

## DISPLAYED PROMPTS, MESSAGES, AND ABBREVIATED TERMS

DISPLAY	EXPLANATION
ANGLE	Prompt reference to station bend angle on two-axis systems.
ANG. ADJ.	Abbreviation for angle adjust prompt used to compensate for adjustment to bend angle on two-axis systems.
BEND ALL.	Abbreviation for internal bend allowance prompt used to establish gauging dimensions.
CALIBRATED	Message flashed when second axis on two-axis systems is calibrated.
CALIBRATING	Flashing message when gauges are moving through calibrating.
CASSETTE?	Prompt in mode menu for entering cassette operation.
CHANGE?	Prompt reference to enable change of existing job number to another number when a programmed job is entered in set-up mode.
COMMUNICATION ERROR	Message displayed as general purpose error for communication to peripherals.
COMPLETED PARTS	Message flashed on display (along with number) after last station in job program is formed when parts counting operation is selected.
CONFIGURATION ERROR	Message displayed when configuration switches are improperly set.
DELETED	Message flashed when a programmed job number or station is erased from memory.
DEPRESS RUN	Instruction message in manual jog to enable gauge servos.
DIAGNOSTICS?	Prompt in mode menu for entering testing operations.
DIE BOTTOM	Prompt to indicate punch penetration into die that operator desires controller to recognize when programming second axis.
DIE OPEN	Prompt to indicate width of die opening on two-axis systems.
DIE TOP	Prompt to indicate punch position above die that operator desires controller to recognize when programming second axis.
DIM.	Abbreviation of dimension prompt for location of station.
DIMENSION ERROR	Message displayed when peripheral is primed with target value greater than maximum.

DISPLAY	EXPLANATION
RAM OVERSHOOT	Message flashed on two-axis hydraulic press brake when operating in "Run-Single Cycle"; used to report the dimension of ram "coast" in relationship to "target" position of the punch.
RAM SPEED	Prompt reference on two-axis hydraulic press brake; used to program a ram speed change at a specific distance (within parameters) above the bend angle target position of the punch.
READ TAPE?	Prompt in mode menu microcassette operation.
RETRACT?	Prompt reference to enable gauge retract after forming station bend.
RET. DIM.	Abbreviation for gauge retract dimension desired from programmed station dimension.
RET. TIME	Abbreviation for retract time desired for gauge to remain at the retracted dimension.
RIGHT FRONT	Message displayed to indicate peripheral type (front - single housing)
RIGHT REAR INSIDE	Message displayed to indicate peripheral type (single housing, or right half of a dual housing gauge)
RIGHT REAR OUT- SIDE	Message displayed to indicate peripheral type (second gauge)
SECOND AXIS	Message displayed to indicate peripheral type second axis.
SECOND AXIS INACTIVE	Message displayed to indicate that second axis is turned off.
STATION #	Prompt displayed to indicate current station number or to select station number.
STAT. AVAILABLE	Abbreviated display to indicate remaining number of unused stations available for programming.
TAPE FULL	Message displayed in mode menu microcassette operation to indicate no room left on tape.
WRITE OVER?	Prompt used in mode menu microcassette operation.
WRITE TAPE?	Prompt used in mode menu microcassette operation.
WRITING TAPE	Message displayed in mode menu microcassette operation while recording.
YES	Prompting answer in response to display (corresponds to plus key).

DISPLAY	EXPLANATION
DUPLICATE JOB	Message flashed on display when an attempt is made to change a job number to a number that has already been programmed.
END OF JOB LIST	Message flashed when a job no. key is pressed after last programmed job number is encountered.
ENTRY ERROR	Message flashed when a numerical value is entered that is larger than maximum allowed for a particular prompt.
FRONT	Prompt valid on system with front gauges and used to command front gauge to programmed data.
ILLEGAL ANGLE	Error message displayed on two-axis systems in run when an attempt is made to program an angle that cannot be formed with master information programmed.
ILLEGAL DIE TOP	Error message on two-axis systems; displayed when an attempt is made to program die top at a position <u>below</u> die bottom.
ILLEGAL RAM OPEN	Error message on two-axis hydraulic press brakes; displayed to indicate that "Ram Open" position is not within parameters.
ILLEGAL SPEED CHANGE	Error message on two-axis hydraulic press brakes; displayed to indicate that the requested Ram Speed change is not within parameters.
INT. BEND ALL.	Abbreviation for internal bend allowance prompt in job master program to automatically calculate each station bend allowance.
JOB #	Prompt displayed to indicate current job number or to select job no. entry.
JOBS AVAILABLE	Message displayed to indicate remaining number of unused jobs available for programming.
KEY DEPRESSED	Message displayed to indicate cause of "Run" exit.
LEFT FRONT	Message displayed to indicate peripheral type (left side of front dual housing).
LEFT REAR INSIDE	Message displayed to indicate peripheral type (dual housing)
LEFT REAR OUT- SIDE	Message displayed to indicate peripheral type (second gauge).
LIMIT SWITCH	Error message displayed to report that a limit switch has been tripped during gauge movement.
MANUAL JOG?	Prompt in mode menu to enable manual jog of gauge.
MASTER CLEAR?	Prompt in mode menu to enable clearing of all programmed memory.

DISPLAY	EXPLANATION
MAT. THICK	Abbreviation for material thickness prompt within job master scheme.
METRIC?	Prompt reference in job master scheme to metric measurements.
MISSING CAL. SWITCH	Message displayed when calibrate switch is not detected during gauge calibration.
MISSING ENC. COUNTS	Message displayed when missing encoder counts are detected for a peripheral.
MISSING LIMIT SWITCH	Message displayed when a limit switch is not detected during calibration.
MISSING MRK. PULSE	Message displayed when marker pulse is not detected during calibration.
MOTION ERROR	Message displayed when gauge is stuck (no encoder counts detected) in "Run".
NEW JOB	Message flashed to indicate that a new job has been created.
NEW STATION	Message flashed to indicate that a new station within a job has been created.
NO	Prompting answer in response to display (corresponds to minus key).
NO STAT. PROGRAMMED	Message displayed when "Run" button is pressed and there are no stations programmed in the currently displayed job number.
NOT AVAILABLE	Message flashed when attempting to enter new job, or station, and there's not enough memory available for programming; also when calibrate key is pressed on single-axis systems.
NOT CALIBRATED	Error message on two-axis systems; displayed if "Run" is depressed and second axis has not been calibrated in the "active" position.
NOT FOUND	Message displayed when an attempt is made to call up a non-existing job or station.
PARTS COUNTER?	Prompt in mode menu to enable part counting operation.
PERIPHERAL RESET	A peripheral reset for no apparent reason.
PUNCH RADIUS	Prompt reference in job master scheme to the male forming tool for calculating target information and bend allowance.
RAM OPEN	Prompt reference on two-axis <u>hydraulic</u> press brake; used to program the position of the ram to a specific distance above the die top, after the forming stroke.

## Programming and Operating THE AUTOBEND 5 CONTROLLER FOR SINGLE-AXIS PRESS BRAKES

- 1-1 These instructions will explain the programming and operation of the Autobend 5 controller for your Autobend gauging system. The instruction book furnished with this course contains pictures and illustrations to assist you. This book should be placed near your tape recorder. Please open your instruction book to Unit One, Page One.

For your convenience we have included a printed transcript of this recorded narration within the Supplemental Information Section of this manual. If your gauging system includes a front gauge, an additional set of instructions pertaining specifically to the front gauge has been included within this training course. Refer to the Table of Contents for location of this data.

