

RamPAC®

Shut Height, Counterbalance and Cushion Control A SmartPAC® Module 1115200 Rev. M June 2019

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Changes for Revision M of the RamPAC User Manual (1115200)

This revision of the RamPAC user manual covers the following software versions:

- for surface-mount board: RamPAC software version 2.13 and higher
- for thru-hole board: RamPAC software version 1.43 and higher

This revision includes the following changes:

- Revision of wiring diagrams and Table 2-9 to reflect communications changes
- Addition of SmartPAC PRO information
- Removal of linear transducer references

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How to Use This Manual

This manual shows you how to install, set up, operate, and troubleshoot RamPAC's shut height, counterbalance, and cushion control features. The manual assumes that you are running RamPAC with a SmartPAC 2 or SmartPAC PRO control, but the instructions can also be used with a RamPAC connected to an original SmartPAC.

Chapter 1 provides an overview of RamPAC features and operation.

Chapter 2 shows you how to mount and wire RamPAC.

Chapter 3 shows you how to enter RamPAC settings in SmartPAC Initialization mode and test Initialization settings.

Chapter 4 shows you how to enter and modify RamPAC tool settings in Program mode and use the shut height operator control to adjust shut height.

Chapter 5 shows you how to respond to RamPAC faults and troubleshoot common RamPAC problems.

Appendix A shows you how to wire the connector for the air pressure transducer if you provide you own cable.

Appendix B provides instructions for exchanging an old RamPAC Control board.

Appendix C provides a dimensional drawing of the old position transducer junction box.

The Glossary provides definitions of some of the terms used in the manual that may be unfamiliar to you.

Wiring diagrams at the end of the manual show connections between RamPAC and original SmartPAC, SmartPAC 2, or SmartPAC PRO.

NOTICE

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Important Highlighted Information

Important danger, warning, caution and notice information is highlighted throughout the manual as follows:

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WARNING

A WARNING symbol indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION

A CAUTION symbol indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

NOTICE

A NOTICE symbol indicates important information that you should remember, including tips to aid you in performance of your job.

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Wintriss Controls Group, LLC

100 Discovery Way

USER MANUAL

Unit 110

Acton, MA 01720

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Chapter 1 – Introduction

NOTICE

VERSIONS OF SMARTPAC

This manual covers use with three versions of SmartPAC:

- Original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO.

"SmartPAC" refers to all three versions, unless otherwise indicated.

NOTICE

THE NAME "RAMPAC"

The name "RamPAC" as used in this manual refers to the original SmartPAC (SmartPAC 1), SmartPAC 2, or SmartPAC PRO Press Automation Control with the RamPAC option.

NOTICE

USING YOUR RAMPAC WITH DIFFERENT VERSIONS OF SMARTPAC

You can use your RamPAC with

- original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO

Figures 1-1 and 1-2 show the front panels of the three SmartPAC versions. They are similar, but have the following differences:

- Original SmartPAC: separate entry keypad, 8 separate function (F) keys
- SmartPAC 2: separate entry keypad, 6 separate function keys
- SmartPAC PRO: entry keys and function keys appear on the touch screen display

Be sure to read the instructions on the display and the labels for the function keys.

This manual shows original SmartPAC screens. SmartPAC 2 and SmartPAC PRO screens are similar. The menu organization is the same on all versions.

Chapter 2 gives instructions for installing RamPAC on a SmartPAC. Refer to the appropriate wiring diagrams at the end of the manual.

Chapters 3 through 6 tell how to initialize, program, run, and troubleshoot your RamPAC/SmartPAC system. Refer to your SmartPAC manual.

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The RamPAC module for SmartPAC automatically controls shut height, counterbalance air pressure, and/or cushion air pressure for each tool you program with these settings. This chapter describes RamPAC benefits, shows you how to use the SmartPAC front panel to program RamPAC (original SmartPAC is similar), gives an overview of RamPAC features, and provides a table of RamPAC specifications.

RamPAC Benefits

RamPAC provides the following benefits:

• Increased productivity with automatic shut height adjustment. After adjusting the shut height to the correct setting, a simple touch of a button saves that setting with all the tool information. Once the setpoint has been established, the shut height is set automatically, relieving the operator of having to look it up. This will decrease setup time and increase production time. RamPAC will always approach the shut height setpoint from the top, ensuring accurate setup time after time. If you attempt to run the tool and the ram is not at the setpoint, an error will be displayed on the SmartPAC screen.

- Easy-to-use ram adjustment. Once the RamPAC shut height module has been installed and set up, its operation is very simple. You select Manual or Automatic operation with a key switch. In Manual, you use the Ram Adjust switch to move the ram up or down. In Automatic, when you turn the switch momentarily to the Down position, RamPAC automatically moves the ram to the shut height setpoint even if the ram is currently below that position. Turning the Ram Adjust switch momentarily to Up will adjust the shut height to the upper limit, a setting entered in Initialization mode, allowing the maximum amount of access to the die area for troubleshooting.
- Improved stopping performance. The correct counterbalance setting can decrease the time required to stop the press, increasing the effectiveness of any die protection you install. Setting the appropriate counterbalance pressure for each tool also enhances point-of-operation guarding by decreasing the safety distance.
- Automatic counterbalance pressure for each tool. All you have to do is enter the press manufacturer's suggested counterbalance air pressure for no die and for the maximum die weight that can be used on the press (information usually found in a counterbalance chart on the side of the press), then enter the upper die weight for each tool, and RamPAC will automatically adjust the counterbalance air pressure when you load the tool. RamPAC will also monitor and adjust the counterbalance pressure during each stroke so that it doesn't drop by more than 1 PSI.
- Economical use of electricity and compressed air. With the counterbalance air pressure set properly for each tool, your press will run more economically, saving electricity used by the motor and air pressure used by the counterbalance system.
- **Increased clutch and press life.** The correct counterbalance pressure will take up clearances in bearings before the die closes, lengthening the bearing life. With the ram properly balanced and the clearances taken up, you could be adding years to the life of your press.
- Extended tooling life. During each stroke of the press, RamPAC monitors and controls the cushion pressure at the correct level, minimizing tool wear.
- Easy, convenient installation of the valve assembly. Fill, dump, check, and lockout/dump valves, manual regulator and a filter are all combined in one easy-to-install package for counterbalance and cushion control. (Each module requires a separate valve package). All the valve package requires is air "in" from your shop air supply and air "out" to the counterbalance or cushion tank.
- Manual lockout/dump valve. This component of the valve package allows you to manually
 dump all air pressure from the counterbalance and cushion tanks and attach a Lockout/Tagout tag
 to the valve, locking it open. Personnel can then work on the press. This feature helps you to
 comply with OSHA 1910.147 Lockout/Tagout regulations.

• Automatic control of cushion or other pressure. Just enter the desired cushion air pressure for each tool in the Program Menu, and the pressure is saved with the tool information. Every time you load that tool, the cushion will be set to that pressure. You can use this feature to control a pressure other than cushion pressure up to 150 PSI.

SmartPAC PRO, SmartPAC 2, and Original SmartPAC

Your RamPAC can be used with the SmartPAC PRO, SmartPAC 2, and original SmartPAC.

To install RamPAC on a SmartPAC, follow the instructions in Chapter 2 and refer to the appropriate wiring diagrams at the end of the manual. (Wiring diagrams show connections for original SmartPAC, SmartPAC 2, and SmartPAC PRO.)

RamPAC menu organization in SmartPAC 2 and SmartPAC PRO is similar to that in original SmartPAC, and the RamPAC screens are similar in all SmartPACs. As a result, you can refer to the screens and follow the steps provided in chapters 3-6 of this manual to initialize, program, run, and troubleshoot RamPAC in original SmartPAC, SmartPAC 2, and SmartPAC PRO. The main differences among the three SmartPACs are in their panel displays, as shown in Figure 1-1 and Figure 1-2.

SmartPAC 2 and SmartPAC PRO operate much like the original SmartPAC, which you may already have in your plant.

All the PAC module options for SmartPAC work with SmartPAC 2 and SmartPAC PRO.

If you are familiar with the original SmartPAC, you will find using the SmartPAC 2 and SmartPAC PRO similar. Figure 1-1 and Figure 1-2 shows the differences between their front panels. Some of the instructions in this manual are based on the instructions for the original SmartPAC.

Figure 1-1 and Figure 1-2 show the differences between the keyboard and display of your SmartPAC 2 or SmartPAC PRO and the original SmartPAC.

Since SmartPAC 2 and SmartPAC PRO have eight function keys (SmartPAC PRO's are "soft keys" on the display) and the original SmartPAC has only six, the function keys will be different in many instances. These are also called "F keys." Be sure to read the instructions on the display and read the descriptive labels next to the function keys, or on the soft function keys, before you press a function key.

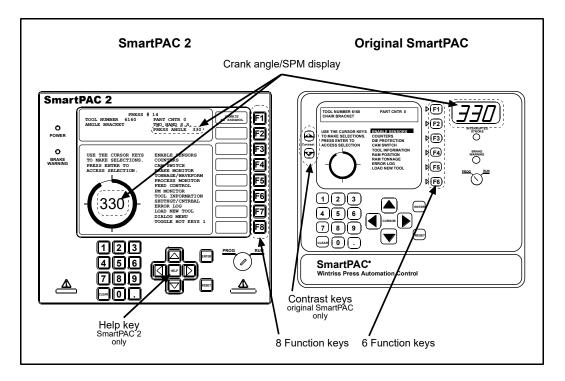


Figure 1-1. SmartPAC 2 and Original SmartPAC

Original SmartPAC, SmartPAC 2, and SmartPAC PRO panel displays use a different number of function, or "F," keys. SmartPAC 2 and SmartPAC PRO have eight function keys, and the original SmartPAC only six. Be sure to read the instructions on the display and the descriptive labels on or next to the function keys before you press an "F" key.

NOTICE

On many screens, you can press the HELP or ? key (see Figure 1-1 and Figure 1-2) to display instructions showing you how to use the screen.

If you need additional help using RamPAC with SmartPAC, SmartPAC 2 or SmartPAC PRO, refer to the appropriate manual.

Original SmartPAC and SmartPAC 2 Front Panels

NOTICE

See SmartPAC PRO Front Panel, page 24 for SmartPAC PRO information.

Programming and operation of RamPAC is accomplished via the SmartPAC front panel, Figure 1-1. A brief description of each panel component is below, Table 1-1. Refer to your original SmartPAC or SmartPAC 2 manual for more information.

Table 1-1. Original SmartPAC and SmartPAC 2 Panel Features

| Display | Used with the keyboard to make and adjust settings, load tools, and view diagnostic messages. SmartPAC PRO has a touch screen. |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Program/Run key switch | Allows Program mode to be locked so settings cannot be changed by the press operator. Key must be set to "Run" to operate the press. Minor adjustments, including loading an existing tool, can be made in Run mode. |
| Keyboard | Cursor keys and numeric keypad (described below under <i>Number keys</i>) are used with the display to make settings. |
| Cursor keys | Enable you to select a display item with the highlight bar. Also allow you to select alphabetic characters and special symbols when naming the press, tools, cam channels, and sensors. |
| Number keys | Enable you to input numeric values such as counter presets or tool numbers. |
| Function keys | Eight keys labelled "F1" to "F8" that perform specific tasks. Functions performed by pressing the key are displayed to the left of the key label. Function keys can also be programmed as "Hot keys" that take the user directly to desired screens. |
| HELP key | Enables you to access a help screen that provides information about the display you are looking at. |
| ENTER key | When you press this key, SmartPAC accepts the menu item you have selected or the number you have keyed in. |
| RESET key | You press this key when you are done with a programming or other procedure. Also resets SmartPAC after fault or event messages appear on the display. |

Detailed instructions on how to use the keyboard and display are provided in Chapter 3 of the original SmartPAC and SmartPAC 2 user manuals.

SmartPAC PRO Front Panel

NOTICE

See Original SmartPAC and SmartPAC 2 Front Panels, page 22, for information on these products.

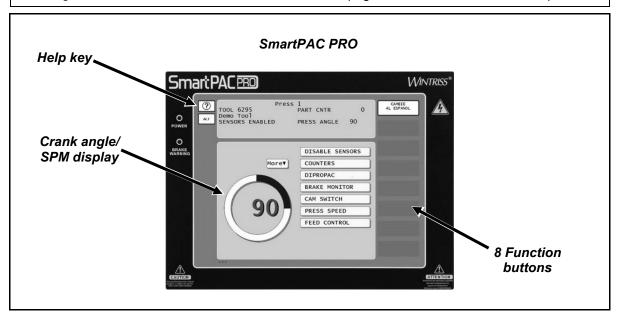


Figure 1-2. SmartPAC PRO

Programming and operation of RamPAC is accomplished via the SmartPAC PRO front panel, Figure 1-2. Refer to your SmartPAC PRO manuals for more information.

SmartPAC PRO features a touch screen with on-screen buttons to enable you to navigate through its menus and make setting for your tools. In addition, SmartPAC PRO utilizes several different on-screen keypads for entering alpha-numeric data or to navigate through certain "legacy" screens using cursor (arrow) "keys". These keypads are described below, in Table 1-2.

NOTICE

You may plug a USB keyboard into the USB port on the front panel of the SmartPAC PRO. When entering alphanumeric data, the SmartPAC PRO automatically recognizes keystrokes from both the external and on-screen keyboards.

Table 1-2. SmartPAC PRO Panel Features

On-Screen Numeric Keypad

Whenever you select a field that requires numbers only, SmartPAC PRO displays a numeric keypad.

The up and down arrow cursor keys on the keypad increment or decrement the value by 1. The backspace key clears the value. The Cancel key closes the numeric keypad without making any changes, and the Enter key accepts the value entered into the field.



When a USB keyboard is used, the Esc key acts as the Cancel button, while the other keys match their counterparts.

Note that when the on-screen keypad is displayed, the "EXIT" key on the screen is disabled. The keypad value must be entered or cancelled before you can access any other buttons on the screen.

On-Screen Keyboard

Whenever you select a field that requires the input of a combination of letters, symbols, and/or numbers, SmartPAC PRO displays its on-screen keyboard.



The backspace key clears the value. The Cancel key closes the numeric

keypad without making any changes, and the Enter key accepts the value entered into the field.

The Shift key capitalizes the next character, the CAPS key functions like a Caps Lock key.

When a USB keyboard is used, the Esc key acts as the Cancel button, while the other keys match their counterparts.

Note that when the on-screen keyboard is displayed, the "EXIT" key and any other buttons on the screen behind the keyboard are disabled. The value must be entered or cancelled before you can access any other buttons on the screen.

RUN Mode Icons



Pressing this button launches context-sensitive help.



Pressing this button saves an image of the current screen to SmartPAC's diagnostic information or to a USB drive if one is plugged into SmartPAC PRO.



Pressing this button brings up the currently active dashboard.



Pressing this button stores the current location to the Favorites screen. It also allows you to creat a new dashboard.

Transducers

RamPAC uses transducers (sensors) to measure shut height and air pressure.

Shut Height Transducer

RamPAC uses a cable extension position transducer, which has a steel cable that extends from a rammounted housing and attaches with a bracket to the part of the barrel that moves.

Air Pressure Transducer

RamPAC uses a pressure transducer called the SA-200 to measure the air pressure of both the counterbalance and cushion systems.

RamPAC Operation

For each tool you set up and program, RamPAC stores the proper shut height, counterbalance air pressure, and/or cushion air pressure. (See Chapter 4, page 97, for instructions on how to make tool settings in Program mode.) After initial setup of each tool, the shut height is stored as a setpoint, and RamPAC automatically sets the shut height to that position every time you load the tool.

If the shut height, counterbalance, and/or cushion parameters being monitored are not at their setpoints, RamPAC will open its E-stop relay and display an error message on the SmartPAC screen. The relay will remain open until the problem has been corrected. Instructions on how to respond to these errors are provided in Chapter 5.

Calculating Counterbalance Pressure

When you set up RamPAC in Initialization mode (see 0, page 66), you enter the counterbalance pressure required to support the ram with no upper die and with the heaviest upper die you will use. When you program individual tools, you enter the appropriate upper die weight. From this value, RamPAC calculates the counterbalance air pressure required for that tool and automatically adjusts the counterbalance pressure to that value when you load the tool. While you are running the job, RamPAC monitors the counterbalance pressure, making any adjustments needed to maintain the pressure at the correct level.

NOTICE

OSHA 1910.217 requires proper counterbalance settings. OSHA also requires that the upper die weight be stamped permanently on the upper die.

Example

Figure 1-3 shows how RamPAC calculates the proper counterbalance setting for a tool with an upper die weight of 1200 lbs. In Initialization, the user entered 45 PSI as the pressure needed to counterbalance the ram with no die installed and 65 PSI as the counterbalance pressure for the ram with an upper die weighing 2000 lbs. RamPAC determines that 57 PSI is the optimum counterbalance air pressure.

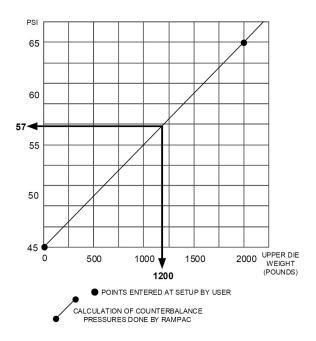


Figure 1-3. Counterbalance Air Pressure Calculation

Counterbalance Control Operation

The RamPAC counterbalance control adjusts the counterbalance pressure to its correct setpoint, then monitors the pressure to make sure it does not deviate too much from the setpoint. Counterbalance adjustment works as follows:

- 1. **Operating Setpoint:** When you change or reload a tool, or whenever the power is turned off and on, RamPAC fills or dumps air to bring the counterbalance pressure within ±1 PSI of the setpoint calculated from the upper die weight setting. This setpoint is the pressure at TDC necessary to counterbalance the ram so that it will not free fall if there is a catastrophic failure.
- 2. **Low Setpoint:** After five strokes, RamPAC opens the Fill valve whenever the actual pressure drops one or more PSI below the setpoint. If the counterbalance pressure falls five or more PSI below the setpoint when the zero cam is closed (i.e., when the press is at the top of its stroke), the E-stop relay opens and an error message displays on the SmartPAC screen.
- 3. **High Setpoint:** After the counterbalance reaches its setpoint pressure, RamPAC monitors the pressure during the next six strokes, automatically setting the high setpoint at five PSI above the highest pressure observed during its sampling. Maximum pressure normally occurs at the bottom of the stroke.

Once the high setpoint has been determined, whenever the zero cam is closed and the counterbalance pressure exceeds the high setpoint (usually due to a leaking fill valve), the E-stop relay opens, and an error message displays on the SmartPAC screen. When the error has been reset, RamPAC goes back to step 1.

Units of Measurement

Depending on the units of measurement you select in Initialization (see 0, page 66), RamPAC displays the current shut height of your press, the upper and lower shut height limits, and the setpoints for different tools in inches (10.258 inches) or millimeters (500.24 mm). All counterbalance or cushion air pressures are displayed in pounds per square inch (52 PSI), kilopascals (10.346 kPa) or bars (45.214 bar).

Specifications

RamPAC specifications are shown in Table 1-3.

Table 1-3. RamPAC Specifications

| Table 1-3. RamPAC Specifications | | | |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Equipment | Enclosure | | |
| | 10.25 x 12 x 4 in. (260.4 x 304.8 x 101.6 mm), NEMA 12, shock mounted. Board and power supply on mounting plate or board only available for installation in user's enclosure or console. | | |
| | Cable Extension Position Shut Height Transducer | | |
| | 9812302 up to 19" adjustment | | |
| | 9812303 up to 29" adjustment | | |
| | 9812304 up to 39" adjustment | | |
| | For shut height adjustments up to 19 or 29 in. (for other adjustment ranges, call the factory) | | |
| | Pressure Transducers for Counterbalance and Cushion Control | | |
| | 0-200 PSI; 1/4 in. NPT female. | | |
| | Counterbalance and Cushion Control Valves | | |
| | 8.25 x 9.25 x 4.96 in. (ref.); 150 PSI max. 1/2 in. NPT female. | | |
| | Operator Controls | | |
| | Ram Mode keylock switch, Ram Adjust switch, Ram Interrupt push button. All switches and buttons mount in 1.2 in. (30.5 mm) holes. | | |
| Electrical | Input | | |
| | 85 to 264 Vac, 110 to 370 Vdc, 50-60 Hz, 30 W. | | |
| | Input check circuit: 12-250 Vac or Vdc. | | |
| Power Requirements if not Using Wintriss AC Power Supply | 24 ± 5% Vdc, 0.5 A. | | |
| | Must be certified to CSA C22.2 No. 234 Standard. | | |
| Operating temperature | 32° to 122° F (0° to 50° C). | | |

| Inputs | Position transducer (for shut height measurement) |
|---------|--------------------------------------------------------------------------------------------------------------------------------|
| | 2 air pressure transducers (for counterbalance and cushion monitoring): 0-200 PSI, 1-6 Vdc, excitation 24 Vdc. |
| | E-stop input |
| | Operator control inputs. |
| Outputs | 8 relays rated 5A @ 120/240 Vac (N/O, held closed) for controlling RamPAC features. |
| | 1 relay rated 4A @ 120/240 Vac with 3 N/O, held closed outputs, one output used for stopping the press under fault conditions. |

Table 1-3. RamPAC Specifications (continued)

| Operator Interface | Through the SmartPAC Press Automation Control. |
|--------------------|-----------------------------------------------------------------------------------------------------|
| Setpoints | Shut height, upper die weight, and cushion setpoints for each of up to 200 tools stored in SmartPAC |
| | Counterbalance setpoint calculated automatically from upper die weight. |
| | Minimum counterbalance setting for manual mode |

Chapter 2 – Installation

NOTICE

VERSIONS OF SMARTPAC

This manual covers use with three versions of SmartPAC:

- Original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO.

"SmartPAC" refers to all three versions, unless otherwise indicated.

NOTICE

WIRING CONNECTIONS FOR RAMPAC WITH ORIGINAL SMARTPAC OR SMARTPAC 2

The instructions provided in this chapter assume that you are installing RamPAC on a SmartPAC PRO control. However, you can still use these installation instructions if you are connecting your RamPAC to an original SmartPAC or SmartPAC 2. Wiring diagrams at the end of the manual (figures 1 through 5) show connections between RamPAC and SmartPAC 2 and original SmartPAC, as well as SmartPAC PRO.

This chapter shows you how to install RamPAC and its components, providing instructions for both mounting and wiring the control. It is organized in the following sections:

| Mounting RamPAC | 32 |
|---------------------------------------------------------------------|----|
| Mounting the RamPAC Enclosure | |
| Installing the RamPAC Mounting Plate | |
| Mounting the RamPAC Control Board | |
| Mounting the Cable Extension Position Transducer | |
| Installing Operator Controls | |
| Installing the Operator Control Enclosure | 39 |
| Installing Operator Controls without Enclosure | |
| Installing Counterbalance and Cushion Control Valves | 40 |
| Installing a Counterbalance Parallel Fill Line | 43 |
| Installing Air Pressure Transducer(s) | |
| Wiring Overview | 45 |
| Terminating Cable Shields | 46 |
| Wiring the Cable Extension Position Transducer | |
| Wiring Operator Controls | |
| Wiring Ram Adjust Motors | |
| Wiring a Ram Adjust Motor When Not Using the Shut Height Feature | |
| Wiring Counterbalance/Cushion Valves | |
| Wiring Counterbalance/Cushion Manual Solenoid | |
| Wiring Air Pressure Transducer(s) | |
| Wiring between RamPAC and SmartPAC | |
| Connecting Communications Wiring | |
| Wiring RamPAC's E-stop Outputs | |
| Wiring the Input Check Circuit | |
| Wiring the Zero Cam Signal to RamPAC | 57 |
| Wiring an E-Stop Input | |
| Wiring a Setup Mode Circuit | |
| Wiring RamPAC To Prevent Air Compressor Operation When Press Is Off | 58 |
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| Wiring RamPAC to Only Monitor Shut Height | 59 |
|------------------------------------------------|----|
| Wiring RamPAC for Counterbalance Control Only5 | |
| Connecting AC Wiring6 | |
| Checking RamPAC Wiring6 | |
| Exchanging RamPAC Control Boards6 | |

NOTICE

Since RamPAC measures and displays shut height and counterbalance and cushion pressures, existing problems with these parts of the press will become more obvious after you install RamPAC. For best performance, your press should be in good condition and properly maintained.

- The ram should move smoothly up and down, not sticking at any point in its travel, with gibs well-maintained and lubricated.
- The main motor and the electric power source should be sufficient for the needs of the press.
- The counterbalance and cushion systems should not leak excessively.

NOTICE

RamPAC is available with or without an enclosure. The no-enclosure RamPAC mounting plate or Control board should be installed in a console or other suitable enclosure.

Mounting RamPAC

This section shows you how to mount each of the following RamPAC options:

- Control board and power supply mounted in an enclosure
- Control board and power supply installed on a mounting plate (no enclosure)
- Control board only (no enclosure)

Mounting the RamPAC Enclosure

To mount the RamPAC enclosure, perform the following steps, referring to Figure 2-1 for mounting dimensions:

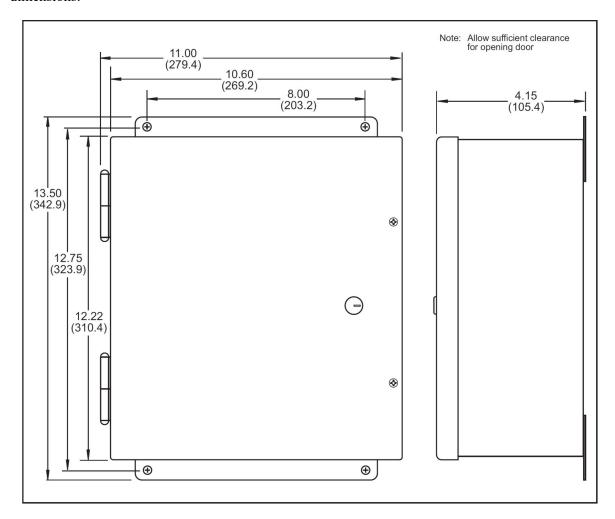


Figure 2-1. RamPAC Enclosure: Mounting Dimension

- 1. Determine a convenient mounting location, considering the following factors:
 - Transducers will be wired directly to the RamPAC board
 - Communications cables will be run from the RamPAC board to the SmartPAC
 - The mounting location must allow enough room for the door to open at least 120°
 - The enclosure can be mounted on the press or on a free-standing pedestal
- 2. Drill holes for mounting. Tap holes and mount the enclosure, using the enclosed shock mounts. Shock mount study are 1/4–20. Use a No. 7 drill and 1/4–20 tap.

