

ROPER WHITNEY

AUTOBRAKE 2000

CNC SHEET METAL BENDING MACHINE



OPERATOR'S MANUAL

ROPER WHITNEY
OF ROCKFORD, INC.

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ABOUT THIS MANUAL

CONTENT

This manual contains the information necessary to operate the Roper Whitney Autobrake 2000 CNC Sheet Metal Bending Machine. Any and all questions regarding installation and major repair are not addressed in this manual and should only be performed using the proper information.

AUDIENCE

This manual is written for an experienced sheet metal operator who has previous knowledge of tooling, materials, work methods, and finished product inspection.

Experienced operators not familiar with this machine will be able to operate it using the information in this manual. Novice operators may be trained using this manual, however, additional instruction may be necessary.

It is strongly recommended that anyone using this machine read and understand all of the information presented in this manual.

INFORMATION USAGE

The setup and operating instructions in this manual are based on the intended application of the machine as defined by Roper Whitney. Use of the machine for other applications is not precluded, but use for purposes specifically excluded is not recommended, and may void the warranty provisions.

Material in this manual is confidential, and Roper Whitney reserves all rights in this regard.

ADDITIONAL ASSISTANCE

If you have any questions concerning usage or operating techniques not covered by this manual, or if you encounter maintenance or repair problems, Roper Whitney field service and product support personnel can provide you with assistance. Before calling, please have the following information available:

- * machine type
- * machine serial number
- * description of the application you wish to attempt
- * description of the problem you have encountered

Contact:

Roper Whitney of Rockford, Inc.
2833 Huffman Boulevard
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WARRANTY PROVISIONS

COVERAGE

All new Roper Whitney tools and machines are warranted, to the original purchaser for use, to be free of all defects in material and workmanship for a period of one year from the date of purchase. Roper Whitney, at its option, will repair, replace, or refund the purchase price of any tool or machine which fails within the warranty period, and is found upon examination by Roper Whitney, to be defective in material or workmanship, or both. This warranty does not cover failures attributed to improper use or maintenance, exceeding rated capacity, alteration, accident, or normal wear of moving parts. Accessories, controls, and components not manufactured by Roper Whitney Company are excluded from this warranty. For services on such parts, refer to the applicable manufacturers' warranties.

EXCLUSIONS

There is no other express warranty to the extent permitted by law. Any and all implied warranties, including merchantability and fitness for a particular purpose are excluded; and implied warranties not excluded are limited in duration to one year from date of purchase. Incidental and consequential damages are expressly excluded from the remedies available to purchaser, and the remedies provided in this warranty shall be exclusive to the extent permitted by law. (Note: Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages; so the foregoing limitations and exclusions may not apply. This warranty gives specific legal rights, and other rights may vary from state to state.)

WARRANTY CLAIMS

The purchaser must give written notice to Roper Whitney Company, at the address shown below, of any warranty claims, within thirty days after failure, and if so instructed, return to Roper Whitney Company the parts to be replaced or repaired, with all transportation charges prepaid by the purchaser. Replacement parts will be invoiced to purchaser, with credit issued for parts covered by this warranty, and freight thereon. Removal and reinstallation of replacement parts shall be at the purchaser's expense.

REGISTRATION

Return of the warranty registration card furnished with the product purchased is necessary to obtain warranty coverage thereon. The card must be fully completed, signed by the purchaser, and, if applicable, signed by the distributor. Return the card to:

Roper Whitney of Rockford, Inc.
2833 Huffman Boulevard
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ROPER WHITNEY

SAFETY MANUAL

FOR SHEET METAL FORMING EQUIPMENT



THIS MANUAL COVERS THE FOLLOWING MACHINES:

Autobrake 2000 Bending Machine

Automax Bending Machine

ROPER WHITNEY
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NOTES:

SAFETY PRECAUTIONS

WARNING

POTENTIAL FOR INJURY OR DEATH

Inattention to proper safety, operation, or maintenance procedures could result in personal injury, death, or damage to the equipment. Before using the machine, fully read and understand the safety precautions described in this section.

Although Roper Whitney sheet metal forming equipment is designed and equipped with numerous safety features, certain safety precautions must be observed while operating, programming, and maintaining the equipment. This section addresses some of these precautions but must not be considered an all-inclusive source on safety information. This section is to be used in conjunction with all other safety material which may apply, such as:

- * Other manuals pertaining to this machine
- * Local, plant, and shop safety rules and codes
- * Governmental safety laws and regulations

PERSONAL SAFETY

Be sure that you know and understand the operation of the equipment and the hazards associated with it. Do not place speed above safety.

Notify your supervisor whenever you feel there is any hazard involving the equipment or the performance of your job.

Never allow untrained or unauthorized personnel to service, operate, or conduct tests on the system.

Wear appropriate clothing. Loose or hanging clothing or jewelry can be hazardous. Use the appropriate safety equipment, such as eye and hearing protection, and, safety-toe and slip-proof shoes. If gloves are worn be sure they are tight fitting and not likely to be caught in moving parts of the equipment.

Never use compressed air to clean debris from yourself or your clothing.

Report all injuries or illnesses to your company's first aid or safety officer.

OPERATIONAL SAFETY

Visually inspect the system components before operating the equipment. Check for cracks, chips, burrs, overheating, and any other evidence of failure.

Make sure all safety guards, shields, barriers, covers, and protective devices are in place, connected, and functional before operating the system.

Observe and follow safety instructions for your work area, paying special attention to posted warnings and warning labels on the equipment. Never alter or deface any warning or instruction signs on the machine.

Avoid any pinch-points created by the movement of the machine's components.

Never override the safety features or attempt to slow down any moving components of the equipment.

If any unusual noises or vibrations occur during machine operation, check the machine condition immediately. Do not attempt to operate the equipment until the problem has been found and corrected.

Always shut the power off to the system before cleaning or servicing the machine. Debris should be removed from the machine with a rake or brush - never with your hands.

Use only approved cleaning materials: do not use explosive or flammable liquids to clean the machine. Discard used cleaning material in the appropriate containers.

Do not operate the machine beyond its rated capacity.

TOOL SAFETY

Use the proper tools and equipment for the task.

Inspect each tool before use and replace any tool that may be damaged or defective.

Remove all hand tools such as wrenches, hammers, and diagnostic equipment from the machine immediately after they have been used.

WORK AREA SAFETY

Keep the work area neat and orderly. Be sure it is well lit, that extra tools are put away, trash and refuse are in the proper containers, and dirt or debris have been removed from the working areas of the machine.

The floor should be clean and dry, and all extension cords or similar trip hazards should be removed.

ROPER WHITNEY

THE BENDING PROCESS

FOR SHEET METAL FORMING EQUIPMENT



THIS MANUAL COVERS THE FOLLOWING MACHINES:

Autobrake 2000 Bending Machine

Automax Bending Machine

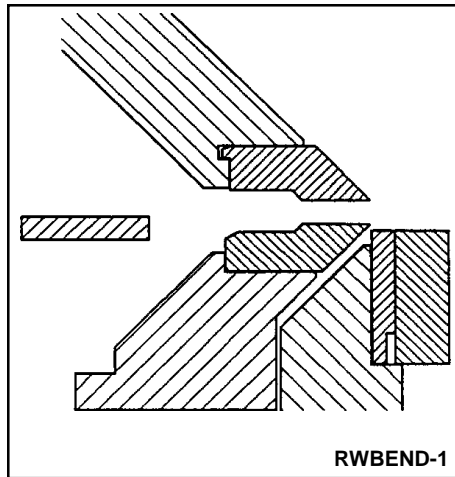
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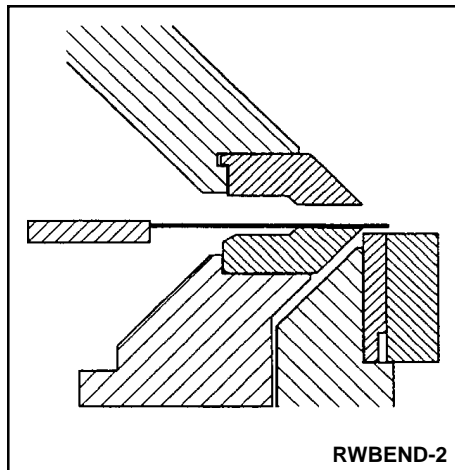
NOTES:

