



OPERATOR'S MANUAL



HYDRAULIC PRESS BRAKE MODEL: BP-9078CNC

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Book 1 of 2

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THANK YOU & WARRANTY

Thank you for your purchase of a machine from Baileigh Industrial. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any goods to Seller. Goods returned without a RGA will be refused. Seller will not be responsible for any freight costs, damages to goods, or any other costs or liabilities pertaining to goods returned without a RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, specifications or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain a RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without a RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 30 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (e) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.



Force Majeure. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightening, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation or provision of Goods. Buyer is solely responsible for furnishing, and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator's manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.

Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorneys' fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

Summary of Return Policy.

- 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
- You must obtain a Baileigh issued RGA number PRIOR to returning any materials.
- Returned materials must be received at Baileigh in new condition and in original packaging.
- Altered items are not eligible for return.
- Buyer is responsible for all shipping charges.
- A 30% re-stocking fee applies to all returns.

Baileigh Industrial makes every effort to ensure that our posted specifications, images, pricing and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:

Please contact one of our knowledgeable Sales and Service team members at: (920) 684-4990 or e-mail us at sales@baileighindustrial.com



INTRODUCTION

The quality and reliability of the components assembled on a Baileigh Industrial machine guarantee near perfect functioning, free from problems, even under the most demanding working conditions. However if a situation arises, refer to the manual first. If a solution cannot be found, contact the distributor where you purchased our product. Make sure you have the serial number and production year of the machine (stamped on the nameplate). For replacement parts refer to the assembly numbers on the parts list drawings.

Our technical staff will do their best to help you get your machine back in working order.

In this manual you will find: (when applicable)

- Safety procedures
- Correct installation guidelines
- Description of the functional parts of the machine
- Capacity charts
- Set-up and start-up instructions
- Machine operation
- Scheduled maintenance
- Parts lists

GENERAL NOTES

After receiving your equipment remove the protective container. Do a complete visual inspection, and if damage is noted, **photograph it for insurance claims** and contact your carrier at once, requesting inspection. Also contact Baileigh Industrial and inform them of the unexpected occurrence. Temporarily suspend installation.

Take necessary precautions while loading / unloading or moving the machine to avoid any injuries.

Your machine is designed and manufactured to work smoothly and efficiently. Following proper maintenance instructions will help ensure this. Try and use original spare parts, whenever possible, and most importantly; **DO NOT** overload the machine or make any unauthorized modifications.



Note: This symbol refers to useful information throughout the manual.



IMPORTANT **PLEASE READ THIS OPERATORS MANUAL CAREFULLY**

It contains important safety information, instructions, and necessary operating procedures. The continual observance of these procedures will help increase your production and extend the life of the equipment.



SAFETY INSTRUCTIONS

LEARN TO RECOGNIZE SAFETY INFORMATION

This is the safety alert symbol. When you see this symbol on your machine or in this manual, **BE ALERT TO THE POTENTIAL FOR PERSONAL INJURY!**

Follow recommended precautions and safe operating practices.

UNDERSTAND SIGNAL WORDS

A signal word – **DANGER**, **WARNING**, or **CAUTION** is used with the safety alert symbol. **DANGER** identifies a hazard or unsafe practice that will result in severe **Injury or Death**.

Safety signs with signal word **DANGER** or **WARNING** are typically near specific hazards.

General precautions are listed on **CAUTION** safety signs. **CAUTION** also calls attention to safety messages in this manual.



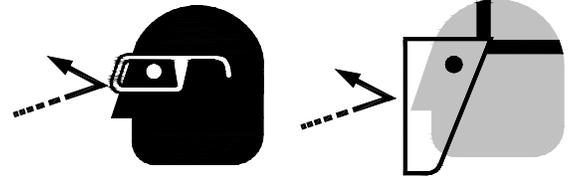


SAVE THESE INSTRUCTIONS.
Refer to them often and use them to instruct others.



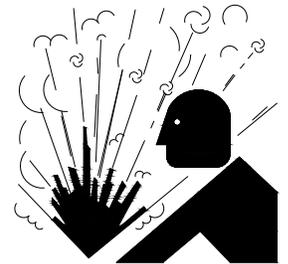
PROTECT EYES

Wear safety glasses or suitable eye protection when working on or around machinery.



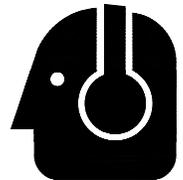
HYDRAULIC HOSE FAILURE

Exercise **CAUTION** around hydraulic hoses in case of a hose or fitting failure.



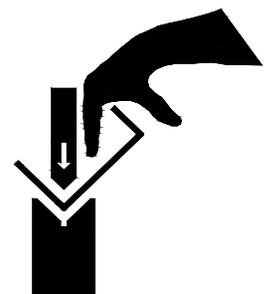
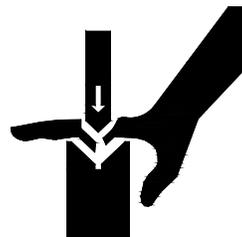
PROTECT AGAINST NOISE

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protective devices such as ear muffs or earplugs to protect against objectionable or uncomfortable loud noises.



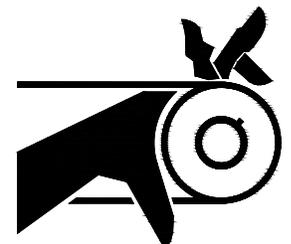
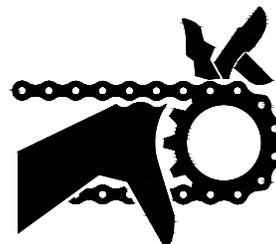
BEWARE OF CRUSH HAZARD

NEVER place your hands, fingers, or any part of your body in the die area of this machine. Closing upper beam and brake bed will result in loss of fingers or limbs if placed in machine.



BEWARE OF PINCH POINTS

Keep hands and fingers clear of all potential pinch points. These include sprockets and chains along with belts and pulleys.





HIGH VOLTAGE

USE CAUTION IN HIGH VOLTAGE AREAS. DO NOT assume the power to be off.
FOLLOW PROPER LOCKOUT PROCEDURES.



EMERGENCY STOP BUTTON

In the event of incorrect operation or dangerous conditions, the machine can be stopped immediately by pressing the **E-STOP** button. Twist the emergency stop button clockwise (cw) to reset.
Note: Resetting the E-Stop will not start the machine.



SAFETY PRECAUTIONS



Metal working can be dangerous if safe and proper operating procedures are not followed. As with all machinery, there are certain hazards involved with the operation of the product. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

Safety equipment such as guards, hold-downs, safety glasses, dust masks and hearing protection can reduce your potential for injury. But even the best guard won't make up for poor judgment, carelessness or inattention. **Always use common sense** and exercise **caution** in the workshop. If a procedure feels dangerous, don't try it.

REMEMBER: Your personal safety is your responsibility.



WARNING: FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

1. **Only trained and qualified personnel can operate this machine.**
2. **Make sure guards are in place and in proper working order before operating machinery.**
3. **Remove any adjusting tools.** Before operating the machine, make sure any adjusting tools have been removed.

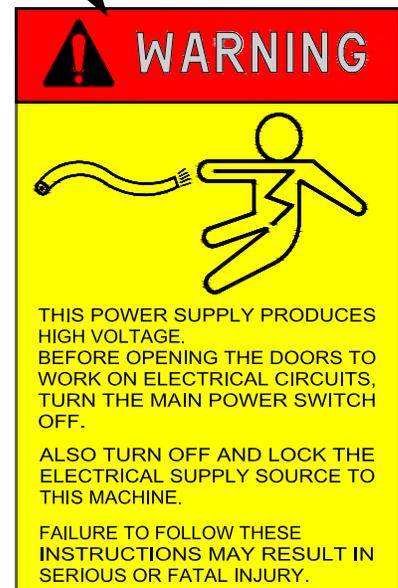


4. **Keep work area clean.** Cluttered areas invite injuries.
5. **Overloading machine.** By overloading the machine you may cause injury from flying parts. **DO NOT** exceed the specified machine capacities.
6. **Machine usage. DO NOT** use the brake as a press or crushing tool.
7. **Dressing material edges.** Always chamfer and deburr all sharp edges.
8. **Do not force tool.** Your machine will do a better and safer job if used as intended. **DO NOT** use inappropriate attachments in an attempt to exceed the machines rated capacity.
9. **Use the right tool for the job. DO NOT** attempt to force a small tool or attachment to do the work of a large industrial tool. **DO NOT** use a tool for a purpose for which it was not intended.
10. **Dress appropriate. DO NOT** wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
11. **Use eye and ear protection.** Always wear ISO approved impact safety goggles. Wear a full-face shield if you are producing metal filings.
12. **Do not overreach.** Maintain proper footing and balance at all times. **DO NOT** reach over or across a running machine.
13. **Stay alert.** Watch what you are doing and use common sense. **DO NOT** operate any tool or machine when you are tired.
14. **Check for damaged parts.** Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
15. **Observe work area conditions. DO NOT** use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted. **DO NOT** use electrically powered tools in the presence of flammable gases or liquids.
16. **Blade adjustments and maintenance.** Always keep blades sharp and properly adjusted for optimum performance.
17. **Keep children away.** Children must never be allowed in the work area. **DO NOT** let them handle machines, tools, or extension cords.
18. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
19. **DO NOT operate machine if under the influence of alcohol or drugs.** Read warning labels on prescriptions. If there is any doubt, **DO NOT** operate the machine.
20. **DO NOT** touch live electrical components or parts.
21. **Turn off** power before checking, cleaning, or replacing any parts.



- 22. Be sure **all** equipment is properly installed and grounded according to national, state, and local codes.
- 23. Inspect power and control cables periodically. Replace if damaged or bare wires are exposed. **Bare wiring can kill!**
- 24. **DO NOT** bypass or defeat any safety interlock systems.
- 25. Keep visitors a safe distance from the work area.

MACHINE SAFETY LABELS





TECHNICAL SPECIFICATIONS

| | |
|--|--|
| Maximum Pressure | 90 Tons |
| Bending Capacity (maximum length @ maximum thickness) | 78.75" / .196" (2000mm / 5.0mm) |
| Distance Between Housings | 61" (1550mm) |
| Distance From Table to Ram | 11.81" (300mm) |
| Table Width | 6.29" (160mm) |
| Throat Depth (to housing) | 7.87" (200mm) |
| Stroke Distance | 5.9" (150mm) |
| Approach Speed | 3.14" / sec. (80mm / sec.) |
| Bending Speed | .236" / sec. (6mm / sec.) |
| Return Speed | 2.36" / sec. (60mm / sec.) |
| Power Back Gauge Length | 23.62" (600mm) |
| NC Control Type | Delem |
| Main Motor | 10 hp (7.45kw) |
| Back Gauge Motor | 1/2 hp (.37kw) |
| Voltage | 220 volt / 3 phase |
| Oil Capacity | 45 gal (170.34L) |
| Shipping Dimensions (L/W/H) | 94.5" / 63" / 94.5" (2400 x 1600 x 2400mm) |
| Shipping Weight | 8800 lbs (4000kg) |

TECHNICAL SUPPORT

Our technical support department can be reached at 920.684.4990, and asking for the support desk for purchased machines. Tech Support handles questions on machine setup, schematics, warranty issues, and individual parts needs: (other than die sets and blades).

For specific application needs or future machine purchases contact the Sales Department at: sales@baileighindustrial.com, Phone: 920.684.4990, or Fax: 920.684.3944.



Note: The photos illustrations using in this manual are representative only and may not depict the actual color, labeling or accessories and may be intended to illustrate technique only.



Note: The specifications and dimensions presented here are subject to change without prior notice due to improvements of our products.



UNPACKING AND CHECKING CONTENTS

Your Baileigh machine is shipped complete in one crate. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.

⚠ WARNING: SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.

If any parts are missing, do not plug in the power cable, or turn the power switch on until the missing parts are obtained and installed correctly.

Cleaning

Your machine may be shipped with a rustproof waxy oil coating and grease on the exposed unpainted metal surfaces. To remove this protective coating, use a degreaser or solvent cleaner. For a more thorough cleaning, some parts will occasionally have to be removed. **DO NOT USE** acetone or brake cleaner as they may damage painted surfaces.

Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.

⚠ WARNING: DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.

⚠ CAUTION: When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.





