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7050601

Manufacturer:	Alvey
Model:	680
Serial No:	01-KH44116
Category:	Paletizers

Description:

Used- Alvey 680 Low Level Palletizer capable of speeds up to 35 cases per minute. Has Allen Bradley SLC 5/05 CPU. Set for 40 x 48pallets, 60" load heights,with automatic pallet magazine and feeder. 3/60/480V.

ALVEY

A PINNACLE AUTOMATION COMPANY

MODEL 680 PALLETIZER

Manual Volume I

Contents

1. Introduction
2. Description of Operation
3. Operating Instructions
4. Service & Maintenance
5. Troubleshooting
6. Installation

MACHINE SERIAL NO. 01-KH44116

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

1. To Our Customers

Alvey 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 Alvey 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. Alvey Palletizers and Unitizers are attractive additions to a clean modern production facility.

If you need information or support, call our Customer One Protection (COP) toll-free "Hot Line" at **1-800-535-2555.** This number lets you discuss issues directly with a qualified Alvey customer service engineer.

You can contact Alvey headquarters at:

- **Alvey Systems, Inc.**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2400**
- **Web site: http://www.alvey.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 electrical panel door.

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.

This manual is Volume I of a three-volume set of manuals:

- **Volume I** includes Installation, Operation, and Maintenance.
- **Volume II** includes Replacement Parts Listings, and Vendor Data.
- **Volume III** includes Electrical Data and the PLC Program.

Volume I, 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.

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.

To avoid confusion, any references to a given side will be in relation to product flow through the machine. 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. Alvey 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. Alvey 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. Alvey 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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1. For Your Safety

Read and become familiar with the contents of this manual before attempting to install, operate, or service this palletizer. It is necessary that all palletizer operators and maintenance personnel study the applicable sections of this manual thoroughly before operating the equipment. 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.

Throughout this manual and on the palletizer, you will find **DANGER, WARNING,** and **CAUTION** safety signs. You should pay particular attention to these because they signal information that is important to your safety and to the correct operation of the equipment.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

CAUTION indicates a potentially hazardous situation which, if not avoided, might result in minor or moderate injury. **CAUTION** might also be used to alert against unsafe practices.

The term **NOTE** is used to call attention to particularly useful information and is not a safety sign.

A. Safety Codes and Standards

Alvey palletizers are designed and manufactured to comply with the **"Safety Standard for Case and Bag Palletizers, Unitizers, Depalletizers, and Related Equipment" (CEMA 650-1992), Safety Standard for Conveyors and Related Equipment (ASME B20.1).**

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)**

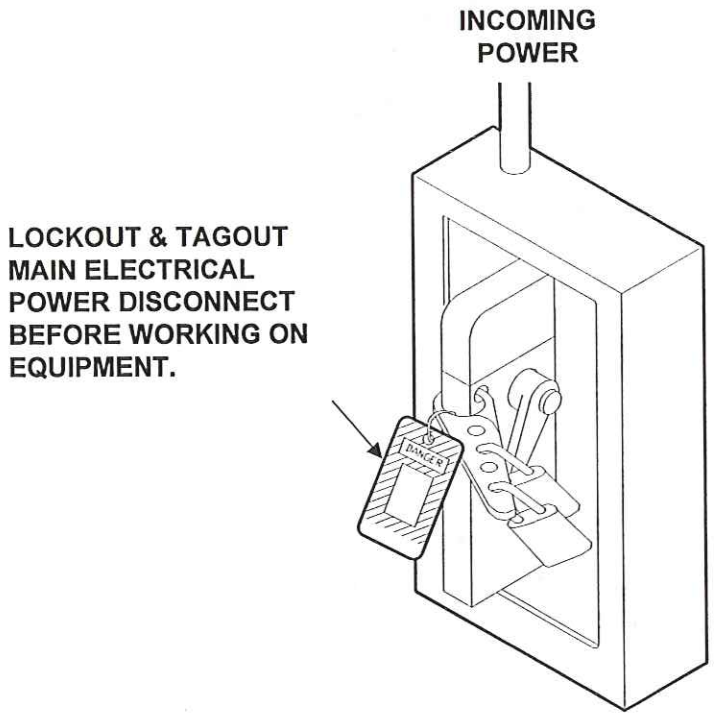

Figure 1-1: Lockout / Tagout Safety Procedures

B. Operator's Safety Precautions

1. Only authorized, properly trained personnel may operate the palletizer/unitizer. Follow your company lockout/tagout procedures for safety. (See Figure 1-1.)
2. Do not attempt to clear jams before pressing the Emergency Stop Button.
3. Do not reach into or climb on the palletizer/unitizer for any reason before pressing the Emergency Stop Button.
4. Extreme care should be taken when near the palletizer/unitizer to prevent fingers, hair, jewelry, or loose clothing from being caught in moving parts.
5. Do not wear gloves when operating the palletizer/unitizer.
6. Remove all tools and non-product material from the palletizer/unitizer before starting.
7. Verify that no persons are in a position to be injured as a result of the start-up.
8. Never step on or over a moving conveyor.
9. Operating the palletizer/unitizer in Manual Mode bypasses most of the operational interlocks, therefore Manual Mode operation makes it possible to crush cases and damage the machine
10. Always observe all safety warnings and notices on the machine and in this manual.

C. Service & Maintenance Safety Precautions

⚠WARNING

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

1. Only authorized and properly trained personnel may service the machine.
2. When working on the 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 device before working on it. Shut off the air pressure to the machine by closing the valves on the main air supply line.

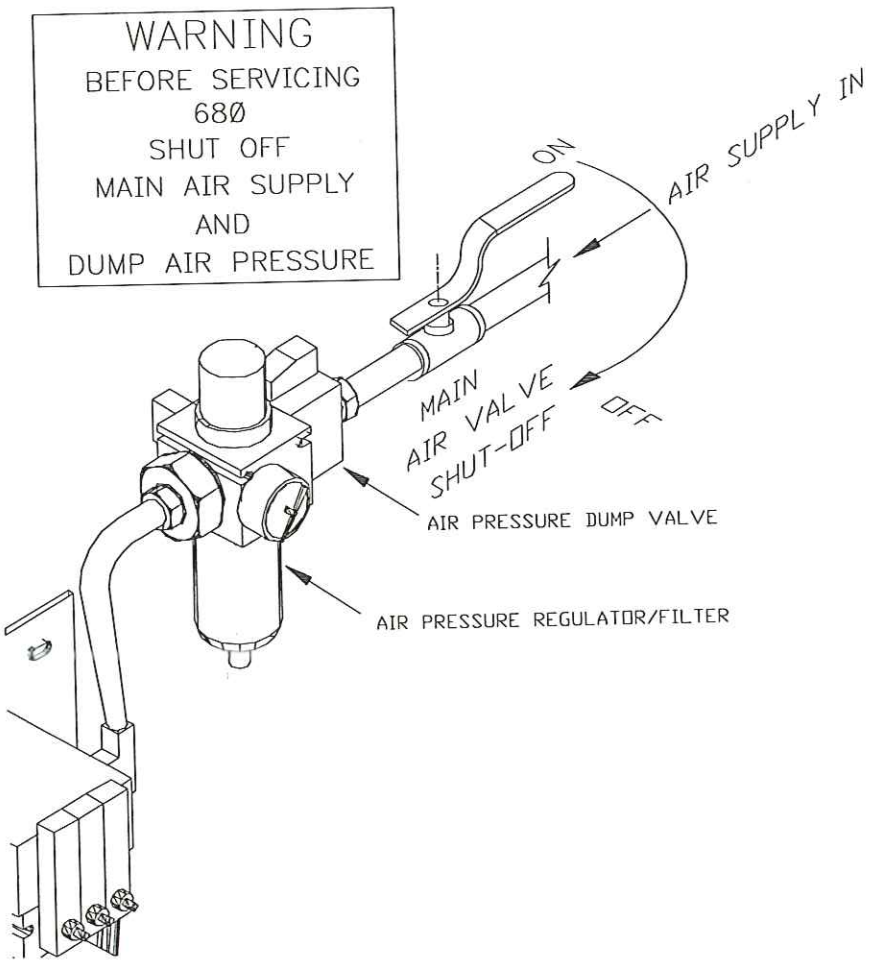

Figure 1-2: Main Air Supply

3. When working on the electrical system, turn the main power disconnect switch OFF, and lockout & tagout the machine before beginning any maintenance or repairs.
4. Before working in the area of a pneumatic device, turn off the air supply (see Figure 1-2) and bleed pressure from the device.
5. Do not attempt to clear jams before pressing the Emergency Stop button.
6. Do not reach into or climb on the machine for any reason before pressing the Emergency Stop button.
7. When it is necessary to work in the general area of the hoist, lower the hoist to its home position (the fully down position) or block the hoist with the four safety pins to prevent it from lowering. (See Figure 1-3 for safety pin locations.)
8. Before restarting and testing the palletizer/unitizer, remove all tools and other material from within the machine.
9. Replace all safety guards and/or covers removed from the machine for maintenance, before operating the machine.

D. Machine Safety Signs

For your safety read and follow all the caution and warning labels attached to this equipment. Safety signs are displayed on the palletizer/unitizer to warn all personnel of hazards. Refer to Figure 1-3, for locations of the safety signs. If any safety signs are missing or damaged, they will be provided to you for no charge.

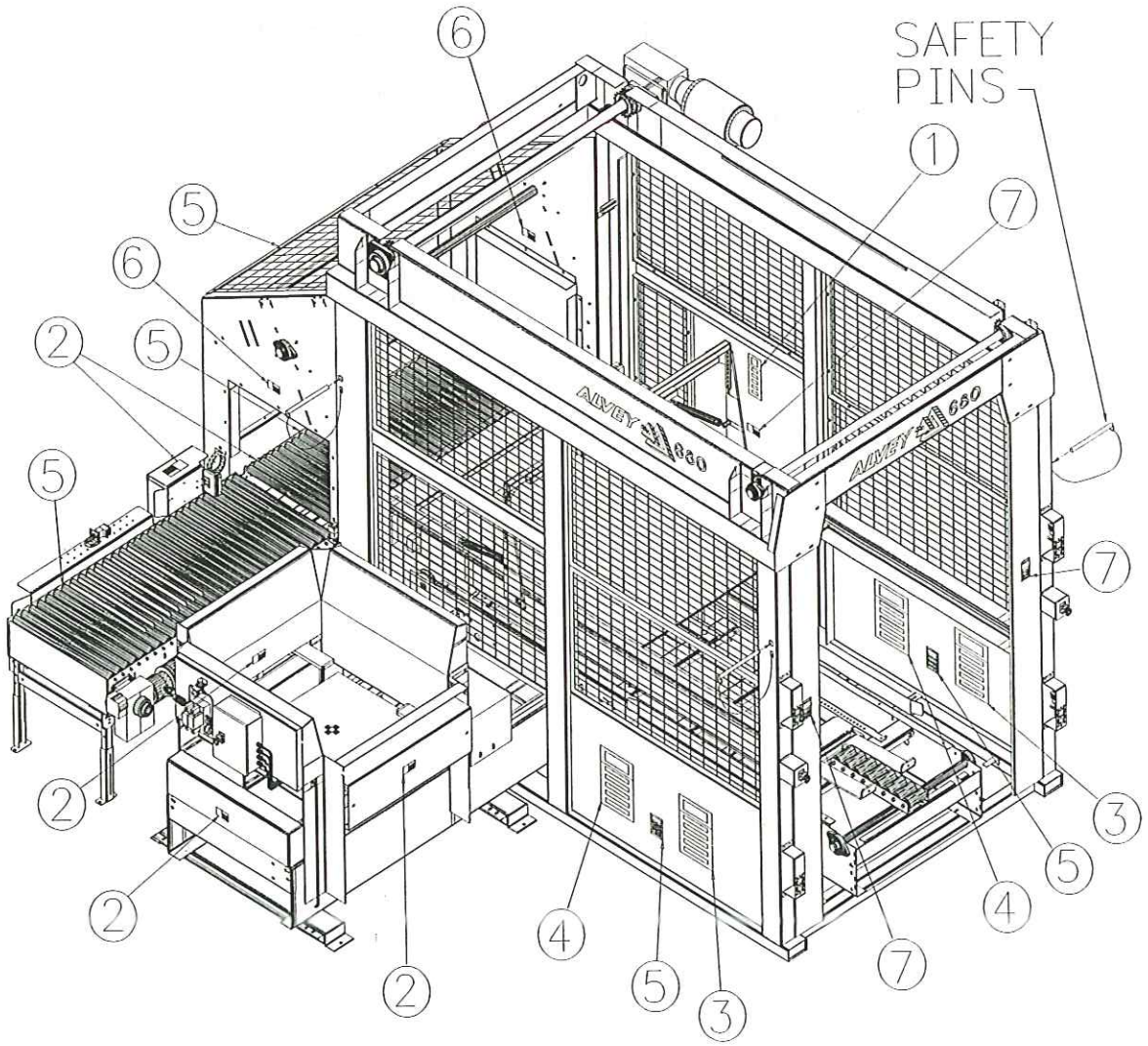

Figure 1-3: Machine Safety Signs

The Safety sign data and Alvey part numbers are listed below:

Item #	Part #	Safety Sign Information
1.	90-00035	**DANGER** - HAZARDOUS VOLTAGE WILL CAUSE SEVERE INJURY OR DEATH. LOCK OUT POWER BEFORE SERVICING.
2.	90-00025	**WARNING** - EQUIPMENT STARTS AUTOMATICALLY - CAN CAUSE SEVERE INJURY. KEEP AWAY.
3.	90-09035	**CAUTION** - TO AVOID SERIOUS BODILY INJURY: 1. DO NOT ATTEMPT TO OPERATE THIS MACHINE WITHOUT PROPER TRAINING. 2. DO NOT START MACHINE UNTIL CERTAIN IT IS CLEAR OF PERSONNEL AND OBSTRUCTIONS.
4.	90-09038	**CAUTION** - TO AVOID SERIOUS BODILY INJURY BY ACCIDENTAL STARTING, DISCONNECT POWER BEFORE SERVICING THIS MACHINE.
5.	90-90059	**IMPORTANT** - FOR THE SAFETY OF ALL PERSONNEL, DO NOT MODIFY OR REMOVE ANY OF THE GUARDS, SAFETY DEVICES, OR WARNING APPLIQUES ON THIS EQUIPMENT.
6.	90-00055	**DANGER** - MOVING PARTS WILL CAUSE SEVERE INJURY. KEEP AWAY.
7.	90-00135	**HAZARDOUS CONDITION** - ENTRY WILL RESULT IN SEVERE INJURY OR DEATH. LOCK OUT POWER AND BLOCK HOIST BEFORE SERVICING.

E. Machine Safety Features

The Alvey 680 palletizer/unitizer is equipped with several built-in safety features designed to decrease the risk of injury to operators, as well as safeguarding the machine from being damaged due to mechanical failure.

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

1. All photo eyes, proximity switches, and push-button operator control switches operate on 24 Volts DC to reduce electrical shock hazards.
2. EMERGENCY STOP buttons are located on the main control station, pallet dispenser, and both sides of the discharge area.
3. Several photo eyes crisscross the discharge area. If the discharge photo eyes are interrupted at any time except during the load discharge cycle, the palletizer will immediately shut-down.

   NOTE: During the load discharge cycle, the photo eyes are disabled as the load passes through the photo eyes. The photo eyes are not enabled again until the photo eyes see the reflector after the load has passed.
4. Lockable air dumps are provided for removing air pressure from the machine's pneumatic system. One device is mounted on each of the two main air supply points.
5. Hoist safety pins (blocks) are located at the four corners of the machine frame for use during maintenance.
6. Safety signs are prominently located on the machine in places where safe operation should be identified.
7. A start-up warning horn will pulsate on and off for five seconds before the machine starts.
8. A lockable control power switch allows the machine operator to lock out the machine operation by removing power to the master control relay. A key must be used to unlock the control power switch.
9. The machine is fully enclosed except where product enters or exits. Sliding interlocking Lexan doors are provided for access to the row forming area.

   NOTE: Optional safety devices may be installed to enhance the safety of the palletizer.

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Section 2
Description of Operation

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1. General Description

This section describes the electrical and mechanical operation of the Alvey 680 series palletizer. A glossary of terms is at the end of this section. It explains commonly used terms for palletizers. Refer to the project layout drawing (provided) for the working plan and refer to the specifications for your specific machine.

The Alvey palletizer automatically interacts with incoming and outgoing conveyors. The palletizer is fully automatic except for some manual set up adjustments required when changing the pattern or product. Cases of product enter from the "infeed end" of the palletizer and full loads are discharged out the "discharge end" of the palletizer.

The palletizer is essentially comprised of two sections, the centrally located case handling section, and the lower pallet handling section. A belt connects the two operations. The middle section of the palletizer receives cases of product from an infeed conveyor, arranges them as required to form a layer, then deposits the layer onto the hoist table. Empty pallets are transferred from the pallet dispenser that releases them one at a time to the palletizer as needed.

The product loads are then discharged from the machine onto a discharge conveyor. When a load reaches the discharge conveyor system it must be removed from the discharge conveyor by a lift truck, or be transferred onto a take-away conveyor system at a right angle to the machine.

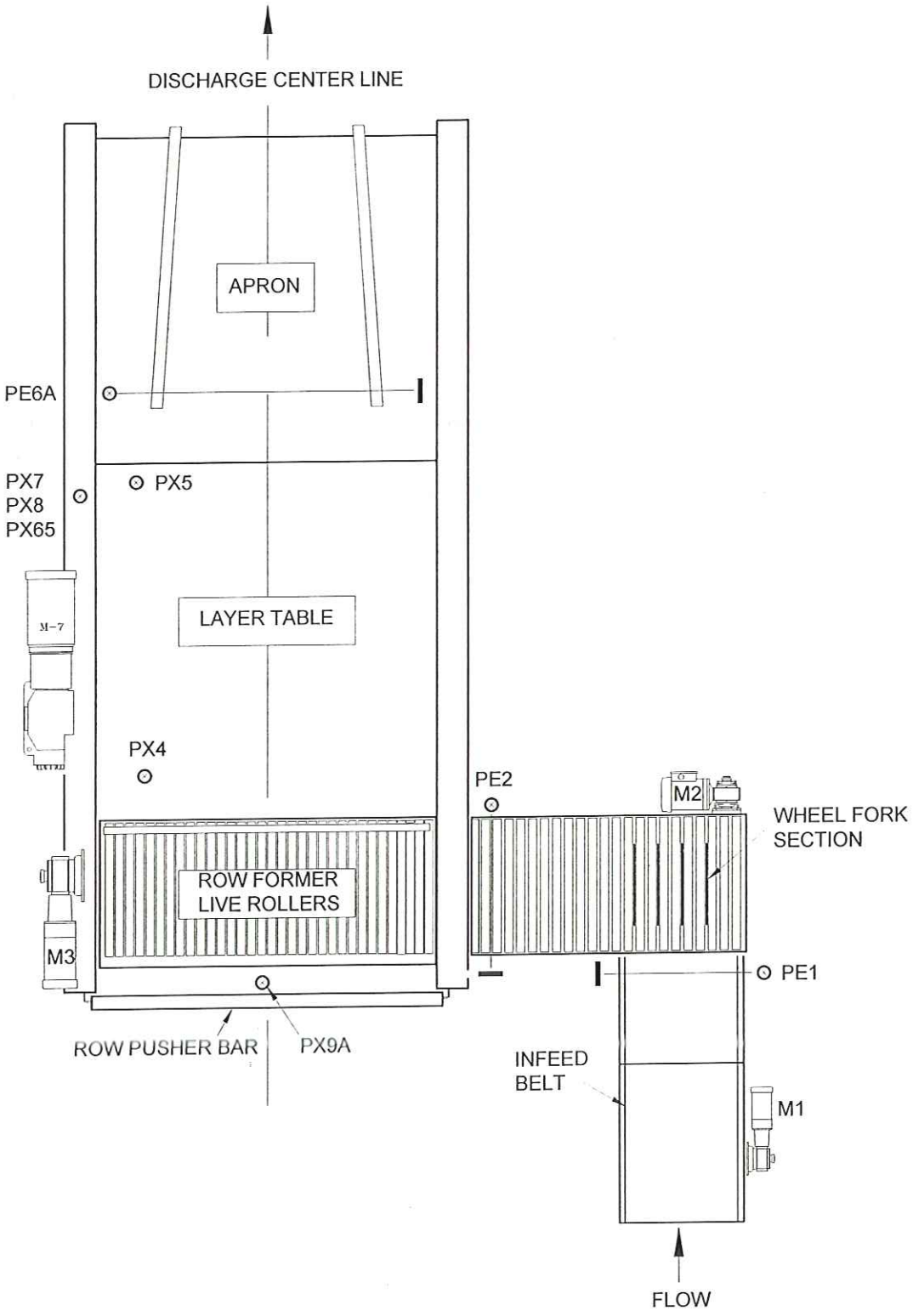

Figure 2-1: Plan View of Case Handling Area

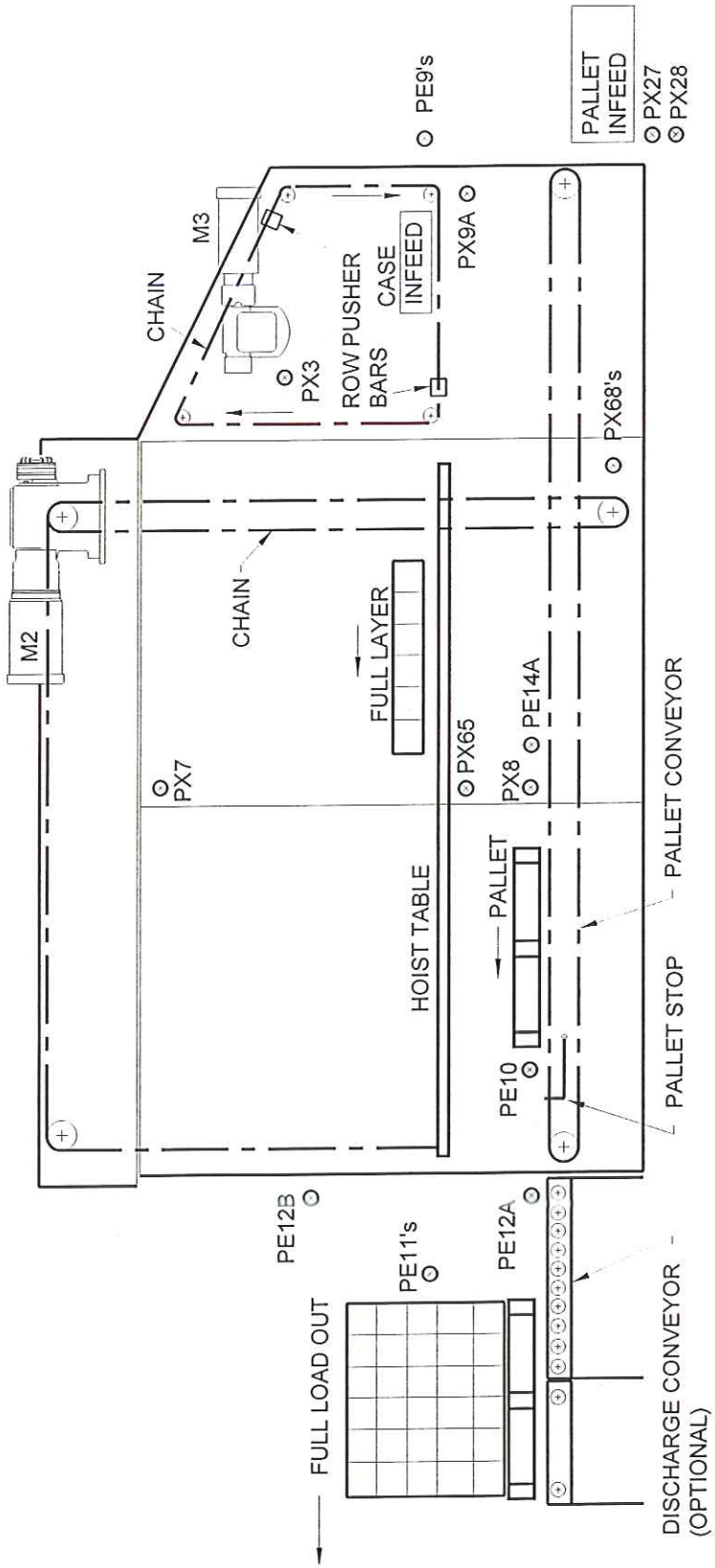

Figure 2-2: Side View of Machine Components

2. Description of Operation

A. Starting Point

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

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

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 palletizer. (See Figure 2-1.)
2. Each case is counted as it blocks and clears photo eye 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. As the case moves from the belt onto the turning device, the forks, that are rows of small wheels between the live rollers, will either be raised or remain lowered.
4. If the forks remain lowered, the case will enter the turning device live rollers. The case will be turned 90° as the case contacts the rollers.
5. If the forks are raised, the case will move forward its full length before the forks lower. This is controlled by a timer operated by clearing PE1. As the forks lower, the case will be carried sideways (same orientation as on the infeed belt) onto the row former rollers.
6. As cases enter the live roller area, each case is counted by photo eye PE2. The total case count at PE2 controls the package stop and the row pusher signal to push the completed row
7. When the last case of a completed row blocks and clears photo eye PE2, a timer is set in the controller. The timer lets the case 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. If photo eye PE1A is blocked by a case before the row pusher starts, the case escapement device responds and raises the case for a long or medium time delay.
8. As the timer keeps tract of time, the row pusher begins its cycle, transferring the row of cases onto the apron or layer table.