THE BENDING PROCESS

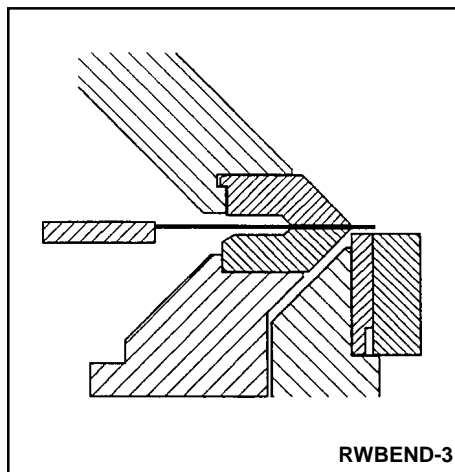
On Roper Whitney equipment, bending takes place as follows:



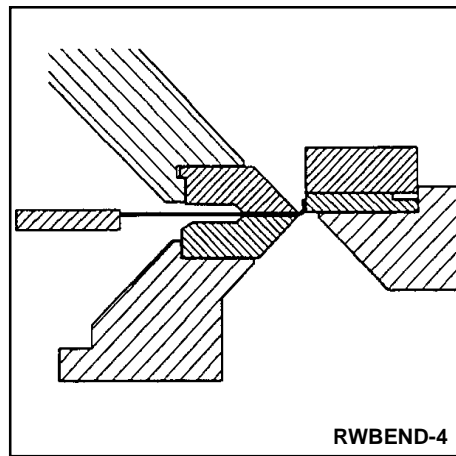
1. The backgauge moves to the programmed position.



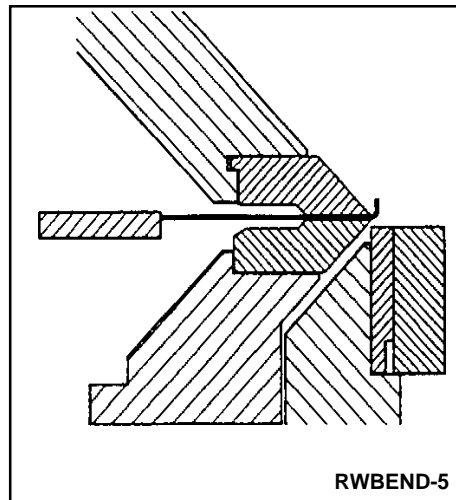
2. The operator positions the workpiece against the backgauge fingers (stops).



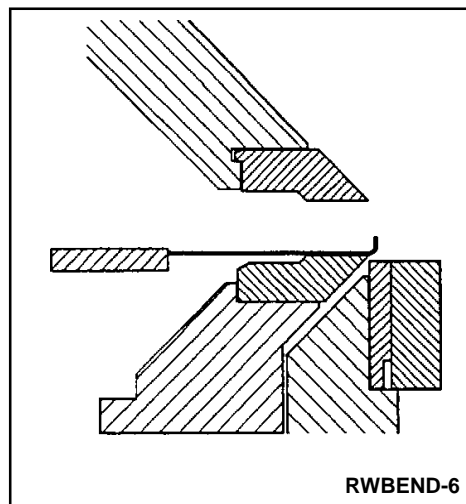
3. The upper beam moves down and clamps the workpiece.



4. The bending beam rotates to the specified angle.



5. The bending beam returns to its home position.



6. The upper beam unclamps, releasing the workpiece.

7. The process repeats for each step required to complete the part.

ROPER WHITNEY
AB1014 & AB1014K
AUTOBRAKE 2000
W/ ORION CONTROL
CNC SHEET METAL BENDING MACHINE



MACHINE DESCRIPTION

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SECTION 1

GENERAL DESCRIPTION

The Autobrake 2000 is a mechanically powered CNC controlled bending and folding machine designed to handle light gauge mild steels. The machine's metal folding system is based on two concepts. First is sequential bending process production: the ability to form complete parts without having to remove the workpiece from the machine. Second is automated operation: every key function is CNC controlled and motor-driven, providing efficiency, precision, and reduced labor effort.



Figure 1-1: The Autobrake 2000

SECTION 2

SPECIFICATIONS

STANDARD BENDING CAPACITIES

The following specifications are applicable to the RW Autobrake 2000 AB1014 when bending 14 gauge mild steel. If the specifications listed below vary from those appearing in the electrical or mechanical prints provided with the machine, the print specifications supersede this manual.

Table 2-1: Specifications

Working Capacities	
Maximum Working Length	122.0 in. (3100 mm)
Bending Angle Range	3° - 145°
Bending Accuracy	± 1°
Maximum Jaw Opening	5.3 in. (135 mm)
Folding Beam Adjustment	2.0 in. (50 mm)
Backgauge Specifications	
Positioning Range	0 - 61 in. (0 - 1550 mm)
Positioning Accuracy	± 0.004 in. (± .1 mm)
Maximum Sheet Weight	200 lbs. (91 kg)
Electrical Data	
Voltage	230 VAC, 3-Phase, 60 Hz.
Current	7 Amps
Bending Motor HP	2.0
Clamping Motor HP	2.0
Kombi Beam HP75

DERATED BENDING CAPACITIES

The bending capacities provided in Table 2-1 are based on the use of the standard 0.79 in. (20 mm) bending blade. Two bending blades are available on the machine. When the thinner bending blade is used, bending capacity must be derated, as shown in Table 2-2.

Table 2-2: Derating Ranges

Blade Thickness	Factor	Gauge
0.39 in. (10 mm)	50%, Approx. 6 Gauge Sizes	20 (Mild Steel)
0.28 in (7 mm)	35%, Approx. 10 Gauge Sizes	24 (Mild Steel)

SECTION 3

MAJOR COMPONENTS

MACHINE LEGS The legs serve as the main support for the other machine units. The fixed beam is mounted between the legs. The legs are equipped with guides in which the upper beam is mounted and moves. The electrical cabinet and pendant control are mounted on the right-hand leg.

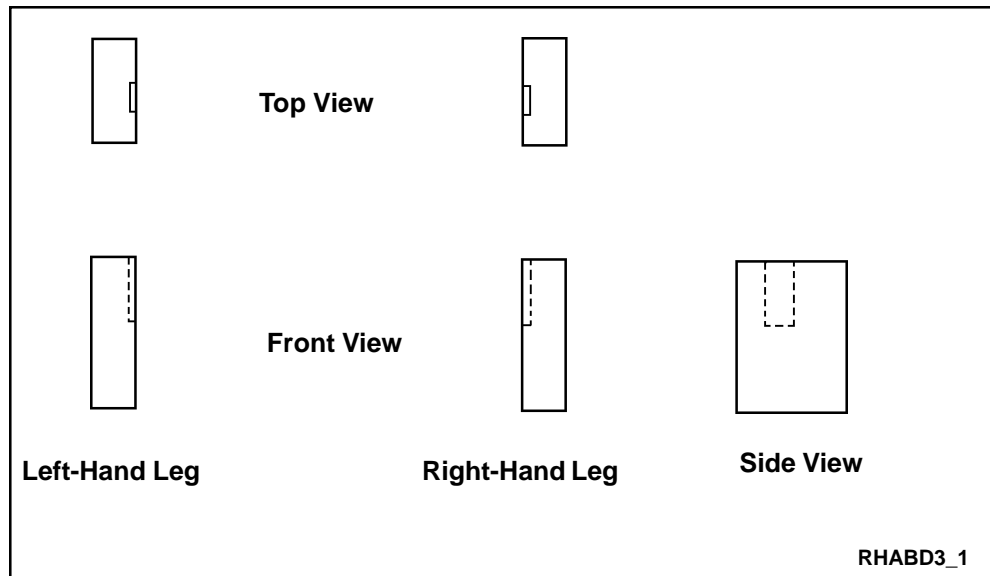


Figure 3-1: The Machine Legs

FIXED BEAM The fixed beam (also called the stationary beam, lower beam, or bed), is bolted and pinned between the legs. It serves as the fixed, lower half of the material clamping system. The beam is equipped with a hardened and ground brake die-steel jaw. The fixed beam also serves as the front support for the backgauge.

