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PN: T2923-2
3/8"-1/2" SHEAR/FLUIDTECH ALL MODELS

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1. Safety

Safety must be a primary concern. When operating or performing maintenance procedures, follow all standard safety guidelines. Do not wear loose fitting clothing or any articles that may be pulled into any moving parts.

Be sure that when operating the equipment, all safety devices operate properly. Never under any circumstances disable, remove, or alter the original configuration of the safety system.

Should any component of the safety system become inoperable, immediately discontinue operation, and notify a supervisor.

- ! **NEVER** place fingers, hands, or any other body part in or under the blade area or other moving mechanisms.
- ! Proper eye protection must be worn at all times when operating the machine.
- ! Always insure that the machine is turned **OFF** before servicing the machine.

Read and understand this manual prior to operating the machine.

The area around the Piranha Shear should be well lighted, dry, and free of obstacles.

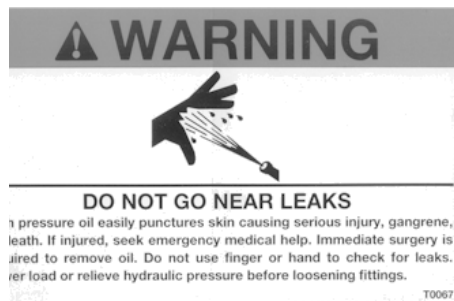
The Piranha Shear is designed for single person operation only.

When servicing the machine always practice standard lockout/tag-out procedures to avoid personal injury.

Qualified maintenance personnel only should perform service operations on the Piranha Shear.

1.1. Warning Labels

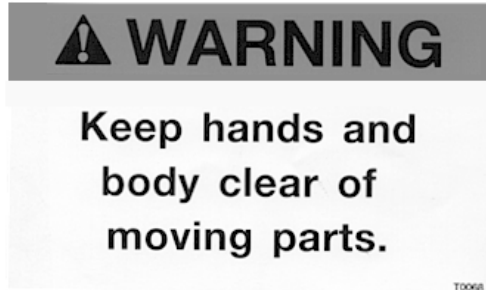
Located around the Piranha Shear are labels warning the operator of various dangers and precautions to be aware of when operating or servicing the machine.



Do not go near leaks

High-pressure oil easily punctures skin causing injury, gangrene and even death. If injured, seek emergency medical help. Immediate surgery is required to remove oil. Do not use finger or hand to check for leaks. Lower load or relieve pressure before loosening fittings.

Part – T0067

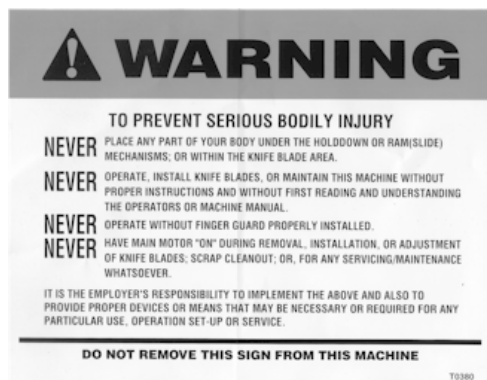


Keep hands clear of moving parts.
Part – T0068



To prevent serious bodily injury do not remove throat guard except when slitting. Replace for normal operation. It is the employer's responsibility to implement the above and also to provide proper devices or means that may be necessary or required for any particular use, operation set-up or service.

Part – T0379



To prevent serious bodily injury;
Never place any part of your body under the hold down or ram (slide) mechanisms; or within the knife blade area.

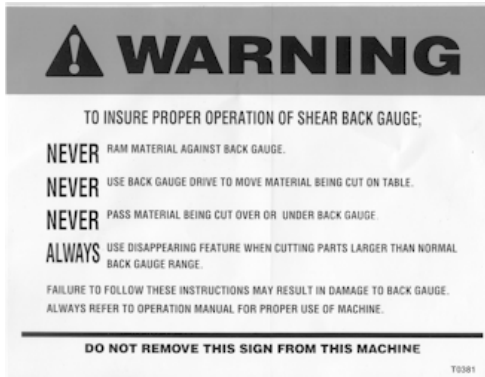
Never operate, install knife blades, or maintain this machine without first reading and understanding the operators or machine manual.

Never operate without the finger guard properly installed.

Never have main motor "on" during removal, installation, or adjustment of knife blades; scrap cleanout; or, for any servicing/maintenance whatsoever.

It is the employer's responsibility to implement the above and also to provide proper devices or means that may be necessary or required for any particular use, operation set-up or service.

Part – T0380



To insure proper operation of shear back gauge;

Never ram material against back gauge.

Never use back gauge drive to move material being cut on table.

Never pass material being cut over or under back gauge.

Always use disappearing feature cutting parts larger than normal back gauge range.

Failure to follow these instructions may result in damage to back gauge. Always refer to operation manual for proper use of machine

Part – T0381



Moving part; do not obstruct.

Part – T0382

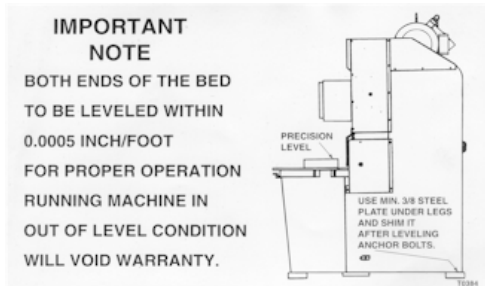


To prevent serious bodily injury;

Do not enter rear area of machine while in operation.

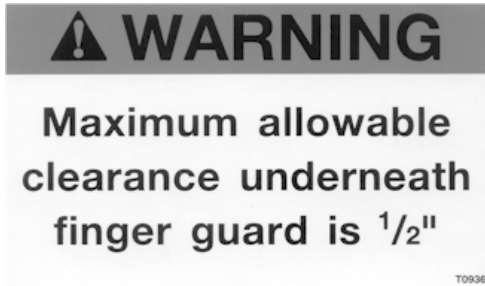
It is the employer's responsibility to implement the above and also to provide proper devices or means that may be necessary or required for any particular use, operation set-up or service.

Part – T0383



Both ends of the bed are to be leveled within 0.0005 inch/foot for proper operation. Running the machine out of level will cause damage and void the warranty.

Part – T0384



Maximum allowable clearance under finger guard is 1/2".

Part – T0936



You must verify and set blade gap to proper setting before operation. Failure to do so will increase the risk of folding over material between the knives, which will damage your machine.

You must verify and set blade gap to proper setting before operation. Failure to do so will increase the risk of folding over material between the knives, which will damage your machine.

Part – T3563

1.2. Safety

1. Immediately report any questionable operation, unusual action, unsafe condition or improper maintenance to the proper personnel.
2. When working with other people insure that all persons are clear of the shear prior to machine operation.
3. Insure that the proper safe material handling equipment (tongs, pliers, vacuum lifters or other mechanical devices) available to the shear operator.
4. When changing the settings of shear controls, insure that the controls are properly adjusted and test cycle the machine to verify correct operation.
5. Insure that all devices are in proper working order.
6. Anytime that the machine has been left unattended or inoperative for even a brief time, verify the correct position of all controls and proper shear operation.

7. Develop a sense of safety for yourself and any persons around you as well as your surrounding area.

1.3. Safety Standards & Specifications

Electrical System Design/Manufacture:

The machines manufactured in Hutchinson, KS, are furnished with electrical/electronic products that are UL (Underwriter's Laboratory) approved. These components have the UL numbers printed or stamped on them and can be easily traced to the point of manufacture.

Hydraulic System Design/Manufacture:

Hydraulic components used in Piranha machines are approved by NFPA (National Fluid Power Association), and those approval numbers can be traced through the manufacturer's part numbers.

ANSI/OSHA Compliance:

Mega Manufacturing meets the current ANSI construction standards for manufacturing of ironworkers, press brakes, and shears:

ANSI B11.4—Shears, Construction, Care, and Use

The ANSI B11 standards were developed to establish levels of responsibility for manufacturing safe products, installation, training, and use of these products. The levels of responsibility are fairly evenly distributed between the manufacturer, the owner/end user of the equipment, and the operator. Specific guarding requirements are in general assigned to the owner/end user of the equipment.

Understand that this ruling places the primary burden of responsibility for maintenance of guarding on the owner /end user of the equipment. Inherent in this requirement is the responsibility of the owner/end user of the equipment to develop and maintain guarding specific to their application for the equipment. These ANSI safety requirements may be acquired from:

American National Standard Institute
254 West 43rd Street
New York, New York 10036
Telephone (212) 302-1286
www.ansi.org

PO Box 457
Hutchinson, KS 67504-0457
Phone: (800) 338-5471
Fax: (620) 669-8964

2. Introduction

Machine Configurations:

Multiple options require a "Configuration code" to identify each machine in service. The configuration code identifier is part of the machine serial number which is located on the machine Identification Plate. The plate is attached to the side wall of the shear. The four codes and descriptions are listed in the table below:

Configuration Code	Configuration
A	20 HP Motor / Base Backgauge
B	20 HP Motor / Premium Backgauge
C	30 HP Motor / Base Backgauge
D	30 HP Motor / Premium Backgauge

The Piranha Shear is a heavy steel constructed, high performance hydraulic powered machine that provides you several important advantages surpassing most other shears in today's market. The Piranha's single hydraulic cylinder and mechanical linkage system provides the following advantages: 1. The upper shear blade moves parallel to the lower blade thus providing maximum blade life, 2. Full length gibs guide the ram laterally and front-to-back at all times during the shearing process thus increasing rigidity, shearing accuracy, and blade life, 3. The straight-line shearing action improves shearing accuracy in all metal thickness.

The machine arrives fully assembled requiring only hydraulic oil and electrical power to become fully operational. The heavy steel "C" frames, interlocking cross members, ram, and bed provide the rigidity and resistance to deflection that is necessary for accurate performance. State-of-the-art, maintenance-free, aerospace bushings provide high load capacity and low friction in the form of a thin walled sleeve. They are completely non-metallic and require no lubrication.

Other standard features include: Full length hardened slides with non-metallic ways, variable cut length adjustment, hydraulic hold downs with replaceable polyurethane shoes, heavy duty, inch/mm motorized, disappearing back gauge with Go-To features and .100" retract feature on each stroke. A squaring arm with recessed inch/mm scale, four-edge high chrome, high carbon shear blades top and bottom.

The first part of this manual provides setup and maintenance instructions including an introduction, machine specifications, installation, operating instructions, and a section on troubleshooting various problems that may occur. The second part provides repair parts information and their respective part number.

Proper understanding and application of the information and procedures given in this manual will aid in establishing a preventative maintenance program and provide assistance for correcting malfunctions that may occur in the machine. The repair parts list provides information for part procurement and assembly breakdowns to aid in disassembly and re-assembly for repair parts installation. Please have machine serial number available when contacting the factory for service or repair parts.

Warranty

Mega Mfg. will replace or repair with like parts, either new or rebuilt, F.O.B. the factory, or refund the purchase price for any parts on ironworkers, pressbrakes, or shears, which are defective in materials and workmanship within (12) months of the date of purchase. Provided the buyer returns the warranty registration within (30 days) of the purchase date, and, at the seller's option, returns the defective materials freight and delivery prepaid to the seller, which shall be the buyer's sole remedy for the defective materials. A 5 year warranty against defects in materials and workmanship applies to major structural components on pressbrakes and shears. Seller shall not be liable to purchaser or any other person for consequential or incidental damages. Hydraulic and electrical components are subject to their respective manufacturer's warranties. This warranty does not apply to machines and/or components which have been altered in any way, or subjected to abusive or abnormal use, inadequate maintenance and lubrication, or to use beyond seller recommended capacities and specifications. Seller shall not be liable under any circumstances for labor costs expended on such goods or consequential damages. Seller shall not be liable to purchaser or any other person for loss or damage directly or indirectly arising from the use of the goods or any other cause. No employee, agent, officer, or seller is authorized to make oral representations or warranty of fitness or to waive any of the foregoing terms of sale and none shall be binding on the seller.

3. Installation

BEFORE INSTALLING THIS SHEAR, READ AND UNDERSTAND THE SHEAR MANUAL WITH PARTICULAR ATTENTION TO "SAFETY TIPS FOR MAINTENANCE PERSONNEL" THE CURRENT ANSI B11.4 STANDARD-"SAFETY REQUIREMENTS FOR THE CONSTRUCTION, CARE AND USE OF SHEARS." Copies can be ordered from: American National Standards Institute, 1430 Broadway, New York, New York 10018

3.1. Unpacking

CAUTION: THE SHEAR IS HEAVY IN FRONT. GUARD AGAINST TIPPING UNTIL ANCHOR BOLTS ARE SECURED.

This machine was carefully packaged at the factory to avoid damage during shipment, should any accidental damage occur contact the responsible freight company immediately and report the damage. Indicate any damage on the Bill of Lading. All Warranty information included in this packet must be returned to the factory.



Figure 1: Lifting Lug Location

The Piranha Shear must only be lifted using a crane, and the lifting lugs located in front of the hydraulic oil tank on top of the machine. **Do not** lift the machine from the bottom (forklift or jack) as the machine is top and front heavy and can tip resulting in serious bodily harm or death. Lifting the machine from the bottom can also result in machine damage.

WARNING: CHECK BLADE GAP BEFORE CYCLING MACHINE.

FAILURE TO DO SO MAY CAUSE BLADE DAMAGE

3.2. Placement

Piranha recommends that the machine be placed on a reasonably level concrete foundation suitable to support the shear's total weight and in accordance with local building codes. The machine should be placed on a single concrete pad free of cracks and seams. Prior to anchoring or setting, the shear should be leveled and shimmed. Section 3.4 of this manual discusses leveling the machine. Anchoring can be accomplished using suitable masonry anchors. Use the machine as a template for anchoring hole locations. Placement of the machine should allow easy access around the machine for the operator and maintenance personnel. For safe operation placement should allow tooling to be installed onto the bed from the end of the machine.

It is recommended that a minimum four-foot area around the Piranha Shear be provided.

3.2.1. Initial leveling

CAUTION: THE SHEAR IS HEAVY IN FRONT. GUARD AGAINST TIPPING BEFORE AND DURING LEVELING.

Level adjusting screws are only provided on the rear feet. The Piranha Shear must be placed on four steel pads: 2 each 6" x 6" x 3/4" for the front feet and 2 each 6" x 6" x 1/2" for the rear feet. These pads are provided with the shear.

3.3. Cleaning

Clean the bed surface, with a mild solvent so as not to damage the paint finish on the machine. The main cylinder rod must also be free of contaminants. Any contaminants left on the cylinder rod may damage the chrome finish and related hydraulic seals. The cylinder rod must be clean and dry. Wipe down the rest of the shear with a mild cleaning solution.

3.4. Precision Leveling

The Piranha Shear must be leveled precisely prior to operation. The following steps represent the typical leveling procedure. These instructions must be followed to avoid damaging the machine.

Using a machinist level, having an accuracy of one-half thousandths of an inch per foot, place the level facing front to back on the left side of the shear squaring arm. Adjust the rear leveling bolt until the bubble on the level is centered. Then, repeat for the right side, placing the level on the outside of the table. It's very important that the sides of the table be parallel to each other with no crosscorner binding of the table. Once the machine is level, place shims having a thickness equal to the gap, between the base plate and the bottom of the shear foot. After your shim stock is in place release the adjusting bolts and recheck the level to ensure that the left and right side of the machine have remained parallel. Tighten the anchoring bolts and recheck the level of the shear. If necessary, re-adjust the shim pack height if the shear has moved during anchoring. Do not cycle machine before it's leveled, or you may damage the shear blades!

NOTE:

Re-check machine level after the first 200 hours of operation, and at regular intervals. Consult the Maintenance section for additional information.

3.5. Electrical

CAUTION: ELECTRICIANS CHECKING DIRECTION OF ROTATION SHOULD BE CAUTIONED NOT TO OPERATE THE SHEAR UNTIL IT HAS BEEN THOROUGHLY CHECKED, CLEANED, LEVELED AND LUBRICATED. A WIRING DIAGRAM IS FURNISHED IN THIS MANUAL. SHEAR OPERATING MODE SWITCH MUST BE IN THE OFF POSITION WHEN CHECKING MOTOR ROTATION.

BEFORE DRILLING ANY HOLES IN THE ELECTRICAL ENCLOSURE, BE SURE THAT THE ELECTRONIC CIRCUIT BOARDS/COMPONENTS ARE PROTECTED FROM METAL CHIPS BECOMING ATTACHED TO THE CIRCUIT BOARD(S). DO NOT USE COMPRESSED AIR TO BLOW METAL DEBRIS FROM THE ENCLOSURE. USE A VACUUM TO REMOVE ANY METAL PARTICLES.

Machine voltage is shown on the nameplate, which is located under the main electrical enclosure on the left side frame of the shear.

3.5.1 Motor Rotation

Electrical connection of the 3-phase systems requires proper phasing. When connecting the press to a 3-phase power source, the rotational direction of the pump drive motor must be correct. The rotational direction may be observed by viewing the motor fan blade rotation. The motor must rotate in the direction of the arrow on the motor. Before operating the machine insure the cover is securely in place.

A licensed electrician should perform all electrical connections.

! **Warning** - The control transformer is for machine operation only. **Do not use the machine transformer to power any additional secondary devices.**

3.6. Hydraulic

Before applying power to the Piranha Shear, the hydraulic reservoir must be filled with oil. To fill the reservoir, locate and remove the filler/breather cap on top of the reservoir. Fill the reservoir with Mobil DTE-13 or ISO32 equivalent, filtered to an ISO 17/15/13-cleanliness level. The proper oil level is between the red and black lines of the sight gauge found on the rear of the reservoir (*See Figure 2*). Do not over fill the reservoir. Replace the filler/breather cap.

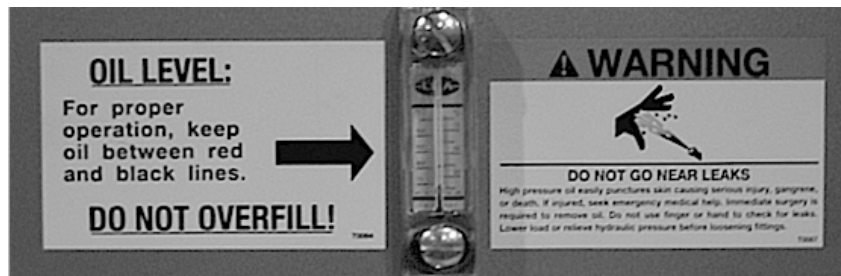


Figure 2: Oil Level & Temperature Sight Gauge

Upon initial start-up of the hydraulic unit visually inspect around the machine for any possible leaks. Do not search for hydraulic oil leaks using exposed flesh; hydraulic pressure can puncture the skin.

