MACH 2
CASEPACKAGING
SYSTEM MANUAL

BEC Machine #3540
Revision Date - 10 April 2012
Prepared Especially For
Diageo

Brenton™
a division of Pro Mach
4750 County Road 13 NE
Alexandria, MN 56308
Phone: 800-535-2730

Liability Waiver

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Introduction and Safety Contents

1. Introduction and Safety

Introduction

Thank You for Purchasing this Brenton Engineering Mach 2 Case Packaging System! If you have questions, or need assistance, feel free to contact our Service Department at:

Brenton Engineering Company
4750 CO. RD. 13 NE
Alexandria, MN 56308
320-852-7705

Warranty Information

Outside Manufacturer's Components:

Items are considered outside manufacturer's components if they are not built at Brenton Engineering; for example, Allen Bradley PLC's.

Your Brenton Engineering packaging system contains outside manufacturer's components. In general, most companies offer a 90 day warranty. For specific information on outside manufacturer's warranties, reference the VENDOR DATA MANUALS.

Brenton Engineering will repair or replace defective components covered by outside manufacturers' warranties according to the provisions of each respective manufacturer's warranty. Freight, labor, expenses, and service rates related to replacement parts under warranty are invoiced at applicable standard rates.

Brenton Engineering Components:

The document titled "Terms and Conditions of Sale" contains comprehensive Brenton Engineering warranty information. A copy of this document is located on the following page. In summary it includes a 1 year, or 7500 operating hours, guarantee on material and workmanship. This warranty excludes expendable components, such as plastic wear guides, vacuum cups, etc.

Note: Changes to the electrical programs, or mechanical modifications without written approval of Brenton Engineering Company, may result in undesirable machine operations and will void the warranty.

About this Manual

Brenton Engineering is committed to helping you maximize the productivity of your system. This manual is specifically designed for your packaging system, to assist you in the operation and maintenance of your new equipment. Please take the time to familiarize yourself with the contents of this manual.

- Section 1 is the Introduction and Safety section. This section discusses safety, terms and conditions of the sale, hazard messages, and installation information. An Emergency Stop Location chart is provided at the end of this section.
- Section 2 is the System Description section. This section will discuss machine specifications including pack patterns, product dimensions and run speeds for each product. Section 2 also includes a machine overview with a brief description of each section of the machine. A Machine Layout Drawing is found at the end of this section.
- Section 3 is the System Operation section. This section describes the operator control panels, the Human Machine Interface, and operational procedures.
- Section 4 is the Troubleshooting section. This section discusses the sequence of operation. In the sequence of operation, each part of the machine, including the various sensor functions, is described as the product flows through the machine. Sensors are described, including a chart of sensors found on the machine. A troubleshooting chart is also found in the back of this section.
- Section 5 is the Changeover and Maintenance section. This section describes the lockout and tagout recommendations. This section's main focus is the changeover steps including pictures, charts, and a Changeover Location Drawing to aid the operator during changeover adjustments. In this section you will also find a suggested maintenance schedule including a maintenance log. A spare parts list and bill of material concludes this section.
- Section 6 is the Electrical Programs section. This section is where the customer should store copies of the system software. Electrical prints are folded and placed in this section for your convenience.
- Section 7 is the Miscellaneous section. This section includes the shipping diagram and a glossary of common terms.

Copyright Notice

General Terms and Conditions of Sale

1. FORMATION OF CONTRACT: The terms and conditions set forth in this document constitute the offer of Brenton Engineering Company ("Seller") to sell the item(s) of sale (IOS) specified herein.

   NO ACCEPTANCE SHALL BE EFFECTIVE WHICH VARIES THE TERMS AND CONDITIONS STATED IN THIS OFFER OR PROPOSES ADDITIONAL TERMS. ANY NON-CONFORMING ACCEPTANCE SHALL BE DEEMED TO BE REJECTED UNLESS EXPRESSLY APPROVED BY SELLER IN WRITING.

2. ACCEPTANCE: No order, sale, agreement to sell, accepted proposal, or contract of sale shall be binding unless accepted on Seller's Order Acknowledgment form and signed by Seller's authorized representative.

3. WRITTEN TERMS EXCLUSIVE: This agreement, when accepted by Purchaser, constitutes a final written expression of all the terms of this agreement and is a complete and exclusive statement of those terms. Any and all representations, promises, warranties or statements by Seller's agent(s) that differ in any way from the terms of this written agreement shall be given no force or effect. Any subsequent changes to this agreement must be in writing and signed by both Seller and Purchaser to be effective.

4. PRICE: All prices are exclusive of federal, state, or local taxes, duties or fees. All such taxes, duties or fees shall be borne by Purchaser. Where Seller has the legal obligation to collect the same, they will be added to the price or billed separately to Purchaser. A monthly service charge of 1.5% per month (18% per year) or the highest rate allowed by law, whichever is lower, will accrue on accounts outstanding more than 30 days.

5. SELLER RETAINS SECURITY INTEREST: Purchaser grants to Seller a security interest in the IOS and the proceeds thereof to secure payment of the purchase price of the IOS Seller is authorized to file financing statements under the Uniform Commercial Code or other statutes naming Purchaser as debtor and Seller as secured party and indicating that the IOS and the proceeds thereof are items of collateral. Purchaser further agrees to execute within five (5) days following any request by Seller such financing statements as Seller shall require for filing or recording of this agreement.

6. DELIVERY: Completion dates submitted are approximate. Furthermore, Seller shall not be liable for any delays in the delivery of orders due in whole or in part, directly or indirectly, to fire, act of God, acts of war, strike, lack of raw materials, supplies or components, retooling, upgrading of technology, delays of carriers, embargo, government order or directive, or any circumstance beyond Seller's control. Purchaser agrees that Seller shall not be liable for any damages, including direct, indirect, consequential, or special damages, which may result from any such delays.

7. INSPECTION AND ACCEPTANCE OF GOODS: Purchaser shall inspect the IOS at the factory of the Seller before shipment end shall be deemed to have accepted the IOS upon Purchaser's signed approval for shipment.

8. SHIPPING AND COSTS: The IOS shall be delivered F.O.B. Seller's factory Carlos, MN (or as otherwise stated in the offer) and shipped and installed by and at Purchaser's risk and expense, including shipping, insurance, handling and Installation costs.

9. WARRANTY: Seller warrants, to the original Purchaser only, that the equipment manufactured by Seller shall be free from defects In material and workmanship for a period of twelve (12) months from the date of delivery or until the equipment has been operated for a total of seven-thousand five-hundred (7,500) hours, whichever occurs earlier. Excluded from warranty are:

   A. Failure due to misapplication or operation beyond rated capacity; b. Damage or failure due to lack of proper maintenance and care, abuse, or operation contrary to the operating instructions of Seller; c. Item(s) altered by anyone other than Seller's authorized Representative.

   B. Any equipment found defective will be repaired or, at Seller's option, replaced. Defective equipment or parts, after factory authorization, shall be returned to seller's designated receiving point, freight prepaid by the Purchaser. Seller will repair or replace the defective part and return it to the Purchaser freight prepaid. Installation of the repaired or replaced parts is the Purchaser's responsibility.

   C. Items not manufactured by Seller but used in the manufacture of the IOS, and the IOS if not manufactured by Seller, are/is specifically excluded from the Warranty, and are covered by the warranty, if any, of the item's manufacturer(s) and, Seller's obligation shall be limited to the extent of the warranties so received by Seller from the item's manufacturer(s).

   SELLER MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. ANY OTHER WARRANTY, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITH OUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE, OR AGAINST INFRINGEMENT, IS HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM ANY AGREEMENT MADE BY ACCEPTANCE OF THIS OFFER.

10. EXCLUSION OF CONSEQUENTIAL DAMAGES: UNDER NO CIRCUMSTANCES WHATSOEVER, INCLUDING IN THE EVENT SELLER'S WARRANTY IS DEEMED TO HAVE FAILED OF ITS ESSENTIAL PURPOSE, SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, LOSS OR EXPENSE (INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR GOOD WILL) ARISING FROM THIS AGREEMENT, OR FROM THE USE OF OR INABILITY TO USE THE IOS FURNISHED HEREUNDER WHETHER SUCH CLAIM IS BASED ON CONTRACT, NEGLIGENCE, STRICT TORT OR WARRANTY.

11. NOTICE OF DEFECTS: Purchaser must inform Seller in writing of any detect in the IOS within ten (10) days after the IOS is put into service, but not more than thirty (30) days after delivery to the Purchaser. Notice of any latent defects in material and workmanship, in all instances, must be given within ten (10) days after discovery.

12. THIRD PARTY LIABILITY, AND REMEDIES: Seller also shall not be liable for loss, damage, or injury to persons or property of Purchaser or third parties arising out of use, mis-use, or possession of any IOS sold under this agreement. Purchaser shall hold Seller harmless for all claims or actions brought by third parties with respect to any such claims or actions.

    Full compliance with OSHA involves the installation and use of the equipment in the hands of the purchaser-owner. Seller cannot, therefore, represent or certify that its equipment conforms in all respects with OSHA regulations. In view of this, if revisions are required, Seller is prepared to quote extra charges for specific modifications at the request of the Purchaser, insofar as technically practical. This policy also applies to any other Federal, state, or local standards which might exist.

13. GOVERNING LAW/DISPUTES: This contract shall be governed by and interpreted in accordance with the internal laws (and not the laws of conflicts) of the State of Minnesota. NO ACTION ARISING OUT OF THIS SALE MAY BE BROUGHT BY PURCHASER MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED. in any action brought with respect to this contract or the IOS sold thereunder, upon prevailing, Seller shall be entitled to its reasonable attorneys' fees, costs and disbursements.

14. NO LICENSE: The sale of the IOS by Seller does not constitute a license, implied or otherwise, for the use of any patents or know-how of others, nor does it constitute a license implied or otherwise on patents or know-how of Seller except as such product itself is the subject of the claims of Seller's patent.

15. WAIVER: The failure of Seller to enforce at any time any of the provisions hereof shall not be construed to be a waiver of such provisions nor the right of Seller to enforce such provisions in the future.

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Safety

At Brenton Engineering Company (BEC), we are committed to building quality packaging and material handling equipment. To achieve this, our machines must be efficient, easy to maintain, and safe to operate.

Before attempting to operate the equipment, become familiar with the safety recommendations and operational components of your Mach 2 Case Packaging System. You should also become familiar with the technical information pertaining to components used within the system, including their operating and safety features. This information is located in the Vendor Data Manual and in other literature supplied with the equipment. To maximize machine safety and efficiency you must operate the machine correctly and comply with the safety features described.

Stay alert and remember: Safety is the responsibility of everyone who operates or services your BEC system.

BEC System Safety Recommendations

Safeguarding personnel that operate and/or maintain automated equipment is the primary consideration. Because it is very dangerous to enter the operating space (work envelope) of a packaging system during automatic operation, adequate safeguards must be in place and safety precautions must be observed.

The following general precautions are recommended for all personnel who perform system operation or maintenance.

- Do lockout-tagout procedures whenever you do maintenance and repair work.
- All personnel who repair, maintain, or operate the equipment need to know the location of all EMERGENCY STOP buttons. See Figure 1 - 5.
- Do not operate the equipment with any of the safety guards removed.
- Do not wear neckties, loose clothing, or long loose-hanging hair around any equipment.
- Observe and follow the DANGER, WARNING, and CAUTION messages throughout this manual, in vendor manuals, and displayed on the equipment.
- DO NOT use steps or stands that allow anyone to reach over guards.
- Personnel should attend all available safety and operational training courses.
- Personnel should know and follow the recommended safety procedures whenever they must enter the packaging systems motion area.
- Personnel should not enter the packaging system while control power is "ON".
- Personnel should not power up the system if someone is in the packaging system.
- The packaging system should be powered down when not in use.
- Personnel should pay special attention to all the posted warnings and cautions located on any devices. Observe all safety and/or precautionary steps and procedures when working with the system.
- Personnel should keep the system clean to make it easier to spot hazards.

Hazard Messages

Notations appear on pages of this manual to alert the reader to important messages regarding a significant hazard for personnel or equipment. These messages convey three levels of risk as defined below. Failure to observe these instructions can result in death, serious injury, damaged equipment, or loss of product or production.

DANGER Denotes the possibility of serious injury or death to personnel.

WARNING Denotes the possibility of potential injury or damage to equipment.

CAUTION Denotes the possibility of damage to product or an interruption of production.

Operation Safety

The following safety precautions are recommended for all personnel who operate this equipment.

- Operators should immediately report unsafe working conditions to a supervisor.
- The operator should understand the function of the entire system including all external devices and equipment that interact with the system.
- Before starting operation, the operator should understand the complete task that the system is designed to accomplish.
- The operator should know the location and functional status of all devices (switches, sensors, control signals) that can cause the system to move.
- The operator should know where each EMERGENCY STOP button is located for both main and external control devices.

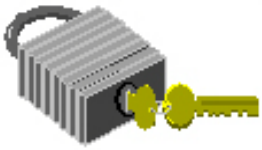
Figure 1 - 1
E-Stop Button

- Do not hesitate to use an E-Stop in an emergency.
- After cycle stopping the machine, press the E-stop prior to entering the working path of the machine. Do not rely on security interlocks alone.
- The operator should make sure all safety devices are functioning and periodically checked for proper operation.
- The operator should ensure that all personnel are outside the system before starting operation.
- The operator should never enter, or allow others to enter the system during automatic operation.

Maintenance Safety

The following safety precautions are recommended for all personnel who are responsible for the maintenance or service of this equipment.

- Personnel should ensure that all safety devices are functioning and periodically checked for proper operation before performing maintenance.
- Before performing any maintenance, service, or inspection inside the main control panel, the 3-phase power source should be turned off and locked out.
- When possible, maintenance should be performed on the system with the power OFF. Lockout and tag out procedures should be followed to protect personnel from injury and to indicate the equipment is being serviced.



Danger!

When performing maintenance, inspection, repair or changeover, execute the Lockout & Tag Out procedure to prevent personal injury – before entering the machine. When you see this symbol, DO LOCK OUT/TAG OUT.

- Personnel should pay careful attention to all devices that may be powered or capable of motion, such as conveyors and pneumatic devices.
- Release or block all stored energy devices (hydraulic or pneumatic) that may present a danger when working with the system. Before working with pneumatic devices, shut off the air supply and purge the air lines.
- Be aware when removing a servomotor or brake that the associated mechanical part will fall unless supported in some manner.
- Use only specified replacement parts. Never use non-specific fuses that have not been specified Brenton Engineering. Potential fire and/or damage may result.
- Before restarting the system, ensure personnel are not in the system and that the system and external devices are operating properly.

Security Interlock Switch

Brenton Engineering used an Interlock Switch, attached to each access door, to guard against unsafe entry into this system. It interlocks the guard to the machine control system and ensures machine power is isolated and remains isolated while the guard door is open. The machine power flows through each of these switches. A mechanical actuator, typically mounted to the guard door itself, is used to actuate a switch that is in a separate sealed case. The switch is wired to the machine control circuit. When the operator requires access to the system, the operator must stop the machine prior to opening the interlocked access door. The door is locked when the machine is running. When a door is open, the machine cannot start.

Note: Brenton Engineering always recommends that the operator use a controlled shutdown procedure using the Cycle Stop button and then an Emergency Stop button.

Figure 1 - 2
Security Interlock Switch

Electrical Lockout and Tagout Recommendations

(See OSHA 1910.147 & OSHA 1910.333 (b)(2) for exception to procedures)

To avoid hazards of electrical shock or other personal injuries, the main power disconnect for the system and any other separate sources of power for the system shall be locked out & tagged as a safety precaution during entry and maintenance to the system.

1. To accomplish this set the Main Power Disconnect operating handle to the "OFF" position and install a personal locking device through the padlock hole on the operating handle.
2. Attach a Danger tag to the handle containing a statement prohibiting unauthorized operation of the disconnect and removal of the tag signed by the individual responsible for locking out the system.
3. If several personnel are performing maintenance, each individual shall install a lockout device and tag.

A qualified person shall verify that the equipment is de-energized by operating controls to verify equipment cannot be restarted and using test equipment to test circuits and electrical parts that will be exposed to personnel.

Figure 1 - 3
Electrical Lock Out

Stored electric energy that might endanger personnel shall be released by discharging the circuits. Check appropriate equipment manuals on exact procedures. To re-energize equipment, a qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that equipment can be safely energized. Personnel exposed to the hazards associated with re-energizing equipment shall be warned to stay clear of equipment. Each lock and tag shall be removed by the person who applied it or under their direct supervision. A visual determination that all personnel are clear of the equipment shall be accomplished before the operating handle on each Main Power Disconnect is placed to the "ON" position.

Pneumatic Lockout and Tagout Recommendations

To avoid hazards of moving mechanisms, pinch points and other personal injuries, the main compressed air supply valve for the system shall be locked out & tagged as a safety precaution during entry and maintenance to the system.

1. To accomplish this, turn the Main Air Supply valve to the "OFF" position and install a personal locking device through the padlock hole on the valve handle.
2. Also attach a Danger tag to the handle containing a statement prohibiting unauthorized operation of the disconnect and removal of the tag signed by the individual responsible for locking out the system.

Figure 1 - 4
Pneumatic Lock Out

If several personnel are performing maintenance, each individual shall install a lockout device and tag. Qualified personnel shall vent any stored or accumulated air in pneumatic/vacuum devices before working on them. Check appropriate equipment manuals on exact procedures.

To re-supply compressed air to the equipment, a qualified person shall conduct visual inspections, as necessary, to verify that mechanisms are properly connected, as well as all tools and other objects have been removed so that equipment can safely operate. Personnel exposed to pneumatic/vacuum hazard areas shall be warned to stay clear of equipment. Each lock and tag shall be removed by the person who applied it, or, under their direct supervision. A visual determination that all personnel are clear of the equipment shall be accomplished before the main air supply valve is turned to the “ON" position.

Installation and First Time Power Up

Brenton Engineering Company employs skilled service technicians to assist equipment purchasers with installation and startup of new equipment, as well as continuous technical support.

For transportation purposes, equipment may be broken down into various sections. For example:

- Main Frame
- Infeed Frame
- Infeed Conveyor

Installation Procedure

- Ensure incoming electrical-service meets all local safety and building codes.
- Ensure your facility is able to meet the systems power requirements.
- Ensure you are able to meet the Systems air pressure requirements and electrical power requirements.

Machine Power Requirements

- 460 VAC, 3 Phase, 100 Amp, 60 Hz
- Glue Tank- 460 VAC, 3 Phase, 20 Amp, 60 Hz

Machine Air Pressure Requirements

- 80 PSI - 15 CFM

Remove Skids

Use caution when removing the skids - BEC recommends you use qualified riggers to uncrate and spot machine components to avoid possible damage. In addition, place floor pads under all legs to help eliminate floor damage and provide surface support.

Level your BEC Packaging System:

- Level the machine in both the length and cross-machine dimensions.
- Using a 30 to 36 inch level, do an initial level check throughout the tray packer at both ends and sides to check the level.
- Do not use the vertical supports for leveling. The vertical supports may be sprung off-center enough to make leveling difficult.
- Adjust the 1" threaded bolts, located in multi-support positions around the lower frame section, to level and adjust the height. (Use an open-end or adjustable wrench to adjust the legs.)

Note: Level machines to eliminate the twisting and binding of assembled components.

- For a final leveling, start at the receiving end of the connecting upstream equipment and level the upstream equipment side-to-side. Also, level across and down the sides

of the machine, including electrical cabinets.

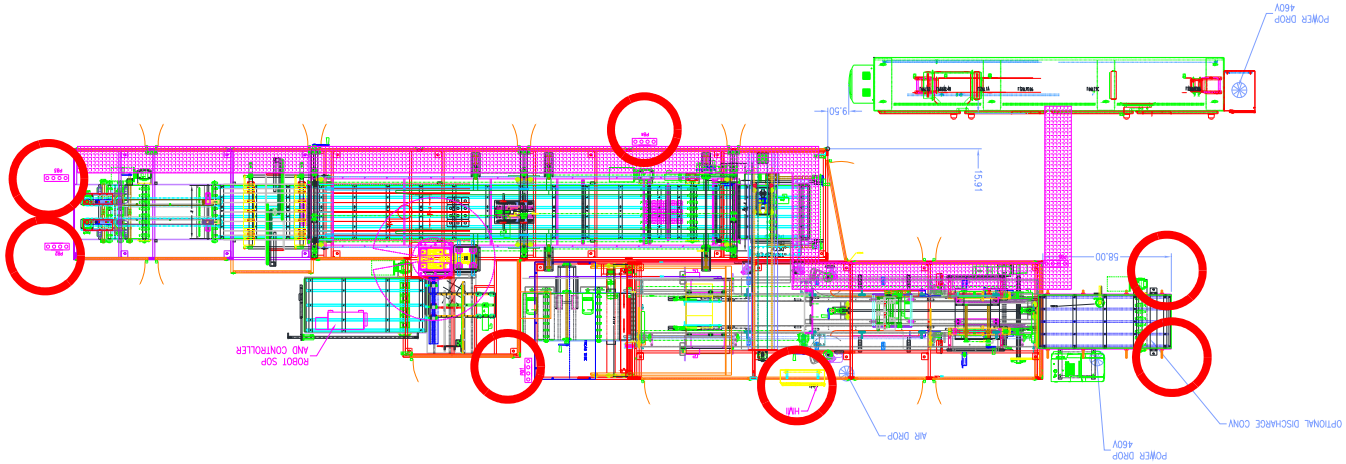
- Align all the frame sections.
- Route electrical wire bundles, pneumatic lines, and mechanical assemblies.
- Carefully pull exposed electrical wire ends through the conduit bodies to avoid damage. Personnel at Brenton Engineering number the electrical wires to assist in the re-installation process.
- Pneumatic lines are marked to match designated solenoid part. Main lines are located near their hookup point.
- Install items such as transfer decks, cylinder mounts, and brackets by orientation of that assembly. Slotted parts have reference marks coinciding to their mating parts.
- Before the BEC service technician arrives, plumb in the air system.
- Mount ALL guards.

AFTER ALL OF THE ABOVE HAS BEEN COMPLETED

- Switch OFF the main power-disconnect for incoming power. Open the main electrical control cabinet.
- Connect the wires for the 3-phase power service and ground (earthing) wire.
- Use an accurate meter to check the incoming-line voltage at the input of the main power-disconnect. Be sure the incoming line voltage meets operating specifications.
- Turn ON the main power-disconnect when you have finished wiring the incoming service to the main electrical panel.
- Check the voltage listed on the manufacture's serial number tag on different electrical components, especially electric motors. If the incoming power does not meet proper specifications take corrective action before proceeding.
- Turn on total machine power. See Section 3, System Operation, for running information.

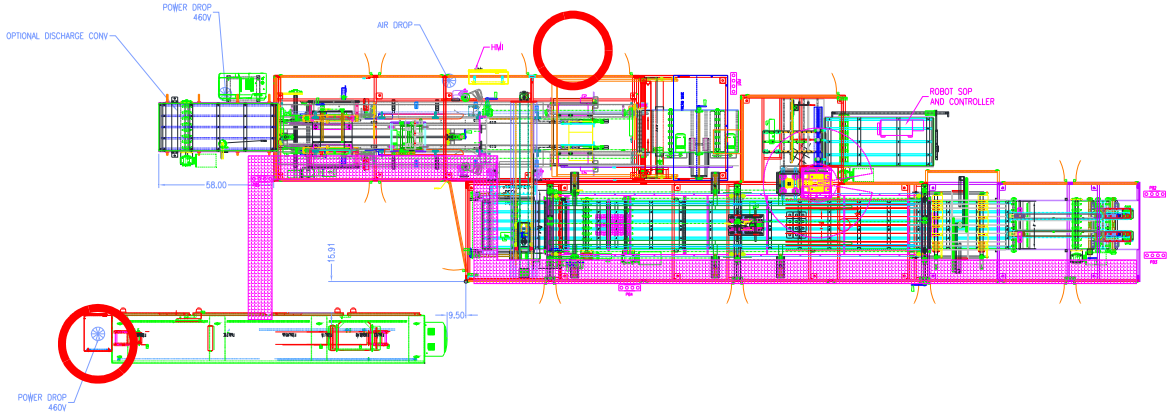
Emergency Stop Location Drawing

Figure 1 - 5
E- Stop Location Drawing



Lock Out/ Tag Out Location Drawing

Figure 1 - 6
Lock Out/ Tag Out Location Drawing



System Description Contents

2. System Description

Machine Specifications

This machine is a Mach-2 case packer, as described below, designed to pack bottles into wrap around cases, operating at speeds up to 144 PPM or 15 CPM.

Infeed

Individual bottles are received in a single file from the customer's in-feed conveyor, and diverted into the proper number of lanes per the pack pattern via S45 lane divider. The pack pattern is separated and released into the load area. Once in the load area, the loader comes down around the pack and collapse the pack pattern, at the same time push into the case. After the case is loaded, the main indexes forward one station, and a multi cell divider is picked opened and guided over the top off the pack pattern.

Main

Case blanks are staged vertically on a standard Mach II magazine and conveyed to the blank picking position via a set of chains controlled via an AC motor. Cases are set up in a U shape at the setup station and flap trap rotate down to capture the bottom majors. The case is indexed to the load station where funnels rotate in to guide the product through the vertical minor flaps. In this same station, the opposite side of the case has there minor flaps folded closed. After the case is loaded, the main machine indexes to the next station and where the load side minors are folded closed and the divider is placed around the bottles. The case then indexes to the next station where the top panel is folded down. Just before the next index, four dots of glue are applied to the manufactures flap. Then the case indexes to the compression station. In-motion side glue guns apply glue to the sides of the case and the major flaps are folded closed. When the index comes to a stop, the top compression comes down and the side compression comes in to compress the glue, sealing the case. The next index discharges the case onto the discharge conveyor.

Pack Patterns

Table 2-1. Pack Pattern Description Chart

DESCRIPTION	MAXI-MUM	"X" LENGTH (DIREC-TION OF TRAVEL)	"Y" WIDTH (VERTI-CAL)	"Z" DEPTH (ACROSS CON-VEYOR)	LENGTH (DIREC-TION OF TRAVEL /?X, Y, Z)	WIDTH (VERTI-CAL /?X, Y, Z)	DEPTH (ACROSS MACHINE /?X, Y, Z)	LENGTH (BETWEEN FLIGHTS)	WIDTH (VERTI-CAL)	DEPTH (ACROSS MACHINE)
750 Round Universal	144	2.96	11.83	2.96	3	1	4	8.88	11.83	11.84
750 ml Round Captain Morgan	144	3.00	11.73	3.00	3	1	4	9.00	11.73	12.00
750ml Round Dickel	144	3.55	10.58	3.55	3	1	4	10.65	10.58	14.20
1 Liter Captain Morgan round	144	3.41	12.25	3.41	3	1	4	10.23	12.25	13.64
1 Liter Universal round	144	3.42	11.83	3.42	3	1	4	10.26	11.83	13.68
1 Liter Dickel Round	144	3.76	11.43	3.76	3	1	4	11.28	11.43	15.04
1.75 Captain Morgan Round	125	4.95	11.87	4.95	2	1	3	9.90	11.87	14.85
1.75 Dickel Round	125	4.95	11.88	4.95	2	1	3	9.90	11.88	14.85
Square Yukon Jack 750ml	144	2.93	10.65	2.93	3	1	4	8.79	10.65	11.72
Square Yukon Jack 1L	144	3.30	11.4	3.30	3	1	4	9.90	11.4	13.20
200 ml Flask Universal	144	3.05	7.156	1.34	6	1	8	18.30	7.156	10.72
375 Flask	144	3.25	8.43	2.10	3	1	4	9.75	8.43	8.40
375 Tall Flask	144	3.75	9.04	1.6	3	1	4	11.25	9.04	6.40

Table 2-1. Pack Pattern Description Chart (Continued)

DESCRIPTION	MAXI-MUM	"X" LENGTH (DIREC-TION OF TRAVEL)	"Y" WIDTH (VERTI-CAL)	"Z" DEPTH (ACROSS CON-VEYOR)	LENGTH (DIREC-TION OF TRAVEL /?X, Y, Z)	WIDTH (VERTI-CAL /?X, Y, Z)	DEPTH (ACROSS MACHINE /?X, Y, Z)	LENGTH (BETWEEN FLIGHTS)	WIDTH (VERTI-CAL)	DEPTH (ACROSS MACHINE)
750ml Flask Myer's Rum, Gold	144	3.92	10.03	2.65	3	1	4	11.76	10.03	10.60
1.75 Capt. Morgan Oval	125	6.00	10.25	3.9	2	1	3	12.00	10.25	11.70

Operator Start Up/Shut Down

To Start Your Packaging System:

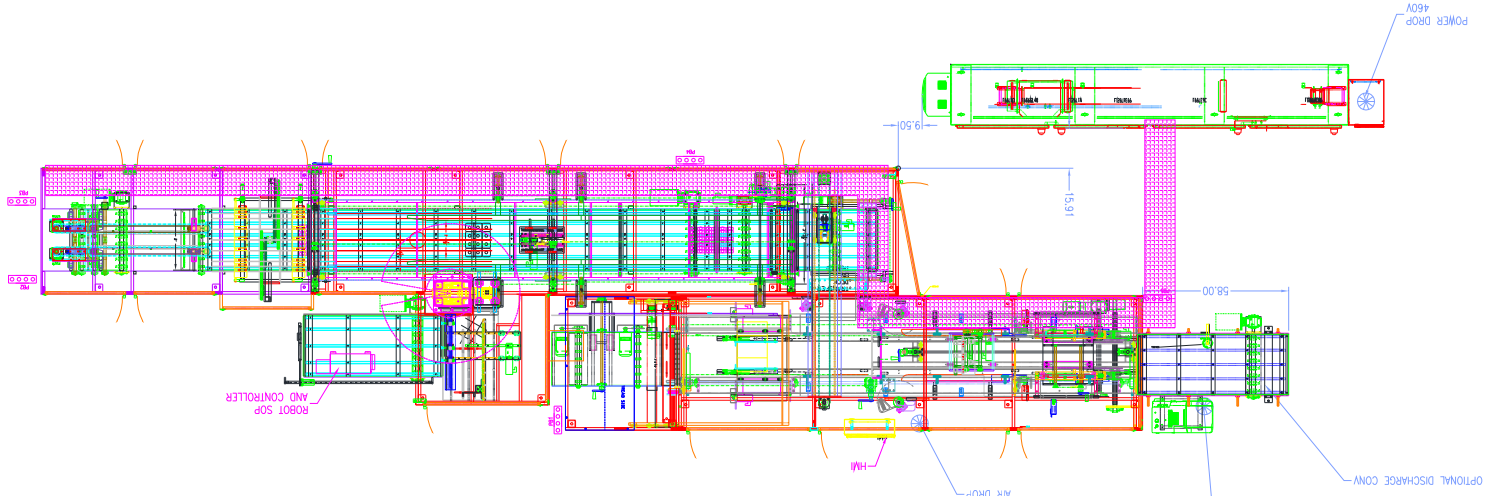
1. Turn "ON" the Main Electrical Disconnect.
2. Turn "ON" the Main Pneumatic Disconnect.
3. Fill the Glue Tank with adhesive.
4. Turn "ON" the Glue Tank. (The Glue takes approximately 15 minutes to heat up to the correct operating temperature.)
5. Fill the Magazine with the correct corrugated blanks for the current production run.
6. Check the Glue Tank temperature. It must be up to temperature to start production.
7. Make sure all personnel; tools, and equipment are clear of the machine.
8. Press and release the Control Power Reset button. The button will illuminate.
9. On the Main screen press Request Start, then press and hold the Global Start button until the machine starts. The Warning horn will sound three times to notify personnel that the machine is about to move.
10. The machine will begin production.

To Initiate a Normal Machine Stop

1. Press any Cycle Stop button. Wait for the machine to come to a complete stop at the end of the current cycle.
2. Press any Emergency Stop Button.
3. Turn off the pneumatic discharge valve.
4. Turn Off the Main Disconnect (Optional).

Machine Floor Plan

Figure 2 - 1
Machine Floor Plan



System Operation Contents

3. System Operation

Operating Procedures

How to Start Your Packaging System

1. Turn "ON" the Main Electrical Disconnect.
2. Turn "ON" the Main Pneumatic Disconnect.
3. Fill the Glue Tank with adhesive.
4. Turn "ON" the Glue Tank. (The Glue takes approximately 15 minutes to heat up to the correct operating temperature.)
5. Fill the Magazine with the correct corrugated blanks for the current production run.
6. Check the Glue Tank temperature. It must be up to temperature to start production.
7. Make sure all personnel; tools, and equipment are clear of the machine.
8. Press and release the Control Power Reset button. The button will illuminate.
9. On the Main screen press Request Start, then press and hold the Global Start button until the machine starts. The Warning horn will sound three times to notify personnel that the machine is about to move.
10. The machine will begin production.

How to Shut Down Your Packaging System

1. Press any Cycle Stop button. Wait for the machine to come to a complete stop at the end of the current cycle.
2. Press any Emergency Stop Button.
3. Turn off the pneumatic discharge valve.
4. Turn Off the Main Disconnect (Optional).

How to Load Corrugated Blanks into the Magazine

1. Place the blanks in the Magazine with the flaps horizontal, as shown below. Place the first group of blanks against the clips.

Figure 3 - 1
The Magazine

2. Lean the remaining blanks, until the Magazine is full.

How to Jog the Machine

From an Emergency Stop

1. Make sure all personnel; tools, and equipment are clear of the machine.
2. Close all guard doors.
3. Release all Emergency Stop buttons.
4. Press the Control Power Reset button.
5. Go to the Maintenance Screen.
6. Press and hold a jog button to jog that component. Release the button to stop the jog.

From a Production Run

1. Press any Cycle Stop Button.
2. Wait for the machine to come to a stop at the end of a complete cycle.
3. See step 5 and 6 above.

Operator Control Panels

The Main Control Panel Layout & Description

The Main Operator Control Station for the case packaging system is designed around an Allen Bradley Panel View color Human Machine Interface. The Human Machine Interface (HMI) is in direct link with the Programmable Logic Controller (PLC) that directs control of the packaging system. The Operator Control Station is equipped with, a Start/ Reset Button, a Cycle Stop Button, and an Emergency Stop Button. The control features are described, in detail, later in this section.

The operator control scheme for the packaging system is based on a simple, menu driven design. Interactive displays serve as both control input devices and visual output devices, providing the operator both automatic and manual control features for directing the packaging system operations. See Figure 3 - 2 and Table 3-1 for Panel Layout and Description.

Figure 3 - 2
Main Operator Control Panel

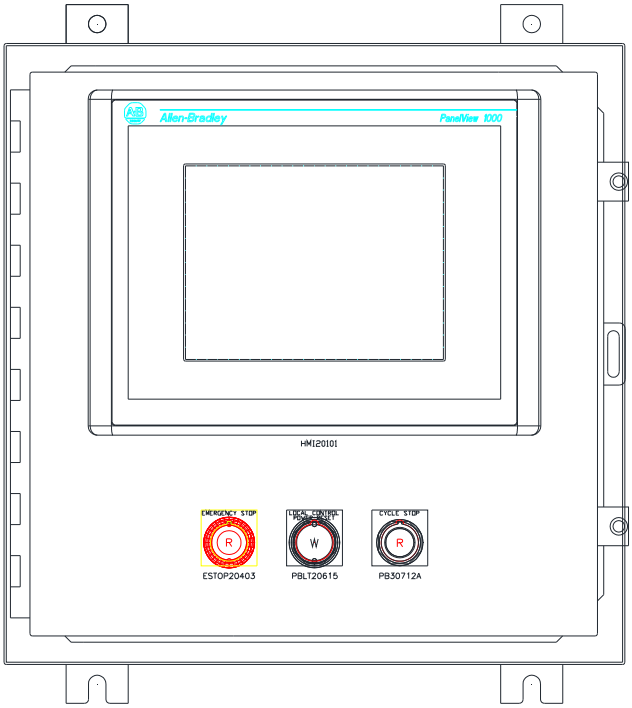


Table 3-1. Main Control Station Button Descriptions

BUTTON	DESCRIPTION
CONTROL POWER RESET	Press this button once to reset the machine control circuit. Press this button as part of the startup procedure prior to pressing the Start button.
EMERGENCY STOP	When the operator presses this button, all machine action comes to an immediate halt. Pull this button out and press the reset button to reset the E-Stop circuit.

Auxiliary Control Panels (CP 4-8)

This system is equipped with auxiliary operator control panels to assist in basic operator machine functions.