- 1-2 Please turn to page 1-2 of your instruction book. After an instruction has been given, you may be asked to complete a specific task. At the sound of the tone, depress the button to turn off your tape recorder and complete the task as instructed. When you have finished that step of the instructions, depress the play button on your tape recorder to continue with this instruction course. Now refer to page 1-3.
- 1-3 It is recommended that you read ALL the information contained within the Introduction Section of this manual for safe, efficient use of this instruction course AND your Autobend press brake gauging system. Familiarize yourself with this information now — when you have finished, simply depress the **play** button on your tape recorder. Now turn to page 1-4.
- 1-4 To perform some of the instructions within this course, you will need a pencil, several Autobend programming sheets and several pieces of scrap metal of sixteen gauge thickness by approximately twelve inches square. Make sure you have these items now.
- 1-5 To prevent possible damage to the equipment and personal injury, follow the instructions as they are presented. Wait until an explanation is complete before attempting to perform the task. Don't hurry, or try to get ahead of this instruction program. If something is not clear, **stop** — rewind the cassette tape and listen to the instruction again.
- 1-6 Before you begin these programming and operating procedures, be sure you have reviewed the safety procedures pertaining to the use of the press brake. Refer to the list of cautions within the Introduction Section of this manual. Remember, this list may not include ALL of the possible hazards with regard to your specific press brake. It is also good practice to review the manuals that have been furnished by the manufacturer of your press brake. It's **your** safety that is involved, so become familiar with all safety information before attempting to use the press brake. Now refer to page 1-5.
- 1-7 These safety precautions will apply specifically to the **Autobend** gauging systems. You may not be familiar with some of the terms, or names at this time. Don't be concerned. They will be identified before you will be told to operate your Autobend gauging system.

These are just a **few** of the safety practices intended to protect you from injury and the machinery from damage. Now turn to page 1-6.

- 1-8 We'll begin by defining some of the programming terms we'll be using. The term **JOB NUMBER** is a numerical sequence that will identify the part to be programmed. This number is frequently the same as the part number taken from the print, but it can be **any** series of numbers up to 12 digits in length. The term **STATION** identifies the bend itself, and is actually the sequence used to form the part. If you're going to make two bends in a part, you'll have **two stations**; three bends — three stations, and so on. The term **DIMENSION** stands for the specific location of the bend.

The term "Programming", as we will use it, means entering data and instructions into the AUTOBEND controller by using the various touch-sensitive keys and pushbuttons on the control panel.

Definitions of some **other** terms used are also reflected on page 1-6. Refer to page 1-7.

- 1-9 We will now explain the AUTOBEND programming sheet which has been designed to make it easier for you to program the necessary instructions into the controller. When this sheet is properly filled out, it will enable you to respond with ease to the information that will be asked by the AUTOBEND controller. Your engineering department may fill this programming sheet out for you, or **you** may have to do it yourself. You should have some of these sheets with you now, if you don't, locate some at this time. Let's divide the programming sheet into three parts for ease of explanation. Turn to page 1-8.
- 1-10 The top third of the program sheet is shown here. Starting at the upper left-hand corner, there are blanks for the date, the number of sheets used in preparing this program, and for the name of the person filling in the programming data. In the center of this area there is a blank for the Part Number. This number should be taken directly from the print, and should include the revision. Beneath the Part Number there is a line for the JOB Number which will be used to identify the part to the controller. This number may be any series of digits up to twelve and is usually the same as the part number. In the boxed area labeled "Material" — on the left side of the program sheet are lines for the "Thickness" of material being formed, the "TYPE" of material the part is to be made of — such as aluminum, or cold-rolled steel — and the "Blank Size" before shaping. The center boxed area, labeled "Tooling" is provided to list the type of tooling used and the "Punch" and "Die" tool numbers. The right-hand box labeled "Special Instructions" is provided to enter information, such as "Use Main Gauge Bar", or "use two 3 inch filp fingers set 3 feet apart." Now refer to page 1-9.
- 1-11 The center portion of the program sheet, which we see here, provides you with an area to sketch the finished part. This sketch will help you determine the best sequence when forming the part. The sketch should show the dimension for each bend and the bend angles. Number each bend in order of forming. This number will become the "STATION" number used to identify the bend. Turn to page 1-10.
- 1-12 The lower section of the programming sheet is labeled "Controller Setting". When properly filled in, this section will contain the information required to correctly respond to the questions that will be asked by the AUTOBEND 5 controller. We call these questions "prompts", and specific controller prompting will depend upon whether the gauging system is single — axis, or two — axis **rear gauge, front gauge or combination of these gauges**. This section of the programming sheet has been designed so each controller prompt can be answered in the **sequence** they appear in the prompting program.

Some of the data boxes that appear within this section of the form may **not** be used within **your** specific prompting program. These boxes are included to standardize the form for multiple usage. Simply ignore those boxes that do not apply to **your** specific Autobend system configuration.

- 1-12A The top portion of this area contains a series of labeled boxes which correspond to the job "**Master**" information that's requested. The AUTOBEND five controller is designed to require this "**Master**" program to be viewed before the **station bend data** can be initially entered. This design feature helps to prevent the omission of any information necessary to form the part correctly.
- 1-12B The first block, labeled METRIC, contains NO and YES boxes. Your controller may **not** allow metric measurements to be **operator selectable**, so these boxes will not apply; but, if your system **does** allow the operator to select metric measurements, check the appropriate answer box to indicate the measuring system you want to use when entering the part dimensions. The controller's **minus** key corresponds to a "no" response, while the **plus** key corresponds to "yes".

- 2-3 The Autobend Five Controller contains all of the displays, touch-sensitive keys — and push-buttons to operate the gauging system.
- The display is a dot-matrix type, clearly visible to the operator.
- The clearly labeled, color-coded **keys** with large touch-pads are functionally grouped for ease of operation.
- The large, colored **pushbuttons** are clearly labeled to describe their function. A key-lock **switch** provides protected access to the controller memory. Turn to page 2-4.
- 2-4 Don't become overly concerned with attempting to completely memorize the information we'll relate pertaining to each control key. Key functions will become adequately clear to you as we program example entries together — later on in this instruction course. Let's now take a closer look at these controls starting with the "**Protected Access**" key lock switch. This switch has two positions.
- 2-4A When the key is turned horizontal, controller data can be **programmed, altered, and/or deleted** when in the "Set-up" mode.
- 2-4B When the key is vertical, Job and Station data previously programmed into the controller memory may be **used, reviewed, or examined** — **BUT** may not be **created, changed, or deleted**. Now refer to page 2-5.
- 2-5 The red "**Stop**" pushbutton is used anytime an emergency exists involving the Autobend equipment — **or** when you wish to temporarily remove power from the gauge drive. When "Stop" is depressed, Autobend operation and gauge motion is immediately stopped — power is removed from the gauge drive servo. Pressing "Stop" will also "blank" the controller display screen. The controller will wait until a **valid** touch-key is pressed before restoring power to the gauge servos. **Valid** touch-keys that restore power are "JOB NO.", "STA. NO.", "SET UP" and "NEXT STA.". Turn to page 2-6.
- 2-6 The "**Run**" pushbutton activates the complete Autobend system and initiates gauge operation. This "lighted" pushbutton allows the selection of any previously programmed job or station within a job. **One** depression of the "Run" pushbutton places the system in "**automatic**" cycle — pressing it **again** places the system in "**single**" cycle. The "Run" pushbutton may be "toggled" between "Automatic" and "Single" Cycle with the **current** operation indicated by the word being illuminated.
- 2-6A When the "Run" pushbutton is depressed, the controller checks to determine if any **programmed stations** exist in the currently displayed job. If **no** stations exist, the "set-up" mode will be entered and the message "No Stations Programmed" is displayed. If stations **do exist**, the "Run" cycle is executed.
- 2-6B Before executing a job, the controller will check to see if the gauges are calibrated — if they are not calibrated, they will be commanded to do so. Once calibrated, the gauges will move to the programmed dimension. While they are moving, the Station data display will be flashing. As soon as the dimension is reached, the display will no longer flash. **Never** attempt to make a bend while the display is "flashing".
- 2-6C When operating in the "**Automatic**" cycle, the gauge will automatically advance to the **NEXT** programmed station within the job — **AND** then to each subsequent station, every time the press brake ram is cycled. After the **last** programmed station is formed, the gauge will return to the **FIRST** station in the job program. This cycle will be repeated during the "Auto-Run". The "Automatic" cycle is exited when **any** control key, or pushbutton is depressed.

