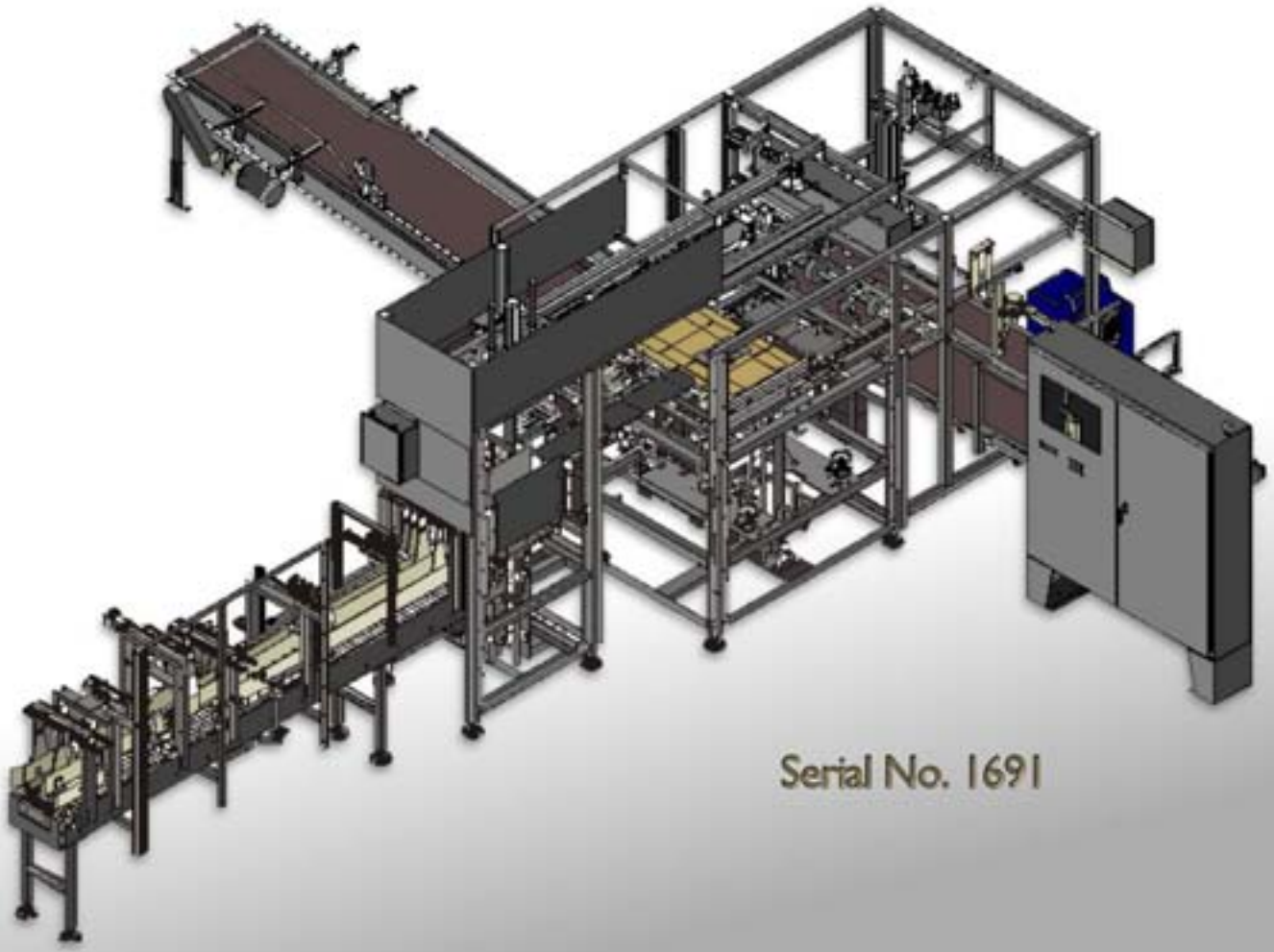
SMURFIT-STONE

Automated Packaging Systems

RAM 350

Machine Manual



Serial No. 1691

Smurfit-Stone Automated Packaging Systems 4364 34th Street Orlando, Florida 32811 800.338.6294 www.smurfit-stone.com

SMURFIT-STONE
Automated Packaging Systems

Overview

Company History

Stone Container Corporation began producing automated packaging systems in 1964, out of Chicago, Illinois. With the 1998 merger of another corrugated industry leader - Jefferson Smurfit Corporation - Smurfit-Stone quickly established itself as North America's premier packaging company.

