MASTEEL BRAKE

Hydraulic Synchronized CNC Control
(TP 700A Control-Y1 Y2 X R)

Version 6.xx

OPERATING MANUAL

MASTEEL AMERICA CORPORATION

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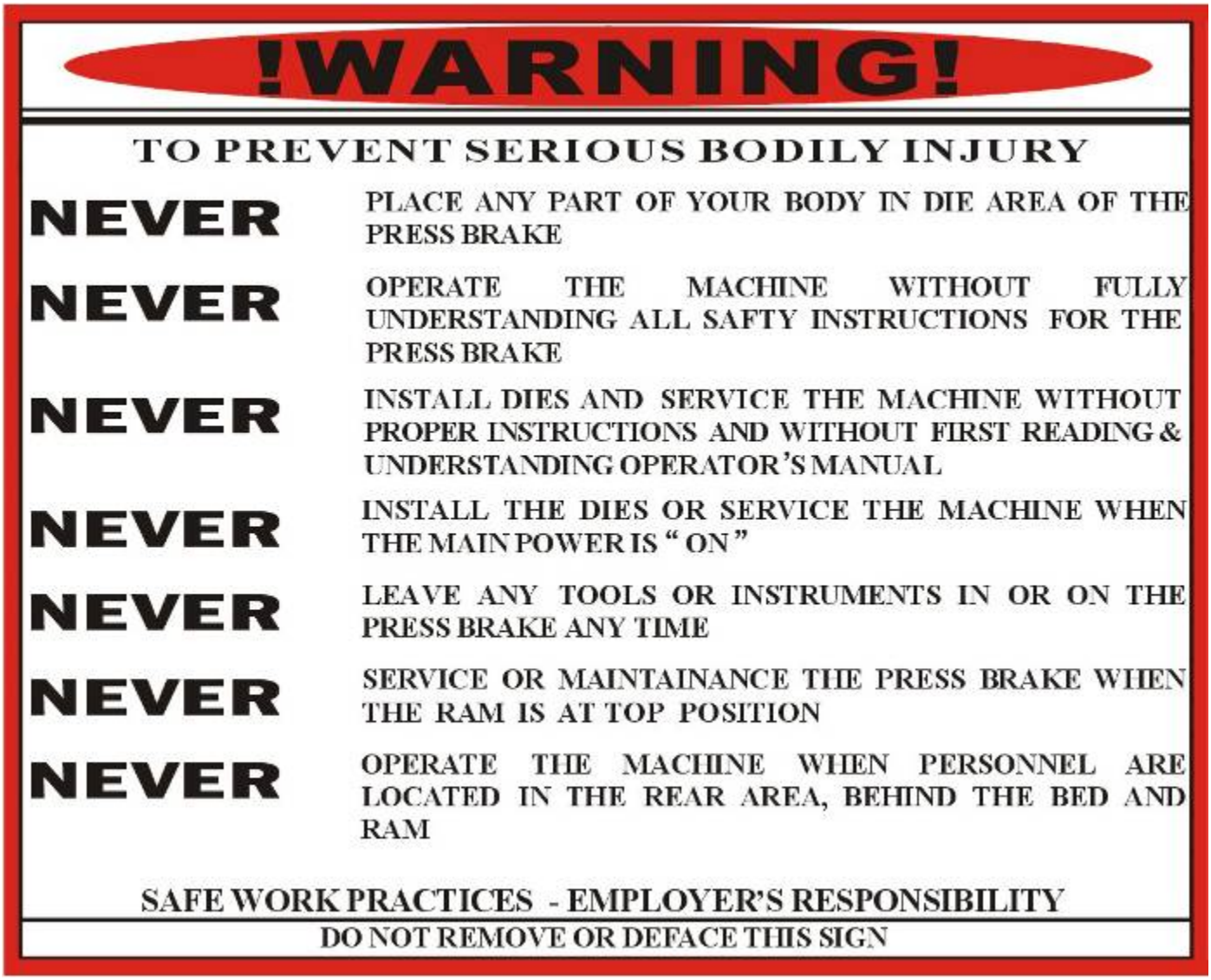

!WARNING!
TO PREVENT SERIOUS BODILY INJURY
NEVER
PLACE ANY PART OF YOUR BODY IN DIE AREA OF THE PRESS BRAKE
NEVER
OPERATE THE MACHINE WITHOUT FULLY UNDERSTANDING ALL SAFTY INSTRUCTIONS FOR THE PRESS BRAKE
NEVER
INSTALL DIES AND SERVICE THE MACHINE WITHOUT PROPER INSTRUCTIONS AND WITHOUT FIRST READING & UNDERSTANDING OPERATOR'S MANUAL
NEVER
INSTALL THE DIES OR SERVICE THE MACHINE WHEN THE MAIN POWER IS " ON "
NEVER
LEAVE ANY TOOLS OR INSTRUMENTS IN OR ON THE PRESS BRAKE ANY TIME
NEVER
SERVICE OR MAINTAINANCE THE PRESS BRAKE WHEN THE RAM IS AT TOP POSITION
NEVER
OPERATE THE MACHINE WHEN PERSONNEL ARE LOCATED IN THE REAR AREA, BEHIND THE BED AND RAM
SAFE WORK PRACTICES - EMPLOYER'S RESPONSIBILITY
DO NOT REMOVE OR DEFACE THIS SIGN

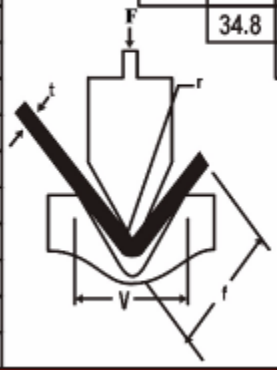
Force to Air-Bend Mild Steel (60,000 PSI)

F = U.S. tons/lineal ft. of workpiece

ALL DIMENSIONS IN INCHES

t ga.	in.	v	1/4	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	v
		f	3/16	9/32	11/32	7/16	9/16	11/16	7/8	1 1/8	1 3/8	1 3/4	1 13/16	2 13/16	3 1/2	4 1/2	5 1/2	6 7/8	f
		r	1/32	1/16	5/64	7/64	9/64	5/32	13/64	1/4	5/16	13/32	33/64	5/8	3/4	1 1/32	1 5/16	1 5/8	ga.
20	0.036		3.1	1.75	1.2														20
18	0.048		5.4	3.1	2.1	1.55	1.3		F Values										18
16	0.060		9.6	5.5	3.8	2.8	2.2	1.45											16
14	0.075			9.3	6.4	4.7	3.8	2.5	1.85										14
12	0.105			20.5	14.0	10.4	8.1	5.6	4.1	3.2	2.2								12
11	0.120				18.5	13.9	10.9	7.4	5.6	4.3	2.9	2.15							11
10	0.135				25.2	17.2	14.5	9.9	7.3	5.7	3.8	2.85	2.23						10
3/16	0.188					34.8	27.6	19.1	13.9	11.0	7.5	5.6	4.3						3/16
1/4	0.250						58.0	39.5	29.0	22.8	15.5	11.4	8.9	6.1	4.5				1/4
5/16	0.313							69.5	51.0	40.0	27.0	20.0	15.6	10.5	7.8	6.1			5/16
3/8	0.375								75.0	59.0	40.0	29.5	23.4	15.8	11.7	9.2	6.2	4.6	3/8
7/16	0.438								115.0	90.0	61.0	45.5	35.2	24.0	17.8	13.9	9.4	6.9	7/16
1/2	0.500										85.0	62.0	44.3	33.0	24.5	19.1	13.0	9.8	1/2
5/8	0.625												86.0	58.0	43.0	34.0	23.2	17.5	5/8
3/4	0.750													91.0	67.0	53.0	36.4	26.7	3/4
7/8	0.875													136.0	101.0	79.0	54.0	40.0	7/8
1	1.000														146.0	115.0	68.0	58.0	1

FOR STEEL OF DIFFERENT TENSILE STRENGTH F VALUE DIFFERS IN PROPORTION TO STRENGTH RATIO INSIDE RADIUS r. FOR MILD STEEL, IS ABOUT 5/32 OF FEMALE = DIE OPENING V FOR ANY t. SHADED F VALUES ARE FOR V = 8t. COMMON FOR AVERAGE 90° BENDING. IF t IS 1/2 IN. OR MORE USE v = 10t.



t = WORKPIECE THICKNESS
r = INSIDE RADIUS OF FORMED PART
v = VEE-DIE OPENING
f = MINIMUM FLANGE

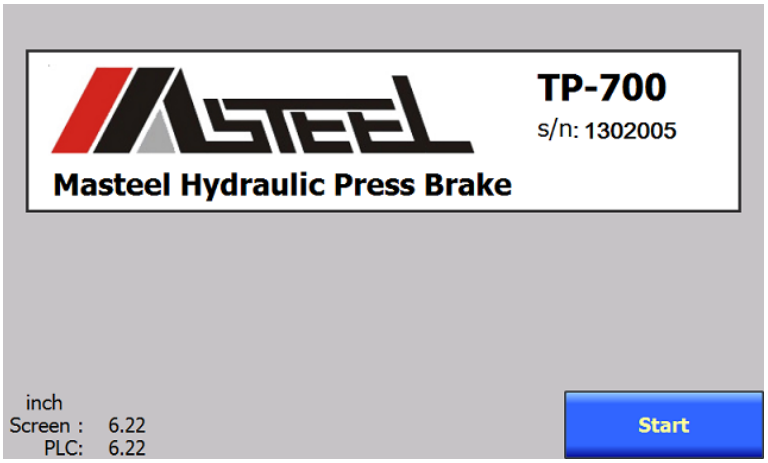
OPERATING INSTRUCTION

1. POWER ON AND START UP
2. TP-700 CONTROL CONSOLE OPERATION
3. MAIN SCREEN DISPLAY
4. OPERATING CONTROLS
5. MUNUAL MODE:
   - SETTING UP BENDING POSITION and BENDING ANGLE
   - BACKGAUGE POSITION CONTROL
6. AUTO MODE: EDIT, CREATE AND AUTO RUN JOBS
7. TOOL SETUP
8. AXIS CALIBRATION (X axis - back gauge, Y1 Y2 axis - ram)

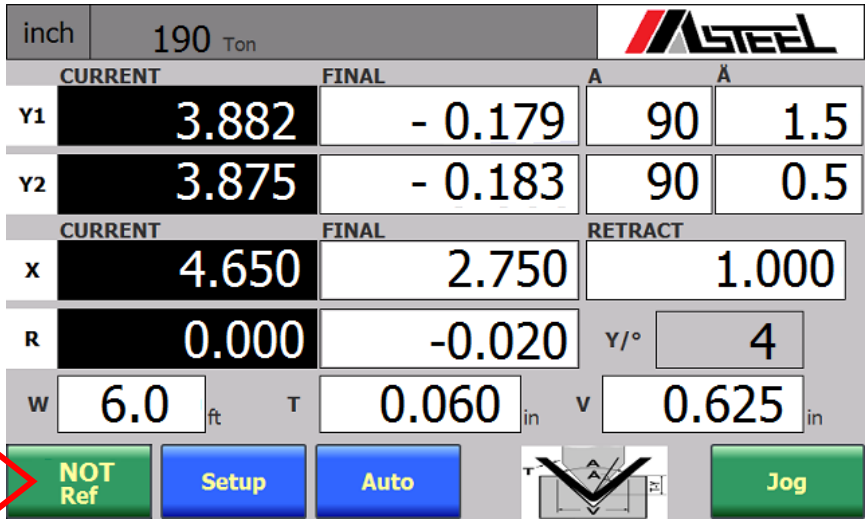
MASTEEL PRESSBRAKE
TP-700 OPERATING INSTRUCTIONS

Always use JOG Mode after changing settings to check bending position.

1. POWER ON AND START UP

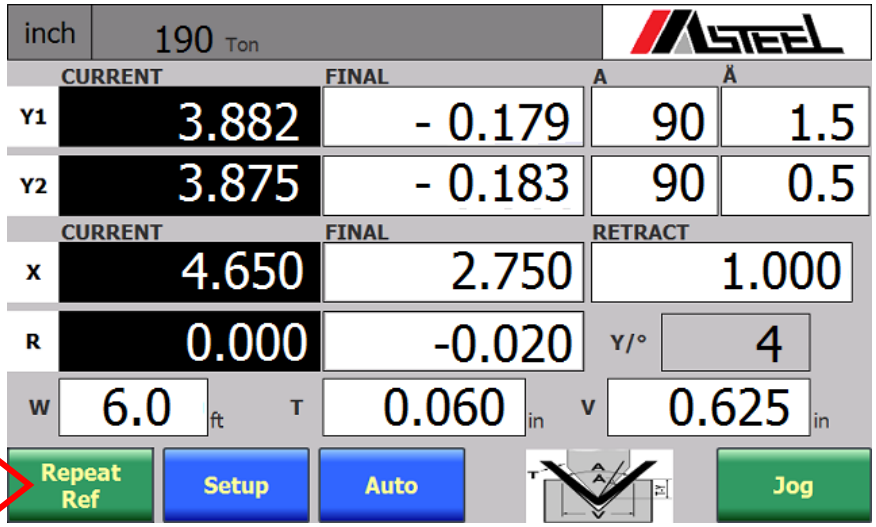


1.1 Turn on the main power switch on side of electrical cabinet.
1.2 Release the emergency switch on control panel and foot control.
1.3 Make sure all the door switches are closed
1.4 Turn the control power key switch to “ON”.
1.5 Insure that no foreign objects can interfere with brake operation
1.6 Press "Start" to Operate the brake and you will see “NOT REF” flashing. This indicates the Y axis need to seize reference position in order to get Y axis position correctly



1.7 Turn on pump. Make sure ram is not all the way up. Press foot pedal to jog the ram down if it is all the way up. And then press Ram up push button and Ram will move up to seize the Y reference position.

Once the Y axis reach to reference position, " NOT REF" will disappear, and changed to display "Repeat Ref" “Repeat Reference” is used for recovery of Y axis position when power surge or any other situation causes the Y axis position errors.

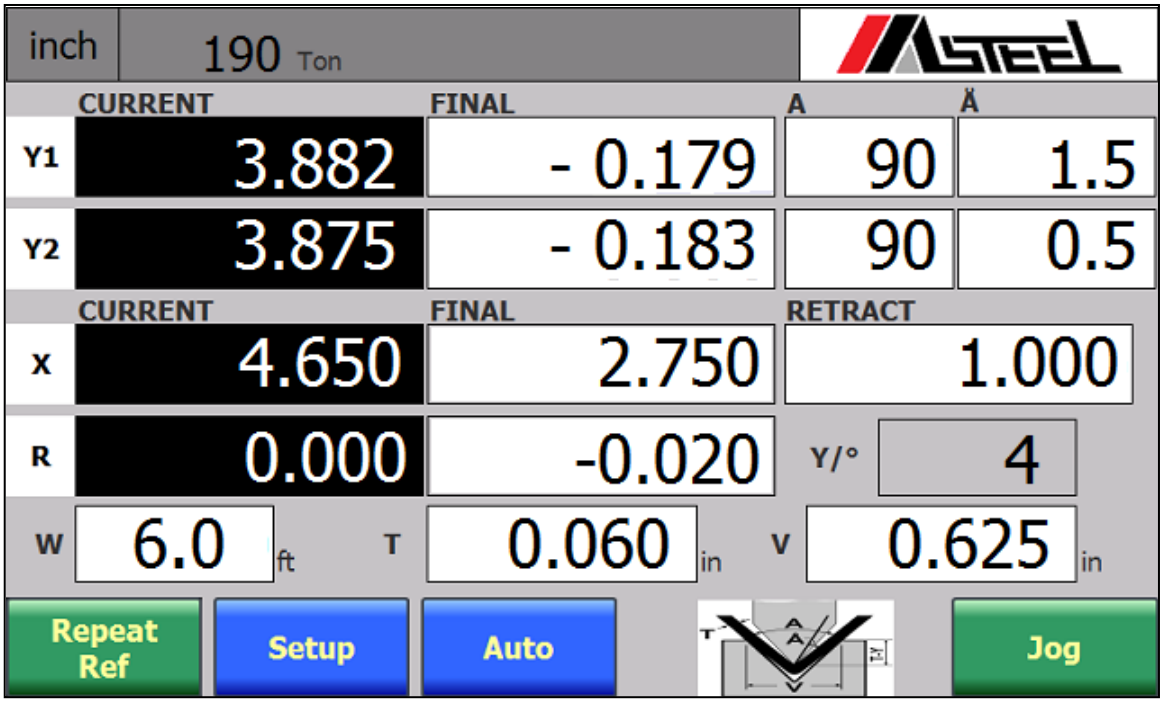


1.8 Prepare to bend

Note:A full ram stroke cycle includes ram fast approach, slow bending and rapid return. Slow speed position must begin above the material. Without proper setting of the ram full stroke, the brake will not perform correctly. The auto mode will not activate the next step cycle without a fully completed ram stroke cycle.

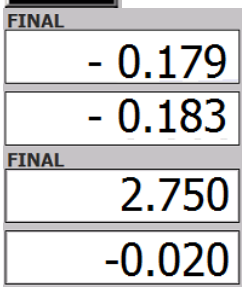
- Check and/or change ram top stop and slow speed position.
  To check slow speed position, use double stop mode. Press and hold foot switch to have ram move to slow speed position. This position must be above job material.
  To change slow speed or ram top position, refer to section 4 of this manual.
- Check working pressure. Pressure are defaut to min pressure after power on machine in case of over pressure to damage the tooling. refer to section 4 of this manual.

2. TP-700 CONTROL CONSOLE OPERATION

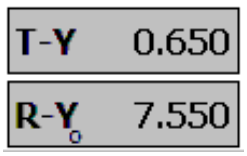


Touch panel display and push buttons

Push Button in dark background -- enables programmable control function and displays next control function screen.

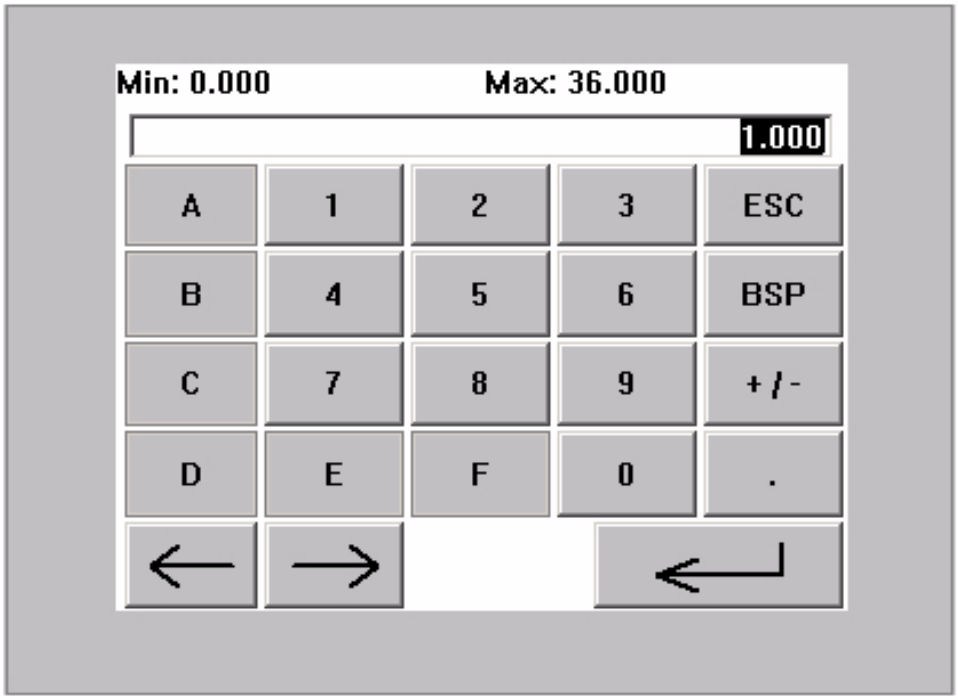


Programmable Setting Field – touch this key and number pad will display to allow input of desired angle setting.



