THE POWER BEHIND THE PACKAGE

PDC International Corp

Operational Manual
PDC Model R250-ERT
Serial No.: 213

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1. INTRODUCTION

1.1 Overview

The PDC Model 75 is for use in labelling or neckbanding consumer product containers on a production-line conveyor.

1.2 Confidentiality

This manual and the information contained therein is confidential property of PDC International Corporation. It may not be reproduced and may only be used in conjunction with the purchased PDC machine.

1.3 Manual Storage

Please keep this manual in a safe and accessible place for all operators and other parties that may be responsible for this machine.

1.4 Warranty Note

The machine is warranted as per PDC "terms and conditions" to work with the materials and products with which it was tested.

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2. SAFETY PRECAUTIONS

2.1 Warning Statement

Failure to install, service, and operate this machine in accordance with the instructions in this manual, proper training, adherence to warning labels, exercising common sense, and due caution may result in serious bodily injury.

Please read this manual carefully and understand it before operating this machinery.

Please contact PDC International directly at (203) 853-1516 with any questions or for any problems or conditions that arise that you do not understand.

2.2 Danger, Warning, and Cautions

(Danger, Warning, and Cautions are based on definitions in ANSI Z535.4 -2007, Section 4.)

⚠ ***Danger: Do not wear loose fitting clothing, a tie, or hair in a ponytail when performing maintenance on machine or when opening machine for any reason. Tuck in clothing, remove tie, and put hair in a hairnet if necessary. These items can get caught in moving parts and result in serious bodily injury or death!***

⚠ ***Caution: Power off machine and turn all switches to the off position including the main power fused disconnect switch (pictured below) and the Wilkerson Safety Lockout Valve (pictured below), and then follow proper lockout/tagout procedures, before using tools to remove the bolt to swing out the main electrical enclosure.***

⚠ ***Caution: Before any work is to be done on the machine, or before reaching into the machine for any reason, if possible turn all switches to the off position including the main power fused disconnect switch (pictured below) and the pressurized air to the machine, and then follow proper lockout/tagout procedures!***

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⚠ ***Caution:*** ***In certain cases where the power must be on to make a specific adjustment, exercise caution and ensure any other operators in the area are aware that 1) the power is on and 2) that an operator is performing maintenance on the machine.***

⚠ ***Caution:*** ***Please read and follow any and all safety stickers and warnings that are on this machine (pictured below).***

© Clarion Safety Systems, LLC

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(The two safety labels above are located on the Lexan™ windowing that covers this machine.)

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(The two safety labels above are located on the main electrical enclosure door.)

2.3 Sleevelabeler/Conveyor Anchoring

Before startup, the PDC sleevelabeler must be securely anchored to the conveyor.

2.4 OEM Components on this Machine

Please see the Literature section at the end of this binder for additional details of OEM components of this machine, including setup, safety, and maintenance instructions. Also, please read and follow any and all safety stickers and warnings on the OEM components that are included as part of this machine.

The Literature section is organized alphabetically by manufacturer's name, for ease of use.

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3. MACHINE AND SUB ASSEMBLY DESCRIPTIONS

3.1 General Description

There are two distinct material flow paths through the labeler. The container flow and the label flow.

The containers are transported single file through the labeler by a small plastic link conveyor. As the containers enter the labeler they go through a timing screw assembly. The timing screw assembly properly spaces the containers for labeling. The correctly spaced containers pass underneath the main feed unit and mandrel, where a label is placed on each container.

The labels consist of printed or clear plastic tubing that shrinks when it is heated. They are supplied from the vendor wound on a small reel. The reel of labels is loaded into the labeler on the unwind assembly.

The label path begins at one of the unwind reels. From there, the film material passes over the splicing table, up through the unwind feed assembly, and into the first vacuum box (unwind vacuum box). The label material moves from this vacuum box through the servo registration sensor assembly and then through the perforator.

The perforator places a horizontal perforation on the labels. The horizontal perforation is for machine label separation. There is also a venting perforation placed on the label to aid in shrink-fitting the label to a curved container. The label moves from the perforator into the second vacuum box (perforator vacuum box), and then it travels to the mandrel assembly. The label is fed over the mandrel, which opens the label up, so that the label can be placed over the top of the container.

After label application, the conveyor moves the container under a band positioner that ensures the label is not seated too high on the container, and then the container travels into a steam tunnel where the label is heat shrunk to the container. After

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the container exits the steam tunnel the container/label is complete and continues down the conveyor to its next destination set by the customer.

3.2 Unwind Film Reels

This is where the reels of labels are mounted. They are equipped with film low sensors to detect the level of labels on the film material reels. When the sensor detects that the reel is low, it will activate the orange light on the stack light (the light assembly located at the top of the machine).

3.3 Splicing Table

The splicing table is located between the dual unwind reels. This table is designed to ease the splicing. There is a film out sensor on the table. When the film runs out, the sensor will stop the machine. The sensors must be kept clean at all times.

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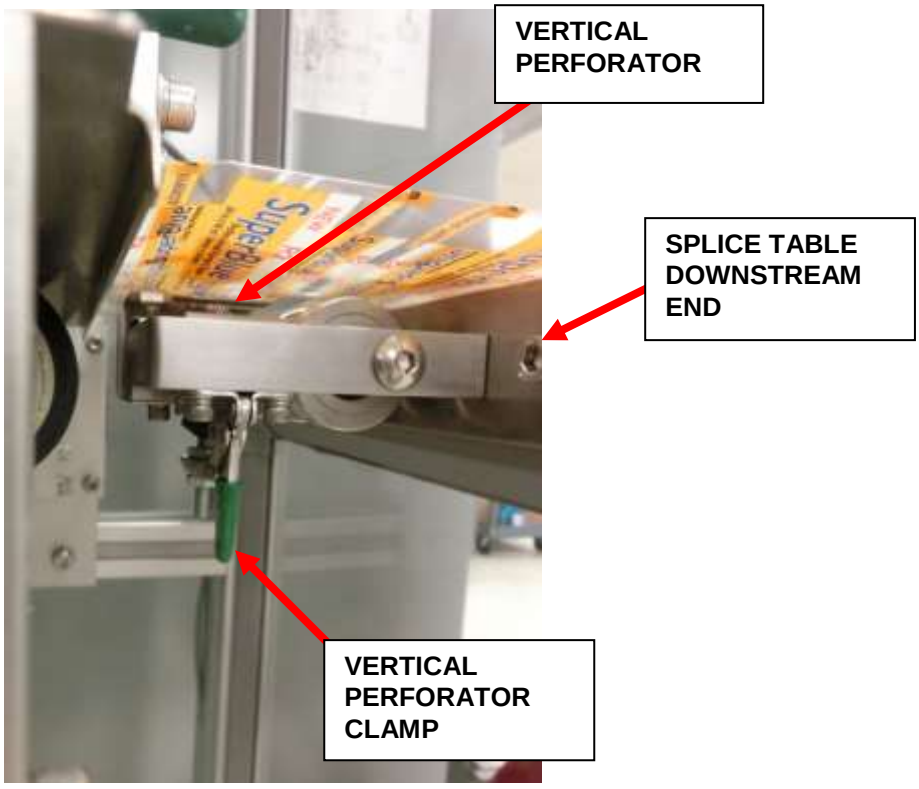
3.4 Vertical Perforator

There is a vertical perforator located just after the splice table. Be sure that the clamp is fastened securely in place. This perforator makes the vertical perforation in the label that the end consumer will use to tear the label off from the container. It looks like a small pizza cutter with teeth. Use caution when doing any work in this area as the vertical perforator is very sharp.

[Note: This unit is called the vertical perforator throughout this manual. There is a separate horizontal perforator (that is referenced in this manual as simply, perforator) that makes the horizontal perforations that separate one label from another.]



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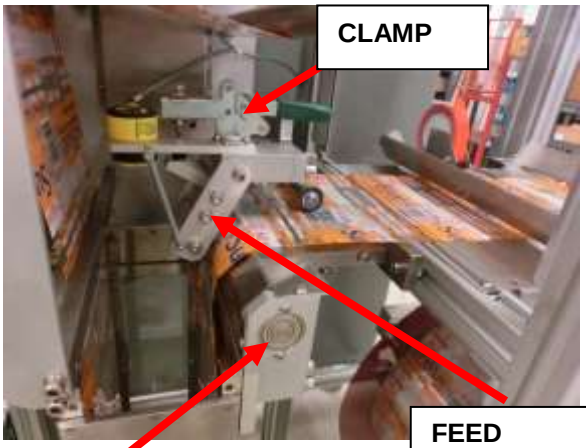
3.5 Unwind Feed Unit

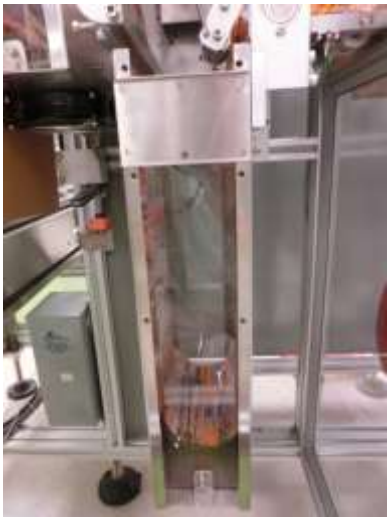
This unit feeds the material into the unwind vacuum box. The feed speed is controlled by the analog sensor that detects the depth of the film loop in the box. Make sure that the clamp is down to maintain proper roller pressure and keep the feed rollers clean with isopropyl alcohol.



3.6 Vacuum Boxes

On the machine there are two vacuum boxes, one for the unwind and one for the perforator. For the unwind, an ultrasonic sensor controls the level of film in the box. This sensor senses position of the film. If the film is low in the box, this will allow the motor to run slower. If it is high in the box, the motor will run faster. These motors are set for the maximum speed. Over speeding the motor will cause a film jam in the boxes or film folding over. If the speed is too low it will not be able to fill the boxes in time, causing the film high condition, which will be detected and the machine will stop. Check motor settings if a problem arises. Then check to see if rollers are clean and if the clamp is properly clamped down.

For the perforator, the same principle is used with the ultrasonic sensor to determine the need for the servo registration feed to deliver labels into the vacuum box.



3.7 Servo Stop Sensor

This unit controls the stop feed of the servomotor by a photoeye for registration. The servomotor feeds the film through the perforator. This photoeye will stop the servo once it detects a registration mark on the film.

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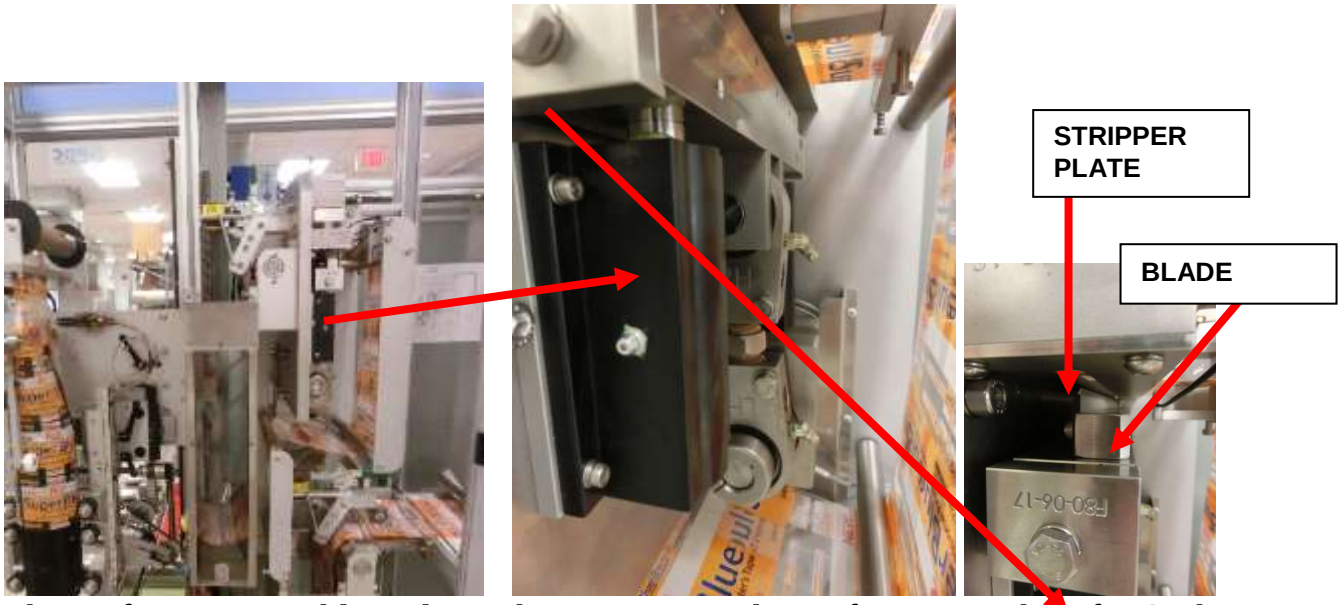
3.8 Perforator



The perforator assembly is driven by a motor via the perforator crankshaft. At the end of the crankshaft there is the rod end assembly. This assembly is for your perforator adjustment and is connected to the perforator blade carriage. Perforations are made by the crankshaft turning the rod end assembly, which in turn moves the perforator blade carriage in an up-and-down motion. It moves up through a stripper plate, against the anvil assembly, where the blade (with vent pin) perforates the film material.