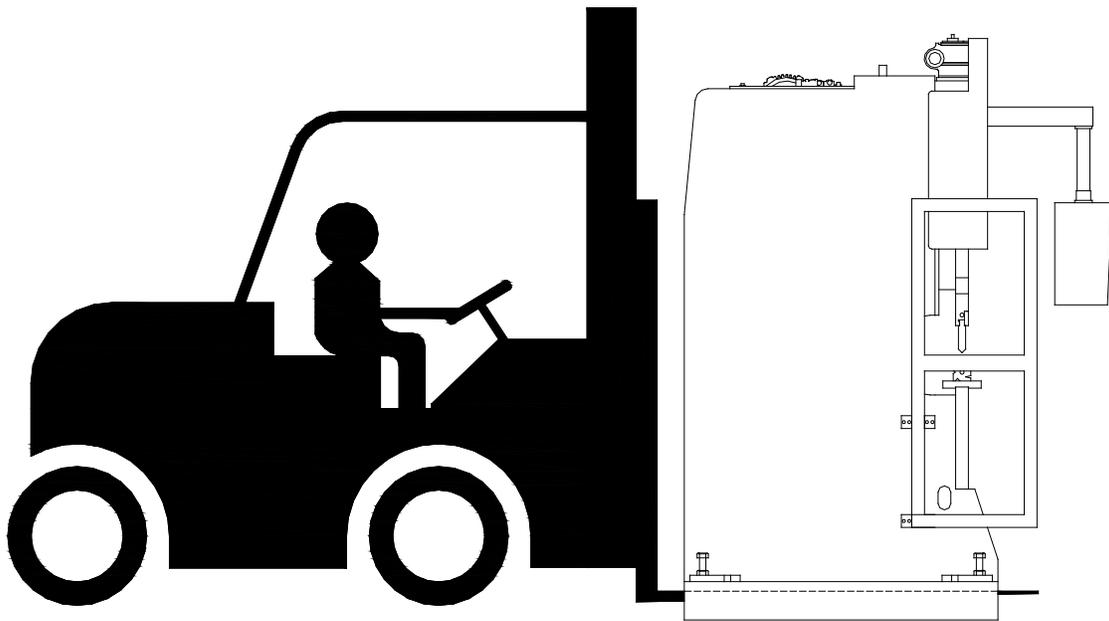
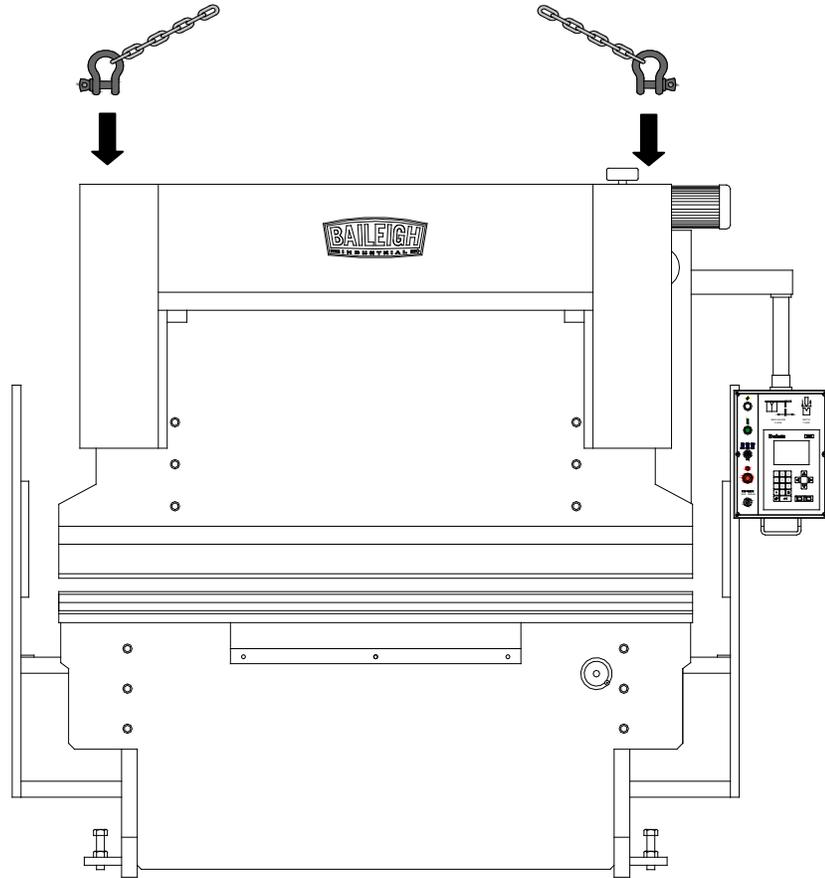
TRANSPORTING AND LIFTING

⚠ CAUTION: Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced. Choose a location that will keep the machine free from vibration and dust from other machinery. Keep in mind that having a large clearance area around the machine is important for safe and efficient working conditions.

Follow these guidelines when lifting:

- The machine is top and front heavy. Lift and carry the machine with the lifting holes provided at the top of the machine. **DO NOT** use a Forklift once the machine has been removed from the pallet it was shipped on.
- Always lift and carry the machine with the lifting holes provided at the top of the machine.
- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Take proper precautions for handling and lifting.
- Check if the load is properly balanced by lifting it an inch or two.
- Lift the machine, avoiding sudden accelerations or quick changes of direction.
- Locate the machine where it is to be installed, and lower slowly until it touches the floor.

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a fork lift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.





INSTALLATION

IMPORTANT:

Consider the following when looking for a suitable location to place the machine:

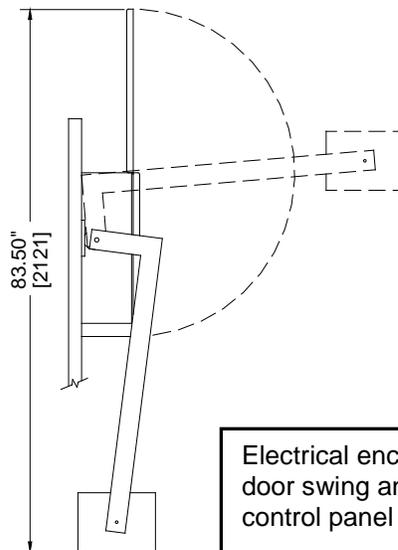
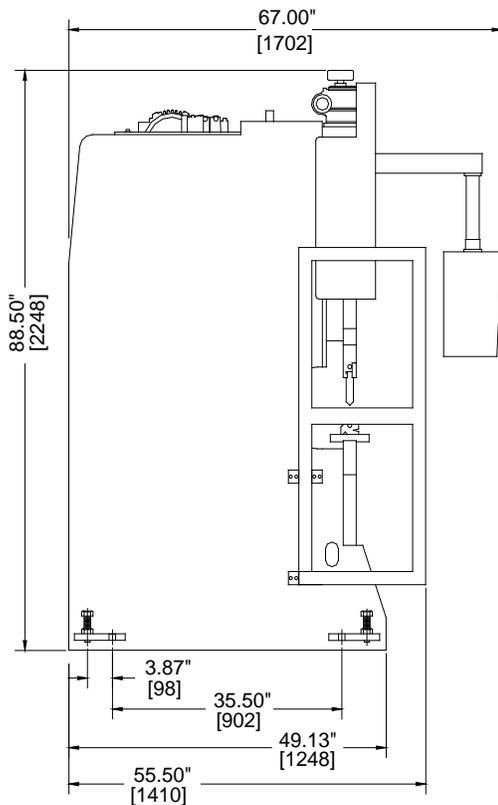
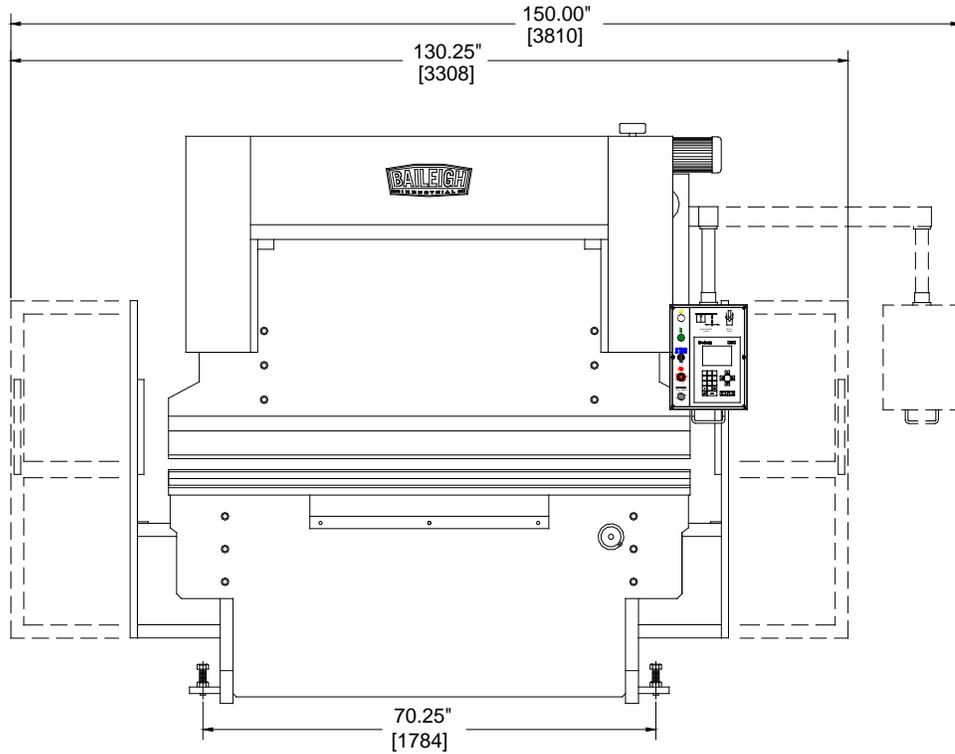
- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.
- Remove scrap and waste materials regularly, and make sure the work area is free from obstructing objects.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any aisles.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor is capable of supporting the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely.
- **POWER SUPPLY PLACEMENT:** The power supply should be located close enough to the machine so that the power cord is not in an area where it would cause a tripping hazard. Be sure to observe all electrical codes if installing new circuits and/or outlets.

Anchoring the Machine

- Once positioned, anchor the machine to the floor, using anchor bolts or sunken tie rods that connect through holes in the base of the stand.



OVERALL DIMENSIONS



PLAN VIEW



ELECTRICAL

⚠ WARNING: Baileigh Industrial is not responsible for any damage caused by wiring up to an alternative 3-phase power source other than direct 3-phase. If you are using an alternate power source, consult a certified electrician or contact Baileigh Industrial prior to energizing the machine.

⚠ CAUTION: HAVE ELECTRICAL UTILITIES CONNECTED TO MACHINE BY A CERTIFIED ELECTRICIAN!
Check if the available power supply is the same as listed on the machine nameplate.

⚠ WARNING: Make sure the grounding wire (green) is properly connected to avoid electric shock. DO NOT switch the position of the green grounding wire if any electrical plug wires are switched during hookup.

Motor Specifications

Your tool is wired for 220 volt, 60Hz alternating current. Before connecting the tool to the power source, make sure the machine is cut off from power source.

Considerations

- Observe local electrical codes when connecting the machine.
- The circuit should be protected with a time delay fuse or circuit breaker with a amperage rating slightly higher than the full load current of machine.
- A separate electrical circuit should be used for your tools. Before connecting the motor to the power line, make sure the switch is in the "OFF" position and be sure that the electric current is of the same characteristics as indicated on the tool.
- All line connections should make good contact. Running on low voltage will damage the motor.
- In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This tool is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.



⚠ WARNING: In all cases, make certain the receptacle in question is properly grounded. If you are not sure, have a qualified electrician check the receptacle.

- Improper connection of the equipment-grounding conductor can result in risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.
- Check with a qualified electrician or service personnel if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.
- Repair or replace damaged or worn cord immediately.

Power cord connection:

1. Open the electrical enclosure door by pushing the button. When the handle pops up, twist it 90°. (**ccw**) counter clockwise. The disconnect switch must be **OFF** before the door will open.
2. Insert a fitting into an open hole to grip the power cord (supplied by customer).
3. Remove the (**E, R, S, T**) plate which covers the terminals. For three phase, connect the three power wires to terminals **R, S & T**. Connect the ground wire (typically green) to the **E** (Safety Ground) terminal.
4. Check that the power cord has not been damaged during installation.
5. Reinstall the (**E, R, S, T**) plate.





Check for correct rotation of the motor (3 phase)

1. Close the electrical enclosure door.
2. With power connected and disconnect turned on, the white power light on the control panel will be lit.
3. Push the green button to start the pump. The green light will be lit.
4. Press the left "**DOWN**" footswitch (fig. 10) and the upper die beam "I" should come down. If not, disconnect power to the machine, and switch the **R** and **T** wires. **DO NOT** move the ground wire E.



Improper rotation can severely damage the hydraulic pump.



MACHINE DESCRIPTION

The Baileigh BP-9078CNC hydraulic sheet metal press brake comes standard with inside lighting, a set of multi-vee tooling, a Delem CNC controller, an auto crowning compensation system, a six sensor safety curtain, and adjustable front material rests.