9. The row pusher bar continues to rotate until proximity switch PX3 is actuated, signaling that the row pusher is at the home position. If another row of cases has formed while the row pusher is cycling, it restarts immediately. When the last row of a layer is being transferred to the apron and proximity switch PX3 is actuated, the row pusher stops.

10. The hoist travels to the deposit position and the apron strips the load. As the apron retracts, the layer is deposited onto the pallet or layer located at photo eye PE6A.

11. When the apron reaches its fully retracted position, proximity switch PX4 is actuated signaling the controller that the layer loading cycle is complete.

12. During the layer loading cycle, if a full row has formed on the row former, the row pusher pushes the row onto the layer table when the layer pusher actuates proximity switch PX3A. If there is already a row on the row accumulator table, and there is a full row formed, the infeed stops. Once the row former is cleared, the infeed begins to operate

13. When the last layer of the load is deposited onto the pallet, the hoist lowers and the pallet load transfers onto the discharge conveyor.

14. When the pallet conveyor transfers the full load out of the palletizer, it is also pulling a new empty pallet into position. When the discharging load clears photo eye PE10, the pallet stop rises.

15. As the full load leaves the palletizer, it blocks and clears photo eye PE12. This signals the controller that the full load is clear of the palletizer.

16. As an empty pallet moves into position, it blocks photo eye PE10 and clears photo eye PE14. This causes the hoist to start delivering layers of product.

C. Pallet Handling Operation

1. When the hoist starts depositing layers of product, the pallet dispenser cycles to dispense a new pallet. The pallet pusher must be in the home position (proximity switch PX28 energized).
2. The pallet dispenser lift cylinder rises until proximity switch PX26 is actuated. This retracts the pallet dispenser fingers and starts lowering the pallet dispenser lift.
3. As the pallet dispenser lift lowers, proximity switches PX13 and PX26 actuate, and the pallet lift stops briefly. This allows the pallet fingers to extend to catch the second-to-the-bottom pallet to hold up the remaining pallet stack.
4. When the pallet dispensing cycle is completed (that is when the pallet dispenser lift has lowered with an empty pallet) proximity switch PX13 is actuated and the pallet pusher chains begin to run.
5. The empty pallet is transferred forward to the pallet pre-load position (photo eye PE14B is blocked, and proximity switch PX27 is energized). This completes the empty pallet loading cycle.

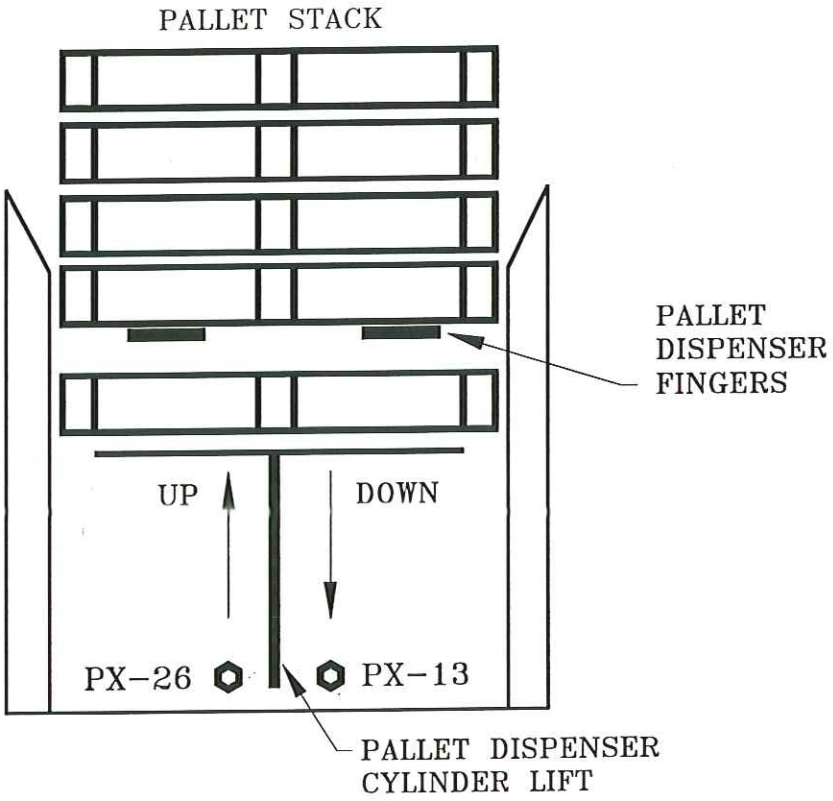

Figure 2-3: Pallet Dispenser

D. Chain Hoist Operation

The chain hoist table carries layers of product up and down during the layer loading cycle. After the apron deposits the first layer onto the hoist, it returns to its home position for each additional layer. The hoist is driven by an electric motor and a brake is used to hold the hoist in place when the motor is turned off.

The hoist operation starts when the last layer of a load is deposited from the apron onto the load conveyor:

1. After the apron has deposited the last layer onto the load conveyor, the hoist lowers until proximity switch PX65 is actuated, signaling the controller that the hoist is at its home position. (See Figure 2-2.)
2. At this point, the hoist is sitting in its home position and a full load is sitting on the load conveyor.
3. If there is room on the discharge conveyor for the full load to discharge, the load conveyor starts discharging the load.
4. As the discharging load clears photo eye PE10, the pallet stop rises.
5. The new empty pallet moves forward blocking photo eye PE10.
6. If a layer is ready on the apron, the hoist begins to travel to position the next layer on the load conveyor.
7. The hoist rises or lowers until photo eye PE6 clears.
8. The apron strips-off the layer onto the load.
9. After the apron strips-off the layer, actuating proximity switch PX4, the hoist rises or lowers.
10. The layer loading cycle is repeated until the set number of layers has been deposited on the load.

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3. Electrical Devices

A. Photo Eyes

Photo Eye	Location	Function
PE1	Infeed Conveyor	Controls the primary case counter as cases block and clear the photo eye, steps the sequencer, controls the extension and retraction of the case turner, and stops the cases as needed.
PE2	Live Roller/Row Former	Controls the secondary case counter that controls raising the case stops as required and starting the row pusher. Also serves as jam protection (the pusher bar can not run when photo eye PE2 is blocked). Cases of product are tracked between photo eyes PE1A and PE2 so a case cannot be lost in transit.
PE6A	Below Apron	Scans the underside of the apron and controls the motion of the hoist table after each layer is deposited. Also stops the up-level of the hoist table. These photo eyes can be in multiples, PE6B, C, D, etc.
PE10	Bottom of Load Forming Area	Scans across the palletizer, perpendicular to the load travel. Raises the pallet stops to position a pallet when the trailing end of a fully loaded pallet clears photo eye PE10.
PE11A	Discharge Conveyor	Scans and verifies that the discharge area is clear.
PE12A, B	Discharge End of Palletizer	Safety photo eyes that turn off the palletizer if the beam is interrupted.
PE14A	Between Load Forming Area & Pallet Dispenser	Scans across the pallet conveyor for the presents of a pallet at the pre-stage position prior to the hoist.
PE9A, B	Pallet Dispenser	Removes the machine from automatic operation when blocked.

B. Proximity Switches

Proximity Switch	Location	Function
PX3	Row Pusher	Verifies pusher bar is in it's home position.
PX3A	Between Row Pusher, Layer Pusher & Apron	Positions row pusher bar at last push of each layer at the full layer position.
PX4	Between Row Pusher & Layer Pusher	Stops apron in fully retracted position.
PX5	Under Apron	Stops apron in fully extended position.
PX7	Top of Hoist Area	Signals hoist is at fully-up position.
PX8	Bottom of Hoist Area	Signals hoist is at fully down position allowing hoist conveyor to run.
PX9A	Pusher Bar Doors	Automatically turns off palletizer operation if interrupted. (Not wired to the I/O.)
PX13	Pallet Dispenser	Detects pallet dispenser lift is down.
PX26	Pallet Dispenser	Detects pallet dispenser lift is up.
PX27	Pallet Dispenser	Detects pallet pusher is extended at pallet prestage position.
PX28	Pallet Dispenser	Detect pallet pusher is at its home position.
PX65	Hoist Area	Detects main hoist carriage is at its home position.
PX68A, B	Hoist Area	Detects slacking hoist chains.

C. Pneumatic Valves

Pneumatic Valve	Location	Function
SVM01	Infeed Belt	Infeed belt brake, engage.
SVMO3	Electrical Cabinet	Row pusher brake, engage.
SVMO7	Electrical Cabinet	Hoist brake release (brake releases when solenoid is on).
SV10	Electrical Cabinet	Case turner forks, raise.
SV21 - 31	Electrical Cabinet	Raise package stop #1, #2, #3, etc.
SV40	Apron	Layer strip bar, down.
SV70	Electrical Cabinet	Raise pallet stop.
SV81A	Pallet Dispenser	Pallet dispenser lift, up.
SV81B	Pallet Dispenser	Pallet dispenser lift, down.
SV82A	Pallet Dispenser	Pallet dispenser fingers, extend.
SV82B	Pallet Dispenser	Pallet dispenser fingers, retract.
SV83	Pallet Dispenser	Pallet transfer plate, raise.

D. Electric Motors

Electric Motor	Location	Function
M01	Infeed Conveyor	Runs the escapement infeed conveyor.
M02	Live Rollers	Runs case turning/row forming rollers.
M03	Row Pusher	Runs row pusher.
M06	Apron	Runs apron.
M07	Hoist	Runs chain hoist.
M08	Load Conveyor	Runs load conveyor.
M11	Discharge Conveyor	Runs discharge conveyor #1.
M10	Pallet Dispenser	Runs pallet dispenser pusher.

4. Glossary of Terms

Not all the terms listed below apply to every palletizer.

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 into 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 Unitizer 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.

Controller The programmable controller system is a solid state memory-process-control unit that provides the sequencing, control, and timing for all palletizer operations. (Also called PLC.)

Conveyors System of conveyors transporting cases to the infeed belt of the palletizer or unitizer.

Pallet Dispenser Lift Pneumatically operated lift mechanism located in the pallet dispenser, used to lower pallets to the chain conveyor for transfer to the loading area.

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 palletizer 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, 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 palletizers use an electrical or pneumatically powered front dam in conjunction with the side dams.

Guide Rails Channel that compacts 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. On the hydraulic ram hoist table, a lip on the forward edge of the table is used to stop the empty pallets as they are fed into the hoist area.

Hoist Ram Hydraulic powered ram cylinder that elevates the hoist table to the proper operating position.

Hoist Preload Position The location on the pallet infeed conveyor, where an empty pallet is staged (delayed) until the pallet chain conveyor moves that pallet onto the hoist.

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 Belt The infeed belt receives cases from the trunk line or infeed conveyor system into the palletizer or unitizer live rollers section. The infeed belt meters cases into the machine at the proper production rate and then opens a space between the cases using a 3:1 ratio. (Also called Spacer Belt, Speed-Up Belt, or Metering Belt.)

Infeed Conveyor Table Table located in the empty pallet conveyor to hold back a stack of empty pallets from entering the pallet dispenser area.

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.

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 accumulate 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.

Pallet Dispenser A separate unit located at near the palletizer used to hold stacks of empty pallets, releasing them one at a time as required.

Pallet Fingers Pneumatically operated assemblies located in the sides of the pallet dispenser that release pallets one at a time from the pallet stack.

Pallet Infeed Conveyor A conveyor that holds stacks of empty pallets prior to their being moved into the pallet dispenser. Used only on automatic pallet stack infeed systems.

Pallet Prestage Position — A location in front of the hoist table where an empty pallet is staged (held) prior to going onto the hoist table.

Pallet Stack Stop — A pneumatically operated device that stops the stack of empty pallets as they travel into the pallet dispenser. Used only on automatic pallet stack infeed systems.

Pallet Stop — Pneumatically operated device mounted to the pallet chain conveyor or machine side frames to stop the pallet at the prestage position, or on the hoist table.

Pallet Tines — Pneumatically operated assembly located in the pallet dispenser that releases pallets, one at a time, from the empty pallet stack.

Photo Eyes — Electronic photocell input devices that signal information to the programmable controller. (Also called Photoelectric Eyes, or Photocells.)

Proximity Switches — 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 — 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.

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 properly positions 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 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.

Slat Divider (Case Divider) The device that positions incoming cases into the proper lanes for pattern formation. Cases are carried on Ultra High Molecular Weight (UHMW) plastic platens. The platens are diverted by pneumatically operated shifters to the various lanes.

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 are deposited onto a cardboard or plastic sheet, or loads are 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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1. For Your Safety

Only authorized and properly trained personnel may operate the 880 series palletizer.

A. Safety Codes and Standards

Alvey palletizers are designed and manufactured to comply with the **Safety Standard for Case and Bag Palletizers, Unitizers, Depalletizers, and Related Equipment (CEMA 650-1992),** and with the **Safety Standard for Conveyors and Related Equipment (ASME B20.1)**

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/tagout procedures for safety.
- Do not attempt to clear jams when the palletizer is running.
- Do not reach into or climb on the palletizer for any reason before pressing the EMERGENCY STOP button and performing the lockout/tagout safety procedures.
- Never step or climb on or over a moving conveyor.
- Take care when near the palletizer to prevent fingers, hair, jewelry, or loose clothing from being caught in moving parts.
- Do not wear gloves when operating the palletizer.
- Remove all tools and non-product material from the palletizer before startup.
- Visually check to see that no one is in a position to be injured as a result of the palletizer startup.
- Always obey all safety signs on the machine and in this manual.
- Remember when operating the palletizer in the Manual Mode, most of the operational interlocks are bypassed, therefore Manual Mode operation makes it possible to crush product.

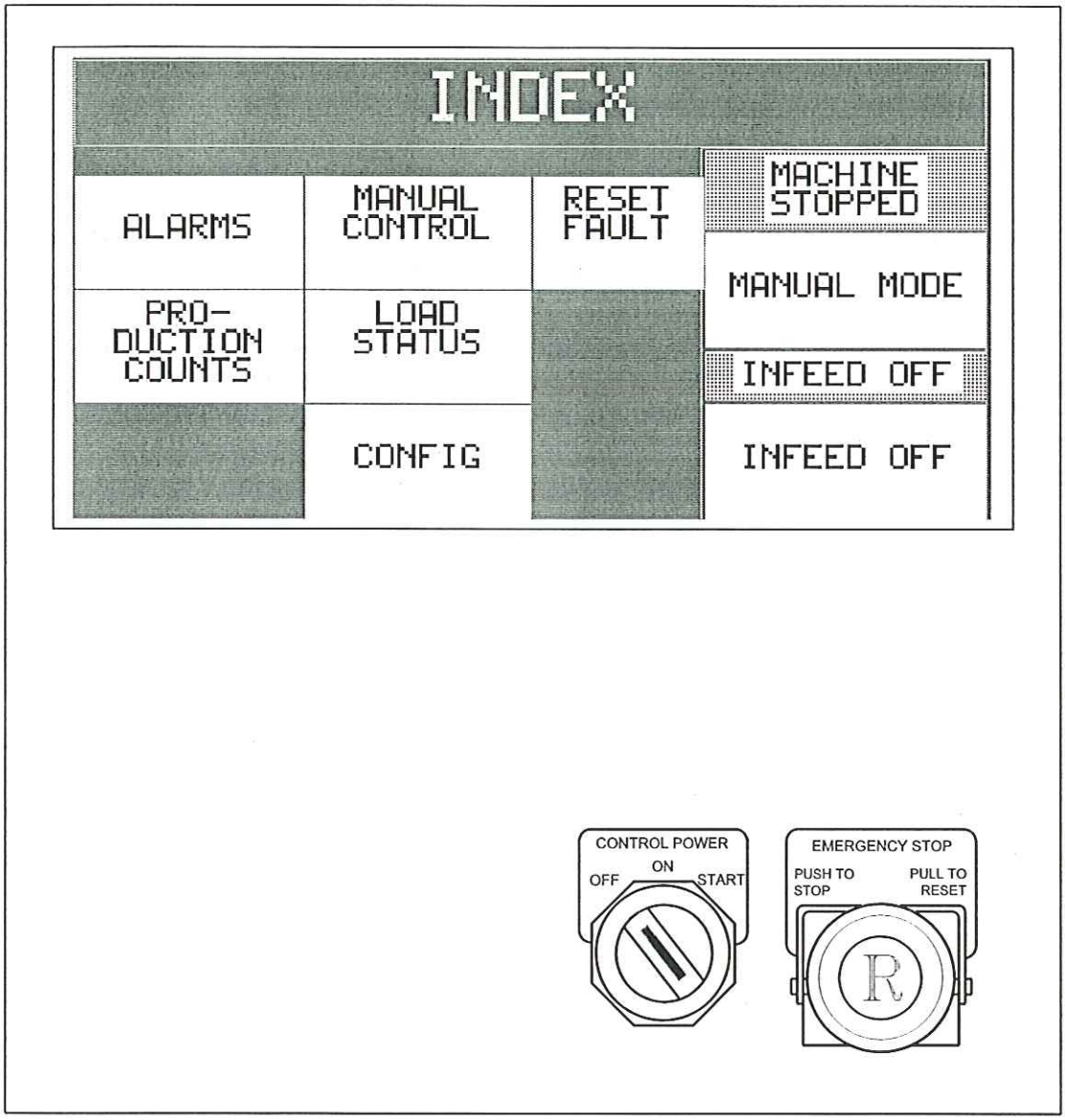

Figure 3-1: Main Control Station

2. Main Control Station

The Main Control Station is mounted at the top of the palletizer near the infeed area. This sub-section of this manual describes the Operator Interface Terminal (OIT) screens that appear at the Main Control Station. The OIT screens are the primary way you control and monitor the Alvey palletizer.

The OIT screens display: the palletizer current operating mode, the infeed belt status, operational messages to prompt you to take action, and diagnostic information on the palletizer operating condition. The OIT screens also contain the manual-function "push buttons" and the load status information. (The push buttons just need to be touched, not pushed, to activate them.)

The main control station hardware includes the EMERGENCY STOP button, and CONTROL POWER key-start switch.

A. Emergency Stop Button

To operate the EMERGENCY STOP, press the red knob in. To reset the EMERGENCY STOP, pull the red knob out. When the EMERGENCY STOP button is pressed in, the palletizer will shut down and all other palletizer controls, both AUTOMATIC and MANUAL, will be locked out until the EMERGENCY STOP button is reset and the palletizer is restarted.

All EMERGENCY STOP buttons must be pulled out before the palletizer can start. The palletizer must be started before any palletizer controls work.

B. Control Power Switch

The Control Power switch lets you disable the palletizer operation by removing power from the Master Control Relay (MCR). All palletizer controls, both AUTOMATIC and MANUAL, will be locked out until the machine has been restarted.

C. How to Start the Palletizer

The following procedure is based on starting the palletizer from the following conditions: the palletizer has been cleared of all product, tools, parts, and materials; an empty pallet or 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 palletizer high-voltage cabinet) to the ON position.
2. Pull out the EMERGENCY STOP buttons at all palletizer control stations.
3. On the OIT touch screen, press the RESET FAULT push button to clear any messages from the screen.

The palletizer can cause death or serious injury in a variety of ways. Be certain everyone is outside the palletizer safety guards before you start the palletizer.

4. Insert the start key into the CONTROL POWER key-switch then turn the key to the START position and hold it there for at least five seconds. It takes approximately five seconds for the MCR to engage. The warning horn will pulsate on and off during the five-second period before the palletizer starts. When the palletizer is operable, the Machine Mode status display on the OIT will read MANUAL MODE.

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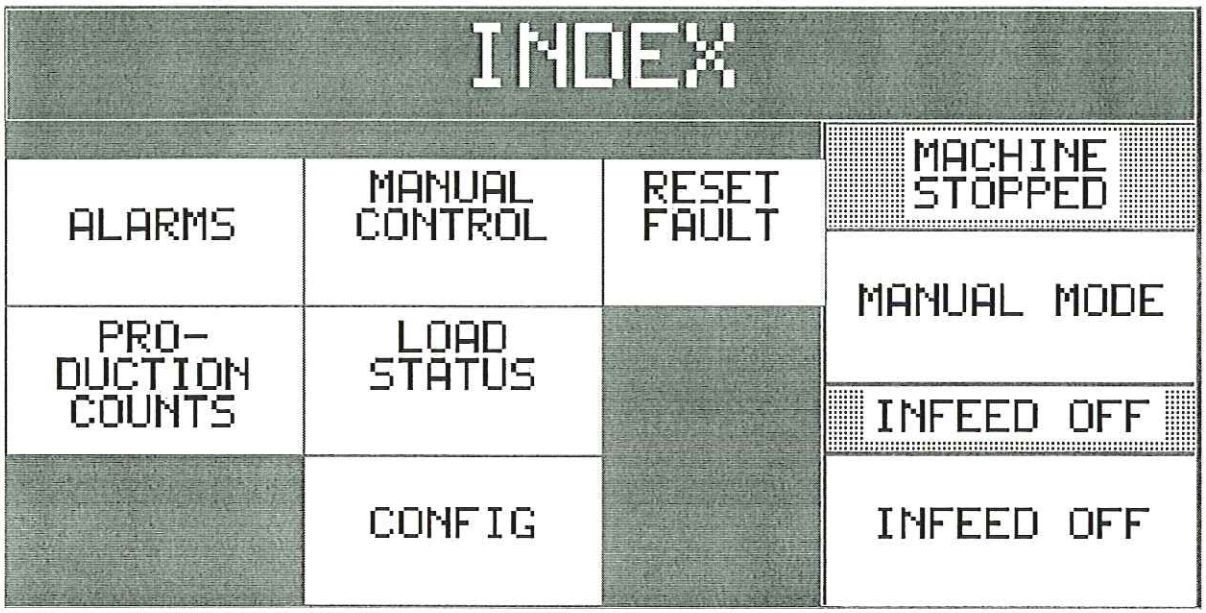

Figure 3-2: Index Screen

D. Index Screen

This screen lets you select other control screens, as needed, to assist in the operation and set up of the palletizer.

MACHINE MODE (Status Display)

- **MACHINE STOPPED** - Indicates the palletizer has not been started.
- **MACHINE IN AUTOMATIC** - Indicates the palletizer has been started and is in automatic mode.
- **MACHINE IN MANUAL** - Indicates the palletizer has been started and is in manual mode.
- **MACHINE STARTING** - Indicates the palletizer 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.