Operating Status Display (display only)

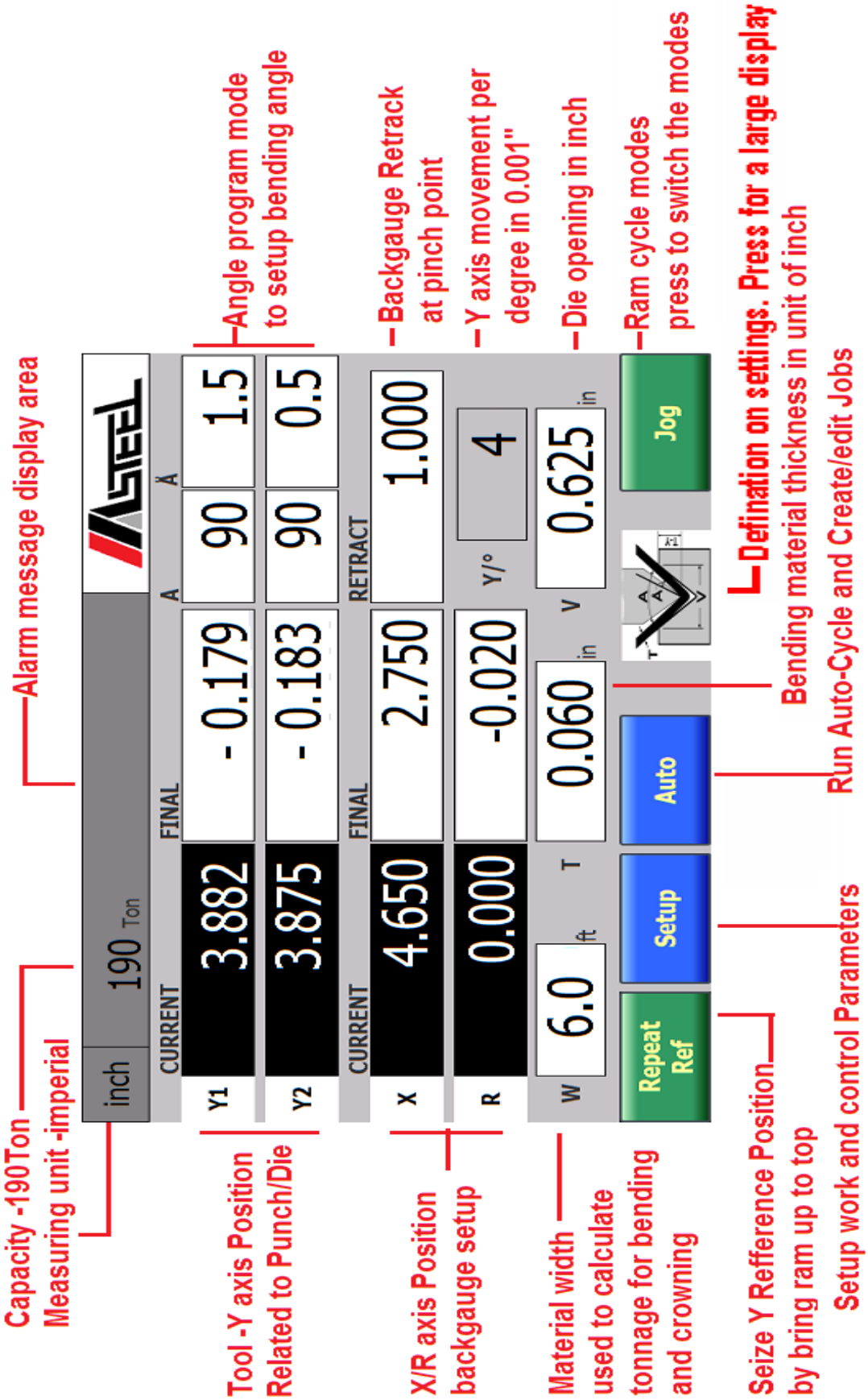
Value Setting Key Pad



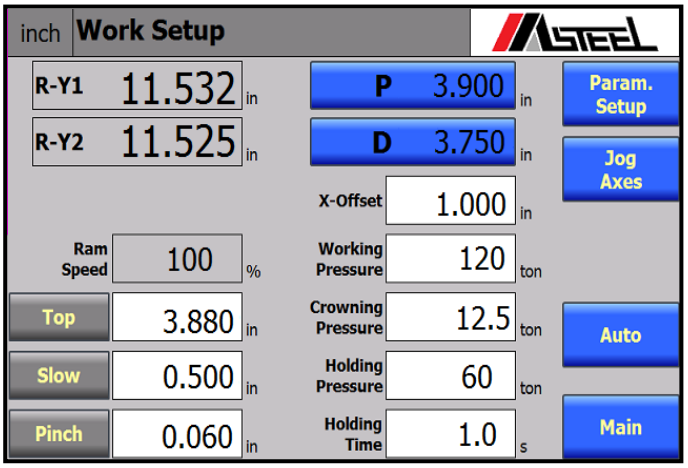
Command Keys Description

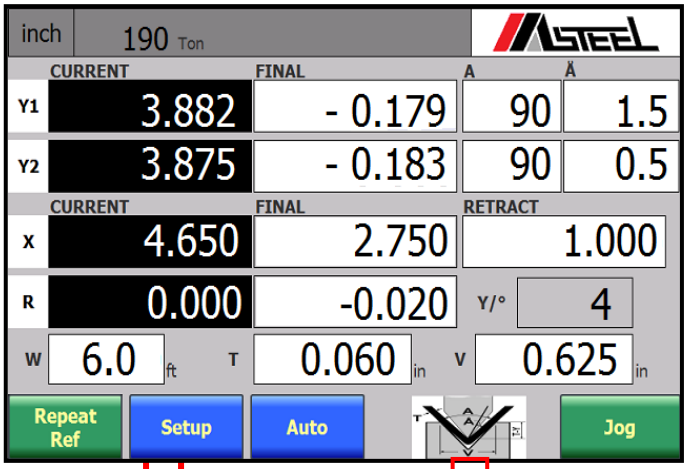
↵	Use this key to enter new data and to acknowledge a message(s).
ESC	Use this key to abort an edit.
BSP	Back space.
←	Scrolls the cursor to left.
→	Scrolls the cursor to right
+ / -	Positive and negative
Help	Definition of the current setting

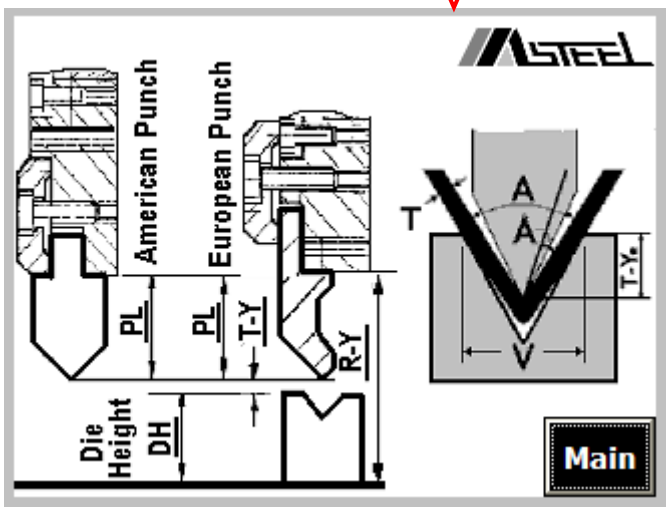
3. MAIN CONTROL FUNCTION AND DISPLAY



3.1 Current operating status display







190 Ton : Maximum Brake Capacity

X/ R/Y1/Y2: TP 700 has capability of control 4 axis on a press brake.
X/R axis are for backguage. X is horizontal backgauge setting and R is Vertical backgauge setting

Y1/Y2 is vertical (Ram travel)

X-X 4.650: Backstop-X current position in “inches”.

R-R 0.000: Backstop-R current position in “inches”.

Y-R 11.528: Current Ram Position related to top of bed in “ inches”. **11.528”** indicates that mounting surface of the punch is **11.528”** above the top surface of table.

Y1-T (Y2-T): Current Punch Position related to Die in “inches”. “**3.882”** indicates that the tip of the punch is 3.882” above the top surface of the die block, i.e. the setting of **T-Y –0.179”** indicates that the punch tip is 0.179” below (negative) the top surface of the die block. The setting of **Y1-T –0.179”** determines the bending angle for 90°+ 1.5°.

Settings to Program bending angle

V : Die opening in "inches". (Refer to Masteel 4-way die specifications)

A : Required bending angle in "degrees". Measured at the inside of the bend

Å : Bending angle correction in “degrees”. Input "0" on the first test bend. Measure inside bend angle to determine correcting angle required. Input "- (minus) " degrees to correct for under bend : input "+ (plus)” degrees to correct for over bend.

T : Material thickness in unit of 0.001" (see bending chart on page 2)

P : Current Punch Setting

D : Current Die Setting

3.2 X/R AXIS POSITION -related to TOOL & Brake configuration

X axis Position

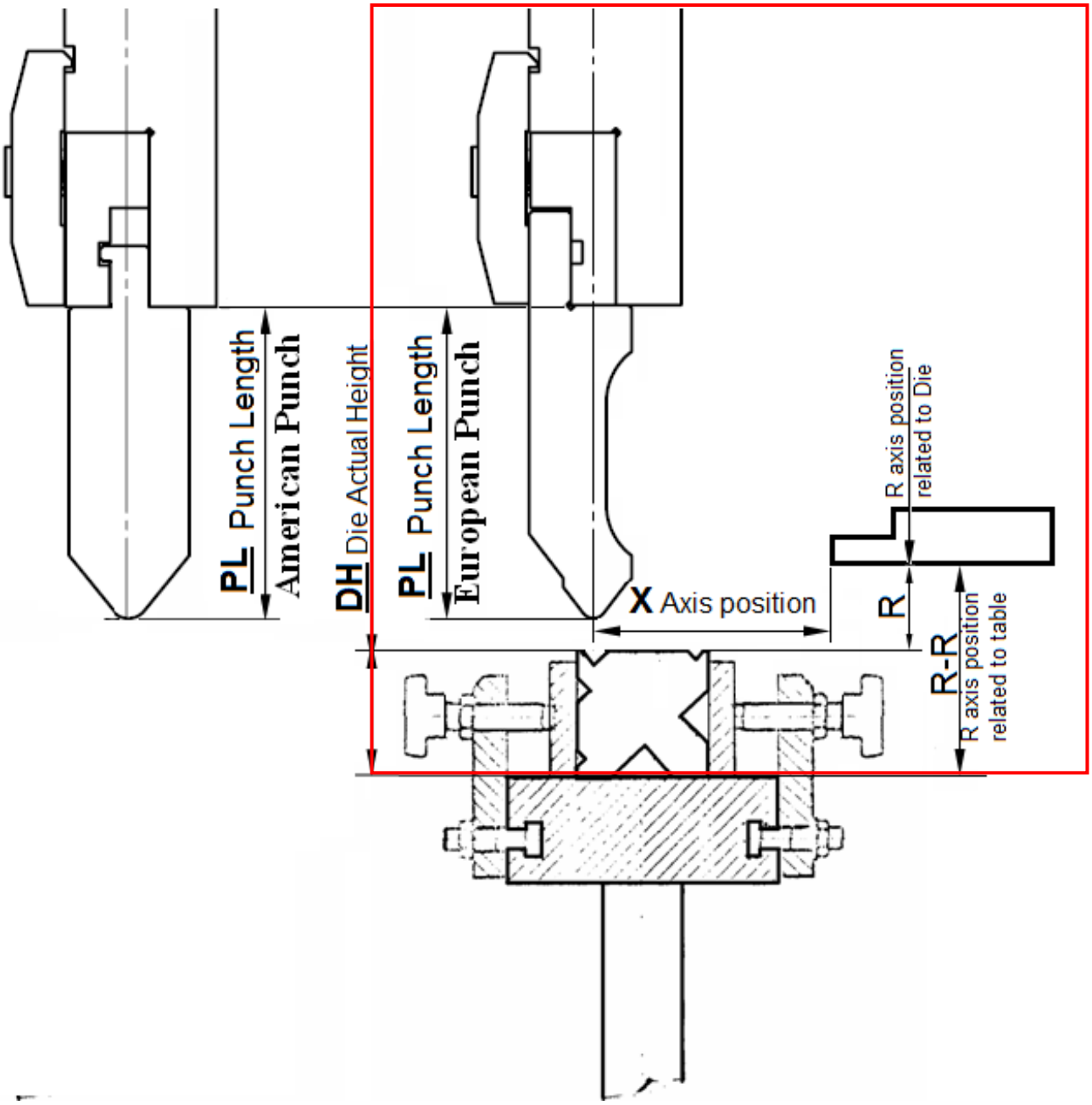
X axis position is Measured from Ram and Punch load support center to end tip of back gauge finger. The center of load support line is "0" for X axis position. It is fixed with brake configuration of brake

There could be 2-4 step of gauge position. Refer to back gauge offset on section 4.4 for work setup

R axis Position related to Die and brake table

R-R axis position is related to brake table. The top of table is "0" position for R-R axis. It is fixed with configuration of brake. This position is used to calibrate R axis.

R axis position is related to Die height. The top of the Die is "0" position for R axis. R axis position is re-calculated every time change Die.



3.3 Y AXIS POSITION --related to TOOL & Brake configuration

T-Y: Tool Coordinate Y axis Position

Tool coordinate Y axis position "T-Y" is relative to TOOLING – punch + die and is defined as the distance measured from the tip of punch to the opening of the die at the bending position. "Zero" position for Tool Coordinate Y axis position is even on the top surface of die. When T-Y is "0" the tip of punch is level with the top of the die opening. A negative T-Y value indicates that the bending position is below the top surface of die. A positive T-Y value indicates that the bending position is above the top surface of the die. T-Y is determined by tool settings – Punch length (PL) and Die height (DH). "T-Y" will not be correct unless tool settings are properly entered. **ALWAYS ENSURE THAT CURRENT TOOL SETTINGS ARE CORRECT**. Current Tool Settings are displayed on the main screen. The setting position of T-Y determines the bending angle and can be programmed by input position or angle on main screen.

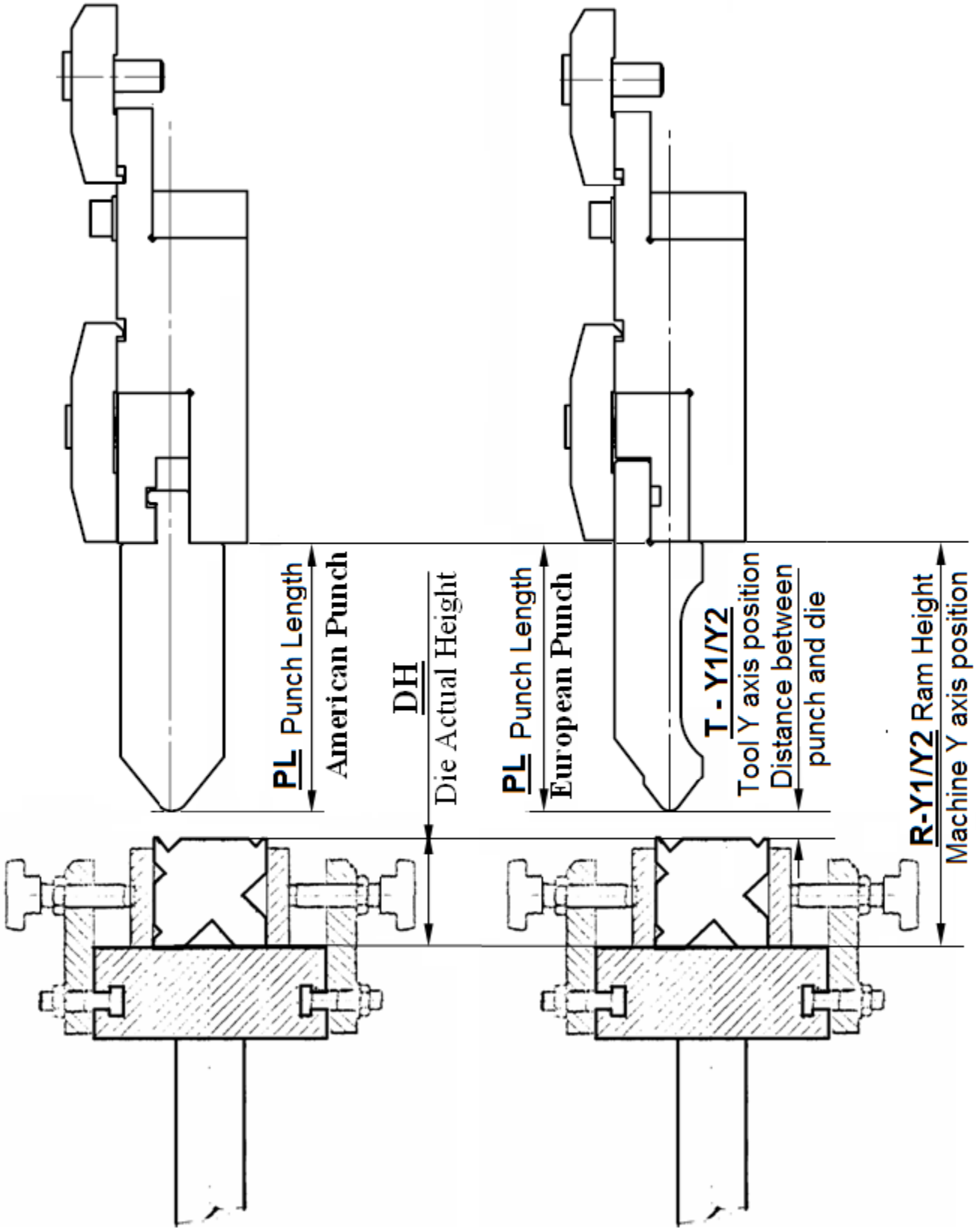
R-Y: Ram Coordinate Y axis Position

Ram Coordinate Y axis Position is relative to BRAKE SPECIFICATION – ram + table and is defined as the distance between the ram mounting surface for punch and top surface of the table for mounting the die. "Zero" position for Ram Coordinate Y axis position is even on the top surface of table. The Minimum position of R-Y indicates Ram close height; the Maximum position indicates Ram Max open height. The formula for calculating R-Y is: PL + DH + "T-Y" ("R-Y" is calibrated by the factory according to brake specification and T-Y is calculated by what punch and die are supplied with machine on delivery).

Calibrate Ram Height R–Y – only when the Y axis position is not correct. First make sure the current tooling is correct

- Check the tool setup on main screen: PL (punch length) is measured from the punch holder to the tip of the punch (see drawing). DL (die height) is measured from the base to the top surface of the die block.
- If the tool settings are not correct see section 9 to reset tool dimensions
- If the tool settings are correct, see section 10 to calibrate R-Y (ram height).

TOOL & RAM COORDINATE Y AXIS POSITION



4. GENERAL INTRUDUCTION OF OPERATING CONTROLS

4.1 Function Control Switch

Operating Control Panel

Pump on push button

Power on indicator light

NC Control Key switch lock-out

Pressure Adjustment (optional)

Ram Up Push Button

Emergency Stop Switch

4.2 Ram Operating control

Foot pedal control functions

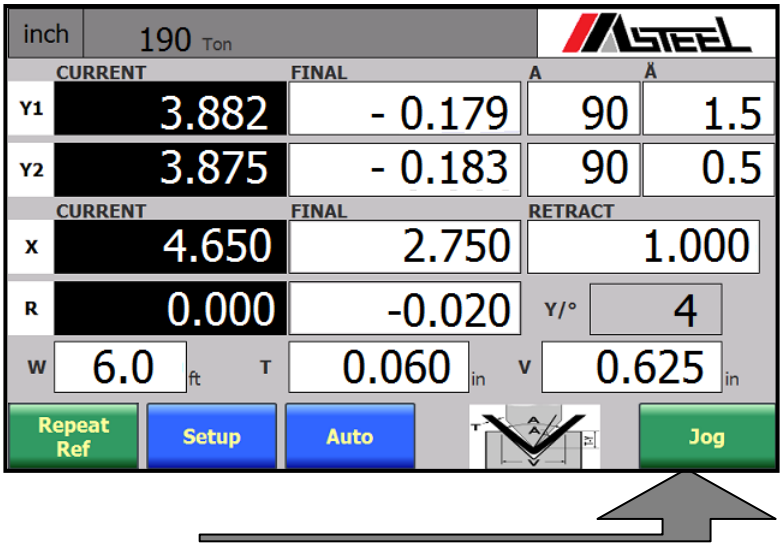
- **Jog Mode –** Press foot switch. Ram will jog down; releasing the foot switch will stop the ram in any position in the down stroke. Press Ram Up button to return ram to top of stroke.
- **Single Stroke Mode –** Press & hold foot switch to start and complete an uninterrupted stroke cycle.
- **Double Stop Mode –** Press & hold foot switch. Ram will move rapidly down to the slow speed position and stop. Release foot pedal then press & hold foot pedal switch again to complete slow speed and bending cycle.
- **Follow Bend Mode –** Press & hold foot switch to have ram rapid approach to the slow speed position and stop. Then, foot pedal is used to jog bend to set angle position and jog up the ram to follow the return of the job material. Make sure material is fully supported before releasing from bend position.
- **Auto Bend Control –** Press & release foot pedal switch to complete each step of the programmed bend sequence.