Once the perforation is made in the film, the perforator blade at this point will start to go to the down stroke. The perforator blades and vent pin then travel back through the stripper plate. When the blades/vent pin are just beneath the top of the stripper plate is the point when the film must index to the next band.

A flag (target) turned by the crank, activates the servo start proximity switch (located on the perforator assembly) which gives the signal for the start feed. The servo motor advances the film.

For proper operation of the machine, it is important to have the labels properly perforated. The perforation depends on the properly maintained adjustment of the connecting rod, sharpness of the blade, and surface quality of the anvil. If the hard

anvil that the perforation blades perforate against is ever damaged, it is to be reground or replaced. Generally, the surface will wear, but redressing the surface by grinding may be required after about a year.

3.9 Servo Feed Unit

This unit feeds the material into the perforator vacuum box. The feed signal is given by the analog sensor that detects the depth of the film in the box. Make sure that the clamp is down to maintain proper roller pressure and keep the feed rollers clean.

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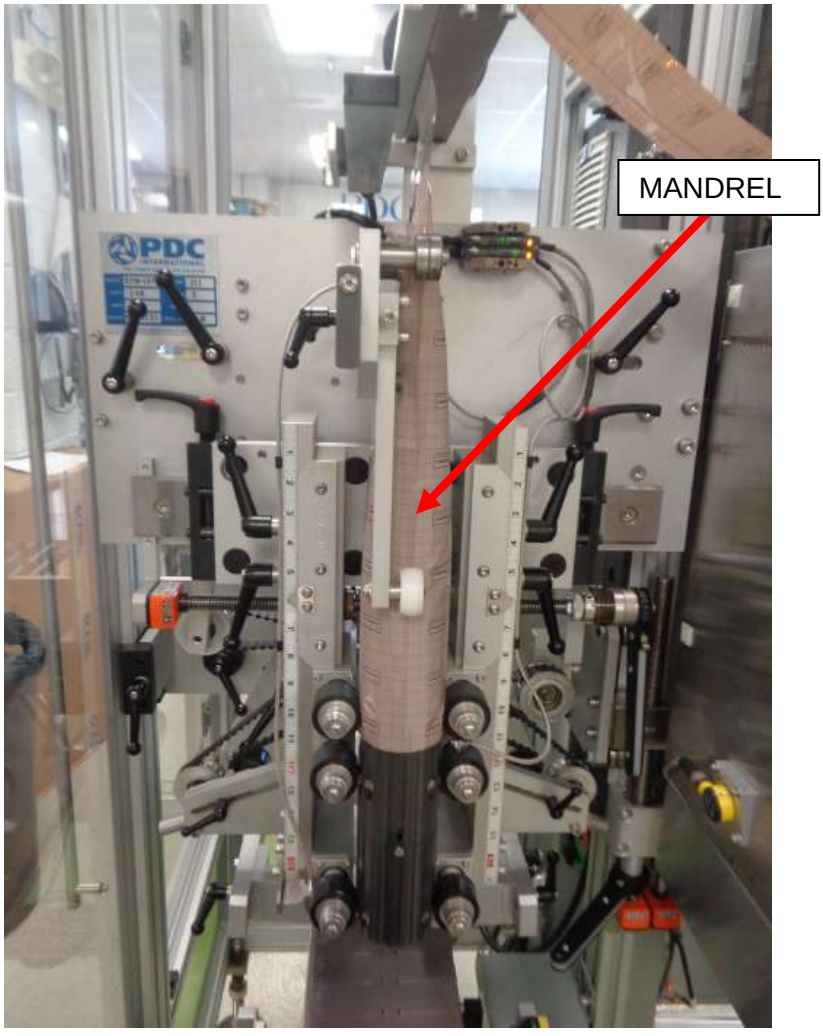
3.10 Machine Feed Unit and Mandrel

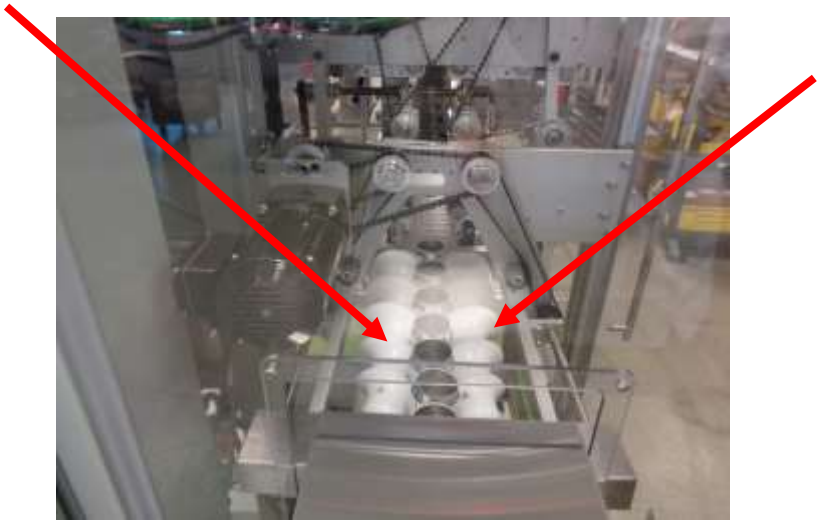
The main feed unit is designed to hold the mandrel in place, allowing it to "float". To feed the film material over the mandrel, perform the "Begin Perforating Batch" routine (See Section 4.10) to generate enough perforated film to prime the mandrel and feed unit. Then turn the "FEED DRIVE" to off and open the guard and load the film over the mandrel and tuck the film into the top feed rollers. Manually turn the rollers to feed film to be just above the registration sensor on the mandrel.

No lubrication is needed for the main unit and the mandrel, but both must be kept clean of dust and oil.



3.11 Timing Screw Assembly

There are dual timing screws, turning inwards in a rotating motion. These are designed to separate the product from the others in the line, and present it to the application area, after which the product is released from the timing screws. The screws should be cleaned periodically with the screw manufacturer-recommended cleaner, Simple Green® cleaner-degreaser.



Viewed from upstream, looking downstream

3.12 Band Positioner (also called Walking Beam)

The band positioner (or walking beam) holds down the label vertically on the container. The band positioner is located after the label applying mandrel and before the heat tunnel.

3.13 Heat Tunnel

After label application, the container travels to the heat tunnel (KST80-712) where the label is shrunk to the container tightly, via heat. See the Tunnel tab in this binder for a separate manual that pertains to this tunnel.

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3.14 Conveyor

The conveyor will be traveling at an appropriate speed for the containers as they pass under the mandrel assembly. The conveyor speed is set to keep the containers in the correct position/spacing once they reach the mandrel assembly. The conveyor should be cleaned and tight at all times.

There are guards at the infeed and outfeed of the conveyor.

⚠ ***Caution: Do not operate the conveyor without these guards in place!***

3.15 Stack Light

The stack light is located at the top of the machine and serves as a readily visible indicator of machine status to the operator.

Green (On): Machine is in running (operational) mode.

Blue (Flashing): Choke feed stop eye has been activated.

Orange (Flashing): Low film sensor has been activated.

Red (Flashing): Machine has stopped due to input from a sensor.

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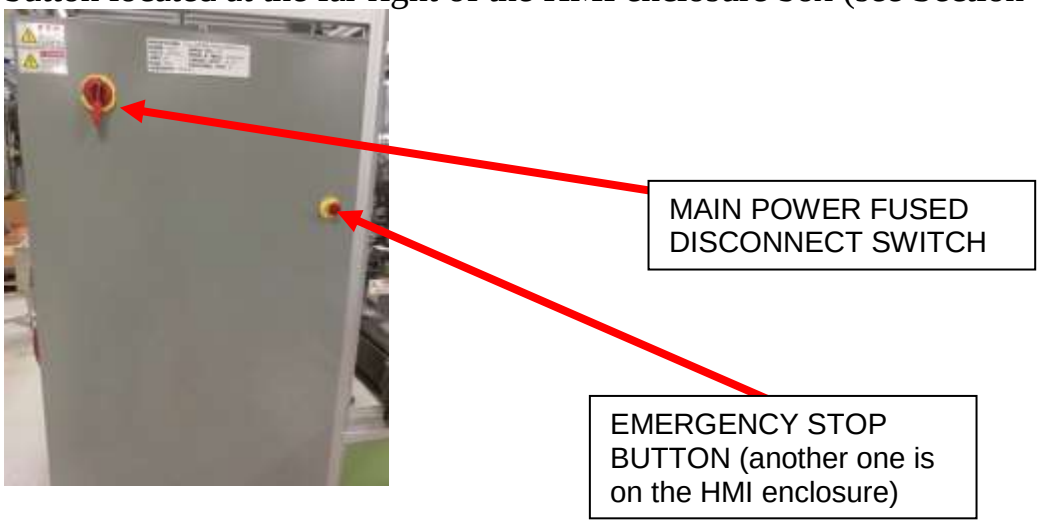
3.16 Main Power Fused Disconnect Switch & E-Stop button

This switch removes power to the machine from the building.

It is located on the main electrical panel door.

Also on this door is an Emergency Stop button [there is also an Emergency Stop button located at the far right of the HMI enclosure box (see Section 4.1)].



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3.17 Sensor Function Identification

Warning: Do not stare at, or into, the beam within any sensor of this machine and do not point the beam at anyone when handling or adjusting a sensor, as the beam may be harmful to the eyes.

Read Section 11.2 for further details on sensors. Some of the sensors are described below.

Film Low Sensors
This is a sensor on the film reel that will signal a low film condition when the film amount is below the corresponding diameter level. This is located behind the reel.

Film Out Sensor
This is a sensor on the splice table that will signal that the roll of film has run out.

Feed Stop Photo-Eye Sensor
This photocell looking at the mandrel detects the sleeve as it is fed by the feed rollers. When the bottom edge of the film is detected, the film is advanced further by the amount of the Band Feed Reg Index value on the servo index parameters screen.

Choke Feed High
This is the high level sensor of incoming material. The machine will not start until product reaches this level.

Choke Feed Low
This is the low level sensor of incoming material. The machine will stop if product is below this level.

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4. CONTROLS PANEL FUNCTIONS

4.1 HMI Enclosure

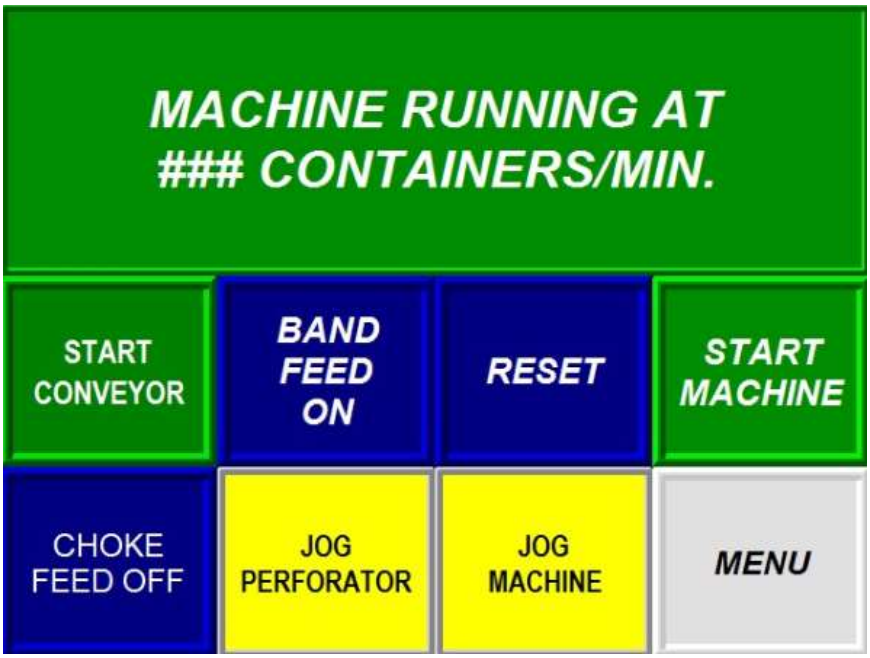
Stop: Stops functions of the main drive, feed drive and unwinding system (press to stop, pull to enable start and jog functions).

Power On: Push button used to power up the control power. Indicates that the power is on, used to reset an emergency stop.

Run/Jog: Switch to go between the run or jog machine functions.

Emergency (E-Stop): Emergency stop, switches off all power when pressed in. To restart system, pull out Emergency and press the "POWER ON" illuminated pushbutton.

4.2 Operator Screen



Operator menu displays machine status messages and any active faults (e.g. "Machine Running At ### Containers/Min.", as shown).

Start (or Stop) Conveyor: Press to start or stop the conveyor.

Band Feed (On/Off): Press to enable or disable the band feed unit.

Reset: Press to reset faults and messages.

Start Machine: This button is used to start the machine main drive. "MACHINE RUNNING" will be displayed during run.