Installing the RamPAC Mounting Plate

If you ordered the RamPAC mounting plate option, you received a Control board, power supply, and input power terminal block mounted on an aluminum plate (see Figure 2-2 for dimensions).

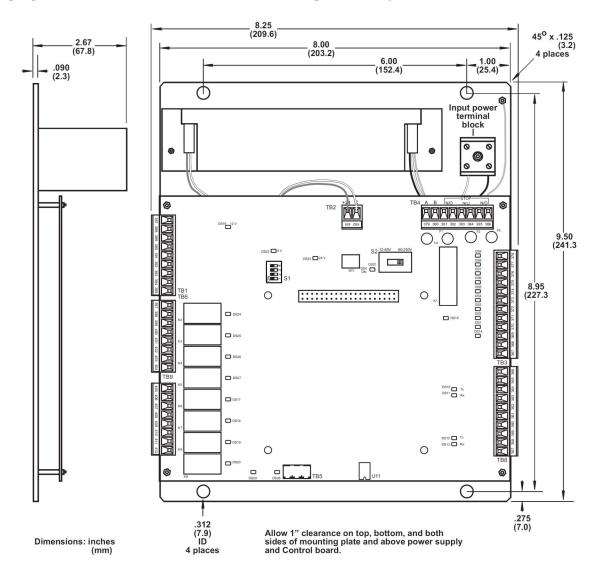


Figure 2-2. RamPAC Mounting Plate: Mounting Dimensions

The plate, which has four mounting holes, facilitates installation of the RamPAC Control board and related components in your console or enclosure.

The power supply on the mounting plate is pre-wired to the power terminal, TB2, on the Control board and to the input power terminal block on the plate. To connect AC wiring to the input power terminal block, follow the instructions starting on *Connecting AC Wiring*, page 60.

When installing the mounting plate, be sure to allow at least 1 in. clearance on top, bottom, and both sides of the plate and above the power supply and Control board.

Mounting the RamPAC Control Board

If you ordered RamPAC without an enclosure and without a 110V power supply, you received a RamPAC Control board. To mount the board in your console or enclosure, perform the following steps, referring to Figure 2-3 for mounting dimensions:

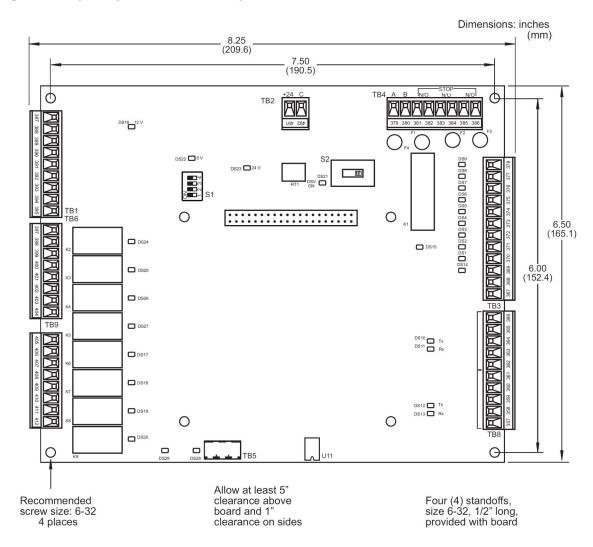


Figure 2-3. RamPAC Control Board: Mounting Dimensions

- 1. Determine a convenient, accessible location in your console or enclosure for mounting the RamPAC board, allowing enough room for board installation and maintenance.
- 2. Mount the board, using the four (4) standoffs provided. Standoffs are 6-32 and 1/2 in. long. Recommended screw size is 6-32 x 3/8 in.

CAUTION

COMPONENTS SHORT-CIRCUITING TO SURROUNDINGS

Allow at least 0.5 in. (13 mm) between the Control board and any metal parts.

Failure to comply with these instructions could result in property damage.

Mounting the Cable Extension Position Transducer

If you plan to use RamPAC to measure shut height, you must install a cable extension position transducer.

CAUTION

DIE DAMAGE IN BALL SOCKET PRESS

Enable Ball Socket mode in Initialization (see page 74) if RamPAC is installed on a ball socket press. On a ball socket press, RamPAC provides accurate shut height information only at top dead center (TDC) or bottom dead center (BDC). If you have a ball socket press and disable Ball Socket mode, automatic shut height adjustment will not work properly and die damage may occur.

Failure to comply with these instructions could result in property damage.

The cable extension position transducer is used to measure shut height. The transducer has a stainless steel measurement cable that extends from and retracts into the transducer body. The transducer provides an electrical output proportional to the distance the measurement cable is extended.

Installation of the cable extension position transducer will vary from press to press. If you have difficulty mounting this transducer, call Wintriss Tech. Support for assistance.

You must install a cable extension position transducer if you wish to measure shut height on a ball socket press. You can also install this transducer on a wrist-pin press.

To install the cable extension position transducer, perform the following steps, referring to Figure 2-4 for mounting dimensions:

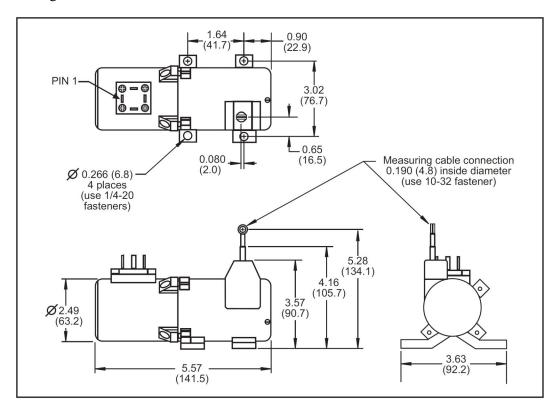


Figure 2-4. Cable Extension Position Transducer: Mounting Dimensions

1. Determine the optimum location at which to mount the transducer and to what component to fasten the measurement cable, using the following criteria:

- The measurement cable should extend vertically from the transducer body.
- The measurement cable should never be fully extended from or fully retracted into the transducer body, which should retain at least 1/2 in. of cable at the highest or lowest shut height.
- In most cases, you will need to fabricate brackets and/or mounting plates for the transducer body and the measurement cable connection.
- The entire transducer assembly (transducer body, cable, and brackets) should move together on the ram while the press is running.
- The measurement cable and bracket should move independently of the transducer body when the shut height is being adjusted.
- Make sure that the transducer, cable, and mounting gear do not touch any part of the press while it is running throughout the range of shut height adjustment.
- Make sure to use a transducer signal cable of sufficient length to prevent the cable from being stretched taut when the ram is at its lower limit and to allow for a service loop. The cable is black with a Hirschman connector on one end.
- When mounted, the transducer should be easily accessible.
- 2. The Hirschmann connector on the transducer comes from the factory at the 12 o'clock position (see Figure 2-5). If during installation you find that you need the connector in a different position (on one of the sides, rather than on the top of the housing), rotate the connector half of the housing as follows:
 - Loosen the four screws securing the two halves of the transducer housing.
 - Rotate the half with the Hirschmann connector 90° to the left or to the right.
 - Reassemble the halves of the housing, being careful to re-seat the O-ring between the two halves to make a good seal.

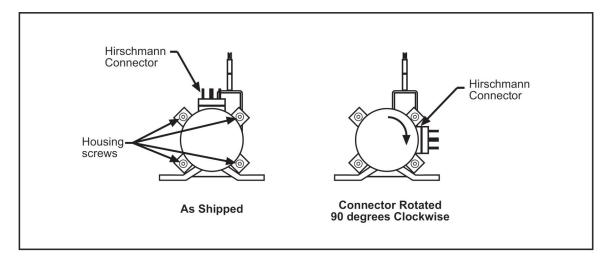


Figure 2-5. Changing Orientation of the Transducer Connector

3. Mount the transducer body using 1/4-20 bolts, providing a base plate or bracket for mounting if necessary. Figure 2-4 shows the dimensions of the mounting holes in the feet of the transducer body. Figure 2-6 shows an example of how the transducer is mounted on a Bliss HP2 150-ton ball socket press.

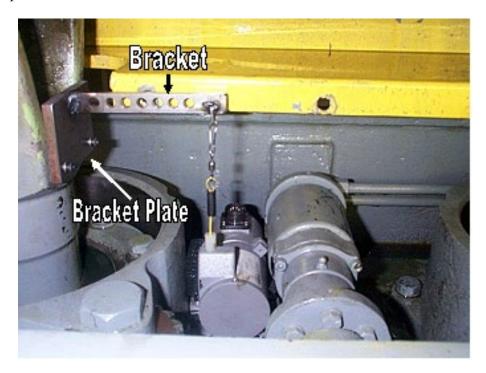


Figure 2-6. Cable Extension Position Transducer: Mounting Example

4. Connect the measurement cable to the press.

In some cases, you can fasten the measurement cable directly to the pitman. On the Aida NC1, for example, you can simply drill and tap a hole in the pitman and use a 10-32 bolt to secure the end of the measurement cable.

In most cases, however, you will need to design a bracket that extends out from the pitman for attachment of the measurement cable. Fabricate the bracket, install it on the pitman, and then connect the measurement cable to it, using 10-32 fasteners and a lock washer.

On a ball socket press, the measurement cable will experience some side-to-side movement as the press cycles but should be perfectly plumb at TDC or BDC. On a wrist-pin press, the cable should always be vertical with no side-to-side movement.

In the example in Figure 2-6, a piece of 1/2 in. stock was used as a bracket plate and a bracket of $1/2 \times 1$ in. steel was welded to it. The bracket was designed so the measurement cable was plumb at TDC and BDC.

NOTICE

The transducer shown in Figure 2-6 differs slightly from the one you are installing. The electrical connector on your transducer is different, and your measurement cable has an eyelet attachment point instead of the clip shown in the photo.

5. When transducer body and cable have been mounted, inch the press up to 0° (TDC) and move the ram to its upper limit. Check to make sure that at least 1/2 in. of the measurement cable remains in the body of the transducer.

- 6. Inch the press down to 180° (BDC) and move the ram to its lower limit. Check to make sure that at least 1/2 in. of the measurement cable remains in the body of the transducer.
- 7. Find a suitable location on the crown of the press to mount the junction box. The junction box should be positioned directly above the transducer in an easily accessible location and as close to the transducer as possible. You will be running a cable directly from the transducer to the junction box. Figure 2-16, page 47, shows mounting dimensions.
- 8. Mount the junction box on the crown of the press.
- 9. To wire the transducer, refer to Wiring the Cable Extension Position Transducer, page 47.

Installing Operator Controls

RamPAC operator controls can be ordered with or without an enclosure. The following sections show you how to mount either option. For wiring, refer to Wiring Operator Controls.

Installing the Operator Control Enclosure

To mount the Operator Control enclosure, perform the following steps:

- 1. Determine an optimum location for the enclosure, bearing in mind that the operator must have immediate access to the Ram Interrupt button and the controls must be wired directly to the RamPAC Control board. Use dedicated, liquid-tight, flexible conduit for the cables.
- 2. Determine the best place for the conduit to enter the enclosure, and punch or drill a hole for the size conduit you will be using.
- 3. Mark and drill holes to mount the enclosure, referring to Figure 2-7 for mounting dimensions.

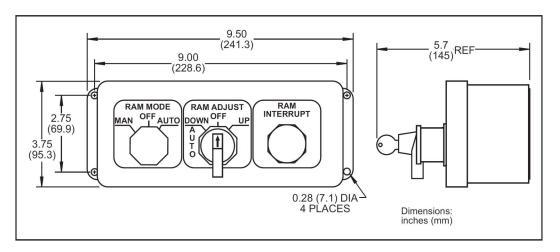


Figure 2-7. Operator Control Enclosure: Mounting Dimensions

4. Mount the enclosure using 4 screws with Loctite-blue, no. 242 or equivalent.

Installing Operator Controls without Enclosure

To mount the Operator Controls without enclosure, perform the following steps:

1. Locate the following Operator Controls supplied with your RamPAC and match them with their corresponding labels:

- Ram Mode control-3-position maintained key switch
- Ram Adjust control—3-position lever switch with spring return to center
- Ram Interrupt control-Momentary push button, normally closed

NOTICE

If your current setup uses Up and Down buttons to adjust the ram, you may opt to use them instead of the Ram Adjust control. In that case, you must still install the Ram Mode and Ram Interrupt controls.

- 2. Determine an optimum location for the three controls, bearing in mind that the operator must have immediate access to the Ram Interrupt button.
- 3. Punch or drill 1.20 in. (30.5 mm) holes.
- 4. Apply the stick-on labels above the holes.
- 5. Install the controls.

Installing Counterbalance and Cushion Control Valves

NOTICE

"CUSHION CONTROL" CAN BE USED TO CONTROL ANOTHER PRESSURE

The second pressure control option is called "cushion control" in this manual, but you can use this option to control another pressure up to 150 PSI.

NOTICE

The valve package has no lubrication requirements.

To install counterbalance and/or cushion valve packages, perform the following steps, referring to Figure 2-8 for mounting dimensions, Figure 2-9, page 42 for valve components, and Figure 2-10 and Figure 2-11, page 43, for typical installations:

- 1. Disconnect shop air from the press.
- 2. Drain the counterbalance and/or cushion air pressure system(s) of all air pressure.
- 3. Determine a convenient location to install the valve package, bearing in mind that it should be accessible for use in MANUAL mode. A good spot would be near the existing manual counterbalance and/or cushion regulator.

NOTICE

You must set the existing manual regulator on the press to full open.

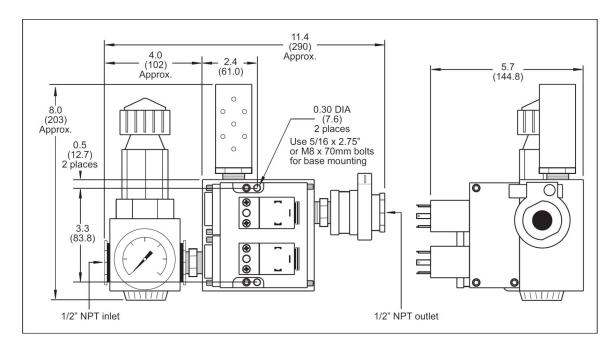


Figure 2-8. Counterbalance/Cushion Valve Package: Mounting Dimensions

- 4. Mark the location on the press at which you will mount the valve assembly, using the assembly as a template. You should mount the valve package in the orientation shown in Figure 2-8 and the other drawings in this chapter.
- 5. Drill and tap the two mounting holes (5/16-24).
- 6. Mount the valve package, using 5/16 x 2.75 in. or M8 x 70mm bolts.
- 7. Connect the standard 1/2 in. NPT plumbing connectors for the valve inlet and outlet into the existing system. Be sure to orient the valve package in the correct direction. As shown in Figure 2-8, the shop air inlet is the side with the manual regulator and the pressure gauge. The fill air for the counterbalance or cushion comes out opposite the shop air inlet at the lockout valve.

NOTICE

You must set the manual regulator on the counterbalance valve package to 20 PSI more than the pressure necessary to balance the heaviest upper die that you will run on the press. This protects the press if you switch RamPAC to MANUAL mode, which sets the counterbalance pressure to the value set on the manual regulator.

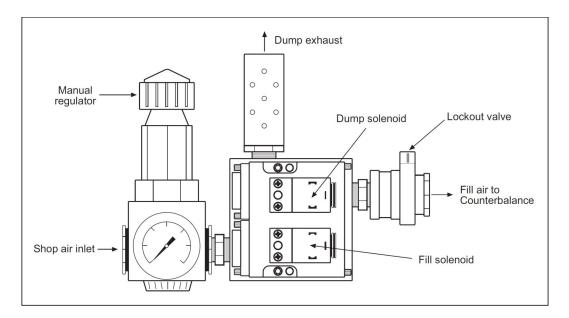


Figure 2-9. Counterbalance/Cushion Valve Package: Components

- 8. Set the manual regulator on the valve package to the value shown below for counterbalance or cushion. Turn the regulator clockwise to increase the pressure or counterclockwise to decrease the pressure.
 - On the counterbalance valve package, set the manual regulator to 20 PSI more than the pressure necessary to balance the heaviest upper die that you will run on the press. Set the regulator on the inlet line to full open.
 - On the cushion (or other pressure) valve package, set the manual regulator to 20 PSI more than the highest pressure setting you will use. Set the regulator on the inlet line to full open.
- 9. To wire the counterbalance and/or cushion valve package, refer to *Wiring Counterbalance/Cushion Valves*, page 50.

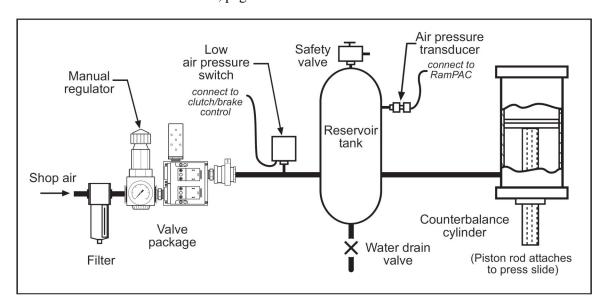


Figure 2-10. Typical Counterbalance Installation

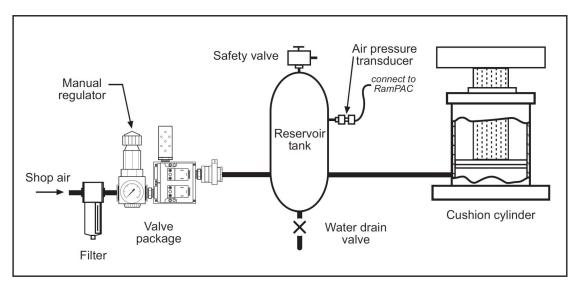


Figure 2-11. Typical Cushion Installation

Installing a Counterbalance Parallel Fill Line

If your press requires large volumes of air for its counterbalance, install a parallel fill line to reduce the time required for filling. Shown in Figure 2-12 the parallel fill line contains a manual regulator, a check valve, and a filter. You can use the manual regulator and filter originally installed on the counterbalance inlet line, if this is convenient.

NOTICE

IMPORTANT

Set the regulator in the counterbalance parallel fill line to the pressure required to balance the empty ram.

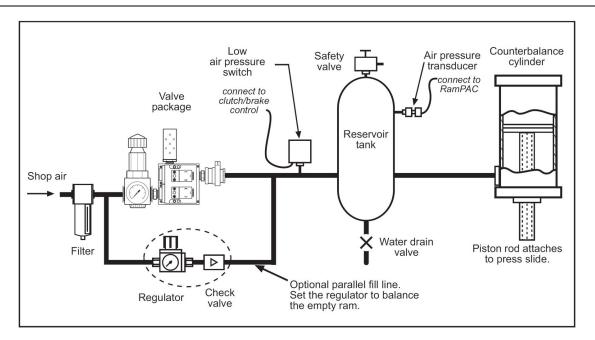


Figure 2-12. Counterbalance Installation with Parallel Fill Line

Installing Air Pressure Transducer(s)

RamPAC uses air pressure transducers installed on the counterbalance and/or cushion valve packages to read air pressure in those systems. To install an air pressure transducer, perform the following steps, referring to Figure 2-13, page 44. See also Figure 2-10, Figure 2-11, and Figure 2-12 for installation examples.

- 1. Disconnect shop air from the press, and drain the counterbalance and/or cushion system.
- 2. Determine a convenient location on the reservoir tank to install the pressure transducer, bearing in mind that you must be able to connect and disconnect the transducer cable.

NOTICE

- If you are unable to install the pressure transducer directly on the reservoir tank, install it on the fill line after the valve package. The transducer should be located as close to the tank as possible and as far as possible from the valve package.
- If you mount the transducer too close to the valve package, the transducer will read the shop air pressure, which is usually higher than the set point, whenever the fill valve opens. In that case, RamPAC will not function properly.

NOTICE

On some presses, instead of a reservoir tank there is a length of pipe extending from the counterbalance cylinder that acts as a reservoir. If this is the case on your press, install the pressure transducer in this length of pipe.

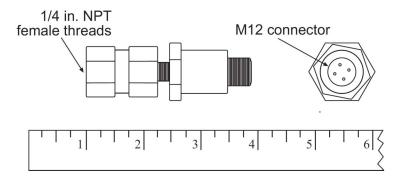


Figure 2-13. Air Pressure Transducer

- 3. Place a fitting in the hole in the tank or in the pipe that will accept the threaded end of the transducer. The transducer comes with a female 1/4 in. NPT fitting.
- 4. Wrap the threaded end of the transducer with plumbing tape, and screw it into the fitting.
- 5. Reconnect the air pressure to the system(s) and check all air fittings, valves and transducers to make sure there are no leaks.

NOTICE

 If your press has other counterbalance monitoring, make sure it does not interfere with RamPAC. If the press has a pressure transducer connected to the Wintriss Clutch/Brake Control (WPC), disconnect that transducer from the WPC, and install a pressure switch instead, as instructed in your WPC manual.

You may be able to use the pressure transducer you remove in the RamPAC air system. Install it on the reservoir tank as described in the steps above. Call Wintriss Tech. Support for assistance.

- If the press has a pressure switch for monitoring the minimum counterbalance pressure, change its setting to the pressure required to counterbalance the empty ram.
- 6. To wire the pressure transducer(s), refer to Wiring Air Pressure Transducer(s), page 53.

Wiring Overview

WARNING

ELECTRIC SHOCK HAZARD

- Disconnect main power at the SmartPAC before installation.
- Disconnect all power to the press, press control, and other equipment used with the press.
- Remove all fuses and "tag out" per OSHA 1910.147 Control of Hazardous Energy (Lockout/Tagout).
- Ensure that installation is performed by qualified personnel.
- Complete all wiring procedures before connecting to the AC power source.

Failure to comply with these instructions could result in death or serious injury.

NOTICE

Do not combine low and high voltage wiring in the same conduit.

All wiring for the RamPAC should be enclosed in flexible, liquid-tight conduit. Refer to Figure 2-14 for connector locations on the RamPAC board and to the wiring diagrams at the end of the. Do not apply power to the RamPAC until all connections have been made.

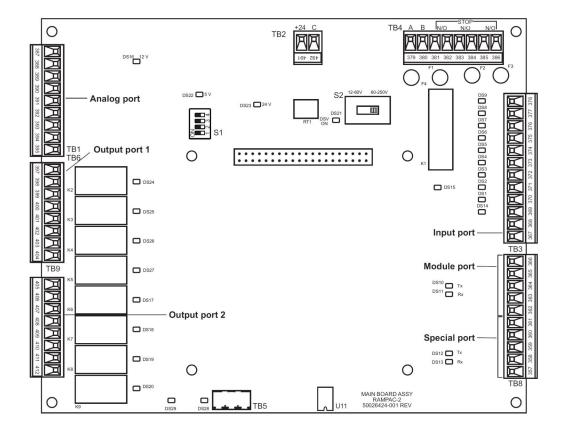


Figure 2-14. RamPAC Control Board: Location of Important Components

Terminating Cable Shields

RamPAC has ground studs on the inside of the enclosure for terminating cable shields at their point of entry. For each shielded cable, perform the following steps to terminate the shield, referring to Figure 2-15:

- 1. Strip the cable jacket as far as the end of the conduit fitting.
- 2. Cut the drain wire to a length that can wrap at least once around the nearest ground stud. Loosen the nut, wrap the drain wire clockwise around the stud, and tighten the nut.
- 3. Connect the rest of the wires in the cable to the terminal block.

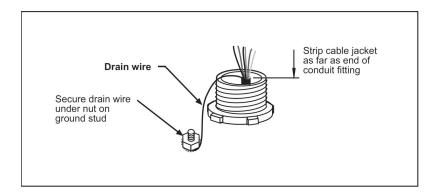


Figure 2-15. Connecting Shield Drain Wire to Ground Stud

Wiring the Cable Extension Position Transducer

To wire the transducer, perform the following steps, referring to Figure 1 or 6 at the end of the manual:

- 1. Plug the Hirschman connector on the black 6-conductor shielded cable into the transducer.
- 2. Run the other end of the black cable into the junction box through the cord grip, leaving a service loop at the transducer end. Do not run the cable through conduit and leave plenty of slack between the transducer and junction box. The cable must be able to flex as the press cycles at any shut height setting.
- 3. Run liquid-tight conduit from the junction box to the RamPAC.
- 4. Run the gray, 3-conductor shielded cable through the conduit from the junction box to RamPAC.
- 5. Strip the ends of all wires in both black and gray cables inside the junction box.
- 6. Connect the wires in both cables to the terminal strip as shown in Figure 2-16. You connect two wires in the black cable from the transducer to each terminal to give the transducer greater reliability.

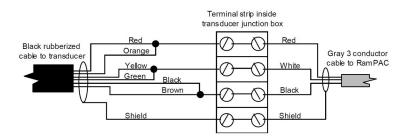


Figure 2-16. Position Transducer Junction Box: Wiring Connections

7. Strip the gray communications cable at the RamPAC end, allowing enough room for a service loop, and connect it to TB1 on the RamPAC Control board as shown in Table 2-1.

| Table 2-1. RamPAC to F | Position Transducer | Junction Box: W | /iring Connection |
|------------------------|---------------------|-----------------|-------------------|
| | | | |

| RamPAC Control Board TB1 Pin# | Signal | Wire Color * |
|----------------------------------|--------|--------------|
| 387 | +5 Vdc | Red |
| 388 | LT | White |
| 389 | GND | Black |

^{*} Terminate the cable shield to a ground stud inside the enclosure close to the entry point.