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

- **AUTO MODE** - The palletizer will perform its programmed functions, automatically.
- **MANUAL MODE** - You can use the manual controls to operate the palletizer.

INFEED (Status Display)

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

INFEED (Switch)

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

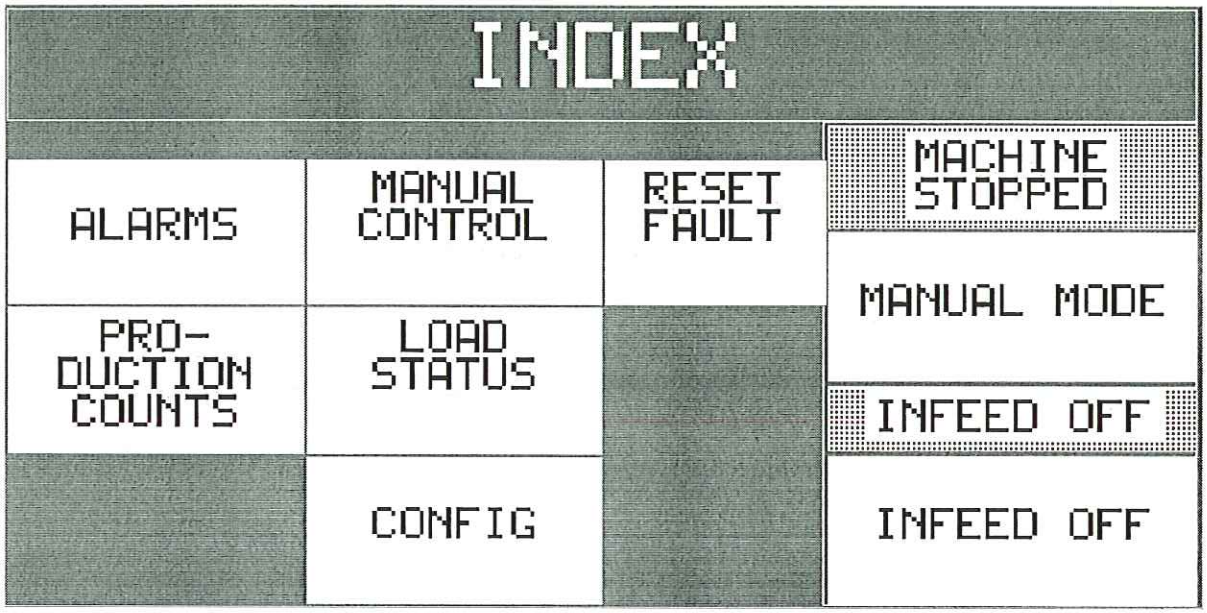

Figure 3-3: Index Screen

Index Screen (continued)

ALARMS
- Changes the screen display to the Alarms screen. This screen displays currently active alarm conditions and the history of alarm conditions that have been acknowledged or corrected by the operator. (See Figure 3-16.)

LOAD STATUS
- Changes the screen display to view palletizer setup information. (See Figure 3-9.)

MANUAL CONTROL
- Changes the screen display to the Manual Control Screen #1 where you can use the push button device controls to jog the palletizer components. (See Figure 3-4.)

Message Window
- The message window, at the top of the screen, displays operational messages to prompt the operator to act, and also displays diagnostic information on the machine's operating condition.

PRODUCTION COUNTS
- Changes the screen display to show the current total case and load counts. (See Figure 3-11.)

RESET FAULT
- Clears diagnostic messages from the screen display. The display will return to the previous information that was being displayed when the message occurred.

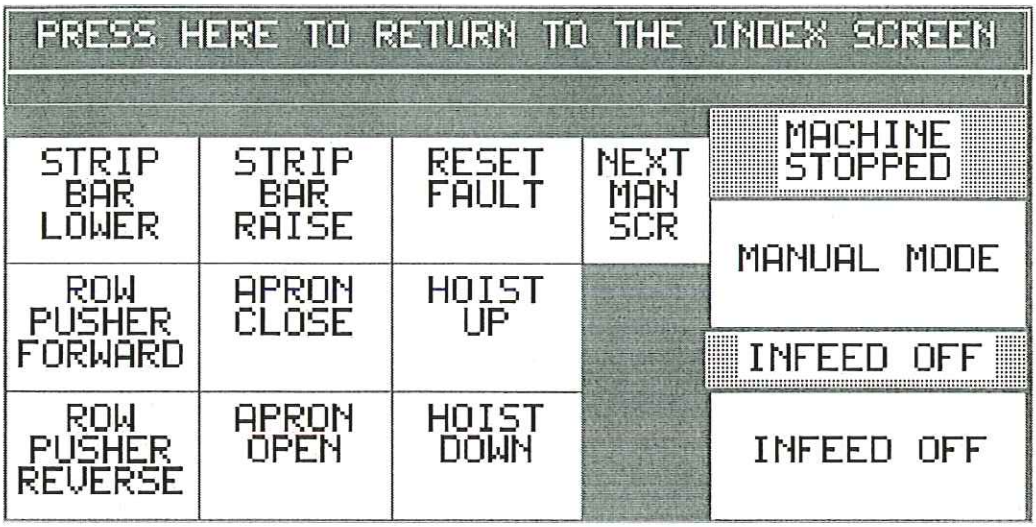

Figure 3-4: Manual Control Screen #1

E. Manual Control Screen #1

The lighted push buttons on this screen are used to manually jog components of the palletizer when the palletizer is in MANUAL mode. Press the corresponding push button to jog the component.

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

APRON EXTEND/RETRACT	• Lets you open/close the Apron when the palletizer is in MANUAL MODE.
HOIST RAISE/LOWER	• Lets you jog the Hoist up/down when palletizer is in MANUAL MODE.
NEXT MANUAL SCREEN	• Switches the screen to Manual Control Screen 2.
RESET FAULT	• Clears messages from the screen. The screen will return to the previous information that was being displayed when the message occurred.
ROW PUSHER FORWARD/REVERSE	• Lets you jog the Row Pusher Bar forward/reverse when palletizer is in MANUAL MODE.
STRIPPER BAR RAISE/LOWER	• Lets you jog the Stripper Bar up/down when palletizer is in MANUAL MODE.

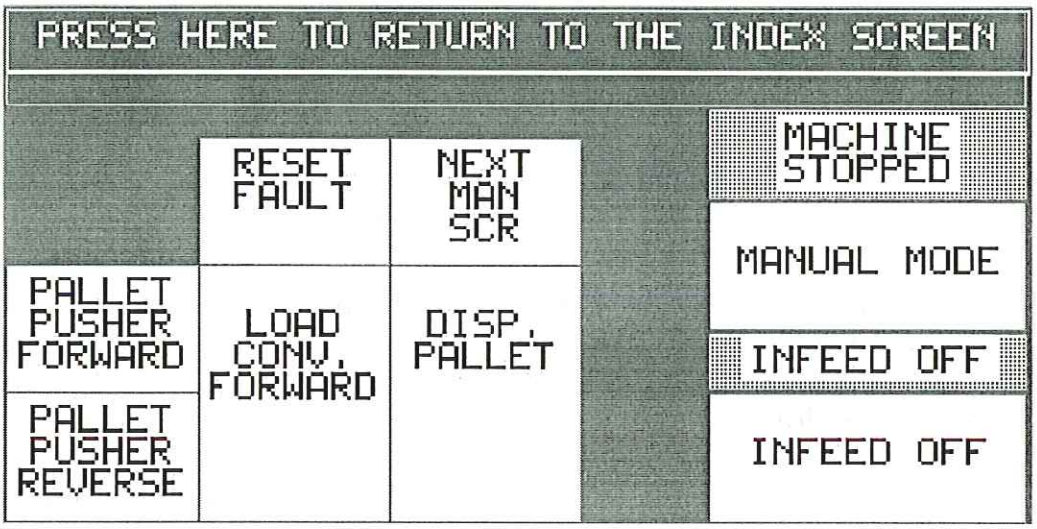

Figure 3-5: Manual Control Screen #2

F. Manual Control Screen #2

The lighted push buttons on this screen are used to manually jog components of the palletizer when the palletizer is in MANUAL mode.

⚠CAUTION

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

DISPENSE PALLET	• Lets you dispense a new pallet when palletizer is in MANUAL MODE.
LOAD CONVEYOR FORWARD	• Lets you jog the Load Conveyor forward when the palletizer is in MANUAL MODE.
NEXT MANUAL SCREEN	• Switches the screen to Manual Control Screen 3.
PALLET PUSHER FORWARD/REVERSE	• Lets you jog the Pallet Pusher forward/reverse when the palletizer is in MANUAL MODE.
RESET FAULT	• Clears messages from the screen. The screen will return to the previous information that was being displayed when the message occurred.

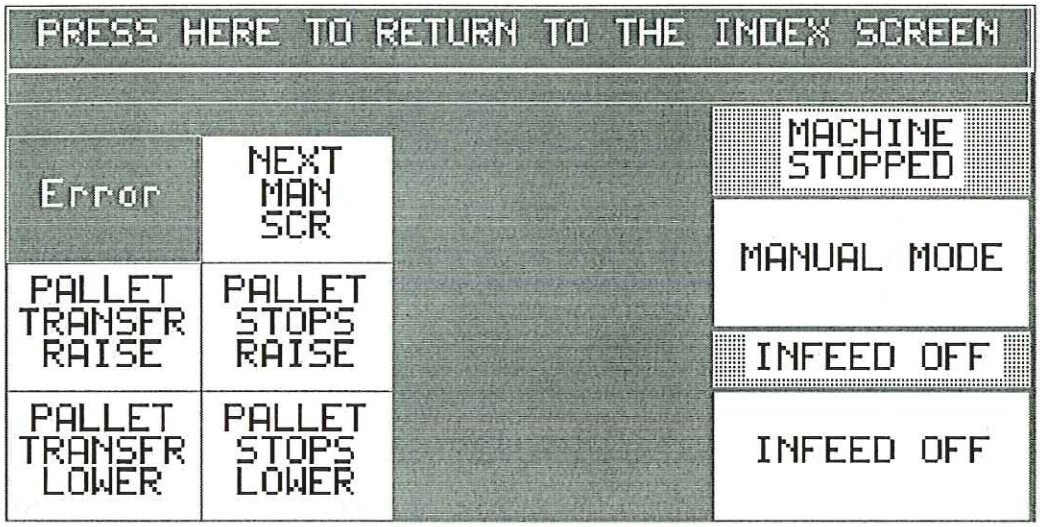

Figure 3-6: Manual Control Screen #3

G. Manual Control Screen #3

The lighted push buttons on this screen are used to manually jog components of the palletizer when the palletizer is in MANUAL mode.

⚠CAUTION

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

NEXT MANUAL CREEN	• Switches the screen to Manual Control Screen 1.
PALLET STOPS RAISE/LOWER	• Lets you raise/lower the Pallet Stop when the palletizer is in MANUAL MODE.
PALLET TRANSFER RAISE/LOWER	• Lets you raise/lower the Pallet Transfer chains when the palletizer is in MANUAL MODE.
RESET FAULT	• Clears messages from the screen. The screen will return to the previous information that was being displayed when the message occurred.

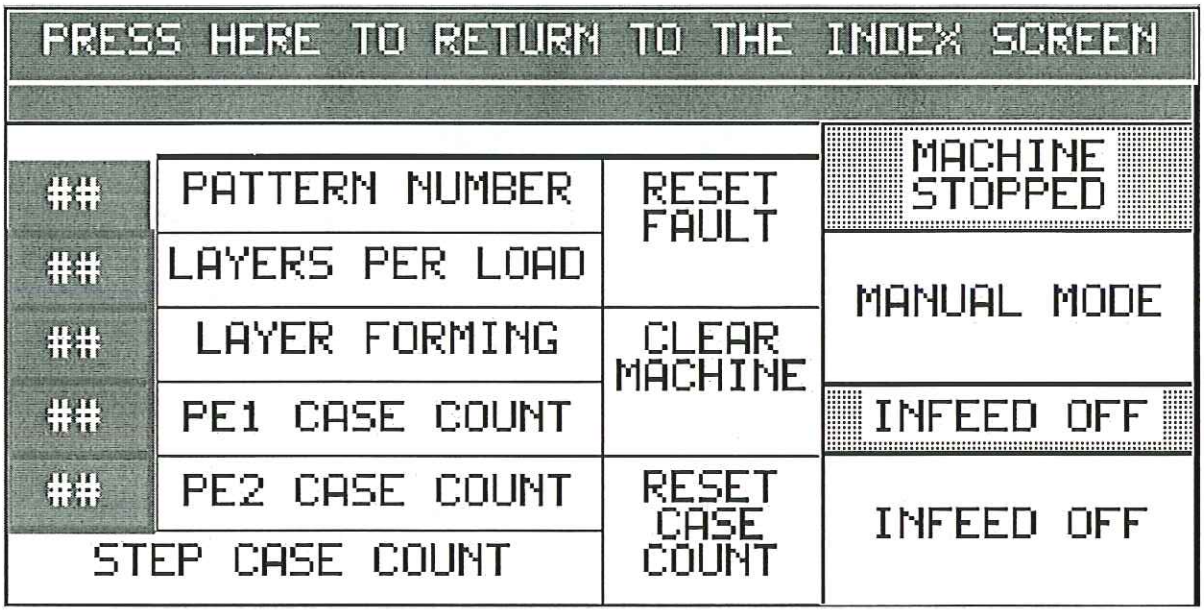

Figure 3-7: Load Status Screen

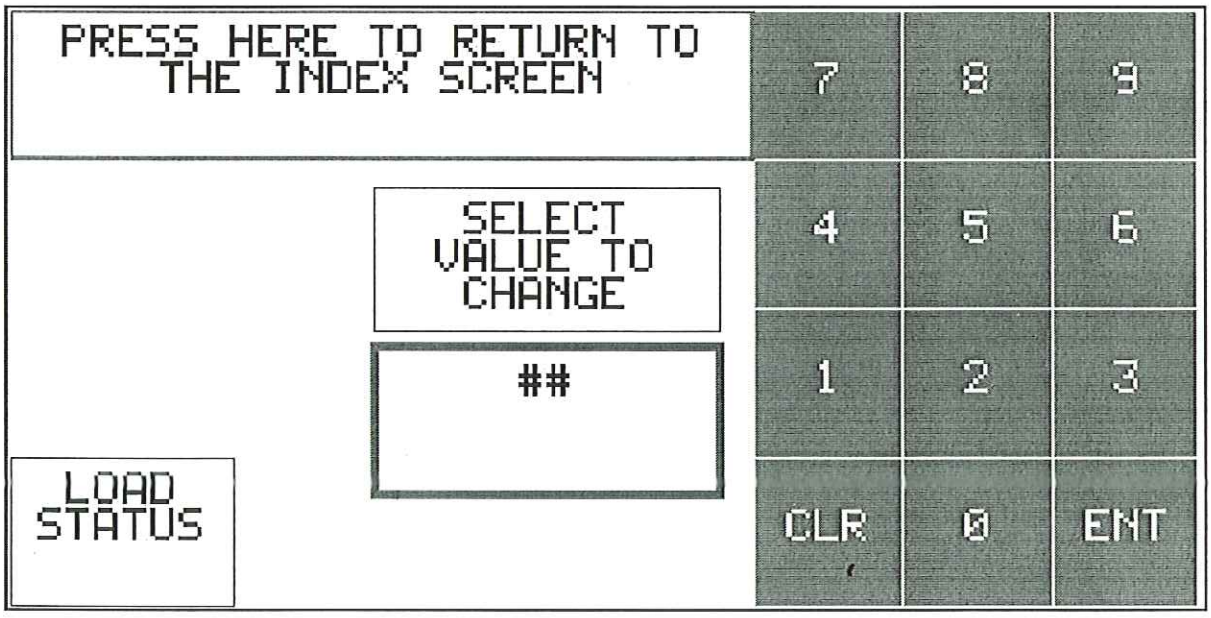

Figure 3-8: Keypad Screen

H. Load Status Screen & Keypad Screen

This screen displays current information on the palletizer set up. When variable information like Pattern Number, Full Layer Size, Layers Per Load, etc. are selected, the screen automatically switches to the Keypad screen. The Keypad screen will display the selected item 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. If the value is OK, the new value will appear on the display screen. To make other changes, repeat the above procedure. Press INDEX to exit the Keypad screen.

CLEAR MACHINE	• When the infeed belt is off, if CLEAR MACHINE is pressed, all cases that have passed photo eye PE1 are cleared from the palletizer and the hoist discharges the load. The case and layer counters automatically reset to zero.
INDEX	• Returns screen to the Index screen
Keypad Functions	• **ENTER** - Enters new data into system.
	• **CLEAR** - Resets the new data to zero. This lets you correct or clear an incorrect entry prior to pressing the **ENTER** key.
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.
LAYERS PER LOAD	• Number of layers selected for a full load.
LOAD STATUS	• Returns the screen to the Load Status.
MANUAL CONTROL	• Changes the screen to the Manual Control screen.

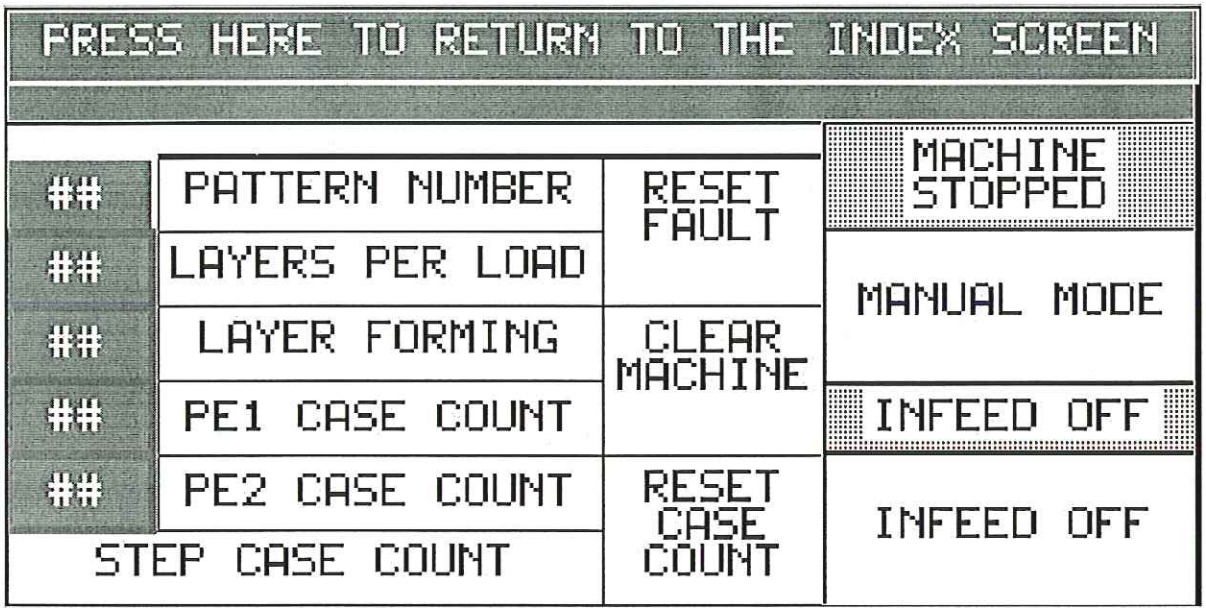

Figure 3-9: Load Status Screen

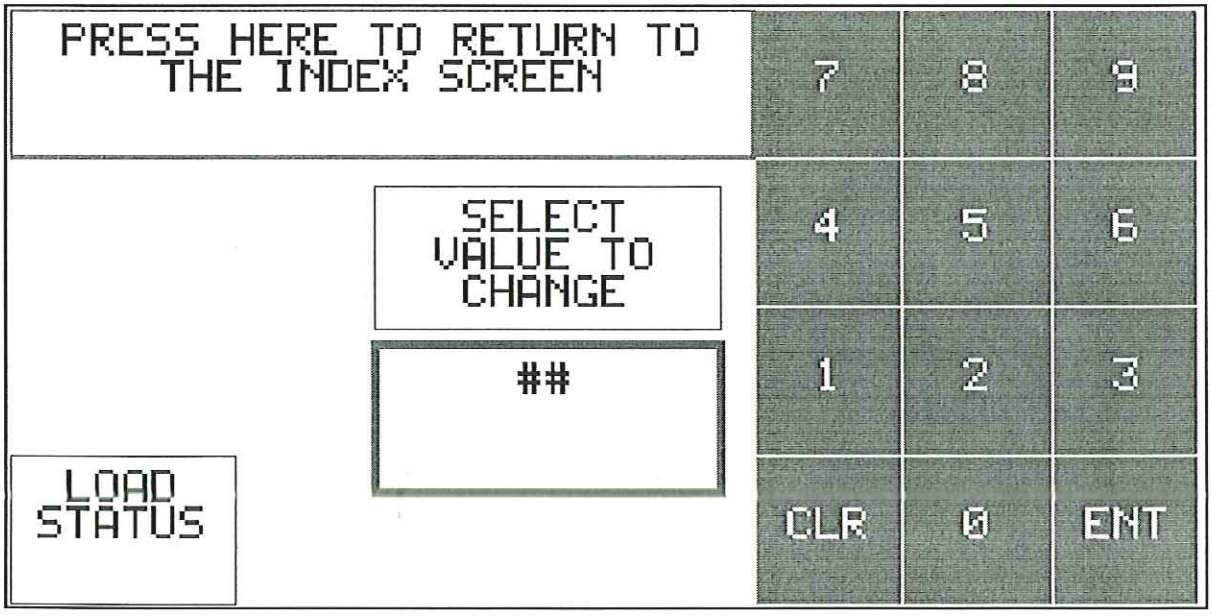

Figure 3-10: Keypad Screen

Load Status Screen & Keypad Screen (continued)

PATTERN NUMBER	• Pattern number currently selected. Refer to the Pattern Data Sheets in Volume III of this set of manuals for the type of pattern formation.
PE1 CASE COUNT	• Current number of cases, for current layer, past PE1 photo eye.
PE2 CASE COUNT	• Current number of cases, for current layer, past PE2 photo eye.
RESET CASE COUNT	• Resets the current case counts past photo eyes PE1 and PE2 to zero.
RESET FAULT	• Clears messages from the screen. The display will return to the previous information that was being displayed when the message occurred.
STEP CASE COUNT	• Steps the case counts forward by one digit each time the key is pressed.

I. Production Counts Screen

This screen displays the number of CASES PER MINUTE being run through the palletizer, the CASE COUNT counted at the infeed, and the LOAD COUNT counted at the discharge.