Ram Up Switch

- **Jog Mode** - Press & release ram up switch. Ram will jog up to stop at any point below maximum ram open height. Ram will stop at maximum ram open height.
- **Single Stroke/ Double Stroke Mode** - Press & release ram up switch. Ram will return to programmed top stop position from ram slow speed position.
  Press & hold ram up switch to have ram return to maximum ram open height.

4.3 Ram Operating Mode

Press operating mode button to switch six operating modes of the ram cycle control.



1. Jog Mode /Jog bend mode
2. Single Stroke Mode
3. Two Stop Mode
4. Jogging bend Mode
5. Follow Bend Mode
6. Adjust Mode

- **Jog Mode /Jog bend Mode**
  - To jog down the ram: press & release foot switch to inch down the ram to the slow speed position, then slow jog the ram to the bending position. The ram can be stopped in any down position by releasing pressure on the foot switch.
  - To jog up ram: press & release ram up switch to jog up the ram to any position until the ram reaches top limit position – (Max. ram open height.)

  Jog bend Mode: ram up automatically after reach bending position
- **Two Stop Mode**
  - Press & hold foot switch and ram will stop at programmed slow speed position.
  - Press & hold foot switch again. Ram will slowly move down to bending position and hold the position for the time set by ram delay.(see setup to adjust).
  - Ram returns to programmed top stop position from bending position to complete double stop cycle.
  - Ram will return to programmed top position when foot switch is released during cycle or ram up switch is pressed at the slow speed position.

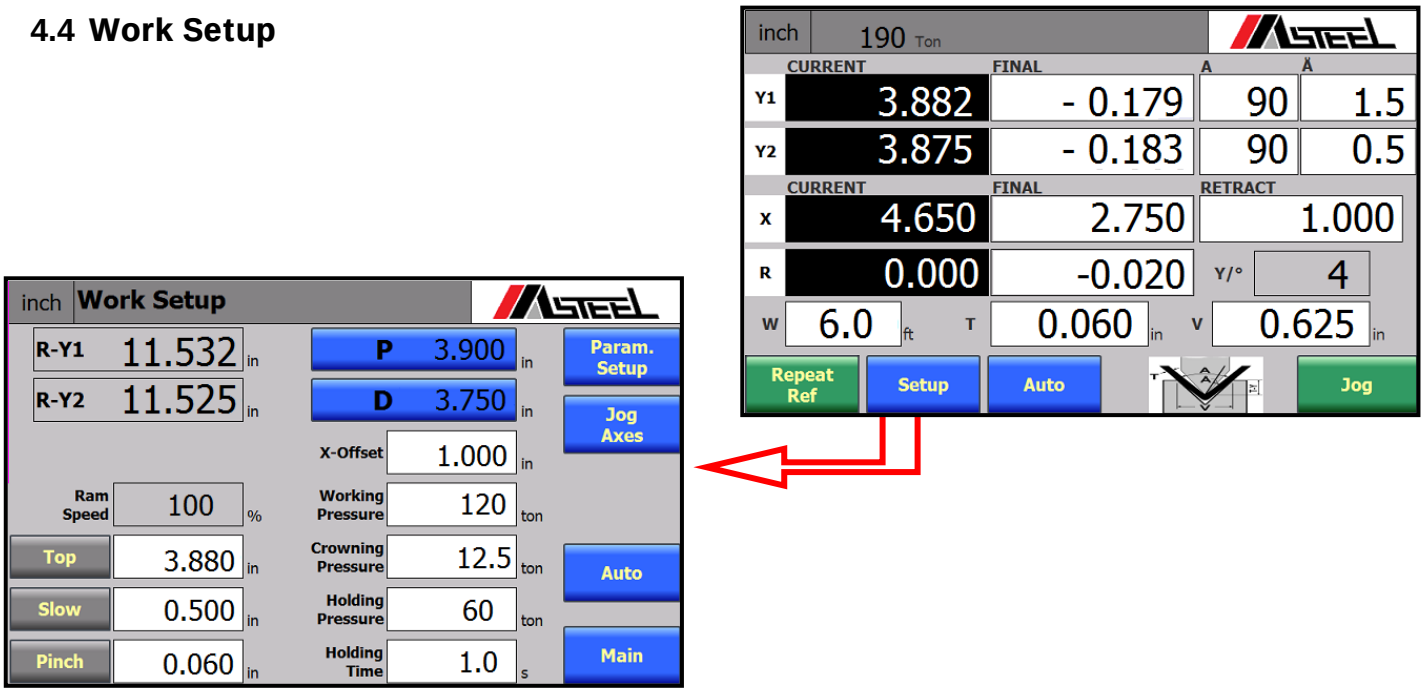
- **Follow Bend Mode -**This mode is useful for bending large or heavy sheet metal using an overhead crane or lifting assist.
  - Press & hold foot switch and ram will stop at programmed slow speed position.
  - Press and release foot switch to jog bend the material. Support the material during the bend cycle.
  - Ram will slow jog to bending position and hold the position for the time set per ram delay setup.
  - Press and release foot switch to slowly jog up to programmed top stop position.

- **Single Stroke Mode**

- Press & hold, ram will rapidly move down to programmed slow speed position, then slow down to bending position and hold the position for time set in the ram delay setup.
- Ram returns to programmed top stop position from bending position to complete single stroke cycle.
- Ram will return to programmed top position any time that foot switch is released.

▭ **Adjustment Mode** -- operating the ram with min pressure for setup tooling and service

4.4 Work Setup



▭ **Setup Ram Top Stop & Slow speed/Second stop position**
A full ram stroke cycle includes ram fast approach, slow bend and rapid return. Slow speed position should start above the bending material. Without proper settings, the ram may not complete a full stroke cycle and consequently the press brake will not perform correctly. Auto mode will not activate the next step cycle without a fully completed ram stroke cycle.

Select **Double Stop** to check the ram setup position. Adjustments are made by input of the T-Y position directly for Top stop and slow bending position, or press “Set” to teach in the current position (as optional)

- Press & hold foot switch to have ram stop at programmed slow speed position
- Press & release ram return switch and ram will return to the programmed top stop position

▭ **Setup pinch point**
Used for backgauge re-track function. The pinch point position should be the same as material thickness, and can be adjustable to suit for material condition like checker-plate. Adjustments are made by input of the T-Y position directly for Pinch Point

▭ **Back Gauge X – Offset**

Used for different setup on finger measuring position. Offset amount indicate finger measurement different from factory setup at front tip of back gauge finger

- **Working Pressure**

  Working pressure is set for the job less than full capacity of brake

- **Holding Pressure and holding time**

  ◊ Used for holding bending position with pressure to ensure constant forming angle and avoid angle various caused by material spring back

  ◊ Used for holding ram in bending position at follow bend for heavy bend application with crane handling

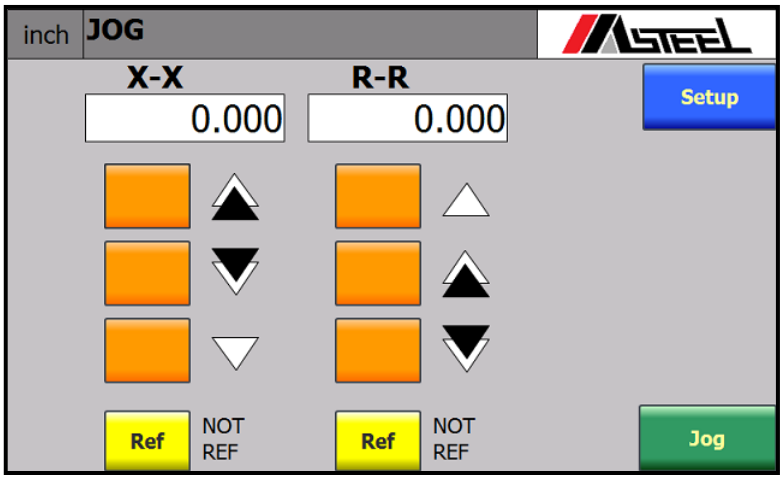
- **Axes Jogging**

  X – X and R-R BACK GAUGE ADJUSTMENT

  Rapid increase adjustment

  Rapid decrease adjustment

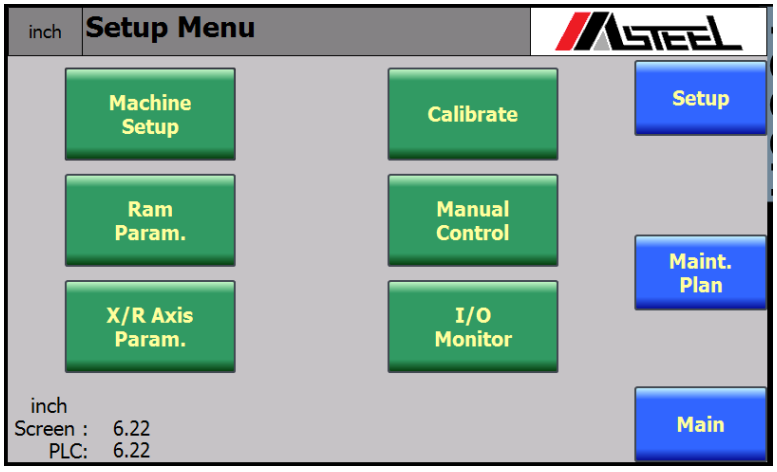
  Fine decrease adjustment



- **Parameter Setup**

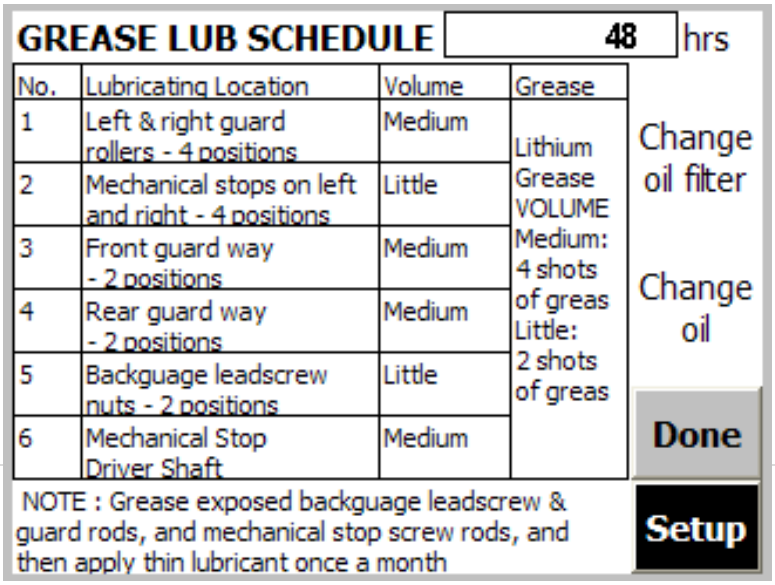
  Password protected and used for brake calibration and parameters setup

  – X and Y axis calibration
  – X axis setup
  – Brake setup
  – Ram parameter
  – Password setup
  – Manufacturer setup



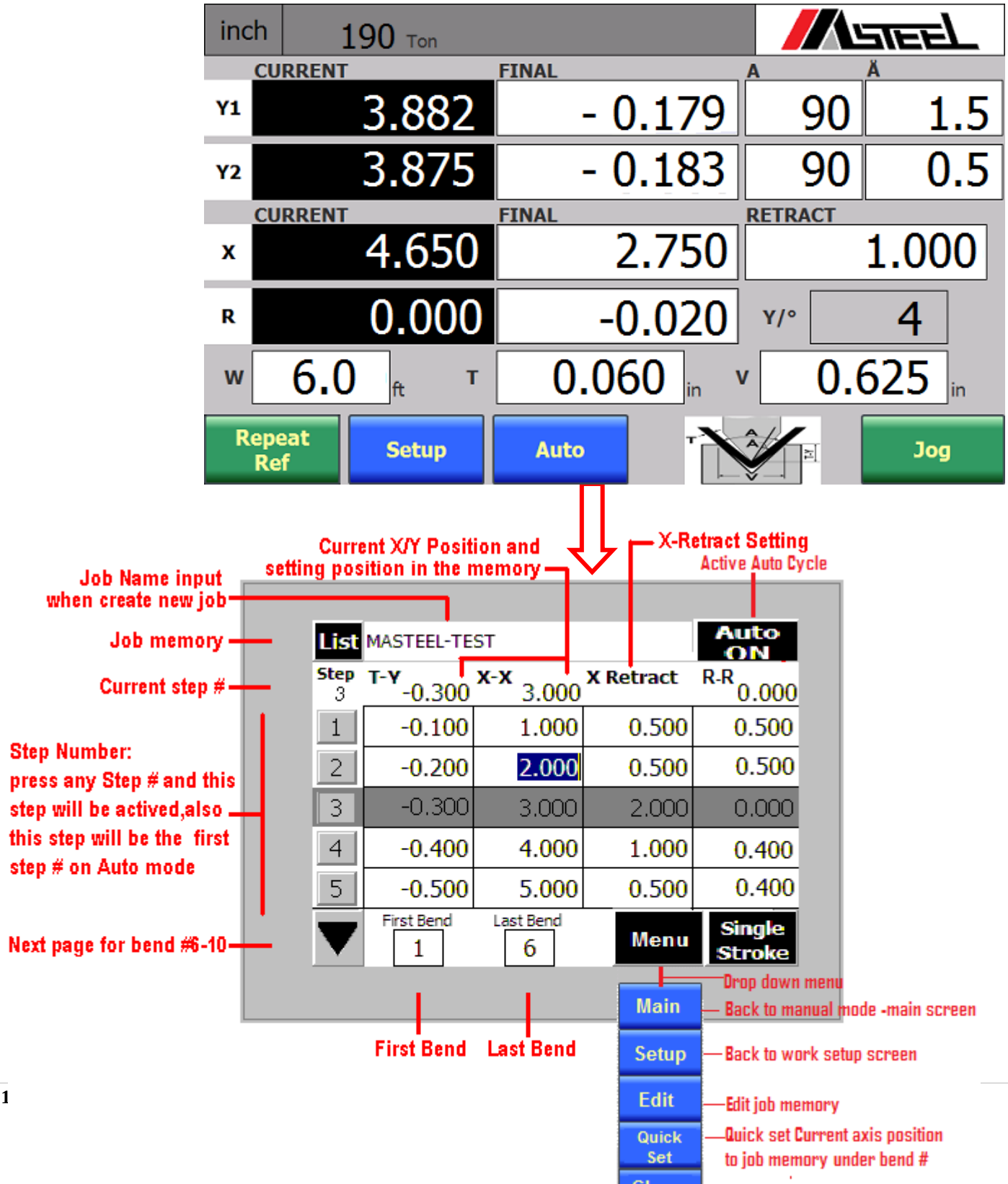
- **Maintenance Plan**

  – operating hour counter
  – Reminder of lubrication
  – Reminder of oil & filter change