Wiring Operator Controls

NOTICE

RamPAC operator controls are low-voltage. You can run operator control wiring through conduit with other low-voltage wires, but do not run it with high-voltage wires.

To wire the Ram Mode, Ram Adjust, and Ram Interrupt operator controls, connect the terminal(s) on one end of each switch to the terminals on TB3 on the RamPAC Control board shown in Table 2-2, page 48 and the terminals at the other end to the ground terminal (pin #368) on TB3. Refer also to Figure 1 or 6 at the end of the manual.

| Operator Control | RamPAC Control Board TB3 Pin # Signal | | |
|---------------------|---------------------------------------|---------------|--|
| Ram Interrupt | 375 | RAM INTERRUPT | |
| D M I | 374 | MANUAL INPUT | |
| Ram Mode | 373 | AUTO INPUT | |
| 5 4 11 4 | 370 | DOWN INPUT | |
| Ram Adjust | 369 | UP INPUT | |
| | 368 | GND | |

Table 2-2. RamPAC to Operator Controls: Wiring Connections

Wiring Ram Adjust Motors

NOTICE

All key switches and push buttons in your current ram adjust circuit should be removed. They will be replaced by the relays on the RamPAC Control board. If your ram adjust circuit has mechanical limit switches, leave them in the circuit for added protection.

NOTICE

Be sure to run the wiring for the motor starters with wires carrying the same approximate voltage. Run high-voltage and low-voltage wires separately.

To connect the ram adjust motors to RamPAC, follow the instructions below, referring to Table 2-3 and Figure 1 at the end of the manual.

| RamPAC Control Board TB6 Pin # | Wiring Connections |
|-----------------------------------|---------------------------------------------------------------------|
| 397 | Pin #381 on TB4 |
| Jump pins #397 and #399 | No external connection |
| 398 | One side of Up starter solenoid (other side connected to Neutral) |
| 400 | One side of Down starter solenoid (other side connected to Neutral) |

Table 2-3. RamPAC to Ram Adjust Motor: Wiring Connections

- 1. Connect pin #397 on TB6 on the RamPAC Control board to pin #381 on TB4, as shown in Table 2-3. Pin #381 is one side of a normally-closed set of dry contacts, which open during an E-stop condition. The other contact, pin #382, is connected to 120 Vac.
- 2. On TB6, jump pin #397 to pin #399.
- 3. If your motor starter does not already have noise suppression devices, use two of the suppressors supplied with your RamPAC and install them across the coils. (The suppressors are plastic cubes with 2 black leads.) Installation of these devices will suppress any noise spikes created when the starter is engaged.
- 4. Connect pin #398 on TB6 to one side of the Up starter solenoid for the ram motor. The other side of this solenoid should already be connected to Neutral. See the wiring diagrams for your main control to find out where to install this wire.
- 5. Connect pin #400 on TB6 to one side of the Down starter solenoid for the ram motor. The other side of this solenoid should already be connected to Neutral.

Figure 2-17 and Figure 2-18 show examples of a ram adjust circuit before and after it was modified with RamPAC.

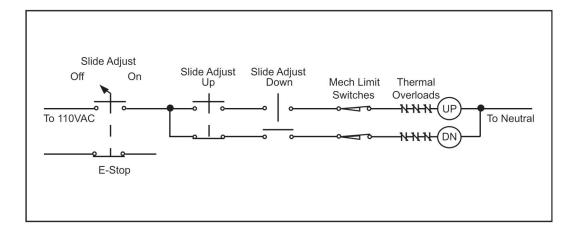


Figure 2-17. Ram Adjust Motor Circuit Wiring Example: Before Installation of RamPAC

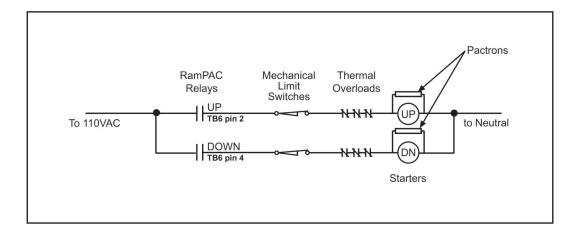


Figure 2-18. Ram Adjust Motor Circuit Wiring Example: After Installation of RamPAC

Wiring a Ram Adjust Motor When Not Using the Shut Height Feature

If your press is equipped with a shut height adjustment system and you are not using the shut height feature, RamPAC is unable to tell when the shut height adjust motor is energized and, consequently, cannot bleed the counterbalance cylinder(s). To enable RamPAC to detect actuation of the shut height adjust motor, you can wire the ram motor "ON" contact to pin 378 on TB3 on the RamPAC Control board (see Figure 3 at end of manual). When the shut height adjust motor is properly wired, RamPAC bleeds the counterbalance cylinders, if necessary, whenever the motor is energized, allowing the ram to be lowered to the desired shut height without having to work against the full force of the counterbalance.

Wiring Counterbalance/Cushion Valves

NOTICE

Be sure to use the valve cables supplied with your RamPAC. These cables provide built-in noise suppression and include indicator LEDs that aid in troubleshooting. You may need to install additional noise suppression devices (Pactrons), also provided with the valve, across the signal (brown) and neutral (blue) wires of each valve cable in the junction box.

NOTICE

- You can use the "cushion control" function to control another pressure up to 150 PSI (see Setting Up the Die Cushion Control, page 84).
- If you are using RamPAC's cushion control, but need to dump the cushion pressure to 0
 (zero) under some conditions, set the cushion operating mode to MANUAL in Program mode
 (see Making Initial Counterbalance and Cushion Settings, page 102) and set the manual
 regulator on the cushion valve package to 0 (zero).

To wire counterbalance and/or cushion valves to RamPAC, perform the following steps, referring to Figure 1 or 6 at the end of the manual:

1. Locate the two black 3-conductor cables with a Hirschman connector at one end supplied with each valve package. Noise suppression is built into the connector. You may need to install additional noise suppression devices (Pactrons) also provided with the valve.

- 2. Write "FILL" on the blank white label on one of the connectors for the counterbalance and/or cushion valves. Write "DUMP" on the label on the other connector.
- 3. Plug the connector labelled "FILL" into the Hirschman connector on the Fill solenoid in the counterbalance and/or cushion valve package (see Figure 2-8, page 41, for location).
 - Plug the connector labelled "DUMP" into the Dump solenoid in the counterbalance and/or cushion valve package (see Figure 2-8).
- 4. Run both cables for each valve package to a junction box close to the solenoids with at least 115 Vac wiring. If an existing junction box is unavailable or has low-voltage wiring, you must install one.
- 5. Wire the Counterbalance Fill and Dump solenoid cables as shown in Table 2-4.
 - Wire the Cushion Fill and Dump solenoid cables as shown in Table 2-5.
 - You may need to install additional noise suppression devices (Pactrons) provided with the valve across the signal (brown) and neutral (blue) wires of each valve cable in the junction box.
- 6. For the counterbalance valves, wire pin #405 on TB9 to pin #381 on TB4.
 - For the cushion valves, wire pin #409 on TB9 to pin #381 on TB4.
 - Pin #381 is one side of a normally-closed set of dry contacts, which open during an E-stop condition. The other contact, pin #382, is connected to 120 Vac.
- 7. For the counterbalance valves, jump pin #405 on TB9 to pin #407.
 - For the cushion valves, jump pin #409 on TB9 to pin #411.

Table 2-4. Counterbalance Valve Package: Wiring Connections

| Solenoid Cable | Pin# | Wire Color | RamPAC Control Board TB9 Pin # | Other Connections |
|-------------------|------|--------------|--------------------------------------|-------------------|
| | 1 | Brown | 408 | |
| Fill | 2 | Blue | NEUTRAL * | |
| | 3 | Green/Yellow | GROUND * | |
| | 1 | Brown | 406 | |
| Dump | 2 | Blue | NEUTRAL * | |
| | 3 | Green/Yellow | GROUND * | |
| | | | 405 | Pin #381, TB4 |
| | | | Jump pins #405 and #407 | |

^{*} These connections do not have to be made at the RamPAC control. You can use existing Neutral and Ground (from the 120V circuit) for these connections.

Table 2-5. Cushion Valve Package: Wiring Connections

| Solenoid Cable | Pin # | Wire Color | RamPAC Control Board TB9 Pin # | Other Connections |
|-------------------|----------|--------------|--------------------------------------|-------------------|
| | 1 | Brown | 412 | |
| Fill | 2 | Blue | NEUTRAL * | |
| | 3 | Green/Yellow | GROUND * | |
| | 1 | Brown | 410 | |
| Dump | 2 | Blue | NEUTRAL * | |
| | 3 | Green/Yellow | GROUND * | |
| | | | 409 | Pin #381, TB4 |
| | | | Jump pins #409 and #411 | |

^{*} These connections do not have to be made at the RamPAC control. You can use existing Neutral and Ground (from the 120V circuit) for these connections.

Wiring Counterbalance/Cushion Manual Solenoid

Some counterbalance and cushion valve packages (not provided by Wintriss Controls) include a third solenoid to control the air when RamPAC is in Manual mode. If you have this type of valve package, wire the manual solenoid for each valve package to the RamPAC as follows, referring to Figure 4 or 9 at the end of the manual:

- 1. Connect one of the solenoid cables to the Manual solenoid on the counterbalance and/or cushion valve package.
- 2. Install a suppressor across the coil.
- 3. Run the cable to a junction box close to the valve package (see step 4 in *Wiring Counterbalance/Cushion Valves*, page 50).
- 4. Wire the cable as shown in Table 2-6.
- 5. For the counterbalance valve, wire pin #401 on TB6 to L1 (120 Vac).

For the cushion valve, wire pin #403 on TB6 to L1 (120 Vac).

Table 2-6. Counterbalance and Cushion Manual Solenoid: Wiring Connections

| Valve Package | Signal | RamPAC Control Board TB6 Pin # | Other Connections |
|--------------------|---------|-----------------------------------|----------------------|
| | SIGNAL | 402 | |
| Counton de alons a | NEUTRAL | NEUTRAL * | |
| Counterbalance | GROUND | GROUND * | |
| | | 401 | L1 (120 Vac) |
| | SIGNAL | 404 | |
| Cushion | NEUTRAL | NEUTRAL * | |
| | GROUND | GROUND * | |
| | | 403 | L1 (120 Vac) |

^{*} These connections do not have to be made at the RamPAC control. You can use existing Neutral and Ground (from the 120V circuit) for these connections.

Wiring Air Pressure Transducer(s)

To wire the counterbalance and/or cushion air pressure transducers, perform the following steps, referring to Figure 1 or 6 at the end of the manual:

1. Locate the transducer cable, which has a gray jacket and a gray connector that plugs into the transducer at one end.

NOTICE

RamPAC pressure transducers normally come pre-wired with the connector that attaches to the transducer. If you wire your own cable to the connector, follow the instructions in Appendix B.

- 2. Feed the cable through flexible, liquid-tight conduit from the transducer to the RamPAC.
- 3. Locate TB1 on the RamPAC Control board (see Figure 2-14, page 46). Cut the cable so you have enough left to use as a service loop when you unplug the connector.
- 4. Strip off the gray cable jacket to reveal approximately 2 in. of the conductors (red, black, and white) and shield. Strip the end of each insulated wire so approximately 1/4 in. of bare wire is exposed.
- 5. Connect the wires for the counterbalance transducer to TB1 as shown in Table 2-7
- 6. Connect the wires for the cushion pressure transducer to TB1 as shown in Table 2-8.

Table 2-7. RamPAC to Counterbalance Pressure Transducer: Wiring Connections

| RamPAC Control Board TB1 Pin # | Signal | Wire Color * |
|-----------------------------------|---------|--------------|
| 393 | +12 Vdc | Red |
| 394 | AN1 | White |
| 395 | GND | Black |

^{*} Terminate the cable shield to a ground stud inside the enclosure close to the entry point.

Table 2-8. RamPAC to Cushion Air Pressure Transducer: Wiring Connections

| RamPAC Control Board TB1 Pin # | Signal | Wire Color * |
|-----------------------------------|--------|--------------|
| 390 | +12Vdc | Red |
| 391 | AN0 | White |
| 392 | GND | Black |

^{*} Terminate the cable shield to a ground stud inside the enclosure close to the entry point.

Wiring between RamPAC and SmartPAC

The following sections show you how to make communications, E-stop output, input check, zero cam, and E-stop input wiring connections between the RamPAC and SmartPAC.

Connecting Communications Wiring

To make communications wiring connections between SmartPAC and RamPAC, perform the following steps, referring to Figure 1 or 6 at the end of the manual.

1. Locate the gray 6-conductor shielded cable without connector.

NOTICE

Use only five of the conductors. Cut the yellow wire and do not use it.

 If RamPAC and SmartPAC are in separate enclosures, run the cable through flexible liquid-tight conduit between RamPAC and SmartPAC. This conduit should contain only low voltage wiring.
 If RamPAC and SmartPAC are in the same enclosure or console, make sure to keep the

communications cable away from any high-voltage wires.

- 3. Locate TB6 on your SmartPAC PRO RTS board, TB102 on the original SmartPAC, or TB103 on the SmartPAC 2 (refer to your SmartPAC manual), and TB8 on the RamPAC Control board (refer to Figure 2-14, page 46).
- 4. Make communications wiring connections as shown in Table 2-9.

Table 2-9. RamPAC to SmartPAC Communications Wiring Connections

| Wire color | _ | C Control rd TB8 Signal | | PAC PRO oard TB6 Signal | | rtPAC 2 B103 Signal | | ginal AC TB102 Signal |
|---------------|-----|-------------------------------|-----|-------------------------------|-----|---------------------------|-----|-----------------------------|
| Black | 362 | GND | 240 | GND | 240 | GND | 240 | GND |
| Red | 363 | +RXD2 | 243 | +TXD2 | 243 | +TXD2 | 243 | +TXD2 |
| Green | 364 | -RXD2 | 244 | -TXD2 | 244 | -TXD2 | 244 | -TXD2 |
| Orange | 365 | +TXD2 | 241 | +RXD2 | 241 | +RXD2 | 241 | +RXD2 |
| Brown | 366 | -TXD2 | 242 | -RXD2 | 242 | -RXD2 | 242 | -RXD2 |

Cut off and do not use the yellow wire.

Terminate the cable shield to a ground stud inside the enclosure close to the entry point.

NOTICE

If you are installing RamPAC on a system with a Wintriss Tonnage Monitor (AutoSetPAC or WaveFormPAC) and/or Process Monitor (ProPAC) installed, you will be making communications wiring connections to the same pins on TB6 (SmartPAC PRO), TB102 (original SmartPAC) or TB103 (SmartPAC 2) as those used by communications wiring from these modules.

Wiring RamPAC's E-stop Outputs

CAUTION

NO STOP SIGNAL WHEN FAULT GENERATED

Connect RamPAC TB4 pins # 385 and # 386 into SmartPAC's E-stop circuit. If you do not do this, RamPAC will not stop the press when a fault is generated.

Failure to comply with these instructions could result in property damage.

When you wire pins #385 and #386 on TB4 on the RamPAC Control board into SmartPAC's Emergency Stop circuit (refer to Table 2-10 and to Figures 1 or 6 at the end of the manual), the press is emergency-stopped when an error is generated. This is a series connection.

Keep E-stop wiring away from any high-voltage lines, but you can run it with other low-voltage wiring.

| RamPAC Control Board TB4 Pin # | SmartPAC PRO RTS Board TB4 Pin # | Original SmartPAC or SmartPAC 2 Board TB101/TB102 Pin # |
|--------------------------------------|----------------------------------------|---------------------------------------------------------------|
| 385 | 208 | 208 |
| 386 | 207 | 207 |

Table 2-10. RamPAC E-Stop Output to SmartPAC: Wiring Connections

Wiring the Input Check Circuit

SmartPAC's input check signal tells RamPAC that the clutch is engaged and the press is running. RamPAC monitors this signal and the zero cam signal (see next section) to verify that the press is operating properly. Wire the input check circuit as follows:

1. Locate the input check circuit voltage selector switch (S2) on the RamPAC Control board and make sure it is set to the same voltage setting as switch S101 on the SmartPAC boards (Figure 2-20). There are two settings, as shown in Figure 2-19, 12-60 V (left) and 60-250 V (right). The factory setting is 60-250 V.

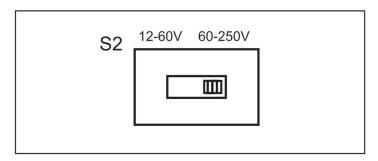


Figure 2-19. RamPAC Input Check Circuit Voltage Selector S2

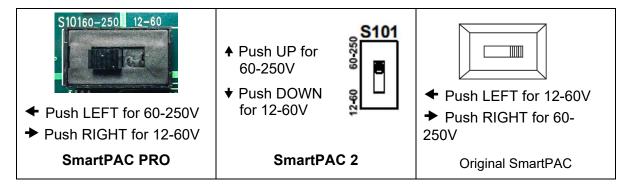


Figure 2-20. Input Check Circuit Voltage Selector Settings on SmartPACs

2. Make wiring connections between TB4 on the RamPAC Control board and the SmartPAC board, as shown in Table 2-11. These wires can be either low or high voltage, depending on your input check switch (S2) setting.

| | RamPAC Control Board TB4 | | SmartPAC PRO RTS Board TB4 | | martPAC AC 2 Board TB102 |
|-------|-----------------------------|------|-------------------------------|------|--------------------------------|
| Pin # | Signal | Pin# | Signal | Pin# | Signal |
| 379 | А | 205 | А | 205 | А |
| 380 | В | 206 | В | 206 | В |

Table 2-11. RamPAC to SmartPAC Input Check Circuit: Wiring Connections

Wiring the Zero Cam Signal to RamPAC

RamPAC needs to receive the zero cam signal from SmartPAC to know when the press reaches the top of the stroke. To wire the zero cam signal, make wiring connections as shown in Table 2-12 and Figure 1 or 6 at the end of the manual. Zero cam connections should be run with other low voltage lines. Zero cam connections will be shared with AutoSetPAC if one is installed on your system.

| RamPAC Control Board TB3 | | SmartPAC PRO RTS Board TB5 | | SmartPAC 2 Board TB107 | | SmartPAC Board | |
|-----------------------------|----------|-------------------------------|--------|---------------------------|--------|----------------|--------|
| Pin # | Signal | Pin # | Signal | Pin # | Signal | Pin# | Signal |
| 376 | ZERO CAM | 248 | ZERO | 248 | ZERO | 211 (TB101) | ZERO |
| 368 | GND | 247 | GND | 247 | GND | 247 (TB107) | GND |

Table 2-12. RamPAC to SmartPAC Zero Cam: Wiring Connections

Wiring an E-Stop Input

RamPAC stops the ram adjustment motor whenever you press the Ram Interrupt operator control (see *Ram Interrupt Control*, page 98). You may also want RamPAC to stop the ram adjustment motor when you push an E-stop button. If this is the case, you should wire RamPAC into the press's E-stop circuit using the Ram Stop input (pin #377) on TB3 on the RamPAC Control board.

To wire the Ram Stop input, connect pins #377 (Ram Stop) and #367 (+24V) on TB3 to a relay that follows the E-stop circuit. If you use a WPC as your press control, wire pin #377 to pin #57 on the WPC board. If you choose not to use the Ram Stop feature, place a jumper between pins #377 and #367 on TB3. Refer to Figure 1 or 6 at the end of the manual

CAUTION

RAMPAC WILL NOT STOP RAM ADJUST MOTOR WHEN E-STOP BUTTON IS PRESSED

Connect RamPAC TB3 pin #377 into the press's E-stop circuit. If you do not connect RamPAC into the E-stop circuit, the ram will continue to move when you push an E-stop button during shut height adjustment.

Failure to comply with these instructions could result in property damage.

CAUTION

OVERVOLTAGE

Use the E-stop circuit at 24 Vdc maximum.

Failure to comply with these instructions could result in property damage.

NOTICE

For a 120 Vac circuit, you will need an extra 120 Vac dry contact relay.

Wiring a Setup Mode Circuit

If you plan to use the Setup Mode feature in RamPAC's Counterbalance Control module, your SmartPAC must be integrated with the WPC clutch/brake control, or you must make the appropriate connections between SmartPAC and your own Stroke Selector key switch.

To wire your own Setup Mode circuit, connect a wire from one side of a normally open switch to

- SmartPAC PRO RTD board terminal block TB5, pin# 252 (Setup)
- SmartPAC 2 terminal block TB107 pin #252 (Inch/Setup) or
- Original SmartPAC terminal block TB201 pin #249 (Inch/Setup)

Connect the other side of the switch to Ground:

- SmartPAC PRO RTD board TB5 pin #247 (GND)
- SmartPAC 2 TB107 terminal #247 GND) or
- original SmartPAC TB201 pin #252 (GRD)

Refer to your SmartPAC manual for wiring schematics.

Wiring RamPAC To Prevent Air Compressor Operation When Press Is Off

Under some circumstances (e.g., at night), RamPAC remains powered On when the air compressor that supplies the counterbalance and/or cushion is off. To prevent RamPAC from attempting to fill the counterbalance and/or cushion when the press is Off, do the following:

Connect a "press motor on" contact in series with pin #377 (Ram Stop) on TB3 on the RamPAC Control board.

Wiring RamPAC to Only Monitor Shut Height

You can wire RamPAC to only monitor shut height without controlling shut height adjustment. This wiring scheme involves a two-position switch:

- When the switch is open, RamPAC displays the shut height and indicates whether it is at setpoint.
- When the switch is closed, RamPAC prevents the press from running if the shut height is not at setpoint in addition to displaying the shut height and indicating whether it is at setpoint.

You must also jumper the Ram Interrupt and Ram Stop circuits so they are on and make sure that no ram adjust motor is wired to pins #398 and #400 on TB6 on the RamPAC Control board.

With these connections made, RamPAC operates as a read-only device. Automatic Shut Height Adjust mode will not work.

To wire a Shut Height Monitor, do the following:

CAUTION

RAM ADJUSTMENT WILL NOT STOP WHEN YOU HIT E-STOP BUTTONS

Since Shut Height Monitor wiring does not include connections for a ram adjust motor, RamPAC will not stop shut height adjustment when you press the E-stop button. Make sure to provide an E-stop mechanism for the ram adjustment features you are installing separate from RamPAC.

Failure to comply with these instructions could result in property damage.

- 1. Wire the Shut Height Monitor switch between pin #373 (Auto Input) on TB3 on the RamPAC Control board and pin #368 (Ground), as shown in Figure 2 or 7 at the end of the manual.
- 2. Wire a jumper between pins #375 (Ram Interrupt) and #368 (Ground) on TB3.
- 3. Wire a jumper between pin #377 (Ram Stop) on TB3 and pin #367 (+24V).

NOTICE

You can wire the Ram Stop circuit so that RamPAC disables counterbalance and/or cushion control whenever an E-stop occurs by connecting pin #377 on TB3 to pin #57 on the WPC Processor board

- 4. Make sure the zero cam is wired as shown in Table 2-12, page 57.
- 5. Make sure the input check circuit is wired as shown in Table 2-11, page 57.

Wiring RamPAC for Counterbalance Control Only

- 1. If you want to use RamPAC to control only the counterbalance pressure, make the following modifications in the wiring, referring to Figure 3 or 8 at the end of the manual.
- 2. Wire a jumper between pins #377 (Ram Stop) and #367 (+24Vdc) on TB3 on the RamPAC Control board.
- 3. Wire a jumper between pins #375 (Ram Interrupt) and #368 (Ground) on TB3.

Connecting AC Wiring

WARNING

ELECTRIC SHOCK HAZARD

Do not connect the AC power source until you are done with all other installation procedures.

Turn off and disconnect power from the machinery RamPAC is connected to before making any wiring connections. This includes power to the machine control and motor.

Failure to comply with these instructions could result in death or serious injury.

To connect AC power to your RamPAC enclosure or to the non-enclosure RamPAC mounting plate, perform the following steps:

NOTICE

IF YOU PROVIDE YOUR OWN POWER SUPPLY

If you ordered the RamPAC Control board without a power supply, refer to Specifications, page 28 for power requirements. Wire +24 Vdc connections from your power supply to the following pins on TB2 on the RamPAC Control board (see Figure 5 at the end of the manual):

- Pin #491: +24 Vdc Pin #492: Ground
- 1. Locate the input power terminal block at the upper right of the RamPAC enclosure, as shown in Figure 2-21. AC Power Connections (RamPAC Enclosure), page 61. The terminal block is mounted just above the RamPAC Control board and to the right of the power supply.
- 2. Determine how you will bring wiring from your 115 or 230 Vac power source to the enclosure or console. For 115 Vac, you need three wires—black (High), white (Neutral), and green (Ground). For 230 Vac, wires are black (High), red (Neutral), and green or green/yellow (Ground). No. 16 wire is recommended, No. 14 if local codes require it, with a minimum 75° C temperature rating.

NOTICE

RAMPAC AUTOMATICALLY ADJUSTS TO 115 OR 230 VOLT INPUT POWER

You do not need to use a switch or other device to set the input power level.

- 3. Run the power wires through flexible, liquid-tight conduit to RamPAC. You can run the wires alone or with other high-voltage cables, but do not run the wires with low-voltage conductors.
 - If you ordered an enclosure, it is rated NEMA 12 (protected against dust and oil). You must use conduit of the same rating and make proper connections to ensure NEMA 12 protection. Wires go through the top right knockout. Leave a small service loop inside the enclosure.