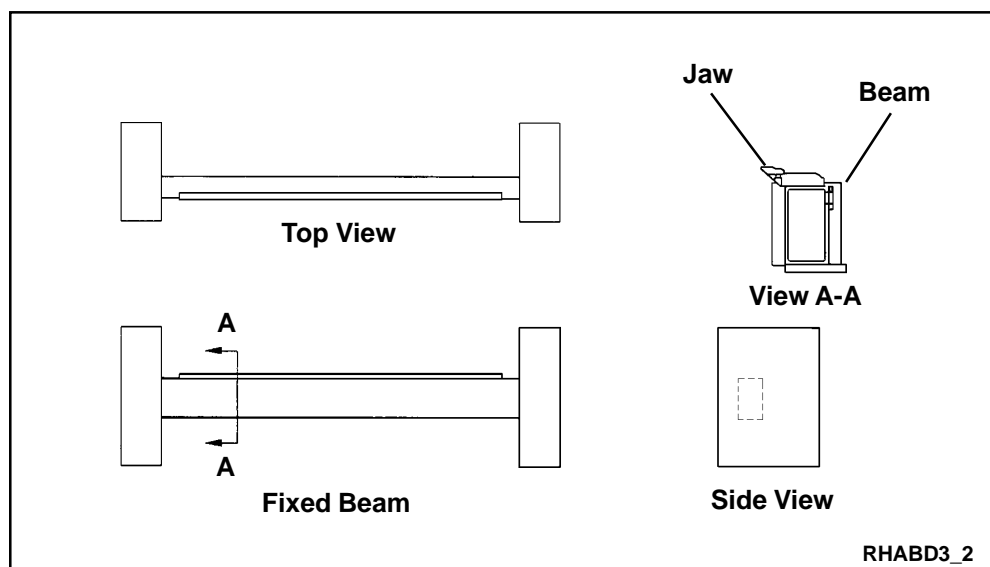


Figure 3-2: The Fixed Beam

UPPER BEAM

The upper beam (also called the clamping beam, or Kombi beam), is mounted within the leg guides. It moves up and down and is the moving, upper half of the material clamping system. The upper beam is equipped with a 2-position rotating mechanism on which the bending tools are mounted. One side of the rotating mechanism is equipped with the standard hardened and ground brake die steel jaw. The other side contains a tool rack on which can be mounted an unlimited array of specialty tools. Various combinations of these tools provide the flexibility to bend pans, panels, boxes, and many other similarly shaped workpieces.

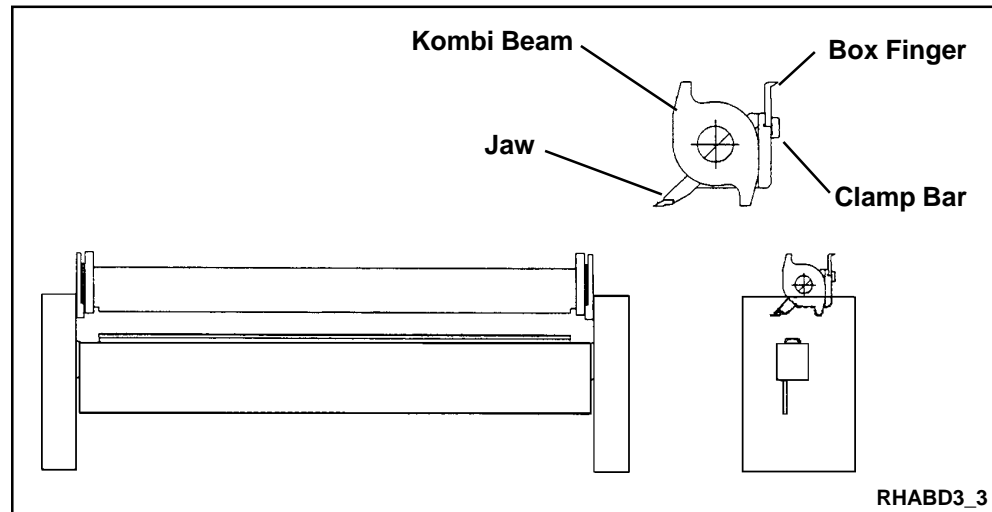


Figure 3-3: The Fixed Beam

BENDING BEAM

The bending beam (also called the folding beam or the apron), is mounted between the pivoting arms at the front of the fixed beam. It rotates around the fixed beam jaw to bend the workpiece to the programmed angle. The beam can be equipped with three different ground, die-steel blades. These blades provide three different blade widths, which allow close-in bending on reverse flanges.

When equipped with the large blade, the machine can bend 100% of its rated capacity, 14-gauge mild steel. When equipped with the intermediate-thickness blade, the machine can bend 50% of its rated capacity, 20-gauge mild steel. When equipped with the thinnest blade, the machine can bend 35% of its rated capacity, 24-gauge mild steel.

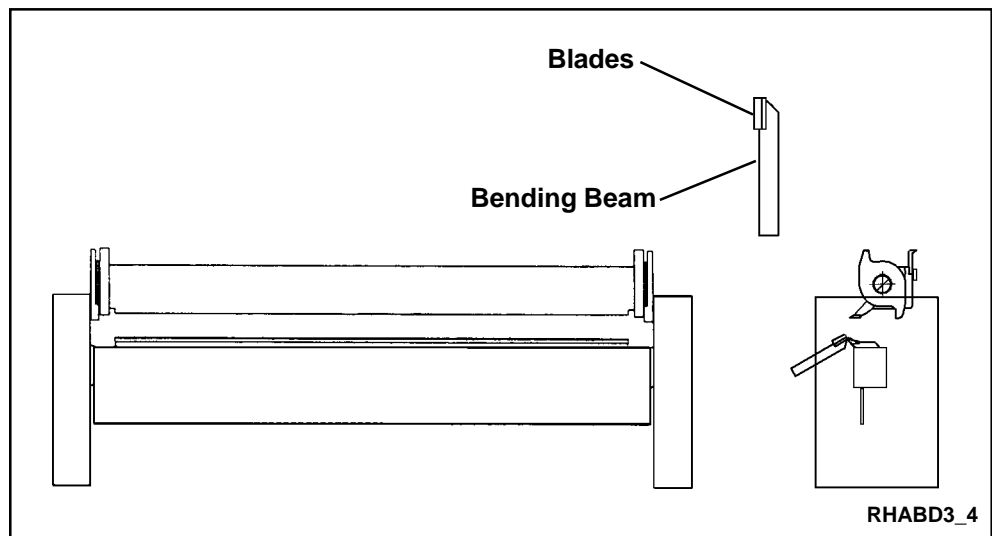


Figure 3-4: The Bending Beam

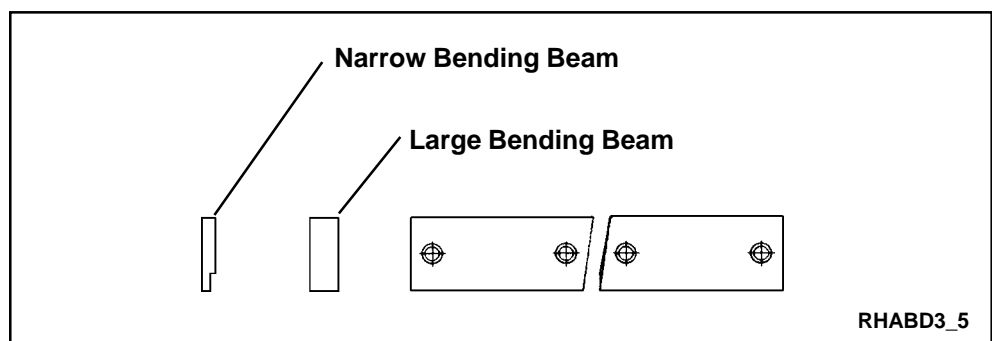


Figure 3-5: Bending Beam Blades

BACKGAUGE

The backgauge is mounted on the back of the fixed beam. It positions the depth of the workpiece within the machine during processing. The backgauge consists of three sets of gauging fingers (stops) assembled on a common carriage. The carriage is moved by a CNC controlled servo motor and ballscrew.

Each of the gauging finger sets includes one fixed stop and two 'disappearing' fingers. The finger sets have 700 mm (27.5 in) of travel. Use of the appropriate finger or the fixed stop permits the workpiece to be positioned anywhere within the machine, up to 1550 mm (61 in) deep.