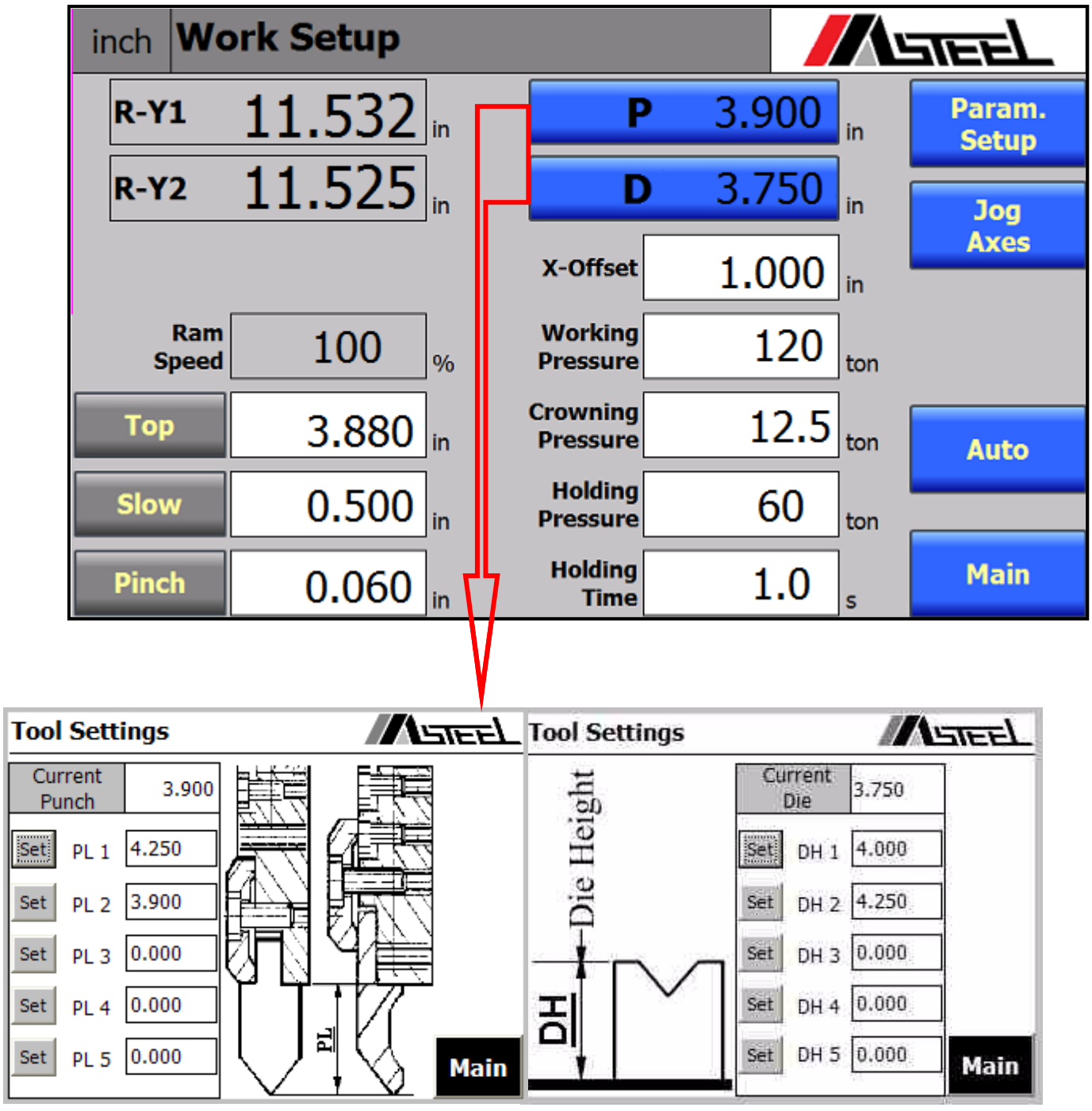
4.5 AUTO MODE

Used for Create and edit job and Operating the job under auto cycle



4.6 Tooling –Punch + Die Setup and Memory

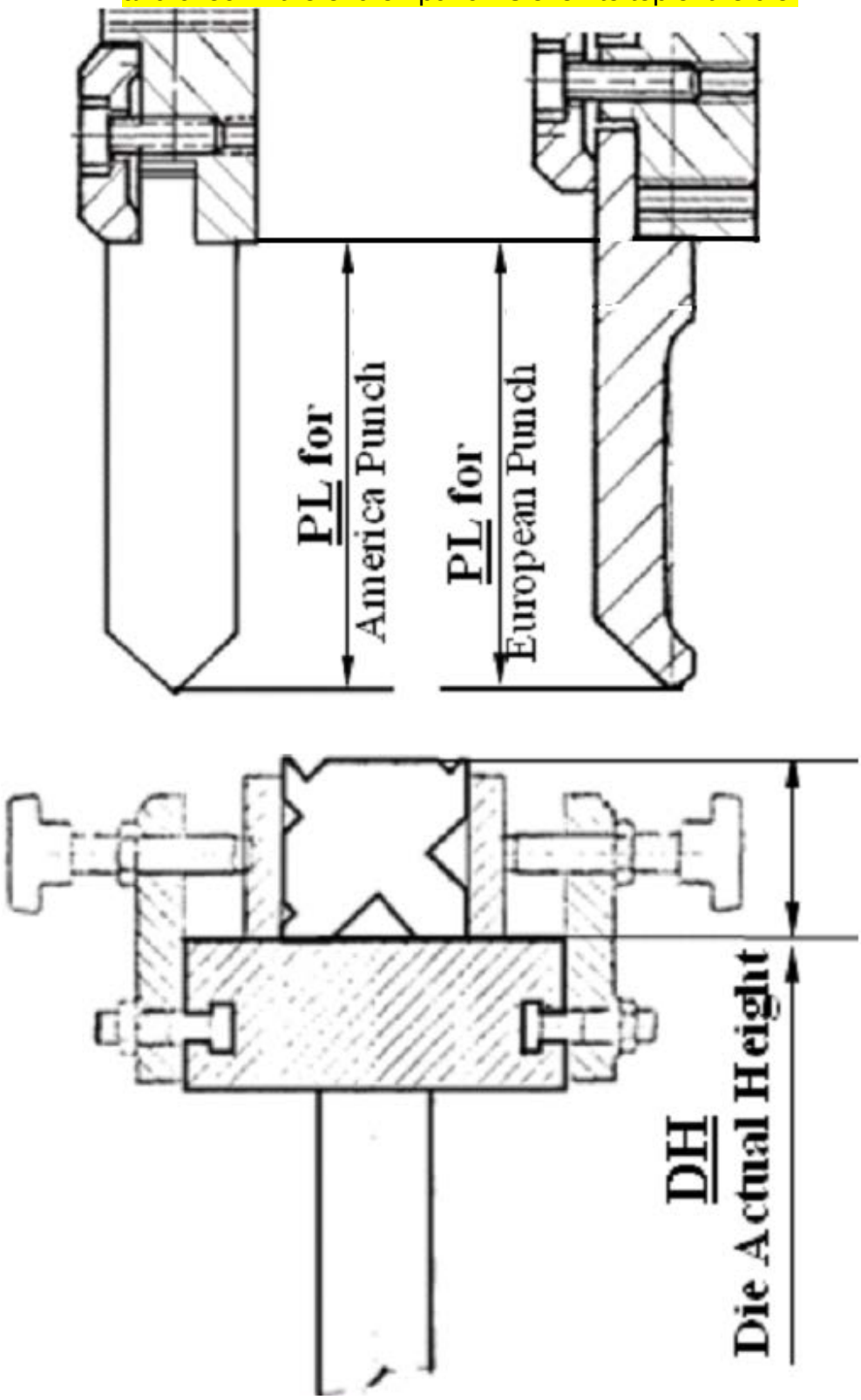
Tool Setup – setup punch length and die height when changing tooling. The controller will re-calculate the tooling coordinate position for programmable angle control.



Press Current Punch and Current Die to display the drawing to measure the settings of punch and Die and tooling memory

- Check current tool setup on main screen.
- Press **Ram Up** button to set ram at top position. If the ram is not at top position, prompt screen will display to remind you of returning the ram to the top position.
- Press **Setup** Button on the main screen
- Press **Tool Setup** on **Setup** Screen
- Press **new value setup key** to pre-set the punch length and die height
- Press **Set** key to transfer the memory setting to current tooling setup

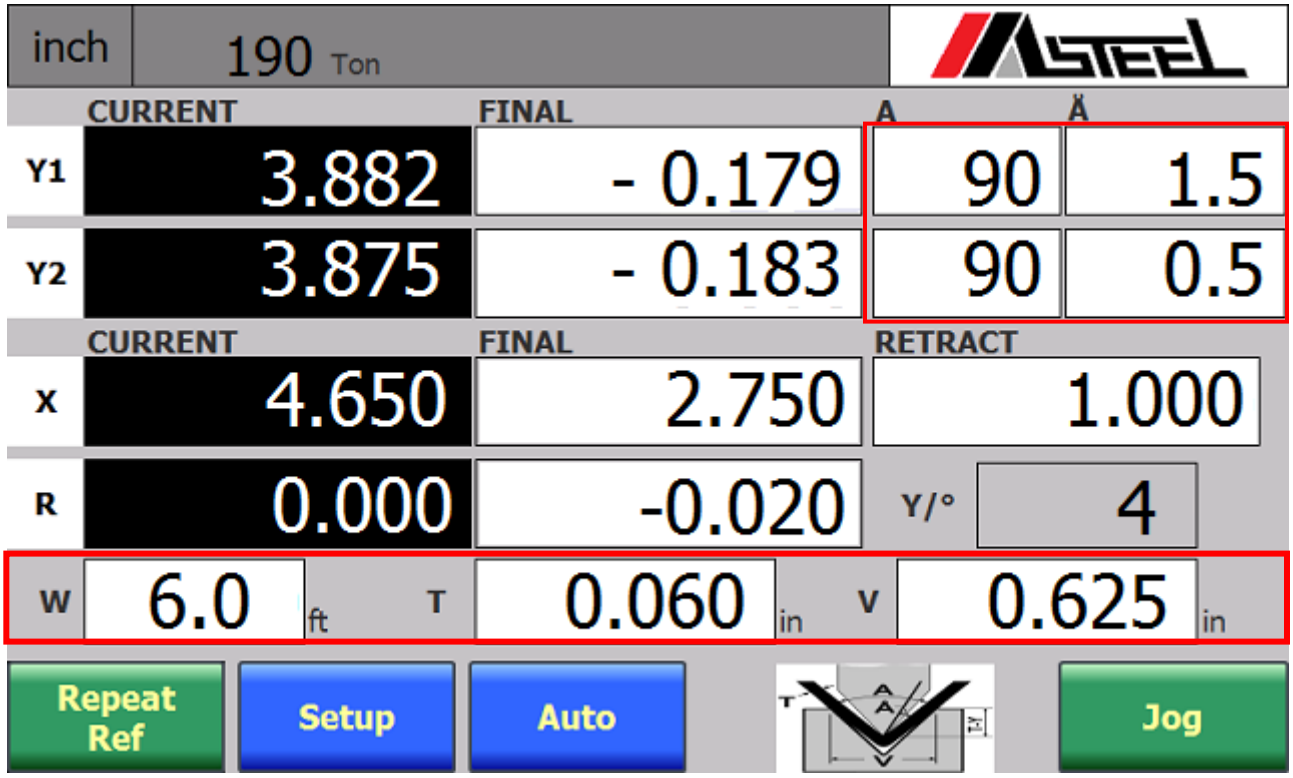
Have ram at top stop position and then setup T-Y to “0” on **Main Screen**, then jog the ram down and check if the end of punch is even to top of the die.



5 MANUAL MODE

SETUP BENDING ANGLE, BENDING POSITION and BACKGAUGE

- ***Die opening*** should be approx. 8 times the material thickness.
- ***Ram*** should be at the top position
- ***New Operators*:** **Use Jog Mode** to check the bending position and to avoid incorrect settings that may damage the tooling. **The bending position should be above the bottom V of the die and clearance should be greater than one material thickness.**



T-Y: Bending Position calculated for programmed angle in units of 0.001"
V : Die opening in units of 0.001". (Refer to Masteel 4-way die dimensions).
A : Bending angle in units of "degrees". Always measure the inside bending angle.
Å : Bending angle correction. Input "0" on the first test bend. Then measure inside bend angle to determine correcting angle. Input "-" degree to correct under bending & "+" degree to correct over bending.

Y/º : Correction reference in units of 0.001"of ram bending position for each degree used to correct bending position**.**
T : Material thickness in units of 0.001".

5.1 Setup Bending Angle

➢In section "angle setup" on main screen≺

Setup Test Bending Angle: bending angle can be programmed in different

1) Select die opening according to **Masteel Die Chart** or measure opening with calipers.
2) Input "**0**" on **Å** - bending angle correction
3) Input desired bend angle in degrees @ "**A"** Angles are always measured as inside angles. For example , if the desired bend is say 45 degrees then the measured inside angle would be 135 degrees (180-45=135 degrees) If the desired angle is 30 degrees then the inside angle would be 150 degrees. It is always the inside angle that is entered as **"A".**
4) Input material thickness **T** in 0.001"
5) The setting position is calculated and displays on → **-0.179**

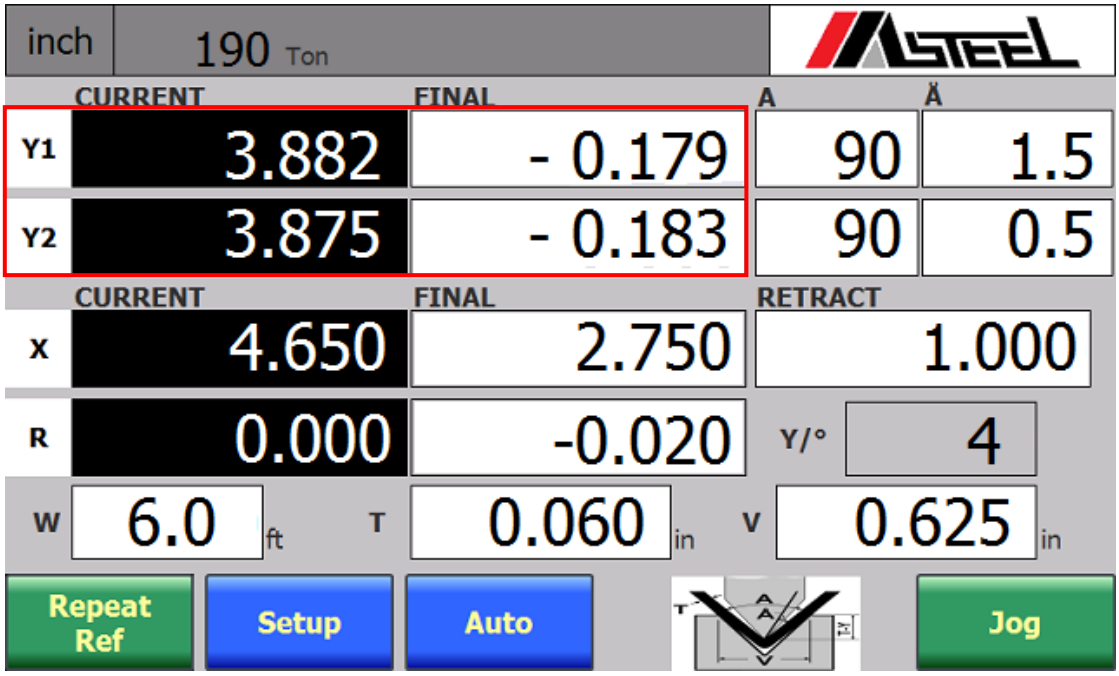
Correct Angle Å to achieve Desired bending angle A: angle correction can be programmed in different

1) Do a test bend and measure angle. Always measure inside angle. If the measured angle **"A"** is under bent, enter required angle correction **Å.** as **"**- degrees", to correct for an over bend, enter **Å** as " + degress".
2) **V, A & T** will remain the same as test bend.
3) The setting position is calculated and displays on → **-0.179**

Do another test bend, measure inside angle and change angle correction if required.

SETUP BENDING POSITION USING T-Y

When desired bend angle is entered as "A", then T-Y will be calculated automatically by the computer. If the operator desires however, T-Y can be entered directly in the main screen T-Y box. This is handy when checking and setting brake parameters. Or move punch down by jogging mode, then touch-press current position and current position will teach in (transfer to) the setting position



➢Directly input the setting position for T-Y

→ **-0.179** – this indicates the setting position for T-Y is -0.179” between the tip of the punch and the top of the die for the bending position

→ **-0.100** – Input the new setting in “- 0.100” inches. The end tip of punch will stop at new position -0.100” below top of die.

-Do test bend and adjust T-Y as required to achieve desired bend angle.

➢ Touch in and transfer current position to the setting position

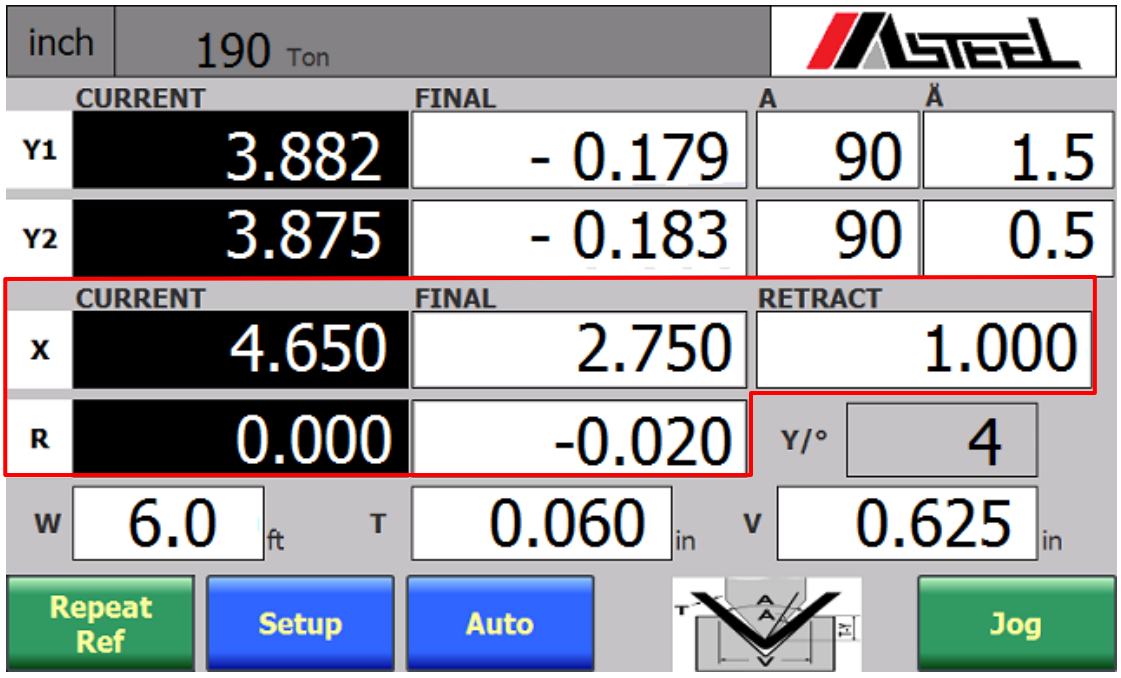
Y1-T 3.882 → **-0.179**

Y1-T 3.882 → **3.882**

– this indicates the setting position for T-Y is -0.179” between the tip of the punch and the top of the die for the bending position

– Touch/press the current position **Y1-T 3.882** and the current position will transfer to the setting position for the final bending position

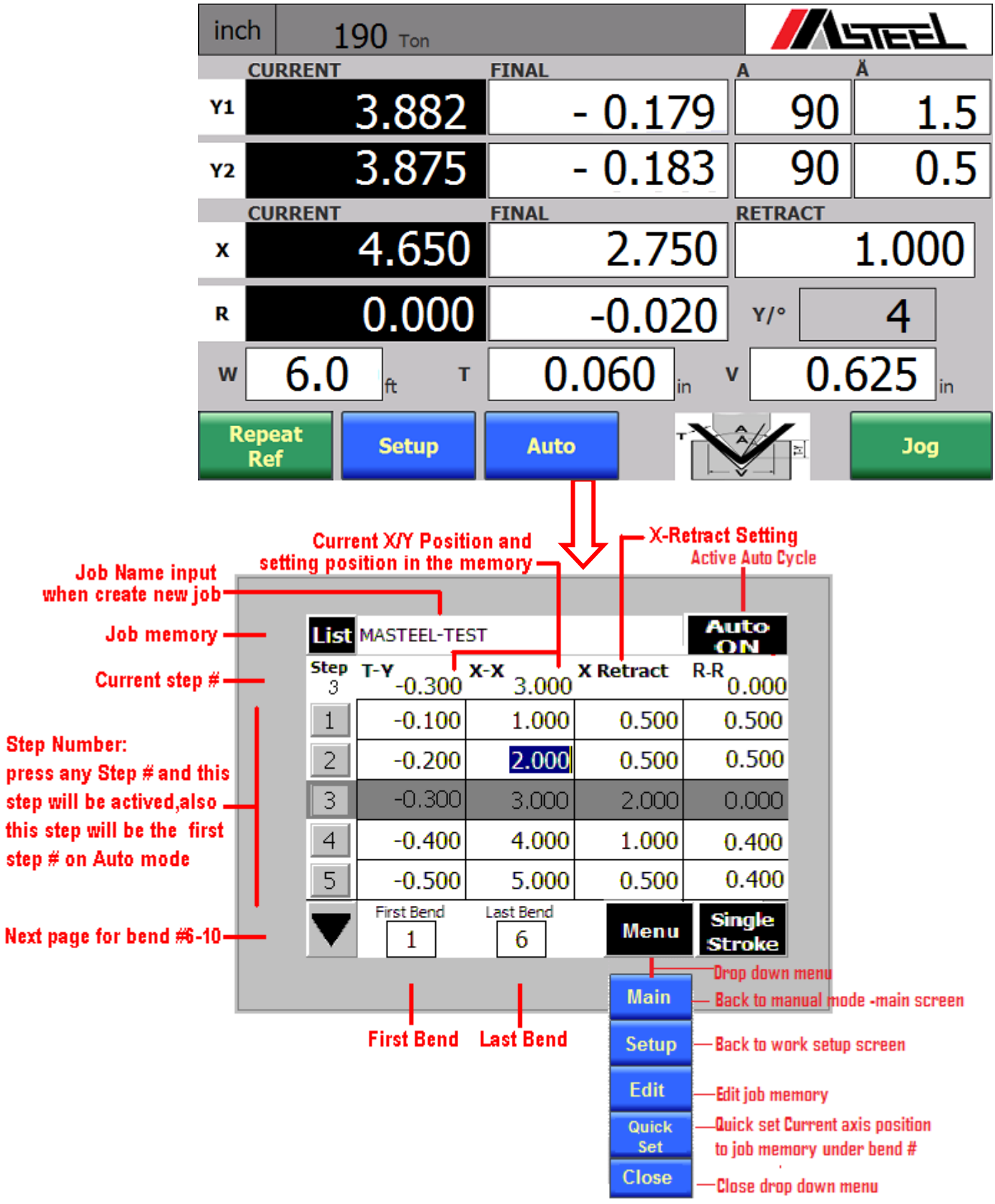
SETUP BACKGAUGE POSITION USING X-X



X – X 4.650 → **2.750** - indicates current position of back gauge at 4.650” and will move to setting position at 2.750”. Change new position by input of new setting directly