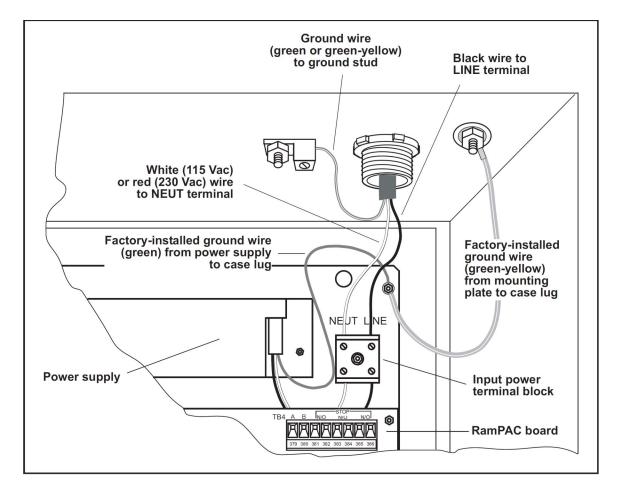


Figure 2-21. AC Power Connections (RamPAC Enclosure)

- 4. Connect the ground (green or green/yellow) wire to the ground stud on the ceiling at the top right of the enclosure, as shown in Figure 2-21. To make the connection, strip the ground wire about 1/4 in. (6.4 mm) from the end, loosen the screw on the ground stud, slide the wire into the hole, and tighten the screw to pin the wire in place.
- 5. Connect the power wires.

For 115 Vac power, connect the black wire to the LINE terminal on the input power block, as shown in Figure 2-21, and the white wire to NEUT.

For 230 Vac, connect the black wire to the LINE terminal and the red wire to NEUT.

Strip the wire 1/4 in. from the end. Loosen the screw in the input power terminal block, insert the stripped portion of the wire, and tighten the screw.

- 6. Double-check connections.
- 7. Make all necessary conduit connections to ensure NEMA 12 protection.

Checking RamPAC Wiring

CAUTION

INCORRECT INSTALLATION

Check the wiring after all installation and wiring connections are complete and before continuing with RamPAC setup (see 0, page 66).

Failure to comply with these instructions could result in property damage.

When you have completed all installation procedures and wired AC power, you should perform the following wiring check:

- 1. Apply power to RamPAC and SmartPAC.
- 2. Check to make sure that RamPAC appears in the list of installed options during SmartPAC startup. If RamPAC is not displayed, turn the power off and do the following:
 - a. Check communications wiring between RamPAC and SmartPAC (see Table 2-9, page 55).
 - b. Verify that +24 Vdc power is connected to TB2 on the RamPAC Control board.
- 3. Power up RamPAC and SmartPAC again. If RamPAC still does not display in the installed options list, find the firmware versions of both RamPAC and SmartPAC, and call Wintriss Tech. Support to determine whether these versions are compatible.
 - Find the RamPAC firmware version number on chip U11 on the RamPAC Control board (see Figure 2-14, page 46 for location.)
 - Find the SmartPAC firmware version number according to the following table.

Table 2-13. Finding the SmartPAC Firmware Version Number

| SmartPAC | If unit can be powered up find the firmware version on the | If the unit cannot be powered up | |
|--------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| SmartPAC PRO | Installed Options List | Contact Wintriss Tech Support with the unit's serial number found on the SD card on the SmartPAC PRO HMI board, see Figure 2-22. | |
| SmartPAC 2 | Installed Options List | Contact Wintriss Tech Support with unit's serial number found on the label of U124 (the bootloader chip), labeled "Monitor Program Memory Serial # xxxxxxxxxx" in Figure 2-7 of your SmartPAC 2 User Manual. | |
| Original SmartPAC (SmartPAC 1) | Installed Options List | Find the firmware version on the label of U301. For the location, see firmware board in Figure 2-5d of your original SmartPAC manual. | |



Figure 2-22. SmartPAC PRO SD Card with Serial Number on HMI Board

NOTICE

IF PRESS DOES NOT RUN AFTER RAMPAC INSTALLATION

Verify that the following connections are wired correctly according to the wiring diagrams at the end of the manual:

- RamPAC TB3 pin #375 (Ram Interrupt)
- RamPAC TB3 pin #377 (Ram Stop)
- 4. When you have RamPAC and SmartPAC operating correctly, make sure there is no tooling or material in the press, then Run the press in Continuous mode for two minutes to ensure that the installation is wired properly.

Exchanging RamPAC Control Boards

Each time RamPAC is powered up, all RamPAC settings, which are stored in the microprocessor, are backed up to the RamPAC firmware chip. (Switch 3 on switch block S1 must be set to OFF, its default position, to enable this backup capability.) If you ever need to replace the RamPAC Control board, SmartPAC 2 and SmartPAC PRO provide a Restore Parameters feature that allows you to carry over your old settings. You simply remove the firmware chip from the old board, install it in the new board, and execute the Restore Parameters function in SmartPAC 2 or SmartPAC PRO. To exchange boards and restore parameters, perform the following steps:

NOTICE

RESTORE PARAMETERS FUNCTION NOT AVAILABLE WITH ORIGINAL SMARTPAC

The original SmartPAC does not provide the Restore Parameters feature, so you cannot move your old RamPAC settings to the replacement board if you are using RamPAC with an original SmartPAC. Instead, you must replace settings manually. Setup sheets, on which you can record the settings stored on the old board so you can transfer them to the new board, are provided at the end of this manual.

NOTICE

MAKE SURE TO SAVE THE FIRMWARE CHIP FROM THE OLD BOARD

The firmware chip on your old board contains all your RamPAC settings. Save the firmware chip so you can restore these settings to the new board. Otherwise, you will have to re-enter the settings by hand.

1. Before you return your old board to Wintriss, remove the firmware chip (component U11–see Figure 2-14, page 46) and put it in a safe place. Note that the semi-circular notch in the chip faces down.

NOTICE

When you install the firmware chip on the new board, the notch in the chip must also face down.

2. When you receive the new board, install it in your enclosure or console. Refer to *Mounting the RamPAC Control Board*, page 35 if you need help installing the new board.

CAUTION

CHIP INSTALLED INCORRECTLY

- Install the chip with the notch facing down; otherwise, when you power up the control, the chip will be destroyed.
- Align pins correctly with the socket before plugging the chip in.

Failure to comply with these instructions could result in property damage.

- 3. Set switch 3 on switch block S1 on the new board to the ON position (see *Enabling Backup of Settings (Switch 3)*, page 87). Setting switch 3 to ON prevents the factory defaults stored in the microprocessor on the replacement board from overwriting the RamPAC settings from your old board that reside on the firmware chip.
- 4. Insert the firmware chip from your old board in the U11 socket on the new board, making sure that the notch in the chip faces down and that the pins are aligned with the socket before you plug them in.
- 5. Power up the SmartPAC and RamPAC.
- 6. On the Main Initialization Menu (see page 73 for instructions in how to access this screen), select RAMPAC INIT to display the RamPAC Initialization Menu, shown in Figure 2-23.

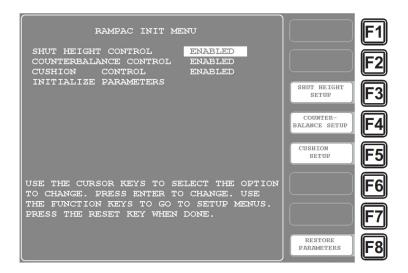


Figure 2-23. RamPAC Initialization Menu

7. Press function key F8 (Restore Parameters) to copy settings from your old firmware chip to the microprocessor on the new RamPAC Control board. The warning window shown in Figure 2-24, page 65 will display.

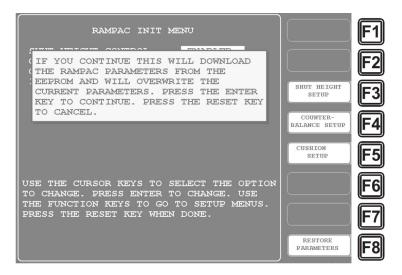


Figure 2-24. RamPAC Initialization Menu with Restore Parameters Warning Message

NOTICE

When you restore parameters, factory settings on the new RamPAC Control board are overwritten by the settings on the firmware chip from your old Control board.

8. Press ENTER to continue with the Restore Parameters process.

NOTICE

Make sure to set switch 3 on switch block S1 back to OFF when you have finished restoring parameters; otherwise, the RamPAC firmware chip will not be overwritten with current backup information. A fault message displays to alert you when switch 3 is set to ON (see page 126).

- 9. When the window closes, set switch 3 on switch block S1 back to OFF.
- 10. You can now operate RamPAC, using your previous settings.

Installing New RamPAC Firmware

WARNING

ELECTRIC SHOCK HAZARD

- Disconnect main power at SmartPAC and RamPAC before working inside the enclosure(s).
 All power to the press, press control, and other equipment used with the press must be off when you work inside the enclosure.
- Remove all fuses and "tag out" per OSHA 1910.147 Control of Hazardous Energy (Lockout/Tagout).
- Ensure that this procedure is performed by qualified personnel.

Failure to comply with these instructions could result in death or serious injury.

NOTICE

YOU MAY ALSO HAVE TO UPGRADE YOUR SMARTPAC FIRMWARE

If you are upgrading RamPAC from a previous version, your SmartPAC firmware may also have to be upgraded. Call Wintriss Tech. Support for more information.

To install an updated version of RamPAC firmware, perform the following steps:

- 1. Verify that power has been turned off to SmartPAC, RamPAC, the press, and any auxiliary equipment.
- 2. Verify that all LEDs on the RamPAC Control board are off (see Figure 5-1, page 114, for LED locations).

CAUTION

STATIC DISCHARGE DAMAGE TO CHIP

Ground yourself before touching circuit boards or chips by touching a large metal object such as the press. Static electricity can destroy electronic components.

Failure to comply with these instructions could result in property damage.

3. Making sure that you are grounded, open the RamPAC enclosure and locate the firmware chip, labelled U11, on the RamPAC Control board (see Figure 2-14, page 46). Note that the chip has a white label and the semi-circular notch on the chip faces down.

NOTICE

The new RamPAC firmware chip must also be installed with the notch facing down.

CAUTION

If you use a screwdriver, be careful not to insert the screwdriver under the socket or you may damage the board.

Failure to comply with these instructions could result in property damage.

4. Use a chip puller to remove the old chip, or insert a small screwdriver between the bottom of the chip and the socket and carefully pry the chip from the board. Put the chip aside.

5. Making sure you are grounded, open the package containing the new firmware chip, and remove the chip from its holder.

CAUTION

CHIP INSTALLED INCORRECTLY

- Install the chip with the notch facing down; otherwise, when you power up the control, the chip will be destroyed.
- Align pins correctly with the socket before plugging chip in.

Failure to comply with these instructions could result in property damage.

6. Plug the chip into its socket, inserting the left row of pins first, then aligning the right row of pins over the socket and pushing them in. Make sure that the notch in the chip faces down and that all of the pins are in the socket.

NOTICE

If the two rows of pins are spread too far apart to plug easily into the socket, hold the chip on its side on a flat surface with the pins pointing toward you. Being careful not to overbend the pins, gently draw the top of the chip toward you until the pins bend a little. Turn the chip over so that the other row of pins is now flat and pointing toward you. Draw the top of the chip toward you again until the pins bend. When the rows of pins look parallel, plug the chip into its socket again. If the chip still doesn't fit, repeat this procedure.

- 7. To verify that the chip is installed correctly, close the RamPAC enclosure, and power up the SmartPAC and RamPAC.
 - If the SmartPAC powers up normally, go to step 8.
 - If the SmartPAC powers up with a fault message like the following

A RAMPAC WAS INSTALLED THE LAST TIME THE UNIT WAS POWERED-UP AND WAS NOT SEEN THIS TIME.

one or more pins may be bent or not plugged in properly. Turn the power off, and repeat the procedure in the Notice for step Plug the chip into its socket, . Power the unit up again. If the same fault message displays, contact Wintriss Tech. Support.

- 8. Access the List of Installed Options screen in SmartPAC Initialization, referring to your SmartPAC manual if necessary. RamPAC should be displayed in the options list along with its new firmware version number (for example, V1.51).
- 9. If RamPAC appears in the list, you have completed installation of your new firmware successfully. If RamPAC is not in the list, contact Wintriss Tech. Support.

Chapter 3 – Making Initialization Settings

This chapter shows you how to enter RamPAC shut height, counterbalance, and cushion control settings in SmartPAC Initialization mode and test Initialization settings in Program and Run modes. Initialization settings establish parameters that control operation of all tools. Settings specific to individual tools are entered in Program mode (see Chapter 4, page 97). The chapter is organized in the following sections:

| Accessing the RamPAC Initialization Menu | 71 |
|---------------------------------------------|----|
| Initializing RamPAC Parameters | 73 |
| Enabling RamPAC Features | |
| Setting Up the Shut Height Control | 74 |
| Setting Up the Counterbalance Control | 79 |
| Setting Up the Die Cushion Control | 84 |
| Setting Switches on Switch Block S1 | 86 |
| Setting Startup Time (Switches 1 and 2) | 86 |
| Enabling Backup of Settings (Switch 3) | 87 |
| Testing Initialization Settings | |
| Creating a "Test" Tool | 87 |
| Testing Shut Height Settings | 90 |
| Checking Shut Height Adjustment | 91 |
| Checking the Upper Shut Height Limit | 92 |
| Checking the Lower Shut Height Limit | |
| Testing Counterbalance and Cushion Settings | 93 |
| | |

NOTICE

VERSIONS OF SMARTPAC

This manual covers use with three versions of SmartPAC:

- Original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO.

"SmartPAC" refers to all three versions, unless otherwise indicated.

NOTICE

REFER TO YOUR SMARTPAC USER MANUAL

Instructions for using the screens in Initialization mode are provided in Chapter 4 of the applicable SmartPAC user manual. For help in using the keyboard, refer to Chapter 3 of the manual.

NOTICE

USING SMARTPAC HELP

If you need help with an Initialization mode screen on SmartPAC PRO, press ? If you need help with an Initialization mode screen on SmartPAC 2, press the HELP key when that screen is displayed.

NOTICE

All screens used as examples in this chapter and throughout the manual are SmartPAC 2 screens. SmartPAC PRO and original SmartPAC screens are similar. Be sure to read the screen and labels of the function keys.

Accessing the SmartPAC Main Initialization Menu

NOTICE

Many of the menus in this manual are from the original SmartPAC. However, the menus on SmartPAC 2 and SmartPAC PRO are similar. The menu organization is the same for all versions of SmartPAC.

Navigation and data entry on the SmartPAC PRO are accomplished on its touch screen, while the original SmartPAC and SmartPAC 2 use keypads and function keys. See *Original SmartPAC and SmartPAC 2 Front Panels*, page 22, or *SmartPAC PRO Front Panel*, page 24, and the user manual for your version SmartPAC.

NOTICE

When switching between operating modes with the Program/Run key, make sure that SmartPAC is displaying the top-level screen in the current mode (i.e., Main Program Menu or Main Run Menu). To return to the top-level menu, press RESET or EXIT repeatedly.

You make RamPAC Initialization settings on the RamPAC Initialization Menu and from three screens accessible from it. To access the RamPAC Initialization Menu via the SmartPAC Initialization menu, do the following:

Table 3-1. Accessing the SmartPAC Initialization Menu

| Access Original SmartPAC or | 1. | Turn the Program/Run key on the SmartPAC front panel to "PROG." |
|-----------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SmartPAC 2 Initialization Menu | 2. | Press the "1" and "CLEAR" keys simultaneously for one second. The Main Initialization Menu appears (Figure 3-2, below; original SmartPAC is similar). The screen you see may be slightly different depending on your installed options. |
| Access SmartPAC PRO | 1. | Turn the Program/Run key switch to "PROG." |
| Initialization Menu | 2. | Select "INITIALIZATION MENU" from the Main Programming Menu. The menu appears, Figure 3-2, below. |

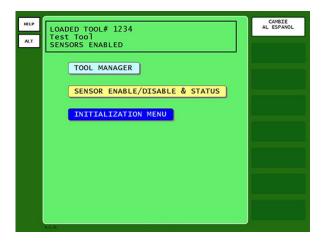


Figure 3-1. SmartPAC PRO Program Menu

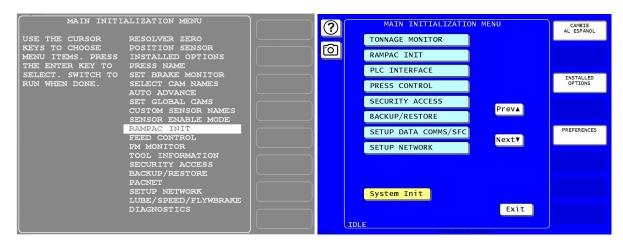


Figure 3-2. SmartPAC 2 Initialization Menu (left); SmartPAC PRO Initialization Menu (right)

Accessing the RamPAC Initialization Menu

You make RamPAC Initialization settings on the RamPAC Initialization Menu and from three screens accessible from it. To access the RamPAC Initialization Menu, do the following:

1. Access the SmartPAC Initialization menu as described in the previous section, Table 3-1.

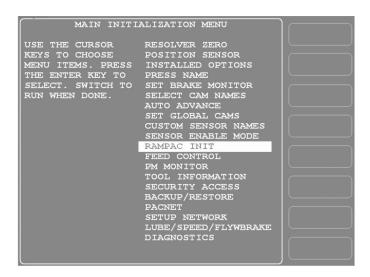


Figure 3-3. Main Initialization Menu

NOTICE

The items displayed on your Main Initialization Menu may be different depending on installed options.

2. Select the RAMPAC INIT item. The RamPAC Initialization Menu, shown in Figure 3-4, displays.

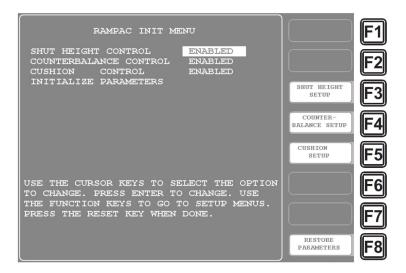


Figure 3-4. RamPAC Initialization Menu

Initializing RamPAC Parameters

[INITIALIZATION - RAMPAC INIT]

Before you make any RamPAC Initialization settings, you need to initialize RamPAC parameters. When you initialize parameters, you return all existing settings to their factory defaults.

NOTICE

INITIALIZE PARAMETERS ONLY WHEN YOU FIRST SET UP RAMPAC

The only time you should initialize parameters is when you first set up RamPAC. If you initialize parameters after entering RamPAC settings, those settings will be lost.

To initialize parameters, do the following:

1. On the RamPAC Initialization Menu (see Figure 3-4,above), select the INITIALIZE PARAMETERS item. The warning window shown in Figure 3-5, page 73, displays.

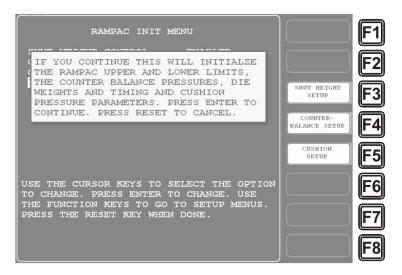


Figure 3-5. RamPAC Initialization Menu with Initialize Parameters Warning Displayed

2. Press ENTER to continue with the Initialize Parameters process.

Enabling RamPAC Features

[INITIALIZATION - RAMPAC INIT]

When you initialize parameters, the SHUT HEIGHT CONTROL, COUNTERBALANCE CONTROL, and CUSHION CONTROL items on the RamPAC Initialization Menu are returned to their default setting, which is "DISABLED." Before making Initialization settings for one of these RamPAC features, you must enable that item. To do so, perform the following steps:

- 1. On the RamPAC Initialization Menu (see Figure 3-4), select a feature you want to enable, and press ENTER to toggle to the ENABLED setting.
- 2. Repeat step 1 for additional features.

NOTICE

• All transducers and other components for a feature must be installed for that feature to work.

If you sometimes run tools using the cushion air (or other pressure) controlled by RamPAC, enable cushion control. When you run a tool that does not use cushion control, set the cushion operating mode to MANUAL in Program mode (see *Making Initial Counterbalance and Cushion Settings*, page102) and set the regulator on the cushion valve package to 0 (zero).

Setting Up the Shut Height Control

[INITIALIZATION - RAMPAC INIT - F3 (SHUT HEIGHT SETUP)]

You make shut height Initialization settings on the Shut Height Initialization Menu. To access this menu, which is shown in Figure 3-6, press the F3 (Shut Height Setup) function key on the RamPAC Initialization Menu with the SHUT HEIGHT CONTROL item enabled.

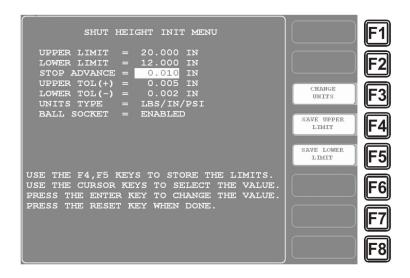


Figure 3-6. Shut Height Initialization Menu

Descriptions of the fields displayed on the Shut Height Initialization Menu are provided in Table 3-2. Instructions for entering this information follow the table.

Table 3-2. Shut Height Initialization Menu Field Descriptions

| Field | Description | | | |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--|--|
| upper limit | The length of the die opening with the press at top dead center (TDC) and the shut height adjusted to its maximum "up" position. This value should be displayed on the nameplate of your press. Upper and lower (see next item) limit settings establish the range of die openings within which shut height setpoints can be made. Default setting: 2.000 in. | | | |
| lower limit | The length of the die opening with the press at top dead center (TDC) and the shut height adjusted to its maximum "down" position. This value should be displayed on the nameplate of your press. Upper (see previous item) and lower limit settings establish the range of die openings within which shut height setpoints can be made. Default setting: 1.000 in. | | | |
| stop advance | The distance before the shut height setpoint that RamPAC turns off the ram adjust motor so the ram stops precisely at the setpoint. This setting compensates for the distance (called the "stopping distance") the ram travels after the ram adjust motor turns off during automatic shut height adjustment and prevents the ram from overshooting the setpoint. Default setting: 0.000 in. | | | |
| upper tol (+) | The distance above the shut height setpoint that the ram can be positioned without preventing the press from running. Default setting: +0.010 in. Tolerance settings depend on how close to the setpoint you need the shut height to be when you change dies and on other factors such as bearing clearance. Perform the procedure in <i>Measuring the Ram Bearing Clearance</i> , page 130, to determine whether you need to adjust tolerance settings to compensate for bearing clearances. | | | |
| lower tol (-) | The distance below the shut height setpoint that the ram can be positioned without preventing the press from running. Default setting: -0.010 in. | | | |
| units type | The units of measurement used to display all numeric entries on Shut Height, Counterbalance, and Cushion Initialization menus. The following units combinations can be selected: | | | |
| | LBS/IN/PSI | Pounds, inches, pounds per square inch (Default) | | |
| | LBS/MM/PSI | Pounds, millimeters, pounds per square inch | | |
| | Kg/MM/BAR | Kilograms, millimeters, bar | | |
| | Kg/MM/Kp | Kilograms, millimeters, kilopascals | | |
| | You should select the units type you plan to use for all settings before making any entries on the Shut Height, Counterbalance, or Cushion Initialization menus. | | | |
| ball socket | Enables or disables Ball Socket mode, which turns on the shut height adjust relays only when the crank angle is within 10° of top dead center (TDC) or bottom dead center (BDC). Ball Socket mode must be enabled on presses with a ball-socket connection. On these presses, the position transducer is exposed to horizontal movement of the connecting rod and cannot provide accurate readings except at TDC and BDC. Ball Socket mode may also be enabled for a press with a wrist-pin connection. Default setting: DISABLED. | | | |

To set parameters on the Shut Height Initialization Menu, do the following:

NOTICE

Select units of measurement before you set any other RamPAC parameters. Settings you make are automatically displayed in the units shown in the UNITS TYPE field. Since RamPAC cannot convert values entered in one units type to values in another units type, you cannot change the Units Type setting without invalidating your previous entries.

1. Highlight the UNITS TYPE item, and press the F3 (Change Units) function key (the ENTER key also works) until the units settings you want are displayed.

NOTICE

All examples used in this manual are shown in pounds, inches, or pounds per square inch.

2. Highlight the UPPER LIMIT item, and press ENTER. A Numeric Entry window similar to the one shown in Figure 3-7 displays.

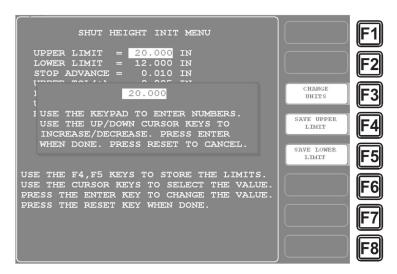


Figure 3-7. Shut Height Initialization Menu with Numeric Entry Window Displayed

- 3. In the Numeric Entry window, key in the upper shut height limit, as shown on the nameplate of your press, and press ENTER to close the window and return to the Shut Height Initialization Menu. Figure 3-6, page 74, shows an upper shut height limit of 20.000 in., as an example.
- 4. Press the F4 (Save Upper Limit) function key. A window similar to the one shown in Figure 3-8 displays, instructing you to move the ram to its upper limit. The value displayed in the center of the window is a counter used by RamPAC to position the ram during shut height adjustment and does not represent a physical measurement.

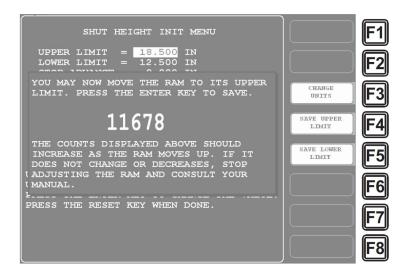


Figure 3-8. Shut Height Initialization Menu with Save Upper Limit Window Displayed

5. With the Ram Mode operator control in MANUAL mode (see *Adjusting Shut Height with Operator Controls*, page 98), use the Ram Adjust control to move the ram to its upper limit. As the ram moves, the counter in the Save Upper Limit window should increase.

CAUTION

EXCEEDING UPPER LIMIT OF SHUT HEIGHT

DO NOT exceed the upper limit of the shut height.