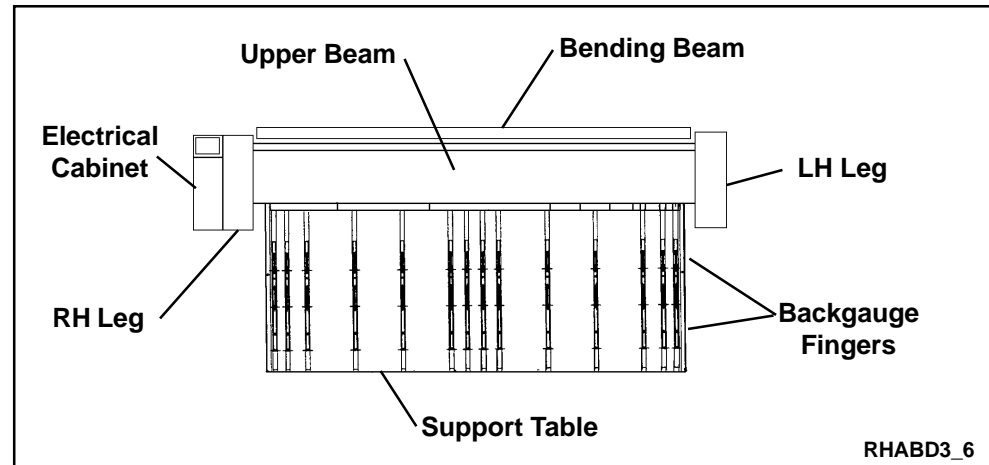


Figure 3-6: Top View of the Backgauge

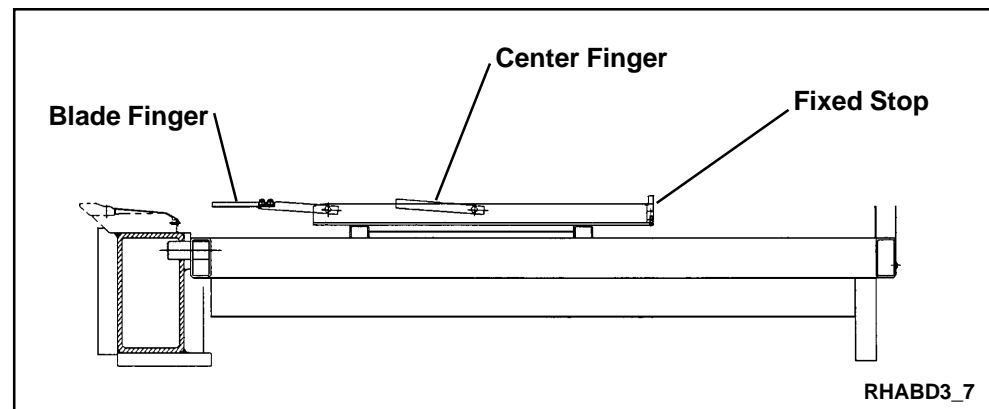


Figure 3-7: Side View of a Backgauge Finger Set

ELECTRICAL CABINET

The electrical cabinet is mounted on the right-hand end of the machine, on the outside of the right-hand leg. It contains the electrical and electronic components controlling all machine operations. A cooling fan provides air flow to the components within the cabinet.

WARNING

HIGH VOLTAGE

Lethal voltages exist within the electrical cabinet, even when the AC power disconnect/lockout is in the OFF position. Observe all suitable safety precautions when working in the electrical cabinet.

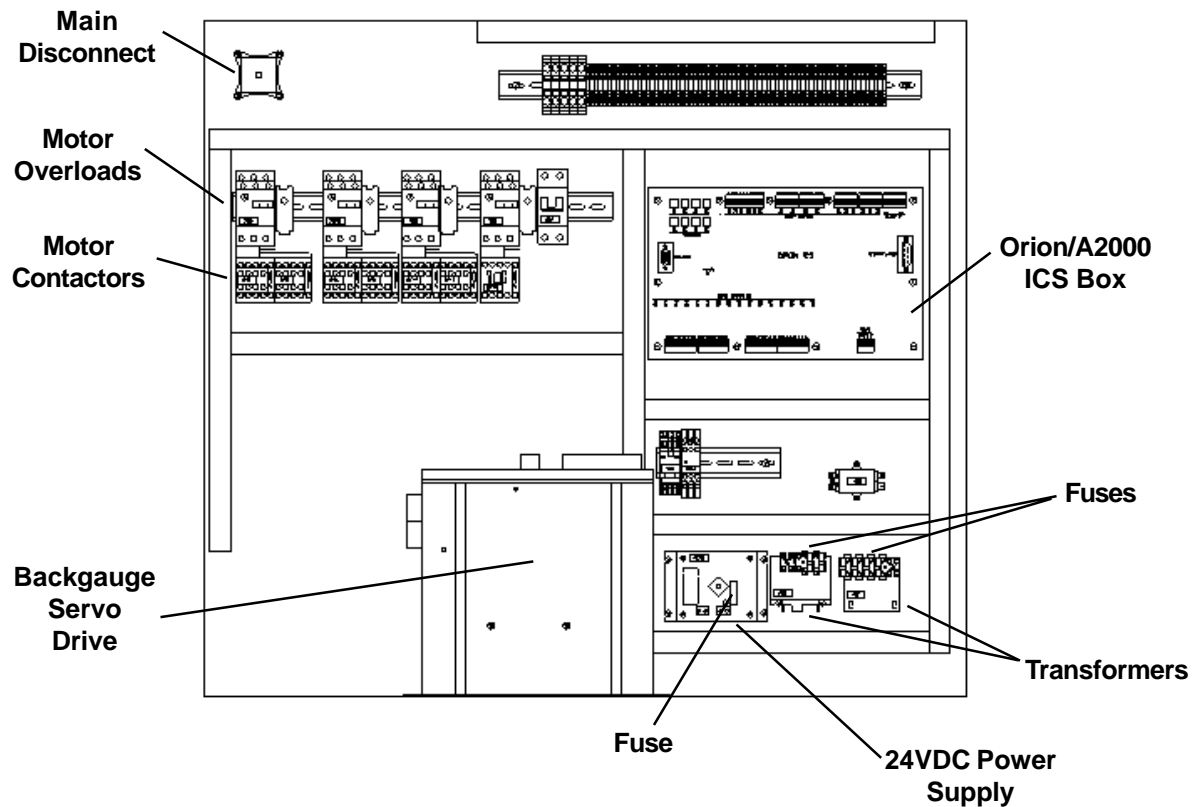


Figure 3-8: The Electrical Cabinet

OPERATOR CONTROLS

Most operator controls are located on a movable pendant at the right-hand end of the machine.

Basic machine controls are located on the pendant, while certain safety controls are located in strategic spots elsewhere on the machine. Function initiation is achieved through a foot pedal on the floor in front of the machine. An explanation of these controls is contained in Section 4, Basic Controls.

CNC control and communication is obtained through a flat screen monitor mounted on the pendant. A complete explanation of the CNC control system is found in the document located behind Tab 4 of this manual.

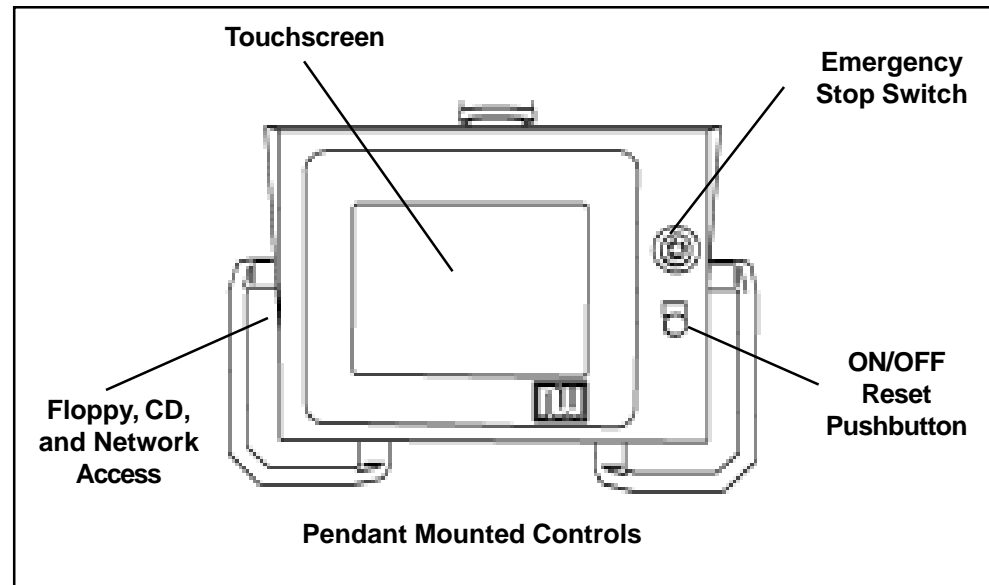


Figure 3-9: The Operator Controls

SECTION 4

BASIC CONTROLS

The basic machine controls include the main On/Off switch, the emergency stop controls, and a machine actuation foot pedal.

