PH SERIES
CNC PRESS BRAKES
60 TO 400 TON MODELS

INSTRUCTION AND PARTS LIST FOR
INSTALLATION, CARE AND USE

Manual Number 4911-120

WYSONG

INSTRUCTIONS FOR PH SERIES PRESS BRAKES

60 THRU 400 TON MODELS

Manual Number 4911-120

MODEL NUMBER _____

SERIAL NUMBER _____

Before operating your Press Brake, it is recommended that the operator and production personnel become familiar with all safety guidelines, operating details and construction of the Press Brake.

This manual outlines installation, care and maintenance of your Press Brake. A Parts List is included and should be referred to when ordering parts.

In writing or calling for information about your machine, please refer to your Press Brake by series, model and serial number. These can be found on the metal nameplate on the front of the ram, and stamped into the bed on the right hand end.

If a problem arises that is not covered in the manual, contact our Service Department.

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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.

WYSONG 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 Wysong for interface assistance.

OTHER INFORMATION REGARDING SAFETY

To help you provide a safe workplace for your employees, we encourage 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 Wysong Distributor
- Your local Occupational Safety Office
- Your local Safety Equipment Supplier

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 (708) 675-2290					X
Dolan-Jenner Ind, Inc. Blueberry Hill Industries Park P.O. Box 1020 Walburn, MA 01801 (617) 935-7444	X				
Guardmark International Inc. P.O. Box 56509 Sherman Oaks, CA 91413 (818) 985-3480	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	
Magline Inc. 503 South Mercer St. Pinconning, MI 48650 (800) 624-5463					X
Osborn Mfg. Corp. P.O. Box1650 Warsaw, IN 46580 (219) 267-6156					X
Positive Safety Corp. 34300 Melinz Parkway Eastlake, OH 44095 (216) 951-2130		X			X
Protech Systems 10050 Miller Way South Gate, CA 90280 (213) 927-7711	X				X
Rockford Systems Inc. P.O. Box 5166 4620 Hydraulic Rd. Rockford IL 61125 (815) 874-7891	X	X	X	X	X
Scientific Technology, Inc. 31069 Genstar Rd. Haywood, CA 94544 (800) 221-7060	X				
Sick-Optic Electronik Inc. 7694 Golden Triangle Dr. Eden Prarie, MN 55344 (612) 941-6780	X				
Surty Mfg. Company W15053 Surty Rd. Gleason, WI 54435 (715) 536-6291			X		
Triad Controls P.O. Box 9306 Pittsburgh, PA 15225 (800) 851-2026	X		X	X	
Weldotron Safety and Automation Systems 1532 S. Washington Ave. Piscataway, NJ 08855 (201) 752-6700	X				

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 Wysong pre-installation package for floor plans or foundation drawings for anchor bolt locations and other foundation information.

Anchor bolt kits are furnished as standard equipment with Wysong press brake models 60, 100, 140 and 175 ton capacities. For larger capacity press brakes, anchor bolt kits may be purchased from Wysong or your local mill supply house.

Before the arrival of your press brake, be sure that the foundation has been properly prepared to Wysong specifications that were included in the Wysong 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

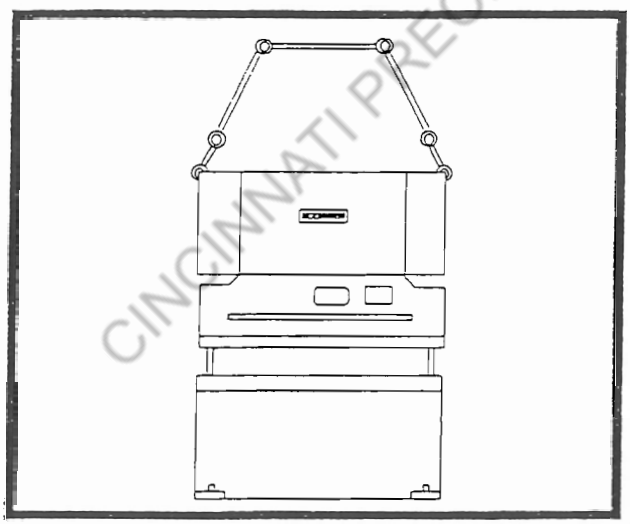
Carefully examine your press brake shipment as soon as it arrives. If you find damage, notify the carrier and file damage notices immediately.

WYSONG 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.



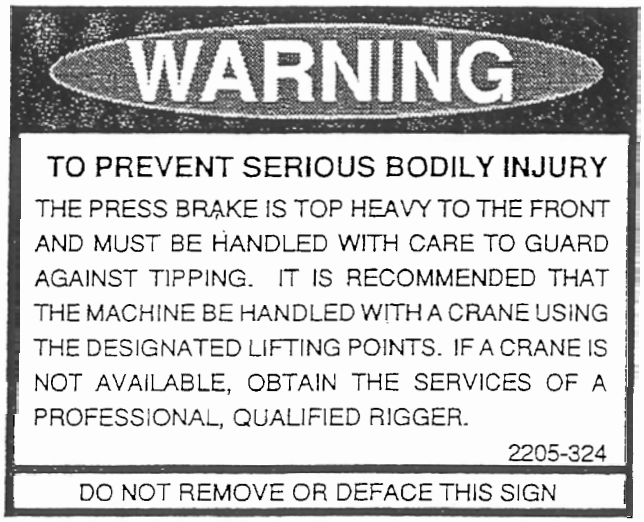


FIGURE 1

INSTALLATION

SECURING THE PRESS BRAKE

IMPORTANT:

TO ENSURE THAT YOUR PRESS BRAKE IS IN OPERATION AS SOON AS POSSIBLE, BE SURE THAT THE FOUNDATION HAS BEEN PREPARED AND THAT THE ANCHOR BOLTS ARE IN PLACE BEFORE A WYSONG SERVICE ENGINEER STARTS UP YOUR PRESS BRAKE.

INSTALLING ANCHOR BOLTS

60 THRU 175 TON PRESS BRAKES

The anchor bolt kit that was sent as part of the pre-installation package includes the following items:

Four (4) anchor bolts
with nuts and washers (Part number 1940-086)

Four (4) capsules (Part number 1940-114)

One (1) drive adapter (Part number 1940-124)

One (1) concrete drill bit (Part number 1940-134)

The pre-installation kit also includes four (4) leveling pads that are to be installed when anchoring the press brake.

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.

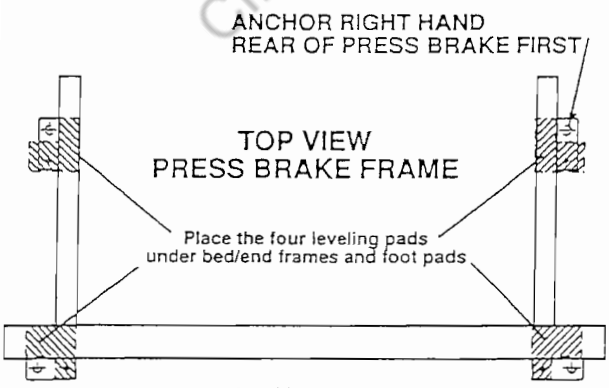


FIGURE 2

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 wait for a Wysong Service Engineer for leveling and initial start-up of your press brake.

250 THRU 400 TON PRESS BRAKES

Press brakes from 250 ton thru 400 ton do not include anchor bolt kits. These should be purchased from Wysong or your local mill supply house. Follow the instructions that are included with your anchor bolt kit and work off the right hand rear hole as described for 60 thru 175 ton models.

Follow the same general steps as described for 60 through 175 ton models.

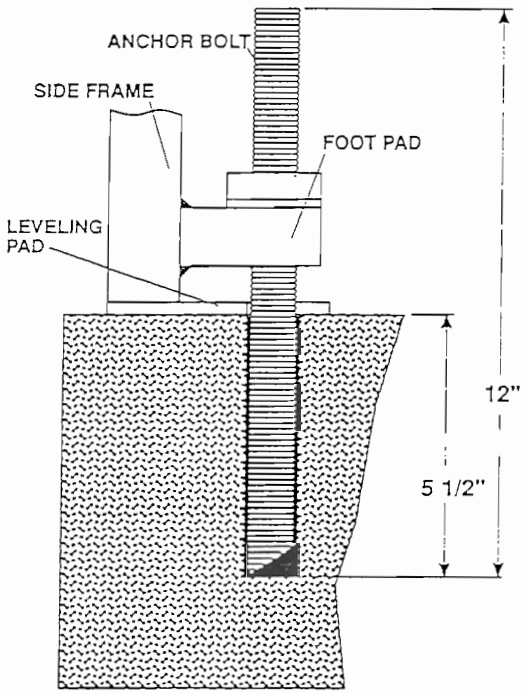


FIGURE 3

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.

INSTALLING FILLER CAP

Before starting the machine, remove orange breather filler shipping cover, or orange pipe plug from top of tank. Install breather filler cap assembly that is located inside the main electrical power box. Failure to install breather assembly will damage the machine.

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.

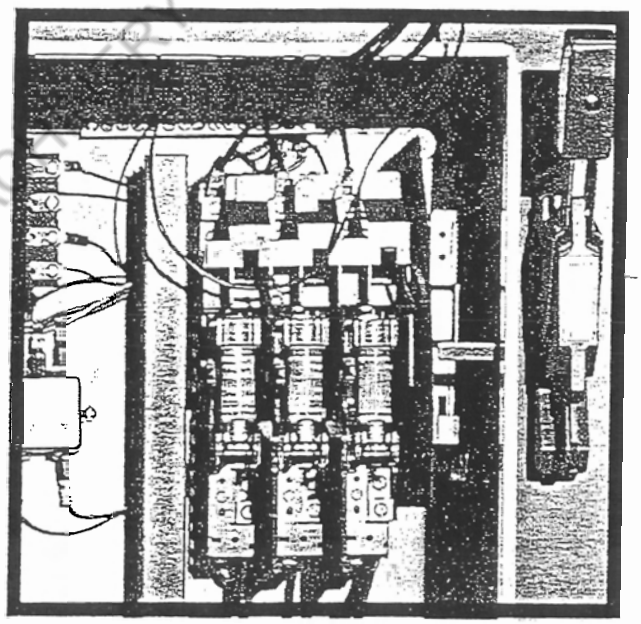


FIGURE 4

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.

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. 1, 2, 3 Blocks or Precision Leveling Blocks
2. Vise Clamps
3. Precision Level that is Accurate to .001" per foot
4. Set of Feeler Gauges
5. Steel Leveling Shims

Before leveling, remove central crown and loosen all gib screws and ram brackets screws.

LEVELING FRONT TO BACK

1. Clamp precision blocks (one two three) to the right hand gib surface and place a precision level on the blocks (See Figure 5). Lower the ram if there is insufficient gib surface to clamp the precision blocks.
2. Level front to back by adjusting the jack screws and 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.
3. 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.

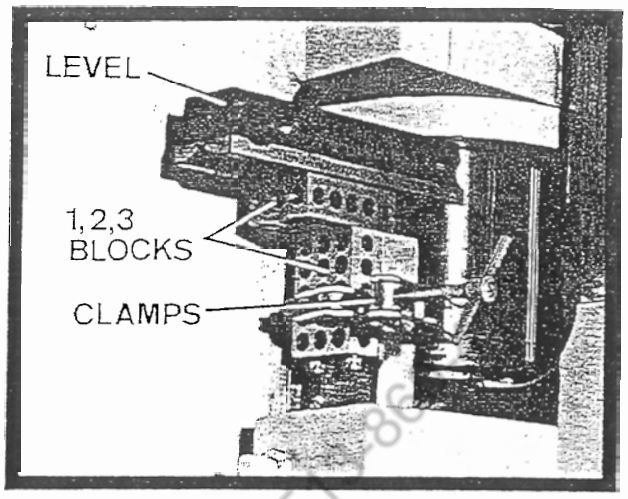


FIGURE 5

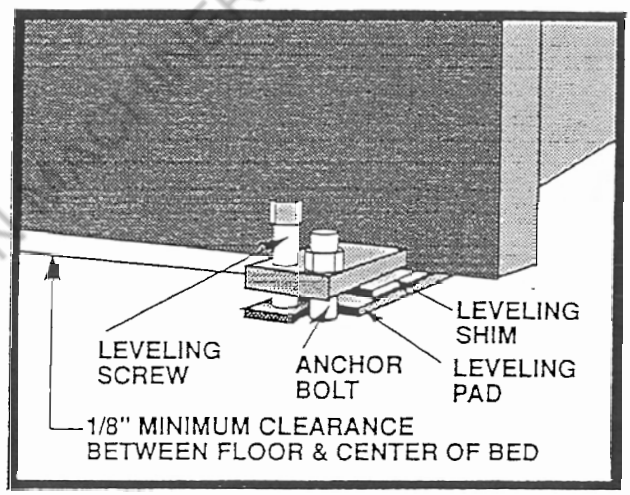


FIGURE 6

INSTALLATION

CHECKING CLEARANCES BETWEEN RAM WAYS AND GIBS

Proper clearance between ram ways and gibs are extremely important for successful operation of your Wysong press brake.

All gibs were loosened when the press brake was leveled and must be properly set.

CHECKING AND ADJUSTING UPPER GIBS

1. Start the press brake and turn the key to "INCH". Position ram (with the Dual Palm Buttons) so that at least 90% of the upper gib surface is in contact with the machined surface on the ram, and turn power "OFF".
2. Tighten the three lower square head screws on the ram bracket to zero clearance (See Figure 7). Repeat procedure on opposite ram bracket.
3. At the back of the press brake, push the rear upper gib up and flush to the ram surface and tighten the gib screws. Repeat procedure on opposite rear gib.
4. From the front of the machine, adjust front gib by inserting a .004" feeler gauge between the machined ram surface and the front gib surface (See Figure 8).
5. Snug up front gib and remove the .004" feeler gauge.
6. This clearance can be a loose .004".
7. Repeat this adjustment on opposite front gib.

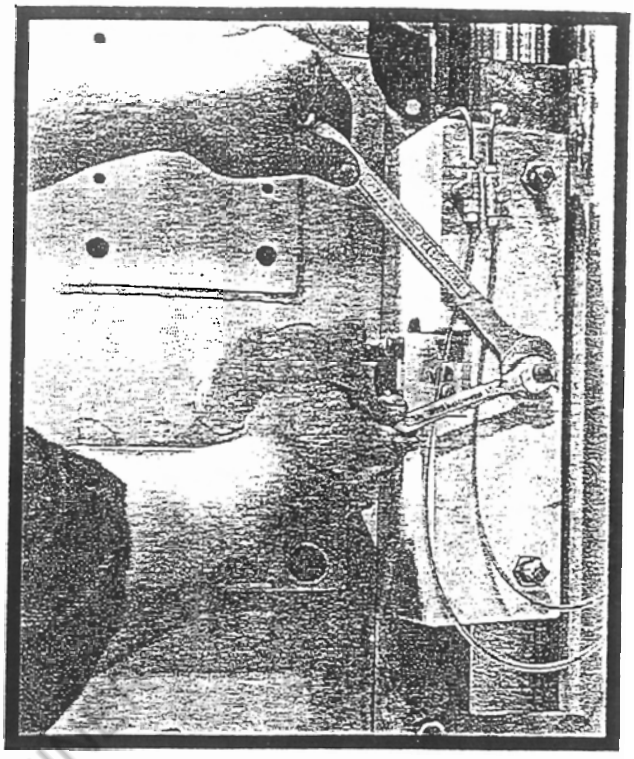


FIGURE 8

SETTING LOWER GIB CLEARANCE

1. Loosen the three square head screws on the ram bracket and insert a .002" feeler gauge between lower gib and ram way (Figure 9).
2. Snug up the three screws and remove the feeler gauge.
3. This clearance should be .002" to .003"

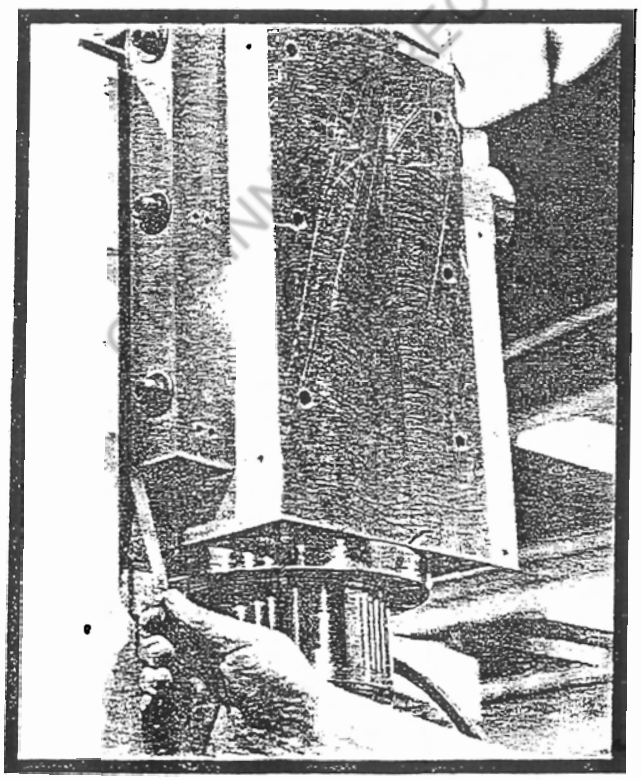


FIGURE 7

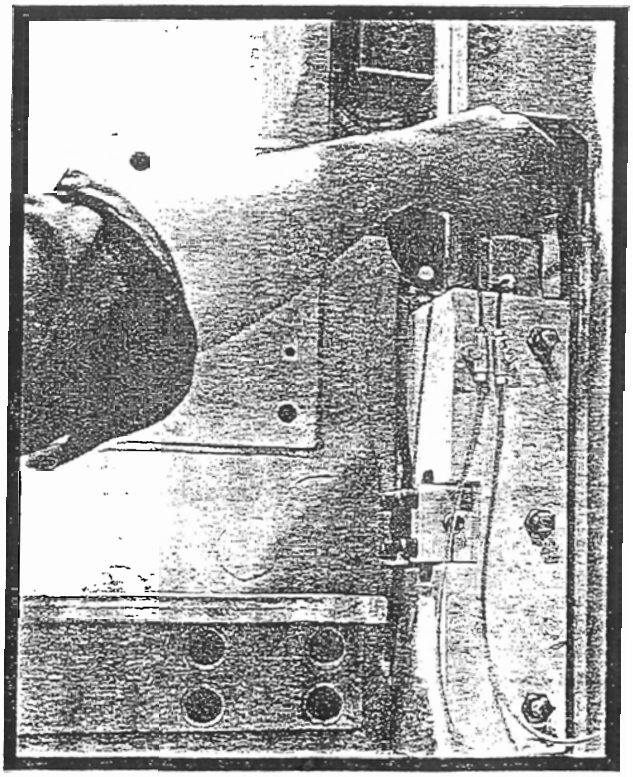


FIGURE 9

INSTALLATION

CHECKING AND ADJUSTING CLEARANCE BETWEEN ROLLER AND RAM WAY

Clearance between roller and ram way should be .010" to .014" on each side. To attain the proper clearance make the following adjustments:

1. Turn power "ON". Position ram to the bottom of stroke and turn power "OFF".
2. Check the clearance by inserting a .012" feeler gauge between the roller and the ram way.
3. If adjustment is required, loosen the lower screw in the two clamping blocks.
4. Insert a .012" feeler gauge between the roller and ram way.
5. Adjust the cam follower shaft so that roller just snugs the feeler gauge (See Figure 10). Leave the feeler gauge in place and adjust the clearance on the opposite roller and way with another .012" feeler gauge.
6. After clearance is attained, tighten the clamp blocks and remove both gauges.

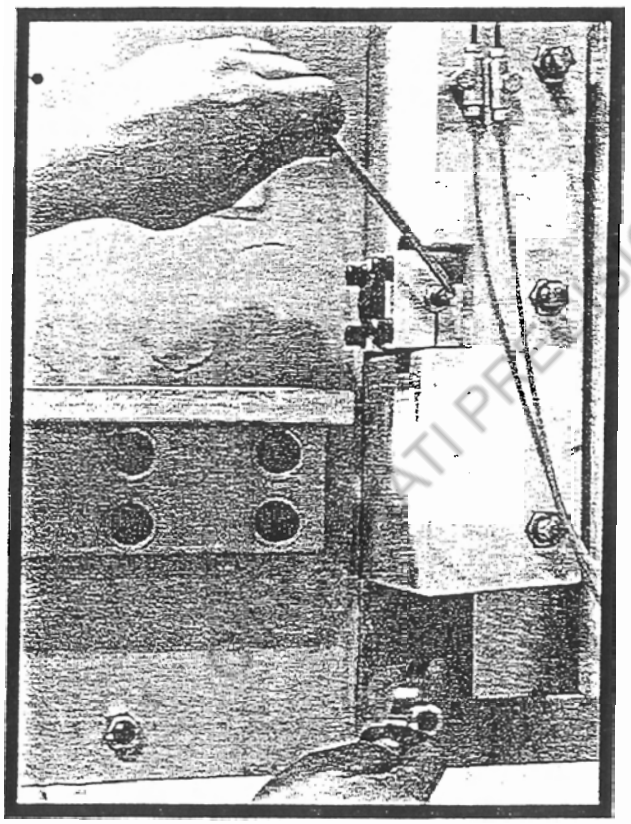


FIGURE 10

SET - UP PROCEDURES

START UP

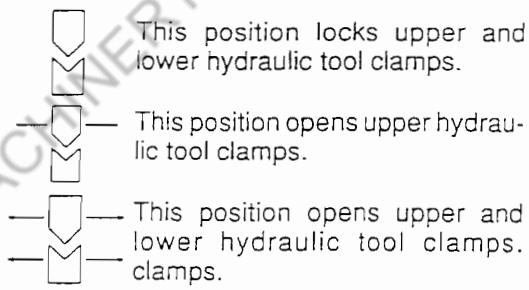
1. With the disconnect door closed, activate the disconnect switch to the "ON" position.
2. Press the "START" pushbutton to activate the pump motor.
3. On the Cycle Mode Switch, turn the key selector to "INCH". The pump motor will not run when the Cycle Control Switch is in the "OFF" position. The press brake can be locked in the "OFF" by removing the key in "OFF".
4. In the "INCH" mode, the machine automatically switches to FOOT/PALM. This is the mode of operation for loading tools, or lowering ram onto blocks before powering down the press brake.

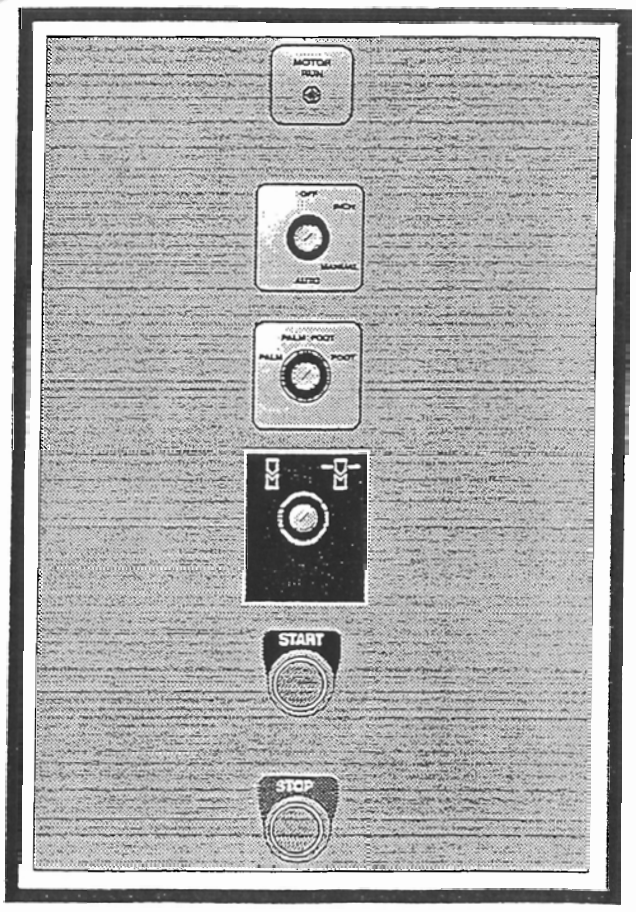
OPTIONAL HYDRAULIC CLAMPING

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).





SET - UP PROCEDURES

INSTALLING PRESS BRAKE TOOLING

After the press brake has been powered up, and with the Cycle Mode Switch in "INCH", you will work through the GC 6000 Control.

The Control will inform you of the tools to be installed, or ask you to program the tools if it is a new job.

After you have entered the required tool information in the GC 6000 you are ready to load the tools (Figure 11).