3.6.1 Rear Safety Guards

Reposition the yellow machine safety guards, so they protrude past the rear of the side frames. The guards must be positioned to prevent a person from entering the backgauge bar travel area.

4. Operator Controls (Configuration B or D)

4.1. Main Control Panel Programmable CNC

The main control panel is located on the left hand side of the Piranha Shear. The following subsections describe the controls located on this panel.



Figure 3: Main Control Panel-Programmable CNC

4.1.1. Start

Depressing the green Start pushbutton will apply power to the electric motor that drives the Piranha 1/2" Shear hydraulic power unit.

4.1.2. Stop

Depressing the stop button will stop the pump motor, but will maintain electrical power to the backgauge control. Re-calibration of the backgauge is not required when the Stop button is depressed.

4.1.3. E-Stop

When you depress the emergency stop, electrical power will be removed from the drive motor and all base machine control circuits, stopping all machine movement. Twist the button clockwise to reset it. The machine cannot start until the E-Stop button has been reset. The backgauge must go through its calibration sequence when you power the machine up again.

4.1.4. Up Button

The up button will raise the ram from any position to the full up position

4.1.5. Cut Length Selector Switch

The cut length selector switch controls the stroke depth of the ram. Shortening the ram stroke permits rapid shearing of shorter material.

4.1.6. Mode Selector Switch

The run mode selector switch permits the operator to select between three operating modes:

Single: The ram will descend when the footswitch is depressed and will pause when the footswitch is released at any point during the down stroke. The shear ram will complete only one cycle in this mode. The footswitch must be reactivated to begin a new shearing cycle.

Jog: During a shear cycle, the ram will stop when the footswitch is released.

Continuous: The ram will cycle continuously when the footswitch is depressed. Releasing the footswitch during the down stroke will cause the ram to stop, releasing the footswitch during the upstroke will not affect the return stroke of the ram.

4.1.7. Shadow Light Switch

The shadow light switch will turn on lights that cast a shadow line onto the material being sheared.

4.2. Backgauge Control-Programmable CNC

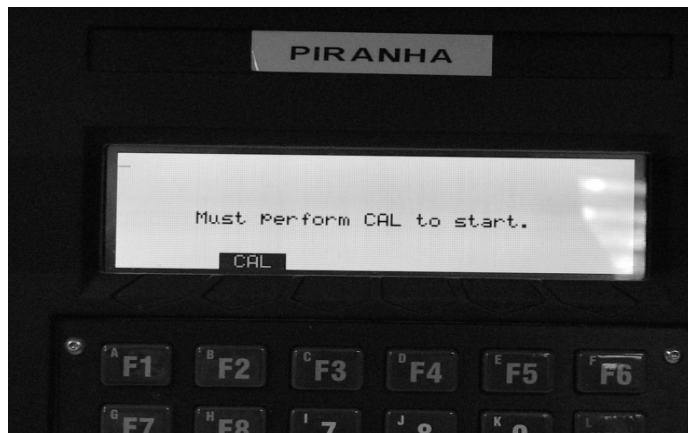
4.2.1 Keypad Functions



MAIN BACKGAUGE CONTROL CONSOLE

4.2.2 Calibration / Re-calibration

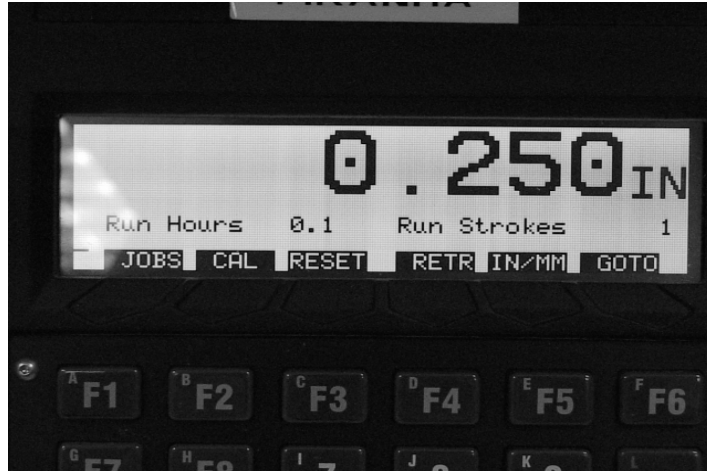
On initial power up or when the E-Stop button has been depressed, the backgauge /controller must be calibrated. The controller will sequence through a start routine and ask for the calibration button to be depressed. Simply depress the "CAL" (F2) button and the backgauge will automatically perform the calibration sequence.



CALIBRATION SCREEN

4.2.3 Programming A Job

When the calibration sequence has been performed, the controller will display the "MAIN SCREEN". See Figure #3.



MAIN SCREEN

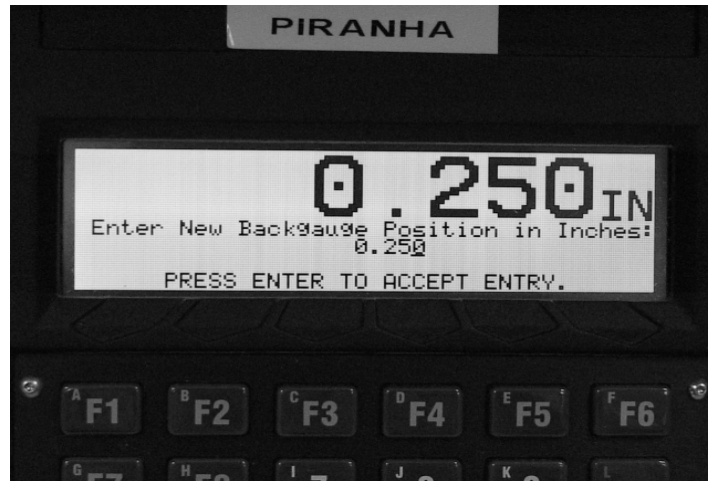
IN/MM: Depress the IN/MM button to toggle between Inch and MM modes. Programming may be done in either mode.

RETR: Depressing the RETR button will cause the backgague to position in the fully retracted mode, i.e.: the backstop bar will be positioned at the furthest dimension and parked in the "disappearing position."

Two options are available for programming a job, a single "Go-To" dimension, or a multi step job.

4.2.3.1 Go-To Function

Depress the “Go-To” button, enter the desired dimension (must be between .250 & 36.00”) and press enter. The control will display an “Entry accepted” message and the backgauge will move to the programmed position. Position the material against the backstop bar, operate the footswitch to initiate the shear cycle.

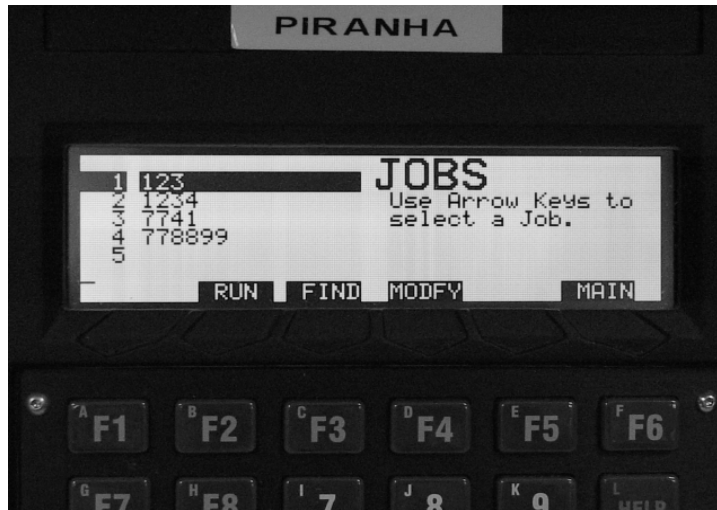


GO-TO SCREEN

4.2.3.2 Programming Jobs

To program a multi step job, perform the following steps:

1. Depress the “JOBS” button (F1)
2. Use the up or down arrow keys to select a blank job field.
3. Depress the “MODIFY” button.
4. Depress the “NEW” button.
5. Enter a job name. The entry may be all alphas, numeric or alphanumeric. To use the alpha characters, depress the “SHIFT” button that is located on the lower left corner of the keypad.
Note: If you make an error entering the job title, use the left/right arrow button to move the cursor under the incorrect digit, press the “DEL” button, and continue entering the correct information.
6. When the job title is programmed, depress the “ENTER” button.
7. Depress the “EDIT” button
8. Enter the target backgauge dimension and depress the “ENTER” button.
9. Enter the number of cuts (or cycles) in the “Reps” field; depress the “ENTER” button.
10. To enter additional steps or cycles, depress the “ADD” (F1) button and repeat steps 8 & 9.
11. If one of the steps requires the backgauge to retract fully, depress the “RTRCT” button (F5) in the “Length” field.
12. When the job is programmed, depress the: “DONE” (F6) button.
13. To run the job, depress the “DONE” button.
14. Depress the “RUN” button.
15. Depress the “ENTER” button, and the backgauge will advance to the position programmed in step 1.
16. When the complete job has been cycled, the screen will display “JOB COMPLETE”.
17. Depress the “OK” (F5) button and the screen will revert to the “MAIN SCREEN” display.



MULTI-STEP JOB SCREEN

4.2.4 Recalling and Running an Existing Job

1. From the Main screen, depress the “JOBS” button (F1)
2. Using the up/down arrow buttons, maneuver the desired job to the highlighted field and depress “RUN” (F2).
3. Enter the number of cycles required to run this job.
4. The screen will display a confirmation of the job number to run, depress the “ENTER” button to run the job.

4.2.5 Editing a Job

1. From the Main screen, depress the “JOBS” button (F1)
2. Using the up/down arrow buttons, maneuver the job list to the highlighted field and depress “MODIFY” (F4).
3. The “JOB ENTRY” screen will display.
4. Depress the “EDIT” (F3) button.
5. The parameters of each step will display. Using the up/down arrow buttons, move the field to the step to edit and depress the “EDIT” (F2) button.
6. Edit the first field or press the “ENTER” button to advance to the next field to be changed. Make the desired changes and depress the “ENTER” button to accept the changes.
7. Depress the “DONE” (F6) button to complete the sequence.
8. Depress the “DONE” (F6) button again to enter the “JOBS” screen.

4.2.6 Renaming a Job

1. From the Main screen, depress the “JOBS” (F1) button
2. Using the up/down arrow buttons, maneuver the job list to the highlighted field and depress “MODIFY” (F4).
3. The “JOB ENTRY” screen will display.
4. Depress the “RENAM” (F2) button.
5. Enter the new name for the job,
6. Depress the “ENTER” button to accept the changes.
7. Depress the “DONE” (F6) button to complete the sequence.

4.2.7 Copying a Job

1. From the Main screen, depress the "JOBS" (F1) button
2. Using the up/down arrow buttons, maneuver the job list to the highlighted field and depress "MODIFY" (F4).
3. The "JOB ENTRY" screen will display.
4. Depress the "COPY" (F4) button.
5. The COPY screen will display information stating the "copy from XXX and the New Job will be XXX (2)"
6. Depress the "OK" (F2) button.
7. The job will be copied and renamed XXX (2).
8. To rename the job, use the up/down arrow buttons, maneuver the job to the highlighted field.
8. Depress the "RENAM" (F2) button.
9. Enter the new name for the job,
10. Depress the "ENTER" button to accept the changes.
11. Depress the "DONE" (F6) button to complete the sequence.

4.2.8 Stroke Counter

1. From the Main screen, depress the "RESET" (F3) button
2. To reset the stroke counter, depress the "STRKS" (F4) button.
3. Depress "DONE" (F6) button.

4.2.9 Hour Meter

1. From the Main screen, depress the "RESET" (F3) button
2. To reset the hour meter, depress the "HOURS" (F2) button.
3. Depress "DONE" (F6) button.

4.2.10 Protected Access Screens

F7, - F9 are dedicated function pushbuttons.

F9 will return an operator to the "MAIN SCREEN"

F7 is a protected access screen for supervisor entry. This screen permits the resetting of service-required messages and other machine tuning functions. A temporary access code (9999) is programmed, permitting initial access to the protected screen. This enables a supervisor to enter preferred access code. The following section describes the functions available in the Supervisor Screen.

Delay Time: Permits programming a "global" time delay between shearing cycles in Continuous Mode.

Zero Offset: Permits electronic tuning of the backgauge calibration position. This is a "global" adjustment.

Service Notes: At predetermined intervals, a *Srv. Req'd message will appear in the upper left corner of the display. This function reminds the operator or maintenance department that scheduled preventative maintenance is due. Depressing the "SERVICE NOTES" (F3) pushbutton will display the maintenance requirements for this service cycle. Piranha highly recommends that this schedule is followed. Failure to do so may result in unscheduled maintenance requirements. Follow on-screen instructions to reset the service timer.

To clear the service reminder, press F7 and enter the Supervisor password (Factory default password is 9999) and press Enter. Press F3 – Clear – Done.

Reset: Supervisor Hours & Supervisor Strokes

New Password: Permits supervisor(s) to change password at their discretion.

F8: is a Mega protected screen and is only accessible through a password supplied by the factory. This section contains vital machine operational codes and settings and must not be accessed without authorization and supervision from a Piranha service engineer.

4.3. Main Control Panel Programmable GOTO

(Configuration A or C)

The main control panel is located on the left hand side of the Piranha 1/4-10 Shear. The following subsections describe the controls located on this panel.



Figure 4: Main Control Panel-Programmable GOTO

4.3.1. Start

Depressing the green Start pushbutton will apply power to the electric motor that drives the Piranha 1/4-10 Shear hydraulic power unit.

4.3.2. Stop

Depressing the stop button will stop the pump motor.

4.3.3. Up Button

The up button will raise the ram from any position to the full up position

4.3.4. Mode Selector Switch

The run mode selector switch permits the operator to select between three operating modes:

Single: The ram will descend when the footswitch is depressed and will pause when the footswitch is released at any point during the down stroke. The shear ram will complete only one cycle in this mode. The footswitch must be reactivated to begin a new shearing cycle.

Jog: During a shear cycle, the ram will stop when the footswitch is released.

Continuous: The ram will cycle continuously when the footswitch is depressed. Releasing the footswitch during the down stroke will cause the ram to stop, releasing the footswitch during the upstroke will not affect the return stroke of the ram.

4.4. Backgauge Control-Programmable GOTO

4.4.1. Programming and Data Entry Keys

0-9 Use the number keys to input numerical values, or to perform special functions when used in conjunction with the Function (FCN) key.

IN/MM Select measurement unit (inch or metric). Depress this key to toggle between the two modes.

FCN Function key is used in conjunction with other data entry keys to enable special functions.

CAL Used to enable calibration of the backgauge.

GO Used to initiate backgauge movement to a programmed position.

CLR Clears data entry, zeros display, cancels preset mode.

Decimal Used to enter decimal during data entry. Restores display to target after GO has been depressed.

Decimal Blinking Target dimension is being displayed, to view actual dimension, momentarily depress CAL button.

Decimal Solid Actual position is being displayed, to view target dimension, depress decimal point button.

4.4.2. Programming Functions

4.4.2.1. Backgauge Positioning

Enter desired dimension using keypad and depress GO button. Backgauge will position to programmed dimension.

4.4.2.2. Presets

This control will store 9 preset dimensions (1-9).

To **program a preset dimension**,

1. Enter the dimension using the keypad,
2. Press FCN, the letter "P" will show on the left side of the display.
3. Press and hold the preset number the dimension is to be stored with until the flashing stops. For example, if a dimension of 12.375" is to be stored in preset #7, use the following procedure. On the keypad enter (1) (2) (.) (3) (7) (5) (FCN) Press and hold (7) until the flashing stops. 12.375 has been stored in preset #7.

To **recall a stored preset**,

1. Press the FCN key,
2. Press the desired stored preset number (1-9),
3. Press the GO button, the backgauge will position to the preset dimension. For example, to recall preset #7 (which has a dimension

of 12.375" stored), Press FCN, press #7 (on the keypad), 12.375 will display on the LED readout. Depress the GO button to position the backgauge to 12.375"

WARNING: DO NOT USE PRESET STATION #0 for programming preset stations.

4.4.2.3. Calibration / Re-calibration

To calibrate the backgauge to an actual position, use the following procedure:

1. Measure the actual distance from the lower blade edge to the backgauge bar. (Example 20 inches) Press (CLR), (2) (0)(.) (0) (0) Press and hold (CAL) until flashing stops. The display will show the calibrated value (20.000")
2. Enter a short distance, (i.e. 3"), press GO button, backgauge will position to 3".
3. Shear a piece of metal and measure the sheared part with a caliper. Enter the measured dimension onto the keypad, press and hold CAL until the flashing stops. Verify the accuracy by shearing another part. Repeat step # 3 if minor adjustments are required.

IMPORTANT:

DO NOT DEPRESS THE STOP BUTTON WHEN THE SHEAR BACKGAUGE IS IN MOTION. This will cause the backgauge to lose calibration and will require recalibration.

ENSURE SHEAR BLADE/RAM IS AT THE TOP OF STROKE before turning machine off. Failure to do so will require backgauge recalibration.

NOTE: If the backgauge begins "Hunting" for position (continuously goes past the target position), either the drive chain (FIG 25A & B) is too loose or the "Drag Block" (Fig 25C & E) has become loose. To adjust the drag block, loosen the jam nut (FIG 25E) and tighten the adjusting screw clockwise in 1/16 rotations until the "Hunting" stops.

WARNING: Over adjusting the tightness on the drag block will cause premature motor failure or electrical over current which will result in a blown fuse.

5. Shear Operation

BEFORE OPERATING THE SHEAR, READ AND UNDERSTAND THE CURRENT ANSI B11.4 STANDARD. CAUTION: READ AND UNDERSTAND THIS ENTIRE MANUAL BEFORE PLACING SHEAR IN OPERATION.

WARNING: CHECK BLADE GAP BEFORE CYCLING MACHINE.

FAILURE TO DO SO MAY CAUSE BLADE DAMAGE

- ! Always review the instructions provided in this manual and observe shearing safety rules!
- ! Insure that no tools, bolts or other obstructions are in the knife area prior to operating the shear.
- ! Locate any available safety handling tools required.
- ! Keep the floor and surrounding area clean and free of obstruction, debris and oil.
- ! Ensure blade gap is adjusted to corresponding material thickness.

5.1. Selecting the Blade Gap – Rapid Set

Lift the locking lever on the manual blade adjustment assembly and rotate the handle to the desired setting and lower the locking lever into the locking slot.

WARNING: Failure to set correct blade gap corresponding to material thickness may cause the material to “fold” and jam between the shear blades. This condition will cause damage to the machine.