Failure to comply with these instructions could result in property damage.

NOTICE

If the counter value displayed in the Save Upper Limit window does not increase as the ram moves up, stop the ram and consult the wiring diagrams at the end of this manual. Make sure the position transducer and ram adjust controls are wired correctly before you continue.

- 6. When you have adjusted the shut height to its maximum "up" position, use a dial indicator to measure the ram height, then do one of the following:
 - If the measured ram height is exactly the same as your Upper Limit setting (see step 3), press ENTER to save the setting and close the window.
 - If the ram height measurement differs from your Upper Limit setting, press RESET to close the window, then change the Upper Limit setting to the height you measured, repeating steps 2 and 3.
- 7. Select the LOWER LIMIT item, and in the Numeric Entry window key in the lower shut height limit, as shown on the nameplate of your press, then press ENTER to close the window and return to the Shut Height Initialization Menu. Figure 3-6, page 74, shows a lower shut height limit of 12.000 in. as an example.
- 8. Press the F5 (Save Lower Limit) function key. A window similar to the one shown in Figure 3-8 displays, instructing you to move the ram to its lower limit.
- 9. With the Ram Mode control in MANUAL, use the Ram Adjust control to move the ram to its lower limit. As the ram moves, the counter in the Save Lower Limit window should decrease.

NOTICE

EXCEEDING LOWER LIMIT OF SHUT HEIGHT

DO NOT exceed the lower limit of the shut height.

Failure to comply with these instructions could result in property damage.

NOTICE

If the counter value displayed in the Save Lower Limit window does not decrease as the ram moves down, stop the ram and consult the wiring diagrams at the end of this manual. Make sure your position transducer and ram adjust controls are wired correctly before you continue.

- 10. When you have adjusted the shut height to its maximum lower position, use a dial indicator to measure the ram height, then do one of the following:
 - If the measured ram height is exactly the same as your Lower Limit setting (see step 7), press ENTER to save the setting and close the window.
 - If the ram height measurement differs from your Lower Limit setting, press RESET to close the window, then change the Lower Limit setting to the height you measured, repeating step 7.

NOTICE

STOP ADVANCE VALUE REQUIRED FOR AUTOMATIC SHUT HEIGHT ADJUSTMENT

Because the ram does not stop moving instantaneously when the ram adjust motor is shut off, you may have to adjust the Stop Advance to allow for this. RamPAC's factory setting for stop advance is 0.000 (zero) inches. Enter an initial value of 0.010 inches. To adjust this initial setting, see *Adjusting Stop Advance*, page 107.

NOTICE

ENTER INITIAL STOP ADVANCE VALUE

Always enter a value for Stop Advance when you do any of the following:

- Install a new RamPAC
- Upgrade RamPAC firmware
- · Initialize parameters
- 11. Select the STOP ADVANCE item, and in the Numeric Entry window key in a Stop Advance setting for your press. Figure 3-6, page 74, shows a value of 0.010 in. as an example. This is a good setting to use as you are programming tools. Once tools have been programmed, you can determine the best Stop Advance setting for all the tools on your press. See *Adjusting Stop Advance*, page 107.

NOTICE

The factory tolerance settings are +0.010 and -0.010 in. This means that with a 6.000 in. shut height setpoint, the press will run when the ram is positioned anywhere between 6.010 and 5.990.

NOTICE

Tolerance settings depend on how close to the setpoint you need the shut height to be when you change dies and on other factors such as bearing clearance. Perform the procedure in *Measuring the Ram Bearing Clearance*, page 130, to determine whether you need to adjust tolerance settings to compensate for bearing clearances.

CAUTION

SHUT HEIGHT TOO LOW

Ensure that the Lower Tolerance (–) is small enough to prevent running the press with too low a shut height.

Failure to comply with these instructions could result in property damage.

- 12. Select the UPPER TOL (+) item, and in the Numeric Entry window key in an Upper Tolerance value. Press ENTER to close the window.
- 13. Repeat step 12 for the LOWER TOL (–) item, keying in a Lower Tolerance value.

CAUTION

DIE DAMAGE IN BALL SOCKET PRESS

On a ball-socket press, the shut height measured by RamPAC is accurate only within 10° of top dead center (TDC) and bottom dead center (BDC). If you have a ball socket press and disable Ball Socket mode, the automatic shut height adjustment will not work properly and die damage may occur.

Failure to comply with these instructions could result in property damage.

- 14. If you wish to enable Ball Socket mode, highlight the BALL SOCKET item, and press ENTER to display the ENABLED selection. "DISABLED" is the default setting.
- 15. When you are finished, press RESET to return to the RamPAC Initialization Menu.
- 16. Perform the shut height tests in *Testing Initialization Settings*, page 87.

Setting Up the Counterbalance Control

[INITIALIZATION - RAMPAC INIT - F4 (COUNTERBALANCE SETUP)]



EXCEEDING MAXIMUM UPPER DIE WEIGHT

NEVER use a die in your press that exceeds

- The manufacturer's recommended maximum upper die weight or
- The maximum upper die weight that can be counterbalanced by your shop air pressure.

Failure to comply with these instructions could result in death or serious injury

You make counterbalance Initialization settings on the Counterbalance Initialization Menu. To access this menu, which is shown in Figure 3-9, press the F4 (Counter Balance Setup) function key on the RamPAC Initialization Menu with the COUNTERBALANCE CONTROL item enabled.

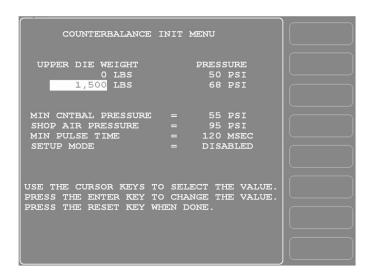


Figure 3-9. Counterbalance Initialization Menu

Descriptions of the fields displayed on the Counterbalance Initialization Menu are provided in Table 3-3. Instructions for entering this information follow the table.

Table 3-3. Counterbalance Initialization Menu Field Descriptions

| Field | Description |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| pressure (0 lb) | The counterbalance pressure required to support the weight of the ram with no die installed. You can find this information on the counterbalance chart on your press. Default setting: 30 PSI. |
| upper die weight (max. lb) | The weight of the heaviest die that can be installed on your press. You can find this information on the counterbalance chart on your press. Default setting: 1000 lbs. |
| pressure (max. lb) | The counterbalance pressure required to support the weight of the ram with the heaviest die installed. You can find this information on the counterbalance chart on your press. Default setting: 200 PSI. |
| min cntbal pressure | The counterbalance pressure required to support the weight of the ram with no die installed. This value should be identical to the PRESSURE (0 LBS) setting. If you attempt to enter a different value, the field reverts to the value displayed in the PRESSURE (O LBS) field. Default setting: 30 PSI. |

| Field | Description | | | | |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| shop air pressure | The value you set on the counterbalance valve package regulator (see step 8 under <i>Installing Counterbalance and Cushion Control Valves</i> , page 40). Wintriss recommends that you set this field to the smaller of the following values: | | | | |
| | Actual shop air pressure | | | | |
| | or | | | | |
| | 20 PSI + Pressure required to counterbalance the heaviest die you intend to run on the press | | | | |
| | Default setting: 200 PSI. | | | | |
| pulse time | The length of the pulse that RamPAC transmits to activate the counterbalance solenoid and change the counterbalance air pressure. Default setting: 100 msec. Maximum value: 999 msec. | | | | |
| | Set the pulse time to 100 msec. if you aren't sure what value to use, and monitor how long it takes for the counterbalance pressure to change. If changes in counterbalance pressure occur too slowly, increase the pulse time. | | | | |
| | For presses of 150 tons or larger, set the pulse time to 500 msec. | | | | |
| setup mode | Enables or disables the Setup mode feature, which lowers the counterbalance pressure to the empty-die pressure during a tool change, facilitating replacement of the die. There are two settings: | | | | |
| | DISABLED (Default) | | | | |
| | • ENABLED | | | | |
| | In order to use this feature, a new tool must be loaded in SmartPAC, and the press must be in Inch mode. For instructions on using Setup mode during a tool change, refer to <i>Changing the Die with Setup Mode Enabled,</i> page 111. | | | | |

To set parameters on the Counterbalance Initialization Menu, do the following:

1. Highlight the PSI setting beneath the PRESSURE caption for the 0 LBS item, and press ENTER. A Numeric Entry window like the one shown in Figure 3-10 displays.

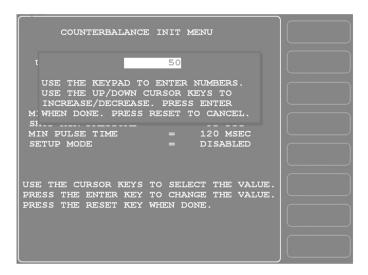


Figure 3-10. Counterbalance Initialization Menu with Numeric Entry Window Displayed

2. In the Numeric Entry window, key in the pressure setting for the weight of the ram with no die installed, as shown on your press's counterbalance chart, and press ENTER to close the window and return to the Counterbalance Initialization Menu.

WARNING

ENTERING TOO LARGE AN UPPER DIE WEIGHT FOR THE PRESS

- Enter the correct maximum upper die weight and pressure on the Counterbalance Initialization Menu.
- NEVER load a tool that exceeds the maximum upper die weight specified by the press manufacturer.

Failure to comply with these instructions could result in death or serious injury.

- 3. Select the LBS item beneath the UPPER DIE WEIGHT caption, and in the Numeric Entry window key in the weight of the heaviest die you can install on your press, as shown on the press counterbalance chart, and press ENTER.
- 4. Select the PSI item beneath the PRESSURE caption for the weight you entered in step 3, and in the Numeric Entry window key in the pressure required to counterbalance this weight, as shown on the press counterbalance chart. Press ENTER.

NOTICE

RamPAC will not allow you to run a die that exceeds the weight that can be balanced by your shop air. If your shop air pressure is not sufficient to balance the heaviest die weight shown on the counterbalance chart, enter the heaviest weight your shop air can balance. See *Example:* Limiting Upper Die Weight to Manufacturer's Recommended Maximum83.

- 5. Select the MIN CNTBAL item, and in the Numeric Entry window key in the value you entered for 0 LBS UPPER DIE WEIGHT in step 2, and press ENTER.
- 6. Select the SHOP AIR PRESSURE item, and in the Numeric Entry window key in the actual shop air pressure or 20 PSI plus the pressure required to counterbalance your heaviest die, whichever is less. Press ENTER to return to the Counterbalance Initialization Menu.

Example: Entering Value for Shop Air Pressure

Your actual shop air pressure is 88 PSI.

Pressure required to balance the heaviest die you will run = 90 PSI.

Calculated Shop Air Pressure = 20 PSI + Pressure to balance heaviest die you'll run = 20 PSI + 90 PSI = 110 PSI

The calculated shop air pressure is greater than the actual shop air pressure, so you would enter 88 PSI (the actual pressure) in the SHOP AIR PRESSURE field on the Counterbalance Initialization Menu.

NOTICE

UPPER DIE WEIGHT CANNOT EXCEED MANUFACTURER'S SPECIFIED MAXIMUM AND/OR MAXIMUM THAT CAN BE COUNTERBALANCED BY SHOP AIR PRESSURE

Once you enter the maximum upper die weight for this press, RamPAC will not let you program a heavier upper die weight for any tool you load on the press.

RamPAC also calculates the highest upper die weight that can be counterbalanced by your shop air pressure, and limits the upper die weight to that value.

Example: Limiting Upper Die Weight to Manufacturer's Recommended Maximum

The manufacturer of your press recommends a maximum upper die weight of 5,000 pounds. You enter that value in the second UPPER DIE WEIGHT field on the Counterbalance Initialization Menu.

If you attempt to enter 5,500 lb for the upper die weight in the Counterbalance and Shut Height Menu in Program mode (see *Making Initial Counterbalance and Cushion Settings*, page 102), RamPAC will edit your entry, displaying only 5,000 lbs., the maximum value.

Example: Limiting Upper Die Weight According to Shop Air Pressure

Your press manufacturer recommends a maximum upper die weight of 5,000 pounds and specifies a counterbalance pressure for that weight of 90 PSI. You enter those values in the Counterbalance Initialization Menu.

Your shop air pressure is 88 PSI, and you enter that value in the Counterbalance Initialization Menu.

The 88 PSI shop air pressure is only capable of counterbalancing an upper die weight of 4,545 lbs. RamPAC will not allow you to program a tool with an upper die weight heavier than this value.

7. Select the MIN PULSE TIME field, key in the pulse time you want in the Numeric Entry window, and press ENTER.

NOTICE

Setup mode is available only if you have a SmartPAC control with WPC integration or if you have wired your own Setup mode circuit. See *Wiring a Setup Mode Circuit*, page 58.

8. If you want to enable Setup mode, select the SETUP MODE item, and press ENTER to display the "ENABLED" setting. Otherwise, skip this step, leaving Setup Mode set to "DISABLED," the default setting.

- 9. When you are finished, press RESET to return to the RamPAC Initialization Menu.
- 10. Perform the counterbalance tests in Testing Initialization Settings, page 87.

Setting Up the Die Cushion Control

[INITIALIZATION MENU - RAMPAC INIT - F5 (CUSHION SETUP)]

NOTICE

This manual refers to the second pressure control option (the first is "counterbalance control") as "cushion control." Nevertheless, you can use this option to control another pressure up to 150 PSI.

You make cushion Initialization settings on the Cushion Initialization Menu. To access this menu, which is shown in Figure 3-11, press the F5 (Cushion Setup) function key on the RamPAC Initialization Menu with the CUSHION CONTROL item enabled.

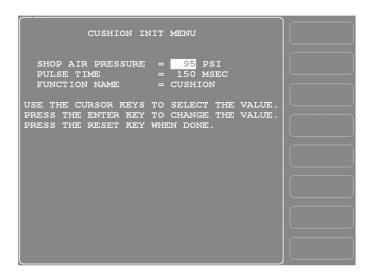


Figure 3-11. Cushion Control Initialization Menu

Descriptions of the fields displayed on the Cushion Initialization Menu are provided in Table 3-4. Instructions for entering this information follow the table.

Table 3-4. Cushion Initialization Menu Field Descriptions

| Field | Description | |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| shop air pressure | The value you set on the cushion valve package regulator (see step 8 under <i>Installing Counterbalance and Cushion Control Valves</i> , page 40). Wintriss recommends that you set this field to the larger of the following values: | |
| | The value you enter for counterbalance shop air pressure (see 83) | |
| | or | |
| | 20 PSI + Highest cushion pressure you intend to use on this press | |
| | Default setting: 200 PSI. | |
| pulse time | The length of the pulse that RamPAC transmits to activate the cushion solenoid and change the cushion air pressure. Default setting: 100 msec. Maximum value: 999 msec. | |
| | Set the pulse time to 100 msec. if you aren't sure what value to use, and monitor how long it takes for the cushion pressure to change. If changes in cushion pressure occur too slowly, increase the pulse time. | |
| | For presses of 150 tons or larger, set the pulse time to 500 msec. | |
| function name | The name of the function to which the settings on this screen apply. If you want the Cushion Control module to monitor and/or control a different pressure function, enter the name of that function in this field. Default setting: CUSHION. Maximum length: 10 characters. | |

To set parameters on the Cushion Initialization Menu, do the following:

- 1. Select the SHOP AIR PRESSURE item, and in the Numeric Entry window key in the actual shop air pressure or 20 PSI plus the highest cushion pressure you intend to use on the press, whichever is greater. Press ENTER.
- 2. Select the PULSE TIME item, key in the pulse time setting you want in the Numeric Entry window, and press ENTER.
- 3. Select the FUNCTION NAME field. An Alphabetic Entry window like the one shown in Figure 3-12 displays.
- 4. Key in the name of the alternative pressure function (10 characters maximum), following the directions displayed in the window.
- 5. Press F6 to save your entry and return to the Cushion Initialization Menu.
- 6. When you are finished, press RESET to return to the RamPAC Initialization Menu.
- 7. Perform the cushion tests in *Testing Initialization Settings*, page 87.

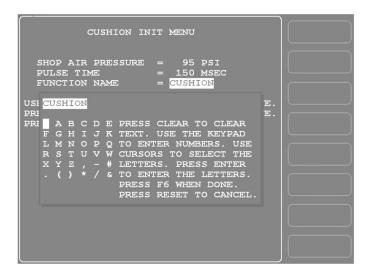


Figure 3-12. Cushion Control Initialization Menu with Alphabetic Entry Window Displayed

Setting Switches on Switch Block S1

Switch block S1 on the RamPAC Control board (see Figure 2-14, page 46 for location) provides settings for RamPAC's shut height adjustment startup timer and RamPAC's backup feature, which allows current settings to be backed up to the RamPAC firmware chip each time RamPAC is powered up. All switches are set at the factory to the OFF (unlabeled) position as shown in Figure 3-13. To set a switch to the ON position, move it to the left, using a small screwdriver or your fingernail.

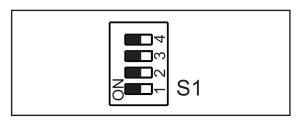


Figure 3-13. Switch Block S1 (Default Settings Shown)

Setting Startup Time (Switches 1 and 2)

8. Switches 1 and 2 control RamPAC's startup timer feature, which specifies the length of time within which the ram must move during shut height adjustment. When the time limit expires, a fault message displays (see page 118). The startup timer is set to 1 second at the factory. This and other switch 1 and 2 settings are shown in Table 3-5.

Switch 1 and 2 Settings **Startup Time** Switch 1 = OFF (Factory setting) 1 second Switch 2 = OFF Switch 1 = ON2 seconds Switch 2 = OFF Switch 1 = OFF 4 seconds Switch 2 = ONSwitch 1 = ON8 seconds Switch 2 = ON

Table 3-5. RamPAC Startup Time Settings: Switches 1 and 2 on Switch Block S1

Enabling Backup of Settings (Switch 3)

Switch 3 enables or disables RamPAC's settings backup feature, which allows RamPAC settings, stored in the microprocessor, to be backed up to the firmware chip (U11 on the RamPAC Control board) each time RamPAC is powered up. This feature ensures that a copy of the most recent RamPAC settings is available if the Control board should fail. Switch 3 is set at the factory to OFF, which enables the backup feature (see Table 3-6). The ON setting disables the feature. Refer to Exchanging RamPAC Control Boards, page 63, for examples of how these settings are used.

| | , , |
|------------------|--------------------------------------------|
| Switch 3 Setting | Function |
| OFF | Enables backup of PamPAC settings on power |

Table 3-6. RamPAC Backup Settings: Switch 3 on Switch Block S1

| Switch 3 Setting | Function | | |
|--------------------------|----------------------------------------------------|--|--|
| OFF (Factory setting) | Enables backup of RamPAC settings on power- up | | |
| ON | Disables backup of RamPAC settings on power- up | | |

Testing Initialization Settings

The following sections show you how to test your Initialization settings in Program and Run modes, using a programmed "test" tool.

Creating a "Test" Tool



WARNING

COUNTERBALANCE FAILURE

- Warn all personnel to stand clear when you load a tool.
- Perform this operation with care. Presses not normally run with high counterbalance air pressure may experience catastrophic failure.

Failure to comply with these instructions could result in death or serious injury.

CAUTION

DIE DAMAGE DURING TESTING

DO NOT load a physical die while you are setting up and testing RamPAC. Only load the tool settings in your SmartPAC.

Failure to comply with these instructions could result in property damage.

NOTICE

RECORD PRESS AND TOOL SETTINGS ON SETUP SHEETS AT BACK OF MANUAL

Setup sheets are provided at the end of the manual so you can record press and tool settings. You will need this information when you upgrade RamPAC firmware (see *Installing New RamPAC Firmware*, page 66).

To create a "test" tool to use in performing Initialization tests, do the following.

- 1. With SmartPAC powered up, turn the Program/Run key on the SmartPAC front panel to PROG. The Main Program Menu displays.
- 2. Select "GO TO THE TOOL MANAGER" to display the Tool Manager screen (see Figure 3-14).

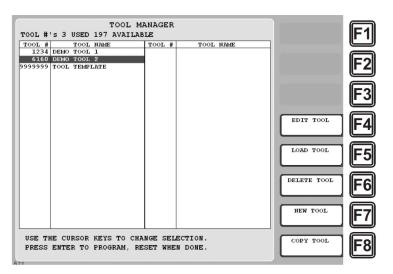


Figure 3-14. Tool Manager Screen

3. Highlight the tool you wish to program, and press F4 (Edit Tool). The Tool Program Menu displays (see Figure 3-15).

NOTICE

If you wish to create a new tool to test RamPAC Initialization settings, follow the instructions in *Creating a New Tool* in Chapter 5 of the SmartPAC user manual.

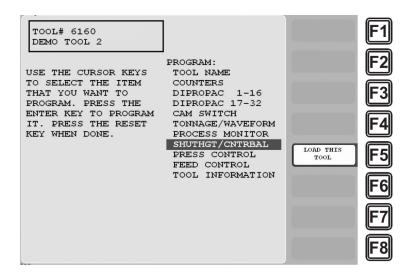


Figure 3-15. Tool Program Menu with SHUTHGT/CNTRBAL Selected

4. Select "SHUTHGT/CNTRBAL." The Counterbalance and Shut Height Program Menu (see Figure 3-16) displays.

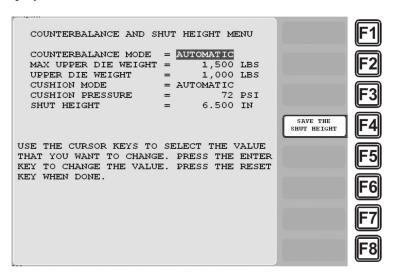


Figure 3-16. Counterbalance and Shut Height Programming Menu

- 5. Program the "test" tool as follows:
 - Set the COUNTERBALANCE MODE field to "MANUAL."
 - Set the UPPER DIE WEIGHT field to half the maximum upper die weight specified by the press manufacturer.
 - Set the SHUT HEIGHT field to a value half way between the upper and lower limits specified in Initialization (see *Setting Up the Shut Height Control*, page 74). For example, if your press's shut height can be adjusted from 12 to 20 in., make the setpoint for this tool 16 in
- 6. Press RESET to return to the Tool Program Menu.
- 7. With the "test" tool still selected, press the F5 (Load This Tool) function key. A warning window like the one shown in Figure 3-17 displays.

> WARNING!! WARNING!! ANCILLARY EQUIPMENT MAY OPERATE WHEN THIS TOOL IS LOADED. WARN ALL PERSONNEL TO STAND CLEAR PRESS ENTER TO LOAD THIS TOOL.
> PRESS RESET TO CANCEL.

Figure 3-17. Load This Tool Warning Window

8. Press ENTER to confirm that you want to load the tool. A second window displays momentarily, indicating that the tool you selected is being loaded, and then both windows close.

NOTICE

When you press ENTER to load the tool, you may hear air dumping from or filling the counterbalance and/or cushion valve. This is a normal occurrence when the pressure setting for the new tool is different from the setting for the previous tool.

9. When the "test" tool has been loaded, turn the stroke selector key switch to Inch mode, turn the Program/Run key to RUN, and inch the press to 0° (TDC).

Testing Shut Height Settings

[RUN - SHUTHGT/CNTRBAL]



WARNING

COUNTERBALANCE OR CUSHION FAILURE

- Warn all personnel to stand clear when you load a tool.
- Perform this operation with care. Presses not normally run with high counterbalance or cushion air pressure may experience catastrophic failure.

Failure to comply with these instructions could result in death or serious injury.

NOTICE

DIE DAMAGE DURING TESTING

DO NOT load a physical die while you are setting up and testing RamPAC. Only load the tool settings in your SmartPAC.

Failure to comply with these instructions could result in property damage.

You test shut height Initialization settings on the Shut Height/Counterbalance/Cushion screen in Run mode. To access this screen, do the following:

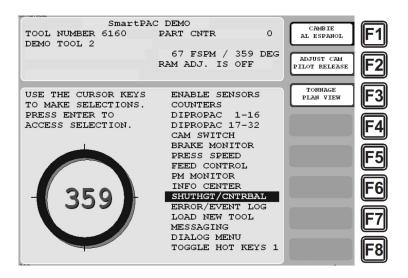


Figure 3-18. SmartPAC Main Run Menu

With the "test" tool loaded, the Program/Run key turned to RUN, and the SmartPAC Main Run Menu (see Figure 3-18, above) displayed, select SHUTHGT/CNTRBAL. The Shut Height/Counterbalance/Cushion Run screen (see Figure 3-19) displays.

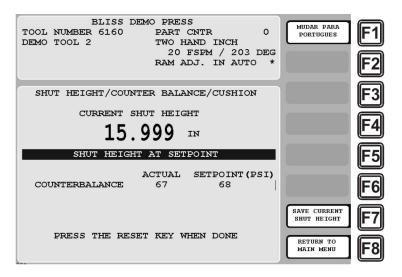


Figure 3-19. Shut Height/Counterbalance/Cushion Run Screen

Checking Shut Height Adjustment

To check shut height adjustment, do the following:

- 1. Turn the Ram Mode control to AUTO.
- 2. Turn the Ram Adjust control to the DOWN/AUTO position momentarily.

The ram should move upward until it is above the setpoint, then reverse direction and move downward to the setpoint. When the ram stops, the screen should display the message "SHUT HEIGHT IS AT SETPOINT" beneath the Current Shut Height value.

If the ram behaves as described and the "SHUT HEIGHT IS AT SETPOINT" message displays, go to the next section. Otherwise, proceed as follows, referring to *Setting Up the Shut Height Control*, page 74, for instructions in how to change Initialization settings:

- If the ram stops below the setpoint, the Stop Advance setting is too low. Increase the Stop Advance value by the difference between the displayed Current Shut Height value and the setpoint.
- If the ram stops above the setpoint, the Stop Advance setting is too high. Decrease the Stop Advance value by the difference between the displayed Current Shut Height value and the setpoint.
- If the ram "hunts" for the setpoint, repeatedly overshooting it in both directions, either the Upper and Lower Tolerance values are too tight or the Stop Advance setting is too low. Check the tolerance settings, and if one or both values are set to zero (0.000 in.), increase the setting(s) by 0.001 or 0.002 in. If the tolerances are loose enough, increase the Stop Advance value.
- If you still cannot get RamPAC to adjust the shut height correctly, call Wintriss Tech. Support.

