Intelligrated®

Alvey® 881 Palletizer

MACHINE SERIAL NUMBER: 01-EK228118

OPERATING MANUAL

Contents

This manual was developed in adherence to the
PMMI Technical Documentation Content and Style Guide.

To Order Reprints of this manual call **1-800-535-2555**, select the Parts Department, and ask for part number **P/N 01EK228118/9301**

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1. To Our Customers

Intelligrated Palletizers and Unitizers are the product of years of innovative research and development in electro-mechanical design and engineering as well as extensive field experience with customers. Freely expressed ideas and manufacturing needs have gone into making the Intelligrated Palletizers and Unitizers true customer enhanced systems. They are high production, highly reliable, user friendly machines. Their sturdy welded steel frame construction and open design offers full access to all the components for easy cleaning and servicing. Intelligrated Palletizers and Unitizers are attractive additions to a clean modern production facility.

This manual is designed for Installers, Operators, Supervisors, Maintenance Personnel, Technicians, and Managers who have a basic knowledge of typical electro-mechanical operations and who have been properly trained to operate sophisticated automatically controlled machines using state-of-the-art technology to arrange full cases of finished product into predetermined patterns which are sequentially stacked to form a load of product resting on a wooden pallet for the purpose of efficient handling and distribution.

If you need information or support, call our Customer Service and Support (CSS) toll-free “Hot Line” at **1-800-535-2555.** This number lets you discuss issues directly with a qualified Intelligrated customer service engineer. You can contact Intelligrated at:

- **Intelligrated, St. Louis Operations Center**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2482**
- **Web site: http://www.intelligrated.com**

Call our parts line at 1-800-535-2555 for prices and availability.

When you call us, have your machine serial number, to expedite assistance. The serial number is located on the serial plate on the electrical panel door.

Table of Contents

2. About This Manual

To find information in this manual, first read the finger tabs to find the section you want, then read the Table of Contents at the front of the section to further refine your search. Every page of this manual contains the name of the section to which the manual is open. Also, the bottom of every page contains the page number, and the revision date.

The Introduction and Sections 1, 4, 5, & 6 of this manual are standard for all Intelligrated palletizers and unitizers. In those sections we use the term “palletizer” to refer to the machine even though the machine might be a unitizer. In Sections 2 & 3, which are different for each machine, we use “palletizer” or “unitizer” depending on which the machine really is.

This book is the **Operating Manual**, one of a four-book set of manuals.

- **Operating Manual** includes the Installation, Operation, and Maintenance sections for the palletizer or unitizer.
- **Electrical Manual** includes the Electrical Drawings and Schematics for the palletizer or unitizer.
- **Parts Listing** includes the Assembly Drawing List, Bill of Materials, Recommended Spare Parts List, and Vendor Listing for the palletizer or unitizer.
- **Assembly Drawings** includes the Assembly Drawing List and Assembly Drawings for the palletizer or unitizer.

The **Operating Manual** is organized in six sections:

Section 1 is a safety section that describes the general safety precautions you should take when you operate the palletizer.

Section 2 provides an overview of the equipment and describes how the palletizer works. A Glossary of Terms is at the end of Section 2.

Section 3 lists all the controls that you use to operate the palletizer. It shows the locations and describes the function of each control. Section 3 includes procedures you should follow when you start up, monitor, and shut down the palletizer. In section 3, the names of switches and buttons as well as the names of switch positions (ON/OFF, etc.) are capitalized. The purpose of this is to emphasize the exact name thus reduce ambiguity. Screen names appear in title case (First Letter Of Each Word Capitalized).

Section 4 provides instructions for basic maintenance and general safety precautions you should take when you maintain the equipment. Section 4 includes the requirements for lubrication, inspection, and the preventative maintenance schedule.

Table of Contents

Section 5 has troubleshooting information. The information is formatted in table form and divided into major machine components to make it easy to find the applicable information.

Section 6 includes the requirements for installing the palletizer. This section includes pre-installation site preparation, moving the palletizer, documentation, and checkout procedures for operating the palletizer.

Throughout this manual, references to “palletizer/unitizer” and “pallet/sheet” should be interpreted as meaning which ever the case may be. The paraphrases “machine” or “equipment” refer to the same palletizer/unitizer that this manual is associated with or may refer to accessories or additional accompanying equipment adjacent to the palletizer or unitizer.

References to a given “side” of a palletizer are in relation to product flow through the palletizer. Products come in at the “infeed end” of the machine and exit at the “discharge end”. As you look in the direction of product travel, the “left side” of the palletizer is to your left.

This document was prepared in Microsoft Word and can be produced and distributed on CD ROMs. Intelligrated will supply the free Adobe Acrobat Reader as a presentation format.

All terms mentioned in this manual that are known to be trademarks or service marks have been appropriately capitalized. Intelligrated can not attest to the accuracy of this information. Use of a term in this manual should not be regarded as affecting the validity of any trademark or service mark.

This manual includes operating instructions for the equipment available at the time that this manual was approved for printing. Intelligrated reserves the rights to make changes in design and specifications and/or make additions to or improvements in the product without imposing any obligations upon itself to install them on previously manufactured products.

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Table of Contents

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Contents

List Of Figures

Table of Contents

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Table of Contents

1. For Your Safety

This manual contains important safety information concerning the use, maintenance, and operation of this equipment. Read and become familiar with the contents of this manual before attempting to install, operate, or service this palletizer or unitizer. It is necessary that all operators and maintenance personnel study the applicable sections of this manual thoroughly before operating the equipment.

If you are unable to understand the contents of this manual, please bring it to the attention of your supervisor or foreman. Failure to comply with the instructions and warnings contained in this manual, and the warnings posted on the machine can result in serious injury to personnel and damage to the equipment. Do not operate this equipment unless you have read and understood the contents of this manual.

El manual contiene información importante concerniente el uso, manteniminto y operación de este equipo. No dando caso a los instruciones y precauciones contenidos en el manual, puede resultar en graves heridas personal y daño a la máquina. No trate de operar el equipo sin entender claramente los instruciones del manual.

Si vous ne comprenez pas le contenu de ce manuel, s.v.p. aviser votre superviseur ou le contremaître. A défaut de suivre les instructions et les avertissements contenus dans ce manuel, et les avertissements installé sur l'équipement, pourrait occasionner des blessures graves au travailleur et endommager l'équipement. Ne pas opérer cet équipement à moins d'avoir lu et compris le contenu de ce manuel d'opérations.

Table of Contents

A. Standard Safety Conventions

This manual includes information essential to the safety of personnel and equipment. As you read through this manual, be alert to the four signal words:

- **DANGER**
- **WARNING**
- **CAUTION**
- **NOTE**

Pay Particular attention to the information provided under these headings which are defined below in descending order of severity.

DANGER – Information appearing under the DANGER caption concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.

WARNING – Information appearing under the WARNING caption concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.

CAUTION - Information appearing under the CAUTION caption concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.

CAUTION used without the safety alert symbol (exclamation point in triangle) indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTE:

The term **NOTE** is used to call attention to particularly useful information and is not a warning label. Information appearing in a NOTE caption provides additional information which is helpful in understanding the item being explained.

B. Safety Codes and Standards

Alvey palletizers and unitizers are designed and manufactured to comply with the “Safety Standard for Conveyors and Related Equipment” (ASME B20.1) and ANSI / PMMI B155.1 Packaging Related Converting Machinery-Safety Requirements for Construction, Care, and Use, and B15.1 Safety Standard for Mechanical Power Transmission Apparatus.

Beginning with the 2006 release of ANSI/PMMI B155.1, Risk Assessments are required by both the manufacturer of packaging related equipment, and by the User of the equipment. Refer to Section 4-Responsibilities and Section 5-User of B155.1 for details.

The Purchaser (User) shall be familiar with and responsible for compliance with all codes and regulations having jurisdiction regarding the installation, use, and maintenance of this equipment. Appropriate Lockout/Tagout policy and procedures shall comply with the Code of Federal Regulations, 29 CFR 1910.147 and the minimum safety requirements outlined in the current publication of the American National Standard Institute's “Lockout/Tagout of Energy Sources” (ANSI Z244.1). All electrical components and panels have a potential electrical Arc Flash hazard. Appropriate Personal Protective Equipment (PPE) is required. Refer to NFPA 70E for more information.

Figure 1-1: Lockout Safety Procedures.

C. Operator Safety Precautions

- Only authorized and properly trained personnel may operate the palletizer or unitizer. Follow your company lockout and tagout procedures for safety. (See Figure 1-1.)
- Do not attempt to clear jams before pressing the EMERGENCY STOP button.
- Do not reach into or climb on the palletizer or unitizer for any reason before pressing the EMERGENCY STOP button.
- Extreme care should be taken when near the palletizer or unitizer to prevent fingers, hair, jewelry, or loose clothing from being caught in moving parts.
- Do not wear gloves when operating the palletizer or unitizer.
- Remove all tools and non-product material from the palletizer or unitizer before starting.
- Visually check to see that no one is in a position to be injured when the palletizer or unitizer starts.
- Never step on a moving conveyor.
- Operating the palletizer or unitizer in Manual Mode bypasses most of the operational interlocks. Therefore, Manual Mode operation makes it possible to crush product and damage the machine.
- Observe all warnings and notices on the machine and in this manual.
- Do Not Remove, Reuse, or Modify Material Handling Equipment for any purpose other than its original intended use.

Table of Contents

D. Service & Maintenance Safety Precautions

DANGER

TURN OFF ALL ELECTRICAL POWER SOURCES INCLUDING THE MAIN POWER DISCONNECT SWITCH, AND PERFORM YOUR COMPANY'S LOCKOUT AND TAGOUT SAFETY PROCEDURES FOR SAFE WORKING CONDITIONS BEFORE BEGINNING ANY MAINTENANCE OR REPAIRS.

WARNING

Turning control switches to the OFF position does not remove all safety hazards. Electrical power can still exist on the line, and air pressure in the pneumatic system can still be present. Always turn OFF the main air supply and bleed the air pressure from any pneumatic device before working on the machine.

1. Only authorized and properly trained personnel may service the palletizer or unitizer. Follow your company lockout procedures for safety. (See Figure 1-1.)
2. Pneumatic system air pressure is NOT removed when the machine is turned off. Always turn off the main air supply and bleed the air pressure from any pneumatic system before working on it. Shut off the air pressure to the machine by closing the valves on the main air supply line. Use the lockable air dump valves provided, to bleed the air pressure.
3. Before beginning any maintenance or repairs, turn the main electrical power disconnect switch to OFF, and lockout the machine.
4. Do not attempt to clear jams before pressing the EMERGENCY STOP switch.
5. Do not reach into or climb on the machine for any reason before pressing the EMERGENCY STOP switch.
6. When it is necessary to work in the general area of the hoist, lower the hoist to its home position (fully down position) or block the hoist to prevent it from lowering.
7. Before restarting and testing the palletizer or unitizer, remove all tools and other material from within the palletizer or unitizer.
8. Before operating the palletizer or unitizer, be certain that all safety guards and covers removed from the palletizer or unitizer are securely attached to the machine.
9. Visually check to assure that no one is in a position to be injured when the palletizer or unitizer starts.
10. Observe all warnings and notices on the machine and in this manual.

E. Machine Warning Labels

Read and follow all warning labels attached to the equipment. Warning signs are displayed on the palletizer or unitizer to warn all personnel of hazards. Refer to Figure 1-2 for locations of the warning labels. If any warning labels are missing or damaged, we will send you a replacement at no charge.

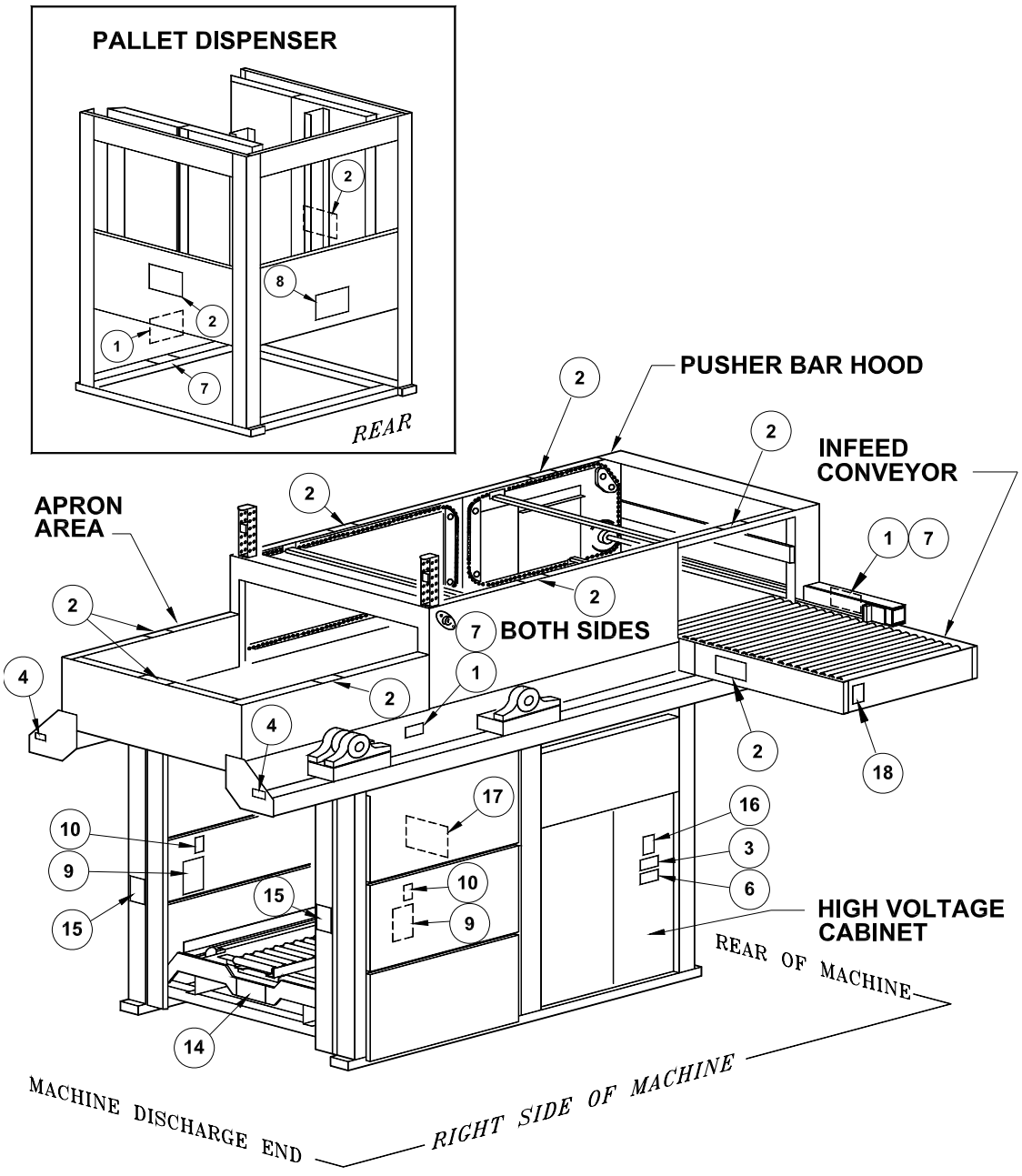


Figure 1-2: Machine Warning Labels

Table of Contents

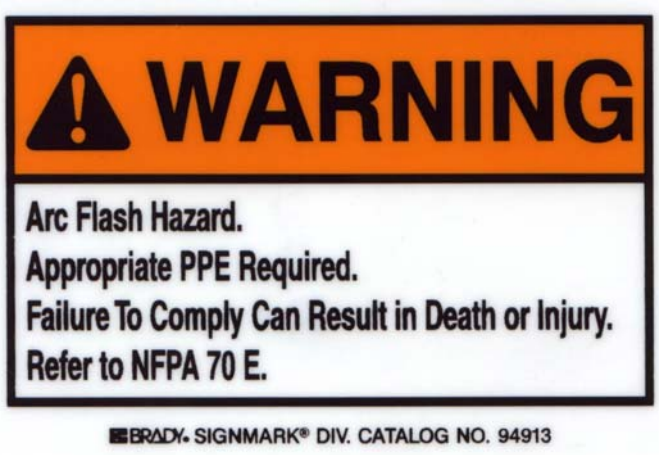
The warning label data and part numbers are listed below:

Item #	Part #	Warning Label Information
1.	9000015	
2.	9000025	
3.	9000035	
4.	9000045	

Table of Contents

Item #	Part #	Warning Label Information
5.	9000075	

On optional platform brackets

6.	9000086	

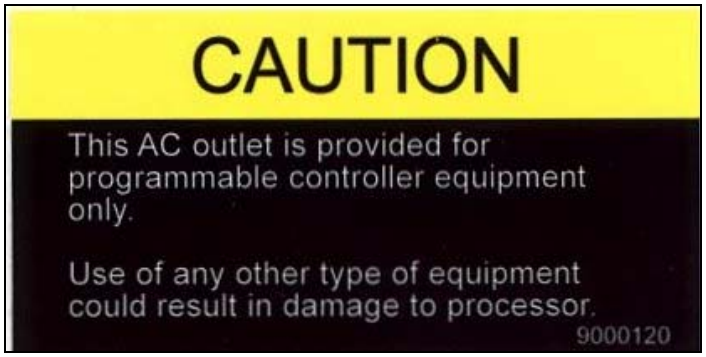
7.	9000088	

8.	9000095	

Table of Contents

Item #	Part #	Warning Label Information
9.	9000102	
10.	9000107	
11	9000110	

On main control station

Item #	Part #	Warning Label Information
12.	9000120	

On main control station

13. 9000121

On optional ram hoist hydraulic deck

14. 9000125

Table of Contents

Item #	Part #	Warning Label Information
15.	9000135	
16.	9000145	

Table of Contents

Item #	Part #	Warning Label Information
17.	9000146	
		On optional ram hoist hydraulic deck
18.	9002380	Picture Not Available

Table of Contents

F. Machine Safety Features

The Alvey palletizers and unitizers have built-in safety features that decrease the risk of injury to personnel and protect the machine from damage.

Do not attempt to circumvent any safety feature. Any attempt to do so could result in injury to personnel and/or damage to the machine. The "lockout" and "tagout" procedures for your company must be followed when entering or servicing the machine.

1. All photoelectric sensors, proximity sensors, and push-button control switches operate on 24-Volts to reduce electrical shock hazards.
2. EMERGENCY STOP buttons are located on the main control station, pallet and/or sheet dispensers, and both sides of the discharge area. The EMERGENCY STOP button has a lockable cover to provide additional security when the machine is turned off.
3. Light curtains monitor the discharge area and the top side of the machine. If the light curtains are interrupted at any time, except during the discharge load cycle, the machine will immediately stop.

   NOTE: During the discharge load cycle, the discharge light curtain is disabled as the load passes through the light curtain. The light curtain is not enabled again until after a timed interval after the load passes the light curtain.
4. Lockable air dumps are provided for removing air pressure from the machine's pneumatic system.
5. Hoist blocks are located on the sides of the hoist area of the machine frame for use during maintenance.
6. Warning labels are prominently located on the machine in places where potential hazards exist.
7. A start-up warning horn will pulsate on and off for five seconds before the machine starts.
8. A lockable control-power switch lets you lockout the machine operation by removing power from the master control relay. A key must be used to unlock the control power switch.

Table of Contents

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Table of Contents

Contents

List of Figures

Table of Contents

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Table of Contents

1. General Description

This section of the manual describes the Alvey® 881 unitizer operations, both mechanical and electrical. Refer to the project layout drawing for the working plan and specifications for your specific machine.

This unitizer is designed to automatically interact with incoming and outgoing conveyors. The unitizer runs automatically except for some manual setup adjustments required when changing the pattern or product.

Cases of product typically enter from the right or left side of the unitizer and full loads are discharged out the front, left, or right side of the unitizer.

The unitizer has of an upper case handling section, and a lower sheet handling section. The upper section of the unitizer receives cases of product from an infeed conveyor, arranges them as required to form a layer, and then deposits the layer onto the hoist. The lower section of the unitizer receives the empty sheet from the sheet dispenser as required. When a sheet is loaded with product, it is discharged onto the discharge conveyor. The full load must be removed from the discharge conveyor by a fork lift truck or other equipment. At the same time, the next empty sheet is being brought into position for the next load.

2. Theory of Operation

The following is a detailed description of the unitizer operation both mechanical and electrical. A glossary of terms has been provided at the rear of this section for explanations of commonly used technical terms when referring to the unitizer.

A. Starting Point

The following description is based on starting the unitizer from the following conditions:

- The unitizer has been cleared.
- An empty pallet is in position to be loaded.
- The discharge conveyor is empty.
- The unitizer is in AUTOMATIC mode with the infeed belt running.

Table of Contents

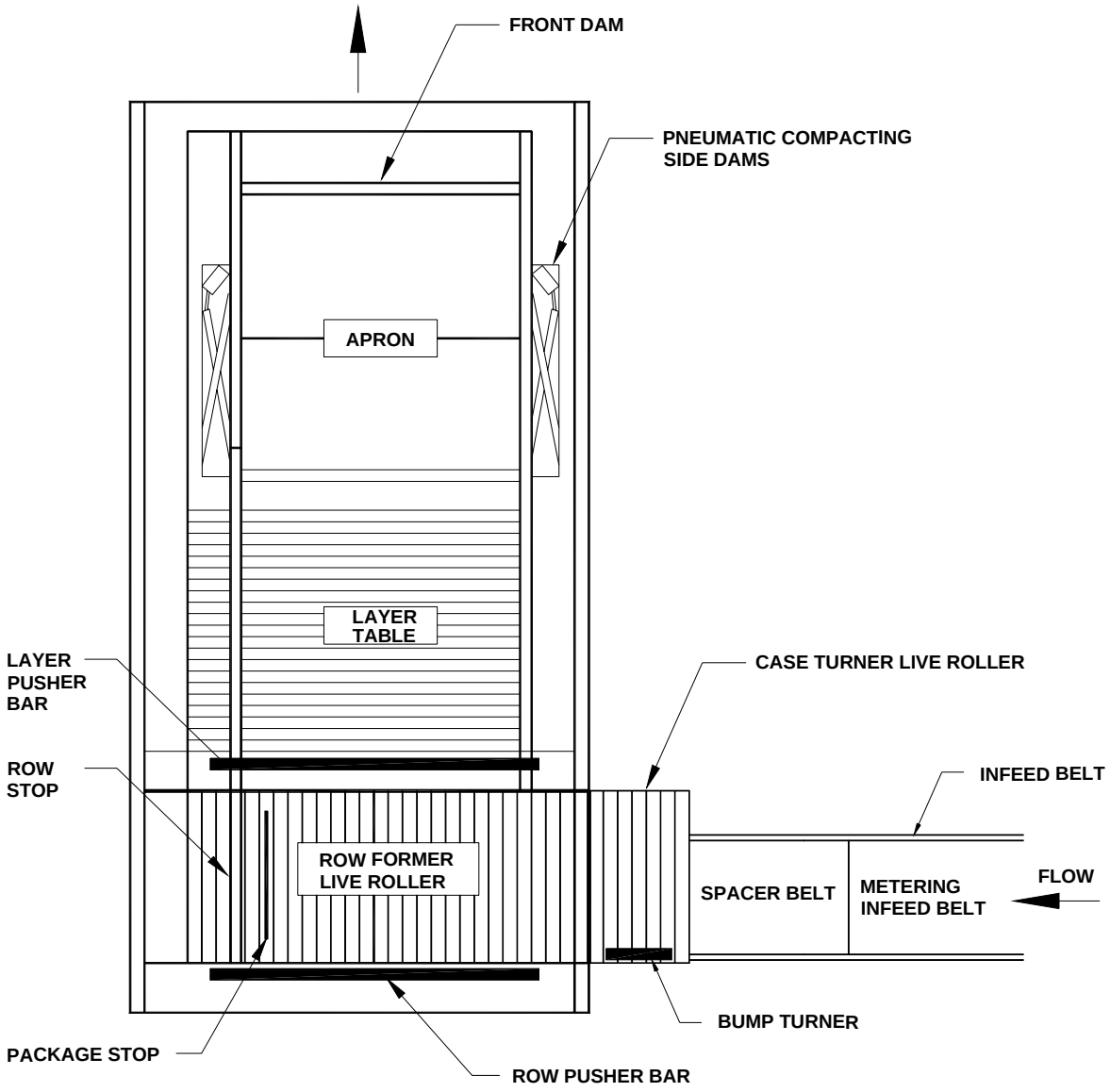

Figure 2-1: Plan View of Case Handling Area

Table of Contents

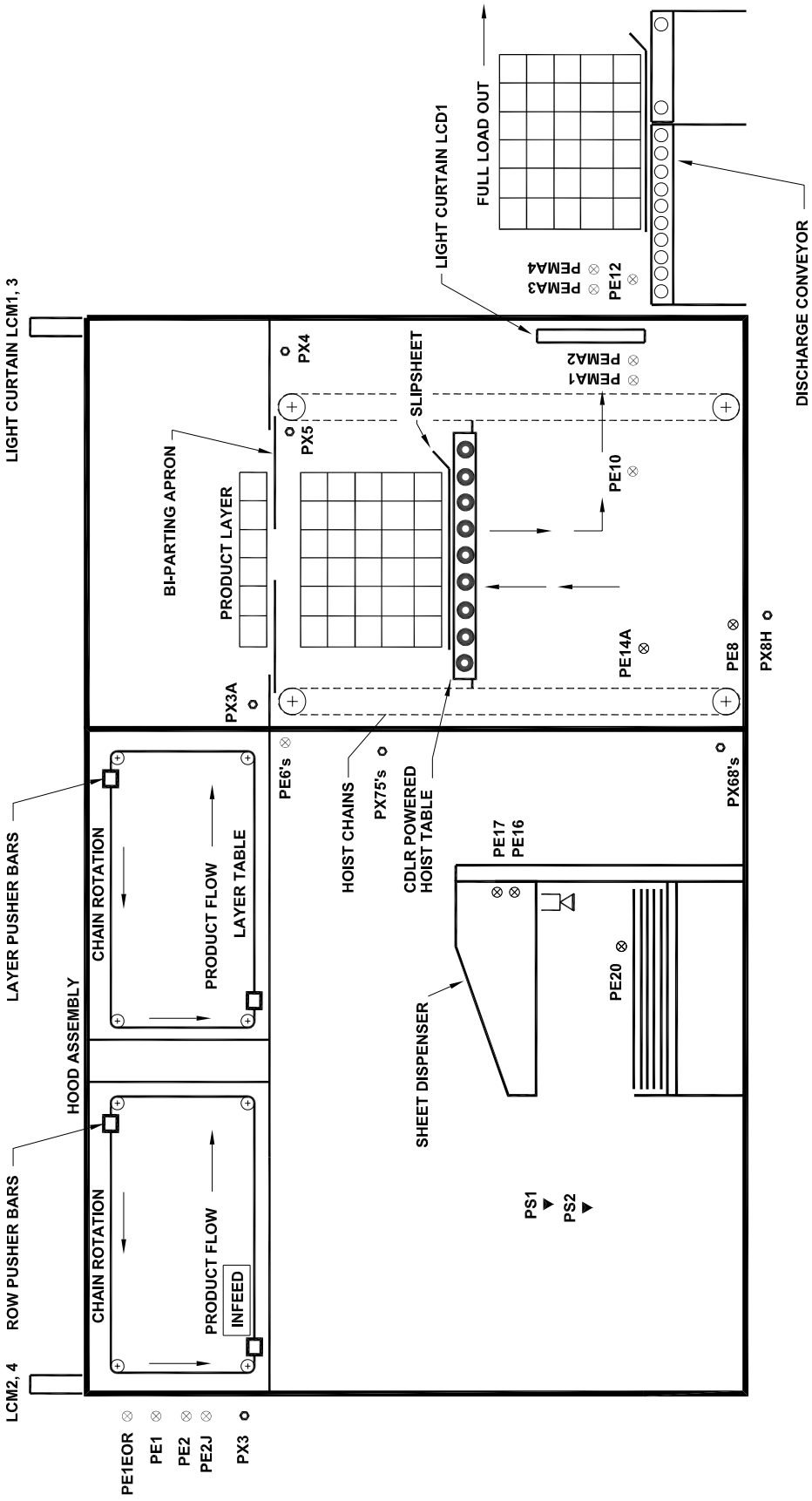

Figure 2-2: Side View of Machine Components

B. Case Handling Operation

1. Cases of product are delivered from the infeed conveyor onto the infeed belt that spaces and feeds cases into the unitizer. (See Figure 2-1)
2. Each case is counted as it blocks and clears photoelectric sensor PE1 as it travels onto the case turning section. (See Figure 2-2) The case count, together with the pattern selected, determines the orientation for each case.
3. If a case is to be turned, the case turner will turn the case 90^{o}.
4. As cases enter the live roller area, each case is counted by photoelectric sensor PE2. The case count at photoelectric sensor PE2 controls the package stops and row pusher bar. When the last case of a completed row blocks and clears photoelectric sensor PE2, a timer is set in the controller, allowing the case to get into proper position before the row pusher cycle begins.

   NOTE: There are three timers (long, medium, and short delay). The time delay required is determined by the time needed for the case to get into position on the row former.

5. If photoelectric sensor PE1 is blocked by a case before the row pusher starts pushing, the infeed belt stops if the long or medium delay is not timed out.
6. When the timer times out, the row pusher begins its cycle and transfers the row of cases onto the apron or layer table. The infeed belt will restart, if stopped.
7. The row pusher continues to rotate until proximity sensor PX3 is actuated, indicating that the row pusher is at its home position. If another row of cases has been formed while the row pusher is cycling, it will restart immediately.
8. When the last row of a layer is being transferred onto the apron and proximity sensor PX3A is actuated, the row pusher stops (after a timed interval).
9. The dams extend and the apron strips (retracts) from under the product. As the apron retracts, the product layer is deposited onto the hoist table. When the apron reaches its full retracted position, proximity sensor PX4 is actuated signaling the controller that the layer loading cycle is completed.
10. The row pusher then begins to retract for a short time interval to disengage with the layer of product on the hoist.
11. The hoist table lowers until all PE6 photoelectric sensors are clear.
12. The apron closes and the row pusher returns to its home position.

Table of Contents

13. During the layer loading cycle, if a full row has formed the row pusher pushes the row onto the layer table when the layer pusher reaches PX3A. If there is already a layer waiting on the layer table, and there is a full row formed, the infeed belt stops. Once the row former is cleared, the infeed belt begins to operate.
14. After the last layer of the load has been deposited on the hoist, the hoist lowers with the load on the hoist conveyor.
15. The hoist conveyor starts moving the full load out of the machine while bringing the next empty sheet into position. As soon as the discharging load clears photoelectric sensor PE10, the next slipsheet is fed into position.
16. As the full load leaves the machine, it blocks and clears photoelectric sensor PE12. This signals the controller that the load is clear of the unitizer.
17. As the next empty sheet moves into position, it blocks photoelectric sensor PE10 and clears photoelectric sensors PE14A and PE14B. When these conditions are met, it causes the hoist to rise to photoelectric sensor PE6.

C. Chain Hoist Operation

The chain hoist table lifts the loads up and down during the product layer loading cycle. After the apron deposits the first layer of product onto the hoist table, the hoist increments downward for each additional product layer. The chain hoist is driven by an electric motor. An air brake is used to hold the hoist in place when the motor is turned off. The following steps describe the hoist operation starting with the last layer of a product load deposited from the apron onto the hoist table.

1. After the apron deposits the last layer of product onto the hoist table, the hoist lowers until photoelectric sensor PE8 and proximity sensor PX8H are activated. (See Figure 2-2)
2. The hoist is now in the down position with the full load setting on the hoist conveyor.
3. If there is room on the discharge conveyor for the load to discharge, the hoist conveyor starts to run discharging the load.
4. As the discharging load clears photoelectric sensor PE10, the sheet dispenser crosshead extends to place a slipsheet on the hoist table.
5. The empty slipsheet moves forward and blocks photoelectric sensor PE10.
6. The hoist rises, if photoelectric sensors PE14A and PE14B are clear.
7. When the hoist rises to the top of its stroke, photoelectric sensor PE6 is blocked.

Table of Contents

8. After a timed interval, the hoist stops, and the sheet is now in position under the apron plates.
9. If a layer is ready on the apron, the apron opens to deposit the next layer on the hoist.
10. The hoist lowers until photoelectric sensor PE6 clears.
11. The hoist stops traveling downward.
12. After the apron closes, the hoist raises.
13. When photoelectric sensor PE6 is blocked, the timing sequence will position the hoist about 1/2” below the apron plates.
14. The loading cycle is repeated until the specified number of layers is deposited onto the sheet.
15. The optional vector hoist drive is supplied with photoelectric sensors PE7 and PE10, used to control the hoist speed. When the hoist nears the top of its stroke, photoelectric sensor PE7 is blocked. This shifts the hoist speed into slow-speed. The hoist continues up in slow-speed until photoelectric sensor PE6 is blocked. As the hoist lowers with a full load, photoelectric sensor PE10 is blocked. This shifts the hoist speed into slow-speed. The hoist continues down in slow-speed until photoelectric sensor PE8 and proximity sensor PX8H are activated.

D. Sheet Dispenser Operation

The sheet dispenser dispenses the sheets (one at a time) onto the hoist CDLR conveyor. Before the sheet dispenser can begin its cycle of operation, a stack of empty sheets must be placed in the sheet dispenser magazine. Stack the empty sheets approximately nine inches (9”) high.

When the sheet dispenser receives a signal to dispense a sheet, the dispenser starts its cycle of operation as follows:

1. The sheet dispenser crosshead lowers to pick-up a sheet.
2. The air vacuum suction cups start to draw a vacuum on the surface of the sheet to pick up the sheet.
3. After a short time interval, the crosshead raises with a sheet, (photoelectric sensor PE16 must be activated).

NOTE: If photoelectric sensor PE16 is not blocked, it indicates that the sheet dispenser did not pick up a sheet. Even so, the crosshead will try again, but if not successful on the third attempt, the sheet dispenser stops the unitizer operation and a diagnostic message is displayed on the unitizer main control station display screen.

4. The crosshead extends to position the sheet over the hoist conveyor.
5. The air vacuum is released depositing the sheet onto the hoist conveyor.

6. As the sheet dispenser crosshead retracts back to its home position, it blocks photoelectric sensor PE17, indicating the sheet dispenser cycle is complete.
7. The sheet must block photoelectric sensor PE10, which raises the hoist.
8. When photoelectric sensor PE20 is activated, the “Low Sheet Supply Warning” at the main control station allows the operator to know that the sheet supply must be replenished.

Table of Contents

3. Electrical Devices

NOTE: All the electrical devices listed in this section may not apply to all unitizers. The unitizer design varies, depending on the application, and the customers specifications.

A. Photoelectric Sensors

Photoelectric Sensor	Location	Function
PE1	Infeed Belt	Mounted 6” to 8” from end of Infeed Belt. Controls the primary case counter as cases block and clear the photoelectric sensor, steps the sequencer, controls the extension and retraction of the turning device, and stops the infeed belt when required.
PE1EOR	Infeed Spacer Belt	Detects an “End of Run”
PE2	Row Former Live Roller	Controls the secondary case counter that controls the raising of package stops where required, and the starting of the row pusher. It also serves as jam protection. (The Pusher Bar cannot run when photoelectric sensor PE2 is blocked.) **NOTE**: Cases of product are tracked between photoelectric sensors PE1 and PE2 so a case cannot be lost in transit.
PE2J	Pusher Bar Hood	Detects cases out of position, and prevents pusher bar jams.
PE6A, B	Below Apron	Scan the underside of the apron and controls the indexing down motion of the hoist after each layer is deposited. Also stops the up-level of the hoist. (Can be in multiples; PE6C, D, E, etc.)
PE6J	Below Apron	Detects if the hoist over-travels upward with an empty sheet.
PE7	Below Apron	Scans the underside of the Apron and will not allow the apron to deposit a layer unless it has been blocked, indicating proper positioning of the hoist.

Photoelectric Sensor	Location	Function
PE8	Bottom Of Hoist Area	Signals that the Hoist is in the down position allowing the hoist conveyor to run.
PE10	Bottom Of Hoist Area	Scans across the unitizer, perpendicular to load travel. Raises the sheet stops to position a sheet when the trailing end of a full load clears photoelectric sensor PE10. On a unitizer equipped with a two-speed hoist, the hoist will shift into low-speed when photoelectric sensor PE10 is blocked. (Can be in multiples; PE10A, B, C, etc. for different sheet sizes.)
PE10J	Bottom of Hoist Area	Detects a pallet that over travels the hoist pallet stop.
PE11A	Discharge Conveyor	Scans to verify that the discharge area is clear.
PE12	Discharge End Of Unitizer	Verifies that the load is discharging.
PE14A	Hoist Area	Scans to verify the hoist is clear.
PE16	Lower Sheet Dispenser	Checks if a sheet has been dispensed.
PE17	Lower Sheet Dispenser	Verifies the sheet dispenser travel head is in its home position.
PE20	Sheet Dispenser	Scans and sends a signal to the unitizer operator when the sheet supply is getting low.
PEMA1, 2, 3, 4	Hoist Area	Detects that a load is discharging and disables the discharge light curtain LCD1 as the load passes through the light curtain.

Table of Contents

B. Light Curtains

Light Curtain	Location	Function
LCM1, 2, 3, 4	Top of Machine	Scans the top of the machine and turns the machine's automatic operation off when interrupted.
LCD1	Hoist Discharge Area	Scans the discharge area of the hoist opening and turns the machine's automatic operation off when interrupted.

C. Proximity Sensors

Proximity Sensor	Location	Function
PX3	Row Pusher	Stops the pusher bar at its home position.
PX3A	Transition Point Between The Row Pusher or Layer Pusher, and the Apron.	Positions the Row Pusher at the last push of each layer at the full layer position.
PX4	Under Apron On Front Dam Side	Signals and stops the apron in the full open position.
PX5	Under Apron	Signals and stops the apron in the full closed position.
PX8H	Bottom Of Hoist Area	Signals Hoist is in position to receive another empty sheet.
PX68A, B	Hoist Area	Detects hoist jams by checking the chain idler arm position.
PX75A, B	Hoist Area	Detects if the hoist blocks are retracted.

Table of Contents

D. Pneumatic Valves

Pneumatic Valves	Location	Function
SVM01	Infeed Belt	Infeed Belt Brake, Engage
SVM03	Rear of Pusher Bar Hood	Row Pusher Brake, Engage
SVM04	Front of Pusher Bar Hood	Layer Pusher Brake, Engage
SVM06	Front of Pusher Bar Hood	Apron Brake, Engage
SVM07	Front of Pusher Bar Hood	Hoist Brake Release (Brake Releases When Activated)
SV10	Case Turner	Bump Turner, Extend
SV21-42	Machine's Main Frame	Raise Package Stop #1, #2, #3, etc
SV51A	Rear of Pusher Bar Hood	Side Dams, Extend
SV51B	Rear of Pusher Bar Hood	Side Dams, Retract
SV52A	Rear of Pusher Bar Hood	Front Dam, Extend
SV52B	Rear of Pusher Bar Hood	Front Dam, Retract
SV90	Sheet Dispenser	Sheet Dispenser Crosshead, Vacuum On
SV91	Sheet Dispenser	Sheet Dispenser Crosshead, Lower

Table of Contents

Pneumatic Valves	Location	Function
SV92A	Sheet Dispenser	Sheet Dispenser Crosshead, Extend
SV92B	Sheet Dispenser	Sheet Dispenser Crosshead, Retract
SV101	Main Air Supply	Resets Ross® air dump valve after the valve has been turned off.
SV110A, B	Main Air Supply	Exhausts main air supply when deenergized (Ross® Air Dump Valve).

E. Electric Motors

Electric Motors	Location	Function
M01	Infeed Belt	Runs Infeed Belt
M02	Live Roller	Runs Case Turning/Row Forming Rollers
M03	Row Pusher	Runs Row Pusher
M04	Layer Pusher	Runs Layer Pusher
M05	Layer Table	Runs Layer Table
M06	Apron	Runs Apron
M07	Hoist	Runs Chain Hoist
M08	Load Conveyor	Runs Load Conveyor
M08A	Filler Conveyor	Runs Filler CDLR Conveyor
M11	Discharge Conveyor	Runs Discharge Conveyor #1

Table of Contents

F. Pressure Switches

Pressure Switch	Location	Function
PS1	Main Air Supply	Detects Low Air Pressure
PS2	Ross® Air Dump Valve	Detects Low Air Pressure on Ross® Air Dump Valve

Table of Contents

4. Glossary of Terms

NOTE: All the terms listed below may not apply to your unitizer. The unitizer design varies, depending on the application, and the customers specifications.

Apron	Bi-parting metal plates or tubes that support the formed layer of product prior to depositing the layer onto the hoist table.
Apron Open	Action of the apron as it pulls back from under a formed layer of cases to deposit the completed layer onto the hoist.
Apron Closed	Action of the apron plates as they come together to receive a layer of product.
BDLR	Belt Driven Live Rollers, used occasionally on discharge conveyors, or hoist conveyors on unitizers.
Bump Turner	A device mounted onto the case turner rollers that contacts the corner of a case coming off the infeed belt causing the case to rotate 90°. The turner will retract to allow the cases to go straight. An air regulator is used to adjust the resisting force of the turner.
Case Stops	Metal plates (blades) that are raised pneumatically between the rollers on the live roller section to create spaces between cases in a row. (Also called Package or Carton Stops.)
Case Turner	Turning device on the case turner rollers section that contacts a corner of a case to turn it sideways. (Also called Bump Turner.)
CDLR	Chain Driven Live Rollers conveyor, generally used as a type of discharge conveyor.
Center Case Turner	A device mounted on the live rollers section that contacts the corner of the case as it is coming off the slat (case) divider inside lanes and causes the case to rotate 90°.
Chain Hoist	Electrically powered chain style lift table, upon which the load is carried up and down. This framework moves vertically beneath the apron. (Also called Hoist Table, Carriage, or Roller Table)
Compacting Case Pusher	A pneumatically powered device that pushes cases to the opposite side of the case turner rollers, allowing double rows of product to be formed for faster output.

Table of Contents

Controller	The programmable controller system is a solid state memory-process-control unit that provides the sequencing, control, and timing for all unitizer operations. (Also called PLC.)
Conveyors	System of conveyors transporting cases to the infeed belt of the palletizer or unitizer.
Deflecting Arm	Rectangular metal arm that extends pneumatically to allow cases to bypass the case turning device. (Also called Infeed Deflector, or Case Deflector.)
Discharge Conveyors	The conveyors outside the unitizer that hold loaded pallets or sheets after they are discharged from the hoist prior to their removal. The conveyors that transport the load can be Gravity, CDLR (Chain Driven Live Rollers), or Two-strand Chain conveyors.
Filler Roller Section	A gravity roller conveyor that rests on a floor mounted snub section inside the hoist area. When the hoist frame rises to receive a load, it also raises the filler roller section off the snub section. The load is then deposited on and supported by the filler roller section until the load is discharged.
Fixed Side Dam	Stationary framework positioned at the opposite side of the apron area from the side compacting dam, which holds cases in line as the apron strips out from beneath them.
Forks	Rows of gravity wheels that are raised and lowered between the case turning rollers. When the forks are raised, a case travels straight off the infeed belt onto the case turning section live rollers. When the forks are lowered, the case enters the live rollers section with the same orientation as it had on the infeed belt. The gravity wheels may be replaced with powered strands of chain as an option.
Front Dam	Stationary framework positioned at the front of the apron area to hold packages in line as the apron moves out from beneath them. The front dam position is adjustable in 1/2" increments by resetting two ball lock pins. Multi-line unitizers use an electrical or pneumatically powered front dam in conjunction with the side dams.
Guide Rails	Channel that guides the cases into the pattern as they travel down the live rollers.
Hoist Table	A framework that carries the load up and down beneath the apron.

Table of Contents

Hoist Ram	Hydraulic powered ram cylinder that elevates the hoist table to the proper operating position.
Hydraulic Power Unit	Supplies the hydraulic oil necessary to power the hydraulic ram cylinder.
Hydraulic System	The hydraulic system consists of two subsystems powered by two pumps and two electric motors. The first is a pressure compensated variable displacement pump that powers the low-speed hoist operation. The second, is a constant displacement pump that combines its high volume operation with the slow-speed pump to power the operation of the hoist in high-speed. The output of the hoist high-speed up pump is piped directly to the hoist while the slow-speed pump is directed to the hoist through the slow-speed valve.
Infeed and Spacer Belt	The infeed belt receives cases from the trunk line or infeed conveyor system and meters them into the palletizer or unitizer. The infeed belt meters cases into the machine at the proper production rate and then opens a space between the cases. The spacer belt receives cases from the infeed belt and opens additional gap for operation on the divider. (Also called Spacer Belt, Speed-Up Belt, or Metering Belt.)
Jog	The term “jog” means to move or actuate a part of the machine up or down or extend or retract part of the machine with a short heavy motion momentarily when the machine is in manual mode.
Layer Stops	Blades that operate pneumatically between the rollers on the live roller that the layer accumulates and forms against.
Layer Table	A product layer holding area that has an additional pusher bar that is located between the row former and the apron. This area allows a layer of product to be formed and accumulated while the apron is depositing a layer onto the hoist. This additional accumulation area increases the case-handling rate of the palletizer or unitizer.
Layer Pusher	Pair of cross bars that are fixed an equal distance from each other on a powered chain system. The first bar holds the rear edge of the layer when the apron strips. The alternate bar pushes full layers across the dead plate and onto the apron.

