

Wintriss Press Control

Please be advised the WPC 1 Clutch/Brake control is no longer serviceable due to parts availability.

We do offer a current version of the Clutch/Brake control called the WPC2000 as a replacement.

In some cases we offer an upgrade program at a discounted price to replace the WPC 1. If you're interested in this upgrade please call our customer service group at 800 586 8324 and select option 1.



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User Manual

Requirements you must meet when installing and using the Wintriss Press Control

The Wintriss Press Control (WPC) is designed solely for controlling operation of metal stamping presses. Before installing or using the WPC, be sure you understand and follow these requirements:

- All metal stamping presses on which the WPC is used must meet the requirements of OSHA regulation 1910.217 and ANSI B11.1-1988. All inspection procedures in 1910.217 must be followed and all presses must be maintained as stated in the regulations. Data Instruments takes no responsibility in cases where stopping mechanisms of machinery or other devices are not maintained or do not meet their applicable regulations or standards.
- If the brake or other mechanism that stops the machine is not working properly, the machine may not stop safely even though the WPC is working properly. Data Instruments takes no responsibility for improper machine operation in cases where the appropriate machine stopping mechanisms are not working properly.
- The WPC must be installed by qualified personnel.
- Point of operation safeguarding, the single most important factor in the elimination of injuries, can only be determined by the press user. All applicable OSHA and ANSI regulations for safeguarding press systems must be followed when installing and operating the WPC. The two hand control must be installed at the correct safety distance as defined in the OSHA and ANSI regulations, and additional safeguarding devices may be needed to ensure operator safety. The WPC is not in itself a safeguarding device. Data Instruments takes no responsibility for injury if the proper safeguarding devices are not installed or working properly.
- Data Instruments further takes no responsibility for operator injury if the proper safety procedures are not followed during installation or operation of the WPC.
- Before making any wiring connections to the WPC, all power to the machinery must be off. This includes power to the machine control and motor. Make sure power is off at the point where wiring for the WPC is connected.
- Wiring and installation must be performed in accordance with the requirements of OSHA lock-out/tagout regulation 1910.147.
- Once the WPC is installed, all checkout procedures in this manual must be performed. Any problems detected must be corrected before use. Data Instruments takes no responsibility in cases where the checkout procedures listed in this manual have not been followed prior to use.
- Only the procedures and repairs listed in this manual should be performed on the WPC. Tests and repairs must be performed by qualified personnel. Data Instruments takes no responsibility for improper operation if any other repairs or modifications are made.
- Never operate any machinery controlled by the WPC if the machinery is not in working order.
- Make sure that supervisors, die-setters, maintenance persons, machine operators, and foremen have read and understand all instructions pertaining to the use of the WPC.
- Make sure all operators and other affected personnel know which machinery the WPC controls. Other equipment or devices which may be operating along with the machinery the WPC is connected to will not be signalled to stop by the WPC.
- All procedures in this manual must be followed for proper WPC operation. Data Instruments takes no responsibility for operation if you do not follow the procedures and comply with warning statements in this manual.

The enforcement of the above requirements is beyond Data Instruments' ability to control. For proper WPC operation, it is your responsibility to follow these requirements and any other requirements and procedures which may be specific to your machinery.

Changes for Revision 8.1 of the Wintriss Press Control User Manual

Revision 8.1 of the Wintriss Press Control User Manual covers all Wintriss Press Control versions.

This is the change for Revision 8.1:

- Figure 4 and Figure 19 have been revised to reflect wiring modifications as related to Shadow V

Note about software revisions: Some software revisions do not affect how you install or operate Wintriss Press Control. They only affect the internal workings of Wintriss Press Control. Manual revisions are made only when software changes affect the user. You may receive this manual with a software revision number higher than the one listed above. This means there were no software changes that affect what is in the manual.

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WARRANTY

Data Instruments Inc. (D.I.) warrants that Data Instruments / Wintriss Press Control is free from defects in material and workmanship under normal use and service for a period of one year from date of shipment. D.I.'s obligations under this warranty are limited to repairing or replacing, at its discretion, and at its factory or facility, any products which shall, within the applicable period after shipment, be returned to D.I. freight prepaid, and which are, after examination, disclosed to the satisfaction of D.I. to be defective. This warranty shall not apply to any equipment which has been subjected to improper installation, misuse, negligence, or accident. The provisions of this warranty do not extend the original warranty of any product which has been repaired or replaced by D.I., and no other warranty is expressed or implied. This warranty is necessarily limited to the quality of materials and workmanship in the Wintriss Press Control as it is supplied to the original purchaser; proper installation and maintenance become the sole responsibility of the user upon receipt of the device.

Data Instruments manufactures its Wintriss Press Control system to meet stringent specifications, and cannot assume any responsibility for consequences arising from its misuse.

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WINTRISS PRESS CONTROL
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Chapter 1

The Wintriss Press Control

The Wintriss Press Control (WPC) controls part revolution mechanical power presses. It is easy to set up and easy to use.

This chapter describes the major components of the WPC and explains where they are installed.

For detailed installation instructions, see Chapter 2.

The Wintriss Press Control

The standard Wintriss Press Control consists of a:

- Control box
- Operator station
- Six-station rotary limit switch with two spare stations, encoder, and drive check mounting base
- Dual monitored 3/4" safety valve
- Switch for monitoring system air pressure
- Shadow light curtain (optional but required for point of operation guarding if the WPC is used with a foot switch or in the One Hand Mode)

Functions of each part of the system

The function of each part of the Wintriss Press Control is described below:

Control box

The brains of the system is the control box. Inside the control box you will find the WPC assembly which consists of the power supply and control board. On the outside of the cover are key switches, digital displays and indicators.

There are two key switches on the standard control box:

STROKE SELECT determines how the press will operate: inch, single stroke, or continuous.

MODE SELECT determines how the operator will run the press: one hand, two hand, or foot.

There are two digital readouts:

STATUS CODE displays status codes when a fault has been detected.

STOP TIME displays stop time of the press.

There are four indicator lights:

INTERRUPTED STROKE comes on when the press is stopped before the completion of the stroke.

BRAKE WARNING comes on when the press's brake is wearing down and should be checked. The lamp lights when stop time is within 10 milliseconds of the brake fault setting.

CONTROL FAULT comes on whenever the press stops and a status code appears in the status code display. Status codes are defined in Appendix A.

BRAKE FAULT comes on when the stop time equals or exceeds the brake fault setting.

The control box should be located so it can be seen by the operator running the press. It can be mounted to the press frame or it can be mounted on a free standing rack. Make sure that the door has enough room to open completely.

Operator station

The press is run from the Operator Station. The Operator Station has several switches and indicator lights located on the front or sides of the unit.

Two **RUN/INCH** palm switches are used to initiate press action.

The **PRIOR ACT** switch is an arming switch that, in certain operating modes, must be pressed before the press will start stroking.

The **PALM TIME** indicator light comes on when any one palm button is pressed. To run the press, the other palm button must be pressed before the light goes out.

The **EMERGENCY STOP/RESET** switch will immediately stop the press. This switch also resets the WPC when a fault occurs.

The **MUTE** indicator light comes on when the light curtain is muted (during the up stroke). Requires optional software.

The **TOP STOP** switch stops the ram at top of stroke during continuous operation.

An optional **LEFT/RIGHT SELECT** keylock switch for the **ONE HAND** trip mode, may be located on the bottom of the Operator Station.

The Operator Station should be located where the operator will run the press. On most OBI's this will be on the front of the bolster. For straight sides it may be on the press or on a pedestal. No one means is preferred or recommended. Each application will be different.

Rotary limit switch and encoder assembly

This assembly provides the WPC with ram position information and shaft encoder input for brake monitoring.

The rotary limit switch and encoder assembly should be mounted where the original rotary limit switch was mounted.

Dual safety valve and system air pressure switch

The Dual Safety Valve controls the air flow that operates the clutch and brake of the press. The Air Pressure Switches monitor the system air pressure.

Shadow light curtain

The Shadow light curtain is a presence sensing device that places an infrared light field between the point-of-operation and the operator. When something enters the sensing field and a light beam is blocked, the object is detected and the press is immediately stopped.

The standard WPC is designed to be used with a Shadow V light curtain. However, you can purchase a Press Control without a light curtain. In this version, the control box does not have a MODE SELECT switch, and the Control will only operate in the TWO HAND mode.

The light curtain is located between the Operator Station and the die space. The mounting bracket design should allow plenty of room for adjustment.

Optional components

These optional components are also available:

- Foot switch
- Counterbalance air pressure switch
- Bar mode box
- Dual monitored 1" safety valve
- Dual operator select control
- External trip control
- Touch Control
- Output for an external relay

FOOT SWITCH

This fully guarded foot switch frees up the operator's hands for increased productivity.

COUNTERBALANCE AIR PRESSURE SWITCH

This works the same as the system air pressure switch. However, this switch is used with the counterbalance air supply. It is required by OSHA regulations on presses with counterbalances.

BAR MODE CONTROL

Lets operators and setup personnel bar the press by hand for die setting and adjustment.

1" DUAL SAFETY VALVE

This Dual Safety Valve has a 1" port. The standard dual safety valve has a 3/4" port.

DUAL OPERATOR SELECT CONTROL

Allows 2 operator stations to be connected to the WPC and also allows the operator to select either operator station or both.

WARNING

When using dual operator select control in single operator station mode, it is important to safeguard the point of operation exposed by the non-working operator station. Data Instruments recommends using light curtains for safeguarding this area.

EXTERNAL TRIP CONTROL

Allows equipment like a feeder to signal the WPC to start the press for one stroke. This is useful when your press must stop after every stroke until a feed is completed. The external trip function allows the feeder to signal the press control to start the press when the feed is complete. See Appendix B for more on external trip.

TOUCH CONTROL

A capacitive proximity sensor which can be used with any Wintriss Press Control (WPC) with one hand and single stroke mode. It can be mounted on or near the press and allows the press operator to cycle the press without using the operator station. To start the press, the operator just touches the yellow start disk as part of his normal hand motion after loading a part. No finger pressure is required. Only a touch is necessary. This helps prevent operator fatigue and repetitive strain injuries. A Shadow V light curtain for guarding the point of operation must be used when using the control. The control can only be used in single stroke operation.

The Touch Control can be used in "light curtain break" mode. In this mode, the operator must touch the start disk on the control within 2 or 8 seconds (selectable) after removing his hands from the light curtain. Otherwise the press will not start.

For complete information on the Touch Control, see Appendix D—"Touch Control Installation and Operating Instructions."

OUTPUT FOR EXTERNAL RELAY

Can be used to control another device (for instance, stop the device when a fault occurs). This output (terminal 4 on the P1 edge connector) is available on all WPC's. See Figure 4—WPC Wiring Diagram for wiring a circuit to this output.

Chapter 2

Installation

This section provides you with general mounting instructions. Because of the wide variety of machines and applications, it is impossible to provide detailed mounting instructions. Instead, these procedures will provide you with general guidelines which can be adapted to your specific application.

The sections in this chapter cover:

- Mounting and wiring the control box
- Mounting and wiring the operator station
- Mounting and wiring the light curtain
- Installing the rotary limit switch and encoder assembly
- Mounting and wiring the bar control (optional)
- Installing dual safety valve and air pressure switches

Keep 115 Vac and low voltage wiring separate

When wiring your press control, it is important to keep the power wiring (115 Vac) separate from the logic wiring (12 or 24 Vdc). The two should not be in the same sealtight or conduit.

For example: Operator station cables should not share the same conduit with 115 Vac wiring. Separate additional rotary limit switch wiring from the shaft encoder and limit switch cables if using 115 Vac on the spare stations.

There are two exceptions to this rule:

- The power and logic wiring for the light curtain can be in the same conduit.
- The power and logic wires for the dual safety valve can be in the same conduit.

WARNING ELECTRICAL HAZARD

To avoid dangerous high voltage, be sure power is off before making any wiring connections.

Mounting the control box

Refer to Figure 5 when mounting the control box. Because the digital display can be on the left side, right side, or front of the enclosure mount the control box so that it is convenient to the operator. If possible, mount the control box so the digital display can be seen and the key switches reached by an operator standing at the front of the press.

The control box does not have to be mounted to the press. It can be mounted on a free standing pedestal or column. For easy access to the interior, make sure there is enough room to open the control box door 120°. Plastic cable ties and self-sticking cable clamps are provided in the accessory parts bag. Use them to position cable and wiring inside the control box in neat and orderly fashion.

Wiring the control box

There are only a few electrical connections that have to be made between the control box and the press: a power line; one or two lines to detect motor rotation (see Figure #4); and an optional signal line to monitor the slide adjustment motor, when applicable.

The WPC requires 115 Vac \pm 10% at 100 VA. Use an isolation transformer with this rating to provide power. Generally, the press's control transformer can be used if the unneeded part of the existing control is disconnected. Refer to Figure #6 and #7.

Most of the original controls on the press will be replaced except the disconnect, motor starter, overload heater, and control transformer.

By comparing Figures #6 and #7 you will see how to wire the WPC to your press by removing or bypassing the air pressure, chain break, lube pressure, and mode selector switches. An emergency stop switch was left in the circuit, but it can also be removed.

It is important that rewiring allows proper operation of the motor starters. Two contact blocks for MF and MR should be disconnected from the existing control and used with the WPC. If, when the motor is on forward, a "10" status code is displayed on the digital readout, replace the contact blocks on the starter with new, unused ones.

If your press has a motorized slide (ram) adjustment, use one of the methods listed below to prevent slide adjustment while the press is running. Figure #12 shows three methods:

Method 1: The easiest method is to install a slide adjust on/off switch shown as an option in figure #12. This switch can be used to signal the WPC that the slide adjust is on.

Method 2: The best method is to use the contacts on the main motor starter relays, MF and MR. They inhibit power to the slide adjustment circuitry when the main motor is on.

Method 3: Connect spare contacts on the slide adjustment switches (up, down) or the relays driven by the switches to the WPC emergency stop circuit.

Mounting and wiring the operator station

This section explains how to wire and mount the operator station. The operator station must be mounted at the correct distance away from the pinch point of the press. This distance must be calculated based on the stop time of your press. Mounting the operator station at the correct safety distance prevents an operator from leaving the station and reaching the pinch point before the press stops.

You cannot permanently mount the operator station until you have the WPC working and the brake monitor is set. This is because you must use the WPC to find the stop time of your press. Then you can calculate the safety distance for the operator station (or light curtain if used). Therefore, place the operator station in a temporary location for now. Just leave it on the floor or on a cart. Then wire the operator station to the control box and continue with all other installation steps, adjustments, and checkout procedures in Chapters 2, 3, and 4. Once you find the proper safety distance, you can permanently mount the operator station at that distance.

To wire and mount the operator station:

1. Punch a hole in the Operator Station box for conduit or sealtight.
2. Connect the conduit or sealtight to the hole.
3. Open the operator station box. Run the operator station cable in the sealtight.
4. Plug the connector end of the cable into the Operator Station.
5. At the other end of the cable, connect the wires to control box terminals P1 and TB #2 as shown in Figure #4.

As noted above, you need to find the press's stop time using the WPC before permanently mounting the operator station. Therefore, do not start the procedures below until all installation, adjustment, and checkout procedures are complete. Be sure to calculate and set the brake monitor since you need to know the brake monitor setting to calculate safety distance. After the WPC is working, carry out the steps below to mount the operator station.

90° stop time test

1. First you must perform a 90° stop time test to find your press's stopping time. OSHA requires a 90° stop time test be used for calculating safety distance. Follow these steps:
 - A. *Before making any changes, record the actual setting of your overrun timing.*
 - B. If your WPC is using a rotary limit switch for timing inputs, temporarily change the overrun timing (channel 1) to on at 0° and off at 40° during the 90° stop time test.
 - C. Install the heaviest upper die set you will use in the press. Adjust the counterbalance for the upper die weight (if the press has a counterbalance).
 - D. Set the press to continuous mode. Start the press, allowing it to reach normal operating speed.
 - E. Press the "Prior Act" button and hold it down. Press the top stop button and hold it down. The press will execute the 90° stop time test.
 - F. Look at the reading in the stop time display. This is the stop time of your press. The numbers in the display are in milliseconds (mS). One millisecond equals 1/1000th of a second.
 - G. Do the test three more times to see if you get higher readings. Record the highest reading. This is the stopping time of your press.
 - H. *Readjust your overrun (channel 1) timing back to where it was.*

WARNING**Overrun timing must be correct to ensure operator safety**

You may need to adjust the leading edge of the overrun timing if you have one of the following versions: 2-Hand control without light curtains, light curtains with muting, or PSDI. A function of the stopping time of the press, overrun provides a backup for top stop timing and is dependent upon the condition of the brake linings and the press speed. If the top stop cam fails, overrun will provide the signal to stop the press. You must set the overrun timing so that if the top stop cam fails, a hazardous situation will not occur on the downstroke. We recommend that you set the overrun to start approximately 40° after the top stop "On" time. See Figure 3 for an example of this.

2. Proceed below based on whether or not you are installing light curtains with the WPC.

A. *If you are using light curtains on your press:*

You do not need to calculate a specific safety distance for your operator station. However, you must mount the light curtain at the correct safety distance. This ensures that a stop command sent to the press by the light curtain will result in a complete stop before anyone can reach the pinch point.

WARNING

The light curtain will only provide full protection for operators when mounted at the correct safety distance.

The safety distance formula for mounting the light curtain is given in the next section "Mounting and wiring the light curtain." It is also given in your *Shadow User Manual*.

Proper mounting of the light curtain eliminates the need to mount the operator station at a set distance from the pinch point. That is because the light curtain now prevents access to the pinch point.

Remember this however: *You must not mount the operator station between the light curtain and the pinch point.*

Mount the operator station where convenient following the above rules.

B. *If you do not use light curtains:*

You must mount the operator station at the correct safety distance. This is required by OSHA regulation 1910.217, Section c—Safeguarding the point of operation. The formula used below for finding the correct distance is from the American National Standards Institute (ANSI) standard B11.1–1988. (See "Mounting and wiring the light curtain" in the next section for more about ANSI standards.)

Data Instruments recommends the ANSI formula because it is more specific than the OSHA regulations. It allows you to account for brake wear when calculating the total stop time of your press.

The OSHA formula is basically the same as the ANSI formula except it does not account for brake wear. When using the OSHA formula, the Precision Metalforming Association (PMA) recommends you add additional time for brake wear as shown in the ANSI formula on the next page. Not adding in this additional time may compromise operator safety as the brake wears.

This is the ANSI formula for calculating safety distance for the operator station:

$$D_s = K \times (T_s + T_c + T_{bm})$$

D_s = the correct safety distance for the operator station

K = the hand-speed constant set by OSHA. It is 63 in./second.

T_s = the stop time of your press at 90°.

T_c = the response time of the WPC.

NOTE: The stop time you found in Step 1 is $T_s + T_c$. The 90° stop time test includes stop time of the press and response time of the WPC.

T_{bm} = the extra time added to allow for brake wear.

You have to allow for brake wear, or else the safety distance will become too short as the brake wears. You find T_{bm} when setting the brake monitor. Remember, you must calculate the brake monitor setting first before calculating safety distance. Setting the brake monitor is covered in Chapter 3 under "Setting the brake monitor."

IMPORTANT: The brake monitor setting must be based on press stopping time *at top stop*. To properly calculate the brake monitor setting, be sure you follow the procedure in Chapter 3.

Example

Here is an example for calculating the correct safety distance. We will use these numbers in our example:

$$T_s + T_c = 200 \text{ mS.}$$

You must convert mS to seconds. To convert mS to seconds, divide by 1000. $200 \div 1000 = 0.2$.

Therefore, $T_s + T_c = 0.2$ seconds.

$$T_{bm} = 20 \text{ mS (or .020 seconds)}$$

We are using 20 mS as an example. As noted above, you find T_{bm} when you set the brake monitor (which must be done before calculating safety distance).

Convert to seconds: $20 \div 1000 = .020$ seconds

Now we will calculate the safety distance:

$$D_s = K \times (T_s + T_c + T_{bm})$$

$$D_s = 63 \times (0.2 + .020)$$

$$D_s = 63 \times .220$$

$$D_s = 13.9 \text{ inches}$$

After you understand how to calculate the safety distance, make your own calculations using the formula. Mount the operator station at the calculated distance from the pinch point of the press. (You can mount it further away but no closer than the calculated safety distance).

Mounting and wiring the light curtain

The light curtain is normally mounted in front of the die space. Any opening or access to the die space not guarded by the light curtain must be guarded by mechanical barriers. This section tells you how to calculate the safety distance for the light curtain. For complete Shadow mounting instructions, see your *Shadow User Manual*.

WARNING

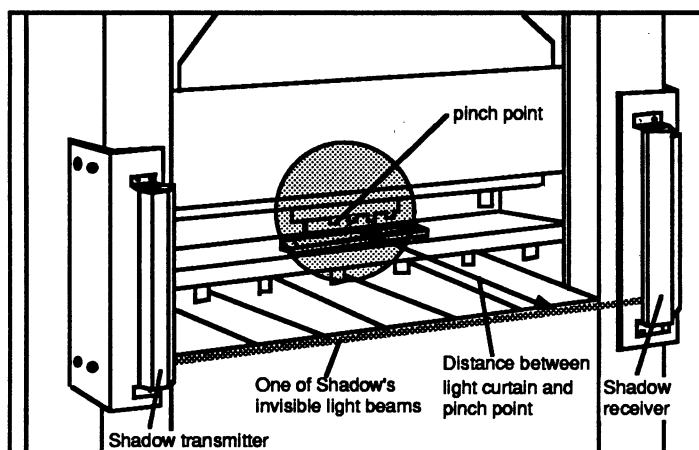
Shadows must be installed and wired correctly. You must follow the instructions in your Shadow manual when installing Shadows. **Improperly installed light curtains can compromise operator safety.**

Before you can calculate the correct safety distance, you must know your press's stop time. You can find the press's stopping time using the WPC. You must use the 90° stop time test to find stop time. This is required by OSHA regulation 1910.217. During this test, the press control stops the press at 90° of the stroke and displays stop time. How to perform this test is covered earlier in this chapter in the section "Mounting and wiring the operator station." See the heading—"90° stop time test"—in Step 1 of that section.

Calculating the safety distance

Once you know the press's stop time, you can calculate the safety distance. Shadows must be mounted away from the pinch point (or hazardous area) of the machinery at a specific distance. This distance is based on stop time. The safety distance must be calculated using a precise formula. This ensures that Shadow can send the stop signal to the press, and the press will stop, before the operator's hand reaches the hazardous area.