- 2-6D **"Single" Cycle** mode will advance the displayed **current** station to the **next** programmed station when "Single-Run" is **entered**. If this were the LAST station in the job, the gauge — and display — will return to the FIRST station dimension. The gauge will then **remain** in the current displayed station regardless of how many times the press brake ram is cycled. To move the gauge bar to the next station in the job program, depress the "Next Station" key. The gauge will move to the next displayed station dimension. Depressing any key, **other than** the "Next Station" key will cause the "Single" Cycle run to exit.
- 2-6E When a key is depressed to force "Run" to exit, the message KEY DEPRESSED will be momentarily flashed on the display.
- 2-6F A communication error, or other type of problem with the system will also force "run" to exit. Errors and problems will then be reported on the display. If a communication error to a gauge occurs, the general message **communicator error** will be displayed. When a key is depressed, a message will **then** be displayed naming the gauge that had the error. When a gauge has a **problem**, the **problem** will be named in the message — such as "missing limit switch", and so forth. In both cases, the message naming the gauge — which we term **peripheral** — will remain displayed until a control key is depressed. Now refer to page 2-7.
- 2-7 The **"Mode"** touch-key allows Master Clearing of all programmed data and manual jog of the gauge. Mode also activates a parts counter which provides a running count on parts formed for a job. When the Mode key is depressed, a message is displayed to indicate the first available feature — which is master clear. Pressing the "Enter Advance" key will cause each available mode feature to be displayed with the initial response — No. Depressing the plus key will change the message to a Yes response and that feature may then be activated.
- 2-7A If the message **"Master Clear? Yes"** is selected — depressing either the "Enter Advance", or "Setup" key will clear all programmed jobs from the controller's memory.
- 2-7B If the message **"Parts Counter? Yes"** feature is chosen — depressing either the "Enter Advance," or "Setup" key will provide a running count on completed parts formed for a particular job. When the last station in the job is formed, the message "Completed Parts" — and the number formed — is momentarily displayed before the gauge moves to station one of the job program. This count will be valid when operating in the automatic cycle. Pressing the job number key will interrupt the parts counting operation and it will start over — beginning with completed part one.
- 2-7C When the feature **"Manual Jog? Yes"** is selected — depressing the "Enter Advance" key will cause a prompting program to be entered. If metric measurement is operator selectable, the prompt "Metric, No" will be displayed — responding Yes to this prompt and pressing "Enter Advance" will cause the manual jog dimension to be displayed in metric. The prompt "Depress Run" is displayed as an operating instruction. When you carry-out this instruction, the manual jog arrow keys are activated and will cause gauge movement when pressed.
- 2-7D When the **Mode** key is pressed, exit can only be made by depressing the **Setup** key. Turn to page 2-8.
- 2-8. The **"JOB NUMBER"** touch-key — abbreviated "JOB NO." — is used to **create** a new job, **search** for a **specific** job and **select**, or **review** a previously programmed job number. Depressing the "Job Number" key causes the **current** job number to be displayed. Repeated depressions of this key will cause each job number to be displayed in the sequence they have been entered into the controller. This allows the operator to "single step" through all of the job numbers programmed.

Depressing the "Job Number" key after the **last** programmed job number has been displayed causes the message "End of Job List" to be flashed on the display — immediately followed by the first job number entered into the controller. If the "Enter Advance" key is pressed while a **current** job number is displayed, the job master program for **that** job will be entered. Repeated depressions of the "Enter Advance" key allows the programmed job data to be reviewed.



2-8A If the “**Protected Access**” key lock switch is **vertical** — pressing the “Job Number” key, followed by a numerical entry, **THEN** by pressing “Enter Advance” key allows the **selected** job program to be entered for **review**. Repeated depressions of the “Enter Advance” key allows the programmed master data to be reviewed, but **not changed**, or **created**. If the **selected** job number **has not** been programmed into the controller, the message “NOT FOUND” will be displayed. If the “Job Number” key is pressed after this message has been displayed — the programmed job number **last displayed** on the screen will appear again.

2-8D If the “Protected Access” key lock switch is **horizontal**, pressing the “Job Number” key, followed by a numerical entry, **THEN** by pressing “Enter Advance” — allows the **selected** job’s master program to be entered for **change**, OR allows new job data to be **created**.

If the job number **has not** been programmed into the controller — AND sufficient memory exists — the number selected is stored and the message “NEW JOB” is momentarily flashed on the display. This is immediately followed by the **first question** in the job master program. The “new job” can then be **created** by appropriate answers to the controller’s prompts.

If the job number **has been** programmed into the controller, the message “Change, no” is displayed and will remain until a key response. The job data previously programmed can be **changed**, including the job number. If job number change is desired, press the plus key in response to the “Change, no” message. Then press the “Enter Advance” key to display the “old” job number — which may then be changed to the new number. Press the “Enter Advance” key to store the new number and enter the job master program which will contain all the data previously programmed under the “old” number.

If the new job number is a **duplicate** of another job entered into the controller, the message “Duplicate Job” will be flashed on the display immediately followed by the **original** job number. The job number will **NOT** be changed. Now refer to page 2-9 in your instruction book.

2-9 The “STATION NUMBER” touch-key — abbreviated, “STA. NO” — is used to **select** a previously programmed station within the current job. Pressing the “Station Number” key causes the **current** station to be displayed. Pressing “Station Number”, followed by a numerical entry and by pressing the “Enter Advance” touch-key causes the **selected** station number, “Run-data” to be displayed. The type of data displayed will depend on your Autobend configuration, If the **selected** station does not exist, the message, “NOT FOUND” will be momentarily “flashed” on the screen, immediately followed by the station number **last** displayed. Repeated depressions of the “Station Number” key when a **valid** station and appropriate “Run-data” is displayed, will advance the display to show each programmed station within the job. Pressing the “Station Number” key after the **last** programmed station has been displayed, causes the **first** station and its information to be displayed again.

2-9A If the “Enter Advance” touch-key is pressed when a selected station “run-data” is displayed — **that** station’s program will be entered. Repeated depressions of the “Enter Advance” key allows all of that station’s **programmed** data to be viewed. The type of station data, or prompts, depends on the Autobend system configuration. If the “Protected Access” key lock switch is vertical, the station program can be **reviewed**, but **not** changed, or created. If the key-lock switch is horizontal, the data contained within the station **can** be changed, or created. Turn to page 2-10.

2-10. The “**SET UP**” touch-key causes the “Run” mode to be exited and the “Set up” mode to be entered. When “Set up” is initially entered, the number of stations available appears on the display. “Stations available” — abbreviated on the display as “STAT. available” — are the number of “free” or unused stations that remain available for programming. The “Set up” key toggles between “Stations Available” and “Jobs Available”. The maximum number of “Jobs Available” in the system is 60 — however, the number of “free” **jobs** displayed may not exceed the number of “free” stations available for programming. If there are no more “Jobs Available” for programming, but there **are** “free” stations available, **New** stations may be created within the **previously** programmed jobs. When all “Jobs Available” have been used and an attempt is made to create a **New** job, the message “NOT AVAILABLE” will be “flashed” on the display — immediately followed by the **last** valid job number displayed.