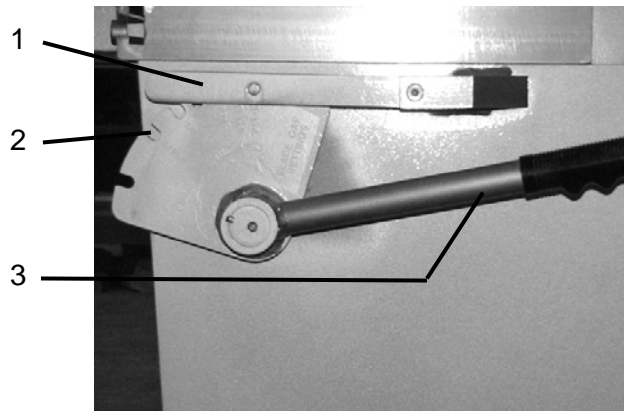


Figure 5 Blade Gap Adjustment –Rapid Set

Item	Description
1	Locking lever
2	Locking slot
3	Handle

WARNING: Failure to set correct blade gap corresponding to material thickness may cause the material to “fold” and jam between the shear blades. This condition will cause damage to the machine.

Adjusting the blade gap - Manual Set (Illustrations of following pages)

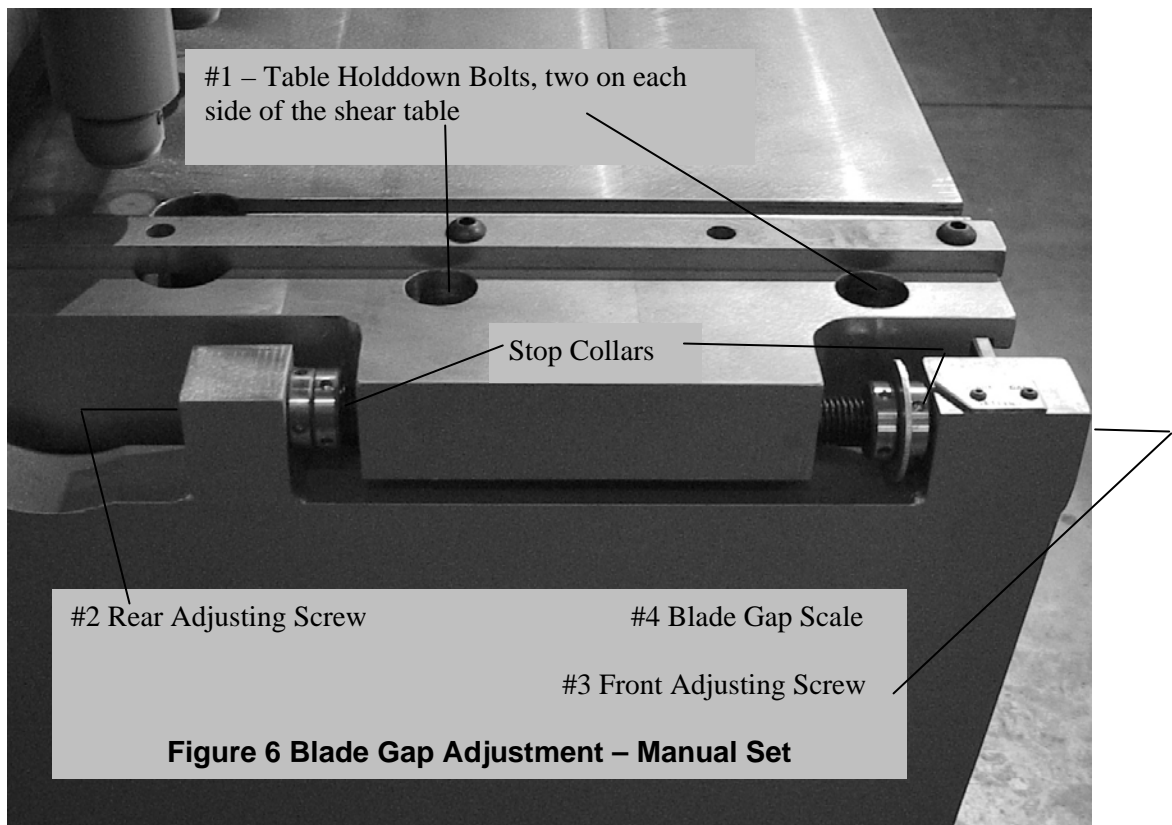
WARNING: Do not make any adjustments using the “Stop Collars” (see photo) Serious maladjustment will occur which may cause damage to shear knives! Remove front guard.

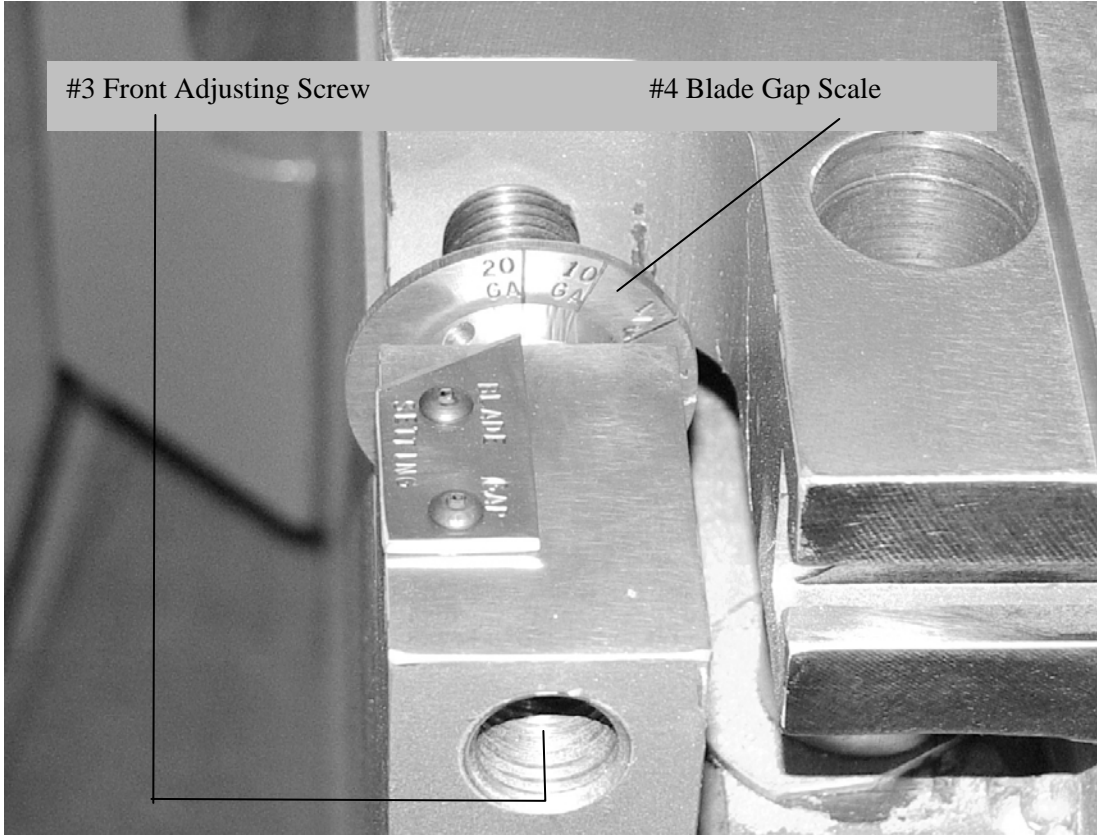
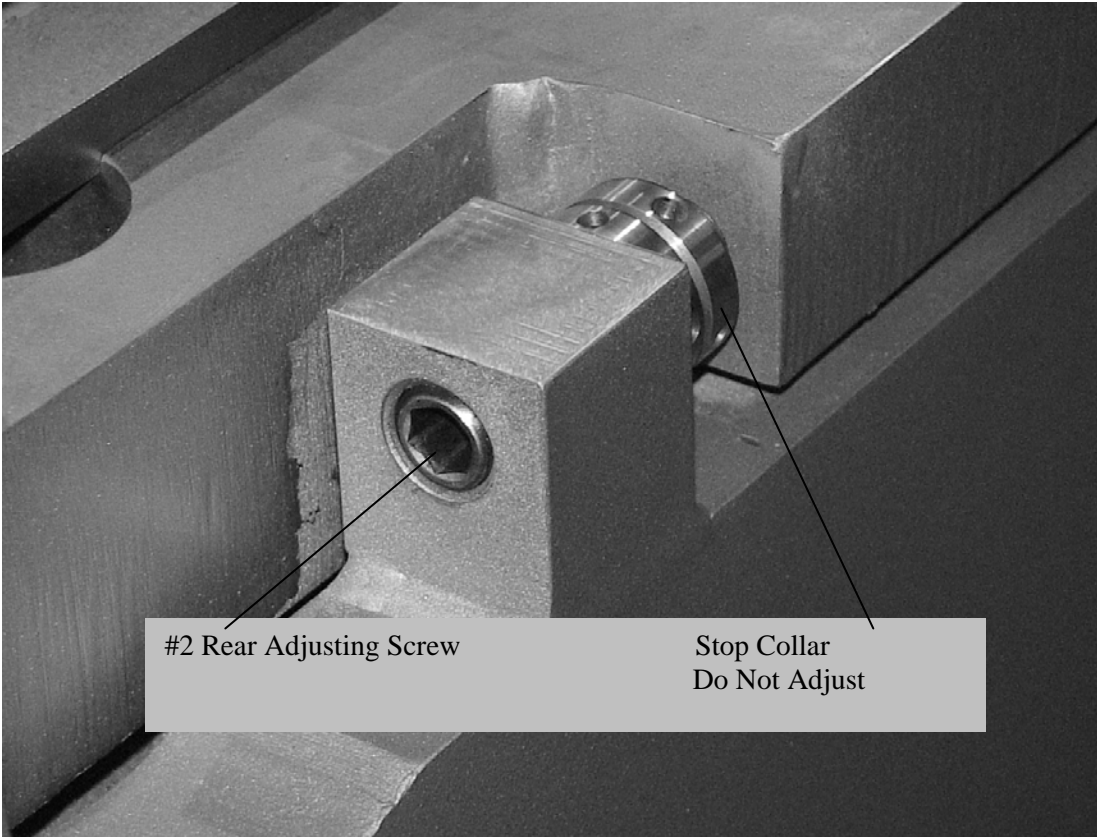
To Increase the blade gap for shearing thicker material:

1. Loosen the four Shear Table Holddown Bolts (Item #1, two on each side of the shear table)
2. Using a suitable Allen wrench, rotate the adjusting screw on the front of the table (item #3) CCW to the desired material thickness indicated on the blade gap scale (#4) for reference.
3. Repeat the same procedure on the opposite side of the shear.
4. Using the Allen wrench, rotate the rear adjusting screw (item #2) CW until the table is pushed forward against the front adjusting screw snugly.
5. Repeat the same procedure for the opposite side of the shear.
6. Re-tighten the four Shear Table Holddown Bolts.

To decrease the blade gap for shearing thinner material:

1. Loosen the four Shear Table Holddown Bolts (Item #1, two on each side of the shear table)
2. Using a suitable Allen wrench, rotate the adjusting screw on the rear of the table (item #2) CCW one half revolution.
3. Repeat the same procedure on the opposite side of the shear.
4. Using the Allen wrench, rotate the front adjusting screw (item #3) CW to the desired material thickness indicated on the blade gap scale (#4) for reference.
5. Repeat the same procedure for the opposite side of the shear.
6. Using the Allen wrench, rotate the rear adjusting screw (item #2) CW until the table is pushed forward against the front adjusting screw snugly.
7. Repeat the same procedure for the opposite side of the shear.
8. Re-tighten the four Shear Table Holddown Bolts.





5.2. Adjusting Shear Blade Clearance / Ram Gib Adjustment Procedure

The following procedure is recommended for re-gapping the shear blades.

1. Verify that the shear is level.
2. **ALWAYS** check gib clearance before adjusting blade clearance.

5.2.1. Checking Gib Clearance:

3. Position the shear ram at the top of stroke so the slides are in full contact with the gibs.
4. Set the manual blade gap lever at the 3/8" position.
5. Ensure clearance exists between the Blades to prevent blade clash when the blades cross.
6. When checking slide clearances, perform the checks from the rear of the machine. When checking the bottom gib clearances, the low side (left side) and the high side (right side) should be checked from the bottom of the gib assembly. When checking the clearances at the top of the gibs, the low (left side) and the high side (right side) should be checked from the top of the gib assembly:
7. With a feeler gauge, check the clearance at the bottom of the slide. The feeler gauge must fit between the bearing material and the front side of the ram slide. Acceptable clearance is .003-.004"
8. Repeat this measuring procedure for the other side of the machine.

5.2.2. Adjusting Gib Clearance:

9. To tighten clearances, loosen the 3/8" jam nut located at the bottom of the slide assembly. Using an Allen wrench rotate the setscrew clockwise until correct clearance is achieved. Lock jam nut on setscrew.
10. Repeat this procedure for the other side of the machine if adjustment is required.
11. To check the clearance on the top of the slide, insert a feeler gauge between the bearing surfaces on the rear side of the ram slide. Acceptable clearance is .003"-.004"
12. To tighten clearances, loosen the 3/8" jam nut located at the top of the slide assembly. Using an Allen wrench rotate the setscrew clockwise until correct clearance is achieved. Lock jam nut on setscrew.
13. Repeat this procedure for the other side of the machine if adjustment is required.
14. Re-adjust the remaining setscrews by tightening the screws with a firm "snug". Tighten the jam nuts.
15. After all the adjustments have been made, re-check the clearances to ensure that they have not moved during the adjustment process.

5.2.3. Adjusting Side Thrust Bearings:

1. Check clearances at the top and bottom of the gib assembly. Insert a feeler gauge between the side slide bearing and the slide. Acceptable clearance is .003"-.004"
2. To tighten the clearance, loosen the jam nut on the top and bottom adjusting screw. Using an Allen wrench rotate the setscrew (either top or bottom may be adjusted first) clockwise until correct clearance is achieved. Lock jam nut on setscrew.
3. Repeat this procedure for the remaining adjusting screw.
4. Re-adjust the remaining setscrews by tightening the screws with a firm "snug". Tighten the jam nuts.
5. After all the adjustments have been made, re-check the clearances to ensure that they have not moved during the adjustment process.
6. Repeat this procedure for the other side of the machine.
7. Grease the gibs after adjustments are complete. Cycle the ram while greasing the gibs.

NOTE: When turning the blades, clean and lightly oil blade and seat before installing blade. Tighten blade bolts firmly. Set clearance adjustment to maximum before overlapping, blades: then reduce clearance and check with feeler gauge; if clearance is under .0015" set adjustment towards rear before jogging ram down; proceed as above. When grinding blades, grind top and bottom of blade only. Shim lower blade, flush with bed top surface. Clean and lightly oil blade and seat. Tighten blade bolts firmly; again, set clearance to maximum before overlapping to avoid damage to blades; proceed as above.

Blade Gap Spread 3/8" Shear – Rapid Set

Gauge Setting	Nominal Gap	
	LHS/ RHS	Center
20 GA	.003"-.004"	.002"-.003"
14 GA	.005"-.008"	
10 GA	.009"-.014"	
3/16"	.013"-.019"	
1/4"	.018"-.025"	
5/16"	.022"-.031"	
3/8"	.026"-.038	

Blade Gap Spread 1/2" Shear – Rapid Set

Gauge Setting	Nominal Gap	
	LHS/ RHS	Center
20 GA	.003"-.004"	.002"-.003"
11 GA	.008"-.012"	
7 GA	.013"-.018"	
1/4"	.018"-.025"	
3/8"	.026"-.038	
1/2"	.035"-.050"	

Blade Gap Spread 3/8" Shear Manual Set

Gauge Setting	Nominal Gap	
	LHS/ RHS	Center
20 GA	.003"-.004"	.002"-.003"
10 GA	.009"-.014"	
1/4"	.018"-.025"	
3/8"	.026"-.038	

Blade Gap Spread 1/2" Shear Manual Set

Gauge Setting	Nominal Gap	
	LHS/ RHS	Center
20 GA	.003"-.004"	.002"-.003"
10 GA	.009"-.014"	
1/4"	.018"-.025"	
3/8"	.026"-.038	
1/2"	.035"-.050"	

6. Maintenance Procedures

BEFORE MAINTAINING OR REPAIRING THE SHEAR, READ AND UNDERSTAND THE CURRENT ANSI B11.4 STANDARD.

This section describes the procedures and requirements for maintaining and repairing the major components of the Piranha Shear.

6.1. Maintenance Schedule

This section outlines the suggested points and intervals for regular scheduled maintenance. The hydraulic power unit is very sensitive to dirt and other contaminants, but will provide many years of reliable service with a minimum amount of service. The operating temperature and the cleanliness of the oil directly affect the life of the hydraulic oil. Regular oil and filter changes will keep the system clean and free of sticking and clogged valves. Because hydraulic cylinders are lubricated with every stroke, keeping them clean and free of scratches and dings that may damage the cylinder rod seals is most important.

The Shear is shipped with an extra hydraulic oil filter. It is important that after the first forty hours of operation the oil filter be replaced. Upon using the included extra oil filter it is suggested that a replacement filter be ordered for the next scheduled filter change.

1. After First 40 hours:

- Change hydraulic filter
- Check fluid level
- Check gib clearances
- Grease ram slides
- Check fittings, bolts, nuts for tightness

2. Every 40 hours (weekly) thereafter:

- Grease ram slides.
- Lubricate Back Gauge lead screws and nuts
- Check fittings, bolts, nuts for tightness

3. Every 3 months:

- Change hydraulic filter

The hydraulic filter element should be changed every 3 months depending on workload and environmental conditions. See repair parts section for re-ordering instructions and part numbers.

- Check hydraulic fluid level
- Check gib clearances & blade gap.
- Check Back Gauge drive chain for excessive slack, lubricate chain.
- Check machine level

4. Every Year:

- Grease electric motor

5. Every Two (2) years:

- Change hydraulic fluid

6.2. Hydraulic Power Unit

The hydraulic power unit is a sophisticated and complex system. Only trained personnel should attempt to perform adjustment procedures on the unit. The power unit generates very high pressures. **Never check for leaks using hands.**

Before servicing the hydraulic system, block the ram and turn power off.

6.2.1. Oil Filter Replacement

Verify the exact element number prior to ordering the replacement element.