NOTE: No matter what safety distance you calculate, it is recommended that Shadow units **never** be mounted closer than 7-1/2" (19.1 cm) from the nearest pinch point hazard. The illustration below shows how you would measure the distance between the pinch point (or hazardous area) of your press and the light curtain.



Measuring distance between pinch point and light curtain on a press.

This distance must be greater than the calculated safety distance or Shadow may not be able to stop the machinery before an operator's hand reaches the hazardous area.

ANSI and OSHA safety distance formulas

You are governed by Occupational Safety and Health Administration (OSHA) regulations when mounting Shadows. The Shadow, must be located at the correct safety distance from the pinch point. OSHA regulation 1910.217 specifies requirements for light curtains when used with mechanical power presses.

When calculating safety distance, however, Data Instruments recommends you use the formula from the American National Standards Institute (ANSI)—standard B11.1-1988. The formula represents a new consensus among manufacturers on the proper installation of light curtains. It takes into account more factors (such as brake monitor setting, object sensitivity, and depth penetration factor) than the OSHA formula. It has been developed specifically for guarding of mechanical power presses. For complete information on OSHA regulation 1910.217 and ANSI standard B11.1-1988, see Appendix C.

Both the ANSI and OSHA formulas are explained in the next sections.

WARNING**Safety distance must be correct**

Properly calculating the safety distance is a very important part of Shadow installation. If you install Shadows too close to the point of operation, the Shadow may not be able to stop the press before an intrusion, like an operator's hand, reaches the dangerous area. Then the machine guarding function of Shadow is lost. If you are not sure how to calculate the safety distance for your press, contact Data Instruments. We'll be able to provide you with the information you need to properly calculate safety distance.

The ANSI safety distance formula

This is the formula Data Instruments recommends for calculating the safety distance:

$$D_s = K \times (T_s + T_c + T_r + T_{bm}) + D_{pf}$$

D_s is the safety distance we will find using the formula.

K is the OSHA-recommended hand-speed constant. This constant is 63 inches-per-second. The hand-speed constant indicates how far you could theoretically move your hand and arm in one second.

T_s is the stopping time of a press in seconds. It is measured at approximately 90° of crankshaft rotation (or at maximum closing velocity).

T_c is response time of the press control. This is the time it takes for the control to activate the machine's brake. In the 90° stop time test using the Wintriss Press Control, the stop time readout includes the stop time of the press and response time of the press control. How to do the 90° stop time test is described in the section "mounting and wiring the operator station" earlier in this chapter.

T_r is response time of the light curtain. Response time for Shadow V's is 30 milliseconds (35 milliseconds for 36" Shadow V)

T_{bm} is additional time added to the stop time of the press to allow for brake wear. You must allow extra time for brake wear because any safety distance based only on stop time will become too short as the brake wears.

T_{bm} is calculated when you set the brake monitor for the WPC. You must calculate and set the brake monitor before calculating safety distance for the light curtain. You are told how to calculate **T_{bm}** when setting the brake monitor. To set the brake monitor, see "Setting the brake monitor" at the end of chapter 3.

D_{pf} is the depth penetration factor. This is a measure of how far an object, like an operator's hand, can move through the light curtain before the light curtain reacts. **D_{pf}** is related to the object sensitivity of Shadow. Object sensitivity is the smallest diameter object Shadow will detect anywhere in its field.

Object sensitivity (S) for Shadow V is 1.25" (3.2 cm). Based on S and ANSI B11.1-1988, **D_{pf}** = 3.3" (8.4 cm)

For Shadow V with one beam blanked, **S** = 2" (5.1 cm) and **D_{pf}** = 5.9" (15 cm). This means **D_{pf}** increases by 2.6" (6.6 cm) when you add one blanking window.

An example for calculating the safety distance using the ANSI formula

Below is an example of how to use the formula to calculate safety distance (**D_s**).

First take another look at the formula we must use:

$$D_s = K \times (T_s + T_c + T_r + T_{bm}) + D_{pf}$$

Let's use these numbers for our variables in the formula:

K (hand speed constant) = 63 inches per second (set by OSHA)

T_s + **T_c** = 0.190 sec.

We include **T_s** and **T_c** together because the WPC automatically adds press control response time to stop time of the press during the stop time test. That is, the number it displays after you do the 90° stop time test is **T_s** + **T_c**.

T_r = .030 sec. (response time for all Shadow V's except 36" which is .035 sec.)

T_{bm} = .040 sec (Remember, you find **T_{bm}** when setting the brake monitor.)

D_{pf} = 3.3

Now let's put our numbers into the formula:

$$D_s = K \times (T_s + T_c + T_r + T_{bm}) + D_{pf}$$

$$D_s = 63 \times (0.190 + .030 + .040) + 3.3$$

$$D_s = (63 \times .260) + 3.3$$

$$D_s = 16.4 + 3.3$$

$$D_s = 19.7"$$

The distance the light curtain must be mounted from the pinch point in our example is 19.6". When using the formula, be sure to do all calculations in this order:

- (1) Add **T_s** + **T_c** + **T_r** + **T_{bm}** first.
- (2) Multiply the result by 63.
- (3) Add this result to **D_{pf}**. This is **D_s**.

If you don't follow this order, your safety distance calculation will be incorrect.

The OSHA safety distance formula

The OSHA safety distance formula as specified in OSHA regulation 1910.217 is explained below. As noted earlier, Data Instruments recommends you use the American National Standards Institute formula for calculating safety distance. It contains more factors that allow you to calculate the safety distance more precisely. The ANSI formula was explained in the previous section.

Here is the OSHA formula:

$$D_S = 63 \text{ inches/second} \times T_S$$

D_S is safety distance.

63 inches-per-second is the OSHA-recommended hand-speed constant.

T_S is the stop time of the press in seconds.

T_S is measured at approximately 90° of crankshaft rotation (or at maximum closing velocity). T_S must include all components that are involved in stopping press. It must include response time of the press control that activates the brake and response time of the light curtain (30 mS for Shadow V).

In the 90° stop time test using the WPC, the stop time readout includes the stop time of the press and response time of the press control. How to do the 90° stop time test is described in the section "mounting and wiring the operator station" earlier in this chapter.

Since some increase in stop time can invariably be anticipated due to clutch/brake system deterioration, a percentage factor must also be added to the actual measured stop time of your press when determining your safety distance.

A percentage factor of 20 percent is recommended for presses with new brakes or brakes in good condition; a percentage factor of 10 percent is recommended for presses with older brakes. This is because the stopping time for older brakes will be longer due to wear. Therefore, you add less time for older brakes.

WARNING

Your number for T_S must include stop time of the press, the response time of the WPC, response time of the light curtain, and the percentage factor added in for brake wear. Otherwise, the safety distance will be too short.

An example for calculating the safety distance using the OSHA formula

The OSHA formula for finding safety distance is: $D_s = 63 \text{ inches/sec.} \times T_s$

We will use a stop time of .190 seconds for this example. This number includes press stopping and response time of the WPC.

Next we will add in the braking percentage factor. Let's say our brakes are new. Then we will add 20% additional time to the stop time measurement ($.20 \times .190 = .038$).

We also must add response time of Shadow V (.030 seconds). Then:

$$T_s = .190 \text{ sec.} + .038 \text{ sec (braking factor)} + .030 \text{ sec. (Shadow response time)}$$

$$T_s = .258$$

Now, we'll calculate safety distance:

$$D_s = 63 \text{ in/sec} \times T_s$$

$$D_s = 63 \times .258$$

$$D_s = 16.3 \text{ in.}$$

Shadow must be mounted more than 16.3 inches from the pinch point using the OSHA formula.

Adding to safety distance for floating or blanking windows

The above examples showed how to calculate the safety distance for Shadows when blanking windows were not used. If using blanking windows, you must add 2.6" (6.6 cm) to the calculated safety distance. This applies whether you use the ANSI or OSHA formula.

So remember this rule: when a blanking or floating window is used, you must add 2.6" (6.6 cm) to the safety distance. Blanking windows and floating windows are discussed in your *Shadow User Manual*.

The wiring diagram (Figure 4) at the end of this manual shows wiring connections between Shadow V and the WPC.

For Shadow I wiring, see Figure 16 in this manual. As shown in Figure 16, connecting Shadow I to the WPC requires use of a device called a level shifter, available from Data Instruments. This is because the WPC checks Shadows for proper operation on every stroke. The level shifter is required for Shadow I because it has no specific terminals for making this test. Shadow V has built-in terminals.

Installing the rotary limit switch and encoder assembly

Refer to Figure #10 for dimensions. This assembly is equipped with a chain break detector switch. The assembly mounting brackets should be strong enough to support the force of the springs against the drive chain.

The rotary limit switches have been pre-adjusted at the factory for typical required timing, refer to Figure #3. The pre-adjustments for the left and right hand drives assume that the press crank rotates clockwise when seen from the left side of the press. If the left hand switch rotates counterclockwise, or the right hand switch rotates clockwise, then the rotary limit switch must be readjusted. When re-adjusting the switch, refer to Figure #3, the cam adjustment sheet enclosed with the assembly, and Chapter 4—Initial Checkout and Troubleshooting, section D, #10.

There are two cables that run from the assembly to the control box. Refer to Figure #4 when connecting the cables.

NOTE

The chain and sprockets must be covered with mechanical guards per OSHA regulations. (Federal Register 1910.212)

To mount the rotary limit switch and encoder assembly:

1. Mount the assembly to the press where the original rotary limit switch is located (generally above the machine crank). You must maintain a one-to-one relationship with the machine's crank or eccentric shaft.
2. Attach the assembly to the drive chain.
3. Check that the chain pulls the rotary limit switch enough to actuate (or de-actuate, depending on the mounting) the chain break switch.

NOTE: If the switch is improperly adjusted, a status code of 13, 53, 54, 55, or 56 may be displayed, depending on how the chain break switch is connected to the WPC.

4. At the assembly base, turn the adjusting screw to adjust the chain brake switch.

If the switch is pulled into the base, turn the screw clockwise until the chain break switch is actuated.

If the switch is pulled away from the base, change the chain break switch wiring from the normally open side to the normally closed side.

Turn the screw clockwise until it is just below, but not actuating, the chain break switch.

Mounting and wiring the bar mode control (optional)

You will need to release the machine's brake when the press is in the bar mode. Therefore, mount the Bar Mode Control in a place that is convenient to the operator while barring the press. Refer to Figure #9 for dimensions. See Figure #4 for wiring.

Installing dual safety valve and air pressure switches

Your WPC was supplied with a Dual Safety Valve manufactured by either Herion or Ross. Wiring instructions are enclosed for each valve. See Figures #11, #13, and #14. (Figure #13 shows a common Ross dual safety valve but one that is not supplied by Data Instruments.)

WARNING

Before installing the valve, make sure the muffler on the valve is tight. The muffler has a threaded shaft which screws into the body of the valve. If you can turn the muffler by hand without applying excessive force, it is not tight enough. To tighten, secure the valve body, grab the muffler with both hands and turn it clockwise as tight as you can get it (without stripping the threads). Be sure to periodically check the muffler for tightness. Vibration may cause the muffler to loosen and fall, possibly causing damage or injury.

Also clean the muffler periodically. See "dual safety valve maintenance" in Chapter 6. A clogged muffler can reduce stopping time.

1. Install a filter regulator and lubricator in-line before the air pressure switch, if not already present.
2. Connect shop air to the air pressure switch input port.
3. If the press is equipped with a counterbalance system, install a second air pressure switch after the counterbalance regulator.
4. Set the system air pressure switch to 35 PSI.
5. Set the counterbalance switch 10 PSI less than the counterbalance pressure.

Bypassing unused immediate stop and delayed stop inputs

Once you've completed wiring the WPC, you must bypass all unused immediate stop and delayed stop inputs. Otherwise the WPC will not work properly.

The four immediate stop inputs are Input #1 (P1-32), Input #2 (P1-19), Input #3 (P1-18), and Input #4 (P1-37). To bypass immediate stop inputs #1 or #2, connect them to ground. To bypass immediate stop inputs #3 or #4, connect them to +24 Vdc.

The two delayed stop inputs are Input #1 (P1-30) and Input #2 (P1-31). To bypass these inputs, connect them to ground.

See the Press Control Wiring Diagram (Figure 4) for the location of all these inputs.

Chapter 3

Adjustments

This chapter tells you how to:

- Adjust the rotary limit switch, if necessary
- Set program select switches on the control board for various modes of operation
- Set internal program jumpers on the control board for various modes of operation
- Set micro-inch time
- Set the brake monitor

Adjusting the Rotary Limit Switch (RLS)

The rotary limit switch supplied with the WPC is pre-adjusted for typical timing based upon the switch orientation (left-hand or right-hand drive) on the press. To confirm the proper timing, remove the RLS cover. Face the RLS's electrical connections. When the press is running normally, the tops of the visible cams should rotate towards you. If not, adjust the Overrun, Mute One, Mute Two, and Top Stop rotary limit switches for timing and dwell. Refer to Figure #3 and Chapter 4— Initial Checkout and Troubleshooting, Section D, #10.

The timing information shown in Figure #3 is not absolute. Use it as a starting point for fine-tuning the system. The dwells shown are usable for press speeds up to 500 SPM. For press speeds higher than 500 SPM, calculate the minimum dwell using this formula:

$$\text{SPM} \times 0.06 = \text{degrees of dwell required}$$

NOTE: Mechanical rotary limit switches cannot be used when press speed is over 500 SPM. Contact Data Instruments for application information.

You may have to move the leading edge of top stop so that the press stops exactly at top (TDC). If the press stops after top dead center, advance the leading edge of the top stop. If the press stops before top dead center, retard the leading edge of top stop.

WARNING

Overrun timing must be correct to ensure operator safety

You may need to adjust the leading edge of the overrun timing if you have one of the following versions: 2-Hand control without light curtains, light curtains with muting, or PSDI. A function of the stopping time of the press, overrun provides a backup for top stop timing and is dependent upon the condition of the brake linings and the press speed. If the top stop cam switch fails, overrun will provide the signal to stop the press. You must set the overrun timing so that if the top stop limit switch fails, a hazardous situation will not occur on the downstroke. We recommend that you set the overrun to start approximately 40° after the top stop. See Figure 3 for an example of this.

WARNING**Mute One timing must be correct to ensure operator safety**

The Mute One switch triggers the auto-carry up feature when the press is operated in single stroke mode. Auto carry-up means the press will run until top stop if the foot switch or palm buttons are held until approximately bottom dead center of the stroke. Auto carry-up is factory set at 120°. Therefore, the operator can release the palm buttons at 120° (or later) and the ram will automatically complete the stroke. With large presses where the stroke length is large and press speed is slow, you must ensure that the operator cannot release the buttons and reach the pinch point before bottom dead center. This applies only when two-hand control is used to safeguard the point of operation and only if any opening allowing access to the pinch point is 1/4" (7 mm) or larger. *If the operator can reach the pinch point, mute #1 must be set greater than 120°.*

Setting the program select switches

These switches are located on a switch block at the top of the control board. The switch block is labelled SW1–SW8. Refer to Figure #2 for a layout of the board. Each of the eight switches are described below. *Turn the power off before making any changes inside the control box.* (If it is necessary to change any switch settings with the power on, push the reset switch on the control board to enter the change into the microprocessor.)

WARNING! ELECTRICAL HAZARD

Dangerous high voltage (115 Vac) is present inside the control box. Turn the power OFF before making any switch settings inside the control box.

Switch 1: off—external trip device has 10 seconds to signal WPC to start press
on—external trip device has 30 seconds to signal WPC to start press

This switch is set when using the external trip function. The external trip function allows a piece of equipment (like a feed or transfer mechanism) to send a "start" signal to the WPC. The control will then cycle the press for one stroke. Switch 1 sets the time the equipment has to signal the WPC after each top stop. If the WPC does not receive the signal within the set time after top stop, it will not continue to single stroke the press. Wiring an external trip version of the WPC is covered in Appendix B. This switch has no effect if the external trip function is not installed or being used.

Switch 2: off—normal operation without Touch Control
on—allows use of Touch Control in light curtain break mode

This switch should be set to "ON" only if Data Instruments' Touch Control is being used. When set to "ON", the operator must remove his hands from the light curtain and start the press with the Touch Control within the time set on the Prior Act switch. Otherwise, the press will not start. The light curtain must be broken again to start the press. See Appendix D for complete information on using Touch Control with the WPC. The Touch Control is a capacitive proximity sensor which can be used to start the press instead of the operator station.

Switch 3: unused

Switch 4: off - Palm time 0.5 seconds.
on - Palm time 8 seconds.

The switch determines the time span during which all the RUN/INCH switches must be actuated to start the press. When there is only one Operator Station, set the switch to off. With multiple Operator Stations, set the switch to on.

Switch 5: off - PRIOR ACT time, 2 seconds.
on - PRIOR ACT time, 8 seconds.

This switch sets the amount of time the PRIOR ACT light (on the prior act button) stays on. Whenever the press is started in continuous mode, the prior act button must be used. OSHA requires two actions to start a press in continuous mode so it cannot be started accidentally. First, the prior act button must be pressed. Then, while the prior act light is on, pressing the palm buttons or foot switch will start the press (depending on the mode set). If the prior act light goes out before all the buttons are pressed, the press will not start. Prior act must be pushed again. Switch 5 sets the time the prior act light is lit. When using a single operator station, set the switch to 2 seconds. If using multiple operator stations, set the switch to 8 seconds.

Switch 6: off - Top-stops in INCH mode
on - Does not top stop in INCH mode.

With this switch off, only one stroke can be made in INCH mode without stroke re-initiation. When the switch is on, the press will run continuously as long as the RUN/INCH switches are pressed. If micro-inch is selected, you may not notice the top stop function. During an interrupted stroke, the WPC automatically switches to the INCH mode and stops at top-stop no matter how Switch 6 is set.

Switch 7: off—for foot trip
on—for foot control

In "foot trip" the press runs for one stroke after you depress the foot switch. In "foot control", you must depress and hold the foot switch through bottom dead center to single stroke the press. If you release the foot switch early, the press stop command is issued immediately.

Switch 8: off - For speeds faster than 60 SPM.

If the press does not start within a set time after the palm buttons (or foot switch) are pressed, the WPC signals a loss of rotation fault (code 79). This switch sets the time the press has to start before this fault occurs. If the switch is set to off, the time allowed is 200 mS. If set to on, time allowed is 400 mS. For press speeds greater than 60 SPM, set the switch to off. For speeds less than 60 SPM, set the switch to on. For variable speed presses, set the switch for the speed range most often used.

Setting internal program jumpers

The program jumpers discussed below determine how the control board will function. Refer to Figure #2 for location.

J1

Selects the voltage supplied to the Rotary limit switches. When using the rotary limit switch assembly supplied with the WPC, install jumper between pins 1 & 2.

Solid state switches (proximity, hall effect, optical, programmable) may require that the jumper be placed between pins 2 & 3. Contact Data Instruments for application assistance when using solid state switches.

J11 (Figure #2)

Selects micro-inch. For micro-inch, insert the jumper. For normal two hand inch, remove the jumper.

J10 (Figure #2)

Not adjustable. Jumper *must* be installed between pins 1 & 2.

J6 and J9 (Figure #2)

Jumpers are required on J6 and J9 for dual safety valves supplied by Data Instruments. Jumpers should not be installed when using a dual safety valve that has limit switches activated by rods or pins attached to valve elements. The WPC monitors the limit switch position based on whether the dual safety valve is energized or de-energized. The WPC indicates a fault if the valve is not operating properly.

If the dual safety valve limit switches were previously used with 115 Vac press control circuits, replace the limit switches. They may be pitted and not work well with the low voltage circuitry (24 Vdc) in the WPC. Refer to Figure #13 for wiring information.

Setting micro-inch time

This adjusts the time that the dual safety valve is open when micro-inch is selected. See Figure #2. Turning the dial counterclockwise decreases the time the valve is open: clockwise increases the time the valve is open. The dual safety valve time can be adjusted between 6 and 600 milliseconds.

The brake monitor

A brake monitor is built into your WPC. It monitors brake wear by measuring stop time every time the press top stops.

The brake monitor software measures the time from the closure of the dual safety valve to stopping of the crankshaft. It records this number in milliseconds and displays the number on the "stop time" display.

You set the brake monitor to a number (in milliseconds) that is longer than the measured stop time at top stop. This extra time is the time allowed for brake wear. When stop time reaches the brake monitor setting, the brake monitor stops the press. Your brake has worn to a point where it must be serviced.

The rule for setting the brake monitor is to add 20% to stopping time if your brakes are new. Add 10% if your brakes are old. The exact procedure for setting the brake monitor is listed later in this section.

Brake warning and brake fault indicators

There are two indicator lights on the front panel of the control box which indicate the condition of your brake.

Brake warning indicator

The Brake Warning indicator light comes on when the measured stop time is within 10 milliseconds of the brake monitor setting. When lit, the light can only be turned off by turning power to the WPC off, then back on. Or you can press the reset switch on the control board. (See Figure #2 for switch location.)

When the brake warning light comes on, the press will still operate normally, but it's time to schedule maintenance on the brake.

Brake fault indicator

The Brake Fault indicator light comes on when the stop time equals or exceeds the brake monitor setting. This light indicates that your brake has worn beyond a safe limit. Along with turning on this light, the brake monitor prevents the WPC from making another stroke.

You cannot initiate another stroke until you push the red Emergency Stop/Reset button on the front panel of the control box. This button also turns off the brake fault indicator light. The brake monitor will continue to signal the fault, however, until stop time no longer exceeds the brake monitor setting. *You must overhaul the brake to continue normal operation of the press.*

How to set the brake monitor

The steps below tell you (1) how to find your press's stopping time, (2) how to calculate the brake monitor setting, and (3) how to set the brake monitor using the two rotary switches on the control board.

1. Finding the press's stopping time

Before you can set the brake monitor, you need to know the stopping time of your press. You must find your press's stopping time at top stop. This is because the brake monitor checks stopping time every time the press stops at top stop. Therefore, the brake monitor setting *must* be calculated based on stopping time at top stop. To find press stop time at top stop, follow these steps:

- A. Remove the upper die set. Adjust the counterbalance for ram weight (if the press has a counterbalance).
- B. Start the press. Use continuous mode. Allow the press to reach normal operating speed.
- C. Top stop the press using the "top stop" switch on the operator station.
- D. Look at the reading in the stop time display. This is the stop time of your press. The numbers in the display are in milliseconds (mS). One millisecond equals 1/1000th of a second (1 mS = .001 sec.)
- E. Do the test 3 more times to see if you get higher readings. Record the highest reading from all your tests. This is the stopping time you will use to set the brake monitor.

