goes, but not affecting the original program. This function is

accessed by depressing F - 1 .

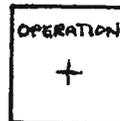
Example: An operator viewing program 030 depresses

F - 1 . Program 030 is transferred as program

001. If the operator wants to change some portions of the program, and run the program, he can do so without affecting the original program left intact in location 030.

3. By depressing F - 4 , the operator can disable the Automatic Advance to the next step which is normally executed after a completed step. With this function, the Autobrake 2000 will stay in its previously executed step until this function is disabled.

To disable this function, depress the button.



4. Depressing F - 5 allows the clamping beam to release pressure as the bending beam is on its downward travel from a previous step. This is useful when an operator has a number of steps he is doing to a piece of material. He can start to reposition his material

before the machine is completely finished with the previous step.

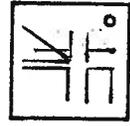
5. Depressing - gives all the steps in a program the same up value, digit 0-9.
6. Depressing - , erases displayed program.
7. The Autobrake 2000 incorporates a built in ram test. The ram memory is the memory the operator uses to program the machine. It is useful sometimes to know whether or not this memory is functioning properly. To test the ram memory, depress - . When the test begins, the display in the "N" counter will increase by 1, and when the test is finished, the display in the "N" counter will reset to "0", if the test was o.k. If there is an error, the "N" counter does not reset, but is once again increased by 1. The memory test is non destructive.
8. Angle compensation capability was +7° and is now +5°. It was felt that the machine should not require more than a +5° compensation. To access this capability, depress the button. The angle is automatically compensated +1° each time the button is depressed to a maximum +5°. Compensated angle can be read on the side display.
9. During the hemming operation, the upper beam moves to the 6mm position instead of the 4mm position. This was done to increase the range of the hemming, and therefore increase hemming performance. Previously the hemming operation hemmed automatically at the "3" position unless programmed otherwise. This was changed to the "0" or lowest position for safety considerations.
10. When hemming, the foot pedal must be depressed through the clamping portion of the hemming operation. Pre-release of the foot pedal will cause the hemming procedure to start again. This is a safety feature added to the system.

11. To interrupt manual bending beam while bending, press right foot pedal.

12. Depress (blank key) to simulate clamping

pressure. This is a useful function to an experienced operator who can "form" a part such as a cone shape by not clamping down on the part. The upper beam must be below the return up position. To protect the upper beam from collision with the bending beam, the bending beam will not rotate more than 92° when the upper beam is not clamped.

13. Incremental adjustment of backgauge for hemming - depress to move material 2mm forward. For closed hems - be sure diode is off for open hems.



CINCINNATI PRECISION MACHINERY 13-8600

OPERATING PROCEDURE EXAMPLE

1. TURN ON ELECTRIC POWER BY MAIN SWITCH.
2. EMERGENCY STOP IN OUTER POSITION.
3. THE KEYBOARD IS LIT UP AND THE MACHINE IS READY FOR PROGRAMMING.



PUSH BACKGAUGE AUTOMATIC MODE, DIODE ON. (BACKGAUGE IS "HOMED").



DIODE IS ON.



PUSH AND FREE PROGRAM APPEARS ON DISPLAY. DIODE ON FOR STEP 1.



PUSH AND SET 146° ON KEYBOARD.



PUSH, DIODE ON, FOR BENDING HEM AT STEP 1.



PUSH AND SET 8 INCHES.



PUSH AND MOVE TO NEXT STEP.



PUSH AND SET 70°.



PUSH AND SET 6 INCHES.



PUSH AND MOVE TO NEXT STOP.



PUSH AND SET 70°.



PUSH AND SET 1 INCH.



PUSH AND SET .5



PUSH AND MOVE TO NEXT STEP.



PUSH AND SET 90°.



PUSH AND SET .375 INCH.



RESET DIODE AND THE PROGRAM IS AUTOMATICALLY STORED.