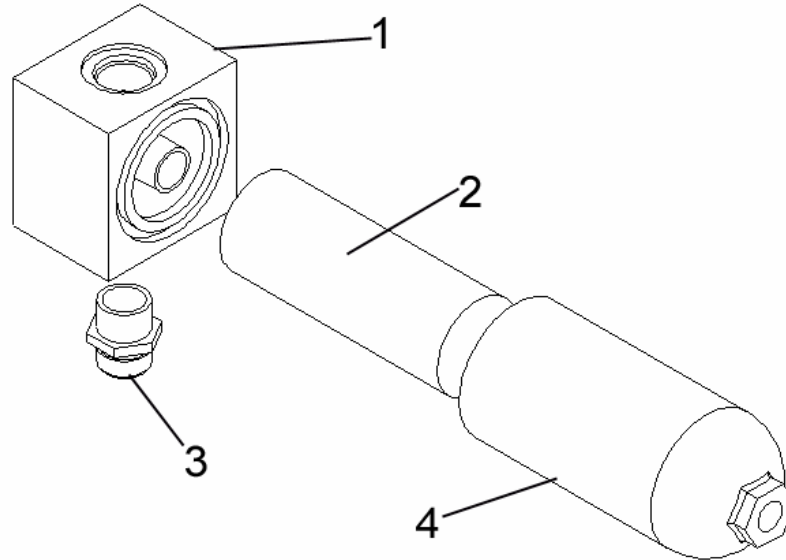


Figure 7 Oil Filter Assembly Exploded View

Item	Description
1	Filter Body
2	Filter Element
3	Fitting - inlet
4	Filter Bowl

Table 1: Oil Filter Assembly Descriptions

The following steps represent a typical filter element replacement.

1. Insure the main electric power is locked out at the safety disconnect.
2. Place a small container (½-gallon) under the filter bowl.
3. Remove the filter bowl by turning in a counterclockwise direction.
4. Remove the filter element by pulling and turning at the same time.
5. Lubricate the O-ring on the new filter with hydraulic oil and slide into place.
6. Wipe the inside of the filter element bowl and replace.

When changing the hydraulic oil, a new oil filter should also be installed.