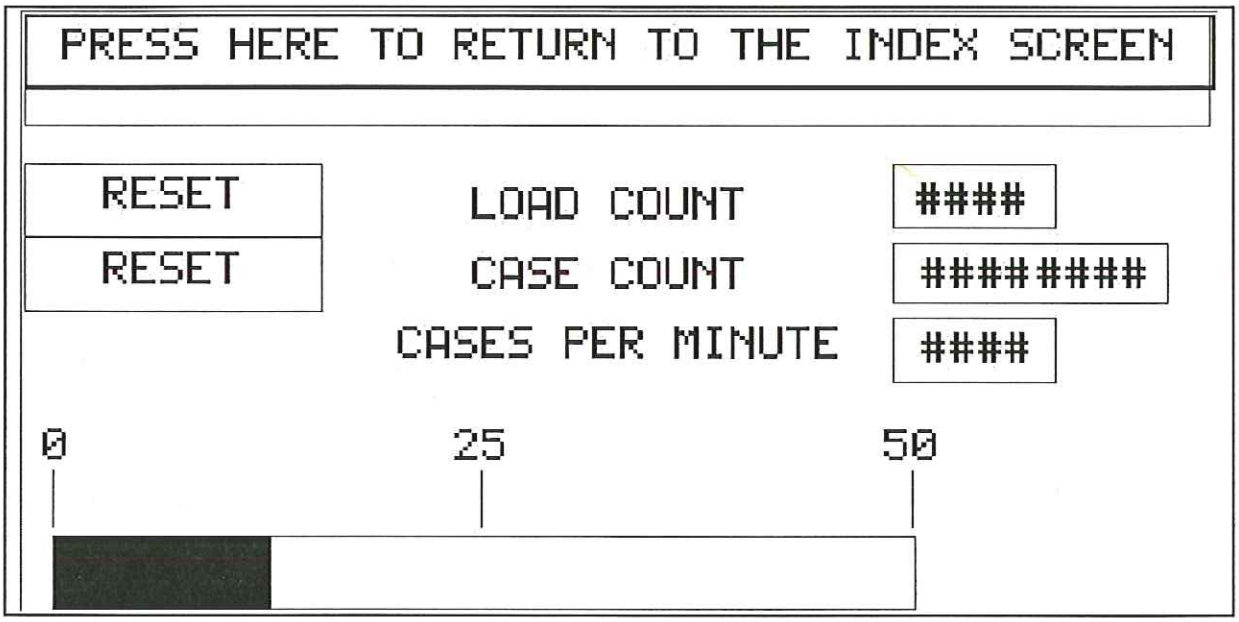

Figure 3-11: Production Counts Screen

CASE COUNT	• Displays the current total case count since the last case count reset.
CASES PER MINUTE	• The average cases per minute rate for the past 15-seconds.
INDEX	• Returns screen to the Index screen.
LOAD COUNT	• The current total load count since the last load count reset.
RESET CASE COUNT	• Resets the total case count to zero.
RESET LOAD COUNT	• Resets the total load count to zero.

J. Machine Setup Screen

This screen lets Alvey technicians start the "simulation" program. This screen is not normally used after the palletizer enters regular service. If you enter this screen by mistake, press INDEX to return to where you were. This screen is sometimes referred to as the *Password* screen.

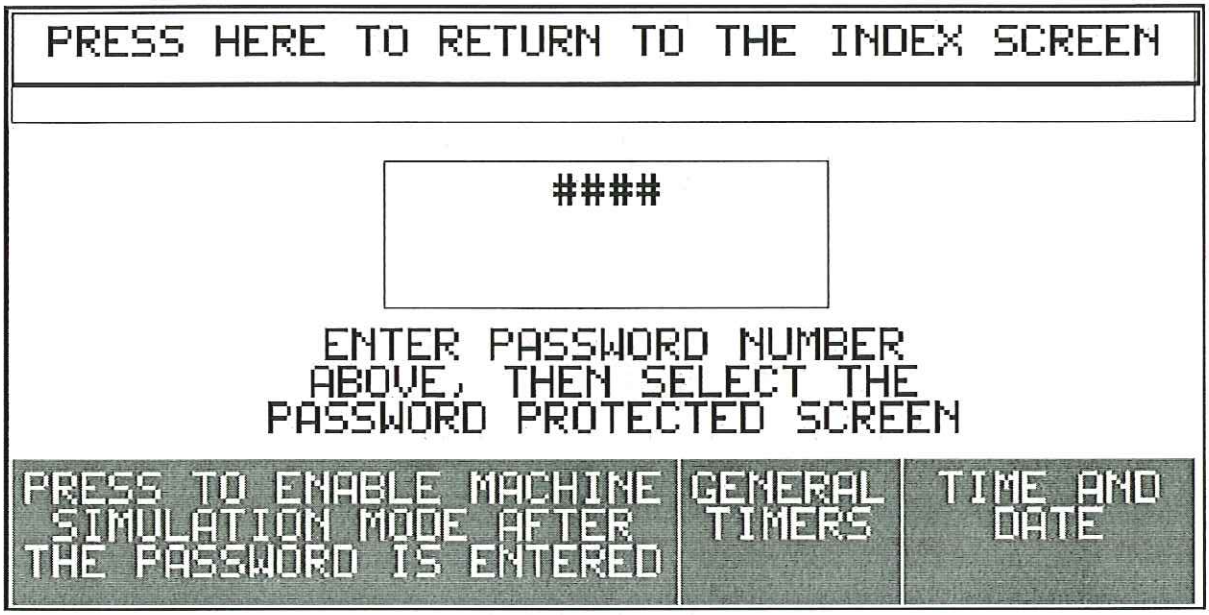

Figure 3-12: Machine Set Up Screen

PRESS TO ENABLE MACHINE SIMULATION...

- Simulates machine operation without any product flowing through the machine.

ENTER PASSWORD...

- Press to display the Keypad screen. Enter the correct password number then press ENTER. If the password was correct the ENABLE MACHINE SIMULATION, TIMERS, and SET TIME AND DATE buttons will be activated.

GENERAL TIMERS

- Displays the Timers Screen.

SET TIME AND DATE

- Displays the Set Time & Date Screen.

K. Start Up Screen

This screen lets you get into the *Time and Date* screen. When the palletizer is first turned on, if you need to change the time or date, press the top button -- the Time and Date screen will come up.

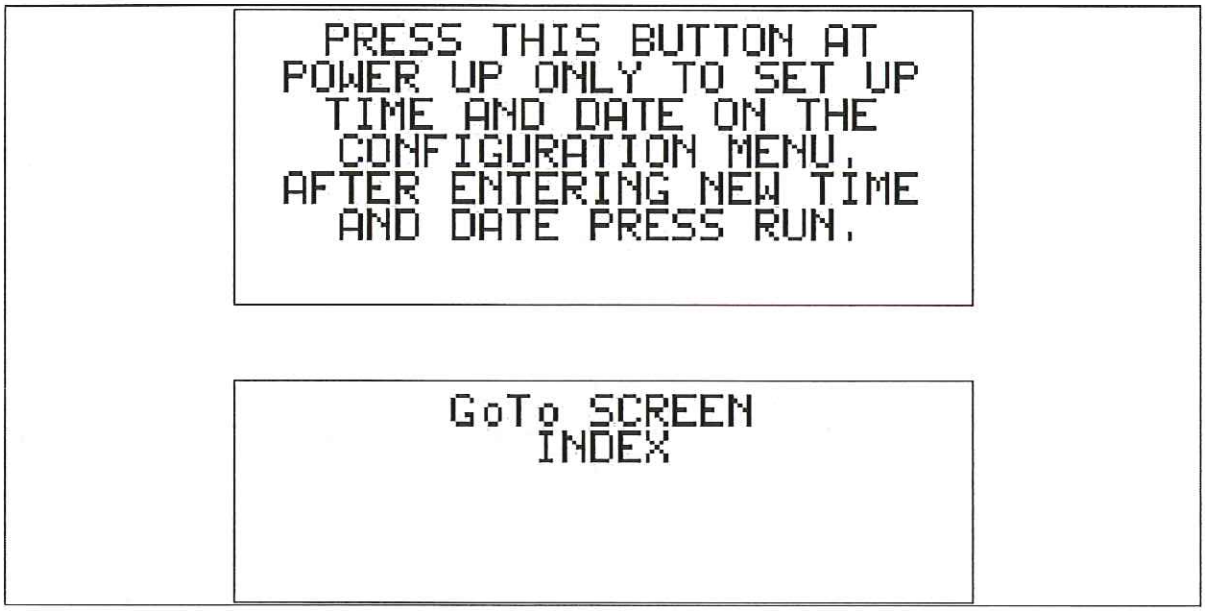

Figure 3-13: Start Up Screen

GoTo SCREEN INDEX • Displays the Index screen.

L. Time and Date Screen

This screen displays the current time and date and is used to change the time and date settings.

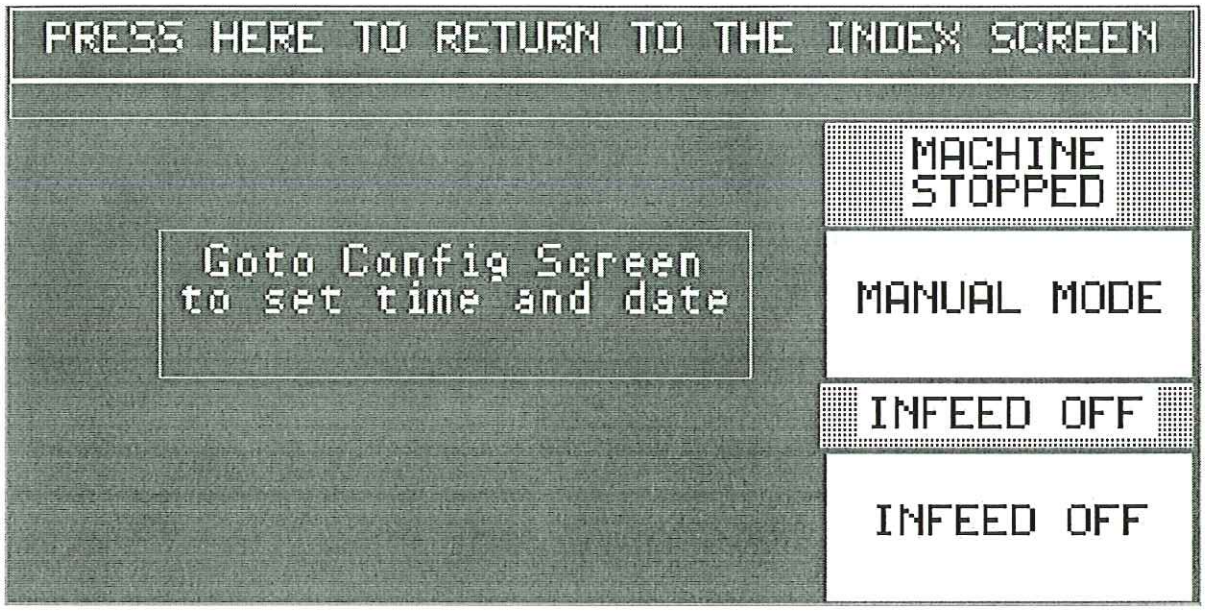

Figure 3-14: Time & Date Screen

Go to Configuration Screen to set time and date

- Switches the screen display to Machine Setup screen.

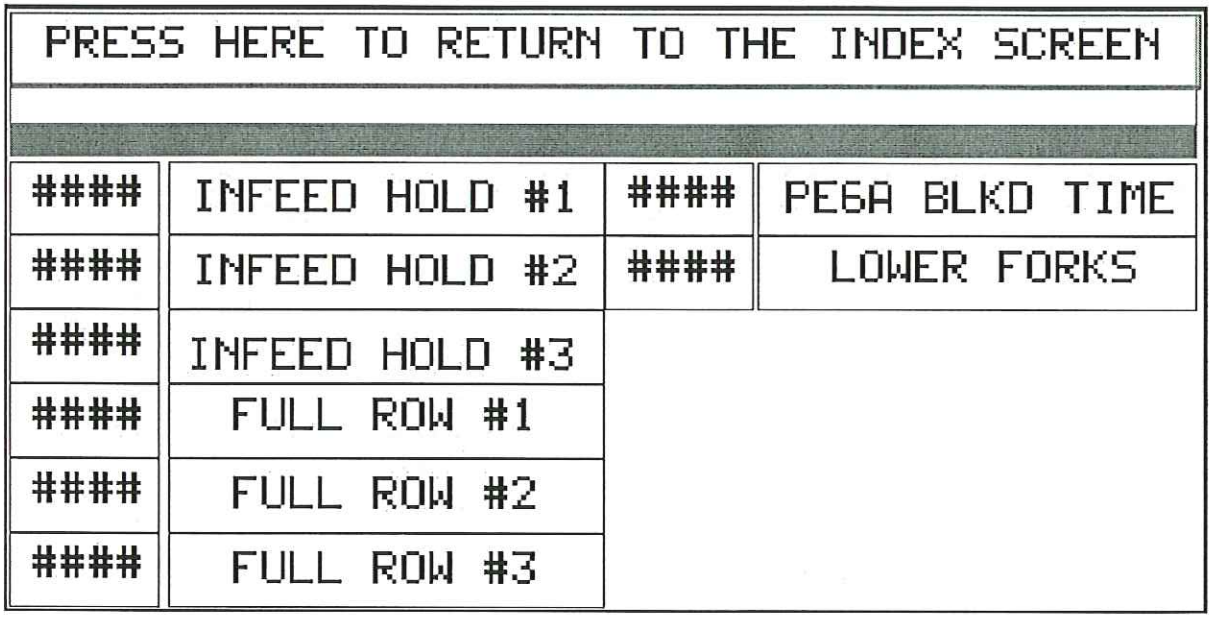

Figure 3-15: Timers Screen

M. Timers Screen

This screen lets you make fine adjustments to aid in the proper operation of the machine. To open the screen a password must be entered. When you make a change on the Timer Screen, do it in small amounts – no more than ±5 units at a time – then test the results.

FULL ROW #1
- Used to let a certain amount of time pass once a full row of product has formed, on the row former, before the row pusher starts its cycle.

FULL ROW #2
- Same as FULL ROW #1, only usually set at a longer time interval.

FULL ROW #3
- Same as FULL ROW #2, only usually set at a longer time interval.

INFEED HOLD #1
- When a full row of product is formed on the row forming section, this timer stops the infeed for an established time in order to keep the incoming product from hitting the row pusher bar.

INFEED HOLD #2
- Usually used when the full machine bit is turned on once the last row of a full load enters the row forming section.

INFEED HOLD #3
- Only used when an extended amount of time is needed to keep incoming product from entering the row forming area.

PE6A BLOCKED TIME
- This timer is essential to proper placement of the load onto the pallet. The timer stops the hoist after an established time once photo eye PE6 is blocked by either the pallet or the previous layer. Adjust this timer no more than ±5 units at a time.

LOWER FORKS
- Lets you adjust the time the forks in the right angle infeed are raised. If the forks lower too soon, cases will be turned as they enter the right angle infeed.

N. Alarms Screen

This screen displays a record of the most recent alarms that have occurred. It also displays the time and date of each alarm that occurred and the time and date the alarm was acknowledged.

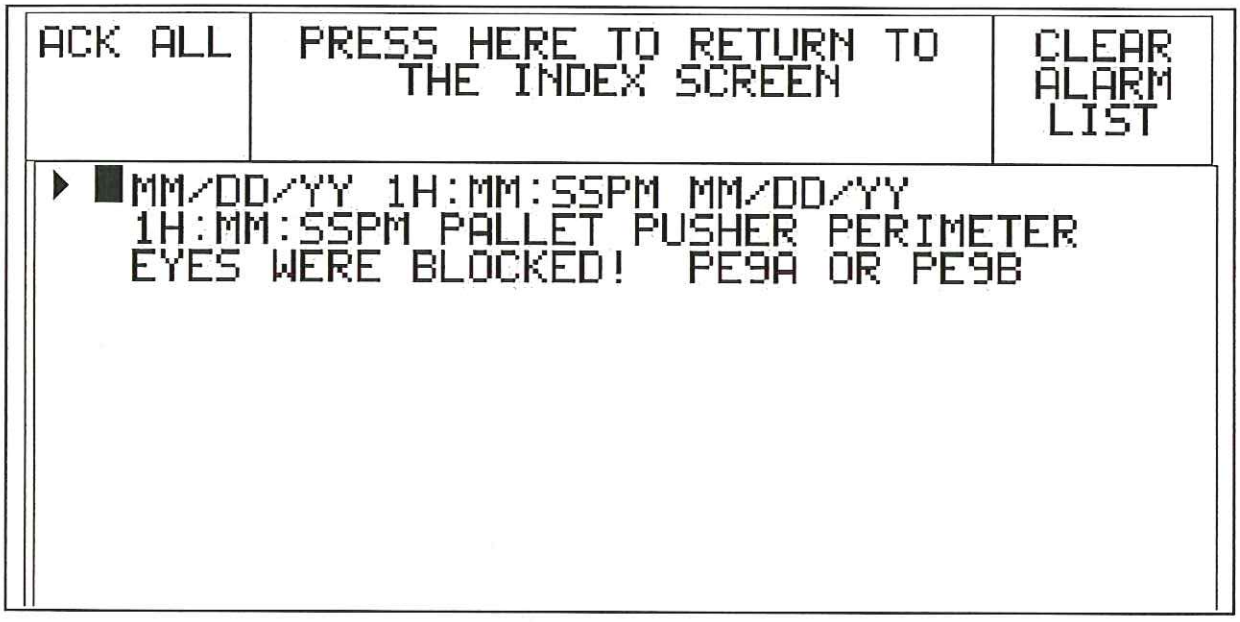

Figure 3-16: Alarms Screen

INDEX
- Returns screen to the Index screen.

ACKNOWLEDGE ALL
- Acknowledges all the alarms shown on the current Alarm Banner and turns the banner off.

CLEAR ALARM LIST
- Clears the Alarms screen.

O. Alarm Banner Screen

This screen will show across the face of any other screen when an alarm condition occurs, e.g., PALLET PUSHER PERIMETER EYES WERE BLOCKED.

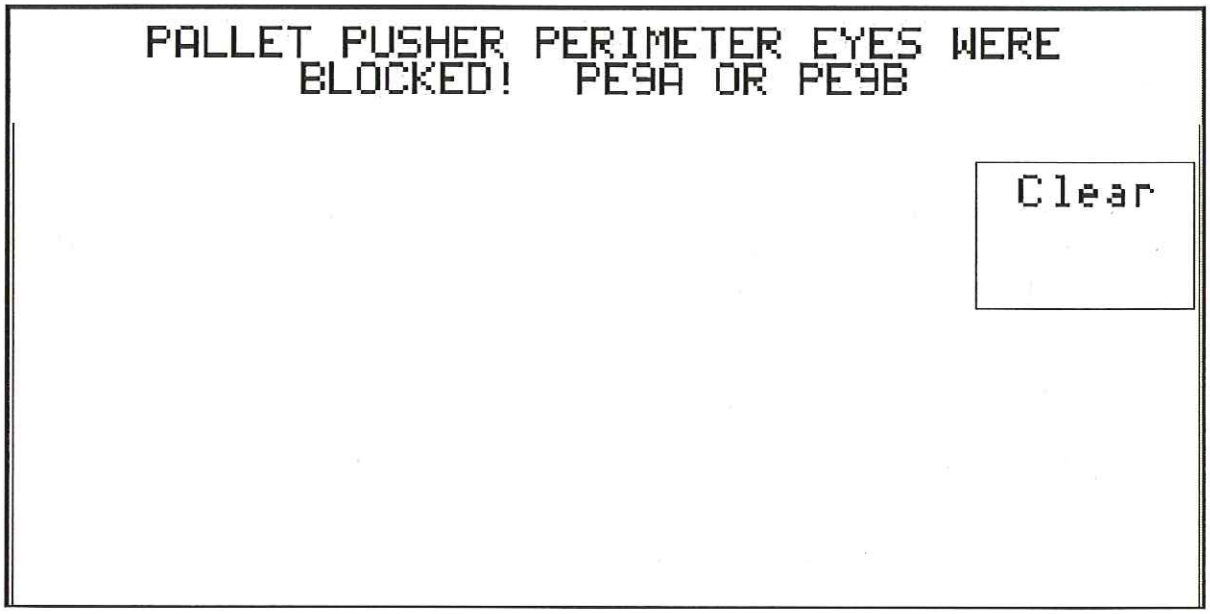

Figure 3-17: Alarm Banner Screen

Clear

- Acknowledges the alarm shown on the current Alarm Banner Screen and turns the banner off.

3. Diagnostic Messages

The palletizer main control panel will be interrupted, as needed, to display diagnostic messages. There are two types of Diagnostic Messages: Alarm Messages and Operational Messages as listed on the following pages.

NOTE: All the diagnostic messages listed below do not apply to every palletizer. The palletizer design varies depending on the application and customer's specifications.

A. Alarm Messages

Alarm messages stop the palletizer, and usually indicate that an undesirable condition has occurred. The message is displayed until the RESET FAULT button is pressed. Every alarm message condition must be corrected before the palletizer can be restarted.

When an alarm message appears do the following:

1. Check designated area for a case jam or a mechanical failure.
2. Check the photo eyes and proximity switches in designated area for proper alignment and adjustment.

List of Alarm Messages

MACHINE E-STOP ENABLED	• One (or more) emergency stop switches has been pressed.
REMOTE SYSTEM E-STOP ENABLED	• Check remote E-stops.
TOP SAFETY EYE BLOCKED	• PE9A, PE9B, PE9C, or PE9D was blocked when the palletizer was running. Check area for cause or failed or mis-aligned photo eyes (PE9's).
DISCHARGE SAFETY EYE BLOCKED	• PE12A or PE12B was blocked by something other than a load being discharged. Check area for cause or failed or mis-aligned photo eyes (PE12A & PE12B).
HOIST CHAIN SLACK DETECTED	• Adjust the hoist chain.
CASE MISCOUNT: PE1/PE2 NOT EQUAL	• The case counts at PE1 and PE2 was not identical when the infeed belt was restarted.

List of Alarm Messages (continued)

INFEED BELT JAM	• PE1 or PE2 was blocked too long. Check infeed area for case jams, failed or mis-aligned photo eyes (PE1 or PE2), or tripped motor overload.
ROW FORMER JAM	• The Row Pusher motor has run too long. Check for case jams, failed or mis-aligned proximity switches (PX3 or PX3A), or tripped motor overload.
ROW PUSHER JAM: PXE2J BLOCKED	• The Row Pusher motor has run too long. Check for case jams, failed or mis-aligned proximity switches (PX3 or PX3A), or tripped motor overload.
ROW PUSHER FAULT: RUN TIMEOUT	• The Row Pusher motor has run too long. Check for case jams, failed or mis-aligned proximity switches or tripped motor overload.
LAYER PUSHER FAULT: RUN TIMEOUT	• The Layer Pusher motor has run too long. Check for case jams, failed or mis-aligned proximity switches (PX3A), or tripped motor overload.
APRON FAULT: OPEN TIMEOUT	• The Apron motor has run too long (opening or closing). Check for failed or mis-aligned proximity switches (PX4 or PX5), or tripped motor overload.
APRON FAULT: CLOSE TIMEOUT	• The Apron motor has run too long (opening or closing). Check for failed or mis-aligned proximity switches (PX4 or PX5), or tripped motor overload.
HOIST FAULT: RAISE TIMEOUT	• The Hoist motor has run too long (raising). Check for failed or mis-aligned photo eyes (PE6 and PE7), or tripped motor overload
HOIST FAULT: LOWER TIMEOUT	• The Hoist motor has run too long (lowering). Check for failed or mis-aligned proximity switch (PX8), or tripped motor overload.
LOAD TOO TALL TO DISCHARGE	• The load being discharged failed to transfer. Check for failed or mis-aligned photo eyes (PE12A & PE12B, and PE11A), or tripped motor overload.

List of Alarm Messages (continued)

PALLET MISFEED: PE14A BLOCKED IMPROPERLY	• A pallet was not clear of PE14A or PE14B when the hoist started to rise. Check for pallet jam, or failed or mis-aligned photo eyes (PE14A & PE14B).
DISCHARGE FAILURE: NO LOAD TO DISCHARGE	• Check discharge area.
DISCHARGE FAILURE: LOAD IS NOT ADVANCING	• Check discharge area.
DISCHARGE CONVEYOR FAULT: RUN TIMEOUT	• Check discharge area.
INFEED BELT VFD FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
ROW FORMER VFD FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
ROW PUSHER VFD FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
HOIST VECTOR DRIVE FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
LOAD CONVEYOR VFD FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
DISCHARGE CONVEYOR #1 VFD FAULT	• The frequency drive indicated has reported an operating fault. Check drive manual for cause.
HOIST BLOCKS ARE NOT STOWED	• Check hoist blocks.
TIESHEET CROSSHEAD RAISE TIMEOUT (Optional)	• Check sheet dispenser.