WARNING

HIGH VOLTAGE

Lethal voltages exist within the electrical cabinet even when the main power switch is in the OFF position and/or the Emergency Stop is in the ON position.

Observe all appropriate safety precautions when working in the electrical cabinet.

To remove all power from the electrical cabinet, use the main disconnect device supplied by your company.

MAIN SWITCH

The Main Switch is a 2-position rotary selector switch used as an AC power disconnect and lockout. It is located on the electrical cabinet, and is usually found on the face of the cabinet door.

In the OFF position, the Main Switch removes 3-phase AC power from the machine. In the OFF position, cutouts in the outer and inner ring align so that a lock may be installed to prevent the application of system power.

In the ON position, the Main Switch applies 3-phase AC power to the machine. The lockout feature on the switch prevents the electrical cabinet from being opened.

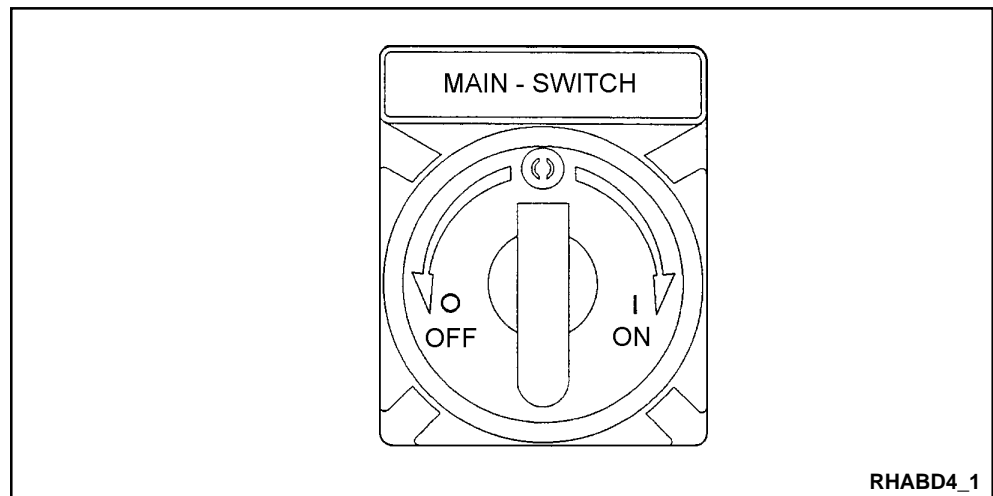


Figure 4-1: The Main Power Switch

EMERGENCY STOP SYSTEM

The Emergency Stop System consists of an Emergency Stop Button which is a 2-position pushbutton located on the operator's control panel. The machine is operated with the Emergency Stop Button in the OFF, or extended, position. When the Emergency Stop Button is in the ON, or depressed, position, all system functions are disabled, and the machine will not function.

WARNING

KNOW AND UNDERSTAND THE EMERGENCY SHUTDOWN PROCEDURE

Be sure to read and understand operation of the emergency shutdown procedure presented in Section 5, Machine Operation.

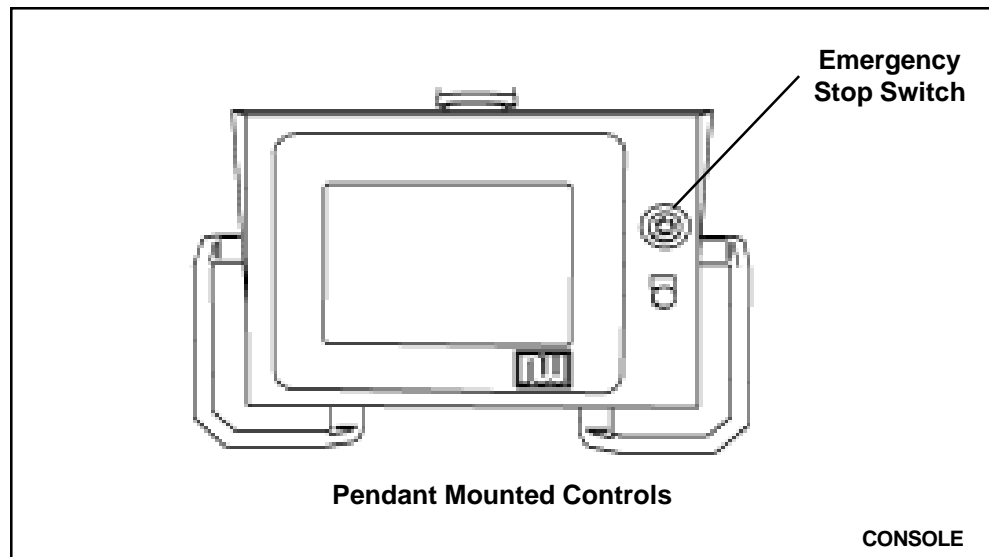


Figure 4-2: Location of the Emergency Stop Buttons

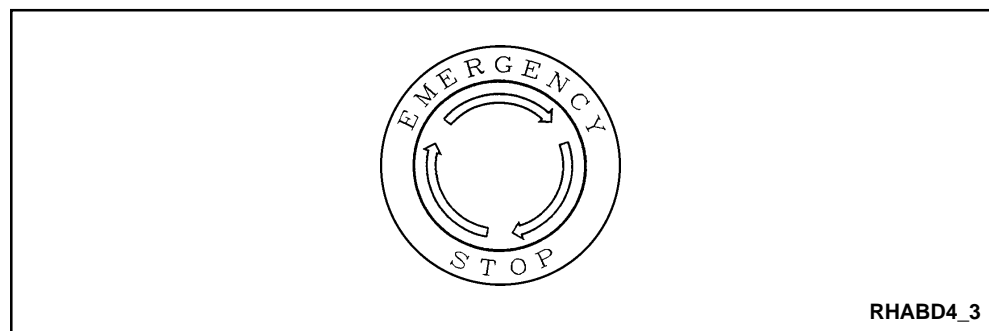


Figure 4-3: The Emergency Stop Button

FOOT PEDAL

The foot pedal is located on the floor in front of the machine. It is attached to the machine with an electrical cable which permits it to be placed anywhere along the front of the machine. For manual operation, it is placed in a convenient location near the right end of the machine so that the operator can control machine functions and use the CNC controls at the same time.

WARNING

SINGLE PERSON OPERATION ONLY

Because there is no auxiliary foot pedal with this machine, there are no safety provisions for a second operator. Do not use a second operator as a helper.

The foot pedal is a 3-station, foot-operated switch which controls all clamping, unclamping, bending, and tool rotation functions.