Table of Contents

Lift and Turn Case Turner	Rotates cases 90° 180° or 270° depending on the case pattern. The live roller section houses a pneumatic turntable that rises under a case to rotate the case. The turntable then lowers the case onto the live rollers.
Live Roller Section	Transports the cases from the case turner rollers and forms the cases into rows. The rows are then pushed onto the apron or layer table. The live roller is powered by a V-belt that is driven by the case turner motor. (Also called, Row Forming Area, or Row Former)
Load Conveyor	A conveyor that transports empty pallets or sheets from the pallet or sheet dispenser to the hoist area and then carries loaded pallets or sheets from the hoist area out of the palletizer or unitizer.
Multi-Line Machine	A palletizer or unitizer that receives cases that are accumulated on product lines and released by the load onto a main trunk line that directs the cases to the infeed belt. The machine is programmed to change product patterns and layer sizes automatically, according to the pre-programmed product lines.
Photoelectric Sensors	Electronic photoelectric sensor input devices that signal information to the programmable controller. (Also called Photoelectric Eyes, Photocells, or Photo Eyes.)
Proximity Sensors	Electronic input devices that signal information to the programmable controller. These switches are sensitive to metal (without physical contact between the metal and the switch) and transmit signals concerning equipment positioning at various states of the operation.
Pusher Bars	Pair of crossbars that are fixed an equal distance from each other on an electrically powered chain system. The first bar positions the rear edge of the load while the apron is opening, while the alternate bar pushes rows of cases from the row forming section onto the apron.
Pneumatic Side Dams	Located in the apron area and designed to compact and hold the load in position from side to side (using air pressure) as the apron is stripping and depositing the layer on the hoist.
Roller Table (CDLR)	The roller table is designed to replace the standard framed hoist table in unitizers. The roller table is driven by a belt or chain to discharge unit loads or pallet loads.

Table of Contents

Row Compactors	Pushers that operate pneumatically between the case stop and row stop in the row forming area to compact portions of the layer as the layer is being assembled. The compacting action is required to properly position cases within the layer.
Row Stops	A stationary framework located at the end of the row forming section opposite the infeed to maintain case positions on the live rollers. Row Stops can also be steel blades that operate (pneumatically) between the rollers on the live rollers section. The row stops stop the cases to form rows and to keep cases from entering the layer forming area under the layer pusher bar.
Sheet Dispenser	A separate unit mounted at the top, bottom, or sides of the machine used to dispense tie-sheets or slip-sheets. The tie-sheets help to hold the product load layers together. Slip-sheets or Pull-sheets are placed on top of a pallet or directly onto the hoist, and are generally used when loads are unitized rather than palletized.
Side Dams	Located in the apron area and designed to compact and hold the load in position from side to side as the apron is stripping and depositing the layer on the hoist.
Soft Start	An electrical device that controls the time required to accelerate the loaded pallet or sheet up to speed.
Spacer Belt	The spacer belt receives cases of product from the infeed belt and opens additional gap for operation on the case divider.
Supply Conveyors	The conveyors that transport cases to the infeed belt.
Trunk Line	Case infeed line that carries product from multiple product release lines to a multi-line palletizer or unitizer.
Unitizer	A machine designed to form loads, without the use of a pallet. Loads may be deposited onto a cardboard or plastic sheet, or they may be deposited directly onto the hoist rollers.
Venturi	A short tube with tapering construction in the middle that causes an increase in the velocity of airflow for creating suction (for lifting sheets onto the pallet or sheet conveyor).

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Table of Contents

Contents

Table of Contents

List Of Figures

Table of Contents

1. For Your Safety

Only authorized and properly trained personnel may operate the Alvey® 881 unitizer.

A. Safety Codes and Standards

Alvey unitizers are designed and manufactured to comply with the “Safety Standard for Conveyors and Related Equipment” (ASME B20.1) and ANSI / PMMI B155.1 Packaging Related Converting Machinery-Safety Requirements for Construction, Care, and Use, and B15.1 Safety Standard for Mechanical Power Transmission Apparatus.

Beginning with the 2006 release of ANSI/PMMI B155.1, Risk Assessments are required by both the manufacturer of packaging related equipment, and by the User of the equipment. Refer to Section 4-*Responsibilities* and Section 5-*User* of B155.1 for details.

The Purchaser (User) shall be familiar with and responsible for compliance with all codes and regulations having jurisdiction regarding the installation, use, and maintenance of this equipment. Appropriate Lockout/Tagout policy and procedures shall comply with the Code of Federal Regulations, 29 CFR 1910.147 and the minimum safety requirements outlined in the current publication of the American National Standard Institute's “Lockout/Tagout of Energy Sources” (ANSI Z244.1).

B. Operator's Safety Precautions

- Follow your company lockout procedures for safety.
- Do not attempt to clear jams when the unitizer is running.
- Do not reach into or climb on the unitizer for any reason before pressing the EMERGENCY STOP switch and performing the lockout safety procedures.
- Never step on moving conveyor.
- Take care when near the unitizer to prevent body parts, jewelry, or clothing from being caught in moving parts.
- Do not wear gloves when operating the unitizer.
- Remove all tools and non-product material from the unitizer before startup.
- Verify that no one is in a position to be injured as a result of the unitizer startup.
- Observe all warnings on the machine and in this manual.
- Remember when operating the unitizer in the Manual Mode, most of the operational interlocks are bypassed, therefore Manual Mode operation makes it possible to crush product.

Table of Contents

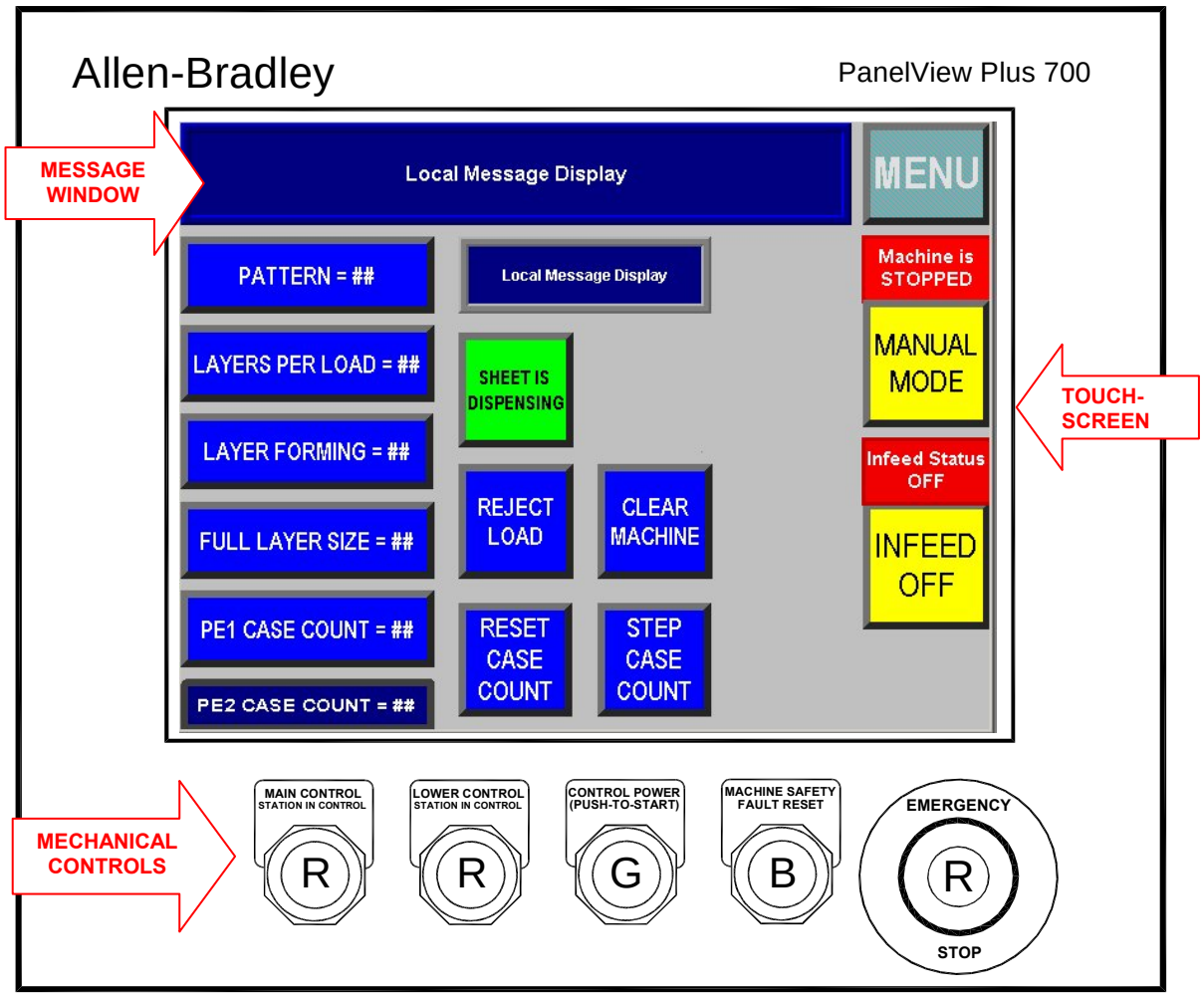

Figure 3-1: Main Control Station

Table of Contents

2. Main Control Station (CSM)

(Figure 3-1) The Allen-Bradley PanelView Plus 700™ Main Control Station is mounted at the top of the unitizer near the infeed area. Figure 3-1 shows the general layout of the main control station used for your unitizer. This sub-section of this manual describes the Main Control Station and the touch-screens that appear at the Main Control Station. The touch-screens are the primary way you control and monitor the unitizer. These screens display: the machine's current operating mode, the infeed belt status, operational messages to prompt you to take action, and diagnostic information on the machine's operating condition.

In addition to the touch-screen, the Main Control Station hardware includes mechanical controls; the EMERGENCY STOP switch, the MACHINE SAFETY/FAULT RESET button, the CONTROL POWER (PUSH-TO-START) button, LOWER CONTROL STATION IN CONTROL button, and the MAIN CONTROL STATION IN CONTROL button. These five controls are described in paragraphs A-E below.

A. Emergency Stop Switch (Red)

To operate the EMERGENCY STOP switch, press the red knob in. To reset the EMERGENCY STOP, pull the red knob out. When the EMERGENCY STOP switch is pressed in, the unitizer shuts down and all other unitizer controls, both AUTOMATIC and MANUAL, are locked out until the EMERGENCY STOP button is reset and the unitizer is re-started.

NOTE: All EMERGENCY STOP switches must be pulled out before the unitizer can start and the unitizer must be started before any unitizer controls can function.

B. Machine Safety / Fault Reset Button (Blue)

The MACHINE SAFETY / FAULT RESET button resets any of the safety relays that may have been tripped. This blue lighted-button must be pressed before you can start the machine.

C. Control Power (Push-To-Start) Button (Green)

The CONTROL POWER (PUSH-TO-START) button is used to start the machine. Press and hold-in the green button for approximately 5-seconds, until the master control relay engages. The warning horn will pulsate on and off during the five-second period before the machine starts. When the machine is operable, the MACHINE MODE display on the touch-screen will read MANUAL MODE, and the green light stays lit.

Table of Contents

D. Main & Lower Control Station in Control Buttons (Red)

Two red pilot lights to both MAIN and LOWER control stations, total of four pilot lights. One pilot light is marked MAIN CONTROL STATION IN CONTROL, the other is marked LOWER CONTROL STATION IN CONTROL. Locks out manual controls for the main control station when the lower control station is active and vice a versa. The pilot light for the station that is active will be lit. A station becomes active when the machine is started from that station or the machine is transitioned from AUTO mode to MANUAL mode at that station. If the machine is STOPPED or enters AUTO mode the station active/inhibit logic is unlatched and now either station can become the active station.

E. How to Start the Unitizer

The following procedure is based on starting the unitizer from these conditions: the unitizer has been cleared of all product, tools, parts, and materials; an empty sheet is in position to be loaded; and the discharge conveyor is empty.

1. Turn the main power disconnect switch (located on the outside of the unitizer high-voltage cabinet) to the ON position.
2. Pull-out on the EMERGENCY STOP switch at all unitizer control stations.
3. Press the blue MACHINE SAFETY / FAULT RESET button to reset any of the safety relays that may have been tripped.

THE UNITIZER CAN CAUSE DEATH OR SERIOUS INJURY IN A VARIETY OF WAYS, BE CERTAIN EVERYONE IS OUTSIDE THE UNITIZER SAFETY GUARDS BEFORE YOU START THE UNITIZER.

4. Press and hold-in the green CONTROL POWER (PUSH-TO-START) button for approximately 5-seconds, until the master control relay engages. The warning horn will pulsate on and off during the five-second period before the machine starts. When the machine is operable, the touch-screen MACHINE MODE display will read MANUAL MODE and the green start button light stays lit.
5. Check the Load Status Screen for the correct pattern, layer, and case settings, and make changes as needed.

   NOTE: Case and Layer counts should equal zero. If not, reset the counters to zero.

6. Check the hoist to see if a sheet is in place. If not, release a sheet from the sheet dispenser using the manual controls.
7. On the touch-screen, set MACHINE MODE to AUTO MODE.
8. On the touch-screen, set INFEED to ON.

F. Text Message Display Window

The message window, across the top of the touch-screen, displays diagnostic operational information on the machine to prompt the operator to take action to clear the message. Operational messages do not stop the machine operation. These messages are displayed in the message window on a blue background for a few seconds, to remind you of the proper machine sequence. After that, the machine status is re-displayed. These messages normally appear when a control button or switch is used at the wrong time.

G. Alarms

Alarms stop the machine, and an alarm message is displayed in the message display window on a red background until the alarm condition is corrected. Every alarm condition must be corrected before the machine can be re-started. Alarms are added to the alarm history when they are triggered. The alarm history provides information on all triggered alarms.

When an alarm message appears, do the following:

1. Check designated area for a case jam or a mechanical failure.
2. Check the photoelectric sensors and proximity sensors in designated area for proper alignment and adjustment.
3. Correct the alarm condition.
4. Pull-out on the red EMERGENCY STOP switch at all unitizer control stations.
5. Press the blue MACHINE SAFETY / FAULT RESET button to reset any of the safety relays that may have been tripped.
6. Re-start the unitizer.

H. Active Touch-Screen Controls

Customized operator screens have been developed to operate and guide you through the operation of your machine. Figure 3-2 shows the power up screen used for your machine. The following pages show and explain the main control station touch-screens and explain the touch-screen selection “buttons” one by one. (The touch-screen selection “buttons” just need to be touched, not pushed, to activate them.)

NOTE: Excessive force when pressing on the touch-screen selection buttons causes premature wear and possible damage to the touch-screen surface resulting in costly repairs.

Table of Contents

I. Machine & Infeed Control Buttons

The Machine and Infeed Control Buttons are programmed to perform specific functions based on the selection made from the touch-screen. When a touch-screen button has been selected, a highlighted box will show the operator which area and function was made active. Not all control buttons will be active based on the selection made.

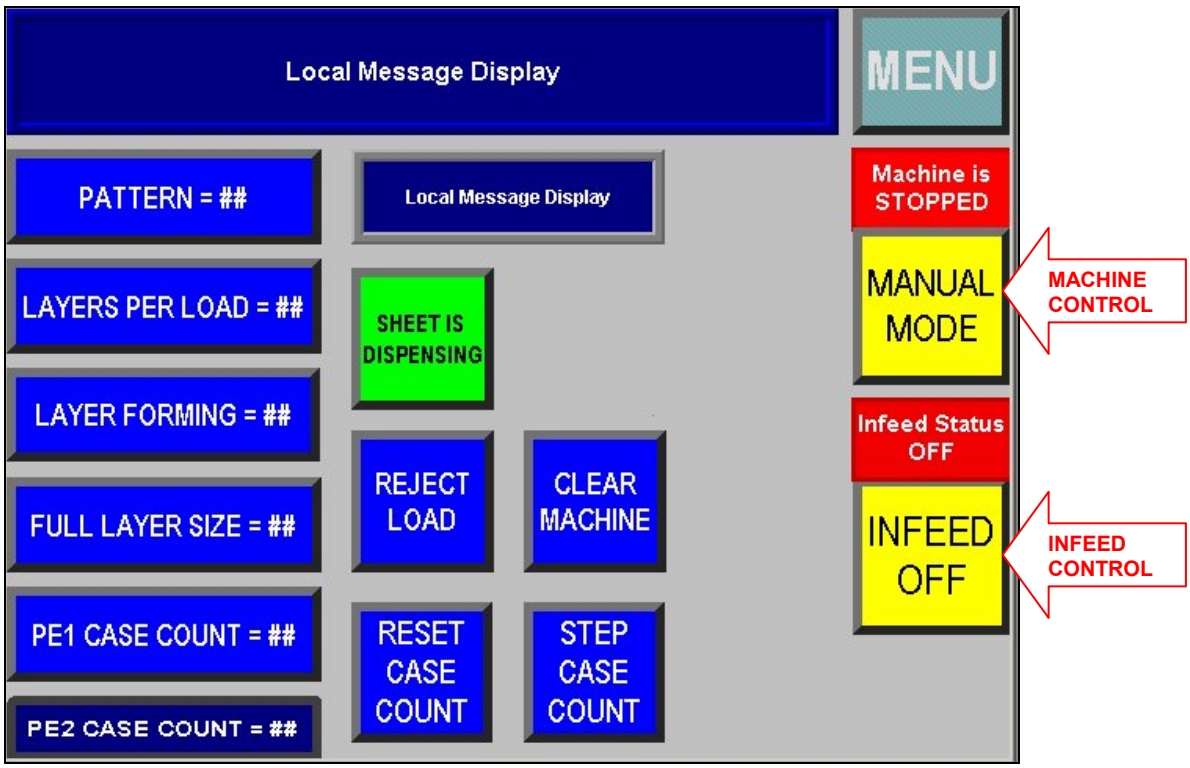

Figure 3-2: Machine & Infeed Control Buttons

Table of Contents

Machine & Infeed Control Buttons (continued)

MACHINE MODE (Status Display)

Indicates the machine's current operating mode:

- **MACHINE IS STOPPED** – Indicates the unitizer has not been started.
- **MACHINE IN AUTOMATIC** – Indicates the unitizer has been started and is in automatic mode.
- **MACHINE IN MANUAL** – Indicates the unitizer has been started and is in manual mode.
- **MACHINE STARTING** – Indicates the unitizer is in the process of starting.
- **MACHINE IN SIMULATION** – Indicates the machine is in automatic simulation mode.

MACHINE MODE (Switch)

- Toggles between AUTO and MANUAL mode after the machine is started.
- **AUTO MODE** – The unitizer will perform its programmed functions, automatically.
- **MANUAL MODE** – You can use the manual controls to operate the unitizer.

CAUTION

Operating the unitizer in the MANUAL mode bypasses most of the operational interlocks and therefore makes it possible to crush cases and damage the unitizer. Be ready to press the EMERGENCY STOP button at the first sign of trouble.

INFEED BELT (Status Display)

- **INFEED STATUS OFF** – The infeed is turned off.
- **INFEED STATUS RUNNING** – The infeed belt is on.
- **INFEED STATUS HOLD IS ON** – The infeed is enabled, but is stopped (on hold) due to program logic.

INFEED MODE (Switch)

- Toggles between **INFEED ON/OFF** after the machine is started and in automatic mode.

Table of Contents

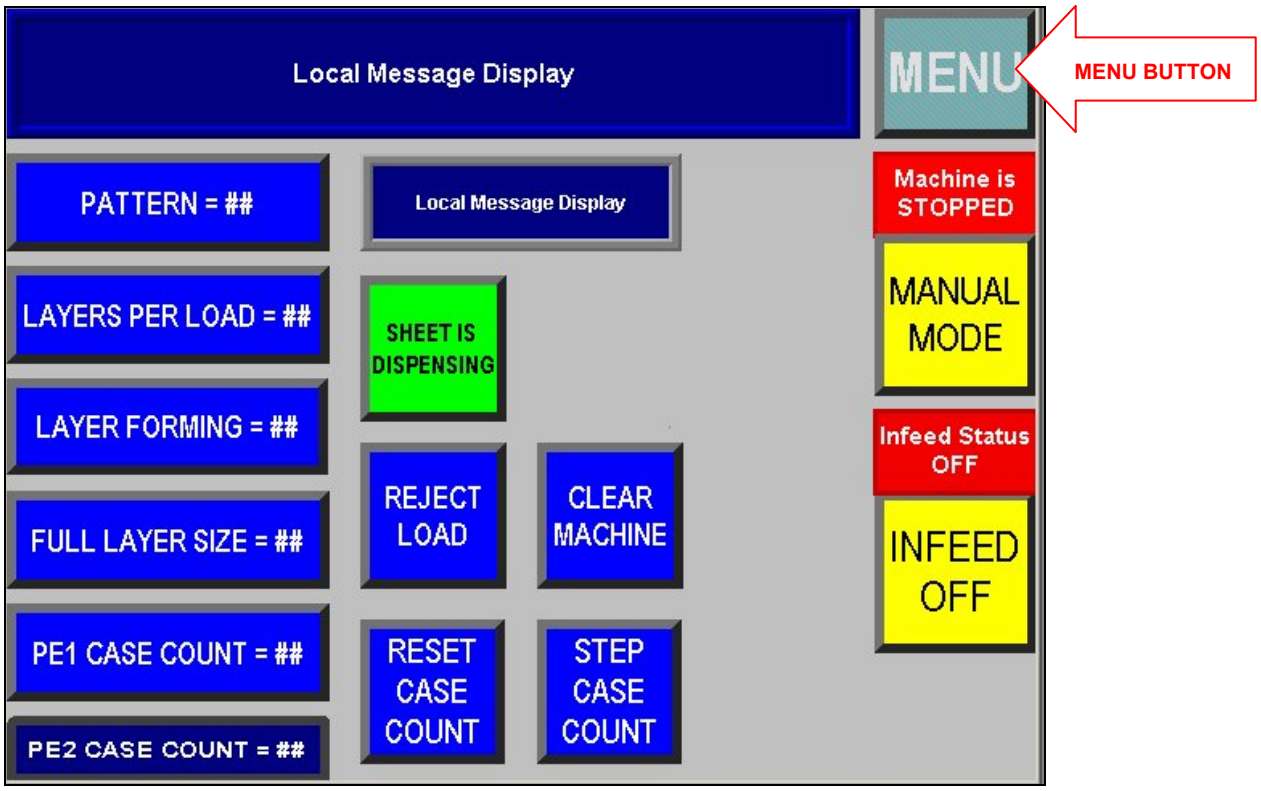

Figure 3-3: Menu Button

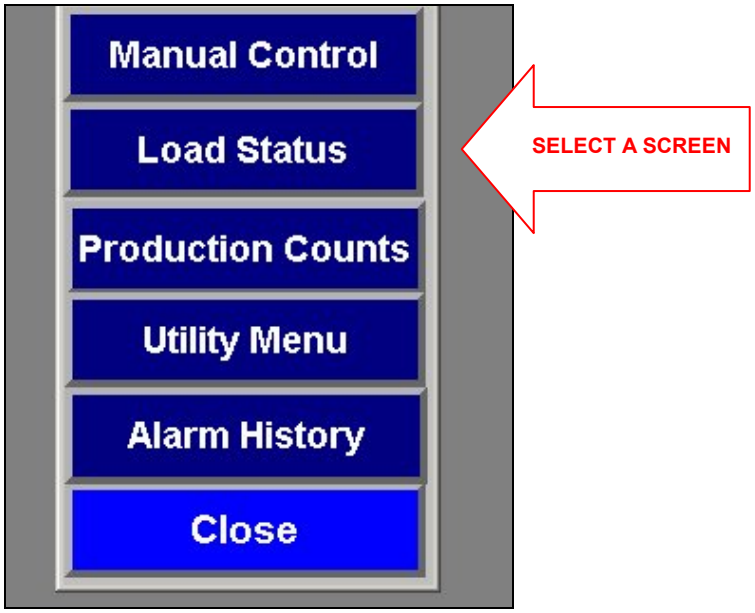

Figure 3-4: Screens Menu

Table of Contents

J. Menu Button

(Figure 3-3 and 3-4) The MENU button displays the Screens Menu. The Screens Menu allows you select other screens, to view as needed, to assist in the operation and setup of the unitizer.

MANUAL CONTROL	• Displays the Manual Controls Screen where you can use the touch-screen controls to jog the unitizer components. (See Figure 3-9)
LOAD STATUS	• Displays Load Status Screen for unitizer setup. (See Figure 3-5)
PRODUCTION COUNTS	• Displays the Production Counts Screen for current Total Case Count, Total Load Count, and Average Cases Per Minute Count. (See Figure 3-10)
UTILITY MENU	• Displays the Utility Menu Screen that allows you open various timing screens to change the machine timing settings. You can also access the Machine Simulation mode program and PanelView™ Setup utilities from this screen. (See Figure 3-11) **NOTE**: This screen is not normally used after the machine enters regular service. Intelligrated technicians are familiar with it.
ALARM HISTORY	• Changes the screen to the Alarm History Screen. The Alarm History Screen displays a record of alarms that have occurred. (See Figure 3-24)
CLOSE	• Closes the Screens Menu.

Table of Contents

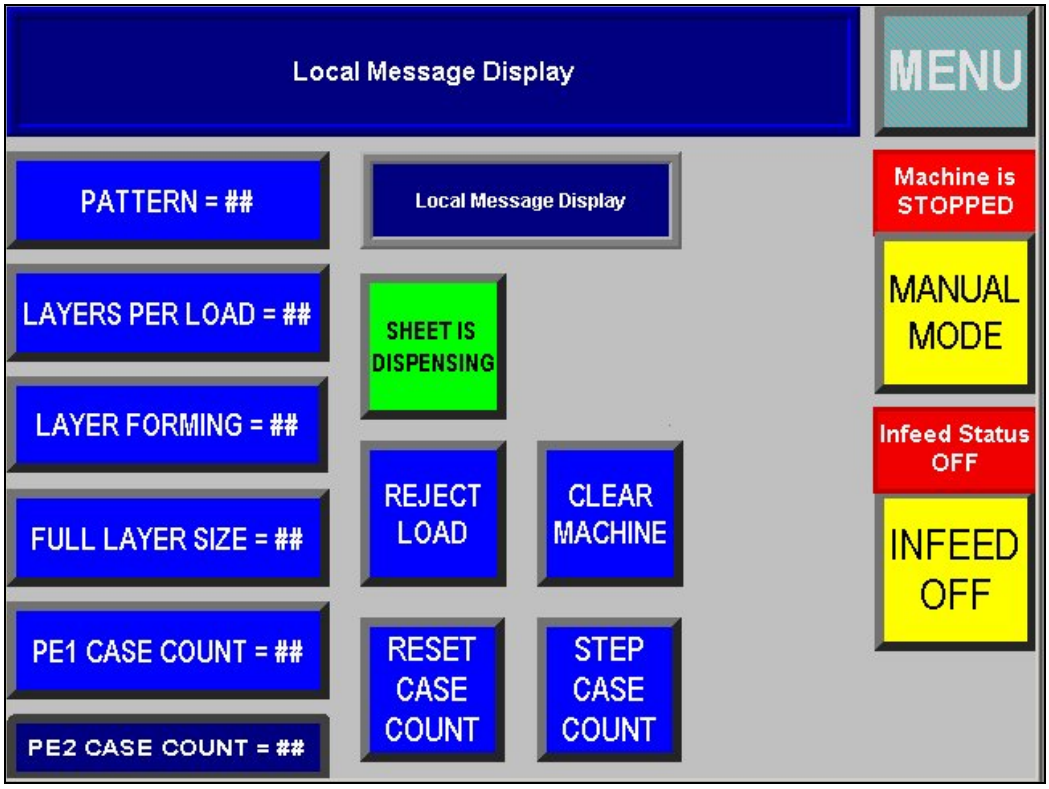

Figure 3-5: Load Status Screen

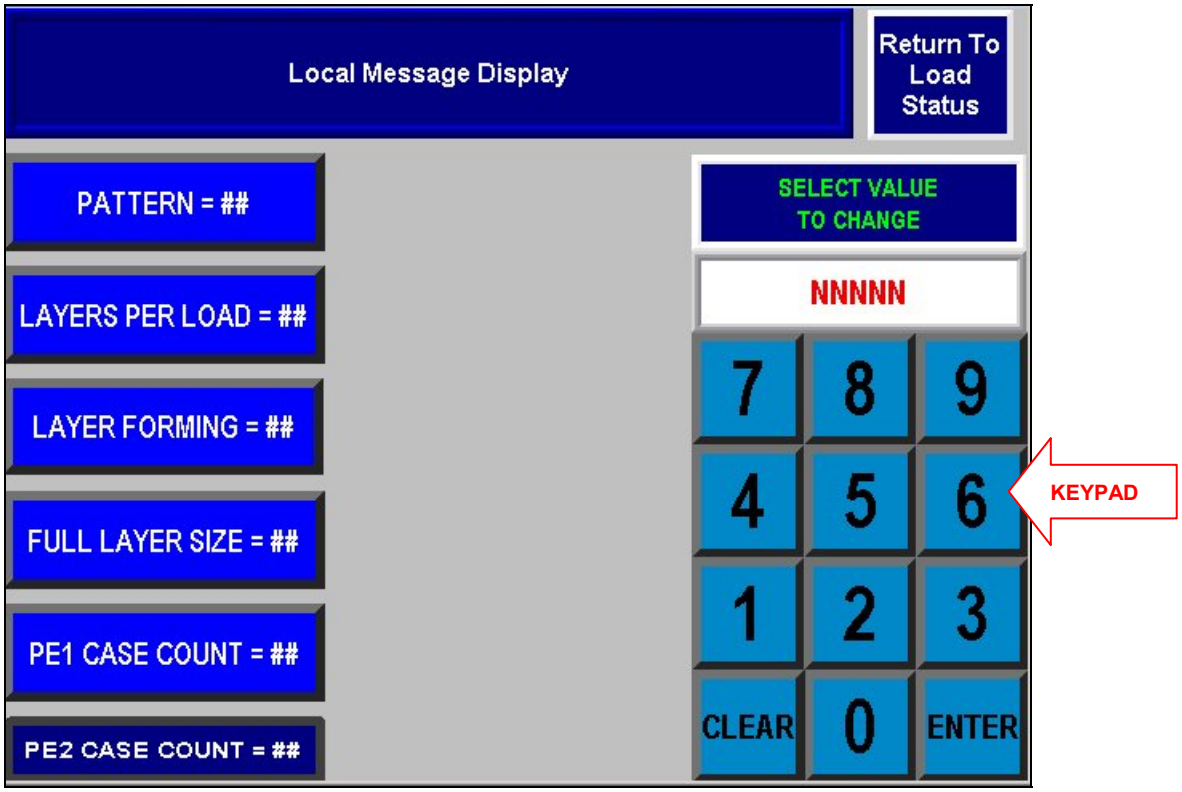

Figure 3-6: Keypad Screen

Table of Contents

K. Load Status Screen

(Figure 3-5 and 3-6) The Load Status Screen displays current setup information on the machine. When variable settings are selected, the screen automatically switches to the Keypad Screen. The Keypad Screen displays the SELECTED VALUE TO CHANGE just above the keypad in the upper right corner. You then use the keypad display to change and enter the new value. Press the ENTER button to save the setting (changes are stored in memory). If the new value is too high or too low, a message will appear to tell you an invalid value was selected. Pressing the CLEAR key resets the new data to zero. This allows you correct or clear an incorrect entry before pressing the ENTER key. If the value is OK, the new value will appear on the display screen. To make other changes, repeat the above procedure. After making changes, press RETURN TO LOAD STATUS to exit the Keypad Screen.

PATTERN NUMBER
- Displays the pattern number currently selected. (Refer to the Pattern Data Sheets supplied in the “Electrical” section of this manual for more pattern information.)

LAYERS PER LOAD
- Displays the number of layers selected for a full load.

LAYER FORMING
- The current layer forming number. This number is always one higher than the number of full layers actually completed for the current load.

FULL LAYER SIZE
- Displays the pusher bar setting that corresponds to the compacted size of a full layer on the apron.

PE1 CASE COUNT
- Displays the current number of cases past photoelectric sensor PE1.

PE2 CASE COUNT
- Displays the current number of cases past photoelectric sensor PE2.

RESET CASE COUNT
- Resets the current case count to zero.

STEP CASE COUNT
- Steps the case count forward by one digit each time the key is pressed.

SHEET DISPENSING
- Displays the current operating mode of the sheet dispenser. Press to dispense a sheet when needed.

Table of Contents

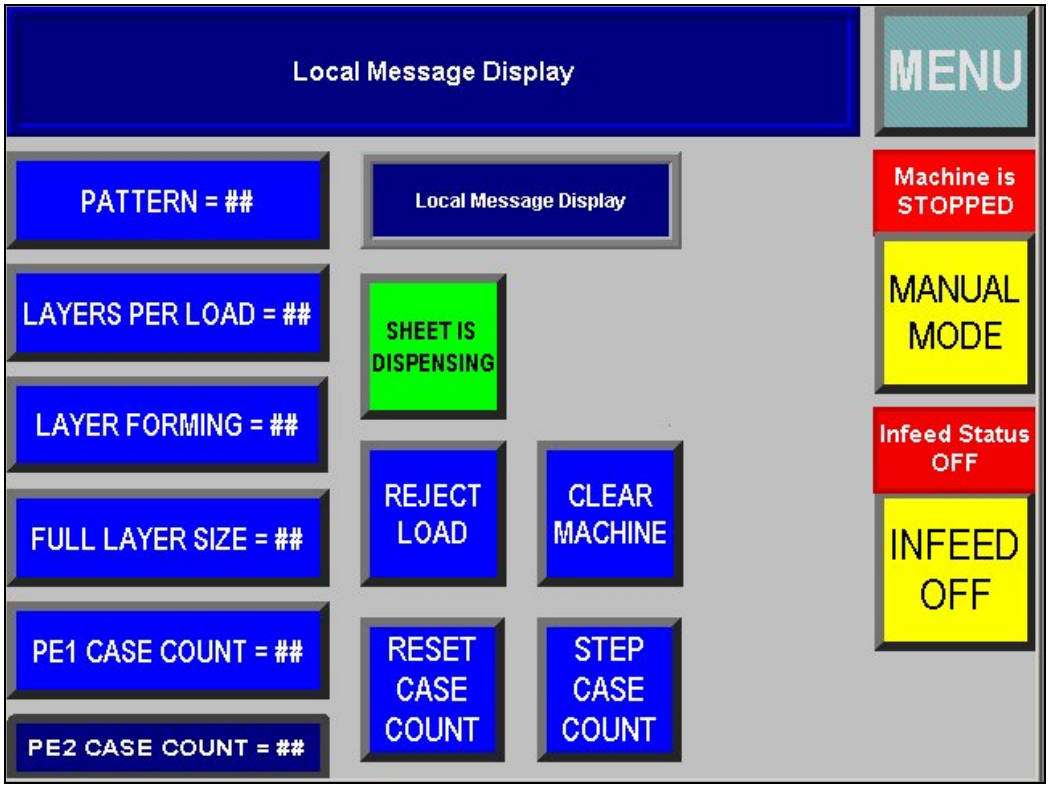

Figure 3-7: Load Status Screen (continued)

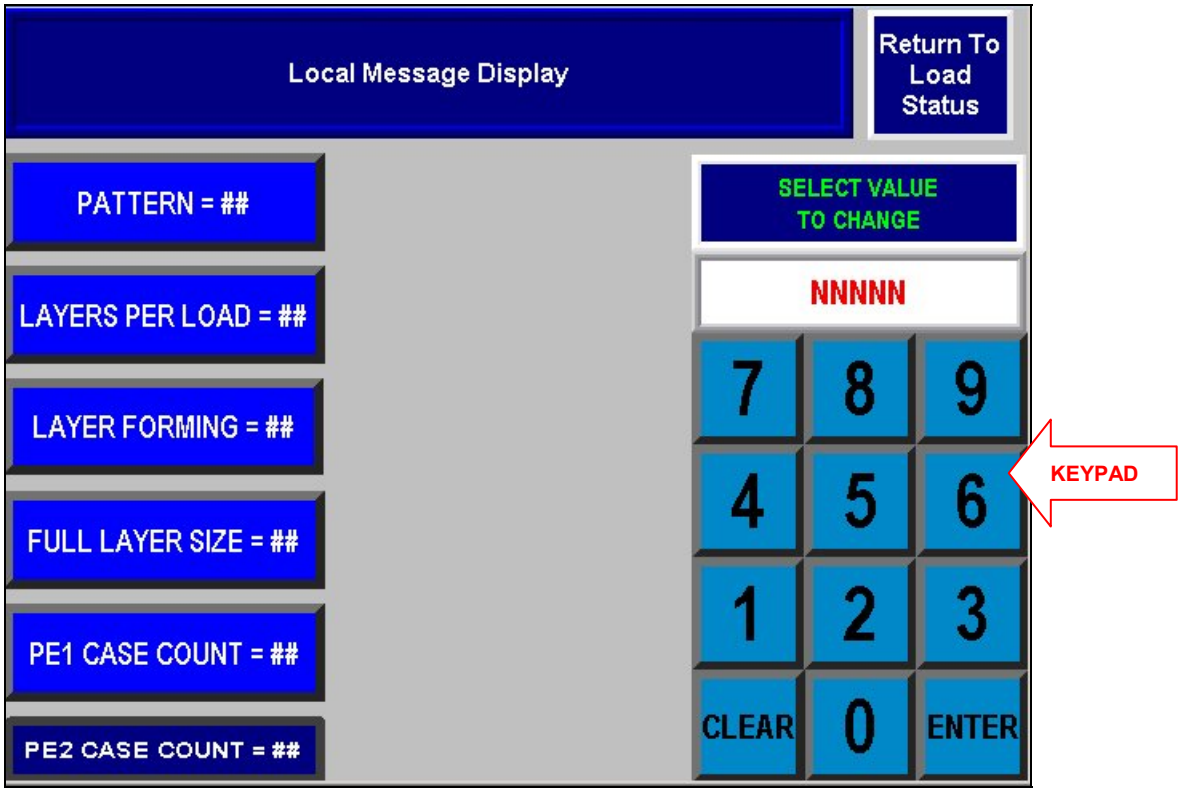

Figure 3-8: Keypad Screen (continued)

Table of Contents

Load Status Screen (continued)

REJECT LOAD

- Discharges the product stacked on the hoist. The Layer Forming number automatically adjusts to compensate for the number of layers discharged. As the load discharges, a new sheet moves onto the hoist as required.

CLEAR MACHINE

- All cases that have passed photoelectric sensor PE1 are cleared from the unitizer and the hoist discharges the load. The case and layer counters automatically reset to zero. The infeed belt must be turned OFF before the CLEAR MACHINE button is used.

Table of Contents

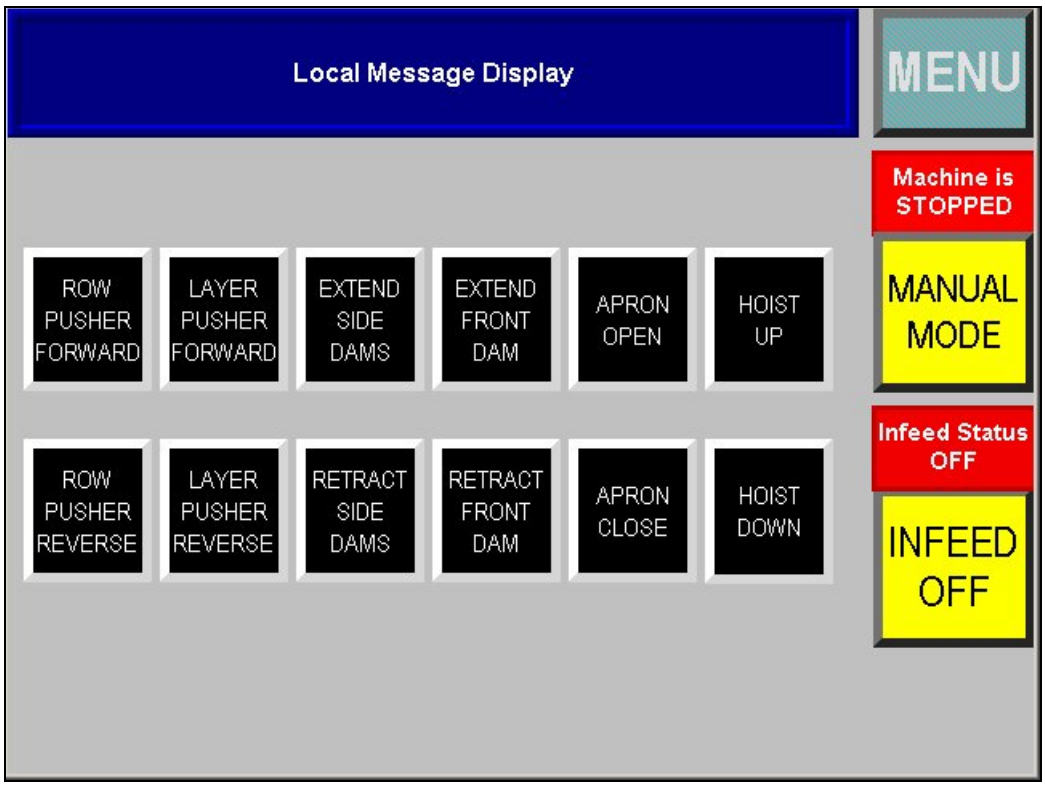

Figure 3-9: Manual Controls Screen

Table of Contents

L. Manual Controls Screen

(Figure 3-9) The touch-screen buttons on the Manual Controls Screen are used to jog the components of the unitizer when the unitizer is in MANUAL mode.

CAUTION

Operation of manual controls should be done with caution because manual operation bypasses most of the operational interlocks; therefore, manual operation makes it possible to crush product.

ROW PUSHER FORWARD / REVERSE	• Jogs the row pusher bar forward or reverse
LAYER PUSHER FORWARD / REVERSE	• Jogs the layer pusher bar forward or reverse
EXTEND / RETRACT SIDE DAMS	• Extends/retracts the side dams
EXTEND / RETRACT FRONT DAM	• Extends/retracts the front dam
APRON OPEN / CLOSE	• Jogs the apron open or closed
HOIST UP / DOWN	• Jogs the hoist up or down

Table of Contents

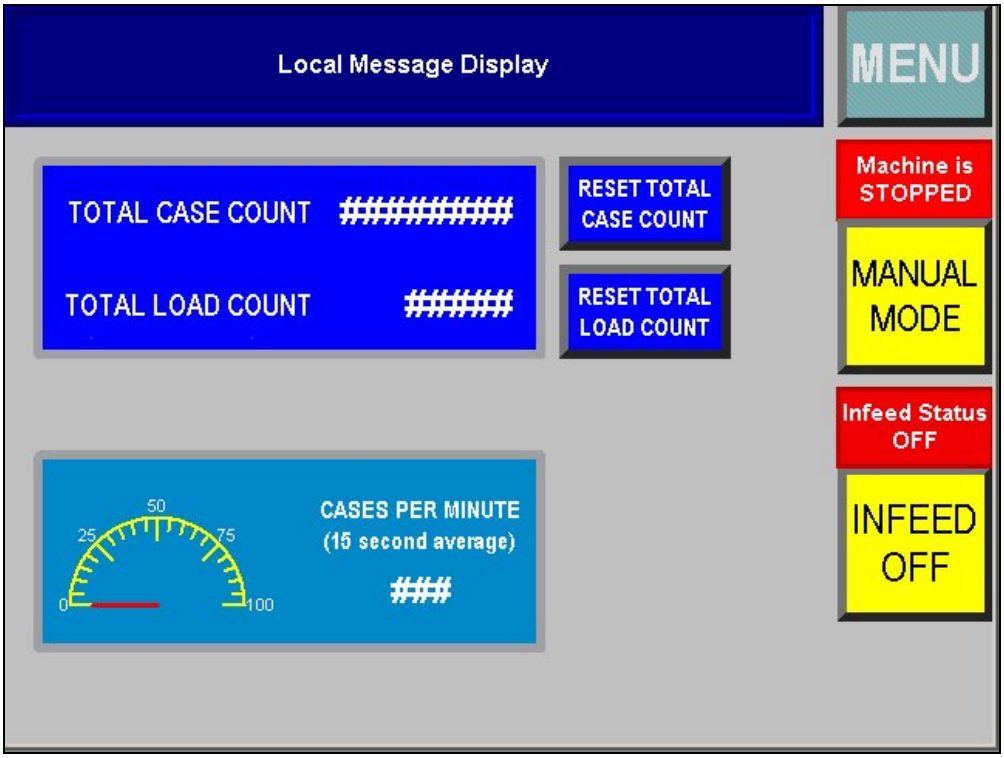

Figure 3-10: Production Counts Screen

Table of Contents

M. Production Counts Screen

(Figure 3-10) The Production Counts Screen displays the TOTAL CASE COUNT, counted at the infeed, the TOTAL LOAD COUNT, counted at the discharge, and the number of CASES PER MINUTE, being run through the unitizer. The case and load counts continue to accumulate until reset to zero.

TOTAL CASE COUNT	• Displays the total number of cases into the unitizer since the last case count reset.
RESET TOTAL CASE COUNT	• Resets the total case count to zero.
TOTAL LOAD COUNT	• Displays the total number of loads discharged from the unitizer since the last load count reset.
RESET TOTAL LOAD COUNT	• Resets the total load count to zero.
CASES PER MINUTE	• Displays the average cases per minute rate for the past 15-seconds.