- 2-10A Depressing the “set up” key when operating in “Run” causes the message “KEY DE-PRESSED” to be flashed on the display — immediately followed by “Stations Available.” Now refer to page 2-11.
- 2-11 The “**Calibrate**” touch-key — abbreviated “CALIB.” is not active on single-axis systems. If accidentally depressed, the message “NOT AVAILABLE” will be displayed. Now turn to page 2-12.
- 2-12 The “**ENTER ADVANCE**” touch-key — abbreviated “Enter ADV.” — is used to advance the controller to the **next** data entry point, or prompt, within the **current** data program. Pressing the “Enter Advance” key when the controller is in “Set up” or “Mode” provides entry to the appropriate data program. If the “Enter Advance” key is depressed when in “Run”, the message “Key Depressed” will be displayed to indicate what caused the “Run” cycle to exit — this message will remain until “Job Number”, “Station Number”, or “Set Up” key is pressed.
- 2-12A Pressing the “Enter Advance” touch-key when the “Protected Access” key lock switch is **horizontal** causes the displayed prompt to be **stored** in memory. The display will advance to the next prompt, or question, within the current program. Pressing “Enter Advance” with Protected Access” switch **vertical** allows entry to the program for review of data stored in memory. Repeated depressions of “Enter Advance” recirculates the prompts within the current program after the last prompt has been viewed. The program prompting into which the “Enter Advance” key will provide entry is “Mode”, “Job Number” and “Station Number”. Now refer to page 2-13 in your instruction book.
- 2-13 The “NEXT STATION” touch-key — abbreviated “Next STA.” — is used to create, or add stations within a job program during “set up”, **provided** “free” stations are available. The “Next Station” key is also used to cycle, or move the gauge bar to its next programmed position when operating in the “Single” Cycle, “Run”. Operation of the “Next Station” key should be fully understood to avoid accidentally creating a “new” station within the Job program during “set up”.
- 2-13 Depressing the “Next Station” key during “set up” — with the “Protected Access” key lock switch horizontal creates a new station, **if** the next station does not already exist. If this new station is Station One, the data will be zero and Station One prompting program will be entered. Pressing the “Enter Advance” key will then allow each prompt, or question, to be viewed for proper response. If the “new” station being created is **not** Station One, pressing the “Next Station” key will **create** the “new” station with the **SAME DATA ENTRIES** as the previous station. The “new” station’s prompting program will be entered, starting with the first prompt. The data carried forward from the previous station may be changed as required. Whenever a station is added to a Job program, the message “NEW STATION” flashes momentarily on the display — immediately followed by the beginning of the station prompting program.
- 2-13B If the “Next Station” key is pressed and the next station already exists, the next station’s prompting program will be entered at the previous station’s prompting level — such as “Bend Allowance”, or “Retract”. This allows a specific data entry already programmed throughout the stations to be viewed — and, if in “set up”, to be changed with ease.
- 2-13C If the “Protected Access” key lock switch is vertical, pressing the “Next Station” key after the Job Number display allows Station One to be viewed, beginning with its first prompt. However, **existing** data cannot be changed and **new** stations cannot be added to the job program. Now turn to page 2-14.
- 2-14 The “Up-Arrow” and “Down-Arrow” touch-keys are used to manually jog the gauge when the controller is in “Mode”. During “set up” and “run”, these keys are not valid commands to the controller.

- 2-14A Depressing the "Up-Arrow" key causes the gauge to move rearward, away from the press brake. Pressing the "Down-Arrow" causes the gauge to move forward, toward the press brake. The gauge position is displayed on the controller and will be "steady" when the gauge is stopped. When the gauge is jogged, the last displayed dimension will be "flashing". When the gauge is again stopped, the new dimension will be displayed. Gauge movement during manual jog is at three-hundred inches per minute. Now refer to page 2-15.
- 2-15 The "plus" and "minus" touch-keys are used to respond to the Job Number and Station prompting that require "Yes", or "No" answers. Plus corresponds to "Yes", Minus corresponds to "No".
- 2-15A If the prompt being viewed displays a "No" and this is the **desired** response — it is not necessary to depress the "Minus" key. Pressing the "Plus" key will change the prompt being viewed from "No" to "Yes". Pressing the "Minus" key will change a "Yes" to "No". The "Enter Advance" key is depressed to **store** the response into the controller's memory. The display will also advance to the next prompt within the program. Now turn to page 2-16.
- 2-16 The "INSERT" touch-key is used in the "set up" mode to insert a New Station, or bend, before an existing station in the job program — provided "free" stations are available. The "new" inserted station may be created when the display shows only the station number — or if the station number and "Run-Data" is displayed. A "new" station may be inserted before existing Station One, or between any two existing stations in the job program.
- 2-16A Pressing the "Insert" key when a Station Number is displayed will create a new station before the station number displayed. The newly **inserted** station will become the Station Number displayed. Its data will be zeroed, and this station's prompting program is entered. All existing stations and programmed data — following the inserted station will be moved up. For example — if the inserted station is to be between existing stations Two and Three, the inserted station will become the "new" station Three and former station Three will become Station Four. When an "Insert" station is created, the message "NEW STATION" will be flashed on the display.
- 2-16B Data is **not** carried from a previous station into the newly inserted station. Therefore, it becomes necessary to complete the "Insert" station's prompting program. Now refer to page 2-17.
- 2-17 The "DELETE" touch-key is used in "set up" to erase from memory a selected Job Number and its programmed stations. It is also used to delete selected **stations** within a specific job. If the Job Number — or Station — does not exist, the message "NOT FOUND" will be displayed when the delete key is pressed.
- 2-17A Pressing "Delete" when a Job Number is displayed deletes that job and its programmed stations. The display will then advance to the next Job Number. When a Job Number is erased from memory, the message "DELETED" will be flashed on the display. Immediately followed by the next Job Number in **entry** sequence. If a "new" Job is created after one has been deleted, it will be entered in sequence **after** the last Job entered into the controller. This may not necessarily be in the **same** sequence vacated by the deleted Job.
- 2-17B Pressing the "Delete" key when a Station Number — or a Station Number and its "Run Data" — is displayed will delete only **that** Station from the Job program. All existing stations following the deleted station will be moved down in number within the Job program. If the deleted station was the last station in the Job, the display will decrease the number to the last valid Station Number. For example: If Station six is deleted and this was the last in the Job program, Station five will be displayed. When a station is erased from memory, the message "DELETED" will be flashed on the display immediately followed by the appropriate station taking its place in the program. Repeated depressions of "Delete" erases the Station being displayed. This allows selected stations to be deleted without erasing the entire job. Turn to page 2-18.

- 2-18 The “zero-thru-nine” numerical and “Decimal Point” touch-keys are used to enter all number values into the controller. Numbers are to be entered in the same manner they are written: For example, the number 12.375 is entered by pressing in order: one, two, decimal point, three, seven five. Any insignificant leading and trailing zeros need not be entered — that is to say, if the zero adds no real value to the number, it need not be programmed. However, the leading zero before the decimal point — and trailing zeros will be displayed even though they haven’t been entered. Insignificant zeros **entered** before a whole number will be automatically dropped by the controller. For example: If 003.25 were depressed, the display will show 3.250 when **reviewed**.
- 2-18A If you attempt to enter a **greater** numerical value than allowed for the prompt being displayed, the message “Entry Error” will be flashed on the display. The value **previously** displayed will then reappear.
- 2-18B To program a dimension of 0.048 — press in order, decimal point, zero, four, eight. The zero before the decimal need not be entered since it lends no value to the number, but the controller displays the zero for the operator’s ease of viewing.
- 2-18C To program a dimension of 3.250, press in order, three, decimal point, two, five — the last zero need not be entered, but the controller will show it on the display. Now refer to page 2-19.
- 2-19 The “CLEAR” touch-key is used to reset to **zero** a numerical entry made in response to prompting during “set up”. If a mistake is made when entering a number during **initial** programming, immediately depress the “Clear” key. This will “clear” any numerical entry **EXCEPT** for the controller calculated internal bend allowance. This may be changed merely by entering the desired figure when the “BEND ALLOWANCE” dimension is displayed.
- 2-19A If the “Enter Advance” key has been pressed to store the entry into the memory and it’s realized that a mistake has been made — repeatedly depress the “Enter Advance” key to cycle the prompting until the entry is again displayed. **THEN ENTER** the correct figure into the controller.
- 2-19B If the “Clear” key is mistakenly depressed when the prompt required a “Yes” or “No” response, you must repeat the initial entry into the prompting program. After the prompting program has been re-entered, press the “Enter Advance” key to cycle the display until the desired prompt again appears. Now turn to page 1 in unit 3 of your instruction book.

### UNIT THREE

- 3-1 Now that you are familiar with the functions of the control keys and pushbuttons, let’s go through a complete programming sequence together, step-by-step. Perform each step after it has been described. Remember, if you don’t understand a procedure, backup and listen to the explanation again. Now refer to page 3-2.
- 3-2 Apply power to the controller by turning the disconnect switch to its ON position. If there have been no programs previously entered, the message “STAT. AVAILABLE, 250” should be displayed. This denotes that there are two-hundred and fifty stations available for programming.
- Each time a station is programmed, it is subtracted from the number of stations available. Refer to page 3-3.
- 3-3 Press the “setup” key. The message “JOBS AVAILABLE 60” should be displayed to denote the number of Jobs that may be programmed into the controller. These also will be decreased as Jobs are used up. Turn to page 3-4.