2. Calculating the brake monitor setting

Once you know stopping time, you add extra time to this number to allow for wear in your brake. Otherwise, the brake monitor would stop the press as soon as the stopping time increased just slightly. This extra time is called T_{bm} . T_{bm} must be a multiple of 10 mS. The minimum value of T_{bm} must be 20 mS. When T_{bm} equals 10 mS, the brake warning indicator turns on. The stopping time plus T_{bm} will be the brake monitor setting.

10% for old brakes, 20% for new brakes

Here's the general rule you can use to figure in this extra time. If your brake is older, add 10% to the stopping time. If your brake is new, add 20% to stopping time.

Here's the reasoning behind this rule. Stopping time should be less with a new brake. So when the 20% is added to stopping time, the figure should be approximately the same as the figure you get when you add 10% to stopping time for an older brake.

Examples for calculating the brake monitor setting

Example 1: Say your recorded stopping time as shown on the display is 200 mS and your brake is new:

$$\text{Take 20\% of 200:} \quad T_{bm} = .20 \times 200 = 40$$

$$\text{Add 40 to 200} \quad 200 + 40 = 240$$

240 is the calculated brake monitor setting.

Example 2: Say your recorded stopping time as shown on the display is 250 mS and your brake is old:

$$\text{Take 10\% of 250:} \quad T_{bm} = .10 \times 250 = 25$$

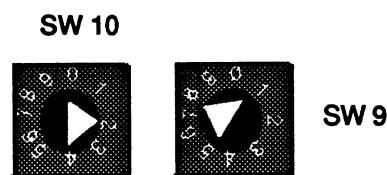
Round to nearest multiple of 10 (5 and over round up; 1-4 round down). After rounding, $T_{bm} = 30$

$$\text{Add 30 to 250} \quad 250 + 30 = 280$$

280 is the calculated brake monitor setting.

3. Setting the brake monitor

Now that you've calculated the brake monitor setting, you set two rotary switches on the control board to this setting. These switches are located on the lower left hand side of the control board inside the control box (see Figure 2 in back of manual). They are 10-position rotary switches as shown below.



Follow these steps to set switches:

- A. Set switch SW 10 to read the same as the left digit in your number. Turn the dial with a small screwdriver until the indicator points to the number. For instance, if your calculated number is 280, set the switch to "2".
- B. Set switch SW 9 to the middle digit of your number. For example, if your calculated number is 280, set the switch to 8.
- C. You do not make any setting for the rightmost digit in your number. Your brake monitor is now set.

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Chapter 4

Initial Checkout and Troubleshooting

These procedures will help you checkout your newly installed Wintriss Press Control system. Start with Section A, and continue through to section F. If your WPC has a Foot Switch or a Bar Mode Control, also go through section G or H.

These procedures will also help you troubleshoot malfunctions that may occur with the control system.

WARNING: KEEP HANDS AWAY

Before performing testing or troubleshooting procedures, make sure all tools are removed from the press. Keep your hands away from the die area when testing.

WARNING: ELECTRICAL HAZARD

Many of the procedures below require work inside the control box with power on. Dangerous high voltage is present inside the control box. Only qualified technicians should work inside the box with the power on.

How to use this chapter

Each lettered section describes checks and tests for verifying proper operation. In the event the WPC fails a test, you will be directed to step-by-step procedures for isolating and possibly correcting the problem. If this does not correct the problem, contact Data Instruments' technical services department for assistance. Don't attempt to replace any components on new WPC's until checking with our technical staff.

All the possible problems or failures that might arise cannot be covered by these few procedures. In some cases, they will only help you narrow down any problem that may occur. These procedures, however, along with phone calls to our Customer Service department, usually will solve the problem.

NOTE

Before performing the checkout and troubleshooting procedures, set the control box switches to the following positions:

STROKE SELECT to OFF
MODE SELECT to TWO HAND

Also make sure the air pressure and power to the press are off.

A. POWER SUPPLY TESTS

Refer to Figure #2 for this test.

WARNING ELECTRICAL HAZARD

Dangerous high voltage is present inside the control box. Only qualified technicians should work inside the box with the power on.

1. At the control box, open the front cover.
2. Turn on the power to the WPC.
3. At the control board, check that the +24 Vdc, +12 Vdc, and +5 Vdc LED indicators are on.
If all the LED's are off, go to step 4.
If only the +12 Vdc LED is off, go to step 7.
4. Turn of the power for 10 seconds then turn it back on again.
5. If the LED's are still off, check power fuse F1. Replace if necessary.
6. If the LED's are still off, check that line voltage is being applied to the system.
7. Turn off the power for 10 seconds then turn it back on again.
8. Recheck the +12 Vdc LED
9. At the control board, check for a short between P1-20 and ground.
If there is no short at P1-20, then the circuit board or WPC assembly may be at fault. Contact Data Instruments' technical services department for assistance.

B. SHADOW TESTS**WARNING ELECTRICAL HAZARD**

Dangerous high voltage is present inside the Shadow transmitter and receiver. Only qualified technicians should work inside the Shadow transmitter and receiver with power on.

At the Shadow Transmitter, check that the amber indicator is on. At the Shadow Receiver, check that the green indicator is on.

Block the light curtain. At the receiver, check that the green indicator goes off and that the red indicator comes on.

Remove the obstruction from the light curtain. At the receiver, check that the red indicator goes off and that the green indicator comes on.

If the receiver is good but the transmitter's amber indicator is off, complete step 1.

1. Remove the transmitter's cover and replace the amber indicator. If the transmitter's amber indicator is off and the receiver's red indicator is on, complete steps 2 and 3.
2. Turn off the power.
3. Check the transmitter's power fuse. Replace if necessary.

If the transmitter's amber indicator is on and the receiver's red indicator is on when the light curtain is unobstructed, complete steps 4 through 7.
4. Check that the receiver and the transmitter are properly aligned.
5. At the transmitter, check that the "INT" terminal shows 0 Vdc when referenced to ground.
6. If the "INT" terminal does not show 0 Vdc referenced to ground, check the wiring.
7. If the wiring is OK and the "INT" terminal does not show 0 Vdc, either the WPC board, the Shadow transmitter, or Shadow receiver may be at fault.

Contact Data Instruments' technical services department for assistance in determining the problem.

C. SYSTEM STATIC TEST

WARNING ELECTRICAL HAZARD

Dangerous high voltage is present inside the control box. Only qualified technicians should work inside the box with the power on.

1. At the control box, set the STROKE SELECT switch to INCH.
2. Notice that the INTERRUPTED STROKE indicator is on and that "10" is shown on the STATUS CODE display.

If the indicator light is off, or the status code is different, go to step 3.
If the indicator light is on and the status code is "10" , go to step 4.
3. Inside the control box, at the control board, check that "inch sel" LED is on.

Go to step 4.
4. At the Operator Station, press and hold the EMERGENCY STOP/RESET button.
5. Notice that "13" appears on the STATUS CODE display.

If a status code "13" does not appear, go to step 6.
If "13" does appear, go to step 7.
6. At the control board, check that the "em stop 1 N/C" and "em stop 2 N/C" LED's go out when the EMERGENCY STOP/RESET button is pressed.
7. Turn on the press motor (forward rotation, if applicable).
8. Notice that the STATUS CODE display goes blank.

If the STATUS CODE does not go blank, go to step 9.
If the STATUS CODE goes blank, go to step 10.
9. At the control board, check that the "mot for N/O" LED is on when the motor is running in forward.
10. At the Operator Station, push both RUN/INCH switches at the same time.

11. Notice that "53" appears on the STATUS CODE display.

NOTE

If the immediate and delayed stops are not connected according to Figure #4, the status code may be different.

If the appropriate code does not appear, go to step 12.

If the appropriate code does appear, go to step 13.

12. At the control board, check that Imm stop #1 LED is off.

Go to step 13.

13. Apply air pressure to the press.

14. At the control board, check that Imm stop #1 N/C" LED is turned on.

15. At the Operator Station, press the EMERGENCY STOP/RESET button.

NOTE

While the EMERGENCY STOP/RESET button is pressed, "13" should appear on the STATUS CODE display.

D. INCH MODE/ROTARY LIMIT SWITCH TEST

For this test, make sure program select switch 6 is set to off. Also remove the jumper at J11 on the control board if installed. (See figure 2 for location).

1. Push and hold both RUN/INCH switches.
2. Observe that the press makes one stroke and stops at or near top dead center. If the ram does not move, go to step 3.

If the ram does not stop at or near top dead center, go to step 8.

If the press stops at/near top dead center, go to step 12.
3. Press and hold both RUN/INCH switches.
4. At the control board, check that the "palm sw N/O" LED is on and that the "palm sw N/C" LED is off.
5. Release both RUN/INCH switches.
6. Check that the "palm sw N/O" LED is off, and that the "palm sw N/C" LED is on.
7. Repeat step 2.
8. At the STATUS CODE readout, observe that an error code between 80 and 89 is displayed. This indicates a problem with the rotary limit switches.
9. Bring the ram to top dead center.
10. While jogging the press through a stroke, observe the control board.

The "overrun sw" LED is off between 310 and 340 degrees.

The "mute one sw" LED is on from 120 to 150 degrees. (This setting can vary based on type of press. The correct setting is important for safe operation. See "Mute 1 must be correct to ensure operator safety" on first page of Chapter 3.)

The "mute two sw" LED is off from 180 to 210 degrees.

The "top stop sw" LED is on between 270 and 330 degrees. (This can vary with setting required for accurate top stop).
11. Go to step 12.
12. At the STOP TIME read out, a three digit stop time is displayed.
13. Initiate another stroke. Observe that the ram stops at top dead center and that the same three digit stop time is displayed.
14. If the control was ordered with optional mute, inch the ram to bottom dead center.
15. At the operator station, the MUTE indicator light should come on.
16. Bring the ram to top dead center.

E. SINGLE STROKE MODE TEST

1. Set the STROKE SELECT switch to SINGLE STROKE.
2. Block the light curtain.
3. Push and hold both RUN/INCH switches.
4. Notice that the press does not cycle and the STATUS CODE display remains blank.

If the press cycles or the STATUS CODE does not remain blank, go to step 5.

If the press does not cycle, go to step 7.

5. At the Shadow light Curtain, make sure the red indicator is on.
6. Go to step 7.

WARNING ELECTRICAL HAZARD

Dangerous high voltage is present inside the control box. Only qualified technicians should work inside the box with the power on.

7. At the control board, observe that:
The "inch sel" LED is off.
The "sngl stk sel" LED on.
The "Shad IN 1 and 2 N/C" LED is on. (It should be off when the curtain is blocked.)
8. Push and hold the RUN/INCH switches.
9. Observe that the ram makes a full stroke and stops at or near top dead center.
If the ram does not cycle or does not stop at top dead center, go to step 11.
If the ram stops at top dead center, go to step 14.
10. At the STATUS CODE readout, observe that an error code between 80 and 89 is displayed. This indicates a problem with the rotary limit switches.
11. Bring the ram to top dead center.
12. While jogging the press through a stroke, observe the control board.
The "overrun sw" LED is off between 0 and 30 degrees.
The "mute one sw" LED is on from 120 to 150 degrees.
The "mute two sw" LED is off from 180 to 210 degrees.
The "top stop sw" LED is on between 270 and 330 degrees. (This can vary with setting required for top stop).

13. Go to step 14.
14. Observe that the three digit stop time is displayed.
15. Momentarily, press and release the RUN/INCH switches.
16. Observe that the ram starts, then stops and that the INTERRUPTED STROKE indicator light comes on.
17. The press will now be in the TWO HAND INCH mode. Complete the stroke by pressing and holding the RUN/INCH switches.

F. CONTINUOUS MODE TEST

1. SET THE STROKE SELECT switch to CONT. (continuous).
2. At the control board, the "sngl stk sel" LED should go out and the "cont sel" LED should come on.
3. At the operator station, press the PRIOR ACT switch/indicator.
If the switch/indicator does not go off within 8 seconds, STOP. Do not go any further. Call your Data Instruments representative.
If the switch/indicator goes off within 8 seconds, go to step 4.
4. Press the PRIOR ACT switch/indicator and, before the light goes out, press both RUN/INCH switches.
Release the RUN/INCH switches after bottom dead center of the first stroke. The press should continue running.
5. At the operator station, press the TOP STOP button.
Notice that the ram stops near top dead center and that a three digit stop time is displayed.
6. Restart the press in continuous mode.
7. Block the light curtain.
8. Make sure the press comes to an immediate stop. If you have a WPC with the muting option, the ram will stop in the non-muted part of the stroke (down stroke). Whether or not you have the muting option, the INTERRUPTED STROKE indicator light should light on the control display.

<p style="text-align: center;">NOTE</p> <p>When a stroke is interrupted, the WPC automatically switches to the two hand inch mode.</p>

9. Press and hold both RUN/INCH switches. Inch the ram to top dead center.

G. CONTROL BOX TEST--WITH FOOT SWITCH OPTION

Perform the following test only if your WPC is equipped with a Foot Switch. When you are directed to the control board, refer to Figure #2.

NOTE: If the Foot Switch is not depressed quickly and fully, a stroke will not be initiated. Foot initiation requires rapid and full actuation.

1. Set the STROKE SELECT switch to SINGLE STROKE and set the MODE SELECT switch to FOOT.
2. Set switch 7 of the program select switch to OFF. Then press and release the reset switch on the control board (see Figure 2). The WPC is now in the "foot trip" mode. Once tripped, the press should run to top stop.
3. On the control board, the "cont sel" LED should be off, the "sngl stk sel" LED should be on, and the "foot sel" LED should be on.
4. Momentarily depress the foot switch. The press should make a single stroke and stop at top dead center.
5. At the control board, notice that the "foot sw N/C" LED goes off and the "foot sw N/O" LED comes on when the foot switch is depressed.
6. Set switch 7 of the program select switch to ON. Push the RESET button on the control board inside the control box (see Figure 2). You are now in the foot control mode. The press should cycle to top stop only if the foot switch is held down until after bottom dead center.
7. Press and hold the foot switch through bottom dead center. Release foot switch after bottom dead center. The press should run and stop at top stop.
8. Press and hold the foot switch again. This time, release the switch before bottom dead center. The press should start but stop immediately when the foot switch is released.
9. Press and hold both RUN/INCH switches. The press will run and top stop.
10. Set the STROKE SELECT switch to CONT (continuous).
11. At the Operator Station, depress the PRIOR ACT switch/indicator.
12. Then depress and hold down the foot switch.
The press should run as long as the Foot Switch is depressed.
13. Release the Foot Switch.
The press should automatically top stop.

If the Foot Switch is only momentarily depressed, the press stops after a single stroke. If allowed to stop, the PRIOR ACT switch/indicator must be depressed before another stroke is initiated.

H. CONTROL BOX TEST--WITH OPTIONAL BAR MODE CONTROL

The following tests are required only if the Bar Mode Control is installed.

1. Set the STROKE SELECT switch to INCH and SET the MODE SELECT switch to TWO HAND.
2. At the Bar Mode Control, set the SELECT switch to ON.
3. At the control board, the "bar sel N/O" should come on.
4. At the control box, "25" should appear on the STATUS CODE display.
5. Turn the press motor off.
6. "30" should now appear on the STATUS CODE display.
7. While the press's flywheel is still turning, press the OPERATE button on the Bar Mode Control.
8. Notice the dual safety valve momentarily energizes and then de-energizes.
9. At the control board, the "bar act N/O" LED should come on when the Bar Mode Control OPERATE button was depressed.
10. At the STATUS CODE readout, "26" will be displayed.
11. At the Operator Station, push the EMERGENCY STOP/RESET button. Wait for the flywheel to stop spinning.
12. At the Bar Mode Control, push the OPERATE button.
13. Notice that the dual safety valve turns on.

You can now bar the press.

NOTE

As you bar the press, the WPC monitors the speed of the crank. It is possible to bar the press faster than the WPC allows. If you bar the press too quickly, the dual safety valve closes and a status code of "26" is displayed, stopping the press.

Chapter 5

Operating instructions

This chapter describes how to operate the press using the Wintriss Press Control.

When operating the WPC, there are three standard stroke select settings you can choose:

INCH
SINGLE STROKE
CONT (continuous)

You can also operate the press in the optional Bar Control mode using the WPC.

Operating instructions for each stroke setting and bar control mode are listed in this chapter. Refer to the appropriate section for the stroke setting you want to use.

NOTE

The WPC will stop the press if: (1) a system fault is detected; or (2) if the light curtain is blocked during any non-muted portion of the stroke.

If this occurs, the interrupted stroke indicator light on the control box will come on. If the ram stopped because of a system fault, there will also be a two digit number in the status code display.

The WPC automatically switches to two hand inch for the remainder of the stroke. In the case of a system fault, press the EMERGENCY STOP/RESET switch to reset the control.

Operating the press in INCH mode

To operate the press in INCH mode (also called two hand inch mode) make these settings:

Set the stroke select switch to INCH.

Set the mode select switch to TWO HAND.

The light curtain will be muted on the up stroke only if the WPC has the muting option.

WARNING

INCH MODE IS NOT A PRODUCTION MODE

The INCH operating mode shall not be used as a production mode as per ANSI B11.1-1988.

Three ways you can operate the press in INCH mode

You can choose three different ways to operate the press in inch mode. These modes are called Top Stop, Top Stop Bypass, and Micro-Inch. Refer to the adjustment section of this manual for instructions on how to select each mode.

Operation in each mode is described below:

Top Stop

To move the ram in this mode, all RUN/INCH switches must be pressed at the same time. The ram will move only as long as all run/inch switches are pressed. The ram will automatically top stop even if both run/inch switches are depressed. To re-initiate a stroke, release and press the run/inch switches.

To stop the ram before top stop, release one of the RUN/INCH switches. The ram will also stop if the light curtain is blocked during the non-muted portion of the stroke, or if a system fault is detected.

If you jog the press you may not notice that the ram top-stops.

Top Stop Bypass

In this mode, the press will now operate just as it does in the top stop inch mode, only it will not automatically top stop, but rather run continuously as long as the run/inch switches are depressed.

Micro-Inch

In this inch mode, you can determine how long the ram will travel when the run/inch switches are pressed.

To adjust micro-inch go to the control board and adjust the potentiometer (see Figure #2) with a small screwdriver.

The press operates the same way it does during top stop inch. However, no matter how long the switches are pressed, the clutch is engaged for a time set by the potentiometer. You can stop the ram before the set time by releasing the switches. To jog the ram through a complete stroke, press and release the run/inch switches as often as necessary.

NOTE

If an interrupted stroke occurs, the control automatically switches to two hand top stop inch, no matter if micro-inch or top stop bypass is selected.

Operating the press in single stroke mode

To operate the press in single stroke mode:

First set the stroke select switch to SINGLE STROKE.

You must now set the mode select switch to either ONE HAND, TWO HAND, or FOOT. Instructions for each setting are given below.

NOTE: There are no ONE HAND and FOOT modes on two hand only systems.

One hand operation

1. Set the mode select switch to ONE HAND.
2. To initiate a stroke, press just one RUN/INCH switch. You can release the switch at any time and the ram will complete the stroke. The left run/inch switch must be used (unless the operator station has an optional right/left hand selector switch).

The ram will stop if a system fault is detected or the light curtain is blocked during the down stroke.

Two hand operation

1. Set the mode select switch to TWO HAND.
2. To initiate a stroke, press all RUN/INCH switches. Hold in switches until at least bottom dead center. The upstroke is automatic.

The ram will stop if any run/inch switch is released during the down stroke, a system fault is detected, or the light curtain is blocked during the down stroke.

Foot operation

You can single stroke the press in one of two foot modes—foot trip or foot control. The mode is set using program select switch 7. (Setting this switch is covered in Chapter 3.)

In *Foot Trip* mode, after depressing the foot switch, the press runs for one stroke. To run the press:

1. Set the stroke select switch to FOOT.
2. Press the foot switch. The press will run for one stroke and top stop.

In *Foot Control* mode, you must depress and hold the foot switch through bottom dead center to single stroke the press. If you don't, the press stops immediately. To run the press:

1. Set the stroke select switch to FOOT.
2. Press and hold the foot switch through bottom. The press will complete one stroke and top stop.

NOTE: When the press stops in two hand operation or foot control mode because the switches were not held in beyond bottom dead center, the "interrupted stroke" indicator lights. The WPC automatically reverts to two hand top stop inch mode for the remainder of the stroke.

Operating the press in CONT (continuous) mode

To operate the press in continuous mode:

First set the stroke select switch to CONT.

You must now set the mode select switch to either TWO HAND or FOOT.

Instructions for each setting are given below.

Two hand operation

To operate the press in two hand continuous mode, perform the following steps.

1. Set the mode select switch to TWO HAND.
2. Depress the PRIOR ACT switch.
3. While the prior act indicator light is on (2 or 8 seconds), press both RUN/INCH switches. (Time on for the prior act light is set using switch 5 of the program select switches. See "setting the program select switches in Chapter 3.)

Keep the switches pressed until after the ram reaches bottom dead center. The press will now operate continuously. The ram will stop when:

- (1) a system fault is detected
- (2) you press the emergency stop/reset switch.
- (3) the light curtain is blocked during the non-muted portion of the stroke
- (4) you press the top stop switch

Foot operation

To operate the press in the foot continuous mode, perform the following steps.

1. Set the mode select switch to FOOT.
2. Press the PRIOR ACT switch.
3. While the prior act indicator light is on (2 or 8 seconds), depress the foot switch.
4. The press will run in continuous as long as the foot switch is depressed. If the foot switch is released the press will top stop.

If you remove your foot from the foot switch and the ram top-stops, you will have to repeat steps 2 and 3 to initiate another stroke.

The press will operate continuously while the foot switch is depressed. However, the ram will stop if:

- (1) a system fault is detected
- (2) you press the emergency stop/rest switch
- (3) you press the top stop switch
- (4) the light curtain is blocked during the non-muted portion of the stroke

Operating the press in bar mode

You can operate in bar mode if you have the bar control option. To operate the press in the bar mode, perform the following steps:

1. Set the stroke select switch to INCH.
2. Set the mode select switch to TWO HAND.
3. Turn off the press main motor.
4. At the bar control box, turn the select switch to ON.
5. Wait for the press flywheel to stop turning.
6. Press the OPERATE button.
7. Bar the press.

Make sure you do not rotate the flywheel/crank too quickly, or the Control will stop the ram. If this happens, the status code will display "26". Press the EMERGENCY STOP/RESET switch to continue barring the press.

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Chapter 6

Maintenance

This chapter lists procedures for replacing faulty Wintriss Press Control assemblies and components.