Table of Contents

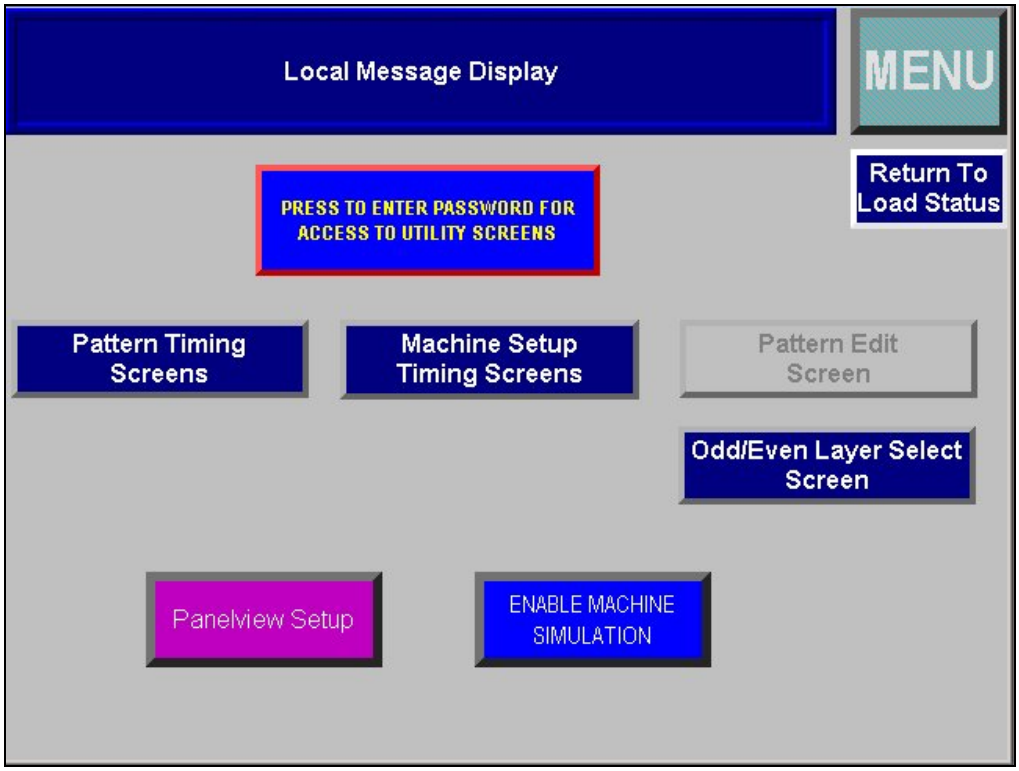

Figure 3-11: Utility Menu Screen

Table of Contents

N. Utility Menu Screen

(Figure 3-11) The Utility Menu Screen is the doorway into a number of other screens that allow you to control how the unitizer runs. This screen allows the Intelligrated technicians open other screens to change the machine timing values and other system setup variables. The Utility Menu Screen selection buttons will not work unless the correct entry code number (password) is entered. This screen is not normally used after the machine enters regular service.

PRESS TO ENTER PASSWORD FOR ACCESS TO UTILITY SCREENS	• When you press this button the utility keypad screen appears, use number keys to enter the password number, and then touch the ENABLE MACHINE SIMULATION key. If the password is not correct, a message appears. Three incorrect passwords will lock this function and require intervention by a supervisor.
PATTERN TIMING SCREENS	• Opens the Pattern Specific Timing Screens where you can change timing settings related to specific patterns of cases for the Infeed and Row Pusher, Package Stops, and Layer Compactors. (See “Pattern Specific Timing Screens”.)
MACHINE SETUP TIMING SCREENS	• Opens the Machine Setup Timing Screens “Menu” so you can change the timing settings for the Hoist, Load Conveyor, Sheet Dispenser, Machine Fault, and Sheet Dispenser. (See “Machine Setup Timing Screens Menu”)
PATTERN EDIT SCREEN	• Displays Product Pattern Edit Screen where you can review how a particular case pattern is formed. (See Figures 3-21)
ODD / EVEN LAYER SELECT SCREEN	• Displays the Layer Edit Screen which toggles between ODD and EVEN layer being viewed or edited. (See Figure 3-22)
PANELVIEW SETUP	• Enables the internal PanelView™ configuration screen. This button is not normally used after the machine enters regular service, and therefore “PanelView™ configuration” is not discussed in this manual. Intelligrated technicians are familiar with it.
ENABLE MACHINE SIMULATION	• This button allows Intelligrated technicians start the “simulation” mode program. An entry code number is required to access the “simulation” mode. This button is not normally used after the machine enters regular service, and therefore it is not discussed in this manual. (If you touch this button by mistake, and it starts to flash, touch it again and it will stop.)
RETURN TO LOAD STATUS	• Displays the Load Status Screen.

Table of Contents

O. Pattern Specific Timing Screens

(Figures 3-12 thru 3-16) The Pattern Specific Timing Screens can only be opened from the Utility Menu Screen after the correct password has been entered. These screens allow you to change machine-timing values related to specific patterns of cases.

To use the screens you first enter the pattern number, in the PATTERN SELECTED FOR TIMING EDITS field, for the case pattern you want to change. The PATTERN SELECTED FOR TIMING EDITS shows the current pattern number that is being changed.

To change the timer settings,

1. Touch PATTERN SELECTED FOR TIMING EDITS and the utility keypad screen will appear.

2. Use the numbered keys on the utility keypad screen to enter the pattern number of the case pattern you want to work on.

3. Touch the button below the present value for the field you want to change. You may edit any timing value on the screen by touching the button of the field you want to change next. The utility keypad screen will appear automatically.

4. Use the numbered keys on the keypad screen to enter the new timer setting for the field.

5. Touch the ENTER key to enter the new value for the field. Touching the ENTER key saves the settings. The new value will appear on the screen.

6. If you want to make other changes, repeat the above procedure for each change or go to the NEXT TIMING SCREEN for additional changes.

7. After the changes have been made, touch the RETURN TO LOAD STATUS key to exit the timing screens.

NOTE: If you go to the Load Status Screen, and thus leave the password-protected screens, you have three minutes to reopen the password-protected screens without re-entering the password.

Table of Contents

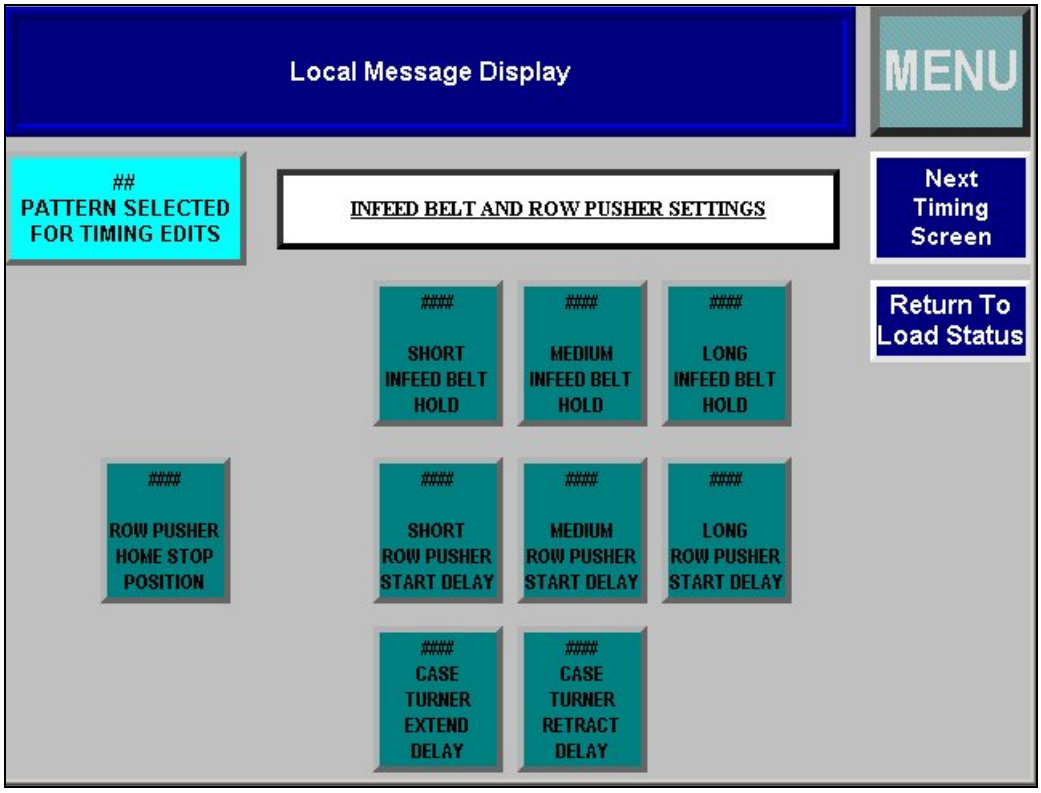

Figure 3-12: Infeed and Row Pusher Settings Screen

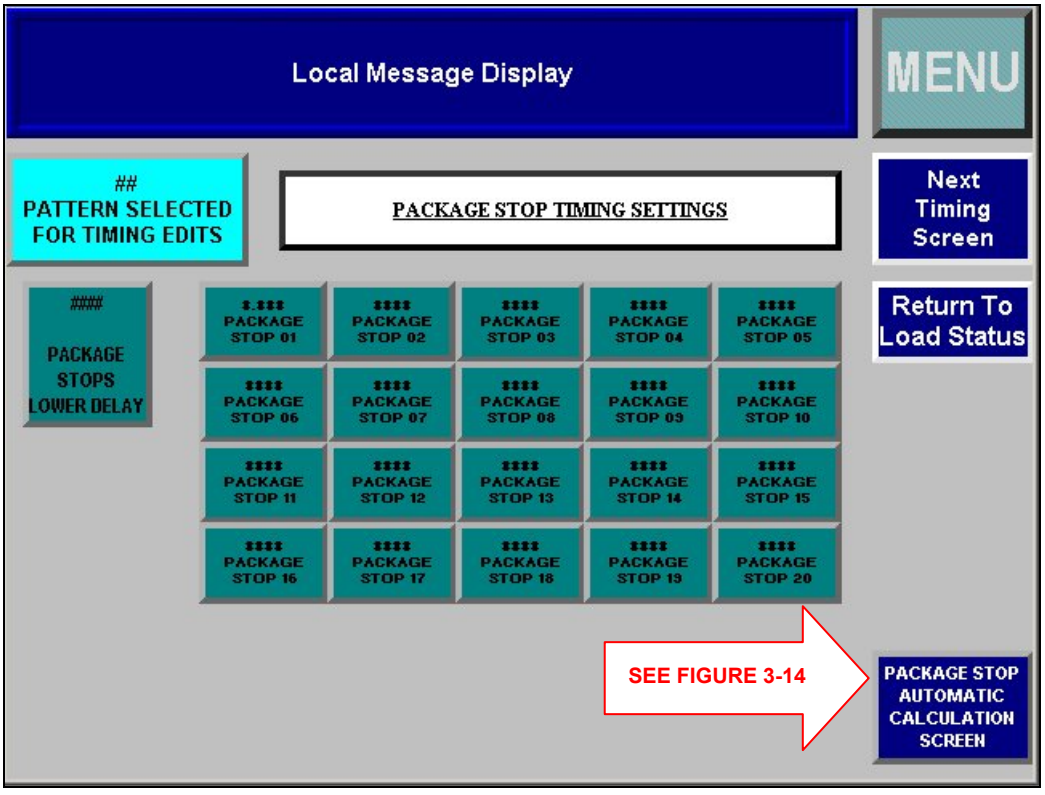

Figure 3-13: Package Stop Timing Settings Screen

Table of Contents

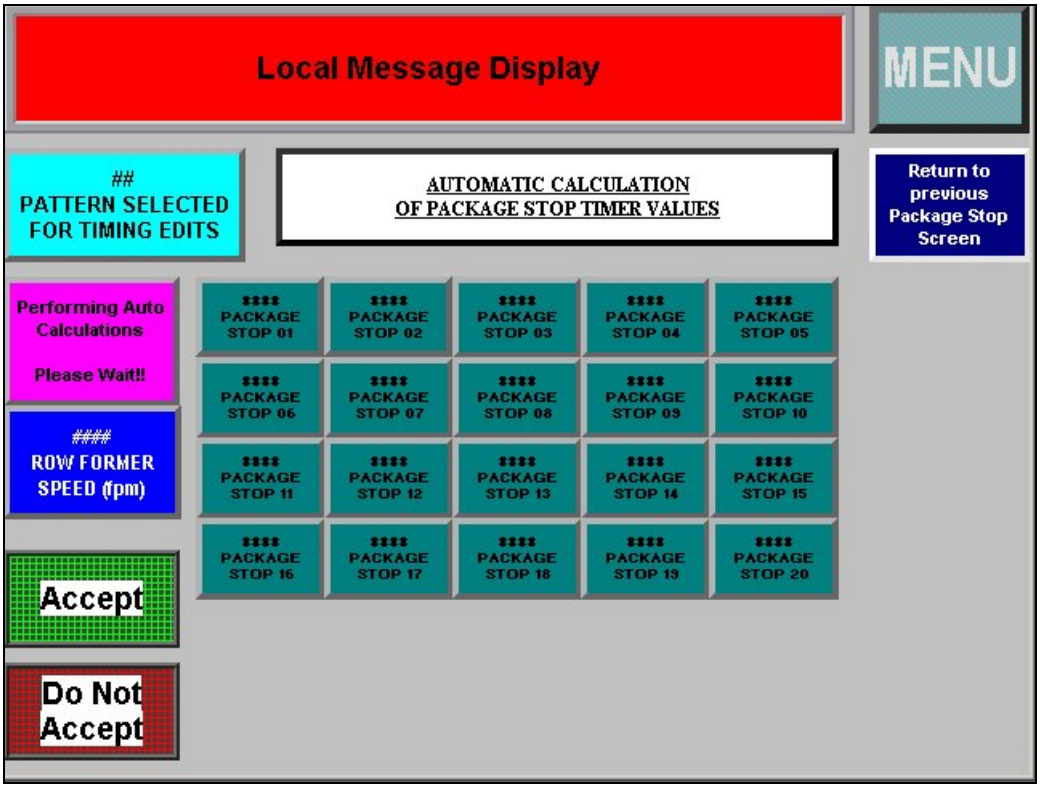

Figure 3-14: Automatic Calculation of Package Stop Timers Screen

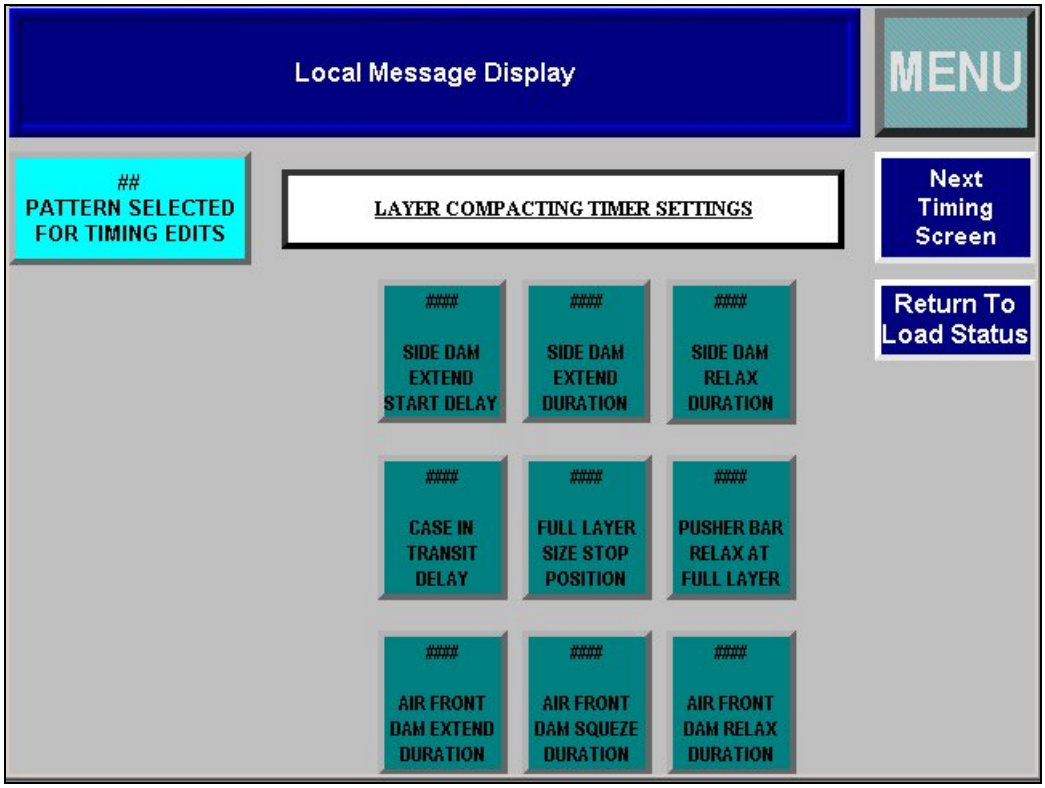

Figure 3-15: Layer Compacting Timers Screen

Table of Contents

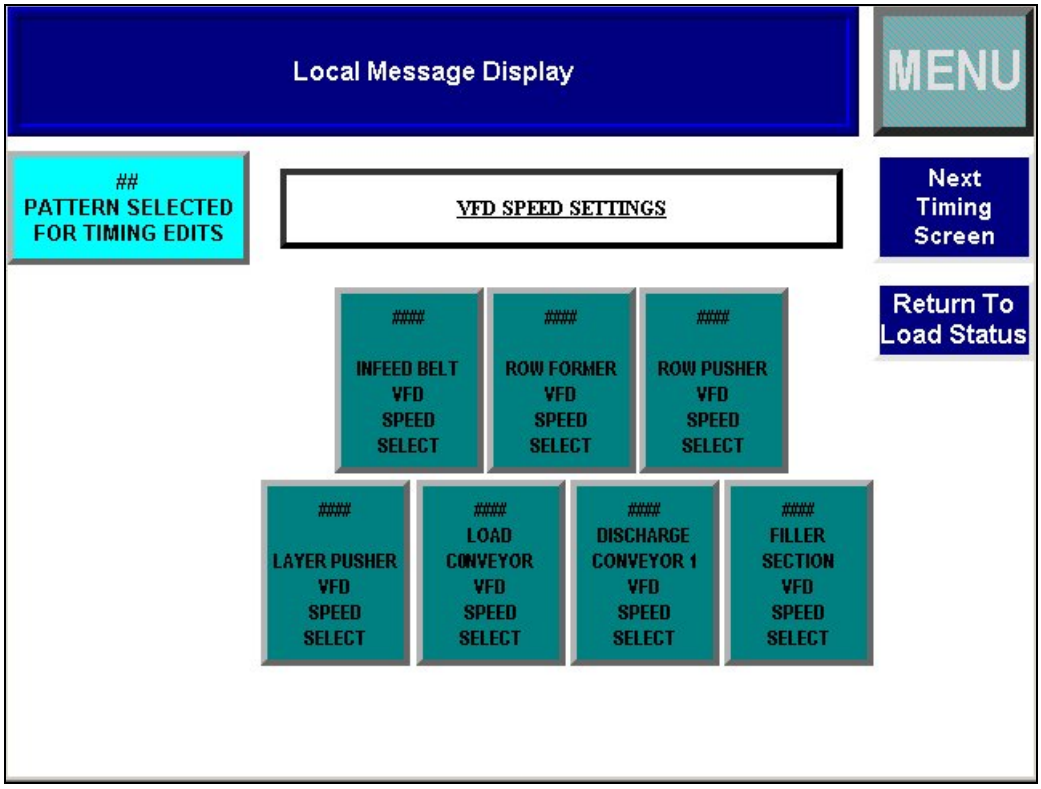

Figure 3-16: Variable Frequency Drive Speed Settings Screen

Table of Contents

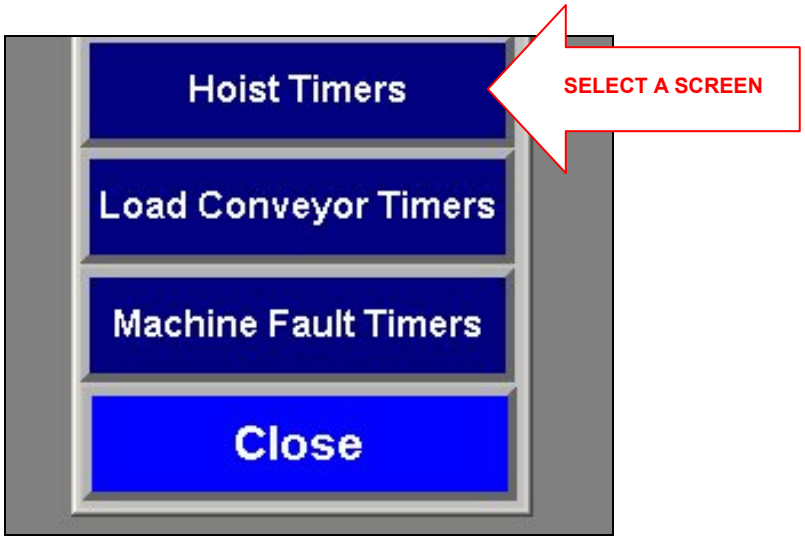

Figure 3-17: Machine Setup Timing Screens Menu

Table of Contents

P. Machine Setup Timing Screens Menu

(Figure 3-17) The Machine Setup Screens Menu can only be opened from the Utility Menu Screen after the correct password has been entered. This drop down menu allows you open other screens where you can change various machine-timing values. Select the screen you want to view and then make changes as necessary.

NOTE: The values displayed on these screens are not pattern dependent. Modifying any of the values on these screens affect the machine operation regardless of the pattern number selected.

HOIST TIMERS	• Changes the screen to the Hoist Timers Screen. (See Figure 3-18)
LOAD CONVEYOR TIMERS	• Changes the screen to the Pallet Infeed and Hoist Table Timers Screen. (See Figure 3-19)
MACHINE FAULT TIMERS	• Changes the screen to the Machine Fault Timers Screen. (See Figure 3-20)
CLOSE	• Closes the Machine Setup Timing Screens Menu.

1. At the screen you selected, touch the button of the field you want to change. The utility keypad screen will appear.
2. Use the numbered keys on the keypad screen to enter the new timer setting for the field.
3. Touch the ENTER key to enter the new value for the field. Touching the ENTER key saves the settings. The new value will appear on the screen.
4. If you want to make other changes, repeat the above procedure for each change or go to back to MACHINE SETUP TIMING MENU screen for additional changes.
5. After the changes have been made, touch the RETURN TO LOAD STATUS key to exit the timing screens.

NOTE: If you go to the Load Status Screen, and thus leave the password-protected screens, you have three minutes to reopen the password-protected screens without re-entering the password.

Table of Contents

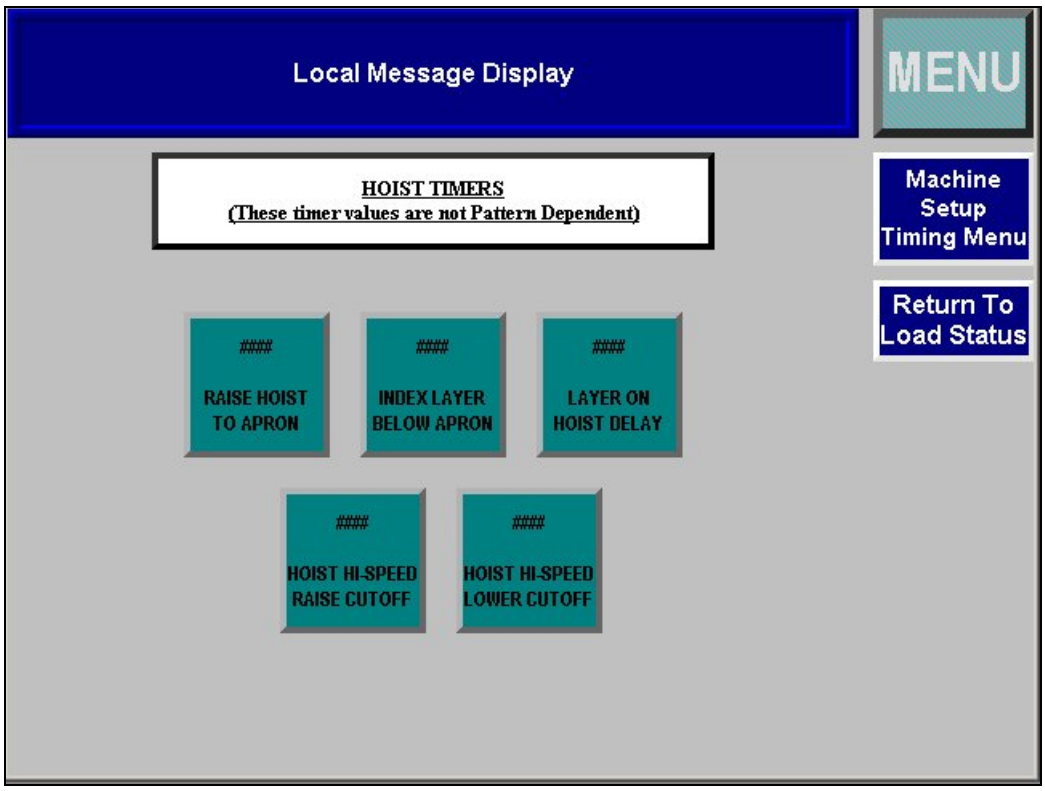

Figure 3-18: Hoist Timers Screen

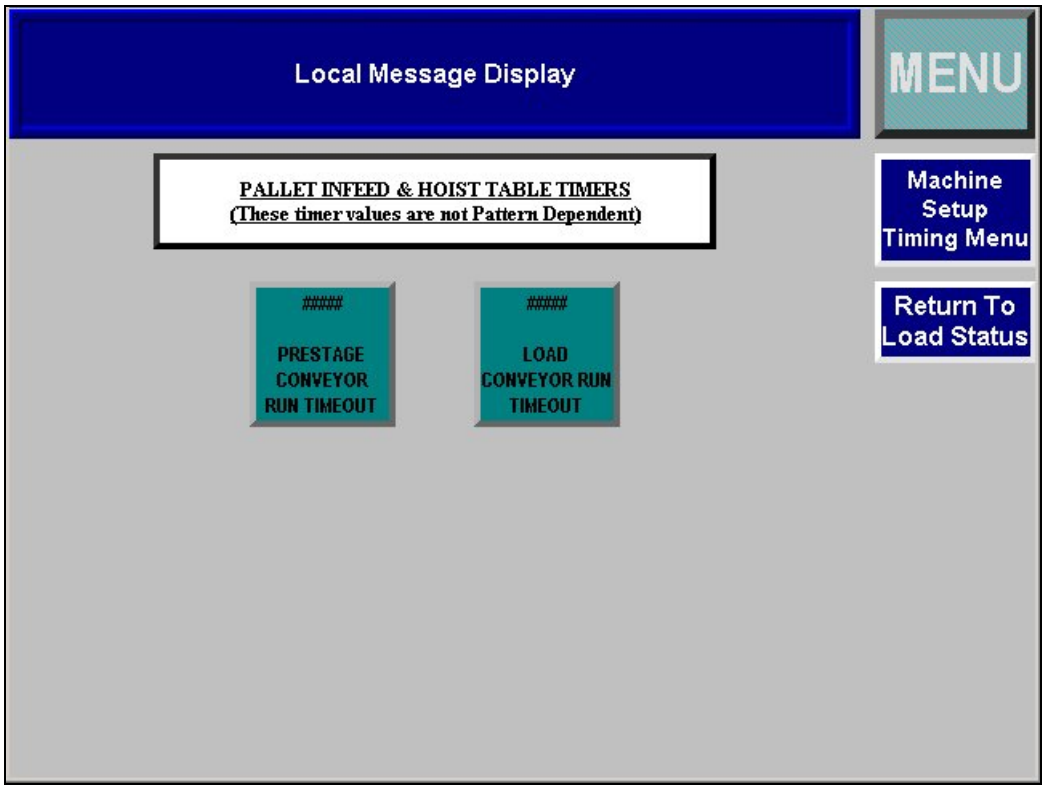

Figure 3-19: Pallet Infeed & Hoist Table Timers Screen

Table of Contents

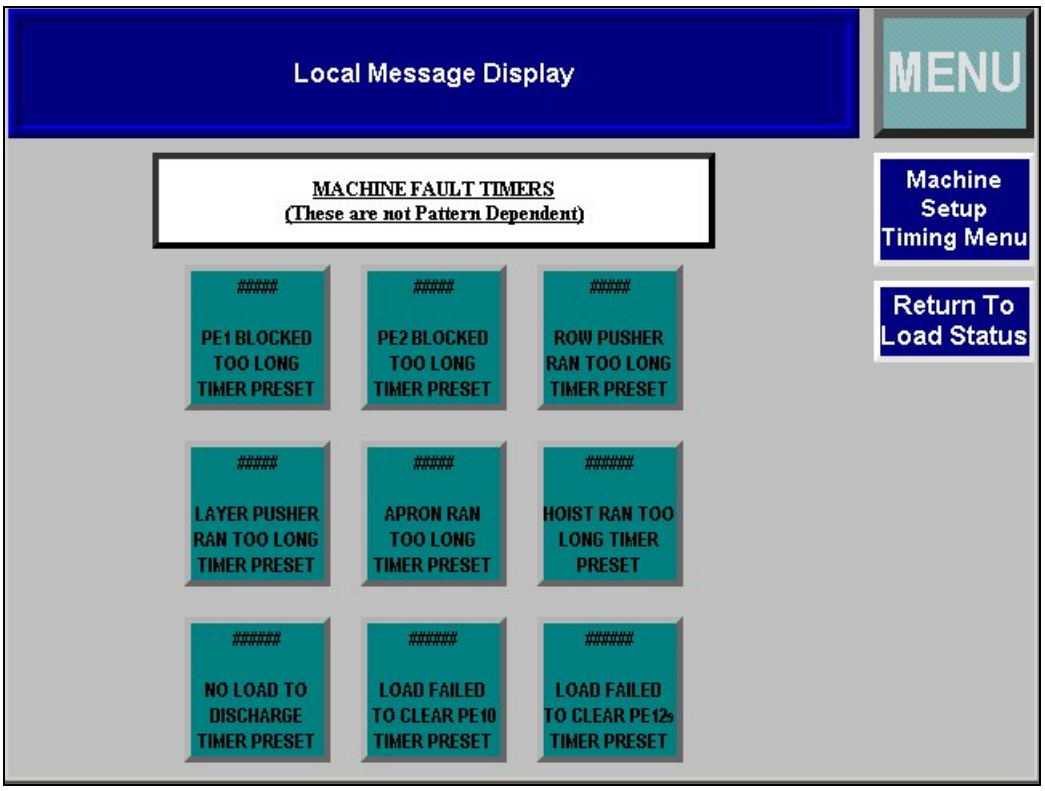

Figure 3-20: Machine Fault Timers Screen

Table of Contents

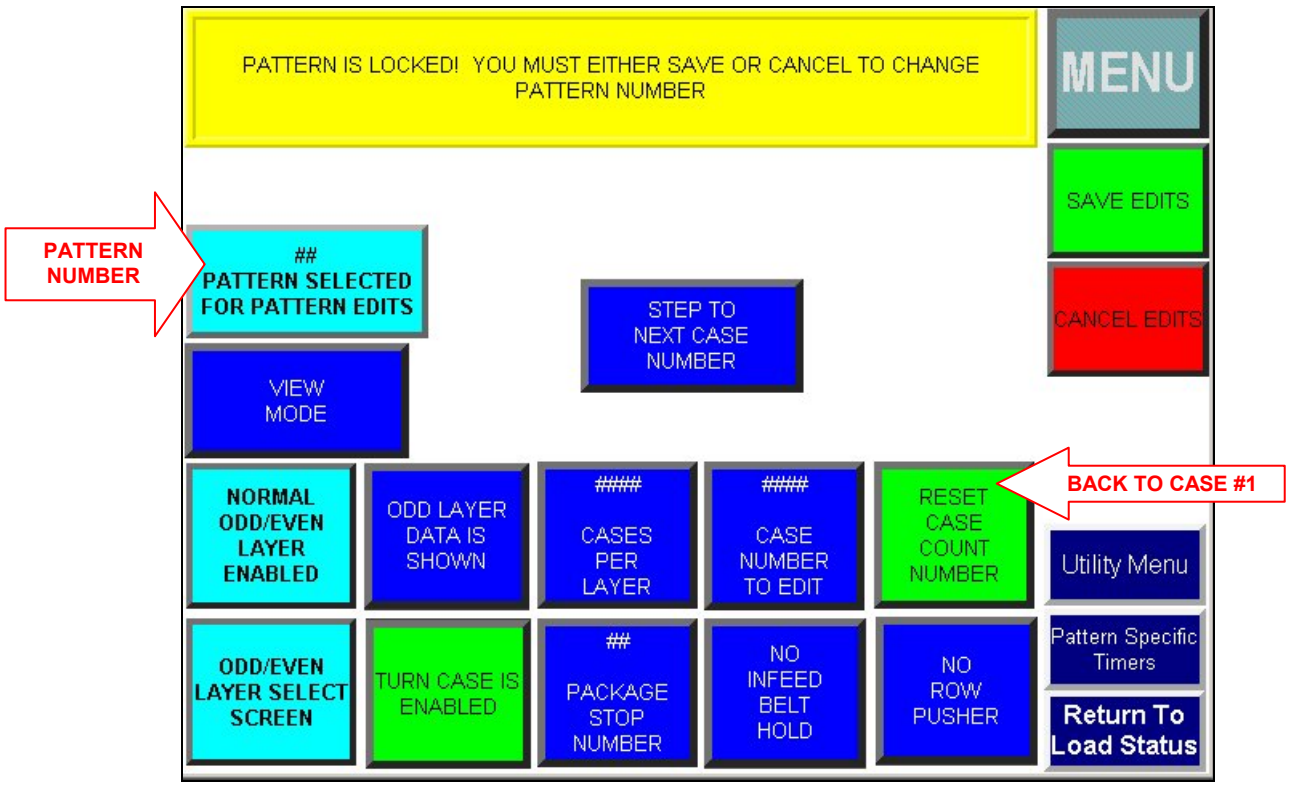

Figure 3-21: Pattern Edit Screen 1

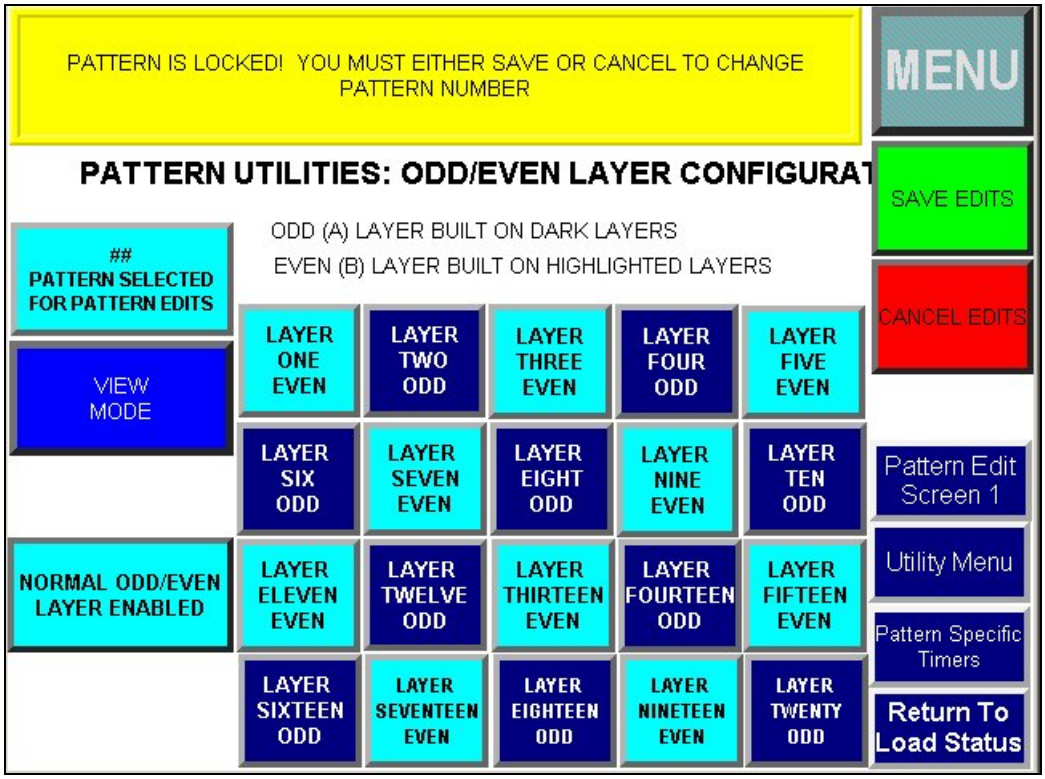

Figure 3-22: Pattern Edit Screen 2

Table of Contents

Q. Pattern Edit Screens 1 & 2

(Figures 3-21 and 3-22) The Pattern Edit Screens allow you to edit an existing case pattern or enter a new pattern into the machine settings. To use the Pattern Edit Screen you first enter the pattern number, in the PATTERN SELECTED FOR EDITS field. The PATTERN SELECTED FOR EDITS shows the current pattern number that is being worked on.

A. Entering a new pattern:

1) Press PATTERN SELECTED FOR EDITS key and enter the pattern number using the Keypad Screen that appears automatically.

NOTE: If a number or value appears on the screen in the CASES PER LAYER value, you know that an existing pattern number was selected. For a new case pattern the CASES PER LAYER value must be zero (0) indicating a new pattern. Check the Pattern Data Sheets Provided with the "Electrical" section of this set of manuals for the Pattern Data Information needed for determining a new pattern number based on existing pattern numbers already in use. Go to a new (the next) number for the new pattern.

2) Toggle the VIEW MODE button to EDIT MODE to enter new data. Data can be made in EDIT mode only. The message window display across the top of the screen reads MUST ENTER CASES PER LAYER.

3) Select the CASES PER LAYER key and enter a valid number (from 1-35) for CASES PER LAYER. Enter the number using the keypad screen that appears automatically, so the new number appears on the screen.

4) Touch STEP TO NEXT CASE NUMBER key between each setting to save the setting into the buffer temporarily. After the STEP TO NEXT CASE NUMBER key is pressed, more edits can be made.

5) The Pattern Edit Screen defaults to the ODD LAYER DATA SHOWN but the odd and even layers can be toggled back and forth. Always start a new pattern with the ODD LAYER first. Enter the settings for both the ODD and EVEN LAYERS following the same procedure for each change.

NOTE: After the last case of a layer, press STEP TO NEXT CASE NUMBER.

6) If a case is to be turned, ENABLE the case turner for that case number if not do not ENABLE that case number. TURN CASE IS ENABLED refers to the CASE NUMBER TO EDIT. Photoelectric sensor PE2 starts the case turning sequence.

Table of Contents

7) Use a tape measure to measure the appropriate length of the layer to determine which package stop to program.

8) Select the PACKAGE STOP NUMBER key and enter a valid number (value 0-20), a zero (0) value removes a stop.

NOTE: Package stops are commonly used where a turned case in a row follows a non-turned case, or partial (or short) rows are being positioned

9) INFEED BELT HOLD and ROW PUSHER settings for the case that is selected are usually the same time delay value. The infeed belt must hold the case back as the row pusher pushes, delaying the case that follows the pusher bar push. STEP TO NEXT CASE NUMBER stores the data to the buffer.

10) The ROW PUSHER, SHORT, MEDIUM, LONG, or NO time delay is based on the distance the case is past photoelectric sensor PE2, and also based on how near the case is to the edge of the sheet. (See illustration on next page)

NOTE: The farther a case travels down the row former the longer the delay time will be.

11) Before selecting SAVE EDITS, step through to make sure that the data is correct for each case of the odd and even layers. Use the STEP TO NEXT CASE NUMBER to do this.

12) The SAVE EDITS key saves the settings in the buffer to the PLC memory and puts you back into VIEW mode.

13) CANCEL EDITS cancels all the data information in the buffer and puts you back into VIEW MODE.

14) After all the changes have been made, touch RETURN TO LOAD STATUS to exit the Pattern Edit Screen.

Table of Contents

Pattern Edit Screens (continued)

Short Delay	Zone 1	Zone 1 is a line to be determined by the length and width of a layer compared to the sheet. Used for short rows consisting of 1 or 2 cases
Medium Delay	Zone 2	Zone 2 is the distance between the end of Zone 1 and the midpoint of the layer.
Long Delay	Zone 3	Zone 3 is the area past the midpoint of the layer to the end of the row former. A single case row at Zone 3 (turned or straight) requires long delay
No Delay	Normal delay	

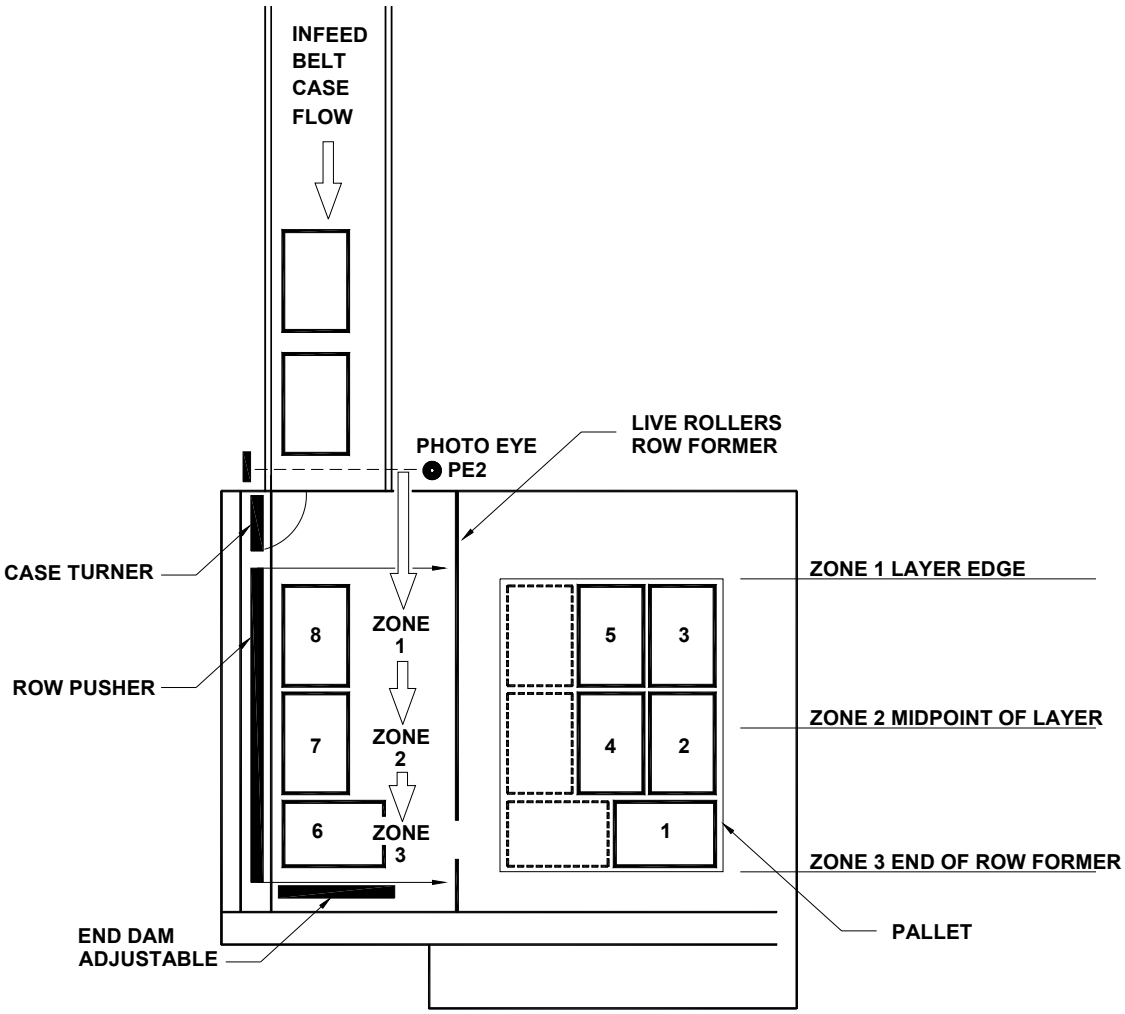

Figure 3-23: Case Positions 1, 2, & 3 Past Photoelectric Sensor PE2

Table of Contents

B. To change the settings for an existing pattern:

1) Touch PATTERN SELECTED FOR TIMING EDITS and the utility keypad screen will appear. Put in the number of the case pattern to edit.
2) Select EDIT MODE.
3) Enter the CASE NUMBER TO EDIT. Use the numbered keys on the utility keypad screen to enter the number.
4) Touch the button below the present value for the field you want to change. You may edit any value on the screen by touching the button of the field you want to change. The utility keypad screen will appear automatically.
5) Use the numbered keys on the keypad screen to enter the new setting for the field.
6) Touch the STEP TO NEXT CASE NUMBER key to enter the new value into the buffer.
7) Touching the SAVE EDITS key saves the settings. The new value will appear on the screen.

NOTE: You must press the STEP TO NEXT CASE NUMBER key to enter the setting into the buffer after each setting including the last setting before pressing the SAVE EDITS key.

8) If you want to make other changes, repeat the above procedure for each change or go to the CANCEL EDITS key to delete the changes.
9) After all the changes have been made, touch the RETURN TO LOAD STATUS key to exit the Pattern Edit Screen.

NOTE: If you go to the Load Status Screen, and thus leave the password-protected screens, you have three minutes to reopen the password-protected screens without re-entering the password.