7. Hydraulic & Electrical Schematics

7.1. Electrical Schematic-Programmable CNC (Configuration D)

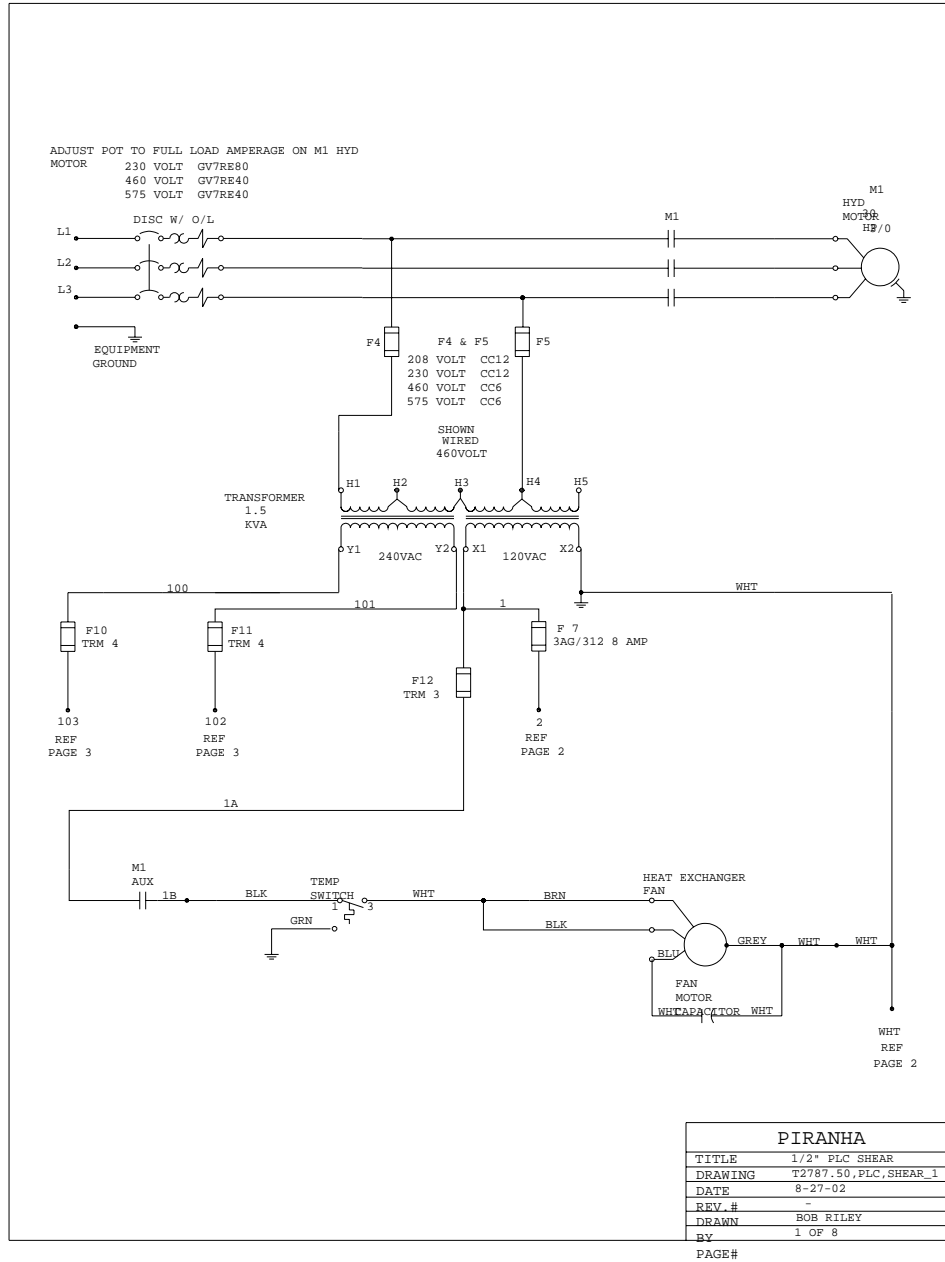


Figure 8: Electrical Diagram 1 of 8

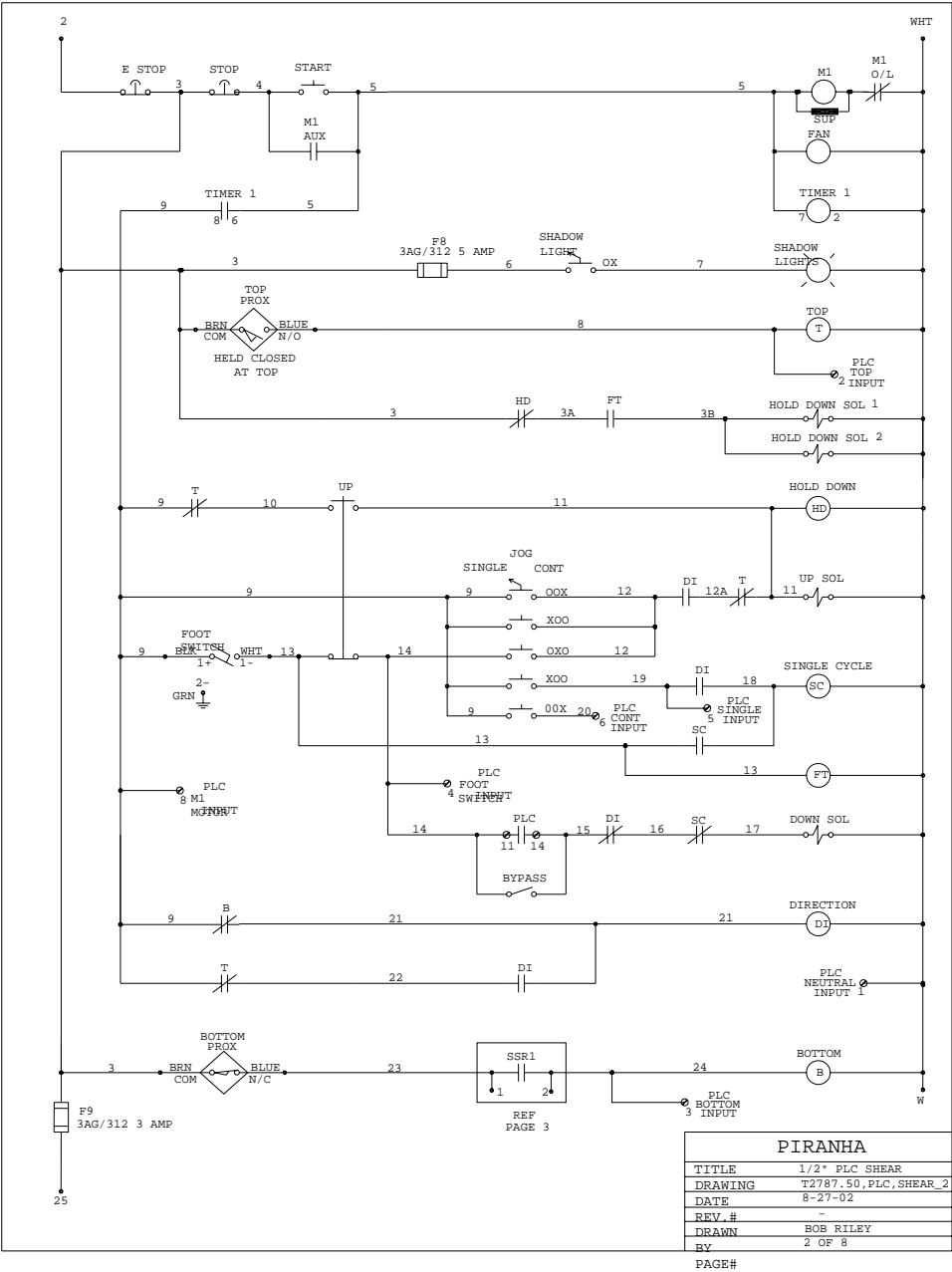


Figure 9: Electrical Diagram 2 of 8

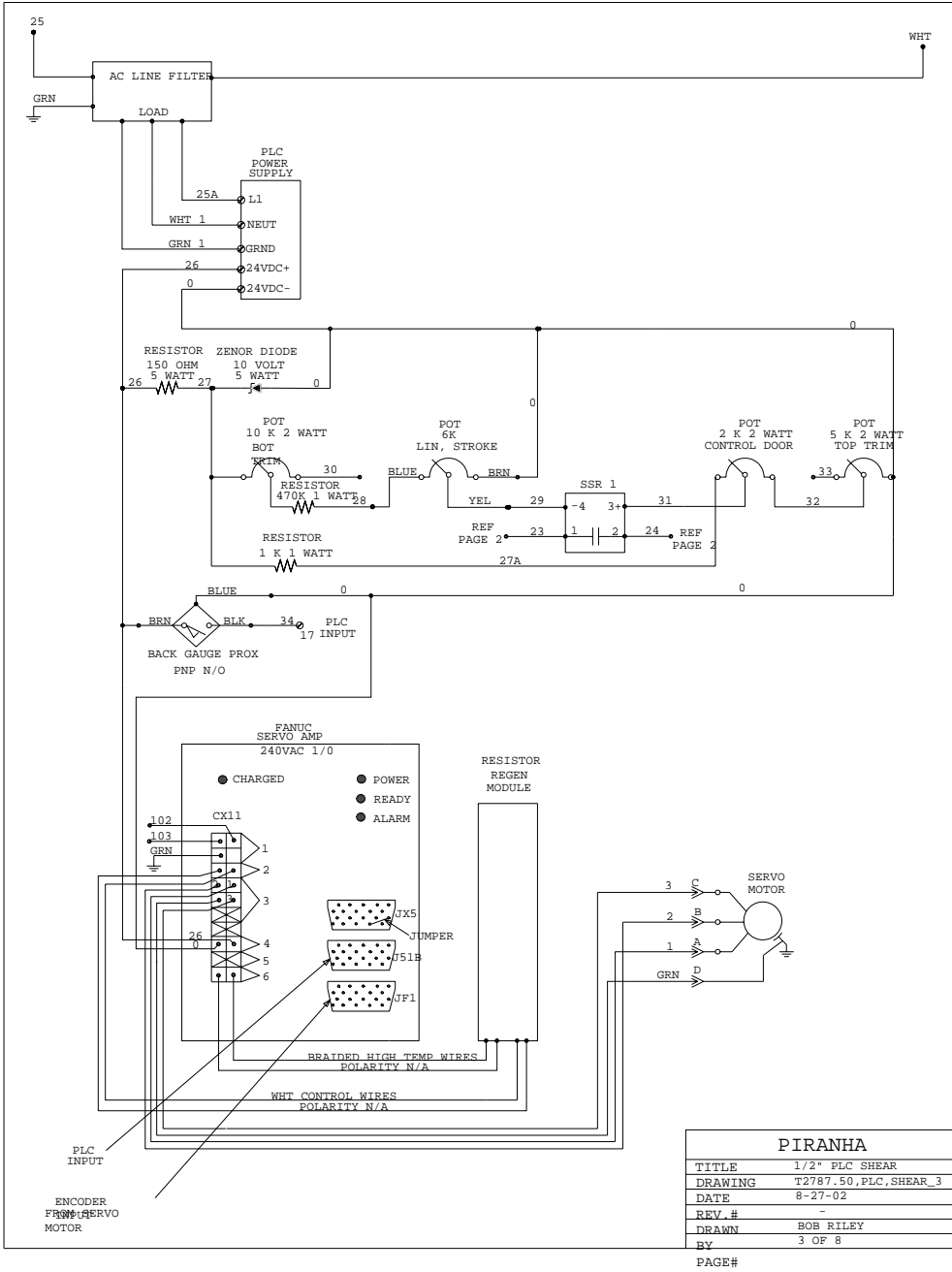


Figure 10: Electrical Diagram 3 of 8

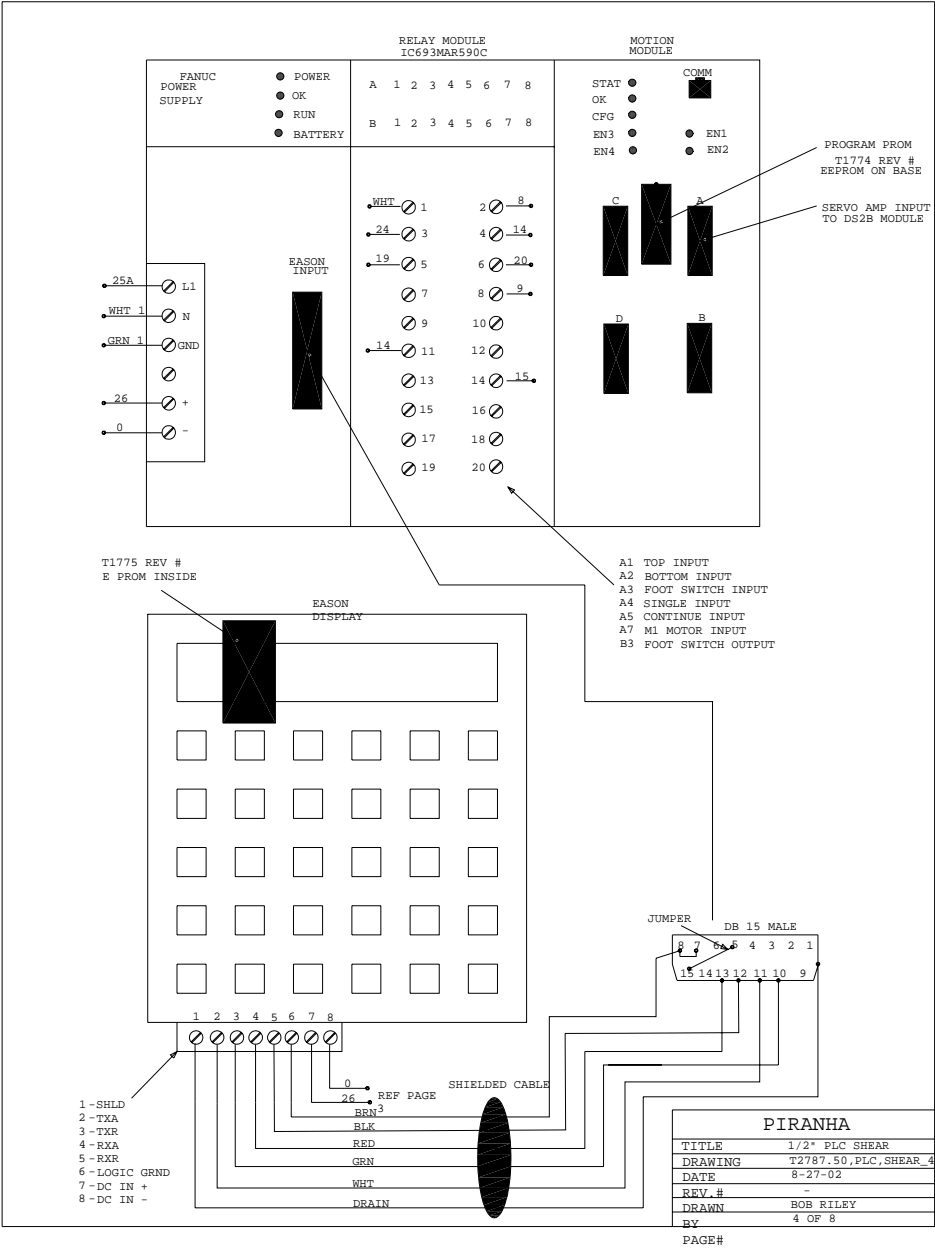


Figure 11: Electrical Diagram 4 of 8

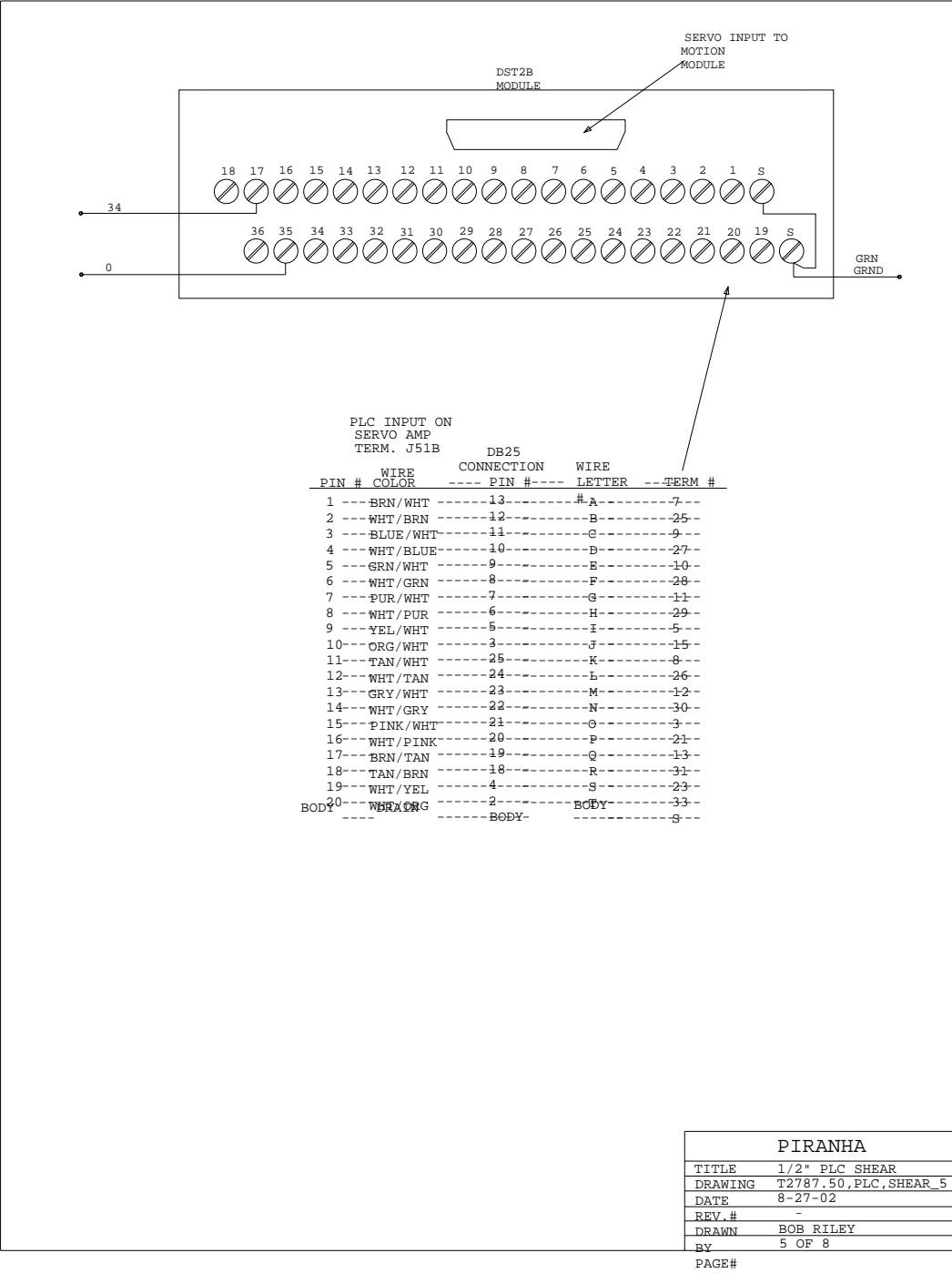


Figure 12: Electrical Diagram 5 of 8

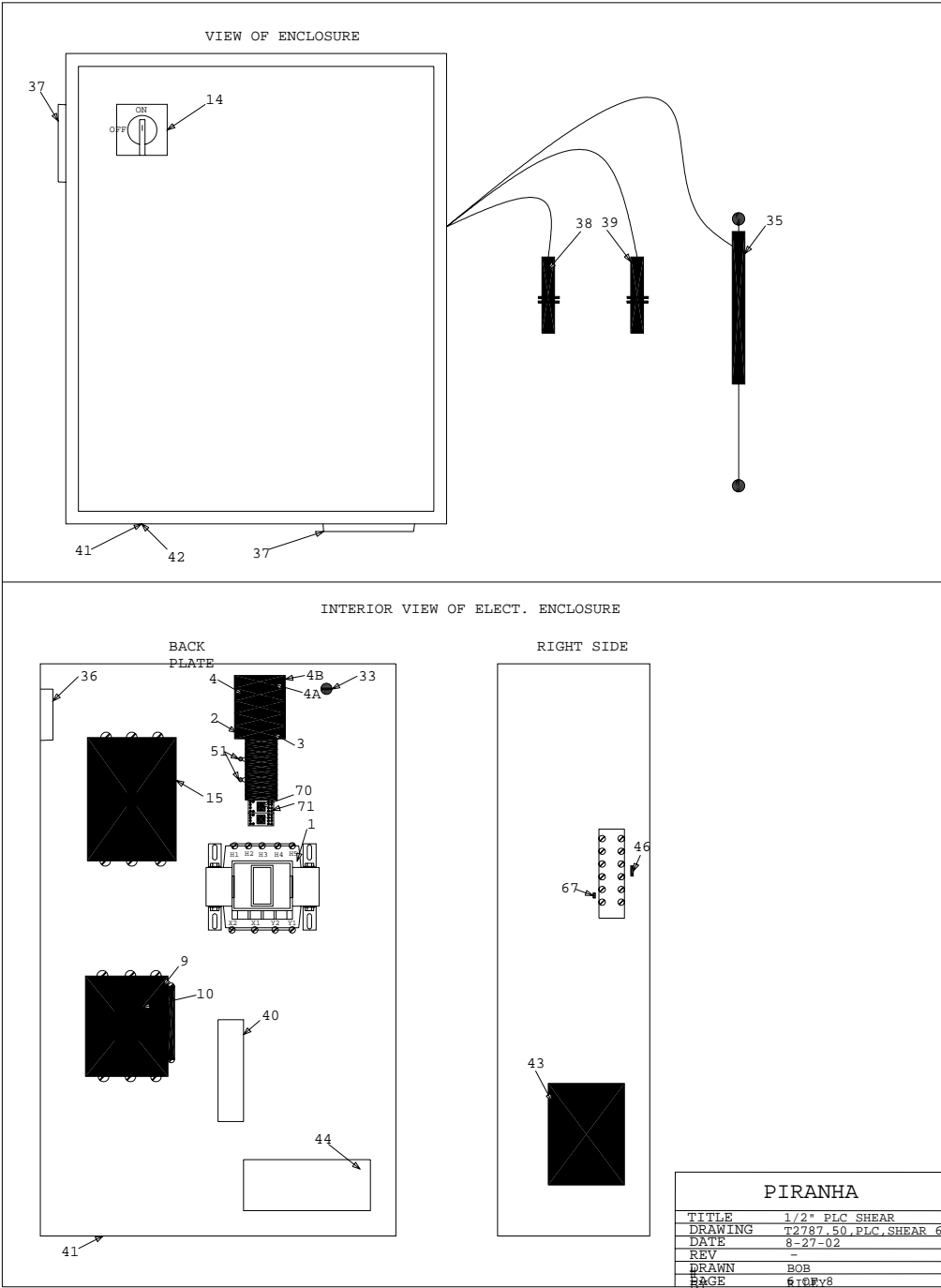


Figure 13: Electrical Diagram 6 of 8

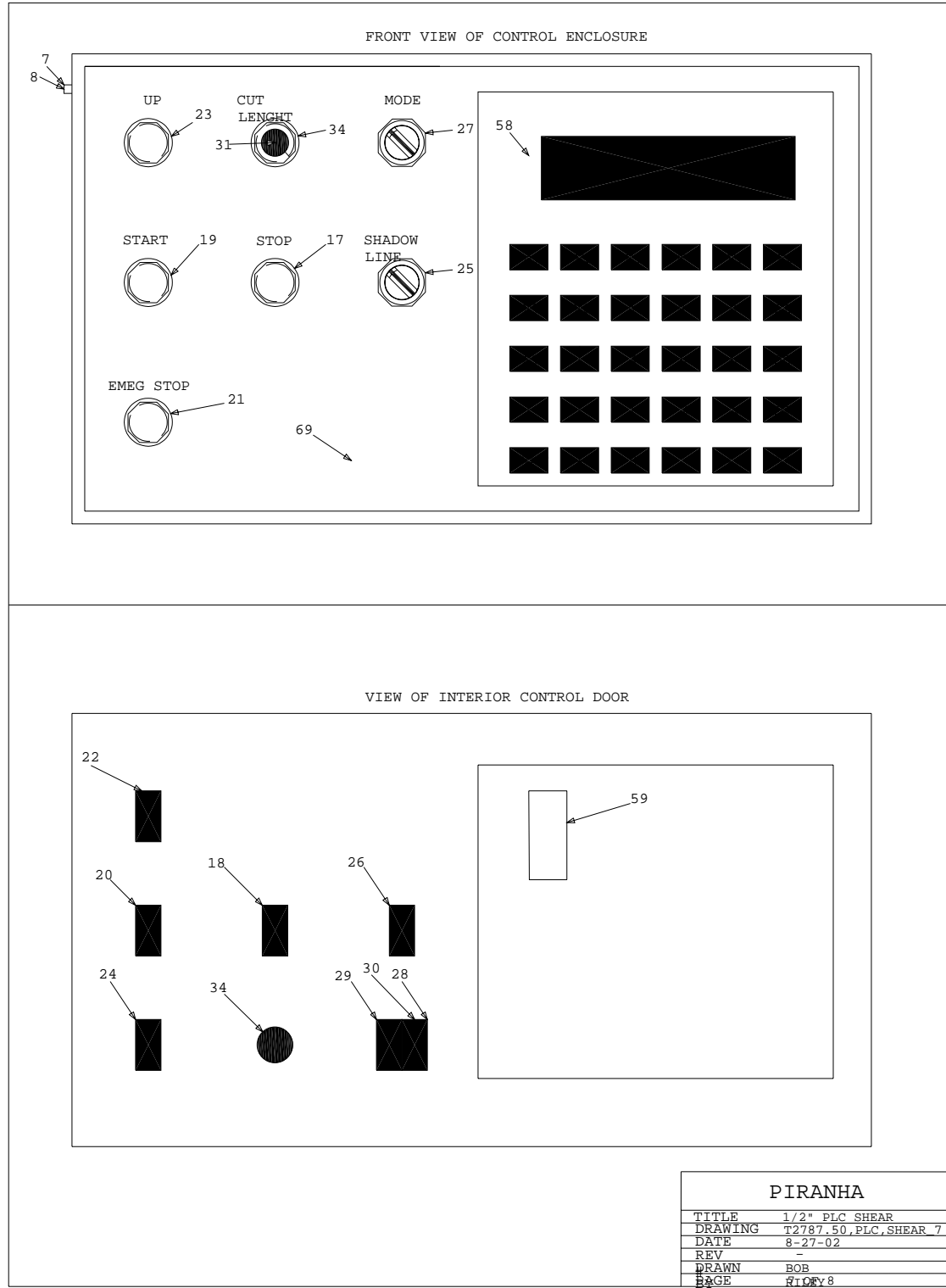


Figure 14: Electrical Diagram 7 of 8

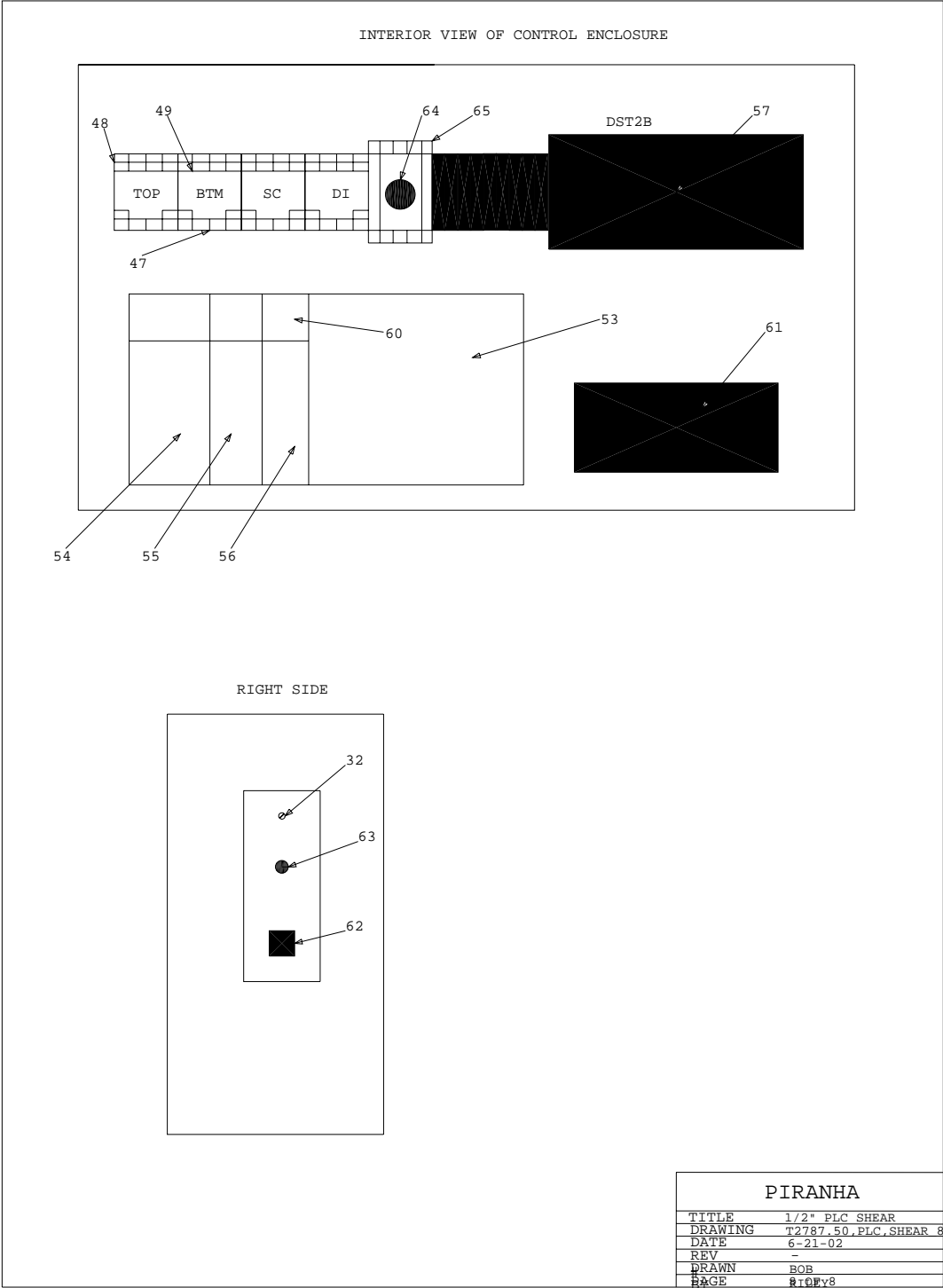


Figure 15: Electrical Diagram 8 of 8

7.2. Electrical Components

FIG. #	DESCRIPTION	QTY	VOLTAGE	PIRANHA PT#
1	TRANSFORMER	1	ALL	T1868
2	TRANSFORMER PRIMARY FUSE	2	208	T0770
2	TRANSFORMER PRIMARY FUSE	2	230	T0770
2	TRANSFORMER PRIMARY FUSE	2	460	T1138
2	TRANSFORMER PRIMARY FUSE	2	575	T1138
3	TRANSFORMER PRIMARY FUSE HOLDER	2	ALL	T1866
4	SECONDARY FUSE, SERVO	2	ALL	T1867
7	FUSE HOLDER, CONTROL CIRCUITS	3	ALL	T0733
8	FUSE, CONTROL CIRCUITS	1	ALL	T0734
8	FUSE, CONTROL CIRCUITS	1	ALL	T0736
8	FUSE, CONTROL CIRCUITS	1	ALL	T1870
9	STARTER, M1	1	ALL	T1853
10	STARTER AUX. CONTACT	1	ALL	
14	BREAKER OPERATOR	1	ALL	T1858
15	BREAKER O/L	1	230	T1854
15	BREAKER O/L	1	460 & 575	T1855
15	BREAKER O/L LUG KIT	6	ALL	T1856
17	STOP BUTTON OPERATOR, RED EXTD.	1	ALL	05316111-1
18	CONTACT BLOCK W/ BASE N/C	1	ALL	05316121-1
19	START BUTTON OPERATOR, GRN FLUSH	1	ALL	05316101-1
20	CONTACT BLOCK W/ BASE N/O	1	ALL	0531696-1
21	EMERG. STOP OPERATOR	1	ALL	T0737-1
22	CONTACT BLOCK W/ BASE N/C	1	ALL	05316121-1
23	UP BUTTON OPERATOR, YELLOW EXTD.	1	ALL	T1668-1
24	CONTACT BLOCK W/ BASE N/O	1	ALL	0531696-1
25	SHADOW LIGHT SELECTA SWITCH OPERATOR	1	ALL	O531695-1
26	CONTACT BLOCK W/ BASE N/O	1	ALL	0531696-1
27	MODE SELECTA SWITCH OPERATOR	1	ALL	05316451-1
28	CONTACT BLOCK W/ BASE N/O	1	ALL	0531696-1
29	CONTACT BLOCK ONLY N/O	1	ALL	O5316781-1
30	CONTACT BLOCK ONLY, N/C	1	ALL	O591596-1
31	POT KNOB	1	ALL	T0762
32	POTENTIOMETER, TOP TRIMMER	1	ALL	T1414
33	POTENTIOMETER, BOTTOM TRIMMER	1	ALL	T1678
34	POTENTIOMETER, STROKE CONTROL	1	ALL	T1871
35	POTENTIOMETER, STROKE CONTROL, LINEAR	1	ALL	T2736
36	FAN	1	ALL	T0726
37	FAN GRILLS AND FILTERS	2	ALL	T0725
38	PROX. TOP N/O	1	ALL	T1674
39	PROX. BOTTOM N/C	1	ALL	T1675
40	SUPPRESSOR, MOTOR	1	ALL	O591604
41	FOOT SWITCH RECP.	1	ALL	O531618

Electrical Components (cont)

FIG #	DESCRIPTION	QTY	VOLTAGE	PIRANHA PT #
42	FOOT SWITCH	1	ALL	T0748
43	SERVO AMP	1	ALL	
44	SERVO AMP REGEN MODULE	1	ALL	
45	SERVO AMP MOTOR	1	ALL	T0926
46	RESISTOR	1	ALL	O591629
47	RELAY SOCKET	4	ALL	T1306
48	RELAY SOCKET CLIPS	8	ALL	T1304
49	RELAY, 120VAC 4 POLE SILVER FLASHED	4	ALL	T0739
50	HYD. VALVE DIN CABLES A/C	3	ALL	O591531
51	SUPPRESSOR, MOV	2	ALL	591619
52	LAMPS, SHADOW LIGHT	12	ALL	T0467-1
53	PLC, CPU BASE	1	ALL	O5916073
54	PLC POWER SUPPLY	1	ALL	5916072
55	PLC RELAY MODULE	1	ALL	T0924
56	PLC MOTION MODULE	1	ALL	T0925
57	PLC AUX. TERM BLOCK	1	ALL	T0930
58	EASON	1	ALL	T0933
59	EASON, E PROM - PROGRAMMED	1	ALL	T1775
60	PLC, EE PROM - PROGRAMMED	1	ALL	T1774
61	SUPPRESSOR, A/C LINE FILTER	1	ALL	T1861
62	RELAY, SOLID STATE	1	ALL	T1862
63	TOGGLE SWITCH	1	ALL	O531619
64	TIMER	1	ALL	T1863
65	TIMER SOCKET	1	ALL	T1864
66	LIGHT SOCKETS, SHADOW LIGHTS	12	ALL	T0466
67	ZENER DIODE	1	ALL	T1865
68	DECAL, ELECT. ENCLOSURE	1	ALL	
69	DECAL, CONTROL LEGEND	1	ALL	T1251
70	RELAY, 120VAC 4 POLE SILVER FLASHED	2	ALL	T0739
71	RELAY SOCKET	2	ALL	T1306