Smurfit-Stone specializes in corrugated products, mill products, displays, RFID products - and at our Orlando, Florida location - Automated Packaging Systems.

Automated Packaging Systems

In 1979, Automated Packaging Systems moved to Orlando, Florida. This division designs and manufactures both standard and custom packaging equipment. This semi or fully automated equipment includes trayformers, case erectors, case packers and case sealers. In addition, we offer complete packaging solutions - such as our VPS and Meta systems.

Our Team

The Automated Packaging Systems division of Smurfit-Stone has some impressive credentials. On both the Application and the Design sides of the packaging industry, our Mechanical and Electrical Engineers have over 200 years of combined experience. Our Fabrication, Assembly and Production teams are comprised of personnel that can bring even the most complex design to life - without compromising performance or efficiency.

Our Product

All Smurfit-Stone systems are framed of heavy-duty, welded, tubular steel construction. We use the finest add-on features - including Allen Bradley controls, Bosch touch screens, Nordson adhesive systems and Lexan guard doors. Your system is designed and customized to meet your specific needs, to seamlessly fit into your existing flow, and to maximize productivity and output.

Smurfit-Stone Automated Packaging Systems has produced over 2,500 systems to date. The large majority of these are still in use today. We take our customer's needs seriously - and provide the support necessary to make certain that our designs have a long and productive life span.

Our Future

The future of Automated Packaging Systems is ever changing, but always bright. Our focus remains on our customers. For us, simply building a machine is not enough.

We provide the complete package - reducing waste, labor and material costs - while maximizing manufacturing efficiency, enhancing retail attraction, and boosting our customer's sales.

In addition, Smurfit-Stone is continually pursuing new and innovative concepts and approaches that may make our employees more highly skilled, our performance more efficient, and our product of even higher quality.

For more information about your own custom equipment needs,
contact Smurfit-Stone Automated Packaging Systems at
800-338-6294.

Table of Contents

Introduction

This manual is designed to assist with the installation, operation, maintenance, service and support of your machine – **RAM 350.**

The information contained herein is important for the smooth and efficient operation of the machine, and for the knowledge and safety of any personnel working on or around the machine. Please take the time to read this manual thoroughly.

This Manual

This manual is divided into eight sections:

Section Specifics

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- *Company History*
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Safety

Safety should always be of the utmost concern. Please follow the guidelines in this manual, incorporated with the safety regulations of your company.

★ Throughout this manual, you will find two safety messages. Please pay particular attention to both messages as they appear in this manual.

CAUTION

appears where failure to observe its message could cause

Damage to the Equipment

WARNING

appears where failure to observe its message could cause

Damage to the Equipment and/or Injury to Personnel

NOTE: Satisfactory operation depends on correct installation, proper application, and adequate maintenance of your machine. Unauthorized modifications to the equipment may result in less than satisfactory performance, failure of the machine entirely, or compromised safety of personnel.

Should you require any information not found in this manual, or if you need additional support, please contact our Service Department at (800) 338-6294.

General Cautions and Warnings

WARNING – Do not operate this machine until you have been instructed in its SAFE use by your supervisor.

WARNING – Determine the location of all E-Stop buttons BEFORE operating this machine.

WARNING – Do not operate the machine without all guards in place.

WARNING – Maintenance and adjustments must not be done unless ALL electrical and air power have been disconnected.

WARNING – Observe extreme caution when switches are turned on. Operation may start automatically - after a time delay.

CAUTION – After a case size changeover, be sure that all machine adjustments have been properly made - before running cases for production.

OSHA requires all machine installations to have energy-isolating devices to the applicable types of energy the machine may employ. The customer must make sure that employees know how to perform a Hazardous Energy Lockout. OSHA 29 CFR 1910.147 states: “The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance where unexpected energizing, start-up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and be rendered inoperative.”

Safety Decals

These *or similar* Safety Decals may be found on the machine. Make sure that you read and thoroughly understand the signs and related procedures - and identify hazard areas **before** operating the machine.