Table of Contents

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Table of Contents

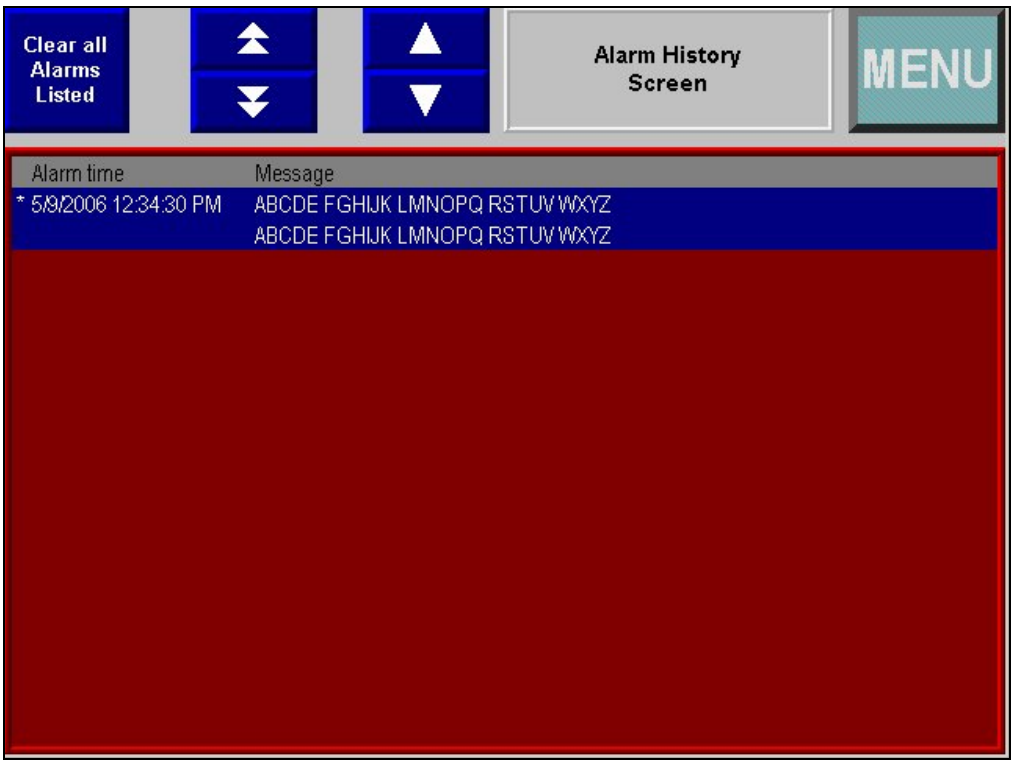

Figure 3-24: Alarm History Screen

Table of Contents

R. Alarm History Screen

(Figure 3-24) The Alarms History Screen displays the alarm history of alarm conditions that have occurred on the machine. The alarm activity is recorded in sequence and provides the time and date of the occurrences. It also displays the time and date the alarm was acknowledged. This information is useful for trouble-shooting machine problems or evaluating the causes of machine downtime.

CLEAR ALL ALARMS LISTED

- Clears the Alarm History Screen.

▲▲ **HOME** ▼▼

- Turns to the start point or the end, of the Alarm History Screen.

▲ **UP / DOWN** ▼

- Turns to the previous or next page of the Alarm History Screen.

MENU

- Displays the Screens Menu.

Table of Contents

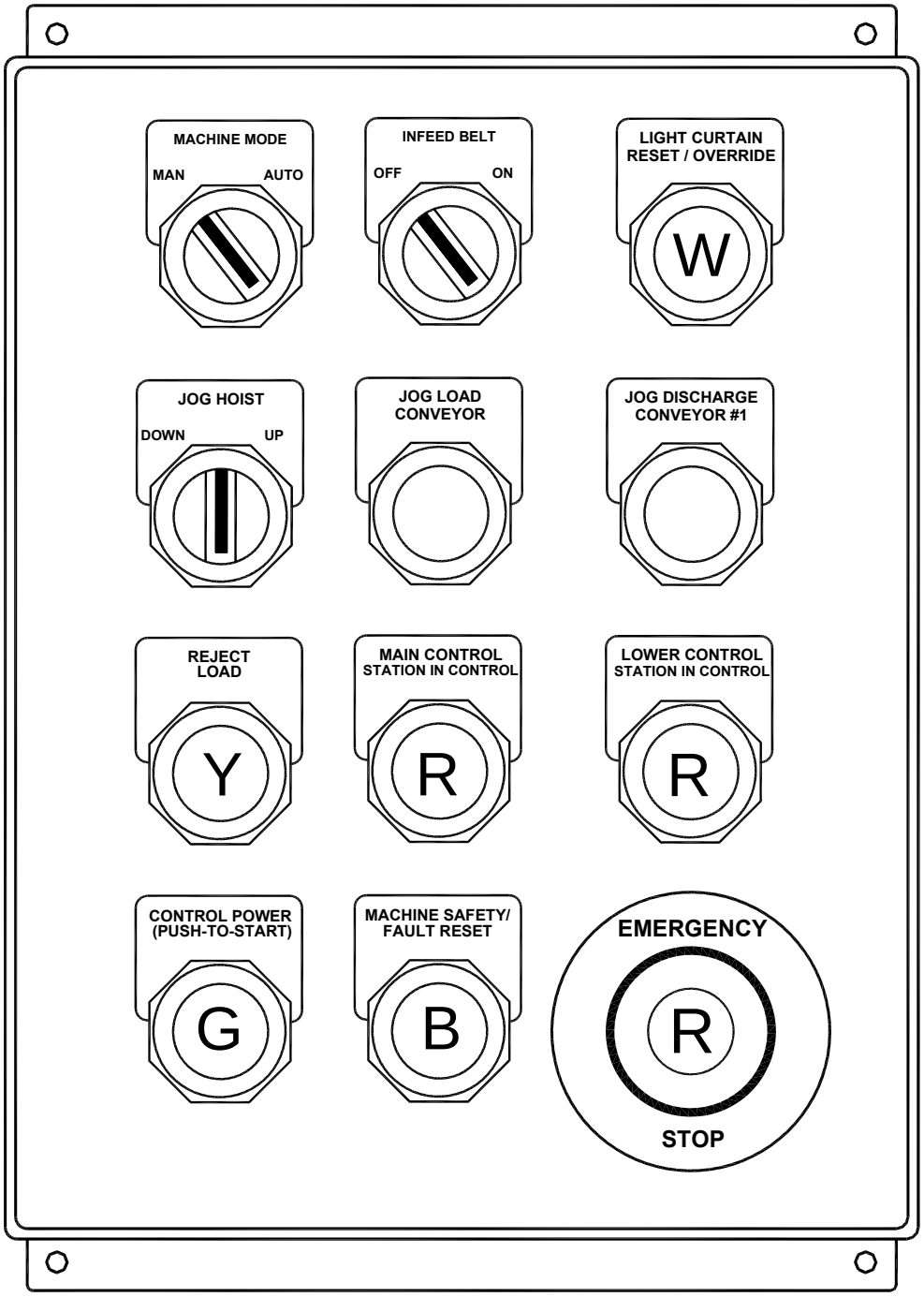

Figure 3-25: Discharge Control Station

Table of Contents

3. *Discharge Control Station*

(Figure 3-25) The Discharge Control Station is located at floor level near the discharge end of the unitizer. The discharge control station has common (interacting) controls for the infeed, hoist, and load handling conveyor. The unitizer must be started before the lower controls become operational.

MACHINE MODE

- **MANUAL** – Allows the machine operator use the manual controls.
- **AUTO** – Automatic mode allows the machine to perform its programmed functions, in sequence, automatically.

INFEED BELT

- **OFF** – Turns the case infeed belts OFF.
- **ON** – Allows the case infeed belts run automatically.

LIGHT CURTAIN RESET / OVERRIDE

- If the light curtain is “faulted”, and blocked by a load, press and hold down this button to re-start the machine and jog the load through the discharge light curtain using manual mode control for the discharge conveyor.

JOG HOIST

- **DOWN** – Allows the machine operator move the hoist down when the switch is held in the DOWN position. The hoist stops its downward motion when the switch is released, or when the load on the hoist is below the apron if photoelectric sensor PE6 was blocked when the switch was turned.
- **UP** – Allows the machine operator move the hoist up when the switch is held in the UP position. The hoist stops its upward motion when the switch is released, or when the load on the hoist blocks photoelectric sensor PE6.

JOG LOAD CONVEYOR

- Jogs the load conveyor forward when the machine is in MANUAL MODE.

JOG DISCHARGE CONVEYOR #1

- Jogs discharge conveyor #1 while the machine is in MANUAL MODE.

Table of Contents

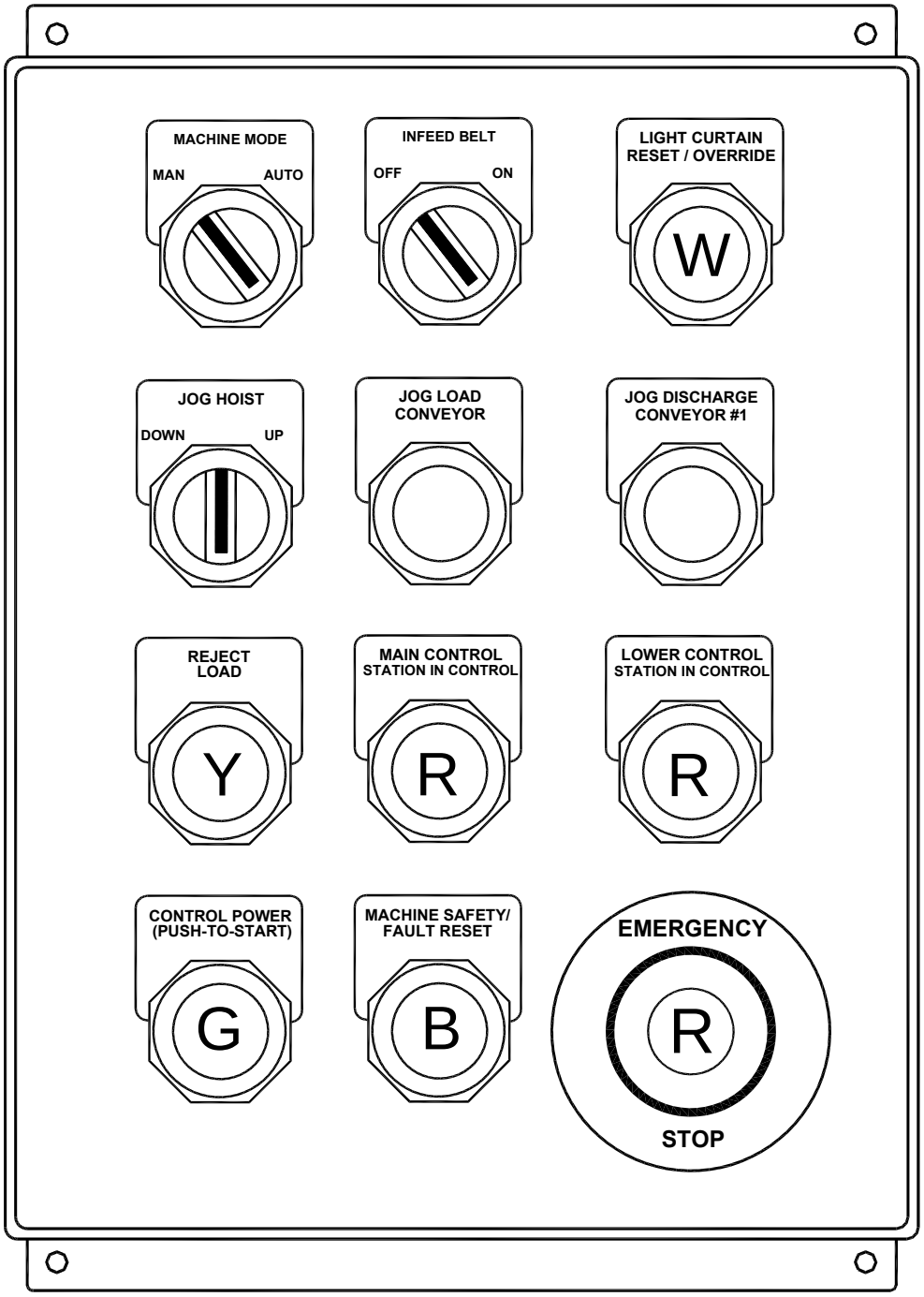

Figure 3-26: Discharge Control Station (continued)

Table of Contents

Discharge Control Station (continued)

REJECT LOAD

- Discharges the product stacked on the hoist. The Layer Forming number automatically adjusts to compensate for the number of layers discharged. As the load discharges, a new sheet moves onto the hoist as required.

MAIN / LOWER CONTROL STATION IN CONTROL

- Two red pilot lights to both MAIN and LOWER control stations. One pilot light is marked MAIN CONTROL STATION IN CONTROL, the other is marked LOWER CONTROL STATION IN CONTROL. Locks out manual controls for the main control station when the lower control station is active and vice a versa. The pilot light for the station that is active will be lit. A station becomes active when the machine is started from that station or the machine is transitioned from AUTO mode to MANUAL mode at that station. If the machine is STOPPED or enters AUTO mode the station active/inhibit logic is unlatched and now either station can become the active station.

CONTROL POWER (PUSH-TO-START)

- The green lighted CONTROL POWER (PUSH-TO-START) button is used to start the machine. Press and hold-in the green start button for approximately 5-seconds, until the master control relay engages. The warning horn will pulsate on and off during the five-second period before the machine starts. The green light stays on indicating that the unitizer power is on.

MACHINE SAFETY/ FAULT RESET

- The MACHINE SAFETY / FAULT RESET button resets any of the safety relays that may have been tripped. This blue button must be pressed before you can start the machine.

EMERGENCY STOP

- When the EMERGENCY STOP button is pressed, the unitizer will shutdown and all other unitizer controls (both AUTOMATIC and MANUAL) will be locked out until the EMERGENCY STOP button is reset and the unitizer is re-started.

Table of Contents

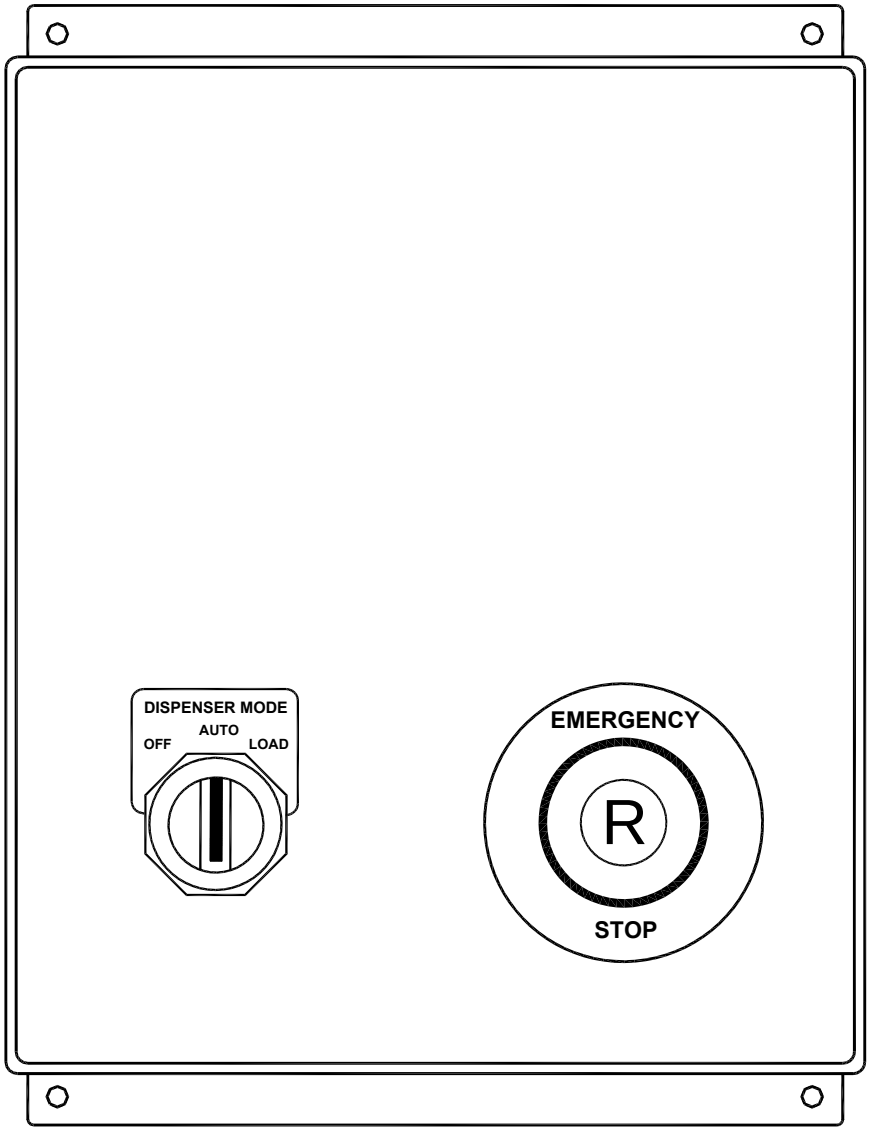

Figure 3-27: Sheet Dispenser Control Station

Table of Contents

4. Sheet Dispenser Control Station

(Figure 3-27) The sheet dispenser control station is located at floor level on the sheet dispenser.

DISPENSER MODE

- Allows the operator select between OFF, AUTO, and LOAD mode.
- **OFF** - Turns the sheet dispenser OFF. The machine will run without calling for a sheet.
- **AUTO** – Allows the sheet dispenser to perform its programmed functions, in sequence, automatically.
- **LOAD** - Takes the sheet dispenser off-line to replenish the sheet supply.

EMERGENCY STOP

- When the red EMERGENCY STOP button is pressed, the unitizer will shutdown and all other unitizer controls (both AUTOMATIC and MANUAL) will be locked out until the EMERGENCY STOP button is reset and the unitizer is re-started.

Table of Contents

5. Discharge Emergency Stop Station

(Figure 3-28) The Discharge Emergency Stop Station is located at floor level at the discharge conveyor on the discharge end of the unitizer.

When the EMERGENCY STOP button is pressed, the unitizer will shutdown and all other unitizer controls (both AUTOMATIC and MANUAL) will be locked out until the EMERGENCY STOP button is reset and the unitizer is re-started.

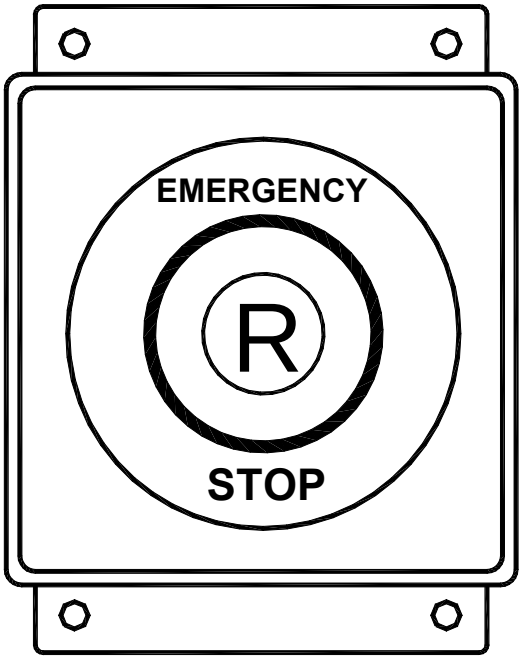

Figure 3-28: Discharge Emergency Stop Station

Table of Contents

6. Routine Operational Procedures

Before starting the unitizer, visually inspect the unitizer and unitizer conveyor areas for damage, wear, and obstructive debris; take corrective action as needed or as specified by your plant procedures. Also, check to assure that the sheet dispenser is full.

A. To Set the Unitizer for Automatic Run:

1. Turn the unitizer main power disconnect switch (located on the outside of the unitizer electrical cabinet) to the ON position.

2. Pull-out on all EMERGENCY STOP switches on all unitizer control stations (all safety eyes must be clear).

3. Press the blue MACHINE SAFETY / FAULT RESET button to reset any of the safety relays that may have been tripped.

THE UNITIZER CAN CAUSE DEATH OR SERIOUS INJURY IN A VARIETY OF WAYS, BE CERTAIN EVERYONE IS OUTSIDE THE UNITIZER SAFETY GUARDS BEFORE YOU START THE UNITIZER.

4. Press and hold-in the green CONTROL POWER (PUSH-TO-START) button for approximately 5-seconds, until the master control relay engages. The warning horn will pulsate on and off during the five-second period before the machine starts. When the machine is operable, the touch-screen MACHINE MODE display will read MANUAL MODE, and the green start button light stays on.

5. Check the Load Status Screen for the correct pattern, layer, and case settings, and make changes as needed.

   NOTE: Case and Layer counts should equal zero. If not, reset the counters to zero.

6. Check the hoist to see if a sheet is in place. If not, release a sheet from the sheet dispenser using the manual controls.

7. Switch the MACHINE MODE to AUTO MODE.

8. Switch the INFEED to ON.

Table of Contents

B. To Change Case Patterns:

After the last case of the current product run has cleared the unitizer:

1. Turn the MACHINE MODE to MANUAL MODE, and use the LOAD STATUS display screen to select the changes needed.
2. At the Load Status Screen, press PATTERN NUMBER.
3. At the Keypad Screen, select the new pattern number. Use the keypad on the screen to select the pattern number and then press ENTER to save the new setting.
4. Check the hoist to ensure a sheet is in place. If not, dispense a sheet from the sheet dispenser using the manual controls.
5. Switch the MACHINE MODE to AUTO MODE.
6. Switch the INFEED to ON.

C. If Product in Machine is Defective, or After Last Case of a Product Run:

1. Turn the INFEED to OFF.
2. With the machine in AUTO mode, press the CLEAR MACHINE button.
3. Wait for the product to clear from the unitizer, the load to discharge, and the hoist to rise to receive a new layer from the apron. The case and layer counters will automatically reset to zero.
4. Change the machine mode to MANUAL mode.
5. Go to the Load Status Screen.
6. Select the appropriate pattern; layer size, etc. using the Load Status Keypad Screen.
7. Return the machine to AUTO mode.
8. Turn the INFEED to ON, and resume normal operation.

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Table of Contents

Contents

Table of Contents

List Of Figures

Table of Contents

1. For Your Safety

Follow all safety codes and “Lockout” and “Tagout” procedures before adjusting the machine. All instructions in this section are intended to assist and provide qualified individuals with maintenance directions for the model A-880 series palletizer or unitizer (hereafter generally referred to as the “machine”). Only authorized and properly trained personnel may service the machine.

Review the following instructions carefully before attempting to perform maintenance on the system.

A. Safety Codes & Standards

Alvey palletizers and unitizers are designed and manufactured to comply with the “Safety Standard for Conveyors and Related Equipment” (ASME B20.1) and ANSI / PMMI B155.1 Packaging Related Converting Machinery-Safety Requirements for Construction, Care, and Use, and B15.1 Safety Standard for Mechanical Power Transmission Apparatus.

The Purchaser (User) shall be familiar with and responsible for compliance with all codes and regulations having jurisdiction regarding the installation, use, and maintenance of this equipment. Appropriate Lockout/Tagout policy and procedures shall comply with the Code of Federal Regulations, 29 CFR 1910.147 and the minimum safety requirements outlined in the current publication of the American National Standard Institute's “Lockout/Tagout of Energy Sources” (ANSI Z244.1). All electrical components and panels have a potential electrical Arc Flash hazard. Appropriate Personal Protective Equipment (PPE) is required. Refer to NFPA 70E for more information.

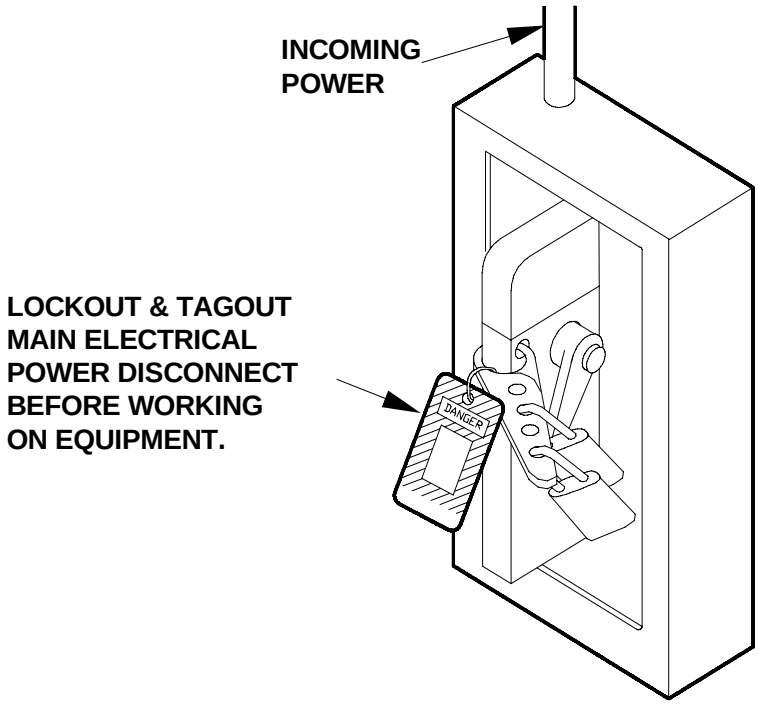


Figure 4-1: Lockout & Tagout

B. Service & Maintenance Safety Precautions

⚠WARNING

Do not circumvent or modify any safety features provided on this equipment. Any attempt to do so could result in injury to personnel and/or damage to the machine.

⚠WARNING

Turning control switches to the OFF position does not remove all hazards. Electrical power can still exist on the line, and air pressure in the pneumatic system can still be present.

⚠WARNING

Pneumatic system, air pressure is NOT removed when the machine is turned off. Always turn OFF the main air supply, and bleed the air pressure from any pneumatic system before working on it. Shut off the air pressure to the machine by closing the valves on the main air supply line. Use the lockable air dump valves provided, to bleed the air pressure. (See Figure 4-2)

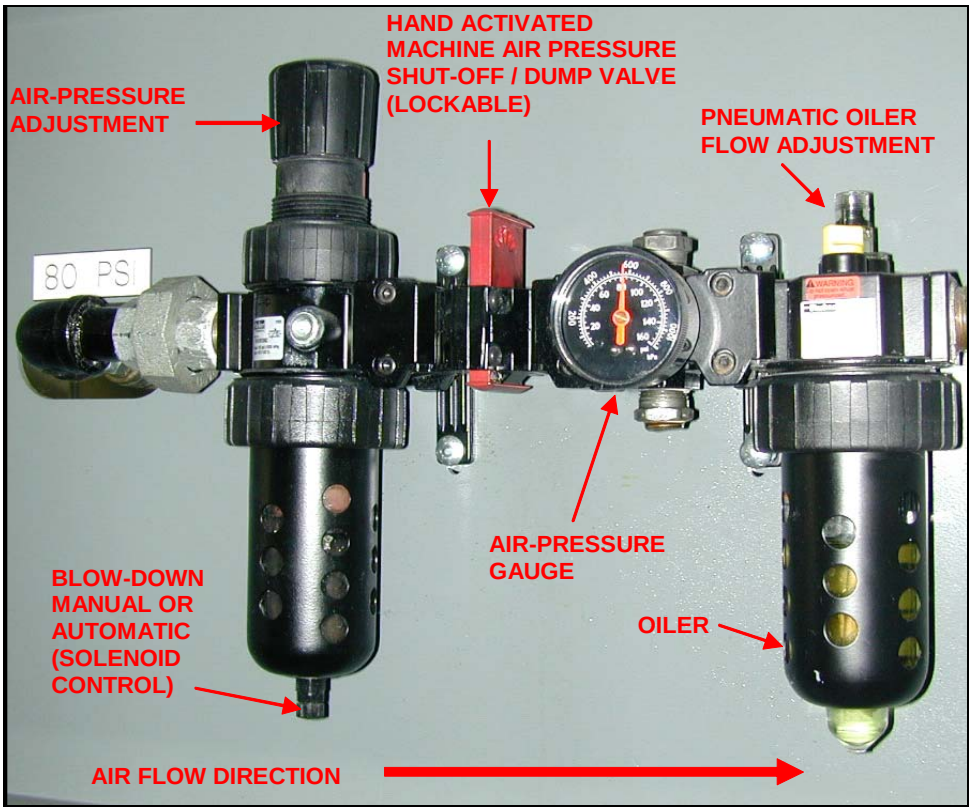


Figure 4-2: Main Air Supply

Service & Maintenance Safety Precautions (continued)

1. Only authorized and properly trained personnel may service the machine.
2. Turn off all electrical power sources including the main power disconnect switch, and perform your company's Lockout/Tagout safety procedures for safe working conditions before beginning any maintenance or repairs. (See Figure 4-1).
3. Do not attempt to clear jams or reach into the machine when the machine is running. Press the EMERGENCY STOP switch and perform your company's Lockout/Tagout safety procedures.
4. Do not climb on, walk, ride, or cross over or under the machine except where suitable catwalks, gates or bridges are provided for personnel travel before pressing the EMERGENCY STOP switch and performing your company's Lockout/Tagout safety procedures.
5. When it is necessary to work in the general area of the hoist, first lower the hoist to its home position (fully down position) or block the hoist to prevent it from lowering.
6. Use extreme caution near moving parts to avoid a hazard of hands, hair, jewelry, or clothing from being caught in moving parts. Always be alert to automatic operations of adjacent equipment.
7. Before restarting and testing the machine, remove all tools and other material from within the machine.
8. Verify that no persons are in a position to be injured as a result of the machine start-up.
9. Replace all safety guards and/or covers removed from the machine for maintenance, before operating the machine.

⚠WARNING

Always replace the safety guards which cover the sprocket drives immediately after making adjustments. Failure to do so could result in accidental contact by personnel to exposed moving parts that can cause severe injury.

10. Remember that when operating the machine in Manual Mode, most of the operational interlocks are bypassed; therefore Manual Mode operation makes it possible to crush cases and/or damage the machine.
11. Observe all safety warnings, signs, labels, and notices, lights and alarms associated with or on this equipment and in this manual when performing operation and/or maintenance.
12. All safety devices, warning lights, and alarms associated with the system should be tested monthly for proper operation and serviced as needed.

Table of Contents

2. General Maintenance Information

A. Introduction

All newly installed equipment should be frequently inspected and serviced as needed during the first few months of operation. After that, an appropriate maintenance program or schedule should be established and followed. Recommended service includes cleaning, lubrication, checking the pneumatic system, and checking the electrical components. Maintenance should be routinely performed in accordance with a checklist and recorded in a Service Record Logbook for future reference. Refer to the Daily, Weekly, Monthly, Semi-Annual, and Annual maintenance schedules provided at the rear of this section.

B. Service Record Logbook

A service record logbook should be kept, detailing the work done on the machine, the date and time, and the name of the person who did the work. Separate logbooks should be kept for each machine. Maintaining separate service logbooks on each type of equipment is especially recommended for plants operating more than one shift. Dates, detailed inspection and service information and name or initials of person(s) performing the equipment inspection or service should be shown on each log sheet for future reference. When malfunctions occur, the log will show corrective action that was taken as well as any other pertinent information.

The suggested time periods and inspection items listed in the Maintenance Program schedules at the rear of this section are intended as a guide for equipment operating on a forty-hour per week schedule. The schedules should be modified to satisfy individual facility conditions, such as extended periods of operation.

C. Daily Inspection

A visual inspection of the machine and its infeed and discharge conveyors should be made daily. General walk-through inspections of the equipment (listening for unusual noises and carefully observing the system) during daily plant operation are recommended. Check for product spills such as glue, wax, or sticky substances that can build-up on rollers, causing the case patterns to form incorrectly. Check for broken pallets or pallet pieces in the machine. Also, check for dust build-up on photo eyes, proximity switches, and proper alignment of all photo eyes. Excessive fiber or dust build-up can make maintenance difficult.

For continuous-duty applications, inspections should be conducted once each shift. Equipment safety guards, warning signs, lights and alarms associated with the operation of the machine system should be frequently checked and kept in good condition to ensure the safety of all plant personnel. Any unusual noise, oil leaks and operational problems should be immediately reported and promptly corrected.

Table of Contents

D. Cleaning the Machine

To ensure the maximum operating efficiency, excessive dirt accumulation on the machine should be avoided. When cleaning the machine, avoid using extra-strength-cleaning products that can remove paint or the printing on the safety labels on the machine. Use mild soap, diluted with water when washing the machine.

CAUTION

Do not hose down the machine. Direct water splashes can damage the electrical components.

Some chain tracks and idler wheels are made of “Duro-Glide UHMW-PE.” (Ultra High Molecular Weight Polyethylene) plastic. Air hoses are also made of polyethylene. Polyethylene components should not be exposed to continuous sunlight or aromatic hydrocarbons such as Carbon Bisulfide, Carbon Tetrachloride, or Ethylene Dichloride.

In case of a chemical spill, follow the safety guidelines specified by your company. Take all steps necessary to prevent personal injury first.

After a chemical clean up; check air hoses, plastic idlers, row former V-groove bearings, and plastic chain guides for damage or melting

Cleaning Procedures

- The frequency of use of the following procedures will be dependent on the environment in which the machine resides, the type of product being handled by the unit, and the amount of shutdown time allowed for cleaning the machine. It is recommended that the machine be cleaned thoroughly at least once a week if it can’t be done in a shorter time frame.
- For cleaning carton dust and debris from the machine, the use of dry pressurized air is recommended. If regulations require that the air quality be above a set standard as far as particulate matter in the air, then high pressure air could not be used. You may be able to use low-pressure air and keep the particulate level down to an acceptable level. This method should be used on the Infeed, Case Turning Area, Live Rollers, Apron Area, and all Pallet and or Sheet Handling Areas.
- For cleaning dirt, grime, grease or oil from the rollers on the machine, both coated and uncoated, the use of a mild detergent and water or a cleaner such as 401™ or Fantastic™ could be used. For a buildup of Ink or Lithograph Ink on the rollers it is recommended to use either a mixture of any name brand wax stripper half and half with water, or a citrus base cleaner concentrate such as Orange Clean, or equivalent. Soak the rollers with either of the above solutions and let set for 5 to 10 minutes then wipe clean making sure to remove all residue. After cleaning, if the rollers are still damp, run the machine without product for a period of time sufficient to allow drying.

Table of Contents

- To clean Photo Eyes and Reflectors it is recommended to use a very soft damp cloth so as not to scratch the surfaces.
- To clean Side Dams and Apron Plates. Use the same solutions as recommended for rollers.
- To clean under the machine you can use a water hose to wash the floor down but be cautious and do not splash water up into the machine where it could get into any Electrical Panels or Junction Boxes, or on any Photo Eyes or Motors.

E. Safety Labels

Safety labels are attached to the machine to warn all personnel of hazards. Warning signs and safety labels posted on or near the equipment shall not be removed painted over or altered. If any safety labels are missing, defective or damaged, new labels will be provided to you for no charge. See Section 1, “Machine Safety Signs” of this manual for part numbers when ordering new safety labels.

Table of Contents

F. Parts Replacement

Do not attempt to repair or replace any equipment component without appropriate replacement parts. To reduce production downtime, selected spare parts should be stocked for replacement of worn components when required. Refer to the parts listings in Volume II, of this set of manuals for the description and location of component parts. Refer to the equipment bills-of-materials where quantity requirements or code numbers are not indicated on the parts list.

If you need information or support, call our Customer Service and Support (CSS) toll-free "Hot Line" at **1-800-535-2555.** This number lets you discuss issues directly with a qualified customer service engineer. You can contact us at:

- **Intelligrated, St. Louis Operations Center**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2400**
- **Web site: http://www.intelligrated.com**

Call our parts line at 1-800-535-2555 for prices and availability.

When you call us, have your machine serial number, to expedite assistance. The serial number is located on the serial plate on the electrical panel door.

Table of Contents

G. Lubrication

1. General Information

When the machine is shipped from the factory, it has been thoroughly lubricated. Frequently there is a delay between the time that the machine is received from our factory, and the time it is placed into operation. If this interval is very long, some of the lubricant can become contaminated with dirt or may drain away from the surfaces where protection is intended. This is particularly true with respect to chains. It is therefore recommended that the entire machine be lubricated again before placing it in service.

Due to the high speeds and intermittent motions involved in machine operations, it is important that the machine be adequately lubricated. This does not mean that excessive amounts of oil or grease should be used, but rather a smaller amount should be applied more often. This is particularly true for the chains that drive the pusher bar and the chain conveyors. An additional requirement with regard to gear motors and speed reducers is the periodic need to be completely drained and flushed so that any sediment can be removed from the gear housing. Furthermore, while some additional oil can satisfactorily be added to these units, the recommended lubricants contain an additive for extreme pressure applications and should not be overly diluted by old oil. Refer to the “Vendor Data” section in Volume II of this set of manuals for additional information on lubrication and maintenance of gear motors and speed reducers.

2. Excessive Lubrication

Make a visual inspection of the areas about to be lubricated to check for excessive grease build-up or excessive oil drippings. Excess grease or oil can attract contaminants and abrasives; like dirt, dust, and other particles, to the working mechanisms. If a build-up of lubricants is occurring, do the following:

a) Wipe off the excess grease or oil.

b) Do not lubricate areas of the machine where excess lubrication was discovered.

c) Record on the maintenance schedule, which areas were lubricated and which areas were skipped due to excess lubrication.

Table of Contents

3. Lubrication Specifications

Applications	Characteristics	Recommendations
Ball Bearings (1) Roller Bearings (1)	NLGI #2 (Consistency Grease or Equivalent.)	Lubriplate 630-RR, 630-2
Remote Lubrication System	NLGI #0 (Consistency Grease or Equivalent.)	Lubriplate 630-AAA
Chains	Viscosity at 100°F 220 SSU (SAE-20)	Lubriplate #2 or Equivalent
Air Chains		
Light-Duty Bearings		
Speed Reducers: - Winsmith™ (2) (3) - Tigear™ (2)	N/A	Mobil - SHC-629 Mobil - SHC-634
Hydraulic System	Viscosity at 100°F 300 SSU Viscosity Index 95 or Above Anti-Wear/Oxidation Stability (SAE-20)	Mobil - DTE-26 or Equivalent
Pneumatic System Lubricator	Viscosity at 100°F 220 SSU (SAE-10)	Lubriplate #2 or Equivalent

(1) The pillow and flange mount bearings are lubricated for life. These bearings do not need additional lubrication.

(2) The right angle reducers are sealed for life. “Do not” fill these reducers unless a major overhaul was performed.

(3) The Winsmith™ gear motors are not sealed for life. These gear motors must be checked periodically for proper oil level. Refer to “Vendor Data” in Volume II, of this set of manuals, for additional information about lubrication and maintenance of gear motors and speed reducers.

Table of Contents

4. Air Lubricator

The air devices used on this machine require little or no lubrication. The air lubricator should be adjusted to dispense one drop every five minutes. Ensure the air lubricator is filled with oil, to ¼" of the top. Use high quality SAE. #10 oil.

5. Lubrication Schedule

The lubrication schedule that follows is based on average operating conditions for continuous (twenty-four hour) service. If production requirements are not this stringent, or conversely, or if the machine is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

- **Daily:** Check the hydraulic oil level in the reservoir. (Optional) Check the air lines lubricator.
- **Weekly:** Oil all chains.
- **Monthly:** Check and fill all gear motors and chain hoist speed reducers.

NOTE: Tigear ™ speed reducers are sealed for life. Do not fill these reducers unless a major overhaul was performed.

H. Rollers & Bearings

Chain driven rollers have factory- welded sprockets, grease-packed bearings, and spring-loaded axles. Filler rollers, if used, are identical to the chain driven rollers except sprockets and roller length. Periodic cleaning of roller tubes and sprockets is recommended.

NOTE: Use appropriate safety precautions and make certain that cleaning solvent (soapy water, kerosene, etc.) does not come in contact with the roller bearings.

Roller bearings are non-relubricatable, factory-greased press-fit bearings. If a bearing is (becomes) defective, both bearings should be replaced when using an arbor press or suitable tools. Field replacement should be done in as clean an environment as possible to prevent contamination of new bearings. DO NOT APPLY FORCE AT ANY TIME TO THE INNER BEARING RACE OR HAMMER DIRECTLY ON BEARING SHELL.

Table of Contents

To Replace Bearings:

1. Press or strike the end of the roller shaft firmly to pop out defective bearing (see below). Repeat at the opposite end to remove other bearing.
2. Inspect roller tube, shaft, and spring; clean or replace as required. The inner bore should be dry and free of dirt or other contamination. Tube ends should be checked for proper interference fit (.003” to .008” typical), parallel with each other and perpendicular to the roller shaft. Replace if bent or damaged.
3. Assemble roller components and install new bearings applying uniform pressure to the outboard side of the bearing. The bearing flange should seat squarely and solidly on the tube end.

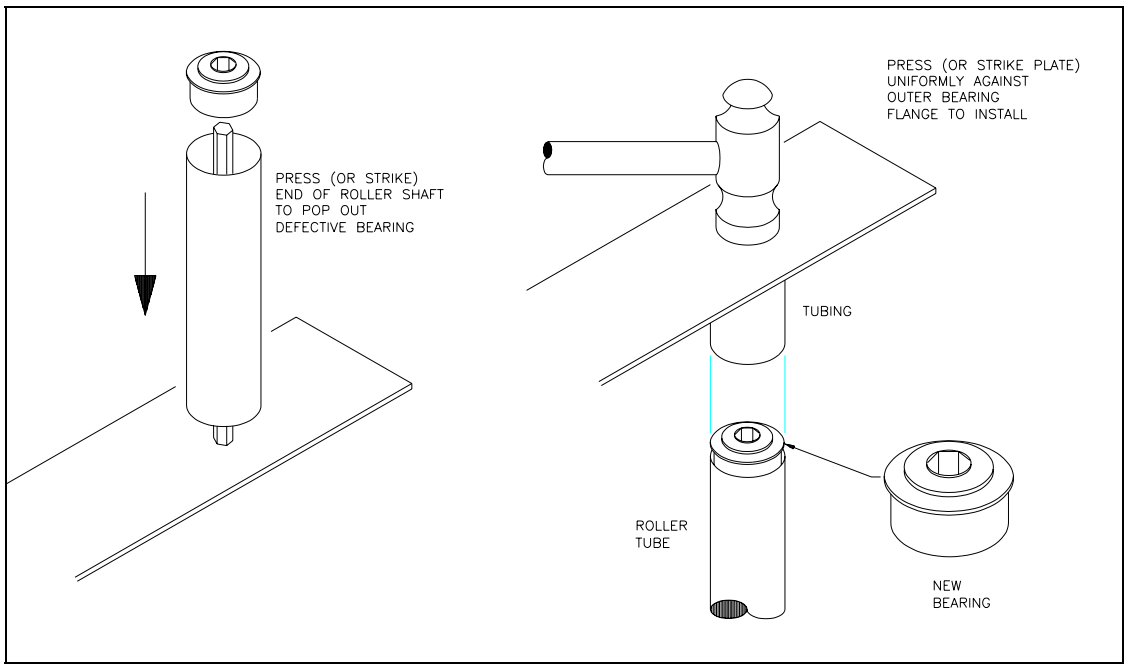


Table of Contents

I. Chain & Sprockets

Proper chain tension is essential for even wear and to avoid damage to both the sprocket and the chain. If the chain is too tight, excessive loads are placed on the bearings. If they are too loose, load shock can cause irregular speed and abnormal wear.

To measure chain tension:

1. Tighten one side of the chain strand so that the excess accumulates on the other side.
2. Use a straight edge and a scale to measure the amount of chain deflection.
3. Keep a record of the sag to determine the amount of chain elongation.

NOTE: Check new chain shortly after placing it in service. The new chains are prone to elongate. For drives that are horizontal or inclined, chain sag should be about 2 percent of the length of the tangent distance between the sprocket centers. For vertical drives, or drives that are subject to unusual loads, rotation reversals, intermittent motions, or dynamic braking, the chain should be almost taut.

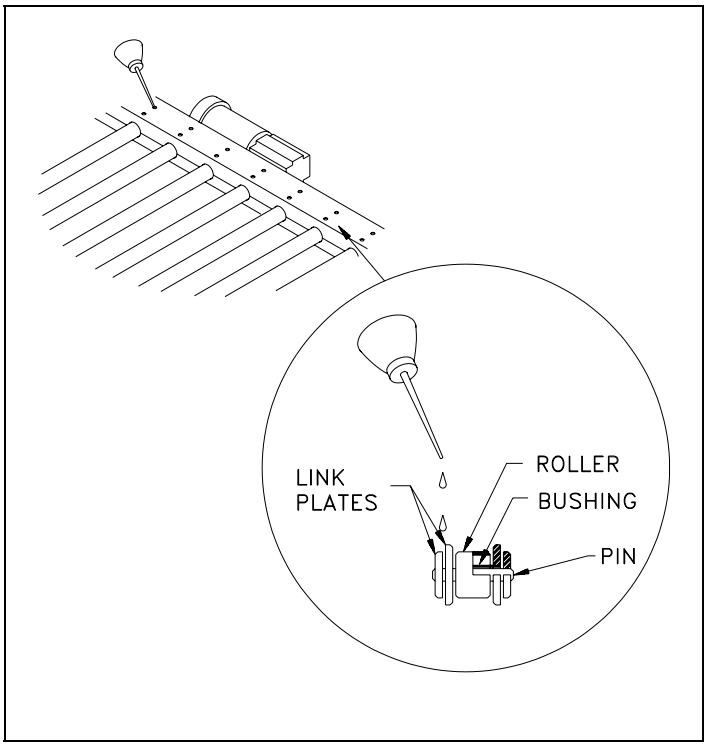
Every 120 hours: lightly lubricate chain between link plates with the appropriate grade of clean, petroleum base oil. Use SAE-10W oil (below -20°F), SAE-20W oil (-20° to 40°F), SAE-30W oil (+40° to +100°F), SAE-40W oil (+100°F to +120°F), SAE-50W oil (over +120°F). With the machine or conveyor locked out, lubricate roller chain with a few drops of oil at each link using a spot can or brush. Remove dirt and dried oil from chain and sprockets as needed with kerosene soaked rag.

- Evidence of good lubrication: chain link pins appear brightly polished.
- Evidence of poor lubrication: chain link pins are rusted, grooved or galled, and pin/bushing joints are discolored (brown, rust red or black).

Every 500 hours: inspect sprockets for worn or broken teeth (poor alignment) and inspect chain joints for discoloration, galling or damaged links (poor lubrication). Check sprocket alignment with a straightedge to ensure sprockets are aligned in the same vertical plane. Check chain tension; maximum chain slack or sag should be about 2 percent of the distance between sprocket centers. Replace sprockets that have broken or worn teeth. The complete roller assembly must be replaced when welded roller sprockets are worn or defective.

Table of Contents

Some chain drive conveyors have lubrication holes provided on the top roller guard. With the conveyor running, lubricate roller chain with a few drops of oil at holes provided on top roller guard. This can be done with the conveyor running. If holes are not provided, you must lockout the conveyor and remove the drive guard before lubricating.