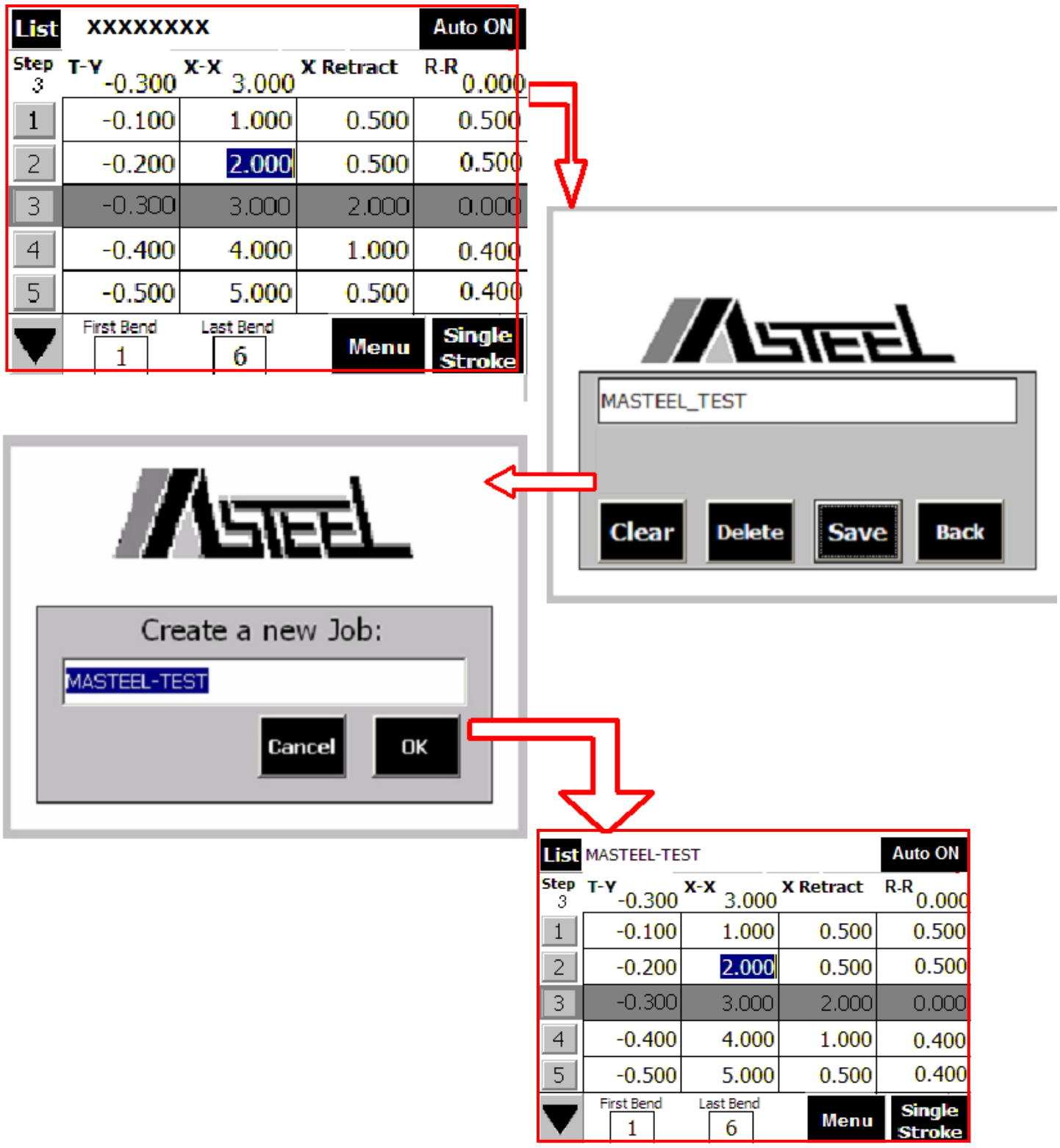
X- RETRACT **1.000** - indicates back gauge will move back 1.000” at pinch point to avoid backgauge interfere with material bending up

6. EDIT, CREATE AND AUTO RUN JOBS



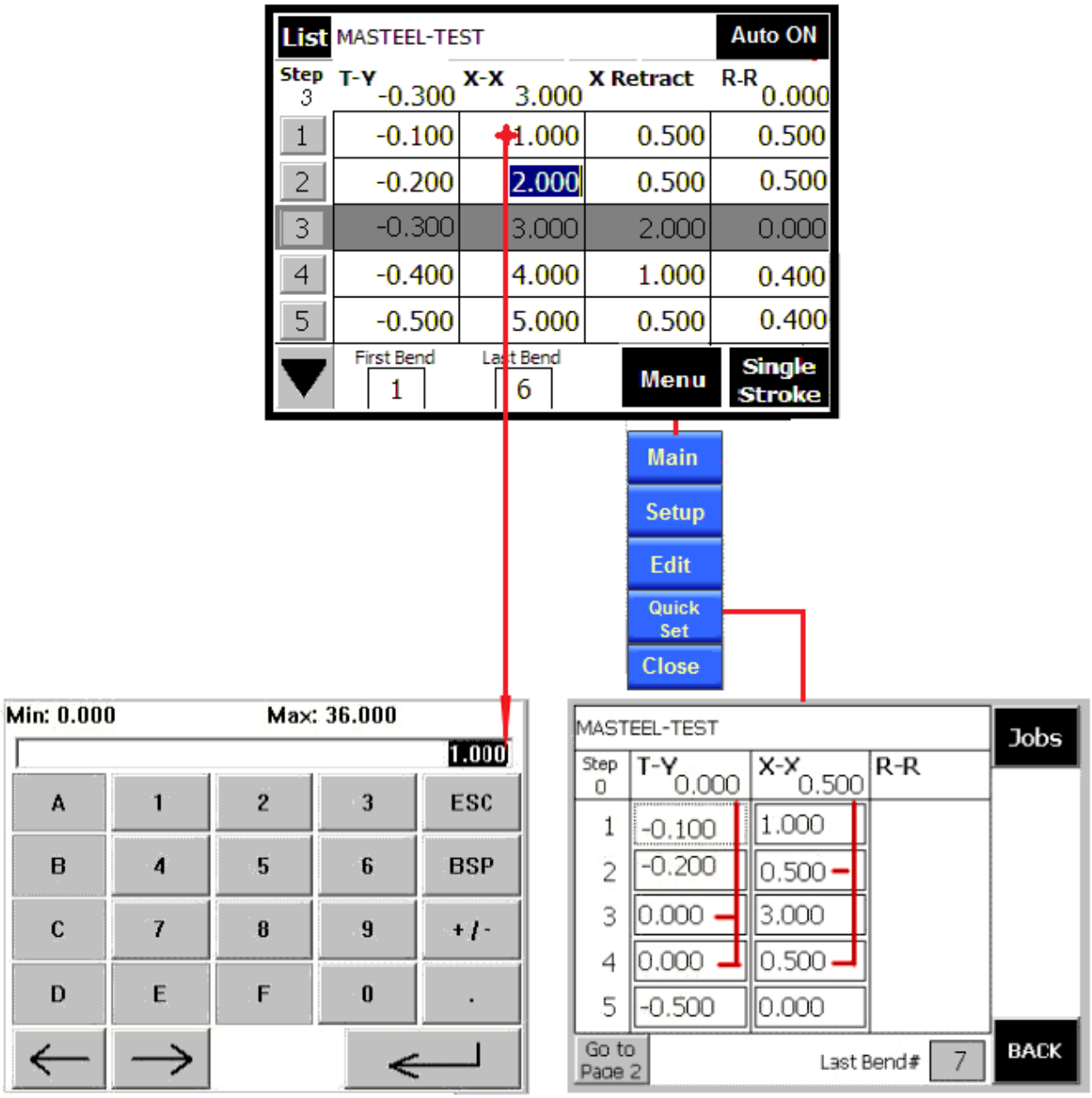
6.1 CREATE JOB NAME AND SETTING

CREATE JOB NAME



INPUT JOB SETTINGS

- Input new setting directly by pressing setting field and use the number key pads to input new value.
- Return to main screen to setup different angle, and back to **Jobs** screen. Press **Quick Set** button to display the quick set screen and press the setting field, the current angle setting or X axis position will transfer to the chosen bend step settings.

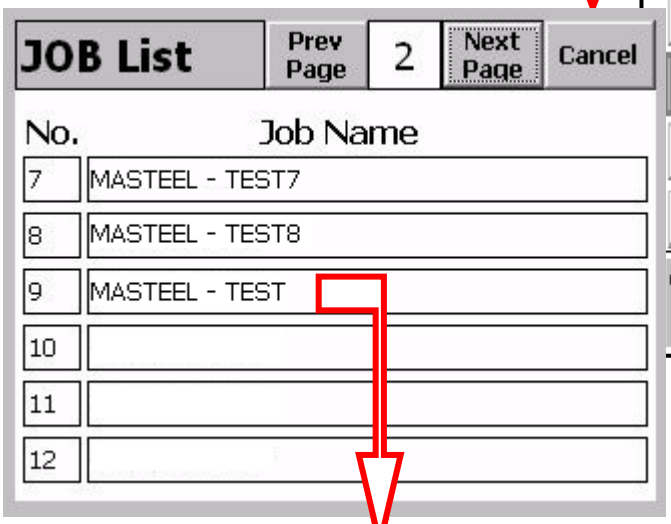


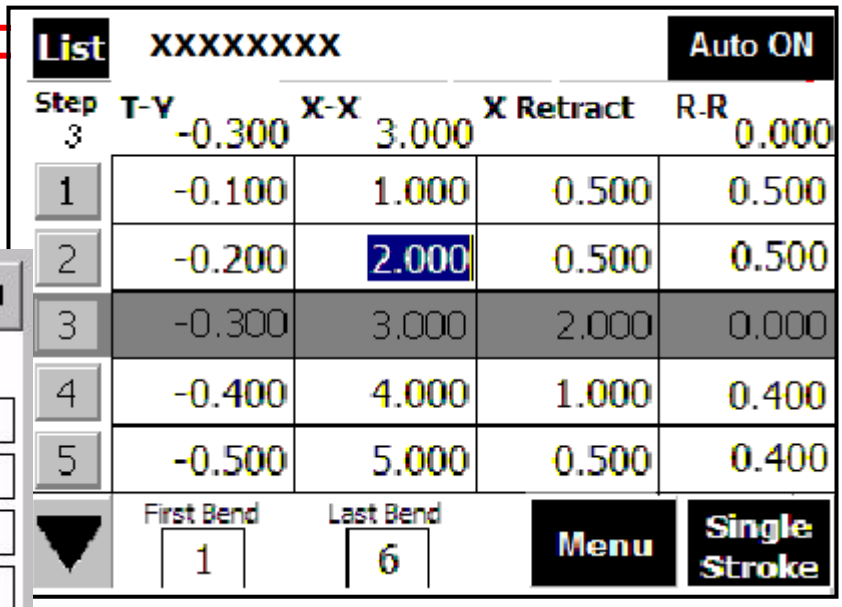
Direct Input Setting
Input new setting directly by pressing setting field and use the number key pads to input new value

Quick Setting
Press Quick Set button to display the quick set screen and press the setting field. And then the current angle setting or axis position will transfer to certain bending settings

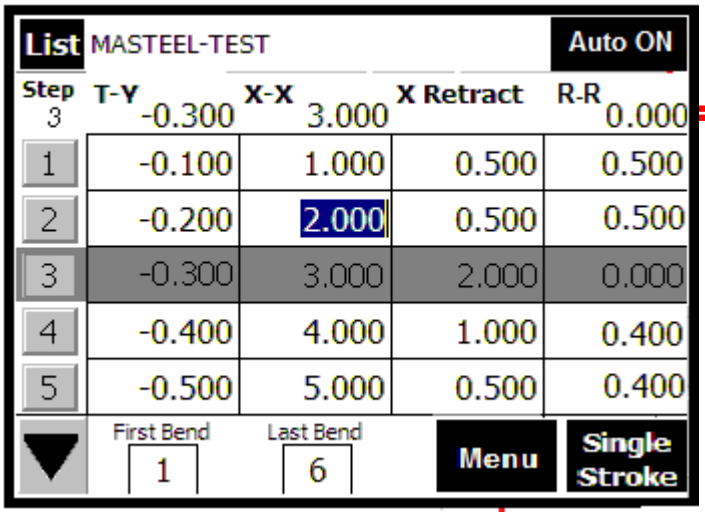
6.2 Modify Existing Job Setting in the Memory and/ SAVE / DELET/ CLEAR JOB

- Press **List** to display the "JOB List"
- Check the job list to find the job name you want to modify.
- press job name.(ie: MASTEEL – TEST) the job settings in memory will load to the **Auto** screen
- Modify the current job setting as required.



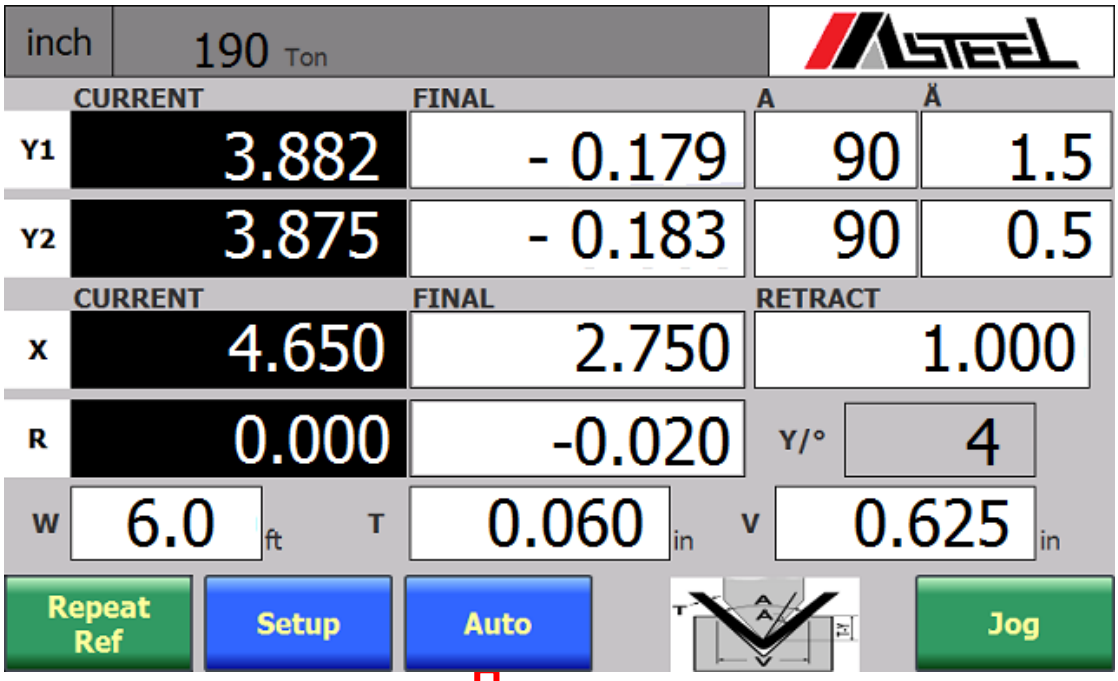


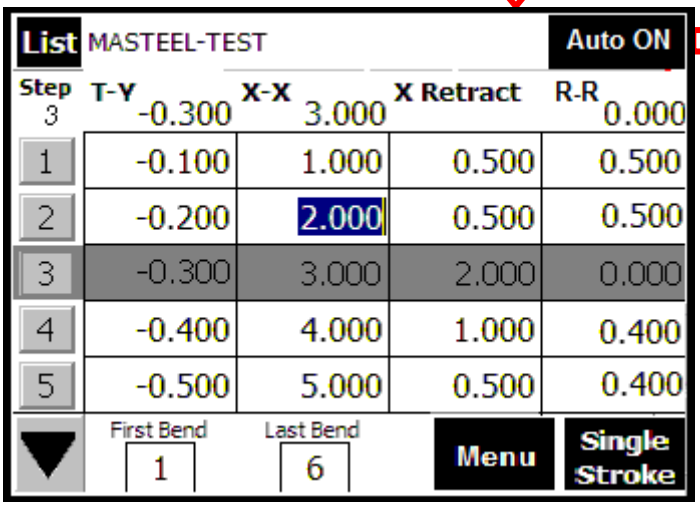
- Then Press "**Edit**",
- **SAVE** to save the settings under the same job name.
- **New** to create a different job name.
- **Delete** to delete the settings under this job name.
- **Clear** to clear job settings

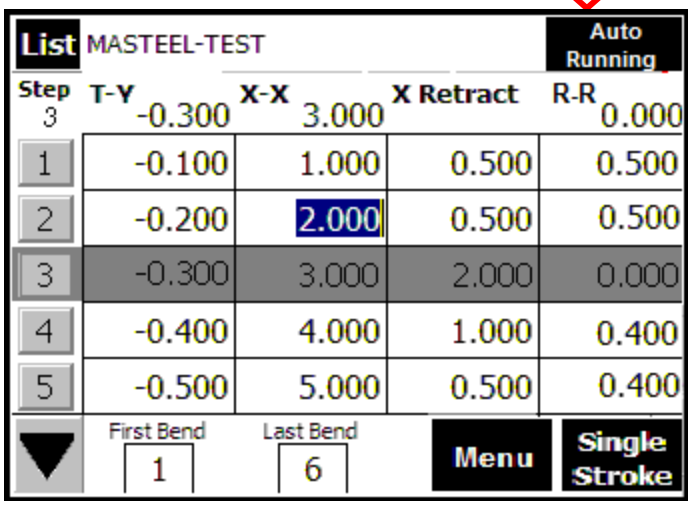


6.3 ACTIVE JOB IN AUTO MODE

A full ram stroke cycle includes ram fast approach, slow bending, then rapid return. Slow speed position should start above the bending material. Without proper setting ram full stroke the brake won't performance right, especially auto mode will not activate the next step cycle without a full completed ram stroke cycle.