List of Alarm Messages (continued)

TIESHEET CROSSHEAD LOWER TIMEOUT (Optional)	• Check sheet dispenser.
TIESHEET DROPPED BEFORE PLACEMENT (Optional)	• Check sheet dispenser.
TIESHEET CARRIAGE FORWARD TRAVEL TIMEOUT (Optional)	• Check sheet dispenser.
TIESHEET CARRIAGE REVERSE TRAVEL TIMEOUT (Optional)	• Check sheet dispenser.
FAILURE OF HOIST DOWN SENSORS PE8/PX8H	• Check hoist area.

B. Operational Messages

Operational messages do not stop the palletizer operation. These messages are displayed for a few seconds, to remind you of the proper machine sequence. After that the palletizer status is re-displayed. These messages normally appear when a control button or switch is used at the wrong time.

List of Operational Messages

MUST BE IN AUTO MODE	• Machine Mode switch must be set to AUTO mode for the INFEED BELT & CLEAR MACHINE controls to be operational.
MUST BE IN MANUAL MODE	• Machine Mode switch must be set to MANUAL mode for the PATTERN NUMBER, LAYERS PER LOAD, LAYER SIZE, CURRENT LAYER COUNT, APRON, and HOIST controls to be operational.
MUST TURN INFEED OFF	• Case INFEED BELT must be OFF (MACHINE MODE - AUTO) for CLEAR MACHINE button to be operational.
MUST CLEAR MACHINE	• CURRENT CASE COUNT and CURRENT LAYER COUNT must display "00" for PATTERN NUMBER or LAYERS PER LOAD buttons to be operational. These cannot be changed in the middle of a load.
MUST START MACHINE	• When the palletizer main disconnect switch is ON, but the START button has not been pressed, none of the control buttons or switches will be operational except for the EMERGENCY STOP button. The EMERGENCY STOP button must be pulled out and the START button must be pressed in and held-in for approximately five-seconds before the palletizer controls will work.
PALLET MIS-FEED	• Check the empty pallet traveling to the hoist for a pallet jam.
DISCHARGE FULL	• Check for load at photo eye PE11 on the discharge conveyor.
CHECK DISPENSER	• Check for jammed pallet or if pallet dispenser is out of pallets.

List of Operational Messages (continued)

PE2 MUST BE CLEAR	• PE2 was blocked when an attempt to change the case count was made. Remove the case blocking PE2.
VALUE OUT OF RANGE	• Message is displayed when you attempt to enter a numeric value that is either too high or too low when changing the load pattern formation parameters.
MUST RESET CASE COUNT	• Indicates that the case count at PE1 and PE2 were not identical when the palletizer mode changed to manual. Typically occurs when a case is blocking PE2.
REMOTE CONTROL POWER SWITCH IN OFF/ON	• Check switch.
MACHINE WAITING ON PRODUCT	• Check product infeed conveyor.
PE6 IS BLOCKED	• Check photo eye PE6.
PE6 NOT BLOCKED	• Check photo eye PE6.
HOIST BLOCKS ARE NOT RETRACTED (Optional)	• Check hoist blocks.
SHEET DISPENSER NOT IN AUTO (Optional)	• Check sheet dispenser.
NO SHEET AT PRESTAGE (Optional)	• Check prestage area for sheet.
SHEET DISPENSER LOW ON SHEETS (Optional)	• Check sheet supply.
SHEET DISPENSER OUT OF SHEETS (Optional)	• Replenish sheet supply.
SHEET PICK-UP FAILURE (Optional)	• Check sheet dispenser crosshead.

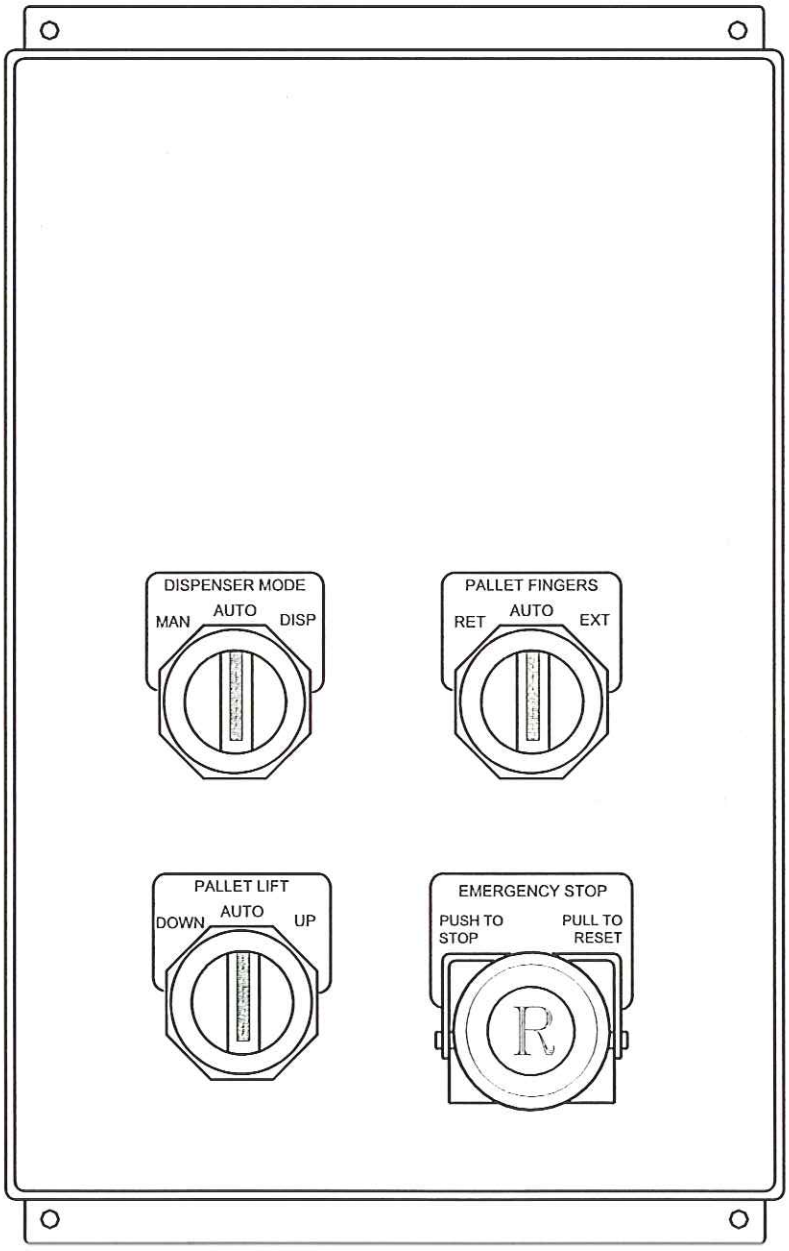

Figure 3-18: Pallet Dispenser Control Station

4. Pallet Dispenser Control Station

The pallet dispenser control station is located at floor level on the pallet dispenser.

DISPENSER MODE

- Selects between MANUAL and AUTO modes, and is spring loaded on the right side for DISPENSE pallet.

EMERGENCY STOP

- When the EMERGENCY STOP button is pressed, the palletizer will shut down and all other palletizer controls, both AUTOMATIC and MANUAL, will be locked out until the EMERGENCY STOP button is reset and the palletizer is restarted.
- **MANUAL** - Lets you use the DISPENSE pallet control (one cycle) if the downstream conditions of the pallet conveyor are met. When in manual mode the pallet dispenser lift table can be jogged up or down and the pallet dispenser fingers moved in or out.
- **AUTO** - Lets the pallet dispenser perform its programmed functions, in sequence, automatically.
- **DISPENSE** - Dispenses a pallet when the pallet dispenser is in AUTOMATIC mode.

PALLET FINGERS

- Selects between EXTEND and RETRACT, and is spring loaded to return to the AUTO position when released.
- **RETRACT** - Retracts the pallet dispenser fingers when the pallet dispenser is in MANUAL mode.
- **AUTO** - Lets the pallet dispenser fingers interact with the palletizer automatically when the pallet dispenser is in AUTO mode.
- **EXTEND** - Extends the pallet dispenser fingers when the pallet dispenser is in MANUAL mode.

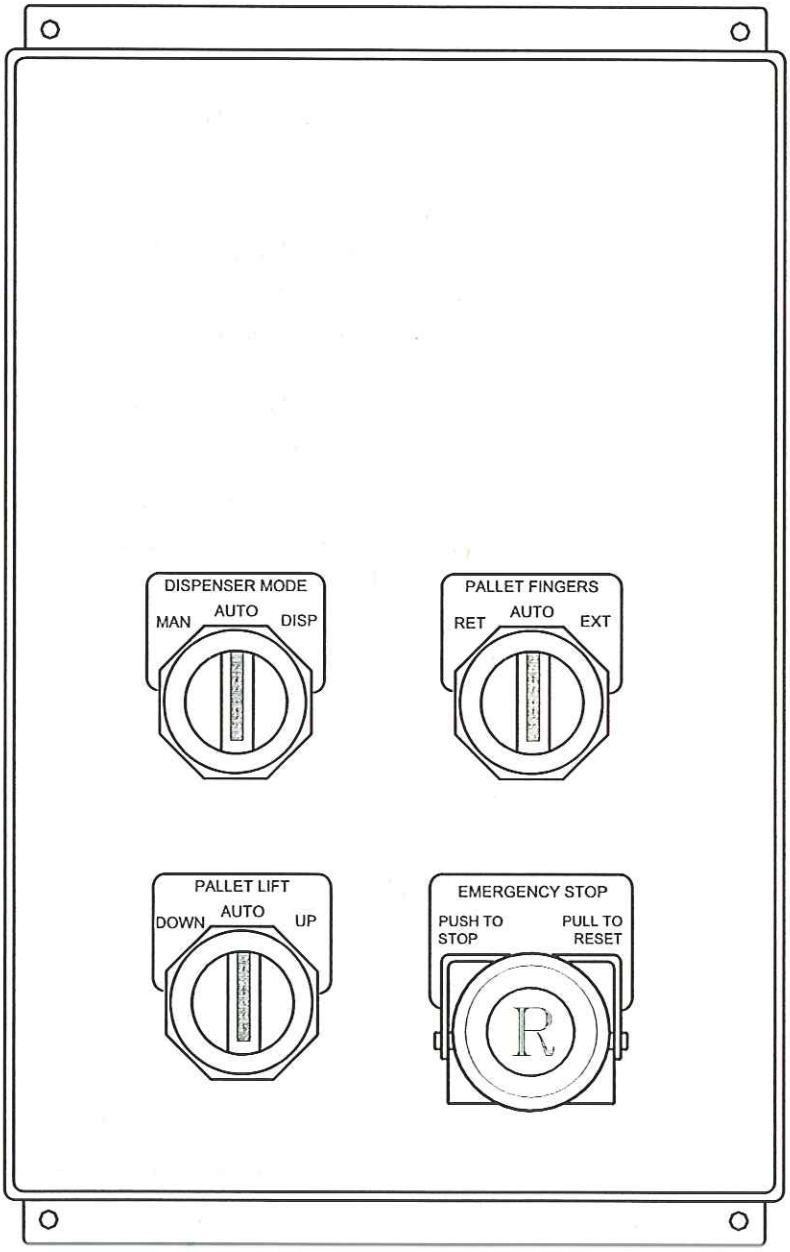

Figure 3-19: Pallet Dispenser Control Station

Pallet Dispenser Control Station (continued)

PALLET LIFT

- Selects between UP and DOWN, and is spring loaded to return to AUTO position when released.
- **DOWN** - Lowers the pallet dispenser lift when the pallet dispenser is in MANUAL mode.
- **UP** - Raises the pallet dispenser lift when the pallet dispenser is in MANUAL mode.
- **AUTO** - Lets the pallet dispenser lift interact with the palletizer automatically when the pallet dispenser is in AUTO mode.

5. Emergency Stop Control Station

The Emergency Stop Control Stations are located at floor level at the discharge end of the palletizer.

When an EMERGENCY STOP button is pressed, the palletizer will shut down and all other palletizer controls, both AUTOMATIC and MANUAL, will be locked out until the EMERGENCY STOP button is reset and the palletizer is restarted.

⚠CAUTION

EMERGENCY STOP buttons do not stop external discharge conveyors from running.

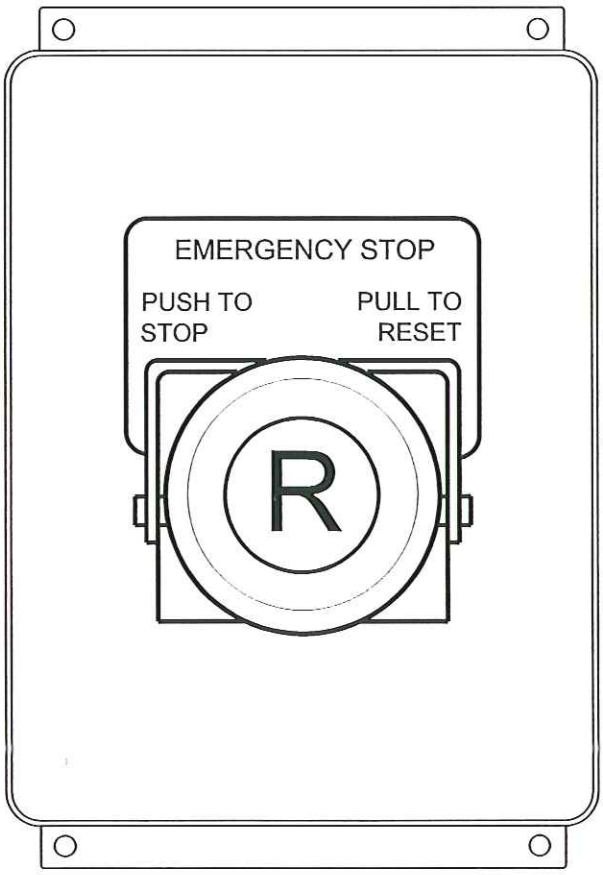

Figure 3-20: Emergency Stop Control Station

6. Routine Operational Procedures

Before starting the palletizer, visually inspect the palletizer and palletizer conveyor areas for damage, wear, and obstructions. Take corrective action as needed or as specified by plant procedures. Also, check to see that the pallet dispenser is full.

A. To Set-Up the Palletizer for Automatic Run

1. Turn the palletizer main power disconnect switch (located on the outside of the palletizer high-voltage cabinet) to the ON position.
2. Pull out all EMERGENCY STOP buttons on all palletizer control stations (all safety eyes must be clear).
3. On the OIT touch screen, press the RESET FAULT push button to clear any messages from the screen.

The palletizer can cause death or serious injury in a variety of ways. Be certain everyone is outside the palletizer safety guards before you start the palletizer.

4. Insert the start key into the CONTROL POWER key-switch then turn the key to the START position and hold it there for at least five seconds. It takes approximately five seconds for the MCR to engage. The warning horn will pulsate on and off during the five-second period before the palletizer starts. When the palletizer is operable, the Machine Mode status display on the OIT will read MANUAL MODE.
5. Check the Load Status screen for correct pattern, layer, and case settings, and make changes as needed.

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

6. Check the hoist to see if a pallet is in place. If not, release a pallet from the pallet dispenser using the manual controls.
7. Switch the palletizer mode to AUTO MODE.
8. Switch the INFEED to ON.

B. To Change Case Patterns

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

1. Turn the MACHINE MODE to MANUAL MODE, and use the Load Status 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 see if a pallet is in place. If not, dispense a pallet from the pallet 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. Wait for the product to clear from the palletizer, the load to discharge, and the hoist to rise to receive a new layer from the apron. The case counters will automatically reset to zero.
3. Select the appropriate pattern, layers per load, layer size, etc. using the Keypad screen.
4. Turn the INFEED to ON, and resume normal operation.

♦♦♦

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1. For Your Safety

All instructions in this section are intended to assist and provide qualified individuals with maintenance directions for the 680 palletizer/unitizer. Review the instructions and drawings carefully before attempting to perform maintenance on the system.

A. Safety Codes and Standards

Alvey machines are designed and manufactured to comply with the **"Safety Standard for Case and Bag Palletizers, Unitizers, Depalletizers, and Related Equipment" (CEMA 650-1992),** and the **"Safety Standard for Conveyors and Related Equipment" (ASME B20.1).**

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)**.

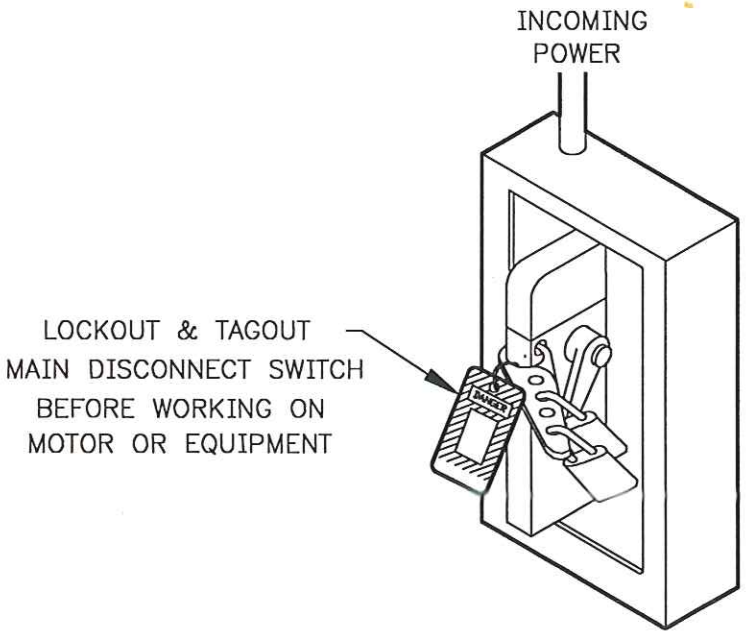

Figure 4-1: Lockout & Tagout Safety Procedures

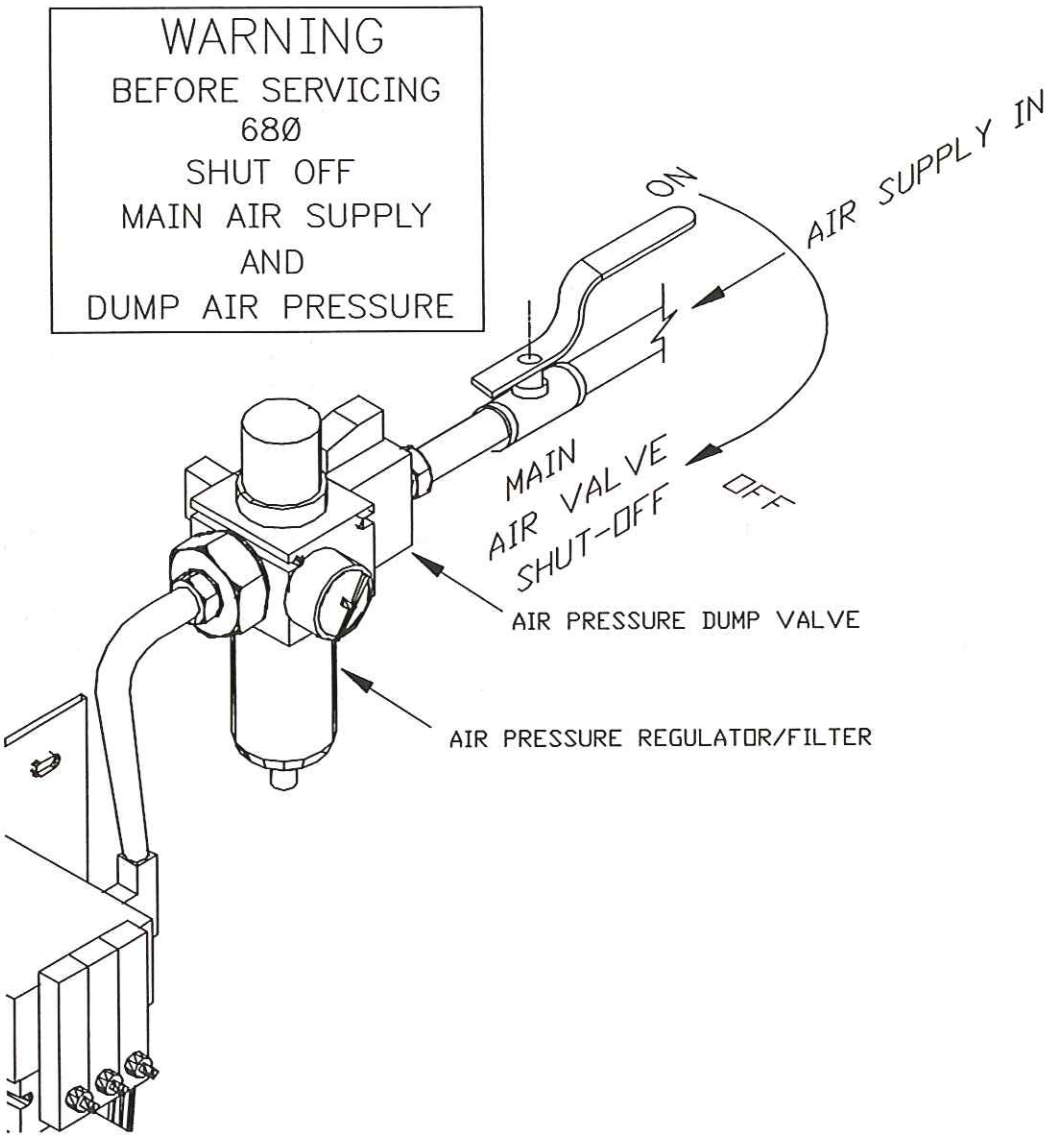

Figure 4-2: Main Air Supply

WARNING

When working on the pneumatic system, air pressure is NOT removed when the machine is turned off. Air pressure in the pneumatic system can still be present. Always turn OFF the main air supply and bleed the air pressure before working on any pneumatic device. Shut off the air supply to the machine at the main shut-off valve and operate the lockable air dump device to release air pressure. (See Figure 4-2.)

B. Service & Maintenance Safety Precautions

1. Only authorized and properly trained personnel may service the machine.

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

2. Turn off all electrical power sources including the main power disconnect switch, and perform your company Lockout/Tagout safety procedure before beginning any maintenance or repairs.
3. Do not attempt to clear jams or reach into the machine when the machine is running. Press the Emergency Stop button and use the appropriate Lockout/Tagout devices.
4. Do not climb on, walk, ride, or cross over or under this machine except where suitable catwalks, gates or bridges are provided for personnel travel before pressing the Emergency Stop button and performing your company 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 with the four safety pins provided at the four corners of the machine frame to prevent the hoist from lowering.
6. Observe all warning signs, lights and alarms associated with the equipment operation and maintenance, and always be alert to automatic operations of adjacent equipment.
7. Use extreme caution near moving parts to avoid a hazard of hands, hair, jewelry, or clothing from being caught in moving parts.
8. Before re-starting and testing the machine, remove all tools and other material from within the machine.
9. Before starting the machine remove the four safety pins if necessary.
10. Before starting the machine, verify that no persons are in a position to be injured as a result of the machine start-up.
11. Replace all safety guards and/or covers removed from the machine for maintenance, before operating the machine.
12. Operating the palletizer/unitizer in Manual Mode bypasses most of the operational interlocks, therefore Manual Mode operation makes it possible to crush cases and/or damage the machine.

2. 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 check-list 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 back of this section of the manual.

B. Service Record Logbook

A service record logbook should be kept, detailing the work done on the palletizer/unitizer, 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 Machine Inspection

General walk-through inspections of the equipment (listening for unusual noises and carefully observing the system) during daily plant operation are recommended. 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 palletizer/unitizer 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.

A visual inspection of the palletizer/unitizer and its infeed and discharge conveyors should be made daily. 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. Excessive fiber or dust build up can make maintenance difficult, check for dust build up on photo eyes and proximity switches, and proper alignment of all photo eyes.

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 equipment. Use mild soap, diluted with water when washing the machine.