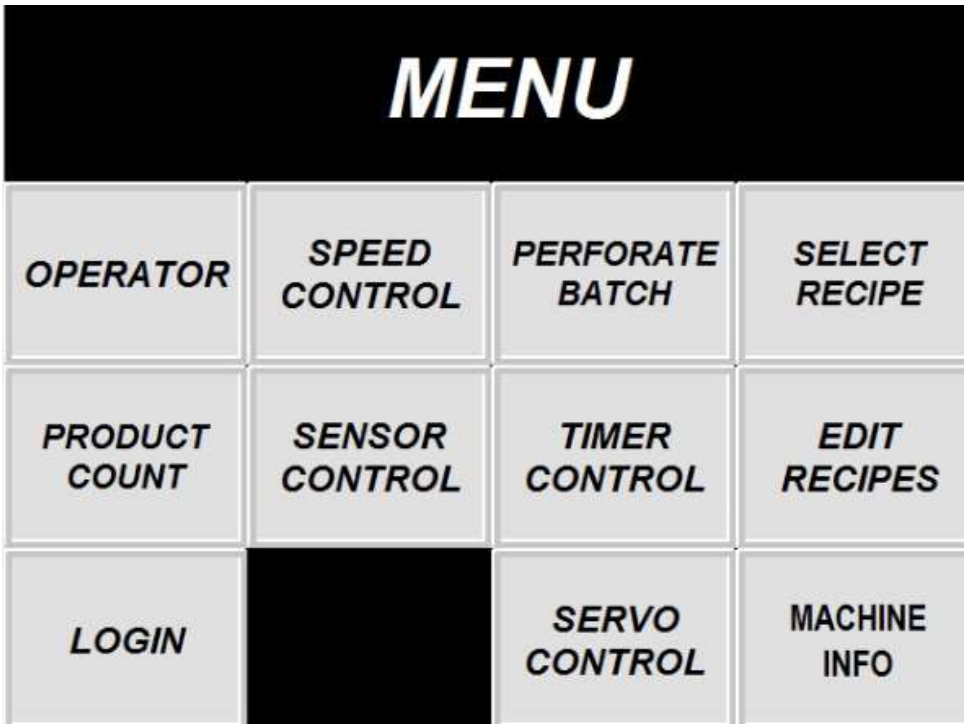
Choke Feed (On/Off): Press to enable or disable the choke feed function.

Jog Perforator: Press to generate perforated bands into the vacuum box. Once the vacuum box sensors are satisfied, the perforator will not feed further bands. This can be used to recover from a vacuum box high fault or to fill the vacuum box if the box is not full before running.

Jog Machine: Press to jog the machine at slow speed which will release containers and apply the sleeves.

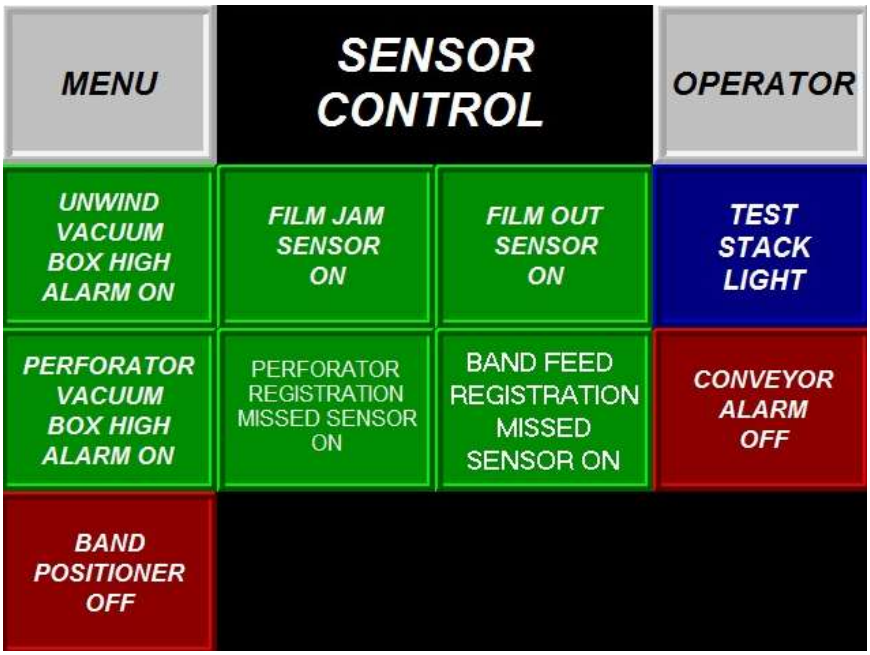
Menu: Press to go to the Menu screen.

4.3 Menu Screen



Press any button to navigate to the selected screen.

4.4 Sensor Control Screen



Press any button to enable or disable corresponding sensor or alarm.

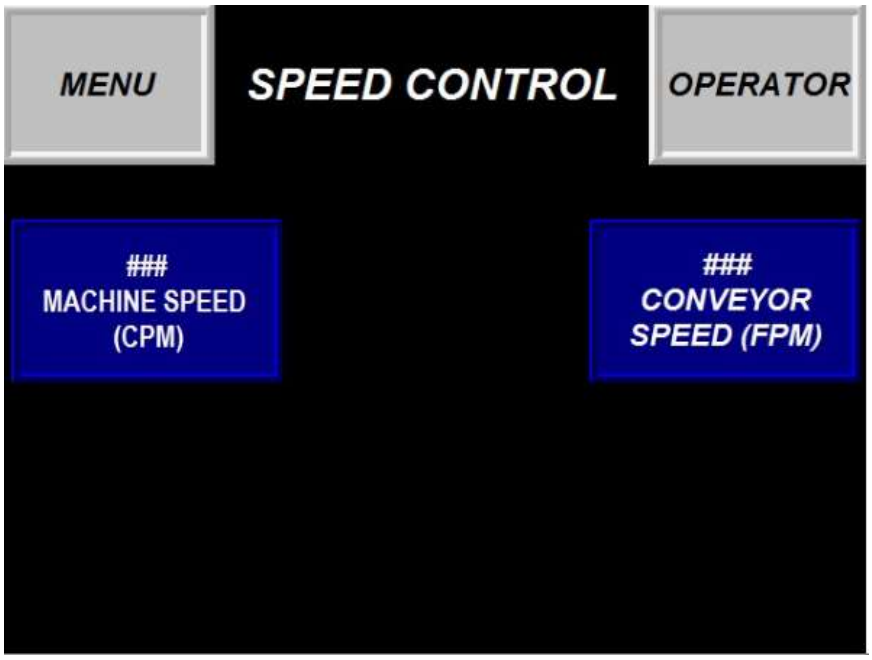
Menu: Press to go to the Menu screen.

Operator: Press to go to the Operator screen.

Test Stack Light: Press to test the stack light (located at the top of the machine). It will illuminate the lights for a few seconds.

Band Positioner (On/Off): Press to enable or disable the band positioner (also called walking beam, located just downstream of the application point).

4.5 Speed Control Screen



Press to activate numeric entry keypad. Enter value within range indicated on keypad and press "ENTER". Press "DONE" to exit keypad. Units are seconds with fixed decimal point.

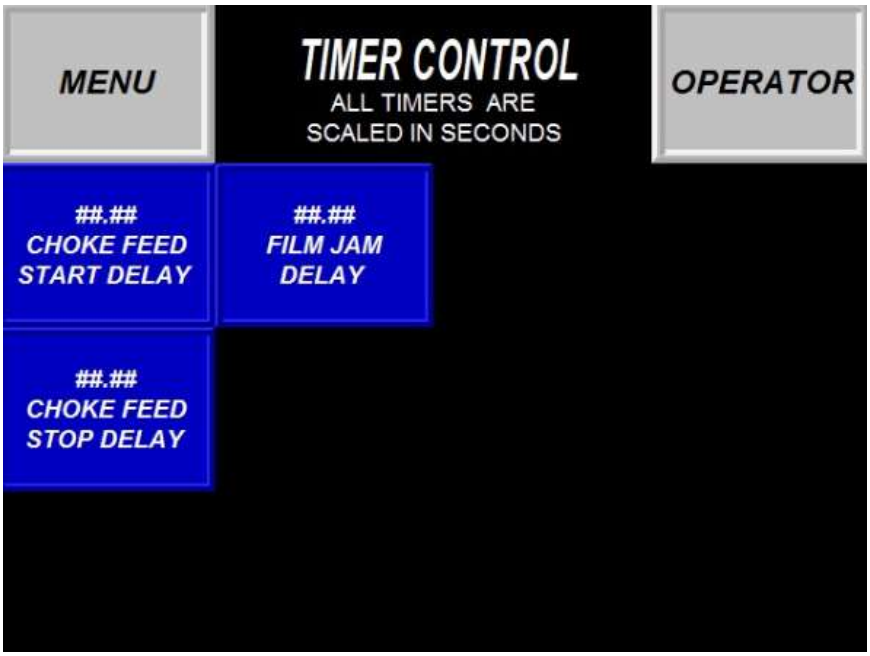
Machine Speed (CPM): Press to set the machine speed (in CPM, containers per minute).

Conveyor Speed (FPM): Press to set the conveyor speed (in FPM, feet per minute).

Menu: Press to go to the Menu screen.

Operator: Press to go to the Operator screen.

4.6 Timer Control Screen



Press to activate numeric entry keypad. Enter value within range indicated on keypad and press "ENTER". Press "DONE" to exit keypad. Units are seconds with fixed decimal point.

Choke Feed Start Delay: Use to set time delay between containers blocking "START" photoeye and automatic starting of machine.

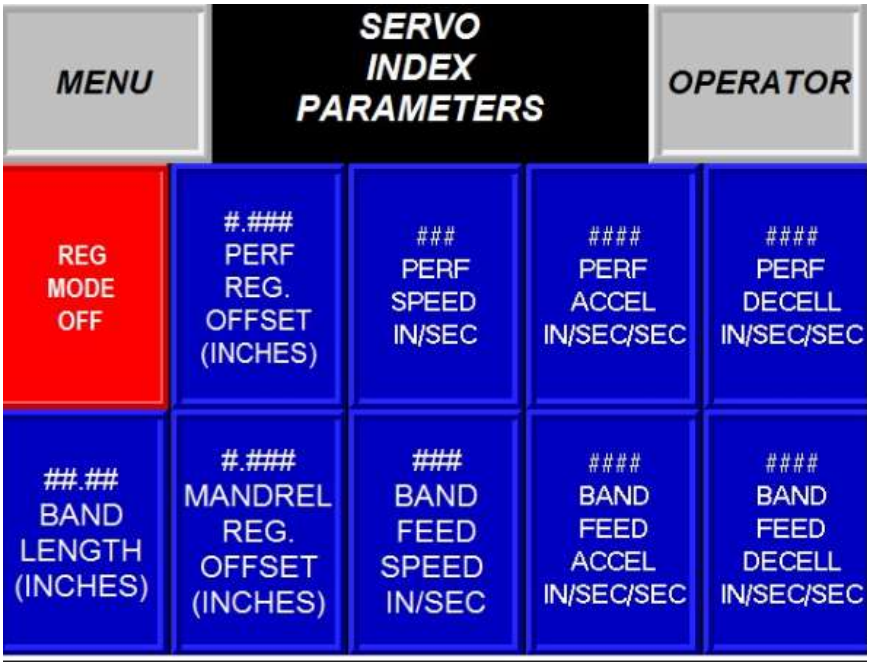
Choke Feed Stop Delay: Use to set time delay between containers unblocking "STOP" photoeye and automatic stopping of machine.

Film Jam Delay: Use to set time delay between a film jam fault condition and stopping of the machine.

Menu: Press to go to the Menu screen.

Operator: Press to go to the Operator screen.

4.7 Servo Control Screen



These functions are volatile and do not affect saved recipes. Generally used as a development or debug tool. If values are to be used on an application, they need to be entered in the Recipe screens and saved.

Note: For buttons needing values, press to activate numeric entry keypad. Enter value within range indicated on keypad and press “ENTER”. Press “DONE” to exit keypad.

Reg. Mode (On/Off): Press to enable or disable the registration mode.

Perf Reg Offset: This is the value of the move after the registration mark is detected to place the registration clear area at the perforator blade.

Perf Speed: This value is the linear speed of the film between the acceleration and deceleration of the index move.

Perf Acceleration: This is the value of the acceleration of the film at the start of the index move.

Perf Deceleration: This is the value of the deceleration of the film at the end of the index move.

Band Length: This is the value of the band length in inches.

Mandrel Reg Offset: This value is the distance that the film is moved beyond the mandrel registration sensor detecting the bottom edge of the film.

Band Feed Speed: This value is the linear speed of the film between the acceleration and deceleration of the index move.

Band Feed Acceleration: This is the value of the acceleration of the film at the start of the index move.

Band Feed Deceleration: This is the value of the deceleration of the film at the end of the index move.

Menu: Press to go to the Menu screen.

Operator: Press to go to the Operator screen.

4.8 Machine Info Screen

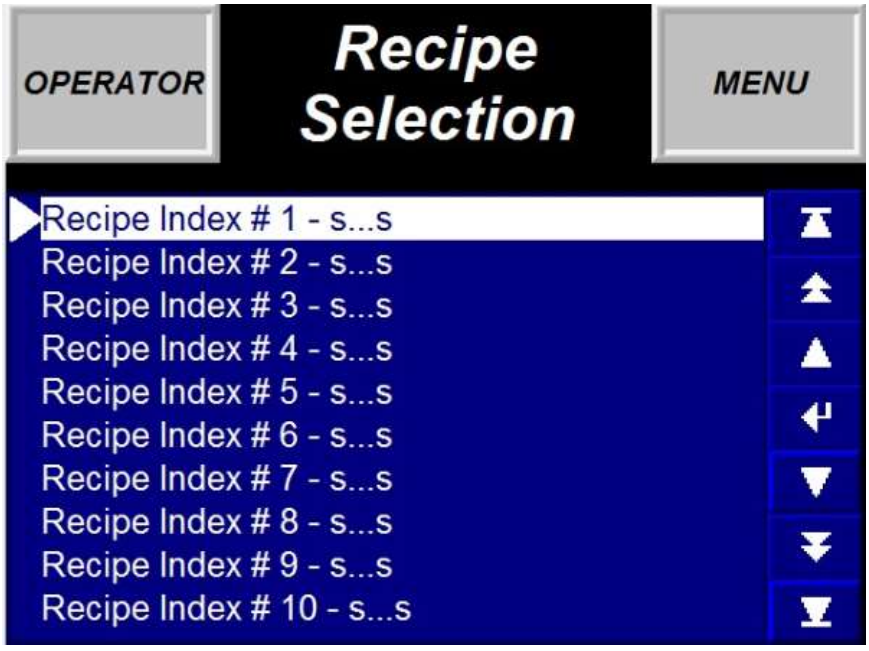
Displays machine information (e.g. model and serial number)

Menu: Press to go to the Menu screen.