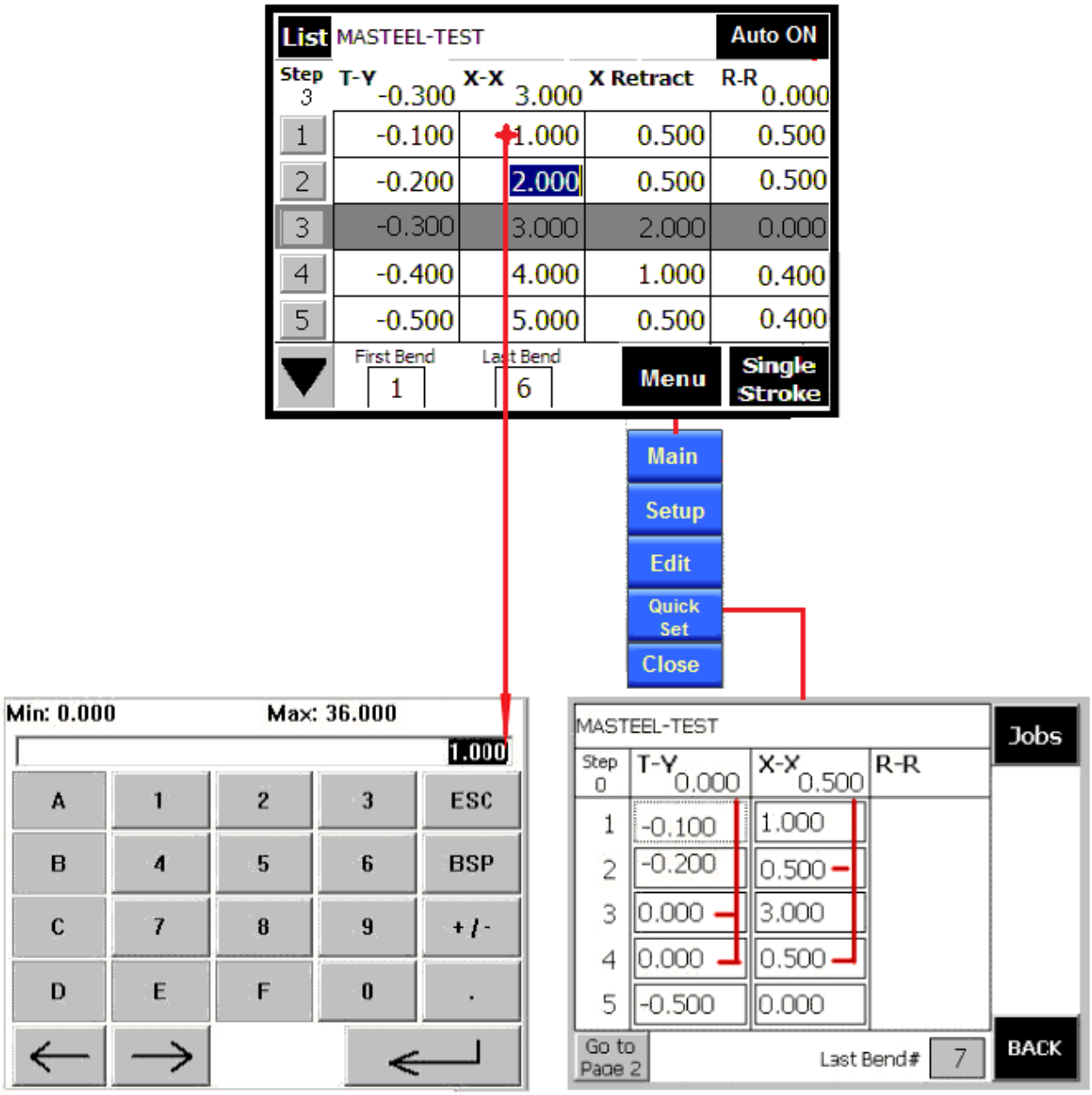


6.4 MODIFY JOB UNDER AUTO MODE

The modification will not be in job memory for next time recall of the job unless Save the modification

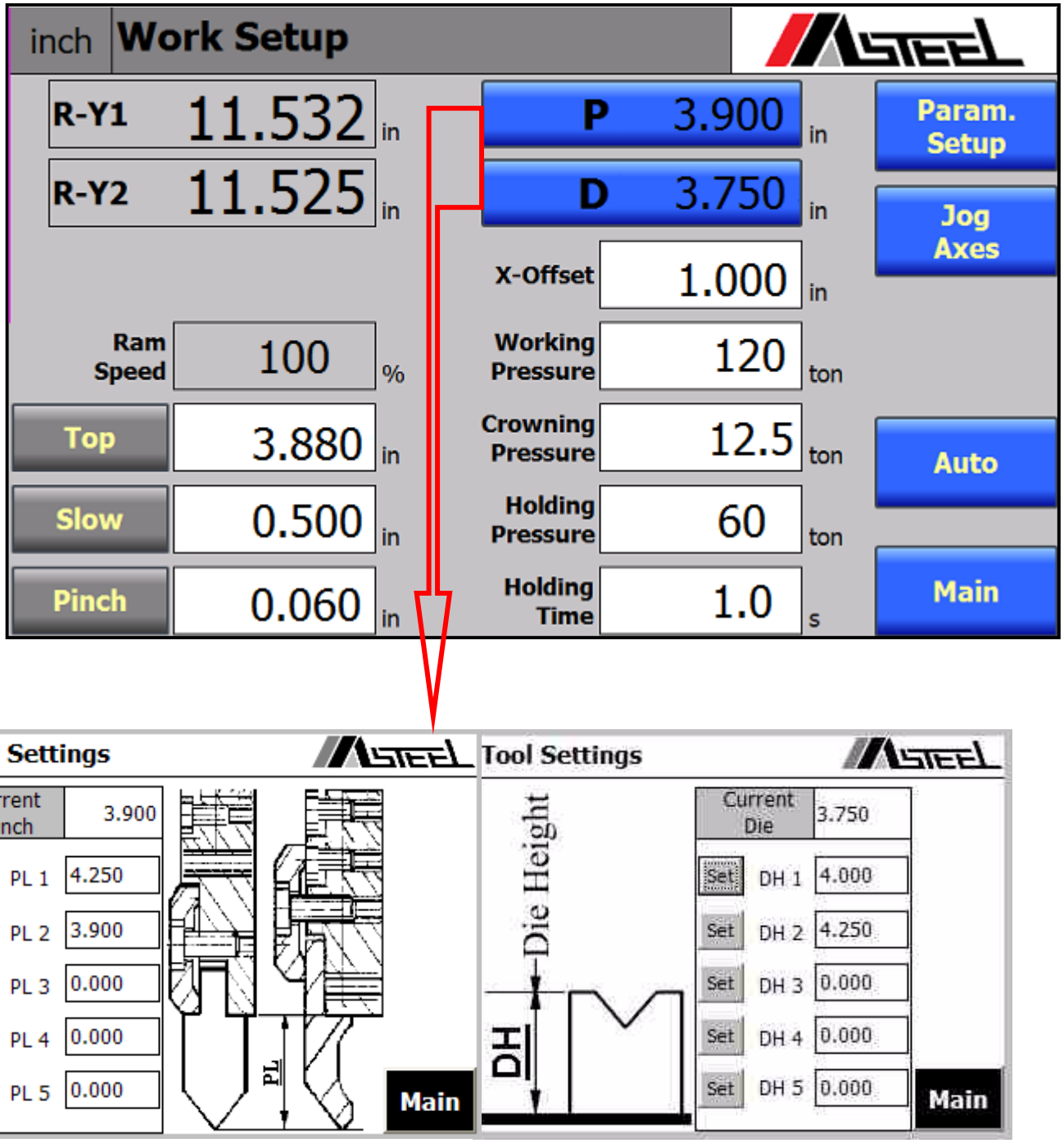
1. Modify the first bend # by pressing the step# key or change the first bend #. The last bend can also be changed however, t**he last bend number can not exceed the last bend setting in job memory.** Set the first bend # to the same as last bend # to repeat the same bend
2. Modify the job setting

- Input new setting directly by pressing setting field and use the number key pads to input new value.
- Alternately, go to main screen to setup different angle or axis positions, return to the auto mode and



select **Quick Set** button to display the quick set screen and press the setting field. The current angle setting or X axis position values will transfer to desired bend step.

7. TOOL SETUP

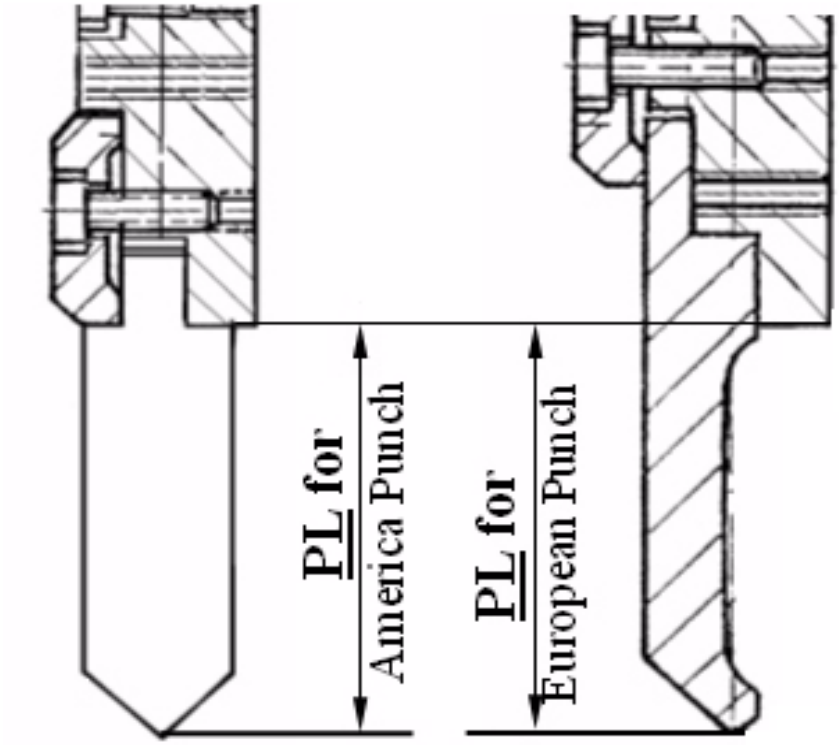


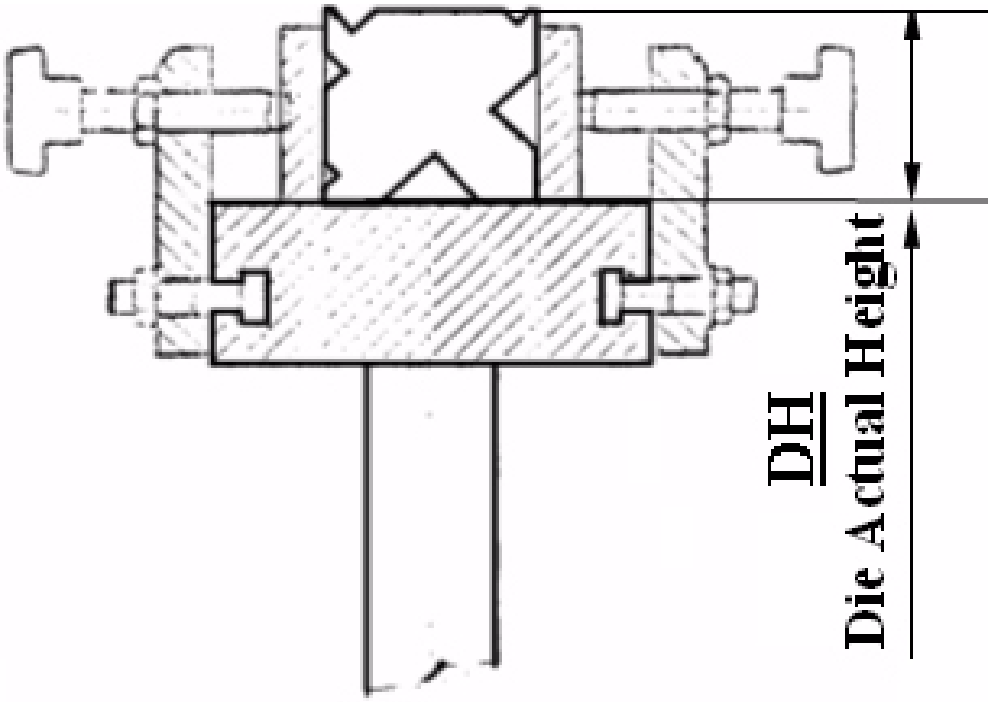
Press Current Punch and Current Die to display the drawing to measure the settings of punch and Die and tooling memory

- Check current tool setup on main screen.
- Pre-set the punch length PL and die height DH as drawing
- Press **Set** key to transfer the memory setting to current tooling setup

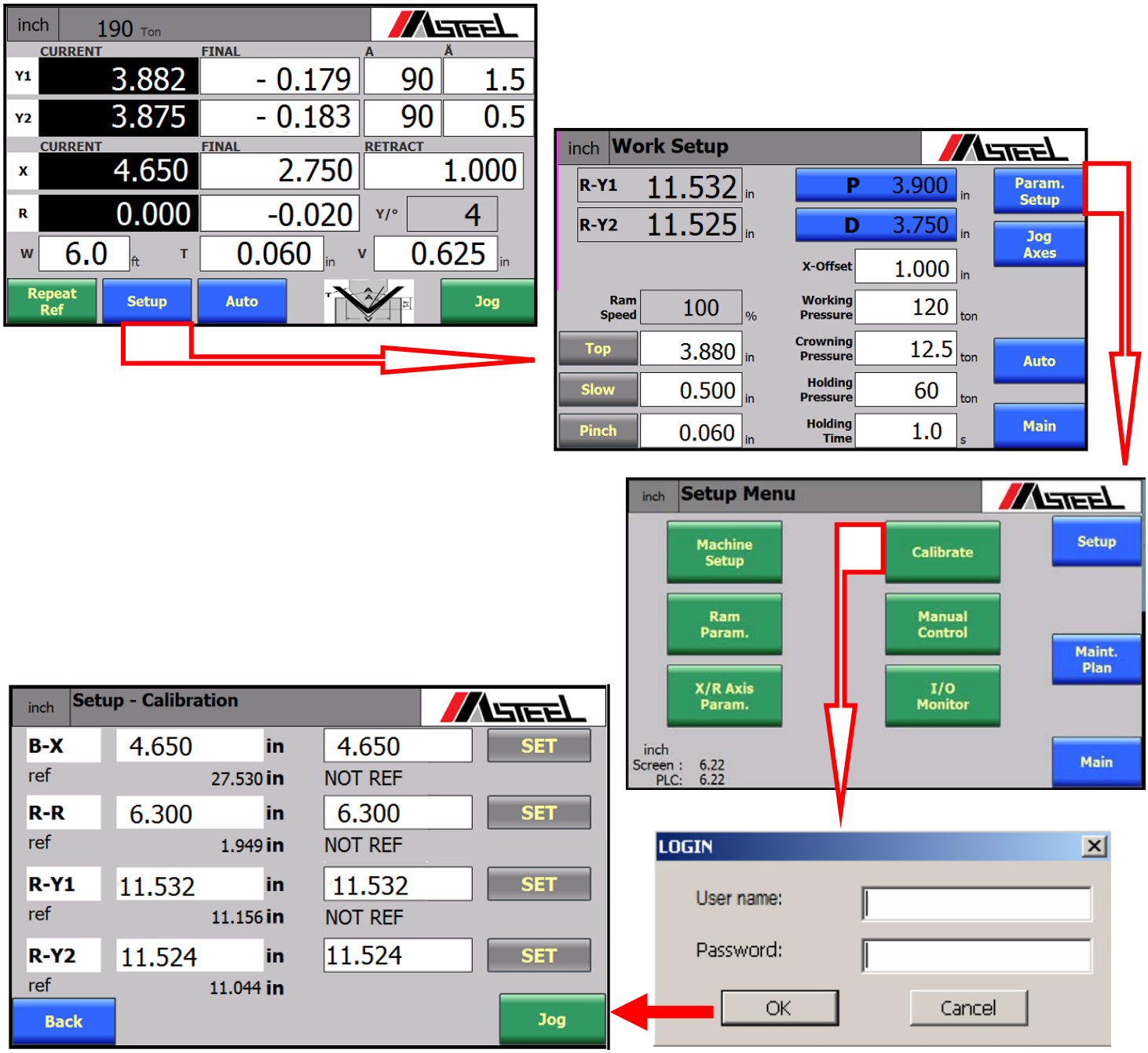
Always check the tooling setup before doing the bend

Have ram at top stop position and then setup T-Y to “0” on **Main Screen**, then jog the ram down and check if the end of punch is even to top of the die.





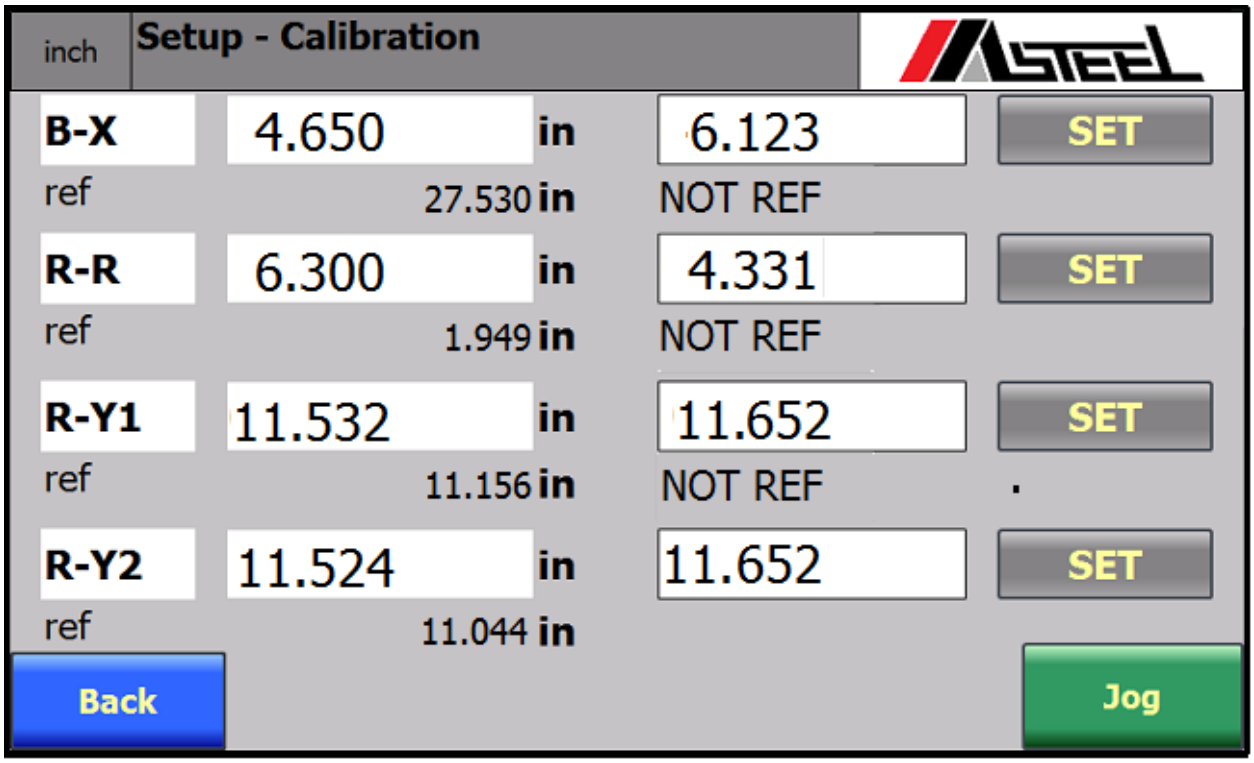
8. CALIBRATION OF AXIS



BACKGAUGE CALIBRATION X-X and R-R

➢ Select Setup on Main Screen, then Select **Calibr.(require Password)** ➢

Calibrate backgauge if the control console display on backgauge is not matching the true position

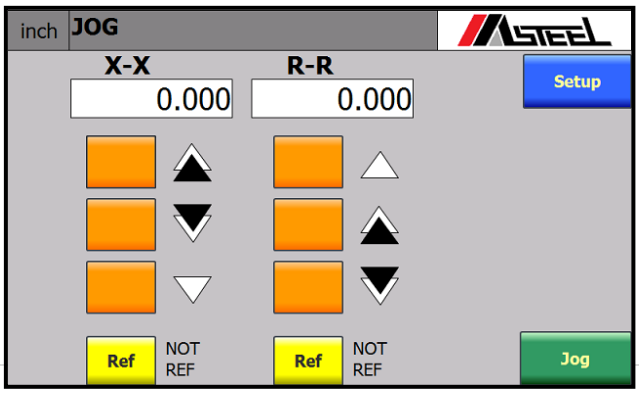


Calibrate X axis position

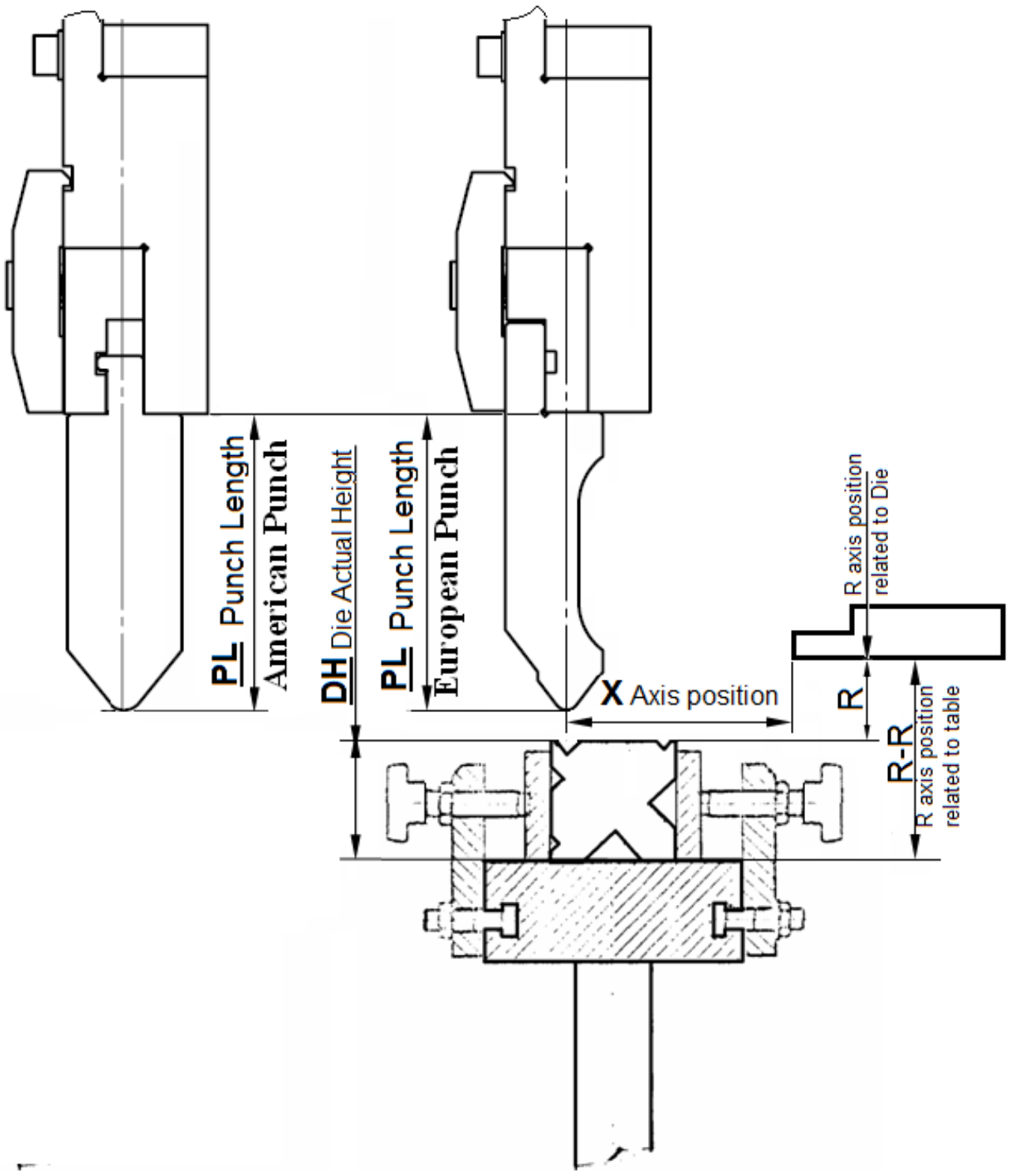
1. Set backgauge X axis position to 4.650” on **Main** screen
2. Place a piece of metal against the backgauge, use **Jog** mode to create a slight bend.
3. Measure the back gauge’s true position from the bending line to the back gauge finger (ie: the measurement is 6.123)
4. Select **Setup**
5. Press **Calibrate** , Then input Password 100
6. Press **Calibrate** again to enter calibrate screen
7. Press **B-X Setting** field to measured back gauge position as 6.123”.
8. Press **SET** to re-calibrate back gauge and the current B-X reading will be changed to 6.123”
9. Return to **Main** screen and re-set back gauge position to 4.000”. Then check the measurement.