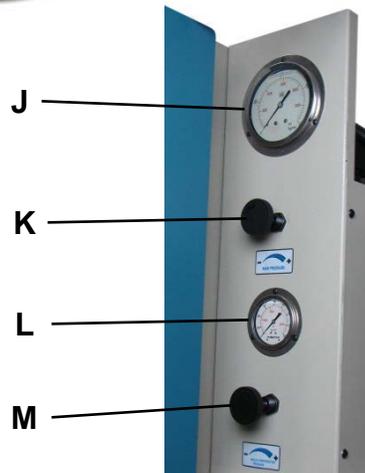
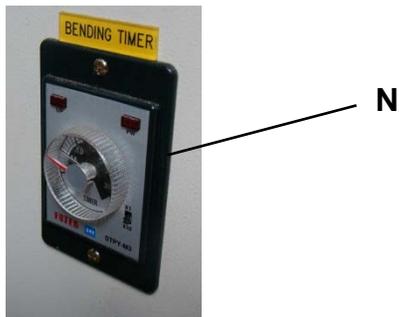
It is a very rigid 2 axis machine with a heavy electro welded plate steel frame. The top beam travels up and down using several 3 axis bearings coupled to a hardened rail system.

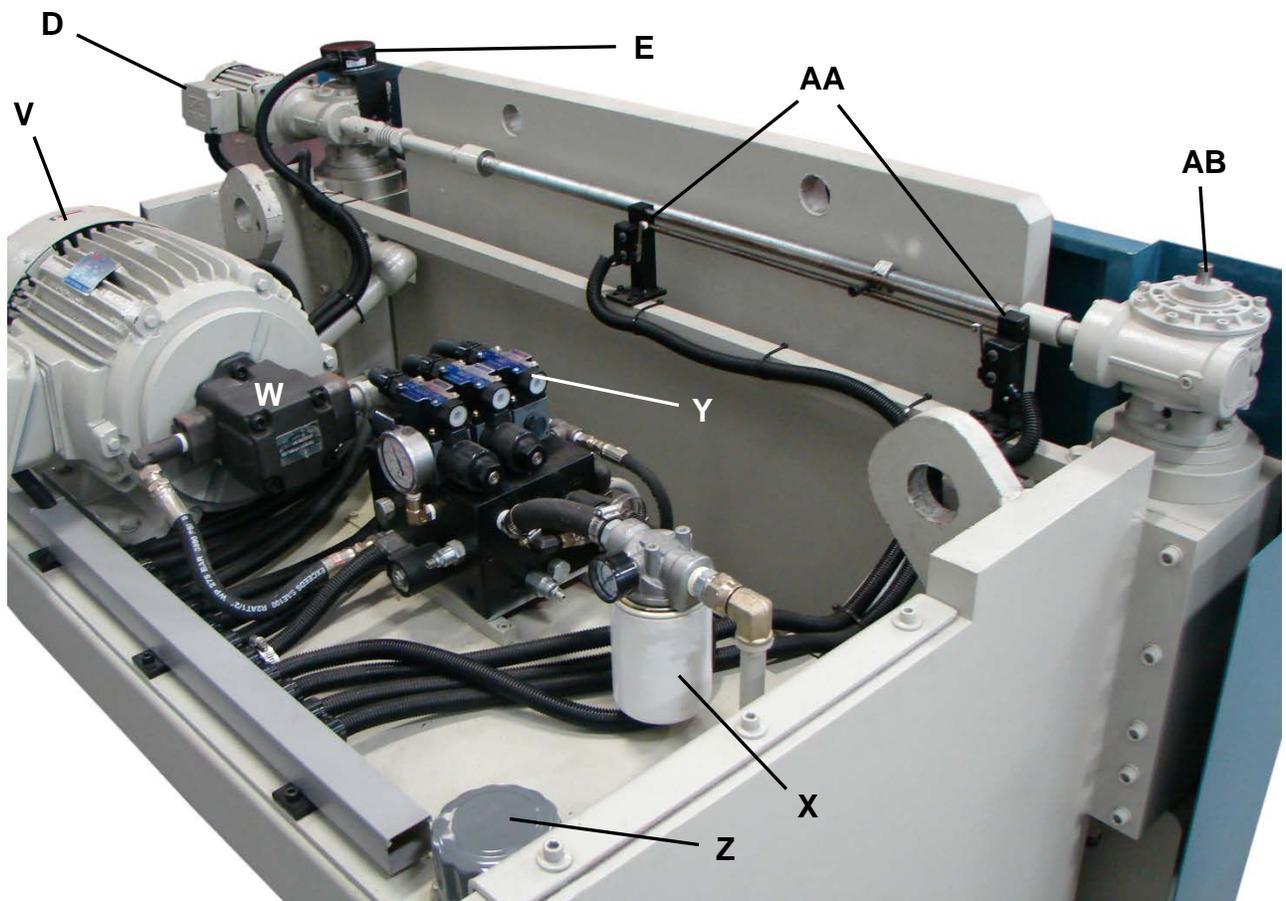
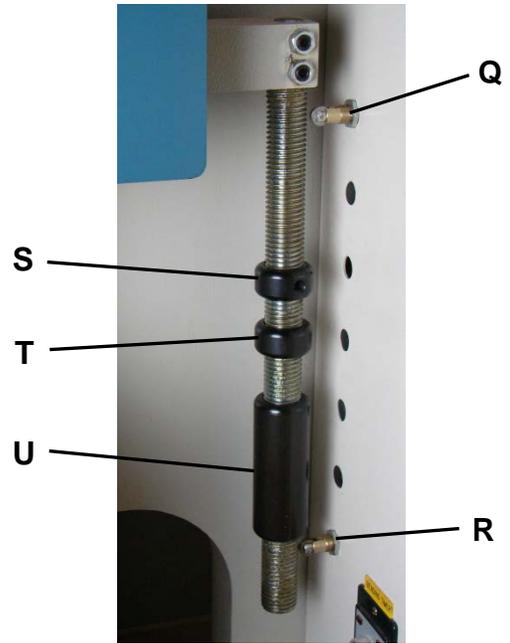
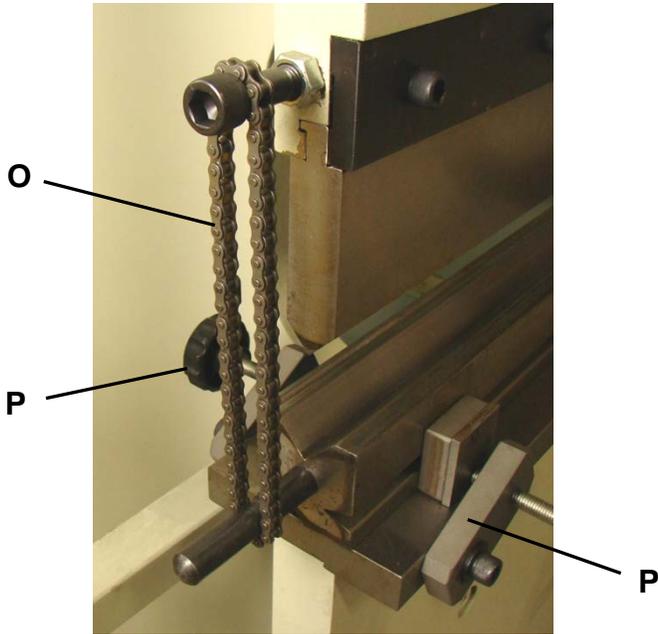
Hydraulic cylinders are controlled by internal mounted mechanical stops assuring accurate angle of bend at all times. An encoder system indicates the exact position of the top beam and adjustments are made on the Delem controller to a servo motor. We use a unique parallel mechanism that provides forced synchronized motions so the top die is always parallel to the bottom die.

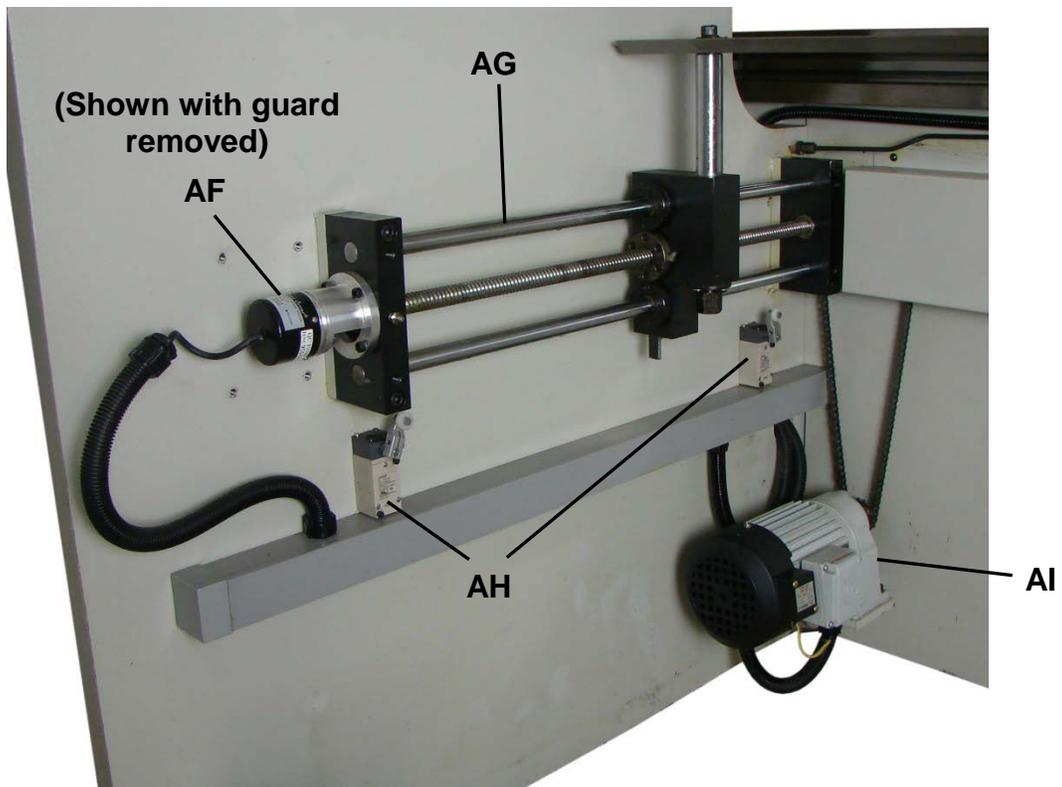
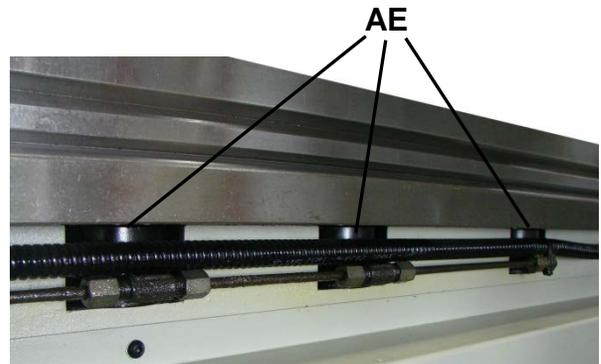
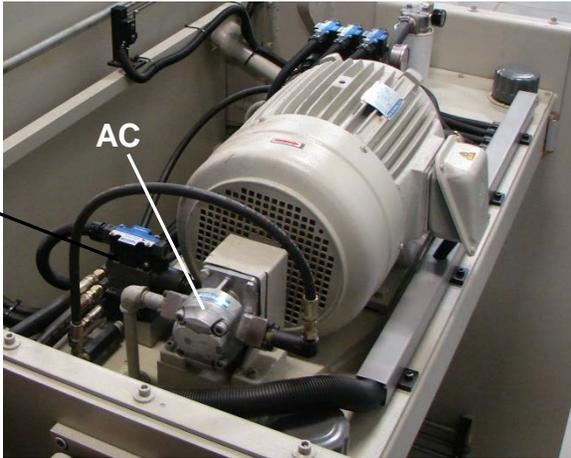
The 90 tons of hydraulic pressure can be measured and regulated depending upon the application. The back gauge is operated from the Delem controller to a servo motor with encoder for accurate positioning. The Delem controller can be programmed with up to 100 programs, with 25 commands per program. The back gauges have manual micro-adjusters for precise settings. Also included is a hydraulic auto crowning compensation system, so any flexing in the middle of the machine while at full capacity can be adjusted, to create crisp bends using the maximum width of the machine.