Warning - This decal appears in hazardous areas an operator or maintenance person may have to enter from time to time. These include areas not intended to support a person's weight, path of a moving part or assembly. Consider any moving part a hazard area even if it is not marked. Always perform lockout procedures before entering any hazard area.

Guards – Do not operate without guards in place. This decal appears on major guards that protect personnel from hazardous areas. Guards should be removed only after completing appropriate lockout procedures. Make sure all guards are installed before operating the machine.

Lockout Reminder - This decal is used to remind personnel to lockout the machine before servicing and/or maintaining.

High Voltage - This decal is used on electrical panels to warn of potential shock hazards. Only qualified personnel should enter electrical enclosures.

Pinch Point - This decal is located on the machine main frame where pinch points occur when guards are removed.

Auto Start – This machine starts automatically.

Burn Hazard – Used on Nordson Glue machine. Always use extreme care when working with the glue unit or any other area where a burn hazard may be displayed.

Operator and Employee Safety

- Whenever there is a problem, first stop the machine, and then solve the problem using only safe procedures. This may require that you stop and ask for help from properly trained.
- Operators and employees should always observe the following guidelines when the machine is in operation.
- Wear OSHA approved Eye Protection anytime you are working around or operating the machine.
- Wear OSHA approved Gloves anytime you are working around or operating the machine.
- Do not wear any loose articles of clothing around the machine.
- Do not wear Jewelry while operating or performing maintenance on the machine.
- Observe all Safety Decals and Procedures. These decals and procedures are for your protection and should be read, understood, and taken seriously. Be sure to read this Manual before starting the machine and keep it nearby in case the need arises to refer to it.

WARNING – Do not reach into the machine while it is in operation.

Compressed Air System

This machine utilizes compressed air as a control and motive force. Efficient operation of the machine is highly dependent on a reliable source of filtered, dry, un-lubricated air (minimum air flow 3/8" NPT). This machine is equipped with devices to filter and separate moisture, and control pressure. Only minimal regular maintenance is required for these devices.

The travel rate of the air cylinders and the response time of the air-controlled devices are affected by pressure and flow rate. If the pressure drops below 90 psi, the timing and operation of the machine will change, often resulting in jams. These changes can be subtle enough that low air pressure is never suspected as the cause. If the air pressure is regulated properly, this condition can be avoided.

Water Wash

WARNING!

DO NOT WATER WASH THIS MACHINE

Use clean, un-oiled, compressed air.
Minimum air pressure – 90 psi / 6 bar.

Equipment Safety Features

This machine has been equipped with safety features that will help to prevent injury to the Operator and damage to the equipment. Among these features may be Jam Detectors, Clear Access Doors, and Emergency Stop Buttons.

Hazardous Energy Lockout Safety

OSHA requires all machine installations to have energy isolating devices to the applicable types of energy the machine may employ. The customer must make sure that employees know how to perform a Hazardous Energy Lockout. OSHA 29 CFR 1910.147 states: "The employer shall establish a program consisting of energy control procedures, employee training, and periodic inspections to ensure that before any employee performs any servicing or maintenance where unexpected energizing, start-up, or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and be rendered inoperative."

➔ The types of energy present in this machine include:

- Electrical Power
- Gravity
- Pneumatics

Lockout and Lockout Removal Procedures are followed by information about each form of energy that must be isolated before servicing and/or maintenance. All steps of the Lockout Procedures must be performed BEFORE servicing and/or maintaining the equipment, which is defined as the following: "Workplace activities such as constructing, installing, setting up, adjusting, modifying and maintaining and/or servicing the machine or equipment.

These activities include lubrication, cleaning or un-jamming of machines or equipment and making adjustments or tool changes, where the employee must be exposed to the unexpected energization or start-up of the equipment or release of hazardous energy."

Electrical Power

The Main Electrical Disconnect is on the Operator Side of the Main Frame and is labeled with an Electrical Lockout decal.

It is the Customer's responsibility to provide training of personnel on proper Electrical Lockout Procedures.

➔ Disable electrical power to the machine as follows:

- Locate the Main Electrical Disconnect and turn down to the OFF position.
- Insert a padlock through the hole provided in the handle and lock it in place. This prevents anyone from turning the power on while you are servicing the machine.
- Keep the padlock key in your possession until the service and/or maintenance is complete.
- Make sure the area is clear of any personnel, debris, tools, corrugated, etc. before removing the padlock and starting the machine.