Figure 3 - 3
Control Panels 4-8

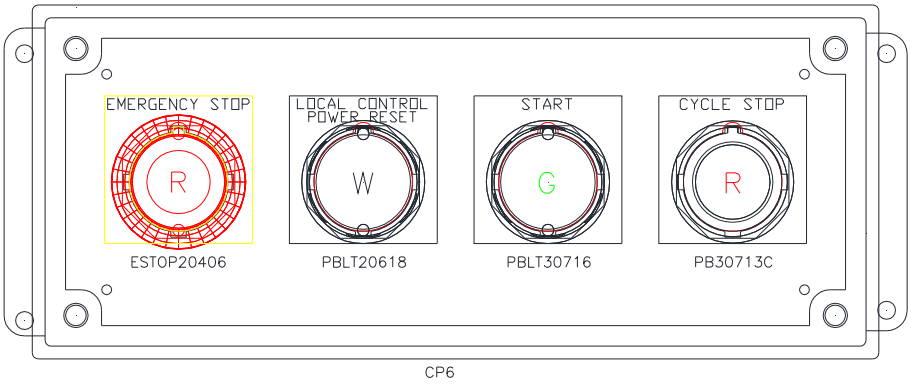


Table 3-2. Control Stations Button Descriptions

BUTTON	DESCRIPTION
EMERGENCY STOP	When the operator presses this button, all machine action comes to an immediate halt. Pull this button out and press the reset button to reset the E-Stop circuit.
LOCAL CONTROL POWER RESET	Press this button once to reset the machine control circuit. Press this button as part of the startup procedure prior to pressing the Start button.
START	With the machine reset and ready to run, press and hold this button to request that the lane divider start. Once lane divider start power is present, press this button to start the Lane Divider. The Warning horn will sound three times to notify personnel that the machine is about to move. To cancel the start, press Cycle Stop during the three alarm horn blasts.
CYCLE STOP	Press this button to bring the lane divider to a controlled stop at the end of its current cycle.

Overhead Sweep Adjust (CP 9)

This is the Overhead Sweep Adjust control panel. This is used to adjust the overhead flights height.

Figure 3 - 4
The Overhead Sweep Adjust Control Panel

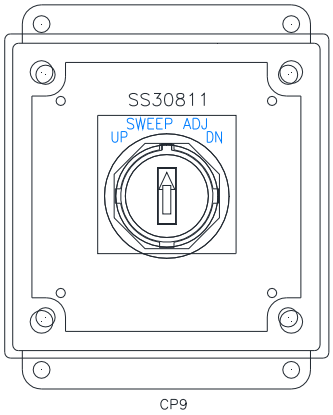


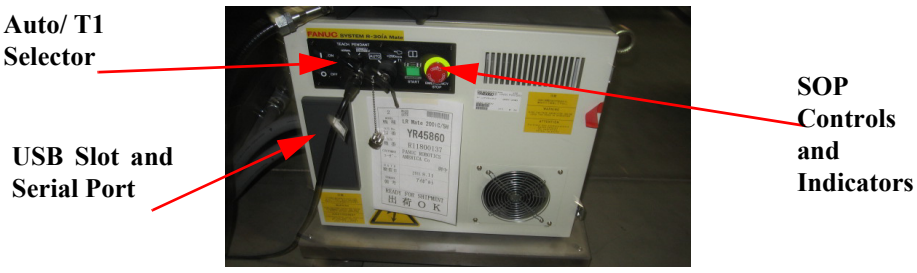
Table 3-3. The Overhead Sweep Adjust Control Station Button Descriptions

BUTTON	DESCRIPTION
UP	Turn and hold the switch in the up position to raise the overhead sweep. Release the switch to stop the jog.
DOWN	Turn and hold the switch in the down position to lower the overhead sweep. Release the switch to stop the jog.

Robot SOP

The Robot Standard Operator Station is used for control various system elements.

Figure 3 - 5
Robot SOP



WARNING When in manual mode, the security interlocks and light curtain is de-activated. E-Stops remain active.

The Robot controller that is supplied with the Fanuc Robot consists of buttons, key switches, and connector ports that are linked to the robot controller. These features, in addition to the Teach Pendant, can be used to direct the control and operation of the robot.

- User 1 and User 2 modes are not implemented.
- Hour Meter - This display indicates the amount of run time on the servomotors/ amps. The Hour Meter starts to accumulate after the servomotors are powered up and a cycle start button has been pressed. After the Hour Meter has started to accumulate time, if a hold button is pressed the robot will pause current motion, but the Hour Meter will continue to accumulate time. The Hour Meter will stop accumulating time when the servomotors are powered down (robot emergency stopped).
- Auto/ T1 - Turn this key switch to Auto for automatic operation. Turn this key switch to T1 for Teach Pendant manual controls. Use the mode select switch to select the most appropriate way to operate the robot, depending on the conditions and situation. See the Fanuc System operation manuals for more information.
- Robot Rotary Disconnect - The disconnect found on the Robot Standard Operator panel is an electrical disconnect to the robot only.
- Teach Pendant - See “Fanuc Teach Pendant Description” on page 3 - 7.
- USB Slot - Used to back up and restore controller memory and files. A USB jump drive retains backup of programs and program data.
- Serial Port - A multipurpose RS232 serial port that is used to connect a PC, floppy disk drive, printer, or other serial devices that interface to the robot controller.

Fanuc Teach Pendant Description

The TEACH PENDANT is a very important operator interface device. It displays system information and the Handling Tool software application menus. It connects to the controller via a cable that plugs into the port labeled "Teach Pendant" on the Standard Operator Panel (SOP). The operator uses the "Teach Pendant" to:

- Interact with the Handling Tool screens while setting up an application.
- Test run a programmed application.
- Run production.
- Manually move the robot or to teach positions.
- Check on system status of the robot controller.
- Diagnose and troubleshoot problems with the robot and work cell.

Figure 3 - 6
Typical FANUC Teach Pendant

Glue Control Panel

This panel is located on the Nordson Glue Tank provided with the system. See Figure 3 - 7. For more information, see the Glue Tank manual provided with the system vendor documentation. The low level glue alarm will show at 50% of tank capacity.

Figure 3 - 7
The Glue Panel

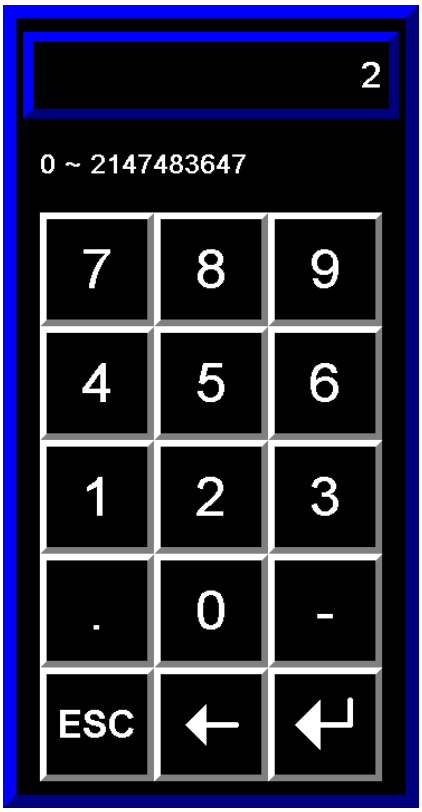
Glue Control Panel

The Human Machine Interface

The Numeric Keypad

When the operator presses a digital display button, a numeric keypad opens in the center of the terminal screen. See Figure 3 - 8. The top of the numeric keypad shows the current value after the operator enters it and the range of values the operator can enter. The operator enters a value and presses the enter key. The display returns to the de-activated state.

Figure 3 - 8 Example Numeric Keypad



The System Information Screen

On the System Info Screen, you may do the following:

View the System Info	Go to the Main Screen
View the Machine Serial Number	

Figure 3 - 9
The Sys Info Screen

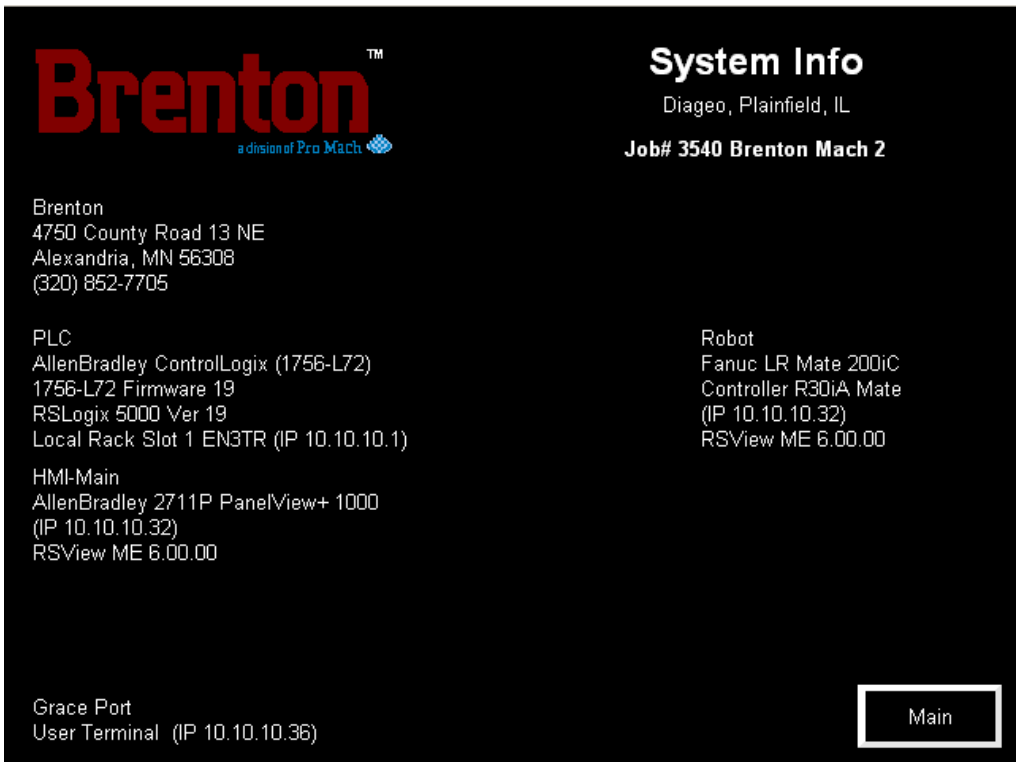


Table 3-4. System Info Screen Button Descriptions

STATE 1	DESCRIPTION
MAIN	Press this button to go to the Main Screen.

The Main Screen

On the Main Screen you may do the following.

Request Start Control (Casepacker, Lane Divider or Global Start)	Release one Case
Cycle Stop the Casepacker, Lane Divider, or Global	Toggle Auto Release on or off
Silence the Audible Alarm Horn	View the Alarm Message Display
Reset the Current Fault Condition	Go to the Menus Screen

Figure 3 - 10
The Main Screen

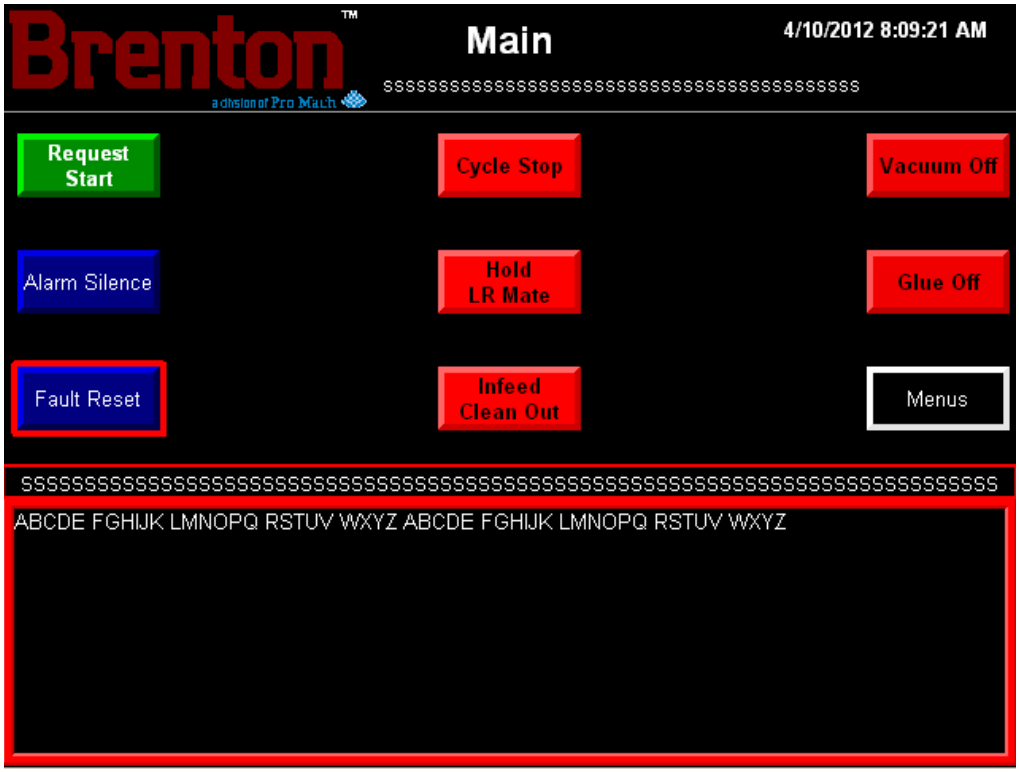


Table 3-5. Main Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
REQUEST START CASE PACKER (START CASEPACKER)	With the machine reset and ready to run, press this button to request that the casepacker start. Once casepacker start power is present, press this button to start the machine. Press and hold start until the casepacker starts. The warning horn will sound three times to notify personnel that the machine is about to move.	REQUEST START CASEPACKER (STARTING CASEPACKER)
ALARM SILENCE	Press this button to silence the audible alarm horn.	SILENCE

Table 3-5. Main Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
FAULT RESET	Press this button to reset the current fault.	FAULT RESET
CYCLE STOP	Press this button to bring the casepacker to a controlled stop at the end of its current cycle.	CYCLE STOPPING
HOLD LR MATE	Press this button to pause the robotic program and hold the robot. The robot will stop its motion. When you are ready, you can resume from where the robot left off by restarting.	HOLD LR MATE
INFEED CLEAN OUT	Press and hold this button for two seconds to activate infeed clean out mode. When in clean out mode, the product currently on the infeed will continue through the system without letting more product in. This allows the user to have an empty machine prior to changing over the machine.	HOLD 2 SECONDS
VACUUM OFF	Press this button to turn the vacuum on or off. When the vacuum is off, the setup won't pick blanks.	VACUUM ON
GLUE OFF	Press this button to turn the Glue Heads on or off. When off, press this button to turn the Glue on. Once on, this button highlights green and displays the text "Glue On," as shown to the right.	GLUE ON
MENUS	Press this button to go to the Menu Screen.	

The Menu Screen

On the Menu Screen you may do the following.

Go to any of the Unlocked Screens (Bold Outlined)	Log Out the Current User
Enter a User Password	

Figure 3 - 11
The Menu Screen

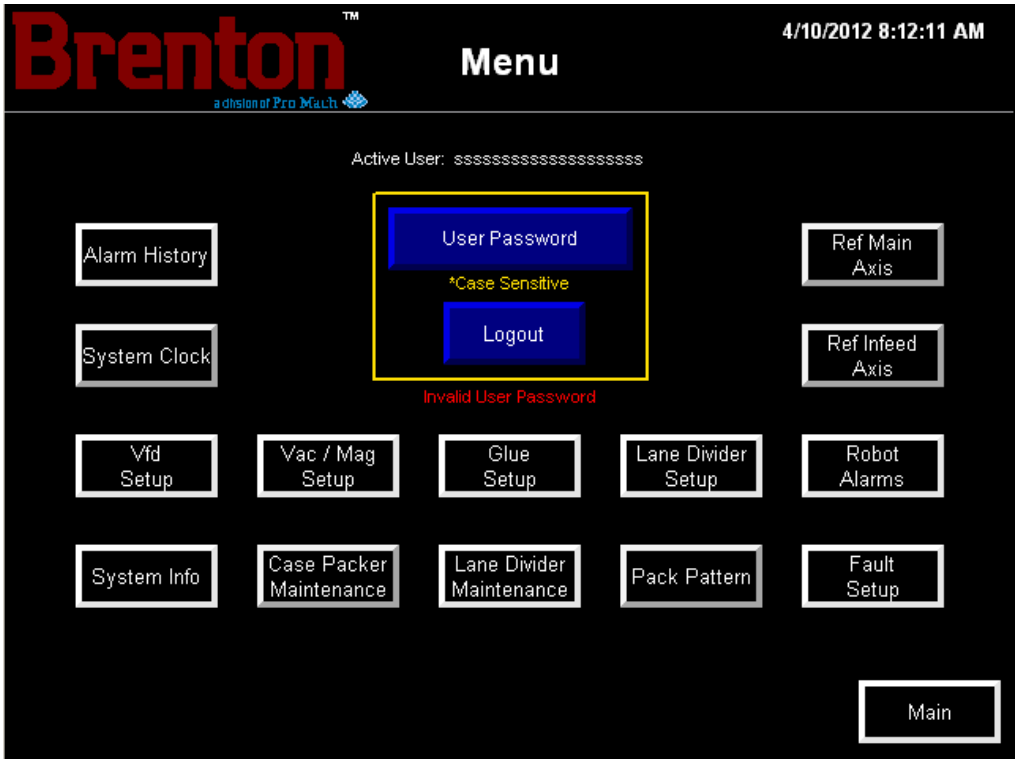


Table 3-6. Menu Screen Button Descriptions

STATE 1	DESCRIPTION
USER PASSWORD	Press this button to display the login keypad, enter the password, and press enter. Once logged in with the proper authorization, the related level screens are unlocked.
LOGOUT	Press this button to Logout the current user.
ALARM HISTORY	Press this button to the Alarm History Screen.
SYSTEM CLOCK	Press this button to go to the System Clock Screen.
VFD SETUP	Press this button to go to the VFD Setup Screen.
SYSTEM INFO	Press this button to go to the System Info Screen.
VACUUM/ MAG SETUP	Press this button to go to the Vacuum/ Magazine Setup Screen.

Table 3-6. Menu Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION
CASEPACKER MAINTENANCE	Press this button to go to the Maintenance Screen.
GLUE SETUP	Press this button to go to the Glue Setup Screen.
LANE DIVIDER MAINTENANCE	Press this button to go to the Lane Divider Maintenance Screen.
LANE DIVIDER SETUP	Press this button to go to the Lane Divider Setup Screen.
PACK PATTERN	Press this button to go to the Pack Pattern Screen.
REF MAIN AXIS	Press this button to go to the Reference Main Axis Screen.
REF INFEED AXIS	Press this button to go to the Reference Infeed Axis Screen.
ROBOT ALARMS	Press this button to go to the Robot Alarms Screen.
FAULT SETUP	Press this button to go to the Fault Setup Screen.
MAIN	Press this button to go to the Main Screen.

The Pack Select Screen

On the Pack Select screen, you may select a pack pattern, jog the magazine height or magazine top guide, enable or disable Inserts, or go to the Menu or Main screens.

Note: Manual controls are only available when the machine is not running, and reset. Once the machine is reset, it is in jog mode.

Figure 3 - 12 The Pack Select Screen

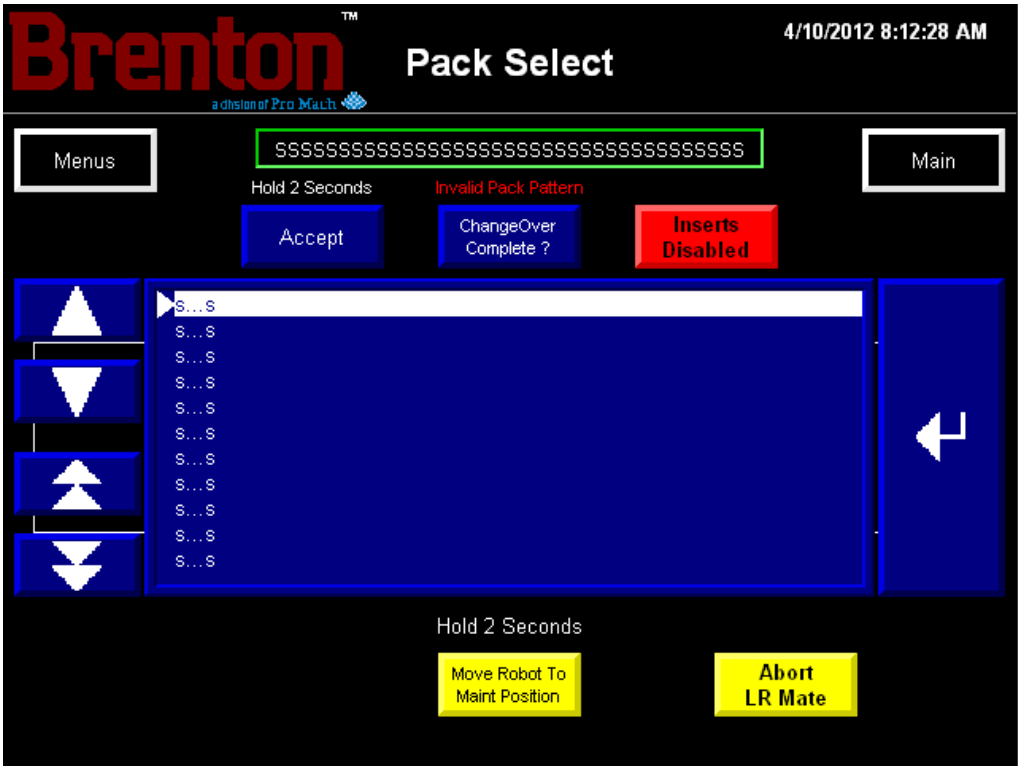


Table 3-7. Pack Select Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
MENUS	Press this button to go to the Menu screen.	
MAIN	Press this button to go to the Main screen.	
ACCEPT	Press and hold this button for two seconds to accept the entered pack pattern.	ACCEPT
MANUAL CHANGE OVER COMPLETE?	Press this button as part of the changeover procedure outlined in section 5 of this manual to confirm that the manual adjustments are complete.	MANUAL CHANGE OVER COMPLETE
INSERTS DISABLED	Press this button to enable or disable divider inserts.	INSERTS ENABLED
PACK PATTERN BUTTON	Use the arrows to select the pack pattern you are changing to. Press Enter to select the pack pattern.	PACK PATTERN BUTTON

Table 3-7. Pack Select Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
MOVE ROBOT TO MAINT POS	With the machine reset and ready to run, press and hold this button for two seconds to move the robot to the maintenance position. This is useful for changeover or doing maintenance to the robot EOAT.	**HOLD 2 SEC**
ABORT LR MATE	Press and hold this button for two seconds to abort the robot program. Once aborted, the robot will need to be re-assigned.	**HOLD 2 SEC**

The Maintenance Screen

On the Maintenance Screen, you may do the following:

Test the Light Tower Beacons	Enable or Disable Open Flap Bypass
Synchronize the Servos	Release any of the Indicated Servo Brakes
Jog the Components Shown	Jog the Main
Purge on Blank	Turn the Glue on or off
Turn the Setup Vacuum on or off	Go to the Menus or Main Screen

Note: Manual controls are only available when the machine is not running, and reset. Once the machine is reset, it is in jog mode.

Figure 3 - 13 The Maintenance Screen

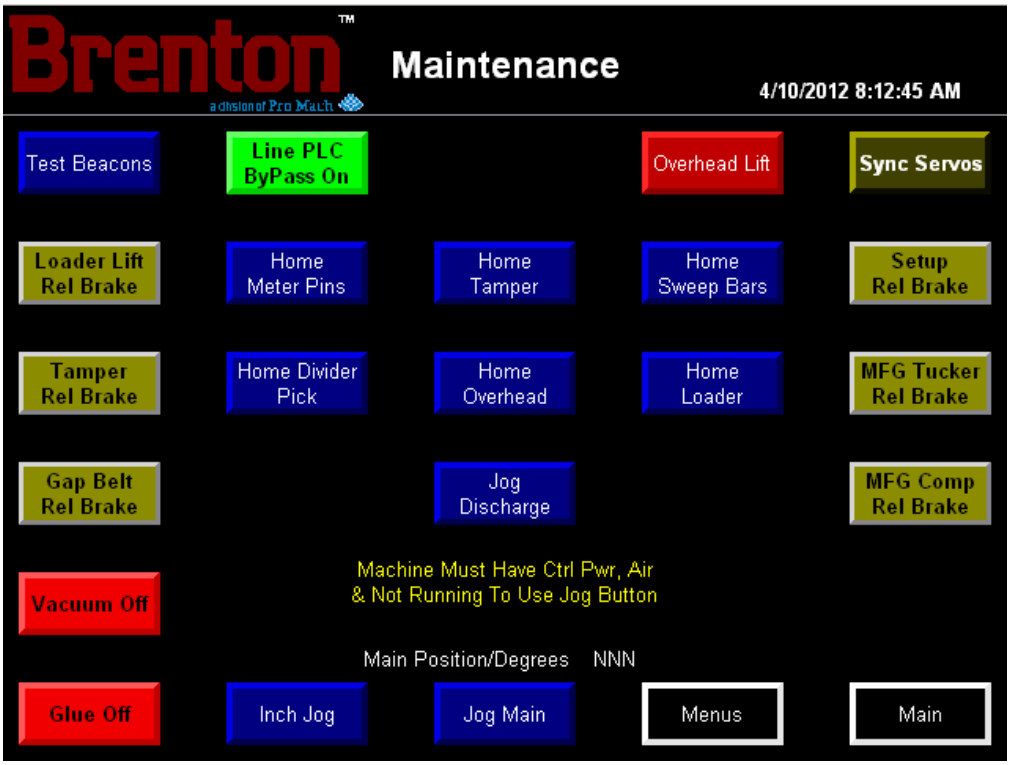


Table 3-8. Maintenance Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
TEST BEACONS	Press this button to test the light tower beacons. This can be useful for determining if any light bulbs are burn out.	TEST BEACONS

Table 3-8. Maintenance Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
LINE PLC BYPASS ON	Press this button to turn the Line PLC bypass on or off.	LINE PLC BYPASS OFF
OVERHEAD LIFT	Press this button to enable or disable the overhead lift.	OVERHEAD LIFT
SYNC SERVOS	Press this button to synchronize the servos. The servos move to the home positions. Slave servos synchronize with the master servos.	SYNC SERVOS
LOADER LIFT REL BRAKE	Press this button to release the Loader Lift servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	LOADER LIFT REL BRAKE
TAMPER REL BRAKE	Press this button to release the Tamper servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	TAMPER REL BRAKE
GAP BELT REL BRAKE	Press this button to release the Gapping Belt servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	GAP BELT REL BRAKE
VACUUM OFF	Press this button to turn the vacuum on or off. When the vacuum is off, the setup won't pick blanks.	VACUUM ON
GLUE OFF	Press this button to turn the Glue Heads on or off. When off, press this button to turn the Glue on. Once on, this button highlights green and displays the text "Glue On," as shown to the right.	GLUE ON
HOME METER PINS	With the machine reset and ready to run, press this button to home the metering pins.	HOME
HOME DIVIDER PICK	With the machine reset and ready to run, press this button to home the Divider Pick.	HOME
HOME TAMPER	With the machine reset and ready to run, press this button to home the Tamper.	HOME
HOME DIVIDER SQUARE	With the machine reset and ready to run, press this button to home the Divider Square.	HOME

Table 3-8. Maintenance Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
JOG DISCHARGE	With the machine reset and ready to run, press this button to home the Discharge.	HOME
HOME SWEEP BARS	With the machine reset and ready to run, press this button to home the Sweep Bars.	HOME
HOME LOADER	With the machine reset and ready to run, press this button to home the Loader.	HOME
SETUP REL BRAKE	Press this button to release the Setup servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	SETUP REL BRAKE
MFG TUCKER REL BRAKE	Press this button to release the Manufacturer's Tucker servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	MFG TUCKER REL BRAKE
MFG COMP REL BRAKE	Press this button to release the setup servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	MFG COMP REL BRAKE
INCH JOG	With the machine reset and ready to run, press this button to switch to inch jog mode or normal jog mode. When in inch jog mode, the main will jog slowly when the jog main button is held. When in inch jog mode, press the jog main button once to jog the main one inch at a time.	IN INCH JOG MODE
JOG MAIN	With the machine reset and ready to run, press and hold this button to jog the main. See the explanation of inch jog mode above.	JOG MAIN
MENUS	Press this button to go to the Menu screen.	
MAIN	Press this button to go to the Main screen.	

The Alarm History Screen

On the Alarm History Screen, you may do the following:

View the Alarm Messages	Clear the Alarm History
Scroll through the Alarm Messages	Go to the Menus or Main Screen

Note: Alarms noted with an * are currently active alarm conditions. Those not marked with an * are past alarms.

Figure 3 - 14
The Alarm History Screen

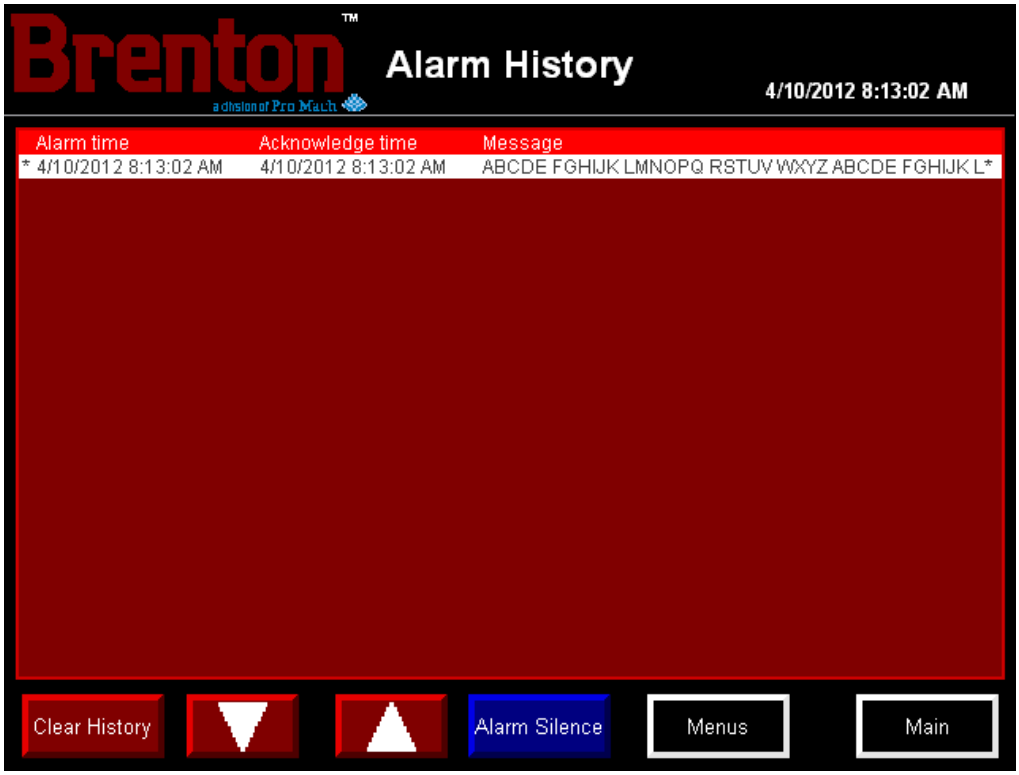


Table 3-9. Alarm History Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
CLEAR HISTORY	Press this button to clear the alarm history display.	
	Press this button to highlight the alarm below the currently highlighted alarm.	
	Press this button to highlight the alarm above the currently highlighted alarm.	
ALARM SILENCE	Press this button to silence the audible alarm horn.	SILENCE

Table 3-9. Alarm History Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
MENUS	Press this button to go to the Menus Screen.	
MAIN	Press this button to go to the Main Screen.	

The System Clock Screen

On the System Clock Screen, you may do the following:

Set the New Month	Set the New Minute
Set the New Date	Set the Year
Set the New Hour	Update the Entered Date and Time

Figure 3 - 15
The System Clock Screen

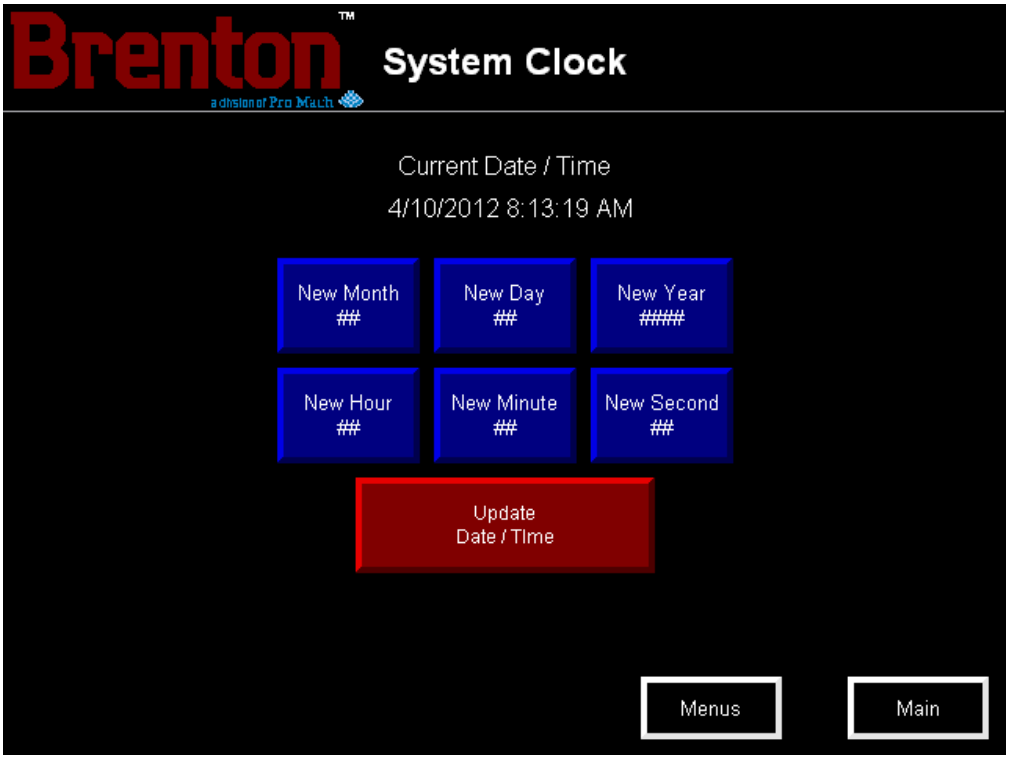


Table 3-10. Date and Time Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
NEW MONTH	Press this button to display the numeric keypad and change the month value.	
NEW DATE	Press this button to display the numeric keypad and change the date value.	
NEW HOUR	Press this button to display the numeric keypad and change the hour value.	
NEW MINUTE	Press this button to display the numeric keypad and change the minute value.	
NEW YEAR	Press this button to display the numeric keypad and change the year value.	
UPDATE DATE AND TIME	Press this button to update the date and time to the entered date and time.	UPDATING
MENUS	Press this button to go to the Menu screen.	

Table 3-10. Date and Time Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
MAIN	Press this button to go to the Main Screen.	

The Fault Setup Screen

On the Fault Setup screen the operator may do the following.

Set the Fault Setup Positions for Insert Missing, Fallen Product Overhead Sweep, Blank Setup, Blank Transfer Jam, and Case Missing at Deck Positions	Test Pick the Setup
Turn the Vacuum or Glue on or off	Jog the Main Servo
Sync the Servos	Go to the Main Screen
Purge one Blank	Go to the Menu Screen

Figure 3 - 16
The Fault Setup Screen

Table 3-11. The Fault Setup Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
FALLEN PRODUCT OH SWEEP ON DEGREES	The Fallen Product Overhead On setting determines the position, in degrees, when the machine begins to detect for fallen product at the overhead position. • Press this button to Display the Numeric Keypad. • A Numeric Keypad displays. Enter the Fallen Product Overhead On Position, in degrees, within the parameters on the numeric keypad. • Press Enter.	
FALLEN PRODUCT OH SWEEP OFF DEGREES	The Fallen Product Overhead On setting determines the position, in degrees, when the machine stops detecting for fallen product at the overhead position. • Press this button to Display the Numeric Keypad. • A Numeric Keypad displays. Enter the Fallen Product Overhead Off Position, in degrees, within the parameters on the numeric keypad. • Press Enter.	
PE FOR MAG		
MENUS	Press this button to go to the Menu Screen.	
MAIN	Press this button to go to the Main Screen.	