Go To Config Screen: Press to go to the PanelView configuration screen.

Operator: Press to go to the Operator screen.

4.9 Select Recipe Screen



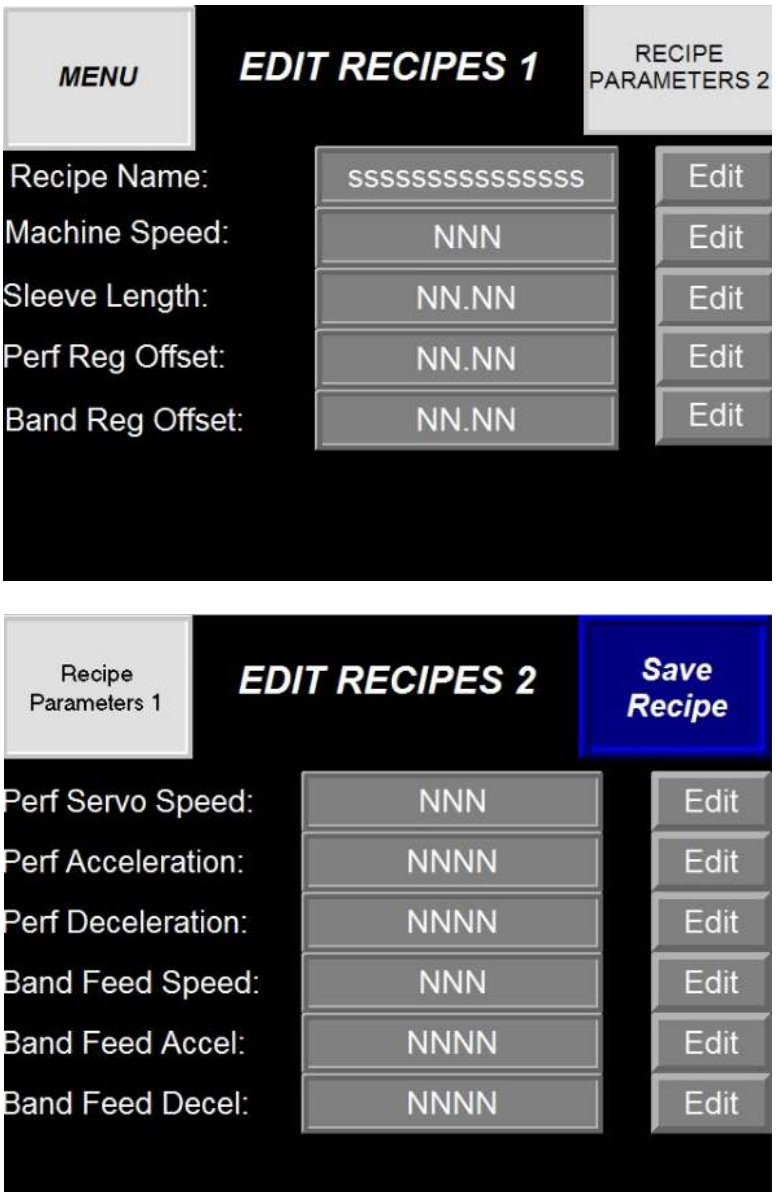
Arrows at right may be used to scroll to highlight a given recipe index.

Then, the middle button  (the Enter key) loads the recipe parameter values to the current running recipe (i.e., the corresponding container's values become current).

Menu: Press to go to the Menu screen.

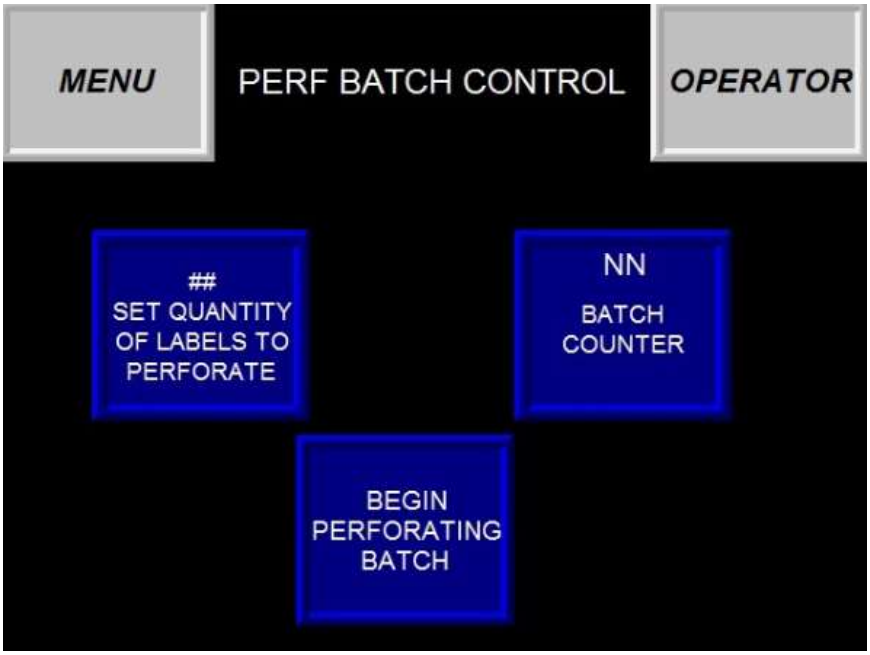
Operator: Press to go to the Operator screen.

4.10 Edit Recipes Screens



Use these screens to edit programs in the machine. Press the Edit button to change values. Once completed, press Save Recipe and re-select recipe to reload saved changes.

4.11 Perf (Perforator) Batch Control Screen



Set Quantity of Labels to Perforate: Press to open a numeric keypad where you can enter the number of labels you would like to perforate.

Batch Counter: Displays (read-only) of batch counter tally.

Begin Perforating Batch: Press to begin perforating the quantity of labels entered in the "Set Quantity of Labels to Perforate" numeric input. Press again or press Operator Stop pushbutton to cancel.

Menu: Press to go to the Menu screen.

Operator: Press to go to the Operator screen.

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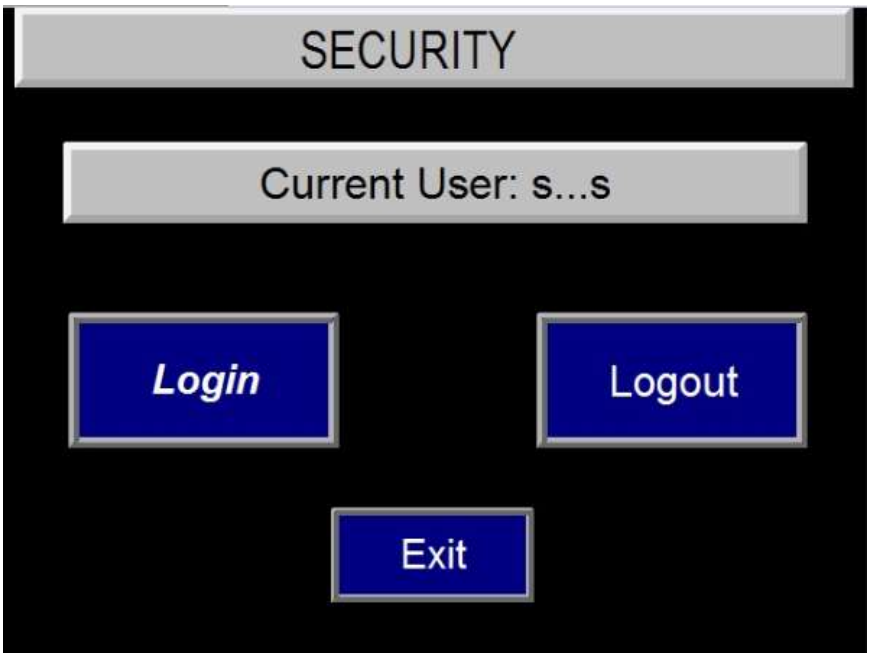
4.12 Product Count Screen

Displays (read-only) the tally of good products that have been run through the machine (since the last reset of the tally).

Menu: Press to go to Menu screen.

Reset Production (Hold 3 Sec): Press (and hold for 3 seconds) to reset the tally to zero.

4.13 Security Screen



Login: Press to open the security login screen to sign in with a username.

Logout: Press to logout of the current username.

Exit: Press to exit the Security screen.

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5. STARTUP

(BEFORE PROCEEDING READ THE CONTROL PANEL FUNCTIONS)

Make sure all operators are clear of the machinery.

Turn on the main power disconnect switch (located on the main electrical enclosure) and, on the HMI enclosure, press the Power On button (the green one).

Manually feed the material through the machine. Coming off the unwind reel go through the low film/ film out sensor rollers over the splice table. Unclamp the unwind feed rollers and feed the material through the rollers then into the vacuum box. Next feed the material through the perforator sensor assembly, perforator unit, then unclamp and feed the material through the perforator feed assembly and clamp roller. Close the machine guard doors and go to the Batch Perforate screen (see Section 4.11). Press the "Begin Perforating Batch" button to produce a length of perforated labels.

Turn the "FEED DRIVE" to off, press the Stop button, and open the guard and load the film over the mandrel and tuck the film into the top feed rollers. Manually turn the rollers to feed film to be about ¼" above the registration sensor on the mandrel.

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6. OPERATION PROCEDURE

Make sure all operators are clear of the machinery.

MACHINE CAUTION: Make sure that the conveyor is turned on and the speed is set correctly in relation to the production speed. Make sure that the conveyor is always running if the shrink tunnel is on.

Make sure that the shrink tunnel is operational and up to the correct temperature.

Set the Main Drive Speed to the desired speed setting (if the machine is equipped with Dual Speed Control the following controls have to be set to the desired speed settings: High and Low Main Drive Speed Control).

Go back to the Menu screen on the HMI enclosure. Turn the Run/Jog select key switch to the Run position. Make sure that all doors are closed so that the red light on the light stack is not flashing (interlock sensors will not allow the machine to start). Press and release the fault reset button on the HMI enclosure screen. Press and hold the machine Start button for approximately 3 seconds (an audible alarm will sound). The Model R-250 will now operate in the automatic mode.

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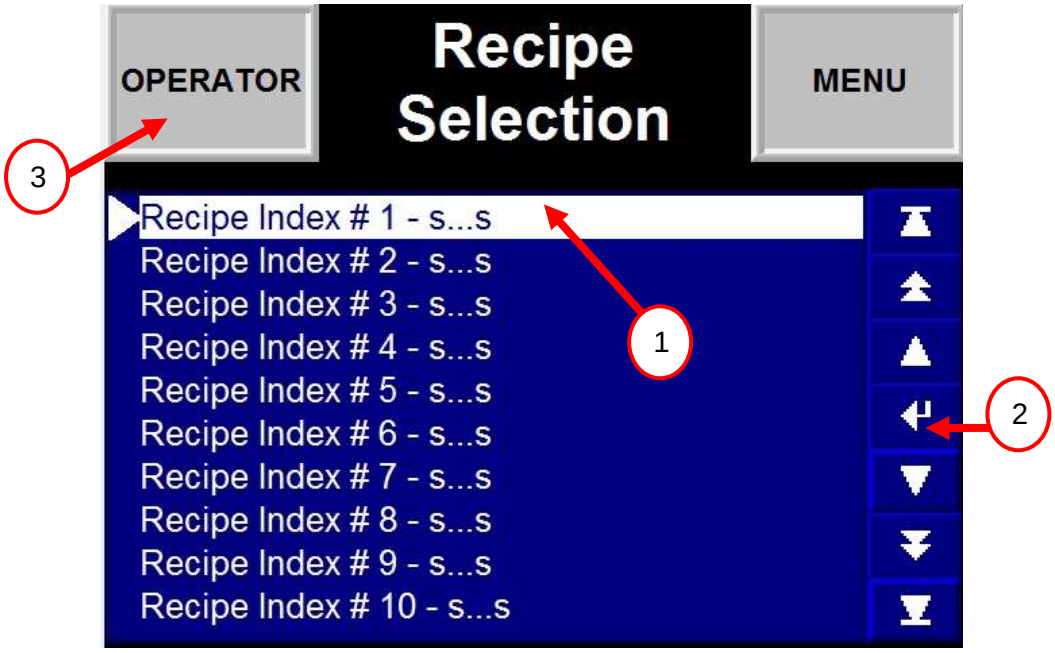
7. CONTAINER CHANGEOVER PROCEDURES

When using the machine for the first container type, or when changing the machine for use of a different container type than an existing setup, the following steps need to be performed. Each container type requires a unique setup. Refer to the Machine Setup Sheet (in this manual binder at the back of the Operational Manual tab) for detailed data for the SIKO readings and other data. Section 7.13 contains an overview of most of the primary adjustment handles for this machine.