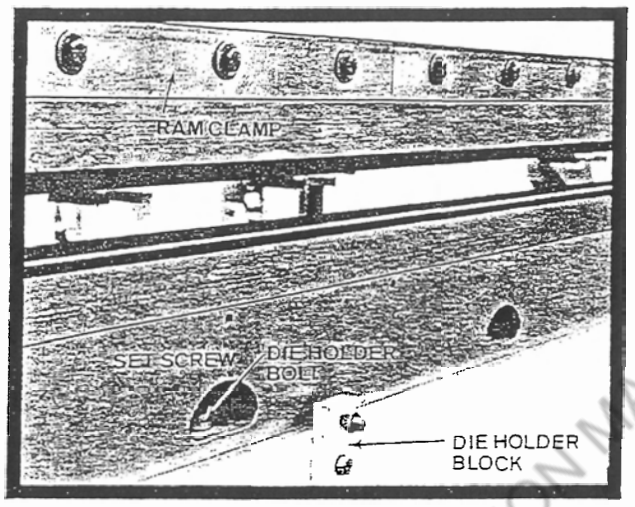


FIGURE 11

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.
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. On the TOOLS INSTALLED page, press the F3 or F4 key.

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.

UPPER TOOL WITH SAFETY TANG

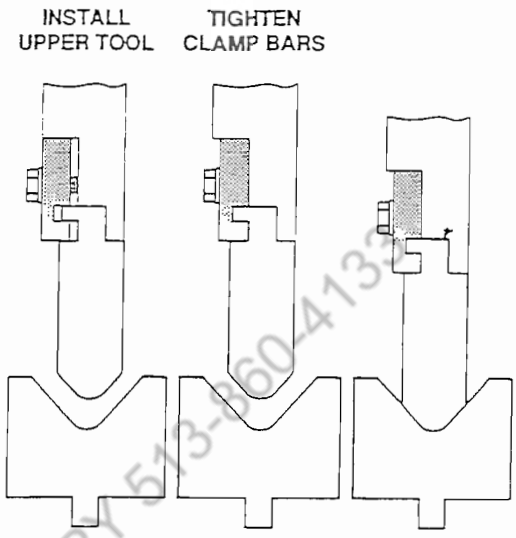


FIGURE 12

UPPER TOOL WITH STANDARD TONGUE

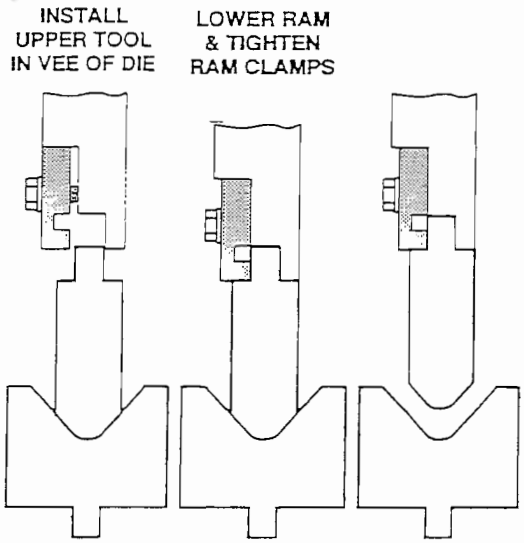


FIGURE 13

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.
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.

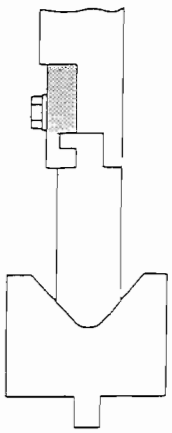


FIGURE 14

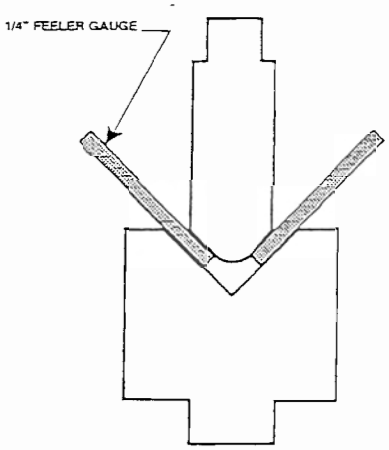


FIGURE 15

When tools are positioned off center, press tonnage is 50% of the rated capacity for bottoming and air bending operations.

WARNING:

Caution should be observed to ensure that tooling is not overloaded.

FOOTSWITCH

If footswitch actuation is desired, turn the keylock selector switch to "FOOT".

CAUTION: Be sure that point of operation safeguarding is in place when using the footswitch. Narrow work pieces should be bent using palm buttons as a point of operation device. See Safety Manual or ANSI B11.3, 1983 Standards.

LUBRICATION

Daily:

Pump one shot oil lubrication twice each day (morning and afternoon). Recommended oil is MOBIL VACTRA EXTRA HEAVY or equivalent.

Weekly:

Clean back gauge guide bars, screws, and vertical adjustment posts. Apply a light coat of MOBIL VACTRA EXTRA HEAVY or equivalent.

Every Three Months:

Grease back gauge idler pulley with MOBIL PLEX 47 or equivalent.

Yearly:

Check quality of hydraulic oil in reservoir and the condition of the suction filter and return filters. If required replace oil with MOBIL DTE-25 or equivalent.

NOTE: Suction filter (stainless steel washable screen) inside tank. Access through cover on top of tank. Return filter is a drop-in cartridge type.

Every Two years:

Grease hydraulic pump motor with MOBIL PLEX 47 or equivelent.

GREASE – MOBIL PLEX 47

HYDRAULIC OIL – MOBIL DTE-25

SUS 215/240 @ 100 ° F.

PARTS LIST FOR
PH SERIES PRESS BRAKES

60 THRU 400 TON MODELS

Manual Number 4911-120

WHEN ORDERING PARTS, BE SURE TO PROVIDE PRESS BRAKE MODEL AND SERIAL NUMBER.

WYSONG

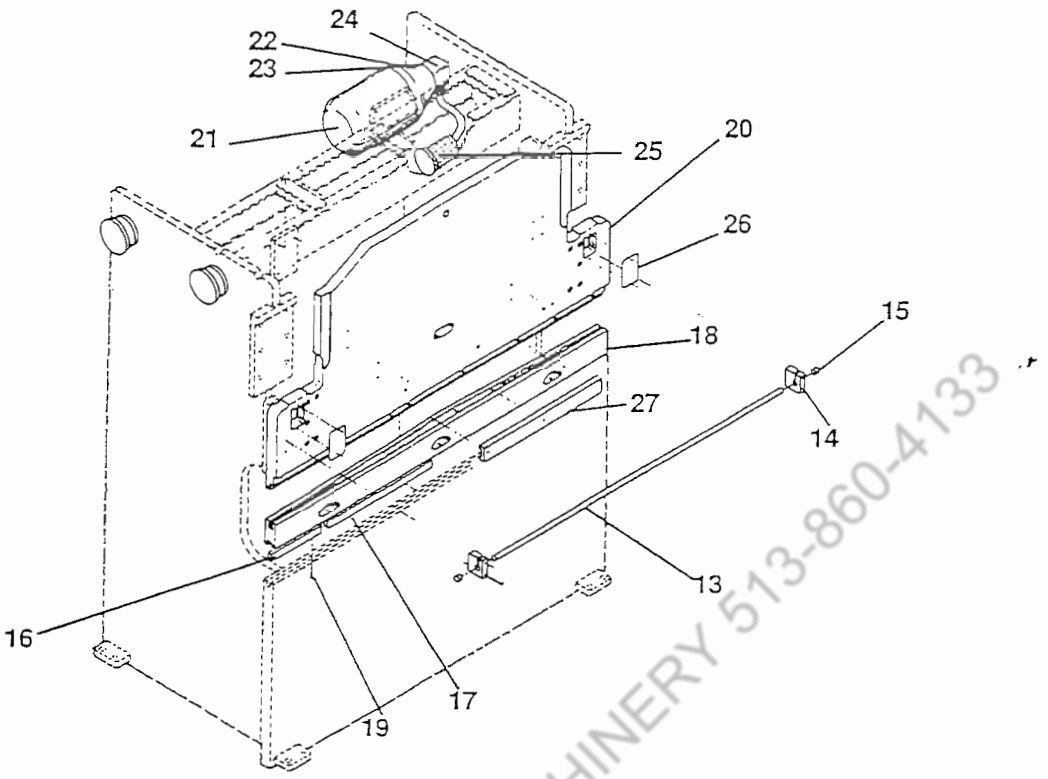
WYSONG & MILES COMPANY

AMERICAN CRAFTSMANSHIP SINCE 1903

P.O. BOX 21168 • GREENSBORO, N.C. 27420

PH SERIES PRESS BRAKES

FRAME ASSEMBLY

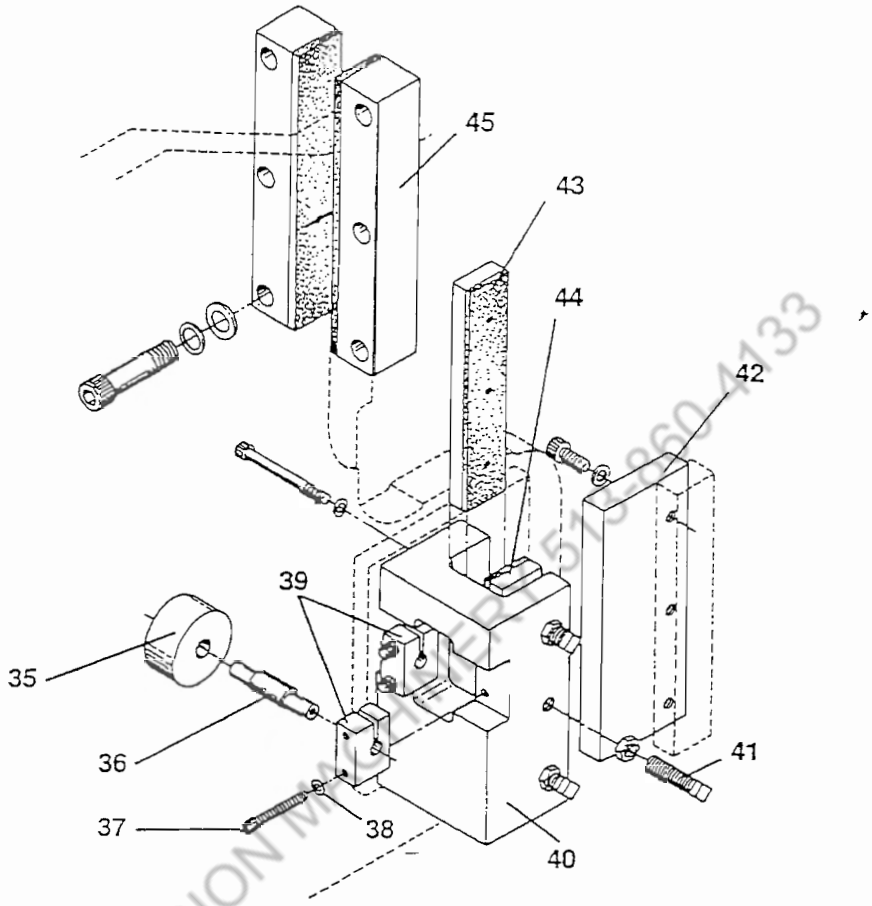


ITEM NO.	DESCRIPTION	PH 60-72	PH 60-96	PH 100-120	PH 100-144	PH 100-168	140-120	PH 140-144	PH 140-168
13	Handrail	3859-206	3859-208	3859-210	3859-212	3859-214	3859-210	3859-212	3859-214
14	Bracket, Handrail Mtg.	7486-315	7486-315	7486-315	7486-315	7486-315	7486-315	7486-315	7486-315
15	Cap, Plastic	4510-100	4510-100	4510-100	4510-100	4510-100	4510-100	4510-100	4510-100
16	Key, Die Holder	7485-083	7485-083	7485-083	7485-083	7485-083	7485-083	7485-083	7485-083
17	Key, Die Holder	7485-084	7485-084	7485-084	7485-084	7485-084	7485-084	7485-084	7485-084
18	Holder, Die	7435-905	7435-906	7485-078	7485-079	7485-080	7485-078	7485-079	7485-080
19	Screw, Soc. Hd. Cap	3303-082	3303-082	3303-082	3303-082	3303-082	3303-082	3303-082	3303-082
20	Ram, Press Brake	7237-183	7237-185	7237-068	7437-326	7437-371		7237-315	
21	Motor	4422-013	4422-013	4424-013	4424-013	4424-013	4426-053	4426-053	4426-053
22	Flange, Pump	3257-061	3257-061	3257-061	3257-061	3257-061	3257-062	3257-062	3257-062
23	Coupling	3428-211	3428-211	3428-211	3428-211	3428-211	3428-218	3428-218	3428-218
24	Pump	3257-128	3257-128	3257-208	3257-208	3257-208	3257-208	3257-208	3257-208
25	Filter, Pump Suction	3764-313	3764-313	3764-313	3764-313	3764-313	3764-313	3764-313	3764-313
26	Cover, Cyl. Rod Nut	7437-014	7437-014	7437-196	7437-196	7437-196	7437-200	7437-200	7437-200
27	Bar, Clamp	7437-160	7437-160	7437-160	7437-160	7437-160	7437-160	7437-160	7437-160

ITEM NO.	DESCRIPTION	PH 175-120	PH 175-144	PH 175-168	PH 250-144	PH 250-168	PH 400-168
13	Handrail	3859-210	3859-212	3859-214	3859-212	3859-214	3859-214
14	Bracket, Handrail Mtg.	7486-315	7486-315	7486-315	7486-315	7486-315	7486-315
15	Cap, Plastic	4510-100	4510-100	4510-100	4510-100	4510-100	4510-100
16	Key, Die Holder	7485-083	7485-083	7485-083	7485-083	7485-083	7485-083
17	Key, Die Holder	7485-084	7485-084	7485-084	7485-084	7485-084	7485-084
18	Holder, Die	7485-078	7485-079	7485-080	7485-079	7485-080	7485-080
19	Screw, Soc. Hd. Cap	3303-082	3303-082	3303-082	3303-082	3303-082	3303-082
20	Ram, Press Brake		7237-173	7237-363	7437-543	7437-549	7289-031
21	Motor	4426-053	4426-053	4426-053	4428-014	4428-014	4430-014
22	Flange, Pump	3257-062	3257-062	3257-062	3257-073	3257-073	3257-064
23	Coupling	3428-218	3428-218	3428-218	3428-218	3428-218	3428-220
24	Pump	3257-209	3257-209	3257-209	3257-169	3257-169	3257-127
25	Filter	3764-313	3764-313	3764-313	3764-304	3764-304	3764-315
26	Cover, Cyl. Rod Nut	7437-200	7437-200	7437-200	7437-200	7437-200	7489-017
27	Bar, Clamp	7437-160	7437-160	7437-160	7488-282	7488-282	7488-282

PH SERIES PRESS BRAKES

GIBBING CONFIGURATION

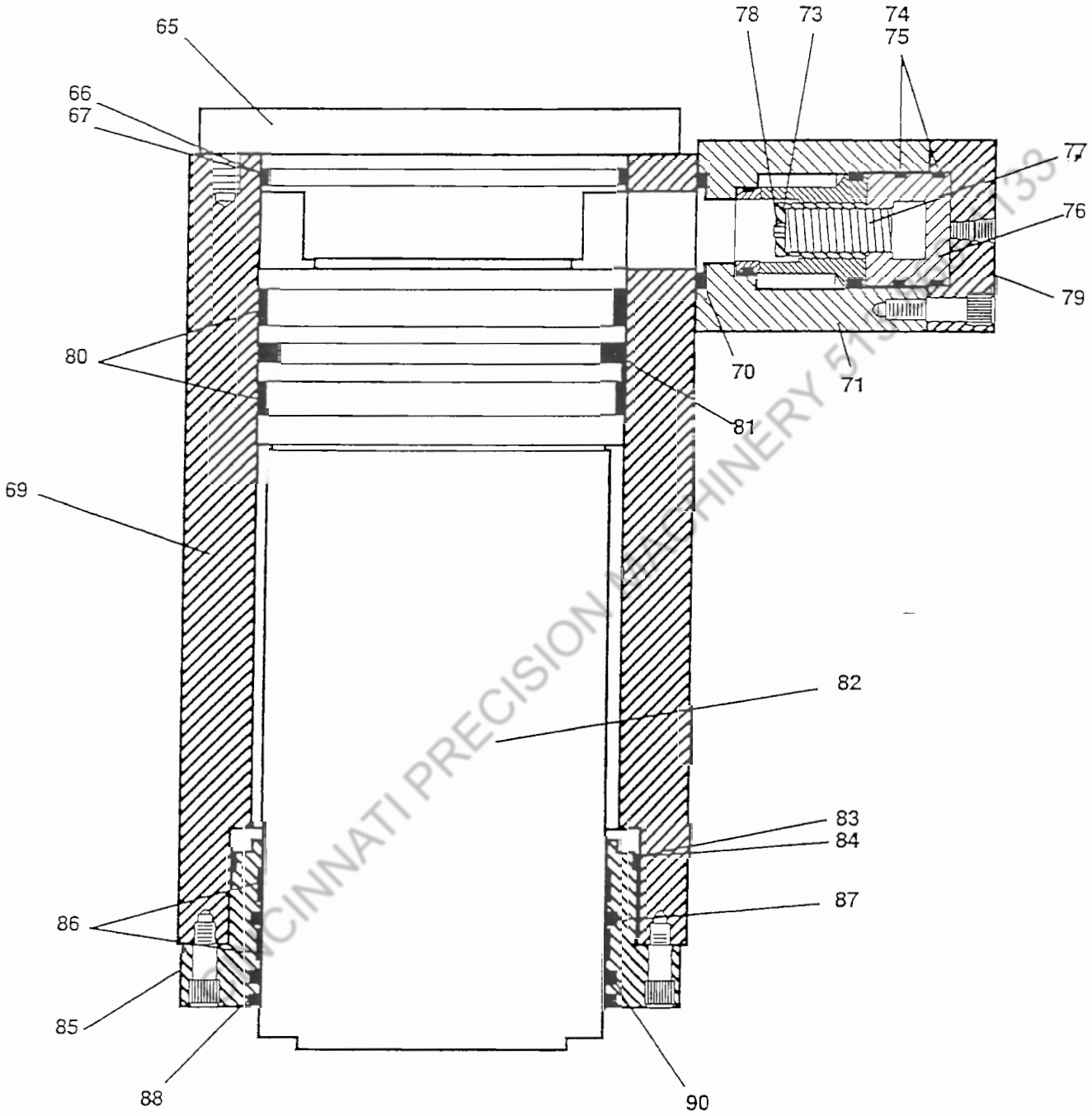


ITEM NO.	DESCRIPTION	PH 60-72	PH 60-96	PH 100-120	PH 100-144	PH 100-168	PH 140-120	PH 140-144	PH 140-168
35	Bearing, Roller	3107-214	3107-214	3107-214	3107-214	3107-214	3107-214	3107-214	3107-214
36	Shaft, Cam Follower	7437-006	7437-006	7437-006	7437-006	7437-006	7437-006	7437-006	7437-006
37	Screw. Soc. Hd. Cap	3303-115	3303-115	3303-115	3303-115	3303-115	3303-115	3303-115	3303-115
38	Washer, Lock	3327-007	3327-007	3327-007	3327-007	3327-007	3327-007	3327-007	3327-007
39	Block, Roller Mtg.	7437-007	7437-007	7437-007	7437-007	7437-007	7437-007	7437-007	7437-007
40	Bracket, Ram	7037-031	7037-031	7037-029	7037-029	7037-029	7037-029	7037-029	7037-029
41	Screw, Sq. Hd. Set	3310-036	3310-036	3310-036	3310-036	3310-036	3310-036	3310-036	3310-036
42	Way, Ram	7437-004	7437-004	7437-158	7437-158	7437-158	7437-158	7437-158	7437-158
43	Gib, Ram Front	7437-017	7437-017	7437-155	7437-155	7437-155	7437-155	7437-155	7437-155
44	Gib, Ram Rear	7437-018	7437-018	7437-156	7437-156	7437-156	7437-156	7437-156	7437-156
45	Block, Upper Gib	7437-233	7437-233	7437-190	7437-190	7437-190	7437-190	7437-190	7437-190

ITEM NO.	DESCRIPTION	PH 175-120	PH 175-144	PH 175-168	PH 250-144	PH 250-168	PH 400-168
35	Bearing, Roller	3107-214	3107-214	3107-214	3107-214	3107-214	3107-220
36	Shaft, Cam Follower	7437-006	7437-006	7437-006	7437-006	7437-006	7489-010
37	Screw. Soc. Hd. Cap	3303-115	3303-115	3303-115	3303-115	3303-115	
38	Washer, Lock	3327-007	3327-007	3327-007	3327-007	3327-007	
39	Block, Roller Mtg.	7437-007	7437-007	7437-007	7437-007	7437-007	7489-011
40	Bracket, Ram	7037-029	7037-029	7037-029	7037-029	7037-029	7089-001
41	Screw, Sq. Hd. Set	3310-036	3310-036	3310-036	3310-036	3310-036	
42	Way, Ram	7437-158	7437-158	7437-158	7437-158	7437-158	7489-009
43	Gib, Ram Front	7437-155	7437-155	7437-155	7437-155	7437-155	7489-005
44	Gib, Ram Rear	7437-156	7437-156	7437-156	7437-156	7437-156	7489-008
45	Block, Upper Gib	7437-190	7437-190	7437-190	7437-460	7437-460	7489-002

PH SERIES PRESS BRAKES

CYLINDER ASSEMBLY



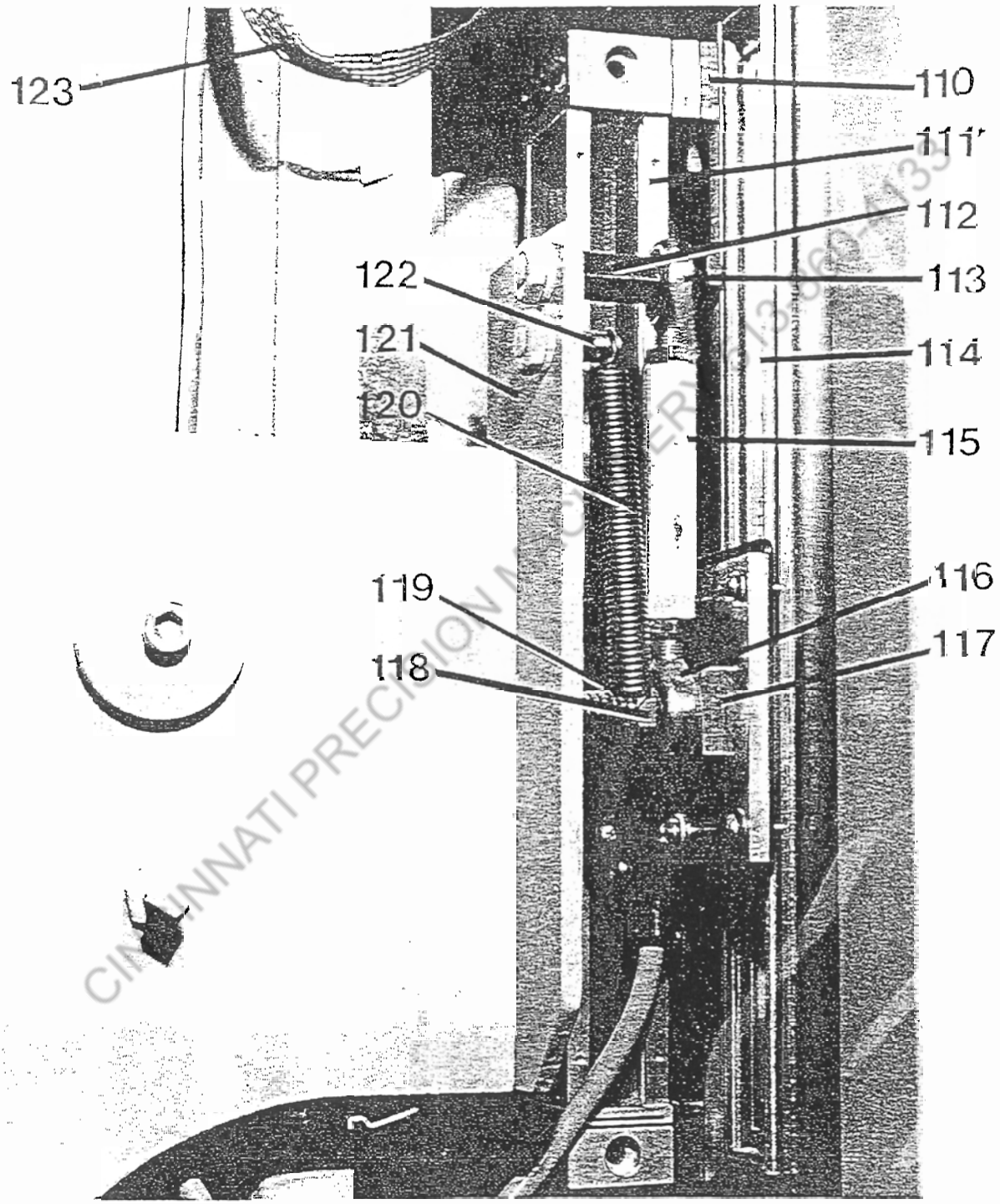
CYLINDER ASSEMBLY

TO IDENTIFY CYLINDER COMPONENT CHANGES ON PH PRESS BRAKE INSTALLATIONS AFTER 6-1-92, REFER TO THE AMENDED PARTS LIST SECTION AT THE BACK OF THIS MANUAL.