J. Sprocket Alignment

WARNING

Replace the safety guards which cover the sprocket drives immediately after making adjustments.

Verify the alignment of sprockets using a straight edge across the face of the sprockets. Correctly aligned sprockets must be in the same plane. It is generally a good practice to align sprockets as close to the shaft bearings as possible. Be sure to tighten all set screws when the alignment is correct.

NOTE: The Pusher Bars and Apron drive sprockets are match keyed in pairs. If they are not keyed properly, the devices will not be aligned correctly, and the sprockets will have to be re-keyed or replaced.

Table of Contents

K. Shaft Alignment

All shafts must be parallel and horizontal in relation to each other. This does not mean that they have to lie in the same horizontal plane, the plane can be inclined, but the shaft ends cannot be axially inclined to each other.

CAUTION

If the shafts are inclined, or are not parallel, the result will be abnormal wear on the chain and on the sprocket teeth.

1. First, check to see that the shafts are level using a carpenter or machinist level.
2. Then, check the parallelism by measuring between the shafts in three different planes, or by measuring diagonally between the shaft ends. There should be no more than 1/8-in. difference in the measurements.

L. Pneumatic Adjustments

The main system air pressure regulator should be initially set at 80-psig and adjusted to suit the machine requirements.

At various points in the pneumatic system, there are adjustable flow controls to control the speed of air operated devices. The speeds of devices will increase as the device wears, and the flow controls should be adjusted to prevent too much speed, which results in abrupt stops. If the air devices slow down, the flow controls could be clogged.

Table of Contents

3. Infeed/Spacer Belt Case Conveyor

A. Description

The exact arrangement of the infeed case conveyor system can vary from one machine to another. The infeed/spacer belt conveyor is either a two (2) or three (3) section belt conveyor depending on your particular machine. (See Figure 4-3) While length and type will vary with each machine and factory layout, the infeed/spacer belt performs the same basic functions:

1. To regulate the flow of cases into the machine.
2. To create a space between cases as they move onto the live rollers which allows the cases to be counted. The spacing process occurs when cases on the longer, slower section called the Metering Belt reach the faster section of the belt, called the Spacer Belt. (See Figure 4-3)

B. Infeed Belt Speeds

The metering belt carries a case at about one-third (1/3) of the speed of the stop/spacer belt. When the cases reach this faster section of the belt, a space will be created between the individual packages. The speed differential is due to the sprocket ratio on the transfer drive from the metering belt to the stop/spacer belt section.

If problems occur with non-turning cases catching up with the preceding turned cases, or if the first case of a new row runs into the row pusher, as the pusher indexes a full row forward, then increasing the speed differential above the 3:1 ratio will provide more space between cases. The stop/spacer speed can be increased until the speed matches the case turning rollers.

NOTE: Any speed changes to the stop/spacer belt will affect several timer functions in the controller program. The timers are all initiated by cases passing photo eye PE1. New timer valves may be required if the stop/spacer belt speed is increased.

Increasing the metering belt speed may increase the overall machine throughput capacity but it should be noted that the metering belt speed as originally provided was designed to match the case length to the pusher bar speed. The matching of case size to component speeds allows the belt to run continuously until a full layer has been formed on the apron. Increasing the belt speed until the metering belt is over-feeding cases into the machine will require a program change to add a stop belt delay at the end of every row. The delay is necessary to prevent the cases from running into the pusher bar. The extra start/stops may require the addition of a clutch unit to the infeed belt motor to reduce wear on the unit.

Table of Contents

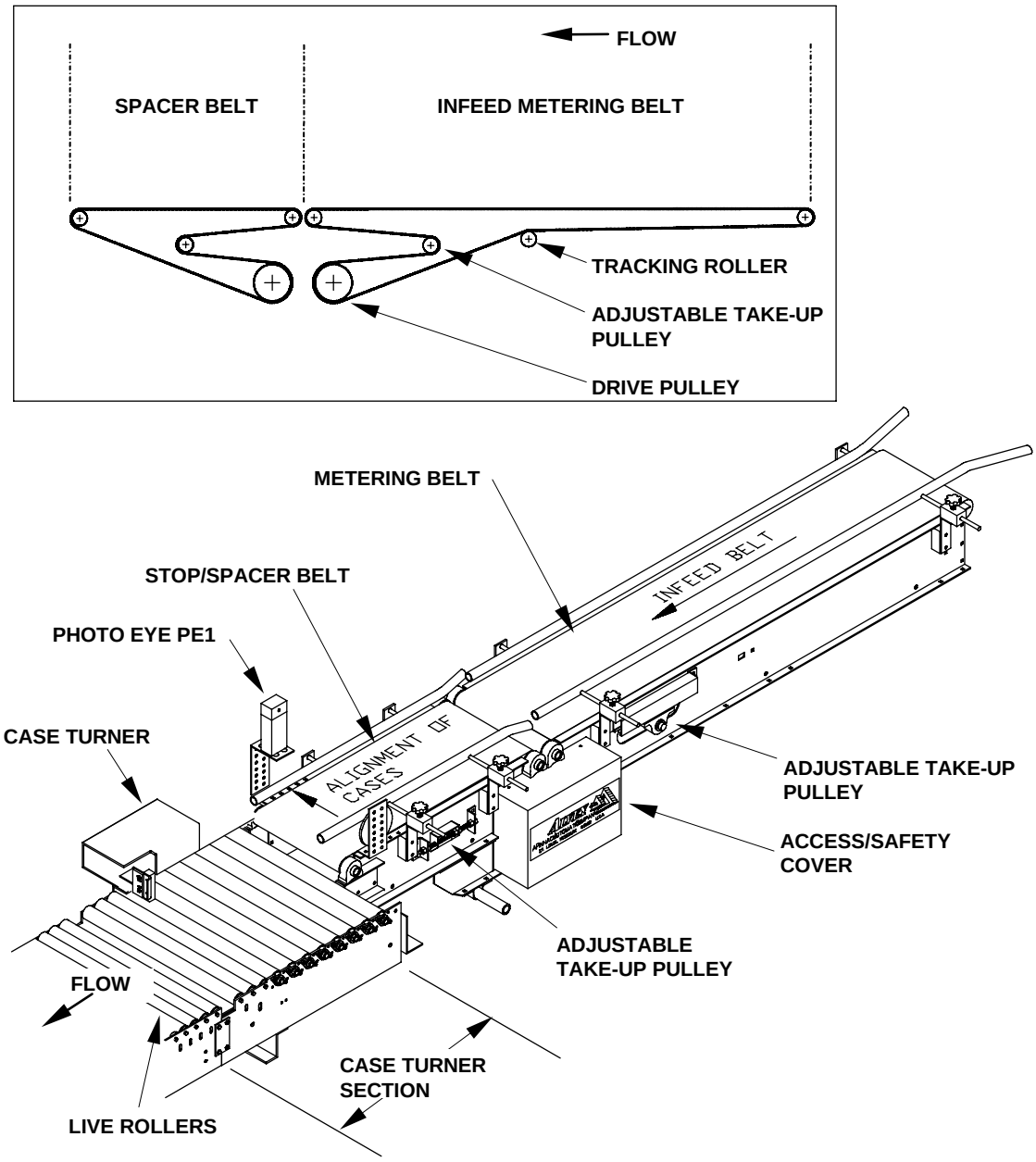


Figure 4-3: Infeed/Spacer Belt Case Conveyor

Table of Contents

C. Tensioning Infeed Belts

Proper belt tension is necessary to prevent excess wear of the drive components. If the belt is too tight, it will wear out prematurely and cause excessive loading of the roller and idler bearings. If it is too loose, the belt will slip and wear out prematurely.

To tighten loose belts:

1. Loosen the take-up pulley bolts and tighten the infeed conveyor belt take-up pulley to eliminate excess belt slack. The belt should be tensioned just enough to prevent slippage on the drive pulley. Excessive belt tension can result in motor overload, shortened belt life, and bearing damage. Insufficient belt tension will prevent the conveyor from running and can shorten the life of the pulley lagging.
2. Using extreme caution, start the drive and observe the slack side of the belt. There should be slight sag if the tension is correct.
3. Re-check squareness of the take-up pulley or roller, and make certain the bearing mounting bolts and take-up nuts are securely tightened on both sides.
4. Run the belt for a few minutes to determine if the belt is tracking correctly and re-adjust the tension if necessary. If the belt is not tracking properly, refer to the “Belt Tracking Instructions” in Section 6, of this manual.

D. Replacing Infeed Case Conveyor Belting

For installation instructions for installing infeed case conveyor belting, refer to Section 6, of this manual.

Table of Contents

4. Case Turner

A. Description

The Case Turner is a pneumatically operated device located in the case turning area that causes cases to turn (or not turn) sideways before they move onto the live rollers. The Case Turner has a padded bump turner device, which is connected to an air cylinder. When the air cylinder is extended, the bump turner device is exposed so that an incoming case bumps against the bump turner. When the case turner air cylinder retracts, the bump turner device retracts out of the path of the case. These cases will not be turned. The case turning device assembly can be pivoted slightly for more contact surface area. The turner blade can also be adjusted for changing the contact surface area on the cases.

When an incoming case bumps against the bump turner, the device “gives” somewhat (like a shock absorber) so adjustments to increase the tension may be required for heavier packages and wooden cases. See “Case Turner Air Pressure Gauge” for adjustments.

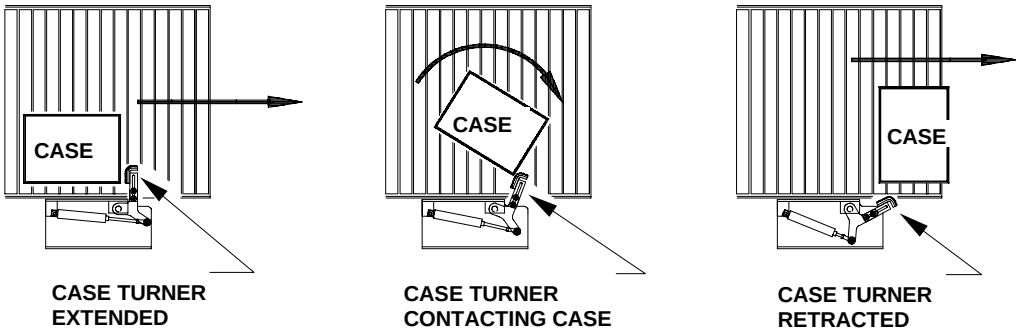


Figure 4-4: Case Turner Sequence Step By Step

B. Case Turner Air Pressure Regulator

The air pressure gauge located on the layer pusher side frame controls the air pressure setting for the case turner device. The resistance tension should be increased or decreased according to package weight. A higher-pressure setting is used for heavier cases, and lower pressure settings for lighter cases.

1. Set air pressure (initially) at 1/2 the package weight.

2. Turn adjustment cap clockwise to increase air pressure and tension on case turner. Turn adjustment cap counterclockwise to decrease the pressure and tension. Some adjustment caps have a safety ring that must be pulled up or pushed down before turning the pressure setting cap.

NOTE: The air line filter must be kept clean to prevent air pressure from decreasing.

Table of Contents

5. Live Rollers Drive Belts

A. Description

The long V-belt on the live rollers section drives the rollers. One end of the long V-belt goes around the drive pulley, and the other end of the belt wraps around the adjustable take-up pulley, located below the rollers in the live rollers section, near the row stop. (See Figure 4-5.)

The short dual V-belt on the case tuning turning section drives the case turning rollers, and wraps around the drive and tail pulleys. (See Figure 4-5.)

B. Tensioning the Live Rollers Drive Belt

To tighten a loose V-belt, loosen the take-up pulley bolts and move the pulley until there is no slack in the belt. Using extreme caution, start the drive and observe the slack side of the belt. There should be slight sag if the tension is correct.

C. Installing the Live Rollers Drive Belt

When a drive belt begins to show signs of wear or cracking, or if it breaks, it should be replaced as follows:

1. Turn the main power disconnect switch to OFF and Lockout/Tagout the machine for safe working conditions before starting.
2. Loosen the nut on the adjustable take-up pulley and loosen the take-up pulley until the belt tension is loose enough to remove the old belt.
3. From under the live rollers section, remove the old belt.

   NOTE: Only if necessary, loosen the snub roller assemblies for additional clearance to remove the belt. Once the snub roller assembly has been loosened, the snubbing pressure will have to be readjusted.

4. After the old belt has been removed, check the drive pulley and take-up pulley for play. The pulleys should be clean with little or no bearing play, and they must turn freely. If necessary, replace the pulleys.
5. Check the snub rollers assemblies. The snub rollers must rotate freely. These rollers are designed to fit loosely on the shaft. There should be a 7/16" gap between the top of the bearings and the bottom of the roller. The snubbing pressure should not have to be readjusted.
6. Install the new belt. Feed the top of the belt over the top of the snub rollers and then loop the end of the belt around the drive pulley.
7. Loop the other end of the belt around the take-up pulley, and adjust the tension so the belt is as straight as possible. Do not over tighten.
8. Ensure that the new belt is positioned securely over the snub rollers and jog the conveyor so the belt turns three or four times. Then re-adjust the take-up pulley if necessary for proper belt tension.

9. The snub assemblies should fit snugly against the drive belt, but should not mash the drive belt against the rollers. The snubbing pressure should not have to be readjusted. However, if adjustment is required (if a roller is not turning) loosen the snub assembly bolts and tap the snub assembly up or down as required to achieve the proper snub pressure. The snub assemblies can be adjusted up or down by loosening the outside bolt and sliding the snub assembly. The snub rollers should support the drive belt allowing direct contact with the underside of the rollers, turning them when the belt is moving. The flanges on the snubs are alternated to keep the belt from walking.
10. Replace any safety guards that may have been removed for access to the pulleys.

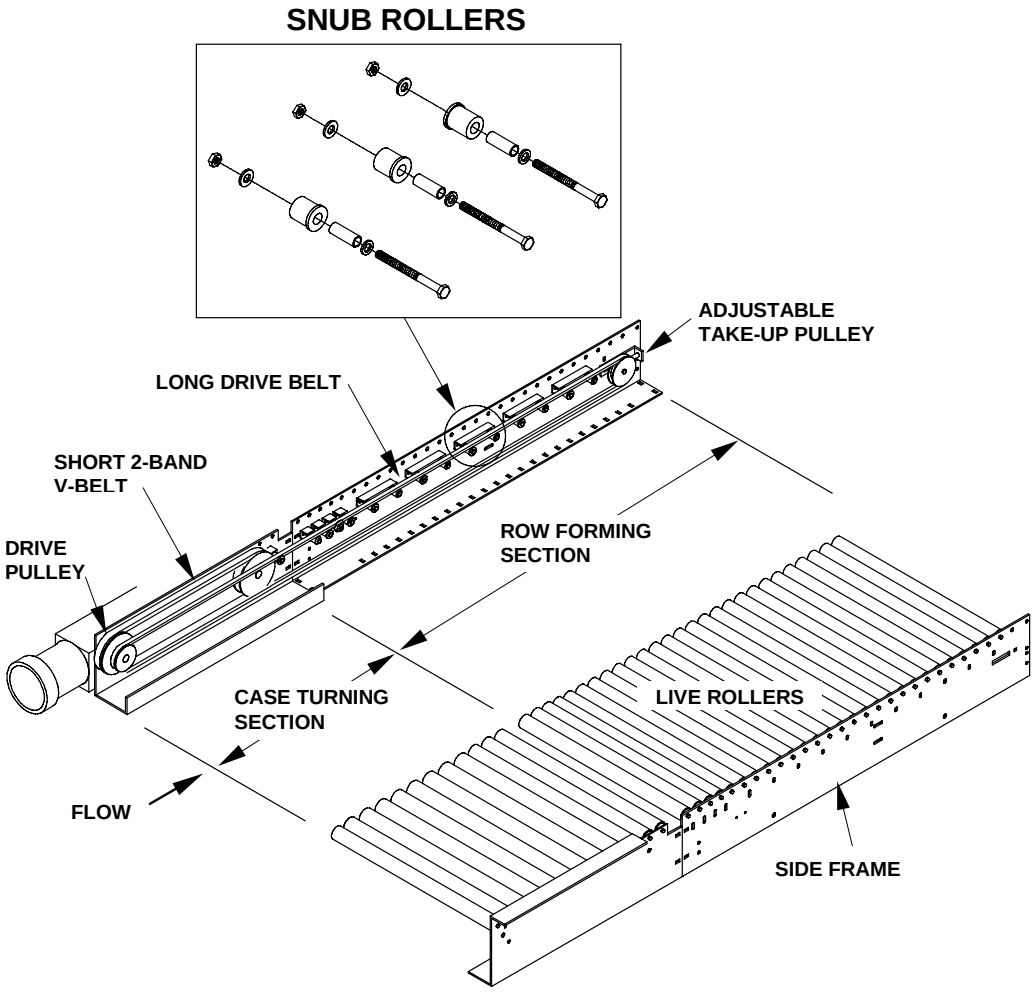


Figure 4-5: Live Roller Drive Belts

Table of Contents

6. Side & Front Dams Adjustments

The Side & Front Dams are located at the front and sides of the apron area to hold packages in line as the apron strips out from beneath them.

A. Mechanical Front & Side Dams (Standard)

The mechanical side and front dams can be adjusted in 1/2 inch increments. Make adjustments as follows:

1. Remove the T-pins at both ends of the dam to be adjusted.
2. Loosen the hand knobs.
3. Move the dam to the appropriate position.
4. Tighten the hand knobs.
5. Replace the T-pins removed in step 1.

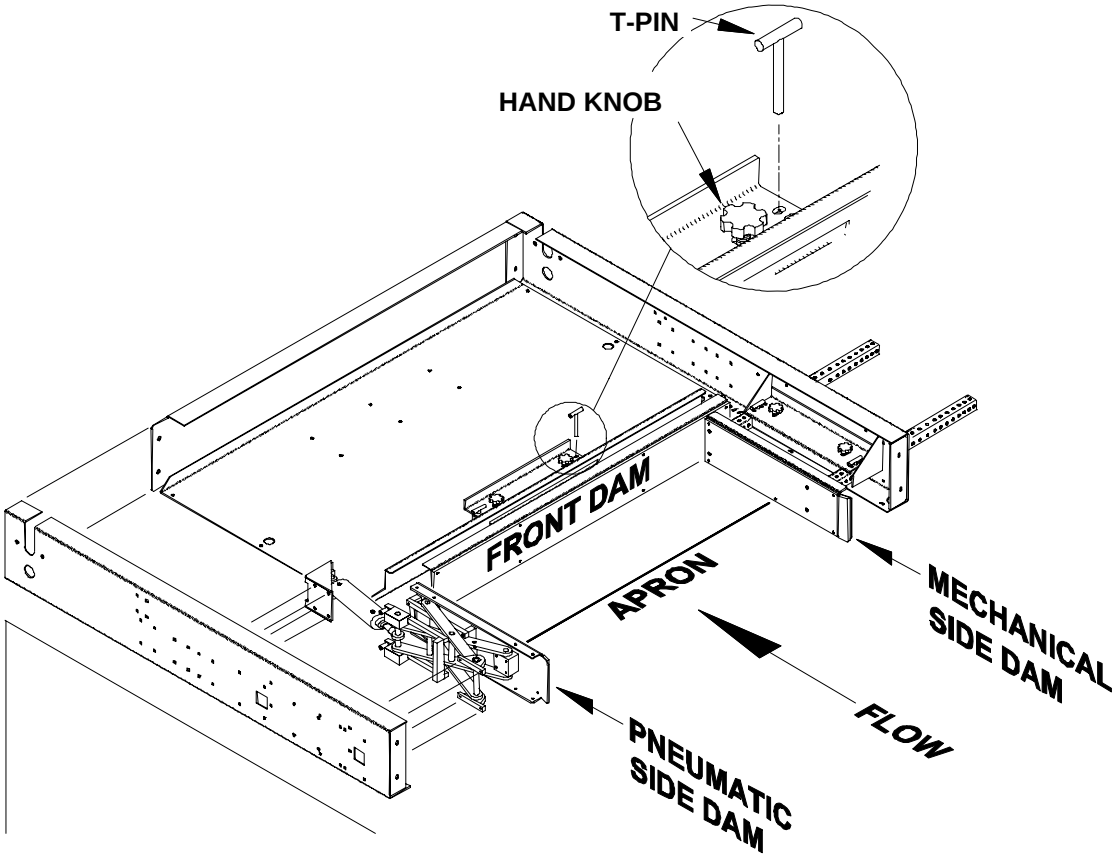


Figure 4-6: Mechanical Front & Side Dams Adjustment

Table of Contents

B. Pneumatic Side Dams (Optional)

The length of time that the pneumatic side dams compact is adjustable through a programmable timer. For instructions, refer to the vendor manual for the programmable controller.

NOTE: Multi-line palletizers use an electrical or pneumatically powered front dam in conjunction with the side dam operation.

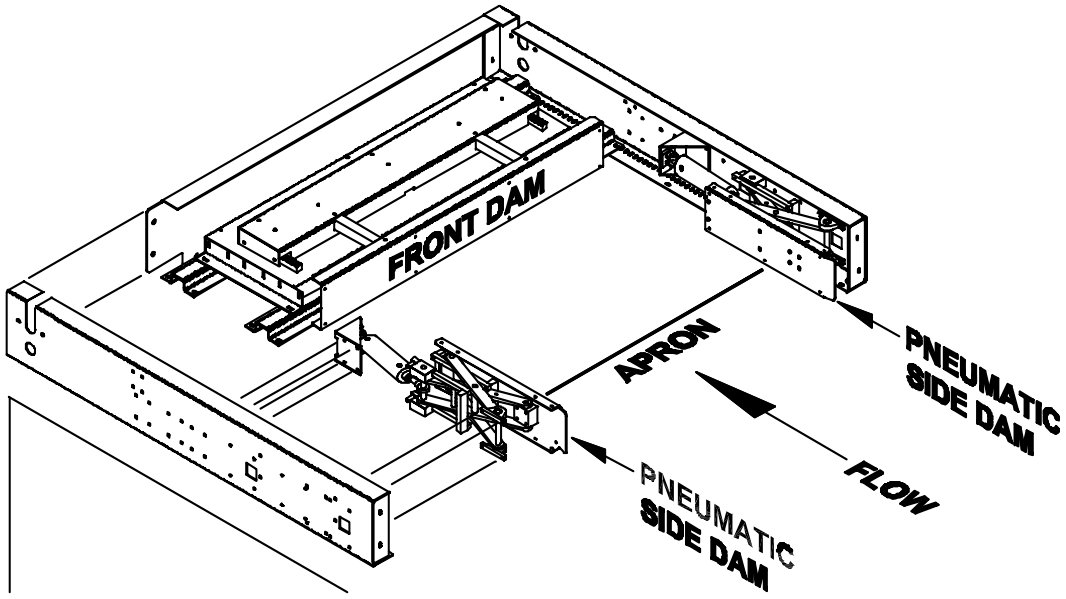


Figure 4-7: Pneumatic Side Dams

Pneumatic Adjustment:

Adjust the FLOW CONTROLS on the two air cylinders. (See Figure 4-8) Normally the two cylinders should move at the same speed. If the two cylinders move at different speeds, the load may be off center.

Mechanical Adjustment:

4. Loosen the lock nut on the hex shaft connecting the air cylinder to the scissors mechanism of the side dam. (See Figure 4-8.)
5. Rotate the hex shaft to either lengthen or shorten the connecting shaft.
6. Tighten the lock nut.

NOTE: Shortening the shaft moves the load to that side of the apron. Both sides can be adjusted to re-center the load.

Table of Contents

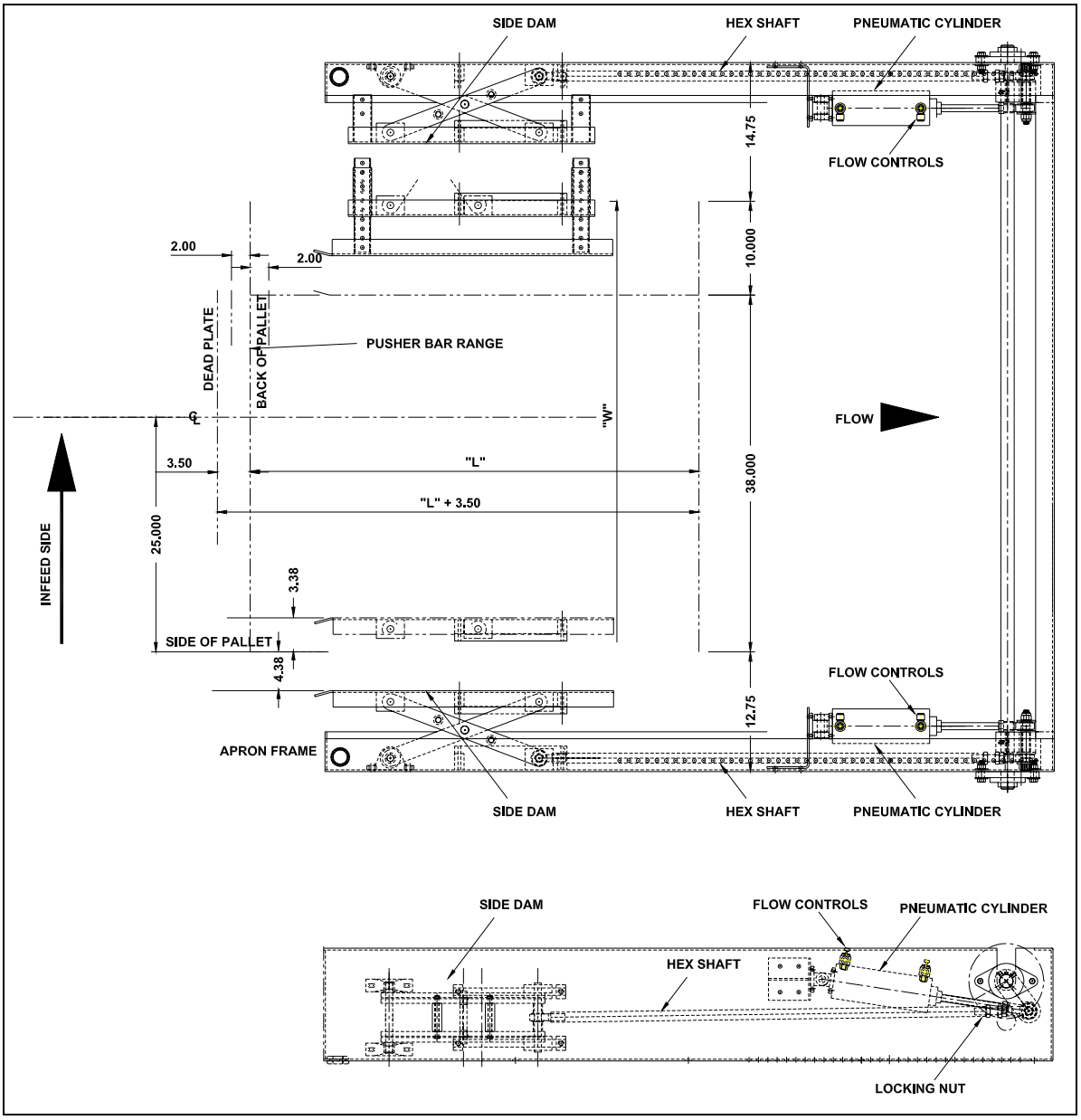


Figure 4-8: Pneumatic Side Dams Adjustments

Table of Contents

7. Pusher Bar Adjustments

The distance that the pusher bar extends can be changed by changing the layer size setting (numeric value) at the operator interface terminal. For more information about pusher bar adjustments, refer to the Electrical Data section in this manual.

8. Pallet Dispenser

A. Description

Alvey Pallet Dispensers are designed in various lengths, widths, and heights for use with various applications and normally installed adjacent to a palletizer.

The pallet dispenser is available in several variations; the specific type depends on the customer equipment requirements. The finger/tine pneumatic version is used primarily. Hydraulic and Electric Motor driven models are also available.

The functioning parts of the pallet dispenser include the Cylinder Lift, the Pallet Dispenser Fingers, and the Pneumatic System. The pneumatic system operates the cylinder lift and the fingers. It consists of two valves and two proximity switches. Through a system of air hoses and air cylinders, the pneumatic system provides the power for the pallet dispenser.

⚠CAUTION

Remove as many empty pallets as possible before working on the pallet dispenser or clearing dispenser jams.

B. Pallet Dispenser Lift Cylinder

The lift cylinder in the pallet dispenser raises a platform that picks up the pallet being supported by the dispenser fingers. While rising, the lift activates the proximity switch PX26 (in the raised position) which causes the lift to stop rising and signals the fingers to retract. As the lift descends, carrying all of the empty pallets, proximity switches PX13 and PX26 (in the middle position) are blocked, which causes the fingers to extend? All of the empty pallets are now being supported by the fingers, except the one actually resting on the cylinder lift. When the lift reaches its lowest position, the pallet will be on the pallet infeed conveyor. Proximity switch (PX13) is then actuated, and it sends a signal to the machine controller that the dispenser cycle is complete.

Table of Contents

To adjust the highest position of the pallet dispenser cylinder lift, the position of the flag for proximity switch PX26 (in the raised position) must be adjusted so that pallets are lifted above the dispenser fingers by about 1". Use the following procedure:

1. Turn the machine's main electrical power disconnect switch to OFF and Lockout/Tagout the machine for safe working conditions.
2. Turn off and lockout the main air supply, and bleed air pressure at the air line dump valve located on the pallet dispenser.
3. Loosen the screws on the bracket to which the proximity switch flag is attached.
4. Move the proximity switch sensing flag as necessary. (This is a trial and error process.)
5. Retighten the screws on the proximity switch flag.
6. To adjust the pallet dispenser cylinder lift speed for lowering or raising the pallet, adjust the air flow control valve (located at the valve stack behind the opposite solenoid):

   Out = Faster
   In = Slower

C. Pallet Dispenser Proximity Switches (PX13 & PX26)

Proximity switches PX13 & PX26 activate the movement of the empty pallet lift cylinder and control the timing of the pallet dispenser finger extensions and retractions. Proximity switch PX26 controls the highest position of the lift and proximity switch PX13 controls the lowest position of the lift.

D. Pallet Dispenser Side Fingers/Tines

The pneumatic pallet dispenser side fingers/tines extend out to support the stack of empty pallets while the pallet lift lowers a pallet to the pallet infeed conveyor. The air flow controls control the timing of the fingers/tines extension, and retraction. The air flow controls are located in the main air valve stack. To adjust the side finger extension and retraction speed, adjust the air flow control valve:

Out = Faster
In = Slower

Table of Contents

E. Pallet Dispenser Side Fingers Cylinder Replacement

All threaded surfaces must be cleaned and primed before installing Loctite™. The following are recommended components that are used at the factory assembly:

- Cleaner - Loctite™ 7070, part #2904121
- Primer - Loctite™ 2348, part #2904001
- Adhesive - Loctite™ 262, part #2900040

1. Assembly of Rod Clevises to the Air Cylinder Rod: (See Figure 4-9.)
   a) Install the Jam Nut until tight against the shoulder of the Air Cylinder Rod. The Jam Nut “must” be installed.
   b) Apply Locktite™ to the threads on the Air Cylinder Rod end.
   c) Tighten the Rod Clevis on the rod until it is jammed against the Jam Nut.
2. Assembly of Cap End Clevises to the Cap End of the Air Cylinder:
   a) Apply Locktite™ to the threads on the Cap End of the Air Cylinder.
   b) Hand-tighten (hard) the Cap End Clevis on the Cap End threads until it is jammed against the shoulder cylinder cap.

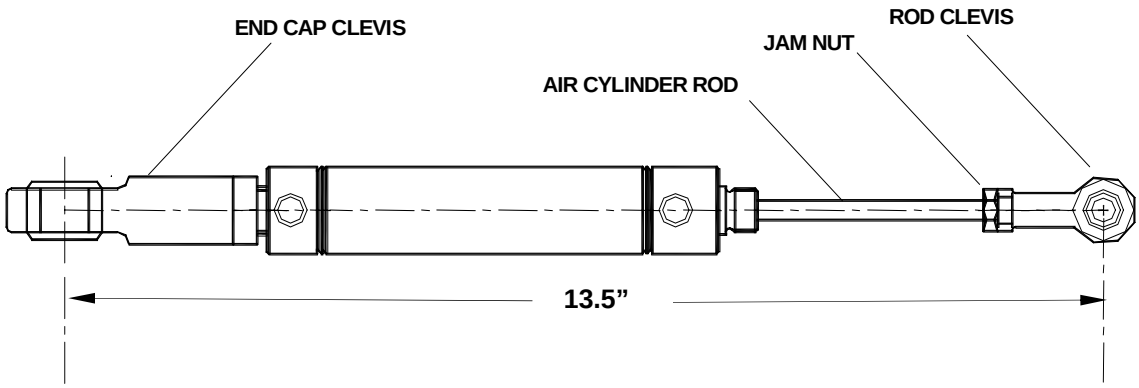


Figure 4-9: Pallet Dispenser Finger Air Cylinder Assembly

CAUTION

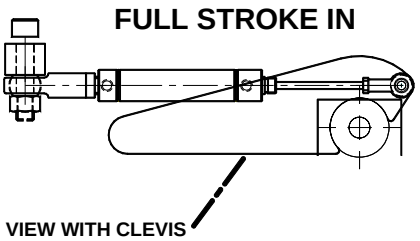
Improper installation may damage the cylinder rod. Ensure that the Pallet Dispenser Finger Air Cylinder Assembly is installed correctly as shown in Figure 4-10.

Table of Contents

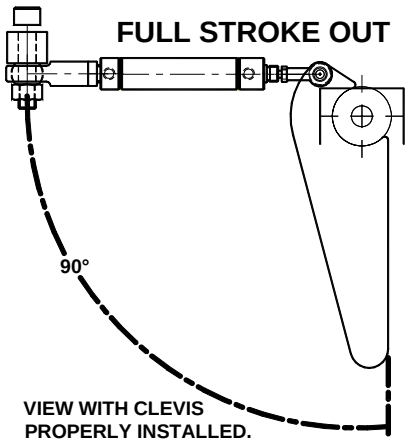
Pallet Dispenser Side Fingers Cylinder Replacement (continued)

Correct Installation

Notice the pallet finger at full stroke in, will be parallel to the cylinder and at full stroke out, will be 90-degrees from the cylinder.



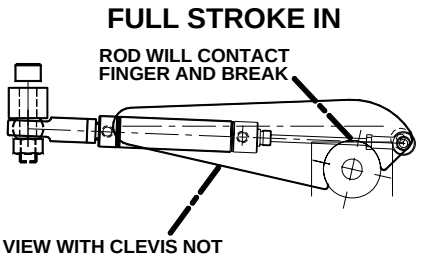
VIEW WITH CLEVIS PROPERLY INSTALLED. NOTICE THE FINGER AT FULL STROKE IN WILL BE 90-DEGREES AND PARALLEL TO THE CYLINDER.



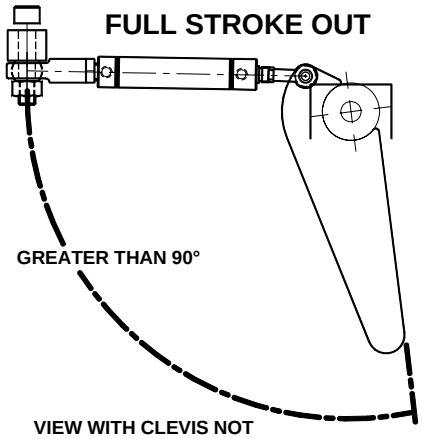
VIEW WITH CLEVIS PROPERLY INSTALLED. NOTICE THE FINGER AT FULL STROKE OUT WILL BE 90-DEGREES FROM THE CYLINDER.

Improperly Installed

The clevis is not screwed on far enough. Notice the pallet finger at full stroke will be past 90-degrees and damage the cylinder rod.



VIEW WITH CLEVIS NOT PROPERLY INSTALLED. THE CLEVIS IS NOT SCREWED ON FAR ENOUGH. NOTICE THE FINGER AT FULL STROKE IN WILL BE PAST 90-DEGREES. DAMAGE TO CYLINDER ROD WILL OCCUR.



VIEW WITH CLEVIS NOT PROPERLY INSTALLED. JAM NUT MISSING. NOTICE THE FINGER AT FULL STROKE OUT WILL BE PAST 90-DEGREES. DAMAGE TO CYLINDER ROD WILL OCCUR.

Figure 4-10: Pallet Dispenser Finger Air Cylinder Installation

Table of Contents

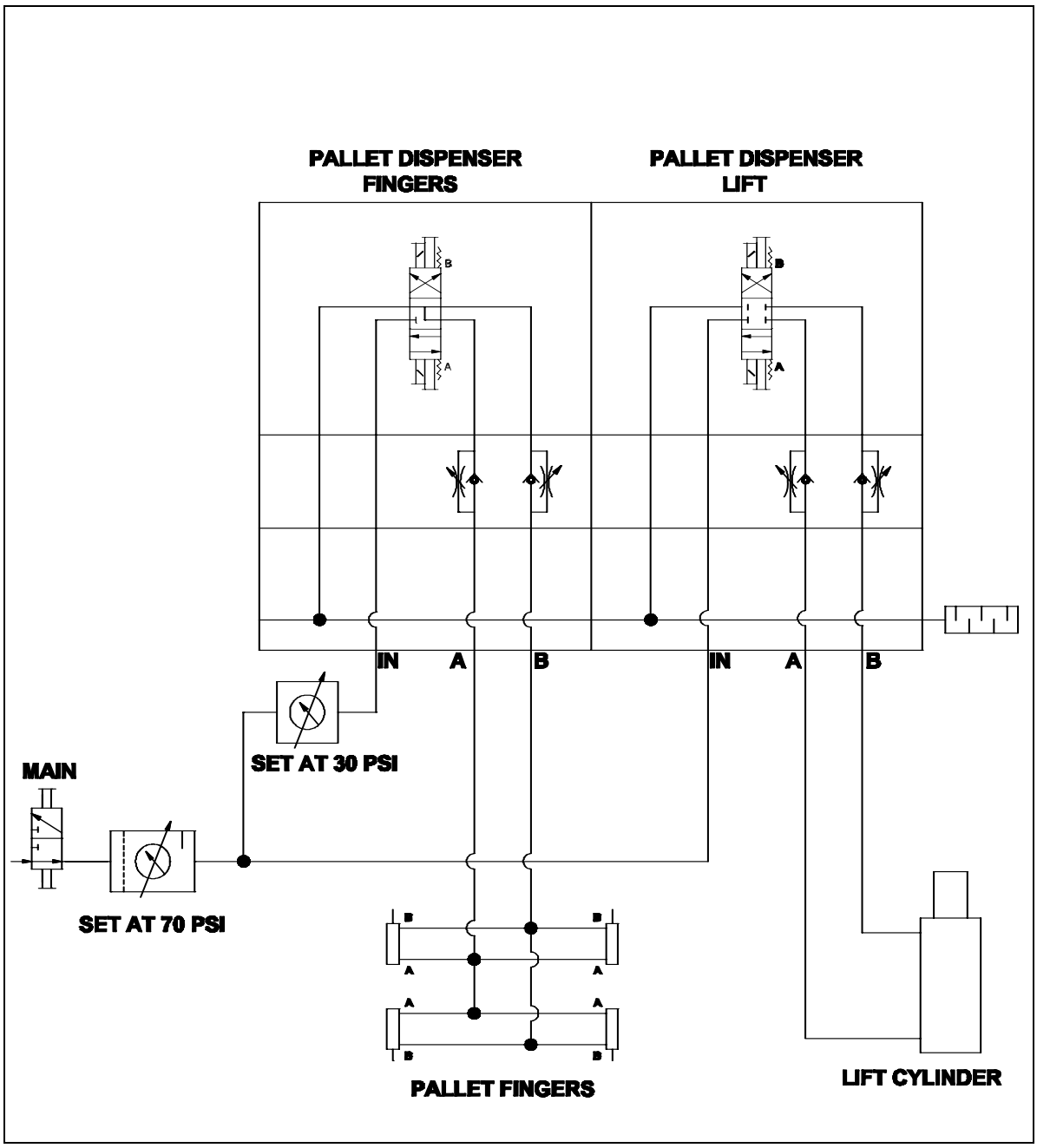


Figure 4-11: Pallet Dispenser Pneumatic Diagram

Table of Contents

9. Chain Hoist Drive Assembly

The chain hoist is driven by an electric motor. A brake is used to hold the hoist when the motor is turned off.

A. Chain Tension

Routine chain tension adjustments are not normally required. However, when components in the Chain Hoist Drive Assembly are replaced, adjustments to the Chain Idler Arm may be required. If the chains are too lose, before making any adjustments, the problem may be and is normally chain elongation that requires the chains to be replaced. Check the chain hoist chains and table. The chain tension is 1" maximum play (deflection) and the table should be level. If the chain is too loose or the table is not level it indicates a problem.

NOTE: The only adjustment that may be required is the Idler Arm position. The Idler Arm Assembly is located in the hoist area and is pictured in Figure 4-12.

B. Adjusting the Chain Hoist Idler Arms

Adjusting the Chain Hoist Idler Arms should not be necessary under normal operating conditions. However if the Hoist Table gets jammed causing extreme chain tension, or if replacement of the chains becomes necessary, the idler arms must be adjusted properly with respect to Proximity Switches (PX68A & PX68B) located in the hoist area. These Proximity Switches check the Chain Idler Arm position.

1. Check both Proximity Switches for proper alignment with the Idler Arms located on both sides of the machine. The Proximity Switch must be positioned no more than 1/8" away from the surface of the Idler Arm and aimed at the upper corner of the Idler Arm as shown in Figure 4-12.

   NOTE: Position the proximity switch high enough so that approximately 1/2 of the switch face is covered by the idler arm. This makes the switch more sensitive to hoist jams.

2. If the Idler Arm needs adjustment, loosen the bolt that holds the Idler Arm in place, and pivot the Idler Arm to the proper alignment with the proximity switch.

3. When the Idler Arm is properly aligned, re-tighten the bolt to hold the Idler Arm in place.

Table of Contents

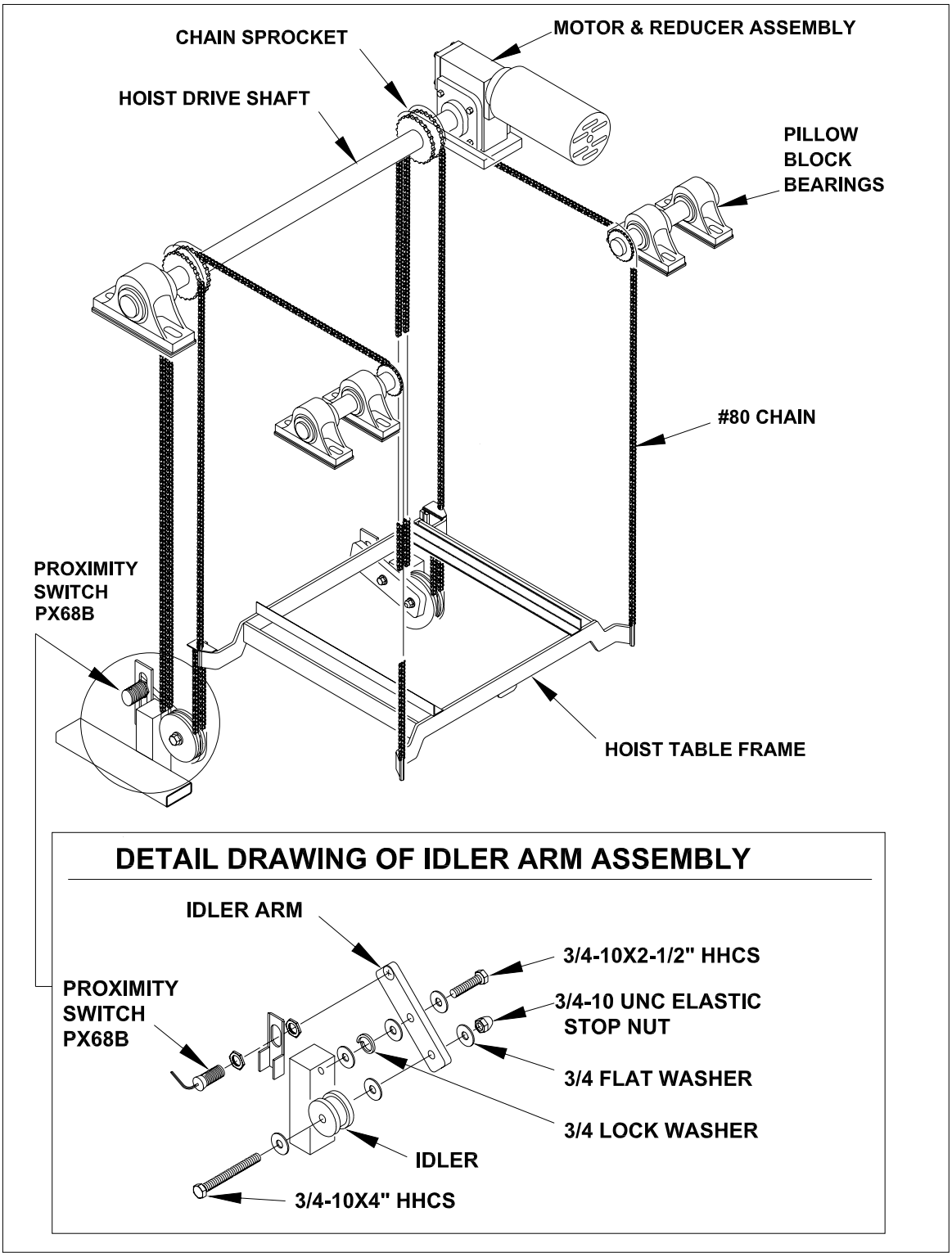


Figure 4-12: Chain Hoist Assembly

Table of Contents

10. Hydraulic Ram Hoist (Optional)

The ram hoist is driven by a hydraulic power unit. Pressurized hydraulic oil raises the ram hoist and solenoid valves are used to lower the ram hoist.