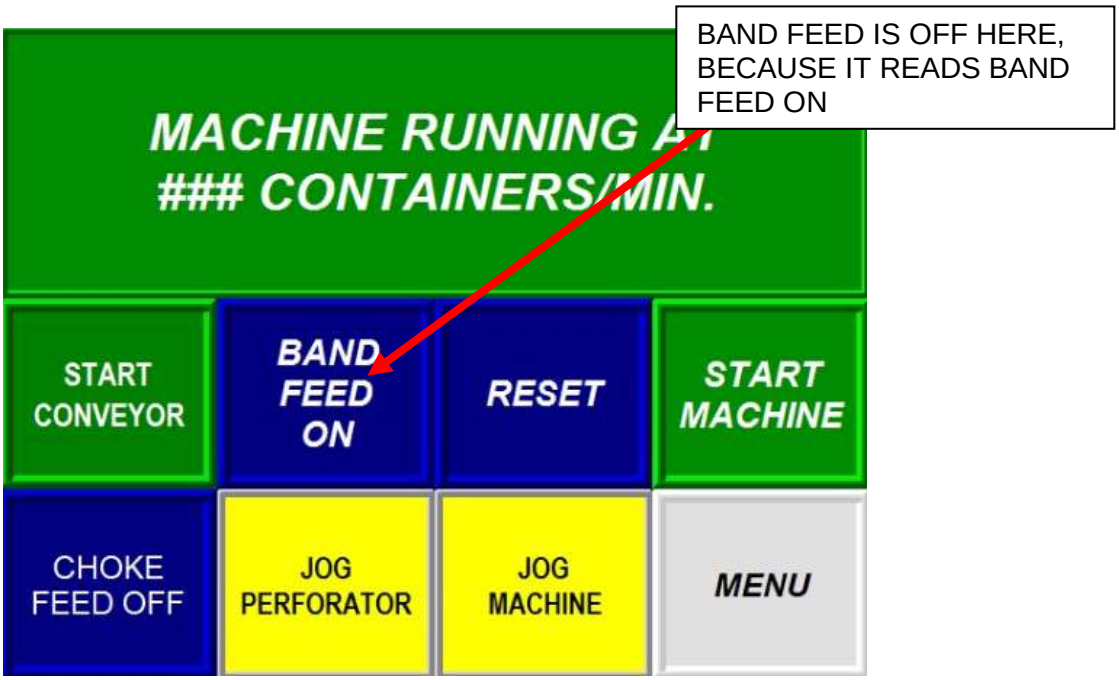
7.1 Change Recipe & Turn the Band Feed Off

On the HMI touchscreen, go to the Menu Screen.
Then click on the "Select Recipe" button to go to the Recipe Selection Screen (shown below).
Then click on the recipe that corresponds to the new container that will be used in the machine (example, Recipe Index #1 is picked in this picture).
Click enter (arrow #2 below).
Click Operator button.



In the Operator Screen, make sure Band Feed is off. It will read *Band Feed On* if it is off and *Band Feed Off* if it is on. (It reads the opposite of what it currently is. So in this case you want the button to read *Band Feed On*.)

Having turned the band feed off, now manual movement of the film on the mandrel is possible.



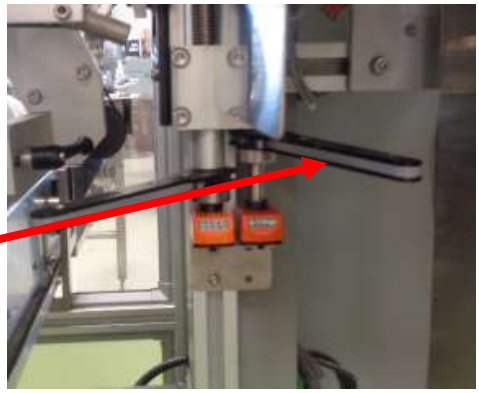
7.2 Splice the Film

Splice (attach) the new film to the existing film in the machine at the splice table. See Splice Procedure Section 8.1.

(If no film is in the machine, then a complete spooling of the film will be necessary. Refer to the threading diagram sticker that is on the back of the HMI enclosure for details of the spooling.)

7.3 Head Height Adjustment

The next step is to raise the head height to make adjustments easier. To do so, loosen the *rightmost* handle on the far right side of the main plate (as shown below) and turn the ratchet located below the vacuum box as shown below, until the head raises to an appropriate height for working.



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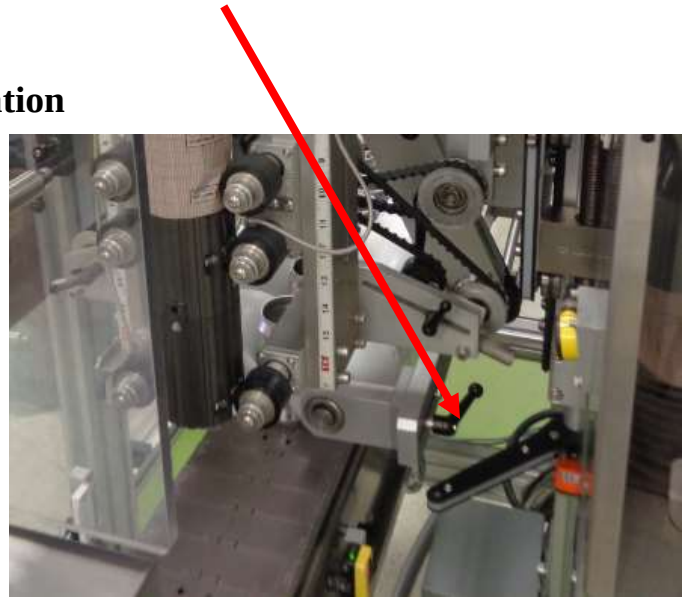
7.4 Timing Screws Adjustment

The timing screws will need to be installed or replaced, as a set.

First, push the Stop button. Open the enclosure door.

7.4.1 Timing Screw Removal/Installation



Perform the following steps, one at a time, for each timing screw.

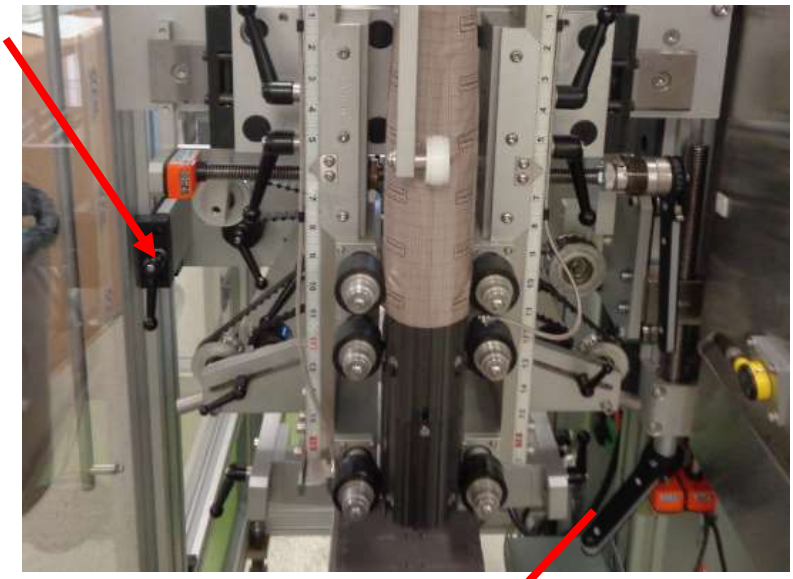
On the downstream side of the timing screws, loosen the handle (as shown, located on the downstream/idler end of the screw, one handle for each screw) of one of on the support arms that locks the shaft of a timing screw in place. Once loosened, hold the timing screw and separate the screw from the support arm carefully. Remove the timing screw. The corresponding conveyor rail may need to be moved to make room for the removal of the screw. Replace timing screw into support arm and retighten the handle (and replace conveyor rail if removed).

Repeat for the other timing screw.

7.4.2 Timing Screw Vertical (Up/Down) Adjustment

Loosen the socket screw on the machine head at the far *left* of the conveyor (as shown below, as viewed looking upstream) and turn the ratchet handle that is located on the *leftmost* of the two (also shown below) to the desired location for the timing screw height (see Machine Setup sheet for detailed SIKO setting data).

Retighten the handle on the machine head.



ADJUST THE TIMING SCREW HEIGHT RATCHET (THE ONE ON THE *LEFT*)

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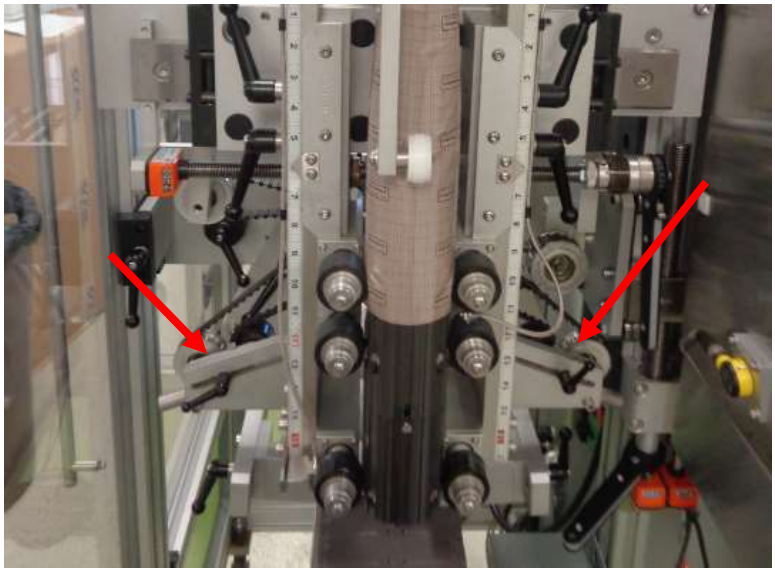
Timing Screw Angular Adjustment

Loosen the handles on the downstream end of the timing screw assembly (as shown below).



Loosen the handle on the far left of the machine from the downstream end (as shown below) and turn the dial of screws until the appropriate pin number is abutting the timing screw support bracket.

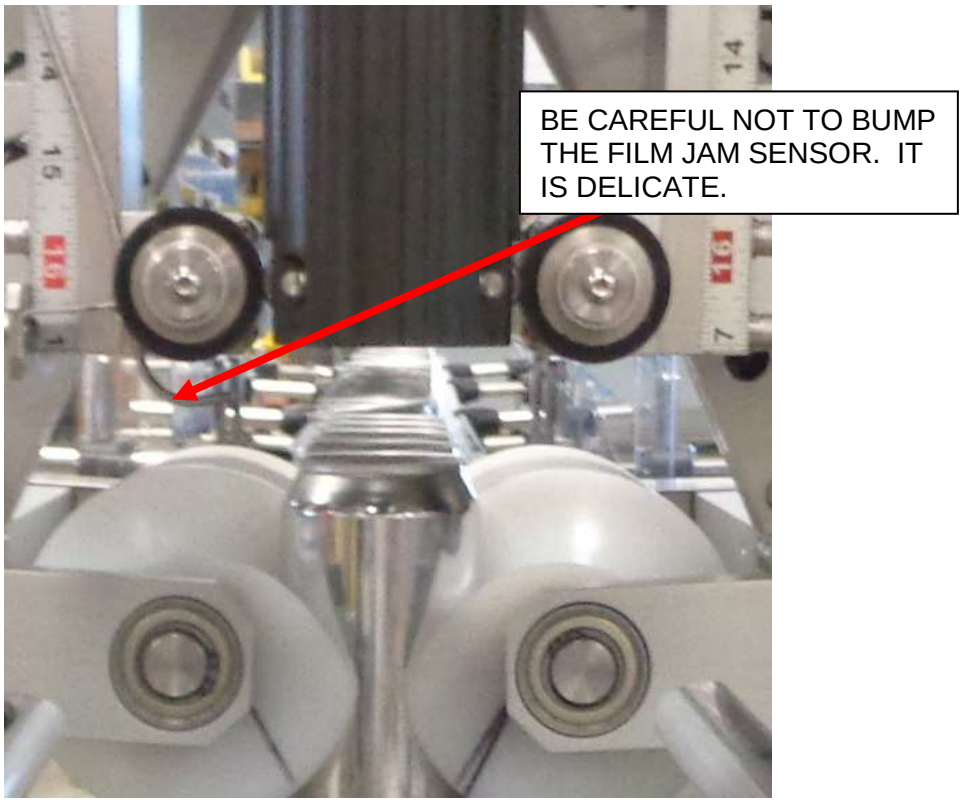
Retighten the handle and the two timing screw assembly handles from the previous step.