ITEM NO.	DESCRIPTION	PH 60-72	PH 60-96	PH 100-120	PH 100-144	PH 100-168	PH 140-120	PH 140-144	PH 140-168
65	Cap, Cylinder Top	7437-242	7437-242	7437-278	7437-278	7437-278	7437-278	7437-278	7437-278
66	O-Ring, Backup	3255-418	3255-418	3255-440	3255-440	3255-440	3255-440	3255-440	3255-440
67	O-Ring	3255-199	3255-199	3255-246	3255-246	3255-246	3255-246	3255-246	3255-246
68	Cover, R.H. Cylinder	7437-247	7437-247	7437-287	7437-287	7437-287	7437-287	7437-287	7437-287
69	Housing, Cylinder	7437-140	7437-140	7437-170	7437-170	7437-170	7437-170	7437-170	7437-170
70	O-Ring	3255-112	3255-112	3255-118	3255-118	3255-118	3255-118	3255-118	3255-118
71	Manifold, Fill Valve	7237-035	7237-035	7237-142	7237-142	7237-142	7237-142	7237-142	7237-142
72	Hose, Cyl. Pre-Fill	3898-804	3898-804	3898-805	3898-805	3898-805	3898-805	3898-805	3898-805
73	Valve, Cart.	3760-040	3760-040	3760-017	3760-017	3760-017	3760-017	3760-017	3760-017
74	O-Ring	3255-112	3255-112	3255-121	3255-121	3255-121	3255-121	3255-121	3255-121
75	Back-Up, O-Ring	3255-420	3255-420	3255-322	3255-322	3255-322	3255-322	3255-322	3255-322
76	Retainer, Fill Valve Spring	7437-042	7437-042	7437-181	7437-181	7437-181	7437-181	7437-181	7437-181
77	Spring, Valve	3510-500	3510-500	3510-510	3510-510	3510-510	3510-510	3510-510	3510-510
78	Screw	3303-630	3303-630	3303-633	3303-633	3303-633	3303-633	3303-633	3303-633
79	Cap, Fill Valve	7437-086	7437-086	7437-351	7437-351	7437-351	7437-351	7437-351	7437-351
80	Bearing, Piston	3188-006	3188-006	3188-017	3188-017	3188-017	3188-017	3188-017	3188-017
81	Seal, Glyd. Ring Piston	3211-821	3211-821	3211-832	3211-832	3211-832	3211-832	3211-832	3211-832
82	Rod, Cylinder Piston	7437-385	7437-385	7437-386	7437-386	7437-386	7437-386	7437-386	7437-386
83	O-Ring	3255-210	3255-210	3255-235	3255-235	3255-235	3255-235	3255-235	3255-235
84	Back-Up, O-Ring	3255-429	3255-429	3255-435	3255-435	3255-435	3255-435	3255-435	3255-435
85	Cap, Cylinder Rod	7437-275	7437-275	7437-274	7437-274	7437-274	7437-274	7437-274	7437-274
86	Bearing, Rod	3188-006	3188-006	3188-009	3188-009	3188-009	3188-009	3188-009	3188-009
87	Stepseal, Cylinder Rod	3211-818	3211-818	3211-819	3211-819	3211-819	3211-819	3211-819	3211-819
88	Wiper, Cylinder Rod	3211-692	3211-692	3211-712	3211-712	3211-712	3211-712	3211-712	3211-712
89	Stud, Cylinder To Ram	7437-013	7437-013	7437-154	7437-154	7437-154	7437-154	7437-154	7437-154
90	Poly Pack, Rod Seal	3211-802	3211-802	3211-803	3211-803	3211-803	3211-803	3211-803	3211-803

ITEM NO.	DESCRIPTION	PH 175-120	PH 175-144	PH 175-168	PH 250-144	PH 250-168	PH 400-168
65	Cap, Cylinder Top	7437-335	7437-335	7437-335	7437-465	7437-465	
66	O-Ring, Backup	3255-444	3255-444	3255-444	3255-447	3255-447	
67	O-Ring	3255-250	3255-250	3255-250	3255-254	3255-254	
68	Cover, R.H. Cylinder	7437-337	7437-337	7437-337	7437-526	7437-526	7489-041
69	Housing, Cylinder	7437-388	7437-388	7437-388	7437-470	7437-470	7489-048
70	O-Ring	3255-118	3255-118	3255-118			3255-184
71	Manifold, Fill Valve	7237-142	7237-142	7237-142			
72	Hose, Cyl. Pre-Fill	3898-805	3898-805	3898-805			
73	Valve, Cart.	3760-017	3760-017	3760-017	3760-017	3760-017	3760-045
74	O-Ring	3255-121	3255-121	3255-121	3255-121	3255-121	3255-184
75	Back-Up, O-Ring	3255-322	3255-322	3255-322	3255-322	3255-322	3255-421
76	Retainer, Fill Valve Spring	7437-181	7437-181	7437-181	7437-468	7437-468	7489-029
77	Spring, Valve	3510-510	3510-510	3510-510	3510-510	3510-510	3510-520
78	Screw	3303-633	3303-633	3303-633	3303-633	3303-633	3303-690
79	Cap, Fill Valve	7437-351	7437-351	7437-351	7437-432	7437-432	7489-028
80	Bearing, Piston	3188-025	3188-025	3188-025	3188-032	3188-032	3188-033
81	Seal, Glyd. Ring Piston	3211-840	3211-840	3211-840	3211-844	3211-844	3211-845
82	Rod, Cylinder Piston	7437-384	7437-384	7437-384	7437-479	7437-479	7489-020
83	O-Ring	3255-252	3255-252	3255-252	3255-255	3255-255	3255-229
84	Back-Up, O-Ring	3255-446	3255-446	3255-446	3255-448	3255-448	3255-437
85	Cap, Cylinder Rod	7437-387	7437-387	7437-387	7437-466	7437-466	7489-021
86	Bearing, Rod	3188-012	3188-012	3188-012	3188-028	3188-028	3188-031
87	Stepseal, Cylinder Rod	3211-828	3211-828	3211-828	3211-841	3211-841	3211-843
88	Wiper, Cylinder Rod	3211-720	3211-720	3211-720	3211-721	3211-721	3211-723
89	Stud, Cylinder To Ram	7437-201	7437-201	7437-201	7437-201	7437-201	7489-016
90	Poly Pack, Rod Seal	3211-804	3211-804	3211-804	3211-837	3211-837	3211-842

LINEAR ENCODER

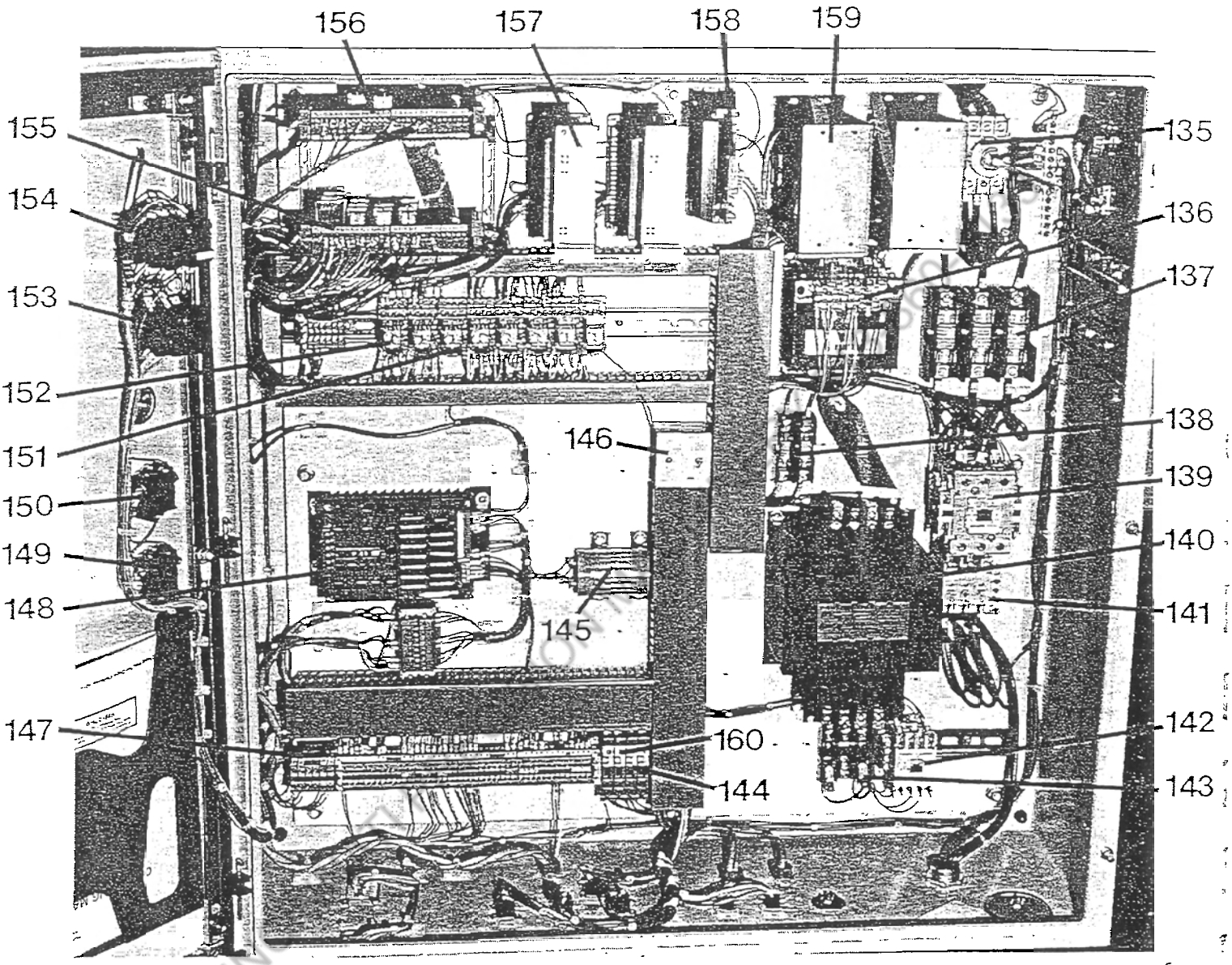


LINEAR ENCODER

ITEM NO.	DESCRIPTION	PH 60-72	PH 60-96	PH 100-120	PH 100-144	PH 100-168	PH 140-120	PH 140-144	PH 140-168
110	Spacer, LH Scale Unit			7437-346	7437-346	7437-346	7437-346	7437-346	7437-346
	Spacer, RH Scale Unit			7437-345	7437-345	7437-345	7437-345	7437-345	7437-345
110A	Pad, Scale Mounting								
111	Encoder, Linear	3900-170	3900-170	3900-100	3900-100	3900-100	3900-100	3900-100	3900-100
112	Stud, Rod End - Upper	7437-359	7437-359	7437-349	7437-349	7437-349	7437-349	7437-349	7437-349
113	Rod End, RH Thd.	3132-254	3132-254	3132-254	3132-254	3132-254	3132-254	3132-254	3132-254
114	Bearing, Slide Packunit	3162-010	3162-010	3162-015	3162-015	3162-015	3162-015	3162-015	3162-015
115	Turnbuckle	7437-350	7437-350	7437-350	7437-350	7437-350	7437-350	7437-350	7437-350
116	Rod End, LH Thd.	3132-255	3132-255	3132-255	3132-255	3132-255	3132-255	3132-255	3132-255
117	Plate, Scanning Head Mtg.	7437-343	7437-343	7437-343	7437-343	7437-343	7437-343	7437-343	7437-343
118	Stud, Spring - Lower	7437-348	7437-348	7437-348	7437-348	7437-348	7437-348	7437-348	7437-348
119	Spring, Compression	3504-103	3504-103	3504-103	3504-103	3504-103	3504-103	3504-103	3504-103
120	Spring, Extension	3506-151	3506-151	3506-151	3506-151	3506-151	3506-151	3506-151	3506-151
121	Plate, Encoder Linkage	7437-353	7437-353	7437-344	7437-344	7437-344	7437-344	7437-344	7437-344
122	Stud, Spring Mtg.	7437-358	7437-358	7437-347	7437-347	7437-347	7437-347	7437-347	7437-347
123	Strap, Grounding	4302-390	4302-390	4302-390	4302-390	4302-390	4302-390	4302-390	4302-390

ITEM NO.	DESCRIPTION	PH 175-120	PH 175-144	PH 175-168	PH 250-144	PH 250-168	PH 400-168
110	Spacer, LH Scale Unit	7437-346	7437-346	7437-346	7437-545	7437-545	7437-545
	Spacer, RH Scale Unit	7437-345	7437-345	7437-345	7437-545	7437-545	7437-545
110A	Pad, Scale Mounting				7437-523	7437-523	7437-523
111	Encoder, Linear	3900-100	3900-100	3900-100	3900-270	3900-270	3900-270
112	Stud, Rod End - Upper	7437-349	7437-349	7437-349	7437-349	7437-349	7437-349
113	Rod End, RH Thd.	3132-254	3132-254	3132-254	3132-254	3132-254	3132-254
114	Bearing, Slide Packunit	3162-015	3162-015	3162-015	3162-101	3162-101	3162-101
115	Turnbuckle	7437-350	7437-350	7437-350	7437-350	7437-350	7437-350
116	Rod End, LH Thd.	3132-255	3132-255	3132-255	3132-255	3132-255	3132-255
117	Plate, Scanning Head Mtg.				7437-524	7437-524	7437-524
118	Stud, Spring - Lower	7437-348	7437-348	7437-348	7437-529	7437-529	7437-529
119	Spring, Compression	3504-103	3504-103	3504-103			
120	Spring, Extension	3506-151	3506-151	3506-151	3506-151	3506-151	3506-151
121	Plate, Encoder Linkage	7437-344	7437-344	7437-344			
122	Stud, Spring Mtg.	7437-347	7437-347	7437-347	7437-347	7437-347	7437-347
123	Strap, Grounding	4302-390	4302-390	4302-390	4302-390	4302-390	4302-390

ELECTRICALS



TO IDENTIFY ELECTRICAL COMPONENTS CHANGES ON INSTALLATIONS AFTER 6-1-92, REFER TO THE AMENDED PARTS LIST SECTION AT THE BACK OF THIS MANUAL.

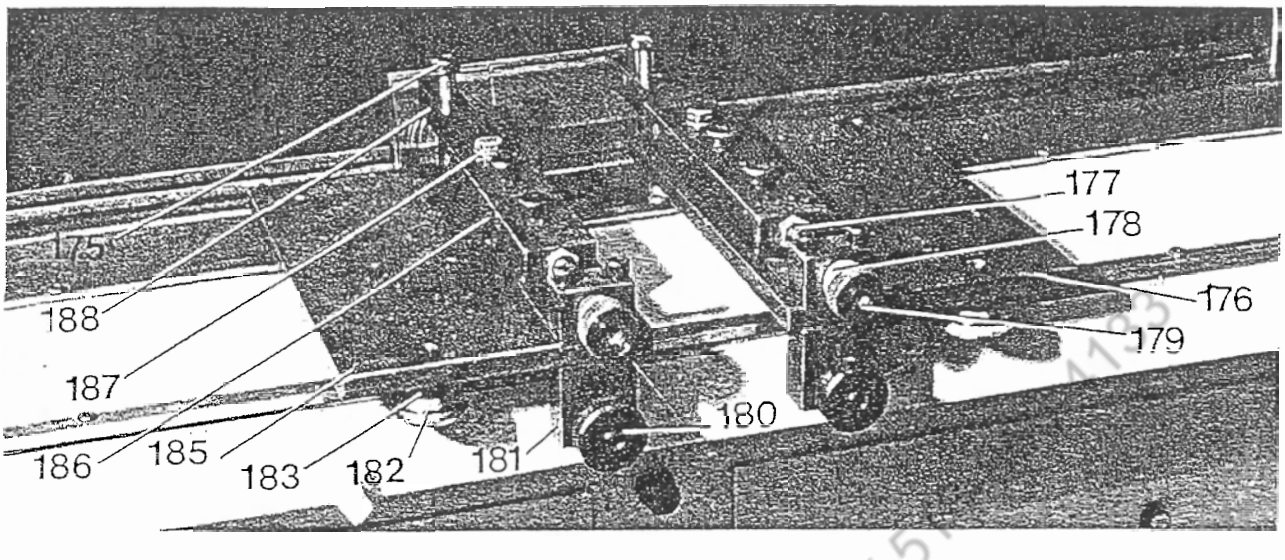
ELECTRICALS

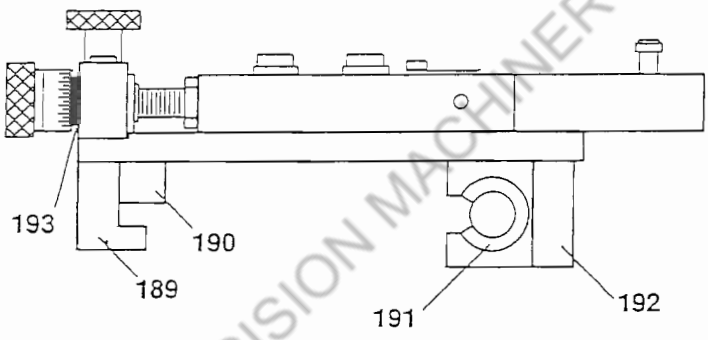
ITEM NO.	DESCRIPTION	PH 60-72	PH 60-96	PH 100-120	PH 100-144	PH 100-168	PH 140-120	PH 140-144	PH 140-168
135	Disconnect	4171-143	4171-143	4171-143	4171-143	4171-143	4171-143	4171-143	4171-143
136	Transformer	4177-901	4177-901	4177-901	4177-901	4177-901	4177-901	4177-901	4177-901
137	Fuse @ 230 Volt	4328-730	4328-730	4328-740	4328-740	4328-740	4328-750	4328-750	4328-750
137A	Fuse @ 460 Volt	4328-715	4328-715	4328-725	4328-725	4328-725	4328-730	4328-730	4328-730
138	Fuse	4327-603	4327-603	4327-603	4327-603	4327-603	4327-603	4327-603	4327-603
139	Starter	4150-822	4150-822	4150-823	4150-823	4150-823	4150-823	4150-823	4150-823
140	Transformer	4177-033	4177-033	4177-033	4177-033	4177-033	4177-033	4177-033	4177-033
141	Heater, Overload @ 230 V.	4125-512	4125-512	4125-514	4125-514	4125-514	4125-520	4125-520	4125-520
141A	Heater, Overload @ 460 V.	4125-510	4125-510	4125-511	4125-511	4125-511	4125-512	4125-512	4125-512
142	Contactor	4106-051	4106-051	4106-051	4106-051	4106-051	4106-051	4106-051	4106-051
143	Fuse	4327-605	4327-605	4327-605	4327-605	4327-605	4327-605	4327-605	4327-605
144	Fuse	4326-060	4326-060	4326-060	4326-060	4326-060	4326-060	4326-060	4326-060
145	Capacitor	3940-125	3940-125	3940-125	3940-125	3940-125	3940-125	3940-125	3940-125
146	Rheostat	4173-240	4173-240	4173-240	4173-240	4173-240	4173-240	4173-240	4173-240
147	Resistor	4173-200	4173-200	4173-200	4173-200	4173-200	4173-200	4173-200	4173-200
148	Servo Amp	4100-106	4100-106	4100-106	4100-106	4100-106	4100-106	4100-106	4100-106
149	Push Button - Stop	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031
150	Push Button - Start	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030
151	Suppressor	3903-005	3903-005	3903-005	3903-005	3903-005	3903-005	3903-005	3903-005
152	Relay	4136-577	4136-577	4136-577	4136-577	4136-577	4136-577	4136-577	4136-577
153	Switch, Selector	4161-230	4161-230	4161-230	4161-230	4161-230	4161-230	4161-230	4161-230
154	Switch, Selector	4161-240	4161-240	4161-240	4161-240	4161-240	4161-240	4161-240	4161-240
155	Board, Relay	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02
156	Board, Relay	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03
157	Card, Driver	4008-003	4008-003	4008-003	4008-003	4008-003	4008-003	4008-003	4008-003
158	Card, Driver	4008-101	4008-101	4008-101	4008-101	4008-101	4008-101	4008-101	4008-101
159	Power Supply	3901-025	3901-025	3901-025	3901-025	3901-025	3901-025	3901-025	3901-025
160	Fuse	4326-063	4326-063	4326-063	4326-063	4326-063	4326-063	4326-063	4326-063

ITEM NO.	DESCRIPTION	PH 175-120	PH 175-144	PH 175-168	PH 250-144	PH 250-168	PH 400-168
135	Disconnect	4171-143	4171-143	4171-143	4171-144	4171-144	4171-144
136	Transformer	4177-901	4177-901	4177-901	4177-901	4177-901	4177-901
137	Fuse @ 230 Volt	4328-750	4328-750	4328-750	4328-770	4328-770	4328-770
137A	Fuse @ 460 Volt	4328-730	4328-730	4328-730	4328-740	4328-740	4328-740
138	Fuse	4327-603	4327-603	4327-603	4327-603	4327-603	4327-603
139	Starter	4150-823	4150-823	4150-823	4150-824	4150-824	4150-824
140	Transformer	4177-033	4177-033	4177-033	4177-033	4177-033	4177-033
141	Heater, Overload @ 230 V.	4125-520	4125-520	4125-520	4125-521	4125-521	4125-521
141A	Heater, Overload @ 460 V.	4125-512	4125-512	4125-512	4125-519	4125-519	4125-519
142	Contactor	4106-051	4106-051	4106-051	4106-051	4106-051	4106-051
143	Fuse	4327-605	4327-605	4327-605	4327-605	4327-605	4327-605
144	Fuse	4326-060	4326-060	4326-060	4326-060	4326-060	4326-060
145	Capacitor	3940-125	3940-125	3940-125	3940-125	3940-125	3940-125
146	Rheostat	4173-240	4173-240	4173-240	4173-240	4173-240	4173-240
147	Resistor	4173-200	4173-200	4173-200	4173-200	4173-200	4173-200
148	Servo Amp	4100-106	4100-106	4100-106	4100-106	4100-106	4100-106
149	Push Button - Stop	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031	STDE-031
150	Push Button - Start	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030	STDE-030
151	Suppressor	3903-005	3903-005	3903-005	3903-005	3903-005	3903-005
152	Relay	4136-577	4136-577	4136-577	4136-577	4136-577	4136-577
153	Switch, Selector	4161-230	4161-230	4161-230	4161-230	4161-230	4161-230
154	Switch, Selector	4161-240	4161-240	4161-240	4161-240	4161-240	4161-240
155	Board, Relay	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02	4007-001-02
156	Board, Relay	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03	4007-001-03
157	Card, Driver	4008-003	4008-003	4008-003	4008-003	4008-003	4008-003
158	Card, Driver	4008-101	4008-101	4008-101	4008-101	4008-101	4008-101
159	Power Supply	3901-025	3901-025	3901-025	3901-025	3901-025	3901-025
160	Fuse	4326-063	4326-063	4326-063	4326-063	4326-063	4326-063