Checking the Upper Shut Height Limit

CAUTION

RAM EXCEEDS UPPER LIMIT

Watch to make sure that the ram stops at its upper limit. Be ready to hit the Ram Interrupt button immediately if it doesn't.

Failure to comply with these instructions could result in property damage.

To check the upper shut height limit, do the following:

With the Ram Mode control set to AUTO, turn the Ram Adjust control to the UP position momentarily. The ram should move to its upper limit and then stop. If the ram does not stop at its upper limit, press the Ram Interrupt button immediately.

- If the ram stops at its upper limit, proceed to the next section.
- If the ram does not stop, check the wiring of the ram adjust motors (see *Wiring Ram Adjust Motors*, page 48) and of the ram adjust operator controls (see *Wiring Operator Controls*, page 48). Then check to make sure you have the correct upper limit entered on the Shut Height Initialization Menu (see Highlight the U).

Checking the Lower Shut Height Limit

CAUTION

RAM EXCEEDS LOWER LIMIT

Watch to make sure that the ram stops at its lower limit. Be ready to release the Ram Adjust control immediately if it doesn't.

Failure to comply with these instructions could result in property damage.

To check the upper shut height limit, do the following:

With the Ram Mode control set to MANUAL, turn the Ram Adjust control to the DOWN/AUTO position and hold it there until the ram stops. If the ram is already at its lower limit, it will move up and then down. If the ram does not stop at its lower limit, release the Ram Adjust control immediately.

- If the ram stops at its lower limit, proceed to the next section.
- If the ram does not stop, check the wiring of the ram adjust motors (see *Wiring Ram Adjust Motors*, page 48) and of the ram adjust operator controls (see *Wiring Operator Controls*, page 48). Then check to make sure you have the correct lower limit entered on the Shut Height Initialization Menu (see Select the L).

Testing Counterbalance and Cushion Settings

CAUTION

INCORRECT INSTALLATION

- Check all wiring connections before proceeding.
- Complete this counterbalance and cushion test before operating your press with RamPAC.

Failure to comply with these instructions could result in property damage.

To test counterbalance and cushion Initialization settings, do the following:

1. With the "test" tool loaded, the Program/Run key turned to PROG, and the Tool Program Menu (see Figure 3-15, page 89) displayed, select SHUTHGT/CNTRBAL. The Counterbalance and Shut Height Program Menu (see Figure 3-20) displays.

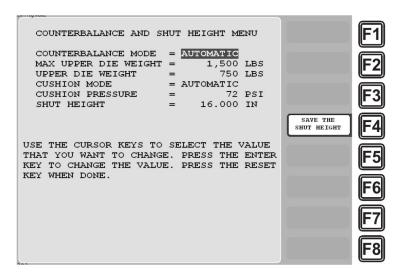


Figure 3-20. Counterbalance and Shut Height Program Menu with Test Settings Displayed

The UPPER DIE WEIGHT and SHUT HEIGHT items should display the values you programmed in *Creating a "Test" Tool*, page 87, step 5. The COUNTERBALANCE MODE item should have defaulted from "MANUAL," which you also programmed earlier, to "AUTOMATIC."

NOTICE

To test or if you need to run the COUNTERBALANCE (or CUSHION) in MANUAL mode, load the tool first. Then go to the PROG and go to the screen shown in Figure 3-20. Change one or both to MANUAL. When done, do NOT load the tool. Go to RUN and to a screen shown in Figure 3-19. You will notice one or both them are in MANUAL.

Remember that any time you load a tool number, both settings revert to AUTOMATIC.

- 2. Make sure that the COUNTERBALANCE MODE item is set to "AUTOMATIC." If it isn't, press ENTER to toggle the setting from "MANUAL" to "AUTOMATIC."
- 3. Change the UPPER DIE WEIGHT setting to the weight of the heaviest die you intend to use on this press by selecting the UPPER DIE WEIGHT item, keying in the desired weight in the Numeric Entry window, and pressing ENTER.
- 4. Select CUSHION PRESSURE, key in the highest cushion pressure you intend to use in the Numeric Entry window, and press ENTER.

A WARNING

COUNTERBALANCE OR CUSHION FAILURE

- Warn all personnel to stand clear when you load a tool.
- Perform this operation with care. Presses not normally run with high counterbalance or cushion air pressure may experience catastrophic failure.

Failure to comply with these instructions could result in death or serious injury.

NOTICE

DIE DAMAGE DURING TESTING

DO NOT load a physical die while you are setting up and testing RamPAC. Only load the tool settings in your SmartPAC.

Failure to comply with these instructions could result in property damage.

NOTICE

When you press ENTER to load the tool, you may hear air dumping from or filling the counterbalance and/or cushion valve. This is a normal occurrence when the pressure setting for the new tool is different from the setting for the previous tool.

- 5. Press RESET twice to return to the Tool Program Menu.
- 6. Press the F5 (Load This Tool) function key. When the Load This Tool warning window (see Figure 3-17, page 90, displays, press ENTER to confirm that you want to load the tool. A second window displays momentarily, indicating that the tool you selected is being loaded, and then both windows close.
- 7. Turn the Program/Run key to RUN.
- 8. On the Main Run Menu (see Figure 3-18, page 91), select SHUTHGT/CNTRBAL.
- 9. On the Shut Height/Counterbalance/Cushion Run screen (see Figure 3-19, page 91), verify that the counterbalance pressure setpoint displayed is reasonably close (within 2 or 3 PSI) to the pressure shown on the press's counterbalance chart for the upper die weight you entered in step 3.

10. Verify that the "actual" counterbalance and cushion pressures are increasing and getting closer to their setpoints. If one or both pressures are not approaching their setpoints, check the Counterbalance Fill (DS18) and/or Cushion Fill (DS20) LEDs on the RamPAC Control board (see Figure 5-1, page 114, for locations) to see whether they are turning on and off. If they aren't, contact Wintriss Tech. Support.

- 11. If the Counterbalance Fill and/or Cushion Fill LEDs are turning on and off, indicating that the fill relays are working, check the cable connected to the fill valve on the counterbalance and/or cushion valve package. There is a small LED on the back of the connector that turns on when the valve is engaged. If this LED does not turn on, check the wiring between the counterbalance and/or cushion valve and RamPAC.
- 12. Press RESET to return to the Main Run Menu, and turn the Program/Run key to PROG.
- 13. On the Main Program Menu, select GO TO THE TOOL MANAGER, and when the Tool Manager screen displays, press the F4 (Edit Tool) function key.
- 14. On the Tool Program Menu, select SHUTHGT/CNTRBAL.
- 15. When the Counterbalance and Shut Height Program Menu displays, change the UPPER DIE WEIGHT setting to 0 PSI and the CUSHION PRESSURE setting to the lowest cushion pressure you intend to use.
- 16. Press RESET to return to the Tool Program Menu, press the F5 (Load This Tool) function key, and press ENTER when the Load This Tool warning window displays to confirm that you want to load the tool.
- 17. Turn the Program/Run key to RUN, and select SHUTHGT/CNTRBAL.
- 18. On the Shut Height/Counterbalance/Cushion screen, verify that the "actual" counterbalance and cushion pressures are decreasing. If one or both pressures are not decreasing, check the Counterbalance Dump (DS17) and/or Cushion Dump (DS19) LEDs on the RamPAC Control board (see Figure 5-1, page 114, for locations) to see whether they are turning on and off. If they aren't, contact Wintriss Tech. Support.
- 19. If the Counterbalance Dump and/or Cushion Dump LEDs are turning on and off, indicating that the dump relays are working, check the cable connected to the dump valve on the counterbalance and/or cushion valve package. There is a small LED on the back of the connector that turns on when the valve is engaged. If this LED does not turn on, check the wiring between the counterbalance and/or cushion valve and RamPAC.
- 20. Making sure that there is no tooling or material in the press, run the press in Continuous mode for at least two minutes. If the press runs properly, RamPAC is now ready for use.

Chapter 4 – RamPAC Operation

This chapter shows you how to make and modify RamPAC settings for individual tools in SmartPAC Program mode and save the current shut height setting in Run mode. The chapter is organized in the following sections:

| Adjusting Shut Height with Operator Controls | 98 |
|-----------------------------------------------------------|-----|
| Ram Mode Control | 98 |
| Ram Adjust Control | 98 |
| Ram Interrupt Control | 98 |
| Accessing the Counterbalance and Shut Height Program Menu | |
| Making Initial Settings for a Tool | 102 |
| Making Initial Counterbalance and Cushion Settings | 102 |
| Making an Initial Shut Height Setting | 103 |
| Loading a Tool with RamPAC Settings Already Made | |
| Modifying RamPAC Settings | 106 |
| Changing the Shut Height Setpoint | 106 |
| Loading a Heavier Upper Die | 107 |
| Adjusting Stop Advance | 107 |
| Determining the Correct Stop Advance Setting | 107 |
| Setting and Testing the Adjusted Stop Advance Value | 110 |
| Changing the Die with Setup Mode Enabled | 111 |

NOTICE

VERSIONS OF SMARTPAC

This manual covers use with three versions of SmartPAC:

- Original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO.

"SmartPAC" refers to all three versions, unless otherwise indicated.

NOTICE

REFER TO SMARTPAC USER MANUAL

Instructions for creating, copying, deleting, and loading tools are provided in Chapter 5 of the SmartPAC user manual. For help in using the keyboard, refer to Chapter 3 of the manual.

NOTICE

USING SMARTPAC HELP

If you need help with a Program mode screen, press the HELP key when that screen is displayed.

NOTICE

All screens used as examples in this chapter and throughout the manual are SmartPAC 2 screens. Screens on the SmartPAC PRO and original SmartPAC are similar.

Adjusting Shut Height with Operator Controls

Shut height is adjusted with the Ram Mode, Ram Adjust, and Ram Interrupt operator controls provided with your RamPAC (see Figure 2-7, page 39 for an illustration of the optional Operator Control enclosure). The following sections show you how to use these controls.

Ram Mode Control

The Ram Mode control, a three-position switch, provides the following settings:

- OFF–Disables the ram adjustment motor.
- MANUAL—Allows you to adjust shut height by turning the Ram Adjust control (see next section
 and Table 4-1, page 99) to UP or DOWN/AUTO. When Ram Mode is set to this position, the
 press will not run.
- AUTO–Enables RamPAC to automatically adjust the shut height to the setpoint when you load a tool or turn the Ram Adjust control momentarily to DOWN/AUTO.

Ram Adjust Control

The Ram Adjust control, a momentary switch that returns to its center position, OFF, from either DOWN/AUTO (left) or UP (right), controls movement of the ram. The DOWN/AUTO position causes the ram to move downward or to the setpoint, depending on the Ram Mode setting (see previous section); the UP position causes the ram to move upward. Table 4-1 summarizes the shut height adjustments accomplished with different combinations of Ram Mode and Ram Adjust settings.

Ram Interrupt Control

The Ram Interrupt control is a button that, when pushed, immediately stops adjustment of the ram.

Table 4-1. Shut Height Control with Ram Mode and Ram Adjust Switch Settings

| Ram Adjust | Ram Mode Switch Position | | | | | |
|--------------------|--------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Switch Position | OFF | MANUAL | AUTO | | | |
| OFF | Ram does not move. Press runs. | Ram does not move. Press does not run. | Ram does not move. Press runs if shut height is at setpoint*. | | | |
| DOWN/AUTO | Ram does not move. | Hold Ram Adjust switch in DOWN/AUTO position; ram moves down | Turn Ram Adjust switch momentarily to the DOWN/AUTO position; ram moves to the setpoint: | | | |
| | | until it reaches lower limit or | If ram starts from above the setpoint, it moves down to the setpoint. | | | |
| | | until you release Ram Adjust switch. | If ram starts from below the setpoint, it moves up above the setpoint and then moves down to the setpoint. | | | |
| | Press runs. | Press does not run. | Press runs only when the shut height is at setpoint*. | | | |
| UP | Ram does not move. | Hold Ram Adjust switch in UP position; Ram moves up | Turn Ram Adjust switch momentarily to the UP position; ram | | | |
| | | until it reaches upper limit | moves up and stops at upper limit. | | | |
| | | or | | | | |
| | | until you release Ram Adjust switch. | | | | |
| | Press runs. | Press does not run. | Press runs only when the shut height is at setpoint*. | | | |

^{*} Within the tolerances set in Initialization (see page 79).

Accessing the Counterbalance and Shut Height Program Menu

The Counterbalance and Shut Height Program Menu is the screen on which you make Program settings for shut height, counterbalance, and cushion control. To access this screen, do the following:

NOTICE

When switching between operating modes with the Program/Run key switch, make sure that SmartPAC is displaying the top-level menu in the current mode (i.e., Main Program Menu or Main Run Menu). To return to the top-level menu, press RESET or EXIT until that menu is displayed.

1. Make sure that the Program/Run key switch is turned to the "PROG" position and the Main Program Menu (see Figure 4-1) is displayed.

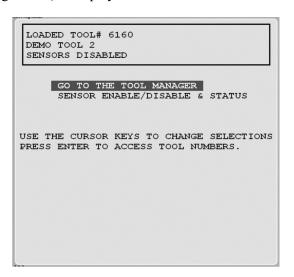


Figure 4-1. Main Program Menu

2. Select "GO TO THE TOOL MANAGER" to display the Tool Manager screen (see Figure 4-2).

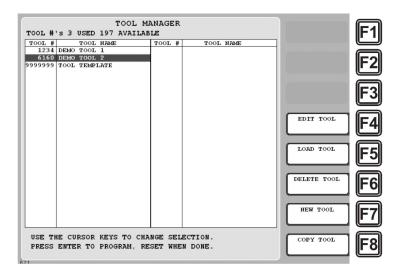


Figure 4-2. Tool Manager Screen

3. Highlight the tool you wish to Program, and press F4 (Edit Tool). The Tool Program Menu displays (see Figure 4-3).

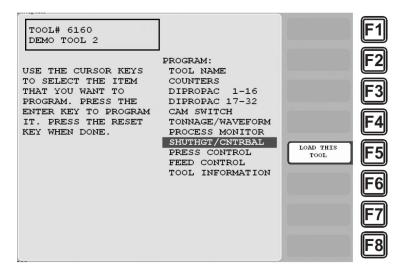


Figure 4-3. Tool Program Menu

4. Select "SHUTHGT/CNTRBAL." The Counterbalance and Shut Height Program Menu (see Figure 4-4) displays.

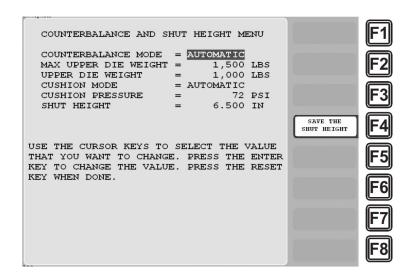


Figure 4-4. Counterbalance and Shut Height Program Menu

Making Initial Settings for a Tool

NOTICE

RECORD PRESS AND TOOL SETTINGS ON SETUP SHEETS AT BACK OF MANUAL

Setup sheets are provided at the end of the manual so you can record press and tool settings. You will need this information when you upgrade RamPAC firmware (see *Installing New RamPAC Firmware*, page 66).

Perform the steps in the following sections to program each tool the first time you load it after RamPAC installation. To change tool program settings, refer to *Modifying RamPAC Settings*, page 106.

Making Initial Counterbalance and Cushion Settings

[PROGRAM – GO TO THE TOOL MANAGER – SELECT TOOL – F4-EDIT TOOL – SHUTHGT/CNTRBAL]

NOTICE

This manual refers to the second pressure control option (the first is "counterbalance control") as "cushion control." Nevertheless, you can use this option to control another pressure up to 150 PSI.

1. On the Counterbalance and Shut Height Program Menu (see Figure 4-4, page 102), make sure that the COUNTERBALANCE MODE item is set to "AUTOMATIC." If it is set to "MANUAL," highlight "MANUAL" and press ENTER to toggle the setting to "AUTOMATIC."

NOTICE

Counterbalance and cushion modes default to AUTOMATIC every time you load a tool.

- In AUTOMATIC, RamPAC automatically sets the air pressure to the value you set for the tool.
- In MANUAL, RamPAC does not control the air pressure. You control the air pressure manually with the regulator on the valve package (see Figure 2-8, page 41).
- 2. Enter the upper die weight of this tool by selecting the UPPER DIE WEIGHT item, keying in the correct weight in the Numeric Entry window, and pressing ENTER. The upper die weight should be stamped on the upper die per OSHA 1910.217 regulations.
- 3. Make the following settings if this tool uses Cushion (or other pressure) control.
 - If this tool uses Cushion air, make sure that the CUSHION MODE item is set to "AUTOMATIC." If it is set to "MANUAL," highlight "MANUAL" and press ENTER to toggle the setting to "AUTOMATIC."
 - If Cushion Control is enabled (see *Enabling RamPAC Features*, page 73) but this tool does not use Cushion air, make sure that CUSHION MODE is set to "MANUAL," and set the manual regulator on the valve package (see Figure 2-8, page 41) to zero (0). Toggle the CUSHION MODE setting to "MANUAL" if necessary.

NOTICE

If you need to run the COUNTERBALANCE (or CUSHION) in MANUAL mode, load the tool first. Then go to the PROG and go to the screen shown in Figure 4-4, page 102. Change one or both to MANUAL. When done, do NOT load the tool. Go to RUN and to a screen shown in Figure 3-19, page 91. You will notice one or both them are in MANUAL. Remember that any time you load a tool number, both settings revert to AUTOMATIC.

4. Press RESET to return to the Main Program menu.

Making an Initial Shut Height Setting

[PROGRAM - GO TO THE TOOL MANAGER - SELECT TOOL - F4-EDIT TOOL -SHUTHGT/CNTRBAL]



WARNING

COUNTERBALANCE OR CUSHION FAILURE

- Warn all personnel to stand clear when you load a tool.
- Perform this operation with care. Presses not normally run with high counterbalance or cushion air pressure may experience catastrophic failure.

Failure to comply with these instructions could result in death or serious injury.

CAUTION

DIE DAMAGE DURING TESTING

DO NOT load a physical die while you are setting up RamPAC. Only load the tool settings in your SmartPAC.

Failure to comply with these instructions could result in property damage.

NOTICE

When you press ENTER to load the tool, you may hear air dumping from or filling the counterbalance and/or cushion valve. This is a normal occurrence when the pressure setting for the new tool is different from the setting for the previous tool.

NOTICE

If the ram will not move when you try to adjust shut height, check to see whether Ball Socket mode is enabled (see page 75) and proceed as follows, depending on the type of press you have:

- If your press is a ball-socket type, make sure that Ball Socket is enabled and that the crank angle is within 10° of TDC or BDC.
- If your press is a wrist-pin type, you can disable Ball Socket mode, or if you want Ball Socket enabled, make sure that the crank angle is within 10° of TDC or BDC.
- 1. On the Tool Program Menu for the tool you want to program, press the F5 (Load This Tool) function key, then press ENTER when the Load Tool warning window displays to initiate loading of the tool.
- 2. Turn the Program/Run key switch to RUN.
- 3. Turn the Ram Mode control to MANUAL.
- 4. Using the Ram Adjust control, adjust the shut height to the desired position.
- 5. Set up the tool the way you normally would.
- 6. Select SHUTHGT/CNTRBAL from the RUN menu. The Shut Height/Counterbalance/Cushion screen (see Figure 4-5) displays.

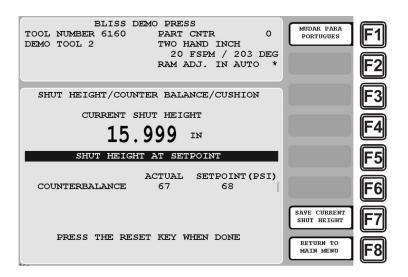


Figure 4-5. Shut Height/Counterbalance/Cushion Run Screen

7. After verifying the setup, press F7 (Save Current Shut Height). The window shown in Figure 4-6 displays, asking you to confirm that you want to replace the current shut height with the new shut height setpoint.

```
PRESS ENTER KEY TO REPLACE THE CURRENT SHUT HEIGHT WITH THE NEW SHUT HEIGHT SETPOINT. PRESS RESET TO CANCEL.
```

Figure 4-6. Save Shut Height Confirmation Window

- 8. Press ENTER to save the new shut height setpoint.
- 9. Press RESET to return to the Main Run Menu.
- 10. Turn the Ram Mode control to AUTO.
- 11. Run the job.

Loading a Tool with RamPAC Settings Already Made

[PROGRAM - GO TO THE TOOL MANAGER - SELECT TOOL - SHUTHGT/CNTRBAL]

When loading a tool with RamPAC settings already programmed, do the following:

1. On the Tool Program Menu for the programmed tool, press the F5 (Load This Tool) function key, then press ENTER when the Load Tool warning window displays to initiate loading of the tool.

NOTICE

When you press ENTER to confirm that you want to load the tool, you may hear air dumping from or filling the counterbalance and/or cushion valve. This is a normal occurrence when the pressure setting for the new tool is different from the pressure setting for the previous tool.

- 2. Turn the Program/Run key switch to RUN.
- 3. Make sure that the press is at 0° (TDC).

4. Select SHUTHGT/CNTRBAL on the Main Run Menu. The Shut Height/Counterbalance/Cushion screen displays.

- 5. Make sure the RAM MODE operator control is turned to AUTO.
- 6. Turn the RAM ADJUST control to DOWN/AUTO momentarily. The ram will begin to move.
 - If the current shut height is below the setpoint, the ram will move above the setpoint and then lower down to it.
 - If the current shut height is above the setpoint, the ram will simply move down to it.
- 7. Once the ram stops moving, the Shut Height/Counterbalance/Cushion screen should display the message SHUT HEIGHT IS AT SETPOINT beneath the Current Shut Height value. If this message does not display, turn the RAM MODE switch to MANUAL and adjust the shut height to the setpoint.
- 8. Run the job.

Modifying RamPAC Settings

[PROGRAM - GO TO THE TOOL MANAGER - SELECT TOOL - SHUTHGT/CNTRBAL]

The following sections show you how to change the shut height setpoint, increase the upper die weight when you install a heavier upper die, and calculate the press's Stopping Distance so you can adjust the Stop Advance setting. To change counterbalance or cushion settings, refer to *Making Initial Counterbalance and Cushion Settings*, page 102.

Changing the Shut Height Setpoint

To change the shut height setpoint for a tool (for example, when a die is sharpened), you have two options. You can follow the procedure described in *Making an Initial Shut Height Setting*, page 103, or, if you know approximately what the new shut height measurement will be, you can do the following:

- 1. On the Counterbalance and Shut Height Menu in Program mode (see Figure 4-4, page 102), select the SHUT HEIGHT item, and when the Numeric Entry window displays, key in the new shut height value, and press ENTER.
- 2. Press the F4 (Save the Shut Height) function key. A window like the one shown in Figure 4-6, page 105, displays, asking you to confirm that you want to replace the current shut height setpoint with the new value you have entered
- 3. Press ENTER to save the new shut height setpoint.
- 4. Press RESET repeatedly to return to the Main Program Menu.
- 5. Turn the Program/Run key switch to RUN to access the Main Run Menu.
- 6. Select the SHUTHGT/CNTRBAL item to display the Shut Height/Counterbalance/Cushion screen.
- 7. Turn the Ram Mode operator control to AUTO.
- 8. Turn the Ram Adjust control to DOWN/AUTO for a moment, then release it. The ram will move to the setpoint you entered in steps 1 through 3.

9. Adjust the shut height, if necessary, then press F7 (Save Current Shut Height) to save the new setpoint.

Loading a Heavier Upper Die



AIR PRESSURE INSUFFICIENT TO COUNTERBALANCE DIE

DO NOT run a die on this press if the full pressure of your shop air is not enough to counterbalance the weight of that upper die. If you run too heavy an upper die on the press, the counterbalance cannot support the die and the stop time for the press will increase. This will affect the safety distance of your point-of-operation guarding devices, such as two-hand control(s) and light curtains.

Failure to comply with these instructions could result in death or serious injury.

WARNING

UPPER DIE WEIGHT EXCEEDS PRESS CAPACITY

DO NOT install a die on this press that exceeds the manufacturer's specified maximum upper die weight.

Failure to comply with these instructions could result in death or serious injury.

To load a heavier upper die (i.e., one that is lighter than the manufacturer's specified maximum upper die weight), follow these steps:

- 1. On the Counterbalance and Shut Height Menu in Program mode (see *Making Initial Counterbalance and Cushion Settings*, page 102), enter the new upper die weight in the UPPER DIE WEIGHT field.
 - If the counterbalance pressure for this upper die weight is higher than the Shop Air Pressure setting on the Counterbalance Initialization Menu (see *Setting Up the Counterbalance Control*, page 79), your Upper Die Weight entry will be changed to the weight that can be counterbalanced by the Shop Air Pressure setting.
- 2. Increase the setting for the SHOP AIR PRESSURE item on the Counterbalance Initialization Menu to 20 PSI greater than the counterbalance pressure for the new, heavier upper die up to the full pressure of your shop air.
- 3. Set the manual counterbalance regulator on the valve package for this higher value.
- 4. Repeat step 1, trying again to enter the new, heavier upper die weight.

Adjusting Stop Advance

If you are using automatic shut height adjustment, you should make sure that the Stop Advance setting is correct for your press and make adjustments if necessary. The factory setting for Stop Advance is 0.000 in. Stop Advance is set on the Shut Height Initialization Menu (see *Setting Up the Shut Height Control*, page 74).