7.5 Remove Mandrel

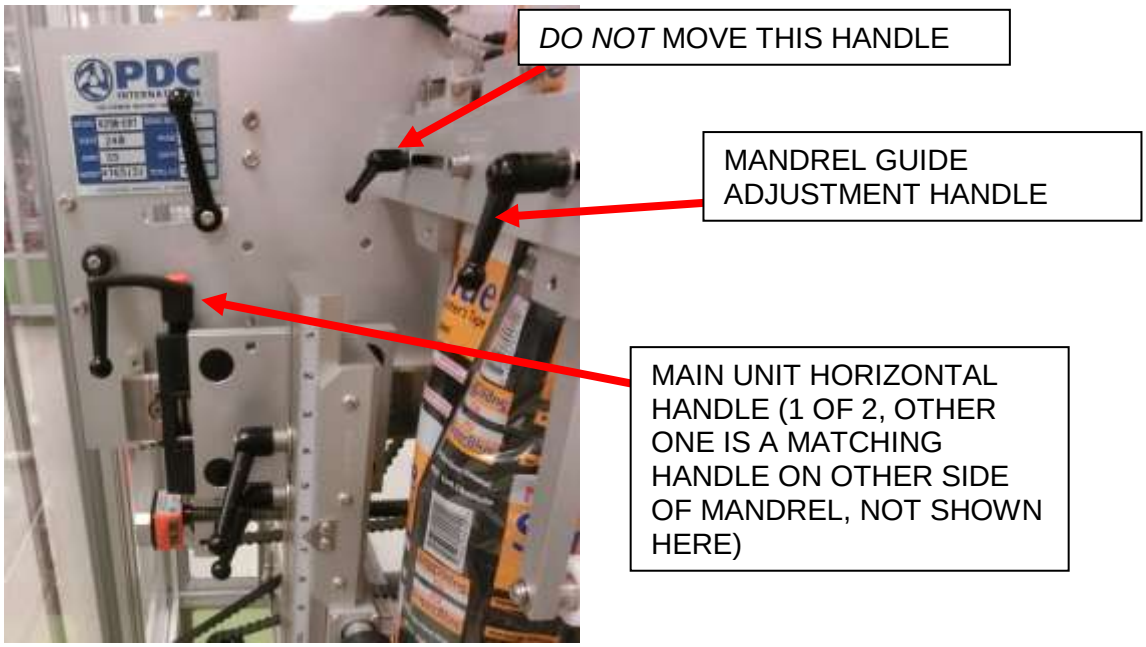
The next step is to remove the mandrel that is currently in the machine.

In the following steps, use care not to bump the film jam sensor (shown below, as a j-shaped tube just below the mandrel).

⚠ ***Caution:*** ***When holding any part in the machine, and especially the mandrel, look for and avoid any sharp edges!***



Loosen the mandrel guide adjustment handle (only loosen the front handle, not the back one. The back handle should not ever need to be loosened.)



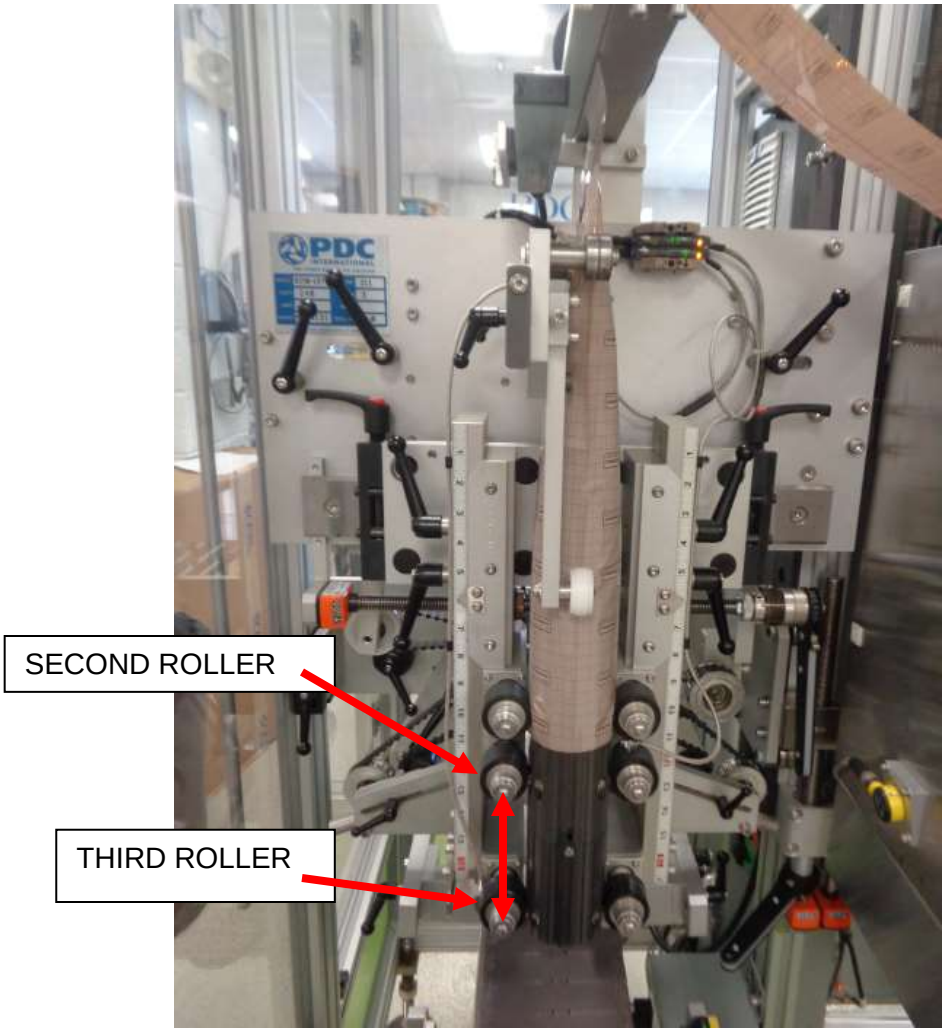
Next, hold the mandrel carefully using caution not to cut your hands, and loosen the main unit horizontal handles (one on each side of the mandrel). Then loosen the main unit horizontal ratchet. Remove the mandrel carefully.

Place the mandrel somewhere safe and clean for working on it and replace the extension piece located at the bottom of the mandrel with the new extension that is needed to fit the proper container that will be run through the machine.

Description	Color	Assembly	Band Height	Product
Mandrel base	NONE	R702-1393-100	N/A	N/A
Mandrel extension	NONE	R702-1393-200	121 MM	12 OZ CAN
Mandrel extension	NONE	R702-1393-300	157 MM	16 OZ CAN

7.6 Set Third Roller Height

The next step is to set the distance between the second and third roller blocks.



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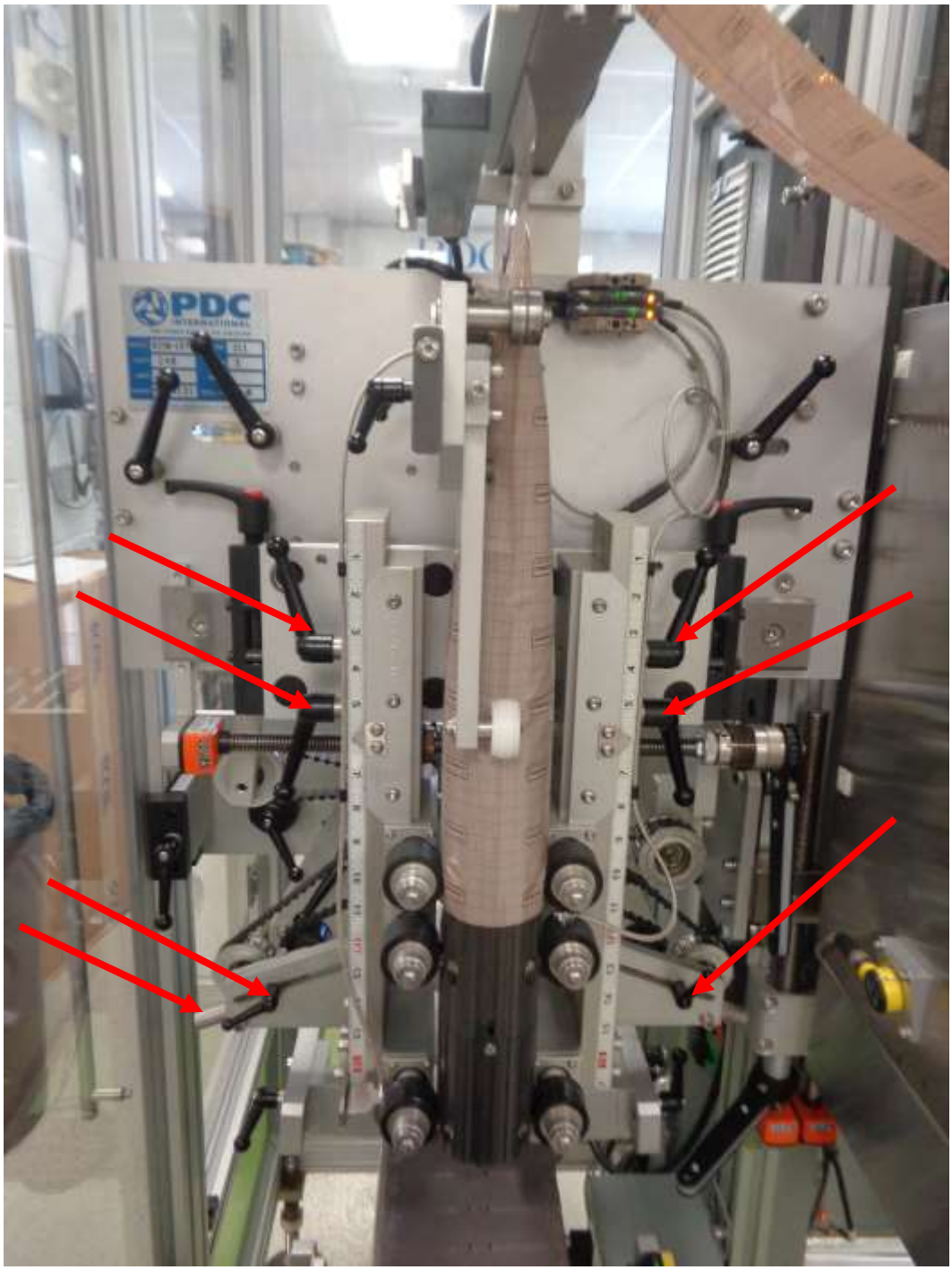
Loosen each of the handles shown below (with the arrows).



Using the tooling gauge block, TG-1393-01, and referencing the description on the gage that corresponds to the new container that will be run through the machine, place the tooling gauge block between the second and third roller blocks and by hand move the third roller block until the exact distance between the second and third roller blocks matches the tooling gauge block's step.

Once this distance is set accordingly, then retighten each of the handles from the previous picture.

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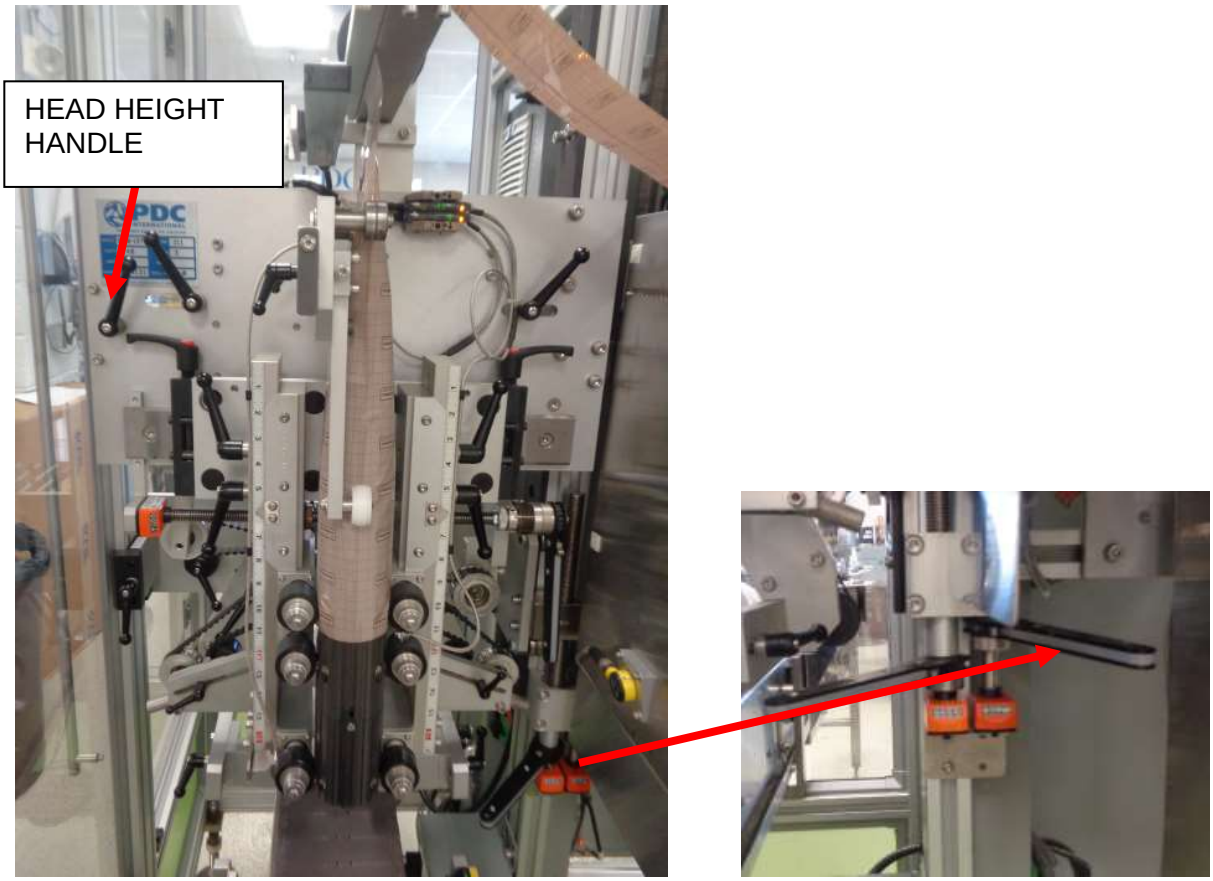
7.7 Head Height Adjustment

The next step is to raise, or lower, the head height. To do so, loosen the handle on the far right side of the main plate (as shown below) and turn the *rightmost* ratchet located below the vacuum box as shown below, until the corresponding SIKO gauge reads the appropriate number for the containers being used. Refer to Machine Setup sheet (found in the manual binder) for the SIKO number.