END OF PROGRAMMING---EXAMPLE SHOWN BELOW:

18 gauge, 8.5 inches wide and 12 inches long



The machine is now ready for bending. First adjust for the material thickness. Then proceed as follows:

1. Start by moving upper clamp to .24 inch down gap position - depress left pedal.

2. Place material 8.5 inch length into the backgauge.
3. Depress left pedal and upper beam moves down and clamps material. Left pedal must remain depressed until upper beam stops moving. Clamp automatically stops at the programmed pressure setting.
4. Depress center pedal to initiate bending sequence. While in automatic mode, once the bending sequence is initiated, machine continues for a complete bending cycle.
5. After the bending beam returns to 0° the upper beam automatically moves up to the .16 inch jaw gap.

CINCINNATI PRECISION MACHINERY 513-860-4135

TROUBLE SHOOTING PROCEDURES

1. If display panel is not on:
 - a. Is there voltage on all phases.
 - b. Is the main switch on.
 - c. Is the emergency stop at its outer position.
 - d. Check the fuses, lower right hand corner on the transformer.
 - e. Check the motor overloads for bending beam, as well as the upper beam, to find out if any of these are tripped in the off position.
 - f. Check all electrical connections.

2. The panel is on, but the machine does not function:
 - a. Push 
 - b. Push 
 - c. Check  diode should not be on.
 - d. Move the upper beam above .24 inch (if possible). The machine is preset so that the back gauge can not be moved when the beam is less than .16-.24 inches from each other.
 - e. If the beam has been set for bending hems, move the upper beam once more.

3. Overload diode is on:
 - a. Check moving joints to make sure they are free to rotate.
 - b. Check that the encoder is not loose.

If limit switch for top stop at manual drive of bending beam is affected, the diode for overload pressure will light up (140° or 160°). Reset with .
 - c. Material may be beyond capacity of machine.

4. Bending beam rotation too much or not a zero start position:
 - a. Check cam retention set-screws inside the electrical cabinet enclosure.

WARNING: Electrical 3-phase power must be turned off at the disconnect box prior to opening the enclosure door and servicing the cams.
 - b. Figure 16 shows the cam locations and which cam to adjust. Adjust cam #1 for stopping at the 0° start position, and cam #2 for stopping at the 146° top position.
 - c. **WARNING:** Call your Distributor or Roper Whitney Service Dept. for any questions, because any incorrect adjustment can effect bending accuracy and/or damage your Autobrake.
5. Clamp beam incorrect stopping at top position, and/or safety gap between jaws is not consistent between material bends:
 - a. Check cam retention set-screws inside the electrical cabinet enclosure.

WARNING: Electrical 3-phase power must be turned off at the disconnect box prior to opening the enclosure door and servicing the cams.
 - b. Figure 16 shows the cam locations and which cam to adjust. Adjust cam #3 to stop the upper beam at the top position. Adjust cam #4 for the 0.16 inch jaw opening. Adjust cam #5 for the 0.24 inch jaw opening.

WARNING: ANY INCORRECT ADJUSTMENT CAN NEGATE THE INTENDED SAFETY OPENING OF YOUR MACHINE, WHEREBY BODILY INJURY MAY OCCUR. THE SPECIFIED JAW GAPS MUST ALWAYS BE SET BY CAMS #4 AND #5--DO NOT INCREASE THESE GAP SETTINGS.
 - c. **WARNING:** Call your Distributor or Roper Whitney Service Dept. for any questions, because any incorrect adjustment may cause bodily injury and/or damage your Autobrake.
6. Solenoids sticking on backgauge
 - a. Retract backgauge and check to see if fingers are popped up the same. Adjust with set screw in rear. If too high, adjust solenoid arms.

- h. Above 6mm position D21-on- goes off when you reach 6mm.
- i. Above 4mm position D27 is-on- goes off when you reach 4mm.

12. Diodes-Signals from software-

- a. D10 = Upper beam up.
- b. D11 = Upper beam down.
- c. D12 = Apron up.
- d. D13 = Apron down.
- e. D14 = Front fingers up backgauge.
- f. D15 = Intermediate fingers up Backgauge.
- g. D25 = Program locked.

13. Machine bending accuracy bad.

- a. Check with kombi-tools first.
- b. Adjust bending blade up or down.
- c. Turn to standard jaw.
 - 1. Check gib clearance.
 - 2. Adjust kombi-set screws.
 - 3. Test bend.
 - 4. If not acceptable you must file jaw on upper beam.
(By Roper Whitney only!)