PH PRESS BRAKES

600 SERIES BACK GAUGE

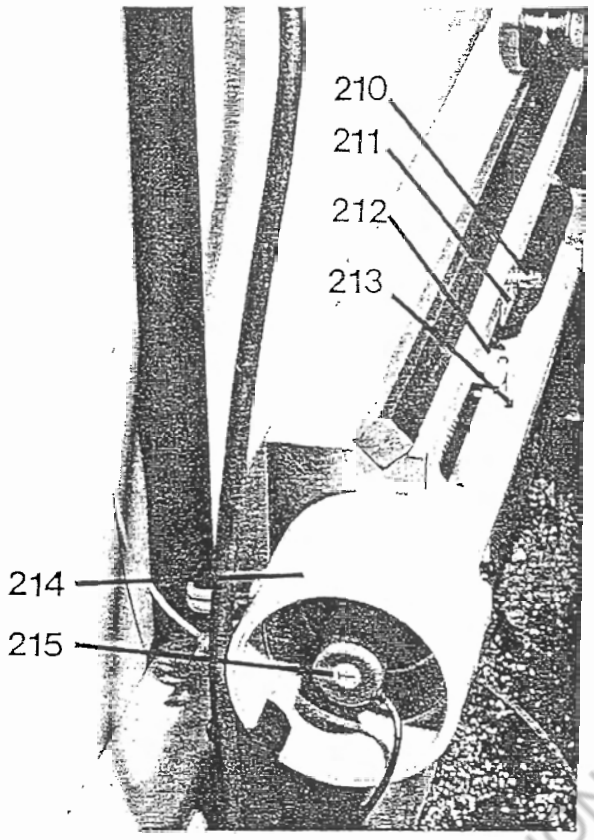


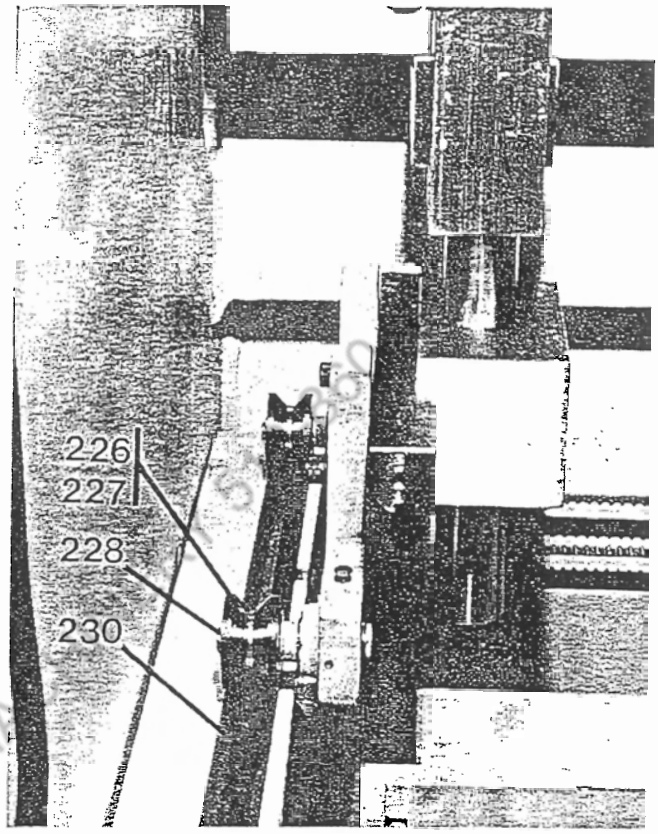


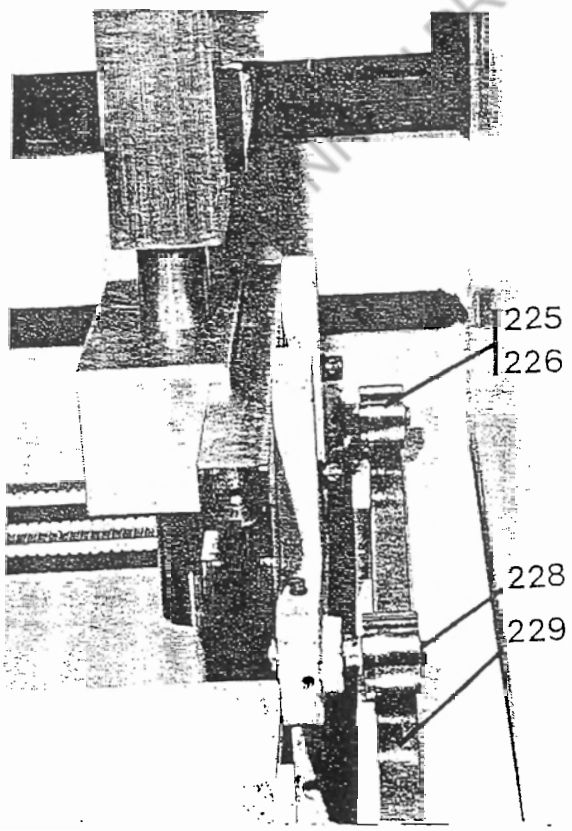
ITEM NO.	DESCRIPTION	All PH Series 60 Ton Thru 250 Ton	PH400 Ton
	Assembly, RH Finger	7386-038-ND	7386-040-ND
	Assembly, LH Finger	7386-039-ND	7386-040-ND
175	Screw, Shoulder	3307-221	3307-221
176	Plate, Finger Mtg. - LH	7486-743	7486-770
177	Screw, Finger Adj.	7486-746	7486-763
178	Scale, Finger Adj.	2205-412	2201-107
179	Nut, Finger Adj.	7486-741	7486-764
180	Knob	2203-050	2203-786
181	Block, Horizontal Locking	7486-742	
182	Wheel, Vee	2203-707	
183	Bushing, Adjustable	2203-731	
183A	Bushing, Stationary (Not Shown)	2203-736	
184	Block, Finger Adj.	7486-747	7486-767
185	Plate, Finger Mtg. - RH	7486-749	7486-770
186	Housing, Finger	7486-745	7486-765
187	Spring, Flat Finger	7486-734	7486-734
188	Finger, Back Gage	7486-748	7486-766
189	Block, Finger Locking		7486-768
190	Slide, Micarta		7041-319
191	Bearing, Linear		3132-425
192	Block, Linear Bearing		7486-771
193	Washer, Wave		3520-338
266	Clamp, Channel Mtg.		

PH PRESS BRAKES

600 SERIES BACK GAUGE





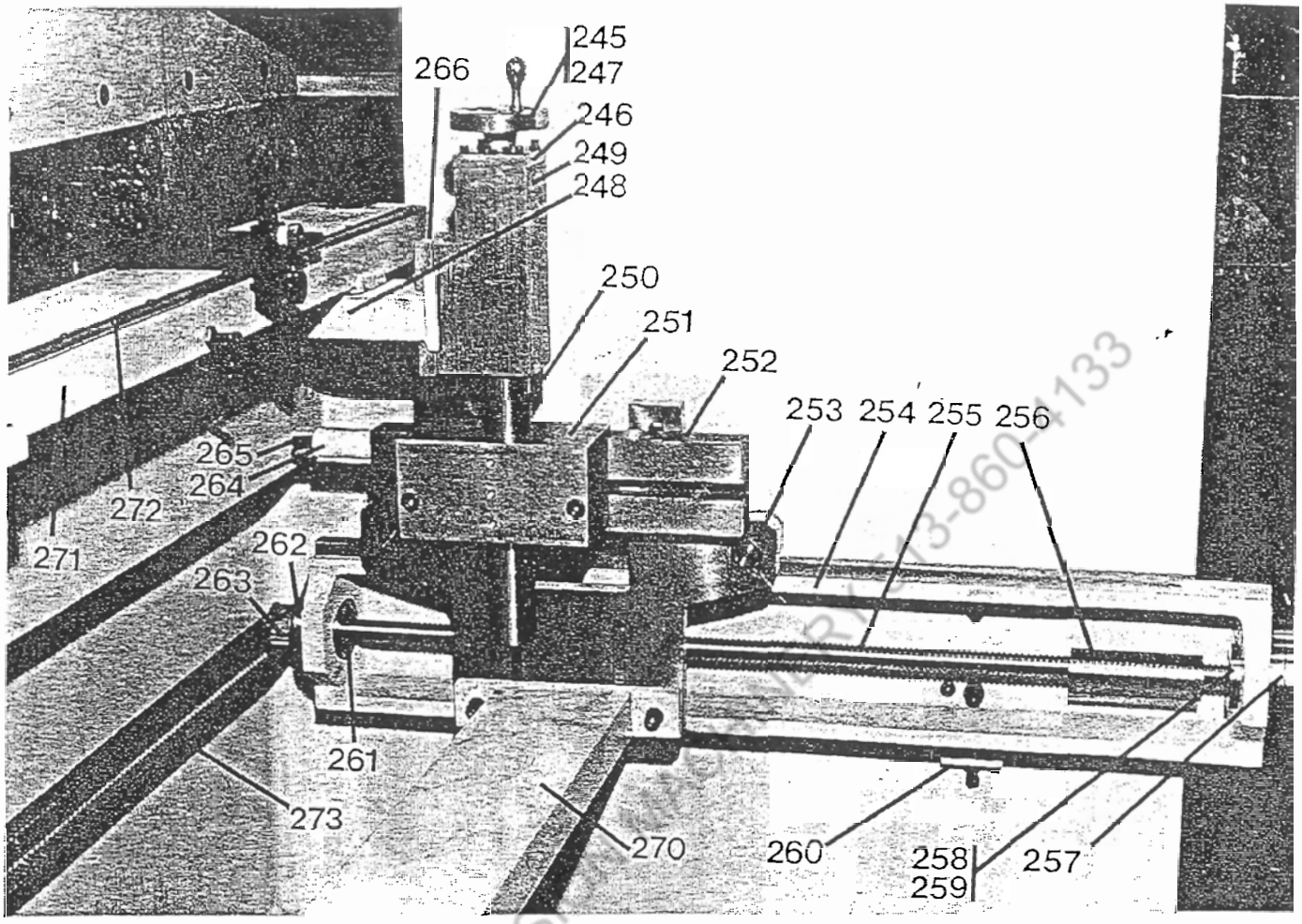


ITEM NO.	DESCRIPTION	All PH SERIES
210	Switch, Limit	4110-023
211	Bracket, Calibration Switch	7445-117
212	Bracket, Rear Limit Switch	7437-656
	Bracket, Front Limit Switch	7437-657
213	Switch, Limit	4110-043
214	Cover, Encoder	7416-357
215	Encoder, Rotery	3900-026

ITEM NO.	DESCRIPTION	All PH SERIES
225	Roller, Flat	7486-605
226	Bearing, Roller	3178-692
227	Roller, Vee	7486-606
228	Shaft, Top Roller	7486-607
229	Bar, Flat Rail 21"Range	7486-586
	Bar, Flat Rail 40"Range	7486-712
230	Bar, Vee Rail 21"Range	7486-790
	Bar, Vee Rail 40"Range	7486-711

PH PRESS BRAKES

600 SERIES BACK GAUGE



ITEM NO.	DESCRIPTION	All PH SERIES
245	Handwheel	7486-493
246	Cap, Block	7486-504
247	Screw, Vertical (Not Shown)	7486-487
248	Bracket, Channel Mounting	7286-314
249	Block, Vertical Adj.	7486-503
250	Tube, Vertical Adj.	7386-025
251	Block, Lower	7486-780
252	Bar, T-Slot	7486-779
253	Saddle, Back Gage	7086-061
254	Rail, LH 21" Range	7086-066
	Rail, RH 21" Range	7086-065
	Rail, LH 40" Range	7086-064
	Rail, RH 40" Range	7086-063
255	Screw, BG Drive, 21" Rg.	3358-128
	Screw, BG Drive, 40" Rg.	3358-130
256	Stop, Screw	6492-121
257	Cover, End - LH Rail	7486-588
258	Base, Encoder	7486-643
259	Bearing, Roller	3178-694
260	Block, Leveling	7486-633
261	Bearing, Roller	3178-699
262	Adapter, Screw	7486-632
263	Pulley, Screw	7486-624
264	Stop, Front	7486-666
265	Bumper, Front	4540-264
266	Clamp, Channel Mtg.	7486-756

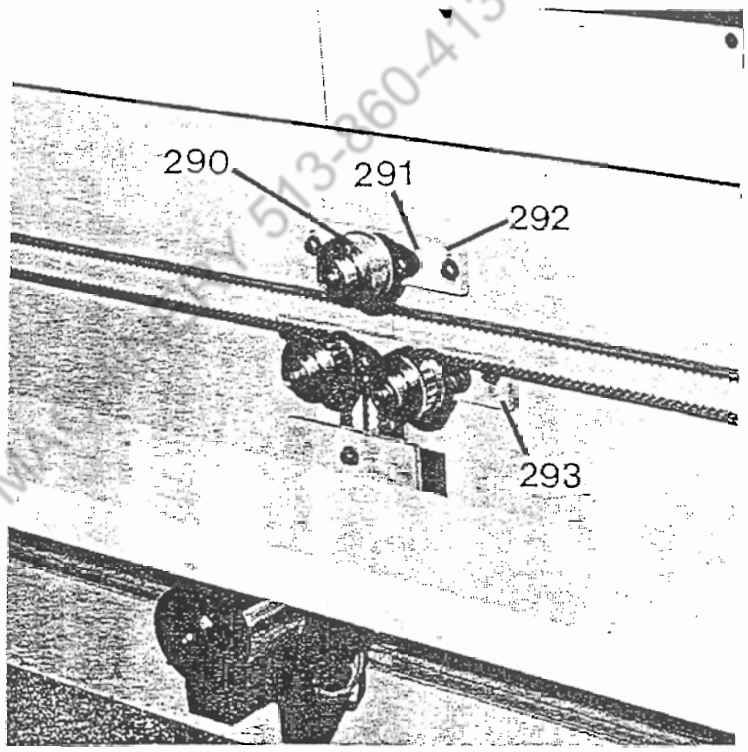
PH PRESS BRAKES

600 SERIES BACK GAUGE

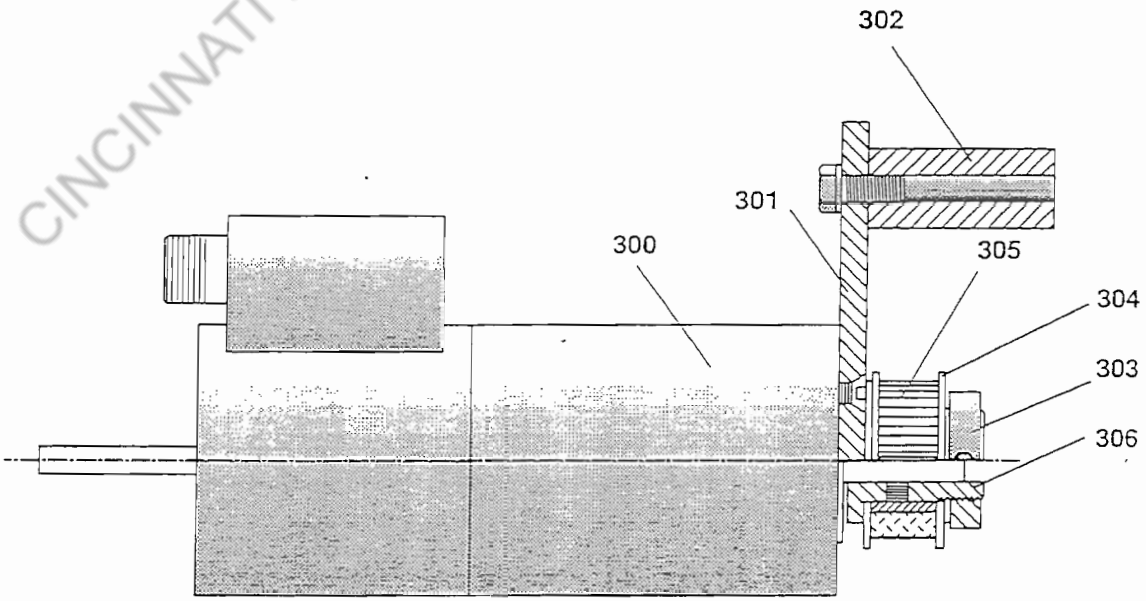
All PH Models-60 Ton Thru 250 Ton**

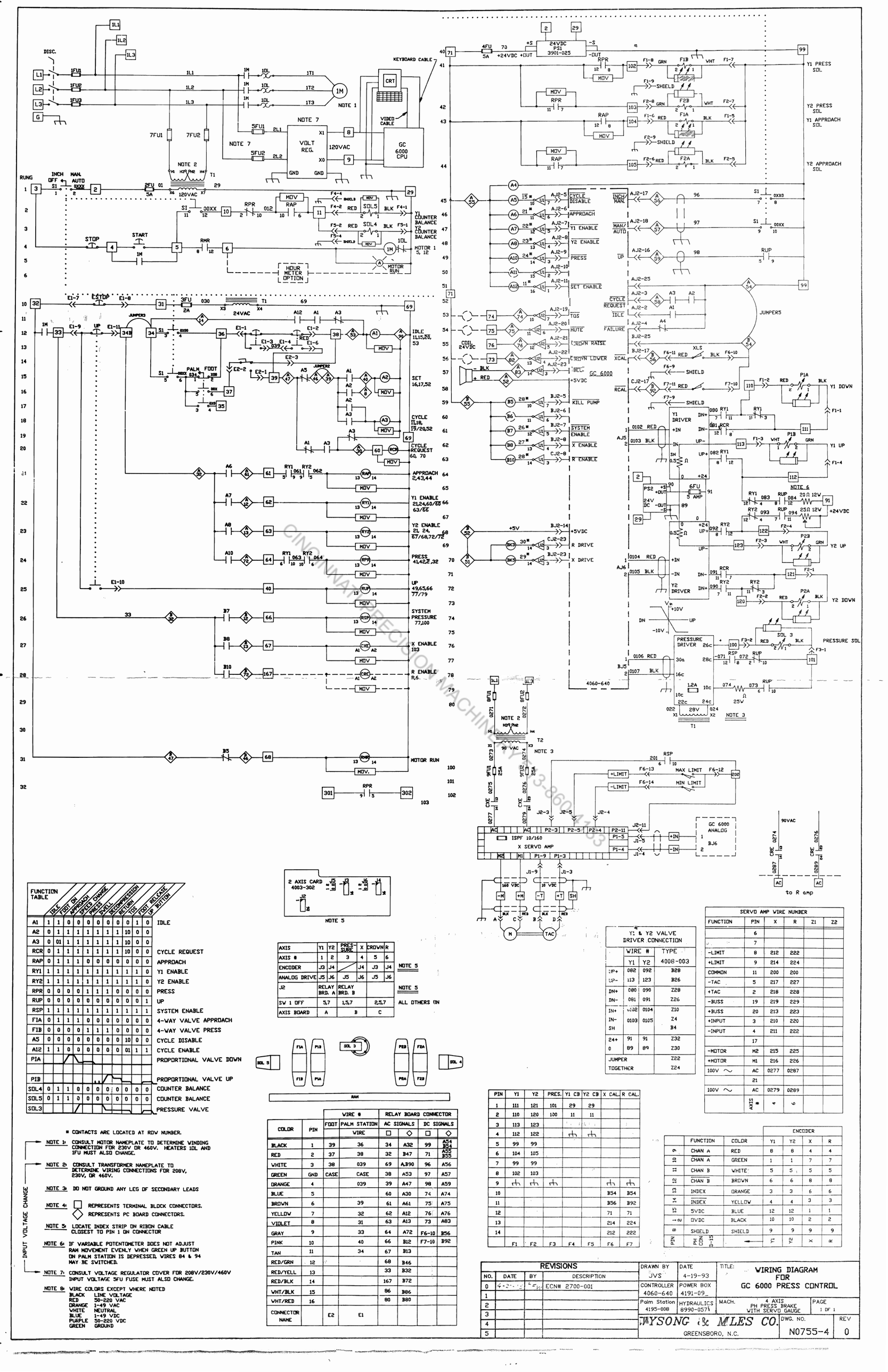
ITEM NO.	DESCRIPTION	PH **-72	PH **-96	PH **-120	PH **-144	PH **-168	PH 400-168
270	Beam, B/G Cross Support	7286-282	7286-283	7286-284	7286-285	7286-300	7286-300
271	Channel, Finger Mtg. Cross	7286-311	7286-326	7286-325	7286-324	7286-323	7286-318
272	Track, Cross Channel	7486-750	7486-752	7486-751	7486-750	7486-752	7486-773
273	Belt, Timing	3413-175	3413-180	3413-182	3413-191	3413-216	3413-216

ITEM NO.	DESCRIPTION	All PH Series
290	Roller, Belt	7486-622
291	Tensioner, Pulley	3412-305
292	Pad, Idler Mtg.	7486-598
293	Pad, Idler Mtg.	7486-623



ITEM NO.	DESCRIPTION	All PH Series
300	Motor, Back Gage	4450-025
301	Base, Motor	7486-795
302	Standoff	7486-794
303	Nut, Timing Pulley	7428-300
304	Washer, Timing Pulley	7428-301
305	Pulley, Timing Pulley	7437-631
306	Hub, Timing Pulley	7486-796





FUNCTION TABLE	IDLE	FOOT ON	APPROACH	SPEED CHANGE	PRESS	PULL-IN	RECONNECTION	RETURN	TDC	FOOT RELEASE	UP BUTTON	
A1	1	1	0	0	0	0	0	0	0	1	0	IDLE
A2	0	1	1	1	1	1	1	1	10	0	0	
A3	0	01	1	1	1	1	1	1	10	0	0	
RCR	0	1	1	1	1	1	1	1	10	0	0	CYCLE REQUEST
RAP	0	1	1	1	0	0	0	0	0	0	0	APPROACH
RY1	1	1	1	1	1	1	1	1	1	1	0	Y1 ENABLE
RY2	1	1	1	1	1	1	1	1	1	1	0	Y2 ENABLE
RPR	0	0	0	0	1	1	1	1	0	0	0	PRESS
RUP	0	0	0	0	0	0	0	0	0	0	1	UP
RSP	1	1	1	1	1	1	1	1	1	1	1	SYSTEM ENABLE
F1A	0	1	1	1	0	0	0	0	0	0	0	4-WAY VALVE APPROACH
F1B	0	0	0	0	1	1	1	1	0	0	0	4-WAY VALVE PRESS
A5	0	0	0	0	0	0	0	0	10	0	0	CYCLE DISABLE
A12	1	1	0	0	0	0	0	0	01	1	1	CYCLE ENABLE
PIA												PROPORTIONAL VALVE DOWN
PIB												PROPORTIONAL VALVE UP
SOL4	0	1	1	0	0	0	0	0	0	0	0	COUNTER BALANCE
SOL5	0	1	1	0	0	0	0	0	0	0	0	COUNTER BALANCE
SOL3												PRESSURE VALVE

AXIS	Y1	Y2	PRES-SURE	X	CROWN	R
AXIS #	1	2	3	4	5	6
ENCODER	J3	J4		J4	J3	J4
ANALOG DRIVE	J5	J6	J5	J6	J5	J6
J2	RELAY BRD. A	RELAY BRD. B				
SW 1 OFF	3,7		1,5,7		2,5,7	
AXIS BOARD	A		B		C	

NOTE 5

NOTE 5

ALL OTHERS ON

Y1 & Y2 VALVE DRIVER CONNECTION	WIRE #		TYPE
	Y1	Y2	4008-003
UP+	082	092	B28
UP-	113	123	B26
DN+	080	090	Z28
DN-	081	091	Z26
IN+	0102	0104	Z10
IN-	0103	0105	Z4
SH			B4
24+	91	91	Z32
0	89	89	Z30
JUMPER TOGETHER			Z22 Z24

SERVO AMP WIRE NUMBER	PIN	X	R	Z1	Z2
	6				
	7				
-LIMIT	8	212	222		
+LIMIT	9	214	224		
COMMON	11	200	200		
-TAC	5	217	227		
+TAC	2	218	228		
-BUSS	19	219	229		
+BUSS	20	213	223		
+INPUT	3	210	220		
-INPUT	4	211	222		
	17				
-MOTOR	M2	215	225		
+MOTOR	M1	216	226		
100V ~	AC	0277	0287		
	21				
100V ~	AC	0279	0289		
	AXIS #	4	6		

PIN	Y1	Y2	PRES.	Y1 CB	Y2 CB	X CAL	R CAL
1	111	121	101	29	29		
2	110	120	100	11	11		
3	113	123					
4	112	122					
5	99	99					
6	104	105					
7	99	99					
8	102	103					
9							
10						B54	B54
11						B56	B92
12						71	71
13						214	224
14						212	222
PIN	F1	F2	F3	F4	F5	F6	F7

	FUNCTION	COLOR	ENCODER Y1	Y2	X	R
9	CHAN A	RED	8	8	4	4
10	CHAN A	GREEN	1	1	7	7
11	CHAN B	WHITE	5	5	5	5
12	CHAN B	BROWN	6	6	8	8
13	INDEX	ORANGE	3	3	6	6
14	INDEX	YELLOW	4	4	3	3
15	5VDC	BLUE	12	12	1	1
16	0VDC	BLACK	10	10	2	2
8	SHIELD	SHIELD	9	9	9	9
PIN			Y1	Y2	X	R

	PIN	WIRE # FOOT	PALM STATION WIRE	RELAY BOARD CONNECTOR AC SIGNALS □	AC SIGNALS ◇	DC SIGNALS □	DC SIGNALS ◇
BLACK	1	39	36	34	A32	99	A34 B24
RED	2	37	38	32	B47	71	A36 B35
WHITE	3	38	039	69	A,B90	96	A56
GREEN	GND	CASE	CASE	38	A53	97	A57
ORANGE	4		039	39	A47	98	A59
BLUE	5			60	A30	74	A74
BROWN	6		39	61	A61	75	A75
YELLOW	7		32	62	A12	76	A76
VIOLET	8		31	63	A13	73	A83
GRAY	9		33	64	A72	F6-10	B56
PINK	10		40	66	B12	F7-10	B92
TAN	11		34	67	B13		
RED/GRN	12			68	B46		
RED/YELL	13			33	B32		
RED/BLK	14			167	B72		
WHT/BLK	15			86	B86		
WHT/RED	16			80	B80		
CONNECTOR NAME		E2	E1				

■ CONTACTS ARE LOCATED AT RDV NUMBER.