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7.8 Insert the New Mandrel

Make sure the proper mandrel extension has been placed onto the mandrel base to match the new container that will run through the machine.

Place the new mandrel into the machine in its place.

7.9 Main Units & Mandrel Guide

The main units are designed to hold the mandrel in place allowing it to "float". If the main units are too loose, the mandrel may fall out. If the main units are too tight, it can cause the mandrel to "walk", which can cause jamming or film break. The units have been designed to be positioned equally about the center at all times.

7.9.1 Main Units Horizontal Adjustment

See Section 7.13 for the handle locations.

Loosen the two (2) *uppermost* Main Unit Belt Takeup handles, then the two (2) Main Unit Horizontal handles (if they were retightened earlier), then turn the Main Unit Horizontal ratchet (located to the right of the mandrel). Turn it to the desired location (see Machine Setup sheet for detailed SIKO setting data). The SIKO dial is at the other end of the screw from the ratchet that you are turning.

Retighten the two (2) Main Unit Horizontal handles, then retighten the two (2) Main Unit Belt Takeup handles.

7.9.2 Main Units Vertical (Up/Down) Adjustment

See Section 7.13 for the handle locations.

Loosen the four (4) Main Unit Vertical handles (as shown), then by hand, raise or lower the main unit height, using the rulers shown (see Machine Setup sheet for detailed setting data).

Retighten the four (4) handles.

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7.9.3 Main Units Angular Adjustment

See Section 7.13 for handle locations.

Loosen the two (2) *lowermost* Main Unit Belt Takeup handles. Turn the dials next to them, to the desired location (see Machine Setup sheet for detailed setting data). Retighten handles.

7.9.4 Mandrel Guide Adjustment

See Section 7.13 for handle locations.

Loosen the Mandrel Guide handle (the front one only, not the back one) and adjust the top, main unit roller assembly (see vertically supported white roller and those rollers connected to its support unit, shown in Section 7.13), to the desired locations (see Machine Setup sheet for detailed setting data). Retighten handle.

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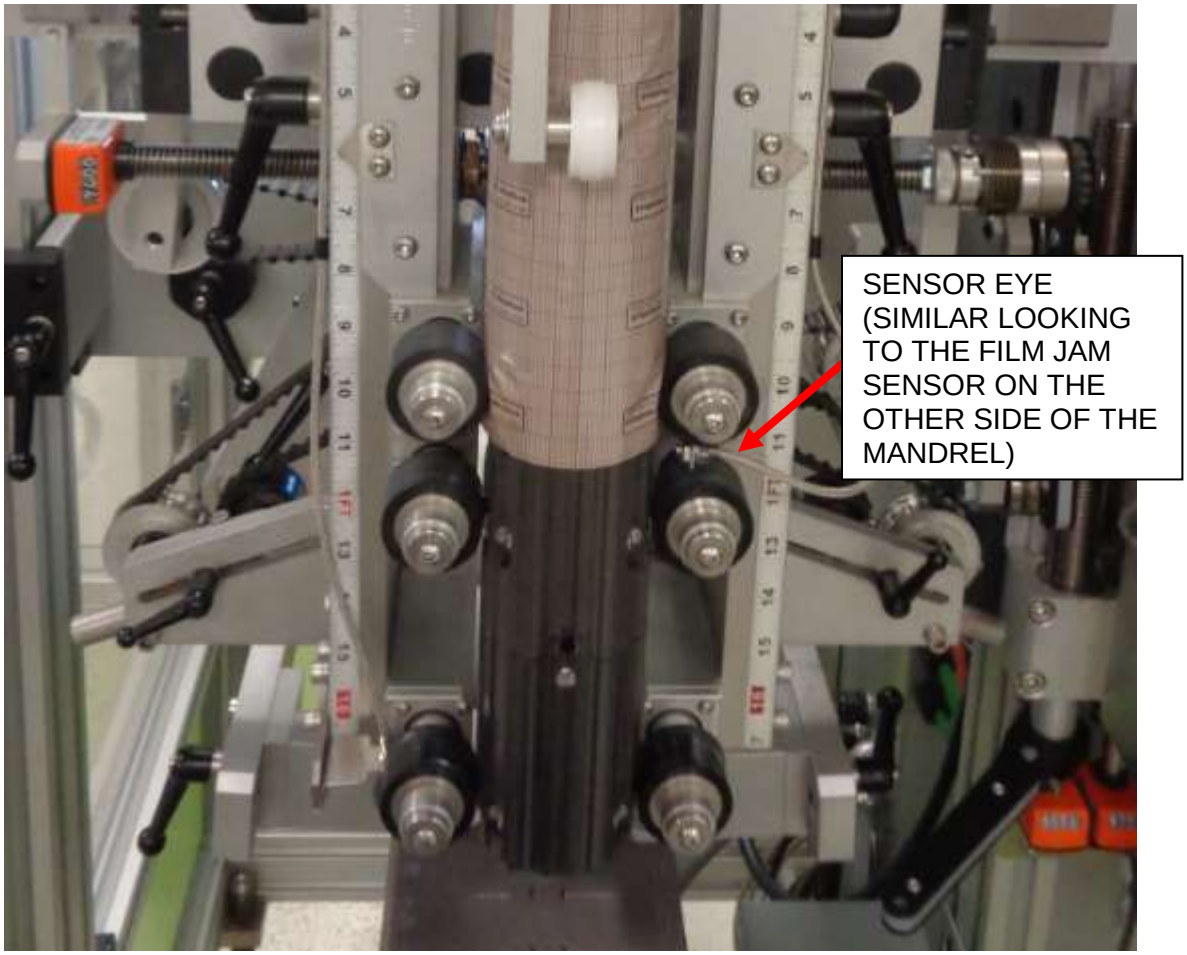
7.10 Place Label

On the HMI touchscreen, make sure you are in the Operator Screen and press the "Start Machine" button and hold for 3 seconds. The labels will be running through the machine now and perforating them as the film goes through the machine.

Once perforated labels for the new container are running over the mandrel, on the HMI touchscreen press Stop Machine. At the mandrel, set the bottom of the current label just above the sensor eye (see below).



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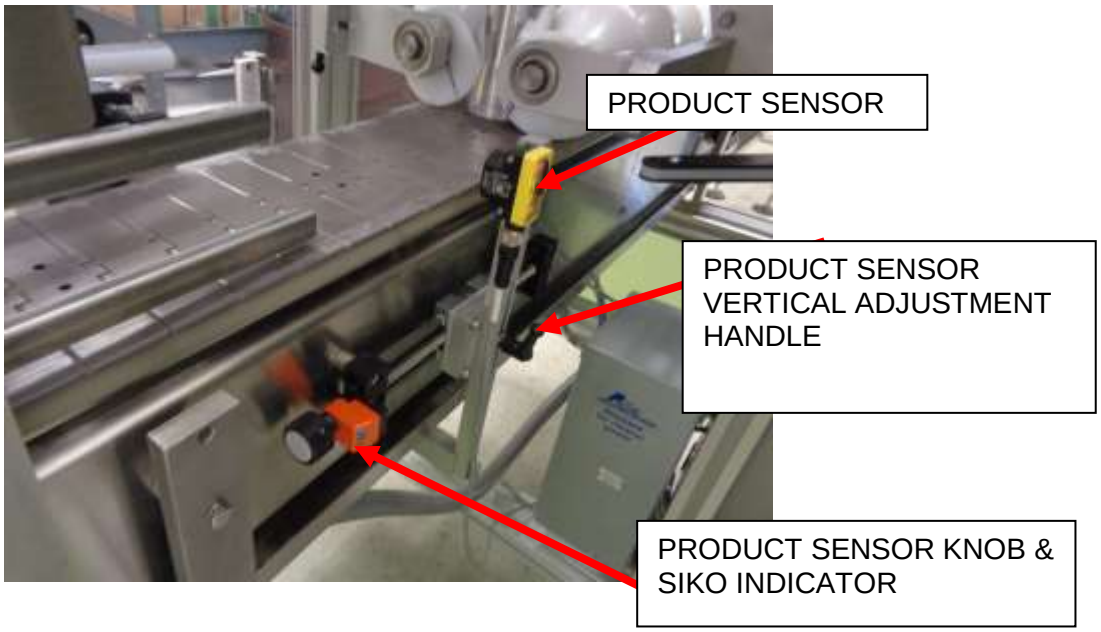
7.11 Product Sensor Adjustment

Next, find the product sensor. It is located just below, and downstream, of the mandrel. Turn the hand knob located downstream from it, to the appropriate SIKO reading for the container being used (see the Machine Setup sheet for detailed data).

(If necessary, loosen the vertical adjustment handle and adjust the height of the sensor, and then retighten the handle.)



7.12 Final Preparatory Steps

Ensure that the proper product containers will be coming down the conveyor.

Caution: ***Ensure that all operators are clear of the machine and that the Lexan™ doors are closed!***

At the HMI touchscreen, in the Operator Screen, turn the Band Feed to be on (so that Band Feed button reads "Off", see Section 4.2 for details on this button).

Machine will now run.

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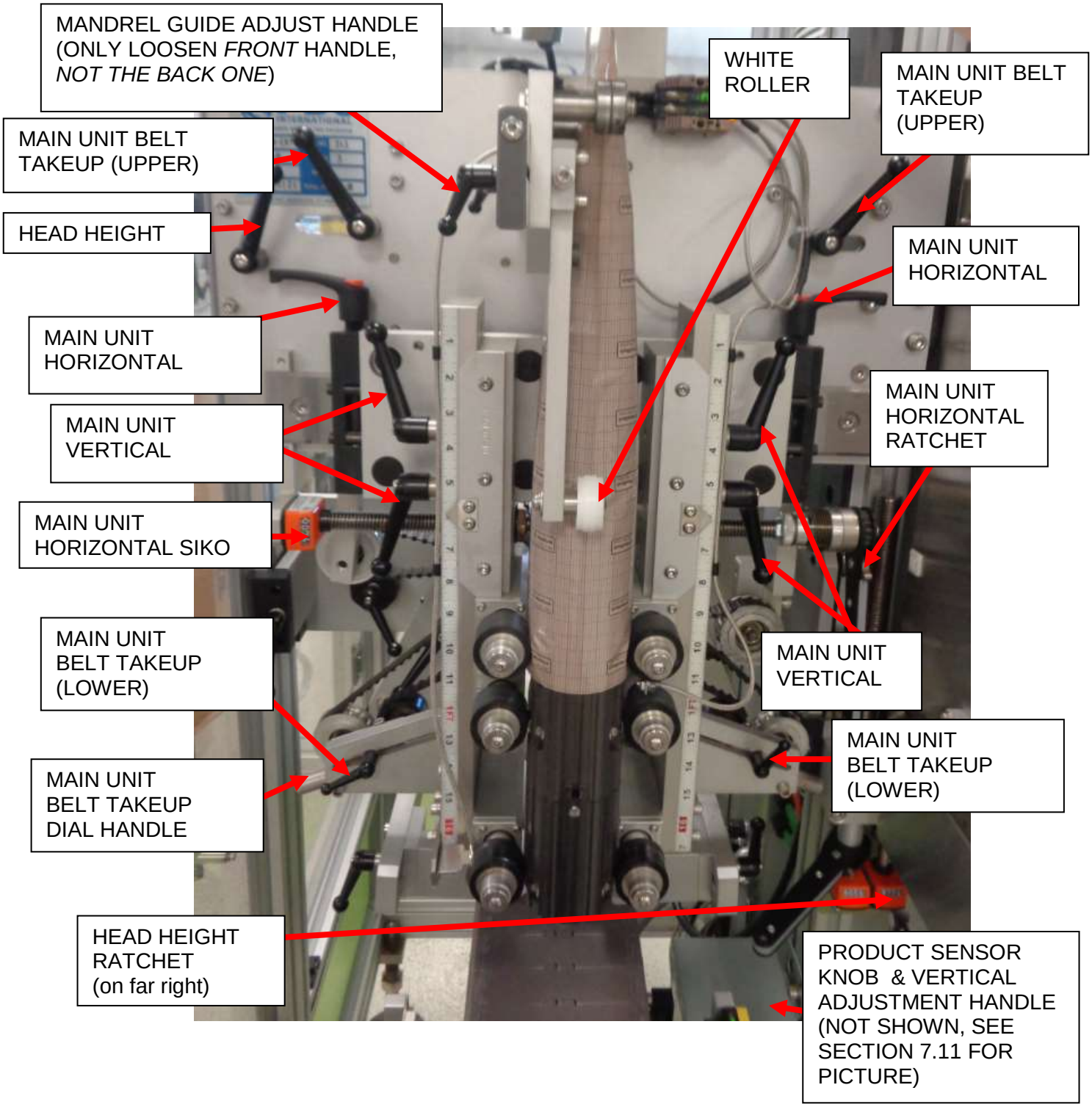
7.13 Handles/Ratchets Overview (For Quick Reference)



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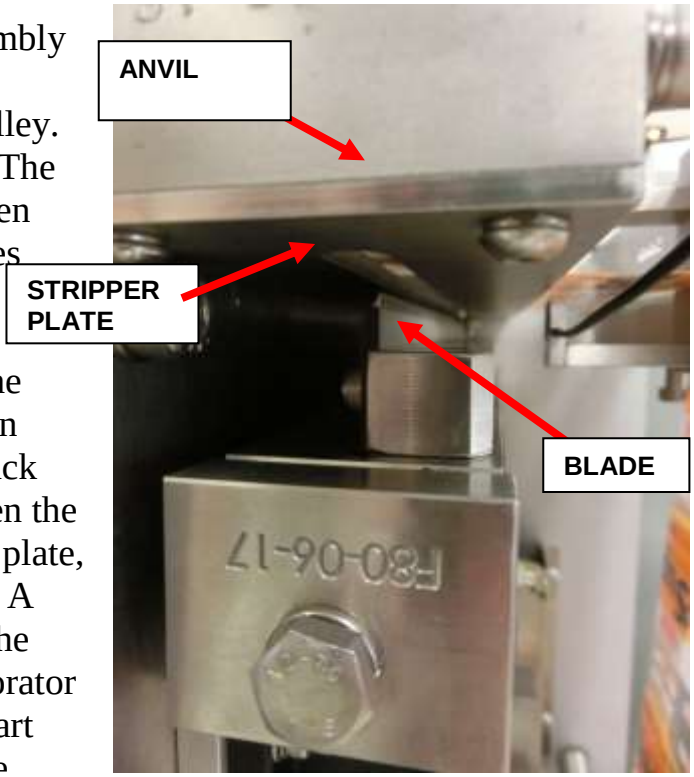
8. PERFORATOR ADJUSTMENT PROCEDURE AND BLADE REPLACEMENT



General Description: The perforator assembly is driven by a 3/8 HP motor. It drives the perforator crankshaft by a gear belt and pulley. The crankshaft drives the blade cartridge. The carriage moves into a stripper plate, and then against the anvil assembly, where the blades perforate the film material.