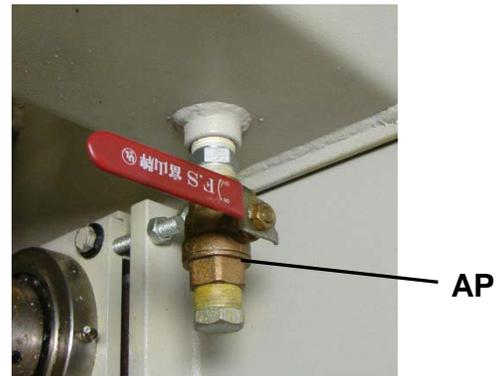
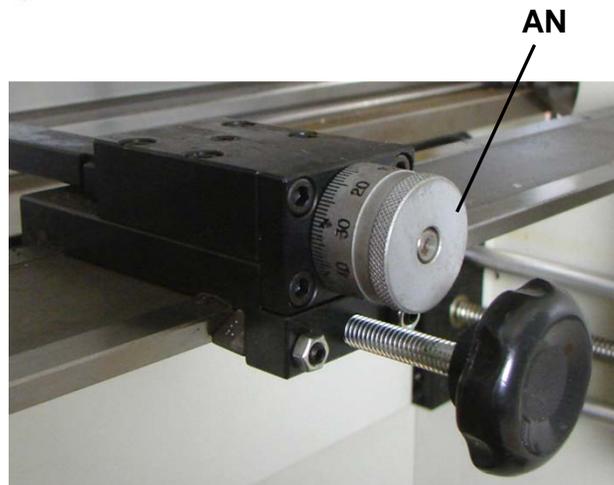
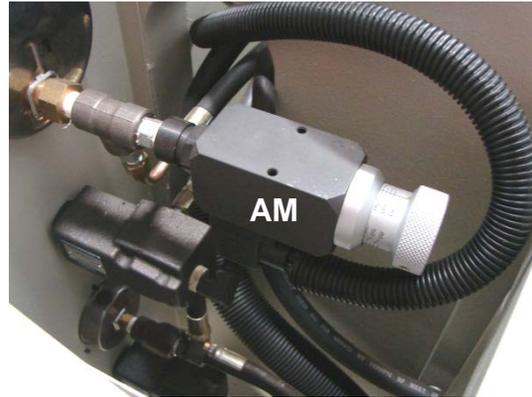
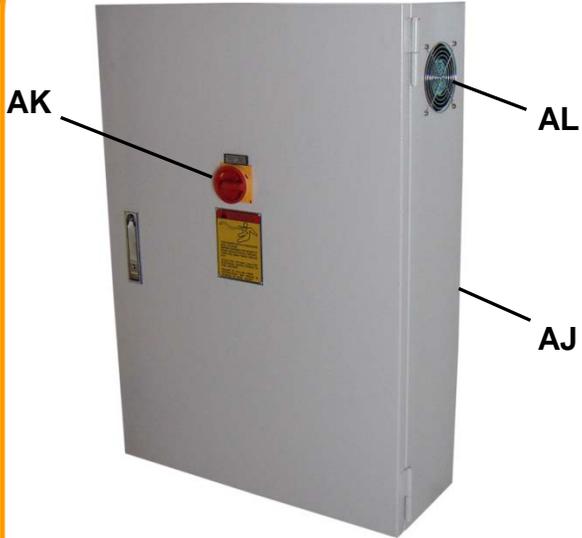


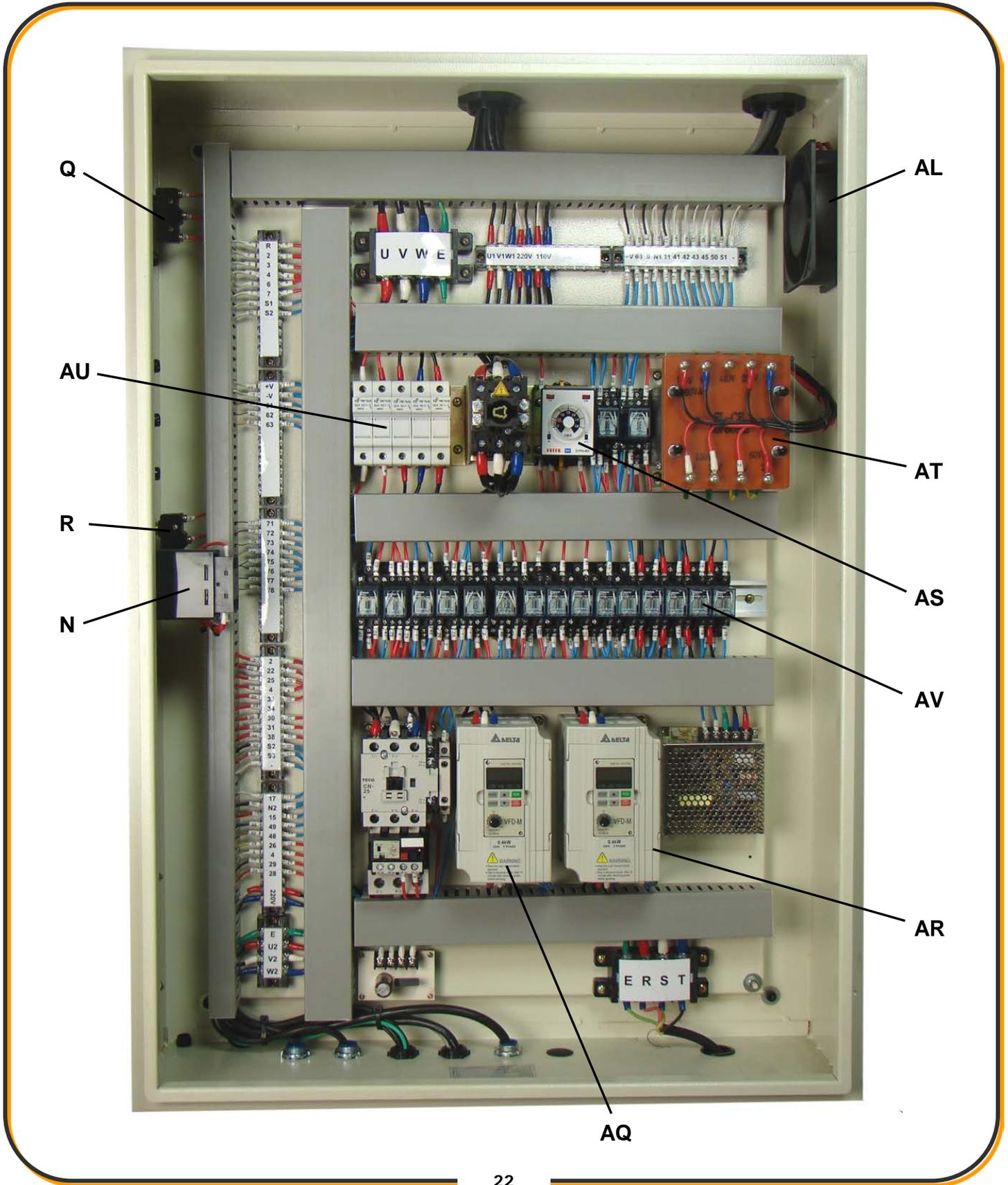
GETTING TO KNOW YOUR MACHINE













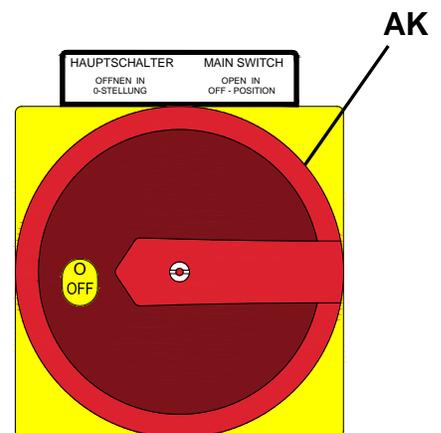
| Item | Description | Item | Description |
|------|------------------------------|------|--|
| A | Light Curtain Emitter | Y | Solenoid Valves |
| B | Light Curtain Receiver | Z | Oil Fill Cap |
| C | Up/Down Foot Pedal | AA | Limit Switches for Encoder Travel |
| D | Encoder Motor | AB | Right Angle Drive |
| E | Encoder | AC | Crowning Auto Compensating Pump |
| F | Suspended Control Console | AD | Auto Compensation Solenoid |
| G | Back Gauge Control Wheel | AE | Auto Compensation Crowning Cylinders |
| H | Adjustable Support Arm | AF | Back Gauge Encoder |
| I | Upper Die | AG | Power Back Gauge Ballscrew |
| J | Main Pressure Gauge | AH | Back Gauge Limit Switch |
| K | Pressure Control Valve | AI | Back Gauge Drive Motor |
| L | Auto Crowning Pressure Gauge | AJ | Electrical Enclosure |
| M | Pressure Control Valve | AK | Safety Disconnect Switch |
| N | Bending Timer | AL | Cooling Fan |
| O | Die Lifting Chain | AM | Adjustable Pressure Switch |
| P | Die Rail Centering Clamps | AN | Back Gauge Micro-Adjuster |
| Q | Up Travel Limit Switch | AO | Hydraulic Tank Oil Level Gauge |
| R | Down Travel Limit Switch | AP | Drain Valve |
| S | Upper Actuating Ring | AQ | AC Motor Drive (Encoder Cylinder Travel) |
| T | Locking Ring | AR | AC Motor Drive (Back Gauge) |
| U | Lower Actuating Ring | AS | Postpone Timer |
| V | 10hp Hydraulic Pump Motor | AT | Transformer |
| W | Main Hydraulic Pump | AU | Fuses |
| X | Oil Filter | AV | Relays |



Electrical Enclosure Switch and Button Functions

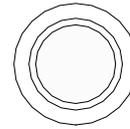
⚠ WARNING: Before opening the door to work on electrical circuits, turn the main disconnect switch “OFF”. Also turn off and Lock Out the electrical supply source to this machine. **FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN FATAL OR SERIOUS INJURY.**

The safety disconnect switch (AK) turns power on to the machine when in the “ON” position. If the door handle is turned while the switch is “ON”, a safety catch will prevent the door from opening.

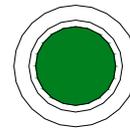




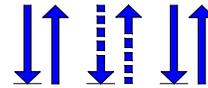
POWER INDICATOR LIGHT – When the disconnect switch is turned on, the white light will be lit. Make sure machine is plugged into correct power source and that the E-Stop button has been reset.



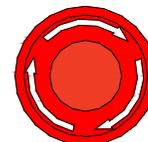
PUMP START PUSHBUTTON – When depressed, the green light on the pump start button will be lit and the pump motor will start. Press the footswitch “Down” pedal and the upper die should go down.



CYCLE MODE SELECTOR SWITCH – This is a 3-position switch which allows you to pick one of three bend modes. In the left “inch” mode, the die will come down when the “Down” footswitch is pressed and will return as soon as it is released. In the center “jog” mode the die will go up or down as you step on the “UP” or “Down” footswitch. In the right “auto” mode, stepping on the “Down” switch sends the die through the bend cycle and returns to the start position.



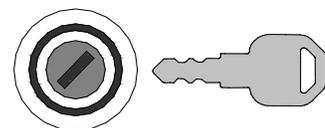
E-STOP BUTTON – When pressed, the red E-STOP button will be lit and all machine functions will stop. Turn button clockwise (cw) to reset.



SAFETY LIGHT CURTAIN SWITCH – With the key inserted and switched to the “Run” position the light emitter and receiver will detect objects in the sensing field. When switched to the “Break position the curtain is de-energized.



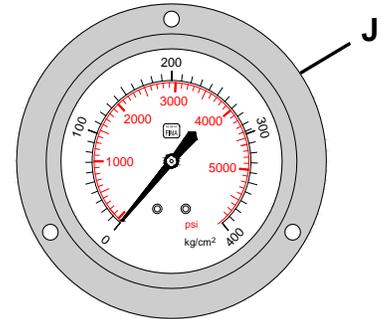
RUN BREAK



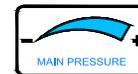
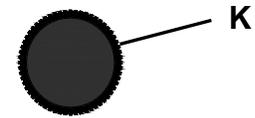


Hydraulic Control Functions

MAIN PRESSURE GAUGE – The main pressure gauge shows the pressure that the die will be applying at the bend. Start the pressure low, and gradually increase to the point where the bend can be made successfully. The pressure can be read in either (psi) or (kg/cm²).



PRESSURE REGULATOR – The pressure regulator controls the main system pressure as read on the pressure gauge. Turning the regulator counterclockwise (ccw) decreases the pressure and turning the regulator clockwise (cw) increases the pressure.



U.S.