NOTE 1: CONSULT MOTOR NAMEPLATE TO DETERMINE WINDING CONNECTION FOR 230V OR 460V. HEATERS IOL AND 1FU MUST ALSO CHANGE.

NOTE 2: CONSULT TRANSFORMER NAMEPLATE TO DETERMINE WIRING CONNECTIONS FOR 208V, 230V, OR 460V.

NOTE 3: DO NOT GROUND ANY LEG OF SECONDARY LEADS

NOTE 4: □ REPRESENTS TERMINAL BLOCK CONNECTORS.
◇ REPRESENTS PC BOARD CONNECTORS.

NOTE 5: LOCATE INDEX STRIP ON RIBON CABLE CLOSEST TO PIN 1 ON CONNECTOR

NOTE 6: IF VARIABLE POTENTIOMETER DOES NOT ADJUST RAM MOVEMENT EVENLY WHEN GREEN UP BUTTON ON PALM STATION IS DEPRESSED, WIRES 84 & 94 MAY BE SWITCHED.

NOTE 7: CONSULT VOLTAGE REGULATOR COVER FOR 208V/230V/460V INPUT VOLTAGE 5FU FUSE MUST ALSO CHANGE.

NOTE 8: WIRE COLORS EXCEPT WHERE NOTED
BLACK LINE VOLTAGE
RED 50-220 VAC
ORANGE 1-49 VAC
WHITE NEUTRAL
BLUE 1-49 VDC
PURPLE 50-220 VDC
GREEN GROUND

INPUT VOLTAGE CHANGE

REVISIONS NO.	DATE	BY	DESCRIPTION
0	4-2[illegible]	[illegible]	ECN# 2700-001
1			
2			
3			
4			
5			

DRAWN BY	DATE
JVS	4-19-93
CONTROLLER	POWER BOX
4060-640	4191-09_
Palm Station 4195-008	HYDRAULICS 8990-0571

TITLE: WIRING DIAGRAM FOR GC 6000 PRESS CONTROL

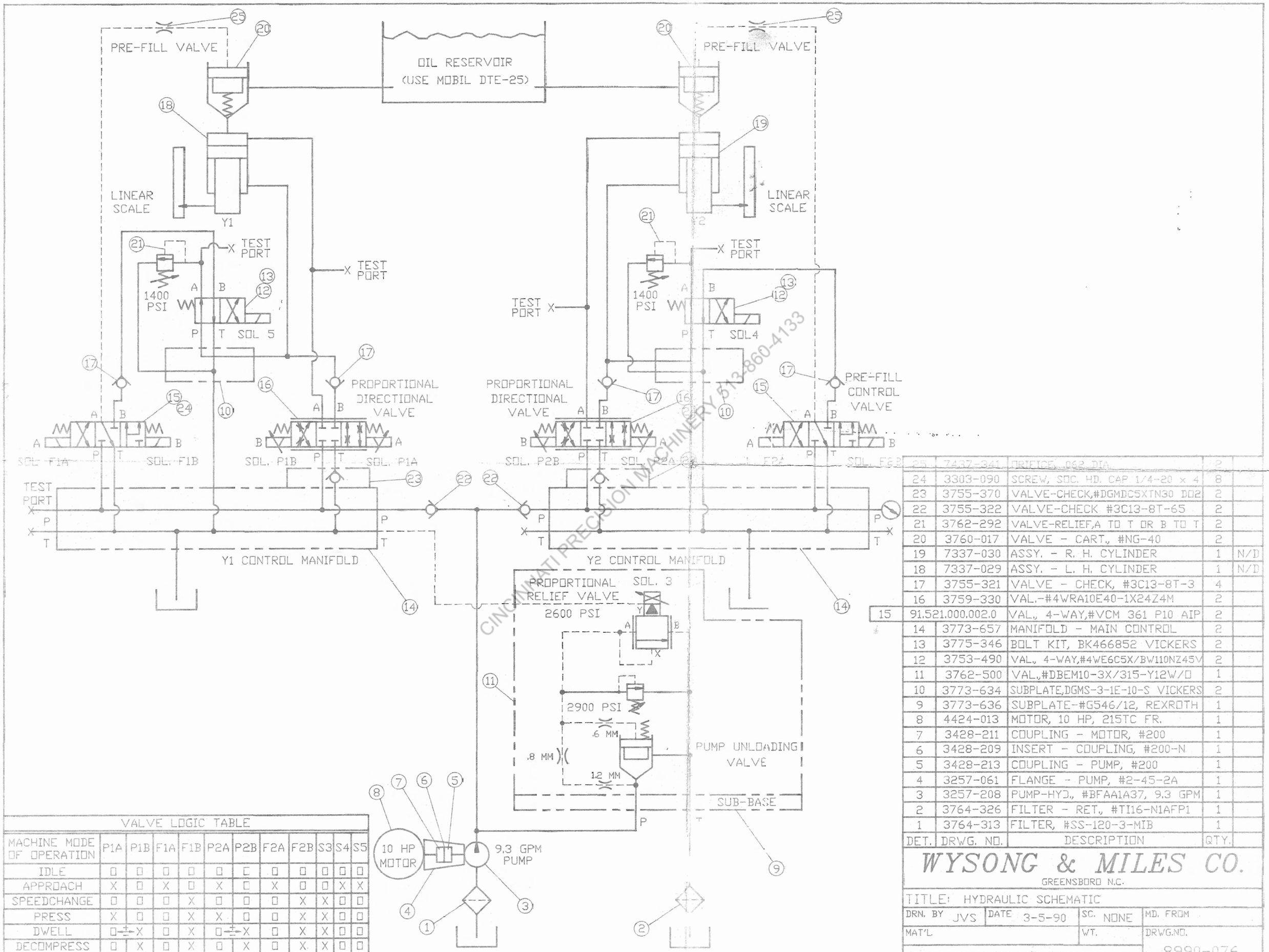
MACH. 4 AXIS PH PRESS BRAKE WITH SERVO GAUGE

PAGE 1 OF 1

JAYSONG & MILES CO. GREENSBORO, N.C.

DWG. NO. N0755-4

REV 0



VALVE LOGIC TABLE											
MACHINE MODE OF OPERATION	P1A	P1B	F1A	F1B	P2A	P2B	F2A	F2B	S3	S4	S5
IDLE	□	□	□	□	□	□	□	□	□	□	□
APPROACH	X	□	X	□	X	□	X	□	□	X	X
SPEEDCHANGE	□	□	□	X	□	□	□	X	X	□	□
PRESS	X	□	□	X	X	□	□	X	X	□	□
DWELL	□-±-X		□	X	□-±-X		□	X	X	□	□
DECOMPRESS	□	X	□	X	□	X	□	X	X	□	□
RETURN	□	X	□	□	□	X	□	□	X	□	□

DET.	DRWG. NO.	DESCRIPTION	QTY.	
25	7437-341	ORIFICE, .062 DIA.	2	
24	3303-090	SCREW, SOC. HD. CAP 1/4-20 x 4	8	
23	3755-370	VALVE-CHECK,#DGMDC5XTN30 D02	2	
22	3755-322	VALVE-CHECK #3C13-8T-65	2	
21	3762-292	VALVE-RELIEF,A TO T OR B TO T	2	
20	3760-017	VALVE - CART., #NG-40	2	
19	7337-030	ASSY. - R. H. CYLINDER	1	N/D
18	7337-029	ASSY. - L. H. CYLINDER	1	N/D
17	3755-321	VALVE - CHECK, #3C13-8T-3	4	
16	3759-330	VAL.-#4WRA10E40-1X24Z4M	2	
15	91.521.000.002.0	VAL., 4-WAY,#VCM 361 P10 AIP	2	
14	3773-657	MANIFOLD - MAIN CONTROL	2	
13	3775-346	BOLT KIT, BK466852 VICKERS	2	
12	3753-490	VAL., 4-WAY,#4WE6C5X/BW110NZ45V	2	
11	3762-500	VAL.,#DBEM10-3X/315-Y12W/D	1	
10	3773-634	SUBPLATE,DGMS-3-1E-10-S VICKERS	2	
9	3773-636	SUBPLATE-#G546/12, REXROTH	1	
8	4424-013	MOTOR, 10 HP, 215TC FR.	1	
7	3428-211	COUPLING - MOTOR, #200	1	
6	3428-209	INSERT - COUPLING, #200-N	1	
5	3428-213	COUPLING - PUMP, #200	1	
4	3257-061	FLANGE - PUMP, #2-45-2A	1	
3	3257-208	PUMP-HYD., #BFAA1A37, 9.3 GPM	1	
2	3764-326	FILTER - RET., #TI16-N1AFP1	1	
1	3764-313	FILTER, #SS-120-3-MIB	1	

WYSONG & MILES CO.
GREENSBORO N.C.

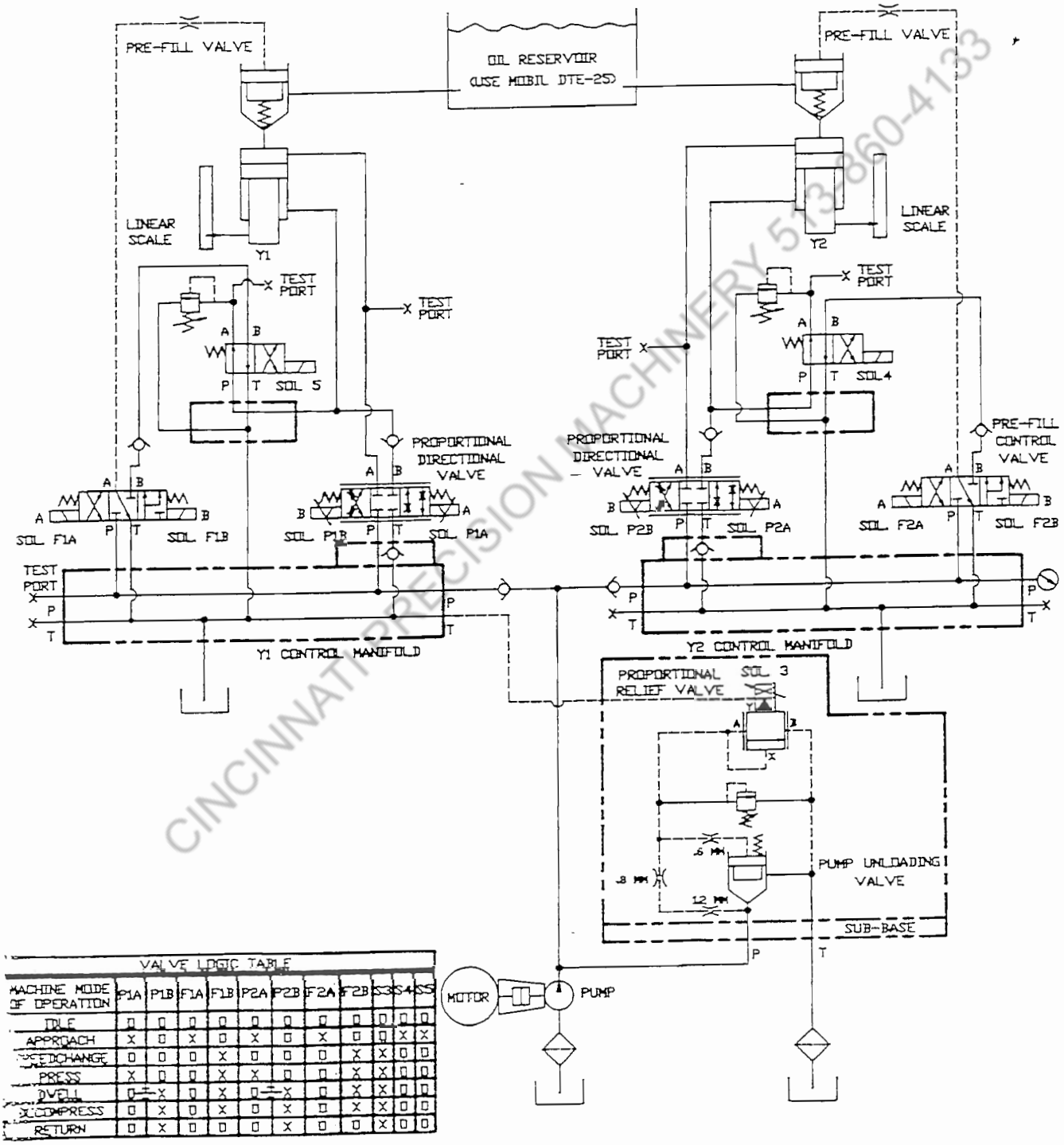
TITLE: HYDRAULIC SCHEMATIC

DRN. BY	DATE	SC.	MD. FROM
JVS	3-5-90	NONE	
MAT'L		WT.	DRWG.NO.
MACHINE: PH100 TON PRESS BRAKE			8990-076

PH PRESS BRAKES

HYDRAULIC SCHEMATIC

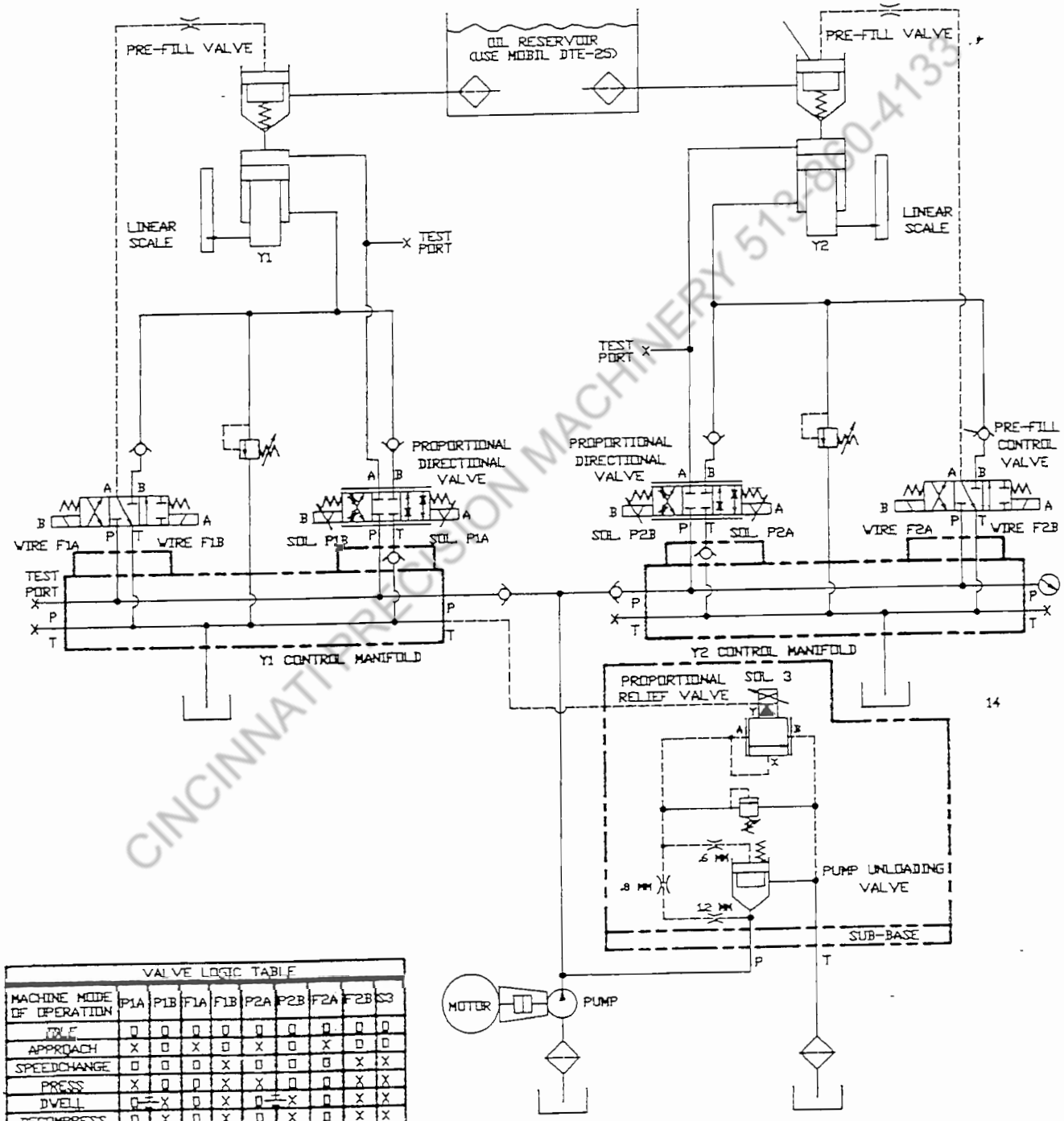
60 TON, 100 TON, 140 TON,175 TON & 400 TON MODELS



VALVE LOGIC TABLE											
MACHINE MODE OF OPERATION	P1A	P1B	F1A	F1B	P2A	P2B	F2A	F2B	S3	S4	S5
IDLE	□	□	□	□	□	□	□	□	□	□	□
APPROACH	X	□	X	□	X	□	X	□	□	X	X
SPEEDCHANGE	□	□	□	X	□	□	□	X	X	□	□
PRESS	X	□	□	X	X	□	□	X	X	□	□
DWELL	□	X	□	X	□	X	□	X	X	□	□
DECOMPRESS	□	X	□	X	□	X	□	X	X	□	□
RETURN	□	X	□	□	□	X	□	□	X	□	□

PH PRESS BRAKES

HYDRAULIC SCHEMATIC
250 TON MODEL



VALVE LOGIC TABLE									
MACHINE MODE OF OPERATION	P1A	P1B	F1A	F1B	P2A	P2B	F2A	F2B	S3
IDLE	□	□	□	□	□	□	□	□	□
APPROACH	X	□	X	□	X	□	X	□	□
SPEEDCHANGE	□	□	□	X	□	□	□	X	X
PRESS	X	□	□	X	X	□	□	X	X
DWELL	□	X	□	X	□	X	□	X	X
DECOMPRESS	□	X	□	X	□	X	□	X	X
RETURN	□	X	□	□	□	X	□	□	X

Form 534-W6 Rev. G

⚠ WARNING

USE OF FOOT CONTROLS ON MACHINERY LACKING EFFECTIVE POINT OF OPERATION SAFEGUARDS CAN CAUSE SERIOUS INJURY TO THE OPERATOR.

Foot controls should only be used where "Point of Operation" and "Pinch Point" guarding devices have been properly installed and are utilized so that it is IMPOSSIBLE for the operator's hands or fingers to remain within the point of operation during the machine cycle.

IT IS THE RESPONSIBILITY OF THE USER to determine the suitability of a foot control for the user's intended use and to determine that the foot control chosen by the user and wiring up and installation of the same will comply with all Federal, State and Local safety and health regulations and codes.

Due to the unlimited variety of business equipment, instruments, machines and vehicles on which our foot switches are used, the thousands of standards, and customers' varying interpretations of the standards covering these applications, it is impossible for LINEMASTER personnel to be experts on standards and requirements for all these products. We offer over 150 stock foot switch models and guards plus a large variety of specials which are made to customer specifications. We can advise you what is available in our foot switch line and you can examine models to see what meets your needs. We believe our customers' engineering departments should the qualified experts in their own product field and know what specifications or details they require in a foot switch for their equipment. If one of our stock models meets their needs, they can specify it, or possibly ask for a modification of a stock model if that is required.

SHOULD YOU HAVE ANY QUESTIONS OR IF ANY OF THE ABOVE WARNING IS UNCLEAR, PLEASE CALL LINEMASTER SWITCH CORPORATION.
(860) 974-1000; FAX (860) 974-0691 OR (800) 974-3668.

READ INSTRUCTIONS on reverse side of this page.

DEFINITIONS:

POINT OF OPERATION - The point or area of the machine or equipment where the work piece or material is actually positioned and work is being performed during any process such as cutting, shearing, punching, forming, welding, riveting, assembling, etc..

PINCH POINT - Any point at which it is possible for a portion of the body to be caught and injured between moving machine or equipment or work piece parts.

HEAVY DUTY ANTI-TRIP FOOT SWITCH

1. ⚠ WARNING: TO AVOID PERSONAL INJURY, DO NOT USE THIS SWITCH ON MACHINERY WITH AN UNGUARDED POINT OF OPERATION.

   ⚠ READ WARNING STATEMENT on reverse side of this page.

2. When wiring up this device make sure POWER IS OFF AND LINES ARE DEAD.

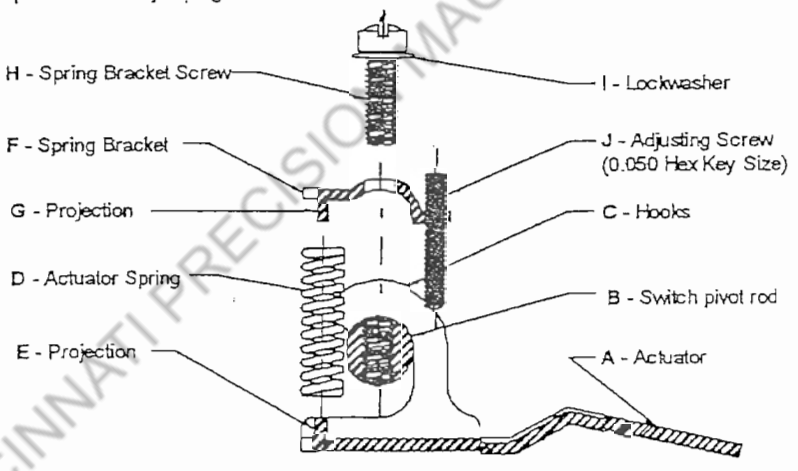
3. This device is for use in ordinary locations, TYPE 2, 4 and 13 and intended to be permanently connected by means of conduit, flexible cord or other system in accordance with the NATIONAL ELECTRICAL CODE.
   When wiring up this device with flexible cord an UNDERWRITERS LABORATORIES LISTED liquidtight connector MUST BE provided. Use appropriate pipe thread sealant at assembly to seal connector threads. When threading into the conduit opening, CARE must be taken to tighten the threaded joint sufficiently to prevent loosening but should NOT BE FORCED. The conduit threads should be kept clean; free from dirt and foreign materials that would hinder proper installation.

4. MODELS 511-B & 511-B3 are supplied with non-adjustable actuating mechanism. Factory set to operate approximately 3/4 treadle stroke.

5. MODELS 511-B2 & 511-B4 are supplied with right interior switch with non-adjustable actuating mechanism. Left interior switch with an adjustable actuating mechanism, set at factory to operate as Double-Pole Double-Throw.

   SPECIAL NOTE:
   In many applications it is highly desirable to wire the Normally Closed Circuit to the adjustable left switch and the Normally Open Circuit to the non-adjustable right switch. In such a case the 511-B2 can then be adjusted to have the Normally Closed Circuit remake near the top of the treadle release stroke. EXAMPLE: This means that in a press control circuit, the operator must go through a substantial portion of the treadle release stroke before he can reset the control circuit for another operation.

6. TO CHANGE ADJUSTMENT of the operating point of the left interior switch, depress the treadle to the point where you want the switch to operate. With the treadle depressed to the desired operating point, turn the adjusting screw until the switch snaps.
   Turn clockwise to lower the operating point and counter-clockwise to raise it.
   Apply Loctite Corporation Threadlocker Adhesive #290 (or equivalent) penetrating low-viscosity anaerobic liquid adhesive to adjusting screw "J" after changing adjustment.
   Avoid applying an excessive amount of the liquid adhesive to prevent migration.
   Remove excess liquid adhesive by wiping.



7. Tighten the cover screws such that an effective seal is obtained with the gasket. Tighten to 30 to 35 in—lb. (3.4 to 4.0 Nm); two tightenings required.

8. CLEANLINESS must be observed during installation and in use.

   On a REGULAR BASIS, lubricate the treadle pivot rod with one or two drops of lubricating oil on that portion of the pivot rod that extends between the outside of the base and inside of the treadle; two places.

   On a REGULAR BASIS, inspect foot switch frequently to guard against wear, damage, unlawful alterations or removal of guards, or for unusual enclosure deterioration and the like. Inspect the entire length of the connecting cord (or wiring system) from where it enters the foot switch to the equipment its wired up to for wear, loose strain relief connections and the like. DO NOT OPERATE the foot switch if any of the above is observed or if the nameplate or warning labels have been obscured or removed.