The Vacuum/ Magazine Setup Screen

On the Vacuum/ Magazine Setup screen, the operator may do the following:

Set the Vacuum on or off Positions	Synchronize the Servos
Jog the Setup Cups	Jog the Main
Jog the Main	Turn the Glue On or Off
View the Current Position of the Main	Go to the Menus or Main Screen

Figure 3 - 17 The Vacuum/ Magazine Setup Screen

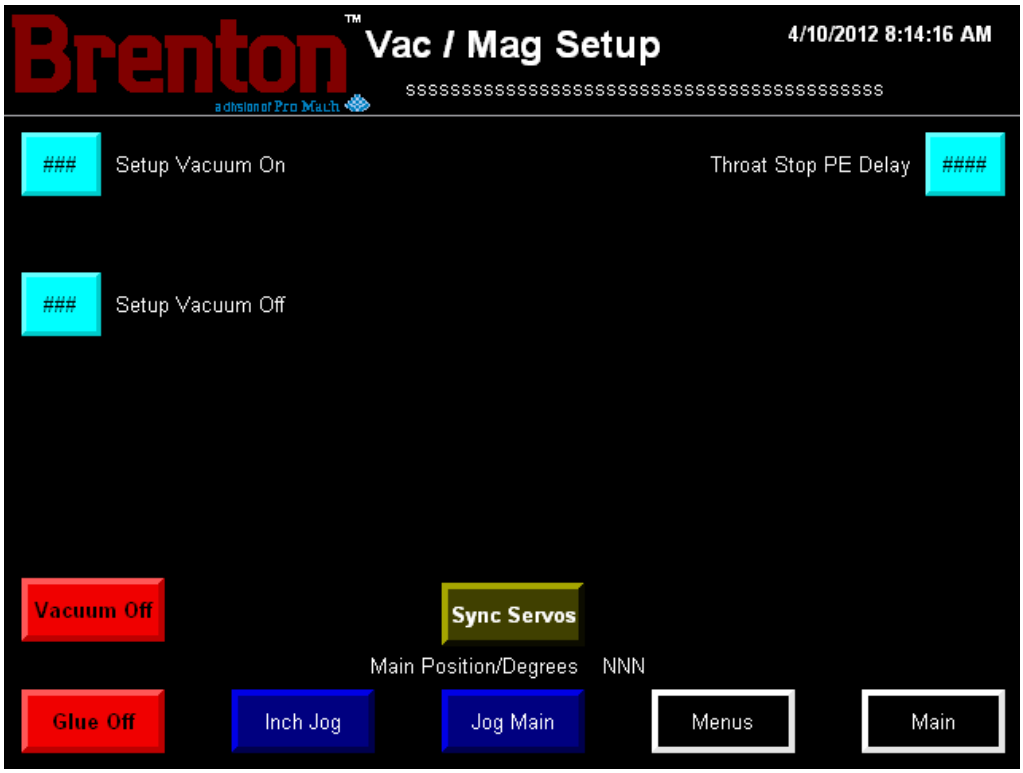


Table 3-12. The Vacuum/ Magazine Setup Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
PARTITION MAGAZINE	Press this button to go to the Partition Magazine Screen.	
SETUP VACUUM ON POSITION ####	• Press this button to display the numeric keypad. • Enter the position where the setup vacuum starts. Use the main position indicator on this screen as a guide. • Press Enter.	

Table 3-12. The Vacuum/ Magazine Setup Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
SETUP VACUUM OFF POSITION ####	• Press this button to display the numeric keypad. • Enter the position where the vacuum turns off. Use the main position indicator on this screen as a guide. • Press Enter.	
SYNC SERVOS	Press this button to synchronize the servo motion group. An alarm message will display prompting the operator to synchronize the servos, when required.	SYNC SERVOS
VACUUM OFF	Press this button to turn the vacuum on or off. When the vacuum is off, the setup won't pick blanks.	VACUUM ON
GLUE OFF	Press this button to turn the glue heads on or off. When the glue is off, the cases will not be glued.	GLUE ON
INCH JOG	With the machine reset and ready to run, press this button to switch to inch jog mode or normal jog mode. When in inch jog mode, the main will jog slowly when the jog main button is held. When in inch jog mode, press the jog main button once to jog the main one inch at a time.	IN INCH JOG MODE
JOG MAIN	With the machine reset and ready to run, press and hold this button to jog the Main servomotor. Release this button to stop the jog.	JOG MAIN
MENUS	Press this button to go to the Menu Screen.	
MAIN	Press this button to go to the Main Screen.	

The FANUC Alarms Screen

On the Alarm History Screen, you may do the following:

View the Alarm Messages	Clear the Alarm History
Scroll through the Alarm Messages	Go to the Menus or Main Screen

Note: Alarms noted with an * are currently active alarm conditions. Those not marked with an * are past alarms.

Figure 3 - 18 The Fanuc Alarm History Screen

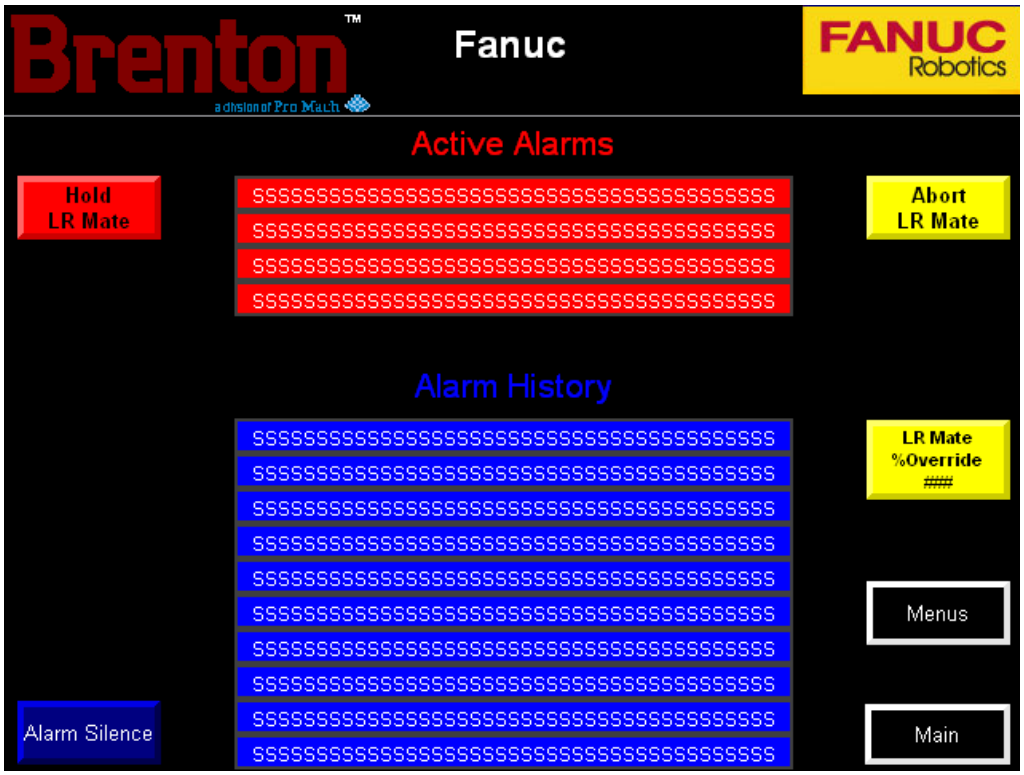


Table 3-13. Fanuc Alarm History Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
HOLD LR MATE	Press this button to pause the robotic program and hold the robot. The robot will stop its motion. When you are ready, you can resume from where the robot left off by restarting.	HOLD LR MATE
ABORT LR MATE	Press and hold this button for two seconds to abort the robot program. Once aborted, the robot will need to be re-assigned.	HOLD 2 SEC

Table 3-13. Fanuc Alarm History Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
LR MATE % OVERRIDE	Press this button to set the Override percentage. The override percentage is the speed at which the robot runs. To set the override percentage: **1.** Press the Override % numeric display. A numeric keypad displays in the center of the screen. **2.** Enter the override percentage, from 5% to 100%. **3.** Press Enter.	
ALARM SILENCE	Press this button to silence the audible alarm horn.	SILENCE
MENUS	Press this button to go to the Menus Screen.	
MAIN	Press this button to go to the Main Screen.	

The Recovery Screen

On the Alarm History Screen, you may do the following:

View the Alarm Messages	Clear the Alarm History
Scroll through the Alarm Messages	Go to the Menus or Main Screen

Note: Alarms noted with an * are currently active alarm conditions. Those not marked with an * are past alarms.

Figure 3 - 19
The Alarm History Screen

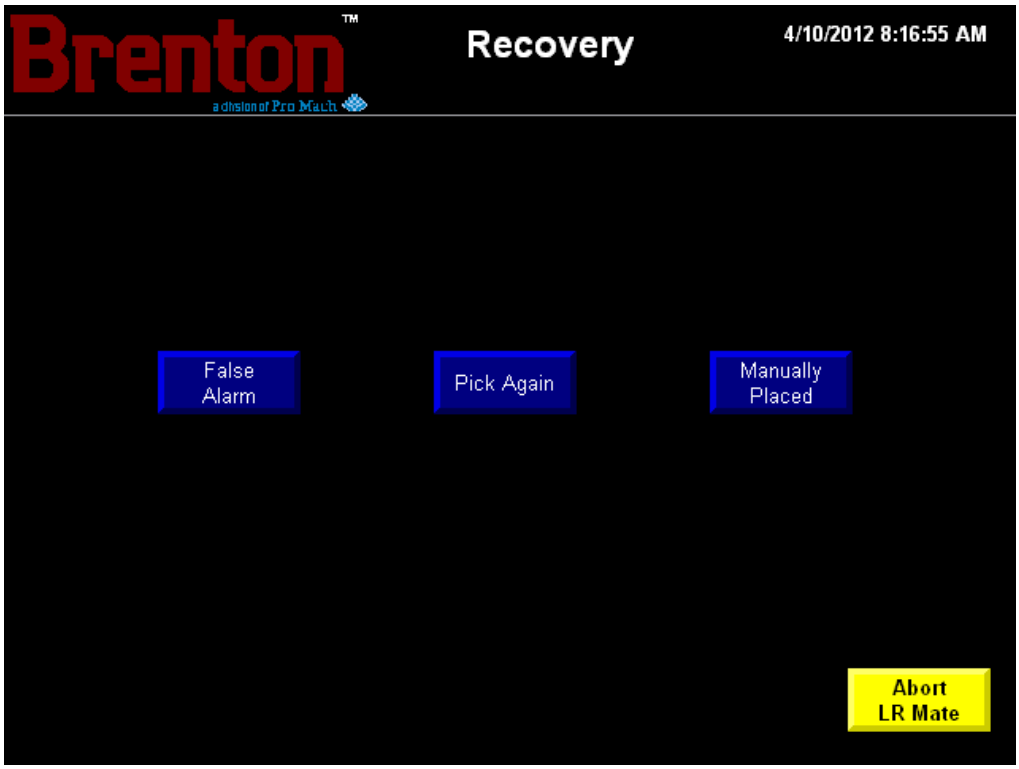


Table 3-14. Recovery Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
FALSE ALARM	Press this button to continue the robot program from where it left off. This command means you are confirming that the robot alarm was false. The robot will ignore that the fault occurred.	FALSE ALARM
PICK AGAIN	Press this button to re-attempt the previous pick again.	PICK AGAIN
MANUALLY PLACED	Press this button to confirm that the divider was manually placed by hand. The robot will begin a new pick.	MANUALLY PLACED

Table 3-14. Recovery Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
ABORT LR MATE	Press and hold this button for two seconds to abort the robot program. Once aborted, the robot will need to be re-assigned.	HOLD 2 SEC
MAIN	Press this button to go to the Main Screen.	

The Glue Screen

On the Glue screen you may do the following.

Set the Start and Stop Positions for Glue Stitch One, Two, and Manufacturer's Timer	Turn the Glue on or off
Synchronize the Servos	Inch Jog or Jog the Main
View the Position of the Main in Inches	Go to the Menus Screen
Turn the Vacuum on or off	Go to the Main Screen

Figure 3 - 20
The Glue Screen

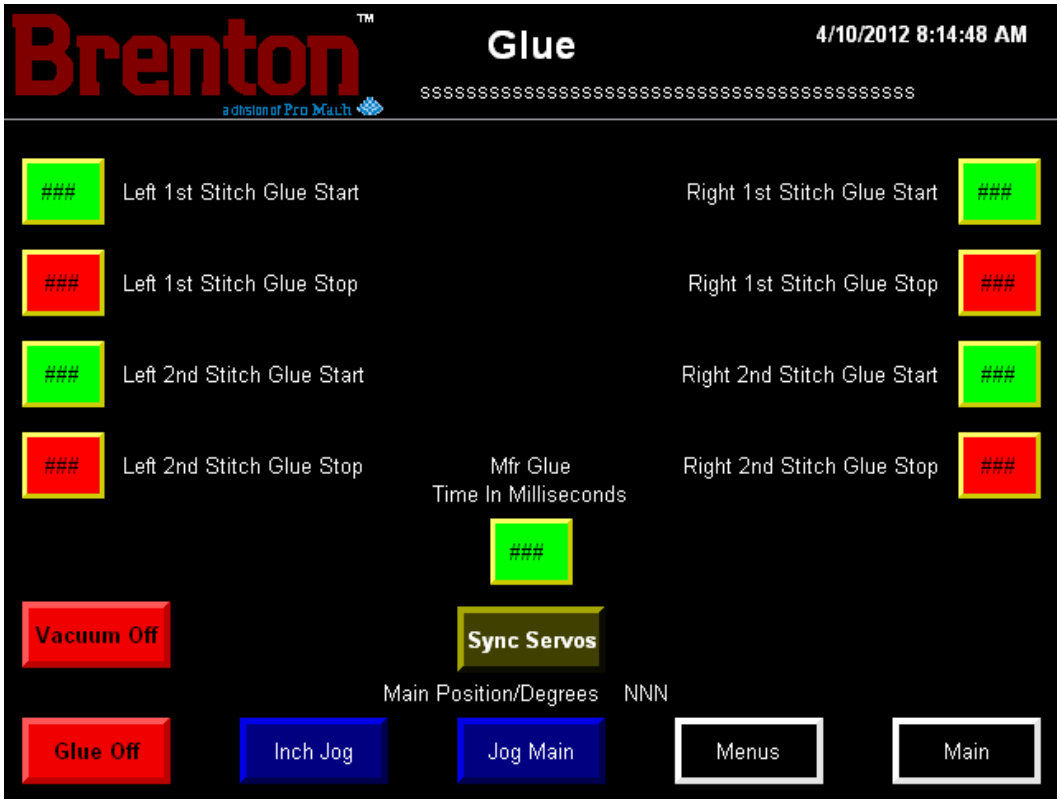


Table 3-15. The Glue Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
LEFT 1ST STITCH GLUE START	• Press this button to display the numeric keypad. • Enter the glue stitch one start position. Use the main position indicator on this screen as a guide. • Press enter.	

Table 3-15. The Glue Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
LEFT 1ST STITCH GLUE STOP	• Press this button to display the numeric keypad. • Enter the glue stitch one stop position. Use the main position indicator on this screen as a guide. • Press enter.	
LEFT 2ND STITCH GLUE START	• Press this button to display the numeric keypad. • Enter the glue stitch two start position. Use the main position indicator on this screen as a guide. • Press enter.	
LEFT 2ND STITCH GLUE STOP	• Press this button to display the numeric keypad. • Enter the glue stitch two stop position. Use the main position indicator on this screen as a guide. • Press enter.	
MFG GLUE TIME IN MILLISECONDS	• Press this button to display the numeric keypad. • Enter the manufacturer's glue spray time in milliseconds. • Press enter.	
RIGHT 1ST STITCH GLUE START	• Press this button to display the numeric keypad. • Enter the glue stitch one start position. Use the main position indicator on this screen as a guide. • Press enter.	
RIGHT 1ST STITCH GLUE STOP	• Press this button to display the numeric keypad. • Enter the glue stitch one stop position. Use the main position indicator on this screen as a guide. • Press enter.	
RIGHT 2ND STITCH GLUE START	• Press this button to display the numeric keypad. • Enter the glue stitch two start position. Use the main position indicator on this screen as a guide. • Press enter.	
RIGHT 2ND STITCH GLUE STOP	• Press this button to display the numeric keypad. • Enter the glue stitch two stop position. Use the main position indicator on this screen as a guide. • Press enter.	
VACUUM IS OFF	Press this button to turn the setup vacuum on or off.	VACUUM IS ON

Table 3-15. The Glue Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
GLUE IS OFF	Press this button to enable or disable the glue. When glue is disabled the glue tank remains active, but glue is not applied to cases.	GLUE IS ON
PURGE ONE BLANK	Press this button to manually setup one blank, when the machine is cycling, but not running production.	PURGE ONE BLANK
SYNC SERVOS	Press this button to synchronize the servo motion group. An alarm message will display prompting the operator to synchronize the servos, when required.	SYNC SERVOS
JOG MAIN	With the machine reset and ready to run, press and hold this button to jog the Main servomotor. Release this button to stop the jog.	JOG MAIN
MENUS	Press this button to go to the Menu Screen.	
MAIN	Press this button to go to the Main Screen.	

The Lane Divider Maintenance Screen

On the Lane Divider Maintenance Screen, you may do the following:

Test the Light Beacons	Jog any of the Indicated Components or the Lane Divider
Rehome the Lane Divider	Release the Metering Belt Servo Brake
Sync the Servos	Reset the Current Fault Condition
Silence the Audible Alarm Horn	Go to the Menus or Main Screens

Figure 3 - 21
The Lane Divider Maintenance Screen

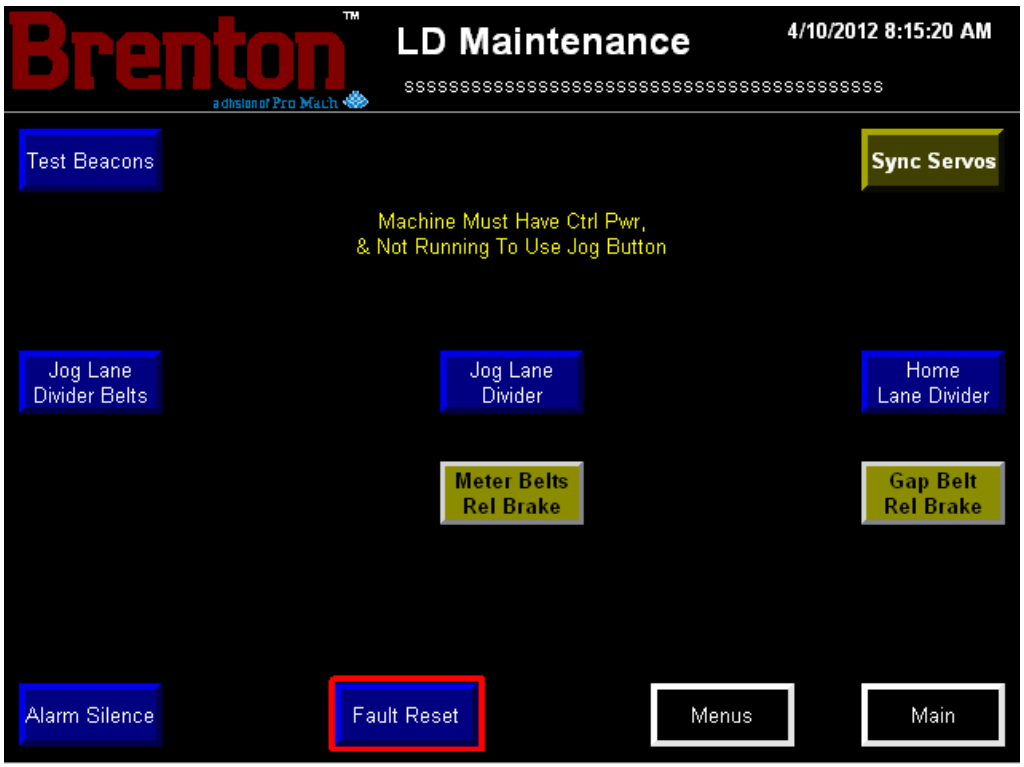


Table 3-16. The Lane Divider Maintenance Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
TEST BEACONS	Press this button to test the light tower beacons. This can be useful for determining if any light bulbs are burn out.	TEST BEACONS

Table 3-16. The Lane Divider Maintenance Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
SYNC SERVOS	Press this button to synchronize the servo motion group. An alarm message will display prompting the operator to synchronize the servos, when required.	SYNC SERVOS
JOG LANE DIVIDER BELTS	With the machine reset and ready to run, press and hold this button to jog the metering and gapping belts. Release the button to stop the jog.	JOG LANE DIVIDER BELTS
JOG LANE DIVIDER	With the machine reset and ready to run, press and hold this button to jog the lane divider position. Release the button to stop the jog.	JOG LANE DIVIDER
HOME LANE DIVIDER	Press this button to rehome the lane divider. Rehoming aligns the mechanical and electrical zero points because all moves are made from the home position.	HOME LANE DIVIDER
METER BELTS REL BRAKE	Press this button to release the metering belts servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	METER BELTS REL BRAKE
GAP BELTS REL BRAKE	Press this button to release the gapping belts servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	GAP BELTS REL BRAKE
ALARM SILENCE	Press this button to silence the audible alarm horn.	SILENCE
FAULT RESET	Press this button to reset the current fault.	FAULT RESET
MENUS	Press this button to go to the Menus screen.	
MAIN	Press this button to go to the Main screen.	

The Lane Divider Servo Setup Screen

On the Lane Divider Servo Setup Screen, you may do the following:

Set the Left Belt Shift Open, Lane Shift Right, and Right Belt Shift Open Positions	Go to the Menus Screen
Teach any of the Lane Positions	Go to the Main Screen

Figure 3 - 22
The Lane Divider Servo Setup Screen

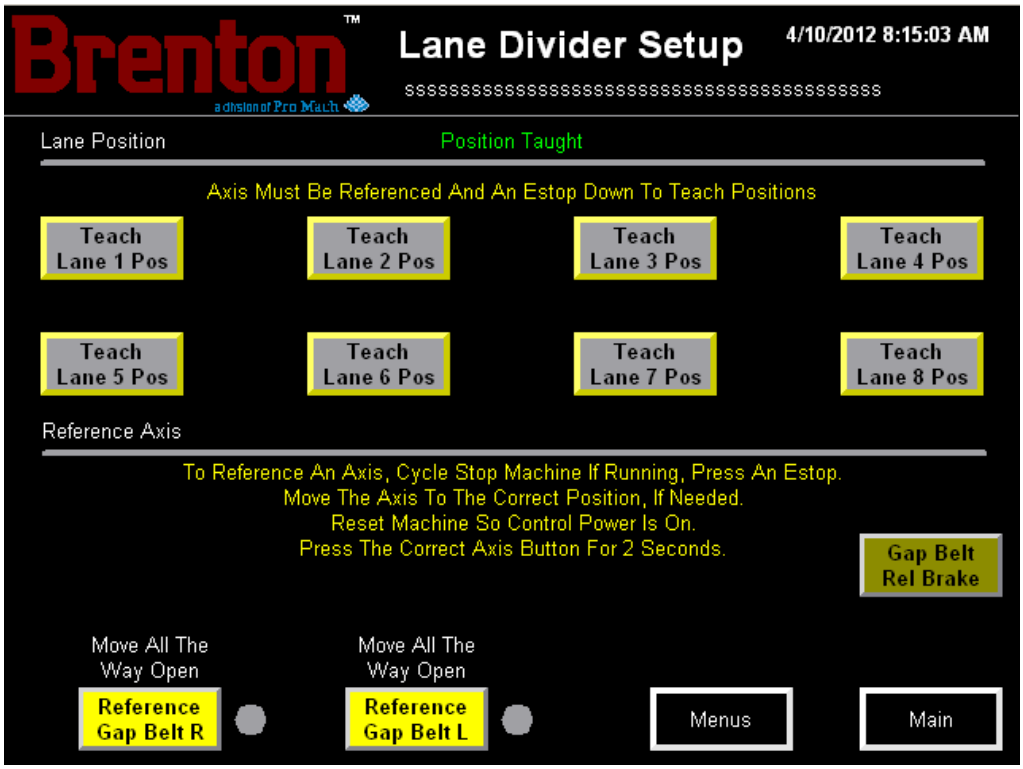


Table 3-17. Lane Divider Servo Setup Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
TEACH LANE # POS	With the axis referenced and the E-stop button down, press and hold this button for two seconds to teach the indicated lane divider position.	**HOLD 2 SEC**

Table 3-17. Lane Divider Servo Setup Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
GAP BELTS REL BRAKE	Press this button to release the gapping belts servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	GAP BELTS REL BRAKE
REFERENCE GAP BELT R	With the Right Gapping Belt all the way open, press and hold this button for two seconds to teach the home position.	HOLD FOR 2 SEC
REFERENCE GAP BELT L	With the Left Gapping Belt all the way open, press and hold this button for two seconds to teach the home position.	HOLD FOR 2 SEC
MENUS	Press this button to go to the Menus screen.	
MAIN	Press this button to go to the Main screen.	

The Partition Mag Setup Screen

On the Partition Magazine Setup Screen, you may do the following:

Set the Erector Vacuum On or Off Positions	Turn the Vacuum or Glue on or off
Set the Rotary Setup Vacuum On Position	Purge one Blank
Set the Partition Magazine Auto Advance Count	Jog the Main
Set the Partition Magazine Auto Advance Run Time	Sync the Servos

Figure 3 - 23 The Partition Magazine Setup Screen

Table 3-18. Partition Magazine Setup Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
MAIN MAGAZINE	Press this button to go to the Main Magazine Screen.	

Table 3-18. Partition Magazine Setup Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
PARTITION MAGAZINE AUTO ADV COUNT	The Partition Magazine Auto Advance Count setting determines the number of indexes for the partition magazine in a cycle. • Press this button to Display the Numeric Keypad. • A Numeric Keypad displays. Enter the Partition Magazine Auto Advance Count, within the parameters on the numeric keypad. • Press Enter.	
PARTITION MAGAZINE AUTO ADV RUN TIME	The Partition Magazine Auto Advance Count setting is the amount of time, in milliseconds, that the partition magazine runs. • Press this button to Display the Numeric Keypad. • A Numeric Keypad displays. Enter the Partition Magazine Auto Advance Run Time, within the parameters on the numeric keypad. • Press Enter.	
MENUS	Press this button to go to the Menu Screen.	
MAIN	Press this button to go to the Main Screen.	

The Axis Reference Main Screen

On the Axis Reference Main Screen, you may do the following:

Set the Home Positions for the Main Servos	Go to the Reference Divider Placer or Reference Infeed Screens
Set the Home Offset Positions for the Leading and Overhead Flights, and Auxiliary Chain	Go to the Menus or Main Screens

Figure 3 - 24
The Axis Reference Main Screen

Table 3-19. The Axis Reference Main Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
SETUP	With the Setup all the way down, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
SETUP REL BRAKE	Press this button to release the Setup servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	HOLD 2 SEC

Table 3-19. The Axis Reference Main Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
TUCKER LEFT	With the Tucker all the way closed, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
FUNNEL LEFT	With the Funnel all the way open, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
FLIGHTS	Press and hold this button for two seconds to teach the flights home position.	HOLD 2 SEC
LEADING OFFSET	Press this numeric display to set the Leading Flights home offset position. This is the move made during homing after reaching the initial home position. The home offset alters the home position.	
FLAP TRAP LEFT	With the Flap Trap all the way open, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
FLAP TRAP RIGHT	With the Flap Trap all the way open, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
TUCKER RIGHT	With the Tucker all the way closed, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
FUNNEL RIGHT	With the Funnel all the way open, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
REF PAGE 2	Press this button to go to the Reference Page 2 Screen.	
REF INFEED	Press this button to go to the Infeed Servo Setup Screen.	
MENUS	Press this button to go to the Menus screen.	
MAIN	Press this button to go to the Main screen.	

The Axis Reference Infeed Screen

On the Axis Reference Infeed Screen, you may do the following:

Set the Home Positions for the Infeed Servos	Go to the Divider Placer Reference or Reference Main Axis Screens
Release the Metering Pin Index Brake	Go to the Menus or Main Screen

Figure 3 - 25
The Axis Reference Infeed Screen

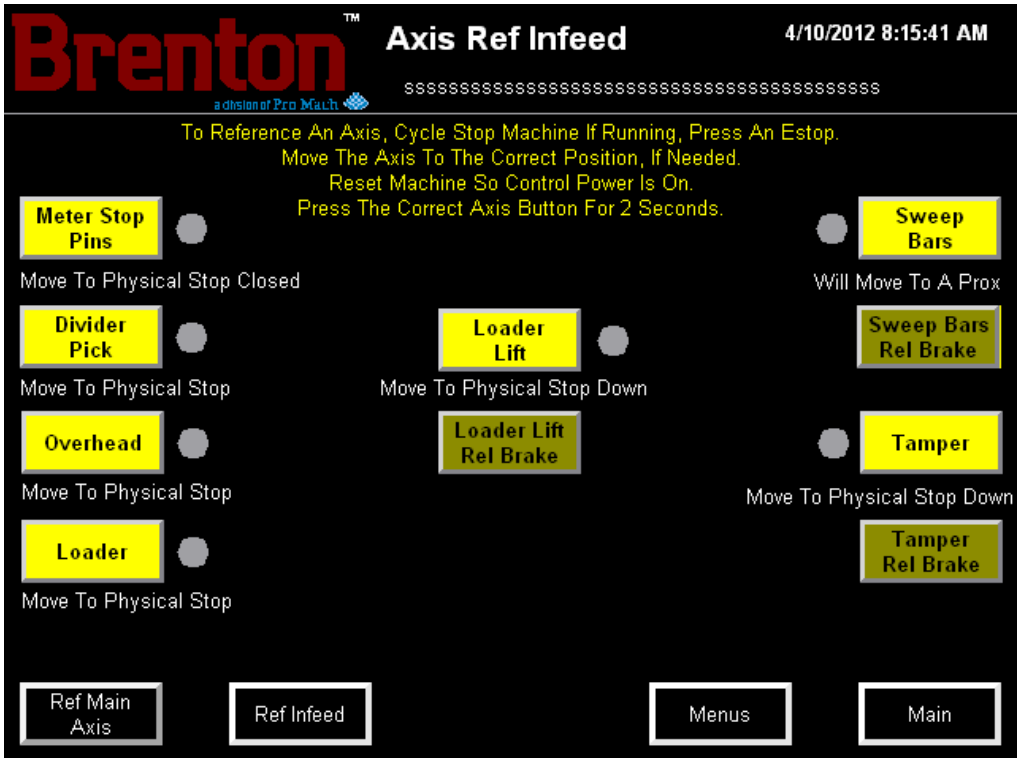


Table 3-20. The Axis Reference Infeed Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
METER STOP PINS	With the Meter Stop Pins all the way closed, press and hold this button for two seconds to teach the home position.	**HOLD 2 SEC**
DIVIDER PICK	With the Meter Stop Pins to the physical stop, press and hold this button for two seconds to teach the home position.	**HOLD 2 SEC**
OVERHEAD	With the Overhead to the physical stop, press and hold this button for two seconds to teach the home position.	**HOLD 2 SEC**

Table 3-20. The Axis Reference Infeed Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
LOADER	With the Loader to the physical stop, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
LOADER LIFT	With the Loader Lift all the way down, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
LOADER LIFT REL BRAKE	Press this button to release the Loader Lift servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	LOADER LIFT REL BRAKE
SWEEP BARS	Press and hold this button for two seconds to teach the flights home position.	HOLD 2 SEC
SWEEP BARS REL BRAKE	Press this button to release the Sweep Bars servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	SWEEP BARS REL BRAKE
TAMPER	With the Tamper all the way down, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
TAMPER REL BRAKE	Press this button to release the Tamper servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	TAMPER REL BRAKE
REF MAIN AXIS	Press this button to go to the Reference Main Axis screen.	
REF INFEED	Press this button to go to the Reference Infeed Axis screen.	
MENUS	Press this button to go to the Menus screen.	
MAIN	Press this button to go to the Main screen.	

The Axis Reference Main Page 2 Screen

On the Axis Reference Main Page 2 Screen, you may do the following:

Set the Home Positions for the Magazine Servos	Release the Nip Rollers Servo Brake
Jog the Setup Upwards	Go to the Menus or Main Screen

Figure 3 - 26
The Axis Reference Magazine Screen

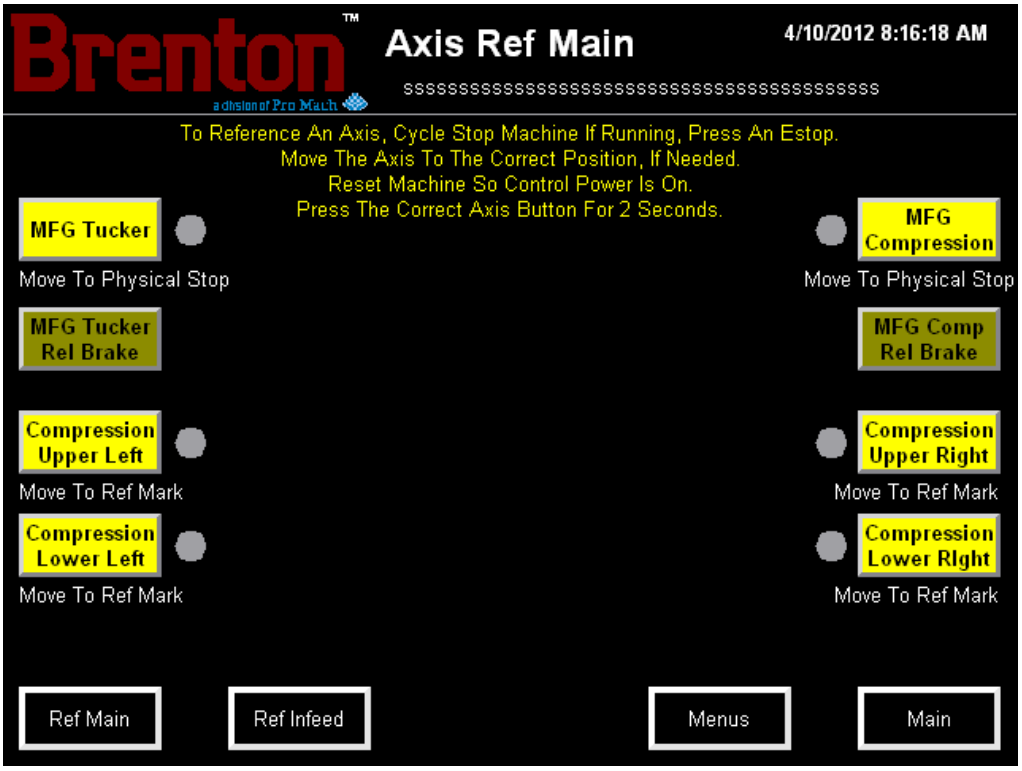


Table 3-21. The Axis Reference Magazine Screen Button Descriptions

STATE 1	DESCRIPTION	STATE 2
MFG TUCKER	With the Manufacturer's Tucker to the physical stop, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
MFG TUCKER REL BRAKE	Press this button to release the Manufacturer's Tucker servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	MFG TUCKER REL BRAKE

Table 3-21. The Axis Reference Magazine Screen Button Descriptions (Continued)

STATE 1	DESCRIPTION	STATE 2
COMPRESSION UPPER LEFT	With the Compression Upper Left to the reference mark, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
COMPRESSION LOWER LEFT	With the Compression Lower Left to the reference mark, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
MFG COMPRESSION	With the Manufacturer's Compression to the physical stop, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
MFG COMP REL BRAKE	Press this button to release the Manufacturer's Compression servo brake. When the servo brake is released, the component moves freely. Always make sure the component is supported in some manner before releasing the servo brake.	MFG COMP REL BRAKE
COMPRESSION UPPER RIGHT	With the Compression Upper Right to the reference mark, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
COMPRESSION LOWER RIGHT	With the Compression Lower Right to the reference mark, press and hold this button for two seconds to teach the home position.	HOLD 2 SEC
REF MAIN	Press this button to go to the Reference Main Axis screen.	
REF INFEED	Press this button to go to the Reference Infeed Axis screen.	
MENUS	Press this button to go to the Menus screen.	
MAIN	Press this button to go to the Main screen.	