Before replacing any components, you should first determine what is wrong with the WPC. Perform the appropriate checkout and troubleshooting procedure in Chapter 4 to isolate the faulty component. If the Checkout and Troubleshooting section in Chapter 4 does not help, call Data Instrument's Customer Service Department for technical assistance.

Do not replace components just because there is a malfunction. First perform the appropriate troubleshooting procedures or contact Data Instruments' Customer Service Department.

CONTROL BOX

Removing the Control Assembly

1. Disconnect J2, J3, and J5 from their mating connectors on the control board. Squeeze the locking tabs on the body of the connector to unlock the connector from its mate and then pull the upper half from the board. **Do not try to remove these connectors without first unlocking them.**
2. Remove the two nuts and washers that hold down the P1 edge connector.
3. Remove the 5 (4 corners & 1 center) KEPS nuts from the control board. **Note the location of any fiber washers. You must use these washers to prevent damaging the printed circuit board.**
4. Lift the control board and P1 clear of the threaded studs. Pull apart the control board and P1. **Ensure not to loosen or pull any wires from P1.**
5. Remount the control board and refasten with the 5 KEPS nuts.
6. Loosen the two captive screws to the left of the control board and swing out the control board.
7. Remove all cables from retaining clips and cable clamps on the back of the swing out plate.
8. Unfasten the retaining clips on the ribbon cable connector at the top of the control assembly.

9. Remove the ribbon cable from the top of the control assembly.
10. Disconnect the cable that connects TB1 to the control assembly. Remember to unlock the connector.
11. Remove the five 1/4 - 20 hex head cap screws from the base of the control assembly. Be sure to support the assembly.
12. Carefully lift out the control assembly. Take care not to damage any of the edge mounted control switches or the assembly.

Installing the Control Assembly

13. Set the programming switches S1-S8 and jumpers J1- J11 on the new board to match those on the old board. Refer to the adjustment section of this manual for additional information.
14. Remove P1 and the new control board from the new control assembly using steps #2 - #5 above.
15. Position the new control assembly in the control box and install it with the five 1/4 - 20 hex head cap screws.
16. Reconnect the cable from TB1 to the control assembly.
17. Reconnect the ribbon cable to the mating connector at the top of the control assembly.
18. Place all cables back into the appropriate cable clamps or retaining clips.
19. Close the swing out plate and fasten with the two captive screws.
20. Insert the new control board into P1 inside the control box. **Ensure not to loosen or pull any wires from P1.**
21. Place the new control board and P1 over the mounting studs and refasten both with the hardware removed in step #14.
22. Reconnect P2, P3, P4, P5, and if applicable P7 by aligning the connectors and then pushing them together until you hear a click.

Removing the control board

1. Disconnect J2, J3, and J5 from their mating connectors on the control board. Squeeze the locking tabs on the body of the connector to unlock the connector from its mate and then pull the upper half from the board. **Do not try to remove these connectors without first unlocking them.**
2. Disconnect P4 from the control board by pushing the locking ears at the top and bottom of the connector up and down respectfully. **Do not try to remove the connector without first releasing the locking ears.** Use the plastic tape loop attached to the connector to pull the connector from the board.
3. Remove the two nuts and washers that hold down the P1 edge connector.
4. Remove the 5 (4 corners & 1 center) KEPS nuts from the control board. **Note the location of any fiber washers.** You **must** use these washers to prevent damaging the printed circuit board.
5. Lift the control board and P1 clear of the threaded studs. Pull apart the control board and P1. **Ensure not to loosen or pull any wires from P1.**

Installing the control board

6. Set the programming switches S1-S8 and jumpers J1- J11 on the new board to match those on the old board. Refer to the adjustment section of this manual for additional information.
7. Insert the new control board into P1 inside the control box. **Ensure not to loosen or pull any wires from P1.**
8. Place the new control board and P1 over the mounting studs and refasten both with the hardware removed in steps #4 & 5.
9. Reconnect P2, P3, P4, P5, and if applicable P7 by aligning the connectors and then pushing them together until you hear a click.

Display board

1. Disconnect the 40 pin connector from the display board by pushing the locking ears on the left and right of the connector left and right respectfully. **Do not try to remove the connector without first releasing the locking ears.** Use the plastic tape loop attached to the connector to pull the connector from the board.
2. Remove the 5 (4 corners & 1 center) KEPS nuts from the display board. **Note the location of any fiber washers.** You must use these washers to prevent damaging the printed circuit board.

NOTE: For a left side mounted display board use a nut driver to access the two nuts at the rear of the board. If you do not have the correct nut driver, then remove the Control Assembly using steps #1 - #12 before removing the display board. This will provide adequate access to the display board.

3. Place the new display board over the mounting studs and refasten with the hardware removed in step #2.
4. Reconnect the 40 pin connector by aligning the connectors and then pushing them together until you hear a click.
5. Install the control assembly using steps #13 - #22 if necessary.

Power supply board

Removal

1. Open the swing out plate by first loosening the two captive screws to the left of the control board.
2. Disconnect the three connectors on the board from their mating connectors. Squeeze the locking tabs on the body of the connector to unlock the connector from its mate. Then pull the upper half from the board. **Do not try to remove these connectors without first unlocking them.**
3. Remove the 5 (4 corners and 1 center) KEPS nuts from the control board. **Note the location of any fiber washers.** You must use these washers to prevent damaging the printed circuit board.

Installation

4. Place the new power supply board over the mounting studs and refasten with the hardware removed in step #3.
5. Reconnect the three connectors by aligning the connectors and then pushing them together until you hear a click.
6. Close the swing out plate and tighten the two captive screws at the left of the control board.

Output relays

Removal

1. Open the swing out plate by first loosening the two captive screws to the left of the control board.
2. On the power supply board, slide the ty wrap off the relay. If necessary, cut the ty wrap from the relay.
3. Remove the relay from its socket.

Installation

4. Insert the new relay. Take care not to bend under any of the relay's pins.
5. Slide the ty wrap over the relay. If the ty wrap will not slide over the relay, then remove the power supply board using steps #1 - #3. Install a new ty wrap and then reinstall the power supply board using steps #4 - #6.

LIGHT CURTAIN

Except for the indicator lights, lens caps, relays, and fuses there are no customer replaceable items in the Shadow V Light Curtains. If the light curtain transmitter or receiver is defective, return it to Data Instruments. If you cannot isolate the problem to one unit, return them both. See Shadow manual for replacement of relays.

Indicator Light Removal

- 1) Remove cover screws of unit with the defective indicator light. Swing open cover.
- 2) Press the light while turning it counter clockwise until it pops out of the socket.

Indicator Light Installation

- 1) Push the light into the socket and turn it clockwise until it locks in place.
- 2) Close cover and replace cover screws.

Light curtain fuses

The Shadow V transmitter has one fuse. The receiver has three fuses. These fuses are common glass slo-blo fuses available at any hardware store. Fuses are located near connectors at bottom of hinged cover.

To replace a fuse, first turn off power to Shadow units. Remove cover screws of unit and swing cover open. Find fuses near bottom of hinged cover. Remove plastic fuse cover. Pop fuse out of holder by prying out at ends. Snap in new fuse. Shut cover and replace cover screws.

WARNING

Only fuses with the same rating as originals must be used.

LIMIT SWITCH/SHAFT ENCODER ASSEMBLY

Limit Switch Replacement

Replacing a defective limit switch is obvious and straight forward. Make sure to use the same contact (N.O./N.C.) when rewiring the switch.

Shaft Encoder Removal

1. At the encoder end of the rubber shaft coupling, cut and remove the ty wrap.
2. Remove the two nuts that hold the encoder mounting bracket to the limit switch assembly.
3. Pull the encoder and bracket out from the rubber shaft coupling.
4. At the in-line connector, disconnect the encoder cable.

If your unit does not have an in-line connector, cut the encoder cable at the ty wrap furthest away from the encoder.

5. Cut and remove the remaining ty wraps holding the cable to the bracket.
6. Remove the six screws holding the encoder to the bracket.
7. Remove the encoder from the bracket.

Shaft Encoder Installation

1. Attach the new encoder to the bracket and secure with six screws.
 2. Push the encoder shaft into the rubber coupling at the end of the limit switch.
 3. Use the two nuts to attach the encoder bracket to the limit switch enclosure.
 4. At the encoder end of the rubber coupling, install a new ty wrap.
 5. Use ty wraps to attach the encoder cable to the mounting bracket.
 6. Reconnect the encoder cable.
- If the original cable did not have an in-line connector, go to step 7.
7. Use the old cable to pull the new cable through the conduit to the Control Box.
 8. In the Control Box, disconnect the old cable from the edge connector terminal strip P1.
 9. Connect the new cable to P1. Refer to Figure #4.

OPERATOR STATION

This section tells you how to replace the MUTE, PALM TIME, and PRIOR ACT indicator lights.

Mute and Palm Time Indicator Light Removal

1. At the Operator Station loosen the two screws and open the cover.
2. At the lens spade, slide off the socket and bulb.
3. Remove the bulb.

Mute and Palm Time Indicator Light Installation

1. Insert the new bulb (#757 or equivalent).
2. Slide the socket and bulb over the lens spade.
3. Close the Operator Station cover and tighten the two screws.

Prior Act Indicator Light Removal

1. At the Operator Station, loosen the two screws and open the cover.
2. Loosen the two screws that hold the contact blocks to the prior act switch.
3. Remove the bulb.

Prior Act Indicator Light Installation

1. Insert the new light bulb (#757 or equivalent).
2. Place the contact blocks on the prior act switch housing.

Make sure you do not pinch any wires between the contact blocks and the switch housing.

3. At the contact blocks, tighten the two screws.
4. Close the Operator Station cover and tighten the two screws.

DUAL SAFETY VALVE MAINTENANCE

Periodically check the muffler on the dual safety valve for tightness. The muffler has a threaded shaft which screws into the body of the valve. If you can turn the muffler by hand without a lot of effort, it is not tight enough.

To tighten, grab the muffler with both hands and turn it clockwise as tight as you can get it (without stripping the threads).

Also periodically clean the muffler. A clogged muffler can reduce stopping time.

To clean muffler:

1. Unscrew muffler from valve.
2. Swish the whole muffler in solvent cleaner.
3. Blow air through muffler.
4. Replace muffler on valve.

WARNING

Do not disassemble the muffler itself. Disassembly is not required for cleaning. You can damage the muffler by trying to take it apart.

DUAL SAFETY VALVE REPLACEMENT

Data Instruments stocks complete dual safety valves and cannot offer spare parts. To repair or overhaul a dual safety valve, contact the manufacturer for spare parts and service information.

WARNING

Dangerous high voltage (115 Vac) is present at the dual safety valve. Make sure the power is off when working on the valve.

Appendix A

Wintriss Press Control Status Codes

When internal diagnostics detect certain types of problems or malfunctions, the STATUS CODE readout on the Control Box displays a two digit code. The different status codes, and what they mean are listed below.

Codes 00 - 30 indicate problems which the operator can correct. These include improper switch selection or "illegal" switch combination such as when FOOT and INCH are selected together.

Codes 51 - 99 indicate a problem with the press or the WPC. Note that codes 51 - 56 are undefined. Although the installation instructions say to connect specific sensors to these inputs, the installer can change these connections without hurting system performance. These status codes must be defined after the WPC is installed. For example, if the lube pressure switch is connected to delayed stop #2, the blank after 52 should say "Low lube pressure."

All status codes not listed indicate a failure that requires trained maintenance personnel.

OPERATOR CORRECTABLE

- 00 Stroke select-off
- 10 Motor Off
- 12 Foot switch held down or not connected properly
- 13 EMERGENCY STOP pressed, or EMERGENCY STOP line open
- 14 PRIOR ACT held closed at stroke start
- 15 Both PRIOR ACT and TOP STOP buttons pressed
- 16 TOP STOP button pressed or aux. stop line open at stroke start
- 20 Motor in reverse
- 22 FOOT mode selected while in INCH mode
- 23 External trip mode selected without setting STROKE SELECT to SINGLE STROKE
- 24 Both palm buttons pressed during one hand operation
- 25 Motor on when bar mode in use
- 26 Excessive speed during bar mode
- 27 MODE SELECT in ONE HAND but STROKE SELECT is not in SINGLE STROKE
- 30 Bar mode selected

PRESS PROBLEMS

- 51 Delayed stop 1: _____
- 52 Delayed stop 2: _____
- 53 Immediate stop 1: _____
- 54 Immediate stop 2: _____
- 55 Immediate stop 3: _____
- 56 Immediate stop 4: _____
- 60 Shadow test failed at stroke start
- 61 Shadow test failed during brake test
- 62 Shadow relays disagree
- 64 Shadow muted at non-interrupted stroke start
- 65 Light Curtain connected to Two Hand only system.
- 70 Dual safety valve relays or limit switches incorrect at stroke start.
- 71 Dual safety valve relays or limit switches incorrect during stroke.
- 72 Dual safety valve relays or DSV monitor incorrect at top stop
- 74 Faulty MODE SELECT switch
- 75 Motor forward and reverse switches closed at the same time
- 76 Faulty stroke selector switch
- 77 Top stop button contacts disagree
- 79 No pulse seen from shaft encoder during stroke
- 81 Mute 2 limit switch and the overrun limit switch closed simultaneously
- 82 Mute 1 limit switch and the overrun limit switch closed simultaneously
- 83 Overrun limit switch closed before top-stop limit switch was detected
- 84 Mute 1 limit switch closed before overrun limit switch was detected
- 85 Top-stop limit switch closed before mute 1 and mute 2 limit switches were properly detected
- 87 Mute 1 limit switch closed before both the top-stop and the overrun limit switches were detected
- 88 Top stop limit switch not detected or not detected in allowable time

CONTROL BOARD ERRORS

The following status codes indicate a problem that requires replacing the control board.

- 90 Data bus shorted
- 91 Check sum one incorrect
- 92 Check sum two incorrect
- 93 Bad memory location found
- 94 Software trap encountered
- 95 Flip-flop one not off at start of stroke
- 96 Flip-flop two not off at start of stroke
- 97 Flip-flop still on at the end of stroke
- 98 Software error before stroke initiation
- 99 Software error before stroke initiation

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Appendix B

External Trip

The Wintriss Press Control external trip function allows an external event to automatically start a single stroke. Generally, material feed is used as the signalling event. However, other events such as part ejection or positive part transfer can be used.

There are three requirements for external trip. First, you must have an external trip version of the WPC. Second, you must have a trigger mechanism. Third, you must have a Shadow light curtain protecting personnel.

As a triggering mechanism you can use a single pole double throw (SPDT) contact (switch or relay) or two solid state switches (NPN, open collector).

If you have any questions about external trip, contact Data Instruments.

Installation

The standard WPC wiring instructions apply to the external trip version.

Wiring information for the external trip switch mechanism is shown in Figure 1. Though a SPDT contact is shown in the figure, you can also use solid state switches (proximity, for example), or outputs from a programmable logic controller (PLC). To make sure the contacts are clean and reliable, the switch or relay should be new and unused.

Operating Instructions

Assuming the correct sensors have been installed, set the Press Control switches as follows:

1. Stroke select to SINGLE STROKE
2. Mode select to TWO HAND
3. External to ON

To initiate the first stroke:

- 1) Depress the PRIOR ACT switch.
- 2) Press the RUN/INCH switches until the ram passes bottom dead center.

The up stroke and all other strokes will be automatic.

It is not unusual for the press to pause at top-stop. It is waiting for the "go" signal from the external switch.

The external signal must occur either within 10 seconds or 30 seconds after top-stop. (You can choose the time by setting switch 1 of the program select switch—see "Setting the program select switch" in Chapter 3.) If the press control does not receive the signal within the set time, it assumes a problem has occurred and will not start the next stroke. If this happens, repeat steps 1 and 2 to re-start.

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Appendix C

OSHA and ANSI regulations

The Occupational Safety and Health Administration (OSHA) regulations and the American National Standards Institute (ANSI) standards for presence-sensing devices are listed here. The OSHA regulations are in Section 1. ANSI standards are in Section 2.

Section 1—OSHA regulation 1910.217

Reprinted below are excerpts from OSHA regulation 1910.217 pertaining to the use of presence-sensing devices for point-of-operation guarding on mechanical power presses. Portions from the text of the OSHA regulations are presented in the left-hand column of the pages in this section. Additionally, an interpretation provided by the Precision Metalforming Association (PMA) is presented in the right-hand column.

Data Instruments makes no claim regarding the accuracy or effectiveness of the PMA interpretation reprinted here. The material is listed for informational purposes only. It should not be relied upon for use in any specific application. Persons making use of this interpretive material do so at their own risk. It has been reprinted with the permission of the PMA.

OSHA Regulations

PMA Interpretation

OSHA 1910.217 (c) (3) (i) (a)

(3) Point of operation devices.

(i) Point of operation devices shall protect the operator by:

(a) Preventing and/or stopping normal stroking of the press if the operator's hands are inadvertently placed in the point of operation.

Presence-sensing device

OSHA 1910.217 (c) (3) (iii)

(iii) A presence-sensing point of operation device shall protect the operator as provided in paragraph (c) (3) (i) (a) of this section, and shall be interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other part of his body is within the sensing field of the device during the downstroke of the press slide.

(c) (3) (i) (a) Refers to the functional requirement of a presence-sensing device which prevents and/or stops normal stroking of the press.

(a) The device may not be used on machines using full revolution clutches.

(b) The device may not be used as a tripping means to initiate slide motion.

European method (curtain of light) uses self trip safety system effectively. Variance applied for 11/17/73 by Interlake Stamping Company to use this fail safe system.

(c) The device shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent the initiation of a successive stroke until the failure is corrected. The failure shall be indicated by the system.

When failure occurs, the best indication is the press won't run

(d) Muting (bypassing of the protective function) of such device, during the upstroke of the press slide is permitted for the purpose of parts ejection, circuit checking and feeding.

Top of stroke is the point at which muting shall cease as it is not possible to set a point on the downstroke as the exact position where the hazard of die closing starts.

(e) The safety distance (D_s) from the sensing field to the point of operation shall be greater than the distance determined by the following formula:

Safety distance represents the distance an operator can move his hand during the time it takes a press to stop. The internationally recognized hand reach speed is 63 inches/second.

$D_s = 63 \text{ inches/second} \times T_s$ where

To determine this safety distance, the stopping time of the press is measured with some appropriate measuring device. The measurement is taken such that the stop signal is given to the press at the 90 degree point of the crank position.

D_s = minimum safety distance (inches);

63 inches/second = hand speed constant and

Since some stopping time increase must be accommodated due to braking system deterioration, a percentage factor must be added to the measure time to obtain the factor for use in the equation for determining safety distance. A percentage factor of 20% is recommended for presses with new brakes or brakes of good condition. For older brakes, a 10% factor is recommended.

T_s = stopping time of the press measured approximately 90° position of crankshaft rotation (seconds)

Example:
Measured stopping time = 0.190

Time factor = $1.2 \times 0.19 \times 0.228$ seconds

Calculation = 63×0.228

Safety distance = 14.4 inches

(f) Guards shall be used to protect all areas of entry to the point of operation not protected by the presence-sensing device.

(3) (iii) (f) Great care must be taken to assure that no access to the die area exists unguarded.

OSHA 1910.217 (c) (3) (5)

(5) Additional requirements for safe-guarding. Where the operator feeds or removes parts by placing one or both hands in the point of operation, and a two hand control, presence-sensing device of Type B gate or movable barrier (on a part revolving clutch) is used for safeguarding:

This paragraph tells the condition under which a brake monitoring system is required after November 1, 1975.

(i) The employer shall use a control system and brake monitor which comply with paragraphs (b) (13) and (14) of this section. This requirement should be complied with by November 1, 1975.

(b) (13) Control reliability

(b) (14) Construction requirements.

OSHA 1910.217 (c) (3) (vii) (c)

(c) The safety distance (D_s) between each two hand control device and the point of operation shall be greater than the distance determined by the following formula:

$D_s = 63 \text{ inches/second} \times T_s$, where:

D_s = minimum safety distance (inches);

63 inches/second = hand speed constant;

and

T_s = stopping time of the press measured at approximately 90° position of crankshaft rotation (seconds).

Example

Measured stopping Time = 0.190 seconds

Time Factor = $1.2 \times 0.19 = 0.228$ seconds

Calculation = 63×0.228

Safety Distance = 14.4 inches

OSHA 1910.217 (e) (1)

(e) INSPECTION, MAINTENANCE, AND MODIFICATION OF PRESSES

(i) It shall be the responsibility of the employer to establish and follow a program of periodic and regular inspections of his power presses to insure that all their parts, auxiliary equipment, and safeguards are in safe operating condition and adjustment. The employer shall maintain records of these inspections and the maintenance work performed.

Records of clutch and brake will be weekly. Other inspections are periodic subject to time factor determined by employer.

(ii) Each press shall be inspected and tested no less than weekly to determine the condition of the clutch/brake mechanism, anti-repeat feature and single stroke mechanism. Necessary maintenance or repair or both shall be performed and completed before the press is operated. The employer shall maintain records of these inspections and the maintenance work performed. These requirements do not apply to those presses which comply with paragraphs (b) (13) and (14) of this section.

If brake monitoring system is installed, weekly inspection and records are not required for clutch/brake mechanism. Other parts of the press will require periodic inspections and records.

Section 2

ANSI standards for presence-sensing devices

ANSI standards for two-hand controls

Reprinted below are the American National Standards Institute (ANSI) standards for presence-sensing devices (light curtains). Also included is Section 6.3.5 on two hand controls. ANSI is the United States clearinghouse and coordinating body for voluntary standards activity on the national level. It is a federation of trade associations, technical societies, professional groups, and consumer organizations. Some 1000 companies are affiliated with the Institute as company members.

ANSI creates voluntary standards to eliminate duplication and to weld conflicting standards into single, nationally accepted standards under the designation "American National Standards." The standards reflect a national consensus of manufacturers; consumers; scientific, technical, and professional organizations; and governmental agencies.

The ANSI standards below are American National Standard Institute B11.1-1988 for presence-sensing devices (light curtains) and two hand controls. Both the ANSI standard and its interpretation are part of ANSI standard B11.1-1988. To get a complete copy of the ANSI standard, write to: ANSI, 1430 Broadway, New York, NY 10018.

Standard Requirements

6.3.2 Presence-Sensing Point of Operation Device.

A presence-sensing point-of-operation device, if used, shall protect the operator and others, and shall be interfaced with the control circuit to prevent or stop slide motion if the operator's hand or other body part is within the sensing field of the device during the closing portion of the stroke. In addition:

- (1) Presence-sensing devices shall not be used for safeguarding the point of operation on presses using full-revolution clutches.
- (2) When the sensing field has been interrupted, use of the normal press stroke-initiating means shall be required after clearing the sensing field to resume press operation.
- (3) Muting (bypassing of the protective function) of the device shall be permitted after the hazardous portion of the press stroke has been completed. Muting of the device shall be accomplished in such a manner that no single component failure shall prevent the normal stop command, but shall prevent subsequent press strokes until the failure is corrected.