- 3-4 If the "Protected Access" key lock switch is vertical, turn it horizontal. The controller is now in the "setup" mode and is ready for programming. Refer to page 3-5.
- 3-5 Depress the "Job Number" key. The display will now show "JOB, #". The rest of the display will be blank. Now turn to page 3-6.
- 3-6 Let's create a NEW JOB by entering job number 123456789. These numbers will now be displayed opposite the "JOB #".
- Remember, up to twelve numerical digits may be used to identify a Job Number. Refer to page 3-7.
- 3-7 Now press the "Enter Advance" key. You should observe the message "NEW JOB" momentarily flashed on the display, immediately followed by the first prompt in the Job master program.
- 3-7A The display will be either "Metric, no" or "MAT. THICK", followed by zeros depending upon your system. Turn to page 3-8.
- 3-8 If metric measurements are operator selectable within your system, press the "Enter Advance" key to record the displayed NO response into your controller. The display will now advance to the next prompt. Now refer to page 3-9.
- 3-9 The prompt message "MAT. THICK" which is for material thickness should be displayed, followed by zeros.
- Let's use a material thickness for sixteen gauge material. Press in order, decimal point, zero, six. Turn to page 3-10.
- 3-10 Now press the "Enter Advance" key. The dimension is stored in memory and the display has advanced to the next job master prompt. On a single-axis system the prompt displayed is "Retract? no". Refer to page 3-11.
- 3-11 Let's program a retract prompt into the Station's program prompting. Press the "plus" key. This changes the display to "RETRACT? YES". Now press the "Enter Advance" key. The prompt now displayed is "INT BEND ALL NO" which stands for Internal Bend Allowance. Turn to page 3-12.
- 3-12 Because we should allow the controller to do our calculations for us, whenever possible, press the "plus" key to change the display to a "YES", now press "Enter Advance". Refer to page 3-13.
- 3-13 The prompt now displayed is "PUNCH RADIUS" followed by zeros. Let's use a punch radius of one-eighth inch. Press decimal point, one, two, five. Now press "Enter Advance". Turn to page 3-14.
- 3-14 Observe the prompt now displayed. This was the first prompt in our Job master program and now we have a chance to review our entries. Repeated depressions of the "Enter Advance" key allows us to review each response programmed for the Job. During this review you may change any of the information previously entered. Just enter the desired response by pressing the correct keys, when the prompt you want to change is again displayed. Remember, you don't have to press the "Clear" key. Refer to page 3-15.
- 3-15 If your system does not allow metric measurements to be operator selectable, ignore this next step. If metric is selectable in your system, let's see what happens if we change our answer to the metric prompt. Press "Enter Advance" to cycle the display until the prompt "METRIC? NO" appears. Now press the "plus" key to change this to a "Yes" response, then press "Enter Advance". Observe that the "Material Thickness" now displays the metric equivalent of our inch dimension. Repeated depressions of "Enter Advance" will show that all measurements

programmed in inches have now been converted to metric measurements. Press "Enter Advance" to cycle the display until the "Metric" prompt appears again. Now change your response from "Yes" to "No" by pressing the "Minus" key. Press "Enter Advance" and observe that the prompts displayed have been converted back to inches. Now turn to page 3-16.

- 3-16 Now that our Job master program has been completed, let's program a bend into this Job. Press the "Next Station" touch-key. Notice that the message "NEW STATION" flashed on the display, immediately followed by "1 DIM. 0.000". The display now shows that the Station one program has been entered, beginning with the first prompt. Refer to page 3-17.
- 3-17 Program a dimension for Station ONE by pressing "zero, decimal point, seven, five". Now press "Enter Advance". This will store the dimension in memory and advance the display to the next prompt. If you make a mistake when entering a number, simply press the "Clear" key, then enter the correct numerical sequence. Remember, if you try to program a value greater than the maximum allowed — the message "ENTRY ERROR" will flash on the display. Now turn to page 3-18.
- 3-18 On a single-axis system, the internal bend allowance prompt is displayed next. This display is "Bend ALL 0.071". This is the bend allowance calculated for us by the controller. If we wanted to change this to a different dimension, we would press the correct keys to enter the new dimension. We **don't** need to depress the "Clear" key first. Refer to page 3-19.
- 3-19 Press the "Enter Advance" key. The prompt displayed is "1 RETRACT? NO". If we needed a gauge retract at Station one, we would change the display to a "Yes" by pressing the "plus" key. Since we don't need a retract after this bend, press "Enter Advance" to store the "NO" response and advance to the next prompt. Turn to page 3-20.
- 3-20 The prompt display on the controller is again "1 DIM." and the dimension we have programmed for Station one. This display indicates we have now cycled the Station program prompting back to its beginning. Repeated depressions of "Enter Advance" will allow us to review the data programmed for Station one. If any of the data is to be changed, we would enter the desired change into the controller when the prompt is displayed. Remember, the "Clear" key must be preceded by a numerical entry for it to be active; therefore, it will not clear these entries now. Refer to page 3-21.
- 3-21 Press the "Station Number" touch-key. The display now shows "STATION" #1". Now press "Enter Advance". The "Run-data" for Station one is displayed; which is "1 0.750". Now turn to page 3-22.
- 3-22 Let's create Station Number two for this Job program. Press "Next Station" key. Observe that the message "NEW STATION" flashed on the controller, immediately followed by "2 DIM. 0.750". This display indicates that Station two has been created and its prompting program entered, **but** Station two contains all of the same data we programmed into Station one. Since we wish to program different data into Station two, let's continue. Refer to page 3-23.
- 3-23 Enter the Station two dimension by pressing "one, decimal point, five". Now press "Enter Advance". Turn to page 3-24.
- 3-24 The prompt now displayed on single-axis systems will be for the internal bend allowance. The controller has already calculated this value for us. Let it remain unchanged and press "Enter Advance" to display the next prompt. Now refer to page 3-25.
- 3-25 The "retract" prompt is now displayed with the "No" response that was selected for Station one but, since this Station two dimension is greater than Station one's — let's program a retract to allow us clearance and time to remove the part before the gauge moves to the shorter dimension. Press the "plus" key to change our retract prompt to "Yes", then press "Enter Advance". Turn to page 3-26.