A. Hydraulic Pressure

Routine hydraulic pressure adjustments are not normally required. However, when components in the hydraulic system are replaced, adjustments may be required. Before making any adjustments, always allow the hydraulic oil to warm up to an operating range between 80^{o} to 120^{o} F.

The high-speed ROPER™ gear pump is equipped with an internal relief valve. The internal relief valve spring will normally limit the maximum hydraulic pressure to 150 to 175-psi. Powered hoist tables have a heavier spring and require pressure in the 250 to 300-psi range. An external hex nut is used to adjust the relief pressure. Refer to the vendor data supplied in Volume II of this set of manuals for the hex nut locations. Adjust the screw in to increase the pressure setting. A pressure gauge is not provided on this pump. Oil by-passing would mean that the up-speed would slow down or stop. (Normal High-Speed up-travel will be approximately 20 inches per second.)

The low-speed variable volume VICKERS™ piston pump is equipped with an external relief valve and a gauge. Typically, this system should be set at 400 to 450-psi range. The pressure can be set by first shutting off the ball valve to the ram cylinder. Then energize the up solenoid on the low speed valve. Adjust the relief screw to the desired setting. Release the solenoid. Open the ball valve to the hoist. The pressure setting should never exceed 600-psi.

NOTE: If the slow-speed pump is removed for service or replacement, it is vital that the following installation and start-up procedure be followed.

B. Installation & Start-Up Procedure for VICKERS™ Pumps

1. Turn the main power disconnect switch OFF, Lockout/Tagout the machine for safety before beginning any maintenance or repairs.
2. Check the pump rotation arrow. The rotation arrow should be pointing counterclockwise when looking at the shaft end of the pump.
3. Install the pump mounting bracket on the pump motor as shown in Figure 4-13.
4. Open the compensator screw adjustment screw.
5. Connect all the hoses to the reservoir.
6. Remove the pump case drain plug.
7. Fill the pump case with hydraulic oil through the case drain plug.
8. Reinstall the pump case drain plug.
9. Open all the ball valves.

10. Remove the Lockout/Tagout means to operate the machine for a short time.
11. Jog the motor starter to check the pump rotation. Do not run the motor more than a few seconds.
12. Actuate the hoist up-slow valve and start the pump. Run the pump long enough to see the hoist table rise.
13. Turn the main power disconnect switch OFF, and Lockout/Tagout all power sources to the machine for safety before beginning.
14. Close the ball valve to the hoist hydraulic ram.
15. Adjust the compensator adjustment (screw in) until the pressure rises.
16. Open the ball valve to the hoist ram.

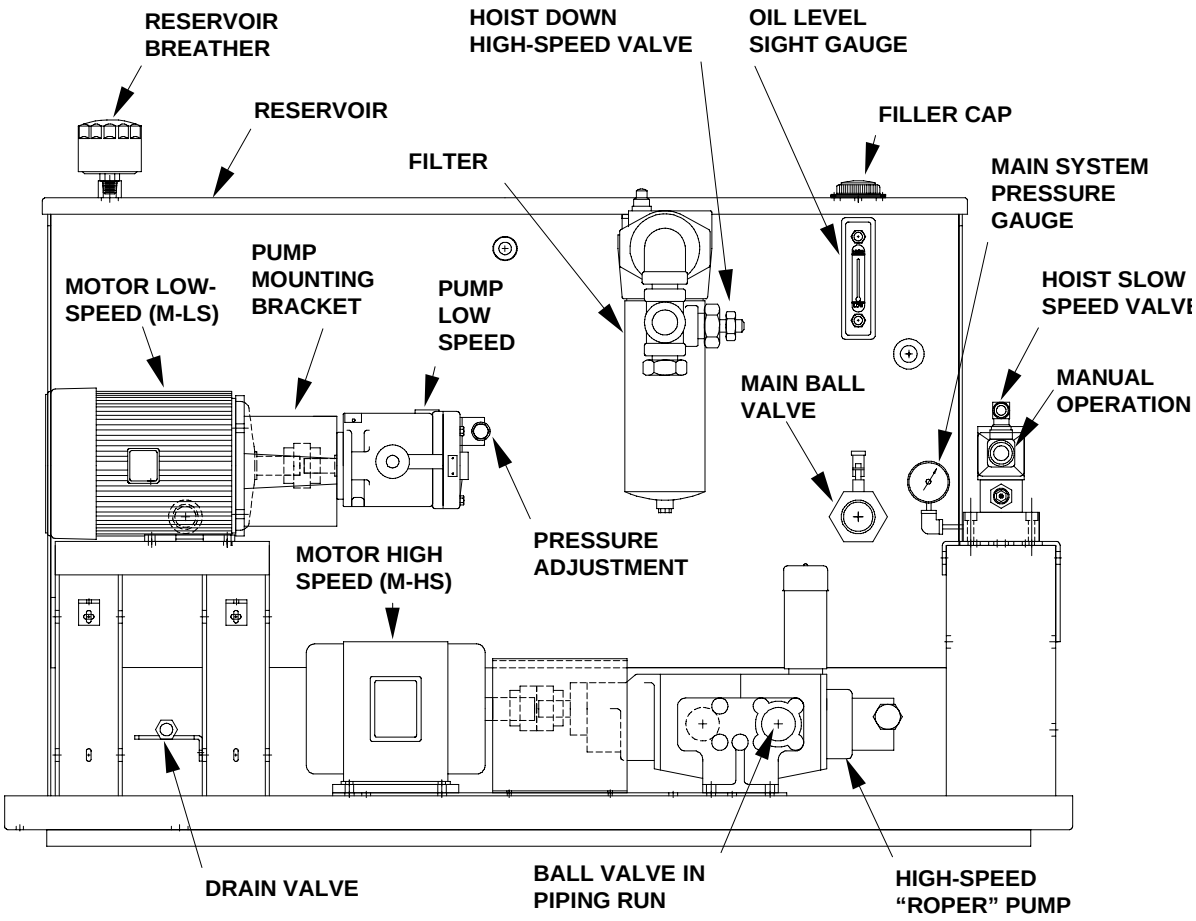


Figure 4-13: Hydraulic Deck Components

Table of Contents

C. Hoist High-Speed (Down) Control

The lowering speed of the hydraulic ram hoist (hoist down speed) once it has reached its top or high-speed, is not adjustable. However, it is possible to control the acceleration or “break-away” time of the hoist high-speed-down. The hydraulic valve that controls the hoist down travel is a two-way, two-position, pilot-operated solenoid valve in the discharge line from the hoist to the tank. An external adjusting screw on the side of the valve allows a variable acceleration time - from immediate to 30 seconds. A protective cap must be removed to gain access to the adjustment screw. It should be noted that any adjustment will affect both the starting and the stopping of the hoist. If the starting acceleration time is decreased, the stopping deceleration time is increased and vice versa.

To decrease the controlled acceleration time, quick start and increase the controlled deceleration time, producing a smoother stop on the discharge cycle, the needle valve should be turned in (clockwise).

The desired operation is a smooth transition from high speed to slow speed down operation, just before the pallet is deposited onto the two-strand chain conveyor.

D. Hydraulic Valve Torque Specifications

The following specifications have been provided for mounting a new or remounting a rebuilt directional valve should it become necessary. When the directional valve is mounted on the manifold stack, if the valve is too tightly torqued to the manifold, the valve body can become twisted, and the spool becomes bound in the valve. The values listed below are for valves that are commonly used on this machine. Other valves can be obtained by referring to the manufacturer's specifications for the particular valve.

1. Bolt Size = 1/4-20
2. Racine™ = 100 lb./in
3. Vickers™ = 112 lb./in

Table of Contents

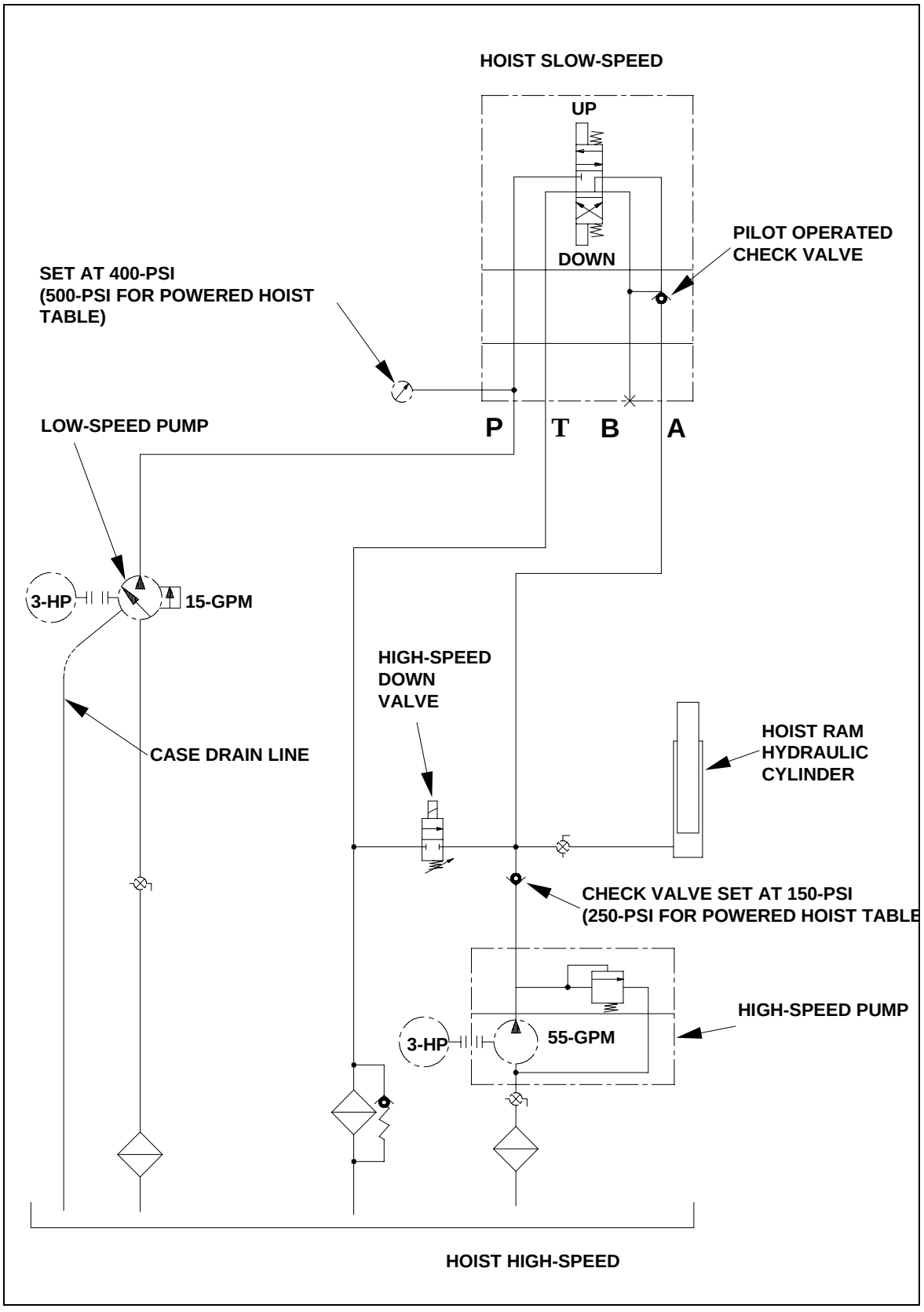


Figure 4-14: Hydraulic Ram Hoist Schematic

Table of Contents

E. Hydraulic Ram Cylinder 4” Packing Replacement

Four parts are needed to repair the top gland cartridge:

#8700053 Rod Wear Ring

#8700146 Rod Seal

#8700147 Rod Wiper

#8700148 O-Ring

1. In preparation, clean the area around the hoist ram to remove all dirt and debris that could contaminate the oil when the packing is removed.
2. Lower hoist to about 6" above the chain track level. Push the OFF button.
3. Place two pallets below the hoist table, one in front of the ram and one to the rear of the ram.
4. Start the machine, and lower the hoist onto the pallets.
5. Press the EMERGENCY STOP switch, turn the main power disconnect switch off, and perform the Lockout/Tagout procedure for safety.
6. Remove the bolts holding the table to the hoist boot and to the ram.
7. Start the machine again, and lower the ram as far as it will go without weight.
8. Jog the pallet chain conveyor to remove the hoist table sitting on the pallets.
9. Press the EMERGENCY STOP switch, turn the main power disconnect switch off, and perform the Lockout/Tagout procedure for safety.
10. Remove the retaining plate from the ram, and bolt on a keeper plate.
11. After removing the retaining ring, use a mechanical puller to remove the gland cartridge. Another method is to start the machine again and then briefly jog the hoist up solenoid valve (the gland cartridge should slide up out of the casing).
12. If the machine was restarted, press the EMERGENCY STOP switch, turn the main power disconnect switch off, and perform the Lockout/Tagout procedure for safety.
13. Turn off ball valve.
14. Remove the keeper plate, and remove the gland cartridge. No force should be necessary, DO NOT FORCE.
15. Inspect the gland cartridge. Normally, only the rubber parts need replacement. The wear ring is made of fiber material and is not normally supplied with the 4" packing kit.
16. Replace the rubber seals (rod wiper, rod seal, and O-ring). Apply clean hydraulic oil to rubber parts before reinstalling.

17. Before replacing the repacked cartridge, remove the bleed plug and drain the hydraulic oil to that level. This will allow the cartridge to slide in place without force. Replace the bleed plug.
18. Place the gland cartridge in position on the ram and secure the retaining plate, DO NOT FORCE.
19. Reinstall the bleed plug.
20. Raise the hoist and open the bleeder valve until a full and steady stream of hydraulic oil passes through the bleeder valve.
21. Close the bleeder valve.
22. Install hoist boot and table. Replace shims if necessary.
23. Open the ball valve, start the machine, and cycle the hoist up and down approximately 10 times. This will force any air to the tank. The bleed screw can be used to bleed the air. (Be careful to avoid dropping the screw into an uncapped hoist hole).

F. Hydraulic Oil Cleaning

When hydraulic equipment becomes contaminated with sugar or syrup, the normal cleaning agents in the hydraulic oil are ineffective. It is necessary to use something that will clean the system.

If the conditions are bad enough for the machine to stop functioning, it will be necessary to remove the parts that are not functioning properly and clean them with very warm water.

If the machine is still operating, and the oil can circulate through the various components, a cleaning solution can be added to remove the contamination (syrup, etc.). The Mobil Oil Co. produces a solution called NYVAC FR200. We have found this product effective.

After determining that the contamination is water soluble, the procedure for application of this cleaning solution is as follows:

1. Drain all the hydraulic oil from the tank.
2. Fill the hydraulic tank with a water glycol fluid. Ensure the glycol is one that is compatible with Buna N type seals. The glycol should be in the 200 to 300-SUS viscosity range at 100° F. Mobil NYVAC FR200 or equivalent.
3. Run the machine in production for 6 to 8 hours. Set the pressure to the lowest possible operating pressure.
4. Drain all the solution immediately after the cycling is complete. Do not allow the solution to remain in the tank overnight. Replace the solution with clean hydraulic oil (Mobil DTE-26 or equivalent).
5. Every morning, drain the bottom of the tank until the clean oil comes out, replacing the drained oil with clean, new oil.

6. Continue this process until sediment no longer appears when the drain line is opened in the morning.

G. Hydraulic Leaks

The machine is designed to be as leak free as possible, however over the course of time; vibration, pressure fluctuations, component wear, and aging may cause leaks or seepage. The advantage of a hydraulic system over other systems is that this condition tends to show up gradually, allowing continued operation until repairs or adjustments can be made.

Since oil flows downward, the following procedure is recommended:

1. Turn the main power disconnect switch OFF, and Lockout/Tagout all power sources to the machine for safe working conditions before beginning.
2. Clean and dry the manifold stack.
3. Locate leakage at the highest point.
4. Correct leaking condition.
5. Clean and dry the manifold stack.
6. Remove the Lockout/Tagout and operate the machine for a short time and again Lockout/Tagout all power sources to the machine for safe working conditions before beginning.
7. Locate leakage at the next highest point.
8. Correct leaking condition.
9. Repeat the above procedure until all leaks have been located and stopped.

Table of Contents

11. Maintenance Schedules

The suggested time periods and inspection items listed in the following maintenance schedules are intended as a guide for equipment operating on a forty-hour per week schedule. The schedules should be modified to satisfy individual facility conditions, such as extended periods of operation. If your production requirements are not this stringent, or conversely, or if the machine is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

A. Daily Service Schedule

1. **Cleaning**
   a) Clean dirt and debris from the machine and discharge conveyors.
   b) Remove carton dust from the live roller section with compressed air.
   c) Clean the area around and under the machine.

Do not “hose down” the machine. Direct water splashes can damage the electrical components.

2. **Lubrication**

   Lubrication should not be needed on a daily basis unless extreme conditions exist. Lubricate the machine if needed (only).

3. **Mechanical**
   a) Check the rollers for free movement.
   b) Check the belt tension on all belt units.

4. **Pneumatic**
   a) Check the air system for leaks and eliminate any excess leakage. Log minor leaks for repair during the scheduled preventive maintenance program
   b) Clean up oil leakage if needed.

5. **Electrical**
   a) Clean all photo eye lenses and reflectors.
   b) Check alignment of all photo eyes.
   c) Check all proximity switches for proper sensing distance (approximately 1/8”)

Table of Contents

B. Weekly Service Schedule

Based on average operating conditions for continuous (twenty-four hour) service:

NOTE: If your production requirements are not this stringent, or conversely, or if the machine is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

1. Cleaning

Clean dirt and debris from the machine apron, live roller, pusher bar frames and dam faces.

2. Lubrication

Oil all chains.

3. Mechanical

a) Check the rollers for free movement.

b) Check the belt tension on all belt units.

4. Pneumatic

a) Fill lubricators with oil.

b) Drain the air filters.

5. Electrical

Check the control voltages (either 24-VDC or 120-VAC nominal) depending on the machine specifications.

Table of Contents

C. Monthly Service Schedule

Based on average operating conditions for continuous (twenty-four hour) service:

NOTE: If your production requirements are not this stringent, or conversely, or if the machine is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

1. Service Record Logbook

a) Check the Service Record Logbook for repetition of difficulties.

b) Take an inventory of the spare parts.

2. Lubrication

Check and fill the chain hoist reducers.

3. Mechanical

a) Check the tension of the drive belts and chains.

b) Check the apron tracks for proper alignment and wear.

c) Check the pusher bar tracks for proper alignment and wear.

d) Check the chain sprockets and shafts for alignment and wear. Correct the alignment if necessary.

e) Check the chain sprocket set screws and set collars for tightness and wear.

f) Check the bearing set screws for tightness.

4. Pneumatic

No additional service required if done on daily or weekly service.

5. Electrical

Inspect all electrical cables for worn insulation or heat damage.

6. Safety Devices

Inspect and test all safety devices, warning lights, and alarms associated with the system.

Table of Contents

D. Semi-Annual Service Schedule

1. Mechanical

a) Inspect all flexible hoses for deterioration.

b) Inspect and tighten nuts, bolts and set screws where required.

c) Inspect the infeed conveyor and live rollers belt for tension and wear.

d) Check the live rollers for wear.

2. Lubrication

No additional service required if done on daily, weekly and monthly service.

3. Pneumatic

No additional service required if done on daily, weekly and monthly service.

4. Electrical

a) Check all plug-in solenoids and verify that they are securely bolted to the manifold.

b) Inspect all conduit and verify that it is secure and not bent or broken.

c) Inspect all electric photo eyes and proximity sensors.

Table of Contents

E. Annual Service Schedule

1. Mechanical

a) Inspect all chains and sprockets.

b) Replace the pusher bar connecting links.

2. Lubrication

No additional service required if done on daily, weekly and monthly service.

3. Pneumatic

No additional service required if done on daily, weekly and monthly service.

4. Electrical

No additional service required if done on daily, weekly and monthly service.

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Table of Contents

Contents

Table of Contents

Table of Contents

1. Infeed Belt

Problem	Electrical	Mechanical
Infeed Belt will not start	Check Infeed Switch input	Check chain drive and sprocket alignment
	Try clear machine operation	
	Check output for motor	
	Check if brake output is off	
	Check overloads and fuses	
Infeed does not stop on auto	Check infeed switch input	Check brake adjustments
	Check brake outputs	
	Check PE1 input	

Table of Contents

2. Pusher Bar

Problem	Electrical	Mechanical
Pusher Bar will not push	Check if PE2 is clear	Check adjustment of brake system
	Check Diagnostics for Row Pusher failure	Check drive chain and sprocket
	Check fuses, overloads and/or breakers	Check for binding within pusher bar tracks
	Check AC output	Check solenoid valve for the brake
	Check DC output to brake for proper operation	
	Check for full layer in layer table	
Pusher Bar will not stop at home position	Check PX3 adjustment (Within 1/8" away from target)	Check adjustment of brake system
	Check for green light (on all the time) on PX3 and for red lights when seeing Target	Check if pusher bar is floating from side-to-side and failing to activate
	Check brake output	Bent Bar
		Loose Chains

Table of Contents

3. Layer Pusher

Problem	Electrical	Mechanical
Layer Pusher will not push	Check alignment of PE2L	Check brake adjustment
	Check PX3A's input	Check drive chain and sprockets
	Check diagnostics for Layer Pusher failure	Check for binding within layer pusher tracks
	Check AC output	
	Check DC output to brake (only)	
Layer Pusher will not stop at home position selected	Check PX3A adjustment (Within 1/8" away from target)	Check PX3A adjustment (Within 1/8" away from target)
	Check Brake output	Check adjustment at brake system
	Check PX3A input	

Table of Contents

4. Apron

Problem	Electrical	Mechanical
Apron will not open	Check PX4 operation (PX4 is Apron opened)	Check brake adjustment
	Check fuses, overloads, and/or breakers	Check for binding within apron tracks
	Check AC output	Check for proper chain tightness (1/2" deflection)
	Check DC brake output	
	Check PE7's (Must be blocked) in AUTO	
Apron will not close	Check DC output, PX5's operation	Check brake adjustment
	Check AC output	Check for binding within apron tracks
	Check fuses, overloads, and/or breakers	Check chain tension
	Check output, brake operation	
	PE6 must be cleared in AUTO before closing	
	PE6 must be cleared in AUTO before closing	

Table of Contents

5. Hoist (Chain Type)

Problem	Electrical	Mechanical
Chain Hoist will not rise with new pallet	Check PE10 operation	Check Hoist Reducers
	Check PE7 to be cleared	
	Check PE8 is made when PE10 is blocked with new pallet	Check air brake operation
	Check if PE12's have been cleared by load	
	PE14's must be cleared	
	Apron not closed (Check PX5)	
	Check fuses, overloads, and/or breakers, and AC output	
Chain Hoist will not lower	Check PE6 (Must be blocked to lower) in AUTO	
	Check hoist down push button input when in MANUAL	Check Hoist Reducers
	PX8 is made or faulty	Check air brake operation
	PE12's must be cleared	
	PX4 must be made in AUTO	
	Check fuses, overloads, and/or breakers	

Table of Contents

6. Hoist (Hydraulic Ram Type)

Problem	Electrical	Mechanical
Ram Hoist will not rise with new pallet	Check PE10 operation	Check high-speed pump coupler
	PE14A and PE14B must be cleared	Check if ball valve at pump inlet
	Check PE7 to be cleared	Check internal high-speed hoist pump pressure relief valve (150-psi)
	Check PX5 operation	
	PE6 must be cleared	Ball valve to main hoist is off
	Check pump fuses, overloads, and/or breakers	
	Check PE12 operation	
	Check AC outputs	
Ram Hoist will not rise to pallet preload position	Check PE10 operation	Check if coupling to pump is loose
	PX8A and PX8B are not sensing target (1/4" away from target)	Check if ball valve at inlet to pump is off
	PE14A and PE14B not blocked	Pressure relief set too low (Must be at 450-psi)
	Check AC output to solenoid	Check if ball valve to main hoist is off
	Check fuses, overloads, and/or breakers to slow speed pump	

Table of Contents

Hoist (Hydraulic Ram Type) continued

Problem	Electrical	Mechanical
Ram Hoist will not lower	Check PX8B's (Hoist Down) operation PX8B's input must be off	Check slow speed down valves operation
	PE6's must be blocked to lower in AUTO	Check Automatic valve (High Speed Down Valve)
	Check Hoist Down switch input (MANUAL MODE)	If hoist packing has been replaced recently, check for binding
	Check PX4 (Apron must be opened to PX4) in AUTO	
	Check outputs for solenoids	
Ram Hoist will not lower in high speed	Check PX8A's operation	Check Automatic valve operation
	Check AC output for high-speed valve	
	Check PE10 (Should be cleared) and it's input	

Table of Contents

7. Pallet Dispenser Chain

Problem	Electrical	Mechanical
Pallet Dispenser Chain will not advance pallet to preload position	Check PX13 input	Check down switch on pallet dispenser (pneumatic) for proper operation
	PE10 must be cleared	Check air supply to pallet dispenser
	PE14A and/or PE14B must be cleared	Check drive sprocket and chain
	Reset diagnostics push button	
	Check fuses, overloads, and/or breakers	
Pallet will not advance to PE10	Hoist must be down (check photoelectric sensor PE8)	Check drive chain and sprockets
	PE10 must be cleared	
	Check overloads, fuses, and breakers	
	Check output card	
Pallet Dispenser Chain pops off track or sprocket	N/A	Take the chain off and check for bent chain (Lay chain out in straight line or hang)

Table of Contents

8. Pallet Dispenser Pneumatic Fingers

Problem	Electrical	Mechanical
Pallet jamming on way down	N/A	Check pneumatic pallet fingers retract switch (should be set so lift goes as high as possible before lowering)
		Check pneumatic pallet fingers extend switch (middle switch) Should be set so pallet fingers extend in center of second to bottom pallet with full stack
		Pallet fingers Regulator 30-psi
Pallet not dispensing	Check pallet dispense solenoid valve output	Check down pneumatic switch on pallet dispenser for airflow
	Check output card	Check for main air pressure at solenoid and at pallet dispenser
	Check PX13 input for PX13	
	PE14's must be cleared	

Table of Contents

9. Pallet Dispenser Motor Operated Tines

Problem	Electrical	Mechanical
Pallet tines will not extend or retract	Check motor starter operation Check proximity sensors PX63 and PX64 for input	Check tine alignment
		Check chain alignment
Lift does not raise or lower	Check solenoid valve operation	Check air bags for air leak
Pallet is not dispensing	Check proximity sensors PX13, PX25, and PX26 for input Photoelectric sensor PE14 must be clear	Check proximity sensor flag location
		Check adjustable stop limits

Table of Contents

10. Sheet Dispenser (Optional)

Problem	Electrical	Mechanical
Suction cups will not pick-up sheets	Check signal to vacuum solenoid valve	Check porosity of sheets. May be too much air flow through sheets
		Check warp of sheets in magazine. If more than 1/2" across the width or length, the suction cups may not be sealing against sheets.
		Increase air pressure to vacuum valve to increase vacuum pressure and vacuum flow
		Check for loose connections on the tubing runs
		Check for worn or cracked suction cups
Suction cups pick-up too many sheets	N/A	Check porosity of sheets. May be too much air flow through sheets.
		Add brushes or air jet to blow across edge of sheets as crosshead lifts the sheet
		Decrease air pressure to vacuum valve to decrease vacuum flow
Crosshead will not lower or rise	Check for signal to the crosshead up/down	Check for binding on the vertical guides
	Verify that the sheet check photoelectric sensor alignment is correct	Check for obstructions on the crosshead

Table of Contents

Sheet Dispenser (Optional) continued

Problem	Electrical	Mechanical
Crosshead will not extend or retract	Check for signal to crosshead extend/retract	Check for binding on the horizontal guides
Crosshead will not extend far enough to place sheet properly	N/A	Check to see if the adjustable guide tubes are out of position

Table of Contents

11. Multi-Strand Chain & Chain Driven Live Roller Conveyor

Problem	Electrical	Mechanical
Conveyor does not start	Electrical power shut off or control circuit NOT energized	Check that system control panel(s) are energized. Be certain emergency stop devices are not activated
	System control devices (photoelectric sensors, limit switches. etc.) out of adjustment or defective	Adjust or replace
	Motor overload open	Check conveyor drive system and overload sizing before resetting
Conveyor shuts off	Photoelectric sensor or other control device(s) actuated or defective	Check for obstruction of control device: remove obstruction or replace control device if defective
	Emergency stop actuated	Correct condition(s) and reset in accordance with control logic
	Power or component failure at system control center	Consult vendor data for corrective action
	Motor overload open	Check conveyor drive system and overload sizing before resetting
Gearmotor unusually noisy	Mounting set setscrew or torque arm loose	Tighten setscrews or torque arm
	Defective unit	Replace unit
	Insufficient lubrication	Check oil level and add if necessary

Table of Contents

Multi-Strand Chain & Chain Driven Live Roller Conveyor (continued)

Problem	Electrical	Mechanical
Conveyor rollers not turning	Roller obstruction	Remove obstruction and inspect roller for damage
	Drive sprocket(s) loose or drive chain broken	Align sprocket(s) and tighten setscrews or replace and tighten drive chain
	Roller sprocket(s) or roller chain broken	Replace roller or chain
	Idler roller bearing failure	Replace roller bearing
Gearmotor runs hot or overheats	Motor overload open	Reduce load and check for obstructions
	High or low voltage	See motor nameplate for proper voltage and test with voltmeter
	Insufficient lubrication	Check oil level and add if necessary
Excessive chain or sprocket wear	Drive roller sprocket	Align sprockets by moving drive roller, loosen setscrew in flange bearings and hollow shaft reducer to realign. Replace drive roller and chain if welded sprockets are damaged.
	Insufficient lubrication	Add proper lubricant and evaluate maintenance procedure
	Conveyor supports or mounting bolts not secured	Tighten or secure as required
	Excessive load application	Reduce load in accordance with conveyor specifications

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Table of Contents

Contents

Table of Contents

List Of Figures

Table of Contents

1. Pre-Installation

Inspect the machine installation site. The site work should be completed in advance of the arrival of the machine. We recommended that an Intelligrated representative supervise the installation.

A. Documentation

The following documentation is needed for installing the infeed conveyors, and discharge conveyors:

- Machine Plan and Elevation Drawings
- Infeed and Discharge Plan and Elevation Drawings
- Machine and Conveyor Shipping Bill of Materials

B. Site Preparation

1. Clear the area to receive the machine. Provide enough space at the installation site for setting up the machine with adequate clearance at both ends and along the sides for servicing, as well as for product infeed conveyors and discharge conveyors. (Refer to the plan and elevation drawings for dimensions.)

2. Ensure there are adequate electrical services available to support the machine. The main power supply must be routed to the high voltage electrical cabinet. The connection is made inside the cabinet at the main power terminals at the upper right side. This will supply power to the electrical cabinet for distribution to the system. Install the main circuit breaker and facility electrical supply according to the electrical specifications and plans supplied by the user.

3. Ensure there are adequate pneumatic services available for the machine. Install the equipment and plumbing needed to supply air pressure to the machine (80-psi required). The air supply line must be no less than 3/4" ID pipe and have a main shut-off valve and drip leg to help remove moisture before it connects to the machine.

4. Plan for the movement of the machine from the receiving area, along the transfer route, to the installation site. Consider the side and vertical clearances, floor conditions, changes in elevation, and amount of space needed for turns.

5. Provide the necessary equipment and personnel to unload and assemble the machine. We recommend professional industrial-machine movers and handlers to unload and move the machine. Heavy duty rollers and a tow motor will facilitate moving the machine.

Table of Contents

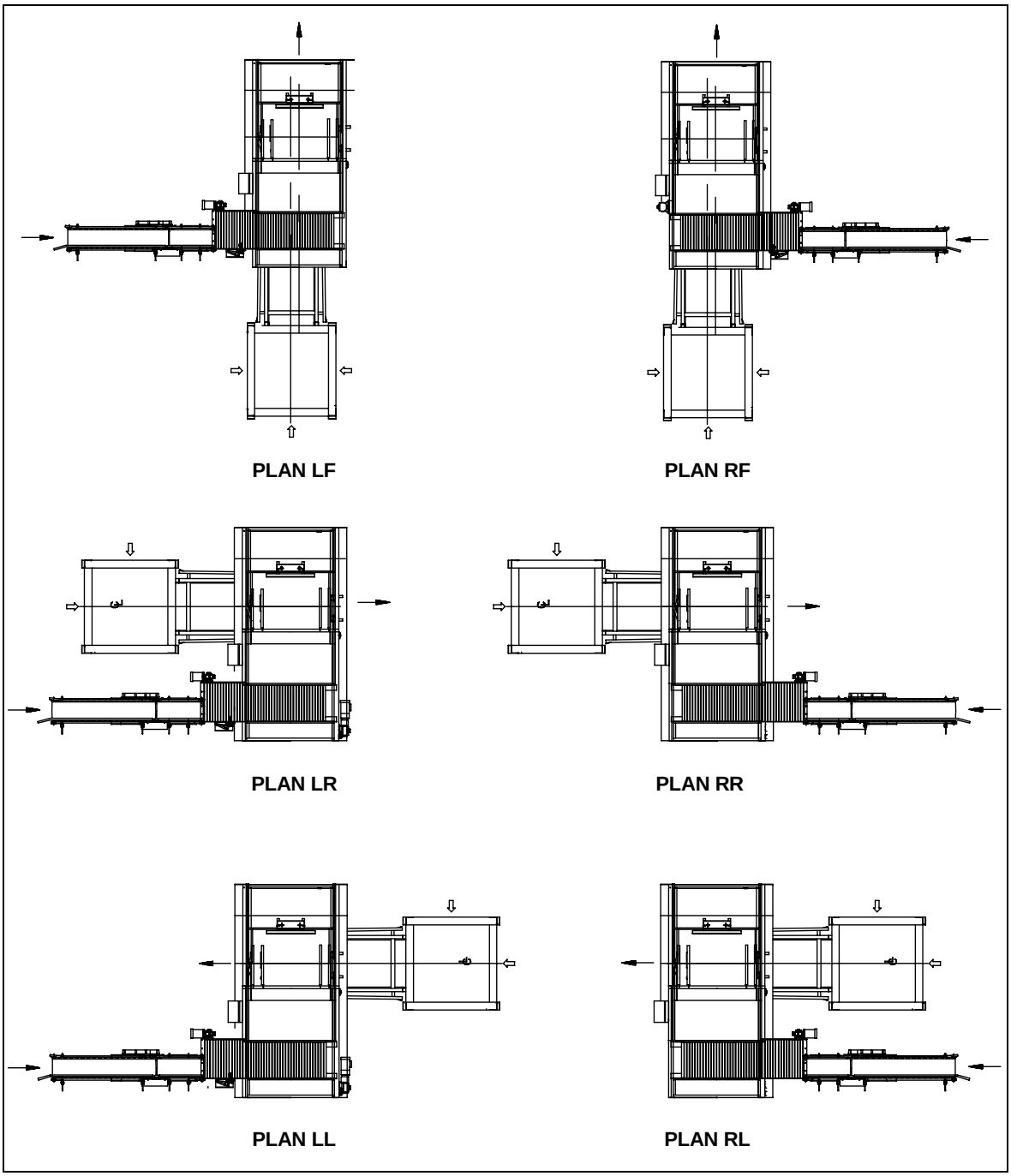

Figure 6-1: Plan View of Various Machine Configurations

Table of Contents

2. Machine Site Preparation

Mark the centerline of the machine on the floor of the installation site using a chalk line or a piece of chalk. Include the location of the infeed conveyor, the discharge conveyor, and empty pallet-loading area. Refer to the machine plan and elevation drawings provided for exact dimensions.

NOTE: By design, the centerline of the infeed conveyor system may not match the centerline of the machine case turner section. Usually, the centerlines are offset. In addition, the discharge conveyor may not be positioned on the centerline of the discharge frame opening.

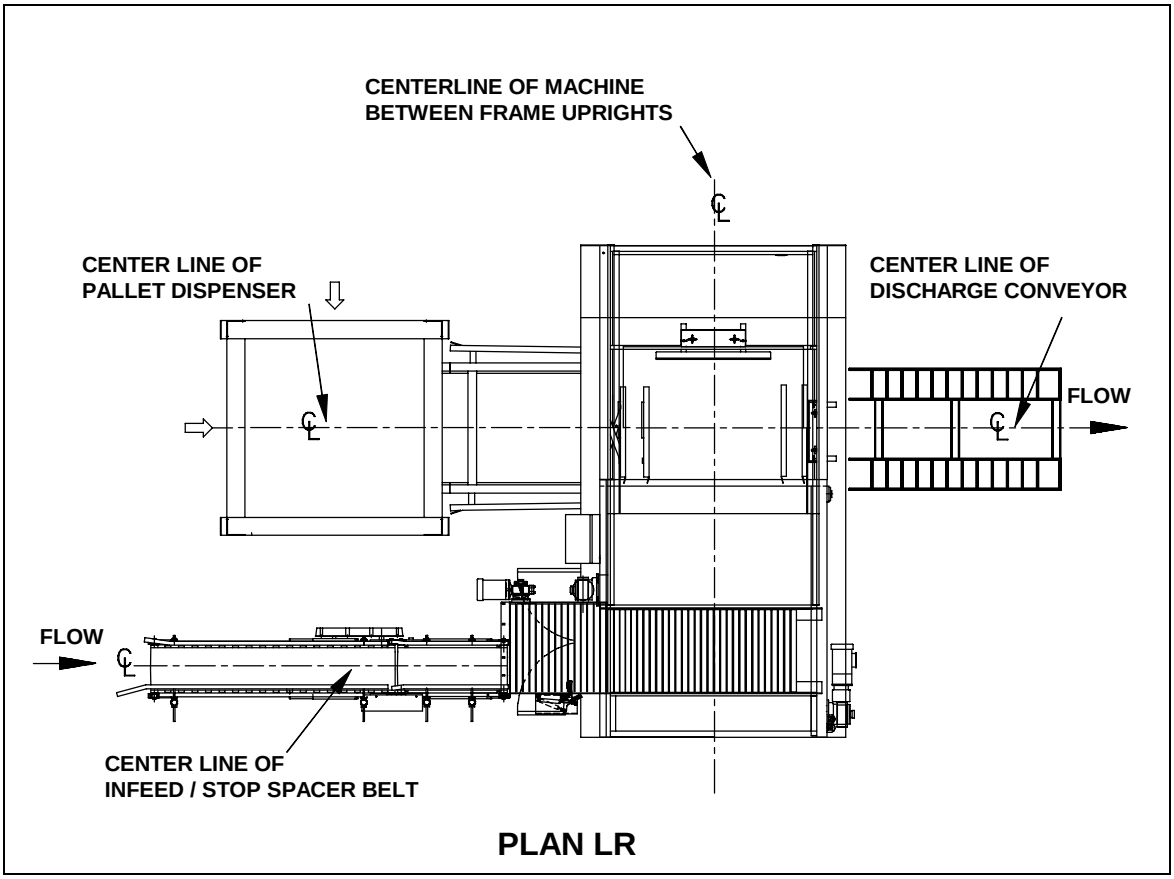

Figure 6-2: Plan View of Infeed & Discharge Conveyor Offsets

Table of Contents

3. Installation & Assembly

This section of the manual has instructions for inspecting and installing the model 880 series “palletizer” or “unitizer” (hereafter generally referred to as the “machine”) connecting the electrical and air supplies, and the machine check-out procedures. The exact equipment furnished and the degree of dismantling may vary from these general installation instructions in certain instances. Review the plan and elevation drawings provided, for special instructions for each installation. Also, review any other installation drawings provided. If you need information or support, call our Customer Service and Support (CSS) toll-free “Hot Line” at **1-800-535-2555**. This number lets you discuss issues directly with a qualified customer service engineer. You can contact us at:

- **Intelligrated, St. Louis Operations Center**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2400**
- **Web site: http://www.intelligrated.com**

When you call us, have your machine serial number, to expedite assistance. The serial number is located on the serial plate on the electrical panel door

A. Damage Inspection

Upon receipt of the palletizer or unitizer, remove the tarpaulins, plastic cover, all chains and cleats which hold the machine to the bed of the truck. (The tarpaulins, chains, etc. belong to the trucking company and should be returned with the trailer. The wood and plastic can be discarded.)

Examine the machine for any damage sustained in transit. If damage is evident, note the extent of the damage on a copy of the delivery receipt and immediately call the carrier to request that an inspection be made. After obtaining an inspection report from the carrier's agent, notify the Traffic Department at Intelligrated, to determine who will file the claim with the carrier.

B. Shortages

Upon receipt of the machine, remove the boxes and miscellaneous parts shipped inside the machine and check the shipment against the shipping list. Report any discrepancies to Intelligrated within 48 hours. Additional information regarding the palletizer or unitizer will be found in the main electrical enclosure. This information, along with the keys for the enclosures, should be turned over to the project manager.

Table of Contents

C. Unloading & Moving the Machine into Position

⚠WARNING

Lifting the machine with a device that is not configured or rated for the machine's load capacity is dangerous to both the equipment and to personnel, and could damage the machine's structure. Ensure that the crane, forklift, and tow trucks being used can lift the full weight of the machine. The palletizer or unitizer weighs approximately 11,150 pounds. (See Figure 6-3)

We recommend professional industrial machine movers and handlers to unload the machine and move it to the installation site.

⚠CAUTION

Due to the length and weight distribution within the machine's frame, two forklifts or tow trucks are suggested for lifting the machine. Always lift the machine using the 5” x 5” structural steel frame at the base of the machine that runs the length of the machine.

The machine is also structurally capable of being lifted from above at each end of the machine from below the 3” x 5” structural steel frame that runs the full length of the machine. (See Figure 6-3) Any other lifting method could result in distortion of the machine’s frame, and/or mechanical damage.

When removing the machine from the trailer we suggest raising the machine from above and pulling the trailer out from under it.

1. Walk the route that the machine will travel to the installation site to ensure that nothing has changed that will interfere with the moving plan. Check the horizontal and vertical clearances.
2. Set the machine on heavy-duty swivel style dollies and move the machine to the installation site. When moving the machine, DO NOT push directly against the machine's frame. Use timber to protect the frame and push against the timber instead of the 3" x 5" steel base tubes.

Table of Contents

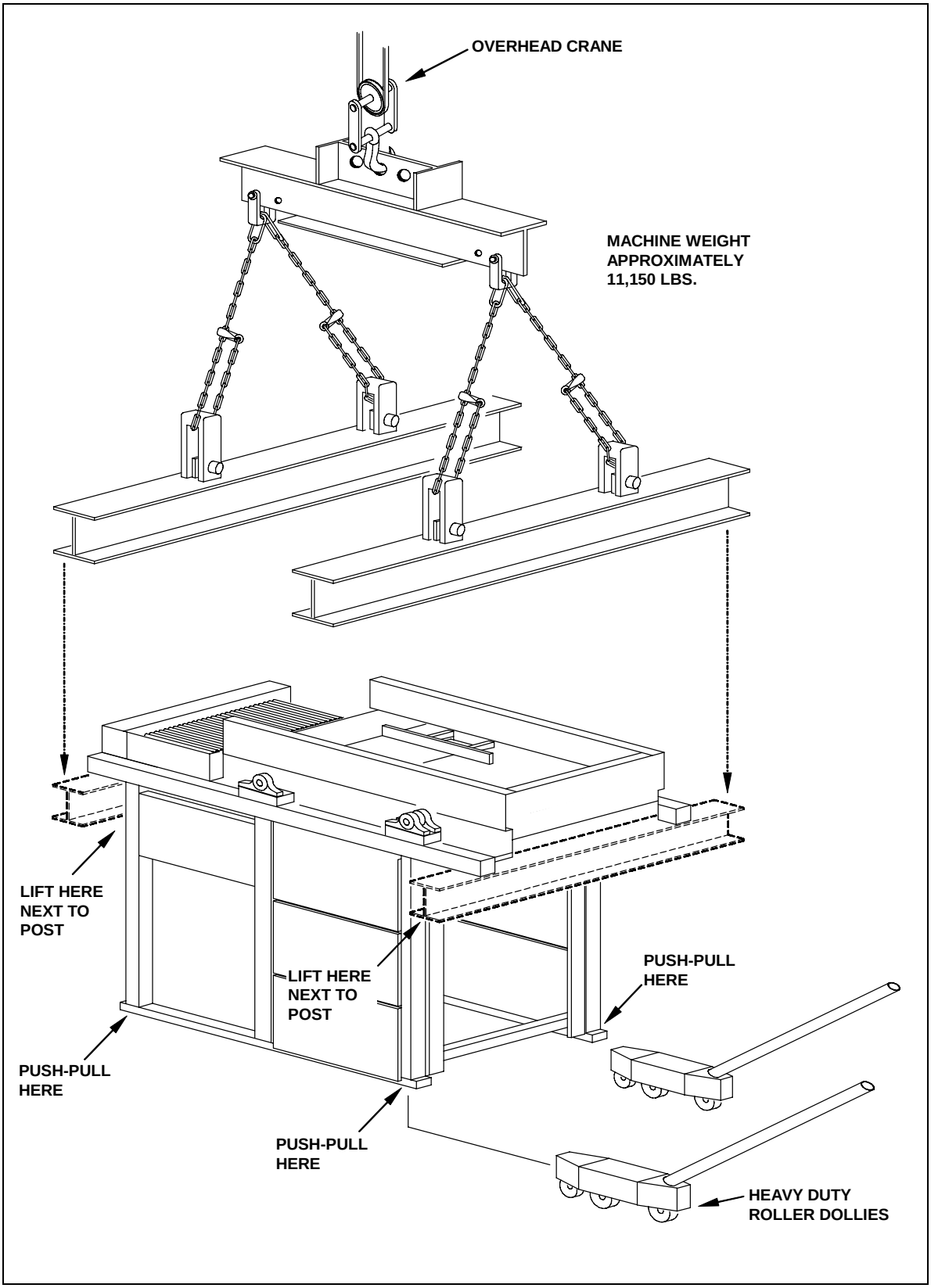

Figure 6-3: Lifting the Machine

Table of Contents

D. Machine Alignment & Leveling

1. Move the machine as close as possible to its final installation location.
2. Align the machine with the measurements and chalk marks laid down on the floor. The main frame may be pushed or pulled by using the base frame steel tube members as the contact areas.
3. Ensure that the machine's base frame is level. Starting under the highest point, level the machine using metal shims (provided) or grout under the base frame or piers.