Explanatory Information

E6.3.2 Presence-Sensing Point-of-Operation Device.

Various presence-sensing devices employ different sensing and adjustment techniques. The point at which a device responds to an intrusion may vary. The device should be located or adjusted so that the device always responds to the intrusion at or prior to the safety distance D (s). See E6.3.2 (13). Also, care should be taken when installing the device so that it does not detect false signals from other devices or equipment in the area.

Usually the electro-optical presence-sensing device is used in a manner that provides a protected zone in front of the primary work area with auxiliary devices or guards used to protect secondary access areas. In some cases, however, mirrors may be used in conjunction with the device to provide two- or three- or four-sided protection. Also, see Illustration 3.

- (3) Muting is typically accomplished by interface circuits or auxiliary controls. The muting element should incorporate a similar level of control reliability as the presence-sensing device itself. A simple cam-operated limit switch wired in parallel with the device's output is inadequate as its failure can remain undetected.

(4) The device shall have an identifiable minimum object sensitivity so that an obstruction of an equal or greater size will be detected anywhere within the sensing field regardless of the plane of intrusion.

(5) The device shall have a maximum response time which shall not be affected by object sensitivity adjustments or environmental changes.

(6) The devices which require adjustments to accommodate variations in ambient or operating conditions or which incorporate channel blanking or floating window features shall be designed so that the adjustments or features are capable of being supervised by the employer.

(7) The presence-sensing device shall be provided with a means that visibly indicates when it is and is not in use and functioning properly. The device shall also indicate which sections, if any, have been blanked out.

(8) The device shall not fail to respond to the presence of the operator's or other's hand or body part due to the presence of a reflective object or workpiece.

(9) The device shall be designed and constructed so that any single component failure, including output devices, shall not prevent the normal STOP command from being sent to the press, but shall prevent operation of the press stroke until the failure has been corrected. In the event of a power failure to the device, it shall initiate a STOP command to the press-control system.

(10) The device and the press-control system shall be interfaced so that the device's STOP command shall initiate stopping action during the closing portion of the press stroke. The interface shall be designed to ensure that a single component failure within the interface of the control system shall not prevent the normal STOP command from being sent to the press, but shall prevent operation of the press stroke until the failure has been corrected.

(4) The device should have a minimum object sensitivity stated by the device manufacturer. For example, electro-optical devices may detect a 1-1/4-inch-diameter opaque object anywhere in its sensing field but allow 1 inch obstructions to pass undetected at certain points in the field.

(5) The device manufacturer should state the maximum total response time, including output devices, of the presence-sensing device.

(6) Typically, these adjustments or controls are key-operated or located under lockable covers.

(7) It is useful to observe a display such as a meter or signal lamp to indicate the degree of penetrations as an aid to setup and shaping of the radio frequency field as well as the separate signal to indicate intrusion resulting in a STOP command. Red and green indicator lamps or other means that can be easily seen by the operator and others should be provided to indicate that the device is functioning. When the device is bypassed, an amber indicator lamp or other means should be used to indicate to the operator and others that the device is bypassed.

(9) See *Control Component Failure* (4.10)

(10) See *Control Component Failure* (4.10). Also see *Ensure* (3.22).

(11) The device's sensitivity to intrusion shall not be adversely affected by changing conditions around the press.

(12) The effective sensing field of the device shall be located at a distance from the nearest point-of-operation hazard so that the operator or others cannot reach into the point of operation with a hand or other body part before cessation of motion during the closing portion of the stroke.

(11) Some devices may be affected by changes in the conditions around the press such as the placement of parts and tote boxes, grounding conditions of the operator, or the movement of forklift trucks.

(12) The total stopping time of the press should include the total response time of the presence-sensing device, as stated by the manufacturer, the response time of the interface, the response time of the control system, and the time it takes the press to cease slide motion. The following formula should be used when calculating the safety distance:

$$D_s = K \times (T_s + T_c + T_r + T_{bm}) + D_{pf}$$

where

K = the hand speed constant = 63 inches per second

T_s = the stop time of the press measured from the final de-energized control element, usually the air valve

T_c = the response time of the press control

NOTE: $T_s + T_c$ = are usually measured by a stop time measuring device.

T_r = the response time of the presence-sensing device and its interface, if any, as stated by the manufacturer or measured by the employer.

T_{bm} = the additional stopping time allowed by the stopping performance monitor before it detects stop time deterioration. See *Stopping-Performance Monitor* (4.11)

D_{pf} = the added distance due to the penetration factor as recommended in Figure 2. The minimum object sensitivity is stated by the manufacturer. If beam blankouts or floating window features are used, these figures should be added to the object sensitivity figure before using the chart.

Whenever the press-stroke stop command or stopping-performance monitor time or angle setting is changed, the safety distance should be recalculated. See *Stopping-Performance Monitor* (4.11).

NOTE: No increase in safety distance is required for fixed-channel blanking applications if the blanked area is entirely occupied by the material or fixtures.

In some instances, the use of blanking does not allow efficient production of certain piece parts. Horizontal placement of the sensing field, so that it detects the operator's waist area, may present a solution. In this application, the operator may freely manipulate the workpiece and operate the press as long as the operator stands outside of the horizontal sensing field. The sensing field should be located so that the operator cannot reach the point of operation prior to interrupting the sensing field and completion of the stopping action. Where possible, the sensing field should be of sufficient depth to prevent the operator from standing between the field and the point of operation.

However, if the position of the device will allow the operator or others to place themselves between the sensing field and the point of operation, auxiliary guards or devices such as but not limited to barrier guards, safety mats, or other devices should be used in conjunction with the device to prevent the operator or others from exposure to the point-of-operation hazard.

(13) The device shall not be affected by ambient light or by light-source decay so that the increase in response time or object sensitivity is greater than the value used to calculate the safety distance.

(14) All areas of entry to the point of operation not protected by the presence-sensing device shall be otherwise safeguarded.

(15) When a device is used on a press in a single-stroke mode and when the protection of the operator is dependent upon the stopping action of the press, a stopping-performance monitor shall be required.

(13) Examples of ambient light are associated with windows, light fixtures, skylights, bay doors, or die lights.

(15) See *Stopping-Performance Monitor* (4.11).

Excerpt from section 6.3.5 on safety distance for two-hand controls

6.3.5 Two-Hand Control Device

(3) Each operator hand control shall be located at a distance from the point of operation so that the operator cannot release either hand control and reach into the point of operation prior to die closure or prior to cessation of slide motion during the closing portion of the stroke.

(3) The total stopping time of the press should include the total response time of the control system and the time it takes the press to cease slide motion. The following formula should be used when calculating the safety distance:

$$Ds = K (Ts + Tc + Tbm)$$

where

K = the hand speed constant = 63 inches per second.

Ts = the stop time of the press measured from the final de-energized control element, usually the air valve.

Tc = the response time of the control.

NOTE: Ts + Tc are usually measured by a stop time measuring device.

Tbm = the additional time allowed by the brake monitor before it detects stop time deterioration.

See *Stopping-Performance Monitor* (4.11)

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Appendix D

Touch Control Installation and Operating Instructions

The Touch Control can be used with any Wintriss Press Control (WPC) with one hand and single stroke mode. The Touch Control is mounted on or near the press and allows the press operator to cycle the press without using the operator station. To start the press, the operator just touches the yellow start disk as part of his normal hand motion after loading a part. What's more, absolutely no finger pressure is required. Only a touch is necessary. This helps prevent operator fatigue and repetitive strain injuries.

The control is a capacitive proximity sensor. It is mounted inside a compact metal enclosure. A Shadow V light curtain for guarding the point of operation must be used when using the control. The control can only be used in single stroke operation.

WARNING

Point of operation safeguarding, the single most important factor in the elimination of injuries, can only be determined by the press user. All applicable OSHA and ANSI regulations for safeguarding press systems must be followed when installing the Touch Control. Neither the WPC nor the Touch Control is a safeguarding device. They must be installed and operated in accordance with OSHA and ANSI regulations. Data Instruments takes no responsibility if the proper safeguarding devices are not installed or working properly.

"Light curtain break" mode

You can use the Touch Control in "light curtain break" mode. In this mode, the operator must touch the start disk on the control within 2 or 8 seconds (selectable) after removing his hands from the light curtain. Otherwise the press will not start. This mode prevents inadvertent operation when the operator is loading or unloading parts. If this mode is not used, the control starts the press whenever it is touched. *You must have the right software in your WPC to use the Touch Control in "light curtain break" mode.* How to find out what software version you have and how to update your software (if necessary) is explained later. See "Updating your software to add the light curtain break mode."

Mounting the control

To mount the control:

1. Shut off power to the press and the WPC.
2. Choose a location on or near the press convenient to the operator. The idea is to mount the control so the operator can reach it as part of his normal hand movement after loading or unloading a part. Mount the control using the mounting flanges at top and bottom of the metal enclosure. **Do not mount the control between the light curtain and the point of operation.**

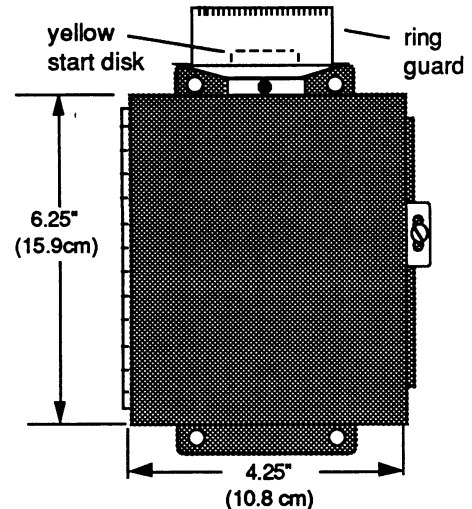


Figure 1. Touch Control

Wiring the control to the WPC

To wire the control, you need to connect three wires from the control to contact blocks inside the operator station. A fourth ground wire must be connected from the control to the grounding terminal inside the press control enclosure.

Follow these instructions to wire the control:

1. Turn off power to the press and to the WPC.

WARNING

Prevent shock. Shut off power to the WPC and press before doing any work. Do not work inside the operator station, touch control, or press control enclosure with power on. All procedures must be carried out by qualified personnel only.

2. Remove the clips at the bottom of the front panel of the operator station. Swing the front panel up and support it so you can work inside the box. (The cover will stay up if you slide it slightly to the left or right.)
3. Knock out a hole in the bottom of the operator station near the existing conduit from the WPC control box. Also knock out a hole at the bottom of the Touch Control box.
4. Run conduit and wiring from the control to the operator station. No. 16 wire is recommended. (No. 14 if local codes require it.)

5. Measure wires to fit before cutting. The ground wire for the control must be grounded at the equipment grounding terminal inside the press control enclosure. Good grounding is very important for proper control operation. Therefore make the ground wire long enough to go through the operator station, through the conduit to the press control enclosure, then to the grounding terminal in the WPC control box.

The other three wires must be run to the left and right palm button contact blocks in the operator station. See Figure 2. These contact blocks are located at the right and left side of the box (adjacent to the palm buttons on the outside).

After measuring, leave a service loop inside the box. Then cut wires.

6. Open the door of the Touch Control enclosure and wire the control as shown in Figure 2. To reach the terminal screws, remove the three cover plate screws near the bottom of the control housing. Then remove the cover plate. Loosen the nut at the base of the control and slide wires through. Connect wires to terminal screws. Retighten the nut and make conduit connections to the control enclosure.
7. To connect wires at the operator station, you must remove the contact blocks to reach the terminal screws. Start with the left block (S4). Before removing the block, check the position of the two plastic clips around the screws holding the block to the chassis. These clips fit into slots in the block. Make note of how they fit so you can re-install them easily. Then loosen the two long screws and pull the block out.
8. Remove the blue wire from S4-B1. Splice the wire from terminal 1 of the touch control to this wire. See Figure 2. Use a butt splice to ensure a good connection.
9. Connect the wire from terminal 2 of the Touch Control to S4-B1.

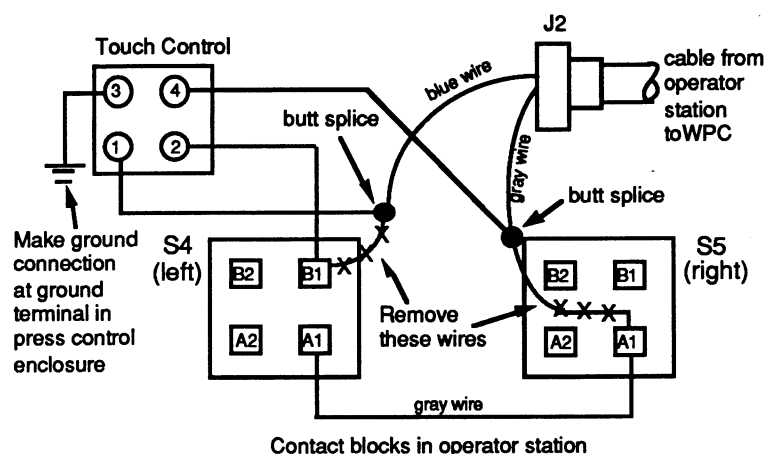


Figure 2. Wiring for Touch Control

10. Re-install the contact block. Make sure the plastic pins on the screws fit into the slots on the block. Tighten screws and make sure contact block is held securely in place.
11. Remove the right contact block (S5).
12. Remove the gray wire that goes from S5-A1 to the connector for the operator station cable (J2). See Figure 1. Make sure you remove the *correct* gray wire. Two gray wires are connected to S5-A1. One goes to the connector, and the other goes to S4-A1. These wires are bundled among other wires, so it will be a little difficult to trace them. However, you must take the time to trace the wires to ensure you remove the gray wire to the connector. If you remove the wrong wire, the control will not work.
13. Splice the wire from terminal 4 of the Touch Control to the gray wire you removed. Use a butt splice to ensure a good connection.
14. Re-install the contact block.
15. Open the cover of the press control enclosure. Run the wire from terminal 3 of the Touch Control (the ground wire) through the conduit running from the operator station to the press control enclosure.
16. Connect this wire to one of the screws on the Equipment Grounding Terminal at the bottom of the enclosure. (This terminal is marked.)
17. Connect the conduit from the Touch Control to the operator station. Tighten all other conduit connections you may have loosened. Close and latch the cover of the operator station and press control enclosure. You are done installing the control.

Updating your software to add the "light curtain break" mode

If you need to install updated software so the Touch Control starts the press only after a light curtain interruption, you must change a chip in the press control enclosure. To tell whether you already have the right software, look at the label on the chip. See Figure 3 for chip location. If the part number is 6300237 or higher, the software for the Touch Control is already installed. If not, obtain a new chip from Data Instruments and install it following the steps below.

To change the chip to update your software:

1. Make sure power to the press and the WPC is off.
2. Open the door of the press control enclosure. The chip you must replace is located in the center of the control board. It sits piggyback on top of a larger chip. See Figure 3. The larger chip is the microprocessor (marked U1). Remember, you are replacing the piggyback chip on top of the microprocessor chip.

3. To remove the piggyback chip, use a small screwdriver or pen knife. Slowly work the blade under the chip. Gently pry it out of its socket by lifting with the blade, then sliding it under further, then lifting again. Continue until the chip is loose. Then remove it by hand.

WARNING: Do not pry on any components on the board. Also make sure you pry under the chip, not under the chip socket. This will crack the socket.

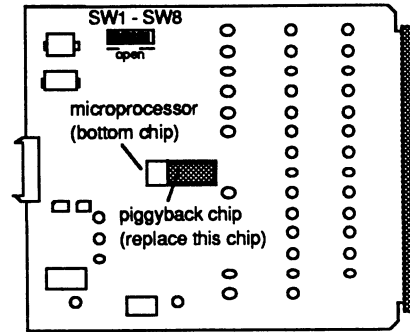


Figure 3. Chip location on board

4. Hold the new chip over the socket the way you would plug it in and find the notch on one edge. Turn the chip so the notch side is to the right.
5. Loosely insert the new chip into the socket. If the pins need to be bent in a little to fit, press the side of the chip on a clean table top. Once all pins fit, press the chip into place in its socket.

Touch Control operation

The Touch Control will work with or without the "light curtain break" mode turned on. If on, the control will start the press only within the set time after the operator withdraws his hands from the light curtain. If the "light curtain break" mode is not on, the control starts the press any time it is touched.

Here's how to operate the press using the Touch Control:

1. To use the "light curtain break" mode, set switch 2 of the program select switch (SW1–SW8) to "on." Leave the switch "off" (set to OPEN) if this mode is not used. This switch is at the top right corner of the control board (see Figure 3).
2. If the "light curtain break" mode is selected, set the time allowed for the press to start using switch 5 of the program select switch. "Off" is 2 seconds. "On" is 8 seconds. If you are not using "light curtain break," skip this step.
3. Close and latch the press control enclosure door. Turn on power to the press and WPC. Set the WPC to single stroke, one hand mode.
4. If the interrupted stroke light on the press control is on, make one stroke with the dual palm buttons to clear the interrupted stroke mode.

5. If you are using "light curtain break," start the press by first breaking the light curtain and removing your hands, then touching the yellow start disk within the time set in Step 2. The press will run and stop at the top of the stroke.

NOTE: The Prior Act light comes on after the light curtain is interrupted and stays on for the time set. If the disk is not touched within the set time, the Prior Act light will go out. The press will not start until you break the light curtain again, then touch the disk within the set time.

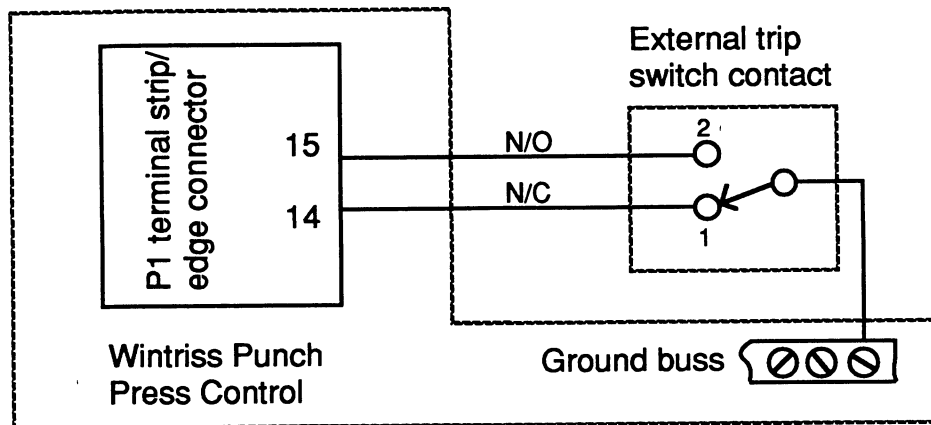
6. If you are using the control without "light curtain break" selected, just touch the yellow start disk. The press will run and stop at the top of the stroke.
7. If the press does not run, turn off power to the press and WPC. Recheck all wiring and connections. Try the control again. If the press still does not run, contact a Data Instruments technical service advisor for assistance.

NOTE: With the Touch Control installed, you cannot use the palm buttons in one hand mode. All other modes work normally as described in your WPC manual.

Figures

for

Wintriss Press Control



How the external trip circuit works:

1. Pin 14 and 15 are wired to an external switch contact as shown. You can use a relay, solid state switches, or a programmable cam switch to initiate switching.
2. The switch contact is shown in the non-actuated position. In this position, pin 14 is connected to ground.
3. After the press top stops, the contact must connect pin 15 to ground (move to position 2). The press control will begin another stroke. After the press starts, the contact must move back to position 1, ready to receive the next trip signal.

Timing requirements for the trip circuit:

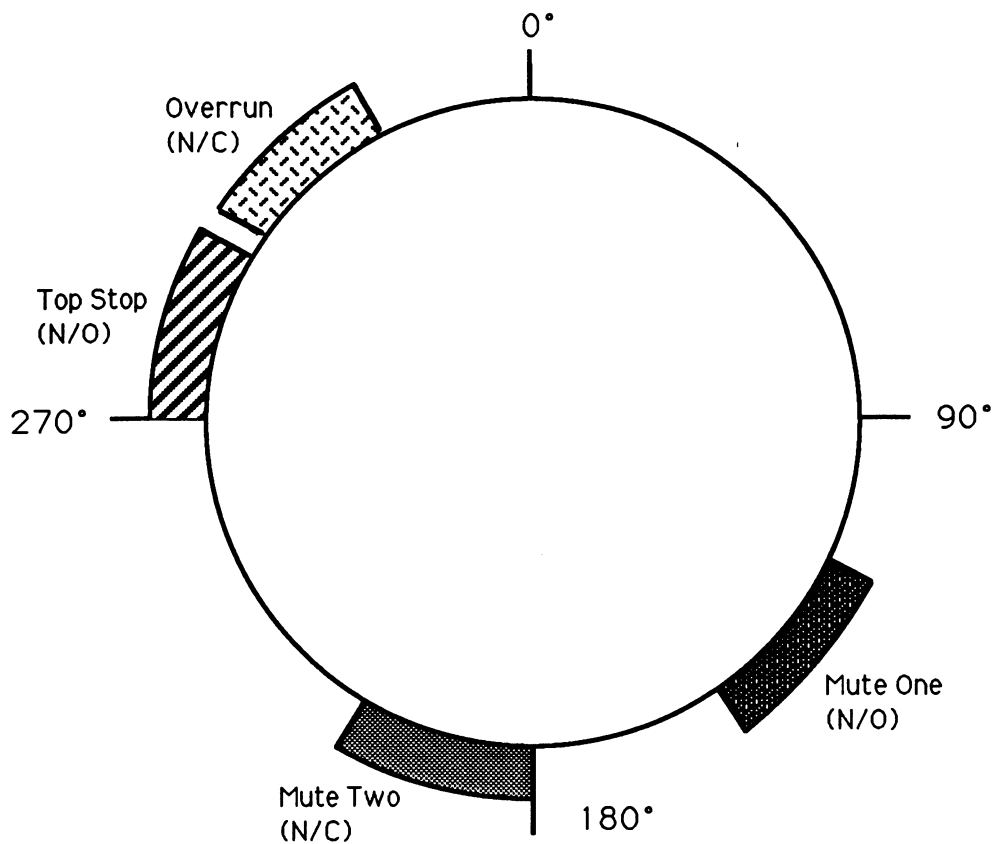
The switch must actuate within 10 seconds or 30 seconds after the press top stops. You can select the number of seconds using Switch 1 on the program select switch. The switch is located on the control board (see Chapter 2 for instructions on setting the program select switches).