   It is IMPERATIVE that inspection authorities and users exercise more than ordinary care with regard to installation and maintenance and that this information sheet be made available to the end user, operators, maintenance personnel and to others responsible for the proper installation and safe operation of this foot switch.

   ADDITIONAL COPIES of this information sheet and warning labels are available upon request.

SECTION 3
GC-6000 PROGRAMMING

WYSONG & MILES COMPANY
GC 6000 PROGRAMMING MANUAL

The first screen you will see when power is applied to the controller displays the copyright notice and current revision number of the program. A message is also displayed which indicates if the special key for FULLY FUNCTIONAL PROGRAM has been installed. If the key has not been installed, DEMO PROGRAM will be displayed. The DEMO PROGRAM will not calculate correct bend allowances or bend depth for the Y-axis or will not save parts or tools. The DEMO PROGRAM is for program presentation only.

GETTING STARTED - THE HOME SCREEN

The {HOME} screen is the first screen that you encounter when you used the GC 6000. From here you select the main function that you want to perform. Upon selection, the program will transfer you to different screens where you may have other choices to make, data to enter, or tools to load. Pressing the "Home" key anytime will bring you back to this screen.

Selecting SELECT JOB allows for the creation of new jobs or the retrieval from memory of jobs previously programmed. This selection also establishes the graphics method of programming parts.

Selecting LIST JOBS will provide a list of the jobs and comments previously programmed and stored in disk memory. You may select a job from the list and run it by using the function keys presented. This is a quick way to recall and run jobs stored on a disk. Use the [PgUp] and [PgDn] buttons to move the screen display forward and backward in list of parts. Use the Up and Down Arrow keys to move the cursor through the list.

When the cursor lays next to the job you want, press enter and the job will be loaded and you will be transferred to the job entry screen. You may then run, modify, or delete the job as normal. The PART NUMBER is the job or part identification. The COMMENT is your additional information.

Selecting TOOL INFORMATION allows entry of tooling information into the tooling library.

Selecting METAL INFORMATION presents the {METAL DATA} screen which displays tensile strengths.

Selecting COPY DATA will present the {COPY DATA} screen. On this screen you are asked what kind of data to copy, (jobs, tools, parameters, etc.) and where to copy it from and to. This screen allows transfers of information between desk top computers and controllers as well as copying to disk memory. This also provides telephone modem access for remote troubleshooting.

Selecting MACHINE PARAMETERS provides access to the parameters which the computer uses to control the press brake.

CAUTION: DO NOT CHANGE PARAMETERS UNLESS YOU ARE
QUALIFIED TO MAKE PARAMETER ADJUSTMENTS.

FOR ASSISTANCE:
Call WYSONG & MILES COMPANY
(336) – 621-3960

Pressing [ENTER] will activate the selection the cursor is positioned to.

BASIC JOB OPERATION

Pressing [BASIC] will present the {BASIC JOB DATA} screen which provides a simple method of programming non-graphic parts.

The {BASIC JOB DATA} screen is used in the basic method of programming. Information common to all bends in the job is entered on this screen.

The PART NUMBER field enables you to identify your jobs with the numbers you are accustomed to using. This part number can be numbers, letters, or a combination of both. The part number can be thirty (30) characters long and is used to store and recall jobs from disk storage.

The COMMENT field can be used for your own purpose. You may use this field to help you identify the program. If you wish, you can leave this space blank.

The METAL field is where you enter the name of the material that the current job will be made with. If the material name that you enter is not currently in the materials library, you will be required to choose from a list of materials one which is close to the new name.

The DWELL TIME field is the amount of time the press brake will hold the material on the bottom of the stroke to set the bend. The range for this time is from 0 seconds to 32,000 minutes!!! BE CAREFUL what you ask for in dwell time, 32,000 minutes is approximately 22 1/4 days!!!

The METAL THICKNESS field is the "measured" metal thickness the part is to be made with, not the gauge.

Set the PARTS REQUIRED field to the number of parts that you want to make.

The PARTS PRODUCED field is a parts counter which counts up by one each time a part is produced. You can set this at anytime to the actual number of parts you have made. When this counter is the same as PARTS REQUIRED, the controller will make a long beeping sound.

The UPPER TOOL field is the name of the punch to be used to produce the part. You will need to clamp this tool to the ram before running the job. You are responsible for making sure the tool selected is the tool that actually gets installed into the brake. Also, if the tool you select is not stored in the tooling library, you will be required to enter it before continuing.

Upper tool RADIUS field is the radius on the point or nose of the upper tool, (punch). Lower tool RADIUS field is the radius on the shoulders of the die at the die width points.

The LOWER TOOL field is the name of the Vee to be used to produce the part. This tool must be compatible with the upper tool you are using. Also if the die you select is not currently in the tool library, you will be required to enter it before continuing.

The HEIGHT field on the UPPER TOOL (punch) is the distance from the shoulder where it seats to the bottom of the ram to the nose (point). The HEIGHT field on the LOWER DIE (V-die) is the distance from the top to the base where it sits on the die holder (sometimes called the die bolster). Do not include the tang in the measurements; the tang is only to clamp the die in place.

The HEIGHT field in the BRAKE END FRAME DATA refers to the vertical dimension of the side plates.

The DIE WIDTH field is the distance between the center points of the shoulder radius.

SAVE JOB

Pressing [SAVE JOB] saves the job on your system hard disk. When jobs are created, they reside in ram memory only. Be sure to SAVE the JOB on disk before turning off your computer.

Pressing [DELETE JOB] presents a flashing message, "ARE YOU SURE YOU WANT TO DELETE" (your job name here). If you do want the job erased from the hard disk, never be seen again, press [YES].

If you have even a shadow of a doubt, press [NO] and save the deletion of the job for a day when you feel like destroying something.

Pressing [RUN JOB] starts the process of running the job and making parts.

The {NEW METAL} screen appears when a metal has been entered which cannot be found in disk storage. A selection must be made which best describes the new metals bending characteristics.

Select ALUMINUM if the new metal has bending characteristics like aluminum.

Select COLD ROLLER STEEL if the new metal has bending characteristics like stainless steel.

Select METAL NAME IS INCORRECT if the new metal name has been misspelled or is the wrong metal name.

Pressing [SELECT METAL] will select the metal the arrow is pointing to.

INSTALLING TOOLS

The {INSTALL TOOLS} screen displays the tools required to be installed on the brake to run the job you have requested. You are responsible for making sure that the tools displayed are in fact the tools that get installed.

Pressing [LEVEL] will move the ram up on the low side until both cylinders are at approximately the same height.

Pressing [SLOW UP] raises the ram slowly until top of stroke or until you press the key again. This function is useful when tools are being loaded, you can "bump" the ram up to just clear the shoulder of the tool.

Pressing [TOOLS INSTALLED] tells the controller you have the tools installed and are ready to begin.

BE CAREFUL!

INSTALLING THE WRONG TOOLS WILL CAUSE A REFERENCE HEIGHT ERROR RESULTING IN THE TOOLS BEING SLAMMED TOGETHER OR NOT COMPLETING THE PROPER BEND DEPTH FOR THE ANGLES PROGRAMMED!!!

The {INSTALL UPPER TOOLS} and {INSTALL LOWER TOOLS} pages provide information about installing multiple tools into the press brake. Station number would be tool pair consisting of an upper tool and a lower tool. The POSITION is where the center of the tool is to be installed with respect to the center

of the press. For example, if station 3 has an upper tool installed with an offset of 10 inches, place the center of the tool 10 inches to the right of machine center. The SEGMENTED LENGTH is how long to make the tool if it is made up of segmented tooling.

Pressing [DRAW BRAKE] presents a graphic representation of your press brake and any tools or multiple tool stations programmed for the current job.

Pressing [CONTINUE] will take you to the screen that you were on when you evoked the DRAW command.

Pressing [LIST UPPER] will display a list of upper tools to install in the ram for this job.

Pressing [LIST LOWER] will display a list of lower tools to install in the die holder for this job.

The {CALIBRATE RAM} screen will be displayed when ram calibration is necessary. Just press [CALIBRATE RAM].

Pressing [CALIBRATE RAM] initiates the calibration procedure for the RAM (Y1 and Y2 axes). The ram will move to the top of its stroke and will then be calibrated.

The {CALIBRATE BACK GAUGE} causes the gauge to move to a fixed switch and then return to preset point. The index parameter value that is set at **Wysong** is then loaded into the current position field and the gauge is calibrated. Once calibrated, the X-axis gauge is accurate to +/- .001".

BASIC PART PROGRAMMING (NON-GRAPHIC)

The {BASIC BENDING} screen is used for both programming and bending a part in the basic mode. This screen is also used for bending a part in the graphics mode. Use PgUp and PgDn to move forward and reverse in the bend data. The bend data will change with each stroke of the press brake.

The BEND NUMBER field shows which bend in the sequence of bends to make the part.

The ANGLE field is in the programming mode. This refers to the angle you want to bend in the part. Zero (0) degrees would be a flat sheet with no bend; 180 degrees would be a part folded back onto itself. Ninety (90) degrees would be a part with a right angle bend. Ninety-one (91) degrees would be one (1) degree acute. Eighty-nine (89) degrees would be one (1) degree obtuse.

In the tool mode, this refers to the ANGLE of the upper tool (punch) which determines the sharpness of the ANGLE that could be bent.

In the {SIDES} screen, the ANGLE field sets the angle the appropriate side forms to one perpendicular to the bend line.

The MEASURED ANGLE field should be set to the angle just bent in order to correct a bend angle error. This information is later used to update the metal library for metal tensile strength.

Entering a value in this field automatically calculates new Y- and X-axis set points.

The FLANGE SIZE field is set to the desired bent dimension for the flange. The X-axis set point will be automatically recalculated and includes one bend allowance.

The FLANGE WIDTH field is the dimension of a flange that runs parallel to the bend line. Changing the value in this field automatically recalculates the BEND TONS.

The Y1 AXIS is the vertical movement of the left side of the ram; each cylinder is recognized by the controller as an independent axis.

The Y2 AXIS is the vertical movement of the right side of the ram; each cylinder is recognized by the controller as an independent axis.

The TOP OF STROKE field sets the distance above the pinch point that the ram will return to after making this bend.

The BEND TONS field sets the tonnage produced by the ram for this bend. Maximum and minimum values are forced on this entered value.

The BOTTOM BEND field when set to a value of one (1) will cause the controller to produce a bottoming bend. BEND TONS for a bottom bend will be calculated at four times the tonnage required for an air bend. The ram will reverse at the bottom of the bend when it stops moving instead of reaching a specific set point.

The X-AXIS field is the back gauge movement which positions the gauge in and out to determine the flange length. The X-AXIS has a useable range of approximately eighteen inches.

The RETRACT DISTANCE field when set to a value will cause the ram to pause at the pinch point in its stroke while the X-axis moves back by the value specified.

The RETRACT TIME field when set to a value will cause the X-axis to delay moving to its next position for the length of time specified.

The R-AXIS field is the position the R-axis gauge for this bend.

Currently an R-axis is not available for the PH press brake.

The NOTES field is provided for the programmer to provide instruction to the operator. These instructions may be which surface of the metal that should be on the first bend as well as instructions to flip, turn, rotate the part as it is bent. A separate message is available for each bend.

Pressing [REPEAT BEND] will cause the controller to continue making this bend. This mode can be used to make this bend in all parts before advancing to the next bend for all parts. This mode can also be used for initial test bending to get a bent angle correct.

Pressing [AUTO SEQ.] will cause the controller to advance to the next bend in the program with each stroke of the ram.

Pressing [FIX ALL] will change all bends in the part program to the value that was last entered in the lower group of fields.

This is useful in the case where all bends are 90 degrees and you have just entered a Y-set point which produces a good bend, and you want all bends to be set to the same value.

By pressing [DRAW PART], this key will draw the part under consideration in a three dimensional wire frame representation if the part has been previously programmed in the graphic mode.

Pressing [JOB DATA] takes you to the "JOB DATA ENTRY" screen. On this screen, you program data that is common to all the flanges and angles of a part, i.e. part number, comments, material thickness, and so on.

Pressing [ADD BEND] adds a new bend onto the end of the bending program.

Pressing [CORRECT BEND] in graphics bending will go to the {CORRECT BEND} screen where a single bend correction can be made or all bends of the same grain can be corrected.

The {GRAPHICS BENDING} screen displays a drawing of the part with the bends made prior to this bend and in position to make this bend. The diagonal bend line that runs from lower left to upper right is the line along which this bend will be made. The area to the upper left of the screen is toward the back gauge. The area to the lower right of the screen is in front of the press brake. Use PgUp and PgDn to move forward and reverse in the bend drawings. The drawing will change with each stroke of the press brake. The BEND ORDER displayed in the upper left corner of the screen indicates the bend number. The STATION in the upper right corner indicates which tool station number to use as in 1 to 10 from left to right.

Pressing [SOLID] will shade the 3–d wire frame drawing you have just seen. Sometimes shading will alleviate the in-side-out optical illusions that you may encounter.

The {ANGLE CORRECTION} screen provides the means to enter data to make angle corrections and fix similar angles in the part.

The MEASURED THICKNESS field is set to the actual caliper measured thickness of the metal.

The MEASURED ANGLE field is set to the angle bent by the brake and measured with a protractor.

Pressing [FIX BEND] will recalculate a new Y1 and Y2 position for this bend.

Pressing [FIX GRAIN] will recalculate a new Y1 and Y2 position for this bend and all other bends with the same grain.

Pressing [FIX NONE] will not make any Y corrections. It will go back to the bending screen.

FILE TRANSFER

The {COPY DATA} screen provides the capability to copy various types of data to several destinations or from several sources.

The PHONE NUMBER field appears when you press [DIAL] and it is the number you wish to call.

Pressing [TYPE] will change the type of data to be copied in the statement at the top of the screen.

Pressing [TO FROM] will change the direction the data will move.

Copying TO will send data from this computer or controller to the selected destination. Copying FROM will send data from the selected source to this computer or controller.

Pressing [SOURCE] will change the device from which data will be copied. This only appears when copy FROM has been selected.

Pressing [DEST.] will change the device to which data will be copied. This only appears when copy TO has been selected.

Pressing [COPY 1] will cause one file of the selected data to be copied.

Pressing [MORE KEYS] will relabel the other softkeys with the additional choices for this screen. You will see this key label often while using the controller. It means that there are more soft key choices available.

Pressing [HANG UP] will cause the modem to hang up.

Pressing [REPLACE DATA] will cause the destination file to be replaced. This soft key only appears when an attempt has been made to copy data which already exists at the destination end.

Pressing [MODEM DATA] will cause the modem to answer the telephone and go into its data transfer mode. In a modem to modem data transfer, one end must be in TO TELEPHONE and the other in FROM TELEPHONE before [MODEM DATA] is pressed.

Pressing [DIAL] will cause a field for the telephone number to appear on the screen, and when a number has been entered, the modem will dial it. The modem expects the number dialed to reach a modem. Status messages will be displayed to indicate the calls progress. In most cases, voice communication should be established first, and then both ends use the [MODEM DATA] to establish data transfer. Voice must be used when calling into Wysong as an operator will answer the telephone.

Pressing [SPECIAL] if it exists will take you to the remote modem troubleshooting page. Remote troubleshooting is intended to be used by **Wysong** technicians.

The {ATTENTION} screen will appear when a **Wysong** technician sends a message to you over the modem. You should read and understand the message and the response with a typed message or one of the soft key responses at the bottom of the screen.

The [SEND TEXT] field is used to send any message to the **Wysong** technician. When you press return after typing the message, it will be transmitted through the modem to Wysong.

Pressing [YES] will indicate your response to the controller.

Pressing [NO] will indicate your response to the controller.

Pressing [OK] will transmit "OK" to **Wysong**.

The {SPECIAL} screen is for **Wysong** technicians to do remote troubleshooting over telephone modem.

The SEND TEXT field will be transmitted to the remote end when ENTER is pressed.

The CANNED <n> field will send a predefined message corresponding to the number entered here. The following is a list of those messages.

0 "OK"
1 "YES"
2 "NO"
3 "PRESS FOOT SWITCH (STROKE)"
4 "GET READY TO PICK UP PHONE (SEND OK WHEN READY)"
5 "PICK UP PHONE NOW"
6 "GET READY TO REPLACE PHONE (SEND OK WHEN READY)"
7 "REPLACE PHONE NOW AND PRESS [DATA MODE]"
8 "DID PROBLEM OCCUR THIS TIME?"

The [TEXT REPLY] field will send any message entered here when the ENTER key is pressed.
Pressing [COPY PAGE] will take you to {COPY DATA} screen.

Pressing [SPEC] will present the {SPECIAL} screen. This soft key appears after drawing the velocity/tilt graphics.

The {SELECT JOB} screen is the first screen you encounter to program a new job or call an old one out of memory. After selecting a job, you may review it, modify or run it as it was programmed earlier.

Pressing [MODIFY BUFFER] allows you to resume modifying the job contained in the working memory buffer. This would be used if an error condition forced the program back {HOME} or you got lost and pressed the Home key. [MODIFY BUFFER] will not reload the job from the disk storage but will go to {JOB DATA} for additional changes to the existing job in the buffer.

Pressing [MODIFY JOB] loads the selected job from

disk memory into the working memory buffer and goes to the {JOB DATA} screen.

Pressing [CREATE NEW JOB] clears the working memory buffer and goes to the {JOB DATA} screen for entering data for a new job.

You must first type a new part name/number into the "PART NUMBER" field.

The {JOB DATA ENTRY} screen is where you enter data that is common to all of the bends of a part, for example, material thickness, tools, and number of flanges in the part. From here you proceed to the bend data screen to program flange and angle dimensions.

The NOMINAL THICKNESS field is for the gauge or thickness the part will be made from. This is the thickness ordered to make these parts.

Pressing [LIST BENDS] presents the flanges and angles of the current part in a tabular format.

MULTIPLE STATIONS

Pressing [MULT. TOOLS] will take you to the {TOOL DATA} screen.

If you plan to use more than one tool set in any given job, you will tell the controller which tools to use, where in the break to put them and what station number to give them. Pressing this key moves you to the "TOOLING STATIONS PAGE". Here you enter the required data to set up the various stations. Later, in programming the job, you will dictate which station to form each bend on.

Pressing [JOB TASKS] this key transfers you from the {JOB DATA ENTRY} screen to the {JOB TASKS} screen. This is the third step of the create new job process. On this page, gauging positions, bend sequencing, bend allowances and "crash" calculations are completed.

By pressing [BEND DATA], this key transfers you to the {BEND DATA} screen. This screen is where you enter the flange and angle data for a job. Each flange has its own page of data. The next or previous bend data pages can be accessed by pressing the "PgUp" or "PgDn" keys. Pressing the "PgUp" key after the last flange returns you to the "JOB DATA ENTRY" screen.

The {LIST OF FLANGES} screen shows some of the data associated with the part bends in list format. The information contained in this list is PART NUMBER, COMMENT, FLANGE NUMBER, ANGLE, DEPTH, BORDER, FLANGE LENGTH, RETRACT DISTANCE, RETRACT TIME, CYCLES.

The {TOOL STATIONS} screen is for programming multistation tooling for a job.

The NUMBER OF STATIONS field is number of sets of tools (punches or dies) that are identified in a program.

The STATION field specifies which station the tooling information concerns.

The UPPER TOOL NAME field is the name of the punch for this station.

The UPPER TOOL POSITION is where the center of the tool is to be installed with respect to the center of the press. For example, if station 3 has an upper tool installed with an offset of 10 inches, place the center of the tool 10 inches to the right of machine center.

The UPPER SEGMENTED LENGTH is how long to make the tool if it is made up of segmented tooling.

The LOWER TOOL NAME field is the name of the die for this station.

The LOWER TOOL POSITION is where the center of the tool is to be installed with respect to the center of the press. For example, if station 3 has a lower tool installed with an offset of 10 inches, place the center of the tool 10 inches to the right of machine center.

The LOWER SEGMENTED LENGTH is how long to make the tool if it is made up of segmented tooling.

Pressing [3d VIEW] will draw a 3d view of the machine with its tools.

Pressing [FRONT VIEW] will draw a front view of the machine with its tools.

GRAPHIC PROGRAMMING

The {BEND DATA} screen shows the data associated with a bend unless it is the first flange which has no bend.

The BEND field is the programmed bend. This is the sequence in which the bends were programmed. This is not the bend order.

The FLANGE field is sequence in which the flanges were programmed. This is not the bend order.

The BEND ORDER field is the arrangement the job is formed by. Most often the bend order is not the same as the order that the angles and flanges are programmed. This order is changed to avoid "crashes" during bend sequence calculations.

The FLANGE LENGTH field is the flange dimension which is perpendicular to the bend line.

Pressing [AXIS DATA] presents the {AXIS DATA} screen which is a table of the machine axis positions for the current flange. Previous and next flange axis positions are presented by pressing the "PgUp" or "PgDn" keys.

The {GRAPHIC BEND} screen provides several views of the part being programmed.

Pressing [BIGGER], in effect, zooms you in on the position of the cursor. This magnification allows for close study of complicated parts.

Pressing [MOVE] moves the part on the screen. In the graphics mode, you can position the cursor anywhere on the drawing, and by pressing the "MOVE" key, snaps that position to the center of the screen.

Pressing [SMALLER] makes the part drawing smaller. This key is the opposite of the [BIGGER] key. This is in effect zooming out.

Pressing [FLAT] redraws the 3D part you are viewing in a 2D view. This can be done to inspect the blank as it would come off a shear or punching system.

Pressing [BENT] presents folded up 3d drawing of the part. The orientation or position of the part is determined by the flange selected by positioning the graphics cursor. There are as many views of the part as there are flanges.

Pressing [TAPE 1] attaches one end of the tape measure to a point on the part that the graphics cursor is closest to. This key will also remove the measurement triangle from the screen if it is no longer desired. Use the [BIGGER], [MOVE], and [SMALLER] keys to size and position the part so the selected point can be chosen with the graphics cursor. See also [TAPE 2] and [LOWER SIDE].

Pressing [TAPE 2] attaches the other end of the tape measure to a part point which is closest to the graphics cursor. A triangle will appear on the screen with one corner at the point selected by [TAPE 1] and another corner at the point selected by TAPE 2.

Dimensions of the triangle are displayed in the upper left of the screen. The measurement triangle and its dimensions will also be displayed in the folded up TOP and EDGE views of the part.

Pressing [LOWER SIDE] prior to [TAPE 1] OR [TAPE 2] will select the lower surface or side of the metal for attaching the corner of the measurement triangle.

Pressing [COPY FROM] will select the flange the graphics cursor is positioned on as the source of data to be copied when a subsequent [ADD COPY] or [COPY MOVE] is pressed.

Pressing [ADD COPY] will add a new flange to the side of an existing flange which is closest to the graphics cursor. Bend data from the flange previously selected by the [COPY FROM] will be used for the new flange.

Pressing [COPY MOVE] will move the flange previously selected by [COPY FROM] to the new location selected by the position of the graphics cursor.

Pressing [ADD FLANGE] will add a new flange to the side of an existing flange which the graphics cursor is closest to. The side is chosen by comparing the centers of all flange sides in the part.

The side center which is closest to the graphics cursor is the one chosen as the destination of the new flange.

Pressing [ADD FLANGE] will add a new flange to the part. In the graphics mode, you may "ADD" a flange to a part by positioning the cursor near the edge to receive the flange and pressing "ADD". The flange that is added is of default dimensions depending on the size of the flange it is attached to.

Pressing [FANCY] will present the {FANCY SHAPE} screen. This is where a flange of any shape can be programmed. Inside shapes, such as holes and slots, are also programmed in this area.

Pressing [SIDES] will present the {SIDES} screen which provides the ability to program flanges with four sides but non–rectangular shapes.

Pressing [EDGE VIEW] will present a folded up drawing in the part. The position of the part is determined by the flange the graphics cursor is positioned on. You will be looking into the edge of the selected flange and will see the curve of the bend as well as

the flat highlighted. There are as many edge views as there are flanges.

Pressing [TOP VIEW] will present a folded up drawing of the part. The position of the part is determined by the flange the graphics cursor is positioned on. You will be looking into the top surface of the selected flange and will see the flat highlighted.

There are as many edge views as there are flanges.

Pressing [DELETE] will delete the flange that the graphics cursor is positioned on. A flange will not be deleted if other flanges are attached to it.

In the {FANCY SHAPES} screen, delete will omit the element last picked.

Pressing [DONE] will present the screen you came from. Press this key when you are done programming in this screen.

Pressing [FIRST BEND] will select the bend the graphics cursor is positioned on as the first bend in the bend order for producing the part. This is how you manually enter a given bend order.

After selecting the first bend, this soft key will change to [NEXT BEND] so you can position the graphics cursor and select the next bend.

Pressing [NEXT BEND] will select the bend the graphics cursor is positioned on as the next bend in the bend order. See [FIRST BEND].