Do not "hose down" the palletizer/unitizer. 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). 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 the event 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

E. Safety Labels

Warning signs and safety labels posted on or near the equipment shall not be removed, painted over or altered. All safety devices, warning lights and alarms associated with the system should be regularly tested for proper operation and serviced as needed. If any safety labels are missing, defective or damaged, they will be provided to you for no charge. See Section 1, "Machine Safety Signs" for the Alvey part numbers when ordering replacement safety labels.

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 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 One Protection (COP) toll-free "Hot Line" at **1-800-535-2555.** This number lets you discuss issues directly with a qualified Alvey customer service engineer.

You can contact Alvey headquarters at:

- **Alvey Systems, Inc.**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2400**
- **Web site: http://www.alvey.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.

G. Lubrication

1. General Information

When the 680 palletizer/unitizer is shipped from the factory, it has been thoroughly lubricated. Frequently there is a delay between the time that the palletizer/unitizer is received from our factory, and the time when 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 palletizer/unitizer be lubricated again before placing it in service.

Due to the high speeds and intermittent motions involved in palletizer/unitizer 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 of this manual 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 palletizer/unitizer where an excess was discovered.

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

3. Lubrication Specifications

Applications	Characteristics	Recommendations
Ball Bearings [1]	NLGI #2 (Consistency Grease or Equivalent)	Lubriplate 630-RR, 630-2
Roller Bearings [1]		
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		
Reducers: - Winsmith® [2] - Tiegear® [2] - Cone® [3] - Winsmith® [3]	N/A	Mobil - SHC-629 Mobil - SHC-634 Mobil - SHC-634
Pneumatic System Lubricator	Viscosity at 100°F. 220 SSU (SAE-20)	Lubriplate #2 or Equivalent

1. The pillow and flange mount bearings are lubricated for life. These bearings do not need additional lubrication.
2. These right angle reducers are sealed for life. **"Do not"** fill these reducers unless a major overhaul was performed.
3. The Winsmith® and Cone® 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 manual, for additional information about lubrication and maintenance of gear motors and speed reducers.

H. Mechanical Adjustments

Follow all safety codes and Lockout and Tagout procedures before making any adjustments to the palletizer/unitizer. Refer to Section 1, of this manual for safety information.

1. 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.

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

a) First, check to see that the shafts are level using a carpenter's or machinist's level.

b) 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.

2. Sprocket Alignment

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

a) Verify the alignment of sprockets by using a straight edge across the face of the sprockets. To be 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.

b) Be sure to tighten all set screws when the alignment is correct.

The Pusher Bars and Chain Hoist 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.

3. Chain Tension

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.

NOTE: Check the palletizer/unitizer 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 two 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 breaking, the chain should be almost taut.

To measure chain tension:

a) Tighten one side of the chain strand so that the excess accumulates on the other side.

b) Use a straight edge and a scale to measure the amount of chain deflection.

c) Keep a record of the sag to determine the amount of chain elongation.

4. Belt Tension

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:

a) Loosen the take-up pulley bolts and adjust the pulley until there is no slack in the belt.

b) Using extreme caution, start the drive and observe the slack side of the belt. There should be a slight sag if the tension is correct.

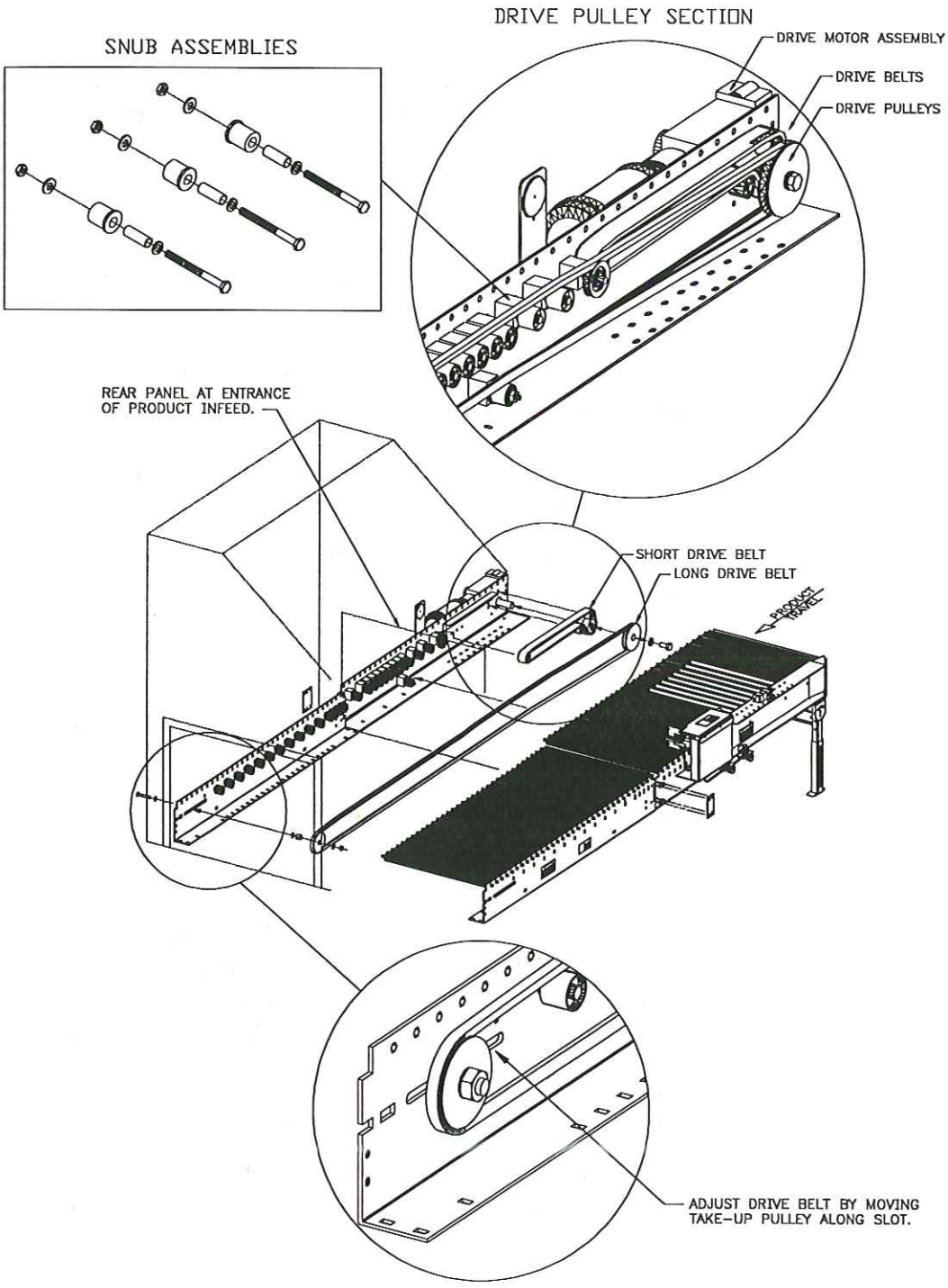

Figure 4-3: Live Roller Drive Belts

5. Live Roller Drive Belts

The long drive belt on the row forming section drives the row forming rollers. One end of the long drive belt goes around the drive pulley, located near the case turning section at the case infeed conveyor. The other end of the belt wraps around the adjustable take-up pulley, located below the rollers in the row former section, near the row stop.

The short drive belt on the case turning section drives the case turning rollers, and wraps around the drive and tail pulleys along side the long drive belt. (See Figure 4-3.)

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

a) Turn the palletizer/unitizer main disconnect switch to OFF, and lockout and tagout the switch for safe working conditions.

b) Loosen the nut on the take-up pulley until the belt tension is loose enough to remove the old belt.

c) From under the live roller section, remove the old belt.

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

d) After the belt has been removed, check the drive pulley and take-up pulley. There should be very little play in the bearings, and they must turn freely. If necessary, replace the pulleys.

e) Check the snub assembly rollers. 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.

f) 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.

g) 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.

h) Make sure that the new belt is positioned securely over the snub rollers and jog the conveyor so the belt turns 3 or 4 times. Re-adjust the take-up pulley if necessary for proper belt tension.

i) 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 approximately 1/2" 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.

j) Replace any safety guards that may have been removed for access to the pulleys.

I. Pneumatic Adjustments

1. Main System Air Pressure Regulator

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

2. Air Flow Controls

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.

3. Case Turner

The pneumatically operated Case Turner Assembly turns cases before they move onto the row former.

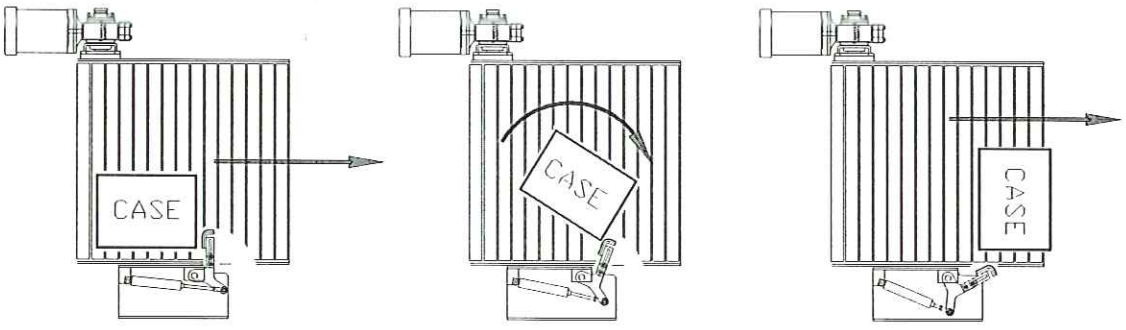

Figure 4-4: Case Turner Operation

The Case Turner has a bump turner device, which is connected to an air cylinder (see Figure 4-5). When the air cylinder is extended, the bump turner device is exposed so an incoming case bumps against the bump turner. This causes the case turn sideways as illustrated in Figure 4-4. When the case turner air cylinder is retracted, the bump turner device retracts out of the path of the case so it will not be turned.

The case turner 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.

The case turning device assembly can be pivoted slightly for more contact surface area, and the turner blade can also be adjusted for changing the contact surface area on the cases.

4. Case Turner Air Pressure Gauge

An air pressure gauge located on the live roller side frame controls the air pressure setting for the case turner device. (See Figure 4-5.) 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.

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

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

b) 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.

J. Pallet Dispenser

The functioning parts of the pallet dispenser include the lift cylinder, the pallet dispenser "fingers," and the pneumatic system. The pneumatic system operates the lift cylinder and the fingers. It consists of two valves and a two proximity switches. Through a system of hoses and air cylinders, it provides the power for the pallet dispenser.

⚠CAUTION

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

1. Pallet Dispenser Lift Cylinder

The lift cylinder on the pallet dispenser raises a platform which picks up the pallet being supported by the dispenser fingers. While raising, the lift activates the UP proximity switch (PX-26) which causes the lift to stop rising and signals the fingers to retract. As the lift descends, carrying all of the empty pallets, both proximity switches PX-13 and PX-26 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. The DOWN proximity switch (PX-13) is then actuated, and it sends a signal to the palletizer/unitizer controller that the dispenser cycle is complete.

To adjust the highest position of the pallet dispenser cylinder lift, the position of proximity switch (PX-26) must be adjusted so that pallets are lifted above the dispenser fingers by about 1". Use the following procedure:

a) Turn the palletizer/unitizer main power disconnect switch to OFF and lockout/tagout the palletizer/unitizer for safety. Turn off and lockout the main air supply, and bleed air pressure from the valve located in the pallet dispenser.

b) Loosen the screws on the bracket to which the proximity actuator is attached.

c) Move the proximity actuator as necessary. (This is a trial and error process.)

d) Re tighten the screws on the proximity switch bracket.

e) To adjust the cylinder lift speed for lowering or raising the pallet dispenser, adjust the flow control valve (located at the valve stack behind the opposite solenoid):

Out = Faster
In = Slower

2. Pallet Dispenser - Penumatic Side Fingers

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

To adjust the finger extension and retraction speed, adjust the flow control valve:

Out = Faster
In = Slower

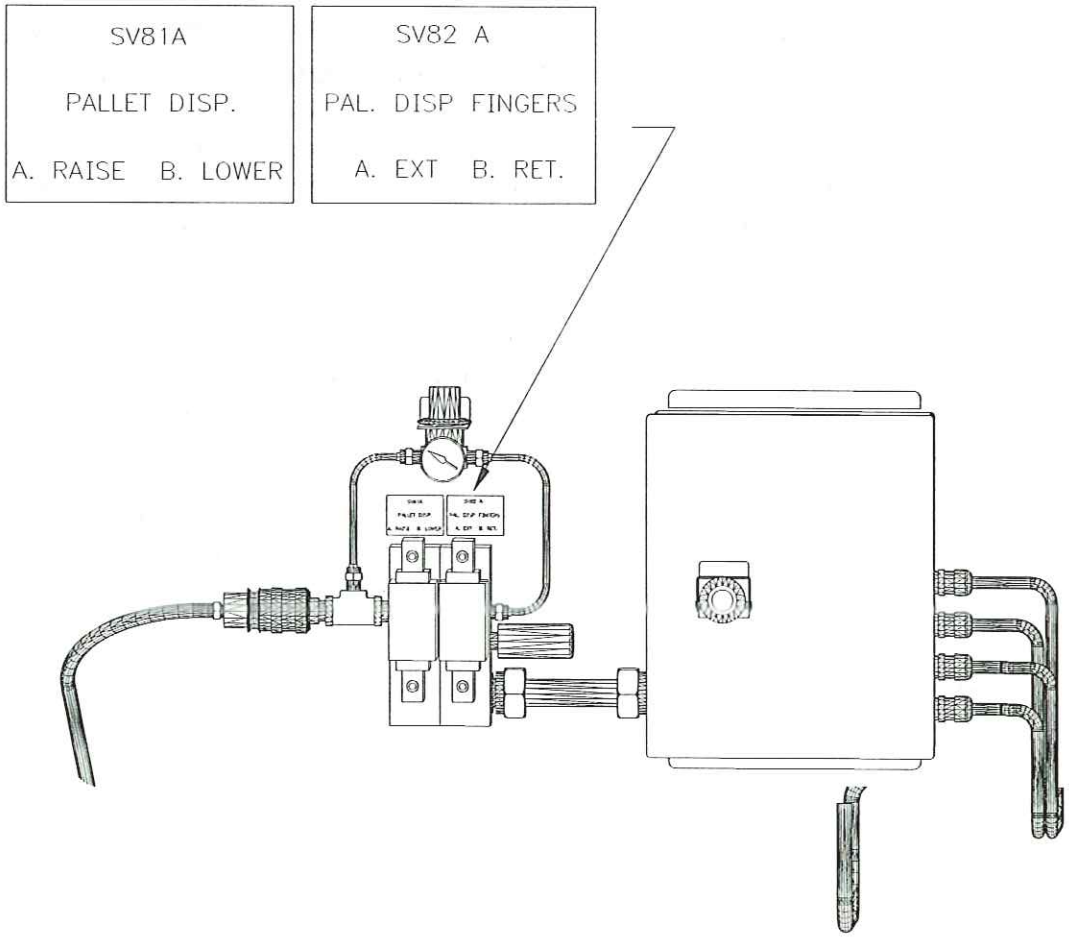

Figure 4-5 Pallet Dispenser Air Flow Controls

3. Pallet Dispenser Proximity Switches

Proximity switches (PX-13 and PX-26) are activated by the movement of the empty pallet cylinder lift. PX-26 controls the highest position of the lift. PX-13 controls the lowest position of the lift. These two switches also control the timing of the pallet dispenser finger extensions and retractions.

3. Maintenance Program

A. Daily 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 palletizer/unitizer is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

1. Cleaning

a) Clean dirt and debris from the palletizer/unitizer and discharge conveyors.

b) Remove carton dust from the live roller section with compressed air.

c) Clean the area around and under the palletizer/unitizer.

⚠CAUTION

Do not "hose down" the palletizer/unitizer. Direct water splashes can damage the electrical components.

2. Lubrication

Lubrication should not be needed on a daily basis unless extreme condition 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")

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 palletizer/unitizer is exposed to extreme conditions of dirt or moisture, the lubrication schedule should be modified accordingly.

1. Cleaning

Clean dirt and debris from the palletizer/unitizer 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 palletizer/unitizer specifications.

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 palletizer/unitizer 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.

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.

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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1. Case Turner/Live Roller

Symptom	Electrical	Mechanical
No drive in AUTO mode.	Check overloads, fuses, and circuit breakers.	N/A
	Check VAC output card.	V-belt broken
	Check input/output.	Snub rollers out of adjustment.
	PE-1 has been cleared for more than 30 seconds.	
Stops will not raise.	Check PE-2 function.	Check cylinder.
		Check air supply.
		Check mechanical operation.
Stops will not drop.	Check package stop disable timer preset valve.	Check cylinder for binding.
	Check for sticking solenoid.	Check mechanical for gravity drop.

2. Pusher Bar

Symptom	Electrical	Mechanical
Pusher bar will not push.	Check if PE-2 is clear.	Check adjustment of brake system.
	Check diagnostics for row pusher failure.	Check drive chain and sprocket.
	Check fuses, overloads and circuit breakers.	Check for binding within pusher bar tracks.
	Check VAC output.	Check solenoid valve for the brake.
	Check output to brake for proper operation.	N/A
	Check for full layer in layer table (optional).	
Pusher bar will not stop at home position.	Check PX-3 adjustment (within 1/8" away from target).	Check adjustment of brake system.
	Check for green light (on all the time) on PX-3 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.

3. Layer Pusher (Optional)

Symptom	Electrical	Mechanical
Layer pusher bar will not push.	Check alignment of PE-2L.	Check brake adjustment.
	Check PX-3A input.	Check drive chain and sprockets.
	Check diagnostics for layer pusher failure.	Check for binding within layer pusher bar tracks.
	Check VAC output.	
	Check VDC output to brake (only).	
Layer pusher bar will not stop at home position selected.	Check PX-3A adjustment (within 1/8" away from target).	Check brake adjustment.
	Check brake output.	Check adjustment of brake system.
	Check PX-3A input.	

4. Apron

Symptom	Electrical	Mechanical
Apron will not open.	Check PX-4 operation (PX-4 is apron open).	Check for binding within apron tracking.
	Check fuses, overloads, and circuit breakers.	
	Check VAC output.	
	Check VDC output.	
Apron will not close.	Check VDC output, PX-5 operation.	Check for binding within apron tracking.
	Check VAC output.	
	Check fuses, overloads, and circuit breakers.	
	Check output, brake operation.	

5. Hoist

Symptom	Electrical	Mechanical
Chain hoist will not raise with new pallet.	Check PE-10 operation.	Check hoist reducers.
	Check PE-8 is made when PE-10 is blocked with new pallet.	Check air brake operation (optional).
	Check if PE-12's have been cleared by load.	
	PE-14's must be cleared.	
	Apron not closed (check PX-5).	
	Check fuses, overloads, circuit breakers, and VAC output..	
Chain hoist will not lower.	Check PE-6 (must be blocked to lower) in AUTO.	Check hoist reducers.
	Check hoist down push-button input when in MANUAL.	
	PX-8 is made or faulty.	Check air brake operation (optional).
	PE-12's must be cleared.	
	PX-4 must be made in AUTO.	
	Check fuses, overloads, and circuit breakers.	

6. Pallet Dispenser Chain

Symptom	Electrical	Mechanical
Pallet dispenser chain will not advance pallet to pre-load position.	Check PX-13 input.	Check down switch on pallet dispenser (pneumatic) for proper operation.
	PE-14A must be cleared.	Check air supply to pallet dispenser.
	Reset diagnostics push-button. Check fuses, overloads, and circuit breakers.	Check drive sprocket and chain.
Pallet will not advance to PE-10.	PE-10 must be cleared.	Check drive chain and sprockets.
	Check fuses, overloads, and circuit breakers	
	Check output card.	
Pallet dispenser chain pops off of track or sprocket.	N/A	Take the chain off and check for bent chain. (Lay chain out in straight line or hang.)

7. Pallet Dispenser Pneumatic

Symptom	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). Switch should be set so pallet fingers extend in center of second to bottom pallet with full satck.
		Pallet fingers Reg. 30 psi.
Pallet not dispensing.	Check pallet dispense solenoid output.	Check down pneumatic switch on pallet dispenser for air flow.
	Check output card.	Check for main air pressure at solenoid and pallet dispenser.
	Check PX-13 input for PX-13.	
	PE-14's must be cleared.	

8. Sheet Dispenser (Optional)

Symptom	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 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 to air jet to blow across edge of sheets as crosshead lifts the sheet.
		Decrease air pressure to vacuum valve to decrease vacuum pressure and vacuum flow.

Sheet Dispenser (continued)

Symptom	Electrical	Mechanical
Crosshead will not lower or raise.	Check for signal to crosshead up/down air valve.	Check for binding on the vertical guide tubes.
	Verify that the sheet check photo cell alignment is correct.	Check for obstruction on the crosshead.
Crosshead will not extend or retract.	Check for signal to crosshead extend/retract air valve.	Check for binding on the horizontal guide tubes.
Crosshead will not extend far enough to place sheet properly.	N/A	Check to see if the adjustable guide tubes are out of position.

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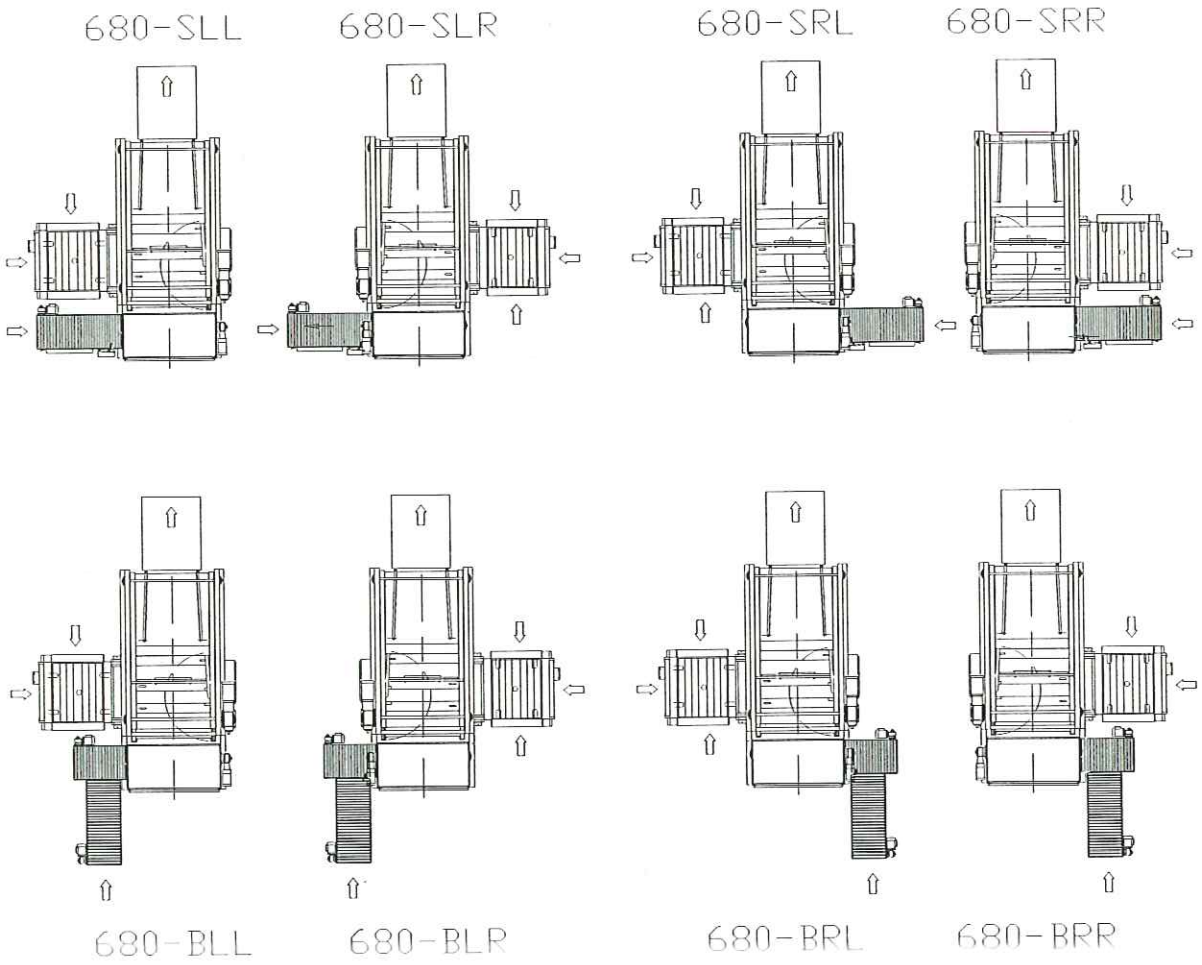


Figure 6-1: Plan View of Various Machine Configurations

1. Pre-Installation

Inspect the machine installation site. The site work should be completed in advance of the arrival of the palletizer/unitizer. It is recommended that the installation be supervised by an Alvey representative.