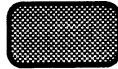


NOTE: Any trip signal received before the press stops is ignored. No press stroke occurs.

Example using a press feed to initiate the trip:

A press feed is wired to a relay controlling the external trip contact. When the relay is de-energized, the contact connects pin 14 to ground (position 1). After the feed is complete and the press has top stopped, the feed energizes the relay, connecting pin 15 to ground (position 2). The press control begins a stroke. (Signal must occur after press stops and within time set on Switch 1 of the program select switch). Switch contact must move back to position 2 to be ready to signal next stroke.

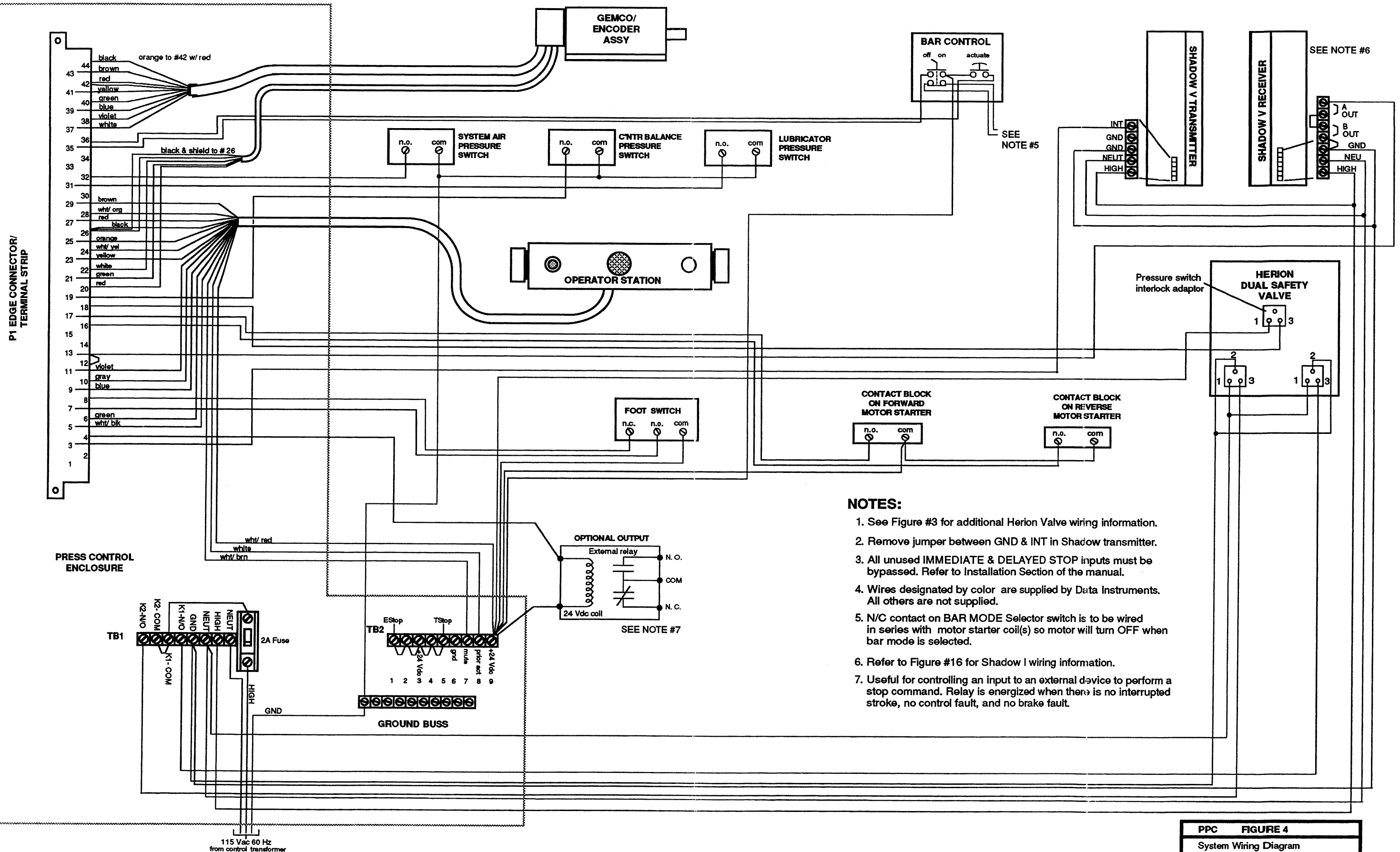
Figure 1. External trip wiring and timing



-  Channel 1 "Mute One": On 120°, Off 150°
 -  Channel 2 "Mute Two": On 210°, Off 180°
 -  Channel 3 "Top Stop": On 270°, Off 300°
 -  Channel 4 "Overrun": On 310°, Off 340°
- The timing must be set to actuate after the top stop timing. In this example it is set to go on 40° after the Top Stop "On" angle.

Note: Channels 1, 3, and 4 are examples only. Channels 1, 3, and 4 must be adjusted for safe operation. Channel 2 has fixed timing and must not be changed. See pages 17-18 for details.

Figure 3. Timings for Rotary Limit Switch Channels 1 - 4

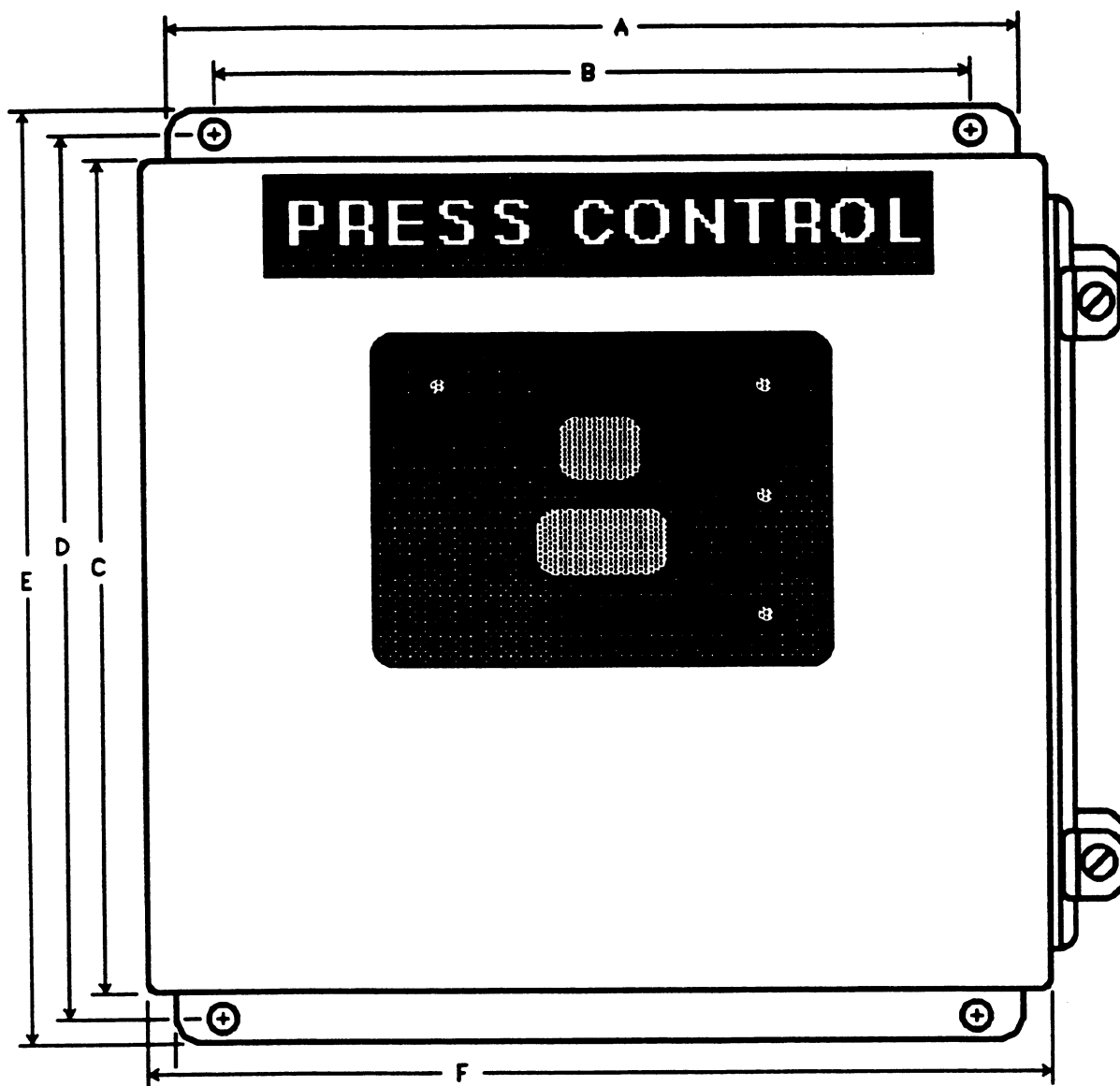


NOTES:

1. See Figure #3 for additional Herion Valve wiring information.
2. Remove jumper between GND & INT in Shadow transmitter.
3. All unused IMMEDIATE & DELAYED STOP inputs must be bypassed. Refer to Installation Section of the manual.
4. Wires designated by color are supplied by Data Instruments. All others are not supplied.
5. N/C contact on BAR MODE Selector switch is to be wired in series with motor starter coil(s) so motor will turn OFF when bar mode is selected.
6. Refer to Figure #16 for Shadow I wiring information.
7. Useful for controlling an input to an external device to perform a stop command. Relay is energized when there is no interrupted stroke, no control fault, and no brake fault.

Figure 4. Wintriss Press Control Wiring Diagram

PPC FIGURE 4	
System Wiring Diagram	
8 Aug 85	CWH
Scale: none	
Revised 4/15/92 AMP	

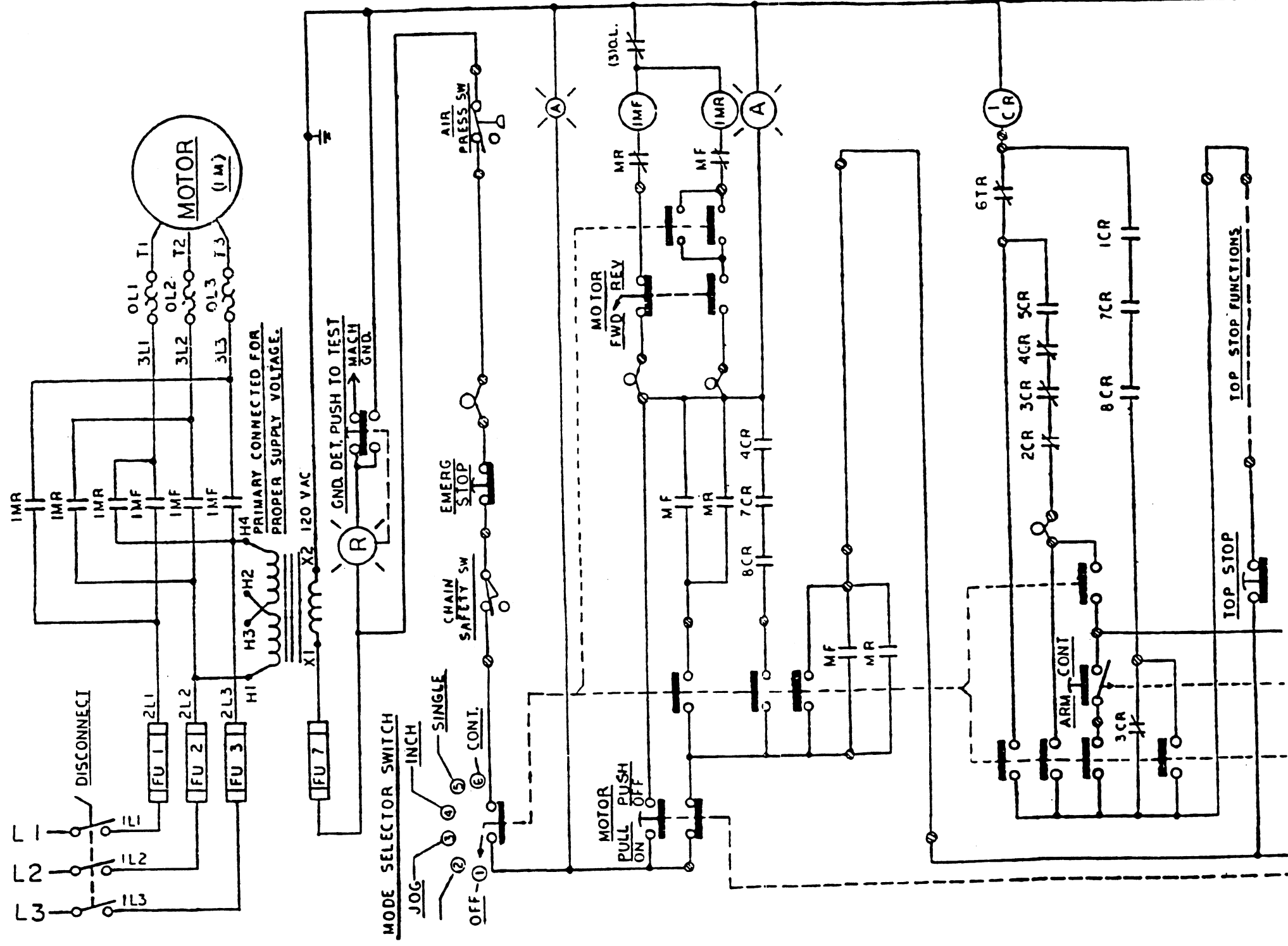


DIMENSIONS					
A	B	C	D	E	F
15.00 (38.1)	14.00 (35.6)	16.00 (40.6)	16.75 (42.5)	17.50 (44.4)	16.00 (40.6)

Mounting hole diameter: 5/16 (0.79)
 Depth of enclosure: 8.00 (20.3)

XX.XX = inches
 (XX.XX) = cm

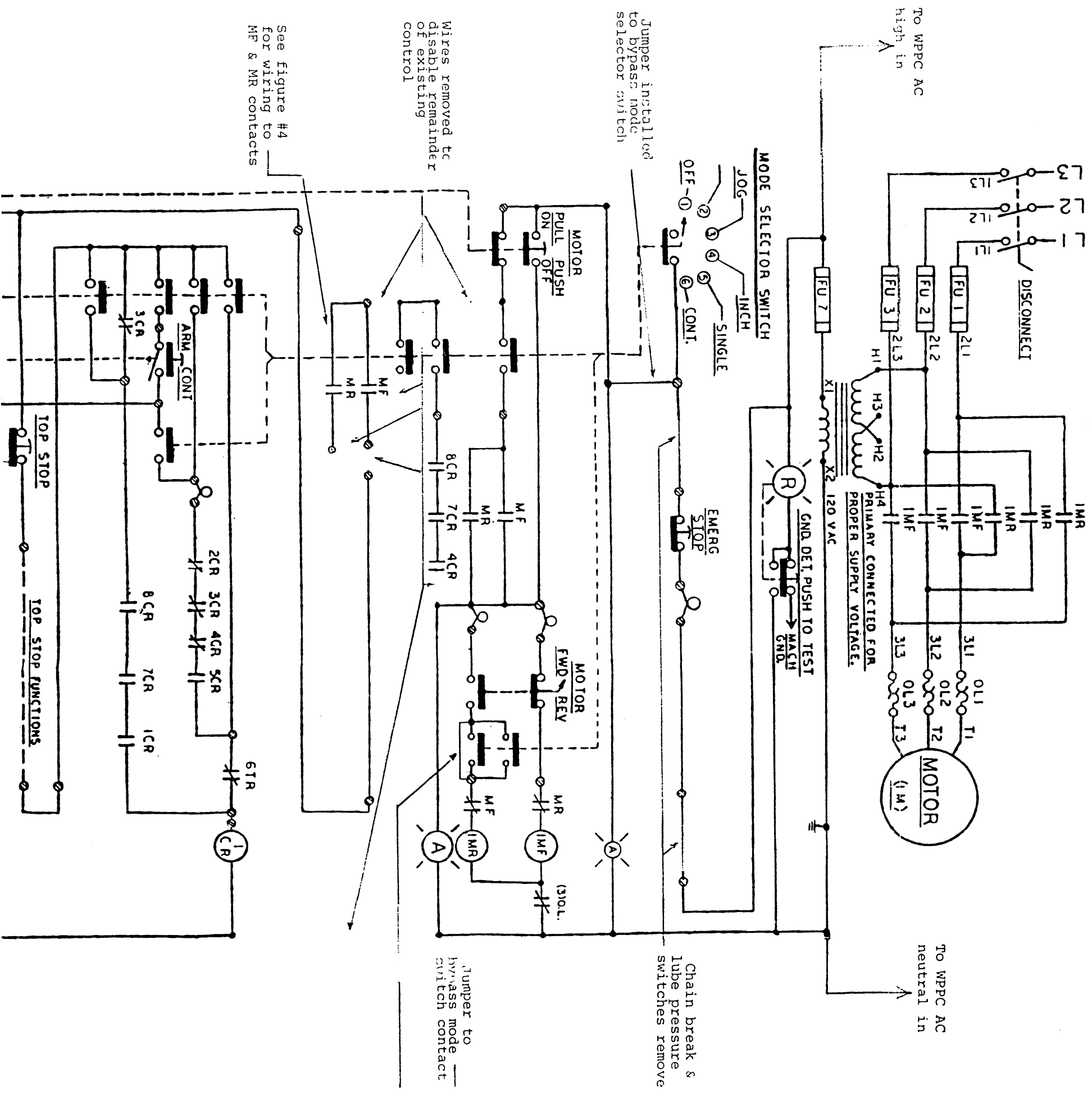
Figure 5. Control enclosure dimensions



TYPICAL PRESS CONTROL PRIOR
TO INSTALLATION OF WPPC.

11/10/83 CWH

FIGURE #7

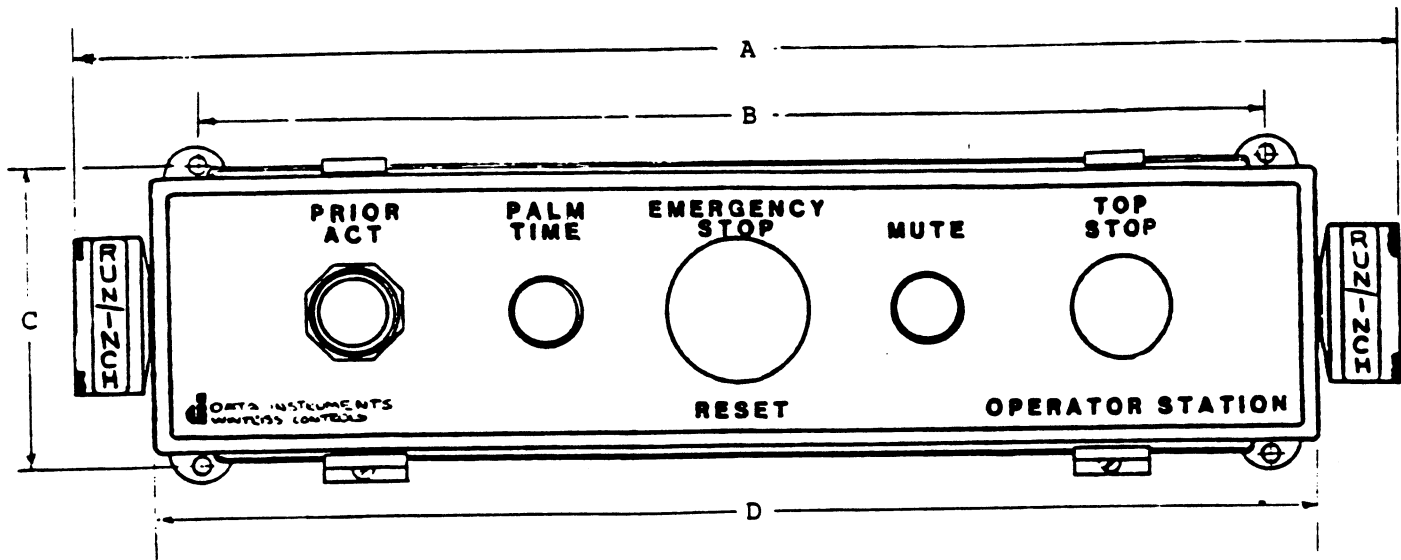


SEE FIGURE #6 FOR SCHEMATIC
OF THE CONTROL PRIOR TO INSTALLATION
OF WPPC.