   NOTE: Because of the allowable tolerances of the structural steel members, there may be some discrepancies when checking the horizontal and vertical alignment at different places on the machine, but leveling the base frame will be sufficient.

4. If optional elevating piers are not required, weld metal angle iron (not provided) to the machine's base frame, and anchor the machine to the floor through the angle iron. The machine must not be able to move.

Table of Contents

E. Elevating Piers (Optional Height)

1. If required, install optional elevating piers under the machine frame:

   a) Lift the machine to remove the dollies and locate the 5”x 5” square elevating piers under the base frame at each vertical post location as shown on the project layout drawings. (See Figure 6-4)

   b) Tack-weld the piers to the bottom of the steel base frame under each vertical post. Piers can be rotated in any direction.

2. Use metal shims to close any gap between the floor and the piers so the load is carried directly to the floor.

3. After leveling the machine, finish-weld the elevating piers to the bottom of the machine's base frame.

4. Anchor the machine to the floor with the floor anchor bolts (provided). Ensure that the piers are not drawn down to the floor when the floor anchor bolts are tightened. Use metal shims as necessary to prevent the piers from being drawn down.

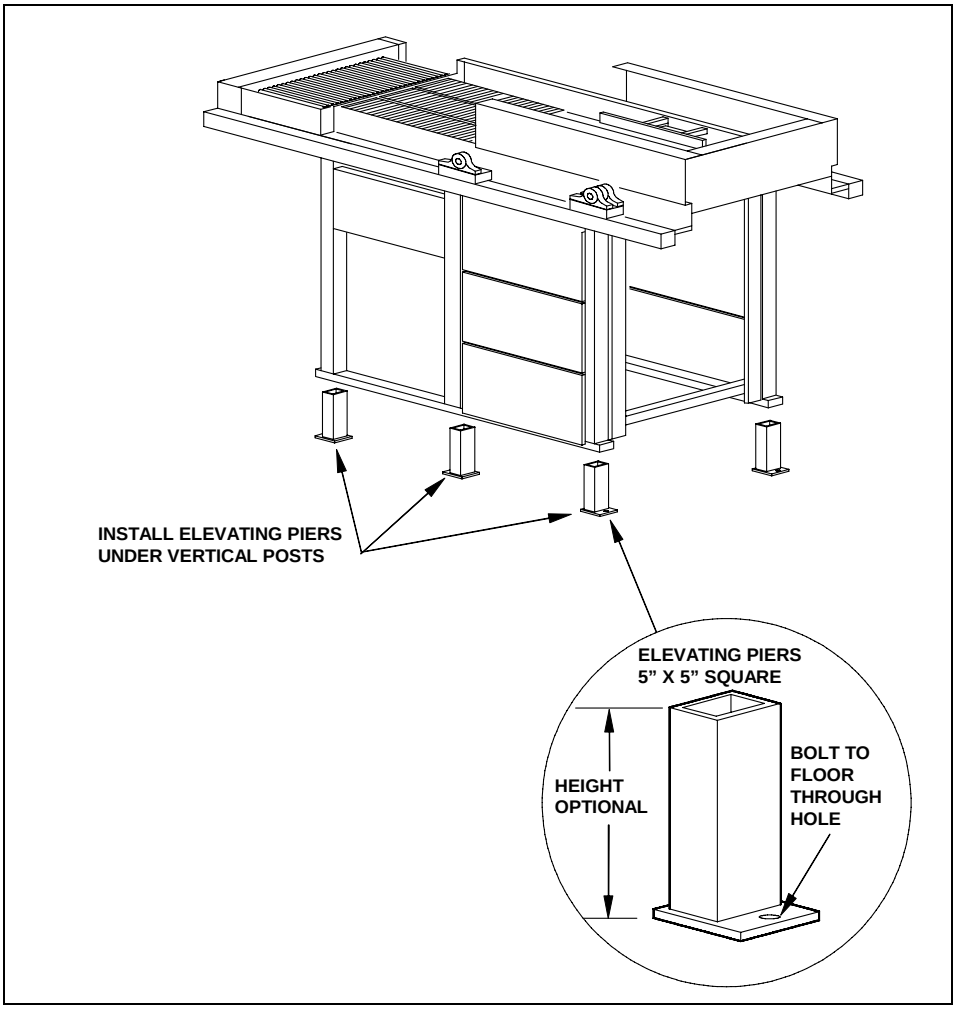

Figure 6-4: Elevating Piers (Optional Height)

Table of Contents

4. Pallet Dispenser Alignment & Leveling

Alvey Pallet Dispensers are designed in various lengths, widths, and heights for use with various applications. The pallet dispenser stores and dispenses empty pallets one at a time as needed. The empty pallet supply (or stack) is loaded into the magazine and pallets are dispensed onto the pallet conveyor when triggered by an electronic controlled solenoid valve. During normal operation, the pallet dispenser is activated and interacts automatically with the system through the program logic controller (PLC) mounted on the palletizer. The pallet dispenser operation must be part of the programming that controls the system. Specifications will vary depending on the application and customer equipment requirements.

The Pallet Dispenser is shipped complete with a section of multiple strand chain conveyor extending out of one side. Remove all the banding, shipping blocks, etc.

A. Locate the Pallet Dispenser next to the palletizer and align the pallet conveyor side frames in the dispenser with the pallet conveyor side frames in the palletizer. Extensions must match up with the sections of chain conveyor in the palletizer.

B. Level the pallet dispenser:

   1. If required, install "optional" elevating piers under the pallet dispenser. (See Figure 6-5, Detail “A”.)

   2. If "optional" elevating piers are not required, weld the metal angle iron brackets (angle iron brackets provided) to the base frame for anchor bolting the pallet dispenser to the floor. (See Figure 6-5, Detail “B”.)

C. Fasten the chain conveyor sections together with four 1/2" x 1" hex head cap screws and lock nuts. Be sure that the chain tracks on the tops of both sections are in line.

D. Anchor the pallet dispenser to the floor with the floor anchor bolts provided.

E. Connect the air line from the main frame to the 3/8" OD tube that runs from a tee near the main regulator to the manual shut off valve at the dispenser.

F. Attach the pallet conveyor side guides between the dispenser and the palletizer frame.

G. Reconnect electrical wiring to the terminals in the junction/control box.

Table of Contents

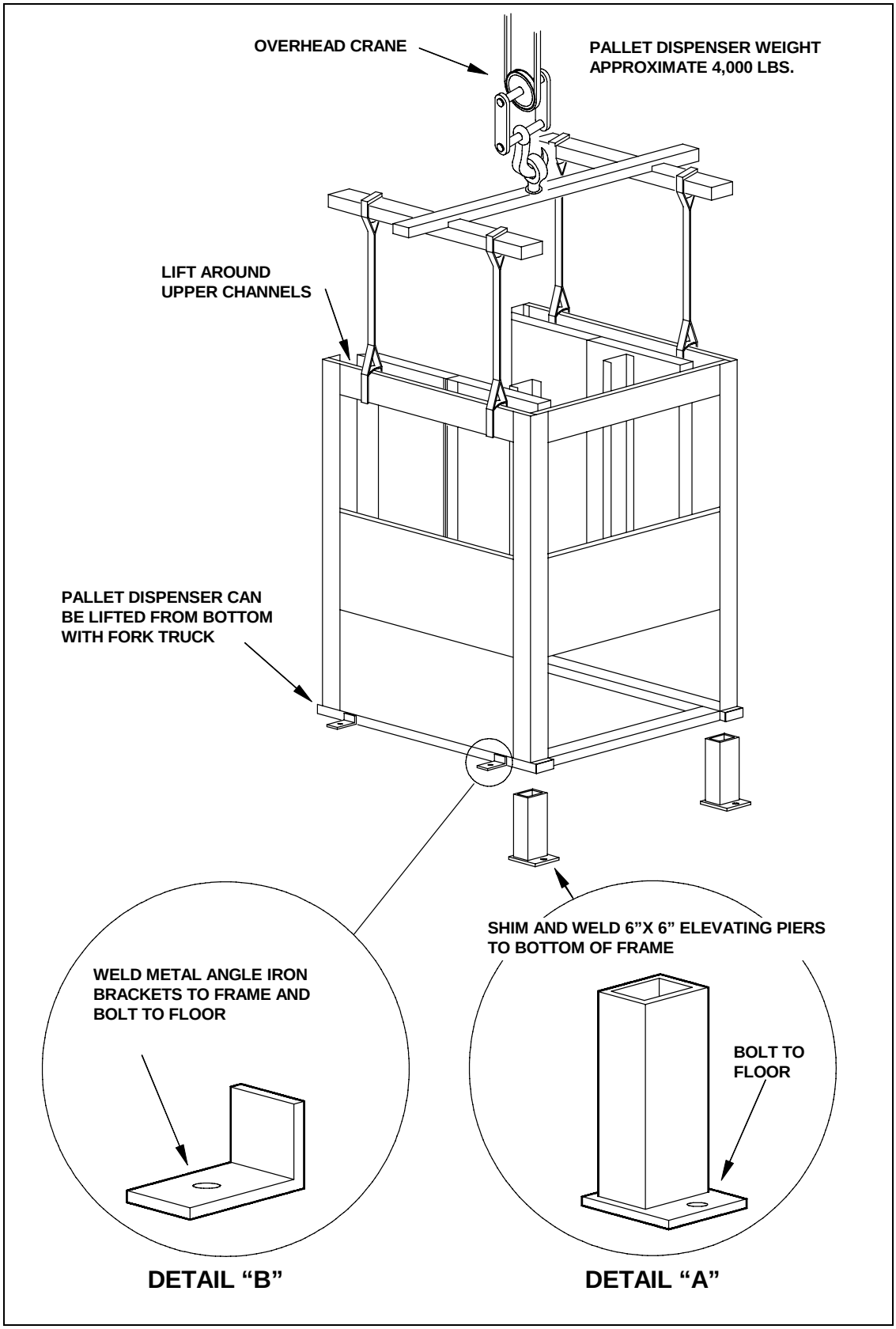

Figure 6-5: Lifting & Anchoring the Pallet Dispenser

Table of Contents

5. Pusher Bar & Hood Installation

A. Use two (2) heavy steel angle irons under the hood assembly frame to lift the hood assembly to the top of the machine. (See Figure 6-6)

B. Bolt the pusher bar and hood assembly to the top of the machine frame with the 3/8" x 2" carriage bolts, washers, and hex nuts provided. (See Figure 6-7.)

C. After the hood assembly has been bolted in place, remove the shipping angles.

D. Connect the drive motor and control wiring to the electrical junction box located on the side of the hood.

E. Mount proximity sensor PX3 onto the row former assembly. (Refer to the "Sensors & Brackets" drawing provided.)

F. Mount proximity sensor PX3A onto the machine frame near the front hood. (Refer to the "Sensors & Brackets" drawing provided.)

G. If the machine side covers and end covers were removed for shipment, reinstall the covers onto the machine side frames. (Refer to Figure 6-7, Detail "B".)

⚠WARNING

Operating the machine with the side safety covers removed exposes the drive chains and sprockets. These moving parts can cause severe injury and should be covered with safety covers before the palletizer or unitizer is started.

H. Mount photoelectric sensors PE9's to the top of pusher hood (See Figure 6-7) Refer to the "Sensors & Brackets" drawing provided.

I. For a layer table palletizer or unitizer, remount photoelectric sensor PE2L (optional) to the middle pusher bar hood. Refer to the "Sensors & Brackets" drawing provided.

Table of Contents

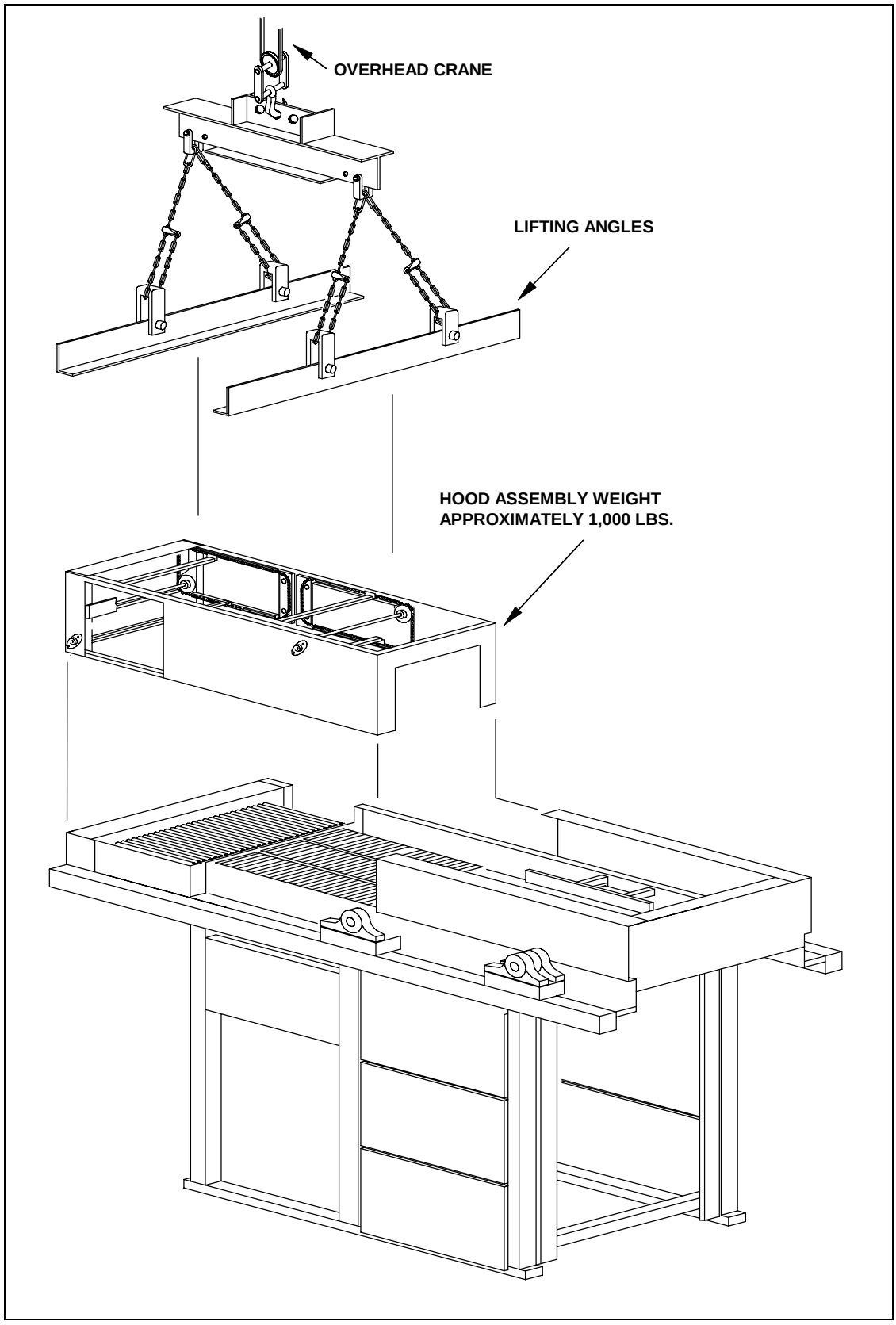

Figure 6-6: Lifting the Pusher Bar & Hood Assembly

Table of Contents

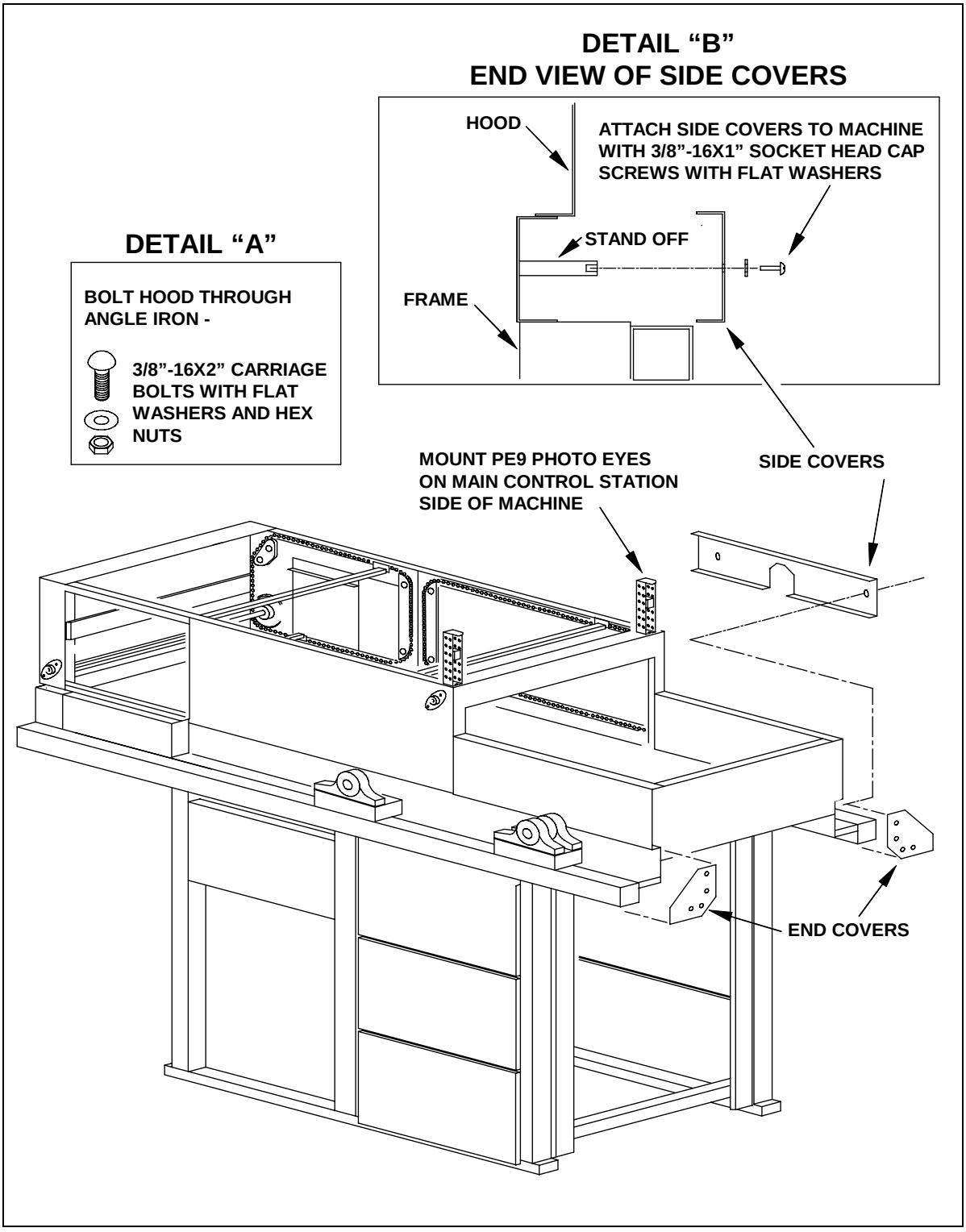

Figure 6-7: Pusher Bar & Hood Assembly Installation

Table of Contents

6. Main Control Station

Mount the main control panel and mounting bracket assembly to the outside corner of the hood frame assembly near the infeed belt. Fasten it to the frame with the 3/8” x1" carriage bolts, washers and nuts provided. (See Figure 6-8.)

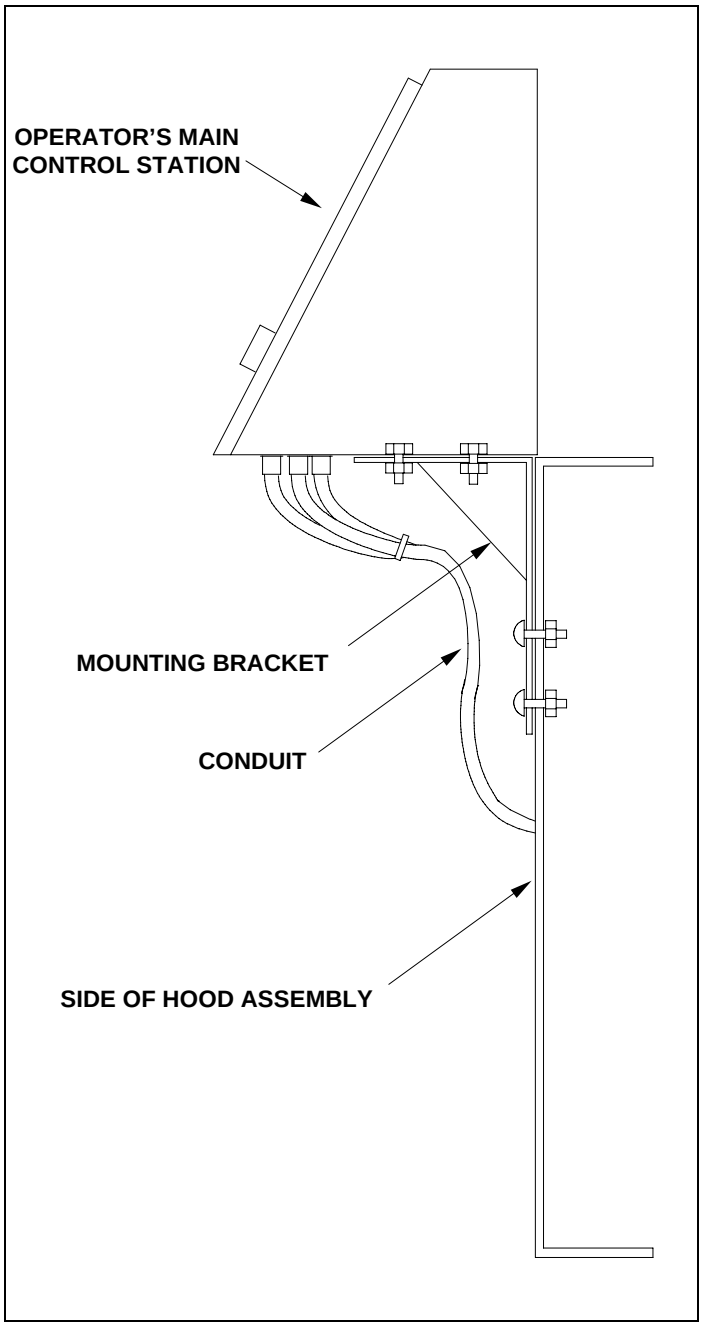

Figure 6-8: Main Control Station

Table of Contents

7. Infeed Stop Spacer Belt Case Conveyor

A. Description

The exact arrangement of the Infeed and Stop Spacer Belt case conveyor can vary from one machine to another. Refer to the System Layout Plans, Elevation Drawings, and the Bills of Material for your system, for a listing of the required components. The attaching parts for the infeed conveyors will be listed on the conveyor bill of materials. The conveyor hangers and supports are not furnished as part of the machine.

The Infeed/Spacer Belt case conveyor is a two-section belt conveyor (See Figure 6-9) While belt length and type will vary with each palletizer or unitizer and factory layout, the infeed/spacer belt performs the same basic functions; to regulate the flow of cases into the machine, and to create a space between cases as they move onto the case turner and live rollers section.

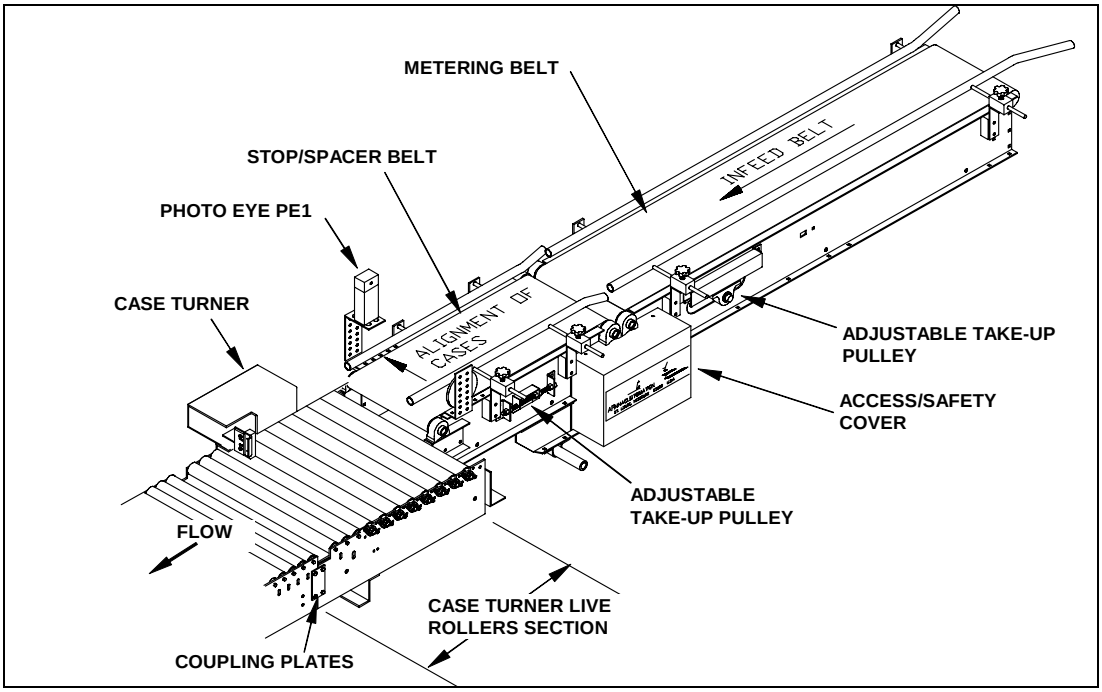

Figure 6-9: Infeed Spacer Belt Attached To Live Rollers Section

B. Installation Instructions

1. Position the infeed case conveyor sections on the floor **according** with the plan and elevation drawings provided.

NOTE: It is possible for conveyor sections to become out of square during shipment. Therefore, check each conveyor drive, intermediate, and tail end section to determine if it is perfectly square before the sections are bolted together. Check the alignment of the conveyor sections by placing a framing square along one of the side frames and checking the opposing roller shaft slots to see if they are directly opposite. If the slots are in line with each other, the rollers will be perpendicular to the side frames and parallel to each other. (Pulleys and rollers should turn freely.)

2. Before installing the Infeed Stop Spacer Belt assembly, reinstall the drive belt for the live rollers. Tension the drive belt with the adjustable take-up pulley on the row former section. (See Figure 6-10)

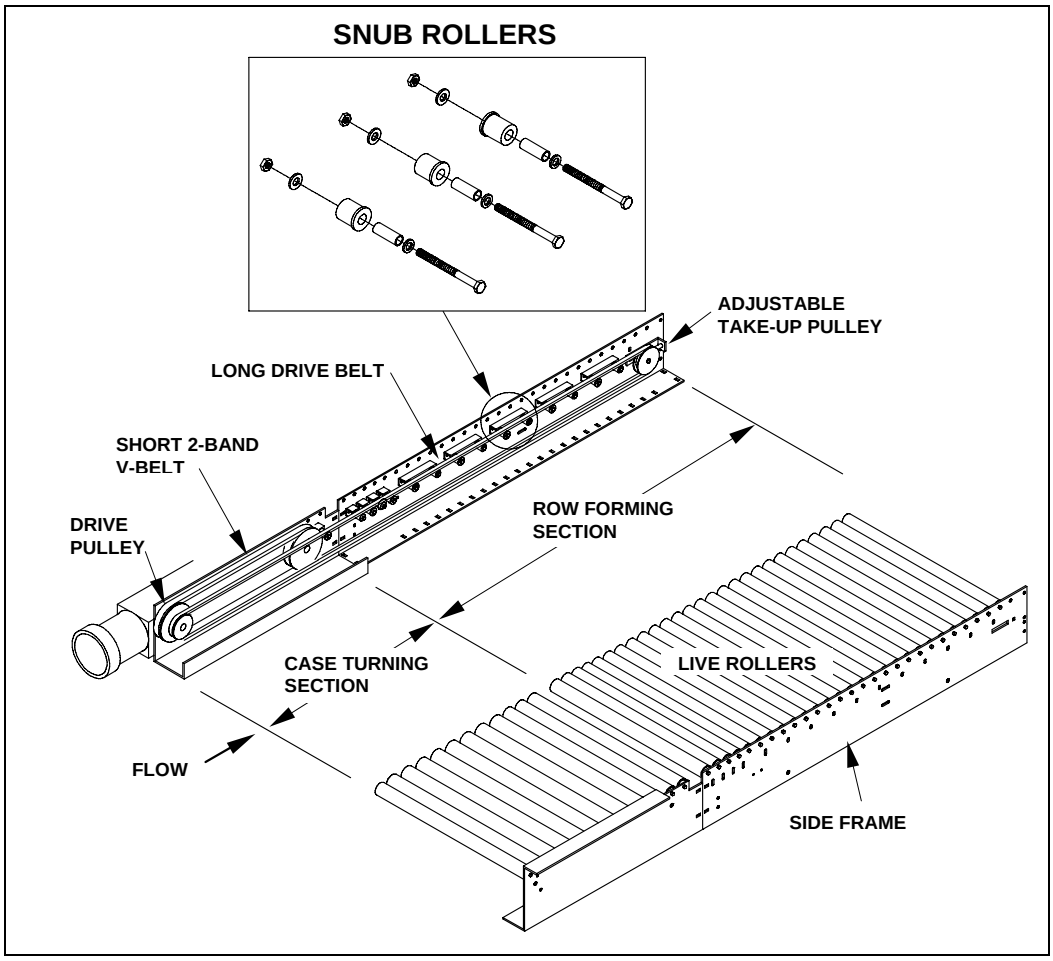

Figure 6-10: Live Rollers Drive Belt

3. If not already installed, attach the Case Turner assembly onto the side frame of the case turner and live rollers section on the drive belt side. (See Figure 6-9) Attach the case turner and live rollers section frames together using the coupling plates provided. Also, bolt through the bottom flanges into the frame members.

4. Connect the air lines to the case turner. All the air lines and connection points are marked or tagged with a number or letter to match the lines to their proper locations.

5. Assemble the infeed conveyor support members (legs and hangers) with the hardware (provided) and install the conveyor system in its fixed position (“hand tighten only”). Do not wrench tighten these bolts until the infeed belt is aligned.

NOTE: The centerline of the infeed belt and the live rollers section will be offset. The inside rail of the stop spacer belt must be aligned with the case turner assembly.

Table of Contents

6. Attach the Infeed Stop Spacer Belt assembly to the end of the Case Turner frame so that the side line of the Infeed Stop Spacer Belt is in direct line with the case turner. The top of the Spacer Belt must raise 1/8" above the top of the Case Turner side frame.

⚠CAUTION

When the Infeed Stop Spacer Belt assembly is being installed at an angle, release the belt tension on the take-up pulley before installation. If the belt tension is not released ahead of time, it will cause excess wear on the pulley bearings. (See Figure 6-11.)

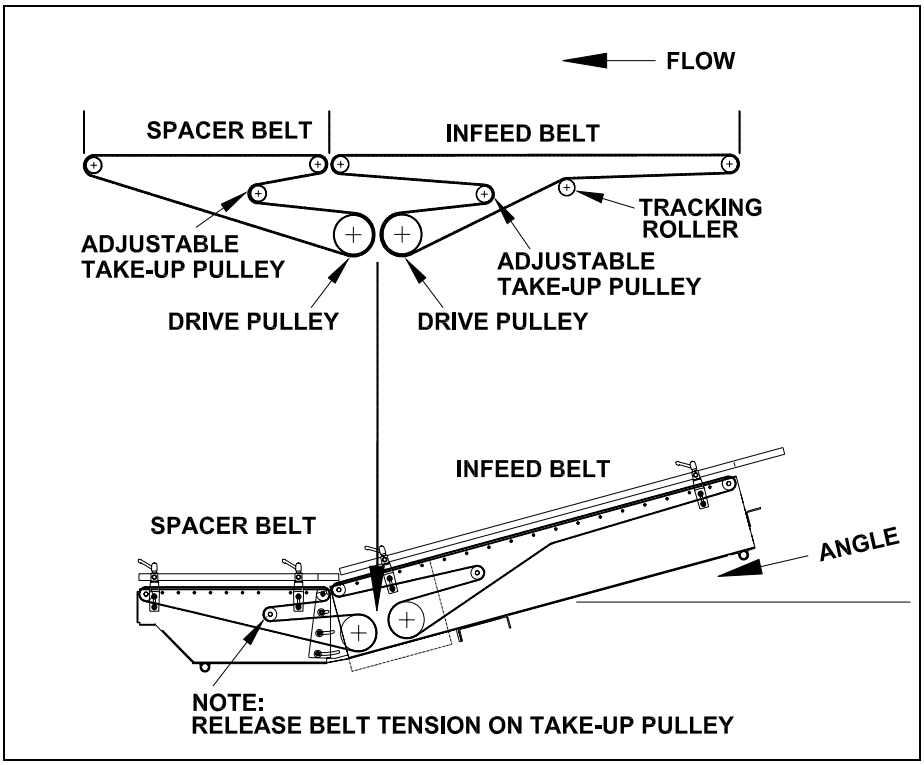

Figure 6-11: Infeed Stop Spacer Belt Pulley Adjustment

7. Install the remaining infeed case conveyor sections.
8. After all the infeed case conveyor sections have been bolted together, they must be aligned from end-to-end in a straight line. (If this is not done, it will be virtually impossible to correctly track the belt.)
9. Adjust the case guides so that the cases will travel down the side of the infeed conveyor. (See Figure 6-9.)
10. Mount photoelectric sensor PE1 near the end of the Infeed Spacer Belt section. (See Figure 6-9.)
11. After the infeed case conveyor is installed, run the belt for a few minutes to determine if the belt is tracking correctly and re-adjust the tension if necessary.

Table of Contents

8. Installing Infeed Case Conveyor Belting

NOTE: Normally the infeed case conveyors are shipped from our factory with the belting installed, therefore the case conveyor belting installation instructions that follow are not needed for most installations. If the belting is not already installed, install the infeed conveyor belting using the following installation instructions. Only trained and qualified personnel must perform the belt installation.

A. Safety

DO NOT install the infeed case conveyor belting before making sure that all power to the gear motor is shut off, and the machine lockout safety procedure for your company has been followed. If this safety procedure is not followed personal injury and/or possible palletizer or unitizer damage could occur.

B. Installation Pre-Check

Before installing the infeed case conveyor belting, be sure to check the following:

1. All conveyor frame sections are square, properly aligned, and securely assembled.
2. All conveyor pulleys and roller shafts are perpendicular (90°) to the conveyor frame.
3. All conveyor idler pulleys and rollers rotate freely.
4. No dips or humps exist along the roller-bed or slider-bed conveyor surface.
5. All take-up pulleys are adjusted to their minimum take-up position.

NOTE: The pillow-block bearing mounting bolts on some units must be loosened before the take-up pulley can be adjusted.

Table of Contents

C. Measuring Belt Length

1. For a short case conveyor, thread a tape or rope through the case conveyor following the path the belt will take, and measure. Cut belt to this length.
2. For longer conveyors, the length of the conveyor can be doubled and 4 ft. added. This gives the approximate belt length required. Cut belt to approximate belt length.

NOTE: Large rolls of belting should be mounted on a shaft for ease of unrolling and threading onto the conveyor. Where insufficient space exists for handling a large roll, the belt should be unrolled and formed into large loops taking care to avoid a kink or placing undue stress on the belt. The belt may then be pulled from the pile in the same manner it is pulled from a coil.

D. Threading Infeed Case Conveyor Belting

1. Orient the belt surface properly on the case conveyor unit. For minimum friction (less belt drag) particularly on slider bed units, the brushed, non-glossy side of the belt must be face-down on the top side of the case conveyor.
2. Thread the belt through the case conveyor. Thread the belt through the bottom of the case conveyor first. Position the belt near one end of the conveyor so the brushed side of the belt is up and the first pulley to be encountered by the belt is the drive pulley.
3. Attach a suitable clamp and cable or rope to the lead end of the belt. (See Figure 6-12) The clamp must distribute belt pull evenly across the width of the belt. Then, with the assistance of a puller on the cable or rope, the lead end of the belt can be guided through the final path, around drive and take-up pulleys, over return rollers, around end pulleys, and finally, up to the top of the conveyor where the it can be joined with the other end of the belt.

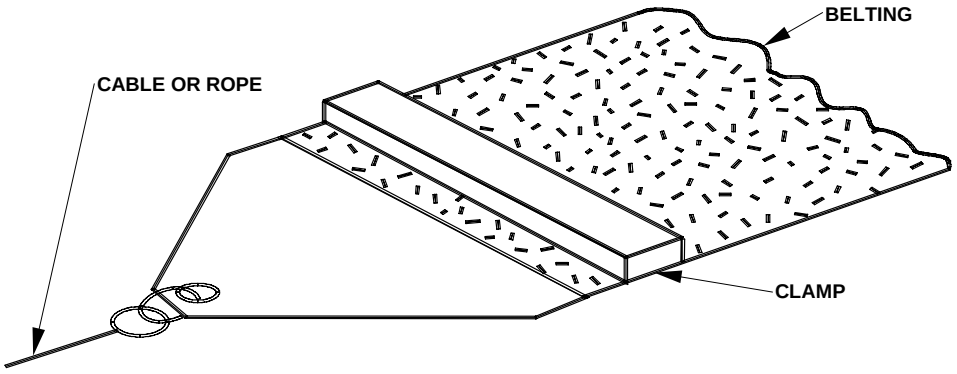

Figure 6-12: Belt Pulling Device

Table of Contents

E. Cutting Infeed Conveyor Belt Ends

1. Pull the belt ends together and secure them with appropriate clamps. (See Figure 6-13) If excessive belt length exists, overlap the belt ends until the belt sag between the return rollers at 10 ft. centers is about 1-3/4 in. (with conveyor take-up at minimum take-up position). Mark the cut line lightly with chalk or pencil.

NOTE: Belt ends must be cut precisely square to ensure proper belt tracking and even distribution of tension load through the belt splice.

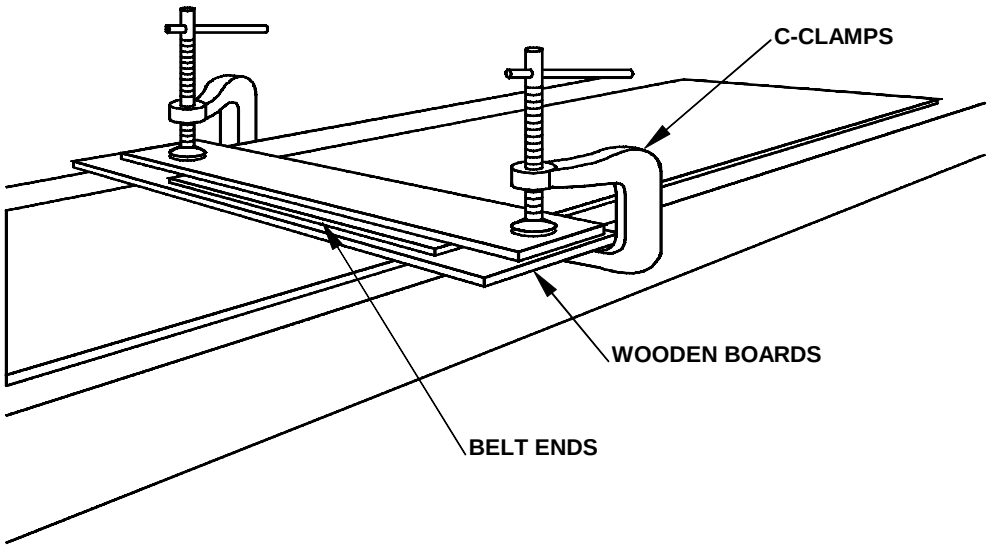

Figure 6-13: Clamping Belt Ends

2. Using chalk or pencil, mark the center of the belt width at a number of points about 1 ft. apart for a distance of 3 to 5 feet near the planned cut.
3. Using a straightedge, mark the center line of the belt width by passing the line through as many center marks as possible.
4. Using a steel square, mark the cut line perpendicular (90°) to the center line.
5. Carefully cut the belt with a sharp knife or belt cutting tool.

NOTE: The corners on squared cut belt ends should be chamfered (notched) at about a 70o angle cutting off a triangle measuring 1/2 in. (along the belt width) and 1-1/2 in. (measured along the belt length). Only the trailing end of one-way belts needs to be notched, notch both ends for reversing belts. Rough tops, ribs, chevrons, etc. should be "skived" back about 1 inch from the belt ends before lacing. Skiving is normally assumed by belting and lacing manufacturers when sizing belt fasteners for these types of belts.

Table of Contents

F. Splicing Infeed Conveyor Belt with Alligator™ Lacing

Alligator™ lacing (a trademark of Flexible Steel Lacing Co.) consists of parallel hooks connected by a flat metal bar. Standard lacing sizes for Our belt conveyors are numbers: 7, 15, 20, 25, and 27. Installation materials needed are a metal chisel or pliers (if lacing bars have to be cut to shorter lengths), a hammer, a wood block, and a metal plate.

1. Before lacing the belt, check the following:

   a) Belt ends are cut square and rough tops are skived off for maximum hook clinch.

   b) Lacing hooks, gauge pin, and hinge pin are properly sized:

      Example 1:

      - Use No. 7 Hook, for PVC100 Friction Surface
      - Hinge Pin Diameter = 1/16 in.
      - Gauge Pin Diameter = 3/32 in.

      Example 2:

      - Use No. 15 Hook, for PVC100 Rough Top
      - Hinge Pin Diameter = 3/32 in.
      - Gauge Pin Diameter = 9/64 in.

2. Cut lacing to proper length, with a metal chisel at the appropriate notch on the inside of the lacing bar. The lacing length should be one hook shorter than the belt width. If a chisel is not available, carefully bend the lacing back and forth at the appropriate notch with pliers.

3. Place the lacing on a flat surface and snap clips between the second and third loop at each end (see Figure 6-14). Place a third clip at the center of the lacing.

NOTE: If the clips are lost, lacing can be applied with the gauge pin alone. If gauge pin is lost, any round metal rod of same diameter can be used.

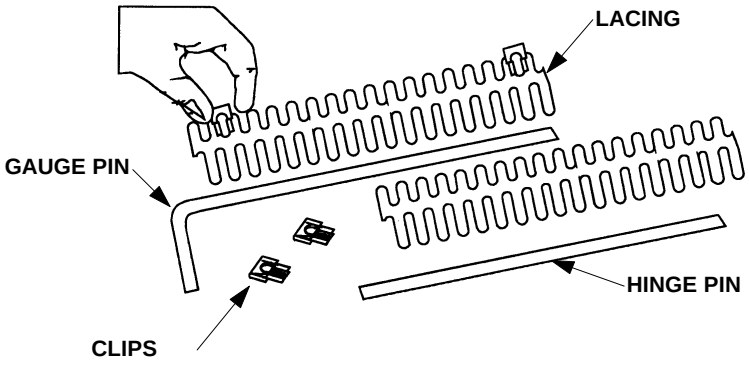

Figure 6-14: Alligator™ Lacing

Table of Contents

4. Insert the gauge pin through the lacing loops. Place wood block under the belt end and center lacing on the belt. Lightly hammer the end hook at each edge into the belt just enough to hold the lacing in place.
5. Fold the belt end back on the wood block. Hold the lacing tightly against the belt and carefully hammer all hooks ONLY HALFWAY into the belt. (See Figure 6-15.)

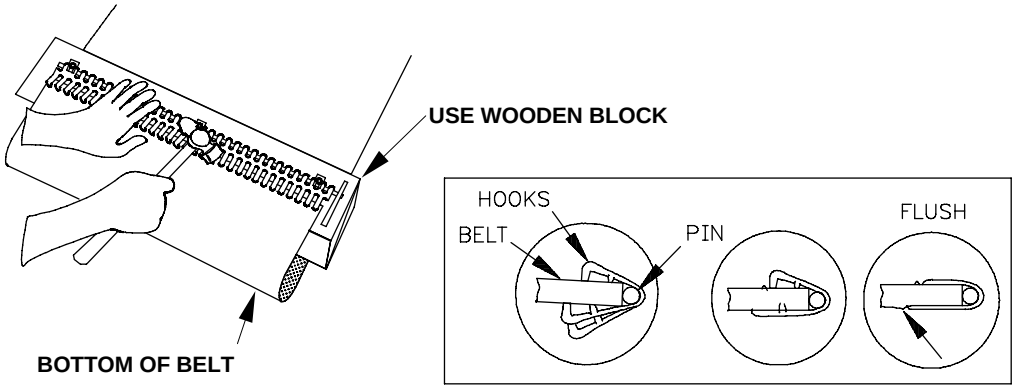

Figure 6-15: Clinching Hooks into Belt Ends

6. Bring the belt end forward top side up on the wood block. Hammer all hooks flush with the belt surface being careful to avoid hitting the lacing bar and the individual loops.
7. Fold the belt end back bottom side up on the wood block. Hammer all hooks flush with the belt surface being careful to avoid hitting the individual loops.
8. Bring the belt end forward top side up with metal plate under the lacing. With firm hammer blows, clinch all hooks tightly against the belt being extremely careful to avoid hitting the lacing bar and the individual loops.
9. Fold the belt end back bottom side up with metal plate under the lacing. With firm hammer blows, clinch all hooks tightly against the belt being extremely careful to avoid hitting the individual loops.
10. Remove the gauge pin and clips, and apply lacing to the other belt end. Inspect the lacing when finished.
11. After lacing both belt ends, bring the ends together using appropriate belt clamps and insert hinge pin to complete the belt splice. Chamfer corners as needed to prevent the end hooks from being torn out should the sides of the belt come in contact with any stationary structure.