7.3. Electrical Schematic – Programmable GOTO (Configuration A)

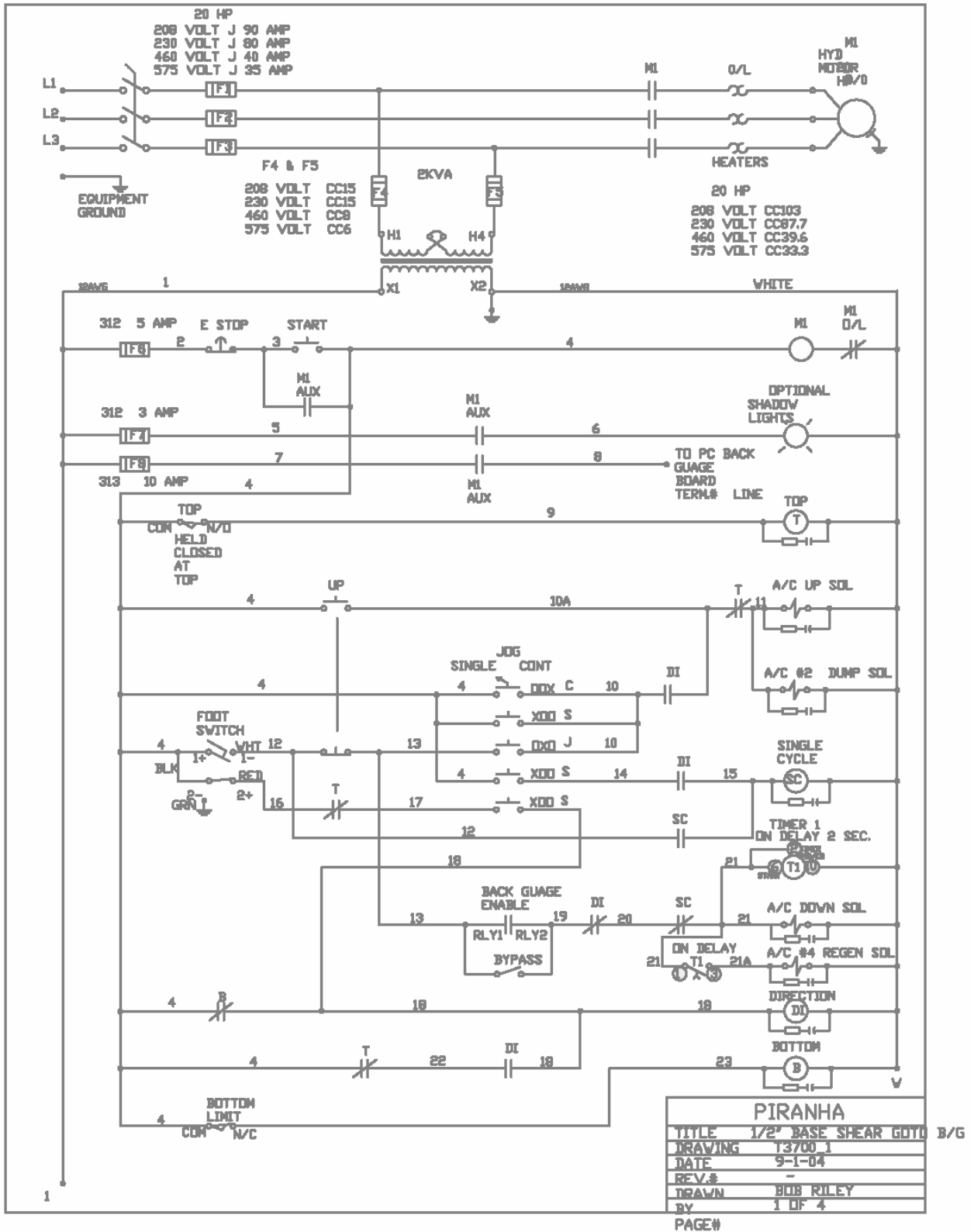


Figure 16: Electrical Diagram 1 of 4

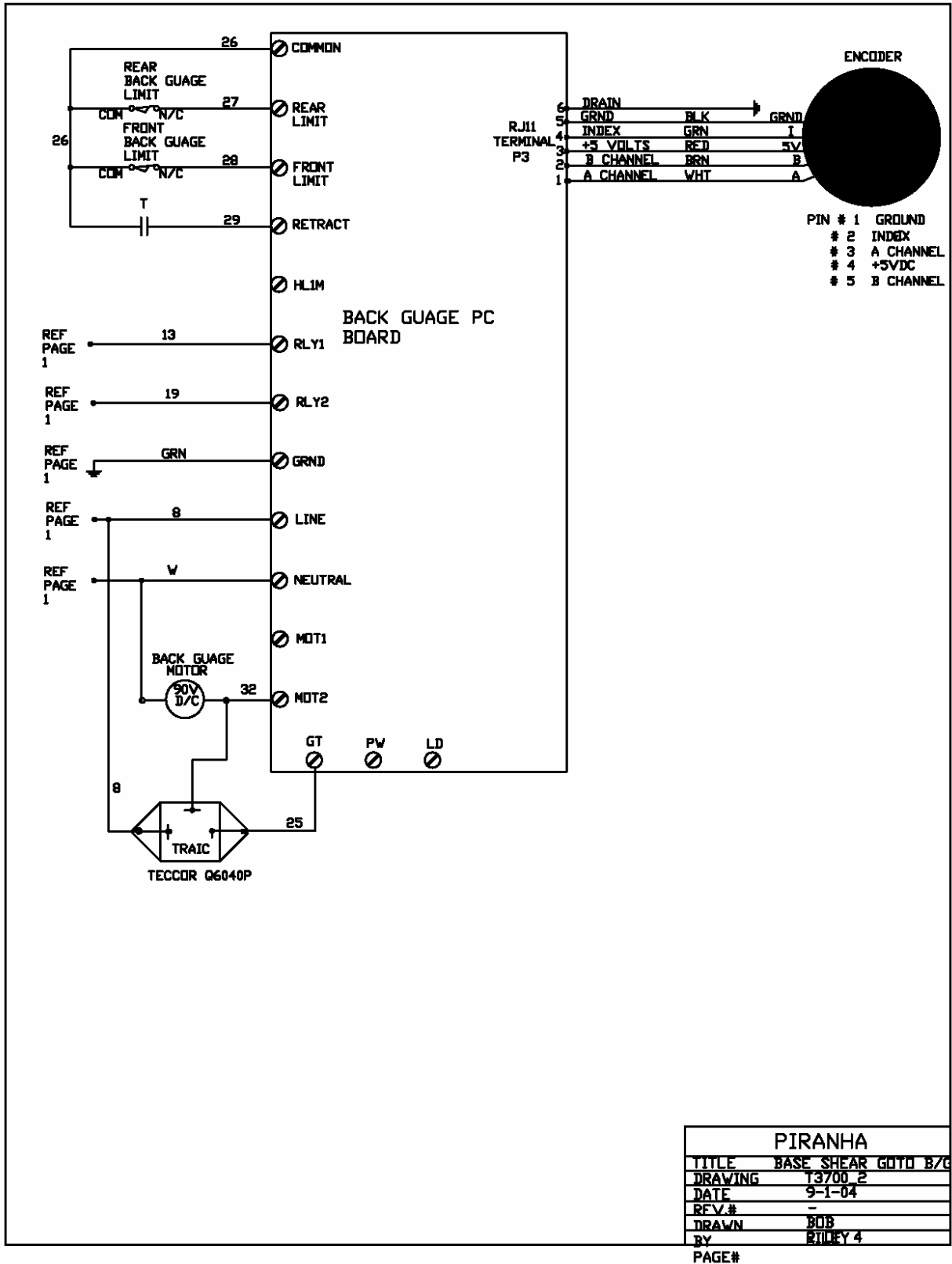


Figure 17: Electrical Diagram 2 of 4

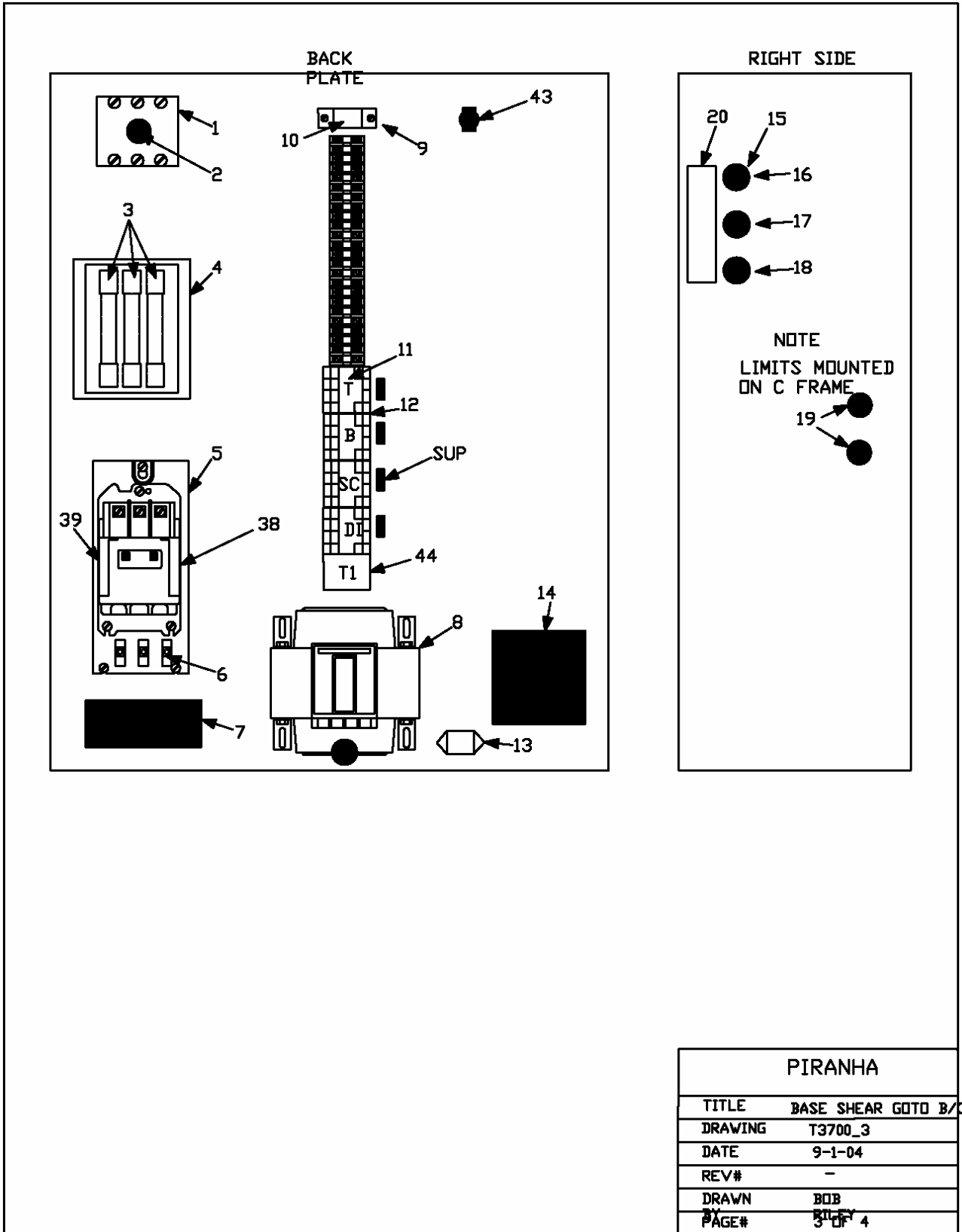


Figure 18: Electrical Diagram 3 of 4

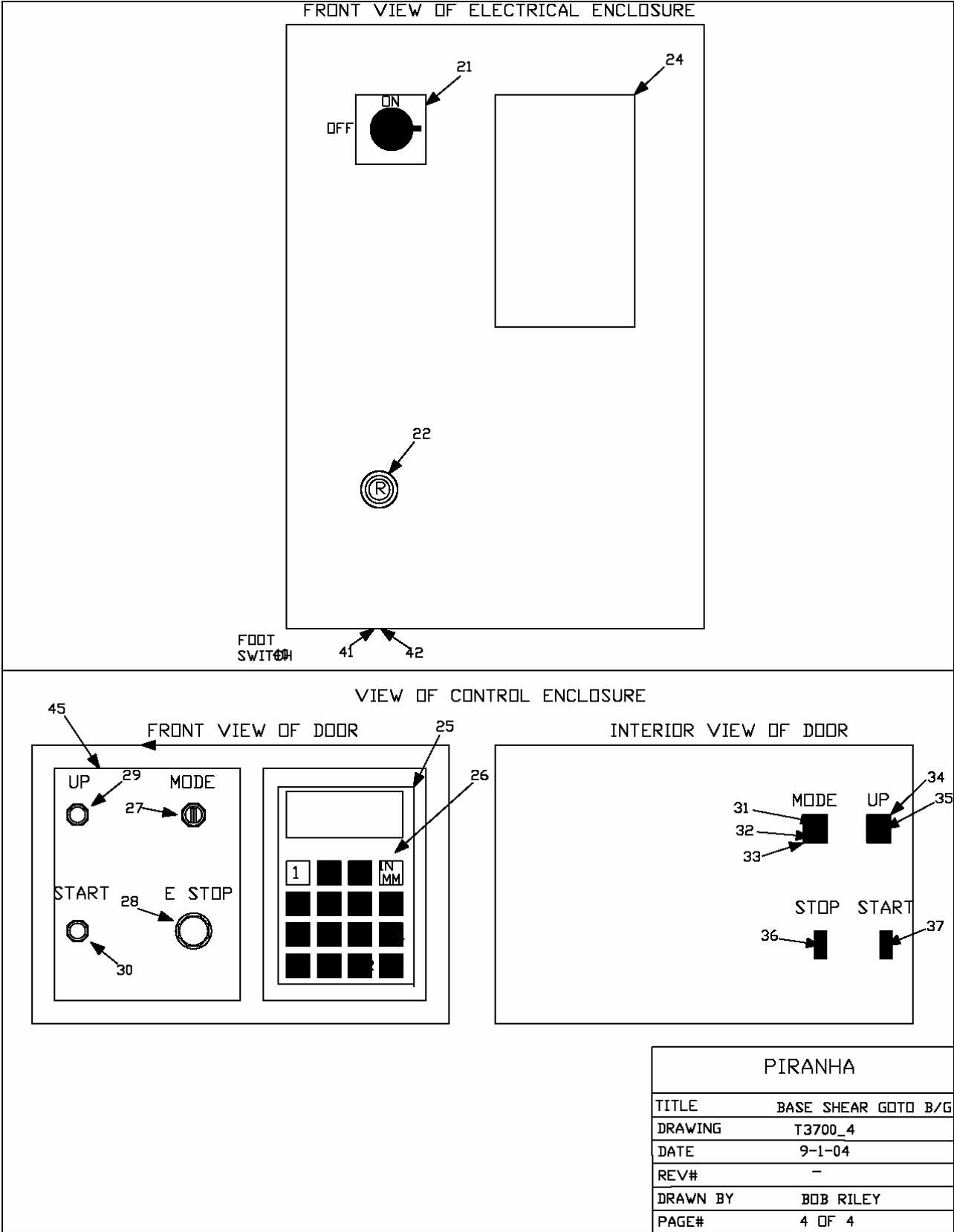


Figure 19: Electrical Diagram 4 of 4

Electrical Component List –20 HP (Configuration A)

FIG	DESCRIPTION	QTY	VOLTAGE	PART #
1	DISCONNECT 20HP	1	208/230	0591602
2	DISCONNECT SHAFT	1	ALL	T0727
3	FUSES, MOTOR SHORT CIRCUIT 20HP	3	208	T0781
3	FUSES, MOTOR SHORT CIRCUIT 20HP	3	230	T0780
3	FUSES, MOTOR SHORT CIRCUIT 20HP	3	460	T0777
3	FUSES, MOTOR SHORT CIRCUIT 20HP	3	575	T2256
4	FUSE BLOCK, SHORT CIRCUIT 20HP	1	460/575	T0782
5	STARTER, M1 20HP	1	208/230	T0729
5	STARTER, M1 20HP	1	460/575	T2257
6	HEATERS, M1 OVERLOAD 20HP CC103	3	208	T0786
6	HEATERS, M1 OVERLOAD 20HP CC87.7	3	230	T0788
6	HEATERS, M1 OVERLOAD 20HP CC39.6	3	460	0531638
6	HEATERS, M1 OVERLOAD 20HP CC33.0	3	575	T2258
7	SUPPRESSOR, MOTOR M1	1	ALL	0501604
8	TRANSFORMER	1	208	T2244
8	TRANSFORMER	1	230/460	T2245
8	TRANSFORMER	1	575	T2246
9	FUSE HOLDER, TRANSFORMER PRIMARY	1	ALL	T1302
10	FUSE, TRANSFORMER PRIMARY	2	208	T2247
10	FUSE, TRANSFORMER PRIMARY	2	230	T2248
10	FUSE, TRANSFORMER PRIMARY	2	460/575	T2249
11	RELAY, 4 POLE 120V A/C	4	ALL	T0739
12	RELAY SOCKETS	4	ALL	T1306
13	TRIAC, D/C BACK GAUGE MOTOR	1	ALL	T2250
14	PRINTED CIRCUIT BOARD, BACK GAUGE	1	ALL	T2114
15	FUSE HOLDER, PANEL MOUNT	3	ALL	T0733
16	FUSE, CONTROL CIRCUIT	1	ALL	T0736
17	FUSE, SHADOW LIGHT	1	ALL	T2251
19	FUSE, BACK GAUGE CIRCUIT	1	ALL	T2252
20	DECAL, CONTROL FUSES	1	ALL	T2200
21	DISCONNECT OPERATOR	1	ALL	0531604
22	RESET BUTTON W/ SHAFT	1	ALL	0531686-1
24	DECAL, MOTOR SHORT CIRCUIT/TRANSFORMER	1	ALL	T2201
25	BACK GAUGE DISPLAY MODULE	1	ALL	T2113
26	KEYPAD, BACKGAUGE	1	ALL	T2018
27	SELECTA SWITCH, 3 POS,MODE	1	ALL	T1670-1
28	EMEG. STOP OPERATOR, RED MUSHROOM	1	ALL	T0737-1
29	PUSH BUTTON OPERATOR, YELLOW EXTED.	1	ALL	T1668-1
30	PUSH BUTTON OPERATOR, GREEN FLUSH	1	ALL	05316101-1
31	CONTACT BLOCK W/ BASE 1N/O	1	ALL	0531696-1
32	CONTACT BLOCK 1 N/O	1	ALL	05316781-1
33	CONTACT BLOCK 1 N/C	2	ALL	0591596-1
34	CONTACT BLOCK W/ BASE 1N/O	1	ALL	0531696-1
35	CONTACT BLOCK 1 N/C	1	ALL	0591596-1
36	CONTACT BLOCK W/ BASE 1 N/C	1	ALL	05316121-1
37	CONTACT BLOCK W/BASE 1 N/O	1	ALL	0531696-1