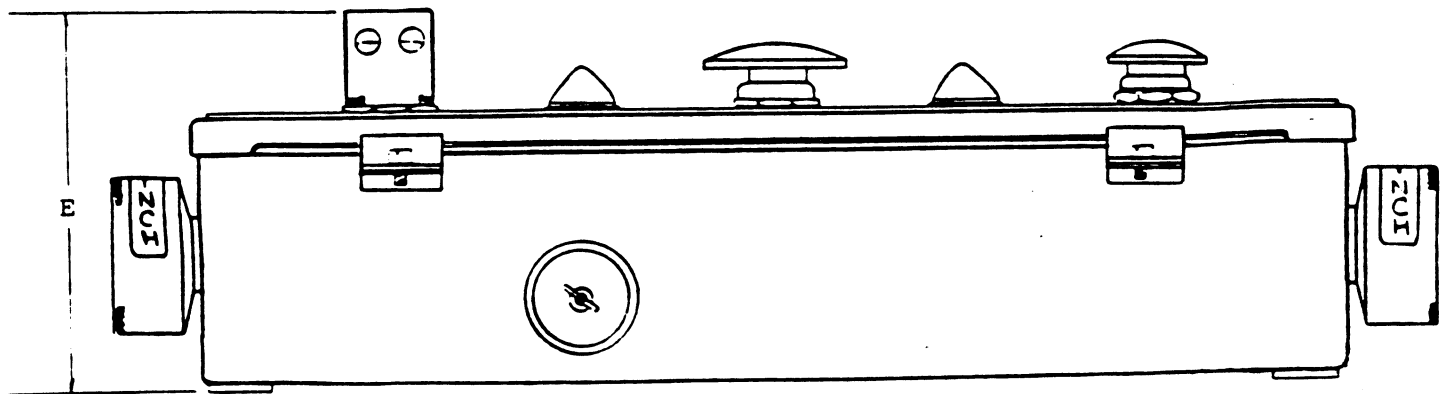
TYPICAL INTERCONNECT TO
EXISTING PRESS CONTROL
CIRCUIT

11/10/83 CWH

FIGURE #8



	A	B	C	D	E
Inches	21 1/4	16 3/4	4 11/16	18 1/4	5 13/16
MM	540	426	119	464	148



Operator Station Outline
28Feb84 CWH

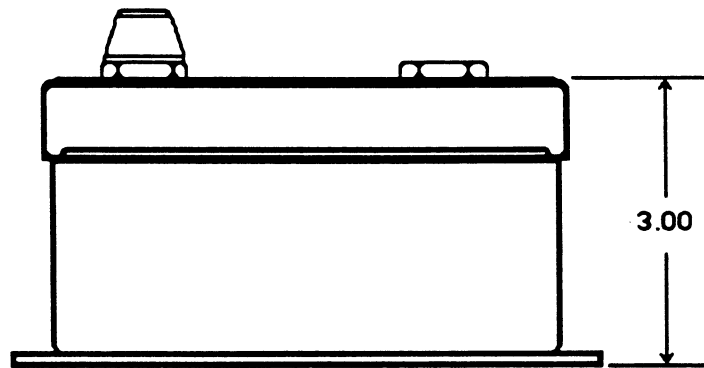
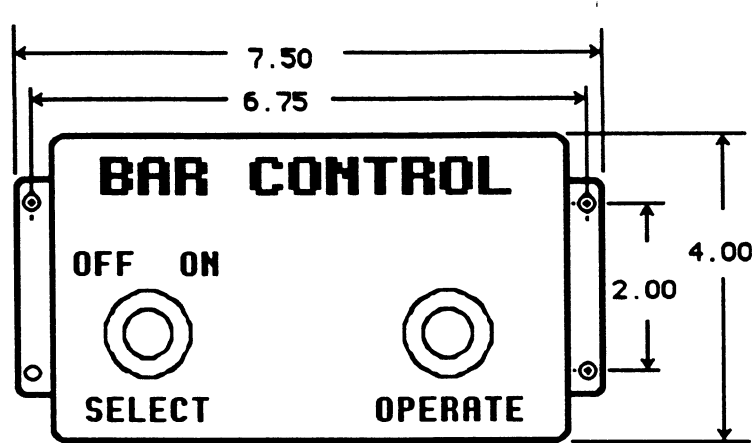
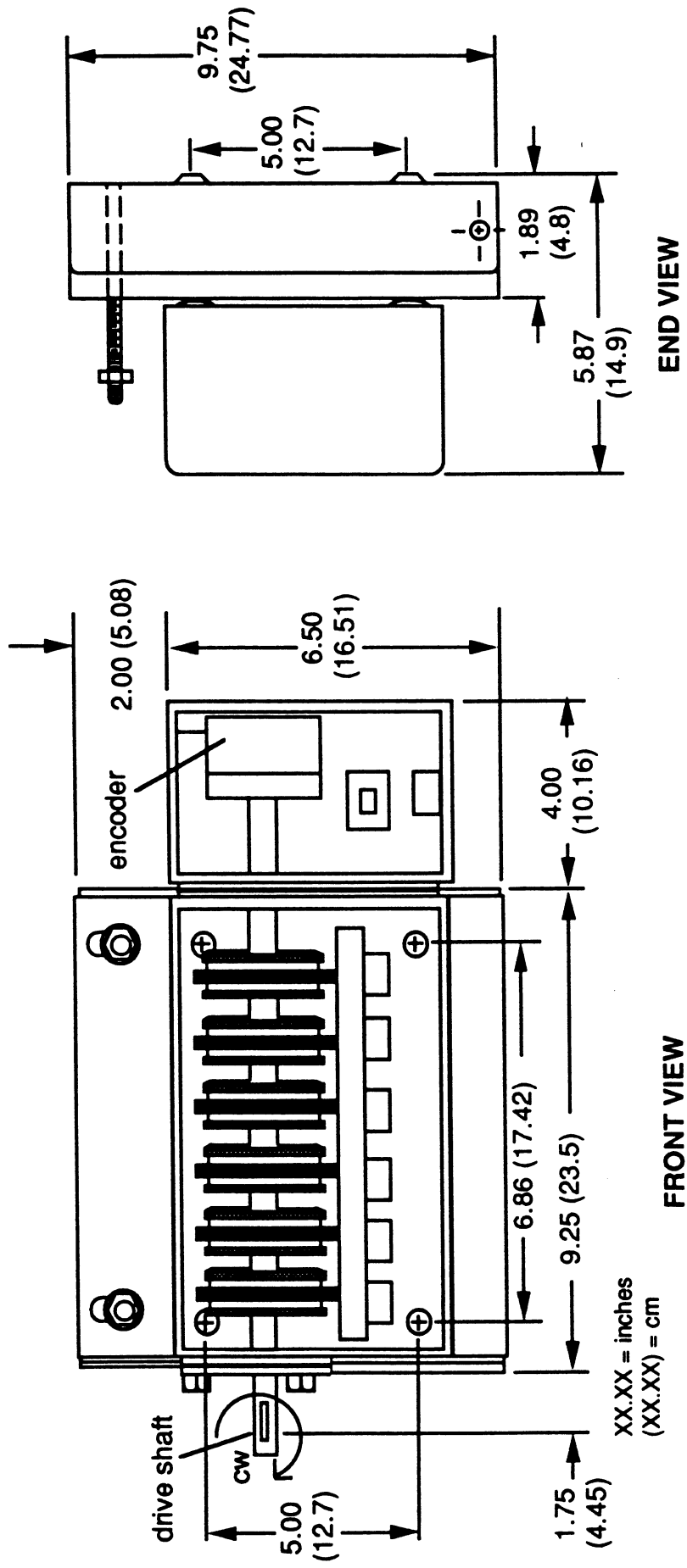


Figure 9. WPC bar mode control



Left hand drive limit switch is shown. Dimensions for right hand drive limit switch are identical. For right hand drive, encoder enclosure and drive shaft are reversed.

Figure 10. Limit switch mounting dimensions

 FIGURE #11

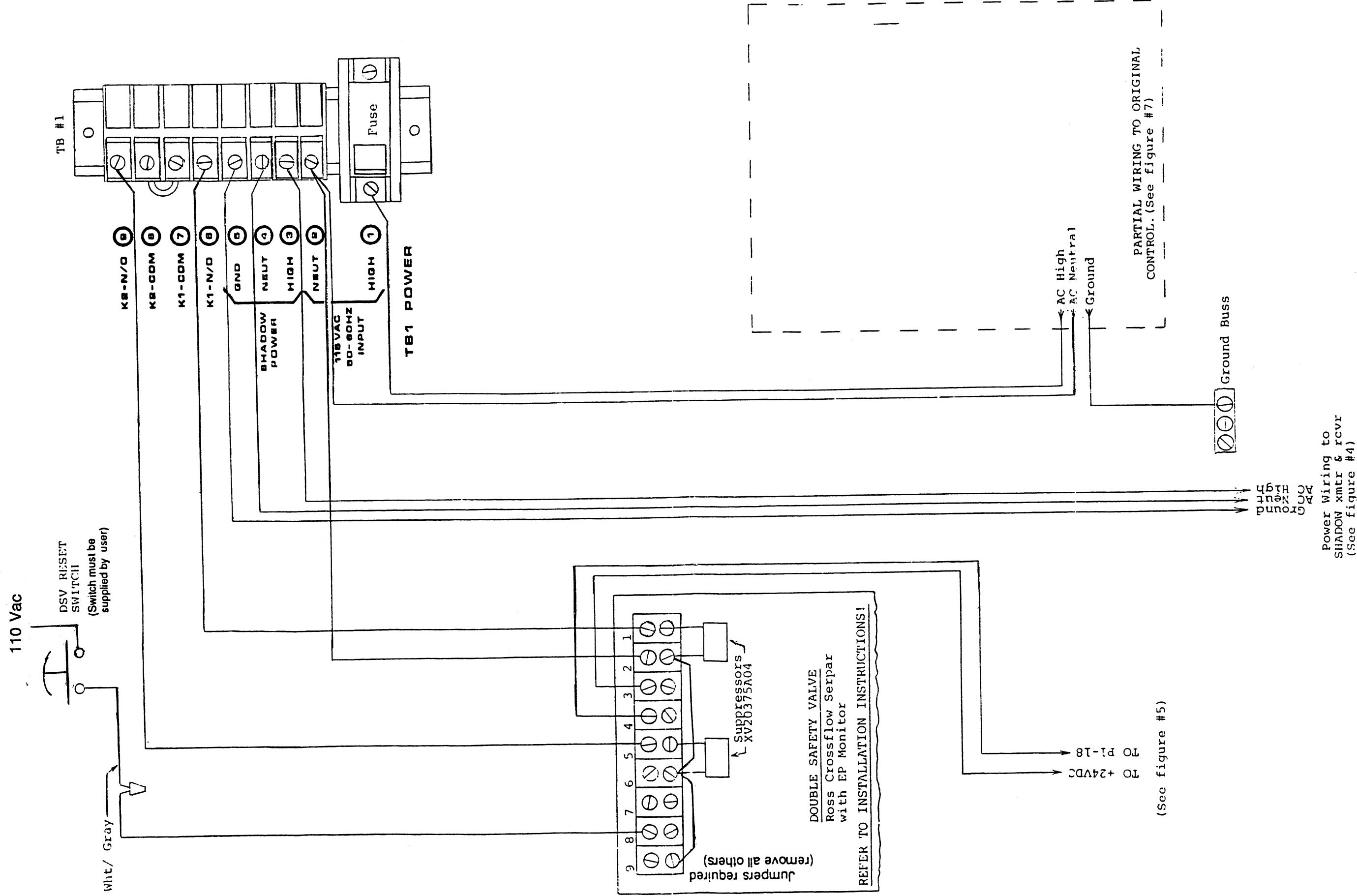
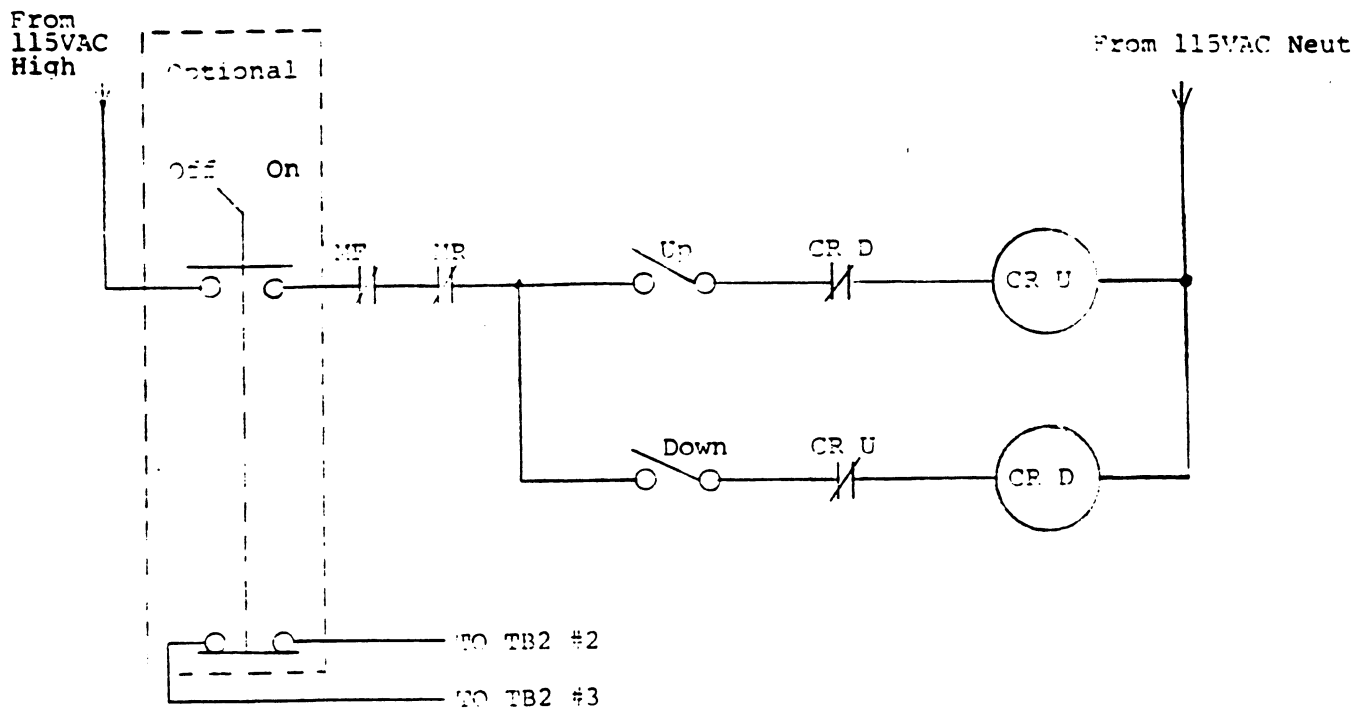
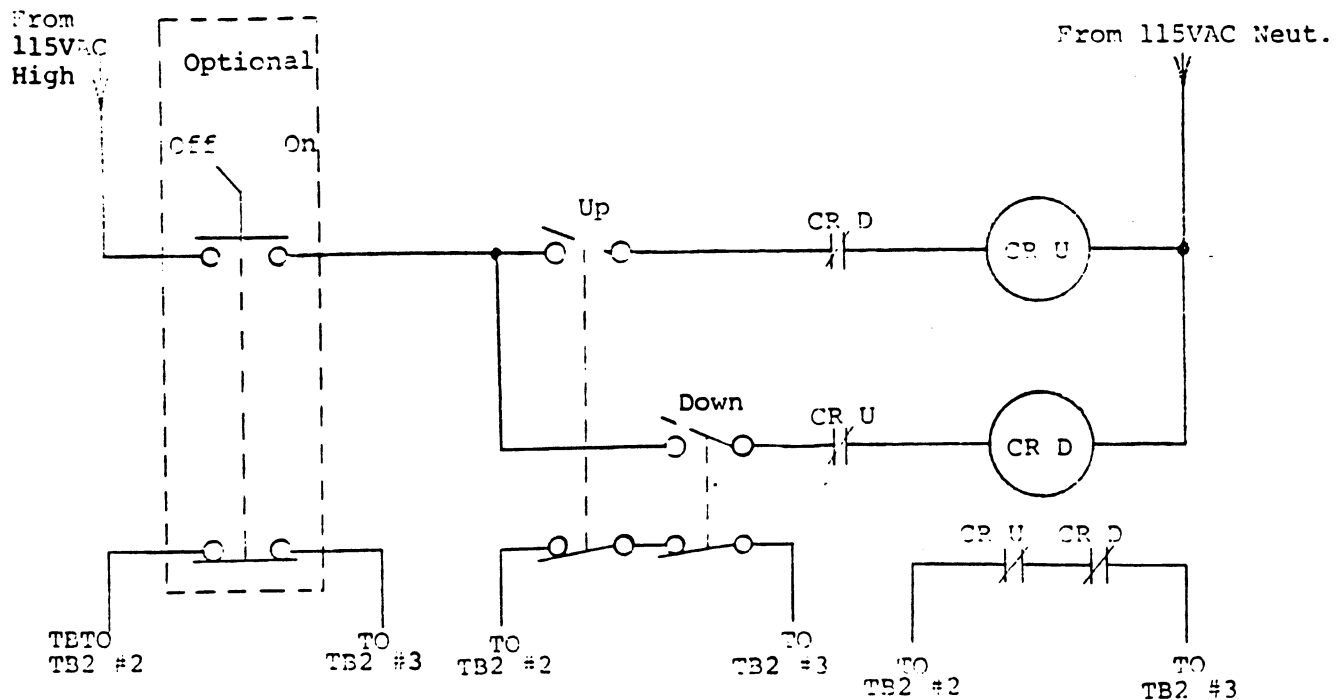


FIGURE #12



METHOD #1



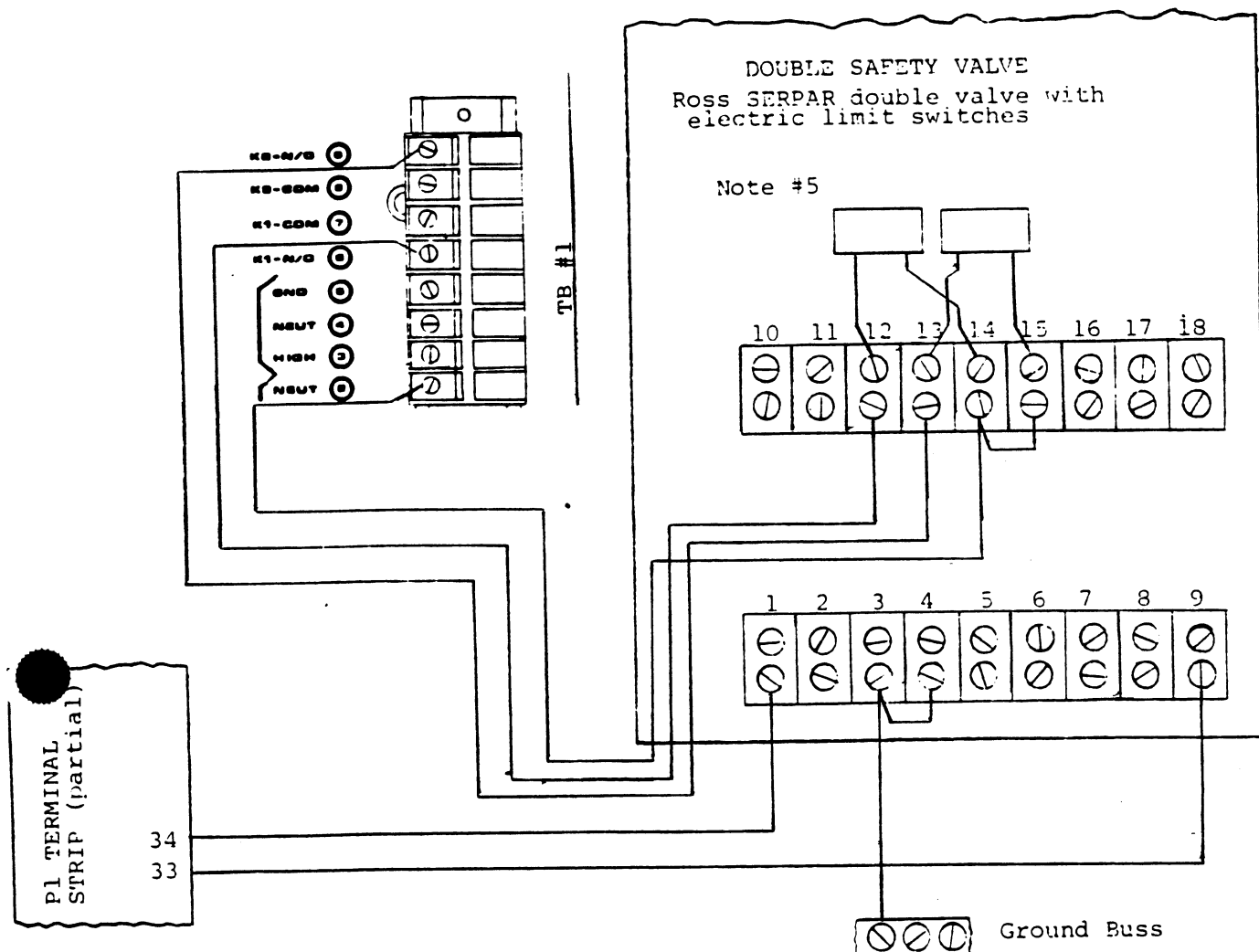
METHOD #2

NOTES:

1. REFER TO INSTALLATION INSTRUCTIONS SECTION 'G' FOR IMPORTANT INFORMATION
2. Use either method #1 or #2 donot use both.
3. If method #2 is used use only one of the three types of interconnection to TB2 #2-3 that is shown.

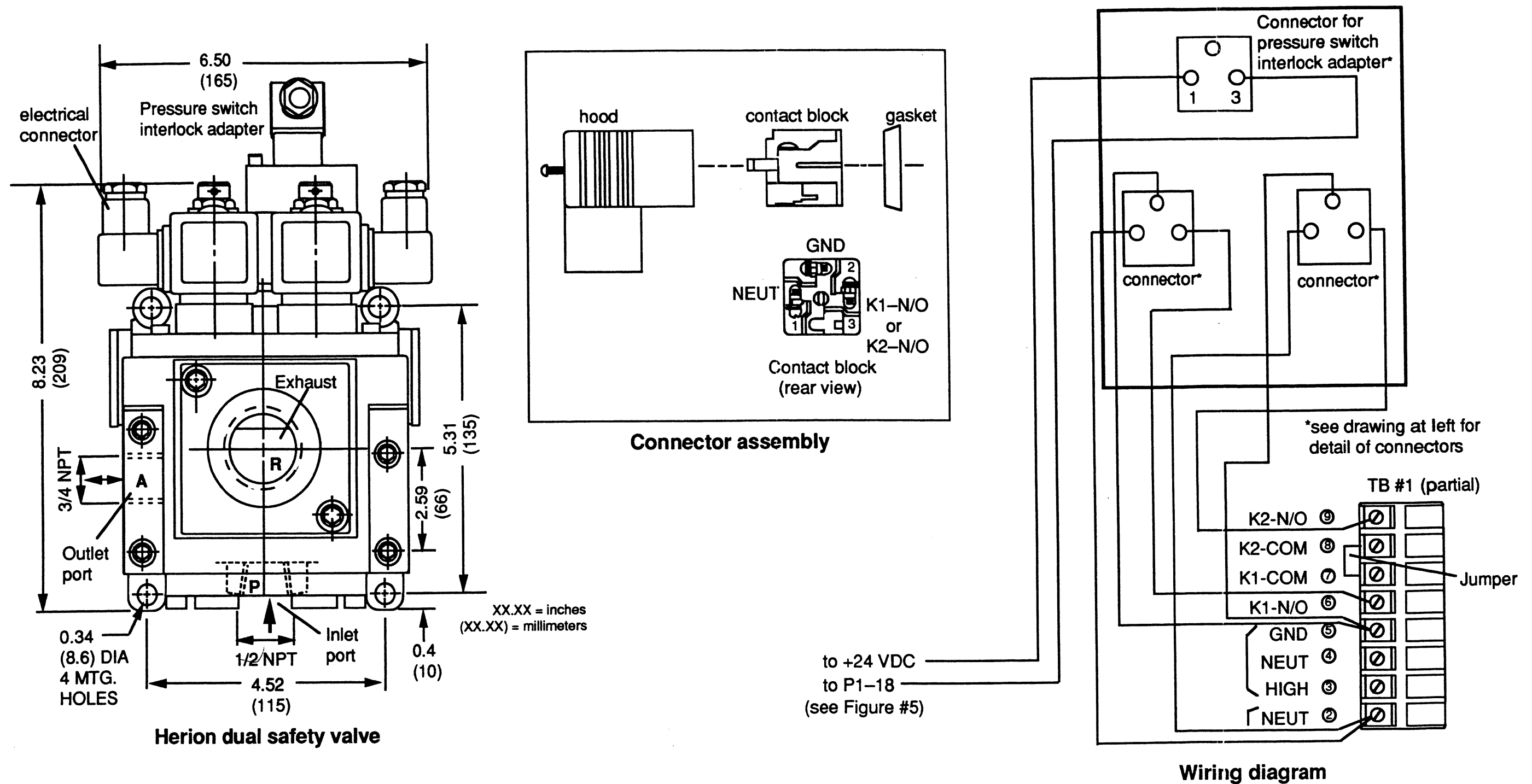
SLIDE ADJUST WIRING
12/9/83 CWH

 FIGURE #13



NOTES:

1. Remove jumpers J6 & J9 on the Control Board (see fig #2).
 or
 Remove jumpers J4 & J5 on the Control Board (see fig #2A).
2. Remove jumper between 12 & 13 in the Ross valve if present.
3. Limit switches within the Ross valve must not have been used with 115VAC control circuits.
4. If Status Codes of 70 or 71 occur then the limit switches are not being properly actuated. Precise positioning of the limit switches relative to the position indicator pins will usually correct the problem.
5. Install noise suppressors XV20375A04 as shown above. This supersedes information in the Installation Instructions section F.