Pressing [MIRROR FLANGE] will cause the flange the graphics cursor is positioned on to become a mirror image of itself.

Pressing [CRASH BEND] will crash test this bend. Crash testing consists of detecting if the part will collide with the press brake bed, ram, and tooling during the bend. Crash testing a single bend can save time in a very complex part if you know the most difficult bend to make, and if this one can be accomplished, the part can be formed.

The {SIDES} screen provides the capability to program four sided flanges that are non-rectangular in shape.

The LENGTH field defines how long the appropriate side will be. See [MORE DATA].

Pressing [MORE DATA] changes the type of sides data presented in the lower left corner of the screen. The major groups of data are TOP SIDE length and angle, BOTTOM SIDE length and angle, FLANGE OFFSET up and down, TOP bend angle, BOTTOM bend angle, and LEFT side width.

The {FANCY SHAPES} screen provides the capability of generating a flange outside shape which can have any number of sides and can include curves such as arcs and splines. This screen also can generate inside cutouts, such as holes, slots, etc., shapes. This screen works very closely with the {SPECIAL SHAPE} screen.

Fancy shapes are constructed from simple elements, such as lines, arcs, and splines. The shape elements and the data which is associated with them is displayed at the lower left corner of the screen. PgUp and PgDn move forward and reverse in the list of elements which make up a complete shape for the flange. When moving forward or reverse in the list, the graphics cursor also moves to the corresponding position on the drawing.

Pressing [PICK] will pick or select the element closest to the graphics cursor. This element will appear in the lower left corner of the screen.

Pressing [EXEC] will execute the command selected on the {SPECIAL SHAPES} screen. If ADD LINE was selected, a new line will be added to the shape. The new line will start at the last picked point and will be drawn to the location of the cursor.

Pressing [SPECIAL SHAPE] will present the {SPECIAL SHAPE} screen which is a list of basic drawing commands which are used to construct fancy shapes.

Pressing [MOVE PICKED] will move the previously picked element to the current location of the graphics cursor.

Pressing [MORE] will relabel the other softkeys with the additional choices for this screen. You will see this key label often while using the controller. It means that there are more soft key choices available.

Pressing [NEW OUTSIDE] will convert the standard or normal four sided flange to a fancy outside flange which can then be modified. A fancy outside shape on a flange will inhibit bend allowances to be applied to flanges attached to this flange. You will have to use the tape measure to make any adjustments for the attached flanges.

Pressing [START INSIDE] will create a new inside shape or cutout in flange at the location of the graphics cursor.

Pressing [DATA] will allow you to change the element data last picked.

The {SPECIAL SHAPE} screen provides a list of fancy shape elements to choose from. When you select an element on this page, it will be executed on the {FANCY SHAPE} screen when you press the [EXEC] soft key. Use the up and down arrow keys to position the arrow to your choice and the press [SELECT].

Selecting ADD LINE will enable you to add holes to the flange. This will also present the {FANCY SHAPE} screen.

Selecting ADD HOLE will enable you to add holes to the flange. This will also request the HOLE DIAMETER.

Selecting ADD RADIUS will enable you to add an arc to an inside or outside shape. This will also request the ARC DEGREES.

Selecting RADIUS CORNER will enable you to add a radius to a corner inside or outside shapes. This will also request the CORNER RADIUS.

Selecting ADD SLOT will enable you to add slots to the flange. This will also request the SLOT LENGTH and SLOT WIDTH.

Selecting START INSIDE SHAPE will enable you to start a new inside shape. This will also present the {FANCY SHAPE} screen.

Selecting ROTATE SHAPE will enable you to rotate selected shapes.

This will also request the ROTATION DEGREES.

Selecting SCALE SHAPE will enable you to make a selected shape larger or smaller. This will also request the SCALE MULTIPLIER. A SCALE MULTIPLIER of 1.5 will make the selected shape 50% larger.

Pressing [SELECT] will select the element indicated by the arrow on the screen.

CRASH DETECTION

The {CRASH VIEW} screen displays a drawing which indicates where the part crashes into the press brake or tools when the part is bent. The line which is highlighted indicates the crash area.

Pressing [LEFT] will present a drawing of the machine and part as viewed from the left end of the machine.

Pressing [RESUME] will continue crash test of the part.

Pressing [QUIT] will terminate crash testing the part and present the {JOB TASKS} screen.

Pressing [3D VIEW] will present a 3d drawing of the machine and part.

Pressing [FRONT VIEW] will present a front view drawing of the machine and part.

The {AXIS DATA} screen shows the calculated positions of the axis and enables the manual entry of new data.

The Z1 AXIS field is the position of left Z finger. The left and right movement of the back gauge fingers are recognized as the Z-AXIS. This axis is an option and your machine may or may not be so equipped. The left finger is the Z1 AXIS.

The Z2 AXIS field is the position of left Z finger. The left and right movement of the back gauge fingers are recognized as the Z-AXIS. This axis is an option, and your machine may or may not be so equipped. The right finger is the Z2 AXIS.

JOB TASK OPERATIONS

The {JOB TASKS} screen presents several choices for different functions commonly used for all jobs. Position the cursor next to your choice and press Enter.

Selecting CALCULATE AXIS POSITIONS will calculate all axis data for all bends.

Selecting FINISHED PART DRAWING POSITION allows you to select the orientation of the 3d drawing the controller will generate for your job on the {JOB SELECT} screen. This feature allows you to view the part in an orientation that is easy for you to understand. The flange you select will be shown on the isometric top as the part is drawn. Thus by selecting different flanges to the top, you can spin the part around and flip it as you see fit.

Selecting DELETE JOB will prompt you for confirmation and then delete the job from your disk storage.

Selecting FIRST POSSIBLE BEND ORDER initiates the bend sequencing calculations for the part under consideration. Controller will take a few minutes to determine the proper order with which to form the job without any collisions with the tools or gauging system.

Selecting CRASH TEST BEND ORDER will crash test the part against the machine for the BEND ORDER specified in the {BEND DATA} screens.

Selecting REVIEW BEND SEQUENCE will present the { } screen in which you can see the part position for each bend.

Selecting PRINT JOB CUT COORDINATES will draw a picture of the outline of the flat part and print a list of the vertex coordinates of the part. You must have an OKIDATA Microline 92 printer for this feature to function properly. Additional printers will be added to this program at a later date.

Selecting SCALE ENTIRE PART will prompt you for a scale multiplier and then make your entire part larger or smaller.

Selecting LIST BEND TENSILES presents the {LIST BEND TENSILES} screen which provides data for updating the metal library.

Pressing [SELECT TASK] will execute the function selected by the position of the arrow. The arrow is moved by using the up and down keys.

The {FINISHED PART VIEW} screen enables you to select the fully formed part drawing orientation on the {SELECT JOB} screen.

Pressing [LAST VIEW] will present the previous drawing position.

Pressing [NEXT VIEW] will present the next drawing position.

The {REVIEW BEND SEQUENCE} screen enables you to see the position of the part at each bend in the bend sequence.

Pressing [SWAP] changes the side of the tools that the larger portion of the bland is on. In the drawing of the blank, the upper and lower corner of the screen is defined as the back side of the tools (the area of the machine where the gauge is located). The lower-right corner of the screen is defined as the front of the machine.

Pressing [NEXT] presents a drawing of the next bend in the bend order.

Pressing [LAST] presents a drawing of the previous bend in the bend order.

MATERIAL DATA FILE

The {METAL DATA} screen provides the ability to create, change and delete metals.

The METAL NAME field is the name of the selected metal. Entering a new name will load the metal tensile data.

The WITH GRAIN TENSILE field is the tensile strength of the metal for bends made with the grain. This file is the tensile strength divided by 1000. Enter 60.000 for a tensile strength of 60,000.

The CROSS GRAIN TENSILE field is the tensile strength of the metal for bends made across the grain. This file is the tensile strength divided by 1000. Enter 60.000 for a tensile strength of 60000.

Pressing [SAVE METAL] will save the metal information tool in the metal library.

After you have described a metal, you must save the information to disk.

Pressing [DELETE METAL] will first verify your intentions and then delete the named metal from disk memory.

Pressing [LIST METALS] will present the {LIST OF METALS} screen.

The {LIST OF METALS} screen provides a listing of the metals in disk storage.

Pressing [METAL DATA] will present the {METAL DATA} screen.

The {LIST BEND TENSILES} screen provides a listing of the part bends and tensile strength related information for each bend. This screen is used as an aid to updating the metal library.

TOOLING DATA FILES

The {UPPER TOOL ENTRY} screen enables you to view, change and create new upper tools (punches).

The TOOL NAME field is your name for the tool.

The TONS PER FOOT field is the pressure the tool will withstand without fracturing. This figure can be obtained from the die manual or from the die manufacturer. If the maximum is different for the top die and bottom die, use the lowest figure.

DO NOT EXCEED THE MANUFACTURER'S RECOMMENDED MAXIMUM LIMIT. IT IS DANGEROUS TO THE OPERATOR AND DAMAGE TO THE DIE MAY OCCUR.

The BODY WIDTH field is thickness of the tool, front to back, at or near its base.

Pressing [LIST TOOLS] on the {UPPER TOOL ENTRY} screen will LIST the information on all the upper tools which have been stored in the tool library.

Pressing [LIST TOOLS] on the {LOWER TOOL ENTRY} screen will LIST the information on all the lower tools which have been stored in the tool library.

Pressing [DRAW] will draw graphics on the screen. If you are in the TOOLS mode, you will see the TOOL drawn. If you are in the JOB mode, you will see the PART drawn.

Pressing [SAVE TOOL] will save the tool in the tool library. After you have described a tool, upper or lower, you must save the information to disk.

Pressing [DELETE TOOL] will first verify your intentions and then delete the named tool from disk memory.

Pressing [LOWER TOOLS] presents the {LOWER TOOL ENTRY} screen.

The {LOWER TOOL ENTRY} screen enables you to view, change and create new lower tools (dies).

The V-ANGLE field is the angle formed by the inside sides of the die. A common air bend die has a 30 degree V-ANGLE.

The SHOULDER RADIUS field is the radius on the top of the die.

The BACK GAUGE LIMIT field limits how close the back gauge can come to the lower tool.

The BOTTOM RADIUS field is the radius at the bottom of the V of the die.

Pressing [UPPER TOOLS] will present the {UPPER TOOL ENTRY} screen.

The {UPPER TOOL LISTING} screen shows a listing of all upper tools in the library. Use the PgUp and PgDn keys to move forward and reverse in the listing.

Pressing [TOOL ENTRY] will enter the tool into the tool edit buffer and present the appropriate tool entry screen.

The {LOWER TOOL LISTING} screen shows a listing of all lower tools in the library. Use the PgUp and PgDn keys to move forward and reverse in the listing.

MACHINE PARAMETER DATA FILES

The {PARAMETER INDEX} screen is an index into the various parameter screens. The parameters are the variables the controller uses to run the press brake.

Selecting AXIS PARAMETERS will present the {AXIS PARAMETER} screen.

THESE PARAMETERS ARE SET AT WYSONG AND SHOULD NOT BE ALTERED UNLESS INSTRUCTED TO DO SO BY A WYSONG SERVICE REPRESENTATIVE!!! IF YOU NEED ASSISTANCE OR HAVE ANY QUESTIONS, CALL WYSONG SERVICE AND GET HELP; DON'T GUESS!! (919) 621-3960

Selecting SCREEN PARAMETERS will present the {SCREEN PARAMETER} screen.

These are the parameters that tailor the monitor to your personal tastes while using the controller. The parameter settings that are installed at **Wysong** have been selected because of clarity and minimal eye fatigue. These are least likely to trouble color blind individuals as well. Video colors are set by activating the "SHOW COLORS" screen and selecting numbers that correspond to your color choice. These numbers are then filled into the attribute fields on the "VIDEO PARAMETERS" screen. FOR ASSISTANCE: Call **Wysong & MILES COMPANY**, (919) 621-3960.

Selecting MACHINE GRAPHICS PARAMETERS will present the {MACHINE GRAPHICS PARAMETERS} screen.

This selection provides access to the parameters which sets the physical dimensions of the end frames, bed and ram of the machine(s) being run by this controller. After setting these parameters, you may, if you wish, have the controller draw the brake for you. This is helpful when multistation forming is used to show the position of the tools along the brake.

CAUTION: DO NOT CHANGE PARAMETERS UNLESS YOU ARE QUALIFIED TO MAKE PARAMETER ADJUSTMENTS. INCORRECT MEASUREMENTS MAY CAUSE CRASHES. FOR ASSISTANCE: Call WYSONG & MILES COMPANY, (919) 621-3960.

Selecting MACHINE DIAGNOSTICS presents the {MACHINE DIAGNOSTICS} screen which enables you to do some interface testing and diagnostics.

Selecting LOCKOUT FEATURES presents the {LOCKOUT FEATURES} screen which enables you to inhibit certain operator functions.

Selecting MANUAL OPERATION presents the {MANUAL OPERATION} screen.

This screen provides you with the ability to select and position the machine gauges by entering target dimensions and activating the gauges. Also available on this page are slow speed manual adjustments for small corrections.

Selecting CONTROLLER PARAMETERS presents the {CONTROLLER PARAMETERS} screen.

The {RAM PARAMETERS} screen enables you to alter the parameters which the controller uses to control the ram.

Now that you have found a delicate area, it is time to tell you a story. Read the story, understand the story and mark it well before you begin to adjust ram parameters for any reason. More ram parameters are found under axis 1 (Y1) and axis 2 (Y2) in the axis parameter screens. This screen, the "RAM PARAMETER" screen contains adjustments that are common to both Y1 and Y2. Axis 1 and axis 2 contain parameter values that are individual to each hydraulic cylinder. Henceforth, the term "target dimension" refers to the point above die bottom that the ram must be sent to achieve the desired angle. Thus the story begins; at the top of the stroke the foot switch is pressed. This starts the ram cycle. The ram is accelerated to approximately 300'/minute.

Upon reaching the target dimension plus the "SLOW SPEED DISTANCE", the ram is decelerated to the "LOW SPEED FILL VALVE OPEN DRIVE" value. At the beginning of this deceleration, a software timer is started. After the "FILL VALVE CLOSE DELAY", the four-way valve is switched to pressing, which in turn closes the fill valve to begin building pressure. At the "LOW TIME DELAY", the proportional valves are switched from the "LOW SPEED DRIVE FILL OPEN" to "DOWN LOW DRIVE". The ram is now at pressing speed (20"/min.) and is developing the required forming pressure. At target dimension plus "ULTRA LOW SPEED DISTANCE", the drive value for "ULTRA LOW SPEED DRIVE" is sent to the proportional valves to complete the bend. At this speed, very accurate stop of ram movement is possible. At the target dimension, the controller outputs the "DWELL DRIVE" value to maintain the ram at the target dimension for the dwell time.

Upon completing the dwell, the controller switches the four-way valves to neutral and sends out the "DECOMPRESS DRIVE" value which just "cracks" the proportional valve. The valve is maintained at this value for the "DECOMPRESSION TIME" to allow the pressure to bleed back to tank. If the decompression drive is too low or too high, or if the decompression time is too short, the ram will "thump" coming off bottom. If the decompression time is too long, it will appear as if the dwell time is longer than asked for. At the end of the decompression time, the ram is accelerated to the "UP HIGH DRIVE". The ram continues up at approximately 200"/minute until it reaches top of stroke (TOS) minus the "TOS SLOW SPEED DISTANCE". At this point, it is decelerated to the "UP LOW DRIVE" value until it reaches TOS, where it stops.

The speed referred to in this section applies to the PH60. Larger machines are generally slower.

The LOW DELAY TIME field is the time between the closing of the fill valve and the switch between fill open low speed drive and low speed drive. This parameter is currently set to zero (0) for the PH60 but can help reduce thumping at the speed change point.

The ULTRA SLOW SPEED DISTANCE parameter determines where in the ram stroke the transition from press speed to ultra slow is made. The ram should be in ultra slow as short as possible but long enough for the ultra slow speed to stabilize.

MINIMUM 0
MAXIMUM .200
TYPICAL .020

The TOS SLOW SPEED DISTANCE parameter determines where in the return stroke of the ram the UP SLOW SPEED DRIVE is sent to the ram. This distance should be as short as possible but still see a small tail of low speed at the end of return.

MINIMUM
MAXIMUM
TYPICAL

The DWELL TIME (DEFAULT) parameter determines the dwell time when no dwell time has been specified for the job.

The DECOMPRESS TIME parameter determines the time the DECOMPRESS DRIVE will be sent to the ram. This parameter should be as short as possible without causing a thump at the beginning of ram return. This parameter works in conjunction with DECOMPRESS DRIVE.

MINIMUM
MAXIMUM
TYPICAL

The MAXIMUM TILT LIMIT determines the permissible amount of ram tilt.

If the ram tilts more than this parameter, the ram will be stopped and an error message displayed.

PH60-72	.375
PH60-96	.375
PH60-120	.625
PH100-96	.5
PH100-120	.687
PH100-144	.875

The PRESS TILT CORRECTION LIMIT parameter determines the amount of ram tilt permissible before a tilt correction is made.

MINIMUM
MAXIMUM
TYPICAL

The PRESS TILT DELAY parameter determines the length of time which must elapse after making a tilt correction before another correction can be made.

MINIMUM
MAXIMUM
TYPICAL

The PRESS TILT ADJUSTMENT parameter determines the amount of correction when a tilt correction is made.

MINIMUM
MAXIMUM
TYPICAL

The FILL VALVE CLOSE DELAY parameter determines the length of time from the beginning of approach deceleration that the fill valve will be closed.

Too large a value will cause a pause in ram motion at the transition from approach to press.
Too small a value will cause a step in tilt during the approach to press transition. This tilt step could be in either direction. Be sure DOWN FILL OPEN LOW SPEED DRIVES have been set with a long FILL VALVE CLOSE DELAY first.

MINIMUM
MAXIMUM
TYPICAL

The T1 DELAY parameter determines the length of time after the end of all ramps before speed sampling will take place. This allows time for the ram speed to stabilize at its final value.

Using T1 DELAY set first cross hair marker to just after Y1 velocity graph reaches flat bottom. The second cross hair marker should also be slightly beyond fill valve closing discontinuities in graph. Typical value is .200.

MINIMUM
MAXIMUM
TYPICAL

The SLOW TILT DELAY parameter determines when the press phase speed and tilt values are sampled for automatic adjustment of the Y1 and Y2 LOW SPEED DRIVE values.

Using SLOW TILT DELAY sets third cross hair marker a little behind the second cross hair marker. The third marker should occur before pinch point. This marker shows the place where press and ultra slow tilt values are learned. Typical value is .075.

MINIMUM
MAXIMUM
TYPICAL .075

The APPROACH SPEED parameter sets the desired ram approach speed. Each stroke of the ram will get closer to this value. TYPICAL for PH60 and PH100 is 300

The PRESS SPEED parameter sets the desired press speed. Each stroke of the ram will get closer to this value. Typical for PH60 is 20. Typical for PH100 is 13.

The ULTRA LOW SPEED parameter sets the desired ultra low speed. Each stroke of the ram will get closer to this value.

This parameter is the target for the automatic learning process.

Set to 6 inches per minute for PH60.

If Y1 or Y2 BOTTOM ERROR is some negative value, reduce ULTRA SLOW SPEED.

Ultra slow should be as fast as possible without causing over shoot at the bottom of the stroke.

Check and correct any DWELL DATA error before adjusting this one. Typical for PH60 is 6.

The RETURN SPEED parameter sets the desired return speed. Each stroke of the ram will get closer to this value. Typical for PH60 is 210. Typical for PH100 is 135.

Pressing [PARM INDEX] will present the {PARAMETER INDEX} screen. This screen enables you to choose which type of parameters you want.

Pressing [SAVE PARMS] will save the controller parameters on disk storage. Anytime you make a change in parameters you need to press this soft key to store the new data. Failure to do so will result in the loss of the new values upon power down.

Pressing [GAUGE PARMS] this soft key will transfer you to the {GAUGE PARAMETERS} screen. This is where the GC 6000 is informed of the gauge axes and types that have been included on a given press brake.

The {GAUGE PARAMETERS} OR AXES PARAMETERS screens enable the various machine axes to be set up. By entering the desired axis number, you will find parameters for all the computer controlled axes of your press brake. The axes for Y1 and Y2 have additional parameters that are reached by pressing the soft key labeled "RAM PARMS". Further help is available on that screen. See also "AXIS TYPE" for further help. THESE PARAMETERS ARE SET AT WYSONG AND SHOULD NOT BE ALTERED UNLESS INSTRUCTED TO DO SO BY A WYSONG SERVICE REPRESENTATIVE!!! IF YOU NEED ASSISTANCE OR HAVE ANY QUESTIONS, CALL WYSONG SERVICE AND GET HELP; DON'T GUESS!! (919) 621-3960

The AXIS NUMBER field is a number assigned to each of the machine axes. A list of axis numbers follows:

1. Left hydraulic cylinder
2. Right hydraulic cylinder
3. System pressure
4. Horizontal back gauge axis (X-axis)
5. Vertical back gauge, if present

The AXIS TYPE field tells the controller the nature of each gauge or hydraulic system it is controlling. A list of valid axis codes follows:

0. Disables any axis
1. Proportional hydraulic ram (Y1 and Y2)
2. Servo hydraulic ram (Y1 and Y2)
3. Inverter controlled A.C. gauge
4. Servo controlled D.C. gauge
5. System pressure control (hydraulic)

The DOWN LIMIT parameter is the extent of downward ram travel allowed by the controller. This point is established in the CALIBRATE MODE at the point where the tools are seated.

The UP LIMIT parameter is the extent of up travel of the ram stroke allowed by the controller. Measure with a vernier caliper the distance between the die holder and ram when the ram is jammed at the top with the [SLOW UP] soft key. Set UP LIMIT to this value.

The DOWN HIGH SPEED DRIVE parameter is the drive value (+/- 2047) that is output to the proportional valve drivers that control the ram motion. This particular parameter controls the high speed down portion of the ram cycle. Increasing this parameter will speed up the fast approach of the ram. Caution must be taken not to increase this value too much as this will result in a loss of control.

Approach speed and tilt are automatically tuned a small amount with each ram stroke. Increasing Y1 and Y1 drives to a more positive value will cause approach speed to increase.

If one of these parameters has a large error, an APPROACH TILT ERROR STOP will occur and this parameter will need to be adjusted manually.

If the tilt plot rises and perhaps goes off screen, adjust the Y2 drive to a more positive value. Do not exceed 2000.

If Y2 drive is at 2000, adjust Y1 drive to less positive value.

If the tilt drops and perhaps goes off screen, adjust the parameters in the opposite direction.

If approach speed is too low and these parameters are close to 2000, increase the gain on the Y valve driver cards or modules.

If these parameters are lower than 1500, decrease the gain on the Y driver cards or modules.

MINIMUM	0
MAXIMUM	2000
TYPICAL	1500-1900

The DOWN FILL OPEN LOW DRIVE is the drive value (+/- 2047) that is output to the proportional valves drivers that control the ram motion. This particular parameter controls the portion of the ram cycle near the four-way valve switch point. Increasing this parameter may cause a rough speed change point. This parameter works as an intermediate speed between fast approach and pressing to allow for deceleration of the ram before switching the four-way valves.

Make a note of FILL VALVE CLOSE DELAY.

Temporarily set FILL VALVE CLOSE DELAY to .300.

The Y2 DOWN FILL OPEN LOW SPEED DRIVE is automatically adjusted with each stroke. Y1 drive will follow Y1 LOW SPEED DRIVE adjustments with each stroke.

If tilt slopes down during the deceleration from approach speed, adjust Y2 drive to a lower positive value. Do the opposite if tilt slopes up.

These drives, being too high, will cause a glitch in velocity graph. Y-velocity drops almost to zero (0) during approach deceleration and then ram falls at higher speed than press for a short period of time. Adjust both drives to lower positive value.

These drives, set too low, will cause a thump at speed change from approach to press.

Initially set these drives to the same values as SLOW SPEED DRIVE (Y1 and Y2).

Reset FILL VALVE CLOSE DELAY to its original value.

MINIMUM	0
MAXIMUM	1500
TYPICAL	

The DOWN LOW SPEED DRIVE is the drive value that is output to the proportional valves drivers that control the ram motion. This particular parameter controls the low speed down portion of the ram cycle. Increasing this parameter will speed up the pressing speed of the ram.

!!! CAUTION !!!

THESE VALUES ARE SET AT WYSONG TO BE THE BEST COMBINATION OF SPEED AND ACCURACY. INCORRECT ADJUSTMENTS WILL EFFECT THE SMOOTH FAST, ACCURATE OPERATIONS OF THIS MACHINE. IF YOU NEED HELP, CALL WYSONG SERVICE AT (919) 621-3960.