- 3-26 The prompt now displayed is "2 RET. TIME," and an "S" for seconds". We could program a time delay of up to sixty seconds, but let's ask for a three second retract. Press numerical "Three", and press "Enter Advance". Now refer to page 3-27.
- 3-27 The prompting has advanced the display to show "2 RET DIM" followed by zeros. This prompt asks us how far rearward we want the gauge to move after forming Station two.
- 3-27A We can program **up to the maximum** rearward movement of the gauge, but let's just ask the gauge to move rearward two inches. Press numerical two. Now press "Enter Advance". The gauge is now programmed to retract two inches from the station two dimension after forming this bend — and remain in this position for three seconds before advancing to station one dimension. Now turn to page 3-28.
- 3-28 We have just completed all changes that will make station two different from Station one. Repeated depressions of "Enter Advance" will cycle our prompting and display our responses. Refer to page 3-29.
- 3-29 Press the "Station Number" key. Now press "Enter Advance". We can now review the "Run-data" display for Station two. Press "Station Number" again. The display now shows Station one "Run-data". If Station Number key is pressed again, Station two "Run-data" appears. Turn to page 3-30.
- 3-30 Press "Next Station" key. Notice that "New Station" flashed on the display and now shows that a New Station three has just been created and its prompting program entered. This demonstrates why the "Next Station" key should **not** be used to **review** Stations. You might accidentally create an **unwanted** Station. Press the "Station Number" key. With "Station Number Three" displayed, press the "Delete" key. Did you observe the message "DELETED" flash on the display? This was immediately followed by the next station in decreasing sequence. In our example it is Station Number Two. Now refer to page 3-31.
- 3-31 Press the numerical "Three" key, which changes our display to "STATION #3". Now press "Enter Advance". Observe that the message "NOT FOUND" was flashed, immediately followed by "STATION #2". This confirms that the Station three is erased from memory. Now turn to page 3-32.
- 3-32. Let's review our Job program. Press the "Job Number" key. The display shows the Job Number we have just programmed — "12345678". Press "Enter Advance". The message displayed is now "CHANGE? NO", to indicate that a previously programmed, Job master program has been entered in "Set up". Refer to page 3-33.
- 3-33 If desired, we can change our Job number to another number and still retain all of the previously programmed data. Let's do this, press the "plus" key to respond "Yes" to this prompt. Now press "Enter Advance". Our original Job Number appears again. Press "123456321" keys. Now press "Enter Advance". We have just changed our Job Number and the display has now advanced to the first prompt in the Job master program. All of the data previously programmed under our "OLD" Job Number is NOW under the NEW number. We can also change, or add to any of this data, if we so desire.
- 3-33A Remember, if the NEW job number is a duplicate of another job number already entered into the controller — which has the memory capacity for sixty different jobs — the message "Duplicate Job" is flashed on the display and the job number will not be changed. Now turn to page 3-34.
- 3-34 Let's see what happened to our "OLD" Job Number. Press the "Job Number" key. Our display now shows the "NEW" Job Number. Now enter the "OLD" Job Number by pressing "123456789". Press "Enter Advance". Notice that the message "NEW JOB" was flashed on the display, immediately followed by the first prompt in the job master program. We have just created a **new** Job with our "OLD" Job Number, and we have **initiated** the Job master prompting. Refer to page 3-35.

- 3-35 We don't need this "new" Job, so press the "Job Number" key. Now press the "Delete key. Notice that the message "DELETED" flashed on the display, immediately followed by our programmed Job Number. We could delete this Job and all of its Station data by pressing the "Delete" key again, BUT LET'S NOT, we still have some practice exercises to perform. Turn to page 3-36.
- 3-36 Now let's program a New bend into our present Job. Insert this new bend between existing stations one and two. Remember, the inserted station is placed **before** the currently **displayed** station.
- 3-36A Press the "Station Number" touch-key. Now call-up Station two "Run-data" by pressing the numerical "Two" key and then the "Enter Advance" key. Station two "Run-data" is now displayed. If we had wanted to insert our new station before Station **one**, we would have called-up Station one. Remember, we may insert our new station when either the Station Number is displayed alone, or when the Station Number and its "Run-data" is displayed. In either case, always call-up the Station Number that you want the NEW INSERTED STATION to precede. Refer to page 3-37.
- 3-37 Press the "Insert" key and observe the display. Notice that the message "NEW STATION" flashed on the display, and that the controller immediately entered the NEW station two program prompting. Notice that all data in this NEW Station two is zeroed. That is to say, no data has been carried over into our NEW Station two. Now turn to page 3-38.
- 3-38 The first prompt is displayed. Let's program a dimension of one inch. Press the numerical "one" key and then press "Enter Advance". Refer to page 3-39.
- 3-39 On single-axis systems, the next prompt displayed is "Bend Allowance". Allow this display to remain unchanged and press "Enter Advance" key to continue onto the next prompt. Turn to page 3-40.
- 3-40 The next prompt in our NEW Station two is "Retract". We could program a retract by responding "Yes", but the dimension of our NEW Station two is less than the dimension that follows for our newly created Station three — which was the OLD Station two. Remember, when we inserted this NEW Station two, the existing Station two was moved-up in number. We don't require a "Retract" in our **NEW** Station two, so press "Enter Advance". Now refer to page 3-41.
- 3-41 The inserted stations program prompting is now complete for single-axis systems. Press the "Station Number" key and then press "Enter Advance". The inserted Station two "Run-data" is now displayed. Again, press "Station Number" key. We now view the "Run-data" for the "new" Station three. Press "Station Number" again. The Station one "Run-data" is displayed. Turn to page 3-42.
- 3-42 Let's erase Station **one** from our Job program. Press the "Delete" key. The message "DELETED" flashed on the display, followed by "STATION #1". Now press "Enter Advance". The **Inserted** Station "Run-data" is displayed and this has **now** become our NEW Station one. Press the "Station Number" key. Station Number **three** has now become Station two and its "Run-data" is displayed. The formed part would now have the dimensions illustrated. Refer to page 3-43.
- 3-43 Erase the entire Job Number program. Press the "Job Number" key and then press "Delete". The message "DELETED" momentarily flashes on the display, immediately followed by "Job #". The remainder of the display is blank. Press the "setup" touch-key. You will observe the number of Stations Available for programming. Now turn to page 3-44.
- 3-44 Now that we have programmed the controller and you are familiar with this procedure, practice filling out a program sheet. Use the information supplied in this illustration of the upper areas to complete the "controller setting" area. If you have any questions, or difficulty, review the instructions given for filling out the programming sheets. Now refer to page 3-45.



- 3-45 Check your program sheet against the one illustrated on page 3-45. If you find an error, correct it. Now turn to page 3-46.
- 3-46 Now complete a program sheet for the part illustrated on this print. Refer to page 3-47.
- 3-47 When you have finished, check your program sheet against the one illustrated on page 3-47 and correct any errors. Don't be concerned if your parts sketch doesn't look exactly like the one shown, but do check your bending sequence.

Now use the two program sheets you have just completed to enter the two jobs into the controller. When you have finished, we'll review them. Don't forget, make sure that the "Protected Access" key lock switch is horizontal before you attempt to enter data into the controller. Now turn to page 3-48.

- 3-48 Compare your entries in the job **master** program for job number 4304961 to the illustrations shown on page 3-48. The key entries in response to the master prompt displays are illustrated in sequence. Now refer to fold-out page 3-49.
- 3-49 Compare your entries in the **station** program prompting for job number 4304961 to the illustrations shown on this fold-out page. Key entries are illustrated in sequence. Now refer to page 3-50 on the other side of this fold-out.
- 3-50 Compare your entries in the job **master** program for job number 11287850 to the illustration sequence at the left side of this fold-out page.
- 3-51 Compare your entries in the **station** program prompting for job number 11287850 to the sequence beginning at the right side of fold-out page 3-50 and continued on page 3-51. The response to the controller displayed prompts are illustrated beginning with the flashed new station display.
- 3-52 The example illustrations reflect one combination of key entries that will effectively create the sample job programs while minimizing errors. Although other entry combinations are possible, it is recommended that you become more familiar with the usage of the controller keys before attempting programming "short-cuts".

If you have any questions at this time, please review the controller programming instructions again. Now turn to page one in unit four of your instruction manual.

## UNIT FOUR

- 4-1 Now that you are familiar with completing the programming sheets and with entering data into the controller — let's prepare your system for a trial bend. Before parts may be formed, the gauge bar **MUST** be referenced to the tooling. This is done by adjusting the continuous surface of the main gauge bar to zero-reference bars inserted between the punch and the die. This referencing must be performed whenever the tooling is changed **and** when flip fingers are added to — or removed from — the gauge bar. Always reference the main gauge bar **directly** to the tooling — even if flip fingers are to be used.
- 4-2 The two zero-reference bars, shipped with the gauge, have a 90° "V" notch located four inches from a machined end. These reference bars are self-centering on punches that have an included angle of 90°, or less.

Two different techniques may be used to reference the gauge bar to **other** shaped punches. One technique is to use locally manufactured custom reference bars. The other is to use a method of trial referencing. Refer to your Service Manual for information pertaining to these two methods.