(in)

(U.S.G.)

| V | R _m | B _m | T.S. =60,000 psi | | | | | | | | | | | | | | | | | | | | | | |
|-------|----------------|----------------|------------------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | | .036 | .048 | .06 | .075 | .105 | .12 | .135 | .15 | .188 | .25 | .312 | .375 | .437 | .5 | .625 | .75 | .875 | 1 | | | | | |
| in. | in. | in. | 20 | 18 | 16 | 14 | 12 | 11 | 10 | 9 | 7 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | | | | | |
| 1/4 | .039 | .163 | 2.9 | 5.9 | | | | | | | | | | | | | | | | | | | | | |
| 5/16 | .049 | .203 | 2.2 | 4.3 | 7.4 | | | | | | | | | | | | | | | | | | | | |
| 3/8 | .059 | .244 | 1.7 | 3.4 | 5.7 | 9.8 | | | | | | | | | | | | | | | | | | | |
| 1/2 | .078 | .325 | 1.2 | 2.3 | 3.8 | 6.5 | 14.7 | | | | | | | | | | | | | | | | | | |
| 5/8 | .098 | .406 | 0.9 | 1.7 | 2.9 | 4.8 | 10.7 | 14.7 | | | | | | | | | | | | | | | | | |
| 3/4 | .117 | .488 | | 1.4 | 2.2 | 3.8 | 8.3 | 11.4 | 15.1 | | | | | | | | | | | | | | | | |
| 7/8 | .137 | .569 | | | 1.9 | 3.1 | 6.7 | 9.2 | 12.2 | 15.6 | | | | | | | | | | | | | | | |
| 1 | .156 | .650 | | | | 2.6 | 5.7 | 7.7 | 10.1 | 13.0 | | | | | | | | | | | | | | | |
| 1 1/8 | .176 | .732 | | | | 2.2 | 4.9 | 6.6 | 8.6 | 11.0 | 18.9 | | | | | | | | | | | | | | |
| 1 1/4 | .195 | .813 | | | | | 4.2 | 5.7 | 7.5 | 9.6 | 16.3 | 32.4 | | | | | | | | | | | | | |
| 1 1/2 | .234 | .975 | | | | | 3.4 | 4.6 | 6.0 | 7.6 | 12.8 | 25.8 | 42.8 | | | | | | | | | | | | |
| 2 | .313 | 1.30 | | | | | | 3.2 | 4.1 | 5.3 | 8.8 | 16.9 | 28.5 | 44.3 | | | | | | | | | | | |
| 2 1/2 | .391 | 1.63 | | | | | | | | 4.0 | 6.7 | 12.6 | 21.0 | 32.4 | 46.7 | | | | | | | | | | |
| 3 | .469 | 1.95 | | | | | | | | | 5.3 | 10.0 | 16.6 | 25.4 | 36.3 | 50.0 | | | | | | | | | |
| 3 1/2 | .547 | 2.28 | | | | | | | | | | 8.3 | 13.6 | 28.7 | 29.5 | 40.4 | | | | | | | | | |
| 4 | .625 | 2.60 | | | | | | | | | | | 7.0 | 11.5 | 17.1 | 24.7 | 33.8 | 57.1 | | | | | | | |
| 4 1/2 | .703 | 2.93 | | | | | | | | | | | | 10.0 | 15.0 | 21.2 | 28.9 | 48.6 | 75.0 | | | | | | |
| 5 | .781 | 3.25 | | | | | | | | | | | | | 13.2 | 18.6 | 25.2 | 42.2 | 64.8 | 93.7 | | | | | |
| 5 1/2 | .859 | 3.58 | | | | | | | | | | | | | | 16.5 | 22.3 | 37.2 | 56.9 | 82.0 | | | | | |
| 6 | .938 | 3.90 | | | | | | | | | | | | | | | 14.8 | 20.0 | 33.2 | 50.7 | 72.7 | 100 | | | |
| 6 1/2 | 1.02 | 4.23 | | | | | | | | | | | | | | | | 18.1 | 30.0 | 45.5 | 65.2 | 89.5 | | | |
| 7 | 1.09 | 4.55 | | | | | | | | | | | | | | | | | 16.5 | 27.3 | 41.3 | 59.1 | 80.9 | | |
| 7 1/2 | 1.17 | 4.88 | | | | | | | | | | | | | | | | | | 15.2 | 25.0 | 37.8 | 53.9 | 73.6 | |
| 8 | 1.25 | 5.20 | | | | | | | | | | | | | | | | | | | 23.0 | 34.8 | 49.5 | 67.5 | |
| 8 1/2 | 1.33 | 5.53 | | | | | | | | | | | | | | | | | | | | 21.4 | 32.2 | 45.8 | 62.3 |
| 9 | 1.41 | 5.85 | | | | | | | | | | | | | | | | | | | | | 30.0 | 42.5 | 57.8 |

U.S. Ton/ft

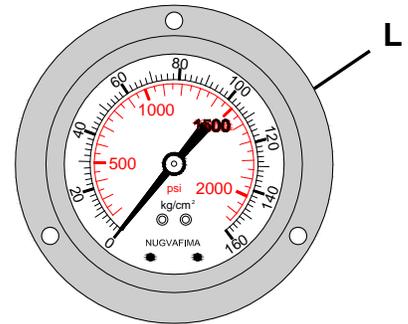
T.S. (Kpsi)

1.92
1.58
1
0.92
0.75
0.62
0.47

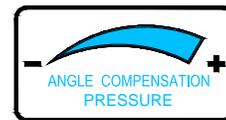
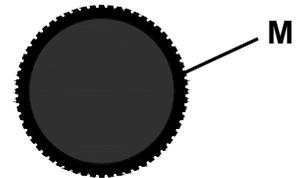
28 37 45 55 60 95 115



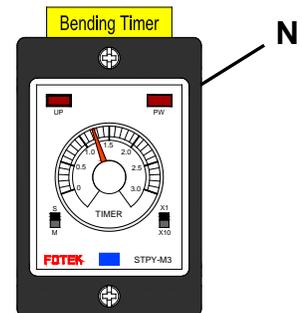
AUTO COMPENSATION PRESSURE GAUGE – This gauge shows the pressure being applied to the cylinders that are part of the crowning auto compensation system. The pressure can be read in either (psi) or (kg/cm²).



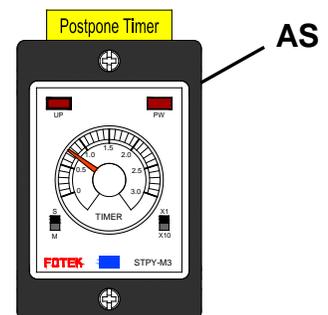
PRESSURE REGULATOR – The regulator controls the pressure as read on the auto compensation pressure gauge. Turning the regulator counterclockwise (ccw) decreases the pressure and turning the regulator clockwise (cw) increases the pressure.



BENDING TIMER – The bending timer controls how long the upper die remains at the bottom of the bending stroke. The timer can be set from (0-3) seconds.



POSTPONE TIMER – The postpone timer controls the time between the fast approach and the slower bending stroke of the top die. The timer can be set from (0-3) seconds and is located inside the main electrical enclosure.





PRESSURE SWITCH – DO NOT ADJUST. This pressure switch has been set at the factory and needs no further adjustment. Contact: Baileigh Industrial at (920.684.4990) if you need assistance.

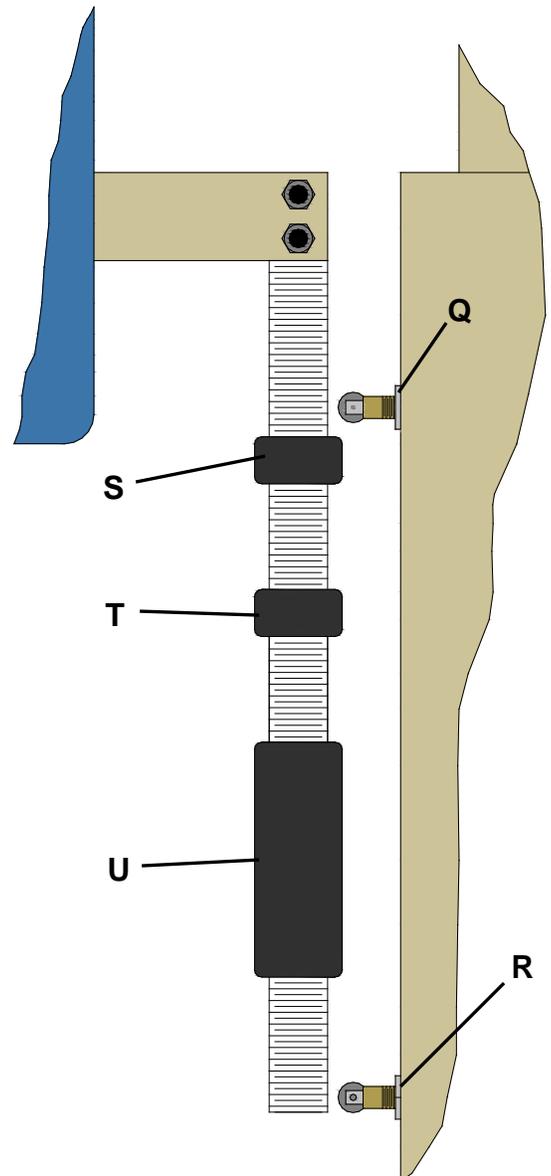


Travel Limit Guide Rod

The travel limit switches (Q) and (R) are actuated by the adjustable dogs (S) and (U). When the upper limit switch (Q) is actuated it will stop the UP stroke of the ram. Lowering the dog (S) allows the ram to travel higher. Raising dog (S) lowers the UP travel of the ram. This is helpful when doing production work where you want to keep the overall cycle time down.

When limit switch (R) is actuated it signals the ram to switch from the fast approach to the slower bending DOWN stroke. The closer dog (U) is located to limit switch (R) the quicker it actuates. The postpone timer is used to set the delay from 0 to 3 seconds for this change of speed to take place.

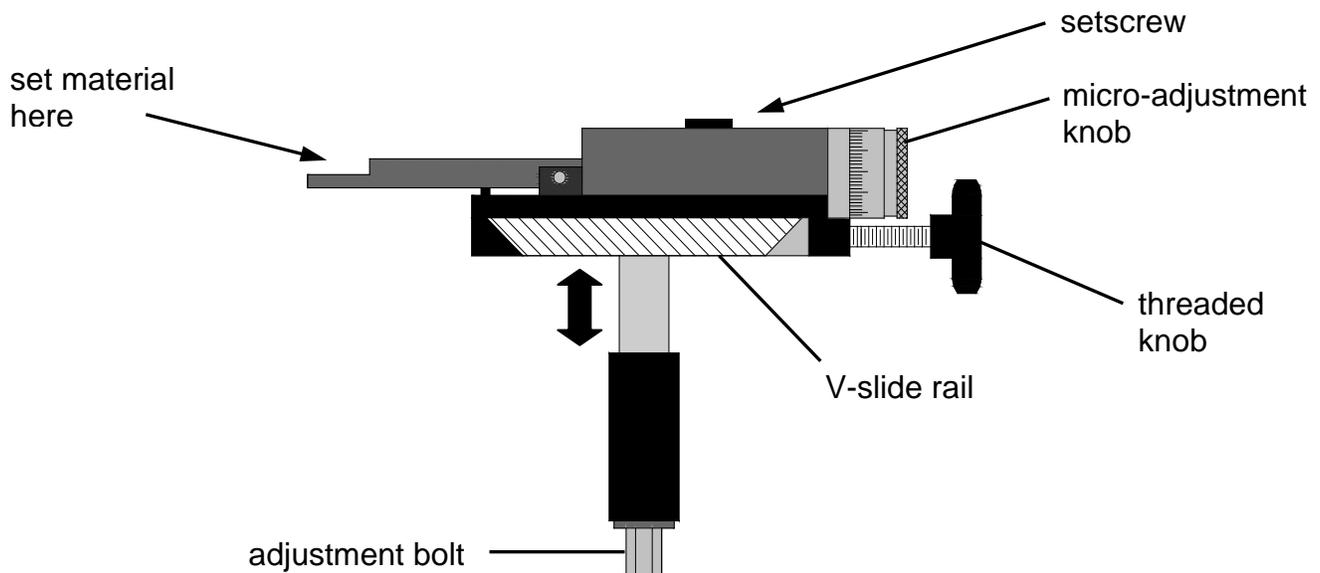
Collar (T) has a setscrew so it can be used similar to a lock nut to keep either dog (S) or (U) in place.





Micro-Adjuster

The two micro-adjusters are mounted to a V-slide rail. By loosening the threaded knob they can be positioned along the slide rail. Each micro-adjuster has a micro adjustment knob for fine tuning. Loosen the center setscrew, make the adjustment, and re-tighten the setscrew. (One full revolution = 1mm (.039") of linear travel.) The entire V-rail assembly can be raised or lowered by turning the adjustment bolts. After adjusting, use a level to make the V-rail parallel to the die.