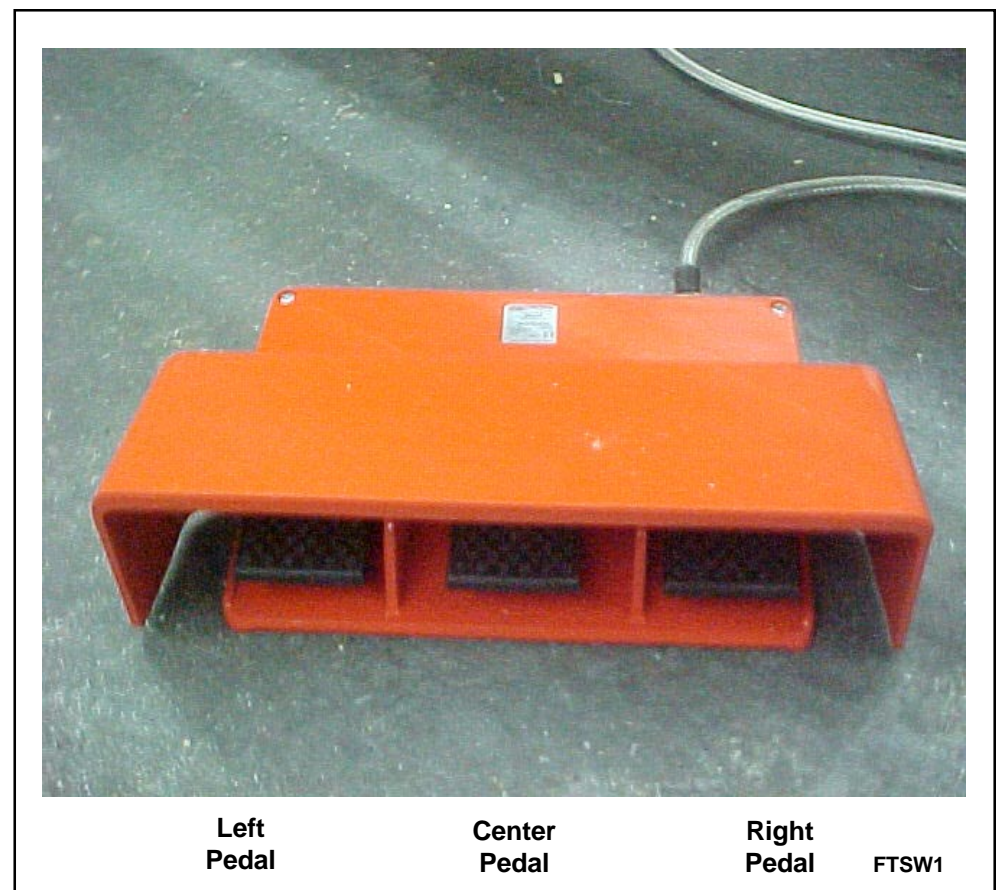


Figure 4-4: The 3-Station Foot pedal

SECTION 5

MACHINE OPERATION

EMERGENCY STOP SYSTEM ACTIVATION

Press the Emergency Stop Button on the operator's console by hand.

All machine motions are immediately halted and disabled. All AC power is removed from all motors and from the CNC control system. All operator controls are disabled.

The Emergency Stop Button will be physically latched in its depressed, (activated) position.

RESETTING THE EMERGENCY STOP SYSTEM

Remedy the condition(s) leading to the emergency stop.

Twist the Emergency Stop Button clockwise.

This unlatches the button and it will pop outward.

Push the ON/OFF Reset Button.

AC power will be restored to the CNC control system and all machine motors. All operator controls will be enabled.

CLAMPING FUNCTIONS

Pulling the upper (Kombi) beam downward against the fixed beam clamps the workpiece in between. An AC motor rotates the clamping drive shaft through a geared transmission. As the shaft rotates, it pulls the upper beam down through a series of links. Shock absorbing springs in the clamping mechanism prevent damage to the moving components.

The force applied during clamping is set through the CNC control system. This enables the machine to bend materials without marring the surface of polished, coated, painted, or other finished materials.

The gauge of the material to be bent is specified through the CNC control system. The upper limit of beam travel is also set through the CNC control system. During operation, the vertical position of the upper beam is monitored indirectly by rotary cams mounted on the end of the clamping drive shaft.

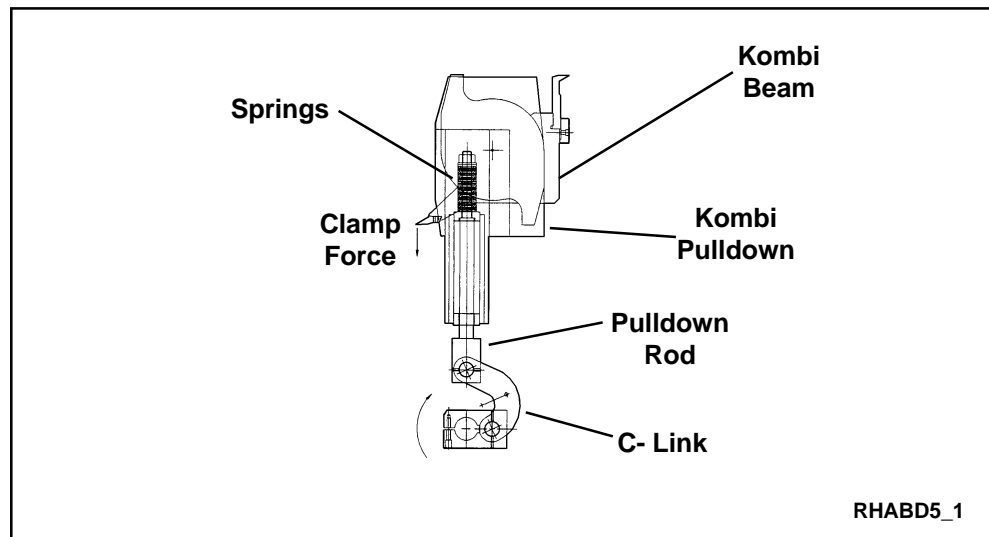


Figure 5-1: The Clamping Mechanism

CLAMPING

The operator initiates clamping by continuously pressing the left foot switch pedal. The upper beam moves downward to clamp the workpiece.

If the upper beam was higher than 6 mm (0.23 inch) above the fixed beam (for instance, at the beginning of a cycle), it moves downward to a preset safety stop at 6 mm, and then stops. The operator completes the clamping operation by releasing and then continuously pressing the left pedal again.

Downward motion of the upper beam ceases if the left pedal is released or when the clamping pressure setting is reached.

UNCLAMPING

In automatic mode, after each bend operation, the upper beam automatically opens to a user programmed height to allow positioning of the material for the next bend in the cycle.

At the end of the cycle, the upper beam is raised by continuously pressing the right pedal of the foot-switch. Upward motion of the upper beam ceases if the right pedal is released, or when the upper limit is reached.

BENDING FUNCTION

During the bending operation, the bending beam rotates upward around the point where the fixed beam, the upper beam, and the bending beam meet. An AC motor drives the bending beam through chain and sprocket drive mechanisms located on either end of the machine. Chain tensioners keep the drive chains taut to assure smooth, accurate, and backlash-free operation.

In the automatic mode of operation, the bend angle is controlled by the preset value in the CNC control system.

Beam position is sensed by an encoder and rotary cams mounted on the bending beam drive shaft. Overload sensing halts the bending sequence if excessive bending loads are detected.

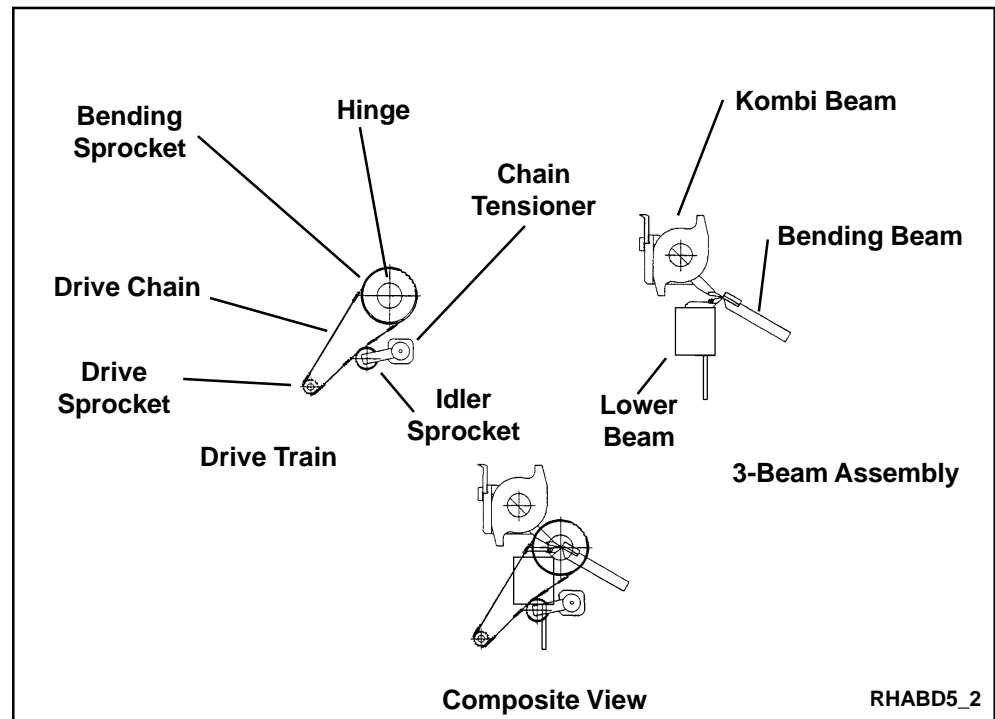


Figure 5-2: The Bending Mechanism

AUTOMATIC MODE BENDING

For safety reasons, the CNC control system will not automatically initiate the bend cycle after clamping. It must be initiated with the foot switch.