The VFD Setup Screen

On the VFD Setup screen, you may do the following:

Set the Speed Setting (In Feet Per Min or Hertz) Within the Parameters on the Numeric keypad for each of the Displayed Settings	Go to the Menus or Main Screen

Figure 3 - 27 The VFD Setup Screen

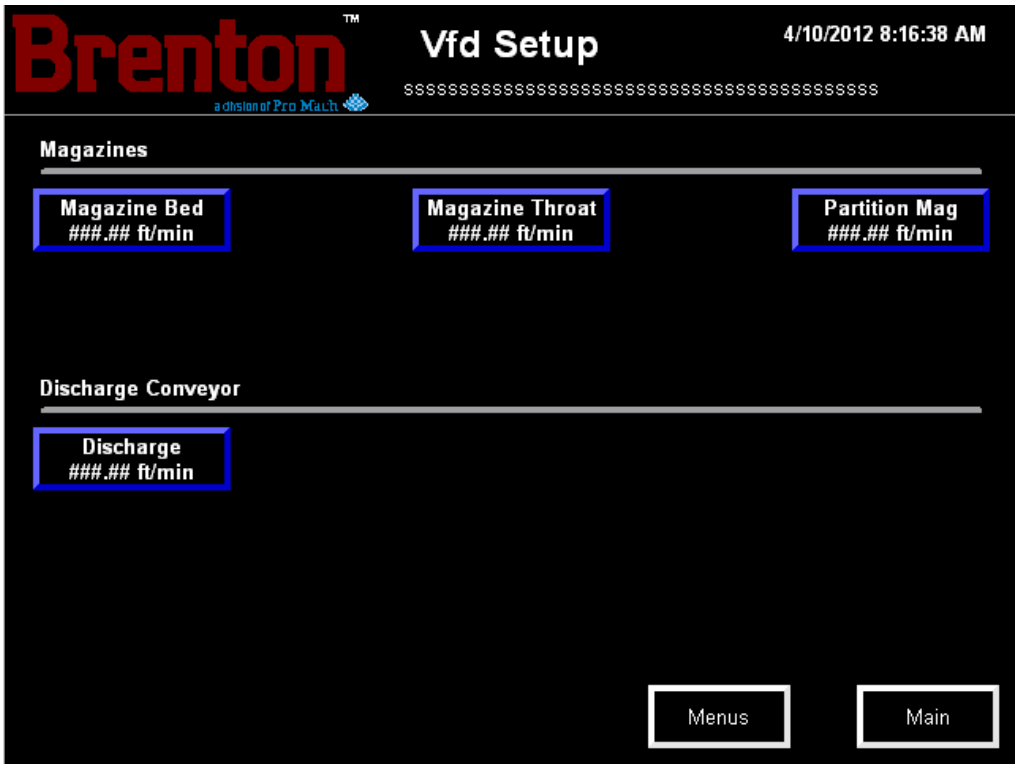


Table 3-22. The VFD Setup Screen Button Descriptions

STATE 1	DESCRIPTION
HZ	• Press this button to display the numeric keypad. • Enter the speed for the indicated conveyor, in Hz, within the parameters listed on the numeric keypad. • Press Enter to confirm the speed change.
MENUS	Press this button to go to the Menu Screen.
MAIN	Press this button to go to the Main Screen.

The Shutdown Screen

On the Shutdown Screen, you may confirm or cancel the HMI software shutdown.

Figure 3 - 28
The Shutdown Screen

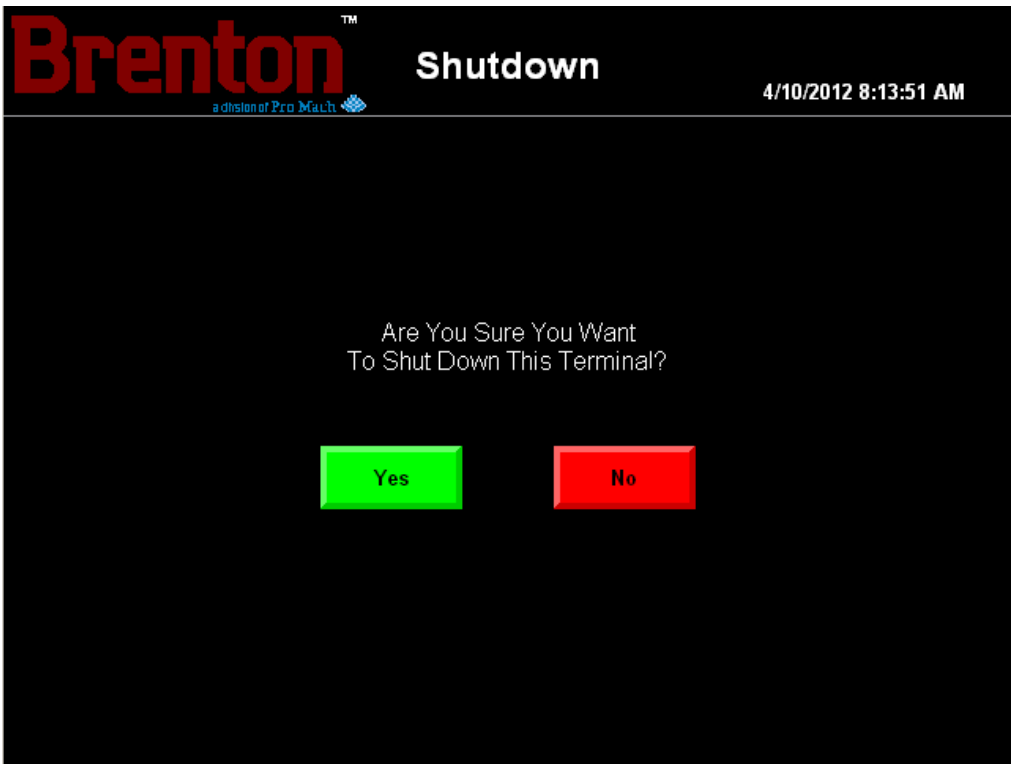


Table 3-23. Shutdown Screen Button Descriptions

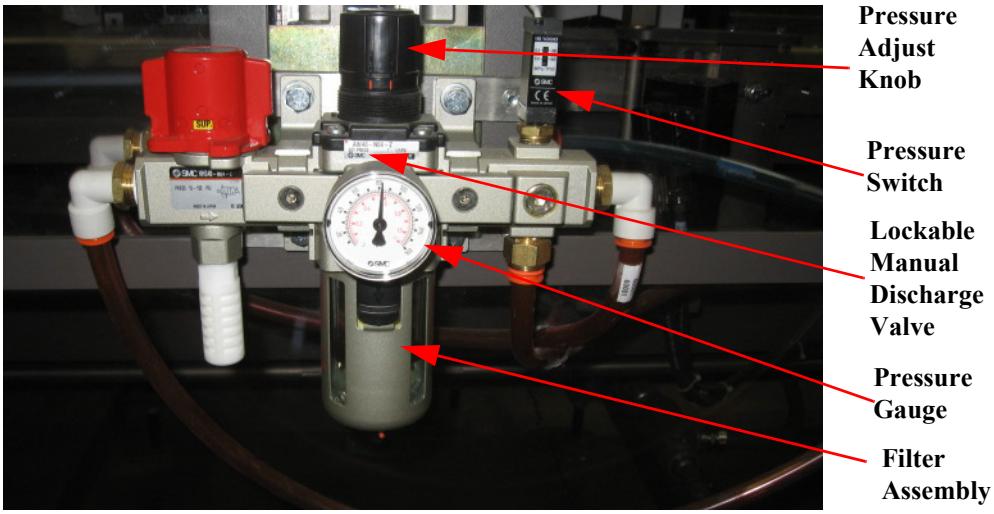
STATE 1	DESCRIPTION
YES	Press this button to confirm the HMI program shut down.
NO	Press this button to go back to the previous Setup Screen.

Pneumatic Controls

The Pneumatic Discharge Valve Assembly

This assembly is located near the HMI. It controls and conditions the air coming into the Case Packaging System.

Figure 3 - 29 The Pneumatic Discharge Assembly



A lockable manual Discharge Valve is located at the Incoming air line to the machine. This valve is used to turn on/off the incoming air to the machine. A lock may be placed on the valve lever to insure safe entrance to the entire machine.

The Pressure Regulator is used to control the amount of incoming air to the system. It is adjustable and should be set at 80 PSI. A pressure gauge is used to visually monitor this pressure. To increase the pressure, pull the Pressure Adjustment Knob up and turn clockwise. To decrease air pressure, turn counterclockwise. To lock the knob, press down.

A Pressure Switch monitors the incoming air pressure. If pressure falls below 55 PSI, the pressure switch signals the PLC and the machine stops automatically. When this happens, an alarm is generated causing a horn to sound. It also causes a message to display on the HMI and the Red Light will turn on in the Light Tower.

An Automatic Discharge (quick release) Solenoid Valve discharges air pressure to the machine, automatically when an Emergency Stop condition occurs.

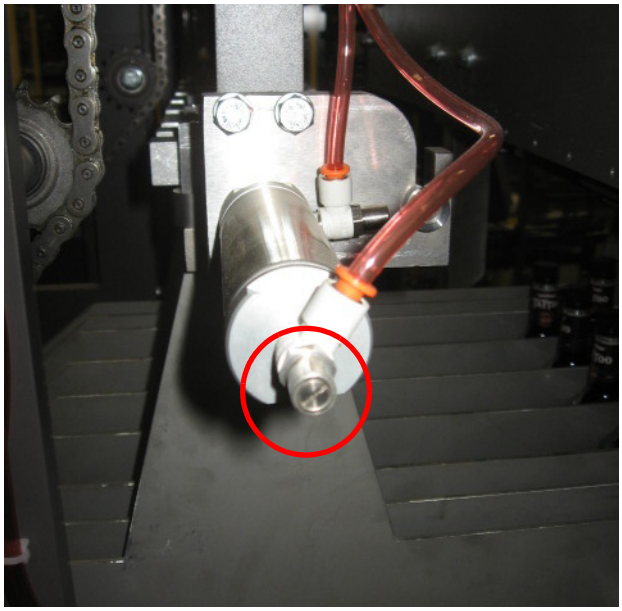
CAUTION ALWAYS CHECK FOR RESIDUAL AIR PRESSURE BEFORE ENTERING THE MACHINE.

Pneumatic Flow Controls

Pneumatic Flow Controls are used to restrict the air pressure while being released from an air cylinder. They allow speed control of cylinder actuation. They can be used on a linear or a rotary actuator. They have a slotted adjustment knob and lock.

- To release the lock, turn it to the left or counter-clockwise.
- To decrease speed, turn the adjustment knob clockwise. This restricts/decreases air-flow from the cylinder and causes the cylinder to move slower.
- To increase speed, turn the adjustment knob counter-clockwise. This increases airflow from the cylinder and causes the cylinder to move faster.

Figure 3 - 30
Pneumatic Flow Control (Typical)

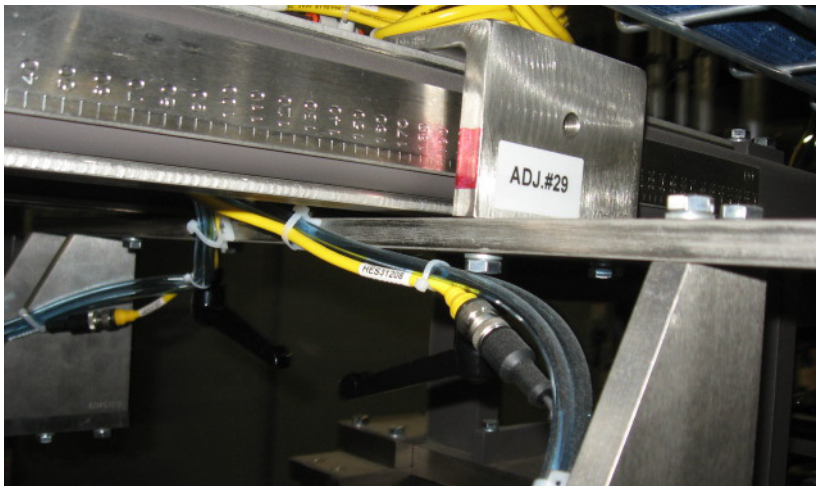


Instrumentation

Adjustment Scales

Adjustment scales are used as a gauge for many of the changeover procedures. Some scales are etched right on the face of the part. Some are glued or riveted on. The changeover section of the operators manual will describe the correct procedures for each of these scales. Adjust the scale so that the marked edge lines up with the scale adjustment detailed in Section 5 of this manual.

Figure 3 - 31
Typical Adjustment Scales



Siko Digital Position Indicator

The Siko Digital Position Indicator is a mechanical counter, that operations or maintenance personnel manually adjust. The counters are used as a gauge to accurately adjust many of the changeover procedures on this machine. Typically, a crank handle is used to drive an adjustment and the Siko Counter is attached to that adjustment. The changeover section of this manual describes the correct setting for each Siko Counter.

Figure 3 - 32
Siko Digital Position Indicator

Information & Alarm History Displays

When a fault, error, or condition occurs, a message is displayed until the fault, jam or condition clears. Correct the condition and press the Control Power Reset to clear the message and continue machine operation. A description of these messages appears on the following pages.

Table 3-24. The Information and Alarm History Displays

MESSAGE	DESCRIPTION	CORRECTION
NO CONTROL POWER	Control power is not present.	Press the control power reset button to re-gain control power prior to starting.
NO AIR PRESSURE	Pneumatic pressure is low.	Check the pneumatic supply. Ensure the pneumatic supply is adjusted to 80 psi.
AIR LOSS FAULT	Air pressure was lost during production.	Check the pneumatic supply. Ensure the pneumatic supply is adjusted to 80 psi.
SERVOS RECOVERING	The servos are recovering.	Allow the servos to recover before startup.
MACHINE RUNNING	The machine is currently running with no faults.	No correction necessary.
MACHINE RUNNING WHILE GLUE IS DISABLED	The machine is running with the glue disabled.	To run full production, enable the glue on the HMI.
MACHINE RUNNING WHILE VACUUM IS DISABLED	The machine is running with the setup vacuum and glue disabled.	To run full production, enable the vacuum and glue on the HMI.
MACHINE READY TO RUN	The machine is reset and ready to run.	Press and hold the start button for three seconds to start the machine.
LOW MAGAZINE CASE PACKER	The magazine is low on case blanks.	Fill the case magazine with the correct blanks for the current production run.
LOW MAGAZINE DIVIDER	The divider magazine is low on dividers.	Fill the divider magazine with the correct blanks for the current production run.
PACK SELECTED NOT VALID	The pack selection is not valid.	Select a valid pack pattern on the Pack Select Screen.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
ACCEPT PACK CHANGE REQUEST	There is a pending pack change request.	Accept the pack request on the Pack Select screen.
HMI E STOP PRESSED	The HMI E-stop is currently pressed.	Release the E-stop to allow operation.
NON OPERATOR SIDE INFEED E STOP PRESSED	The indicated E-stop is currently pressed.	Release the E-stop to allow operation.
NON OPERATOR SIDE DISCHARGE E STOP PRESSED		
LANE DIVIDER LEFT SIDE E STOP PRESSED		
LANE DIVIDER RIGHT SIDE E STOP PRESSED		
DIVIDER MAGAZINE E STOP PRESSED		
DISCHARGE E STOP PRESSED		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
GUARD DOOR 1 OPEN **GUARD DOOR 2 OPEN** **GUARD DOOR 3 OPEN** **GUARD DOOR 4 OPEN** **GUARD DOOR 5 OPEN** **GUARD DOOR 6 OPEN** **GUARD DOOR 7 OPEN** **GUARD DOOR 8 OPEN** **GUARD DOOR 9 OPEN** **GUARD DOOR 10 OPEN** **GUARD DOOR 11 OPEN** **GUARD DOOR 12 OPEN** **GUARD DOOR 13 OPEN** **GUARD DOOR 14 OPEN** **GUARD DOOR 15 OPEN** **GUARD DOOR 16 OPEN** **GUARD DOOR 17 OPEN** **GUARD DOOR 18 OPEN**	The indicated guard door is currently pressed.	Close the guard door to allow operation.
ROBOT TEACH PENDANT E STOP PRESSED	The indicated E-stop is currently pressed.	Release the E-stop to allow operation.
ROBOT SOP E STOP PRESSED		
ROBOT NOT IN AUTO	The robot SOP key switch is not in the Auto position.	Turn the key switch in the Auto position to allow automatic operation.
ROBOT TEACH PENDANT ENABLED	The Fanuc Teach Pendant is enabled.	Turn the On/Off switch on the Fanuc hand held teach pendant to the off position to allow automatic operation.
ROBOT FAULTED	There is a Fanuc fault.	See the Fanuc Alarm Screen for Fanuc Faults.
ROBOT NOT READY VERIFY NOT IN STEP MODE	The robot is not ready to run and could be is step mode.	Turn off step mode on the Teach Pendant.
ROBOT ABORTED	The robot program is aborted.	Re-assign the robot, when ready.
ROBOT PAUSED	The robot program is paused.	Resume, when ready.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
ROBOT COLLISION	A collision was detected.	Respond to the recovery screen on the HMI. See "The Recovery Screen" on page 3 - 30.
ROBOT UNEXPECTED FAULT	There is a Fanuc fault.	See the Fanuc Alarm Screen for Fanuc Faults.
ROBOT COMMUNICATION FAULT	There is a robot communication fault.	Check connections to the robot controller and robot.
ROBOT NOT ON CORRECT PATTERN	The robot is assigned to a different pack pattern than the casepacker.	Check the robot assignment, change the assignment.
SERVO SAFE OFF RELAY FAULT	There is a safe off relay fault.	Reset the relay to continue.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
SETUP SERVO FAULT	The servo is unable to complete its move. Possible conditions that cause this problem include: • E-stop condition • Position error • Mechanical bind • Product blocking the servo assembly • The servo cannot move • Internal fault	• Check Fuses and Power to the Servo Drive. • See the vendor data sheets for more troubleshooting information.
FLAP TRAP LEFT SERVO FAULT		
FLAP TRAP RIGHT SERVO FAULT		
FUNNELS LEFT SERVO FAULT		
FUNNELS RIGHT SERVO FAULT		
TUCKER LEFT SERVO FAULT		
TUCKER RIGHT SERVO FAULT		
5TH PANEL TUCKER SERVO FAULT		
5TH PANEL COMPRESSION SERVO FAULT		
COMPRESSION UPPER LEFT SERVO FAULT		
COMPRESSION LOWER LEFT SERVO FAULT		
COMPRESSION UPPER RIGHT SERVO FAULT		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
COMPRESSION LOWER RIGHT SERVO FAULT	The servo is unable to complete its move. Possible conditions that cause this problem include: • E-stop condition • Position error • Mechanical bind • Product blocking the servo assembly • The servo cannot move • Internal fault	• Check Fuses and Power to the Servo Drive. • See the vendor data sheets for more troubleshooting information.
LEADING FLIGHTS SERVO FAULT		
TRAILING FLIGHTS SERVO FAULT		
METERING BELTS LEFT SERVO FAULT		
METERING BELTS RIGHT SERVO FAULT		
GUN BELTS SHIFT LEFT SERVO FAULT		
GUN BELTS SHIFT RIGHT SERVO FAULT		
METERING STOP PINS SERVO FAULTS		
PRE LOAD CONVEYOR SERVO FAULT		
LOADER CONVEYOR SERVO FAULT		
SWEEP BARS SERVO FAULT		
TAMPER SERVO FAULT		
LOADER SERVO FAULT		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
LOADER LIFT SERVO FAULT **DIVIDER PICK SERVO FAULT** **OVERHEAD SERVO FAULT**	The servo is unable to complete its move. Possible conditions that cause this problem include: • E-stop condition • Position error • Mechanical bind • Product blocking the servo assembly • The servo cannot move • Internal fault	• Check Fuses and Power to the Servo Drive. • See the vendor data sheets for more troubleshooting information.
SETUP COMMUNICATION FAULT **FLAP TRAP LEFT COMMUNICATION FAULT** **FLAP TRAP RIGHT COMMUNICATION FAULT** **FUNNELS LEFT COMMUNICATION FAULT** **FUNNELS RIGHT COMMUNICATION FAULT** **TUCKER LEFT COMMUNICATION FAULT** **TUCKER RIGHT COMMUNICATION FAULT**	There is a communication fault to the indicated servo.	Check connections. Check that the servo node is properly selected.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
5TH PANEL TUCKER COMMUNICATION FAULT	There is a communication fault to the indicated servo.	Check connections. Check that the servo node is properly selected.
5TH PANEL COMPRESSION COMMUNICATION FAULT		
COMPRESSION UPPER LEFT COMMUNICATION FAULT		
COMPRESSION LOWER LEFT COMMUNICATION FAULT		
COMPRESSION UPPER RIGHT COMMUNICATION FAULT		
COMPRESSION LOWER RIGHT COMMUNICATION FAULT		
LEADING FLIGHTS COMMUNICATION FAULT		
TRAILING FLIGHTS COMMUNICATION FAULT		
METERING BELTS LEFT COMMUNICATION FAULT		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
METERING BELTS RIGHT COMMUNICATION FAULT	There is a communication fault to the indicated servo.	Check connections. Check that the servo node is properly selected.
GUN BELTS SHIFT LEFT COMMUNICATION FAULT		
GUN BELTS SHIFT RIGHT COMMUNICATION FAULT		
METERING STOP PINS COMMUNICATION FAULT		
PRE LOAD CONVEYOR COMMUNICATION FAULT		
LOADER CONVEYOR COMMUNICATION FAULT		
SWEEP BARS COMMUNICATION FAULT		
TAMPER COMMUNICATION FAULT		
LOADER COMMUNICATION FAULT		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
LOADER LIFT COMMUNICATION FAULT	There is a communication fault to the indicated servo.	Check connections. Check that the servo node is properly selected.
DIVIDER PICK COMMUNICATION FAULT		
OVERHEAD COMMUNICATION FAULT		
22 COMM E 20109 COMMUNICATION FAULT		
22 COMM E 20113 COMMUNICATION FAULT		
SETUP SERVO NEEDS TO BE REFERENCED	The indicated servo needs to be referenced.	On the correct Axis Reference screen, check the correct position to place the component. Press and hold the reference button for two seconds to reference the servo position.
FLAP TRAP LEFT SERVO NEEDS TO BE REFERENCED		
FLAP TRAP RIGHT SERVO NEEDS TO BE REFERENCED		
FUNNEL LEFT SERVO NEEDS TO BE REFERENCED		
FUNNEL RIGHT SERVO NEEDS TO BE REFERENCED		
TUCKER LEFT SERVO NEEDS TO BE REFERENCED		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
TUCKER RIGHT SERVO NEEDS TO BE REFERENCED	The indicated servo needs to be referenced.	On the correct Axis Reference screen, check the correct position to place the component. Press and hold the reference button for two seconds to reference the servo position.
5TH PANEL TUCKER SERVO NEEDS TO BE REFERENCED		
5TH PANEL COMPRESSION SERVO NEEDS TO BE REFERENCED		
COMPRESSION UPPER LEFT SERVO NEEDS TO BE REFERENCED		
COMPRESSION LOWER LEFT SERVO NEEDS TO BE REFERENCED		
COMPRESSION UPPER RIGHT SERVO NEEDS TO BE REFERENCED		
COMPRESSION LOWER RIGHT SERVO NEEDS TO BE REFERENCED		
LEADING FLIGHTS SERVO NEEDS TO BE REFERENCED		
TRAILING FLIGHTS SERVO NEEDS TO BE REFERENCED		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
GUN BELTS SHIFT LEFT SERVO NEEDS TO BE REFERENCED	The indicated servo needs to be referenced.	On the correct Axis Reference screen, check the correct position to place the component. Press and hold the reference button for two seconds to reference the servo position.
GUN BELTS SHIFT RIGHT SERVO NEEDS TO BE REFERENCED		
METERING STOP PINS SERVO NEEDS TO BE REFERENCED		
SWEEP BARS SERVO NEEDS TO BE REFERENCED		
TAMPER SERVO NEEDS TO BE REFERENCED		
LOADER SERVO NEEDS TO BE REFERENCED		
LOADER LIFT SERVO NEEDS TO BE REFERENCED		
DIVIDER PICK SERVO NEEDS TO BE REFERENCED		
OVERHEAD SERVO NEEDS TO BE REFERENCED		
GLUE TANK NOT READY	The glue tank is not ready to run.	Check the glue tank panel. The temperature may not be up to production temp.
GLUE TANK FAULTED	The glue tank is faulted.	Check the nordson glue tank error code with Nordson documentation.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
GLUE TANK LOW	The glue tank is low on glue.	Fill the glue tank. Allow the glue tank to reach operation temperature before running.
LANE DIVIDER METER BELTS JAM	There is a jam at the indicated location.	Clear the jam. Reset and restart when ready.
LANE DIVIDER GAPPING BELTS JAM		
MAGAZINE BED VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
MAGAZINE BED MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
MAGAZINE THROAT VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
MAGAZINE THROAT MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
PARTITION DIVIDER MISSPICK	The partition divider attempted a pick, but did not properly pick the partition.	Place the partition in the staged position. Check partition divider adjustments. Check partition picker vacuum cups for worn or damaged cups. Ensure vacuum pressure is at 80 psi. Check that partitions are not warped, damaged, or wet.
PARTITION MAGAZINE DISCONNECT OFF	The partition magazine disconnect is off.	Turn the field disconnect on to allow operation.
PARTITION MAGAZINE VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
PARTITION MAGAZINE MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
DISCHARGE VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
DISCHARGE MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
LANE DIVIDER CONVEYOR VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
LANE DIVIDER CONVEYOR MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
GAP BELT LEFT VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
GAP BELT LEFT MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
GAP BELT RIGHT VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
GAP BELT RIGHT MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
LINE PLC IS BYPASSED	The line PLC is bypassed.	Turn off bypass on the Maintenance screen to allow the line PLC to control.
UNDER SWEEP CONVEYOR VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
UNDER SWEEP CONVEYOR MOTOR NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
MISSPICK MAIN	The setup mispicked.	Remove any loose blank from the main. Check vacuum cups for worn or damaged vacuum cups. Ensure the vacuum cups are not clogged with corrugate dust. Check magazine clip adjustments. Check that blanks are not warped, damaged, or wet.
INFEED CLEAN OUT MODE	The infeed is in clean out mode.	Disable clean out mode once the product is cleaned out.
FALLEN PRODUCT IN SWEEP BARS	Fallen product is detected at the sweep bars.	Remove or upright the fallen product.
SWEEP VERTICAL ADJUSTMENT VFD FAULTED	The Variable Frequency Drive has faulted. The fault indicator light on the front of the VFD is illuminated.	After correcting the cause of the fault, press Fault Reset.
SWEEP VERTICAL ADJUSTMENT VFD NOT RUNNING	The indicated component is not running, but should be.	Check for mechanical binding.
CASE SQUARE JAM	There is a jam at the indicated location.	Clear the jam. Reset and restart when ready.
OPEN FLAP FAULT	An open flap was detected.	Check for the cause of the open flaps. Check the glue temperature. Check compression settings.
DISCHARGE BACKED UP	The discharge is backed up.	Check for the cause of the downstream backup. Reset and restart, when ready.
LOW PRODUCT INFEED	There is low product on the infeed.	Check for the cause of the upstream slow down.
PRODUCT STILL AT LOAD AREA	Product is detected at the loader after the expected load.	Remove the bottles. Fill the case at the loader. Reset and restart, when ready.
DIVIDER PICK CYLINDER JAM	There is a jam at the indicated location.	Clear the jam. Reset and restart when ready.
INFEED OVERHEAD CYLINDER JAM		

Table 3-24. The Information and Alarm History Displays (Continued)

MESSAGE	DESCRIPTION	CORRECTION
INFEED PRODUCT ALIGNMENT CYLINDERS JAM	There is a jam at the indicated location.	Clear the jam. Reset and restart when ready.
DISCHARGE DISCONNECT OFF	The discharge disconnect is in the off position.	Turn the disconnect on to allow operation.
LINE PLC COMMUNICATION LOST	Communication with the line PLC is lost.	Check for the cause of the lost communication or bypass the line PLC on the Maintenance screen.
NO RUN PERMISSIVE FROM LINE PLC	There is no run permissive from the line PLC.	Check why the line permissive is not granted or bypass the line PLC on the Maintenance screen.
NO DOWN STREAM RUN PERMISSIVE	There is no downstream run permissive.	Check for the cause of the downstream not ready. Restart when downstream equipment is ready or bypass the downstream run permissive, if appropriate.
NO INFEED RUN PERMISSIVE FROM LINE PLC	There is no infeed run permissive from the line PLC.	Check why the line permissive is not granted or bypass the line PLC on the Maintenance screen.
NO DISCHARGE RUN PERMISSIVE FROM LINE PLC	There is no discharge run permissive from the line PLC.	Check why the line permissive is not granted or bypass the line PLC on the Maintenance screen.
DIVIDER SQUARE CYLINDER JAM	There is a jam at the indicated location.	Clear the jam. Reset and restart when ready.
DIVIDER HOLD BACK CYLINDER JAM		

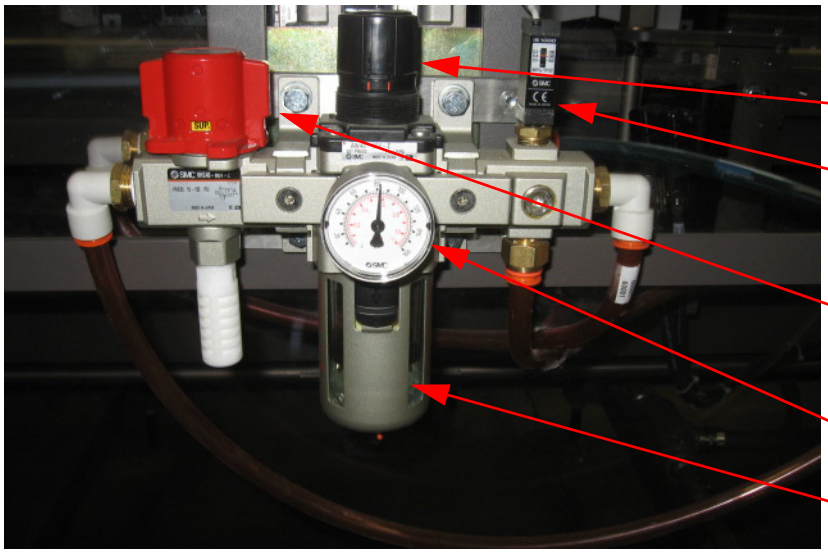
Troubleshooting Contents

4. Troubleshooting

Sequence Of Operation

Initial Conditions Before Startup

Figure 4 - 1
Pneumatic Supply Components



1. Turn the red hand valve in on the "Manual Discharge Valve" to turn on the main air supply. Air flow is supplied to the following components:
   - The "Air Filter and Pressure Regulator."
   - The “Pressure Switch.”
   - All pneumatic components unless it has the "Electric Air Dump Valve."
2. The air filter features a drain to release any moisture the filter collects from the compressed air system.
3. Adjust the air pressure. The "Pressure Gauge" should read 85 PSI. If 55 PSI is present at the pressure switch, input in the PLC is satisfied.
4. Move the “Main Disconnect” to the “ON” position. Make sure the Auxiliary Disconnect is in the “ON” position.
5. Close all guard doors.
6. The "Guard Door" master control relay is energized and reset button pushed when all the doors are closed.
7. Disengage all E-stops. See Figure 1 - 5 on page 1 - 13.
8. Make sure all personnel, tools, and equipment are clear of the machine.
9. Make sure the Vacuum is "ON."
10. Make sure the case blanks are loaded into the magazine.

Overview

The Lane Divider

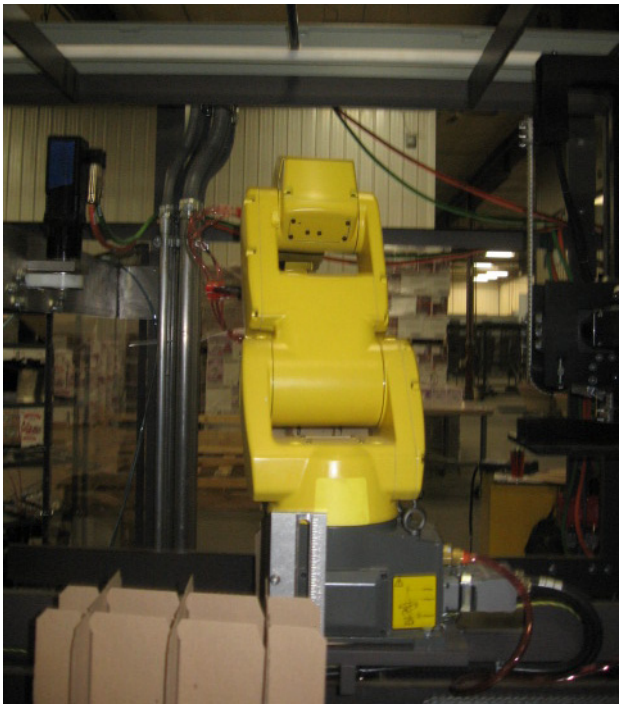
Individual bottles are received in a single file from the customer's in-feed conveyor, and diverted into the proper number of lanes per the pack pattern via S45 lane divider. After the lane divider, a product gate holds the pack pattern back until the entire pack pattern is accumulated. The product gate again closes to hold back the second pack pattern once the first is released to the overhead sweep bars.

Figure 4 - 2
The Lane Divider

The Divider Placer Robot

Before the case is loaded, a multi cell divider is picked opened and staged for the Fanuc LR mate to pick. The robot uses a clamp style End of Arm Tool to pick the divider. The robot stages the divider over the pack pattern, which is held in place by overhead bars at the placement station. A mattop conveyor ensures the bottles are tightly pressed against the overhead sweep bars. The robot then guides the divider over the top off the pack pattern. At the next station, the divider is tamped all the way down.

Figure 4 - 3
The Divider Placer Robot



The Divider Tamper

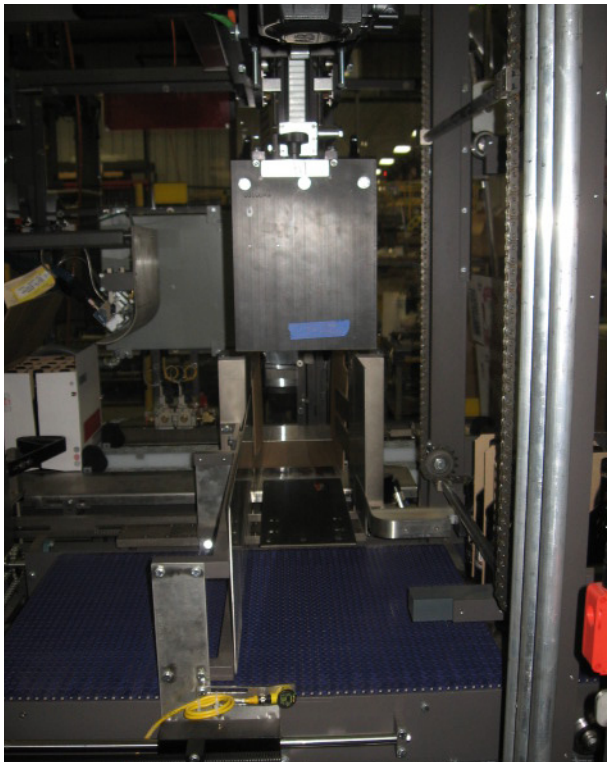
At the previous station, the robot placed a divider, but due to reach, the robot only placed the divider partially into the pack pattern. At this station, the divider tamper pushes the divider all the way down into the pack pattern with a servo driven tamper. The flat plate stops at a pack pattern defined height. The tamper mechanism rides on V-rails.

Figure 4 - 4
The Divider Tamper

The Loader

The pack pattern is separated and released into the load area. Once in the load area, the loader comes down around the pack and collapse the pack pattern, at the same time push into the case. The loader contains the pack pattern all the way into the case. Once the case is loaded, the clamp releases and the loader lifts on return to the infeed home position.

Figure 4 - 5
The Loader



The Magazine

Case blanks are staged vertically on a standard Mach II magazine and conveyed to the blank picking position via a mattop controlled via an AC motor.