Crowning Auto Compensation

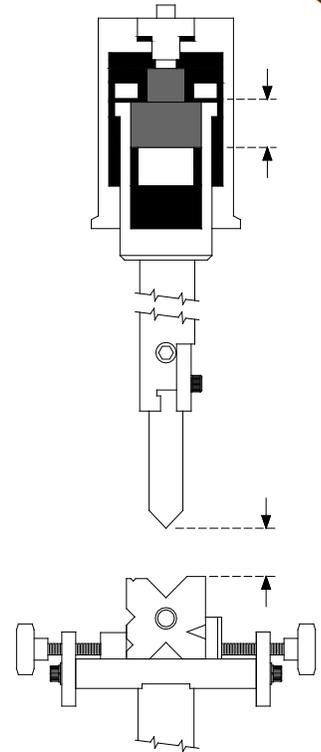
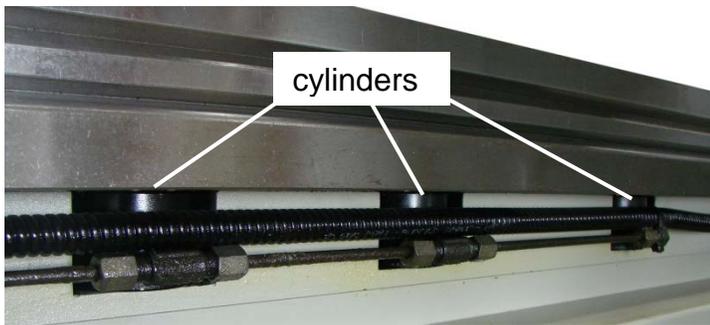
The BP-9078 press brake has hydraulic auto crowning compensation which means that any flexing in the middle of the die while at full capacity is automatically corrected for. The pressure for the cylinders can be manually adjusted to suit a specific application and is monitored on the pressure gauge. The auto crowning feature means that you can create crisp bends using the maximum width of the machine.





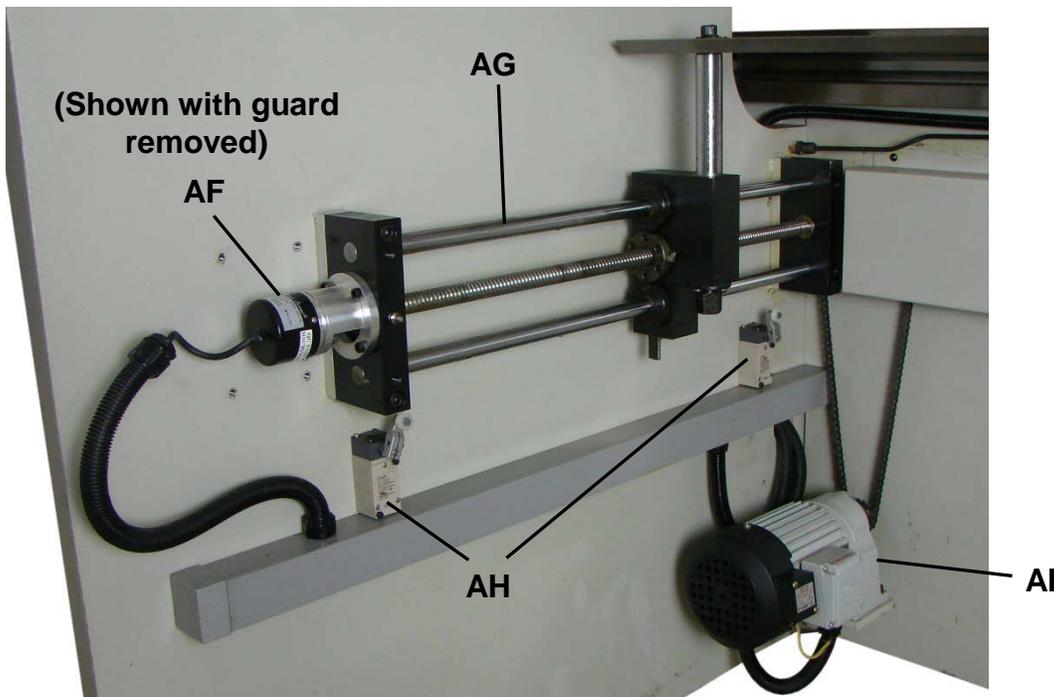
Depth of Bending

The hydraulic cylinders are controlled by mechanical stops inside the cylinders, assuring accurate angle of bend at all times. The encoder system indicates the exact position of the top beam and adjustments are made on the Delem controller to a servo motor. When doing multiple bends, the delay and clicking sounds you hear are the encoder responding to the cylinders movement.



NC Controlled Back Gauge

The back gauge on the Baileigh BP-9078 CNC Press Brake is connected to a servo motor (AI) with an encoder (AF) and operated from the Delem controller for accurate positioning. There are two limit switches (AH) on the "X" axis of the slide to stop motion at the end of travel.





CHANGING THE DIES

The Baileigh BP-9078CNC uses American style press brake tooling. Tooling can be found readily available to handle an array of sizes for various materials and in many die configurations.

Replacing Upper Die



WARNING: Before removing the upper die, **TURN OFF** and **LOCKOUT** power to the machine.

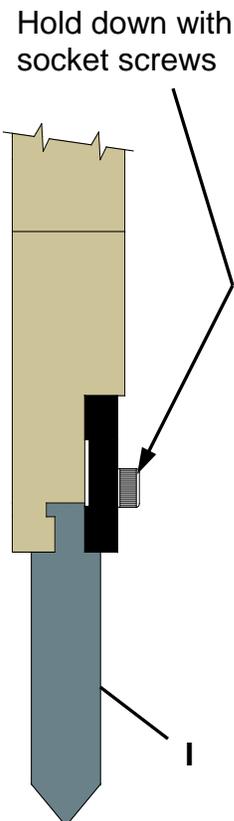
Always keep hands and fingers from between the dies.

The upper die supplied with the press weighs approximately 125 lbs. (57kg). Have an assistant and a suitable lifting device available. DO NOT try and remove by yourself.

1. Lower the ram until the top die (I) is approximately 1/32" (1mm) from bottoming in the lower die.
2. Loosen the socket hold down screws enough to slide out the die (I). Make sure there is adequate clearance around the machine to safely remove and replace the die.
3. Carefully slide in the new die (or die segments). When located as needed, tighten the socket hold down screws.



Note: Never install dies that are cracked, chipped, or otherwise damaged. Make sure dies are the correct size and type to reduce the risk of overloading the brake press.





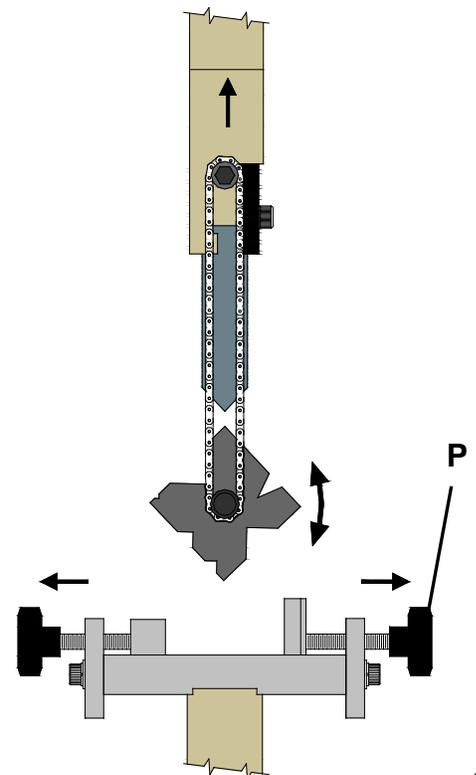
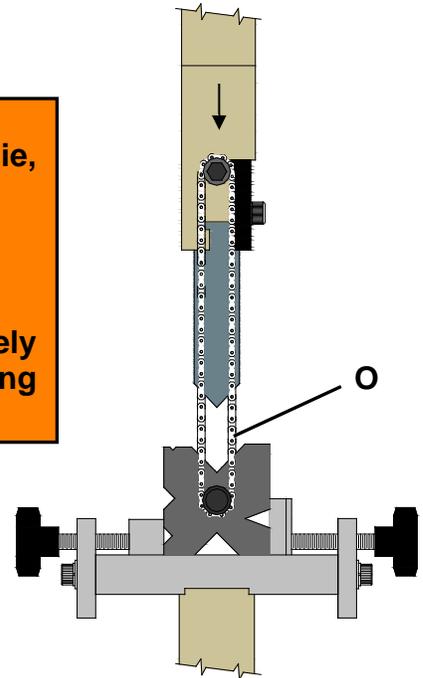
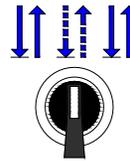
Rotating Lower Die

⚠ WARNING: Before removing the upper die, **TURN OFF** and **LOCKOUT** power to the machine.

Always keep hands and fingers from between the dies.

The upper die supplied with the press weighs approximately 125 lbs. (57kg). Have an assistant and a suitable lifting device available. **DO NOT** try and remove by yourself.

1. With the machine powered up and the hydraulic system energized, set the cycle mode selector switch to “jog”
2. Press the “Down” foot switch until the ram is close enough to the bottom die allowing you to attach the chains (O).
3. Loosen the four hold down clamps (P) which secure the die to the bolster.
4. With the clamps loosened, slowly raise the die from the bolster using the “UP” foot switch.
5. When the die is clear of the clamps, rotate to the desired position.
6. Slowly jog the die down onto the bolster.
7. Lower the ram slightly and remove the chains from the top bolt. They can hang from the lower die bolt so they are always available for use.
8. Now lower the top die gently into the selected V-groove of the bottom die to position it. Adjust clamps accordingly and then tighten securely.



Note: Never install dies that are cracked, chipped, or otherwise damaged. Make sure dies are the correct size and type to reduce the risk of overloading the brake press.



Replacing Lower Die



WARNING: Before removing the upper die, **TURN OFF** and **LOCKOUT** power to the machine.

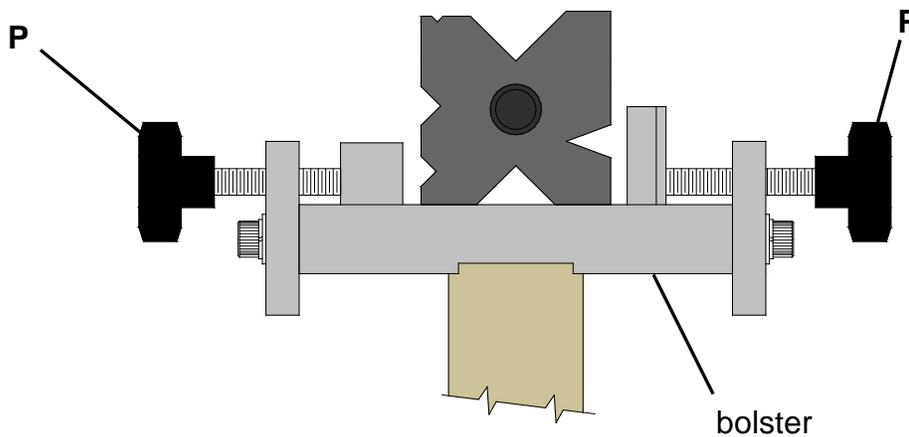
Always keep hands and fingers from between the dies.

The upper die supplied with the press weighs approximately 125 lbs. (57kg). Have an assistant and a suitable lifting device available. **DO NOT** try and remove by yourself.

1. Loosen the four hold down clamps (P) which secure the die to the bolster.
2. Slide out the die. Make sure there is adequate clearance around the machine to safely remove and replace the die.
3. Carefully slide in the new die (or die segments).
4. Now lower the top die gently into the selected V-groove of the bottom die to position it. Adjust clamps accordingly and then tighten securely.



Note: Never install dies that are cracked, chipped, or otherwise damaged. Make sure dies are the correct size and type to reduce the risk of overloading the brake press.





OPERATION

⚠ CAUTION: Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

⚠ CAUTION: Keep hands and fingers clear of the clamping beam. Stand off to the side of the machine to avoid getting hit with the bending apron as it comes up to bend. When handling large heavy materials make sure they are properly supported.



IMPORTANT: Before actually bending on the Baileigh BP-9078CNC brake press, read through and understand the manual on the Delem DA-41 controller. Also familiarize yourself with the safety aspects and basic parts of the machine throughout this operator's manual.

1. Check that the hydraulic tank is at least 90% full with Shell 32AW or equivalent hydraulic oil. DO NOT rely on the site gauge alone, as they sometimes give an incorrect indication of the oil level. A shortage of hydraulic oil will cause hydraulic system failure and damage to major mechanical components due to overheating.
2. Determine the size of material you will be processing and setup the support arms accordingly. Using the tapped holes you can move the arm assembly left or right of the position. The arms can also be adjusted up and down or in and out. Each arm has an adjustable dog to keep the piece part from backing up.
3. Set up the dies for the type of bending you will be doing. Refer to the previous sections for changing dies information. The Delem controller also needs to know what die is being used.
4. Make sure the proper voltage has been connected to the machine by a qualified electrician.
5. Close and latch the safety light curtain panels.
6. Turn on the main disconnect. (The white power light will be lit)
7. Insert the key in the light curtain switch and turn to run position. You should notice the red scanning lights are on for the emitter and a yellow for the receiver. Also look for a green light at the bottom of the receiver module indicating that the curtain is working properly. If you wave a piece of paper or an object through the beam the green light will turn red.
8. Press the green pushbutton to start the hydraulic pump.