Once the perforation is made in the film, the perforator blade will start to go on the down stroke. The perforator blade then travels back through the stripper plate. At the point when the blade is just beneath the top of the stripper plate, the film must be indexed to the next band. A flag (target) turned by the crank activates the start proximity switch (located on the perforator assembly) which gives the signal for the start feed. The motor advances the film. On the infeed of the perforator assembly is the stop photo eye. This eye will stop the motor once it detects an eye mark on the film.

For proper operation of the machine, it is important to have the labels properly perforated. The perforation depends on the properly maintained adjustment and surface quality of the anvil (back up block) and the sharpness of the blade.

To remove the blade, follow the description below:

The first step is to jog the machine. To do so, first turn the Run/Jog switch on the HMI enclosure to Jog.

Jog the machine, from the HMI enclosure Menu screen, until the perforator is in the fully open position. Remove one screw and cap then slide out.

Once the cap is removed, slide out the whole blade guide.

8.1 SPLICING PROCEDURE

Splicing (connecting) film is done when one reel has run low and prevents the new reel from having to be threaded through the machine. The new reel is connected to the previous reel at the point of the splicing table.

Remove the old cardboard core from the machine and install a new reel of material.

Take the beginning of the new reel of material and overlap it onto the end of the material in the machine.

If the material is registered, line up the artwork from the new material until it is matches with the artwork on the material currently in the machine.

Cut the material straight across the flat width (through the middle of the artwork if registered) with a razor blade.

Connect (splice) the new material to the current material in the machine by butting the two pieces together and applying tape to the splice.

Note: There should not be a gap between the two pieces of material, otherwise the tape will stick to itself and will cause a jam in the machine. Also, if the material is registered, the tape should not overlap or interfere with the registration mark in any way.

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9. MAINTENANCE

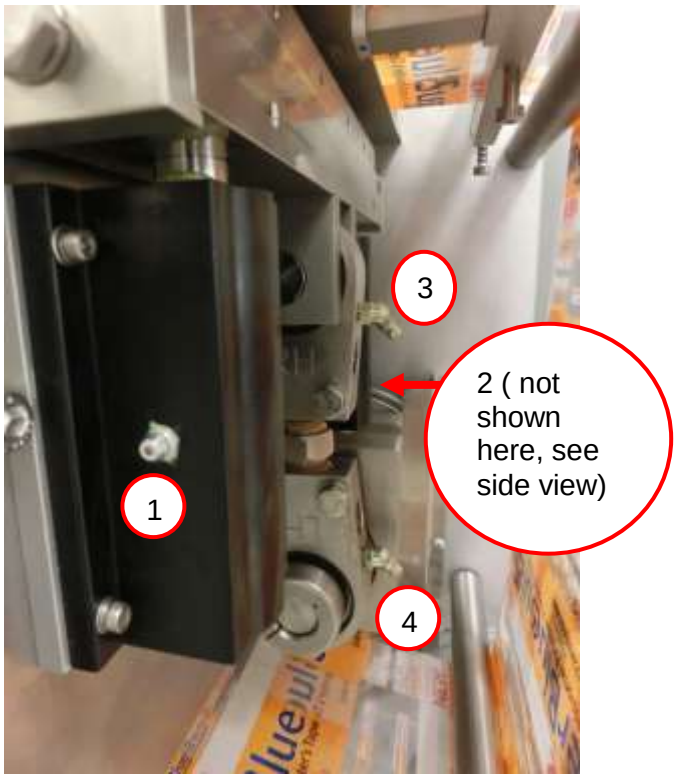
9.1 Preventive Maintenance

General Guidelines

- Regularly check and keep clean the following:
  - All roller surfaces that come into contact with the film (path includes splice table running all the way to the rollers that abut the mandrel).
  - Anvil for perforator
  - Guide rail surfaces (vertical rails located behind roller assemblies)
  - The timing screws
  - All external belts (located in both front and rear of machine) associated with the power transmission of this machine
  - Photoelectronic sensors (lenses may be cleaned with a clean non-abrasize and non-contaminating cloth and lukewarm water only).
- Check and maintain proper tension in the external belts.
- Check around the machine for any evidence of loose screws, rollers, fixtures, etc. Examine all roller assemblies for free rotation, excessive play, etc. and correct as necessary. Examine moving parts for excessive wear. Check the stability of all motor, clutch/brake, feed drive rollers and blade assembly mounting brackets. Examine timing belts and timing chains for damage. Replace as necessary.
- Check perforator blade and vent pin for wear. Replace blade and/or vent pin if necessary.
- Note wear of any components that may need replacing and replace whenever necessary.
- Adhere to the manual lubrication schedule as best as possible (shown below, Section 9.2).

Below is further detail.

9.2 Lubrication Points



Picture of perforator area (front view)

Picture of perforator area (side view)

Lube Point	Location	Frequency	Lubricant
1	Perforator Shaft	Weekly	Mobilgrease® FM-222
2	Perforator Shaft	Weekly	Mobilgrease® FM-222
3	Linear Bearing Perforator	Weekly	Mobilgrease® FM-222
4	Linear Bearing Perforator	Weekly	Mobilgrease® FM-222

* CRC® NSF H1 Multipurpose Food Grade Aluminum Complex Based White Grease (SL35600) is used at time of manufacture and the MSDS is included in this manual. Mobilgrease® FM-222 is a recommended comparable product.

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9.3 Installation and Factory Service Notification

Date	Brief Description of Problem	Solution Applied	Signature

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10. GENERAL CLEANING

10.1 Cleaning

The equipment and surrounding area are to be kept clean.

Floor
Sweep daily the surrounding area of the equipment to maintain safe operator area.

Exterior Lexan™ Guarding
Weekly wipe panels clean with general purpose window cleaner to maintain cleanliness and visibility.

Interior of Equipment
Weekly blow carefully with an air hose to remove debris. Clean urethane feed rollers with isopropyl alcohol.

Control Panel Enclosures
Weekly clean with general purpose cleaner that is acceptable for the plant and product environment that you are working in.

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11. TROUBLESHOOTING GUIDE

***Danger*: Do not wear loose fitting clothing, a tie, jewelry, or exposed long hair when performing maintenance on machine or when opening machine for any reason. Tuck in clothing, remove tie and jewelry, and put hair in a hairnet if necessary. These items can get caught in moving parts and result in serious bodily injury or death!**

***Caution*: Before any work is to be done on the machine, or before reaching into the machine for any reason, if possible turn all switches to the off position including the main power fused disconnect switch and any pneumatic lines to this machinery, and then follow proper lockout/tagout procedures!**

***Caution:* In certain cases where the power must be on to make a specific adjustment, exercise caution and ensure any other operators in the area are aware that 1) the power is on and 2) that an operator is performing maintenance on the machine.**

11.1 PDC Component Troubleshooting

The following section describes problems which can occur and which may be remedied by basic procedures. In the event serious problems develop, it is advisable to request qualified assistance. If this situation should arise, try to give as precise and detailed of a description of the fault condition as possible. It is very important that you record all actions taken when attempting to correct problems.

Note: Exercise caution at all times when making adjustments to the machine. When possible the main power fused disconnect switch should be turned off.

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Perforator Troubleshooting:

The perforation is not located in the proper position and it does not keep good consistency of the position:
Make sure the gear belt driving the feed rollers is properly tightened. If not, tighten the belt and check performance of the machine (this is the most frequent cause). If the test is negative, check the position of the feed units. Make sure the photo eye for film feed is clean and set to the correct sensitivity.

Check the spring-loaded guides on the servo stop table. Make sure that the table is free from dirt or oil. If the problem is still there, check for any type of drag. Too much drag will cause drifting or ripping. The film is also guided. If the guides are too tight this will allow the film to wedge and cause a film fault.

Check the feed assembly for proper roller pressure. Ensure that the rollers are not slipping, or else the rollers must be cleaned. If any signs of wear, rollers must be replaced. To check slippage, power must be on with the E-Stop button pushed in. Grasp the top roller and try to turn it. If the top roller turns, check for dirty rollers or a loose clamp. Clamp is adjusted by increasing the rubber bumper engagement. Also check for worn clamp. If any signs of wear on any parts, they must be replaced as soon as possible.

The perforation is difficult to separate:
Try manually to separate a pre-perforated label. If it is difficult to separate on the perforation, replace the perforator blade. Then check the quality of the perforation again. If there is no improvement, check for a groove on the perforating surface of the perforator back up (anvil) block. If there is a visible groove on the block, the backup block assembly should be removed and reground. Note: The backup block is pinned for correct alignment during assembly.

The perforator is not working:
1. The unwind vacuum box analog eye may be faulty.
2. The flag (target) starting the servo is not aligned with the start proximity switch.

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Material jamming on the bottom of the mandrel:

Check the flat width (the measurement of the width of the flattened material in millimeters, see the Machine Specification Form for this specification) of the material – the measurement must be within the permissible tolerances.

Labels not applied correctly:

If the label is being misapplied you will need to adjust the product sensor photo eye. You will have to move it forward (downstream) if the label is applied too early and backward (upstream) if the label is applied too late. If the label is applied in the timing screws, check the timing of the dwell position of the product.

If you see a problem at the point of application there is a chance that the blade is dull. If separating the labels by hand is difficult, the blade should be replaced at this point.

Check for moisture on the containers. If the containers are wet, the label will not be applied properly.

Check the main feed units for alignment. If there is not correct pressure on the feed rollers (too loose), the label will not be fed through the mandrel at the required speed.

Check that the main unit feed rollers are not dirty or worn, as that can cause slippage.

Check that the timing screws are timed properly.

Check that the conveyor speed is correct.

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11.2 Electronic Sensor Setups & Adjustments

***Warning*: Do not stare at, or into, the beam within any sensor of this machine and do not point the beam at anyone when handling or adjusting a sensor, as the beam may be harmful to the eyes.**

See the manufacturer's literature (in the Literature section of this binder) for detailed setup and adjustment of the individual electronic sensors used on this machine.

The Literature section is organized alphabetically by manufacturer's name, for ease of use.

11.3 Spare Parts List

Please see the Spare Parts section of this binder for a list of priced parts that include the suggested items to have as on-hand replacements for this machine.

12. SHUTDOWN OR DECOMMISSIONING OF MACHINE

***Caution**: Before any work is to be done on the machine, or before reaching into the machine for any reason, if possible turn all switches to the off position including the main power fused disconnect switch and any pneumatic lines to this machinery, and then follow proper lockout/tagout procedures!*

To Stop the machine, simply push the control panel Machine Stop button, the leftmost Red button on the HMI enclosure.

NOTE: A safety switch is mounted on the enclosure doors. The machine will shut down the machine if any door is opened while the machine is operating and may cause a film jam in the feed assembly. The door should not be used for an operator stop.

NOTE: When the machine will be shut down for an extended period of time, turn all control panel switches to the off position, back off all air regulators (if applicable) until all gages read zero, turn off the main power fused disconnect switch and any pneumatic lines to this machinery, and follow proper lockout/tagout procedures.

13. TECHNICAL INFORMATION

Refer to the Literature tab that is included in this binder, for further information.

14. DOCUMENTS AND DRAWINGS

14.1 PDC Components

Please see the Assembly Drawings section in this binder for additional details on the PDC manufactured mechanical parts and assemblies of this machine. Please see the Electrical Schematics section in this binder for additional details on the PDC manufactured electrical parts and assemblies of this machine.

15. CUSTOMER SERVICE CONTACT INFORMATION

If you have machine servicing, maintenance, parts replacement, or any other customer service needs or questions, please contact Anthony Caccamo or Todd Smith at PDC International in the United States at 00-1-203-853-1516 and they will be happy to assist you.