14. Clamping pressure

- a. Adjust from Keypad.
- b. Watch linkage for over travel.
- c. Adjust pressure switch (push down!). (By Roper Whitney only!)

15. Hem pressure

- a. Keypad adj. 0-9.
- b. Check 6mm cam.
- c. Adjust dip switches. (By Roper Whitney only!)

16. Backgauge

- a. Align-nuts-for parallelity of blades.
- b. Adjust homing read fork - check programmed distance.
- c. Rods out of line. Loosen rod supports in the center for the end that is furthest to the front in the back position.

CINCINNATI PRECISION MACHINERY 513-830-4123

BENDING BEAM

- #1 BOTTOM STOP
- #2 TOP STOP

UPPER BEAM

- #3 TOP STOP
- #4 .16 INCH
- #5 .24 INCH

CONTACTORS

<i>BEAM</i>	<i>UP</i>	<i>BEAM</i>	<i>DOWN</i>	<i>APPROX</i>	<i>UP</i>	<i>APPROX</i>	<i>DOWN</i>
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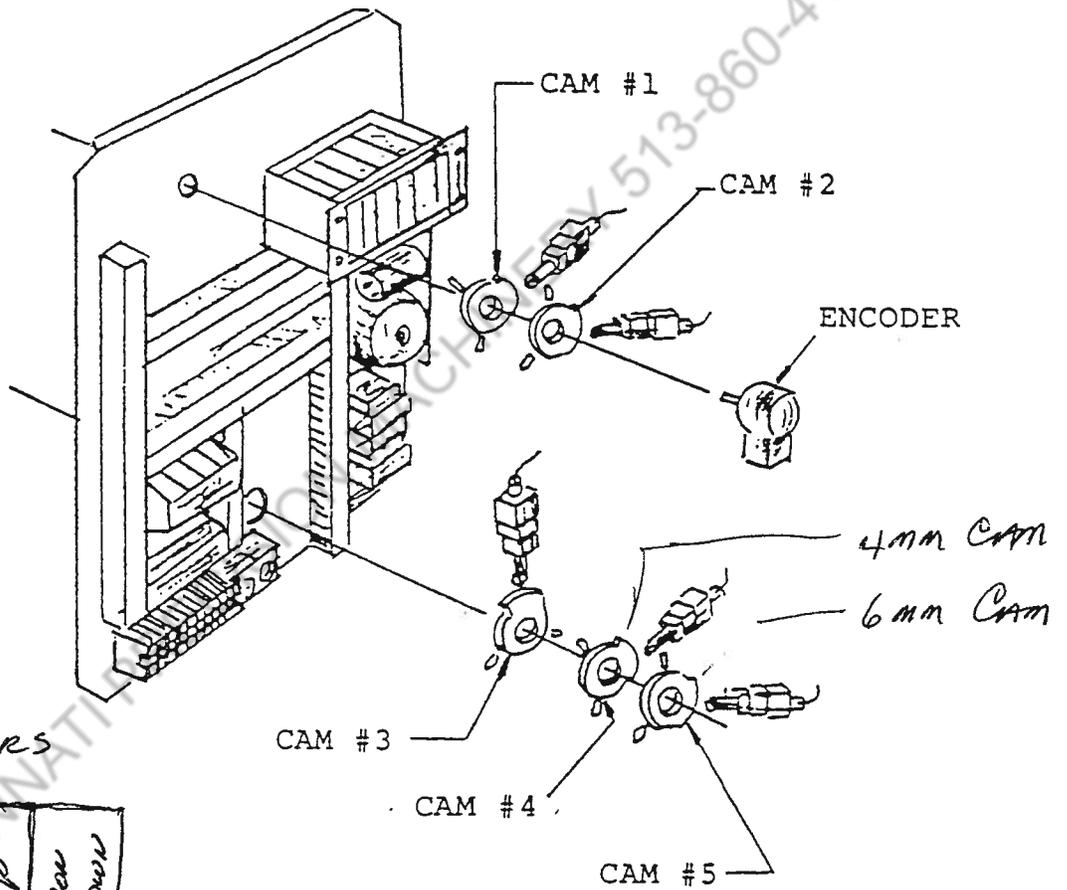
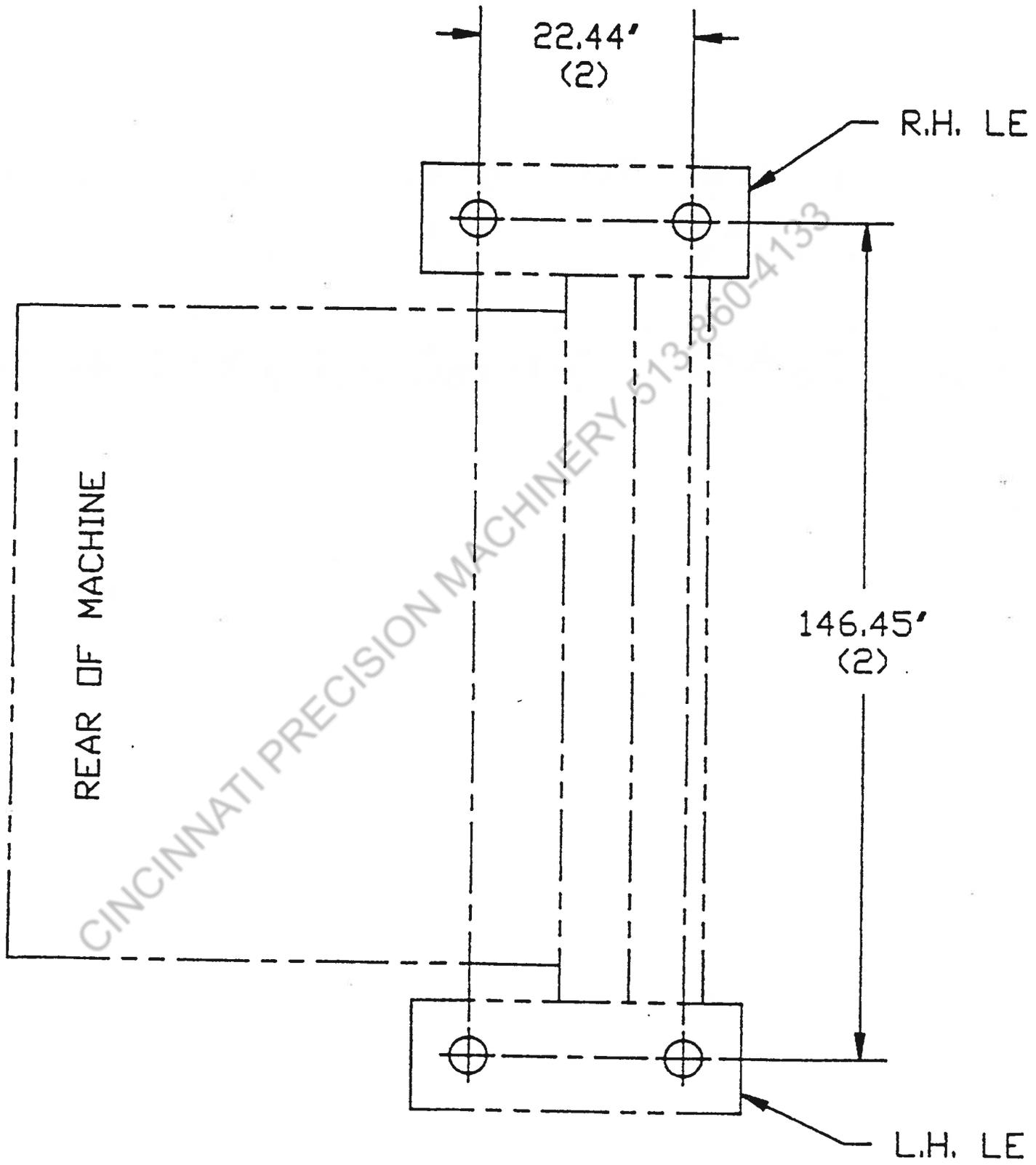