FIG	DESCRIPTION	QTY	VOLTAGE	PART #
38	STARTER AUX. CONTACT, 1 N/O	1	ALL	T01303
39	STARTER AUX. CONTACT, 2 N/O	1	ALL	T2253
40	FOOT SWITCH	1	ALL	T0748
41	FOOT SWITCH PLUG	1	ALL	0531617
42	FOOT SWITCH RECP.	1	ALL	0531618
43	TOGGLE SWITCH	1	ALL	0531619
44	SUPPRESSOR, MOV	2	ALL	0591619
45	DECAL, CONTROL PANEL	1	ALL	T1964
	RECTIFIED HYD. PLUGS	2	ALL	0531529
	ENCODER	1	ALL	T2159
	SHADOW LIGHT LAMPS	8	ALL	T0467-1
	SHADOW LIGHT LAMP SOCKETS	8	ALL	T0466

7.4. Hydraulic Valve Block

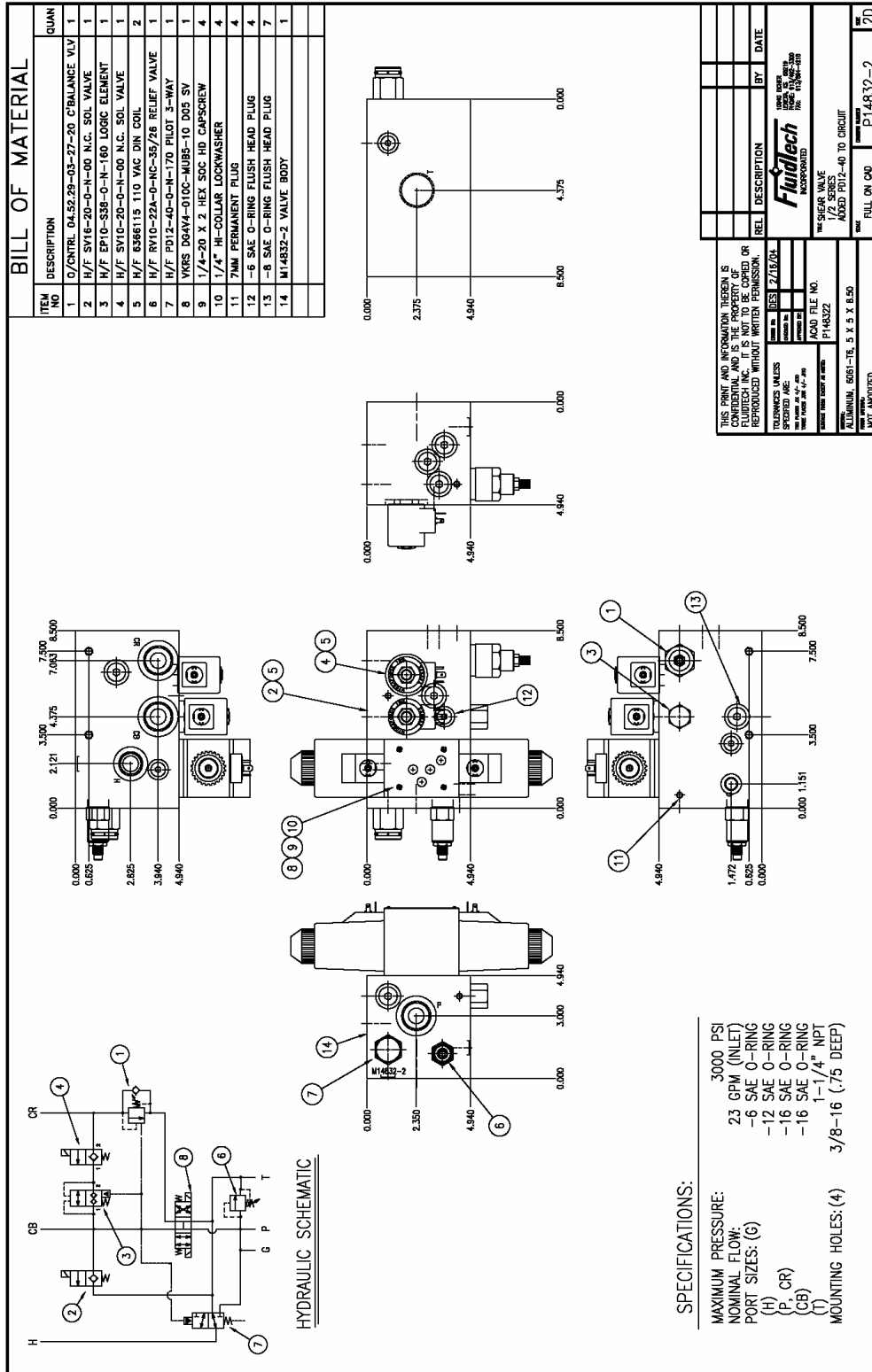


Figure 20: Hydraulic Diagram

Hydraulic Schematic- T2765-1

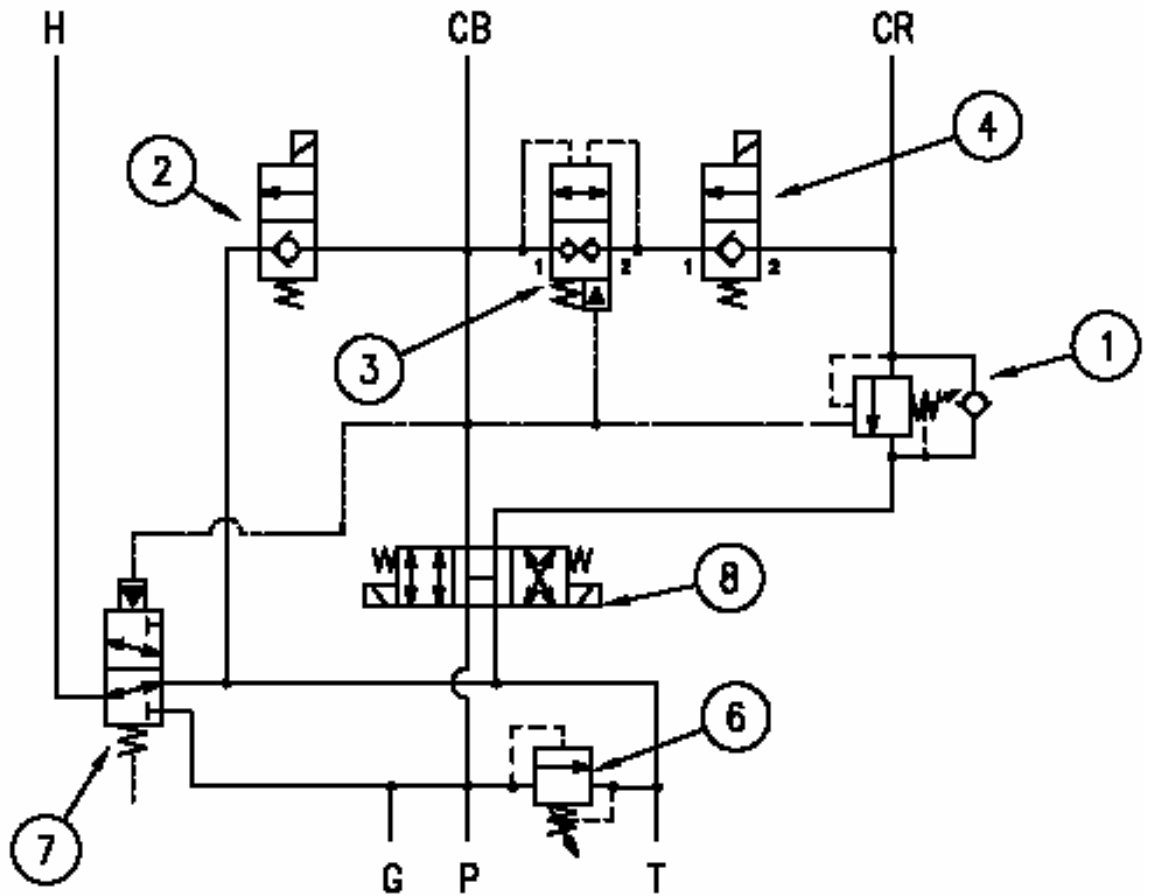


Figure 21 Hydraulic Schematic

	Description	20 HP	30 HP
1	Counterbalance Valve	T3570	T3577
2	N/C Solenoid Valve	T3571	T3571
3	Logic Element	T3572	T3572
4	N/C Solenoid Valve	T3573	T3573
6	Relief Valve	T3575	T3574
7	Pilot 3-Way	T3579	T3579
8	Directional Valve	T3576	T3578

- H Hold downs
- CB Cylinder Base End
- CR Cylinder Rod End
- G Gauge Port
- P Pressure (From Pump)
- T Tank (Return to Tank)

8. Parts

Diagrams are provided for the major assemblies of the shear. The accompanying parts lists provide item references and descriptions. Part numbers and quantities are provided only where applicable.

Repair parts are available for the Piranha Shear from the manufacturer. Always provide the model and complete serial number of the press brake along with the part number description and quantity of the desired parts.

8.1. Finger Guard & Hold downs

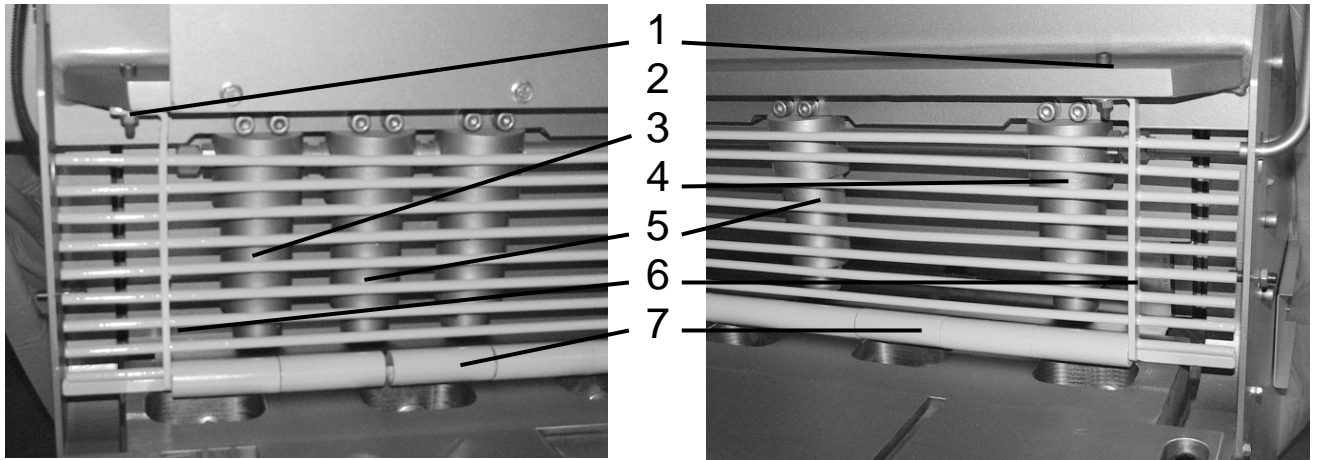


Figure 22: Finger Guard & Hold downs

Item	Description	Part #	Qty.
1	Finger Guard Mounting Bolts		
2	Hold Down Mounting Bolts		26
3	Hold Down Cylinder Left Side	T2144	1
4	Hold Down Cylinder Right Side	T2143	1
5	Hold Down Cylinder	T2138	11
6	Finger Guard	T0400-2	1
7	Awareness Barrier		

8.2. Ram & Linkage

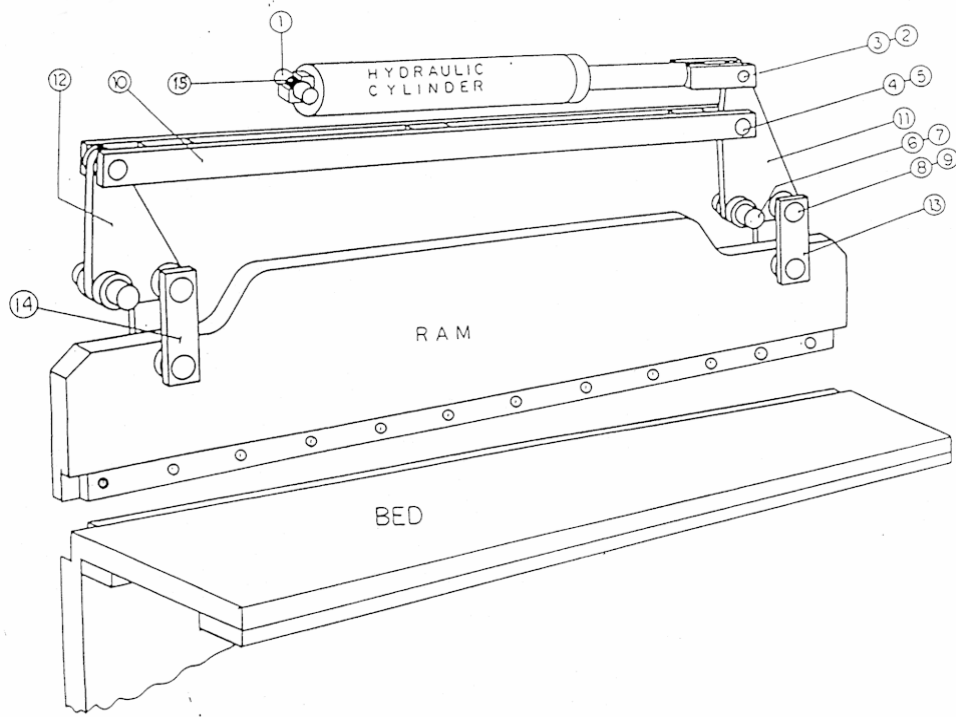
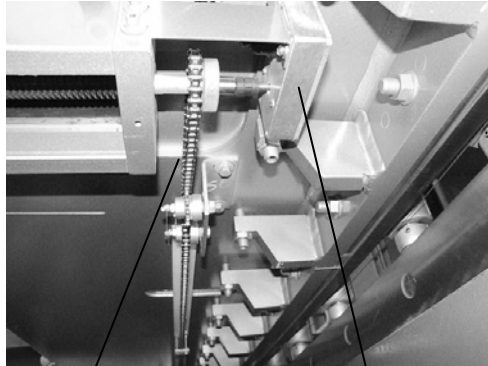


Figure 23: Ram & Linkage

Item	Qty.	Description	Part #
1	1	Cylinder Pin	
2	1	Cylinder Lever Pin	
3	2	Garfil Liner	
4	2	C-Rod Pin	
5	2	Garfil Liner	
6	1	Main Hinge Pin	
7	2	Garfil Liner	
8	4	Link Pin	
9	4	Garfil Liner	
10	1	C-Rod	
11	1	Lever, Long	
12	1	Lever, Short	
13	2	Link	
14	2	Link	
15	2	Garfil Liner	
16	1	Hydraulic Cylinder Assembly	T0553-1
	2	Shear Blade 10' (10' Shear)	T3084
	2	Shear Blade 12' (12' Shear)	

8.3. Back Gauge Assembly – Base GOTO



Chain Drive

Encoder Assy

FIG #

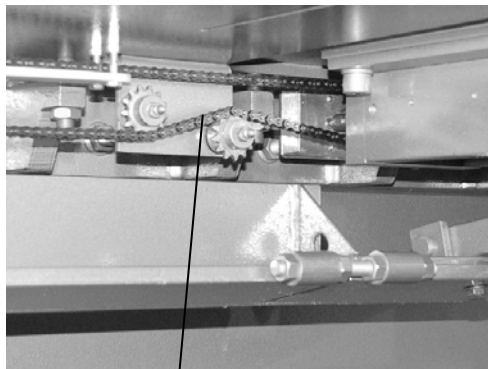
24A

24D



Front Power Cut Off Back Gauge Limit Switch

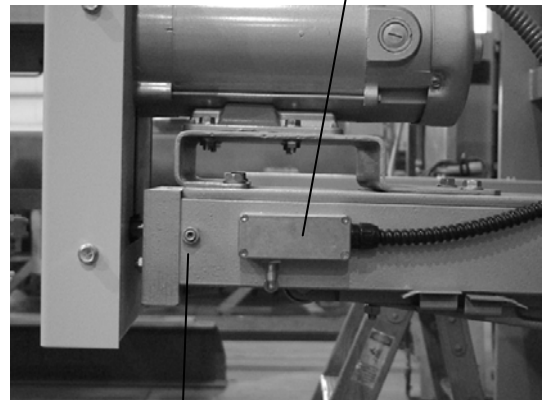
Rear Power Cut Off Back Gauge Limit Switch



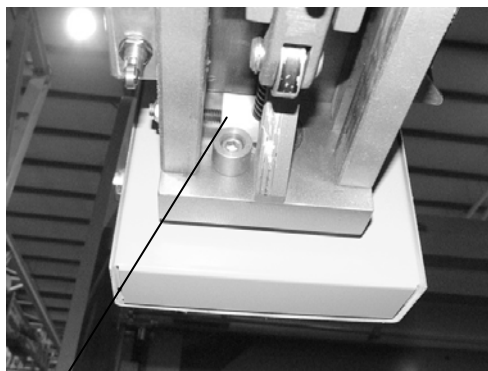
Chain Tension Idler Assy

24B

24E



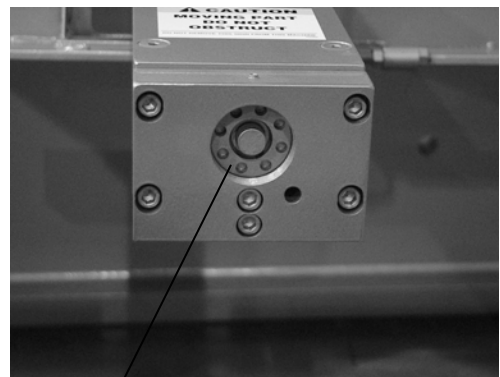
Back Gauge Drag Block Adjustment Nut



Back Gauge Drag Block

24C

24F



Back Gauge Lead Screw Spanner Nut

Figure 24 BG Assy GOTO

Back Gauge Bar



Figure 25: Back Gauge Bar

Item	Qty.	Description	Part #
1	3	Back Stop Straightener Assy	
2	2	Back Stop Bar Machined	