Calibrate R-R axis position

1. Set backgauge R axis position to 0” and X axis position to 1" on **Main** screen
2. use **Axis Jog** mode to move R axis to top of Die
3. Measure the back gauge’s true position from the top of table (ie: the measurement is 4.331), or just simply use the value of Die height.
4. Select **Setup**
5. Press **Calibrate** , Then input Password 100



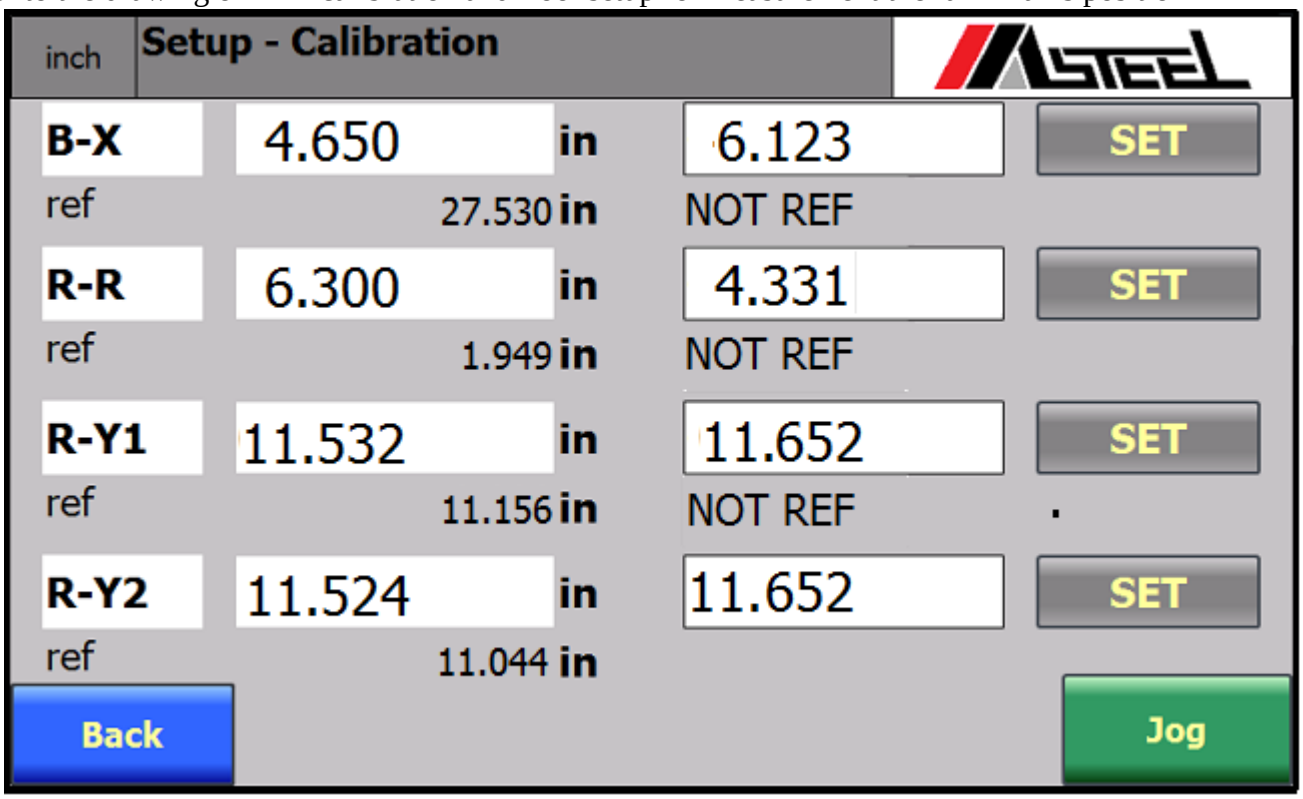
6. Press **Calibrate** again to enter calibrate screen
7. Press **R-R Setting** field to measured back gauge position as 4.331".
8. Press **SET** to re-calibrate back gauge and the current B-X reading will be changed to 4.331"
9. Return to **Main** screen and re-set back gauge position to 4.000". Then check the measurement.



R-Y RAM HEIGHT CALIBRATION

➢ Select Setup on Main Screen, then Select **Calibr. (Require Password)** ➴

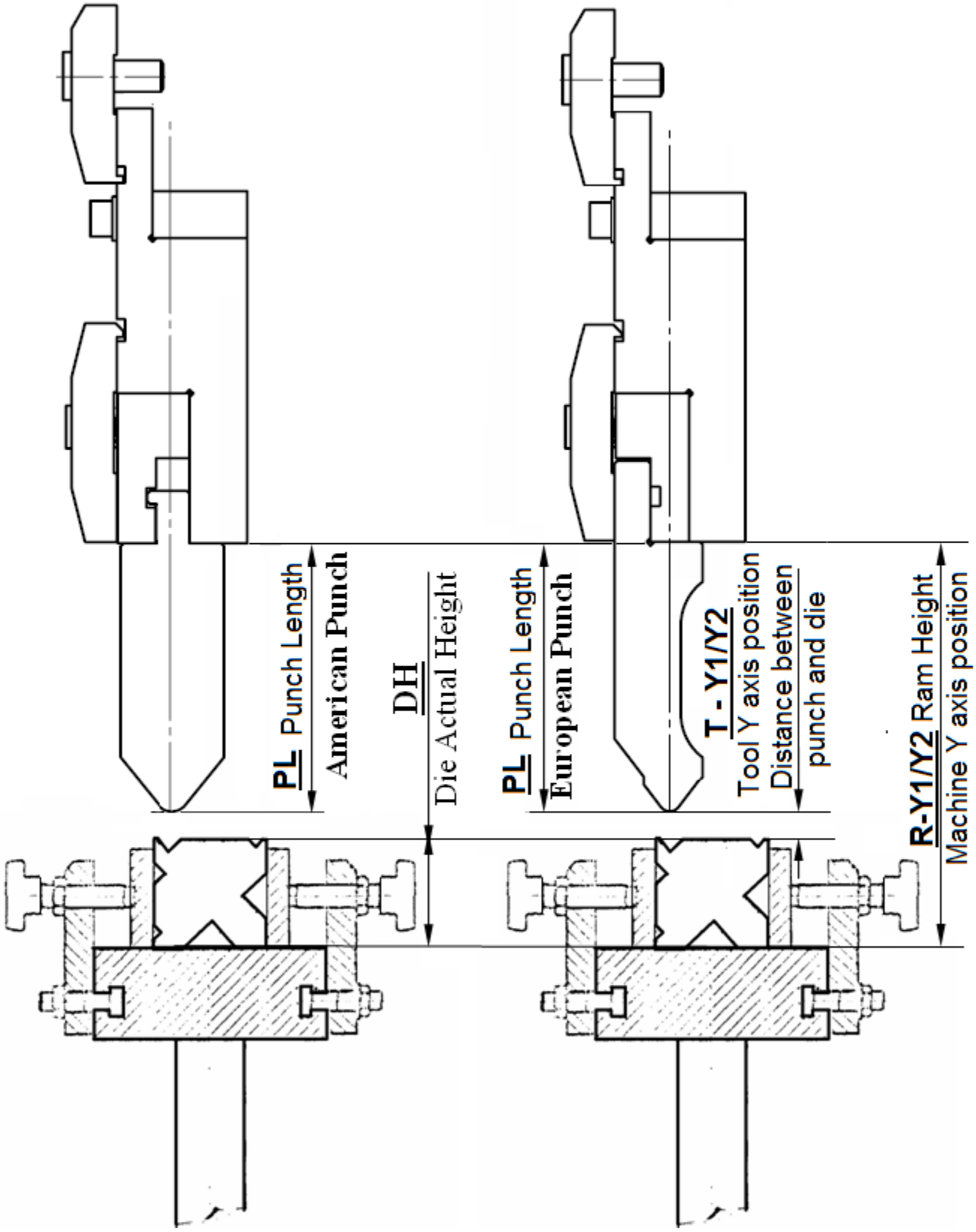
Calibrate ram Y axis position R-Y if the control console display on T-Y is not match to the true position. Refer to the drawing on R-Y calibration and Tool setup for measurement the ram Y axis position R-Y



1. Operating mode at **Jog.**
2. Ram at top position.
3. Check on main screen if the current tool setups are correct.
4. Set T-Y position to 0.000” main screen.
5. Jog the ram to the lowest position.
6. Measure the ram Y axis positoin as shown on the drawing for R-Y calibration within an accuracy of 0.002”.(ie: example this measurement is 11.652” for both R-Y1 and R-Y2)
7. Select **Setup**
8. Press **X/Y Calibrate** , input Password 100.
9. Press **X/Y Calibrate** again to enter calibration screen.
10. Press R-Y calibrate setting field to input correct Ram Y axis position as 11.652”.
11. And press "**SET**" to calibrate R-Y and the current R-Y reading will be changed to 11.652”
12. Jogging ram up and go back to main screen
13. Set T-Y to 0.020” on main screen
14. Bring the ram down, use 0.020” feeler gauge to check if the distance between end of punch and top of the die is 0.002”
15. If not, measure the distance and add PL – Punch length + DH – Die height = RH ram height
16. Repeat from the step 7 -17 to recalibrate ram height

R-Y CALIBRATION AND TOOL SETUP

PL – punch length and DH – die actual height



GENERAL SAFETY SETUP INSTRUCTION

1. SAFETY
    a. SAFETY IS EVERYBODY'S BUSINESS
    b. POINT OF OPERATION SAFEGUARDING
    c. WARNING
2. INSTALLATION
    a. Foundation
    b. Unloading and Handling
    c. Securing the Press Brake
    d. Cleaning
    e. Power Requirements
    f. Checking Motor Rotation
    g. Check Oil Reservoir
    h. Leveling the Press Brake
3. SET – UP PROCEDURES
    a. Installing Press Brake Tooling
    b. Alignment of Tools

SAFETY IS EVERYBODY'S BUSINESS

Whether you are the owner, employer, operator, die setter or the maintenance man, Press Brake Safety is your business. You are responsible for operating and maintaining your equipment in compliance with these instructions and with the use of just plain common sense.

Masteel Press Brakes are designed and constructed to give you many years of service for a variety of applications. Knowing the piece part to be formed, the operator's supervisor can then determine the proper dies to be installed, the appropriate method for feeding and removing the work and the type of point of opertion safeguarding that will be required. With all these facts, the supervisor can determine operator procedures that ensure safe, productive operation.

SAFE WORK PRACTICES–EMPLOYER'S RESPONSIBILITY

An organized safety program is a must to insure an efficient and productive shop. A committee can review your plant's safety procedures and make recommendations to eliminate unsafe working habits. Proper operating and safety instructions need to be provided to not only new employees, but also, those old timers that need a refresher as to proper work methods. Contact your worker's compensation insurance carrier for information on organizing your safety program.

Remember, OSHA (Occupational Safety & Health Act of 1970, as amended) requires that each employer furnish his workers with a shop that is free from recognized hazards which could cause death or serious injury. A safe work place and good work habits are good investments. Safe press brake operating conditions depend on detection of existing and potenital hazards and on taking immediate action to remedy them.

ANSII B11.3 Standard (Safety Requirements for the Construction, Care, and use of Power Press Brakes) states that the employer shall train and instruct the operator in the safe methods of performing any operation **before** starting work on any operation. The employer shall provide adequate supervision, and insure that correct operating procedures are being followed.

SELECTING THE RIGHT COMPONENTS FOR YOUR PRODUCTION SYSTEM

A power Press Brake is but one part of your production system. It is the power component, or the muscle component of the system. Different types of press brakes (hydraulic, mechanical, hydra-mechanical) with different types of controls are suited for a variety of applications. Dual palm buttons should be used to activate the ram when the piece parts are small and the operator has to stand close to the point of operation. Footswitches should be used for long-flanged piece parts when the operator is allowed to stand away from the point of operation. Foot-treadle machines may be used for a number of operations that require the operator to be close to the machinery. Proper point of operation safe guarding is a must with each type of press brake.

Press brakes can bend, form, notch, punch and pierce a piece part when equipped with appropriate dies. This is referred to as the tooling component. The method of feeding the piece part for producing the final product can either be by mechanical or manual means.

The final component necessary to complete a functioning production system is that of point of operation safeguarding. A thorough analysis of the hazards associated with the operation should be performed by the user. Consideration of all these components–piece part to be formed, type of press brakes, tooling, method of feeding–must be considered in order to select suitable point of operation safeguarding.

Remember, a safe combination of components for one production system may not be a safe combination for another piece part production system. Careful analysis must be made of the components of the production system to insure the most efficient and safest method for performing a piece part forming operation.

POINT OF OPERATION SAFEGUARDING

The object of providing safeguarding should be to prevent the operator (and/or helper) from placing any part of the body within the point of operation. Remember, there is no universal safeguard for all press brake applications. Different safeguarding arrangements may be required for each separate application. Each guard or device appropriate for use must be maintained and adjusted in accordance with the manufacturer's instructions.

ANSI B11.3 states that the employer is to evaluate each operation before any material is formed to determine if a point of operation guard or device can be used to protect the operator (and/or helper) from injury near or within the point of operation of the press brake. If a point of operation guard or device can be used, it must be used.

Hand tools may be used in conjunction with an approved point of operation guard or device for loading and unloading narrow piece part components. Users shall follow specific instructions from the safeguarding manufacturer for proper installation, adjustment and use of each guard or device.

After selecting a supplier for safeguarding equipment, contact **US** for interface assistance.

Company Name	Presence Sensing Devices	Pullbacks and Restraints	Drop Gate Guards	Dual Palm Buttons	Hand Tools
All-Vac Industries, Inc. 7303 N Linder Ave. Skokie, IL 60077 (312) 675-2290					X
Astco Inc. 723 Dunn Way Placentia, CA 92670 (714) 996-5420	X		X	X	
Data Instruments Inc. 4 Hartwell Place Lexington, MA 02173 (617) 861-7450	X				
Dolan-Jenner Ind, Inc. Blueberry Hill Industries Park P.O. Box 1020 Walburn, MA 01801 (617) 935-7444	X				
Guardmark International Inc. 6785 Telegraph Rd. Suite 400 Bilmington, MI 48010 (313) 647-1005	X				
ISB Industrial Protection Ltd. 9365 Pascal Gagnon Montreal, Quebec, Canada H1P 1ZA (514) 372-5818	X				
Link Electric & Safety Control Co 444 McNally, Nashville, TN 37211 (615) 833-4168	X		X	x	
Magline Inc. 5 Mercer St. Pinconning, MI 48650 (517) 879-2411					X
Osborn Mfg. Corp. P.O. Box 676 Warsaw, IN 46580 (219) 267-6156					X
Positive Safety Corp. 34991 Melinz Parkway Eastlake, OH 44094 (216) 951-2130		X		X	
Rockford Systems Inc. P.O. Box 5166 4620 Hydraulic Rd. Rockford IL 61125 (815) 874-7891	X	X	X	X	X
Sick-Optic Electronik Inc. 2051 White Bear Ave. St. Paul MN 55901 (612) 777-9453	X				
Surty Mfg. Company W15053 Surty Rd. Gleason, WI 54435 (715) 536-6291		X			
Weldotron Safety and Automation Systems 1532 S. Washington Ave. Piscataway, NJ 08854 (201) 752-6700	X				

OTHER INFORMATION REGARDING SAFETY

To help you provide a safe workplace for your employees, we incourage you to contact any or all of the following regarding safe press brake operations:

- National Safety Council
  444 North Michigan Ave.
  Chicago. Ill. 60611
- American National Standards Institute
  1430 Broadway
  New York, New York 10018
- Your Worker's Compensation Carrier

Your local distributor

- Your local Occupational Safety Office
- Your local Safety Equipment Supplier

SAFETY

NOTE: *BEFORE OPERATING THE PRESS BRAKE,* ALWAYS REVIEW AND UNDERSTAND FULLY ALL RECOMMENDED OPERATING AND SAFETY INSTRUCTIONS. THE FOLLOWING IS A LIST OF BASIC SAFETY PRECAUTIONS THAT MUST BE OBSERVED AT ALL TIMES.

REFERENCE: WYSONG & MILES PRESS BRAKE SAFETY MANUAL.

NEVER install or move Press Brake without services of qualified, professional riggers.The Press Brake is top heavy to the front and must be handled with care *to guard against tipping.*

NEVER eliminate or bypass any point of operation safeguarding or related safety components on the Press Brake.

NEVER place any part of the body in the die area of the Press Brake.

NEVER operate the Press Brake when personnel are located in the rear area, behind the bed and ram.

NEVER tie down ram actuating devices to provide continuous operation.

NEVER operate Press Brake on skids or leveling screws. Leveling screws are supplied for initial leveling only. Machine must be shimmed to firm level position and bolted securely to foundation or floor.

NEVER leave any tools or instruments in or on Press Brake at any time.

NEVER reach into die area to lubricate, clean or adjust. Use remote systems or long-handled instruments.

NEVER operate Press Brake with access covers or plates removed.

NEVER *operate Press Brake without pinch points* guarded and without adequate point of operation safeguarding.

NEVER remove warning plates, instruction manual, or safety equipment from machine.

ALWAYS use safety tools, fixtures and supporting devices when changing or adjusting Press Brake tooling.

ALWAYS leave ram at bottom of stroke when Press Brake is not in operation.

ALWAYS support the ram by inserting safety blocks between the dies, if it becomes necessary to position the ram above the bottom of the stroke when Press Brake is not in operation.