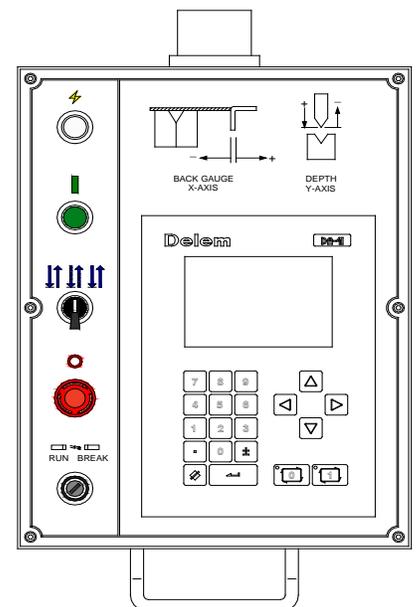




9. To check that the pump and motor are turning in the correct direction, place the cycle mode selector switch to the center jog position, and tap on the DOWN footswitch. The ram should come down.
10. On the Delem controller enter a program and then select that program. Verify the bottom die you are using and also the material thickness you will be bending. Refer to the Delem controller manual located in the back of this operator manual.
11. Press the green start button "1" on the Delem controller.
12. Turn the cycle mode selector switch to either the inch mode or the auto mode.
13. If in INCH mode, press and hold the DOWN pedal. If in AUTO mode, press and release the DOWN pedal.
14. With the light curtain switch set to "RUN" and an operators hand or object breaks the safety beam, the ram will not come down when the footswitch is stepped on.

⚠ WARNING: IF A HAND OR OBJECT BREAKS THE SAFETY BEAM AFTER THE CYCLE HAS BEEN STARTED THE RAM WILL NOT STOP unless you press the E-STOP button.

15. Adjust the dog on the travel limit guide rod so that the distance between the upper die and lower die is only slightly more than the thickness of the material being run. This does two things: Less chance of a foreign object getting between the dies and a faster cycle time when doing production work.





BENDING ALLOWANCE

In order to bend sheet metal accurately, you will need to consider the total length of each bend. This is referred to as bend allowance. Subtract the bend allowance from the sum of the outside dimensions of the piece part to obtain the actual overall length or width of the piece. Because of differences in sheet metal hardness, and whether the bend is made with the grain or against it, exact allowances must sometimes be made by trial and error. However bend allowances for general use can be obtained from metal working books or from the Internet.

UNDERSTANDING SPRINGBACK

Springback, also known as elastic recovery, is the result of the metal wanting to return to its original shape after undergoing compression and stretch. After the bending leaf is removed from the metal and the load is released, the piece part relaxes, forcing the bent portion of the metal to return slightly to its original shape. The key to obtaining the correct bend angle is to over bend the metal a little and allow it to spring back to the desired angle. All metals exhibit a certain amount of spring back.

MATERIAL SELECTION

 **CAUTION:** It must be determined by the customer that materials being processed through the machine are NOT potentially hazardous to operator or personnel working nearby.

When selecting materials keep these instructions in mind:

- Material must be clean and dry. (without oil)
- Material should have a smooth surface so it processes easily.
- Dimensional properties of material must be consistent and not exceed the machine capacity values.
- Chemical structure of material must be consistent.
- Buy certificated steel from the same vendor when possible.



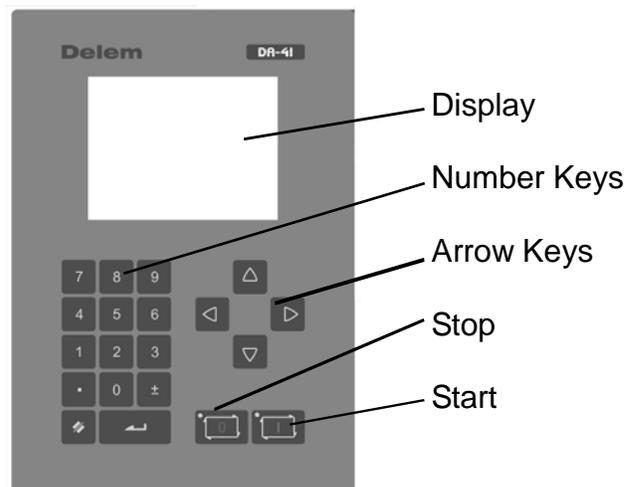
DELEM PROGRAMMABLE CONTROLLER

Front Panel

The following picture shows a representation of the front panel. The panel contains one display and several keys for programming and axis control. The display will be explained in the next section.

The keyboard contains the following keys:

- 10 numerical keys (0 - 9)
- decimal point
- plus/minus toggle
- clear key, to clear a parameter value
- enter key, to enter a typed value
- arrow keys, to select various parameters
- stop key (0) (incl. status LED)
- start key (1) (incl. status LED)



Display

The DA-41 has a monochrome LCD display, 320 x 240.

At the top of the screen, the different operation modes are represented by symbols.

| | | | | | | |
|---|------|------|------|---|-----|---|
| | | | | | | |
| Y = ___ . ___ X = ___ . ___ | | | | | | |
| : 1 : 1.00 # : 0 | | | | | | |
| | | | | | | |
| 1 | 90.0 | 0.00 | 0.00 | 0 | 0.0 | 0 |
| | | | | | | |
| | | | | | | |



Operating Modes

Introduction

The control has several modes for programming and operation:



product programming and execution



tool programming



program constants



manual movement



bend program selection

It is indicated in the top of the screen which mode is active.

Basic Navigation

- To switch between modes, press the <arrow up> key until the mode symbol is highlighted. Then use the <arrow left> and <arrow right> key to move to the required mode.
- Within a mode, use the arrow keys to move around between parameters and fields.
- To program a parameter, move the cursor to the appropriate symbol and type the required value. Press ENTER to confirm the value. A programmed value is also confirmed when an arrow key is pressed. In some cases, the <arrow left/right> keys can also be used to change values.
- Steps and their parameters can only be programmed and viewed when the control is stopped.
- To start execution of a program, press the 'Start' key.



Product Programming



Select this symbol for product programming and execution

This programming screen is divided into three areas:

- current Y and X position
- general product properties
- table with bend steps, each step has several parameters

In the upper right corner of the screen, the number of the currently active program is shown.

In this screen, a product program can be edited and executed. Programming of tools is explained in the programming section.

| | | | | | | |
|------------------------------------|------|------|------|---|-----|---|
| 1 | | | | | | |
| Y = ____ X = ____ | | | | | | |
| : 1 : 1.00 # : 0 | | | | | | |
| ↓ ↓ _r ↓ ↵ ↶ | | | | | | |
| 1 | 90.0 | 0.00 | 0.00 | 0 | 0.0 | 0 |
| | | | | | | |
| | | | | | | |

Tool Programming



Select this symbol for tool programming.

In this window, a set of tool properties can be programmed. During product programming, these tool properties are used for the calculation of Y-axis values.

Programming of tools is explained in the programming section.

| | | | | | | |
|-----------------------------|-------|------|--|--|--|--|
| 1 | | | | | | |
| : 1 : 0.00 : 0.10 | | | | | | |
| ↓ | | | | | | |
| | 60.0 | 0.00 | | | | |
| | 90.0 | 0.00 | | | | |
| | 120.0 | 0.00 | | | | |
| | 180.0 | 0.00 | | | | |



Program Constants



Select this symbol for the program constants

In this screen, several control settings can be viewed and changed.

V x.x Software version of this control

"/mm : Switch to select units:
0 = millimeters
1 = inches

 : hours: the number of hours the machine has been running. This parameter is read-only.

 : strokes: the number of bend strokes the machine has executed. This parameter is read-only.

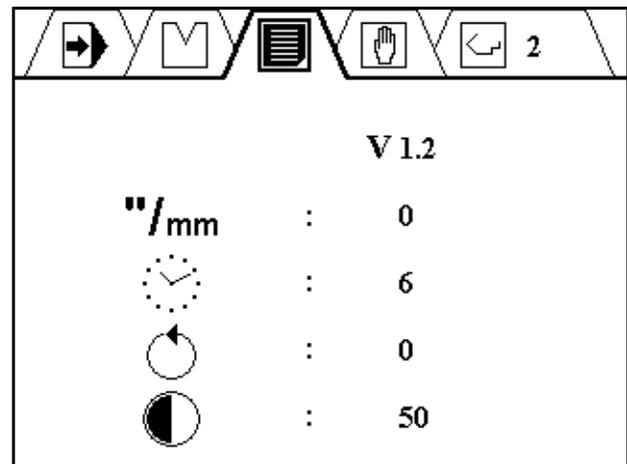
 : contrast (%)

 : brightness (%)

X : Current X-axis position. Program the current position of the X-axis. The control will retain this position value after power-down and automatically assume the same position value after power-on. After power-on, verify the axis position and correct this parameter when necessary. This parameter is only available in case there is no reference system for this axis installed on the machine.

Y : Current Y-axis position. This parameter works the same as for the X-axis.

Parameters (except the read-only ones) can be edited using the arrow keys (left and right) or they can be programmed numerically.





Manual Movement

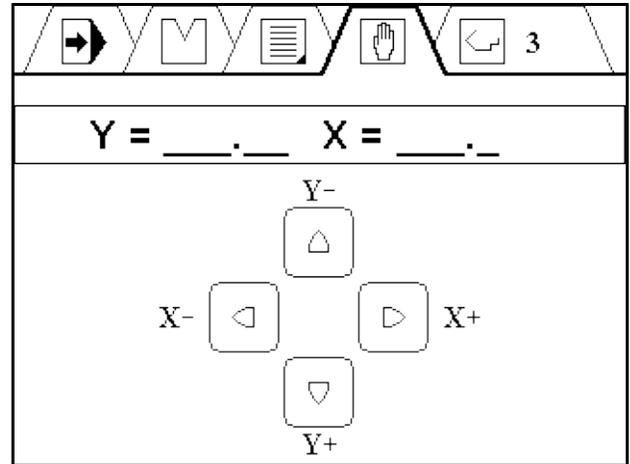


Select this symbol for the manual movement screen

In this screen the X- and Y-axis can be moved manually with the arrow keys. This can only be done when the control is not started. On the screen is indicated how an axis can be moved with a particular arrow key.

To move an axis gradually, press the arrow key once. To move an axis at high speed, press the arrow key continuously.

Press the 'stop' key to leave this mode and return to the product programming screen.



Product Selection



Select this symbol for the product selection screen

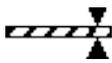
The symbols above each column have the following meaning:



Product number.

N

The number of bends in this product.



Sheet thickness of this product.



Used tool in this product.

| | | N | | |
|--|---|----------|------|---|
| | 1 | 1 | 1.00 | 1 |
| | 2 | 0 | 1.00 | 1 |
| | 3 | 0 | 1.00 | 1 |
| | 4 | 0 | 1.00 | 1 |



There are 100 product programs available in the control. To edit a program, it must be selected first. By default, all programs consist of 0 steps. As soon as a program has been selected, one step is added to the program.

To select a program, move the cursor to the required program number and press ENTER to select it. This program number is also displayed in the upper right corner of the screen, beside the mode symbol.

To select a program with a high number (e.g. 74), press the first digit of this number (e.g. 7). The cursor will automatically jump to the group of numbers that begin with this digit. Then use the arrow keys to get to the correct program number.

When a program has been selected, the control automatically switches to the programming mode.

A program remains active until another program is selected or until it is deleted.

To delete a program, move the cursor to the program number and press the clear key. The program number remains, but the number of steps is reset to 0.

Key Lock

The control is equipped with a key lock function, to prevent unauthorized programming.

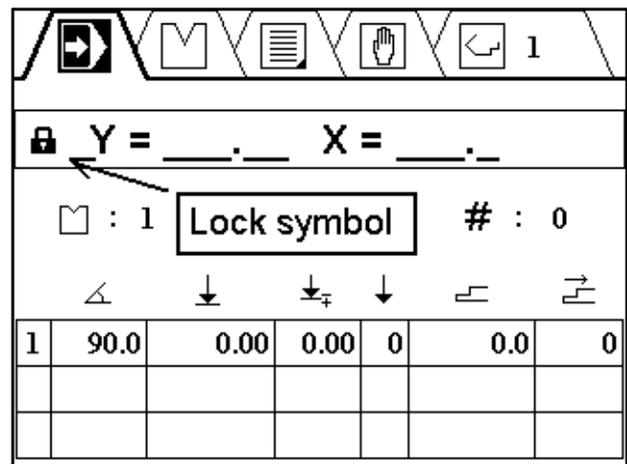
It depends on machine settings whether the key lock is implemented.

If the control is unlocked, it can be programmed as described in this manual.

If the control is locked, it is indicated by a lock symbol in the upper left corner of the programming window.