Press speed and tilt are automatically tuned a small amount with each ram stroke. Increasing Y1 and Y2 drives to a more positive value will cause press speed to increase. Press speed and tilt are taught at the third graphics marker.

If one of these parameters has a large error, a PRESS TILT ERROR STOP will occur and this parameter will need to be adjusted manually.

If the tilt graph rises and perhaps goes off screen, adjust the Y2 drive to a more positive value. Do not exceed 2000.

If Y2 drive is at 2000, adjust Y1 drive to less positive value.

If the tilt drops and perhaps goes off screen, adjust the parameters in the opposite direction.

MINIMUM	0
MAXIMUM	1500
TYPICAL	1000-1400

The DOWN ULTRA LOW SPEED DRIVE controls the ram speed just prior to its reaching the set point at the bottom of stroke.

Ultra slow speed and tilt are automatically tuned a small amount with each ram stroke. Increasing Y1 and Y2 drives to a more positive value will cause ultra slow speed to increase.

Ultra slow tilt is taught at the third marker and follows the press tilt corrections.

Temporarily set ULTRA SLOW SPEED DISTANCE to .075.

Adjust these parameters so that the slope of ultra slow speed is the same as press speed tilt.

If one of these parameters has a large error, a PRESS TILT ERROR STOP will occur and this parameter will need to be adjusted manually.

If the tilt graph rises and perhaps goes off screen, adjust the Y2 drive to a more positive value. Do not exceed 2000.

If Y2 drive is at 2000, adjust Y1 drive to less positive value.

If the tilt drops and perhaps goes off screen, adjust the parameters in the opposite direction.

MINIMUM	0
MAXIMUM	2000
TYPICAL	1000-1400

The DWELL DRIVE parameter controls the ram during the dwell at the bottom of stroke.

This value is typically up (negative) because the four-way valves are shifted to pressing which causes the proportional valves to "leak". The dwell drive must bias these valves in the opposite direction to compensate for this "leakage".

These parameters are the drive supplied to the proportional valves during the dwell portion of the stroke. They compensate for valve leakage.

These parameters are automatically adjusted a small amount with each stroke if an error is detected. Normal dwell times do not generally provide enough time to see any DWELL DELTA so these parameters should be manually set using a long dwell time.

Temporarily set DWELL TIME to 10 seconds.

Stroke

If DWELL DELTA is negative, increase Y1 or Y2 as necessary.

If DWELL DELTA is positive, decrease Y1 or Y2 as necessary.

MINIMUM	0
MAXIMUM	+ or - 2000
TYPICAL	0 to - 1000

The DECOMPRESS DRIVE parameter controls the ram during decompression. This is the drive value sent out to the valve drivers to control the proportional valves during hydraulic decompression. At the bottom of the stroke, after any dwell, the valves are "cracked" open to allow the pressure to bleed back to tank. If this drive is too high, the brake will "thump" during decompression. If it is too low, the brake will "thump" when the up command is issued. This parameter works with the decompression time parameter to obtain smooth but quick decompression. See also the help screen for ram parameters.

MINIMUM	0
MAXIMUM	-2000
TYPICAL	0 to -1000

The UP HIGH SPEED DRIVE parameter is the drive value sent to the valve drivers for the rapid up portion of the return stroke.

MINIMUM	0
MAXIMUM	-2000
TYPICAL	-1500 to -1800

The UP SLOW SPEED DRIVE parameter adjusts the slow speed drive value that controls during the last portion of the up stroke. If this value is too high, the ram will "thump" at the TOS. If it is too low, the ram will be noticeably slow to make TOS.

MINIMUM	0
MAXIMUM	-2000
TYPICAL	-1000 to -1400

The RAMP STEPS parameter sets the speed of the acceleration and deceleration ramps. If the ram is thumpy during most ramp times, then increase this value.

MINIMUM	10
MAXIMUM	200
TYPICAL	30

The SLOW SPEED DISTANCE parameter for inverter driven axis is that portion of the movement where the gauge is seeking the programmed position. The gauge appears to go from high speed to stop, but actually shifts into this slow speed for final positioning.

The SLOW SPEED DISTANCE parameters for Y1 and Y2 determine where in the ram stroke the transition from approach to press speed is made. If the ram is not in slow speed before the upper tool contacts the metal, it could possibly just sit on the metal and not bend it. The ram should be in press a second or two before metal contact. Increasing these parameters will cause the ram to enter press speed higher in the stroke.

The MINIMUM PRESSURE DRIVE parameter is the minimum drive for pressing pressure. Too low a pressure will cause ram to drop too fast in press.

MINIMUM	0
MAXIMUM	2000
TYPICAL	1000

The MAXIMUM PRESSURE DRIVE limits the drive to the relief valve.

MINIMUM	0
MAXIMUM	2000
TYPICAL	2000

The RETURN PRESSURE DRIVE controls pressure during the return portion of the stroke. If this value is too low, the ram will not go up. This value should be 30% higher than what is necessary to lift the ram.

The PRESSING PRESSURE DRIVE is not a parameter but the value calculated by the tons in the bend data. This is for information only.

The FORWARD LIMIT parameter is the smallest dimension the back gauge can get to.

The REVERSE LIMIT parameter is the longest dimension the back gauge can get to, i.e. the longest flange that can be gauged.

The REVERSE OVERSHOOT parameter forces the

gauge to always approach the set dimension from the rear. If the current position of the gauge is close to the front and a new set point is farther back, the gauge will pass the new set point by the amount in REVERSE OVERSHOOT and then come into the set point from the rear. Zero in this parameter will cause the set point to be approached from both directions. More accurate gauge positioning will result from using a small REVERSE OVERSHOOT.

The ADVANCE STOP parameter will cause the stop command to precede the set point. Use this parameter to correct any small overshoot which cannot be corrected by the inverter slow speed adjustment.

The CALIBRATION SWITCH LOCATION parameter sets the gauge calibration point.

The POSITIONING TOLERANCE parameter allows this plus or minus tolerance to exist in gauge positioning accuracy. If the gauge comes to rest outside this band, the gauge will again seek the set point.

The SHORT SEEK DISTANCE is the seek distance below which the LONG SEEK ADVANCE SLOW parameter is used to calculate the seek sequence. A seek distance below the SHORT SEEK DISTANCE will use two of the fractional advance slows to calculate the seek sequence.

The SHORT SEEK DISTANCE should be set to a distance in which a seek of this distance will allow the gauge to just reach its full speed.

The LONG SEEK ADVANCE SLOW parameter sets the transition point for the switch from high speed to slow speed for a seek of 7/8 the SLOW SPEED DISTANCE.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT 7/8 SSD parameter sets the transition point for the switch from high speed to slow speed for a seek of 7/8 the SLOW SPEED DISTANCE.

Use the [EXER. XP] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT 3/4 SSD parameter sets the transition point for the switch from high speed to slow speed for a seek of 3/4 the SLOW SPEED DISTANCE.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT SSD/2 parameter sets the transition point for the switch from high speed to slow speed for a seek of 1/2 the SLOW SPEED DISTANCE.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT SSD/4 parameter sets the transition point for the switch from high speed to slow speed for a seek of 1/4 the SLOW SPEED DISTANCE.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT SSD/8 parameter sets the transition point for the switch from high speed to slow speed for a seek of 1/8 the SLOW SPEED DISTANCE.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The ADVANCE SLOW AT SSD=0 parameter sets the transition point for the switch from high speed to slow speed for a very short seek.

Use the [EXER. X P] and [EXER. X W] keys to exercise and set the proper value in this parameter.

The INDEX TO CALIBRATION SWITCH value is not a parameter. It is a value displayed to indicate the relationship of the calibration switch transition to the encoder index pulse. If this value is less than .050 or greater than .200, change the position of the calibration switch arm. Be careful you have not changed the switch arm to a position in which the gauge carriage will not activate the switch. Switch activation can be checked in the X-AXIS DIAGNOSTICS.

Pressing [MANUAL MOVE] presents the {MANUAL GAUGE CONTROLLER} screen. Allows you to move some axes manually. You can use the MANUAL MOVE to position the Back Gauge.

Pressing [EXER. X P] will exercise the back gauge for the parameter the cursor has selected. The gauge will first move to five inches. The gauge will then move back to the proper distance for the parameter selected. The last movement is the one of importance and is back to five inches, and you want to watch carefully for the gauge position in which the speed achieves slow speed. The gauge should run in slow for one to two seconds or .050 before coming to a stop. If the gauge runs too long in slow, decrease the parameter the cursor is on. If the gauge

runs too short or overshoots the five inch target, make the parameter the cursor is on larger.

Pressing [EXER. X W] will exercise the back gauge for the parameter the cursor has selected and the one above it. The gauge will first move to five inches. The gauge will then move back to the proper distance for the parameter selected and the one above it. The last movement is the one of importance and is back to five inches. You want to watch carefully for the gauge position in which the speed achieves slow speed. The gauge should run in slow for one to two seconds or .050 before coming to a stop. If the gauge runs too long in slow, decrease the parameter the cursor is on and the one above it. If the gauge runs too short or overshoots the five inch target, make the parameter the cursor is on and the one above it larger.

Pressing [RAM PARMS] presents the {RAM PARAMETERS} screen which provides access to the parameters common to Y1 and Y2.

The {SCREEN PARAMETERS} screen presents the parameters that taylor the monitor to your personal tastes while using the controller. The parameter settings that are installed at Wysong have been selected because of clarity and minimal eye fatigue. These are least likely to trouble color blind individuals also. Video colors are set by activating the SHOW COLORS screen and selecting numbers that correspond to your color choice. These numbers are then filled into the attribute fields on the VIDEO PARAMETERS screen. FOR ASSISTANCE: Call WYSONG & MILES COMPANY, (919) 621-3960.

The 40 CHARACTER SCREEN MODE parameter is the MSDOS code for the particular monitor used with your system. It tells the computer about color versus black and white and what graphics card will be used.

!!! WARNING !!!

DO NOT CHANGE THIS PARAMETER FROM THE FACTORY SETTING.

The 80 CHARACTER SCREEN MODE parameter is the MSDOS code for the particular monitor used with your system. It tells the computer about color versus black and white and what graphics card will be used.

!!! WARNING !!!

DO NOT CHANGE THIS PARAMETER FROM THE FACTORY SETTING.

The NORMAL BLINK VIDEO ATTRIBUTE parameter sets the attribute for displayed fields which are normal video and blinking.

The NORMAL VIDEO ATTRIBUTES parameter sets the attribute for displayed fields such as the names of variables on the screens.

The REVERSE VIDEO ATTRIBUTE parameter sets the attribute used for displayed fields such as the variable values.

The REVERSE BLINK VIDEO ATTRIBUTE parameter sets the attribute used for displayed field which are warning messages.

Pressing [SHOW COLORS] presents a color display screen. The colors for back ground, characters and reverse video are displayed with identifying numbers. Use these numbers to select your color choices on the video parameter screen.

The {COLOR SELECTION} screen displays possible colors for use in the {SCREEN PARAMETERS} screen. Choose the color you like and remember the number inside. Use it for the parameter.

Pressing [VIDEO PARMS] will present the {SCREEN PARAMETERS} screen.

The {LOCKOUTS} screen enables you to lockout or prevent access to selected screens if you have the key floppy disk.

The LOCKOUT TOOL SAVE field enables you to prevent the saving of tool data when a "1" is entered in this field.

The LOCKOUT PARAMETER SAVE field enables you to prevent the saving of parameter data when a "1" is entered in this field.

The LOCKOUT MACHINE SAVE field enables you to prevent the saving of machine data when a "1" is entered in this field.

The LOCKOUT PART SAVE field enables you to prevent the saving of part data when a "1" is entered in this field.

The LOCKOUT METAL SAVE field enables you to prevent the saving of metal data when a "1" is entered in this field.

The LOCKOUT UPLOAD field enables you to prevent the uploading of any data when a "1" is entered in this field.

The {CONTROLLER PARAMETERS} screen provides access to parameters which govern basic controller operation.

The ACTIVE BRAKE NAME field selects the press brake which is used for crash testing. This would normally only be used on a desktop work station to select which machine of multiple machines in the shop to be used for crash testing and bend sequence generation.

The METRIC DIMENSIONS parameter when set to a "1" will enable the use of metric values.

The INSIDE ANGLES parameter when set to a "1" will enable the use of the inside angles. An inside angle of 180 degrees is flat and 45 degrees is an acute angle.

The PART COLOR parameter sets the color of the part when drawn on the graphics screen. Select any number from 1 to 15.

This is the color code the computer uses when it graphically shows the part under consideration. The number of choices available is dependent upon the graphics card and monitor of your system.

!!! NOTE !!!

Color code 0 is black; choosing this code for "PART COLOR" draws the black part on a black background and is invisible.

The MODEM COM PORT (0 - 4) parameter sets the COM port such as COM2 that the program will telephone modem communications.

The {MANUAL BACK GAUGE CONTROLLER} screen enables you to move the various machine axes without actually running a job. The NEW POSITION column is the position you would like the gauge to move to. The CURRENT POSITION is the position the gauge is located at now.

Pressing [MOVE GAUGES] will cause the gauges to move to the NEW POSITION column.

To use this function, you enter the dimensions you want the axis to be sent to in the NEW POSITION fields at the top of the screen and press this key.

!!! YOU MUST ASK FOR DIMENSIONS THAT ARE WITHIN THE LIMITS OF EACH AXIS !!!

Pressing [CALIB X] will calibrate the back gauge.

By pressing [CALIB Y], this key initiates the calibration procedure for the RAM (Y1 and Y2 axes).

Pressing [LEVEL] will cause the ram to level itself by raising the lower side. This is not a precision leveling function but rather an approximate level.

Pressing [SLOW UP] will cause the ram to go up in slow speed. The ram is not tilt limited nor corrected in this function. If you continue to press the [SLOW UP] button, the ram will jam at the top. This is not bad for the machine and provides a check of ram calibration. The jammed at top value should be the same as the Y1 and Y2 UP LIMIT which is used for calibration.

MACHINE DATA FILES

The {BRAKE BED DATA} screen enables you to enter dimensions for the bed of each machine you add to the machine library. The GC 6000 uses these dimensions during bend sequence and "crash" calculations.

The BRAKE NAME parameter is the reference name of the press brakes you have described to the controller. Different brakes can be considered by one controller given they are identified and stored in the brake library. See also {MACHINE GRAPHICS PARAMETERS}.

The BED THICKNESS is the front to back dimension of the bed. This thickness is used for "crash" detection when a job is run through possible bend sequence calculations.

The BED HEIGHT parameter is the dimension from the floor to the top of the bed. This dimension should include the die holder.

The BED LENGTH parameter is the length of the machine surface that the lower tool rests on. This dimension is important when using the machine in a multistation mode where the stations are given a certain programmed position along the brake.

The RAM HEIGHT parameter is the vertical dimension of the RAM. This dimension is used to calculate part interference.

The RAM WIDTH parameter is the dimension of the RAM front to back. This dimension is used to calculate part interference with the ram.

The RAM LENGTH parameter is the overall LENGTH of the RAM or working length. This dimension is usually the same as the bed length.

The RAM MAXIMUM TONS parameter is the rated tonnage of the machine.

The RAM OPEN HEIGHT parameter is the dimension between the bed and ram with the ram jammed at top of stroke which is sometimes referred to as daylight or die space. Measure from the top of the die holder. Take this measurement in the center of the ram. This dimension is used to calculate the target for the ram for bending.

Pressing [LIST BRAKES] will present the {BRAKE LISTING} screen. This is a library of the brakes you have already described to the controller. From the brake index, you can select any machine programmed or create a new one. The total benefits of multi-machine abilities are realized if a shop has more than one GC 6000. Jobs programmed on one machine can be tested for its feasibility to run on another machine of different configuration.

Pressing [DRAW BRAKE] will present a drawing of the brake described by the parameters on this page.

Pressing [SAVE BRAKE] will save the named brake in disk storage. You would press this key after entering the graphic brake parameters of a new brake to store it in the brake library. See also "GRAPHIC MACHINE PARAMETERS".

Pressing [DELETE BRAKE] removes the currently named machine from disk memory. This should not be done unless the brake in question is known to be out of service or the brake parameters are badly in error.

Pressing [FRAME DATA] presents the {FRAME DATA} screen. Here you can enter or edit the "MACHINE GRAPHICS PARAMETERS" for the end frames and throat of your brake(s).

The {BRAKE END FRAME DATA} screen provides for entering or altering data which is used to draw the active press brake. These dimensions are also used for "crash" testing the part bends.

The THICKNESS field is the left to right dimension of the plate which makes up the side frames of the press brake.

The WIDTH refers to the front to back dimension of the brake end frame.

The INSIDE OFFSET parameter refers to the dimension from the center of the machine to the inside of the end frame.

The THROAT DEPTH is the horizontal dimension from the center of the die to the back of the cut out in the end frame of the press brake. This determines the largest flange which can be bent on a piece longer than the distance between the end frames.

The THROAT HEIGHT is the vertical dimension of the throat, (end frame cutout), of the press brake.

The THROAT HEIGHT OFFSET is the vertical dimension from the floor to the bottom of the throat.

Pressing [BED DATA] presents the {BRAKE BED DATA} screen.

The {BRAKE DRAWING} screen presents a drawing of the brake which helps to show typographical errors in the drawing parameters.

Pressing [3D VIEW] will present a 3D drawing of the press brake.

Pressing [LEFT VIEW] will present a view of the machine from the left end.

The {BRAKE LISTING} screen provides a listing of available press brakes.

Pressing [END DATA] will present the {BRAKE END FRAME DATA} screen.

Pressing [BED DATA] will present the {BRAKE BED DATA} screen.

DIAGNOSTICS

The {DIAGNOSTICS INDEX} screen enables you to select the axis for diagnostic testing.

1 NU - NOT USED YET.

The {Y-AXIS DIAGNOSTICS} screen enables you to run diagnostic tests on the ram.

Selecting [DIAGNOSTIC INDEX] will present the {DIAGNOSTIC INDEX} screen.
Y DRIVER 0 ADJUST - Not functional yet.

Y DRIVER LOW ADJUST - Not functional yet.

Y DRIVER HIGH ADJUST - Not functional yet.

MODE SWITCH AND FOOTSWITCH - Not functional yet.

NU - Not functional yet.

The {X-AXIS INVERTER DIAGNOSTICS} screen enables you to run diagnostic tests on the back gauge and inverter.

Selecting SLOW SPEED ADJUST will turn the inverter on in slow speed but will not run the gauge. This enables you to adjust the inverter for the correct slow speed.

Selecting FAST SPEED ADJUST will turn the inverter on in high speed but will not run the gauge. This enables you to adjust the inverter for the correct high speed.

Pressing [SLOW FORWARD] will move the back gauge in slow speed toward the back of the press brake.

The {LAST STROKE DATA} screen provides data associated with the last stroke of the ram. Each phase of ram motion is shown with its time and velocity.

The APPROACH TIME field indicates the speed of the ram during the approach phase of the ram cycle.

The PRESS TIME field indicates how long the ram was in the press phase of the ram cycle.

The PRESS SPEED field indicates the speed of the ram during the press phase of the ram cycle.

The ULTRA SLOW TIME field indicates how long the ram was in the ultra slow speed phase of the ram cycle.

The ULTRA SLOW SPEED field indicates the speed of the ram during the ultra slow phase of the ram cycle.

The Y1 DWELL DELTA field indicates any drift of the left side of the ram during the dwell phase of the ram cycle.

The Y2 DWELL DELTA field indicates any drift of the right side of the ram during the dwell phase of the ram cycle.

The Y1 BOTTOM ERROR field indicates any error at the bottom of the stroke by comparing the position of the ram's left side at the end of dwell to the target position.

The Y2 BOTTOM ERROR field indicates any error at the bottom of the stroke by comparing the position of the ram's right side at the end of dwell to the target position.

The RETURN TIME field indicates how long the ram was in the RETURN speed phase of the ram cycle.

The RETURN SPEED field indicates the speed of the ram during the return phase of the ram cycle.

The CYCLE TIME field indicates how long the entire ram stroke was.

The {ARE YOU SURE?} screen verifies your intention to delete the specified file.

The {REPLACE CONFIRMATION} screen determines if you want to replace the named file or give you an opportunity to change the file name.

The {WANT TO SAVE?} screen gives you an opportunity to save the job. You have altered the job in the buffer and are entering a screen in which the job in the buffer could be replaced.

The {ERROR MESSAGE} screen will appear when the controller has detected a fatal error in the data or procedure or in controlling the machine.

Valve Driver Setups

Proportional valve driver (original) setup procedure.

Proportional valve driver (new) setup procedure

Relief valve driver setup procedure.

Proportional valve driver (original) initial setup.

VICKERS driver (NO FRONT PANEL) - Pull relief valve driver to prevent ram movement, possibly pull other proportional valve driver for access.

Select inch mode
Ram down at bottom
Pump on
Set up slow speed to -2000 (temp)
Set down slow speed to 0 (temp)
Use pin 30c for voltmeter common
Set span max ccw
Set + ramp max ccw
Set - ramp max ccw
Set dither max ccw

DAC DRIVE	ADJUST	FOR		AT
0	bal	0 vdc		board edge end of r 51
0	bias 1	.01 vdc	palm down	pin 26c
0	bias 2	.01 vdc	palm down	pin 22c
0	gain	.75	slow up	pin 22 c

Proportional valve driver (new)

VICKERS driver (new one for 100 ton with FRONT PANEL)
Position ram at very bottom of stroke
Power off
Pull relief valve driver to prevent ram movement
Set both dead bands ccw
Set ramp time ccw
Power on; pump on
Set UP SLOW SPEED DRIVE to -2000
Set DOWN SLOW SPEED DRIVE to 2000
Meter on current test point
Go to {INSTALL TOOLS} screen
Press [SLOW UP]
Adjust Up gain pot for -.7 or just below limit
Press PALM BUTTONS
Adjust Down gain for +.7 or just below limit
Note: Use factory setting for dither

Relief valve driver initial setup.

Set ramp up max cw
Set ramp down max cw
Use factory dither setting

DAC DRIVE	ADJUST	FOR
0	Min	??? 0v
2000	Max	?? 24v

Inverter initial setup

Set ACC maximum cw
Set DEC maximum cw
Using X diagnostic page

Adjust UL for 60 Hz on display.
Adjust VGN for 5 vdc at test point????<<<<
Adjust UL for 80 Hz on display.

Use X diagnostic page to turn on low speed.

Adjust LL for .8 Hz on display.

Use X diagnostic page to run in slow to set VBS (boost).

Use lowest setting which will so run entire gauge length in slow. Too much boost will cause motor to cog.

GREEN IS TILT

The green line on the ram tilt and velocity graphs is the tilt of the ram.

If the green line is above center, Y2 is higher than Y1 during that portion of the stroke.

Y graph

BLUE IS SPEED

The blue line on the ram stroke graphs is the speed of Y1.

Y graph

BASIC PART PROGRAMMING PROCEDURE

When on the {HOME} screen, press [BASIC].
Fill in the {BASIC JOB DATA} screen.
Press [RUN JOB].
Fill in {BASIC BENDING} screen for first bend.
Press [ADD BEND] and fill in data for each additional bend.
Press [JOB DATA].
Press [SAVE JOB].
Press [RUN JOB].

Now part is programmed and saved so position metal and press foot switch make the first bend.

The INSTALL TOOLS PRESSURE DRIVE parameter sets the hydraulic pressure when on the {INSTALL TOOLS} screen and the palm buttons are pressed to lower the ram.

Too low a pressure and the ram will come down erratically. The tools will not be seated properly.

Too high a pressure could cause tool damage to small tools. Use the smallest pressure possible to get good ram motion and seat the tools properly.

Ground

The NETWORK SPEED parameter selects the speed of data transmission for RS-232 and network communications. Too high a speed will result in a high data error rate or failure to communicate.

NETWORK SPEED	BAUD RATE
0	110
1	300
2	600
3	1200
4	1800
5	2400
6	9600
7	12k
8	19.8k
9	23.8k
10	29.7k
11	39.6k
12	59.5k
13	119k

The NETWORK/RS-232 ADDRESS parameter determines the number to which this controller or computer will respond to on the network. It is just like this controller's phone number. Typically on RS-232 the desktop would be "1" and the press controller would be "2". The maximum valid address is 31.

The NETWORK COM PORT (0 - 4) parameter determines which com port, such as COM2, will be used by the RS-485 local area network. Zero (0) will disable the network and maximum is 4.

The RS-232 COM PORT (0-4) determines which com port will be used for RS-232 communications. Zero (0) disables RS-232 and the maximum if 4.

The CONTROLLER (1=CONT 0-DESKTOP) parameter determines if the program will operate as a press control or a desktop program without a press connected to it. This parameter must be set to "1" in order to control the press brake. This parameter must be set to "0" to operate without a machine attached.

RS-232 CABLE