Determining the Correct Stop Advance Setting

To determine the correct Stop Advance, or Stopping Distance, setting for your press, run the following test on a number of tools with varying shut heights, recording the results on a form like the one shown in Table 4-2.

| Tool # | Shut Height Setpoint | Current Shut Height: Test 1 | Stopping Distance: Test 1 | Current Shut Height: Test 2 | Stopping Distance: Test 2 | Current Shut Height: Test 3 | Stopping Distance: Test 3 |
|-----------|----------------------------|--------------------------------------|---------------------------------|--------------------------------------|---------------------------------|--------------------------------------|---------------------------------|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Table 4-2. Stopping Distance Test Results Form

- 1. On the Shut Height Initialization Menu (see Table 3-6), set the STOP ADVANCE item to 0.000.
- 2. Press RESET repeatedly to return to the Main Program Menu, then select GO TO THE TOOL MANAGER.
- 3. On the Tool Manager screen, highlight a programmed tool, and press the F4 (Edit Tool) function key. Record the tool number in the Tool # column of your Stopping Distance test results form.
- 4. On the Tool Program Menu, select SHUTHGT/CNTRBAL.
- 5. Record in the Shut Height Setpoint column of your results from the value displayed in the SHUT HEIGHT field on the Shut Height and Counterbalance Menu. Press RESET.

A WARNING

COUNTERBALANCE OR CUSHION FAILURE

- Warn all personnel to stand clear when you load a tool.
- Load the tool with care. Presses not normally run with high counterbalance or cushion air pressure may experience catastrophic failure.

Failure to comply with these instructions could result in death or serious injury.

CAUTION

DIE DAMAGE DURING TESTING

DO NOT load a physical die while you are setting up RamPAC. Only load the tool settings in your SmartPAC.

Failure to comply with these instructions could result in property damage.

NOTICE

When you press ENTER to initiate loading of the tool, you may hear air dumping from or filling the counterbalance and/or cushion valve. This is a normal occurrence when the pressure setting for the new tool is different from the pressure setting for the previous tool.

6. On the Tool Program Menu, press F5 (Load This Tool), and when the Load Tool warning window displays, press ENTER to initiate loading of the tool.

- 7. When the tool has been loaded, press RESET repeatedly to return to the Main Program Menu, then turn the Program/Run key to RUN.
- 8. On the Main Run Menu, select SHUTHGT/CNTRBAL to display the Shut Height/Counterbalance/Cushion screen.
- 9. With the Ram Mode control set to AUTO, turn the Ram Adjust control momentarily to the DOWN/AUTO position to adjust the ram to the shut height setting for the tool. When the ram stops moving, record in the Current Shut Height: Test 1 column of your results from the value shown below the CURRENT SHUT HEIGHT caption on the Shut Height/Counterbalance/Cushion screen.
- 10. Subtract the value you recorded in step 9 from the shut height setpoint you recorded in step 5 and record the difference in the Stopping Distance: Test 1 column of your results form. This is the Stopping Distance for your first test.

Example: Recording Stopping Distance Test Data

If the shut height setpoint is 12.425 in. and the ram stops at 12.417 in., the stopping distance is 12.425 - 12.417 = 0.008 in.

11. Turn the Ram Mode control to the MANUAL position and move the ram away from the shut height setpoint, then perform steps 9 and 10 again, recording your results in the appropriate columns for Test 2. Repeat this step for Test 3.

NOTICE

If the ram "hunts" for the setpoint, repeatedly overshooting it in both directions, enter a small value for Stop Advance, 0.005 in., for example, run the test again and note how far the ram overshoots the shut height. Add this distance to the value you entered and test again. Repeat this procedure until the ram stops at the shut height setting. Then run the test at different shut heights, as described in step 12.

12. Repeat steps 2 through 11 on a number of different tools with varying shut heights, both low and high, recording the results on the form. Table 4-3 provides an example of how your table might look when test results have been recorded for three tools.

| Tool # | Shut Height Setpoint | Current Shut Height: Test 1 | Stopping Distance | Current Shut Height: Test 2 | Stopping Distance | Current Shut Height: Test 3 | Stopping Distance |
|-----------|----------------------------|--------------------------------------|----------------------|--------------------------------------|----------------------|--------------------------------------|----------------------|
| 1 | 12.425 | 12.417 | 0.008 | 12.418 | 0.007 | 12.418 | 0.007 |
| 25 | 18.625 | 18.607 | 0.018 | 18.609 | 0.016 | 18.608 | 0.017 |
| 313 | 16.000 | 15.989 | 0.011 | 15.990 | 0.010 | 15.991 | 0.009 |
| | | | | | | | |
| | | | | | | | |

Table 4-3. Stopping Distance Test Results Form Showing Results for Three Tools

- 13. Determine the Stopping Distance to use as the Stop Advance setting for your press as follows:
 - If the stopping distances recorded on your form are all the same, use that value as the Stop Advance setting.
 - If the stopping distances recorded on your form vary, use the largest value as the Stop Advance setting.

Example: If Stopping Distance Varies

In Table 4-3, the largest stopping distance is 0.018 in. Use this distance as the Stop Advance setting.

CAUTION

SHUT HEIGHT AUTOMATIC ADJUSTMENT VARIES

Manually adjust the ram to the correct shut height if it is not correct after automatic adjustment. This may be necessary when the Stopping Distance varies so much from tool to tool that the Stop Advance setting cannot compensate.

Failure to comply with these instructions could result in property damage.

Setting and Testing the Adjusted Stop Advance Value

To set and test the adjusted Stop Advance value, do the following:

- 1. Enter the adjusted Stop Advance setting on the Shut Height Initialization Menu (see Figure 3-6, page 74).
- 2. Press RESET repeatedly to return to the Main Program Menu.
- 3. Turn the Program/Run key to RUN to access the Main Run Menu.
- 4. Select SHUTHGT/CNTRBAL to access the Shut Height/Counterbalance/Cushion screen.
- 5. Turn the Ram Mode control to MANUAL. Using the Ram Adjust control, move the ram away from the setpoint so that the SHUT HEIGHT IS AT SETPOINT message is no longer displayed.

NOTICE

If the ram is below the shut height when you turn the Ram Adjust control to DOWN/AUTO, the ram will first move up until it is above the shut height, then move down to the shut height setting.

- 6. Turn the Ram Mode control to AUTO, then turn the Ram Adjust control momentarily to DOWN/AUTO. The ram adjusts to the shut height setting for the tool, approaching the shut height from above.
- 7. Repeat steps Turn the Ram Mode control to MANUAL. Using the Ram Adjust control, move the ram aw and Turn the Ram Mode control to AUTO, then turn the Ram Adjust control momentarily to DO for a number of other tools with different shut height setpoints until you are satisfied with the new Stop Advance setting.

Changing the Die with Setup Mode Enabled

With Setup mode enabled on the Counterbalance Initialization Menu (see Figure 3-9, page 80), RamPAC automatically dumps air from the counterbalance valve to reduce pressure to its empty-die value whenever you place the press in Inch mode and load a new tool in SmartPAC. RamPAC fills the counterbalance valve to the correct pressure for the loaded tool when you return the press to Single-stroke or Continuous following the tool change.

To change a die with Setup mode enabled, follow a procedure similar to the following:

- 1. Place the press in Inch mode.
- 2. Inch the press down. Unclamp the upper die.
- 3. Load the new tool in SmartPAC. RamPAC dumps air from the counterbalance valve until it reaches the zero-die-weight pressure.
- 4. Move the empty ram up.
- 5. Unclamp the lower die. Remove the old die set; bring in the new die set. Clamp the lower die.
- 6. Adjust the shut height.
- 7. Inch the ram down, and clamp the new upper die.
- 8. Switch to Single Stroke or Continuous mode, holding the switch in position for at least two seconds. RamPAC fills the counterbalance to the correct pressure for the tool's upper die weight and fills the cushion to the pressure you entered for this tool.

NOTICE

You can return to Inch after switching to Single Stroke or Continuous without RamPAC reverting to Setup mode. The only time RamPAC dumps the counterbalance valve down to the to zero-dieweight pressure is when the press is in Inch and a new tool has been loaded.

Chapter 5 – Troubleshooting

This chapter shows you how to troubleshoot problems you may encounter with your RamPAC. Refer to your SmartPAC manual or other product documentation to troubleshoot problems not covered in this chapter. The chapter is organized in the following sections:

| Diagnosing Problems Using Control Board LEDs | .114 |
|---------------------------------------------------|------|
| Troubleshooting the Shut Height Control | |
| Troubleshooting the Counterbalance Control. | |
| Troubleshooting the Cushion Control | .124 |
| Troubleshooting Miscellaneous Faults | .125 |
| Checking Fill and Dump Relays | |
| Checking Counterbalance for Excessive Air Leakage | |
| Measuring the Ram Bearing Clearance | |

NOTICE

VERSIONS OF SMARTPAC

This manual covers use with three versions of SmartPAC:

- Original SmartPAC (SmartPAC 1)
- SmartPAC 2
- SmartPAC PRO.

"SmartPAC" refers to all three versions, unless otherwise indicated.

NOTICE

FOR BEST OPERATION OF RAMPAC

Since RamPAC measures and displays the shut height and counterbalance and cushion pressures, pre-existing problems with these parts of the press will become more obvious after you install RamPAC. For best performance, your press should be in good condition and properly maintained.

- The ram should move smoothly up and down, not sticking at any point in its travel, with gibs well maintained and lubricated.
- The ram adjust motor and the electric power source should be sufficient for the needs of the press.
- The counterbalance and cushion systems, piping and fittings should not leak excessively.
- Drain surge tanks regularly to remove water and contamination buildup.
- The RamPAC valve package does not require any lubrication, and operates best when there
 is as little oil as possible in the supply air.

NOTICE

IF PRESS DOES NOT RUN AFTER RAMPAC INSTALLATION

Verify that the following connections are wired correctly as shown in the figures at the end of the manual:

- RamPAC TB3 pin #375 (Ram Interrupt)
- RamPAC TB3 pin #377 (Ram Stop)

Diagnosing Problems Using Control Board LEDs

LEDs located on the RamPAC Control board indicate whether selected RamPAC features are operating properly and can be used to help you diagnose problems with the RamPAC system. LED locations are shown in Figure 5-1. LED functions and operation are shown in Table 5-1.

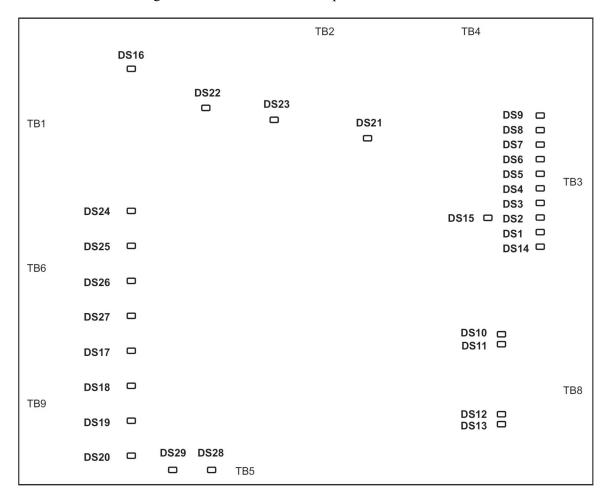


Figure 5-1. RamPAC Control Board LED Map (Terminal Blocks Shown for Reference)

Table 5-1. RamPAC Control Board LEDs: Functions and Operation

| LED# | Function | Operation |
|------|---------------|-------------------------------------------------|
| DS1 | DOWN | ON when Ram Adjust control is in DOWN position. |
| DS2 | No connection | Not used. Should always be OFF. |
| DS3 | No connection | Not used. Should always be OFF. |

| LED# | Function | Operation | |
|---------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| DS4 | AUTO | ON when Ram Mode control is in AUTO position. Should be OFF in "OFF" and "MANUAL" modes. | |
| DS5 MANUAL | | ON when Ram Mode control is in MANUAL position. Should be OFF in "OFF" and "AUTO" modes. | |
| DS6 | RAM INTERRUPT | Normally ON. Turns OFF when Ram Interrupt button is pressed. | |
| DS7 | ZERO CAM | ON when the press is at or near the top of the stroke. | |
| DS8 | ESTOP INPUT | Normally ON. If wired to an ESTOP circuit, should turn OFF when user-supplied ESTOP button(s) is pressed. | |
| DS9 | No connection | Not used. Should always be OFF. | |
| DS10 and DS11 | RAMPAC- SMARTPAC COMMUNICATION | LEDs flash ON and OFF alternately when RamPAC and SmartPAC are communicating. | |
| DS12 and DS13 | SPECIAL PORT | Not used. Should always be OFF. | |
| DS14 | UP | ON when Ram Adjust control is in UP position. | |
| DS15 | ESTOP RELAY | ON when relay is closed (i.e., energized). Turns OFF when relay opens. | |
| DS16 | 12 Vdc | ON when 12 V supply is normal. | |
| DS17 | COUNTERBALANC E DUMP | ON when Counterbalance Dump relay is energized. | |
| DS18 | COUNTERBALANC E FILL | ON when Counterbalance Fill relay is energized. Pulses ON and OFF in AUTO mode. Steadily ON in MANUAL and when counterbalance control is disabled (on RamPAC Init. Menu). | |
| DS19 | CUSHION DUMP | ON when Cushion Dump relay is energized. | |
| DS20 | CUSHION FILL | ON when Cushion Fill relay is energized. Pulses ON and OFF in AUTO mode. Steadily ON in MANUAL and when cushion control is disabled (on RamPAC Init. Menu). | |
| DS21 | INPUT CHECK CIRCUIT | ON when the press clutch is engaged (i.e., when press is running). | |
| DS22 | 5 Vdc | ON when 5 V supply is normal. | |
| DS23 | 24 Vdc | ON when 24 V input circuit is providing power to the Control board. | |

| LED# | Function | Operation |
|---------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DS24 | UP | ON when Ram Adjust UP relay is energized. |
| DS25 | DOWN | ON when Ram Adjust DOWN relay is energized. |
| DS26 | COUNTERBALANC E MANUAL (alternative valve package only) | ON when counterbalance MANUAL relay is energized or when counterbalance control is disabled (on RamPAC Init. Menu). |
| DS27 | CUSHION MANUAL (alternative valve package only) | ON when cushion MANUAL relay is energized or when cushion control is disabled (on RamPAC Init. Menu). |
| DS28 and DS29 | PROGRAMMING NEW FIRMWARE | Both LEDs are ON when new firmware is being programmed, turn OFF when programming is complete (approximately 3 seconds). LEDs are active only during start-up. |

Troubleshooting the Shut Height Control

To troubleshoot shut height control problems, refer to Table 5-2 and the fault message remedies that follow the table.

Table 5-2. Troubleshooting the Shut Height Control

| Problem | Diagnosis and Solution |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ram will not move when you try to adjust shut height. | Ball Socket mode is enabled, and crank angle is outside allowable adjustment range. See Table 3-2, page 75. |
| | Move ram to TDC (0° ±10°). |
| Shut height readings differ from measurements made with a dial | Check position transducer mounting. See <i>Mounting</i> the Cable Extension Position Transducer, page 36 |
| indicator. | Check position transducer wiring. See <i>Wiring the Cable Extension</i> Position Transducer, page 47. |
| | Re-initialize RamPAC (see <i>Initializing RamPAC Parameters</i> , page 73) and use dial indicator to get true upper/lower limit. |
| Shut height readings in Run mode | Bearing clearance is affecting shut height. |
| fluctuate during a stroke but return to normal at TDC. | If you do not know the bearing clearance, measure it. See <i>Measuring the Ram Bearing Clearance</i> , |
| Note: A fluctuation of a few thousandths is normal. A new | page 130. |
| press typically has .001 in. of fluctuation in each bearing per inch of shaft diameter. Check with your | If the bearing clearance is the same value as the fluctuation, increase the shut height upper tolerance (+) to the bearing clearance value. See Setting Up the Shut Height Control, page 74. |

| Problem | Diagnosis and Solution |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| press manufacturer for acceptable wear specifications. | |
| Shut height adjustment works in | Wiring is incorrect. |
| Manual mode but not in Automatic mode. | Verify that the Ram Adjust control (see page 2-25) and Ram Adjust Motor Up/Down relays (see page 2-26) are wired properly. |
| | Check LEDs DS24 and DS25 on RamPAC Control board to confirm that relays are wired and operating correctly. See Table 5-1, page 114. |
| During automatic adjustment, the ram goes up and down repeatedly, never achieving the correct shut height. | Upper and/or Lower Tolerance settings or Stop Advance value may be set to zero (0.000) or to too small a value. If one or both tolerances are set to zero, increase setting(s) by 0.001 or 0.002 in. If tolerances are loose enough, increase the Stop Advance value. See Setting Up the Shut Height Control, page 74. |

SHUT HEIGHT BOTTOM LIMIT
The shut height has reached the bottom limit.

Problem: You have reached the lower limit while adjusting the press with the Ram Mode

control set to MANUAL.

Remedy: Leaving the Ram Mode control in MANUAL, use the Ram Adjust control to move

the ram up until it is above the lower limit, at which point the error should clear. RamPAC prevents the ram from moving down when this error is displayed.

SHUT HEIGHT TOP LIMIT

The shut height has reached the

top limit.

Problem: You have reached the upper limit while adjusting the press with the Ram Mode

control set to MANUAL.

Remedy: Leaving the Ram Mode control in MANUAL, use the Ram Adjust control to move

the ram down until it is below the upper limit, at which point the error should clear.

RamPAC prevents the ram from moving up when this error is displayed.

THE POSITION TRANSDUCER DID NOT INDICATE THAT THE RAM WAS MOVING The ram adjust motor was running and the transducer did not show any movement.

Problem:

You are attempting to adjust the ram in Run mode, and the transducer does not indicate that the ram is moving. Possible causes are:

- The shut height transducer may have come loose
- The ram may have started moving very slowly, so that no ram motion occurred before the RamPAC startup timer expired. The startup timer monitors ram motion during ram adjustment (see *Setting Startup Time (Switches 1 and 2)*, page 86.
- The ram may not be moving.

Remedy:

Do the following:

1. Verify that the bracket from the position transducer to the barrel is connected tightly at both ends and that the transducer is not physically damaged.

NOTICE

If both the Ram Adjust control and Ram Adjust Motor Up/Down relays are wired backward, manual adjustment works properly, but automatic adjustment does not. Check LEDs DS24 and DS25 on the RamPAC Control board to confirm proper wiring (see Table 5-1, page 114).

- 2. Verify that the transducer and the Ram Adjust control are wired correctly (see *Wiring the Cable Extension* Position Transducer, page 47, *Wiring Operator Controls*, page 48, and *Wiring Ram Adjust Motors*, page 48).
- 3. If the error still occurs, increase the startup time by changing switch 1 and 2 settings on switch block S1, as shown in Table 3-5, page 87.
- 4. Verify that the ram actually moves when you turn the Ram Adjust control. If it does not, there may be a problem with your ram adjust mechanism.

THE RAMPAC SHUT HEIGHT PARAMETERS ARE NOT CORRECT

Check the shut height setpoint and make sure it is within the proper range, then check the upper and lower limits.

Problem:

You have changed the shut height upper and/or lower limits after you have programmed one or more tool shut height setpoints.

Remedy:

Re-enter all shut height initialization parameters, even if they look correct, following the instructions under *Setting Up the Shut Height Control*, page 74.

THE SHUT HEIGHT CANNOT BE ADJUSTED AT THE CURRENT PRESS ANGLE.

The press needs to be moved to the top or bottom dead center before the shut height can be adjusted.

Problem:

Ball Socket mode is enabled on the Shut Height Initialization Menu (see *Setting Up the Shut Height Control*, page 74), and the ram is not within $\pm 10^{\circ}$ of TDC or BDC. In Ball Socket mode, automatic shut height adjustment works only when the press crankshaft is within $\pm 10^{\circ}$ of TDC or BDC.

CAUTION

DIE DAMAGE ON BALL SOCKET PRESS

Make sure to enable Ball Socket mode in Initialization when RamPAC is installed on a ball socket press. On a ball socket press, RamPAC provides accurate shut height information only at top dead center (TDC) or bottom dead center (BDC). If you have a ball socket press and disable Ball Socket mode, the automatic shut height adjustment will not work properly and die damage may occur.

Failure to comply with these instructions could result in property damage.

Remedy:

Do the following, depending on whether the press is ball socket or wrist pin type:

- On a ball socket press, make sure that the press is at TDC or BDC before RamPAC attempts to adjust the shut height automatically.
- On a wrist pin press, either disable Ball Socket mode on the Shut Height
 Initialization Menu or make sure the press is at TDC or BDC before RamPAC
 automatically adjusts the shut height.

THE SHUT HEIGHT CONTROL IS IN THE MANUAL MODE

The press can not be run with shut height control in the Manual mode. It must be in OFF or in Automatic mode to operate.

Problem: You are attempting to run the press with the Ram Mode control in the MANUAL

position.

Remedy: Change the Ram Mode control setting to either AUTO or OFF.

THE SHUT HEIGHT IS NOT CORRECT
The shut height is not set to the shut height setpoint, or the tolerances may be set too tight.

Problem:

The press is in Run mode, the Ram Mode control is in the AUTO position, and you are attempting to operate the press when the ram is not at the shut height setpoint.

Remedy:

Do the following:

- 1. Press RESET.
- 2. Turn the Ram Adjust control to the DOWN/AUTO position momentarily.

NOTICE

When you turn the Ram Adjust control momentarily to the DOWN/AUTO position

- If the ram is above the setpoint, it moves down to it.
- If the ram is below the setpoint, it moves up beyond the set point and then moves down to it.

The ram should move to the setpoint, and the message "SHUT HEIGHT IS AT SETPOINT" should display below the CURRENT SHUT HEIGHT caption on the Shut Height/Counterbalance/Cushion Run screen and stay there after the ram stops moving.

If the "SHUT HEIGHT IS AT SETPOINT" message does not continue to display after the ram stops:

• Change the Stop Advance value on the Shut Height Initialization Menu (see *Setting Up the Shut Height Control*, page 74).

or

 Adjust the shut height manually if your press's stopping distance is not consistent.

THE SHUT HEIGHT IS OUTSIDE OF THE UPPER OR LOWER LIMITS

Check lower and upper limits and inspect the transducer to determine the problem.

Problem:

The press is in Run mode, the Ram Mode control is in the AUTO position, and the setpoint value entered on the Counterbalance and Shut Height Program Menu is either below the lower limit or above the upper limit.

Remedy: Do one of the following:

- 1. Turn the Ram Mode control to the MANUAL position.
- 2. Move the ram to the proper shut height, and press the F6 key to save that setting as the stored setpoint.

or

- 3. Press RESET.
- 4. Switch to Program mode, access the Counterbalance and Shut Height Program Menu, and enter a shut height setpoint that falls between upper and lower limits (see *Making Initial Settings for a Tool*, page 102).

Troubleshooting the Counterbalance Control

To troubleshoot counterbalance control problems, refer to Table 5-3 and the fault message remedies that follow the table.

Table 5-3. Troubleshooting the Counterbalance Control

| Problem | Diagnosis and Solution |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Counterbalance fills to line pressure. | Is counterbalance in Manual mode? If it is, switch to Automatic mode. |
| | Set the regulator on the counterbalance valve package to 20 PSI more than the pressure required to balance the heaviest upper die. |
| | Check LED DS18 on the RamPAC Control board (see Table 5-1, page 114). If the LED is lit steadily when counterbalance is in Automatic mode, the Fill relay is stuck in the ON position. Call Wintriss Tech. Support. |
| Counterbalance higher than setpoint. | Is counterbalance in Manual mode? If it is, switch to Automatic mode. See page <i>Making Initial Settings for a Tool</i> , page 102. |
| Counterbalance cannot reach setpoint. | Make sure regulator on inlet line to counterbalance valve package is full open. |
| | Check air pressure with regulator on inlet line full open. If pressure is low, check air compressor and shop air lines. |
| | Make sure regulator on counterbalance valve package is set for 20 PSI more than the pressure required for the heaviest upper die. |
| | Is a green light flashing on Fill solenoid on the valve package? If it is not, check the wiring between the Fill solenoid valve and RamPAC. See <i>Wiring Counterbalance/Cushion Valves</i> , page 50. |
| Counterbalance tries to fill when air compressor is off. | Make wiring change described in Wiring RamPAC To Prevent Air Compressor Operation When Press Is Off, page 58. |

[AUTO/MANUAL] MODE - COUNTERBALANCE PRESSURE IS BELOW THE MINIMUM.

The counterbalance pressure is lower than the minimum allowed.

Problem:

You are operating the press in Run mode with the counterbalance in Manual mode, and the counterbalance pressure is below the minimum allowable pressure.

Remedy:

Turn the counterbalance pressure up to the correct level with the Manual regulator on the valve package.

or

On the Counterbalance and Shut Height Program Menu, change the counterbalance mode to AUTOMATIC, and enter an upper die weight (see *Making Initial Counterbalance and Cushion Settings*, page 102).

F46 COUNTERBALANCE PRESSURE IS OUTSIDE THE UPPER OR LOWER LIMITS Check the cntr. bal. air pressure and make sure it is set within the limits for the loaded tool number.

Problem:

Your system has a Wintriss Clutch/Brake Control (WPC) monitoring counterbalance pressure while RamPAC is controlling counterbalance pressure. This error appears in Run mode.

Remedy:

If your WPC is monitoring counterbalance pressure with a pressure transducer, do the following:

- 1. Disconnect the WPC pressure transducer.
- 2. Connect a pressure switch to the WPC as instructed in the WPC manual, and set the switch to the pressure required to counterbalance the empty ram.

If your WPC uses a pressure switch to monitor minimum pressure:

3. Change the setting on the pressure switch to the pressure required to counterbalance the empty ram.

THE COUNTERBALANCE PRESSURE did not reach THE SETPOINT

The setpoint was not reached in the 5 strokes that are allowed.

Problem:

You are operating the press in Run mode, and the counterbalance pressure is not at setpoint.