A. Site Preparation

1. Clear out 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 palletizer/unitizer plan and elevation drawings for dimensions.)
2. Make sure there are adequate electrical services available to support the machine. The main power supply must be routed to the palletizer/unitizer 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. Make sure there are adequate pneumatic services available to support the machine. Install the equipment and plumbing needed to supply air pressure to the palletizer/unitizer (80 psi required). The air supply line must be no less than 3/4" pipe.
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 to maneuver turns.
5. Provide the necessary equipment and personnel required to unload and assemble the machine. We recommend professional industrial machine movers and handlers to unload and move the palletizer/unitizer. Heavy duty rollers and a tow motor will facilitate moving the machine.

B. Documentation

The following documentation is needed when installing the palletizer/unitizer, infeed conveyors, and discharge conveyors:

1. Machine Plan and Elevation Drawing
2. Infeed and Discharge Plan and Elevation Drawing
3. Machine and Conveyor Shipping Bill of Materials.

2. Installation & Assembly

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 One Protection (COP) toll-free "Hot Line" at **1-800-535-2555**. This number lets you discuss issues directly with a qualified Alvey customer service engineer. You can contact Alvey headquarters at:

- **Alvey Systems, Inc.**
  9301 Olive Blvd.
  St. Louis MO. 63132-3299
- **Telephone: (314) 993-4700**
- **Fax: (314) 995-2400**
- **Web site: http://www.alvey.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. Ground Plan

Mark the center line 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 palletizer/unitizer plan and elevation drawings for dimensions.

NOTE: By design, the center line of the infeed conveyor system may not match the center line of the palletizer/unitizer case turner section. Usually, the center lines are offset.

B. Damage Inspection

Upon receipt of the palletizer/unitizer, remove the tarpaulins, plastic cover, all chains and cleats which hold the palletizer/unitizer 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 palletizer/unitizer 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 ALVEY INC., to determine who will file the claim with the carrier.

C. Shipment Shortages

Upon receipt of the palletizer/unitizer, remove the boxes and miscellaneous parts shipped inside the palletizer/unitizer and check the shipment against the shipping list. Report any discrepancies to Alvey within 48 hours. Additional information regarding the palletizer/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.

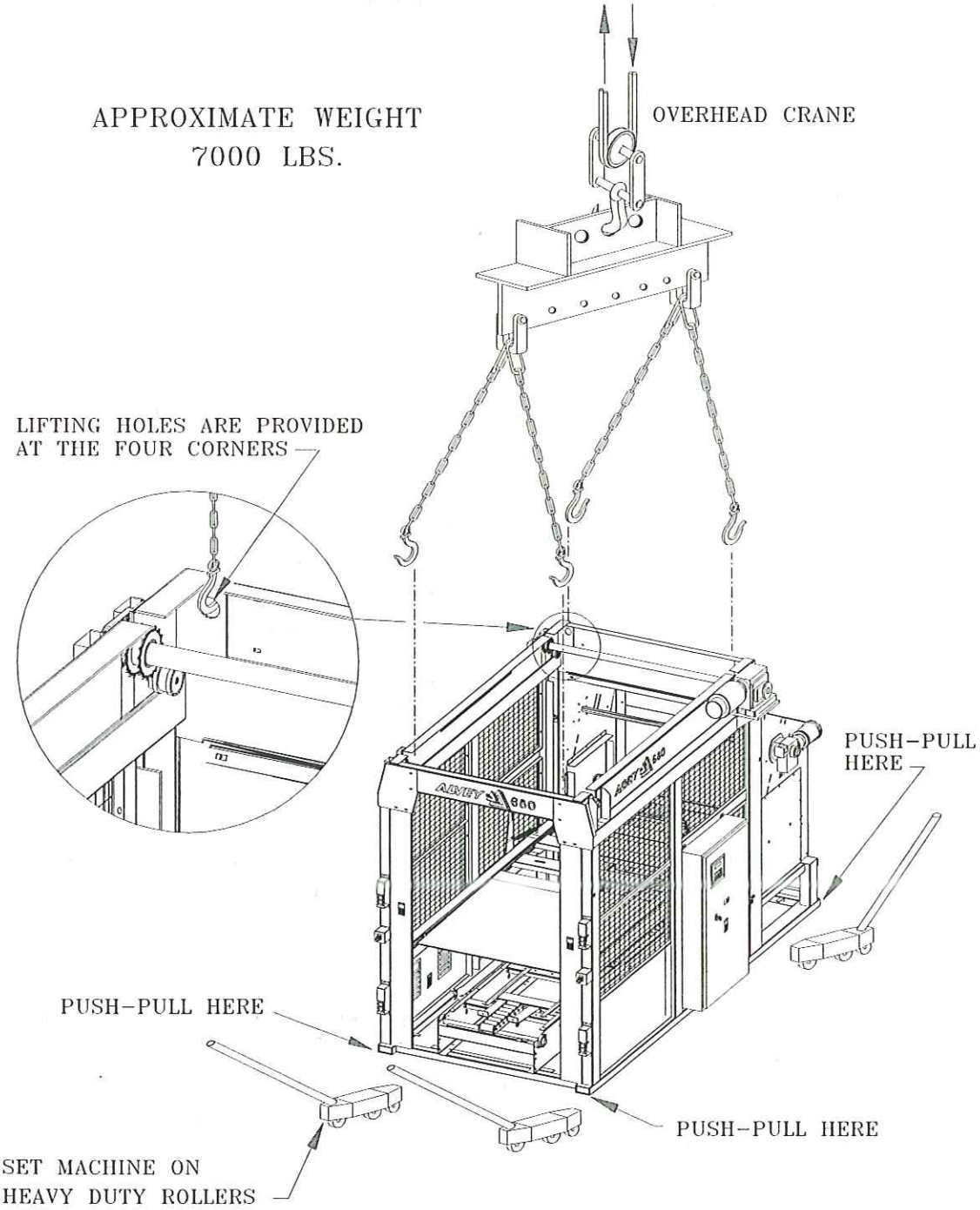


Figure 6-2: Lifting the Palletizer or Unitizer

D. Unloading & Moving the Machine Into Position

Set the palletizer/unitizer on heavy-duty swivel style rollers and move the palletizer/unitizer to the installation site.

⚠WARNING

The palletizer/unitizer weighs approximately 7,000 pounds. Lifting the palletizer/unitizer with a device that is not configured or rated for the palletizer/unitizer's load capacity is dangerous to both the equipment and to personnel, and could damage the palletizer/unitizer's structure. Make sure that the crane, fork-lift, and tow trucks being used can lift the full weight of the palletizer/unitizer.

⚠CAUTION

Due to the length and weight distribution within the palletizer/unitizer's frame, two fork-lifts or tow trucks are suggested for lifting the palletizer/unitizer. Always lift the palletizer/unitizer using the structural steel frame supports at the base or top of the palletizer/unitizer. Any other lifting method could result in distortion of the frame, and/or mechanical damage. When removing the palletizer/unitizer from the trailer we suggest that the palletizer/unitizer be raised from above and that the trailer be pulled out from under it.

When moving the palletizer/unitizer, DO NOT push directly against the palletizer/unitizer's steel frame. Use timber to protect the frame while pushing against the 5" x 3" steel base tube. (Push against the timber.)

E. Machine Alignment & Leveling

1. Move the palletizer/unitizer as close as possible to its final installation location. Use the ground plan center lines and chalk marks laid down on the floor for precise placement of the machine. The main machine frame may be pushed or pulled by using the base frame steel tube members as the contact areas.

2. Make sure that the palletizer/unitizer's base frame is level. Starting under the highest point, level the base frame using the metal shims (provided) or grout under the base frame.

   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 palletizer/unitizer, but leveling the base frame is sufficient.

3. If optional elevating piers are not required, weld metal angle irons (not provided) to the base frame of the machine for anchoring the machine to the floor.

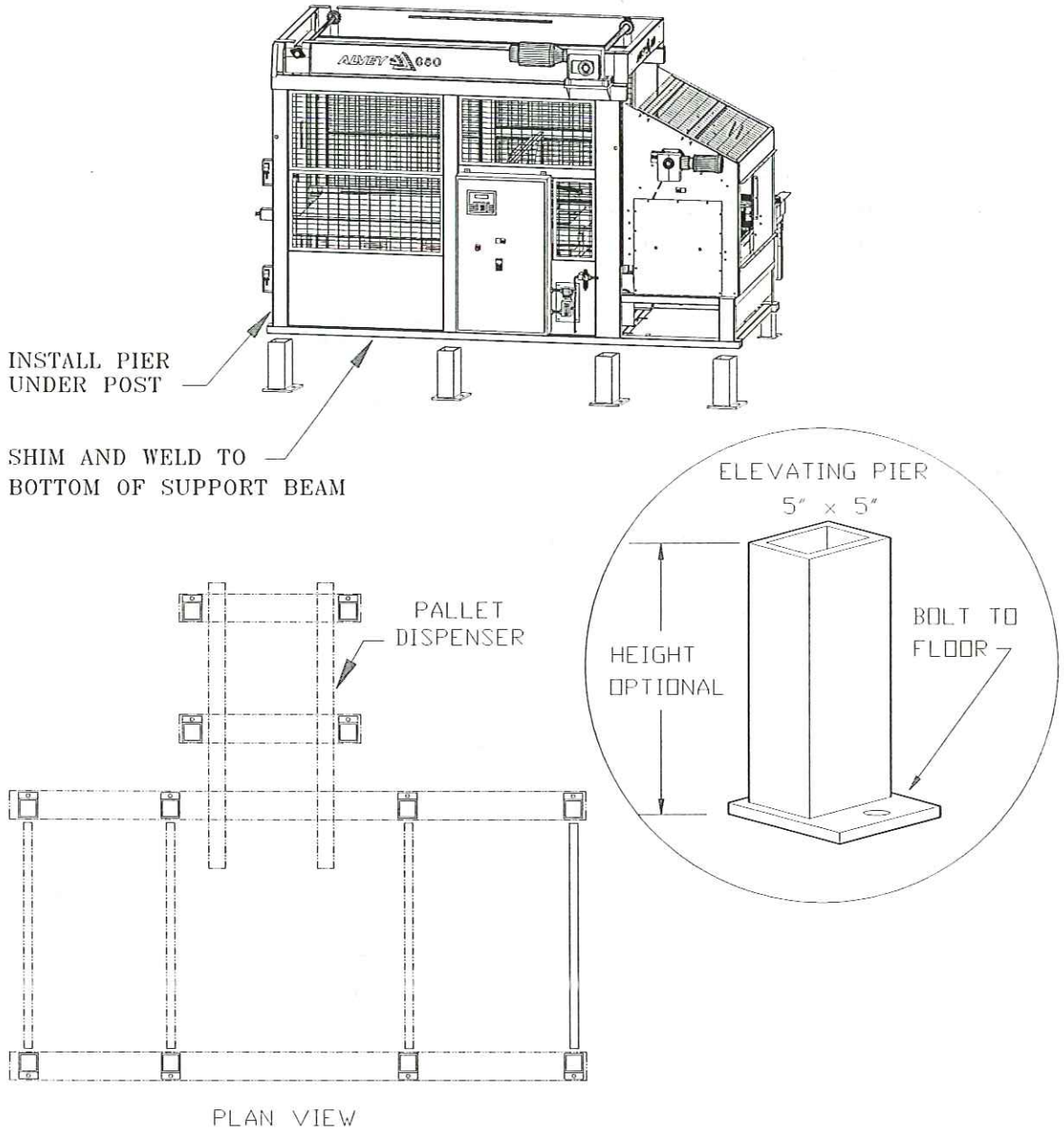


Figure 6-3: Elevating Piers (Optional)

F. Elevating Piers (Optional)

1. Install the elevating piers under the machine. Lift the palletizer/unitizer to locate the elevating piers under the base frame at each vertical post location. (See Figure 6-3.)

   NOTE: Use the metal shims (provided) to close any gap between the floor and the piers so that the hoist load is carried directly to the floor.

2. After leveling, weld the elevating piers to the bottom of the palletizer/unitizer's base frame.

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

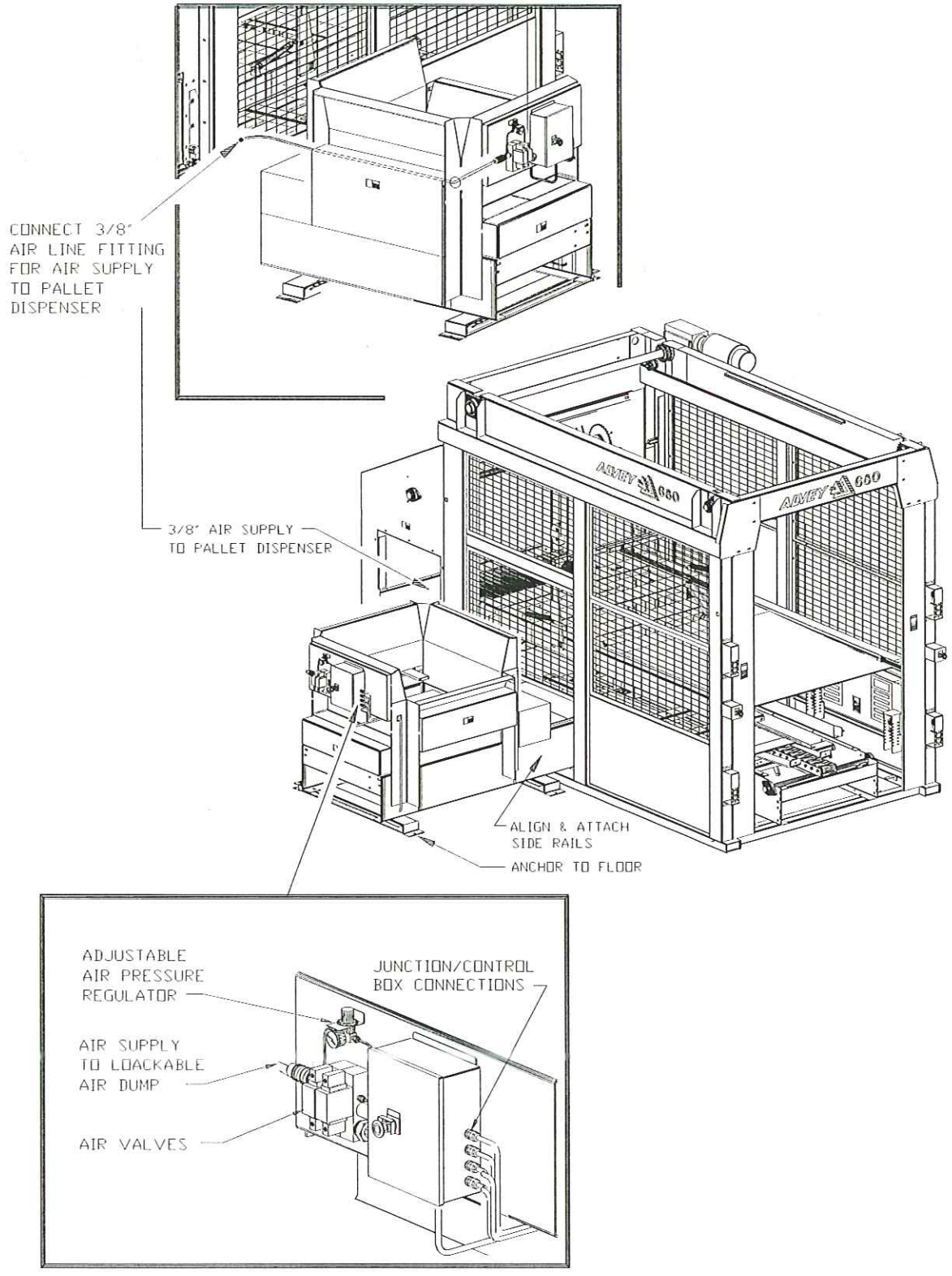
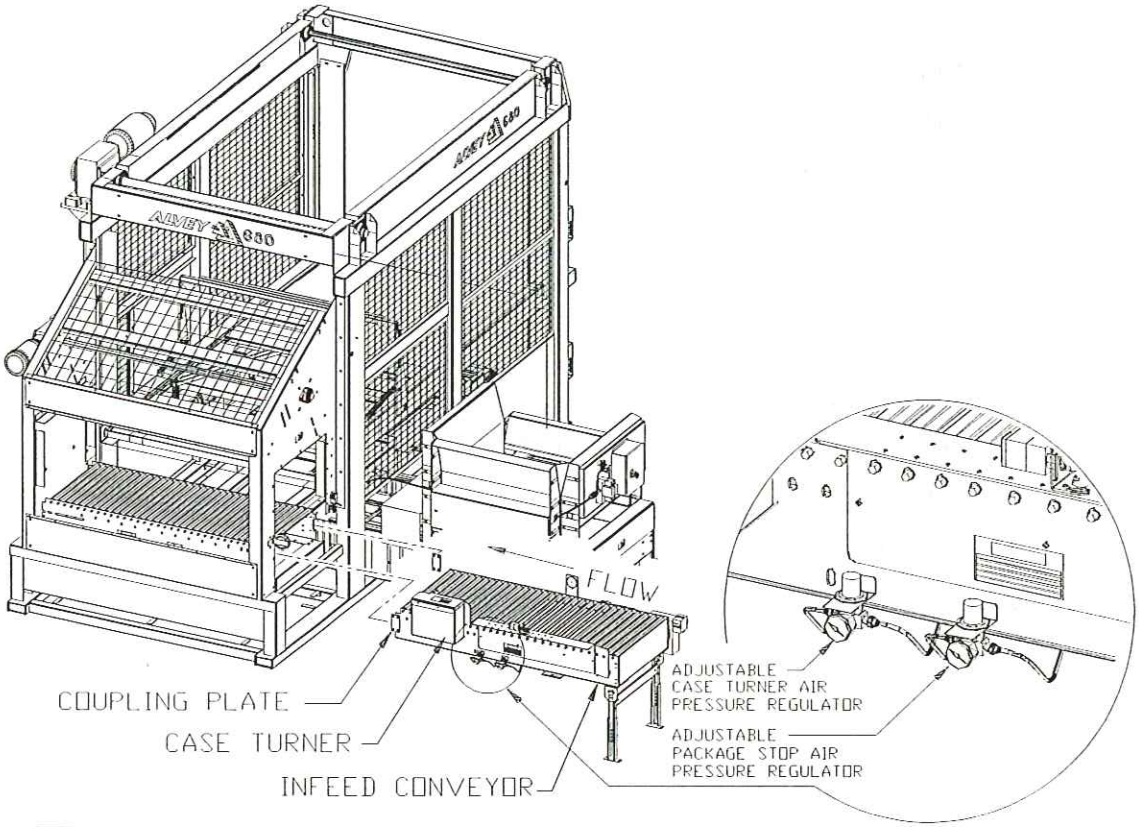


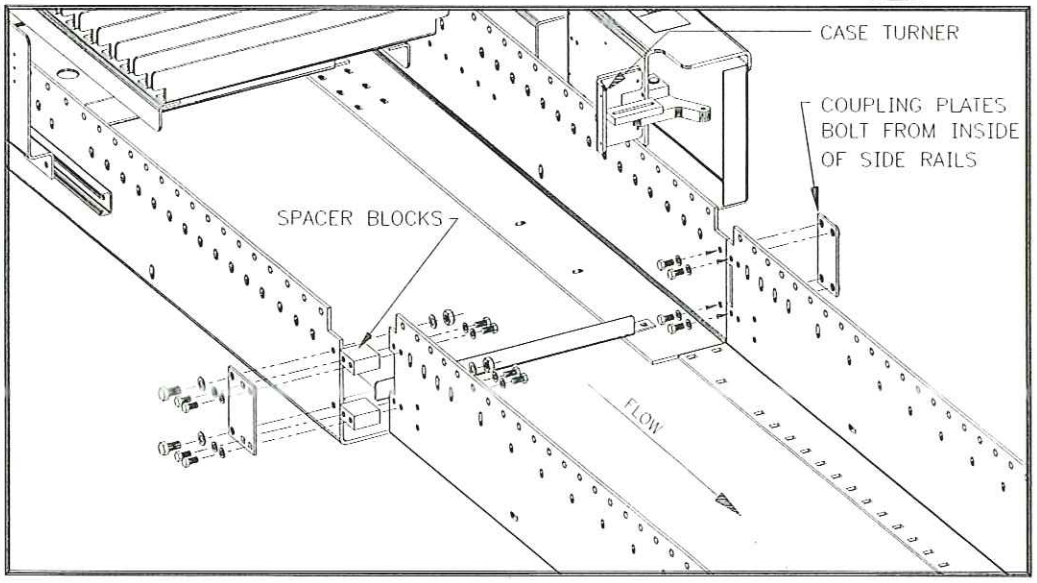
Figure 6-4: Pallet Dispenser Alignment & Leveling

G. Pallet Dispenser Alignment & Leveling

The Pallet Dispenser will be shipped with a section of multiple strand chain conveyor extending out of one end. Remove all banding, shipping blocks, etc.

1. Locate the Pallet Dispenser next to the machine and align the pallet conveyor side frames in the dispenser inside the machine frame.
2. Level the pallet dispenser. If required, install optional elevating piers under the pallet dispenser frame. (Refer to Figure 6-3.)
3. Anchor the pallet dispenser to the floor with the floor anchor bolts provided.
4. Connect the air supply line from the machine to the 3/8" O.D. tube that runs from a tee near the main regulator to the manual shut off valve at the pallet dispenser. (Refer to Figure 6-4.)
5. Attach the pallet conveyor side guides between the pallet dispenser and the machine frame.
6. Reconnect electrical wiring to the terminals in the junction/control box.





REAR VIEW OF INFEED CONVEYOR INSTALLATION

Figure 6-5: Infeed Conveyor

H. Infeed Conveyor

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. (All pulleys and rollers should turn freely.)

1. If not already installed, attach the Case Turner Assembly to the row former side frame.
2. Connect the case turning section of the infeed conveyor to the machine infeed conveyor frame with the two coupling plates and bolts provided. Also, bolt through the bottom flanges into the machine frame members.
3. Install the drive belt for the Live Rollers. Tension the belt with the take-up pulley on the side frame. (See Figure 6-6.) Refer to Section 4, "Service & Maintenance" for drive belt adjustment information.
4. Connect the air lines to the case turning device. All air lines and connection points should be marked or tagged with a number or letter to match all the lines to their proper locations.
5. Assemble the infeed conveyor support member legs with the attaching parts provided and install the conveyor system in place.