Figure 4 - 6
The Magazine

The Setup

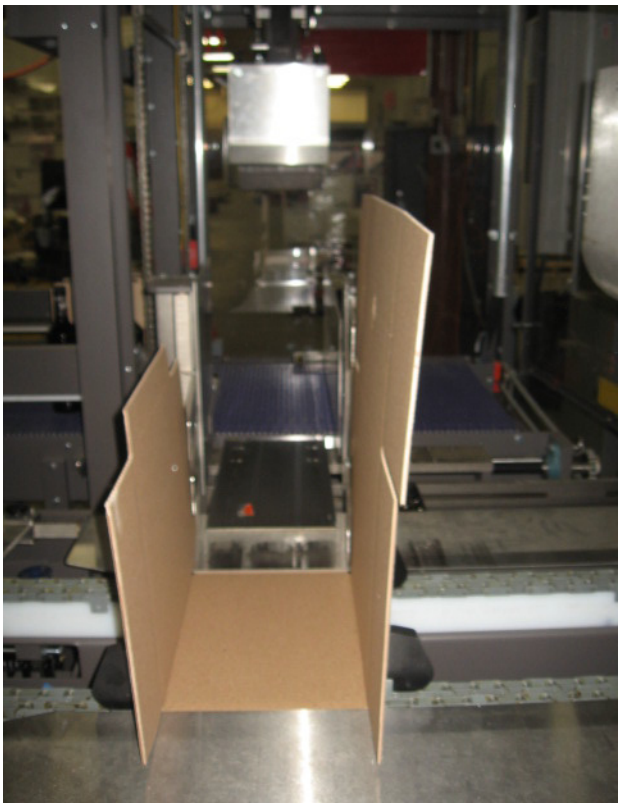
Cases are set up in a U shape at the setup station and flap trap rotate down to capture the bottom majors. A breaker bar assists the cases in breaking properly before the blank is placed in the flights. The setup arms are on a servo driven shaft. Vacuum is created using vacuum generators filtered with a Piab vacuum filter.

Figure 4 - 7
The Setup

The Load Station

The case is indexed to the load station where funnels rotate in to guide the product through the vertical minor flaps. In this same station, the opposite side of the case has there minor flaps folded closed.

Figure 4 - 8
The Load Station



The Glue Stations

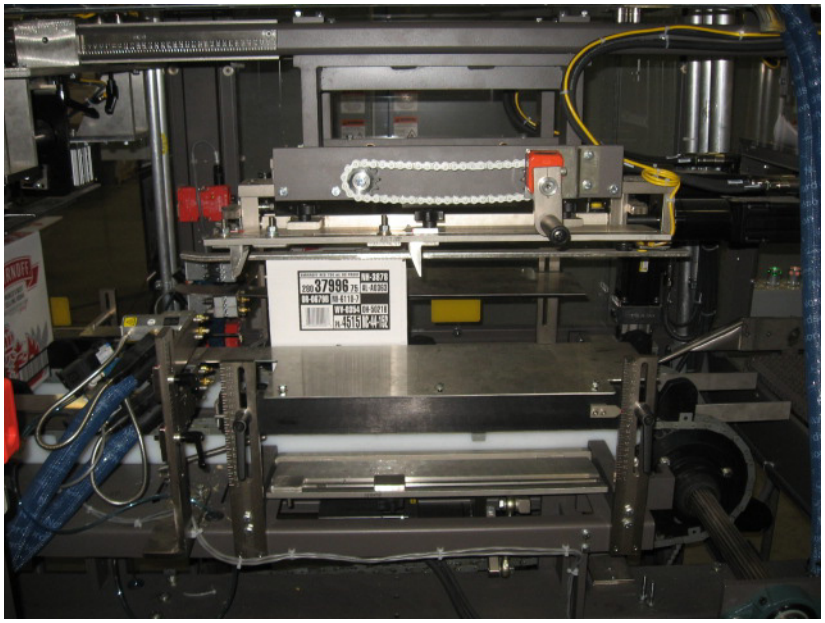
The case then indexes to the next station where the top panel is folded down. Just before the next index, four dots of glue are applied to the manufactures flap. Then the case indexes to the compression station. In-motion side glue guns apply glue to the sides of the case and the major flaps are folded closed.

Figure 4 - 9
The Glue Station

The Compression Station

When the index comes to a stop, the top compression comes down and the side compression comes in to compress the glue, sealing the case. The next index discharges the case onto the discharge conveyor.

Figure 4 - 10
The Compression Station



Sensor Functions

Your BEC Mach 2 Case Packaging System contains proximity switches, solenoid valves, and photo electric eyes:

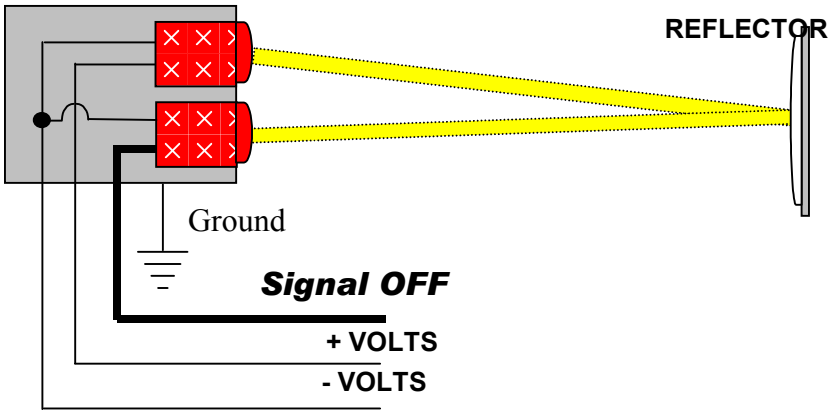
- PROXIMITY SWITCHES generate a high frequency electro-magnetic field. When an object enters this field, the prox's circuit recognizes a change and turns its solid state output ON or OFF.
- SOLENOID VALVES are electrically operated pneumatic valves used to control pneumatic actuators.
- There are three types of Photo electric switches - REFLECTIVE UNITS, THRU-BEAM UNITS, and FIBER OPTIC UNITS.
- REFLECTIVE UNITS project a beam from a transmitter/receiver unit to a reflector. Object detection occurs when the beam is interrupted.
- THRU-BEAM UNITS project a beam from a transmitter unit to a receiver unit. Object detection occurs when the beam is interrupted.
- FIBER OPTIC UNITS function as either Reflective Units or Thru-Beam Units. (The transmitter and receiver are in the same housing.)

See the Vendor Data Sheets and Manuals for specific product information on the sensors located on your BEC Mach 2 Case Packaging System.

Retro-Reflective Sensors

The illustration below depicts a retro-reflective, infrared photoelectric sensor. An infrared light beam is emitted from the emitter side of the sensor. The light beam bounces back to collector side of the sensor from a remote mounted reflector.

Figure 4 - 11
The Retro-reflective Sensor



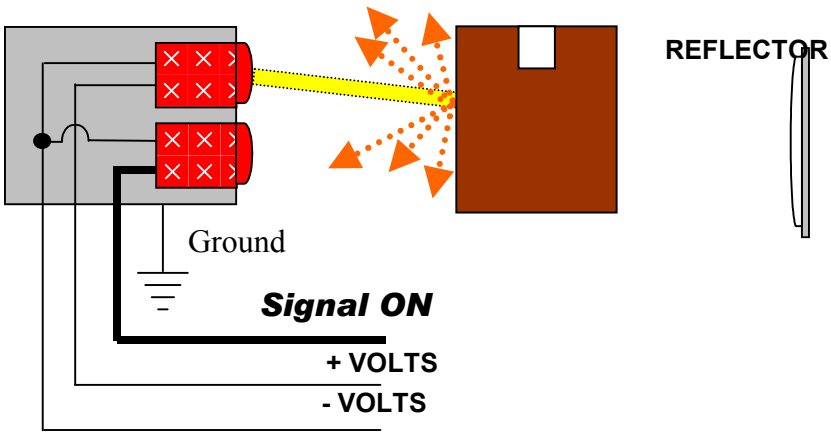
When the sensor is set for light operation, the signal from the sensor is ON when the collector is receiving the light beam.

When the sensor is set for dark operation, the signal from the sensor is OFF when the collector is receiving the light beam.

When the beam becomes blocked by an object, the amount of light reflected is not strong enough to be received by the collector.

In this state, the signal coming from the sensor is OFF. Retro-reflective sensors will be triggered when an object passes anywhere between the sensing device and the reflector.

Figure 4 - 12
The Retro-reflective Sensor Blocked

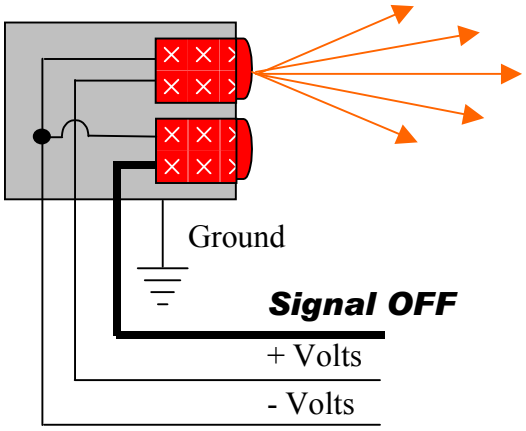


Diffuse Sensors

The illustrations below, depicts a diffuse, infrared photoelectric sensor. An infrared light beam is emitted from the emitter side of the sensor. The light beam expands as it is emitted from the device, but is not reflected back to the collector portion of the sensor by a reflector.

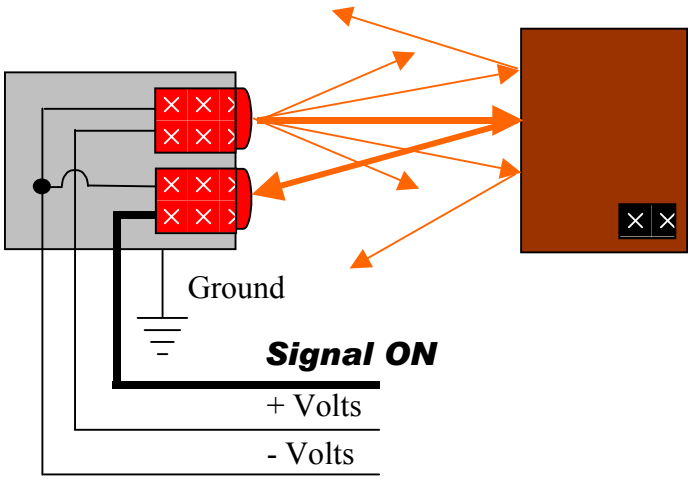
When the sensor is set for light operation, the signal from the sensor is ON when the collector is receiving the reflected light.

Figure 4 - 13
The Diffuse Sensor



When an object appears in front of the beam, a portion of the light is reflected back to the emitter. In this state, the signal coming from the sensor is ON. Diffuse type sensors typically have a limited sensing distance.

Figure 4 - 14
The Diffuse Sensor Blocked



Inductive Proximity Sensor

Inductive sensors work by generating a current that sets up an electromagnetic field around the sensing device. When this field is disturbed, a change in the electrical current that drives the field is sensed. An output from the device is triggered, indicating a disturbing presence (metal) within the sensing field of the device. This type of sensor is typically used to detect metal objects.

Figure 4 - 15
The Inductive Sensor

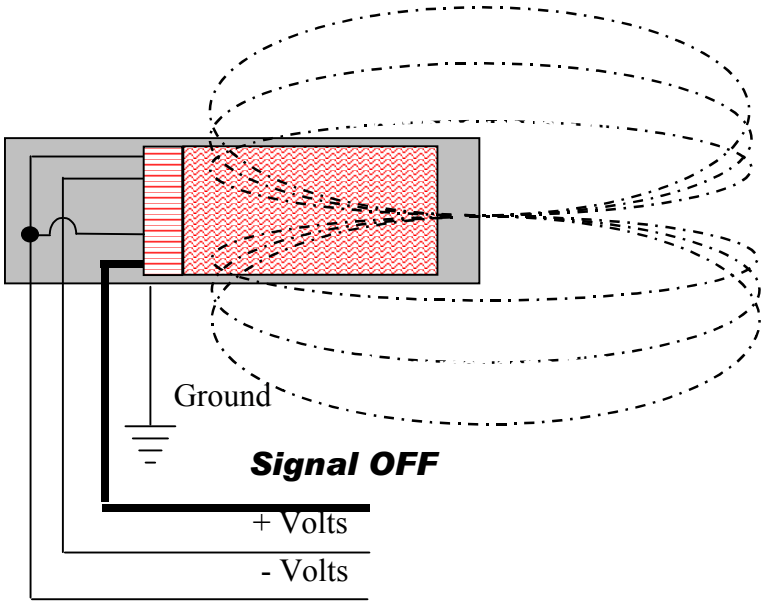
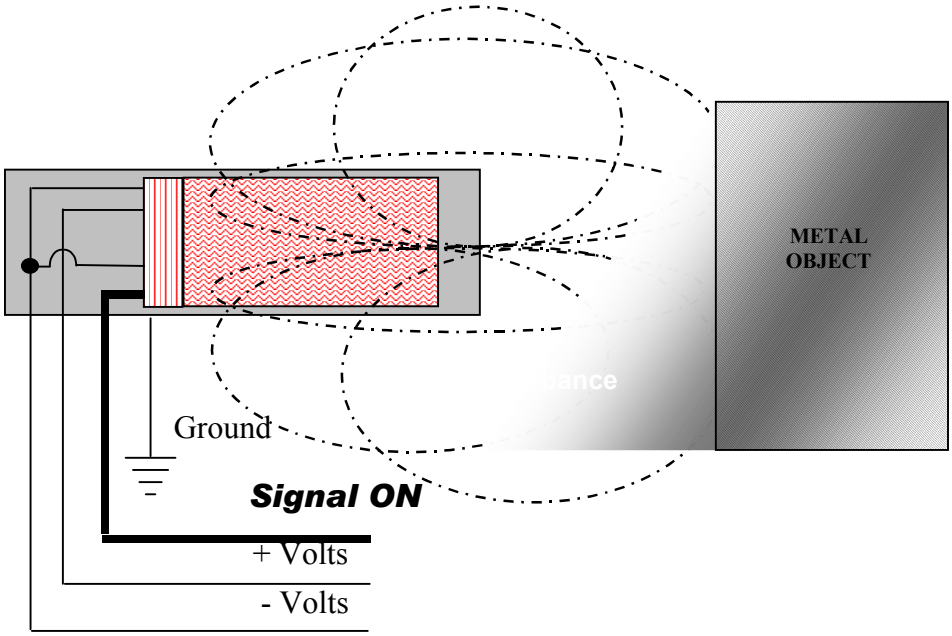


Figure 4 - 16
The Inductive Sensor Blocked



Sensor Charts

Each sensor on the machine is labeled. The tables below describe the type of sensor, its function, and necessary parameters.

Table 4-1. Proximity Sensors

LABEL	FUNCTION		LABEL	FUNCTION
PRS 31014	Sweep Bars Home		PRS 31016	Trailing Flights Home
PRS 31015	Leading Flights Home			

Table 4-2. Hall Effect Switches

LABEL	FUNCTION		LABEL	FUNCTION
HES 31207	Case Square Left Retracted		HES 31208	Case Square Right Retracted

Table 4-3. Photo Eyes

LABEL	FUNCTION		LABEL	FUNCTION
PE 31101	Lane Divider Jam Eye Clear		PE 31113	Case At Load Blocked
PE 31102	Meter Belt Count Clear		PE 31114	Case At Side Glue Blocked
PE 31103	Product At Meter Pins Stop Clear		PE 31115	Divider Magazine Low Clear
PE 31104	Product At Sweep Bar Clear		PE 31116	Partition Enable Pins Clear
PE 31105	Ok To Place Divider Clear		PE 31115	Case At Mfrs Glue Blocked
PE 31106	Product At Loader Clear		PE 31116	Discharge Clear
PE 31107	Divider Low Maga-zine Clear		PE 31201	Fallen Product Sweep Bars Clear
PE 31108	Divider On Pick Cups Clear		PE 31202	Open Flap Left
PE 31109	Divider Open Ready For Pick Clear		PE 31203	Open Flap Right
PE 31110	Low Magazine Clear		PE 31204	Lane Divdier Count Clear
PE 31111	Magazine Advance Incline Clear		PE 50101	Divider Present
PE 31112	Case At Setup Blocked		PE 50102	Divider Present

Table 4-4. Solenoid Valves

LABEL	FUNCTION		LABEL	FUNCTION
SOL 31502	Left Glue Head Top On		SOL 31608	Flap Lift Retract
SOL 31503	Left Glue Head Bottom On		SOL 31702	Setup Vacuum On
SOL 31504	Right Glue Head Top On		SOL 31703	Divider Vacuum Left Top Cup 1 On
SOL 31505	Right Glue Head Bottom On		SOL 31704	Divider Vacuum Left Top Cup 2 On
SOL 31506	Manufacturer's Glue On		SOL 31705	Divider Vacuum Left Bottom 2 Cups On
SOL 31601	Infeed Overhead Up		SOL 31706	Divider Vacuum Middle Top Cup 1 On
SOL 31602	Infeed Overhead Down		SOL 31707	Divider Vacuum Middle Top Cup 2 On
SOL 31603	Infeed Product Squeeze Left Extend		SOL 31708	Divider Vacuum Right Bottom 2 Cups On
SOL 31604	Infeed Product Squeeze Left Retract		SOL 31709	Divider Vacuum Right Top Cup 1 On
SOL 31605	Infeed Product Squeeze Right Extend		SOL 31710	Divider Vacuum Right Top Cup 2 On
SOL 31606	Infeed Product Squeeze Right Retract		SOL 31711	Divider Vacuum Right Bottom 2 Cups On
SOL 31607	Case Square Extend			

Table 4-5. Pressure Switch

LABEL	FUNCTION
PS 30701	Air Pressure Present

Glue Settings

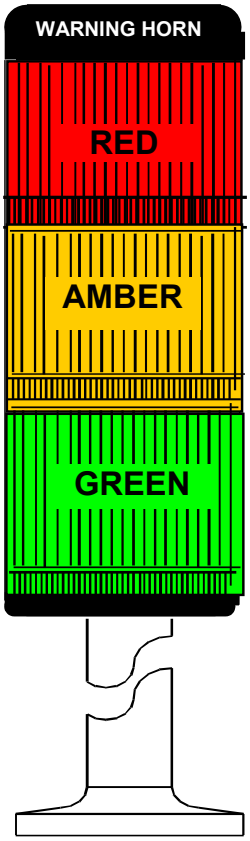
The glue settings for the Nordson at the time of shipment are below.

Table 4-6. Glue Temp and Pressure

NAME	TEMP	PRESSURE
Tank	325°	30 PSI

Light Tree Status Indicator

The system is equipped with a LIGHT TREE STATUS INDICATOR mounted on top of the machine. The INDICATOR is composed of three colored lenses (green, amber and red). The state of each of these colored lights indicates the operational status of the machine.



WARNING HORN - The warning horn sounds three times during startup to alert any one in the area that the machine is going move. It also sounds for machine fault conditions.

RED LIGHT - ON indicates that the system is in an Emergency Stop condition. Operator assistance to restart the system is immediately required.

AMBER LIGHT ON -indicates a "Low Magazine" condition. An operator should fill the "Magazine" with "Case Blanks" immediately.

GREEN LIGHT - ON indicates that the system is running normally.

GREEN LIGHT - FLASHING indicates that the system is "Ready to Run." This is also an indication the machine is in jog mode.

Troubleshooting

Problems are listed in the left column, and causes in the middle column. Solutions, along with further manual references, are listed in the right column. If the problem(s) cannot be solved after consulting this section and/or appropriate sections of this manual, feel free to call Brenton Engineering Company's Service Department at (800) 535-2730 or after hours at (320) 219-8305.

Table 4-7. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE	SOLUTION
Machine Will Not Operate in Jog Mode	No power	Check to see if machine is on and is receiving power.
	No air pressure	Check air dump valves and airs filters.
	Disconnect switches are OFF.	Turn disconnect switches ON.
	Guard door is open.	Close all guard doors.
	Emergency stop activated.	Deactivate emergency stop.
	Fault or overload detected.	Clear all faults & reset.
	Improper control panel settings.	Reset control panel.
Machine Will Not Operate in RUN Mode	No power	Check to see if machine is on and receiving power.
	Emergency stop is activated.	Deactivate emergency stop.
	Fault or overload detected.	Clear all faults & reset.
	Disconnect switch is not on.	Turn disconnect switch on.
	Servo drive is not homed.	Home the servo drive.

Table 4-7. Troubleshooting Chart (Continued)

PROBLEM	POSSIBLE CAUSE	SOLUTION
Machine Won't Pull Blanks	Defective vacuum line.	Check for leak, restriction or disconnection.
	Defective vacuum cups.	Replace if needed.
	Clogged vacuum filter.	Clean the vacuum filter.
	Vacuum cups not making proper contact with case.	Adjust
	Magazine adjusted to improper counter settings	Adjust
	Magazine Advance photoeye malfunctioning or out of alignment.	Inspect the sensor for damage; make sure they are securely mounted. Re-align IF NECESSARY. See “Sensor Charts” on Page 4-15. Also refer to product data sheets in the Vendor Documentation.
	Vacuum not turned on at control panel.	Turn control panel vacuum on.
	PLS vacuum setting incorrect	Set according to manual instructions.
	Incorrect pack pattern selected on control panel.	Set correct case type on control panel.
Any Thermal Overload	The overload contact on the motor starter is open.	Check overload indicator. If it is tripped, Reset overload as shown in.
	The rated amperage draw on the motor nameplate is higher than the motor starter is set at.	Reset amperage setting on the motor starter to equal the rated amperage draw of the motor.
	Bad fuse	Check all fuses on the incoming lines to the motor starter.
	The motor is drawing too much amperage.	Check current draw at motor leads.
		If the motor is mounted to another component, remove the motor and check current draw.
		Call an electrician to determine if motor is bad. Replace if necessary.

Table 4-7. Troubleshooting Chart (Continued)

PROBLEM	POSSIBLE CAUSE	SOLUTION
Glue Heads Developing Angel Hairs	Air Pressure is not at the correct setting.	Set proper regulated air pressure to the corresponding glued Head. See “Glue Settings” on Page 4-18.
	Glue temperature setting is not at the correct temperature.	Set proper glue temperature. See “Glue Settings” on Page 4-18.

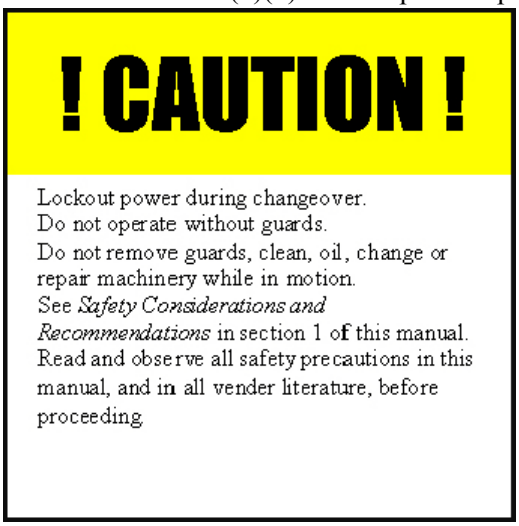
Changeover and Maintenance Contents

5. Changeover and Maintenance

Lockout and Tagout Recommendations

Electrical System

(See OSHA 1910.147 & OSHA 1910.333 (b)(2) for exception to procedures)



To avoid hazards of electrical shock or other personal injuries, the main power disconnect for the system and any other separate sources of power for the system shall be locked out & tagged as a safety precaution during entry and maintenance to the system.

1. To accomplish this, move the Main Power Disconnect operating handle to the "OFF" position and install a personal locking device through the padlock hole on the operating handle. Attach a Danger tag to the handle containing a statement prohibiting unauthorized operation of the disconnect and removal of the tag signed by the individual responsible for locking out the system. If several personnel are performing maintenance, each individual shall install a lockout device and tag. A qualified person shall verify that the equipment is de-energized by:
2. Operating controls to verify equipment can not be restarted.
3. Using test equipment to test circuits and electrical parts that will be exposed to personnel. Stored electric energy that might endanger personnel shall be released by discharging the circuits. Check appropriate equipment manuals on exact procedures.
4. To re-energize equipment, a qualified person shall conduct tests and visual inspections, as necessary, to verify that all tools, electrical jumpers, shorts, grounds, and other such devices have been removed, so that equipment can be safely energized. Personnel exposed to the hazards associated with re-energizing equipment shall be warned to stay clear of equipment. Each lock and tag shall be removed by the person who applied it or under their direct supervision. A visual determination that all personnel are clear of the equipment shall be accomplished before the operating handle on each Main Power Disconnect is placed to the "ON" position.

Pneumatic and Vacuum Systems

To avoid hazards of moving mechanisms, pinch points and other personal injuries, the main compressed air supply valve for the system shall be locked out & tagged as a safety precaution during entry and maintenance to the system. To accomplish this:

1. Turn the Main Air Supply valve to the "OFF" position and install a personal locking device through the padlock hole on the valve handle.
2. Also attach a Danger tag to the handle containing a statement prohibiting unauthorized operation of the disconnect and removal of the tag signed by the individual responsible for locking out the system.
3. If several personnel are performing maintenance, each individual shall install a lockout device and tag. Qualified personnel shall vent any stored or accumulated air in pneumatic/ vacuum devices before working on them. Check appropriate equipment manuals on exact procedures.
4. To re-supply compressed air to the equipment, a qualified person shall conduct visual inspections, as necessary, to verify that mechanisms are properly connected, as well as all tools and other objects have been removed so that equipment can safely operate. Personnel exposed to pneumatic/vacuum hazard areas shall be warned to stay clear of equipment. Each lock and tag shall be removed by the person who applied it, or, under their direct supervision. A visual determination that all personnel are clear of the equipment shall be accomplished before the main air supply valve is turned to the "ON" position.

Danger!

When performing maintenance, inspection, or repair, execute the Lock Out & Tag Out procedure to prevent personal injury – before entering the system.

Changeover

How to use Changeover

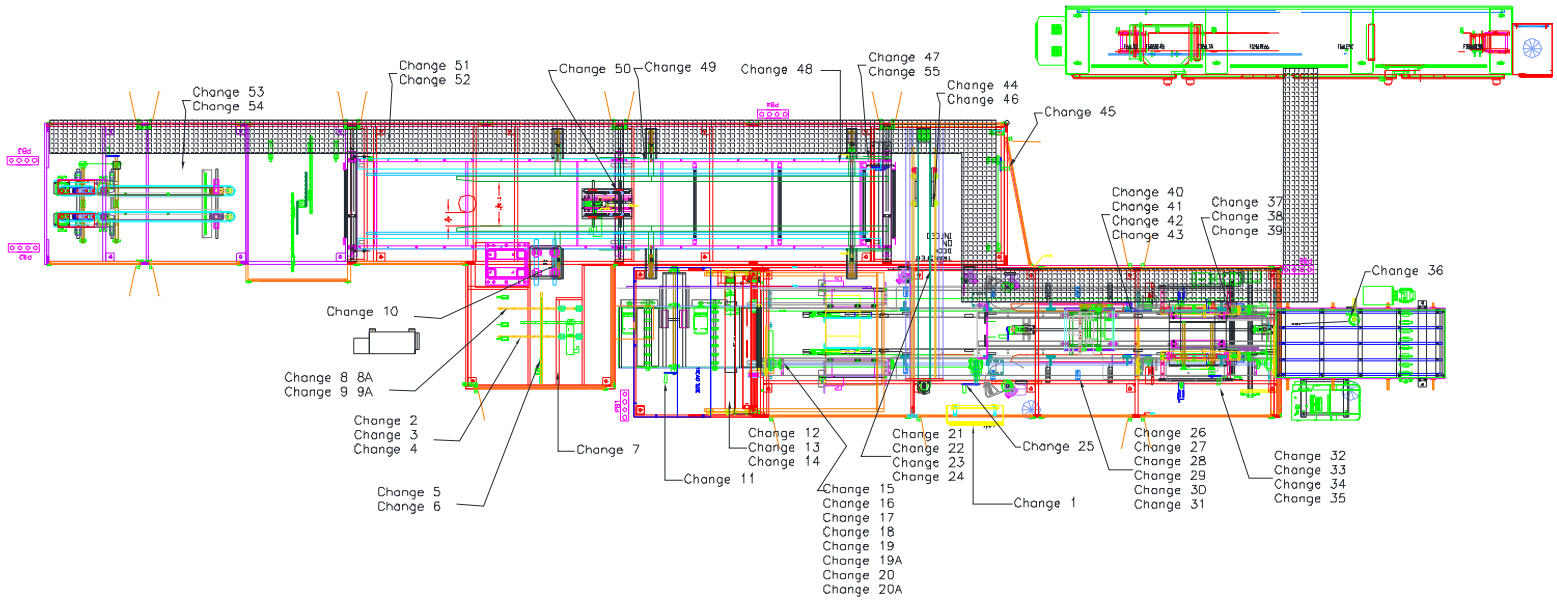
Each changeover step has pictorial changeover instructions and is also shown on the quick reference chart. A floor plan shows the proper step locations.

Where possible, settings for changeover positions are marked. It is important to note that these settings are APPROXIMATE. The settings may change, especially those pertaining to the magazine (corrugated and other factors influence the settings.)

Changeover Location Drawing

This drawing shows the location of each of the changeover steps on this system. Use this drawing along with the changeover quick reference chart and/ or the pictorial changeover to successfully complete the changeover procedure. This changeover quick reference chart on the next page is meant to be used as a guide and is subject to change.

Figure 5 - 1
Changeover Location Drawing



Changeover Quick Reference Chart

Table 5-1. Changeover Quick Reference Chart

LOC	DESCRIPTION			200ML		CM TATTOO		CM PS		CRR
1.	HMI			#8		#17		#15		#13
2.	Right Side Magazine			75		365		197		250
3.	Center Clip Vertical			143		25		120		71
4.	Center Clip Horizontal			400		570		548		547
5.	Divider Setup Plate			469.6		428.5		468.6		457
6.	Divider Backstop			185		172		157		152
7.	Divider Side Guide			251		130		175		175
8.	Setup Moveable Arm			115		Off		120		100
8A.	Moveable Arm Top Cup			240		100		240		240
9.	Stationary Arm Top Cup			250		100		240		250
9A.	Stationary Arm Middle Cup			330		260		330		330
10A.	Robot Tool Gripper #1					127		133		142
10B.	Robot Tool Gripper #2					200		186		178

Table 5-1. Changeover Quick Reference Chart (Continued)

LOC	DESCRIPTION			200ML		CM TATTOO		CM PS		CRR
10C.	Robot Tool Gripper #3					213		213		213
10D.	Robot Tool Gripper #4					72		80		80
10E.	Robot Tool Rail #1					205		205		205
10F.	Robot Tool Rail #2					80		90		90
11.	Magazine Left Side			466		485		470		469
12.	Magazine Overhead Vertical			506.2		619.4		564.1		576.1
13.	Magazine Right Side			382.7/200		405.7/150		393.7/170		401.7/165
14.	Magazine Height			575.7		526.7		566.7		555.6
15.	Magazine Overhead Horizontal			29		25-1/2”		26		25
16.	Magazine Clips			12-1/2, 31-1/2, 46-1/2		12-1/2, 31-1/2, 46-1/2		12-1/2, 30-1/2, 46-1/2		12-1/2, 30-1/2, 46-1/2
17.	Magazine Breaker Bar			Down		Down		Down		Down
18.	Magazine Waterfall Degree Wheel			157		162		162		162
18A.	Magazine Breaker Bar			5-3/4”		13-3/4”		9”		9-3/4

Table 5-1. Changeover Quick Reference Chart (Continued)

LOC	DESCRIPTION			200ML		CM TATTOO		CM PS		CRR
19.	Flap Trap			80		125		80		90
19A.	Flap Trap			230		250		170		250
20.	Setup Arm Cups			235/410		290/460		170/340		270/500
20A.	Setup Cup On/ Off			On		Off		On		Off
21.	Left Funnel Top			310		310		310		310
22.	Left Funnel Bottom			220		220		220		220
23.	Right Funnel Top			Up		Up		Up		Up
24.	Right Funnel Bottom			Down		Down		Down		Down
25.	Bedplate Width			536		529		533		534
26.	Overhead Compression When Adjusting Smaller, Check 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41			429		465		435.8		443.0
27.	Manufacturer's Glue			310		310		310		310
28.	Right After Tucker Rail			200		185		200		130
29.	Case Back Stop Cylinder			270		25		195		140

Table 5-1. Changeover Quick Reference Chart (Continued)

LOC	DESCRIPTION			200ML		CM TATTOO		CM PS		CRR
30.	Right Side Glue Top			140		0		140		115
31.	Right Side Glue Bottom			240		230		250		210
32.	Right Lower Compression Plate			VS/400		S/		S/335		S/280
33.	Right Minor Flap Containment			55		100		62		75
34.	Right Upper Compression Plate			VS/475		S/230		S/400		S/350
35.	Case Compression			445		458		452		448
36.	Bump Wheel			Up		Down		Up		Up
37.	Left Upper Compression Plate			VS/475		S/230		S/400		S/350
38.	Left Minor Flap Containment			55		100		62		75
39.	Left Lower Compression Plate			VS/460		S/		S/335		S/280
40.	Left Glue Top			140		0		140		115
41.	Left Glue Bottom			240		230		250		210
42.	Case Backstop Cylinder			270		25		195		140

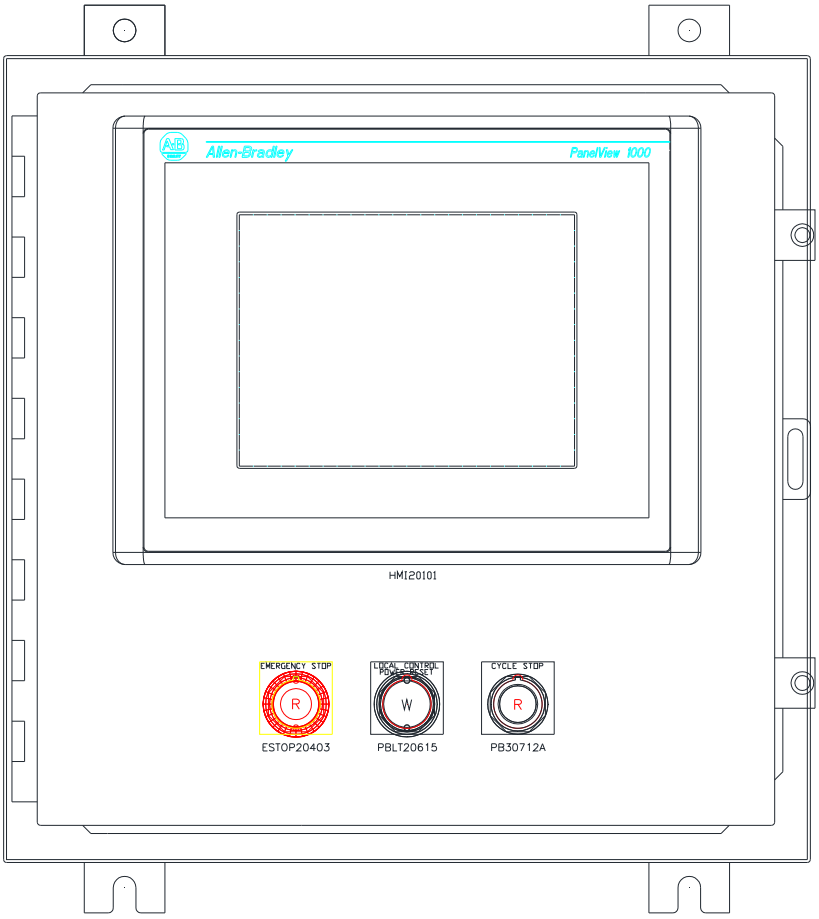
Table 5-1. Changeover Quick Reference Chart (Continued)

LOC	DESCRIPTION			200ML		CM TATTOO		CM PS		CRR
43.	Left After Tucker Rail			200		185		200		130
44.	Loader Transfer Plate			3		1		6		5
45.	Product Backstop Guide			481.8		409.3		461.3		447.8
46.	Loader Head Adjustment			4/35		1/72		8/50		6/38
47.	Lanes Width			474.5		482.2		479.2		476.3
48.	Lanes Funnels			65		50		95		50
49.	Compression Cylinder Plate			In		Out		Out		Out
50.	200 ML Tool			In		Out		Out		Out
51.	Lanes Blocks			4		1		1		6
52.	Counting Photoeye			40		120		50		70
53.	Metering Belts Width			476.2		482.3		482.4		481.4
54.	Counting Photoeye			65		160		75		110
55.	Overhead Sweep Height			495		497.4		495		495.5

Pictorial Changeover

1. Press the Cycle Stop Button.

Figure 5 - 2
Control Panel 3



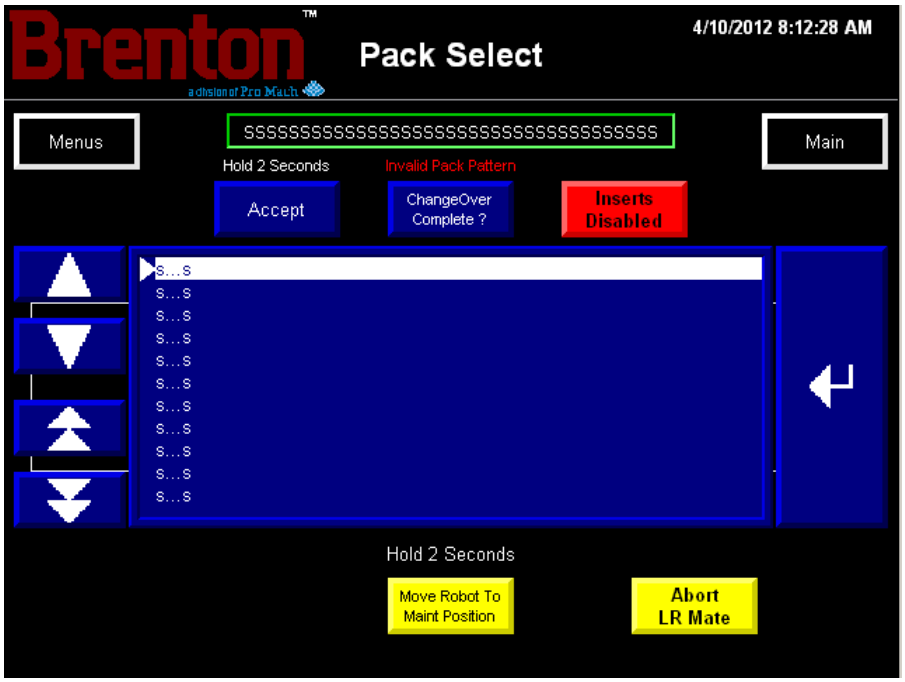
2. Press the Emergency Stop.
3. Empty the magazine and clear out product from the machine.