8.4. Hydraulic Assemblies-

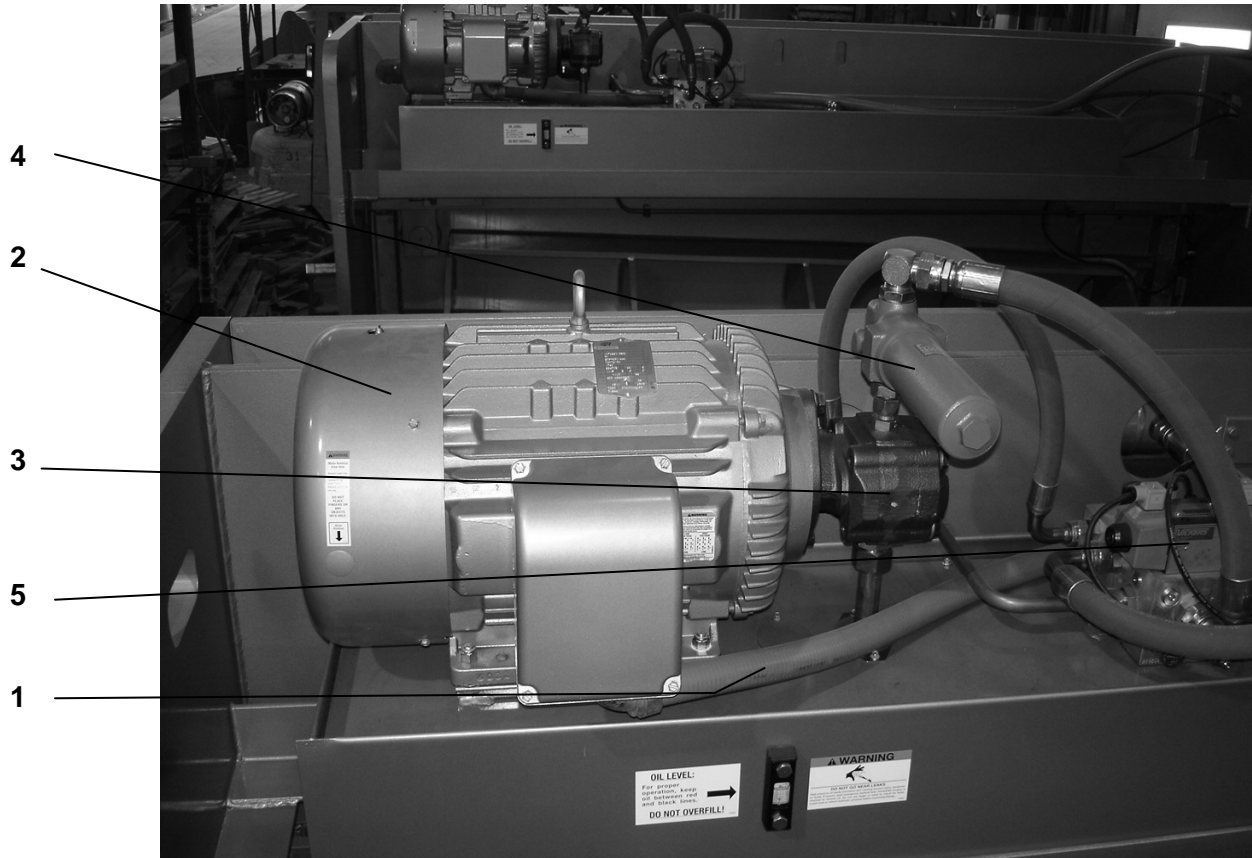


Figure 26: Hydraulic Power Unit

Item	Description	Part # 20 Hp	Part # 30 Hp	Qty.
1	Motor Power Harness	10'-T37002	10'-T2788	1
		12'-	12'-	1
2	Motor			
	208 Volt	0571662-1	T1540	1
	220/440 Volt	0571660-1	T1540	1
	575 Volt	0571665-1	T	1
3	Pump	05915701-1	T2764-1	1
4	Filter Assembly	0591550-1	0591550-1	1
4	Filter Element	0591551-1	0591551-1	1
5	Valvepack	T0271-4	T2765-1	1

Table 2: Hydraulic Power Unit Descriptions

8.4.1. Valve Body Assembly



Figure 27: Valve Body Assembly

Item	Qty.	Description	Part Number 20 Hp	Part Number 30 Hp
1	1	Counterbalance Valve	T3570	T3577
2	1	N/C Solenoid Valve	T3571	T3571
3	1	Logic Element	T3572	T3572
4	1	N/C Solenoid Valve	T3573	T3573
6	1	Relief Valve	T3575	T3574
7	1	Pilot 3-Way	T3579	T3579
8	1	Directional Valve	T3576	T3578

8.5. Oil Filter Assembly

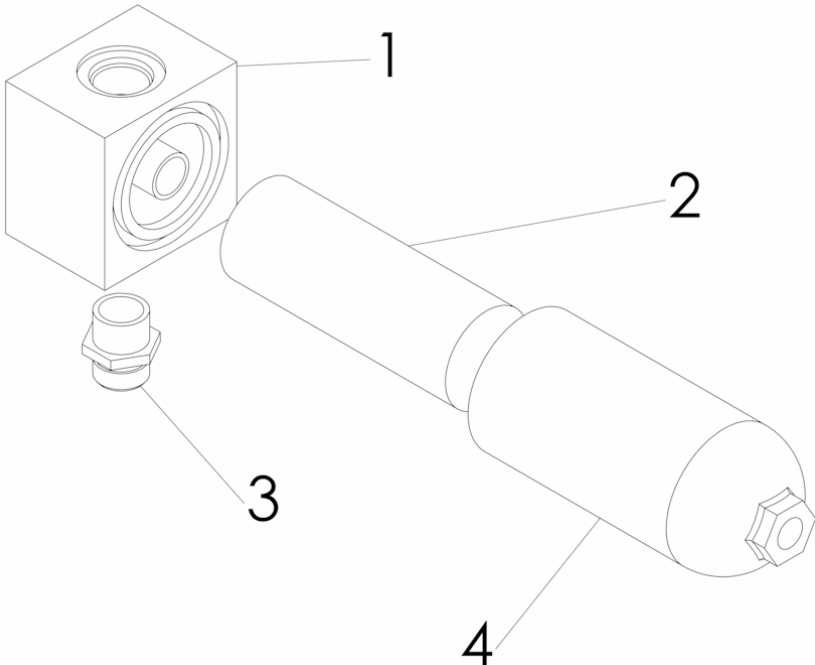


Figure 28: Oil Filter Assembly (PN-0591550-1) Exploded View

Figure-Item	Description	Part #
1	Filter Element	0591551-1

8.6. Blade Adjust Components

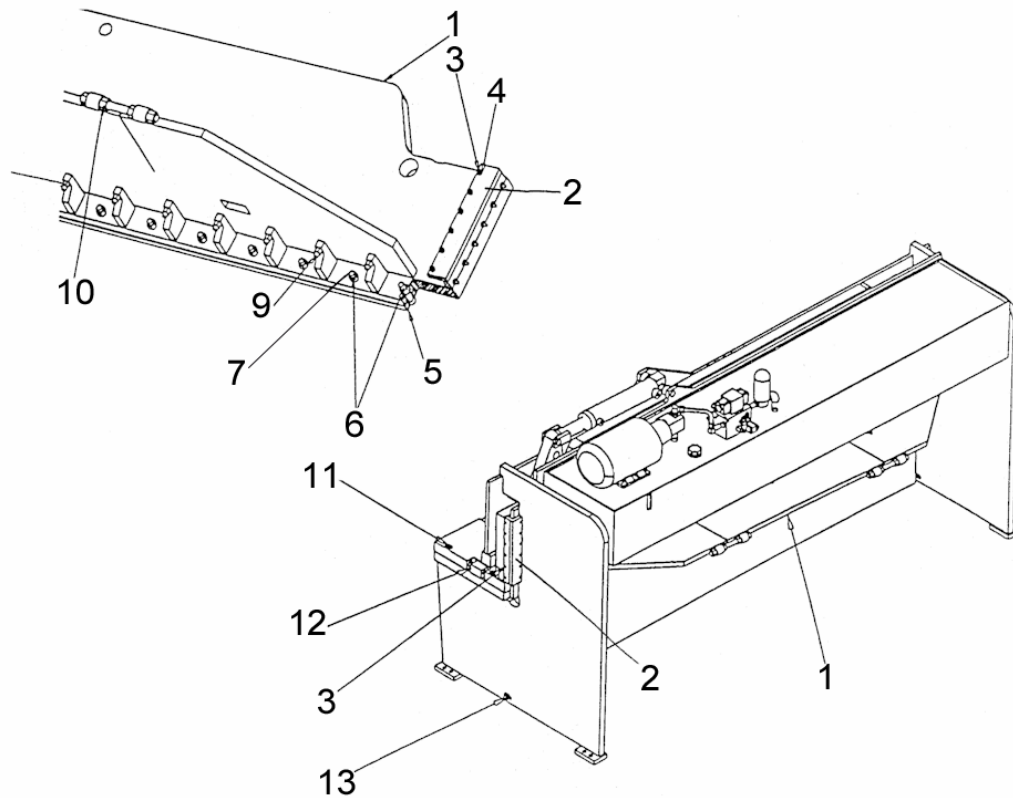


Figure 29: Blade Adjust Components

Item	Description	Qty	Part Number
1	Ram	1	
2	Gib Supports	2	
3	3/8"-16 SSS 2-1/4" Flat Point		
4	3/8"-16 FIN Hex Nut Plain		
5	Knife 12' Shear	2	
6	Shear Knife Bolt	32	
7	Shear Knife Nut	32	
8			
9	Blade Straightness Adjustment Nut		
10	Ram Tension Nut		
11	Bed Locking Bolts		
12	Blade Clearance Adjustment Bolts		
13	Bed Locking Bolts		

8.7. Ram Slides

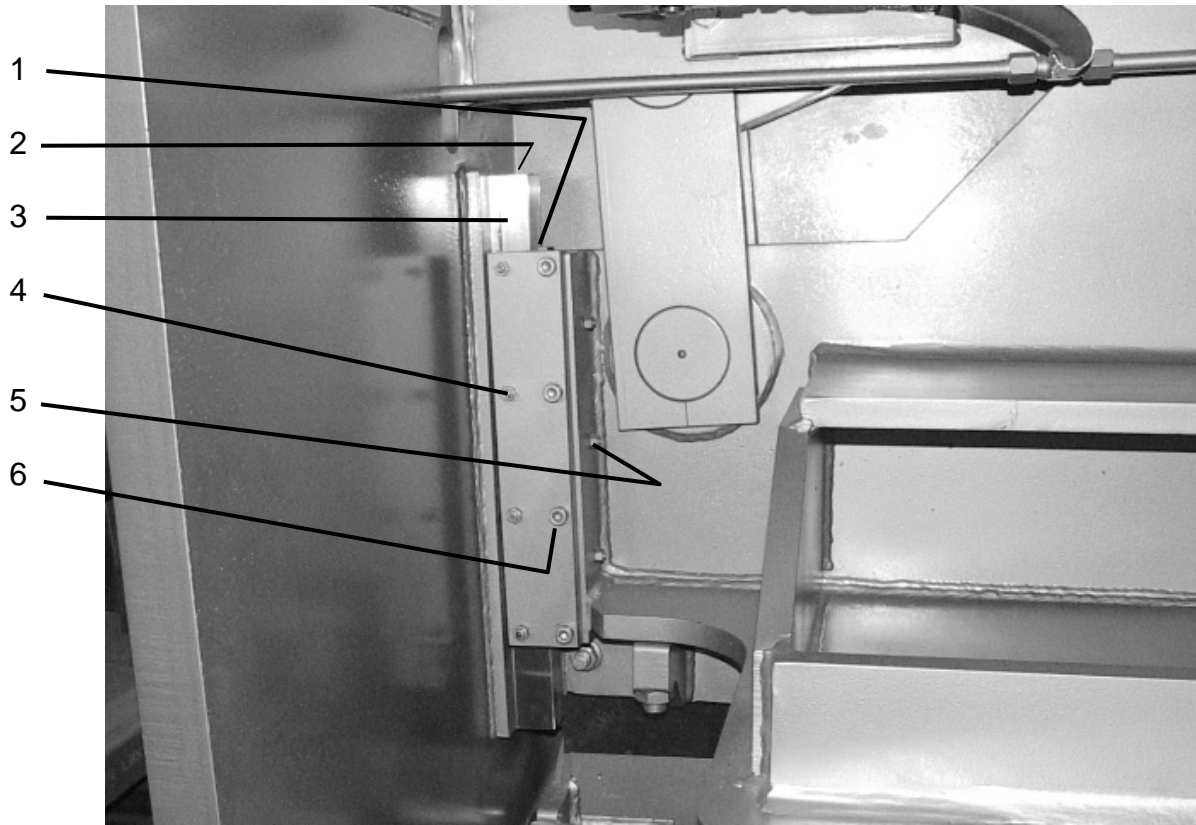


Figure 30: Ram Slide Components

Item	Description	Part #	Qty
1	Ram Slide Phenolic LHS (Rear)	T2685	1
1	Ram Slide Phenolic RHS(Rear)	T2686	1
2	Ram Slide Phenolic LHS(Front)	T2680	1
2	Ram Slide Phenolic RHS(Front)	T2681	1
3	Ram Slide	T2689	2
4			
5			
6			

9. Glossary

AC Motor	<i>An electric motor designed to operate using AC power.</i>
Accuracy	<i>The deviation of a value from its theoretical value after the device has been correctly calibrated.</i>
Ambient Condition	<i>The surrounding atmosphere and environment.</i>
ANSI	<i>American National Standards Institute. A national, nonprofit organization. Its principle function is to establish industry-wide standards that are put in place through a process of consensus among qualified participants.</i>
Backlash	<i>Mechanical clearances that exists or may develop through wear between a driven component and a drive source.</i>
Ball Bushing/Linear Bearing	<i>A tubular shaped ball bearing assembly designed for linear movement on a shaft.</i>
Bed	
Circuit Breaker	<i>A device used with electrical equipment to provide overload protection.</i>
Coupling (Shaft)	<i>A mechanical device used to join a motor output shaft to a machine part, typically a roller.</i>
Cycle	<i>A series of events or operations that recur regularly and usually lead back to the start.</i>
Cylinder	<i>A piston-type actuator.</i>
DC Power Supply	<i>An electrical device used to convert incoming AC power to regulated DC power.</i>
Electrical Spike	<i>An unpredictable and infrequent momentary high electrical voltage which can harm electrical/electronic devices.</i>
Encoder	<i>A device typically electromechanical, that translates motion into electrical pulses. See also Resolver, Tachometer, or Transducer.</i>
Feedback	<i>The return to an input of a part of the output of a machine or control system, or process.</i>

Fuse	<i>Electrical overload protection device.</i>
Fuse Block	<i>A holder for a fuse or fuses including wire termination.</i>
Gauge	<i>A stop against which the material or workpiece is placed to locate it within the point of operation.</i>
Gibs	<i>The machine members used for guiding the ram.</i>
Grease zerk	<i>Fitting designed to accept grease for lubricating components.</i>
Hydraulics	<i>The branch of mechanics, which uses controlled hydraulic oil flow, and pressure to provide force to an actuator.</i>
Inertia	<i>A property of matter by which it stays at rest or in uniform motion in the same straight line unless acted on by an external force.</i>
Lifting lugs	<i>Steel plates with large holes that are attached to the press brake to assist in lifting the machine.</i>
Limit Switch	<i>Typically, an electrical device that provides position information to a control system.</i>
Low Voltage	<i>A voltage reading that is lower than the required or expected voltage.</i>
Machinist Square Level	<i>Machinists level having four sides. Permits' measuring vertical surfaces as well as horizontal surfaces.</i>
Motor Starter	<i>A relay capable of withstanding inductive load generated when starting an electric motor (AC or DC).</i>
Open Loop	<i>A control concept in which feedback is not used to modify the characteristics of the output.</i>
Operator Interface	<i>Typically, a control or control panel provided for an operator to modify or monitor system variables.</i>
Photo Sensor	<i>An electronic sensor that uses light wavelengths to detect the position or presence of an object.</i>

Point of Operation	<i>The location in the shear where the material or a workpiece is positioned and work is performed.</i>
Pressure Reducer	<i>Typically, a hydraulic component that senses secondary pressure to maintain that output pressure regardless of the incoming pressure.</i>
Pressure Relief	<i>Typically, a hydraulic component that uses a spring to hold an orifice closed until system pressure overcomes the spring and allows flow to the reservoir.</i>
Proximity Sensor	<i>An electrical device capable of detecting the presence of an object.</i>
PSI	<i>Acronym. Available Force expressed in Pounds per Square Inch</i>
Pushbutton	<i>A small button or knob actuated by pushing, provided for operator control, electrical, pneumatic, or mechanical.</i>
Relay	<i>An electromechanical device for remote or automatic control that is actuated in variation of conditions of an electrical circuit and that operates other devices in an electrical circuit.</i>
Repeatability	<i>The closeness of agreement among multiple measurements of an output, for the same value of the measured signal under the same operating conditions, approaching from the same direction for full range traverses.</i>
Reset	<i>To restart or arm a control or safety system.</i>
RPM	<i>Acronym. Rotational speed expressed as Revolutions per Minute.</i>
Safeguarding	<i>A method for protection of personnel from hazards using guards, safety devices, or safe work procedures.</i>
Selector Switch	<i>A small button or knob actuated by turning, provided for operator control, electrical, pneumatic, or mechanical.</i>
Service (Safety) Disconnect	<i>Typically, a large mechanical switch that is provided to completely remove incoming power for the purpose of storage or service of a machine.</i>

Setup	<i>The process of adjusting the press brake and the installation and adjustment of work holding devices or tooling and appropriate safeguarding to ensure proper and safe operation of the press brake.</i>
Shield (foil or braided)	<i>Typically, a metallic encasement surrounding wiring or components to avoid interference from RF signals.</i>
Solenoid Valve	<i>Typically, a pneumatic or hydraulic valve actuated by an electromagnetic coil.</i>
Throat	<i>An opening or recess in the ram (housing) to permit the positioning of material or workpieces.</i>
Transducer	<i>A device typically electromechanical, that translates motion into electrical pulses.</i>
Transformer	<i>An electrical device that employs the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit.</i>
Valve	<i>Any of numerous mechanical devices by which the flow of liquid, gas, or loose material in bulk may be started, stopped, or regulated by a moveable part that opens, shuts, or partially obstructs one or more ports or passageways.</i>

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11. Addendums