The operator initiates the bending cycle by momentarily pressing the center pedal of the foot switch. The bending beam rotates upward to the programmed bend angle, and then returns to the home position.

MANUAL MODE BENDING

In the manual or jog mode, the operator presses the center pedal continuously, and releases it when the desired bend angle is reached. When the center pedal is released, upward rotation ceases. The user presses and holds the right pedal to return the apron to its down (home) position.

BACKGAUGE FUNCTIONS

The backgauge provides stops which control the workpiece depth within the machine, and thereby establish the point at which the material is bent.

The backgauge is moved forward and back on its linear ways by a ballnut and ballscrew mechanism driven by a servo motor. Backgauge positioning is controlled directly by the CNC control system, in response to values programmed into the machine by the operator.

Each backgauge finger contains three stops. The rearmost stop is fixed, at the rearward end of the backgauge finger. Two intermediate stops are raised and lowered by solenoids as the need arises. The CNC control system automatically selects the correct stop and positions the backgauge to obtain the depth desired. As the bending operation cycles through sequential steps, the CNC control system repositions the backgauge for each step.

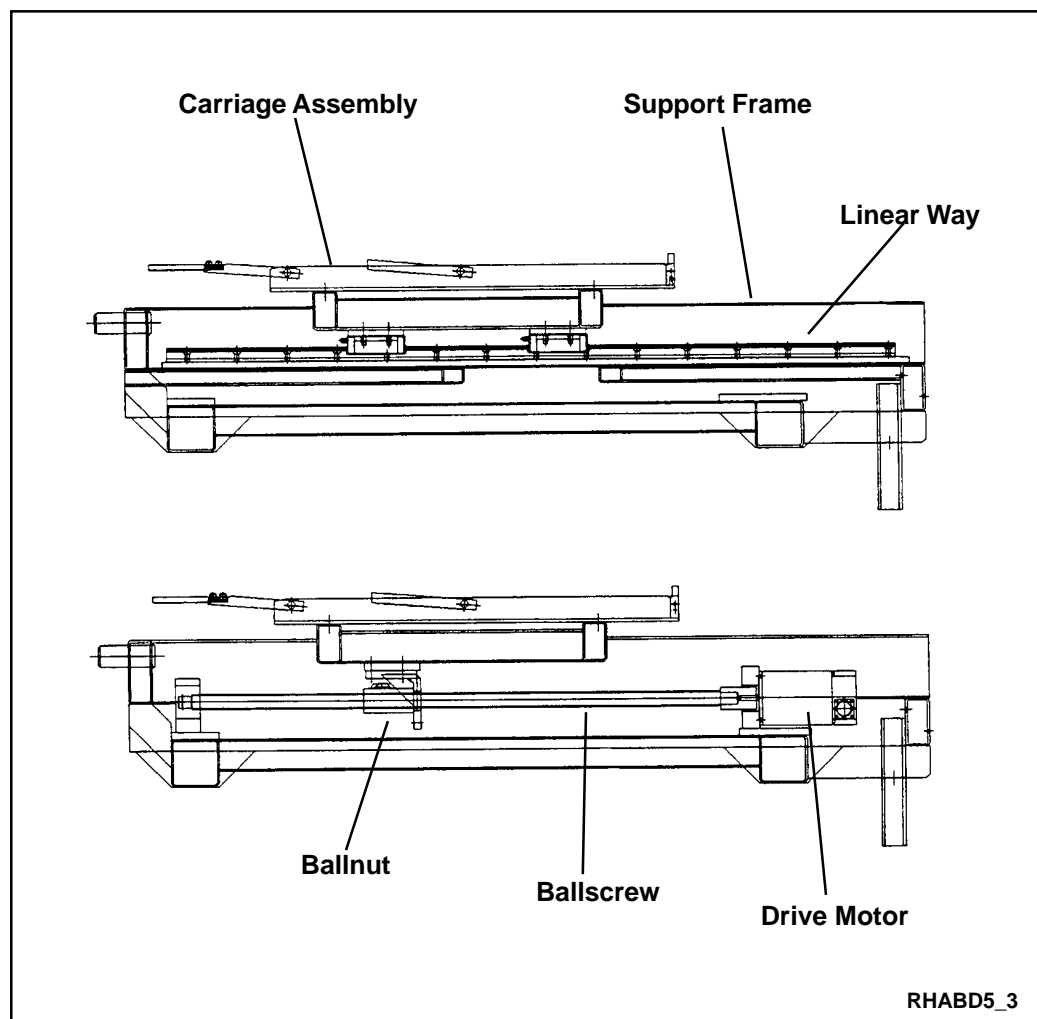


Figure 5-3: The Backgauge Mechanism

TOOL ROTATION FUNCTIONS

The upper (Kombi) beam rotates forward or backward between the standard brake jaw position and the specialty tool position. Fixed stops assure repeat positioning after each rotation. The beam is automatically locked in place against the fixed stops by hydraulic nuts on either end of the beam. Proximity switches indicate which tooling position is current.

An AC motor drives the beam through its rotation through a chain drive transmission. A torque limiting slip clutch on the motor output shaft protects the assembly from damage at the end of the rotation.

AUTOMATIC OPERATION

During automatic operation, the CNC control system will initiate a user programmed tool change by raising the upper beam to it's maximum height position. As a safety precaution, the operator must depress the left-hand foot pedal on the foot-switch to activate rotation. This pedal must remain depressed through its entire travel.

Note: Operator may stop movement at any time, to change box tooling position, for example, by removing their foot from the left pedal.

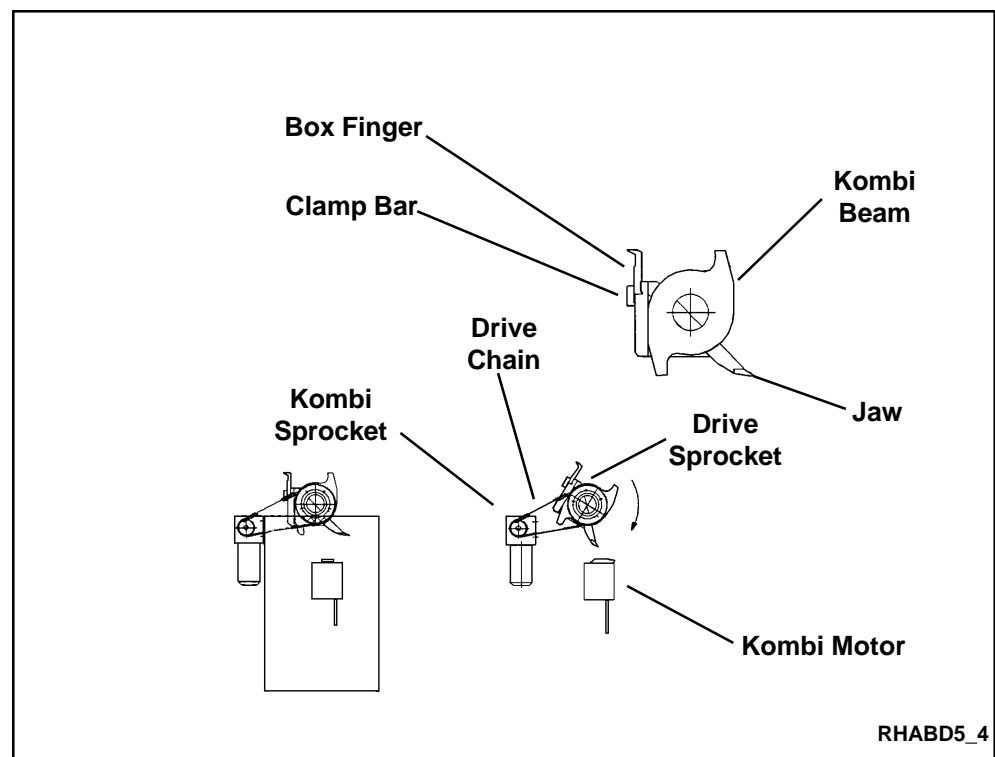


Figure 5-4: Upper Beam Tool Rotation

CHANGING SPECIALTY TOOLING

To change the specialty tooling, use the following procedure:

1. Raise the upper beam to the top of its travel.
2. If necessary rotate the upper beam so that the specialty tooling is in the ready-to-clamp position at the front of the machine.
3. Remove the clamp bar from the upper beam.
4. Remove the previously installed tooling from the upper beam.
5. Install the proper new tooling on the upper beam.
6. Replace the clamp bar on the upper beam. Secure with the screws previously removed. Be sure the screws are tightened securely.