Changeover Location #1

Adjust the HMI

- Select the correct pack pattern on the HMI.

Figure 5 - 3
The HMI Adjustment

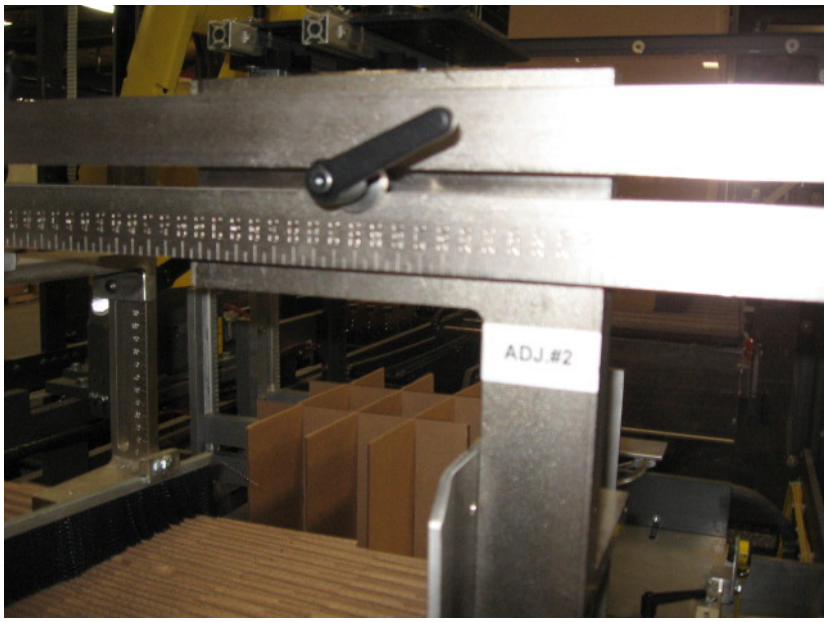


Changeover Location #2

Adjust the Right Side Magazine

- Loosen the kip handle.
- Adjust Right Side Magazine to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 4
The Right Side Magazine Adjustment

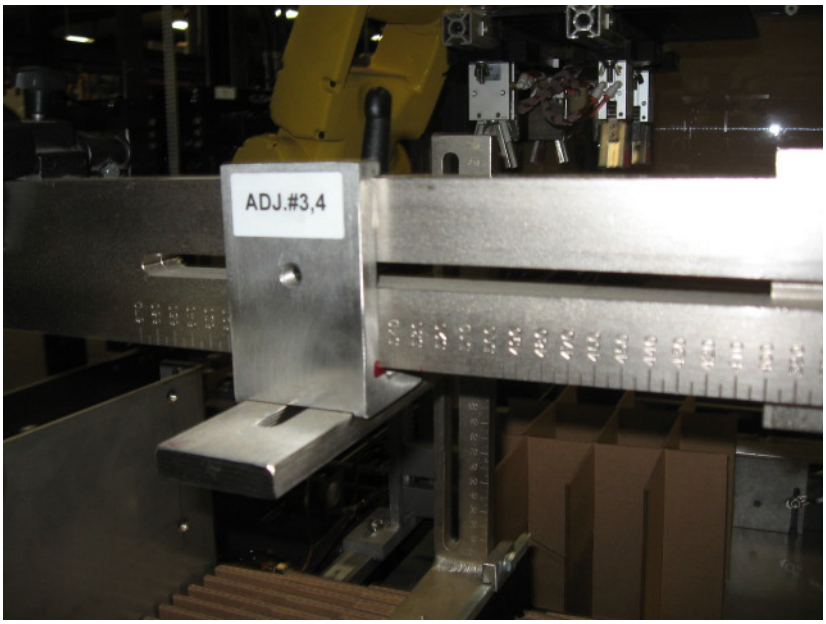


Changeover Location #3

Install or Remove the Center Clip Vertical

- Loosen the kip handle.
- Adjust Center Clip Vertical to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 5
The Center Clip Vertical Adjustment

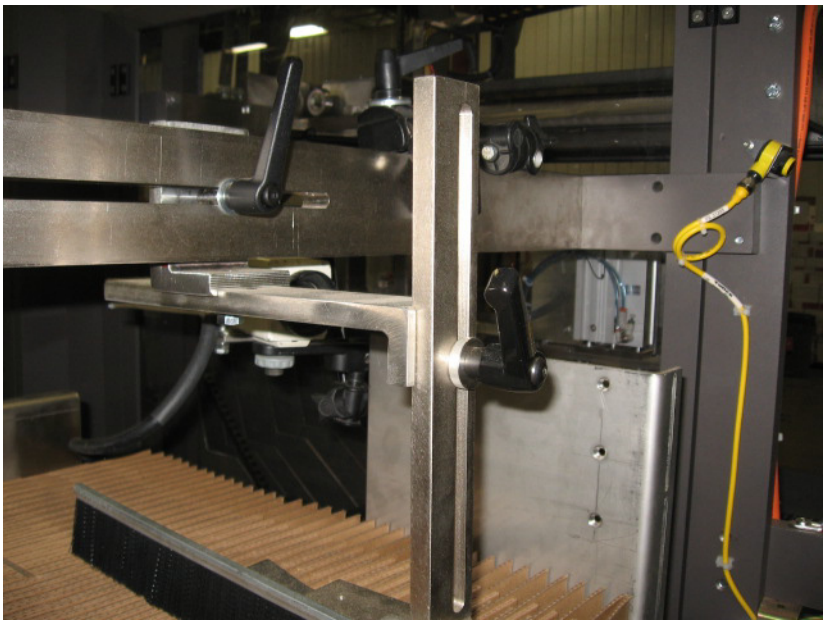


Changeover Location #4

Adjust the Center Clip Horizontal

- Loosen the kip handle.
- Adjust Center Clip Horizontal to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 6
The Center Clip Horizontal Adjustment

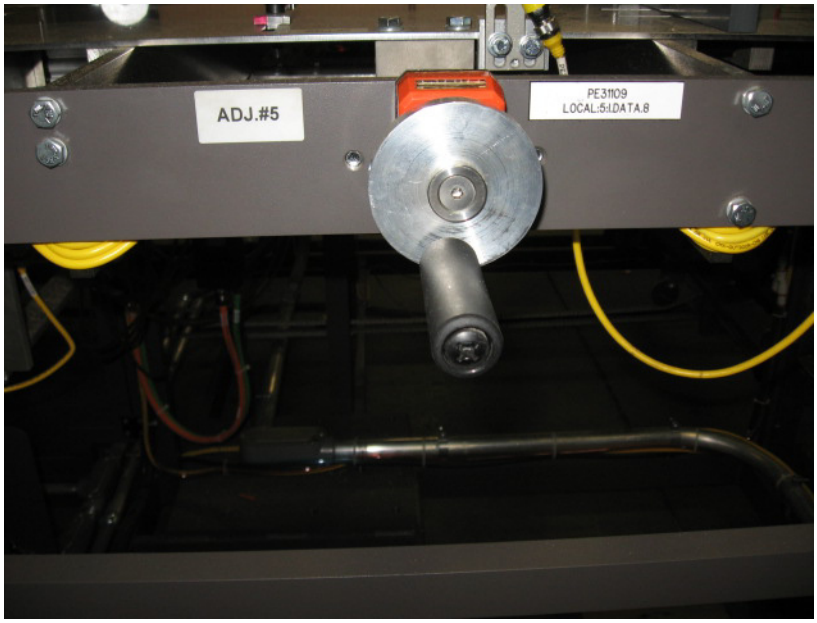


Changeover Location #5

Adjust the Divider Setup Plate

- Using the hand crank, adjust the Divider Setup Plate to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 7
The Divider Setup Plate Adjustment

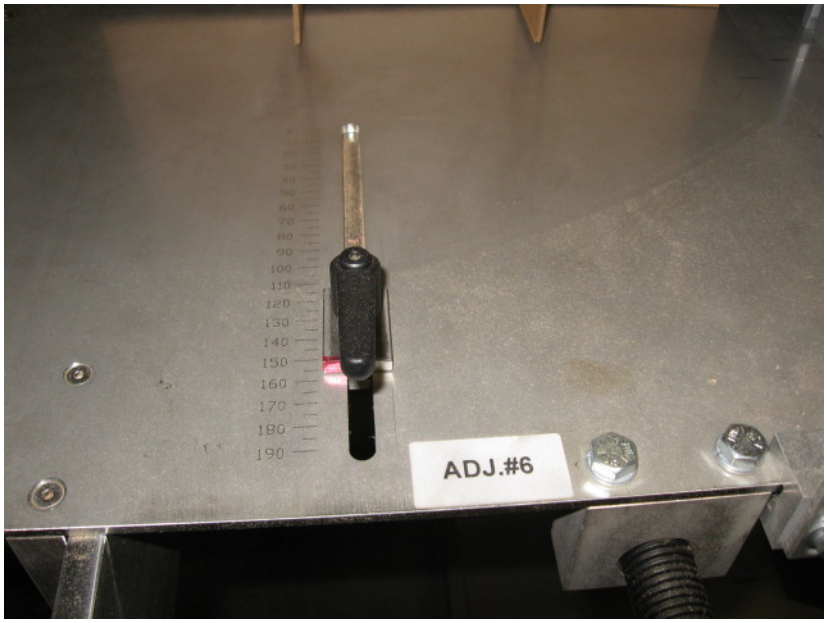


Changeover Location #6

Adjust the Divider Backstop

- Loosen the kip handle.
- Adjust the Divider Backstop to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 8
The Divider Backstop Adjustment

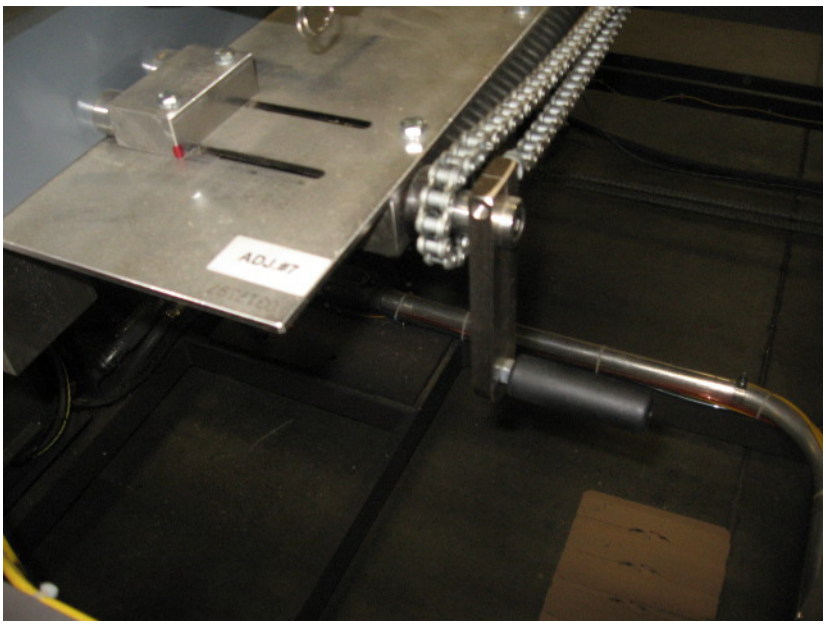


Changeover Location #7

Adjust the Divider Side Guide

- Using the hand crank, adjust the Divider Side Guide to the correct number on the scale, according to the changeover chart.

Figure 5 - 9
The Divider Side Guide Adjustment



Changeover Location #8

Adjust the Setup Moveable Arm

- Loosen the kip handle.
- Adjust the Setup Moveable Arm to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 10
The Setup Moveable Arm Adjustment

Changeover Location #8A

Adjust the Moveable Arm Top Cup

- Loosen the kip handle.
- Adjust the Setup Moveable Arm Top Cup to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

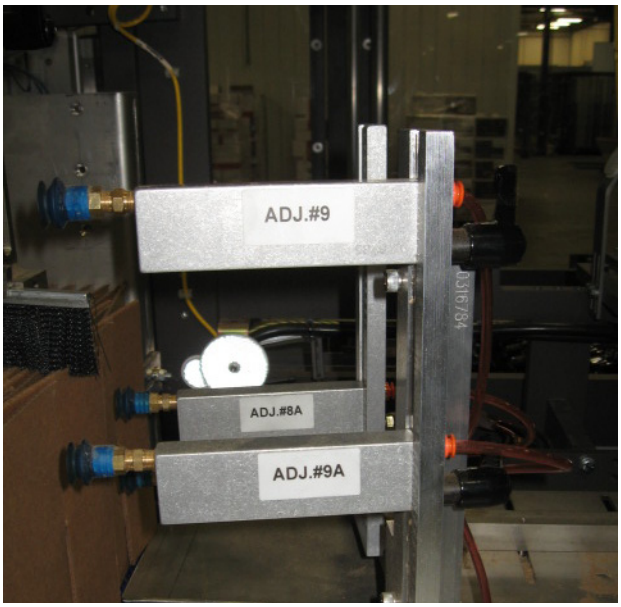
Figure 5 - 11
The Setup Moveable Arm Top Cup Adjustment

Changeover Location #9

Adjust the Stationary Arm Top Cup

- Loosen the kip handle.
- Adjust Stationary Arm Top Cup to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 12
The Stationary Arm Top Cup Adjustment

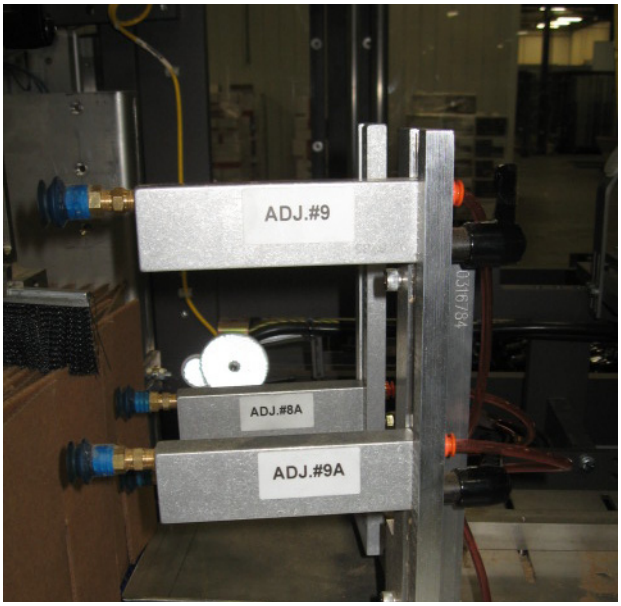


Changeover Location #9A

Adjust the Stationary Arm Middle Cup

- Loosen the kip handle.
- Adjust Stationary Arm Middle Cup to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 13
The Stationary Arm Middle Cup Adjustment

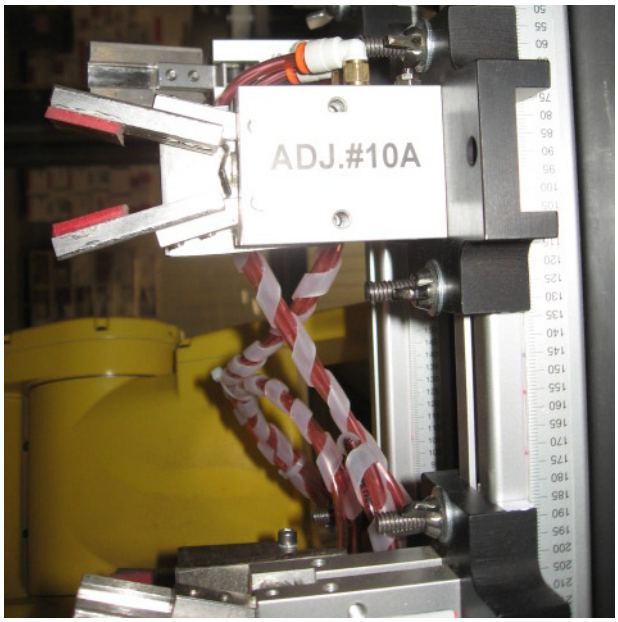


Changeover Location #10A

Adjust the Robot Tool #1

- Loosen the wing nuts.
- Adjust the Robot Tool #1 to the correct number on the scale, according to the changeover chart.
- Tighten the wing nuts.

Figure 5 - 14
The Robot Tool #1 Adjustment

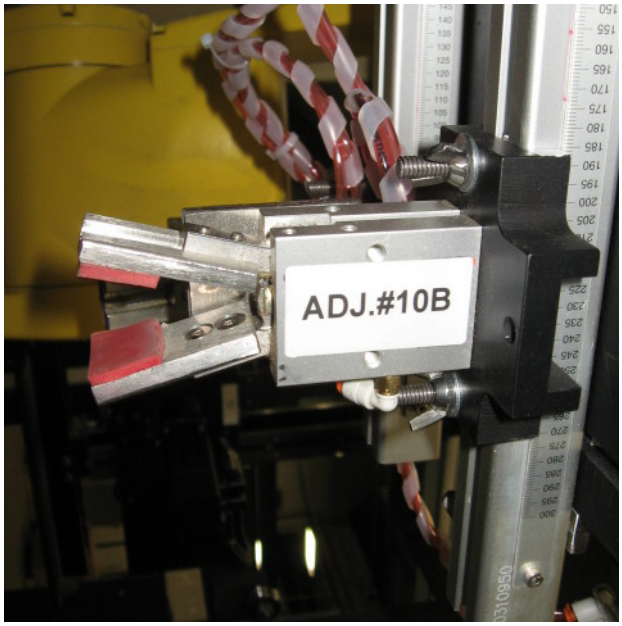


Changeover Location #10B

Adjust the Robot Tool #2

- Loosen the wing nuts.
- Adjust the Robot Tool #2 to the correct number on the scale, according to the changeover chart.
- Tighten the wing nuts.

Figure 5 - 15
The Robot Tool #2 Adjustment

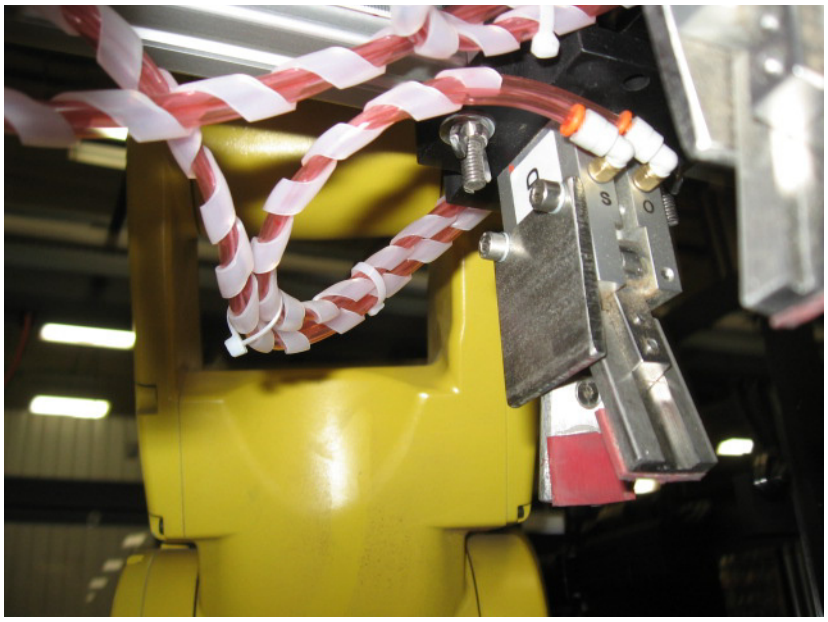


Changeover Location #10C

Adjust the Robot Tool #3

- Loosen the wing nuts.
- Adjust the Robot Tool #3 to the correct number on the scale, according to the changeover chart.
- Tighten the wing nuts.

Figure 5 - 16
The Robot Tool #3 Adjustment

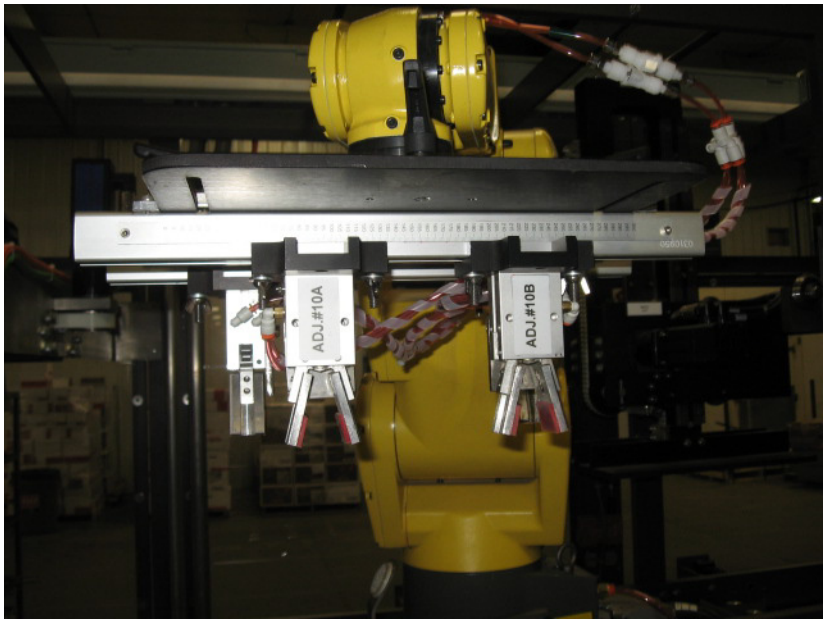


Changeover Location #10D

Adjust the Robot Tool Gripper #4

- Loosen the wing nuts.
- Adjust the Robot Tool #4 to the correct number on the scale, according to the changeover chart.
- Tighten the wing nuts.

Figure 5 - 17
The Robot Tool #4 Adjustment

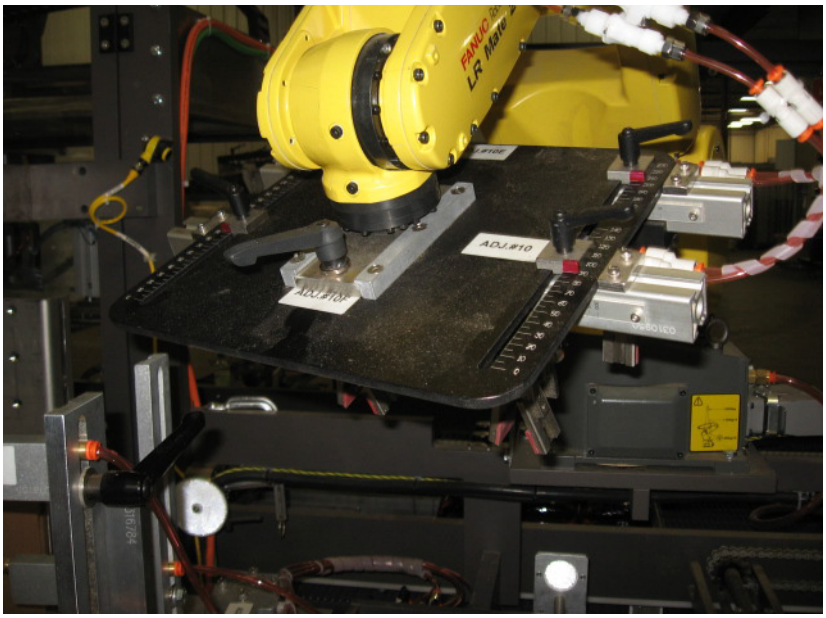


Changeover Location #10E

Adjust the Robot Tool Rail #1

- Loosen the kip handle.
- Adjust the Robot Tool Rail #1 to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 18
The Robot Tool Rail #1 Adjustment

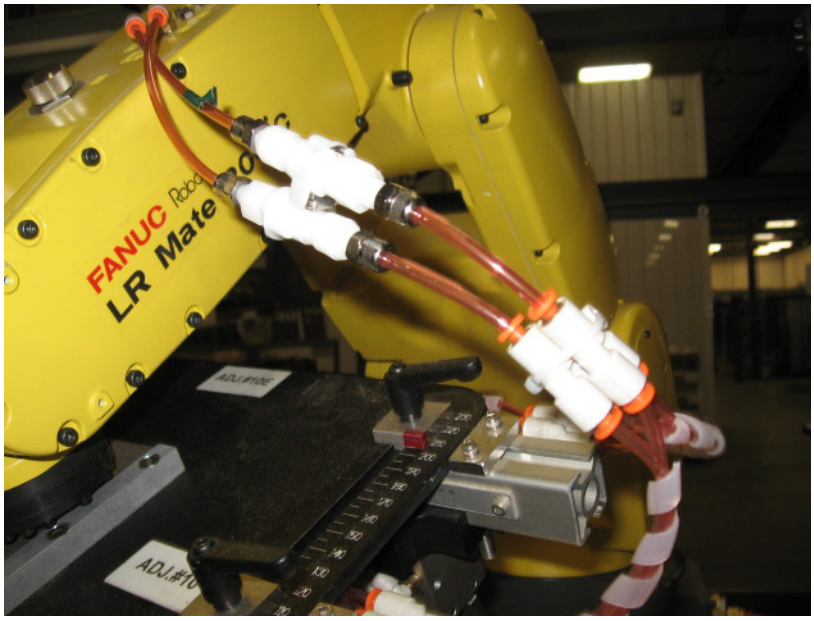


Changeover Location #10F

Adjust the Robot Tool Rail #2

- Loosen the kip handle.
- Adjust the Robot Tool Rail #2 to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 19
The Robot Tool Rail #2 Adjustment



Changeover Location #11

Adjust the Magazine Left Side

- Using the crank handle, adjust the Magazine Left Side to the correct number on the Siko Digital Indicator, according to the changeover chart.

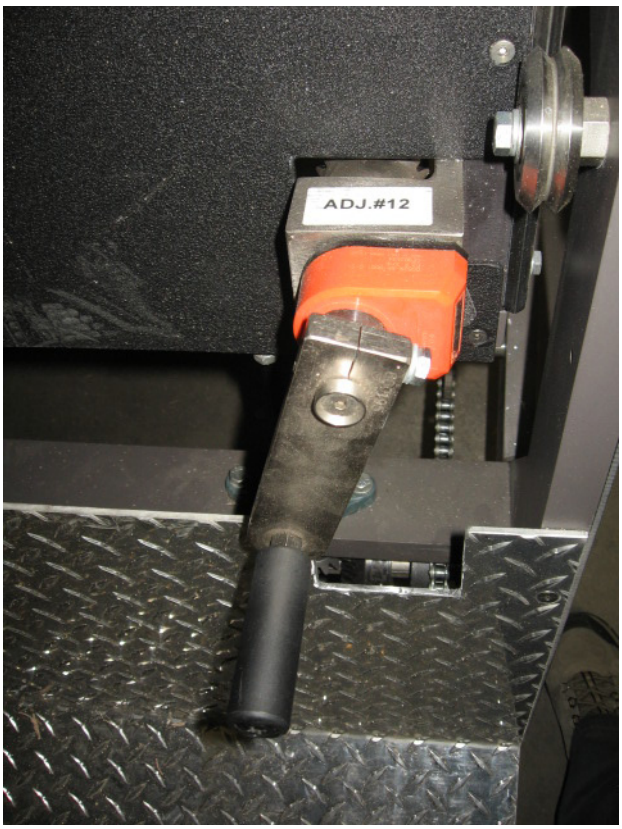
Figure 5 - 20
The Magazine Left Side Adjustment

Changeover Location #12

Adjust the Magazine Overhead Vertical

- Using the crank handle, adjust the Magazine Overhead Vertical to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 21
The Magazine Overhead Vertical Adjustment

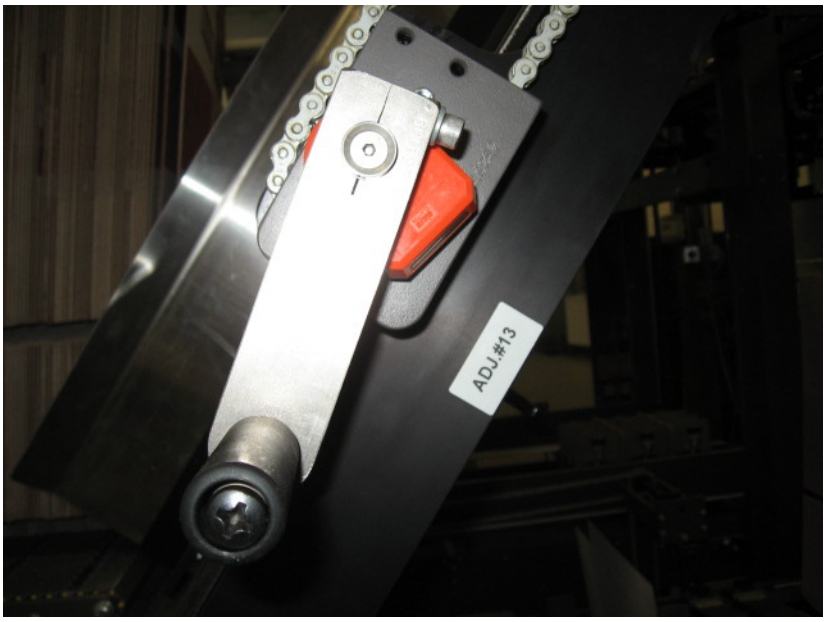


Changeover Location #13

Adjust the Magazine Right Side

- Using the crank handle, adjust the Magazine Right Side to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 22
The Magazine Right Side Adjustment



Changeover Location #14

Adjust the Magazine Height

- Using the crank handle, adjust the Magazine Height to the correct number on the Siko Digital Indicator, according to the changeover chart.

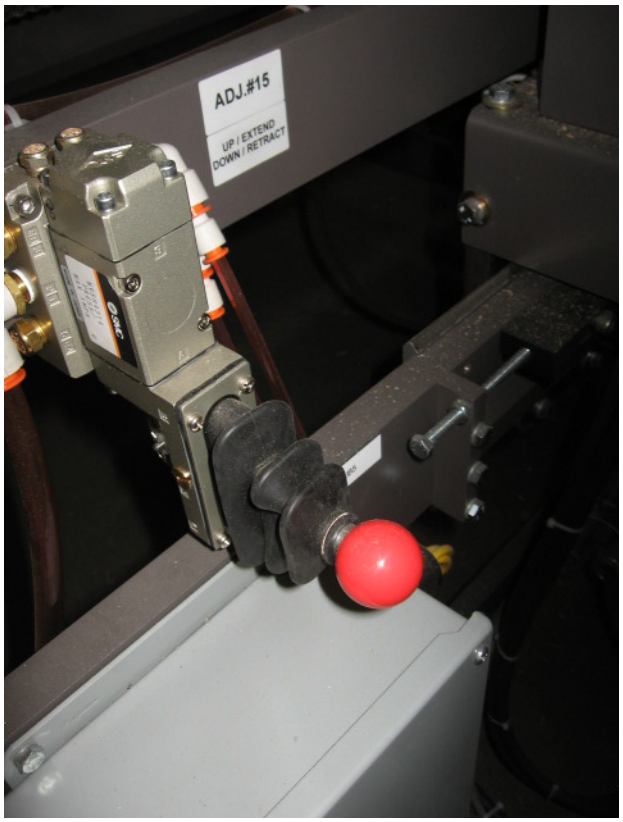
Figure 5 - 23
The Magazine Height Adjustment

Changeover Location #15

Adjust the Magazine Overhead Horizontal

- Using the handle running the pneumatically driven motor, adjust the Magazine Overhead Horizontal to the correct number on the scale, according to the change-over chart.
- Up extends and down retracts the Magazine Overhead Horizontal.

Figure 5 - 24
The Magazine Overhead Horizontal Adjustment

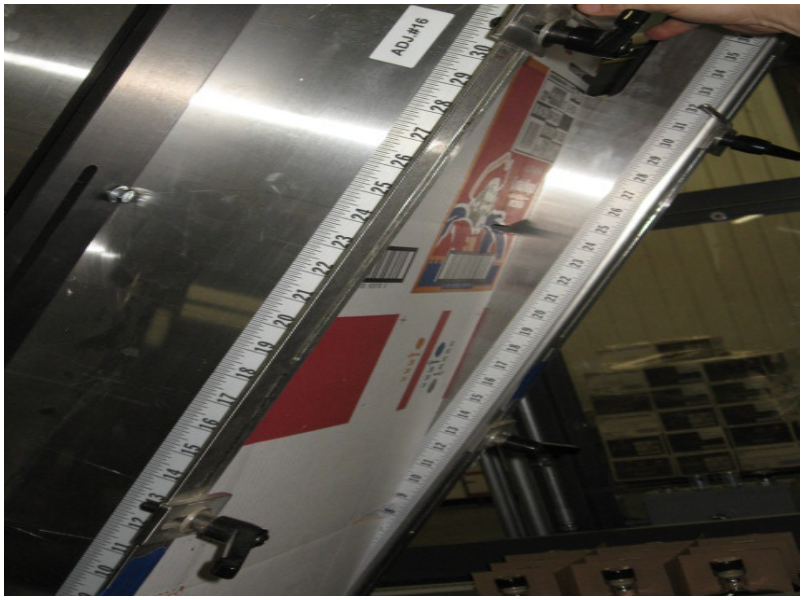


Changeover Location #16

Adjust the Magazine Clips

- Loosen the kip handle.
- Adjust Magazine Clips to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 25
The Magazine Clips Adjustment

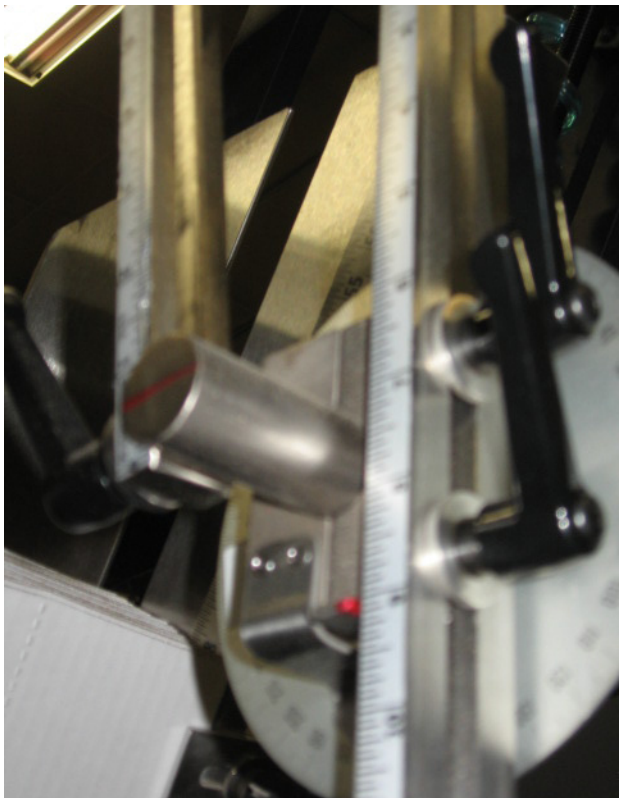


Changeover Location #17

Adjust the Magazine Breaker Bar

- Loosen the kip handles.
- Adjust the Magazine Breaker Bar to the correct number on the scale, according to the changeover chart.
- Tighten the kip handles.