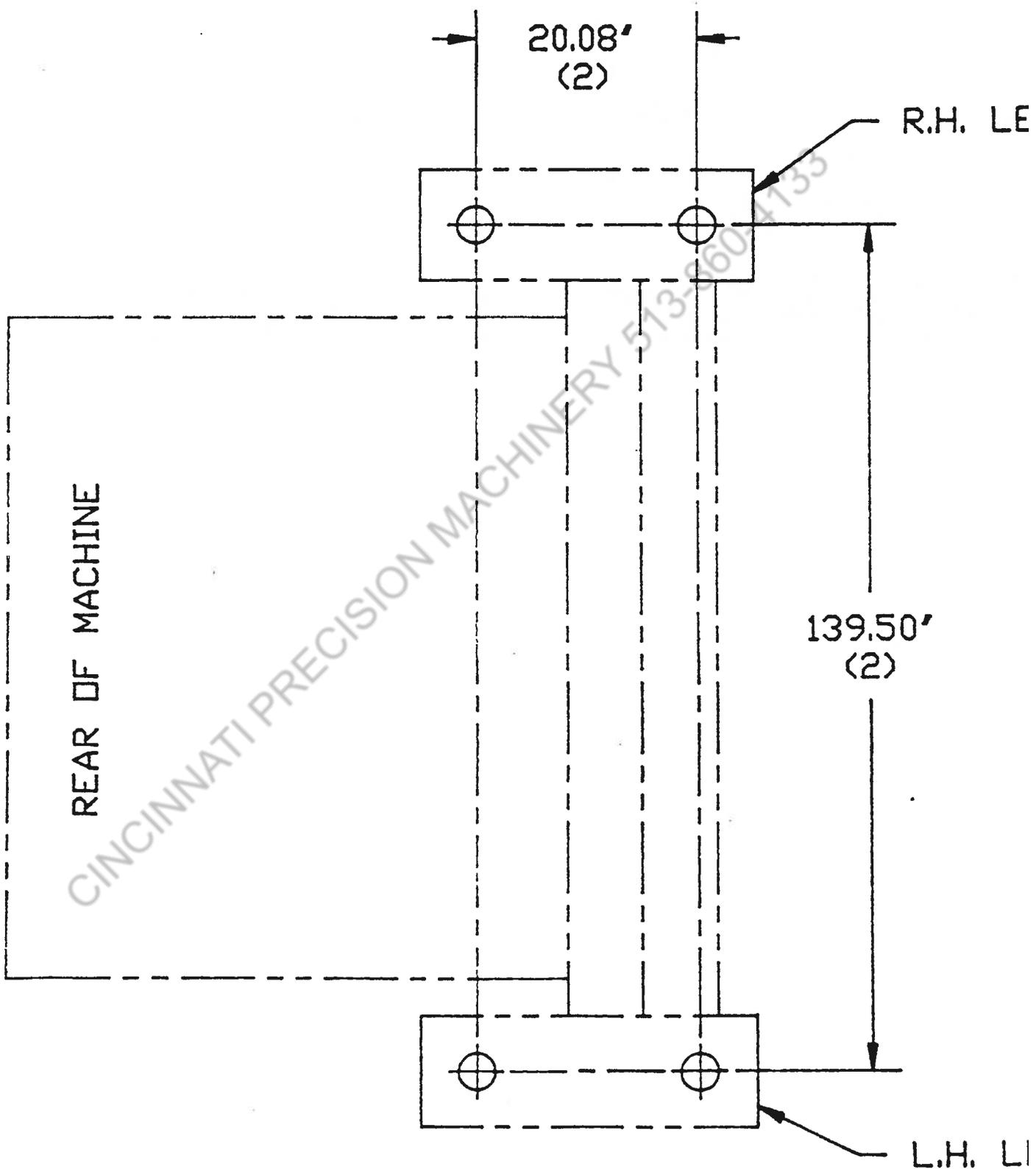
FIGURE 16: CAM LOCATIONS IN ENCLOSURE

Mounting Hole Location "FOOT PRINT"
FOR AB1014K - AB1014KR - AB1014R - AB1014



AB1014K SHOWN

MOUNTING HOLE LOCATION 'FOOT PRINT'
FOR AB1018K - AB1018KR - AB1018R - AB1018



AB1018K SHOWN

FILL WITH GROUT HERE

3/4-10 HEX NUT
W/ WASHER

*

6.0"
HOLE DEP

3/8 x 3/8 x 1/2
WELDED TO 3/4-10
THREADED ROD
MAX. 8.0" LG.

2.5" DIA.

SK 1.1