- 4-3 Here are some very important procedures that must be observed when referencing the gauge bar to the tooling:
- 4-3A Be very careful when operating the press brake ram to close on the zero-reference bars. These bars must be held firmly by the punch — but excessive force must not be used. If the reference bars are too loose, gauge bar referencing may not be accurate. **BUT A NOTE OF WARNING** — excessive force upon the zero-reference bars may cause them to bend, or break — pieces can be thrown outward with enough force to cause personal injury.
- 4-3B The gauge carriage arrestor bars must be correctly installed to prevent possible damage to gauging components and tooling.
- 4-3C The punch and die must be correctly aligned to each other.
- 4-3D The press brake ram adjustment must be correct to provide equal tension on the zero-reference bars. If the ram is badly out of adjustment, one reference bar may be too loose while the other is too tight.
- 4-3E When flip fingers are used, the usable gauge travel is reduced by the length of the fingers. The flip fingers are made to precise one inch increments and may be installed at any location on the main gauge bar. Referencing should always be made from the center of the punch to the continuous surface of the main gauge bar. When flip fingers are added to the gauge bar, their length should be subtracted from the referencing dimension that is programmed. For example — if three inch flip fingers are to be used in the job program, subtract three inches from the reference four inch dimension used for adjusting to the zero reference bars. Program this one-inch difference into station one of the temporary job reference program. This referencing method will bring the face of the flip fingers into a direct relationship with the centerline of the punch when the main gauge bar surface is against the four-inch zero-reference bars. This also should prevent the flip fingers from contacting the tooling.
- 4-3F The down-limit switch if applicable must be properly adjusted.
- 4-3G Specific adjustment procedures pertaining to tonnage requirements must be performed per instructions within your **Press Brake Manual**.
- 4-4 Reference the main gauge bar for Rear Gauging Systems as follows:
- Install the tooling called for in the parts program for example job number 11287850. Now turn to page 4-2 in your instruction manual.
- 4-5 Loosen BOTH horizontal support arm clamps. Now slide the main gauge bar fully rearward into the horizontal arm supports. Lightly tighten the clamping handles. The position of these handles may be changed by pulling outward on the handle **hub** and turning to the desired position. Refer to page 4-3.
- 4-6 Place the controller in “setup” by pressing setup key with protected access key horizontal. Temporarily program a non-existing job number — such as zero — and repeatedly press “Enter Advance” key **without** responding to any of the job master prompts — **DO NOT REQUEST A BEND ALLOWANCE**. Now create station one for this reference program by pressing “Next Station”. Program a four-inch dimension for station one — if flip fingers are used, remember to subtract the flip finger length from the reference dimension. Do not respond to any remaining station prompting. Press “Station Number” and then “Enter Advance”. Station One “Run-Data” should be displayed. Now turn to page 4-4.
- 4-7 **A FEW WORDS OF CAUTION** — prior to performing the next step, **MAKE CERTAIN** no one can be struck by the rapid movement of the gauge bar — **AND** make sure that nothing will interfere with gauge movement in either direction. Refer to page 4-5.

- 4-8 Press the "Run" pushbutton **FIRMLY** to cause gauge activation. Observe gauge movement and controller display. The "Run" button and the word automatic should illuminate on the controller. The gauge should then calibrate and move to the reference dimension of station one. While the gauge is calibrating, the message "Calibrating" should be displayed. When the gauge moves to the station one dimension, station one "run-data" will be displayed.

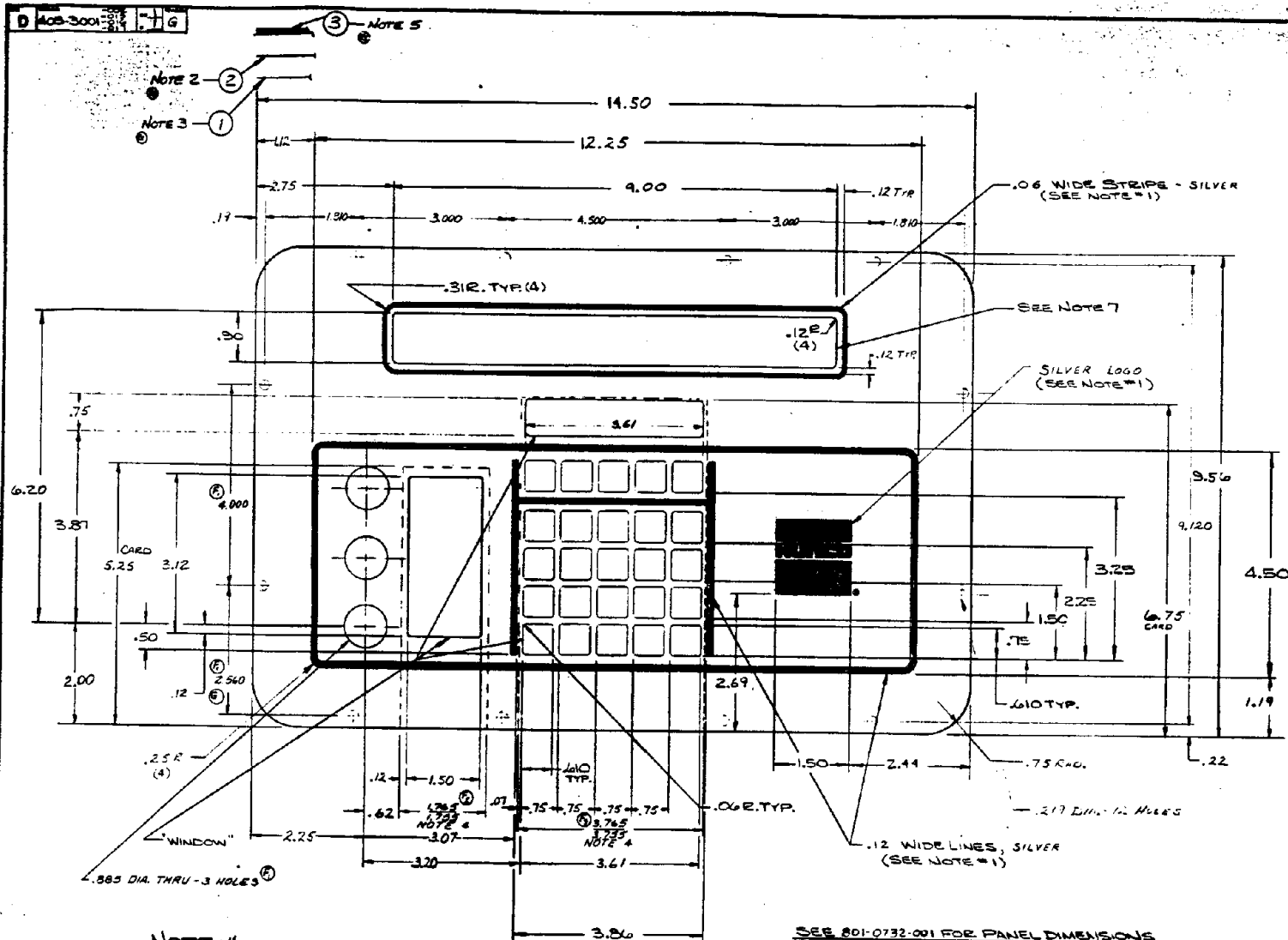
If the "Run" button is not **firmly** depressed, a message other than "Calibrating" may appear on the display and gauge movement will stop. Should this occur, press the "Run" button again and a message will appear to indicate which peripheral had the error. **FIRMLY** press "Run" again. The gauge should first calibrate and then move to the programmed station one dimension.

Do not activate the press brake ram during gauge movement. Now turn to page 4-6.