Figure 5 - 26
The Magazine Breaker Bar Adjustment

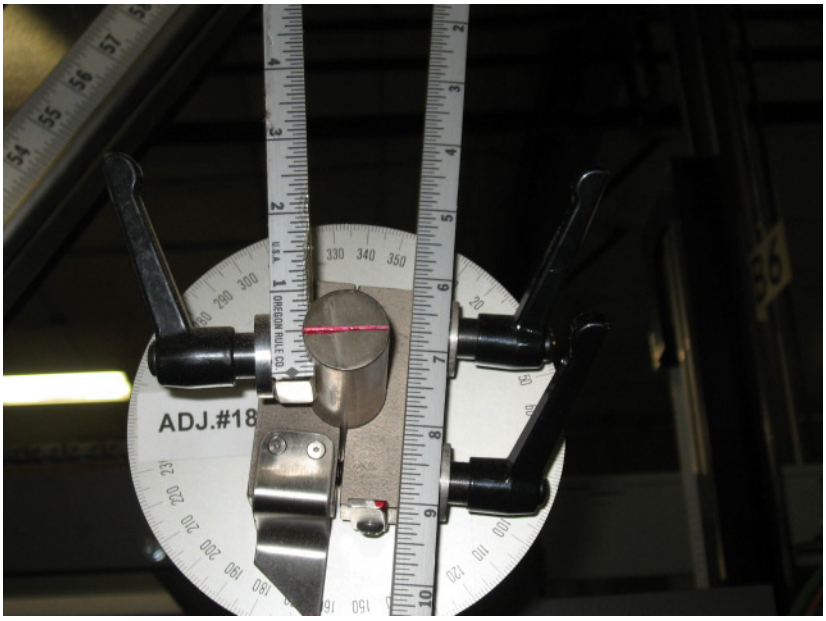


Changeover Location #18

Adjust the Magazine Waterfall Degree Wheel

- Loosen the kip handle.
- Adjust Magazine Waterfall Degree Wheel to the correct number on the degree wheel, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 27
The Magazine Waterfall Degree Wheel Adjustment

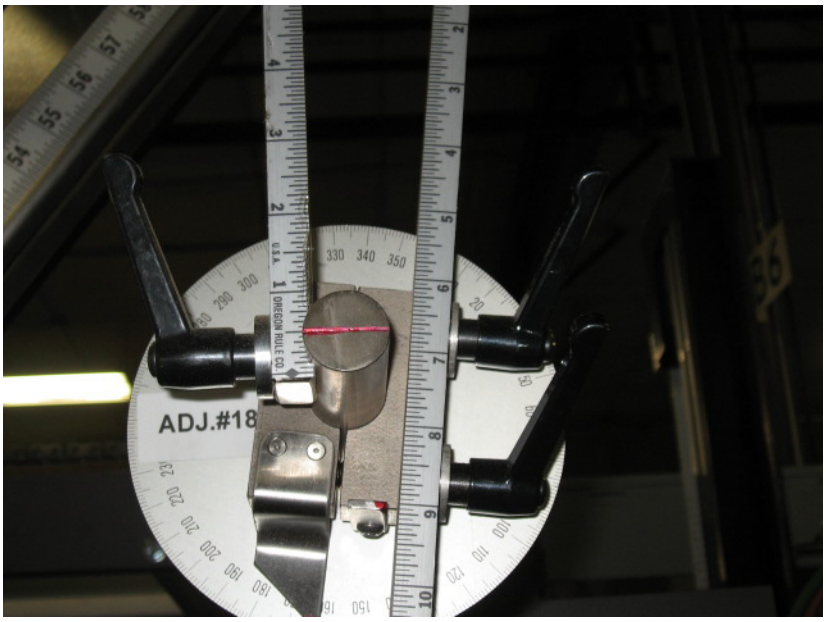


Changeover Location #18 A

Adjust the Magazine Breaker Bar

- Loosen the kip handle.
- Adjust Magazine Breaker Bar to the correct number on the degree wheel, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 28
The Magazine Breaker Bar Adjustment



Changeover Location #19

Adjust the Flap Trap

- Loosen the thumb knobs.
- Adjust Flap Trap to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knobs.

Figure 5 - 29
The Flap Trap Adjustment

Changeover Location #19A

Adjust the Flap Trap

- Loosen the thumb knob.
- Adjust Flap Trap to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knob.

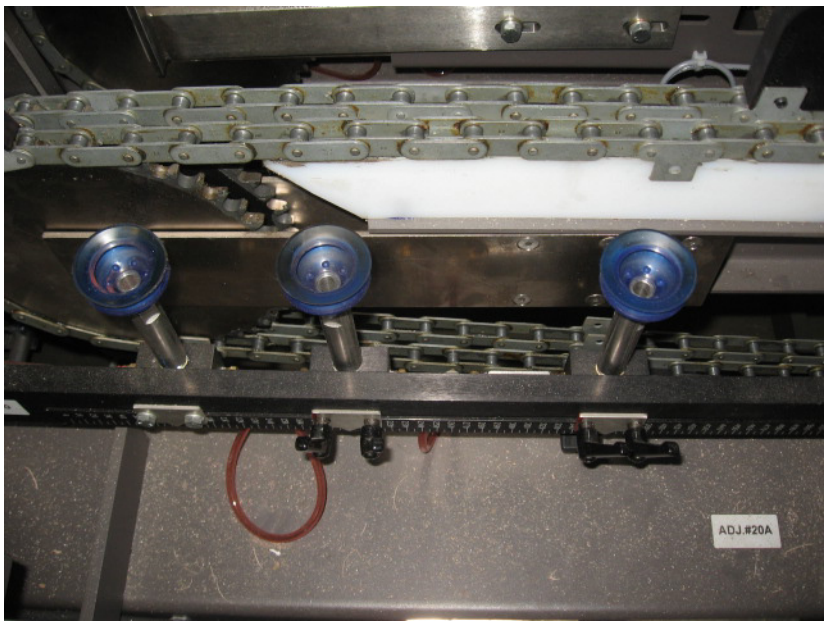
Figure 5 - 30
The Flap Trap Adjustment

Changeover Location #20

Adjust the Setup Arm Cups

- Loosen the kip handles.
- Adjust the Setup Arm Cups to the correct number on the scale, according to the changeover chart.
- Tighten the kip handles.

Figure 5 - 31
The Setup Arm Cups Adjustment



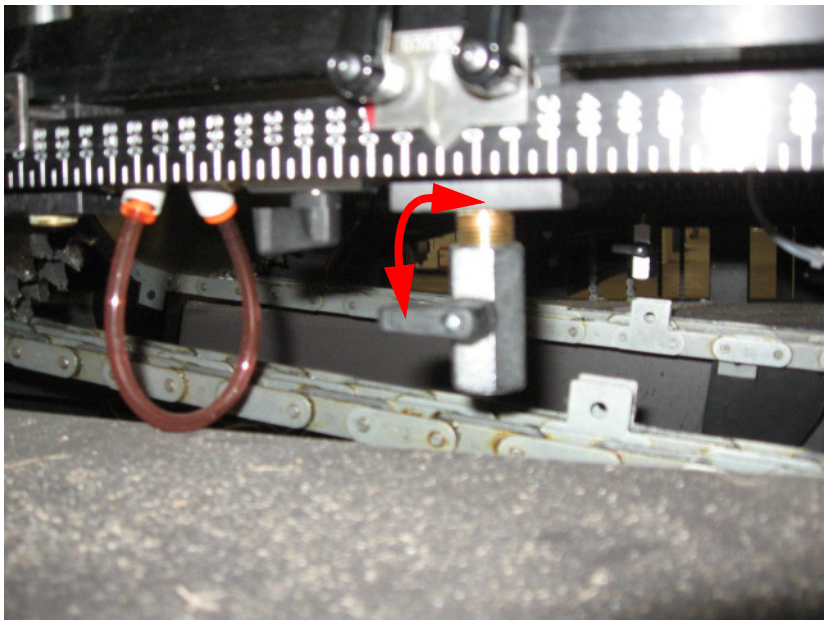
Changeover Location #20A

Turn the Setup Cup Valve On or Off

- Turn the Setup Cup Valve on or off according to the changeover chart.

Note: Shown in the off position.

Figure 5 - 32
The Setup Arm Cups Adjustment



Changeover Location #21

Adjust the Left Funnel Top

- Loosen the kip handle.
- Adjust Left Funnel Top to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 33
The Left Funnel Top Adjustment

Changeover Location #22

Adjust the Left Funnel Bottom

- Loosen the kip handle.
- Adjust Left Funnel Bottom to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

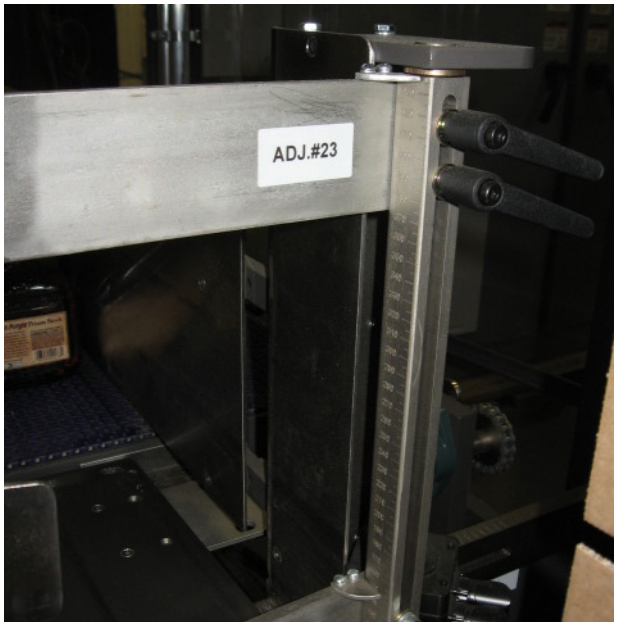
Figure 5 - 34
The Left Funnel Bottom Adjustment

Changeover Location #23

Adjust the Right Funnel Top

- Loosen the kip handle.
- Adjust Right Funnel Top to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 35
The Right Funnel Top Adjustment

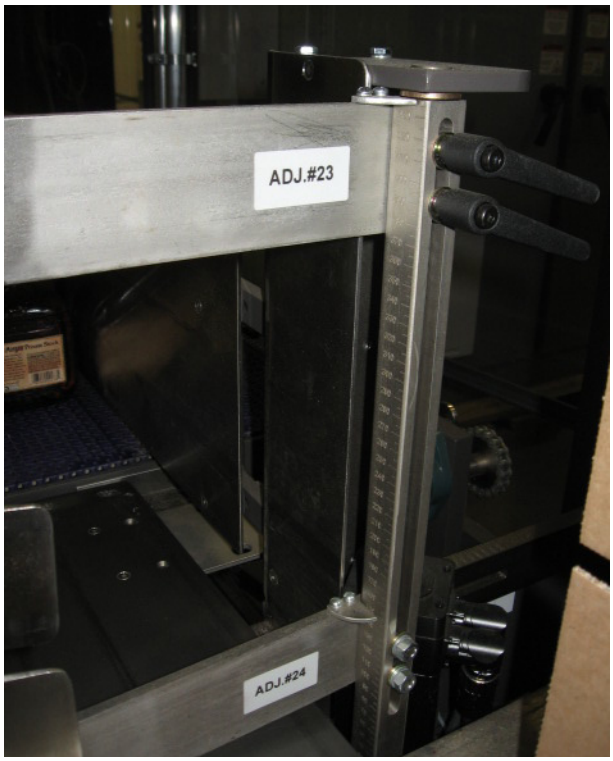


Changeover Location #24

Adjust the Right Funnel Bottom

- Loosen the kip handle.
- Adjust the Right Funnel Bottom to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 36
The Right Funnel Bottom Adjustment

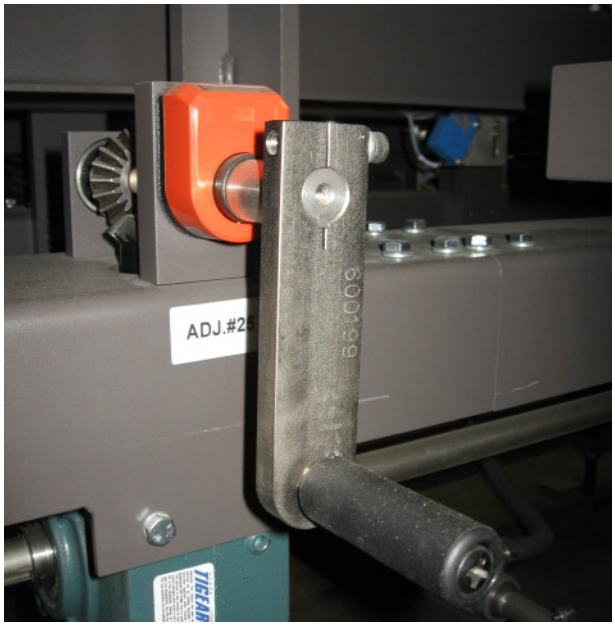


Changeover Location #25

Change the Bedplate Width

- Using the hand crank, adjust the Bedplate Width to the correct changeover part, according to the changeover chart.

Figure 5 - 37
The Bedplate Width Changeover

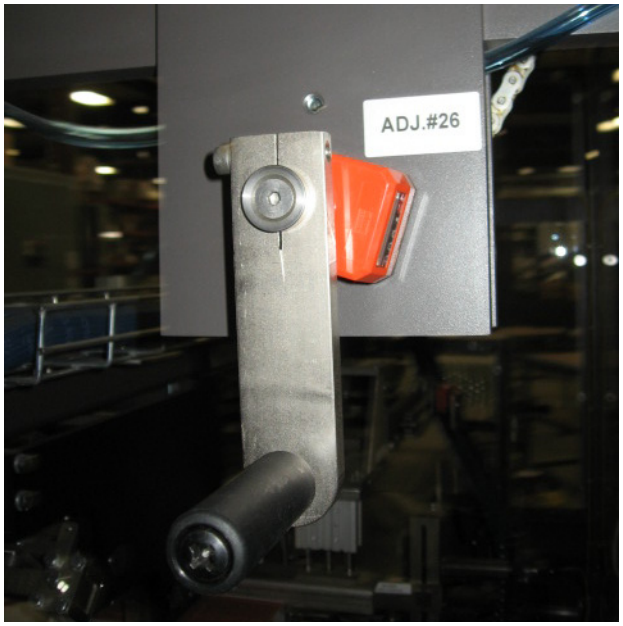


Changeover Location #26

Adjust the Overhead Compression

- Using the hand crank, adjust the Overhead Compression to the correct number on the siko digital indicator, according to the changeover chart.

Figure 5 - 38 The Overhead Compression Adjustment

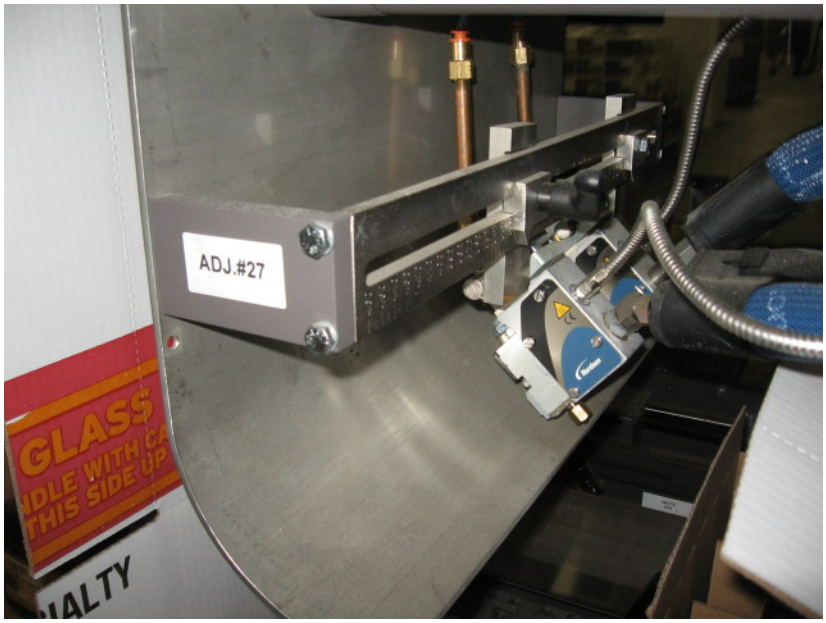


Changeover Location #27

Adjust the Manufacturer's Glue

- Loosen the kip handle.
- Adjust the Manufacturer's Glue to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 39
The Manufacturer's Glue Adjustment



Changeover Location #28

Adjust the Right After Tucker Rail

- Loosen the kip handle.
- Adjust the Right After Tucker Rail to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 40
The Right After Tucker Rail Adjustment

Changeover Location #29

Adjust the Case Back Stop Cylinder

- Loosen the kip handle.
- Adjust the Case Back Stop Cylinder to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 41
The Case Back Stop Cylinder Adjustment

Changeover Location #30

Adjust the Right Side Glue Top

- Loosen the kip handle.
- Adjust the Right Side Glue Top to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 42
The Right Side Glue Top Adjustment

Changeover Location #31

Adjust the Right Side Glue Bottom

- Loosen the kip handle.
- Adjust the Right Side Glue Bottom to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

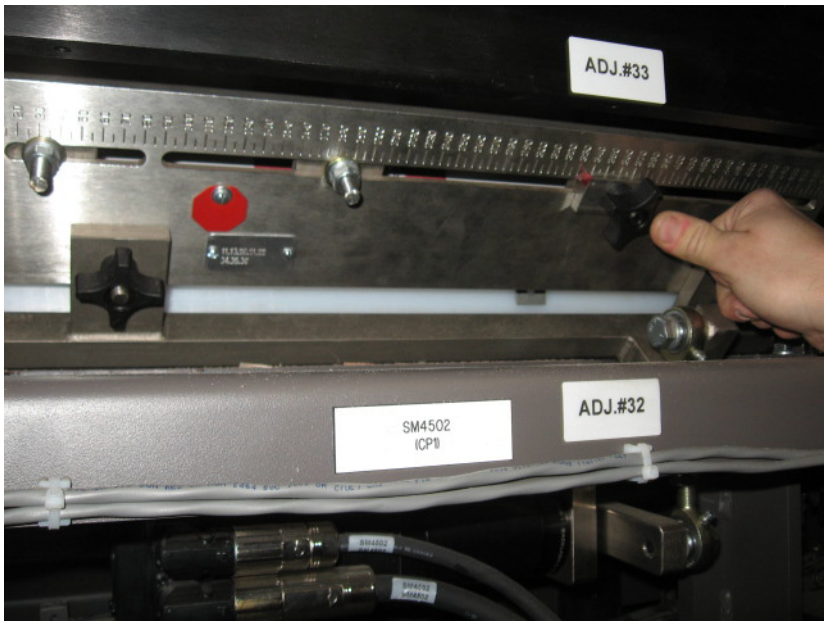
Figure 5 - 43
The Right Side Glue Bottom Adjustment

Changeover Location #32

Adjust the Right Lower Compression Plate

- Loosen the thumb knobs.
- Adjust the Right Lower Compression Plate to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knobs.

Figure 5 - 44
The Right Lower Compression Plate Adjustment



Changeover Location #33

Adjust the Right Minor Flap Containment

- Loosen the kip handles.
- Adjust the Right Minor Flap Containment to the correct number on the scale, according to the changeover chart.
- Tighten the kip handles.

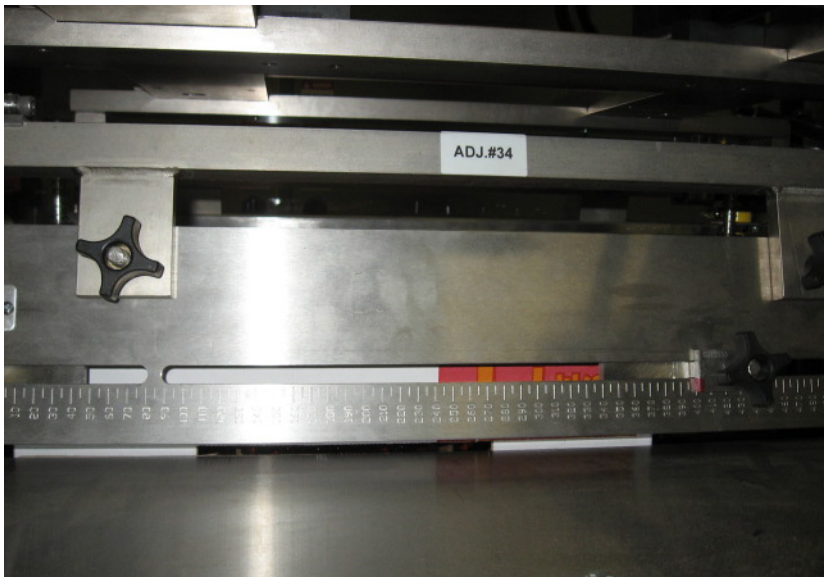
Figure 5 - 45
The Right Minor Flap Containment Adjustment

Changeover Location #34

Adjust the Right Upper Compression Plate

- Loosen the thumb knobs.
- Adjust the Right Upper Compression Plate to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knobs.

Figure 5 - 46
The Right Upper Compression Plate Adjustment

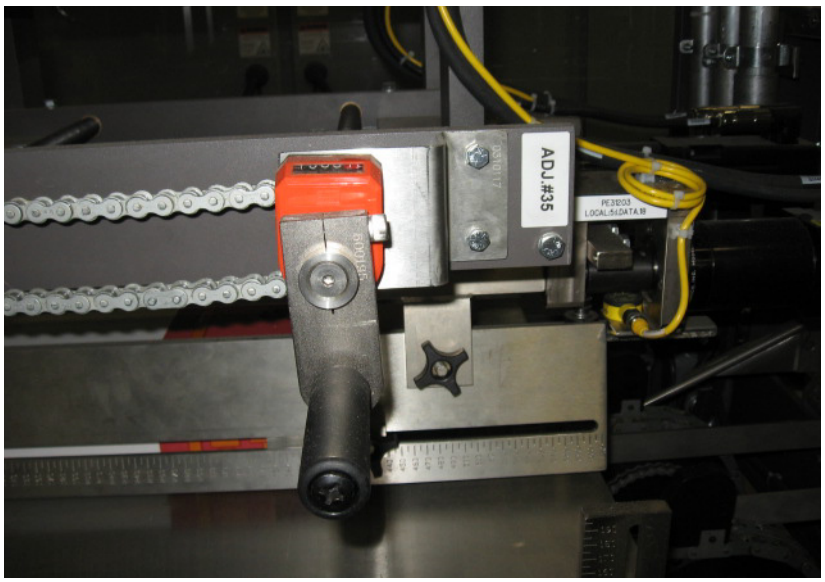


Changeover Location #35

Adjust the Case Compression

- Using the hand crank, adjust the Case Compression to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 47 The Case Compression Adjustment

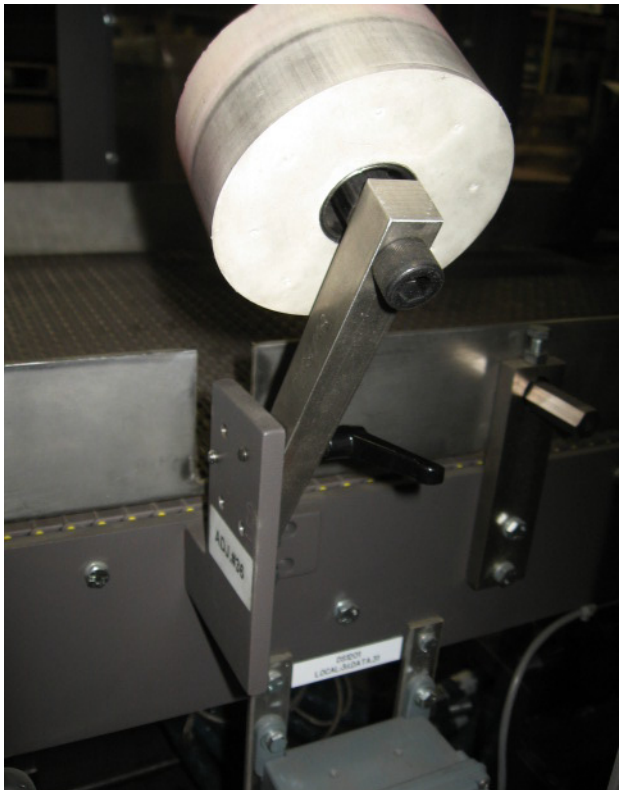


Changeover Location #36

Adjust the Bump Wheel

- Loosen the kip handle.
- Adjust the Bump Wheel up or down, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 48
The Bump Wheel Adjustment

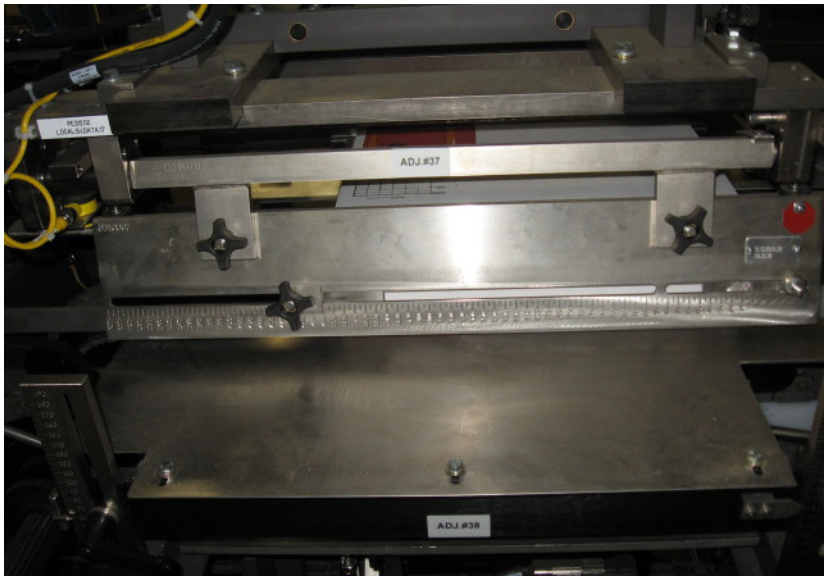


Changeover Location #37

Adjust the Left Upper Compression Plate

- Loosen the thumb knobs.
- Adjust the Left Upper Compression Plate to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knobs.

Figure 5 - 49
The Left Upper Compression Plate Adjustment

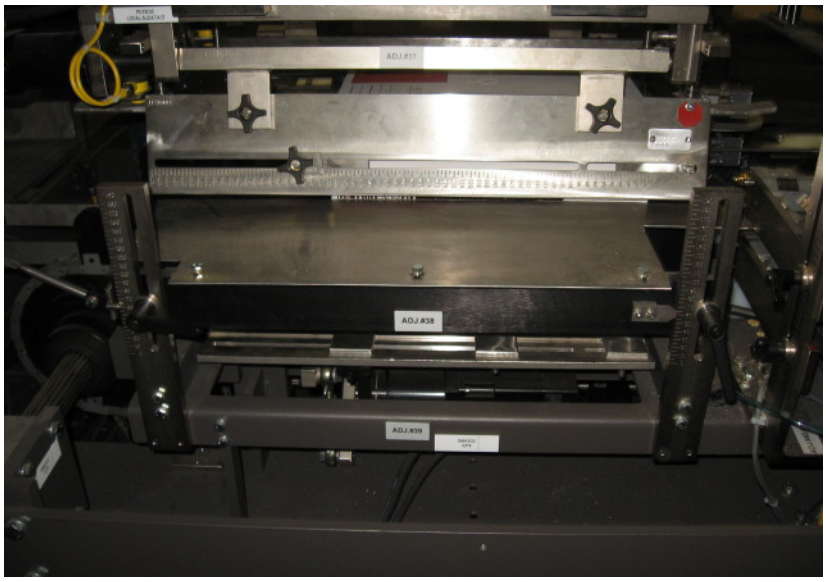


Changeover Location #38

Adjust the Left Minor Flap Containment

- Loosen the kip handles.
- Adjust the Left Minor Flap Containment to the correct number on the scale, according to the changeover chart.
- Tighten the kip handles.

Figure 5 - 50
The Left Minor Flap Containment Adjustment



Changeover Location #39

Adjust the Left Lower Compression Plate

- Loosen the thumb knobs.
- Adjust the Left Lower Compression Plate to the correct number on the scale, according to the changeover chart.
- Tighten the thumb knobs.

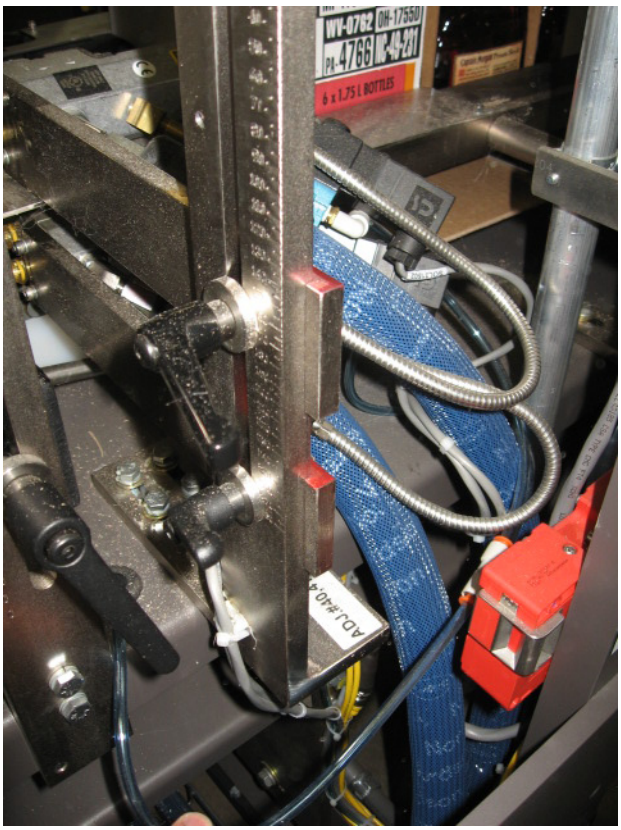
Figure 5 - 51
The Left Lower Compression Plate Adjustment

Changeover Location #40

Adjust the Left Glue Top

- Loosen the kip handle.
- Adjust the Left Glue Top to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 52
The Left Glue Top Adjustment

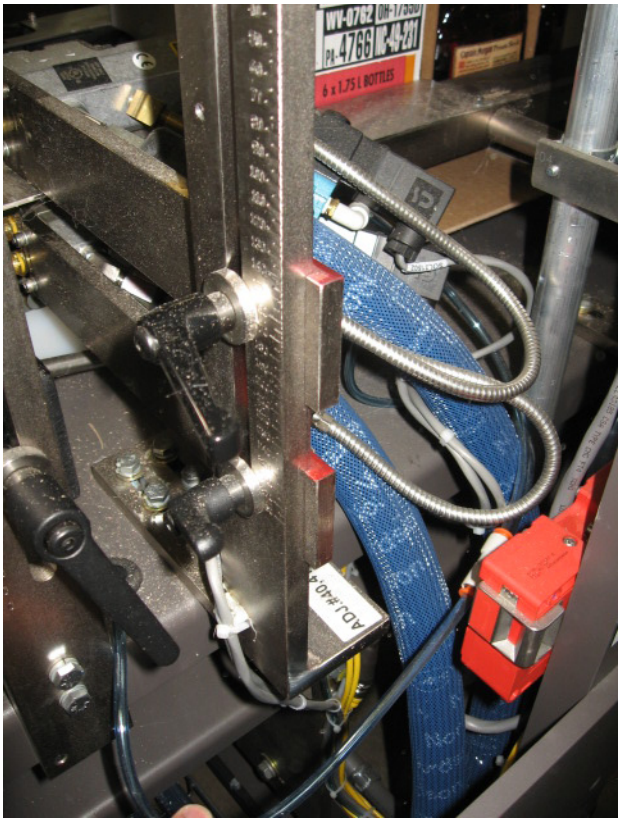


Changeover Location #41

Adjust the Left Glue Bottom

- Loosen the kip handle.
- Adjust the Left Glue Bottom to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 53
The Left Glue Bottom Adjustment

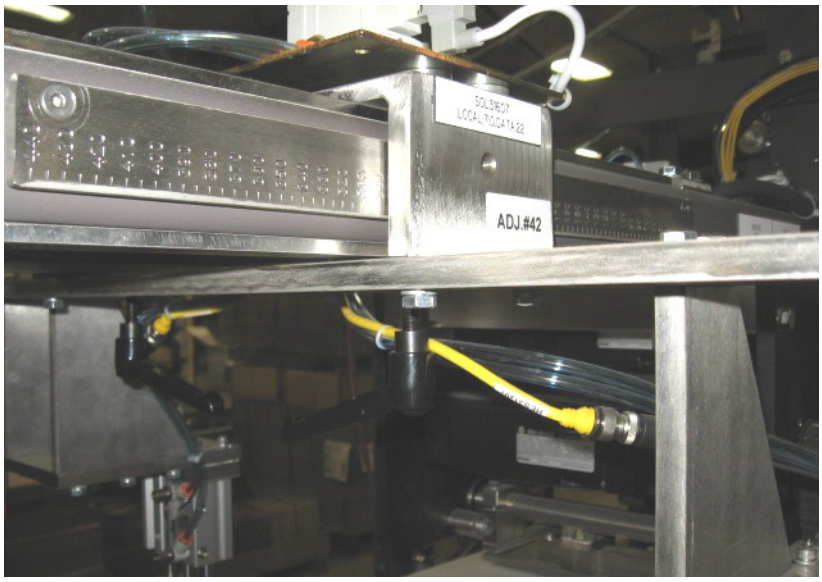


Changeover Location #42

Adjust the Case Backstop Cylinder

- Loosen the kip handle.
- Adjust the Case Backstop Cylinder to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 54
The Case Backstop Cylinder Adjustment



Changeover Location #43

Adjust the Left After Tucker Rail

- Loosen the kip handle.
- Adjust the Left After Tucker Rail to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 55
The Left After Tucker Rail Adjustment

Changeover Location #44

Change the Loader Transfer Plate

- Remove the Allen bolts.
- Change the Loader Transfer Plate to the correct part, according to the changeover chart.
- Tighten the Allen bolts.