When locked, the following restrictions apply:

- programs cannot be created or edited
- programs cannot be deleted
- tools cannot be created or edited



The following actions are still possible when the control is locked:

- programs can be selected (if they consist of one or more steps)
- programs can be executed
- Y-axis corrections within programs can be changed
- program constants can be changed
- axes can be moved through the manual movement screen



Programming Products and Tools

Introduction

Programming of products and tools can be done very straightforward.

Normally, bend programs can only be programmed when tools are available, so tools must be programmed first.

Tools Programming

A tool is programmed on the control by entering a few essential tool values. These values will be used for automatic bend depth calculation during bend programming.

At the top of the tools window, three general tool properties are shown:



Tool number. Range: 1 - 15.



V-opening of the die.



Intended product thickness for this tool.

| Angle (°) | Y-axis (mm) |
|-----------|-------------|
| 60.0 | 0.00 |
| 90.0 | 0.00 |
| 120.0 | 0.00 |
| 180.0 | 0.00 |

The thickness programmed here will be important during product programming. The V-opening value serves for reference only and will not be used for calculations.

At the bottom of the tool window, a table is shown with angle values and Y-axis values.



Angle set point

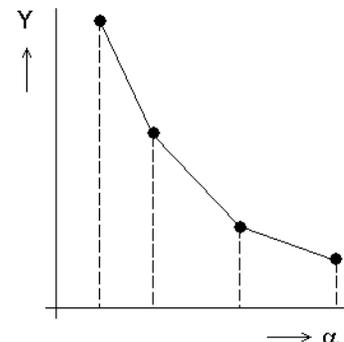


Y-axis value (bend depth) at this programmed angle value.

This table will be used to calculate the necessary bend depth to obtain a certain angle.

You must program four set points in the table. For angle values which are not programmed in this table, the control will use interpolation between two adjacent set points to calculate a corresponding Y-axis value.

In case there are less than four set points, program the required set points and leave the Y-value at zero for the invalid set points. The angle values in the first column must be programmed in increasing order.





Product Programming

Program Screen

As already explained, this programming screen shows the following information: Current axes positions, general product properties and a table with bend steps. In middle of the screen, the general product properties are displayed:

| | | | | | | |
|---|------|------|------|---|-----|---|
| | | | | | | |
| Y = ____ X = ____ | | | | | | |
| : 1 : 1.00 # : 0 | | | | | | |
| | | | | | | |
| 1 | 90.0 | 0.00 | 0.00 | 0 | 0.0 | 0 |
| | | | | | | |
| | | | | | | |

Number of the tool which is used for this product.

The thickness of this product.

Stock counter: count the number of products. If programmed to 0, the counter will increase after each finished product. If programmed higher than zero, the counter will count down. When it has reached 0, the control will stop and the stock counter will be reset to the programmed value.

Below this line, a table is shown with the bend steps of this product. Each line represents one bend step. The first column contains the bend number. For each bend step, the following properties can be programmed:

Angle of this bend.
Program here the required angle value. This parameter is available when a tool is programmed.

Y-axis bend depth.
When an angle is programmed, this value is calculated from the tool properties. A higher value means a lower beam position.

Correction on the Y-axis bend depth.
When angle programming is used, this correction is used to correct faulty Y-axis values. A positive correction means a lower beam position.

Y-axis opening time.
The required opening time after a bend, programmed as a percentage of the maximum opening time. This parameter depends on machine settings.



Beam high speed yes/no (1/0).

Select high travel speed for the beam during this bend, yes or no. This parameter depends on machine settings.



Back gauge position.

The required back gauge position for this bend.



Retract distance of the back gauge.

This parameter depends on machine settings.

A maximum of 25 bends can be programmed. For quick programming:

- put the cursor on the angle or Y-axis parameter
- type the required value and press ENTER: the cursor automatically jumps to the back gauge parameter
- type the required value and press ENTER
- repeat these steps for other bend steps

Use the arrow keys to move to a specific parameter.

Angle Programming

Angle programming is possible when a tool is programmed. When an angle value is entered, the control automatically searches the tool data for a matching angle value to obtain the corresponding Y-depth from. If no matching value is found, the control will calculate a Y-depth value from the existing tool data. To program a different Y-depth for a bend, simply change the bend depth value and press ENTER. Notice that the Y-depth value will not change, but the correction of the Y-depth will change to reflect recent modifications. Of course, the same can be achieved by programming the correction directly.

If the product thickness in the bend program is different from the thickness programmed in the tool then this difference will also be added to the resulting Y-axis value. So a larger thickness value in the product program will result in a lower Y-axis value (the beam will travel less deep) and vice versa.



Program Edit

To add a bend to the program:

Go to the last bend of the current program, move the cursor to the first column (bend number) and press ENTER. A new bend is added, which has the same parameter values as the previous bend.

To delete one or more bends:

Go to the last bend you wish to keep, move to the first column (bend number) and press the 'clear' button. All bends after the current bend are deleted.

The first bend cannot be deleted in the programming screen. To delete the program, go to the program selection screen and delete the program with the clear key.

Direct Axis Programming

To create a bend program without using the programmed tools, program 0 for the tool number. The angle parameter will no longer be available. Now it is possible to enter plain axis values.

Production Mode

Program execution is carried out from the programming screen. From here, it is possible to execute one or more bend steps.



To start a program, press 'Start'. The control will begin execution of the step on which the cursor is placed.



To stop execution, press 'Stop'.

A program is repeated until 'Stop' is pressed or until the stock counter (#) has reached 0 after down counting.

Programs can only be executed on the machine when the pump for the hydraulic system is running.



This symbol indicates the pump is not started.

| | | | | | | | |
|---------------|------|--------|--------|---|---------------|---|--|
| | | | | | | | |
| Y = ___ . ___ | | | | | X = ___ . ___ | | |
| | : 1 | | : 1.00 | # | : 0 | | |
| | | | | | | | |
| 1 | 90.0 | 117.00 | 0.00 | 0 | 0.0 | 0 | |
| | | | | | | | |
| | | | | | | | |



PARAMETER SETTING

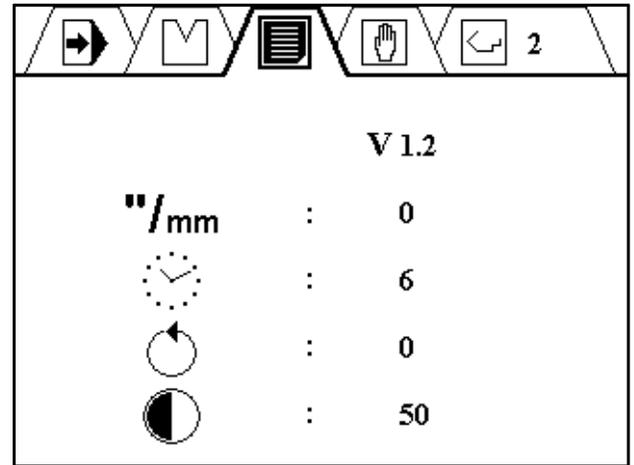
Select this symbol for the program constants.

Press ▲ or ▼

Choose "/mm

Type access code 852 and press enter

Parameter settings, press ▲ or ▼, select parameter and press enter



DA-41 PARAMETER

| Item | Function | Default | Correction | Remarks |
|----------------|---------------------------|---------|------------|-------------------------|
| General | Language | 0 | 0 | 0 = English |
| | | | | 1 = German |
| | | | | 2 = Turkish |
| | | | | 3 = Chinese Traditional |
| | | | | 4 = Chinese |
| | | | | 5 = Korean |
| | X-axis programmable | 1 | 1 | 0:NO, 1:YES (DEFAULT) |
| | Axis retract programmable | 1 | 1 | 0:NO, 1:YES |
| | Beam speed programmable | 1 | 1 | 0:NO, 1:YES |
| | Beam opening time | 0.0 | 0.0 | 0.0~9.9 sec |
| | Single inverter mode | 0 | 0 | 0: DUAL, 1:SINGLE |
| | Show state | 1 | 1 | 0: NO, 1:YES |



| Item | Function | Default | Correction | Remarks |
|--------------|--------------------------------|---------|------------|--------------------------------------|
| X-axis | Control type | 1 | 2 | 0:No 1:Servo 2:AC |
| | Min. value | 0.00 | 0.197" | 0.00~9999.99mm |
| | Max. Value | 9999.99 | 24.409" | 0~9999.99mm |
| Encoder | Pre scaling | 50.000 | 40.000 | 1.000~9999.999 counts/mm |
| | Count direction | 1 | 0 | 0~1 |
| | Reference search | 0 | 0 | 0:Manual, 1:Autoref |
| | Encoder filter | 1 | 1 | 0:1 MHZ, 1:100KHZ |
| Control | Spindle allowance | 1 | 0 | 0=One-side positioning 1=Two-side |
| | Overrun | 1.00 | 0.001" | 0.00~9999.99mm |
| | Overrun wait time | 500 | 1 | 0~9999ms |
| Output | In position tolerance | 1.00 | 0.039" | 0.01~9999.99mm(servo) |
| | Unipolar | 0 | 0 | 0:+-/10V, 1:10~10V |
| AC control | Drive type | 1 | 2 | 1:1 Speed, 2:2 Speed |
| | Positioning tolerance | 1.00 | 0.004" | 0.01~9999.99mm |
| AC output | Brake point low speed (BSS) > | 10 | 10 | 0~9999 count |
| | Brake point high speed (BFS) > | 100 | 100 | 0~9999 count |
| | Brake point low speed (BSS) < | 10 | 28 | 0~9999 count |
| | Brake point high speed (BFS) < | 100 | 6000 | 0~9999 count |
| | Stop time | 0 | 0 | 0~9999ms |
| | DC slow speed > | 4 | 4% | 1~100% |
| | DC high speed > | 80 | 80% | 1~100% |
| | DC slow speed < | 4 | 4% | 1~100% |
| | DC high speed < | 80 | 80% | 1~100% |
| | Acceleration ramp | 5 | 5 | 5~9999ms |
| Braking ramp | 5 | 5 | 5~9999ms | |



| Item | Function | Default | Correction | Remarks |
|------------|--------------------------------|---------|------------|--------------------------------------|
| Y-axis | Control type | 1 | 2 | 0:No 1: Servo 2:AC |
| | Min. value | 0.00 | 0.197 | 0.00~9999.99mm |
| | Max. Value | 9999.99 | 7.874 | 0~9999.99mm |
| Encoder | Pre scaling | 50.000 | 400.000 | 1.000~9999.999 counts/mm |
| | Count direction | 1 | 0 | 0~1 |
| | Reference search | 0 | 0 | 0:Manual, 1:Autoref |
| | Encoder filter | 1 | 1 | 0:1 MHZ, 1:100KHZ |
| Control | Spindle allowance | 1 | 0 | 0=One-side positioning 1=Two-side |
| | Overrun | 1.00 | 0.020" | 0.00~9999.99mm |
| | Overrun wait time | 500 | 1 | 0~9999ms |
| Output | In position tolerance | 1.00 | 0.001" | 0.01~9999.99mm (servo) |
| | Unipolar | 0 | 0 | 0:+-/10V, 1:10~10V |
| AC control | Drive type | 1 | 2 | 1:1 Speed, 2:2 Speed |
| | Positioning tolerance | 1.00 | 0.001" | 0.01~9999.99mm |
| AC output | Brake point low | 10 | 10 | 0~9999 count |
| | speed (BSS) > Brake point high | 100 | 100 | 0~9999 count |
| | speed (BFS) > Brake point low | 10 | 3 | 0~9999 count |
| | speed (BSS) < Brake point high | 100 | 90 | 0~9999 count |
| | speed (BFS) < | 0 | 0 | |
| | Stop time | 4 | 4% | 0~9999ms |
| | DC slow speed > | 80 | 80% | 1~100% |
| | DC high speed > | 4 | 4% | 1~100% |
| | DC slow speed < | 80 | 80% | 1~100% |
| | DC high speed < | 5 | 5 | 1~100% |
| | Acceleration ramp | 5 | 5 | 5~9999ms |



DA-41 BENDING VALUE

Width and thickness in accordance with the value of the value of the angle.

| | | | | |
|---------------------------------|--------|--------|--------|--------|
| <p>1 0.236" 0.039"</p> | ~L90° | L120° | L135° | L180° |
| | 5.626" | 5.226" | 5.206" | 5.157" |
| <p>2 0.394" 0.047"</p> | L90° | L120° | L135° | L180° |
| | 5.346" | 5.263" | 5.231" | 5.150" |
| <p>3 0.591" 0.079"</p> | L90° | L120° | L135° | L180° |
| | 5.413" | 5.289" | 5.240" | 5.118" |
| <p>4 0.984" 0.118"</p> | L90° | ∠120° | ∠135° | ∠180° |
| | 5.571" | 5.363" | 5.282" | 5.079" |
| <p>5 1.1575" 0.177"</p> | L90° | ∠120° | ∠135° | ∠180° |
| | 5.807" | 5.474" | 5.346" | 5.020" |



NOTES



NOTES



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