CHANGING BOX TOOLING

To change the box tooling, use the following procedure:

1. Raise the upper beam to the top of its travel.
2. If necessary rotate the upper beam so that the box tooling is in position at the front of the machine.
3. Loosen any necessary clamp bars from the upper beam.
4. Rearrange as necessary the box tooling from the upper beam.
5. Retighten the clamp bars on the upper beam.

ROPER WHITNEY

AUTOBRAKE 2000

CNC SHEET METAL BENDING MACHINE



PREVENTIVE MAINTENANCE

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PREVENTIVE MAINTENANCE

The Autobrake Series machines require a minimum of preventive maintenance. The basic principals of preventative maintenance are: machine cleaning and lubricating. Preventive maintenance consists of clamping gears, gibs, and linear guides and drives clean and lubricated.

NOTE

Failure to accomplish the preventative maintenance tasks may result in machine damage, premature wear, and termination of warranty.

RECOMMENDED LUBRICANTS

Under the warranty policy, oils and lubricants used in the machine must be those specified or be an equivalent in performance specifications. If you are using an equivalent, you and your lubricant supplier are responsible for choosing an equivalent that will give the same performance characteristics as the recommended oils and lubricants. Recommended lubricants are provided in Table 1-1.

Table 1-1. Recommended Lubricants

Lubrication Points	Recommended Lubricants
Oil Fittings	White Lithium Grease
Machine Jaws & Blades	White Lithium Grease
Clamping Beam Drive	Mobil #375
Bending Beam Drive	Multi Purpose Grease
Backgauge Ways	White Lithium Grease
Backgauge Ball Screws	White Lithium Grease

LOCATION OF LUBRICATION POINTS

The location of lubrication points on the machine is provided in Figure 1-1.

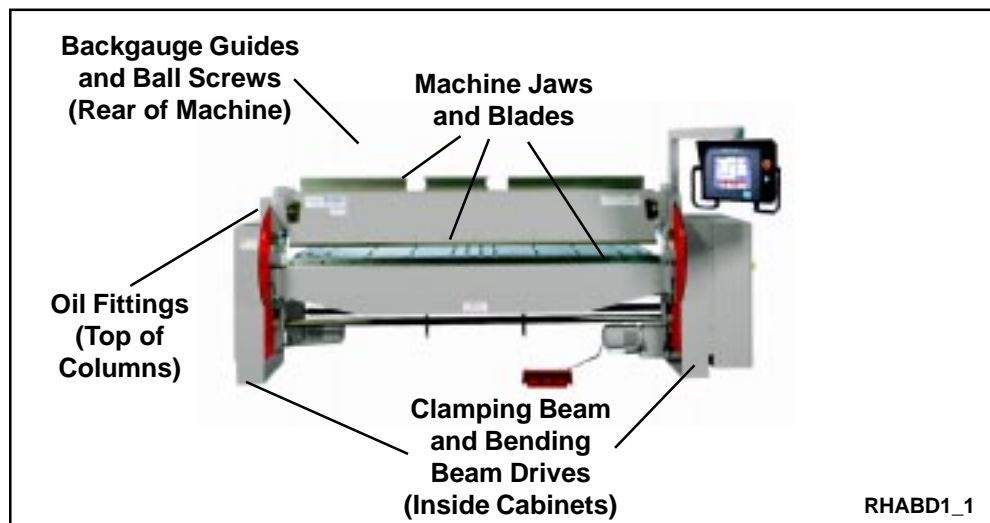


Figure 1-1: The Autobrake 2000 Lubrication Points

DAILY MAINTENANCE

The following task(s) should be carried out daily or every 8 hours of operation.

1. Verify that safety guards, shields, barriers, covers, and protective devices are in place, connected, and functional.
2. Clean and inspect the jaws and blades.
3. Raise the upper beam to its full up position. Press the Emergency Stop Button and turn the Main Switch off.
4. Clean the fixed beam jaw, upper beam jaw, and bending beam blade with a light weight, non-deterggent automotive oil or WD-30
5. Inspect the jaws and blades for nicks and scratches. Use a fine knife sharpening stone to remove any burrs or high spots caused by nicks and scratches.

CAUTION

Do not use powered 'grinding' tools to remove burrs from the beams and/or blades.

6. Lubricate the jaws and blades .
7. Check gib for signs of abnormal wear and/or damage (scratches, pits, etc.).
8. Wipe the gibs clean and relubricate.

MONTHLY MAINTENANCE

The following task(s) should be carried out monthly or once every 160 hours of operation at a minimum.

1. Clean the cooling fan filter(s), using a grease cutting soapy solution. Extract excess liquid from the filter(s) before reinstalling.
2. Raise the upper beam to its full up position. Press the Emergency Stop Button and turn the Main Switch off.
3. Remove all the backgauge support panels.

NOTE

The backgauge carriage assembly can be manually moved (push or pull) so that all areas of the linear ways and ballscrew can be cleaned and lubricated.

4. Wipe away dirt and 'old' lubricant from the linear ways and the ballscrew.
5. Lubricate the linear guides and ballnut with approved ballscrew and linear guide grease.
6. Check and tighten the bolts in the bending beam's blade and upper beam's jaw.

QUARTERLY MAINTENANCE

The following task(s) should be carried out every three months or once every 500 hours of operation at a minimum.

1. Raise the upper beam to its full up position.
2. Generously grease the clamping beam gears. On later models, the electrical cabinet is hinged to provide access to the righthand leg. On earlier models, a lubrication point is provided on the right rear leg.
3. Lower the upper beam in approximately 2-inch increments and apply additional grease until the upper beam has clamped.
4. Repeat the procedure while raising the upper beam to its full up position.
5. Press the Emergency Stop Button and turn the Main Switch off.
6. Remove excess grease which may accumulate under the upper beam's drive gears. The electrical cabinet is hinged to permit access to the gears.
7. If applicable, rotate the Kombi beam to the standard tool.
8. Reset the emergency Stop and turn the Main Switch on.
9. Lower the upper beam to its 6 mm (0.25") safety stop.
10. Press the Emergency Stop Button and turn the Main Switch off.
11. Check for a minimum of 0,5 mm (0.002") clearance between the upper beam's gib and the leg's guide. Check both legs at the front.

NOTE

Less than 0,5 mm (0.002") clearance is unacceptable. Insufficient clearance would indicate a machine alignment problem(s) such as Kombi Beam tooling stop misalignment or legs out of level.

12. Check and tighten the machine holddown bolts (2 in each leg).
13. Reset the emergency Stop and turn the Main Switch on.
14. Raise the upper beam to its full up position.
15. Press the Emergency Stop Button and turn the Main Switch off.
16. Check and tighten the bolts in the fixed beam jaw.

SEMI-ANNUAL MAINTENANCE

The following task(s) should be carried out every six months or once every 1,000 hours of operation at a minimum.

1. Press the Emergency Stop Button and turn the Main Switch off.
2. Lubricate the bending beam's chain drive. Access to the lefthand chain is provided by removing the large cover from the outside of the lefthand leg. The electrical cabinet is hinged to provide access to the righthand chain.
3. Check the backgauge cables and wiring, particularly the coil cord, for signs of wear.

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