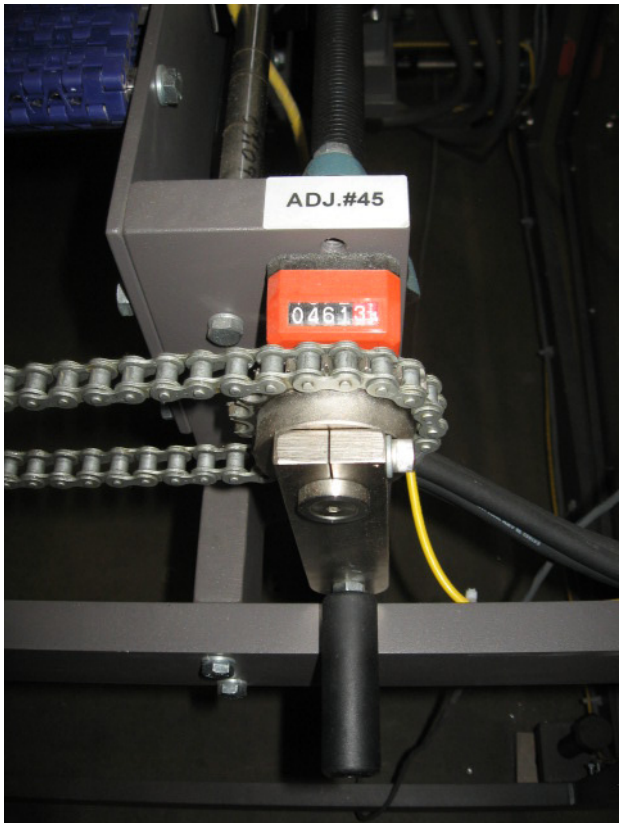
Figure 5 - 56
The Loader Transfer Plate Changeover

Changeover Location #45

Adjust the Product Backstop Guide

- Using the hand crank, adjust the Product Backstop Guide to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 57 The Product Backstop Guide Adjustment

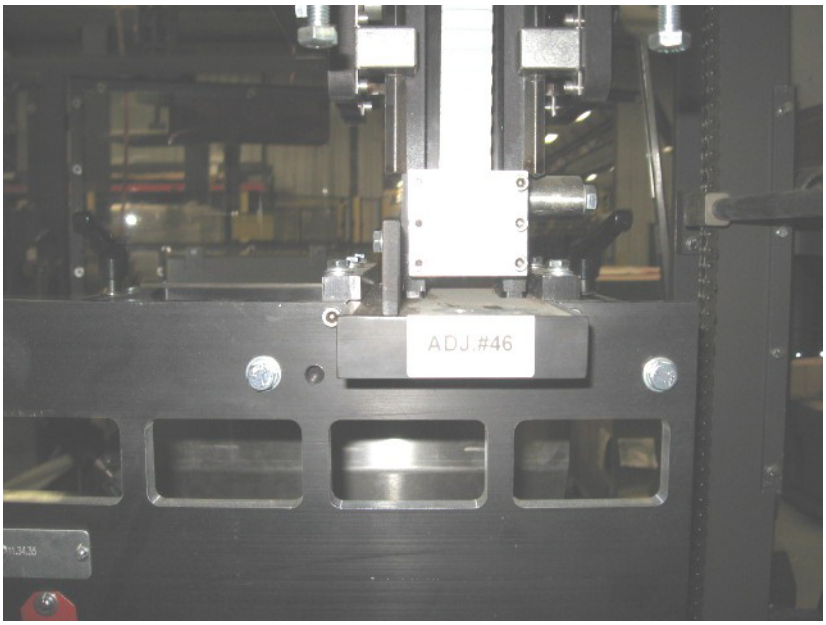


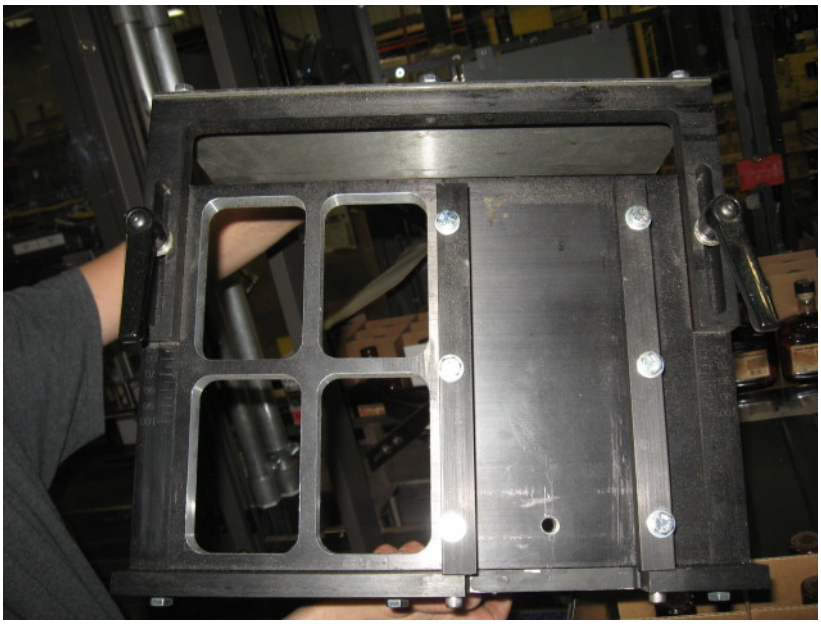
Changeover Location #46

Adjust the Loader Head Adjustment

- Loosen the kip handles.
- Adjust the Loader Head Adjustment to the correct number on the scale, according to the changeover chart.
- Tighten the kip handles.

Figure 5 - 58
The Loader Head Adjustment



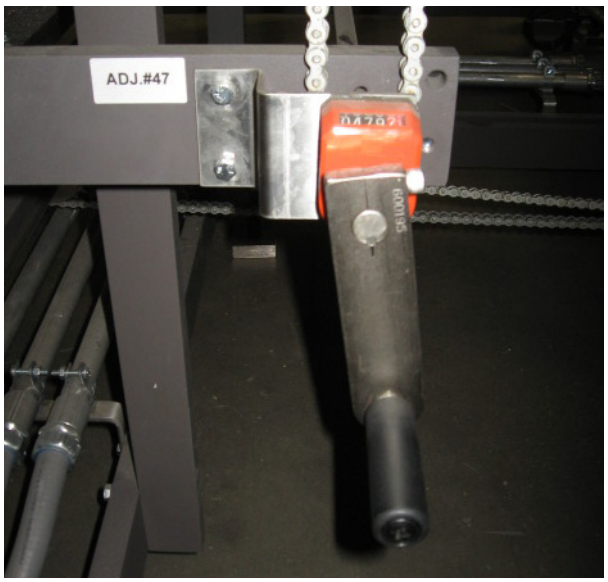


Changeover Location #47

Adjust the Lanes Width

- Using the hand crank, adjust the Lanes Width to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 59
The Lanes Width Adjustment



Changeover Location #48

Adjust the Lanes Funnels

- Loosen the kip handle.
- Adjust the Lanes Funnels to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

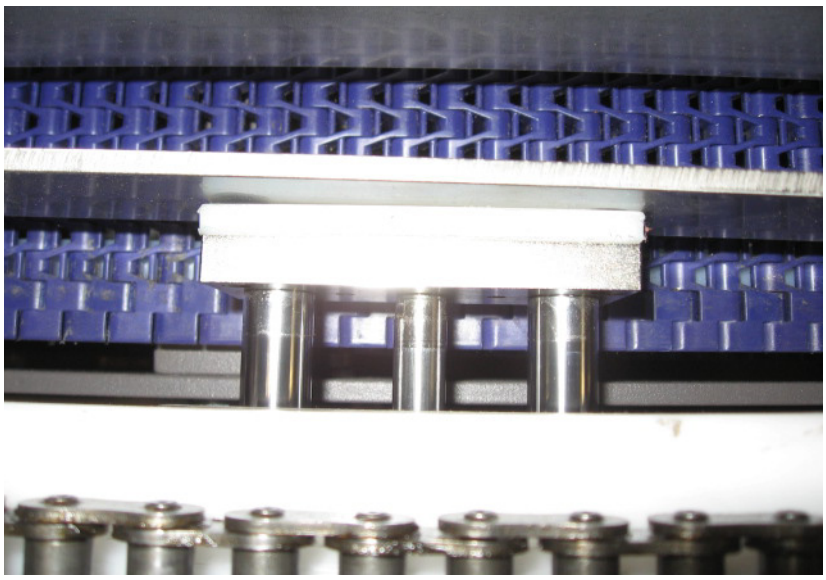
Figure 5 - 60
The Lanes Funnels Adjustment

Changeover Location #49

Change the Compression Cylinder Plate

- Insert or remove the Compression Cylinder Plate, according to the changeover chart.

Figure 5 - 61
The Compression Cylinder Plate

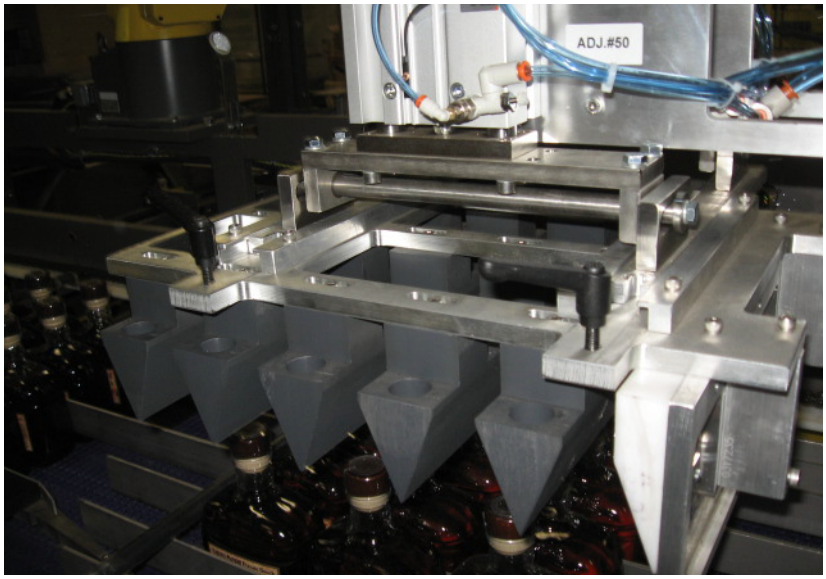


Changeover Location #50

Change the 200 ML Tool In or Out

- Loosen the kip handles.
- Change the 200 ML Tool in or out, according to the changeover chart.
- Tighten the kip handles.

Figure 5 - 62
The 200 ML Tool

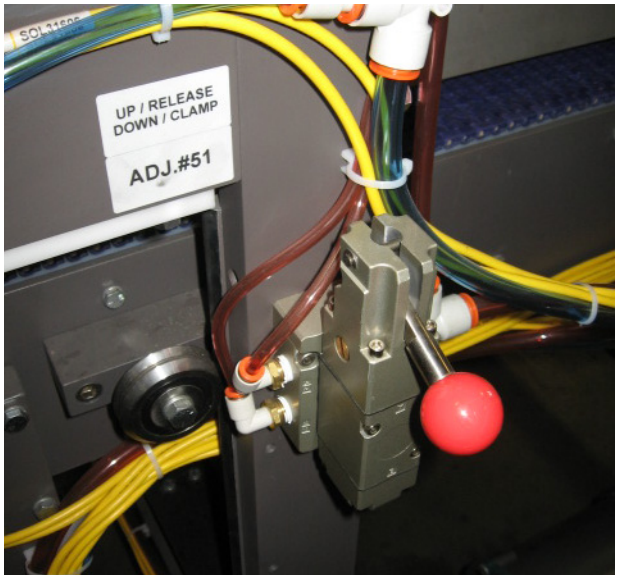


Changeover Location #51

Adjust the Lanes Blocks

- Remove the previous lane blocks.
- Insert the correct lane blocks.
- Use the knob shown below to clamp the correct lanes block in place.

Figure 5 - 63
The Lanes Blocks



Changeover Location #52

Adjust the Counting Photoeye

- Loosen the kip handle.
- Adjust the Counting Photoeye to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 64
The Counting Photoeye Adjustment

Changeover Location #53

Adjust the Metering Belts Width

- Loosen the kip handle.
- Using the hand crank, adjust the Metering Belts Width to the correct number on the Siko Digital Indicator, according to the changeover chart.
- Tighten the kip handle.

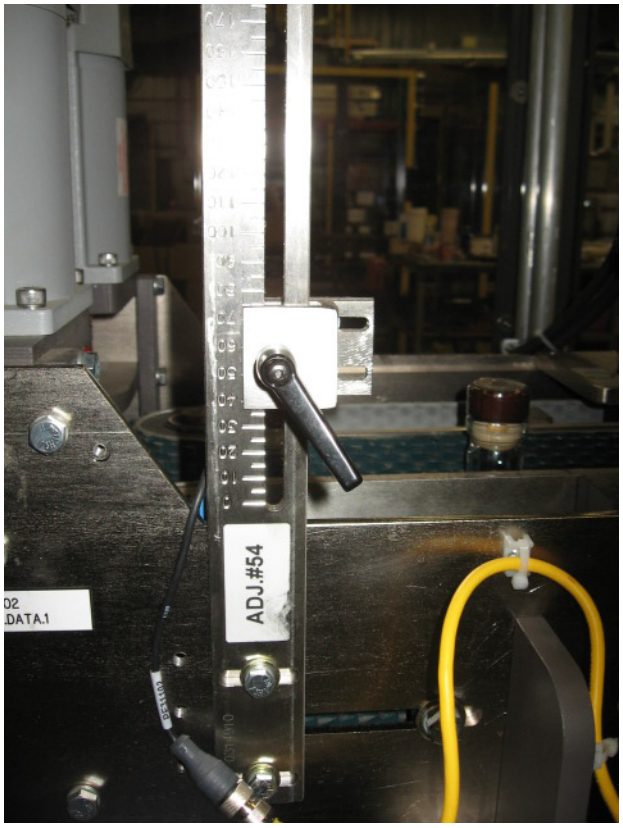
Figure 5 - 65
The Metering Belts Width Adjustment

Changeover Location #54

Adjust the Counting Photoeye

- Loosen the kip handle.
- Adjust the Counting Photoeye to the correct number on the scale, according to the changeover chart.
- Tighten the kip handle.

Figure 5 - 66
The Counting Photoeye Adjustment



Changeover Location #55

Adjust the Overhead Sweep Height

- Using the switch, adjust the Overhead Sweep Height to the correct number on the Siko Digital Indicator, according to the changeover chart.

Figure 5 - 67
The Overhead Sweep Height Adjustment

Completing the Changeover

1. Fill the Magazine with the correct corrugated blanks for the current production run.
2. Check the Glue Tank temperature. It must be up to temperature to start production.
3. Make sure all personnel; tools, and equipment are clear of the machine.
4. Press and release the Reset button once.
5. Press and hold the Start button for three seconds. The warning horn will sound three times.
6. The machine will begin production.

Robot Manual Jogging

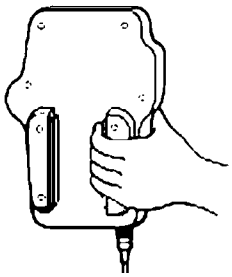
Collision Detect Common Causes:

- Part does not match the product ID and/or unit load number on the status screen.
- Part dimensions are incorrect.
- Part has inconsistent surface for picking (flaps open, rounded surfaces).
- Part orientation is incorrect on the EOAT or the Infeed.
- Part manually placed incorrectly.
- Station setups were incorrectly taught or UTOOL incorrect.

Collision Detection and Recovery

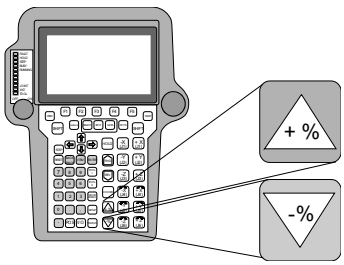
1. A fault occurs when the Tool collides with an object. The Collision Sensor senses the obstruction and creates a fault. The following procedure must be followed to recover from this fault.
2. Turn the AUTO/T1 switch on the R-J3 Remote Operator Panel to the **T1** position.
3. While holding the Fanuc Teach Pendant, press and hold in the yellow Deadman switch located on the back of the Fanuc Teach Pendant. The Deadman switch must remain held (pressed) in the on position throughout the recovery operation. See “Robot (Teach pendant) Operation Safety” on page 1 - 9.

Figure 5 - 68
Deadman Switch



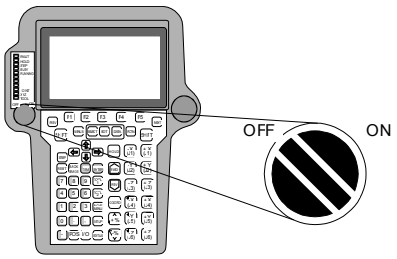
4. Set the speed override % to a safe jogging speed (10%) by pressing the [**-%**] button until the Fanuc Teach Pendant display indicates that the override speed has reached the desired setting.

Figure 5 - 69
Override Speed Adjust



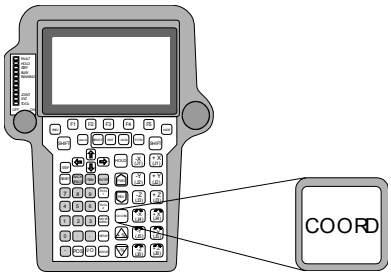
5. Turn the Fanuc Teach Pendant enable switch to the **ON** position.

Figure 5 - 70
ON/ OFF Switch



6. Set the coordinate frame to jogframe by pressing the [**COORD**] button. The XYZ LED will illuminate when jogframe has been properly selected. jogframe will also be displayed momentarily on the Fanuc Teach Pendant display.

Figure 5 - 71
Coord Key



7. On the Fanuc Teach Pendant, press and hold the [**SHIFT**] key. Pressing and holding the [SHIFT] key bypasses the fault condition so that the robot can move.
8. Using the Jog Keys on the Fanuc Teach Pendant, move the Tool (Typically pressing the [+Z] button) upward and away from the obstruction.
9. When the tool is clear of the obstruction, turn the ON/OFF enable switch into the **OFF** position.
10. On the R-J3 Remote Operator Panel, turn the AUTO/T1/ T2 switch to the **AUTO** position.
11. Return the **override %** speed to the desired operation speed.
12. Correct any problems that caused the Hand Breakage Fault.
13. Verify system and machine control power are on. If it is not on, then address that issue.

WARNING The next step causes robot motion. Make sure all personnel are outside of the Safety Enclosure.

Note: If the program was paused and not aborted, all cell operations will resume from the state in which they were originally paused.

14. Press the **CELL START** button.

    The system will resume operation.

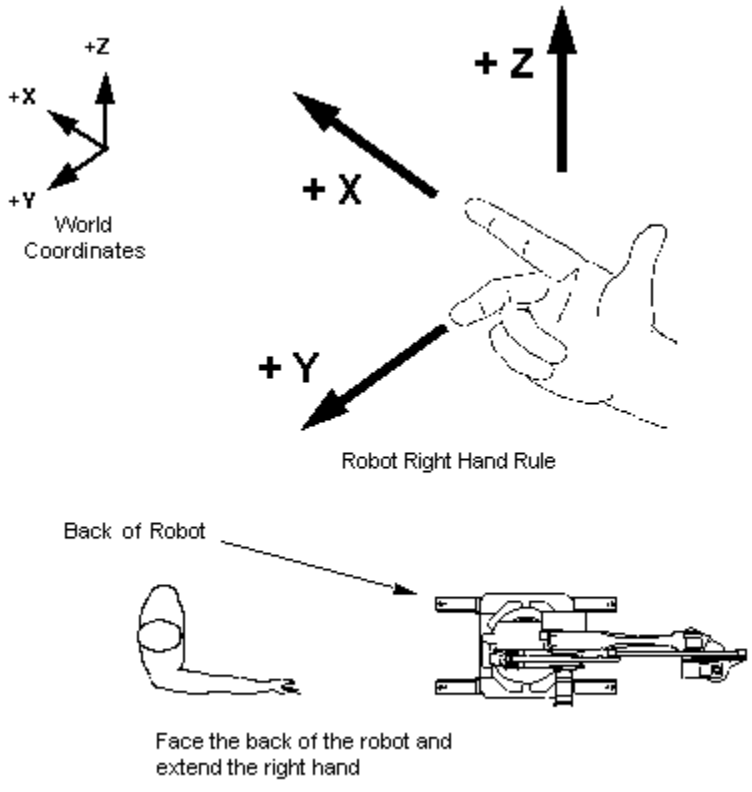
Right Hand Rule

To determine the direction that the robot Tool moves when jogging the robot, apply the following concept.

WARNING This rule applies to world coordinates only! Unexpected motion will occur, if you are in the wrong coordinate frame.

1. To determine the coordinate directions using the right hand rule, do the following:
2. Stand facing the back of the robot.
3. Extend your right arm straight forward.
4. Pretend your arm or wrist are the cables coming out of the back of the robot.
5. Extend your middle finger, index finger, and thumb as shown above.
6. Your index finger will be pointing in the motion direction of the EOAT if the [+X] key is pressed (forward away from the back of the robot). Similarly the EOAT will travel opposite this direction if the [-X] key is pressed (towards the back of the robot).
7. Your middle finger will be pointing in the motion direction of the EOAT if the [+Y] key is pressed (right to left). Similarly the EOAT will travel opposite this direction (left to right) if the [-Y] key is pressed.
8. Your thumb will be pointing in the motion direction (up) of the EOAT if the [+Z] is pressed. Similarly the EOAT will travel opposite this direction (down) if the [-Z] key is pressed.

Figure 5 - 72
The Right Hand Rule



Maintenance

Electrical P.M.

- Electrical PM on this system is minimal. Periodic inspection is all that is required to ensure that the electrical connections and components are secure and maintained.
- Check the flex cables monthly to ensure they are secure and don't show signs of fatigue.

Control Enclosures

- Clean outside of cabinets with a damp cloth only. A mild detergent may be used - NO WASH DOWN!
- Keep the inside of cabinets free of dust and debris. Clean with power turned OFF, use low air pressure or vacuum.
- Inspect all buttons and switches for snugness and correct operation.
- Inspect all indicator lights for bad bulbs.
- Ensure that all electrical connections are secure.

Junction Boxes

- Clean outside of boxes with a damp cloth only. A mild detergent may be used - NO WASH DOWN!
- Ensure that all mounting, piping, and electrical connections are secure.
- Check all sensing devices. Ensure all sensing devices are lined up properly and mounted tightly.

Sensing Devices

- Ensure that all mounting, piping, and electrical connections to the devices are secure.
- Check lenses for dirt build-up or blockage. Wipe off all Photoeye lenses and reflectors with a soft cloth and Windex® or another comparable glass cleaner.
- Verify alignment and check for proper signal operation.

Daily Inspections

- Remove remnants of glass, cardboard, glue, film, labels, etc. off the guides walk planes belts or channel to avoid obstructions, clean with compressed air or soft cloth.
- Check vacuum pump filters or replace.
- Grease the shafts and Axial Sliding Bushings.
- Check all chains.
- Check all that all guards and guard switches are functioning correctly.
- Check all belts for excess wear.
- Clean any residual dirt off the Infeed conveyor and lane guides.
- Check that the glue tank and guns are working correctly; clean glue nozzles.
- Check that the belts on all conveyor are tracking correctly.
- Inspect Vacuum Cups for wear & tears. Replace if necessary.
- Check and tighten any loose belts and or hardware.

Weekly Inspections

- Inspect the physical condition of each belt for damage. Replace any damaged belts.
- Check for loose bolts and guarding.
- Check for any evidence of an oil leak around gearboxes. Replenish oil following manufacturers instructions. Replace gearbox if a leak persists.
- While in operation, check for any unusual bearing noise and for bearings working loose in the carrier roller ends.
- Check to ensure that all photo-eye mountings are secure and that all sensors are aligned and functional.
- Check all linear bearings lubricate zerks according to frequency chart. See Table 5-2, “Zerk Lubrication Reference,” on page 5 - 83.
- Check V Rails for evidence of excessive wear or damage. Lubricate V rails with machine oil or food grade oil, as required for the application.

Three-Month Preventative Maintenance

- Remove chain guards. Check the drive chains for each section to ensure they are aligned with sprockets and running freely without excessive noise.
- Check drive and roller chains for proper lubrication and signs of excessive wear. Apply chain lubricant or equivalent (SAE 20) as necessary.
- Check oil leakage around reducers.
- Check all pneumatic components. Tighten fittings and look for air leaks at all components, fittings and pneumatic tubing.

Chain and Sprockets

- Check sprocket alignment periodically and correct misalignment immediately. Wear on the inside of sidebars or on one side of a sprocket is a definite indication of misalignment. Give reducers and gear motors, on indexing drives or drives equipped with brakes, special attention to prevent drive sprocket mountings from getting loose and shifting.
- After the initial start-up inspection, make a careful 100 hour check and another at 500 hours. Set up a periodic inspection schedule thereafter based on operating conditions. Indexing and braking drives require more frequent inspection than conventional drives.
- Most conveyor drive chains operate in a semi-protected condition; it is good practice to remove them periodically for cleaning and re-lubrication. Overly tight chains are just as harmful as a loose chain.
- For correct chain tension, the deflection on the slack side should measure 2% to 3% of the sprocket center distance.

Nexen Brakes

- To lubricate the air line leading to the Nexen brakes, add two drops of SAE 10 viscosity oil, or similar. Do not over lubricate.

Pulleys & Sprockets

- All pulleys should be checked for surface build-up. Clean if necessary. Check to be sure set screws and/or set collars are tight and properly aligned on their shafts.

Drive Chains

- Always be sure motor is not running & lockout is activated!
- Call your local lubrication specialist for extreme hot or cold conditions.
- All lubricant should be applied to the inside of the chain so that centrifugal force will help work the oil into the pin joints instead of throwing it off.
- A thin lubricant will penetrate into the chain joints. Lubrication with an oil cup, spout can, or brush is adequate as long as the atmosphere contains no abrasive particles.
- Where this condition exists, it is better not to have conventional lubricants on the surface of the chain to attract abrasive particles. Use dry lubricants such as molybdenum disulphide or de-flocculated colloidal graphite in a volatile carrier.
- Remove the side casing of the machine and check if the drive chains are tightened and parallel clean and remove any residual, dirt, etc.
- To keep drive chains in good operating, the following procedures are recommenced:
    - Flush away foreign materials, such as metal particles, dirt, rust or corrosive chemicals before lubricating.
    - Chains should be lubricated with SAE 10 to SAE 40 viscosity oil to prevent galling and seizing of the contact surfaces. Oils formulated for chain lubricant will retard oil throwing.
    - Lubricate all sprocket contact surfaces.

Cleaning & Sanitation

- Use a paint scraper or putty knife, clean all glue off the Tuckers, Plows, After Tucker Rails, Compression Rails and Bedplates.
- Using an air hose at medium air pressure, blow down the whole machine Magazine, Bedplates, Transfer Deck, and Infeed conveyor.
- Clean all dirt and old or spilled product out from under machine.
    - Do not wash down this machine.

Lubrication

- The Alpha high-speed gearboxes as seen on the servomotors are sealed for life and maintenance free. The oil used is a high quality synthetic gear oil.
- Chains should be lubed with a dry spray lubricant or brushed with a wet chain lube.
- Dodge and Tigear reducers and gearboxes are factory filled with synthesized hydro-carbon lubricant which stay contamination free and won't break down under normal operation conditions.

Note: The recommended food grease is Mobil FM 101 or FM 221 FG grease.

WARNING Avoid excessive amounts of lubricant. It is better to lube with less grease more often than to use excessive amounts at infrequent intervals.

- Lubricate components with a longer stroke more with more grease than those with a shorter stroke.

WARNING More frequent lubrication may be necessary under harsh conditions.

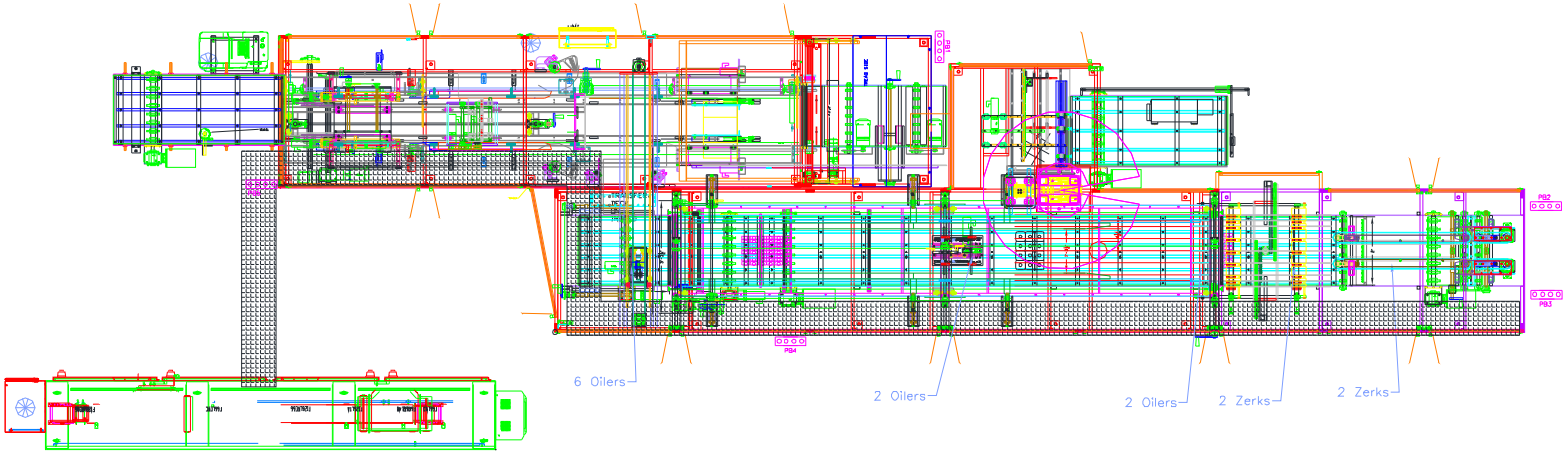
Table 5-2. Zerk Lubrication Reference

FREQUENCY	EXPLANATION
RED **24 Hours**	Represents unsealed bearings (RBC and Bushings.) Example: Loader Slide.
YELLOW **200 Hours**	Represents Non-Sealed cam followers and some linear bearings.
WHITE/ NONE **400 Hours**	Represents V Rail Oilers. Oil the V Rail Felt every 400 hours under normal conditions.
NONE WITH ZERK **Annual**	Represents changeover adjustment zerks. These components move, but only when an adjustment is made during a changeover. Grease these zerks once a year, under normal conditions.
NONE NO ZERK	Represents all sealed bearings. These bearings are lubed for life. Replace these bearings at the end of their useful life.

Lubrication Location Drawing

The locations of the required lubrications for the system are in the drawing below.

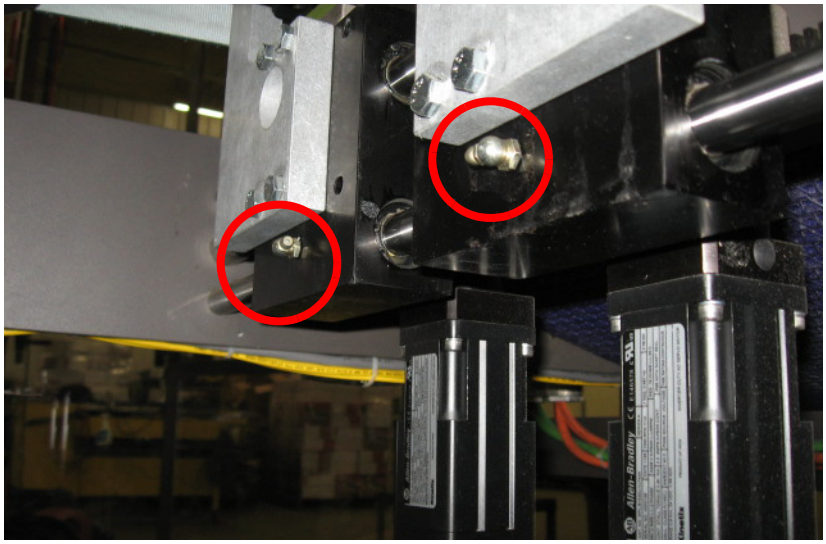
Figure 5 - 73
The Lubrication Location Drawing



Linear Bearing Zerk Locations

There are eight (8) linear bearing zerks for the THK bearings in the lane divider area. The photos below show their locations. These are medium frequency lubrication points. Lubricate these zerks with a manual grease gun. For lubrications information including frequency, see “Lubrication” on page 5 - 83.

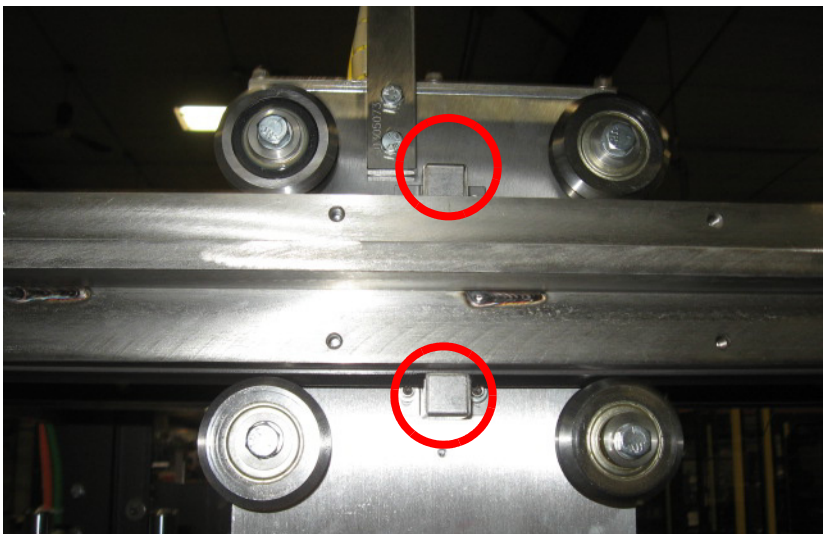
Figure 5 - 74
Lane Divider Linear Bearing Zerks



Oiler Lubrications

Below is an example of oilers that should be lubricated once per 400 hours with food grade oil, under normal conditions. For locations of these lube points, see “Lubrication Location Drawing” on page 5 - 84. For frequencies, see “Lubrication” on page 5 - 83.

Figure 5 - 75
Example Oilers



Siko Counter Reference Positions

Each Siko counter used for changeover adjustments have a hard stop, collar, or reference mark at the 500.0 position. This means that if the Siko counter ever fails, you can replace the counter at that hard stop position and dial the counter to 500.0.

Figure 5 - 76
Adjustment at 500.0 Hard Stop

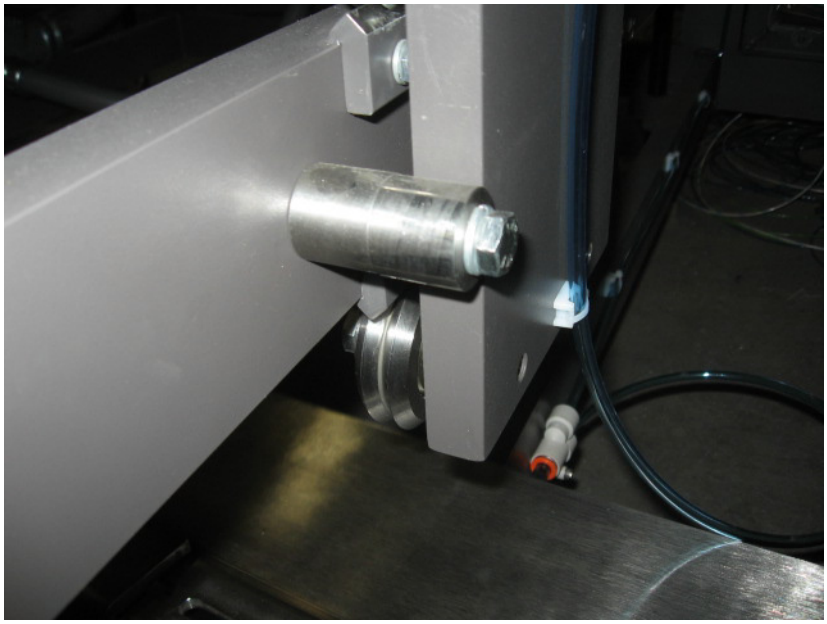


Table 5-3. Maintenance Log

DATE	INITIALS	COMMENT

Spare Parts List & Bill of Materials

Spare Parts Legend

Code & Description

ABPB	PUSHBUTTON
ADP	ADAPTER
BB	BRONZE/BRASS BUSHING
BELT	BELT
BRG	BEARING
CAM	CAM
CAN	CHAIN
CHPB	PUSHBUTTON
CLH	CLUTCH
COND	CONDUIT
CPLG	COUPLING
CYL	CYLINDER
EC	ELECTRICAL SUPPLIES
EM	ELECTRIC MOTOR
ENCL	ENCLOSURES & PANELS
FUSE	FUSE
GBP	GEAR BOX PULLEY
GBX	GEAR BOX
GEAR	GEAR
GLUE	GLUE SYSTEM
GROB	GROB
HISD	HI SPEED
HNDL	HANDLE
HNWL	HAND WHEEL
HTRS	MTR STARTER HEATERS
HYD	HYDRAULIC COMP.
LUBE	LUBRICATION
MCC	MTR CONTROL CENTER
MISC	MISCELLANEOUS PARTS
MSCE	MISCELLANEOUS ELECT
PC	PNEUMATIC
PLC	PLC HARDWARE
PLL	PULLEY
PNLS	PANEL MOUNTED MISC.
PNT	PAINT
RDE	ROD END
RLY	RELAYS & RELAY MISC.
RUBR	RUBBER
SDPB	PUSHBUTTON
SEAL	SEAL
SENS	SENSOR
SERV	SERVO
SPL	SPECIAL ELECTRICAL
SPRG	SPRING
SPRK	SPROCKET
STCK	STICKER
STEP	STEPPER
STFB	STOCK FABRICATED
TQL	TORQUE LIMITERS
TRAN	TRANSFORMER
VAC	VACUUM
VECT	VECT LENZE
VFD	VARIABLE FREQUENCY
VLV	SOLENOID VALVES

Color Key

Grey - Low Cost Consumables/Switches
Yellow – Project Specials
Blue – Servo Related (Requires longer lead)

6. Electrical Programs & Prints

Table of Contents

Place copies of all software here after completing startup.

Servo Program

PLC Ladder Logic

Human Machine Interface

A. Appendix A: Index