- 4-9 Exit the "Run" mode by pressing "Setup".
- 4-10 Locate the two zero-reference bars that have been shipped with the gauge. Now turn to page 4-8.
- 4-11 If yours is a mechanical down-acting press brake, carefully jog the ram downward until it reaches the bottom of its stroke. Now use the power ram adjustment to raise the ram until the reference bars can be inserted between the punch and the die.. Insert one of the zero-reference bars at each end of the tooling with the "V" notch upward toward the punch. The machined, slightly beveled four-inch end to be toward the gauge bar. Use the power ram adjustment to carefully close the ram so that both reference bars are held firmly in place, with the punch centered in the bottom of the "V" notches. Do not exert excessive force on the reference bars. Now refer to page 4-9.
- 4-11A If yours is an up-acting press brake, make certain that tonnage and limit switch adjustments are correct. Now turn the positioning handwheel adjustment to **fully** lower the beam. This is to prevent the lower beam from contacting the upper beam when the foot pedal is depressed. Now depress the press brake foot pedal and secure it in the continually depressed position by either — inserting a metal rod in the "screwdriver hole" — or operating the pedal locking lever — depending upon your model of press brake.
- Insert one of the zero-reference bars at each end of the tooling with the "V" notch upward — toward the punch — and the machined slightly beveled four-inch end toward the gauge bar. Now turn the positioning handwheel to carefully raise the lower beam until both reference bars are held firmly in place, with the punch centered in the bottom of the "V" notched. Do not exert excessive force as the reference bars may be broken and pieces can be thrown outward with enough force to cause personal injury.
- 4-12 Loosen both horizontal support arm clamps. Slide the main gauge bar toward the tooling until the continuous surface of the main gauge bar contacts the two zero-reference bars. Turn the handwheels to adjust the vertical height of the gauge bar to align with the die. Tighten the horizontal support arm clamps to maintain this position. Use feeler gauge stock of 0.004 inch or **less** to make sure that the gauge bar remains against both reference bars. If necessary — repeat the adjustment procedure!
- 4-13 Remove the zero-reference bars from the press then adjust the punch to the correct forming depth so that the ram does not "bottom out" when it is cycled.
- A. If yours is an up-acting press brake, remove the metal rod — or remove the pedal locking lever — whichever applies to your model. Now turn to page 4-10.
- 4-14 Delete the temporary job number zero reference program from the controller by pressing "Job Number" to display Job Number Zero. Press "Delete" key. Refer to page 4-11.

- 4-15 Turn disconnect switch to “off-lock” position to remove power from the servos. Now manually push the rear gauge carriage toward the press brake until the gauge bar — or flip fingers, if they are being used — almost contacts the tooling. Install and tighten the carriage arrestor bars to prevent the gauging surface from moving past this point. Turn to page 4-12.
- 4-16 Turn the disconnect switch to the “on” position. You should now be ready to begin a trial bending of parts on your single-axis, gauging system. Call up example job program number 11287850. Press the station number key and then numerical four key. Be absolutely sure that no one will be struck by the gauge and nothing will interfere with gauge movement. **FIRMLY** depress “Run” to cause activation of the gauge. The word “automatic” should illuminate below the word run. The gauge will first be commanded to calibrate while the message “Calibrating” is being displayed. The gauge will then move to the station four dimension of 1.750 inches and the station four “run-data” will be displayed. While the gauge is moving, the “run-data” will be flashing — but when the gauge reaches the programmed dimension, the display will become steady. Now refer to page 4-13.
- 4-17 Firmly press the “run” button again. The word “single” will illuminate above the word “run”. The gauge will then move to the station one dimension. Station one “run-data” will be displayed. Remember what we said about single-cycle operation. When **ENTERING** single-cycle, the current station displayed is advanced to the **NEXT** programmed station and results in gauge movement. Now turn to page 4-14.
- 4-18 Select a piece of scrap material of the same thickness as called for in the Job Program. Position this scrap piece in the press brake and against the gauge bar. Be certain to observe **ALL** safety precautions concerning press brake operation. Now single cycle the press to form the Station One dimension. Refer to page 4-15.
- 4-19 Measure the dimension of the bend formed and compare it to the programmed dimension. Make sure the bend angle is also correct as this angle directly affects the measured dimension. Due to slight differences in tooling, the measured bend dimension may not be the same as the programmed dimension. It is then necessary to change the programmed **bend allowance**. **DO NOT CHANGE** the programmed station dimension **UNLESS** You are absolutely sure that station dimension is incorrect. Don't change the bend allowance without first measuring your trial bend. Now turn to 4-16.
- 4-20 To change the programmed bend allowance, place the controller in “Setup” and enter the **Station's** program prompting. After the bend allowance change has been made, exit “Setup” and enter “run/single-cycle”. Make sure that station **ONE** “run-data” is displayed and form another trial bend. Again measure that trial bend dimension to ensure that the change has resulted in the programmed dimension. Now refer to page 4-17.
- 4-21 After correctly forming station one, press “Next Station”. This advances the gauge to station two while in the “Run/Single-Cycle” mode. Now single-cycle the press to form station two. Measure the bend and compare it to the programmed dimension for station two. Now turn to page 4-18.
- 4-22 Make trial bends for each station in the example job program. Measure the formed dimension after each bend and change the bend allowance only where necessary. Remember — don't change the programmed dimension, just the station bend allowance where required. Refer to page 4-19.
- 4-23 Now that you have formed trial bends for each station in the example job program and have entered any necessary corrections into the controller — call up station one and press the “Run” pushbutton to enter “Automatic” operation. Observe all safety precautions concerning press brake operation and ensure no one will be struck by gauge bar movement. Form several complete parts of the example job program while operating in “Run/Automatic” cycle. Now turn to page 4-20.

- 4-24 This completes the programming and operating instruction course for your Autobend Five Gauging System. Clear the example job programs from the controller's memory — remember, there are two different procedures you may use to clear, or delete job memory. You may have selected the master clear feature of the mode key — or you could have elected to use the delete key while job numbers are displayed on the controller. Which method **did you** choose? If you have any questions about programming, setup, or the operation of this system, review this course. Please advance your tape recorder to the end of the tape cassette and return these materials to your supervisor.

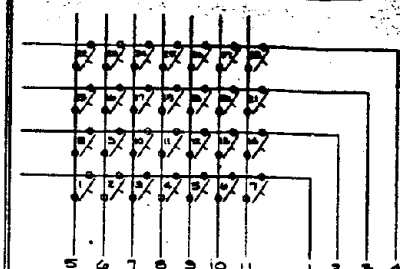




NOTE 45

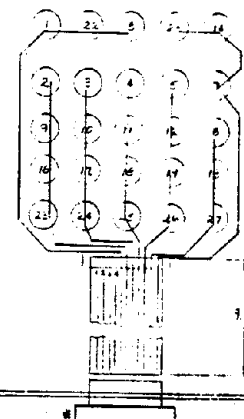
1. LABEL TO BE BLACK BACKGROUND  
SILVER - PANTONE 877-A. HURCO TO SUPPLY CAMERA READY ART FOR LOGO.
2. BEZEL LAYER: .005 VELVET POLYCARBONATE (ITEM 2)
3. GRAPHIC LAYER: .010 SUEDE POLYCARBONATE (ITEM 1)
4. GRAPHIC INSERT POCKET TO BE FORMED BY CUT-OUTS  
IN SPACER (NOTE 6)
5. SWITCH LAYERS: .005 CLEAR POLYESTER (ITEM 3)  
(SWITCH CONTACTS) - KEYBOARD CABLE Mx. 2.5 INCHES Lg.
6. SPACER: .005 CLEAR POLYESTER WITH  
ADHESIVE BOTH SIDES (TOTAL THK. .007)
7. DISPLAY FILTER: .030 AMBER POLYCARBONATE  
WITH A NON-GLARE & SCRATCH RESISTANT FIRST  
SURFACE COATING.

SEE 801-0732-001 FOR PANEL DIMENSIONS

### KEYBOARD DETAIL



- |               |   |   |
|---------------|---|---|
| 1. MODE       | 11. 6   | 21. NC  |
| 2. 1          | 12. -   | 22. JOB NO.   |
| 3. 2          | 13.  | 23. •   |
| 4. 3          | 14. CALIB.  | 24. 0   |
| 5. +          | 15. NC  | 25. CLEAR   |
| 6. NEXT STA.  | 16. 7   | 26. DELETE  |
| 7. ENTER ADV. | 17. 8   | 27.  |
| 8. STA. NO.   | 18. 9   | 28. SETUP   |
| 9. 4          | 19. INSERT  |   |
| 10. 5         | 20. NC  |   |



# CABLE TERMINATION TO MATE TO AMP 187224 (0.089 IN. SQ. SQUARE  
PHOSPHOR BRONZE POSTS ON .100 CENTERS WITH 15 μ GOLD OVER  
50 μ NICKEL)

403-3001-002 LABEL ASSEMBLY

[illegible]