Table of Contents

G. Splicing Infeed Conveyor Belt with Clipper™ Lacing

Clipper™ lacing consists of parallel, staggered-grip hooks on removable carding paper. Standard lacing sizes for Our belt conveyors are numbers 1-A, 1, 2, 3, and 4. A Clipper™ lacing machine (manual or electric-hydraulic) is required. (See Figure 6-16A) The following general instructions are applicable to all Clipper™ lacers; refer to the vendor manual provided with the lacer machine for more details.

1. Before lacing the belt, be sure to check the following:

   a) Belt ends are square and rough tops are skived off for maximum hook clinch. If repairing a torn belt, use a belt cutter to square the belt ends.

   b) Gauge the belt for the proper size lacing hook, and hinge pin.

   Example 1:

   - Use No. 25 Hook Pin , for PVC100 Friction Surface
   - Hook Pitch = 0.125 in.

   Example 2:

   - Use No. 13 Hook Pin, for PVC100 Rough Top
   - Hook Pitch = 0.125 in.

2. Turn adjusting lever to open the lacer jaws. Remove the loading strip, and load the hooks into the appropriate face strip (with carding paper reading upside-down), secure the hooks into the face strip by re-inserting lacer pin, and close lacer jaws just enough to hold hooks in position. Uncurl and pull carding paper off the hook points. (See Figure 6-16B.)

3. Insert the belt perpendicular to the lacer (not at an angle) between hook points, and center the belt in the hooks from side-to-side. Hold the belt down flush on the hook retainer and secure the belt by closing the belt clamps. (See Figure 6-16C.)

4. Open the rollers on the lacer head all the way by turning the adjusting knob clockwise. Position the lacer head over the hooks and close the rollers (turn counter-clockwise) until the hook points begin to touch both sides of the belt. (See Figure 6-16D.)

5. Using the drive handle, move the lacer head across width of belt, embedding the hooks. Close the adjusting knob 1/2 turn following each pass. Generally, five or six passes are needed to complete the splice. (See Figure 6-16E.)

6. Examine hook clinch for proper clinching. (See Figure 6-16F) Hooks are properly clinched when 1/2 diameter of hook leg is embedded into the belt cover, and hook points break surface of belt. Hooks should not wiggle, hook legs should be nearly flush with belt surface, and hook points should be slightly visible. (On rubber belting, hook points will recede into the belt cover when jaw pressure is released.)

Table of Contents

7. After lacing both the belt ends, bring the ends together using the appropriate belt clamps and insert the hinge pin to complete the belt splice. (See Figure 6-16F) Chamfer belt corners as needed to prevent end hooks from being torn out should sides of belt come in contact with any stationary structure.

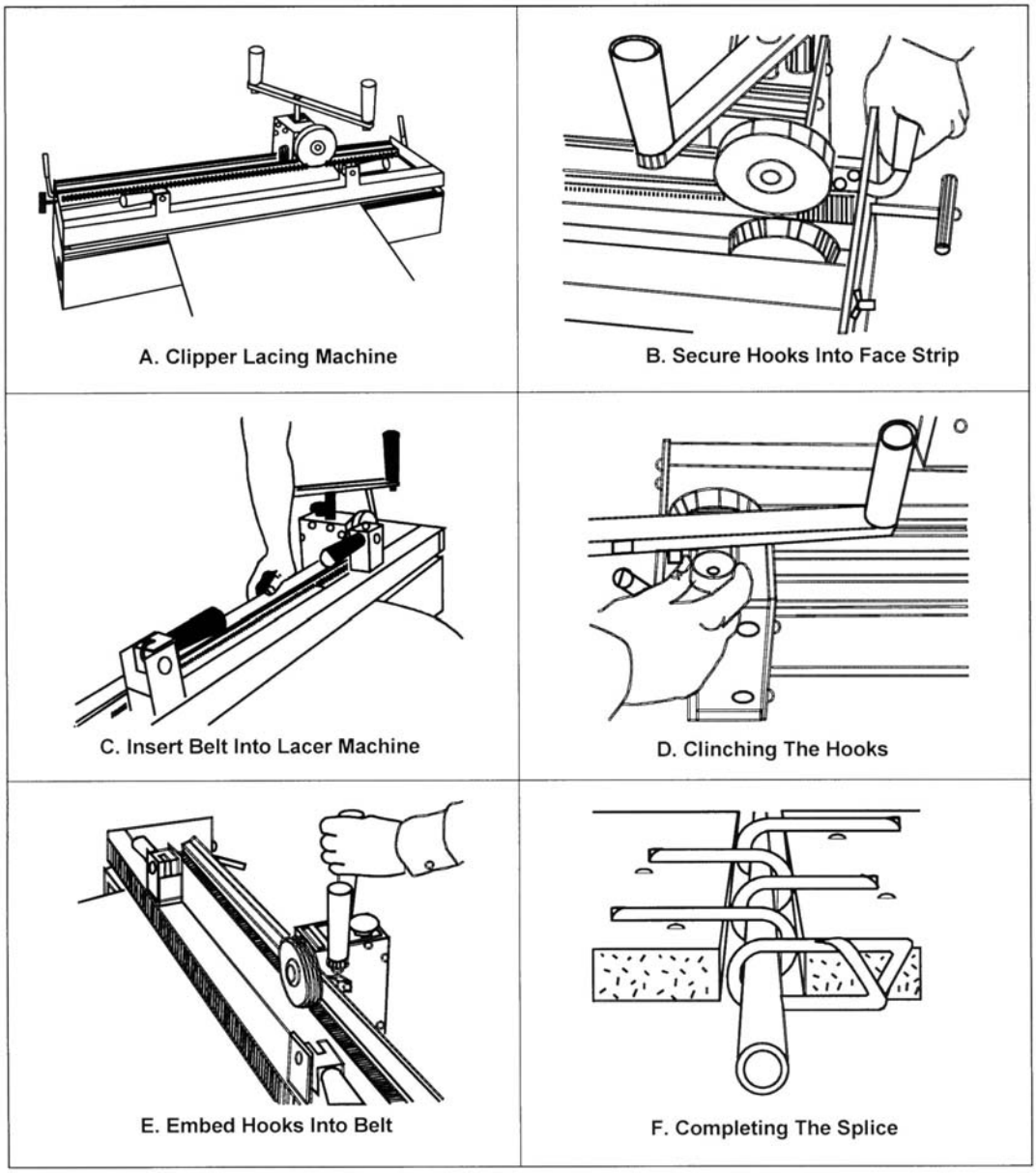

Figure 6-16: Operating the Clipper™ Lacing Machine

Table of Contents

H. Tensioning Infeed Conveyor Belts

1. Tighten the infeed conveyor belt take-up pulley to eliminate excess belt slack and to provide initial belt tension for conveyor start-up. Belt sag between return rollers at 10-ft. centers should be about 3/4" to 1" for standard PVC-100 polyester belting. The belt should be tensioned just enough to prevent slippage on the drive pulley. Excessive belt tension can result in motor overload, shortened belt life, and bearing damage. Insufficient belt tension will prevent the conveyor from running and can shorten the life of the pulley lagging.
2. Re-check the squareness of the take-up pulley or roller, and make certain the bearing mounting bolts and take-up nuts are securely tightened on both sides.

I. Conveyor Pre-Operational Check List

The following describes the checklist prior to equipment start-up:

1. Check conveyor elevation and adjust supports as needed.
2. Check conveyor alignment (lengthwise and widthwise) with a spirit level. Adjust supports or add shims as needed and securely tighten all mounting bolts.
3. Check that all pulleys and rollers are mounted perpendicular (90°) to the direction of belt travel.
4. Check belt sag and adjust take-up pulley as needed.

   NOTE: Do not over tension the belt.

5. Check driver/driven sprocket alignment with a straightedge. Securely tighten all sprocket fasteners.
6. Check the drive chain tension and adjust gear-motor platform as needed. Securely tighten all mounting bolts.
7. Check electric motor wiring connections.
8. Check other wiring connections and test all conveyor electrical controls for proper operation.
9. Check that all conveyor safety guards removed during the installation have been replaced.
10. Check that tools and all installation materials have been removed from the conveyor.

Table of Contents

J. Belt Tracking Instructions

At this point, the case conveyor is properly installed, all sections are aligned, and all carrier rollers are level and square with the frame. The belt is installed with all pulleys, snub, and return rollers at right angles to the conveyor frame, and all pre-start-up precautions observed. Now you are ready to track the belt.

Belt tracking is performed while the conveyor is running and is dangerous. Only trained and qualified personnel must perform the belt tracking function. The personnel must be instructed to always be alert for any unsafe condition and to use extreme care when tracking the belt.

1. When first tracking the belt, station qualified personnel at each end of the conveyor to observe possible belt tracking problems.
2. Run the belt for a few minutes to determine if the belt is tracking correctly and re-adjust the tension if necessary.
3. It is seldom possible to make the pulley shafts perfectly parallel. Corrective adjustments must be made with the snub rollers.

   NOTE: A common mistake is to adjust the end pulleys for any belt-tracking problem. Adjusting the end pulleys is proper only for mistracking on the end pulley at the discharge end of the conveyor.

4. Notice if the belt creeps toward the side of the pulley or snub roller that it touches first. Make adjustments accordingly.

   NOTE: All adjustments should be slight and you must allow sufficient time for the belt to react to the adjustment, (especially if the conveyor operates at slow speeds). Multiple revolutions of the belt are required for the belt to reach equilibrium.

Table of Contents

K. Belt Tracking Check List

1. Check the entire belt path for serious tracking problems that require immediate attention.
2. Watch the belt's position at a given point for at least one complete rotation. If the belt does wander off center and then returns back to the center position, there is no need to make any adjustments. When the belt wanders off center, it is caused by camber in the belt length that will tend to straighten out in time.
3. (For Roller Bed Only) If the upper run of the belt moves off center in a particular section, check that section to see if the rollers are square to the frame rails. If they are not at right angles with the frame, the section(s) must be straightened.
4. If the upper belt runs "off-center" the full length of the conveyor, first make adjustments of the Snub Roller as shown in Figure 6-20. Then, if necessary, adjust the Head Pulley as shown in Figure 6-19.
5. Observe the belt's return run and its position on each return roller. Adjust any roller that causes the belt to move off center.
6. If the belt does not track at the Upper Bend Unit, adjust the Upper Bend and/or Snub Rollers as shown in Figure 6-21 and Figure 6-22.
7. If the belt does not track at the Center Drive Unit, adjust the Snub Roller preceding the Drive as shown in Figure 6-23 and/or Figure 6-24.
8. On reversible unit, first track the belt in the forward direction of travel, then reverse the conveyor, and repeat the tracking steps.

L. Principles of Belt Tracking

You must understand the principles of belt tracking in order to properly track the belt:

1. **Crowned Pulleys** - Belts connecting parallel shafts tend to run toward that part of the pulley that is largest in diameter. Therefore, pulleys are crowned to keep the belt on center.
2. **Taut Belt** - The belt must be sufficiently tensioned to not slip on the drive pulley. DO NOT over-tighten.
3. **Parallel Shafts** - If the pulley shafts are not parallel, the belt will creep toward the side where the shaft centers are closest.

Table of Contents

M. Examples of Belt Tracking

1. As shown in Figure 6-19 through Figure 6-21, the belt creeps to the right side of the conveyor. The right side of the conveyor is the side to your right when you are facing in the direction of forward travel of the product (See Figure 6-17). For reversible conveyors, forward travel is that direction of travel that is used to convey the largest amount of product.

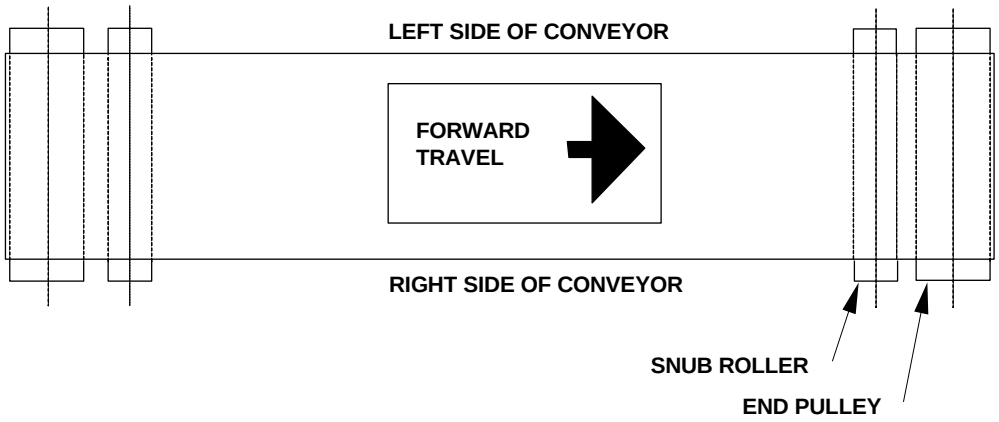

Figure 6-17: Top View of Direction of Belt Travel.

2. The conveyor's ends are identified by their location in relation to the forward direction of product travel. The conveyor's infeed end (forward travel) is referred to as the "tail end", and the discharge end is the "head end" (See Figure 6-18). On reversible units, the "head end" and "tail end" designations will remain the same for both directions of travel once the forward direction is established.

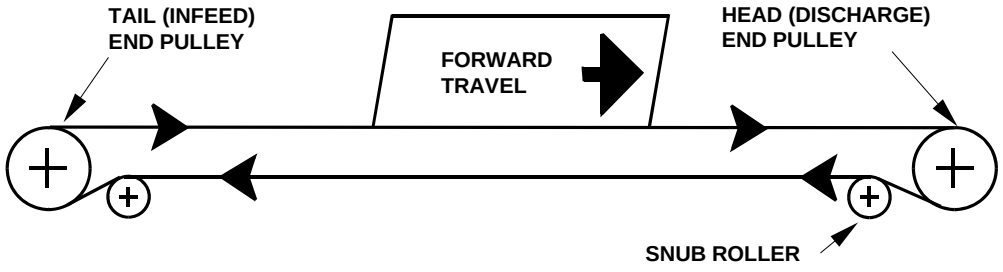

Figure 6-18: Side View of Product Travel from "Tail End" to "Head End" of Conveyor.

Table of Contents

3. During forward product travel, if the belt creeps to the right on the head pulley (drive/idler), adjust the right side of the head pulley in direction “F” (Forward) and/or the left side in direction “R” (Rearward) (See Figure 6-19).

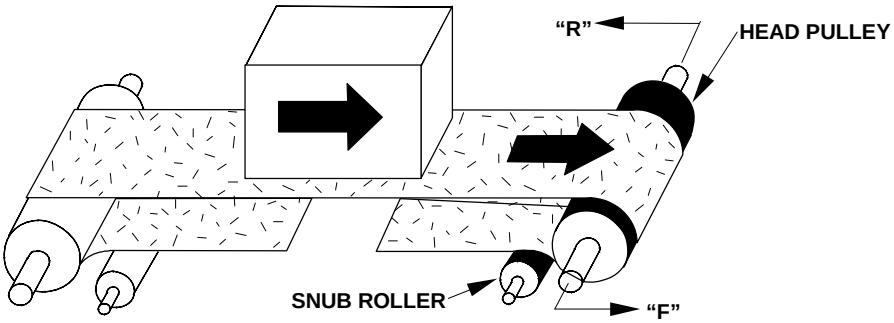

Figure 6-19: Adjusting the Right Side of the Head Pulley.

4. During forward product travel, if the belt creeps to the right on the tail pulley, adjust the right side of the “tail end” snub roller in direction “R” and/or the left side in direction “F” (See Figure 6-20).

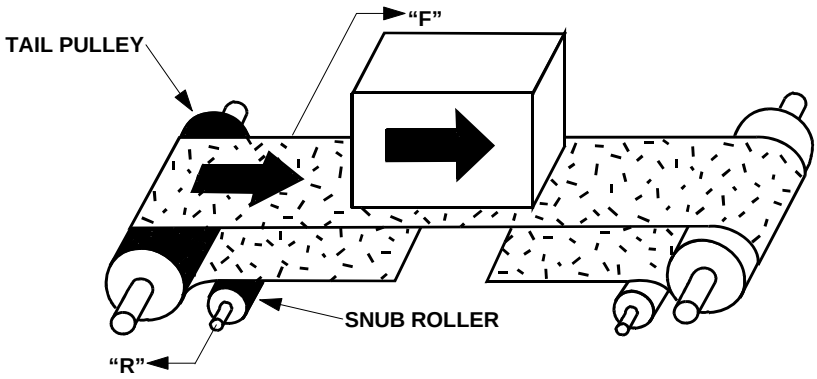

Figure 6-20: Adjusting the Right Side of the “Tail End” Snub Roller.

Table of Contents

5. During forward product travel, if the belt creeps to the right at the upper bend, adjust the right side of the upper bend roller “A” in direction “F” and/or the left side of upper bend roller “B” in direction “R”. (See Figure 6-21.)

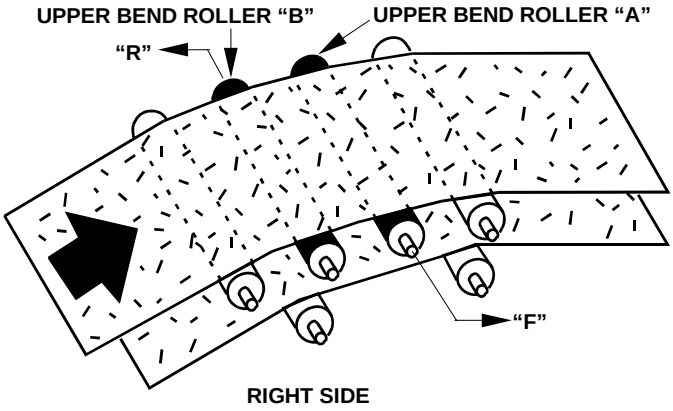

Figure 6-21: Adjusting Upper Bend Roller for Tracking Upper Run of Belting

6. Proper installation is a key factor in tracking the belt at the Upper Bend. Make certain the unit is level (from side-to-side) and that both sides are adjusted evenly. (See Figure 6-22.)

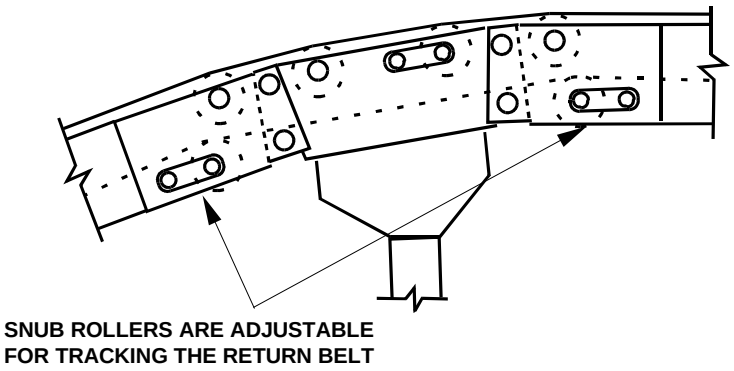

Figure 6-22: Adjusting Upper Bend Snub Rollers for Tracking Return Run of Belting.

Table of Contents

7. In Figure 6-23 and Figure 6-24, the direction of product travel is not mentioned. This is necessary as the center drive units are reversible and may be installed as either right-hand or left-hand assemblies.
8. With the belt travel as shown in Figure 6-23, if the belt creeps to the near side of the drive and take-up pulleys, adjust the near side of snub roller “A” in direction “R” and/or the far side in direction “F”.

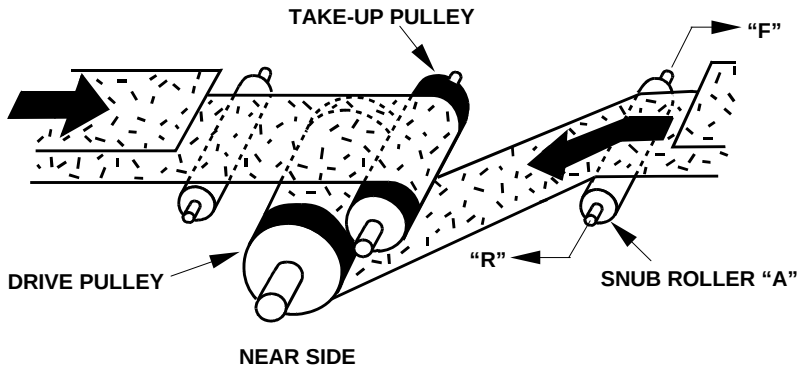

Figure 6-23: Adjusting the Near Side of the Snub Roller “A”.

9. With the belt travel as shown in Figure 6-24, if the belt creeps to the near side of the drive and take-up pulleys, adjust the near side of snub roller “B” in direction “R” and/or the far side in direction “F”.

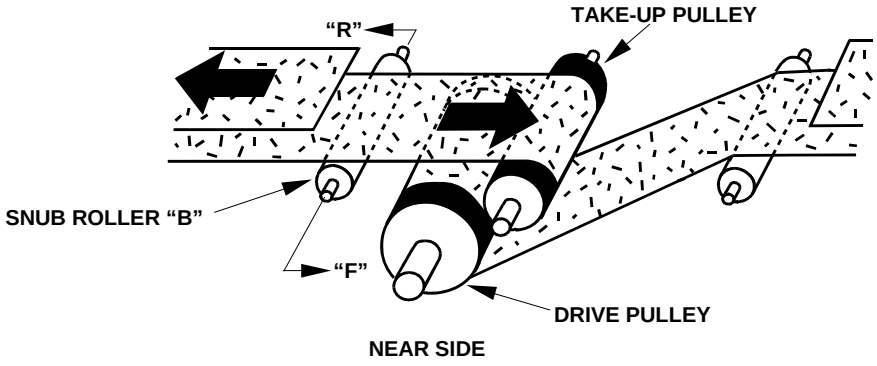

Figure 6-24: Adjusting the Near Side of Snub Roller “B”.

Table of Contents

9. Installing Pallet Conveyor

A. Infeed Pallet Conveyor

The number and arrangement of the infeed pallet conveyor sections can vary from one machine to another. Refer to the plan and elevation drawings and the bills of material for a listing of the required components.

B. Discharge Pallet Conveyor

The number and arrangement of the discharge pallet conveyor sections may vary from machine to machine. Therefore, refer to the System Layout Plans, Elevation Drawings, and the Bills of Materials for a listing of the required components. The attaching parts for the Discharge Conveyors will also be listed on the Conveyor Bill of Materials and should be bagged and wired to each unit.

1. Move the Discharge Conveyor sections to their permanent locations and position them in accordance with the Plan and Elevation Drawings provided. The centerline of the Discharge Conveyor will normally match the centerline of the machine internal conveyor, but this may not always be true.

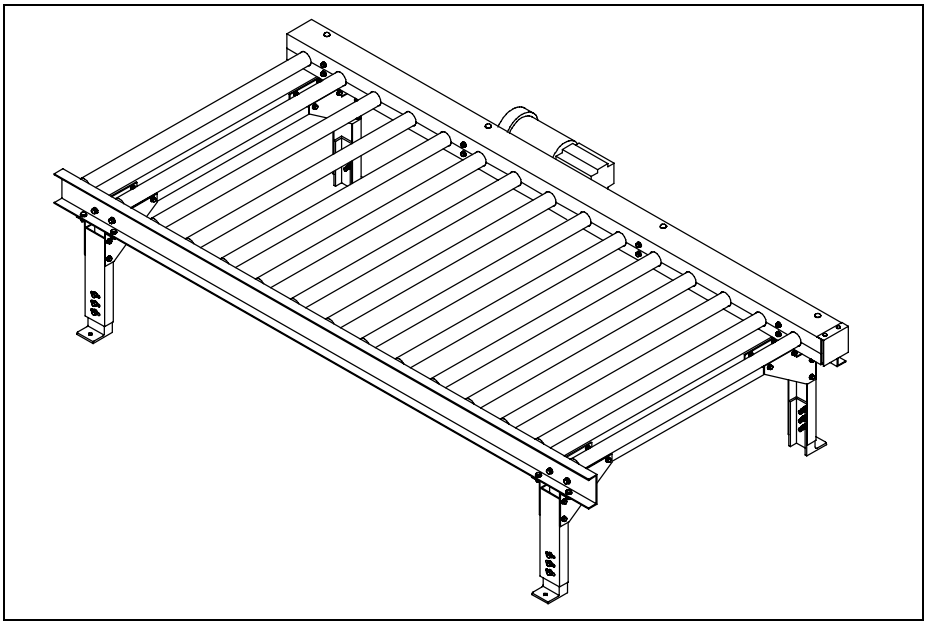

Figure 6-25: CDLR (Chain Driven Live Roller) Discharge Conveyor (Optional)

Table of Contents

2. Check the alignment of each conveyor section by placing a framing square along one of the side frames and checking the opposing roller shaft slots to see if they are directly opposite. If the slots are in line with each other, the rollers will be perpendicular to the side frames, and parallel to each other.

   NOTE: If the rollers are not square in the side frames, the load will not travel down the conveyor centerline.

3. Fit the conveyor sections together according to the project layout drawings and secure them with the attaching parts provided.

4. Level the conveyor sections with a machinist's or carpenter's level across the roller intermediates. Tighten all bolts on legs and feet when finished.

5. Use holes in conveyor feet as a template to drill holes in the floor, and install concrete anchor bolts at each foot to hold the conveyors in place.

   NOTE: Ensure that the conveyor feet are not drawn down to the floor when tightening the anchor bolts. Shims must be used to close any gap between the floor and the feet.

6. After the elevation is set, tack weld the adjustable support feet to the conveyor legs so they will not slip after leveling.

   NOTE: Before welding the feet solidly to the legs, fully loaded pallets should be run over the conveyor. Level again if necessary. After running full pallets on the conveyor, verify that the elevation and alignment is still correct. The feet can then be welded permanently.

   ⚠CAUTION

   Do not weld threaded rod-type feet; just tighten the lock nut securely.

7. Install Forklift Truck Bumpers and Chain Guards on the drive units where required. Forklift Bumpers are not supplied with the machine.

Table of Contents

10. Pneumatic - Field Connections

A. Connect the main air supply to the system Air-Filter/Regulator. The air supply pipe must be at least 3/4" ID pipe, and have a shut-off valve installed. Route the pipe so that it does not prevent access to the top of the machine.

B. Install a moisture drip leg to help remove moisture before the air line connects to the machine. (See Figures 6-27 and 6-28.)

C. The system Air-Filter/Regulator should be set at the factory to 80-psi and adjusted to suite the palletizer or unitizer requirements.

D. The air devices used on this machine require little or no lubrication. Ensure the air lubricator is filled with oil to ¼" of the top. Use high quality SAE #10 oil.

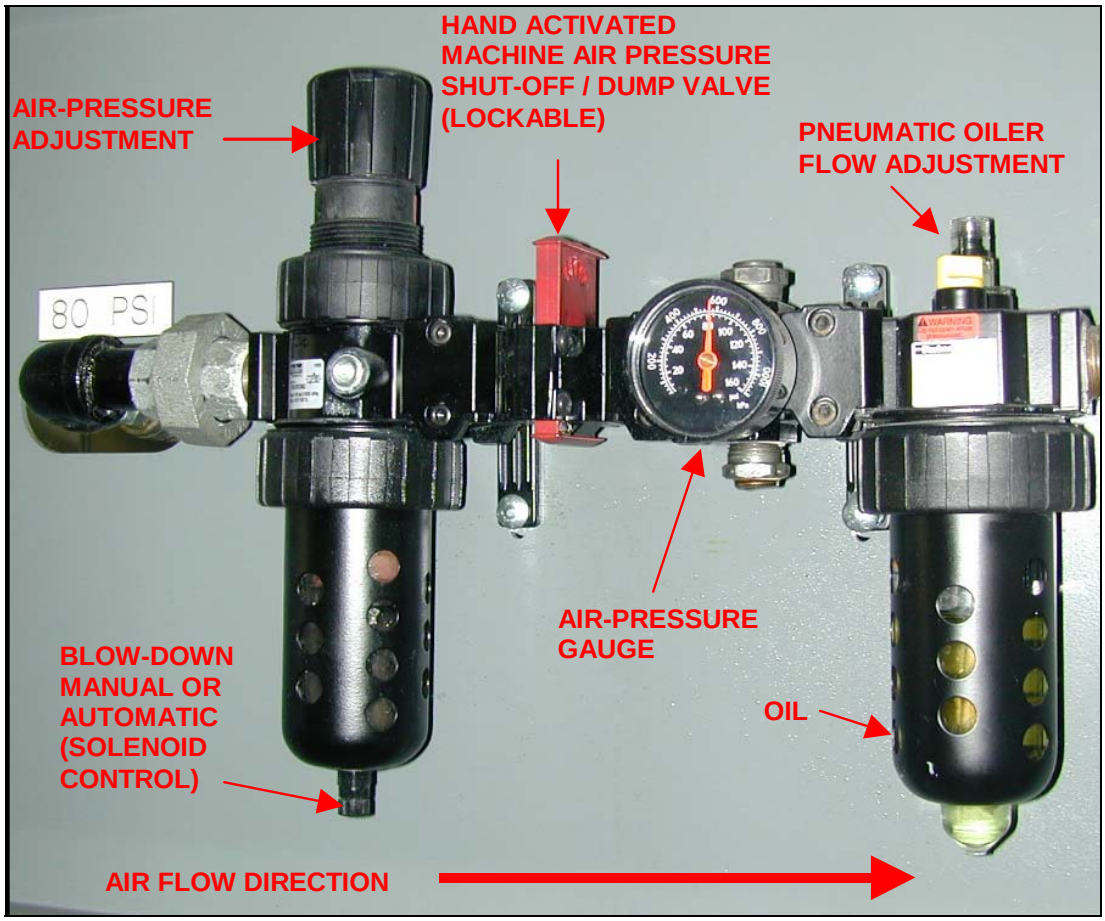

Figure 6-26: Main Air Supply System

Table of Contents

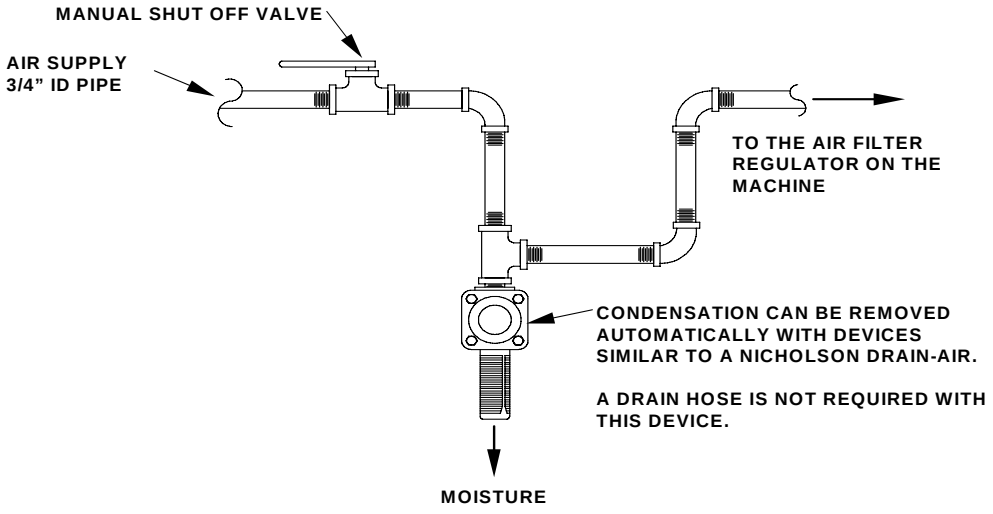

Figure 6-27: Typical Air Line Drip Leg with Automatic Drain

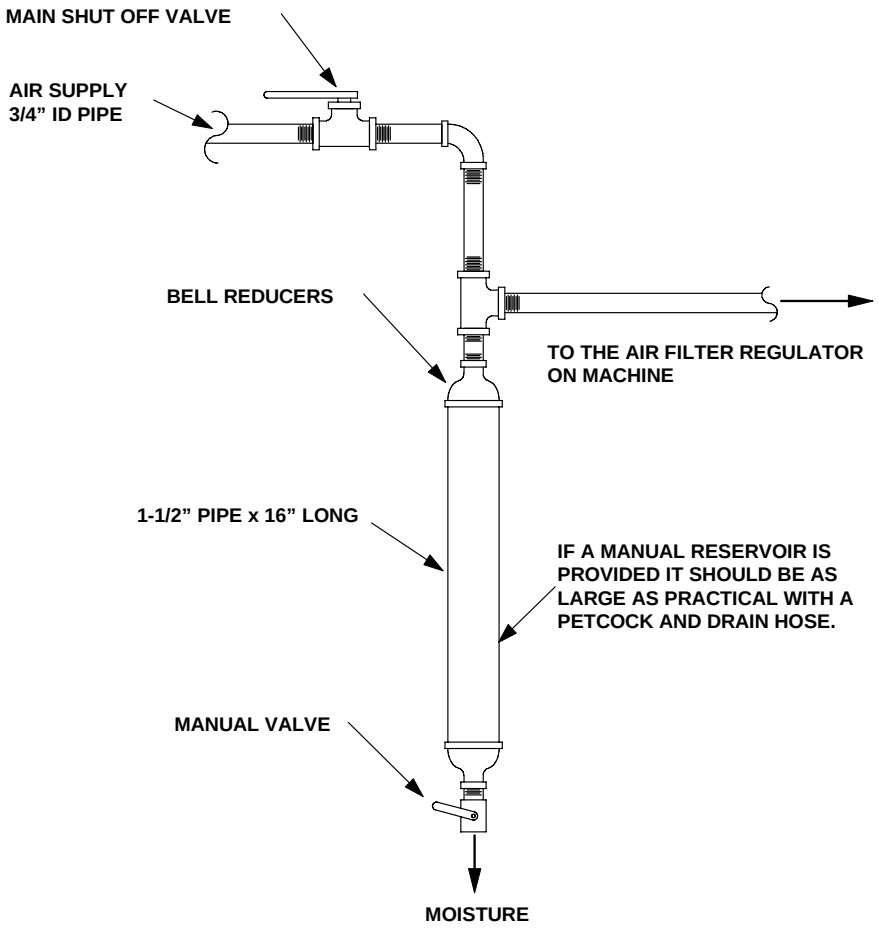

Figure 6-28: Typical Air Line Drip Leg with Manual Drain

Table of Contents

11. Electrical - Field Connections

Use extreme caution when working on or around electrical components. All electrical components and panels have a potential electrical Arc Flash hazard. Appropriate Personal Protective Equipment (PPE) is required. Refer to NFPA 70E for more information.

A. Turn the main power disconnect switch (located on the high voltage cabinet) to the OFF position and Lockout the machine for safe working conditions before beginning this work.

B. Make interconnections with other systems (if required). Refer to the electrical plans for proper wiring.

C. Route conduit runs and wires for the infeed belt conveyor motor, case counting photoelectric sensor PE1, pallet infeed, and discharge conveyors. The installer must supply all conduit and wire unless otherwise stipulated. Refer to the electrical plan drawings for devices.

D. Mount and align all photoelectric sensors and reflectors.

E. Connect the high voltage main electrical power supply line to the machine's main power disconnect switch. The main power disconnect switch is located inside the high voltage cabinet near the upper right corner. Wiring must be sized to carry the service required. Measure the supply voltage to assure conformity with the general specifications. Refer to the electrical plan drawing for proper wiring.

Table of Contents

12. Platform & Ladder Assembly (Optional)

A. When installing the Machine Platform and Ladder assemblies, refer to the blueprint drawings provided for details.

B. Mount the left and right hand Platform Support Brackets to the machine frame. (See Figure 6-29) Mount each bracket with 1/2" x 1-1/4" hex head cap screws, washers, and nuts provided.

C. Install the Platform Floor and Side Rails assembly on top of the Platform Support Brackets. Fasten with 3/8" x 1" carriage bolts, washers, and nuts provided.

D. Install the Ladder and Handrail assembly onto the platform assembly. Attach to Ladder Support Bracket with 3/8" x 1" carriage bolts, washers, and nuts provided. Attach the Hand Rails to the side rails with 3/8" x 3-1/4" hex head cap screws, washers, and nuts provided.

E. Install the Safety Chain and Snap assembly.

Table of Contents

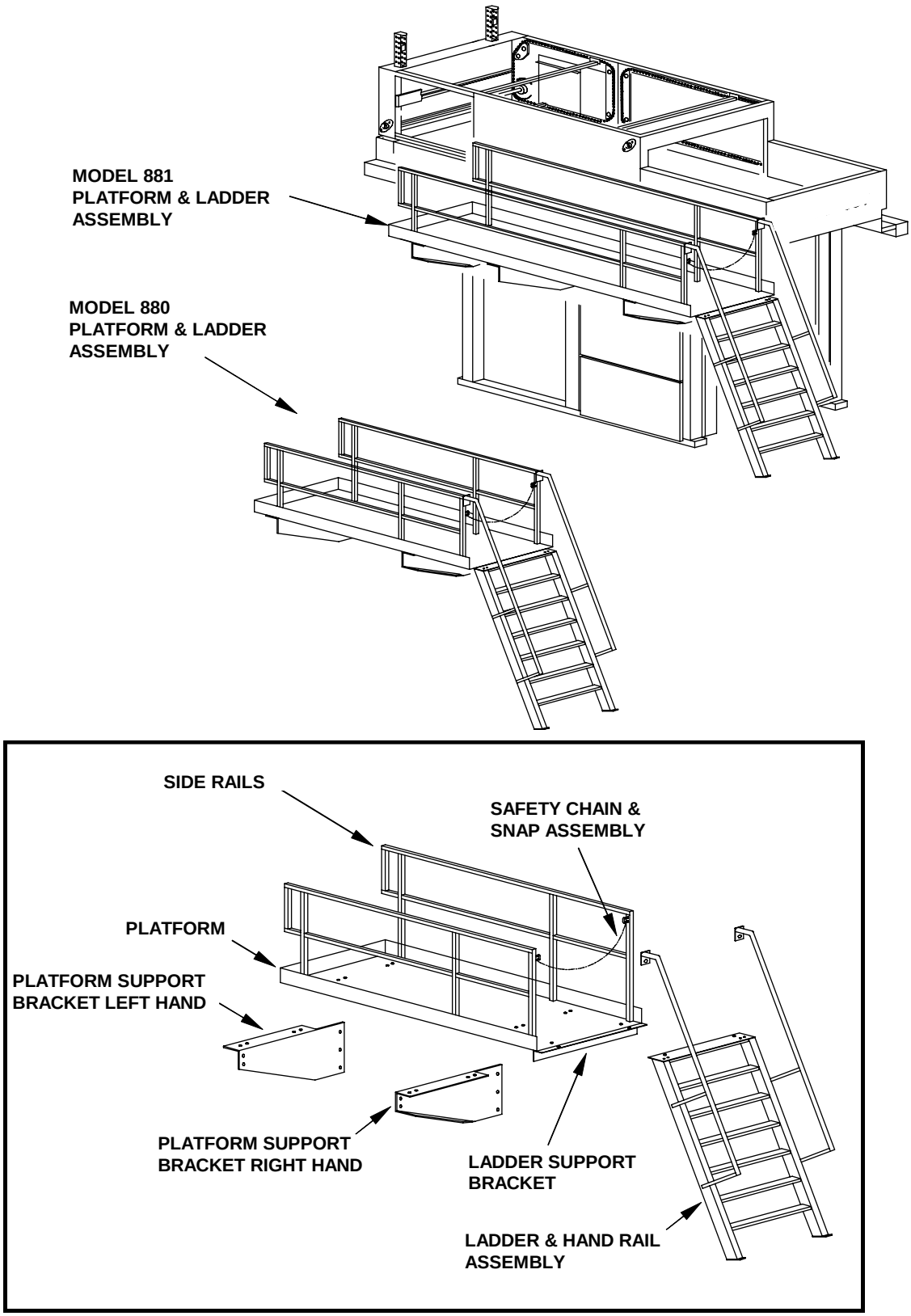

Figure 6-29: Platform & Ladder Assembly (Optional)

13. Machine Check-Out Procedures

A. Mechanical Pre-Power Check-Out

1. Remove all tape, paper, shipping blocks, and other protective material.
2. Clean excess oil from the rollers of the row forming section and the apron.
3. Inspect all moving parts to ensure that no foreign matter will interfere with their motion. Check the case infeed conveyor framework and all dams to see that they are free of weld splatter, paint, or other foreign material that would hinder the movement of the product.
4. Check the alignment and tightness of all sprockets and sheaves.
5. Check all chain connections at the hoist for tightness.
6. Check all other nuts and bolts for tightness.
7. Check all threaded rods that connect air cylinders to mechanical devices for tightness.
8. Check the oil level of the hoist reducers, and fill if necessary.

   NOTE: WINSMITHTM & RELIANCETM reducers are permanently lubricated and sealed at the factory and do not require additional lubrication.

9. Fill the air line lubricator with high quality SAE #10 oil to within ¼" of the top.
10. Brush a light coating of SAE #20 type oil onto all chains.
11. Replace all screens, covers, and guards removed before shipping.

B. Pneumatic System Check-Out

After the machine is set up and all air lines have been connected to their proper fittings, check out the air valves. Run the following tests with machine power OFF.

1. Check the system Air-Filter/Regulator setting. It should be factory set to 80-psi. If not, turn the adjustment cap on top of the air regulator to the 80-psi setting.
2. Check the pallet dispenser fingers air pressure regulator setting. It should be factory set to 20-psi. If not, turn the adjustment cap to 20-psi. The pallet dispenser fingers air pressure regulator is located at the front of the pallet dispenser, on the framework, next to the various air valves. A protector plate covers it. The cover does not have to be removed in order to adjust the air valves or air pressure regulator.
3. Check the case stops. Press the "manual operator button" on the air valve controlling each case stop. When the manual operator button is pressed, the corresponding case stop should extend upward. Stops should remain extended until the operator button is released.

4. Check the air operated side and front dams. There are two "manual operator buttons" on the air valve controlling the pneumatic side or front dams. One button causes the dam to extend, and the other button causes the dam to retract. Press either button to see that the intended motions occur. Set the flow controls for a smooth operation.

C. Pre-Operational Electrical Check-Out

Exercise extreme caution when working on or around electrical components. All electrical components and panels have a potential electrical Arc Flash hazard. Appropriate Personal Protective Equipment (PPE) is required. Refer to NFPA 70E for more information.

1. Locate the main power disconnect switch located on the high voltage electrical cabinet, and switch it to the OFF position. Then lockout the machine for safe working conditions before beginning this operation.
2. Remove all the I/O (input-output) modules from the I/O rack(s), and check the electrical connections to be sure that none of the terminals are grounded.
3. Remove the fuse from the secondary side of the control transformer.
4. Close the main disconnect switch, and manually operate each motor starter to check the rotation of the motors.
5. Measure the control system voltage value on the secondary side of the transformer at 117-VAC, nominal.
6. Open the main disconnect switch, and replace the control transformer fuse removed in Step 3.
7. Install the input modules in the I/O rack.
8. Switch the main disconnect power switch to the ON position.
9. Check all inputs as follows:

   a) Actuate each control panel switch, and observe the LED input module indicator illumination.

   b) Align each photoelectric sensor beam with its respective reflector, and then flag each photoelectric sensor to see if the input module is receiving a signal.

   c) Check all proximity sensors to ensure they are secure. Actuate each switch to see if the input module is receiving a signal. Check the positioning of each proximity sensor to see that its proper actuating device actuates it. The distance between the top of a proximity sensor and the bottom of its actuating device should be 1/8".

Table of Contents

10. Check each output by applying power to each output terminal and observing the correct mechanical output function.
11. Install the output modules in the I/O rack.
12. Using a programming device, verify that the programmable controller has retained the program. If it has not, reload the program. (The vendor manual for the programmable controller was shipped inside the electrical panel on the right side of the machine.)
13. Check each output by applying power to each output terminal and observing the correct mechanical output function.
14. Install the output modules in the I/O rack.
15. Using a programming device, verify that the programmable controller has retained the program. If it has not, reload the program. (The vendor manual for the programmable controller was shipped inside the electrical panel on the right side of the machine.)

Table of Contents

D. Machine Operation Check-Out

1. Review all safety precautions in Section 1, “Safety” of this manual.
2. Turn the main power disconnect switch (located on the outside of the palletizer high-voltage cabinet) to the ON position.
3. Pull out the EMERGENCY STOP buttons at all palletizer control stations.

   NOTE: All EMERGENCY STOP control switches must be pulled out before the machine will operate.

4. At the Main Control Station touch-screen located at the top of the machine, touch the RESET FAULT or DIAGNOSTIC RESET button to clear any messages from the screen and reset the safety relays.

THE PALLETIZER OR UNITIZER CAN CAUSE DEATH OR SERIOUS INJURY IN A VARIETY OF WAYS, BE CERTAIN EVERYONE IS OUTSIDE THE PALLETIZER OR UNITIZER SAFETY GUARDS BEFORE YOU START THE MACHINE.

5. Press and hold-in the green CONTROL POWER (PUSH-TO-START) button for approximately 5-seconds, until the master control relay (MCR) engages. The warning horn will pulsate on and off during the five-second period before the machine starts. When the machine is operable, the touch-screen MACHINE MODE display will read MANUAL MODE, and the green start button light stays on.
6. Select INFEED ON. The case infeed conveyor belt should run forward, run the belt for a few minutes to determine if the belt is tracking correctly and re-adjust the tension if necessary.

   NOTE: If the infeed belt runs backward, turn off power, lockout the machine for safety, and reverse the power leads at the motor starter.

7. Use the Manual Controls to jog the ROW PUSHER FORWARD push button long enough to observe the travel direction of the row pusher bar. The row pusher bar should travel from behind the row-forming conveyor, towards the apron area. If the pusher bar does not travel in this direction, the main power leads were wired incorrectly and must be reversed.

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Table of Contents