ALWAYS check with your shop supervisor when in doubt as to the Press Brake capacity or when using any die with which you are unfamiliar.

ALWAYS use hand tools and supporting devices for feeding, supporting and removing small piece parts.

ALWAYS support long, wide material which must be held during forming, from below, on the open palm of *the hand.*

ALWAYS be sure that the piece part has made firm contact with the back gauge, before activating the Press Brake.

ALWAYS place your unoccupied hand on the hand rail.

ALWAYS use protective hood on footswitches and foot pedals to prevent actuation by falling objects.

ALWAYS turn key selector switch and power switch to the "OFF" position and remove keys when the Press Brake is not in use.

INSTALLATION

FOUNDATION

Before machine installation, refer to your pre-installation package for floor plans or foundation drawings for anchor bolt locations and other foundation information.

Before the arrival of your press brake, be sure that the foundation has been properly prepared to specifications that were included in the pre-installation package, and that you have anchor bolts and grout to fasten the press brake to the foundation.

Your foundation should be substantial enough to prevent the end frames from lifting and pulling up anchor bolts when the machine is under load. The minimum concrete thickness is 6 inches. Refer to your foundation drawing that is included in your pre-installation package.

UNLOADING AND HANDLING

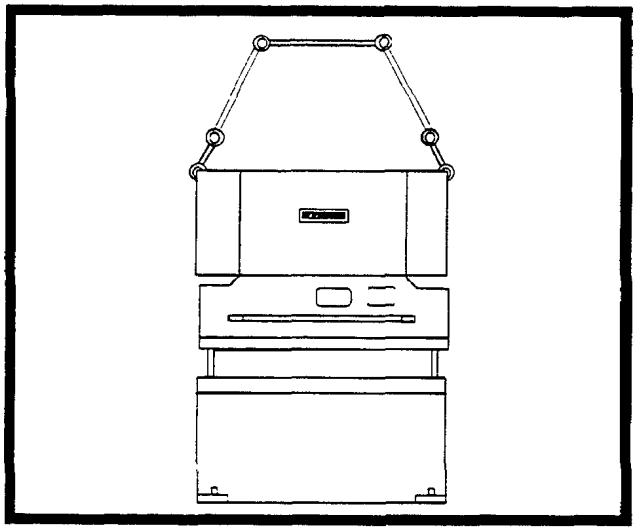
Carefully examine your press brake shipment as soon as it arrives. If you find damage, notify the carrier and file damage notices immediately.

Masteel IS NOT RESPONSIBLE FOR DAMAGE THAT OCCURS DURING SHIPMENT. DO NOT RELEASE THE CARRIER FROM RESPONSIBILITY UNTIL A WYSONG REPRESENTATIVE INSPECTS YOUR MACHINE.

The PRESS BRAKE IS TOP HEAVY to the front, and must be handled with care to guard against tipping. When moving or lifting the press brake, it is recommended that the Press Brake be handled with a crane or hoist, using the designated lifting points at the top of the end frames. If only one hoist is available, use a spreader bar in a sling to prevent side loading (Figure 1). Be sure that all lifting devices are strong enough to support the weight of the Press Brake before moving or lifting.

NEVER MOVE OR LIFT THE PRESS BRAKE BY ALLOWING THE WEIGHT OF THE MACHINE TO BE SUPPORTED BY THE RAM.

NEVER INSTALL OR MOVE THE PRESS BRAKE WITHOUT THE SERVICES OF A QUALIFIED, PROFESSIONAL RIGGER.



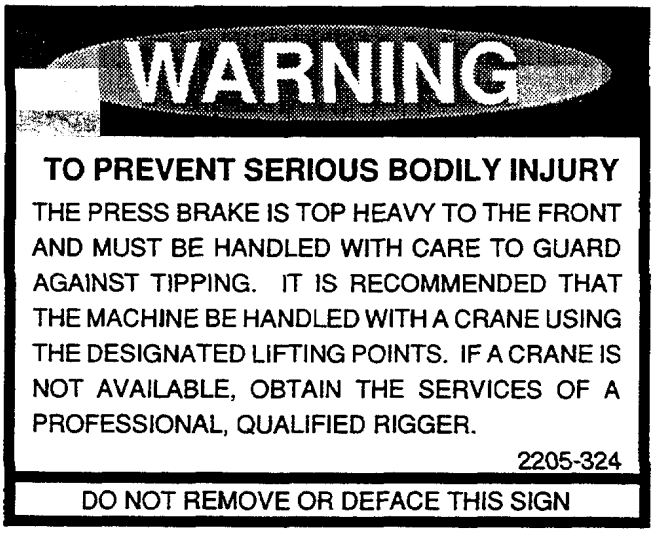


FIGURE 1

INSTALLATION

SECURING THE PRESS BRAKE

INSTALLING ANCHOR BOLTS

75 - 250 TON PRESS BRAKES

The anchor bolt kit includes the following items:
(Purchase Separately)

Four (4) anchor bolts with nuts and washers
Four (4) capsules
One (1) drive adapter
One (1) concrete drill
four (4) leveling pads

TO INSTALL ANCHOR BOLTS,
FOLLOW THE STEPS BELOW

Step 1. On the prepared foundation, mark the general location of the four anchor bolts.

Step 2. Drill a 1" diameter clearance hole (with supplied concrete drill) for the right hand rear anchor bolt as shown Figure 2. Clearance holes should be 5 1/2" deep (Figure 3).

Clean the clearance hole an insert a capsule, making sure that the capsule is at the bottom of the hole.

Step 3. Drive anchor bolt into the hole with a standard rotary hammer drill and supplied drive adapter. This action breaks the glass capsule and mixes the hardener. Drive bolt until resin is visible.

It will take approximately 30 minutes for the hardener to set-up.

Step 4. Remove skids from press brake and position right hand rear press brake foot pad over anchor bolt. Place the four leveling pads under bed/end frames and the foot pads (Figure 2). Carefully lower machine so that the hole in the right rear foot pad clears the anchor bolt.

Step 5. Drill and clean the three remaining holes through the foot pad holes and repeat step 3.

Step 6. Snug the anchor bolts against the foot pads and level the press brake in accordance with the installation instructions on page 7 and 8.

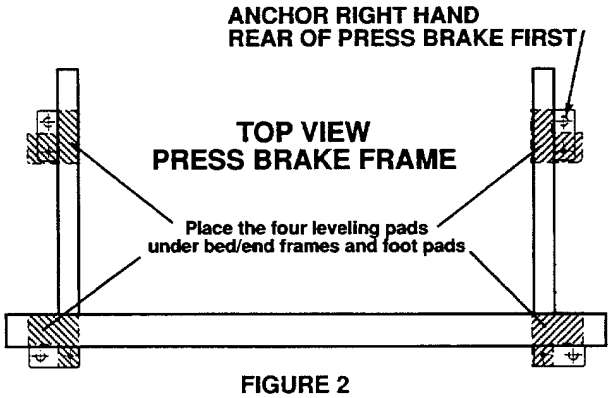
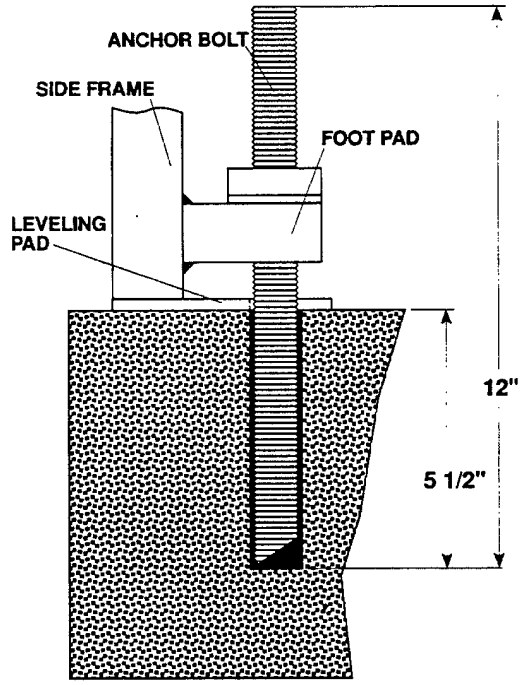


FIGURE 2



WHEN DRILLING ANCHOR BOLT HOLES, CARE SHOULD BE TAKEN TO AVOID BREAKING THROUGH FOUNDATION

FIGURE 3

INSTALLATION

LEVELING THE PRESS BRAKE

To ensure that the press brake provides forming accuracy without premature wear of moving parts, it is important that the press brake be properly leveled.

RECOMMENDED TOOLS FOR LEVELING AND CHECKING CLEARANCES:

1. Precision Level that is Accurate to .001" per foot
2. Set of Feeler Gauges
3. Steel Leveling Shims

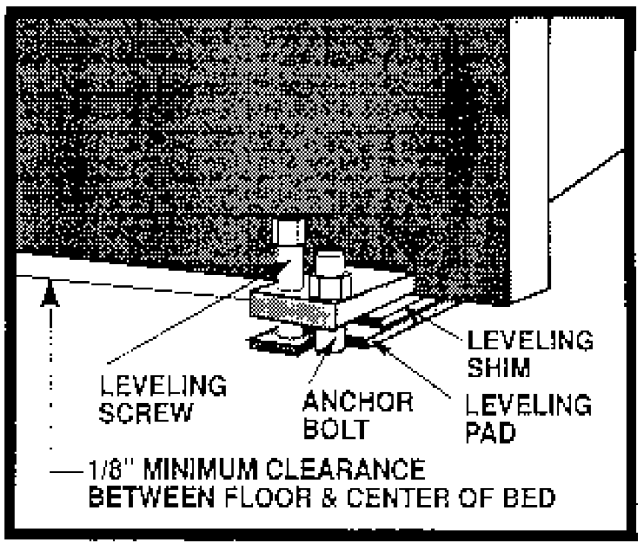


FIGURE 6

LEVELING FRONT TO BACK

. Level front to back by adjusting the jack screws anc placing leveling shims between the bed/end frame and the leveling pads (See Figure 6).

When the machine is level to within ±.001" (front to back), tighten anchor bolts.

. Repeat leveling procedure on the left hand gib surface.

LEVELING LEFT TO RIGHT

1. Place a precision level on the bed surface (not die holder) and level from left to right. This reading is not as critical as front to back leveling and can be ±.005" per foot.
2. Level with leveling shims between the bed/end frames and the leveling pads.

Re-check all leveling points, and be sure all anchor bolts are tightened after the machine has been leveled.

Do not allow the weight of the press brake to rest on leveling screws after shimming and bolting the machine to the foundation.

Be sure that there is a 1/8" minimum clearance between the foundation and the center of bed.

After 3 to 4 weeks of press brake operation, check and re-level if necessary. For best operation, check level periodically.

INSTALLATION

CLEANING

All machined surfaces on the Press Brake are coated with a rust preventive for protection during shipping, which is easily removed with ordinary solvents. CLEAN RAM WAYS, GIBS, PISTON SLEEVES AND BACK GAUGE THOROUGHLY BEFORE BEGINNING PRESS BRAKE OPERATION. Grease all fittings with Mobilplex 47.

POWER REQUIREMENTS

Before wiring machine to power, refer to your machine specifications list for the electrical configuration of your press brake. The list is located in the manual holder on the left side frame. Verify the voltage requirements shown on the specifications list with the red tag that is located inside the control box.

Wiring should be completed by a certified electrician. Before turning on power, check voltage at the disconnect to verify specifications.

CHECKING MOTOR ROTATION

INITIAL START UP

Remove keys for the keylock selector switches from inside the control box. These keys are used to select ram cycling modes that are explained in the SET-UP PROCEDURES on page 10. You will also use these keys after you have checked the rotation.

Connect the palm button station to the electrical control box. The machine will not operate without the palm button station connected.

CHECK MOTOR ROTATION

Motor rotation must be checked for clockwise rotation before press brake operation. This procedure requires two people — one person at the electrical control box, and the other person at the end of the pump motor. Remove the pump motor coupling cover to view the pump motor coupling rotation or watch the fan blade from the end of the motor.

With the electrical enclosure door closed, move the disconnect switch to the "ON" position.

Press the "START" push-button to start the pump motor and immediately push the "STOP" button.

The rotation of the pump motor coupling and the fan blade should run in a clockwise direction as indicated by the arrow on the pump motor housing.

If motor is running in reverse, move the disconnect switch to the "OFF" position.

Turn off the incoming power supply to the press brake.

To correct rotation, interchange two input power lead wires at the top off the disconnect switch (Figure 4).

After the rotation check, power the press brake and run the ram to the top of stroke.

Turn power "ON" and push the "START" push button. Place the key (for the keylock selector switches) into the INCH/MANUAL/AUTO switch and turn the key to the "INCH" position. Run the ram to top of stroke by pressing the "UP" button on the Dual Palm, Pedestal Control.

WARNING! ! Turn power "OFF" at the press brake and at the incoming power supply. Change only the power leads at the top of the disconnect switch — not the motor leads.

CHECK OIL RESERVOIR

Check the oil reservoir to ensure that it is full of hydraulic oil (see oil sight gauge). Oil should be half way in the sight gauge when the ram is all the way to the top of stroke. The recommended hydraulic oil is Mobil DTE-25 or equivalent, with a viscosity of 215 / 240 SUS at 100° F.

After you have completed this section, turn power "OFF" before leveling the press brake.

SET - UP PROCEDURES

INSTALLING PRESS BRAKE TOOLING

program the pressure to 60 Ton on control to prevent damage or personal injury when setting dies

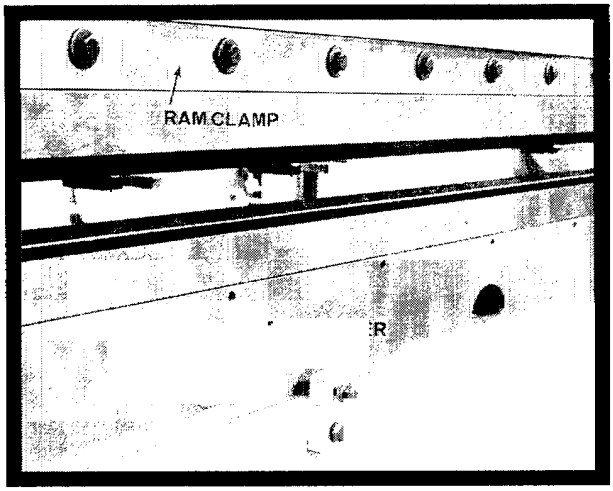


FIGURE 11

INSTALLING LOWER PRESS BRAKE DIE

1. Loosen center die holder bolts and die holder blocks enough to allow the die holder to move during tooling alignment (Figure 11).
2. Loosen die holder set screws.
3. Slide lower die into the slot in the die holder.
4. Tighten the lower die with socket set screws in die holder.

Before installing the upper tool, raise the ram to provide enough working clearance.

INSTALLING UPPER TOOL WITH A TANG

1. When installing upper tools with a safety tang (Figure 12), loosen ram clamps enough so that the tang of the upper tool clears the clamps and ram surface.

   Be sure that the ram clamps are tight enough to support the tool, yet loose enough to allow the tool to slide.
3. Slide the upper tool onto the ram clamp shoulder and slide the tool into position.
4. Tighten ram clamps.

INSTALLING UPPER TOOL WITH A TONGUE

1. When installing upper tools with a tongue (Figure 13), slide the tool into the vee of the lower die and slide the tool to the desired position.
2. Loosen ram clamps enough to allow the tongue to clear the ram and ram clamps.

UPPER TOOL WITH SAFETY TANG

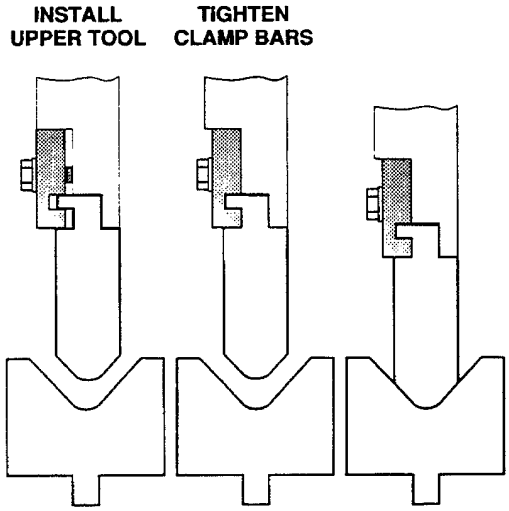


FIGURE 12

UPPER TOOL WITH STANDARD TONGUE

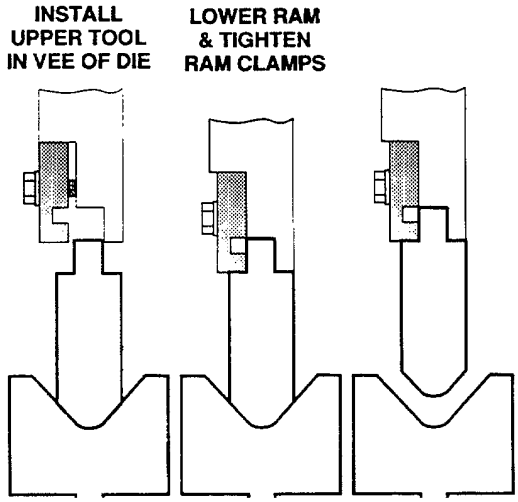


FIGURE 13

3. With the PALM/DOWN buttons, lower the ram so that the tang on the upper tool lines up with the opened slot of the ram clamps. Lower ram until the shoulder of the upper tool makes contact with the shoulder on the ram and ram clamps.
4. Tighten the ram clamping screws to secure the upper tool.
5. Raise the ram so that the tip of the upper tool is not in contact with lower die.

SET - UP PROCEDURES

ALIGNMENT OF TOOLS

1. To align tools, lower the ram until the punch tip contacts die bottom (Figure 14).
2. Raise the ram until there is enough clearance to insert a 1/4" feeler gauge along the sides of the upper and lower tools (Figure 15).
3. Check clearance along the length of the upper tool, on both sides, and adjust die block screws accordingly.
4. When tools are aligned, tighten all die holder bolts.

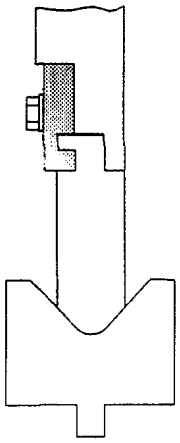


FIGURE 14

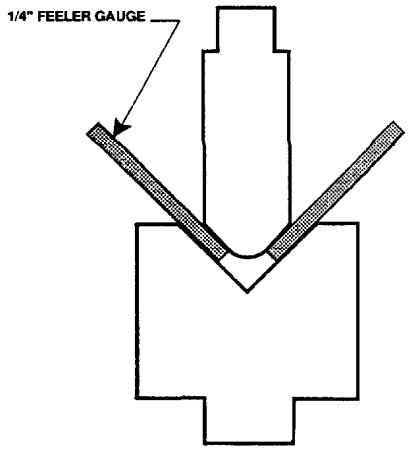


FIGURE 15

After dies are properly installed, adjust tonnage control to the desired pressure.

Off-center loading is not recommended on MTH series press brakes. Always center the short die sets in the middle of the bed and ram. Also, perform short work on long die sets in the middle of the bed and ram.

As an additional safety measure, always use upper female dies that are manufactured with safety tangs.

WARNING:

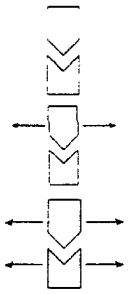
Caution should be observed to ensure tooling is not overloaded.

OPTIONAL HYDRAULIC CLAMPING

If your machine is furnished with hydraulic tool clamping the modes of operation are as follows:

1. Hydraulic clamping is operational only when the Cycle Mode Switch is in the "INCH" position.

CAUTION: If upper tool does not have a safety tang, the upper tool will drop out of the clamp bars in the opened, upper hydraulic tool clamp position. Always lower ram so that the upper tool rests in the vee of the lower die when opening upper tool clamps (See figures 12 and 13).



This position locks upper and lower hydraulic tool clamps.

This position opens upper hydraulic tool clamps.

This position opens upper and lower hydraulic tool clamps. clamps.