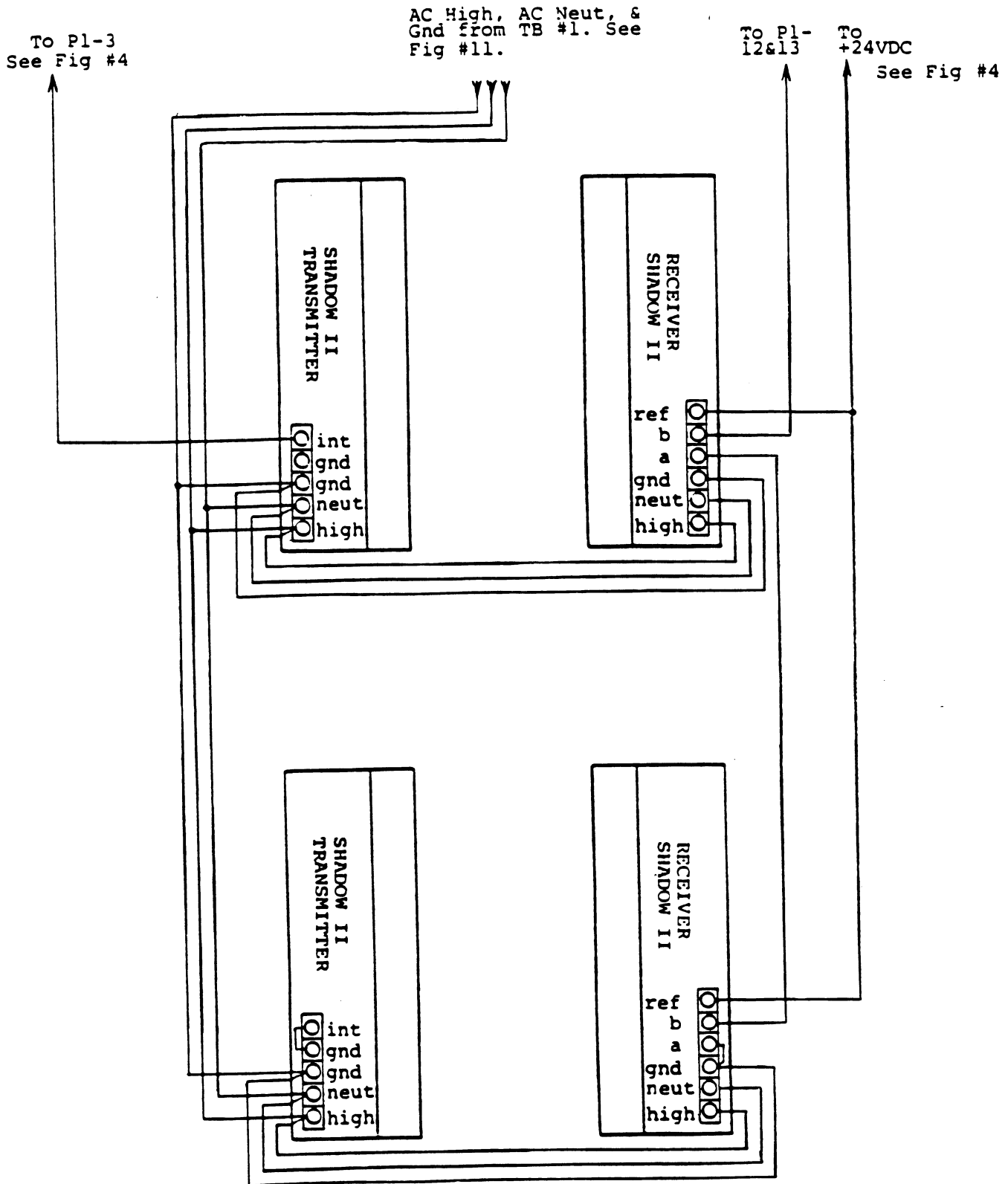


Herion valve wiring notes:

1. The contact blocks have terminal identification marks moulded into the plastic. Ensure the marks on the contact block agree with the drawing above.
2. The Herion valve is automatically reset once a fault is cleared.
3. Noise suppressors XV20375A04 must be installed on TB #1 since there is no terminal strip within the valve. Install a suppressor between 9 and 2 (K2-N/O) and another between 6 and 2 (K1-N/O).
4. *Wiring shown here is for Herion valve only. See Figure 11 for Ross valve wiring.*

Figure 14. Wiring diagram for Herion Dual Safety Valve

FIGURE #15



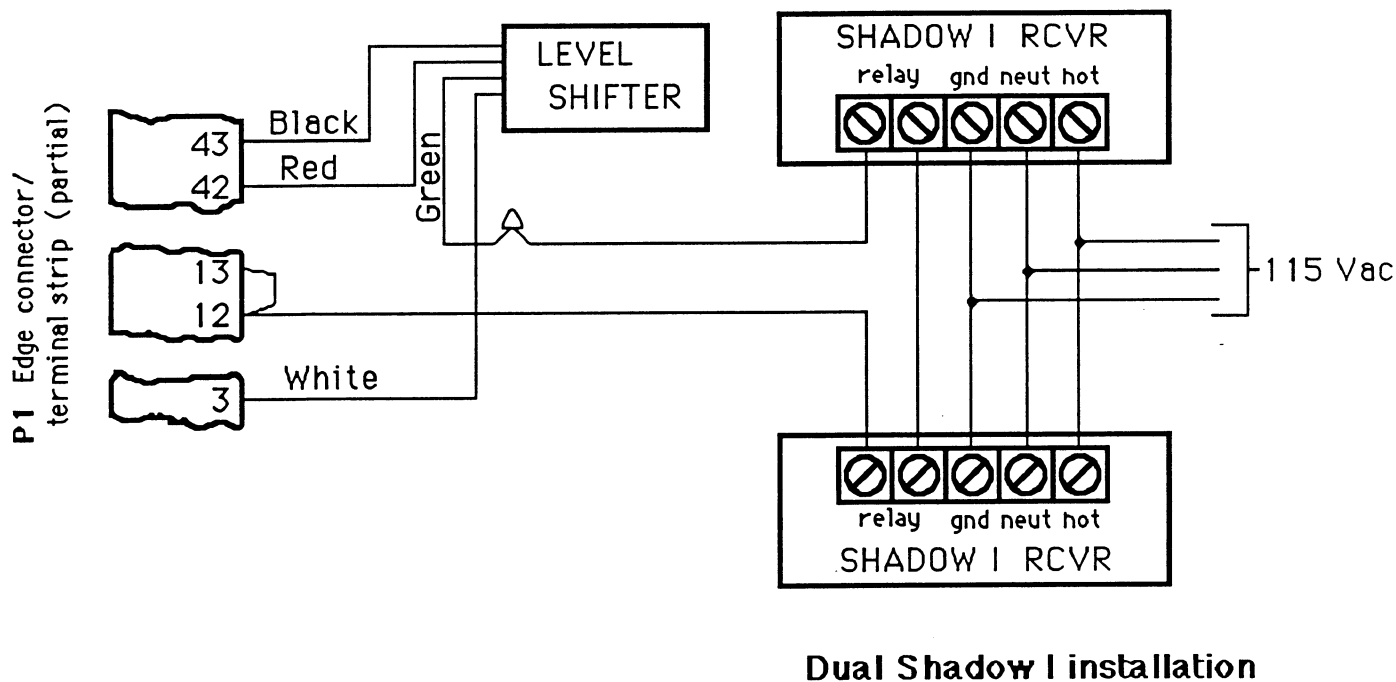
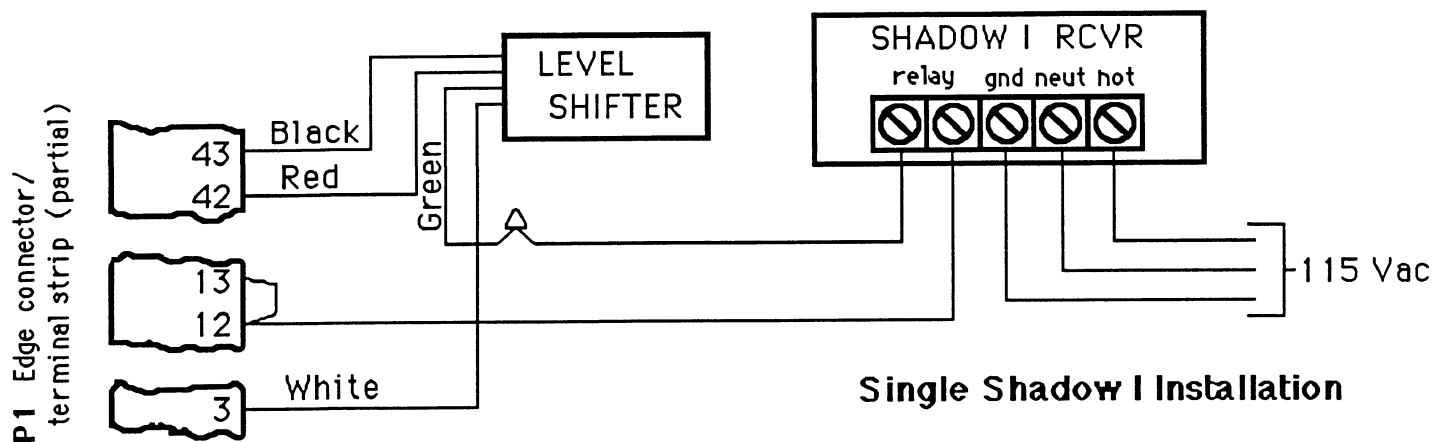


Figure 16. WPC level shifter wiring

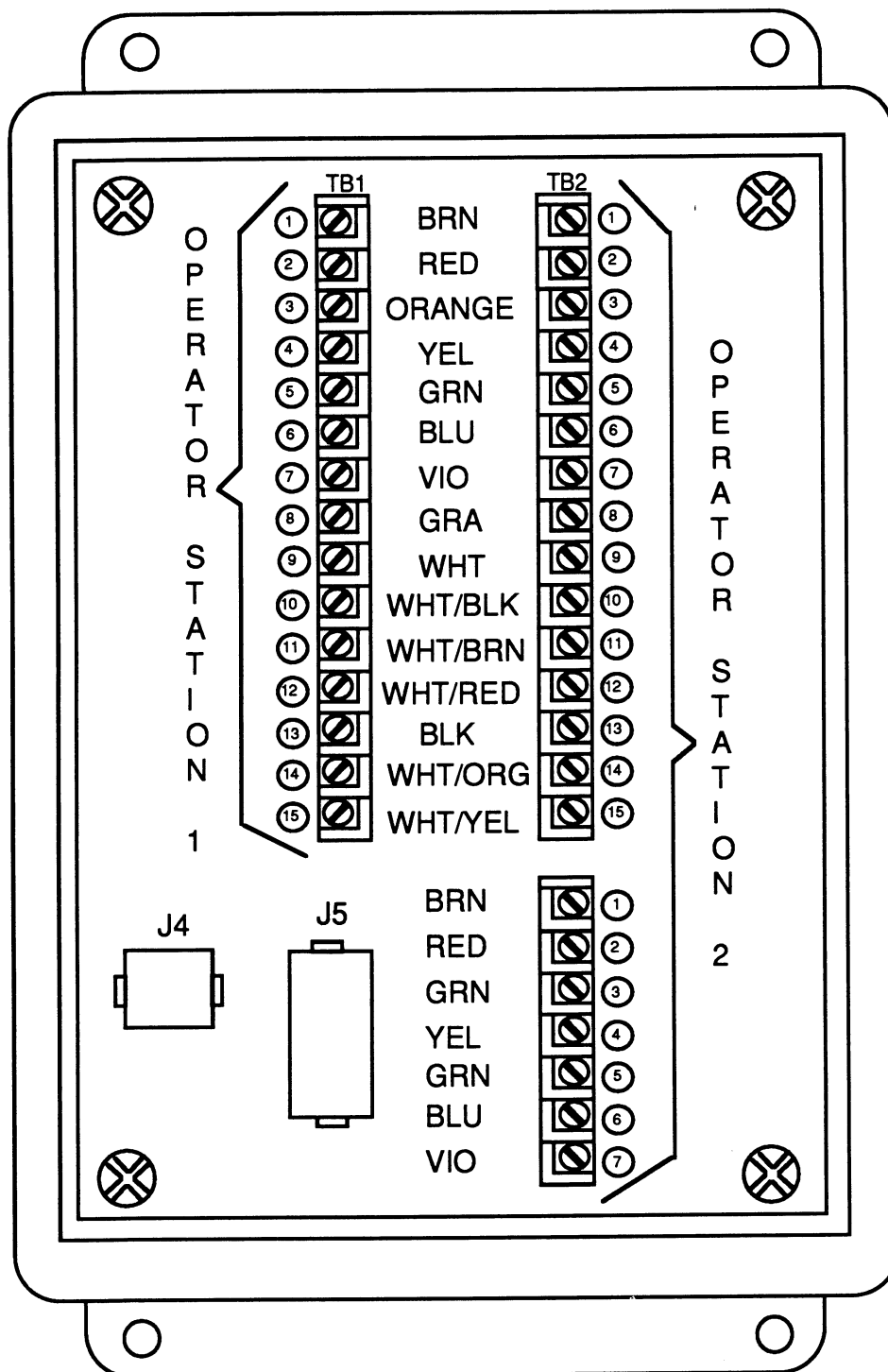


Figure 17. Dual operator select box wiring information

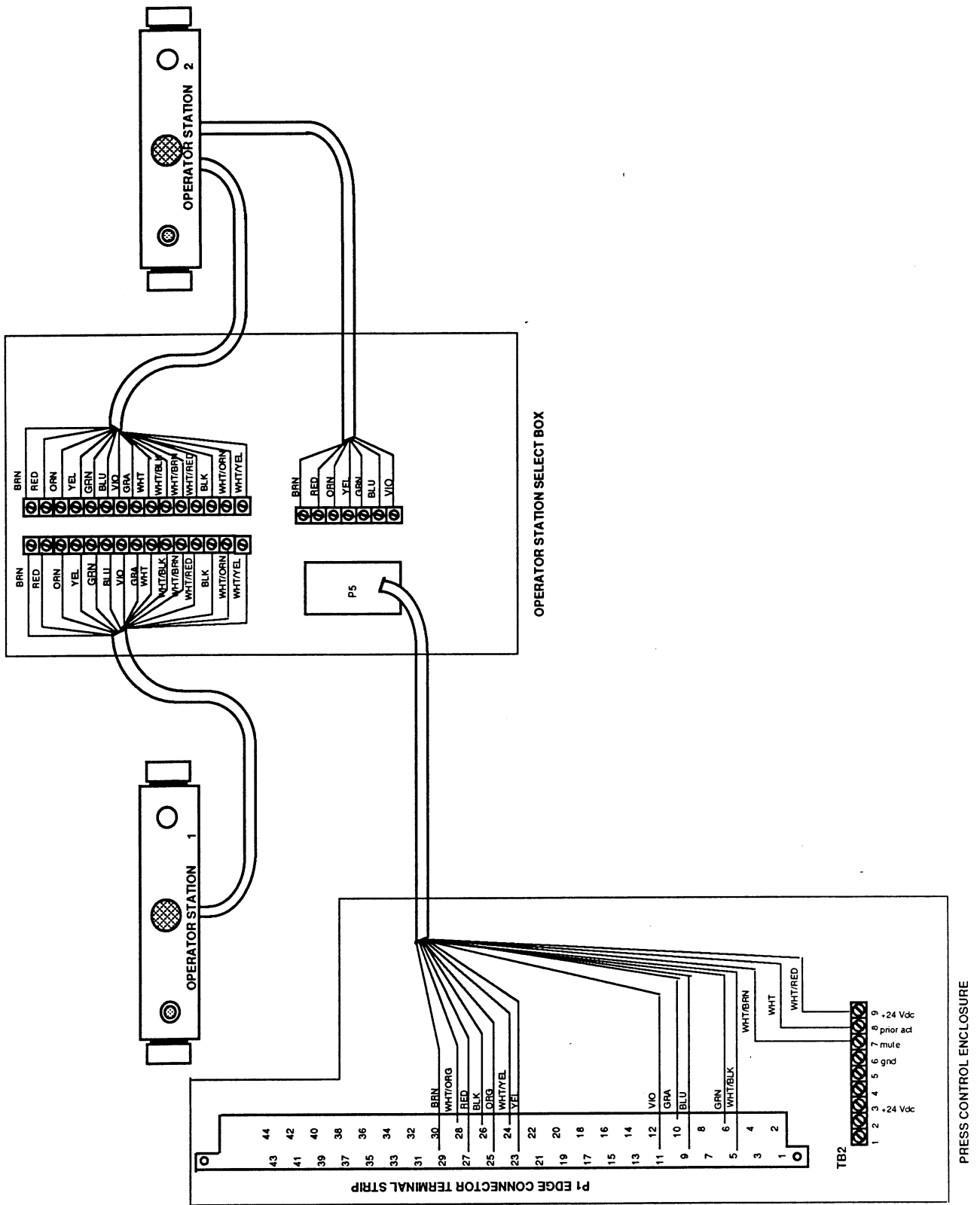


Figure 18. Dual operator select wiring

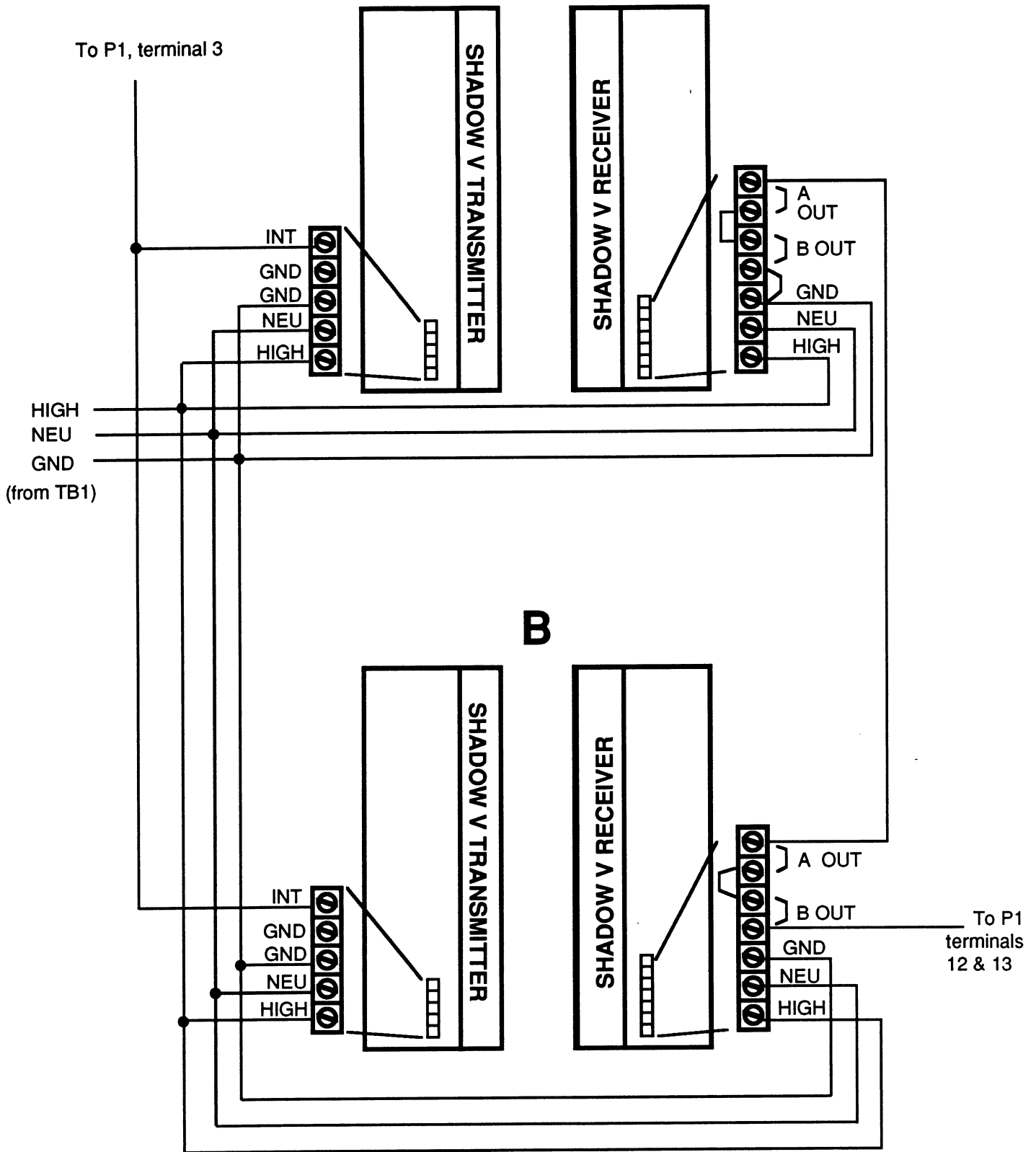
A

Figure 19. Dual Shadow V Wiring