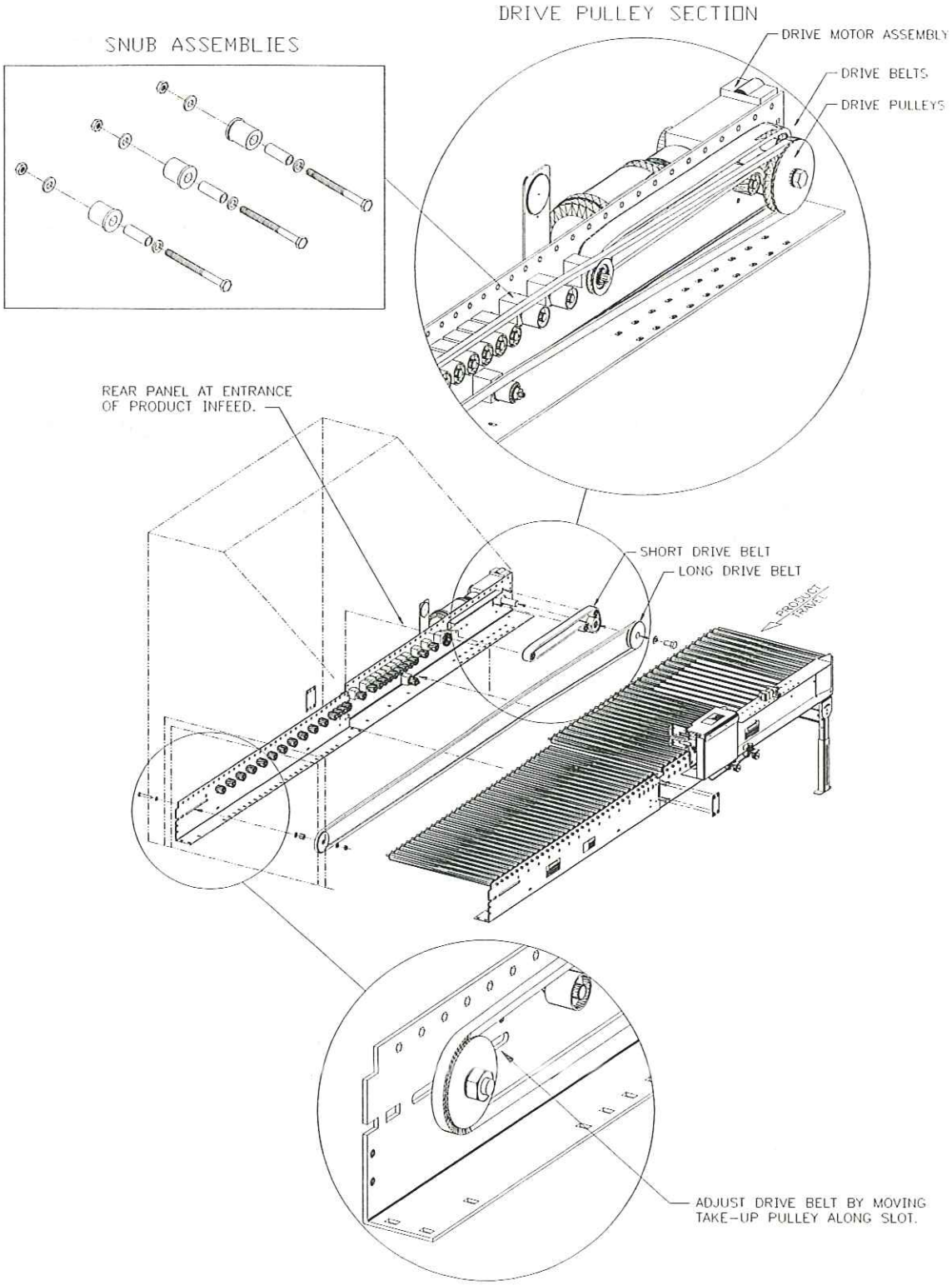


Figure 6-6: Infeed Conveyor Belts

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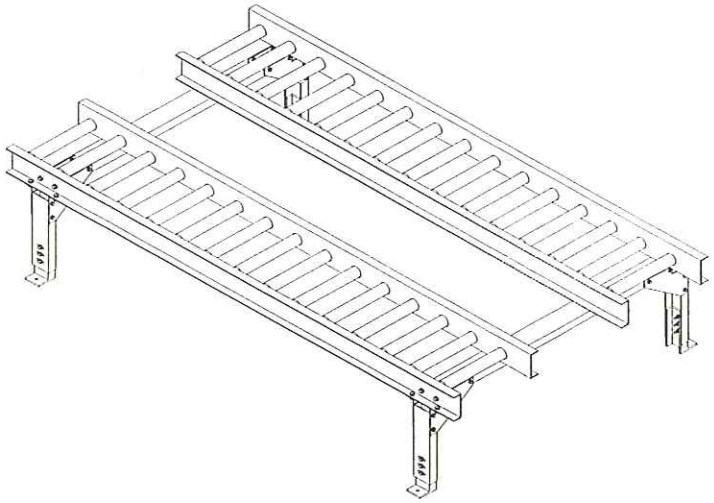

Figure 6-7: Gravity Discharge Conveyor (Optional)

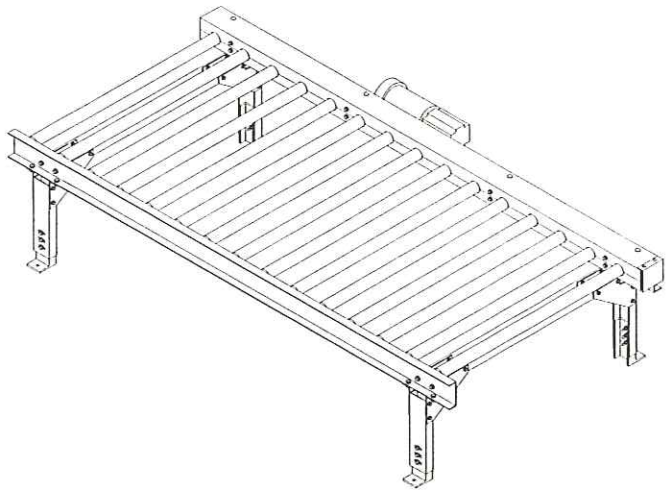

Figure 6-8: CDLR Discharge Conveyor (Optional)

I. Discharge Conveyor (Optional)

The number and arrangement of the discharge conveyor sections may vary from machine to machine. Therefore, refer to the Plan and Elevation Drawings, and the Bills of Materials (provided) 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 center line of the Discharge Conveyor will normally match the center line of the palletizer/unitizer internal pallet conveyor, but this may not always be true.

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 center line.

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

4. Tack weld the adjustable support feet to the conveyor legs so they will not slip after leveling.

   NOTE: Before the conveyor feet are welded solidly to the legs, fully loaded pallets should be run over the conveyor. Then, if necessary, re-level the discharge conveyors before welding the feet.

5. Fit the discharge conveyor sections together in accordance with the layout drawings and secure them with the attaching parts that are provided.

6. Use the 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: Make sure 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 conveyor feet.

7. Install Fork Lift Truck Bumpers and Chain Guards on the drive units if required. Fork Lift Bumpers are optional and not supplied with the palletizer/unitizer.

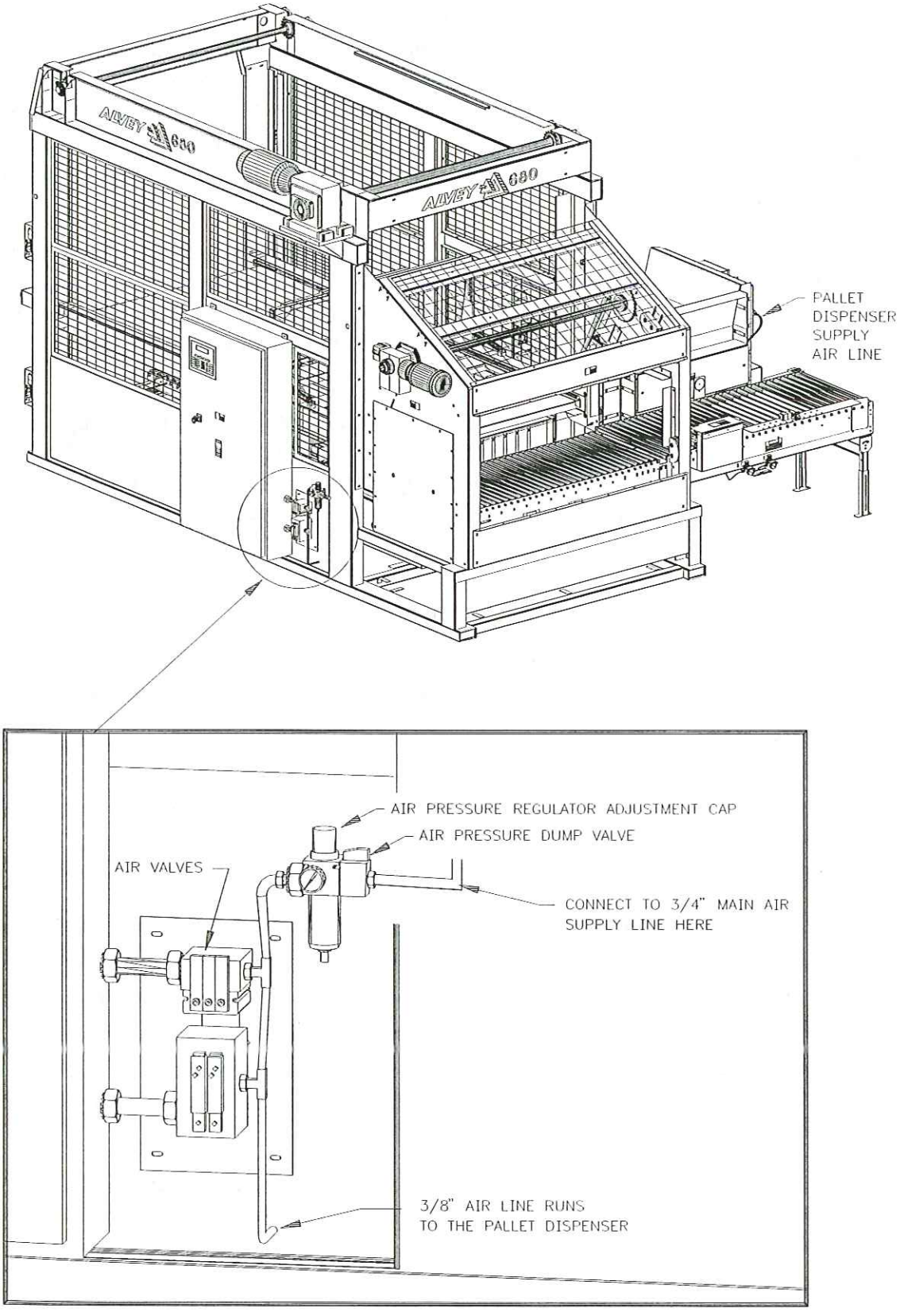

Figure 6-9: Main Air Supply

J. Pneumatic - Field Connections

1. Main Air Supply

a) Connect the main air supply line to the system Air Filter-Regulator-Lubricator. The main air supply line should be at least 3/4" O.D. pipe, and have a main shut-off valve. Route the pipe so that it does not prevent access to the top of the machine.

NOTE: Installing a drip leg will help remove moisture before it connects to the machine. (See Figures 6-10. & 6-11. for typical drip-leg information.)

b) Check the system Air Filter-Regulator-Lubricator, for 80-lbs. psi. factory setting.

2. Pallet Dispenser Air Supply

Connect the pallet dispenser air supply line brass fitting to the palletizer fitting located at the rear corner of the pallet dispenser as shown in Figure 6-4.

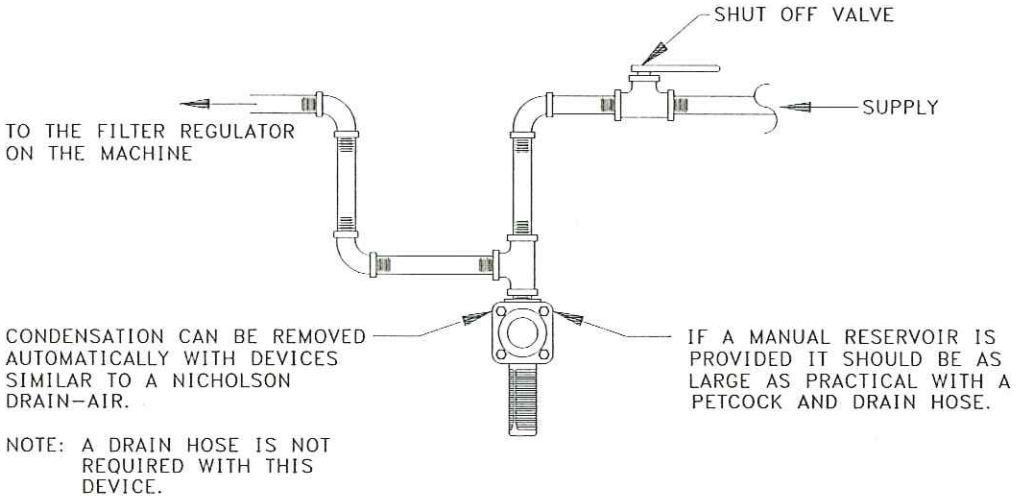

Figure 6-10: Typical Air Line Moisture Drip-Leg with Automatic Drain

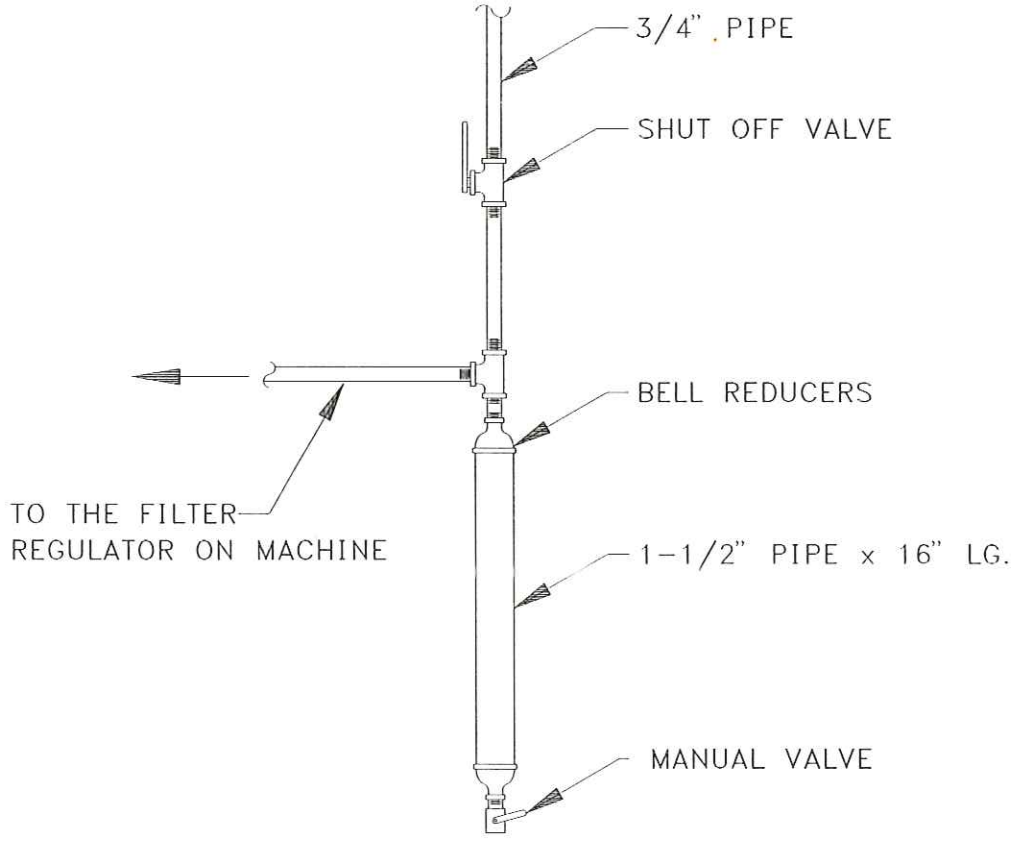

Figure 6-11: Typical Air Line Moisture Drip-Leg with Manual Drain

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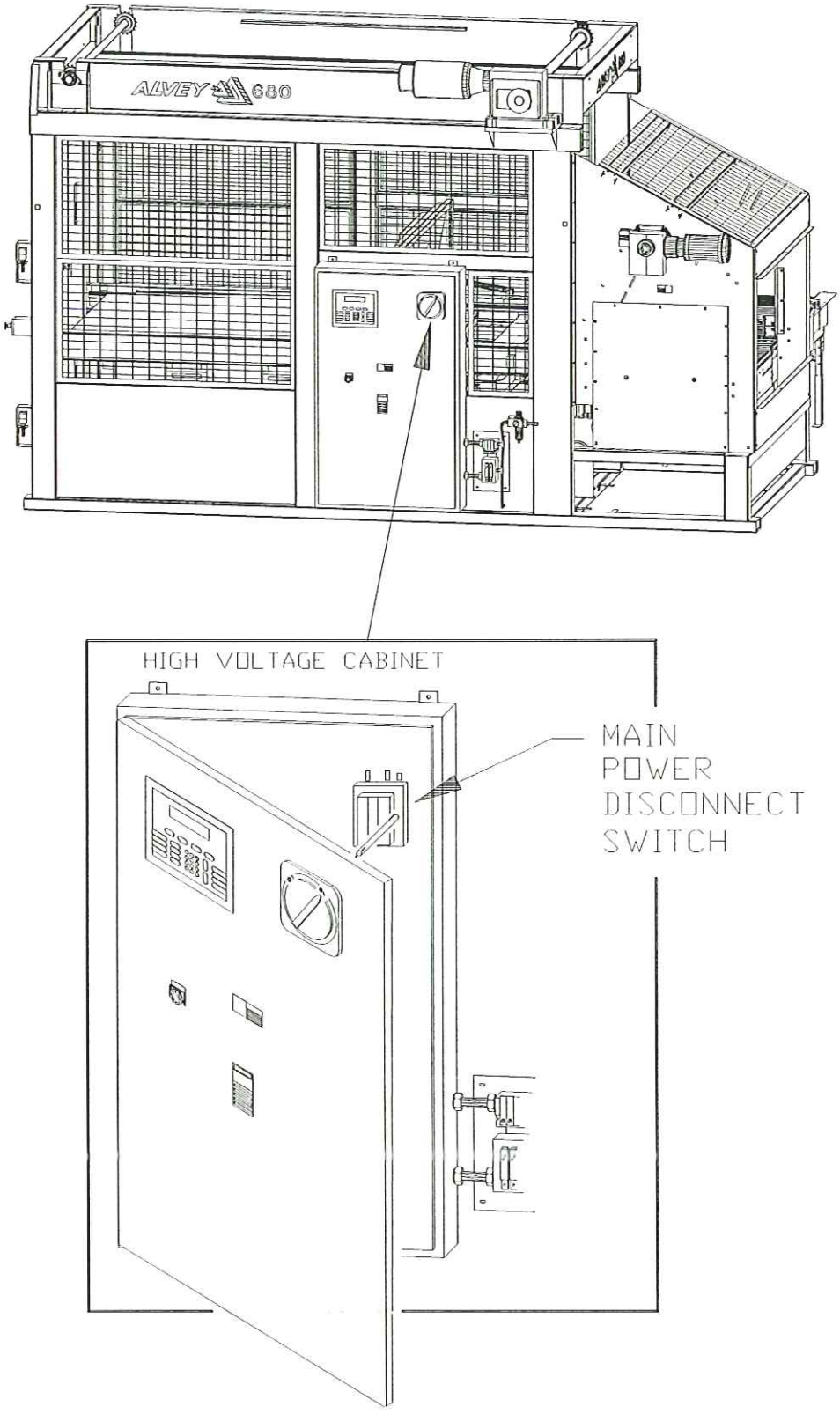

Figure 6-12: Electrical Main Power Supply Connection

K. Electrical - Field Connections

⚠WARNING

Always use extreme caution when working on or around electrical components.

1. Turn the main power disconnect switch (located on the outside surface of the machine high voltage electrical cabinet) to the OFF position and Lockout/Tagout the palletizer/unitizer for safety. (Refer to Section 1, of this manual for safety precautions.)
2. Make interconnections with other systems (if required). Refer to the electrical plans for proper wiring.
3. Route conduit runs and wires for the infeed conveyor motor, case counting photo eye PE1, pallet Infeed, and discharge conveyors. (All conduit and wire must be supplied by the installer unless otherwise stipulated.)
4. Mount and align all photo eyes and reflectors.
5. Connect the high voltage main electrical power supply to the palletizer/unitizer main power disconnect. The main power disconnect switch is located inside the high voltage electrical cabinet near the upper right corner. (See Figure 6-12.)

   NOTE: 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 specifications.

3. 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 row forming section rollers and the apron.
3. Inspect all moving parts to ensure that no foreign matter will interfere with their motion.
4. 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.
5. Check the alignment and tightness of all sprockets and sheaves.
6. Check all chain connections at the hoist for tightness.
7. Check all other nuts and bolts for tightness.
8. Check all threaded rods that connect air cylinders to mechanical devices for tightness.
9. Check the oil level of the hoist reducer, and fill if necessary.

   NOTE: RELIANCE® & WINSMITH® reducers are permanently lubricated and sealed at the factory and do not require additional lubrication.
10. Brush a light coating of S.A.E. #20 type oil onto all chains.
11. Replace all screens, covers, and/or safety guards that may have been removed before shipping.

B. Pneumatic System Check-Out

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

1. Turn the adjustment cap for the air filter/regulator to 80 psi; the adjustment cap is located on the top of the air pressure regulator next to the electrical cabinet.
2. Turn the adjustment cap on the case turner pressure gauge to 20 psi.
3. Turn the adjustment cap on the air pressure regulator for the pallet dispenser fingers to 20 psi. This adjustment cap is located at the front of the pallet dispenser, on the framework, next to the various air valves.
4. Check the package stops. Press the "manual operator button" on the air valve controlling each package stop. When the manual operator button is pressed, the corresponding package stop should extend upward. Stops remain extended until the operator button is released.

C. Pre-Operational Electrical Check-Out

Exercise extreme caution when working on or around electrical components.

1. Locate the main power disconnect switch located on the high voltage electrical cabinet, and switch it to the OFF position. Then lockout/tagout the palletizer/unitizer for safety before beginning. (Refer to Section 1, of this manual for safety information.)
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 photo eye beam with its respective reflector, and then flag each photo eye to see if the input module is receiving a signal.
   c) Check all proximity switches; make sure they are secure. Actuate each switch to see if the input module is receiving a signal. Check the positioning of each proximity switch to see that it is actuated by its proper actuating device. The distance between the top of a proximity switch and the bottom of its actuating device should be 1/8".
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 palletizer/unitizer.)

D. Palletizer/Unitizer Operation Check-Out

Make sure that no person is in a position to be injured when the palletizer/unitizer starts-up. Read Section 1, of this manual for safety information before proceeding.

1. Turn the main power disconnect switch (located on the outside panel of the high voltage electrical cabinet) to the ON position.
2. Pull-out on all EMERGENCY STOP buttons at all palletizer/unitizer control stations.

   NOTE: All EMERGENCY STOP buttons must be pulled out before the palletizer/unitizer will operate. Operation can be stopped at any time by pressing the Emergency Stop button.
3. Turn the MACHINE MODE switch on the Main Control Station (located at the top of the palletizer/unitizer) to the MANUAL MODE position.
4. Press and hold-in the START button for approximately 5 seconds, until the Main Control Relay (MCR) engages. The warning horn will sound during this 5 second time period (before the palletizer/unitizer starts). When the palletizer/unitizer is on, the control panel display will read MANUAL MODE, indicating that the palletizer/unitizer is on and ready for operation.
5. Turn the INFEED CONVEYOR switch to ON. The case infeed conveyor should run forward, if it runs backward, turn off power, lockout/tagout the palletizer/unitizer for safety, and reverse the power leads at the motor starter.
6. Press and hold the JOG ROW PUSHER FORWARD push-button long enough to observe the 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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