Remedy:

Do the following:

1. Check the manual regulator on the valve package to be sure that it is set to a pressure 20 PSI greater than the pressure needed for the heaviest upper die you plan to run. Turn the regulator clockwise to increase the pressure setting.

2. Check the manual regulator, if there is one, on the inlet line to the counterbalance valve package. It should be fully open.

Refer to Table 5-3, page 121, for additional information.

THE COUNTERBALANCE PRESSURE IS ABOVE THE MAXIMUM PRESSURE.

The counterbalance pressure has exceeded the maximum allowed.

Problem: A valve may be leaking or incorrect counterbalance settings have been entered in

Initialization.

Remedy: Check the counterbalance valve package for leaks, and correct if necessary.

If a leaking valve is not the problem, check the counterbalance Initialization settings, and change if necessary. See *Setting Up the Counterbalance Control*, page 79.

THE RAMPAC COUNTERBALANCE PARA-METERS HAVE BEEN CORRUPTED Check the counterbalance initia-

lization parameters to make sure that they are set correctly.

Problem: Memory locations may have changed when you upgraded RamPAC firmware, or

there may be other causes.

Remedy: Re-enter all counterbalance initialization parameters, even if they look correct,

following the instructions; see Setting Up the Counterbalance Control, page 79.

Troubleshooting the Cushion Control

To troubleshoot cushion (or other pressure) control problems, refer to Table 5-4 and the fault message remedies that follow the table.

Table 5-4. Troubleshooting the Cushion (or Other Pressure)
Control1115200M_RamPAC.docx

| Problem | Diagnosis and Solution |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cushion fills to line pressure. | Is cushion in Manual mode? If it is, switch to Automatic mode. |
| | Set the regulator on the cushion valve package to 20 PSI more than the maximum cushion pressure you intend to run with any tool. |
| | Check LED DS20 on the RamPAC Control board (see Table 5-1, page 114). If the LED is lit steadily when cushion is in Automatic mode, the Fill relay is stuck in the ON position. Call Wintriss Tech. Support. |
| Cushion higher than setpoint. | Is cushion in Manual mode? If it is, switch to Automatic mode. See <i>Making Initial Counterbalance and Cushion Settings</i> , page 102. |
| Cushion cannot reach setpoint. | Make sure regulator on inlet line to cushion valve package is full open. |
| | Check air pressure with regulator on inlet line full open. If pressure is low, check air compressor and shop air lines. |
| | Make sure regulator on cushion valve package is set to 20 PSI more than the maximum cushion pressure you intend to run with any tool. |
| | Is a green light flashing on Fill solenoid on the valve package? If it is not, check the wiring between the Fill solenoid valve and RamPAC. See <i>Wiring Counterbalance/Cushion Valves</i> , page 50. |
| Cushion tries to fill when air compressor is off. | Make wiring change described in Wiring RamPAC To Prevent Air Compressor Operation When Press Is Off, page 58. |

| Run mode display shows a cushion pressure of 8 PSI even though the cushion pressure is set to 0 (zero) PSI or another value less than 8 PSI. | The lowest pressure RamPAC can regulate is 8 PSI. Set the cushion (or other) pressure to its correct operating value (see <i>Making Initial Counterbalance and Cushion Settings</i> , page 102). If the tool you loaded does not use a cushion (or other pressure), set the Cushion Mode to MANUAL (see <i>Making Initial Counterbalance and Cushion Settings</i> , page 102) and set the manual regulator on the cushion valve package to 0 (zero) PSI. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cushion does not fill. | The manual regulator on the cushion valve package is closed (set to 0 PSI) because the previous tool you loaded did not use an air cushion. Set the regulator on the cushion valve package to 20 PSI more than the maximum cushion pressure you intend to run with any tool. |

THE CUSHION [OR OTHER] PRESSURE
IS DIFFERENT THAN THE SETPOINT
It is not within the setpoint
limits.

Problem:

You are operating the press in Run mode, and the cushion pressure is not at setpoint.

Remedy:

Do the following:

- 1. Check the manual regulator on the valve package to be sure that it is set to a pressure 20 PSI more than the maximum cushion pressure you intend to run with any tool. To adjust the regulator, pull the regulator knob straight out, and turn it clockwise to increase the pressure setting.
- 2. Check the manual regulator, if there is one, on the inlet line to the cushion (or other pressure) valve package. It should be fully open.

Refer to Table 5-4 for more information.

Troubleshooting Miscellaneous Faults

Refer to the following remedies to troubleshoot miscellaneous faults.

ERROR NUMBER 0 RAMPAC.

Problem:

This error, which occurs only rarely, indicates that there has been an extreme electrical noise disturbance.

Remedy: Press RESET to clear the error. If the error persists, call Wintriss Tech. Support.

PARAMETERS BACK-UP/ RESTORE ERROR.

The EPROM did not respond or it is not installed. Check that the EPROM is installed correctly.

Problem:

You are powering-up the RamPAC or are performing the Restore Parameters procedure, and the RamPAC firmware chip is missing.

Remedy:

Do the following:

- 1. Power RamPAC down.
- 2. Open your enclosure or console, and find socket location U11 on the RamPAC Control board (see Figure 2-14, page 46).

If the socket is empty, install the RamPAC firmware chip.

If the firmware chip is already installed in the socket, remove and reinstall it, making sure that you seat the chip correctly. Refer to step 6 in *Installing New RamPAC Firmware*, page 66.

3. Power RamPAC back up.

RAMPAC PARAMETERS NOT BACKED-UP Option switch 3 is ON. It needs to be in the OFF position to allow backup. Press the Ram Interrupt button to continue.

Problem:

The unit has been powered-up with switch 3 on switch block S1 on the RamPAC Control board in the ON position, preventing RamPAC parameters from being backed up to the firmware chip. When switch 3 is set to OFF, RamPAC backs up settings each time the unit is powered up.

NOTICE

Switch 3 should only be set to ON during power-up after replacement of an old RamPAC Control board with a new board (see *Exchanging RamPAC Control Boards*, page 63).

Remedy:

To enable RamPAC settings to be backed up during power-up, do the following:

Press the Ram Interrupt button.

Power RamPAC down.

Set switch 3 to the OFF position, following the instructions in *Enabling Backup of Settings (Switch 3)*, page 87.

Power RamPAC back up. During power-up, the backup routine should proceed normally, and this fault message should not display.

THE RAMPAC DID NOT RECEIVE AN INPUT CHECK SIGNAL FROM SMARTPAC. Check the wiring between the SmartPAC and the input check input. Use input check LED.

Problem:

The input check circuit input is not wired, or the wiring has become disconnected.

CAUTION

BOTH INPUT CHECK AND ZERO CAM CIRCUITS WIRED WRONG

Make sure that both these circuits are wired correctly. If one circuit is wired correctly and the other is not, RamPAC generates a fault. However, if both circuits are wired incorrectly, preventing RamPAC from detecting their signals, RamPAC does not generate an error condition. In this situation, the shut height could be adjusted while the press is running or the counterbalance pressure could be set incorrectly.

Failure to comply with these instructions could result in property damage.

Remedy:

Verify that the input check circuit input is wired correctly (see *Wiring the Input Check Circuit*, page 56), using LED DS21 to check the signal (see Table 5-1, page 114).

THE RAMPAC DID NOT RECEIVE A ZERO CAM SIGNAL FROM SMARTPAC.
Check the wiring between the Smart PAC and the zero cam input. Use the zero cam LED for help.

Problem:

The zero cam input is not wired, or the wiring has become disconnected.

CAUTION

BOTH INPUT CHECK AND ZERO CAM CIRCUITS WIRED WRONG

Make sure that both these circuits are wired correctly. If one circuit is wired correctly and the other is not, RamPAC generates a fault. However, if both circuits are wired incorrectly, preventing RamPAC from detecting their signals, RamPAC does not generate an error condition. In this situation, the shut height could be adjusted while the press is running or the counterbalance pressure could be set incorrectly.

Failure to comply with these instructions could result in property damage.

Remedy:

Verify that the zero cam input is wired correctly (see Wiring the Zero Cam Signal to RamPAC, page 57), using LED DS7 to check the signal (see Table 5-1, page 114).

THE RAMPAC HAS RESET FROM AN ELECTRICAL NOISE DISTURBANCE
Do not operate the press until you confirm that the current shut height setting is correct.

Problem:

Electrical noise has interfered with RamPAC's operation.

Remedy:

Re-enter all RamPAC Initialization parameters, even if they look correct, following the instructions under *Setting Up the Shut Height Control*, page 74.

TOP STOP RELAY CLOSED

The stop relay appears to be closed when it should be open.

Problem:

This error indicates failure of the RamPAC Control board.

Remedy:

Call Wintriss Tech. Support for a replacement board.

TOP STOP RELAY OPEN

The stop relay appears to be open when it should be closed.

Problem:

This error indicates failure of the RamPAC Control board.

Remedy:

Call Wintriss Tech. Support for a replacement board.

UNDEFINED ERROR RAMPAC.

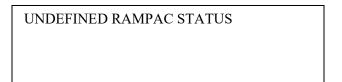
Problem:

This error, which occurs only rarely, indicates that there has been an extreme

electrical noise disturbance.

Remedy:

Press RESET to clear the error. If the error persists, call Wintriss Tech. Support.



Problem: This error, which occurs only rarely, indicates that there is something wrong with

the RamPAC program (e.g., a problem caused by an extreme electrical noise

disturbance).

Remedy: Power RamPAC down, then power the unit back up to clear the error.

If you are adjusting the ram in MANUAL when the error occurs, try to clear the error by moving the ram up or down, using the DOWN/AUTO or UP setting on

the Ram Adjust control.

If the error persists, call Wintriss Tech. Support.

Checking Fill and Dump Relays

WARNING

ELECTRIC SHOCK HAZARD

- Use extreme caution when examining LEDs inside the enclosure or console with the power on.
- DO NOT touch anything inside the enclosure when power is on.
- · Ensure that this procedure is performed by qualified personnel.

Failure to comply with these instructions could result in death or serious injury.

To check the operation of Fill and Dump relays, do the following:

- 1. Open the enclosure or console, and locate the appropriate Fill or Dump relay LED on the left side of the RamPAC Control board (see Figure 5-1, page 114, and Table 5-1, page 114). Observe whether the LED is steadily illuminated or pulsing when you load a tool.
- 2. If the LED is steadily illuminated, check to see if the counterbalance is in Manual Mode. If it is not, you may need to replace the RamPAC board. Contact Wintriss Tech. Support.
- 3. If the LED is pulsing, the relay is operating properly.

Checking Counterbalance for Excessive Air Leakage

NOTICE

All counterbalance systems leak to some degree. Use the following procedure only if there seems to be an excessive amount of air leakage.

To check the counterbalance for excessive air leakage, do the following:

- 1. Make sure the press is at TDC.
- 2. Lock out main press power.
- 3. If your counterbalance system has an oil injection reservoir, check to see if it is clogged.

- 4. Using a sniffer or soapy water, check all counterbalance plumbing connections.
- 5. If plumbing connections are leaking, tighten them down or re-plumb.
- 6. If the counterbalance cylinders are leaking, try lubricating the seals with oil. Contact the press manufacturer for the best oil weight to use.
- 7. If excessive air leakage persists, contact the press manufacturer.

Measuring the Ram Bearing Clearance

NOTICE

Bearing clearance should be considered when determining shut height tolerances. See Setting Up the Shut Height Control, page 74.

To measure the clearance in the ram bearings, do the following:

- 1. Grease the gibs so the ram can move up and down freely.
- 2. Make sure the press is at BDC.
- 3. Fill the counterbalance system to the pressure required for the heaviest die weight.
- 4. Place a hydraulic jack under each connection. Jack the ram up as far as it will go.
- 5. Using a dial indicator, measure the ram height from the bolster to the bottom of the ram, keeping the indicator as close as possible to the connection(s).
- 6. Remove the jack(s).
- 7. Completely dump the counterbalance system, tanks and all.
- 8. Using the same dial indicator in the same location(s), measure the ram height from the bolster to the bottom of the ram.
- 9. Subtract the ram height you measured in step 8 from the ram height you measured in step 5 (see the example below). This is your ram bearing clearance. If you measured the ram height in more than one location, calculate the bearing clearance at each location, then average the clearances.

Example

```
Step 5: BDC, ram jacked up, counterbalance set for maximum die weight

Step 5 ram height = 5.020 in.

Step 8: BDC jacks removed, counterbalance completely dumped
```

```
Step 8: BDC, jacks removed, counterbalance completely dumped 
Step 8 ram height = 5.000 in.
```

```
Bearing clearance = (Step 5 ram height) – (Step 8 ram height) = 5.020 - 5.000 = 0.020 in.
```

Appendix A – Pressure Transducer Wiring

Cables for RamPAC air pressure transducers normally come pre-wired with the connector that attaches to the transducer. If you wire your own cable to the connector, perform the following steps:

1. Strip the cable jacket and wires as shown in Figure A-1 and Table A-1 The colors may be different in your cable.

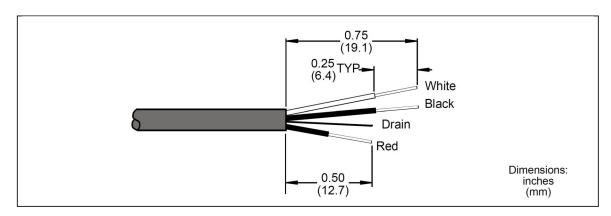


Figure A-1. Air Pressure Transducer Cable: Stripping Wires

Table A-1. Air Pressure Transducer Cable: Wiring Connections

| | Wire Color | Total Length Strip and trim 0.25 in. (6.4 mm) | Transducer Connector Pin # | RamPAC Counter- balance TB1 Pin # | RamPAC Cushion TB1 Pin # |
|----------|------------|-----------------------------------------------|----------------------------------|--------------------------------------------|--------------------------------|
| (shield) | Drain | 0.50 | 1 | * | * |
| AN1/AN0 | White | 0.75 | 2 | 394 | 391 |
| Ground | Black | 0.75 | 3 | 395 | 392 |
| +12 Vdc | Red | 0.50 | 4 | 393 | 390 |

^{*} Terminate shield to a ground stud inside the enclosure close to the entry point.

2. Feed the cable through the connector components as shown in Figure B 2, page B 2. Solder wires to the appropriate pins as shown in Figure A 2 and Table A 1.

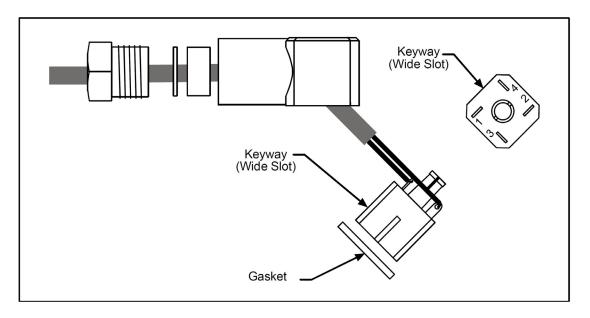


Figure A-2. Air Pressure Transducer Cable: Wiring to Connector

3. Complete assembly of the connector as shown in Figure A 3.

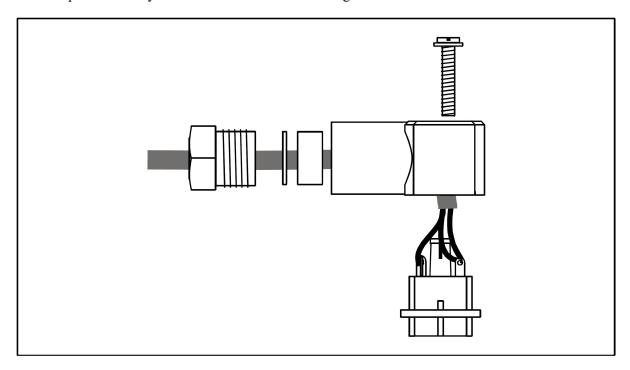


Figure A-3. Air Pressure Transducer Cable: Completing Connector Assembly

Appendix B – Exchanging Old RamPAC Boards

NOTICE

IDENTIFYING OLD BOARDS

Old RamPAC Control boards are identified by assembly number D43002, which is printed in the lower left corner of the board, as shown in Figure B 1.

If you have an old RamPAC Control board (see Figure B 1 for board layout) and need to exchange it for a replacement board, perform the steps following the figure.

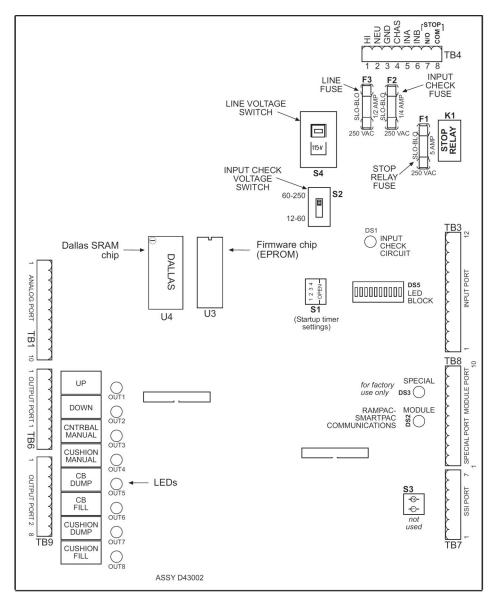


Figure B-1. Old RamPAC Control Board: Location of Important Components

NOTICE

MAKE SURE TO SAVE THE SRAM AND FIRMWARE CHIPS FROM THE ORIGINAL BOARD

The SRAM chip on your original board contains all your RamPAC settings. Save the SRAM chip so you can restore these settings to the replacement board. Otherwise, you will have to re-enter the settings by hand.

- 1. Before you return your original RamPAC board to Wintriss, do the following:
 - c. Remove the Dallas SRAM chip (component U4) and put it in a safe place. Note the orientation of the label "DALLAS" printed on the chip and the small circle enclosing the numeral "1" in the chip's upper left corner. You must install the chip with the same orientation on the replacement board.

NOTICE

When you install the SRAM chip on the replacement board, the "DALLAS" label must face in the same direction as it did on the board you are replacing and the encircled "1" must appear in the chip's upper left corner.

d. Remove the firmware chip (component U3) and put it in a safe place. Note that the semicircular notch in the chip faces up. You must install the chip with the same orientation on the replacement board.

NOTICE

When you install the firmware chip on the replacement board, the notch in the chip must also face up.

- e. Record the DIP switch settings on switch block S1, which control the duration of the Startup Timer (e.g., 1 second, 2 seconds, etc.). If you want your shut height adjustment to work the same way it did with the original board, you must set the switches on S1 to the same positions on the replacement board.
- f. Record the voltage setting on switch S2, which selects the voltage range for the input check circuit (12-60 Vac or 60-250 Vac). You must set switch S2 on the replacement board to the same setting.
- g. Record the voltage setting on switch S4, which selects the voltage for AC input power (115 Vac or 230 Vac). You must set switch S4 on the replacement board to the same setting.
- 2. When you receive the new board, install it in your enclosure or console.

CAUTION

CHIP INSTALLED INCORRECTLY

- Install the SRAM chip with the "DALLAS" label facing in the same direction as it did on the original board and with the encircled "1" in the chip's upper left corner; otherwise, when you power up the control, the chip will be destroyed.
- Align pins correctly with the socket before plugging the chip in.

Failure to comply with these instructions could result in property damage.

3. Insert the Dallas SRAM chip you removed in step 1a in the U4 socket on the replacement board, inserting the left row of pins first, then aligning the right row of pins over the socket and pushing

them in. Make sure that the "DALLAS" label faces in the same direction as it did on the original board and that the encircled numeral "1" appears in the chip's upper left corner.

NOTICE

If the two rows of pins are spread too far apart to plug easily into the socket, hold the chip on its side on a flat surface with the pins pointing toward you. Being careful not to overbend the pins, gently draw the top of the chip toward you until the pins bend a little. Turn the chip over so that the other row of pins is now flat and pointing toward you. Draw the top of the chip toward you again until the pins bend. When the rows of pins look parallel, plug the chip into its socket again. If the chip still doesn't fit, repeat this procedure.

CAUTION

CHIP INSTALLED INCORRECTLY

- Install the firmware chip with the notch facing up; otherwise, when you power up the control, the chip will be destroyed.
- Align pins correctly with the socket before plugging the chip in.

Failure to comply with these instructions could result in property damage.

4. Insert the firmware chip you removed in step 1b in the U3 socket on the replacement board, inserting the left row of pins first, then aligning the right row of pins over the socket and pushing them in. Make sure that the notch in the chip faces up.

NOTICE

If the two rows of pins are spread too far apart to plug easily into the socket, hold the chip on its side on a flat surface with the pins pointing toward you. Being careful not to overbend the pins, gently draw the top of the chip toward you until the pins bend a little. Turn the chip over so that the other row of pins is now flat and pointing toward you. Draw the top of the chip toward you again until the pins bend. When the rows of pins look parallel, plug the chip into its socket again. If the chip still doesn't fit, repeat this procedure.

5. Set the DIP switches on switch block S1 on the replacement board to the positions you recorded in step 1c. Switch block S1 controls the Startup Timer setting. Switch settings for available startup times are shown in Table C-1.

Table B- 2. RamPAC Startup Time Settings (Old Board): Switches 1 – 4 on Switch Block S1

| Switch 1 – 4 Settings | Startup Time |
|------------------------------------------------------------|--------------|
| All switches set to OPEN (Factory setting) | 1 second |
| Switch 1 set to CLOSED Switches 2 – 4 set to OPEN | 2 seconds |
| Switch 2 set to CLOSED Switches 1, 3, and 4 set to OPEN | 4 seconds |
| Switch 3 set to CLOSED Switches 1, 2, and 4 set to OPEN | 6 seconds |
| Switch 4 set to CLOSED Switches 1 – 3 set to OPEN | 8 seconds |

- 6. Set switch S2 on the replacement board to the setting you recorded in step 1d.
- 7. Set switch S4 on the replacement board to the setting you recorded in step 1e..
- 8. Power up SmartPAC and RamPAC.
 - If the SmartPAC powers up normally, go to step 9.
 - If the SmartPAC powers up with a fault message like the following

```
A RAMPAC WAS INSTALLED THE LAST
TIME THE UNIT WAS POWERED-UP
AND WAS NOT SEEN THIS TIME.
```

one or more pins on the SRAM and/or firmware chips may be bent or not plugged in properly. Turn the power off, and repeat the procedure in the Notices for steps 3 and 4. Power the unit up again. If the same fault message displays, contact Wintriss Tech. Support.

- 9. Access the List of Installed Options screen in SmartPAC Initialization, referring to your SmartPAC manual if necessary. RamPAC should be displayed in the options list along with its firmware version number (for example, V1.33).
- 9. If RamPAC appears in the list, you have completed the board exchange successfully.

If RamPAC is not in the list, contact Wintriss Tech. Support.

Appendix C – Mounting the Old Junction Box

If you have an old position transducer junction box, install the unit, referring to the mounting dimensions shown in Figure C 1. Mounting dimensions for the new junction box are shown in Figure 2-16, page 47.

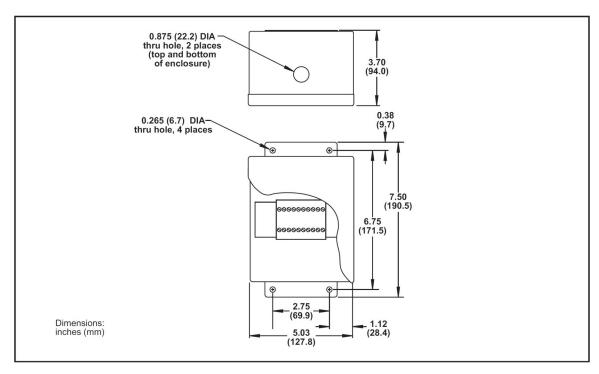


Figure C-1. Position Transducer Junction Box (Old): Mounting Dimensions

Glossary

NOTICE

Cross-references to other glossary entries are shown in italics.

ball socket mode A setting made in Initialization mode when RamPAC's shut height control is

used on a ball socket press. When ball socket mode is enabled, shut height can only be adjusted when the ram is within $\pm 10^{\circ}$ of TDC or BDC. On ball socket presses, the position transducer is exposed to horizontal movement of the connecting rod and cannot provide accurate readings except at TDC and

BDC.

BDC Abbreviation for "bottom dead center."

counterbalance pressure

The amount of air pressure needed to counteract the weight of the ram and attached die and hold it at any point in the stroke during a catastrophic failure. Counterbalance pressure also reduces the energy needed to run the press.

cushion pressure The amount of air pressure needed to hold the workpiece during forming.

input check A signal RamPAC receives from the SmartPAC on each stroke, indicating

that the Dual Safety Valve (DSV) is energized and the clutch is engaged. The input check signal is used together with the *zero cam* signal to verify that the

press is operating properly.

setup mode A setting made in Initialization mode that reduces the counterbalance

pressure during a tool change to the empty-die pressure, facilitating replacement of the die. Setup mode is active only when a new tool has been

loaded in SmartPAC and the press is in Inch mode.

shut height The vertical distance between the bottom of the ram and the top of the bed of

the press when the ram is fully closed. Also called the "closed height." The shut height indicates the die height that can be accommodated in the current

RamPAC setting.

stop advance A setting made in Initialization mode that prevents RamPAC from

overshooting the setpoint during automatic shut height adjustment. The amount of overshoot, which is called the *stopping distance*, is used as the "stop advance" setting, which instructs RamPAC to turn off the ram adjust

motor that distance before the shut height setpoint.

stopping distance The distance the ram travels after the ram adjust motor is turned off.

TDC Abbreviation for "top dead center."

zero cam

A closure-to-ground signal that turns on at approximately 270° and turns off at 30° . The zero cam signal is used in RamPAC together with the *input check* signal to verify that the press is operating properly. RamPAC assumes that the press is travelling through TDC during the zero cam signal and verifies many RamPAC settings during this interval.

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