➔ To verify electrical lockout, you can do the following:

- Look for indicator lights, motors, etc. that are still on.
- Pull the Emergency Stop button.
- Check for zero voltage with a volt-meter.

Gravity

Always lower all moving portions of the machine to their lowest position before locking the machine out electrically.

Removing any pins, bolts, or other parts could allow portions of the machine to lower further and pose a danger. Always take extreme caution around heavy machine parts.

➔ To verify that Gravity Hazards are reduced, you can do the following:

- Make sure all moving parts are in their lowest position.
- Make sure blocking is stable and secure.
- Apply weight to the blocked part to make sure it is stable and secure.
- If removing Pivot Points, remove them slowly and watch for movement or shifting.

Pneumatics

When the Main Electrical disconnect is turned off, the air in the pneumatic system bleeds off to atmosphere.

➔ Disable pneumatics to the machine as follows:

- Locate the FRL and turn the pneumatic disconnect to the OFF position.
- Insert a padlock through the hole provided in the handle and lock it in place. This prevents anyone from turning the power on while you are servicing the machine.
- Keep the padlock key in your possession until the servicing and/or maintenance is complete.
- Make sure the area is clear of any personnel, debris, tools, corrugated, etc. before removing the padlock and starting the machine.

➔ To verify there is no air pressure in the system, you can do the following:

- Check the pressure gauge at the Filter / Regulator.
- Manually actuate the solenoid valve.
- If removing fittings, remove them slowly to detect leaking air pressure.

Heat

Heat cannot be locked out. However, to reduce its hazards, do not handle machine components that may be hot until they have cooled to 100 degrees. The exception to this is the Hot Melt Glue System that requires some procedures to be performed when the unit is still hot enough to maintain hot melt adhesive in a semi-fluid state.

Installation

The following information is intended to assist with the installation process.

Preliminary

Site Preparation

Decide on a satisfactory location for the machine. Whether integrated into a larger assembly line, or acting as a stand-alone unit, the following should be addressed:

- Plan for the machine to be moved – from the receiving area to the production area. Decide on which route the machine may be moved – considering clearances needed, elevation changes, cornering around turns, etc.
- Make certain the area will accommodate the overall size of the machine – and still allow for personnel to work comfortably around the machine.
- Make certain the area is level. If not, the machine may need to be shimmed or floor resurfacing may be needed.
- Make certain that the floor and greater area is free from debris, heavy grease or other items or substances that may compromise safety or compromise the firm placement of the machine.
- Make certain that the area is pre-serviced for all appropriate needs – such as pneumatics, electrical, adequate lighting, etc.
- If the machine is being installed into an existing system, consider any needs or alterations necessary so that the new machine will fit and flow with the existing structure.

Necessary Equipment

- At least one heavy-duty lift truck (forklift). This should have a minimum capacity of at least 5,000 lbs. In addition, extension forks should be available.

Arrival

Receiving

- Inspect surfaces for evidence of dents, scratches, and other physical damage.
- Inspect pusher bars, drive chains, and driving mechanisms for proper positioning on idlers and sprockets.
- Open the Electrical Box and inspect all relays, fuses, etc.
- Check wire terminal connections for tightness.

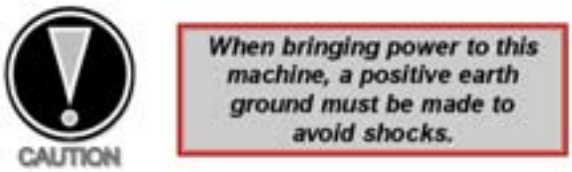
Set-Up

Installation Basics

- Remove all shipping brackets and shipping tape.
- Replace any parts that may have been removed for shipping.
- Place the machine in the desired location in your production line.
- Lock down all casters, if applicable.
- Once the machine has been placed in the desired location, make sure that it is level.
- Lubricate according to the lubrication instructions in this manual.

Finalizing

Read through the Smurfit-Stone Machine Manual, reference all included schematics, and consult any necessary vendor manuals for more detailed information on any additional setup that may be required. After that, your machine will be ready for normal operation and a long life of reliable production.



Initial Adjustments

Air Supply Connection

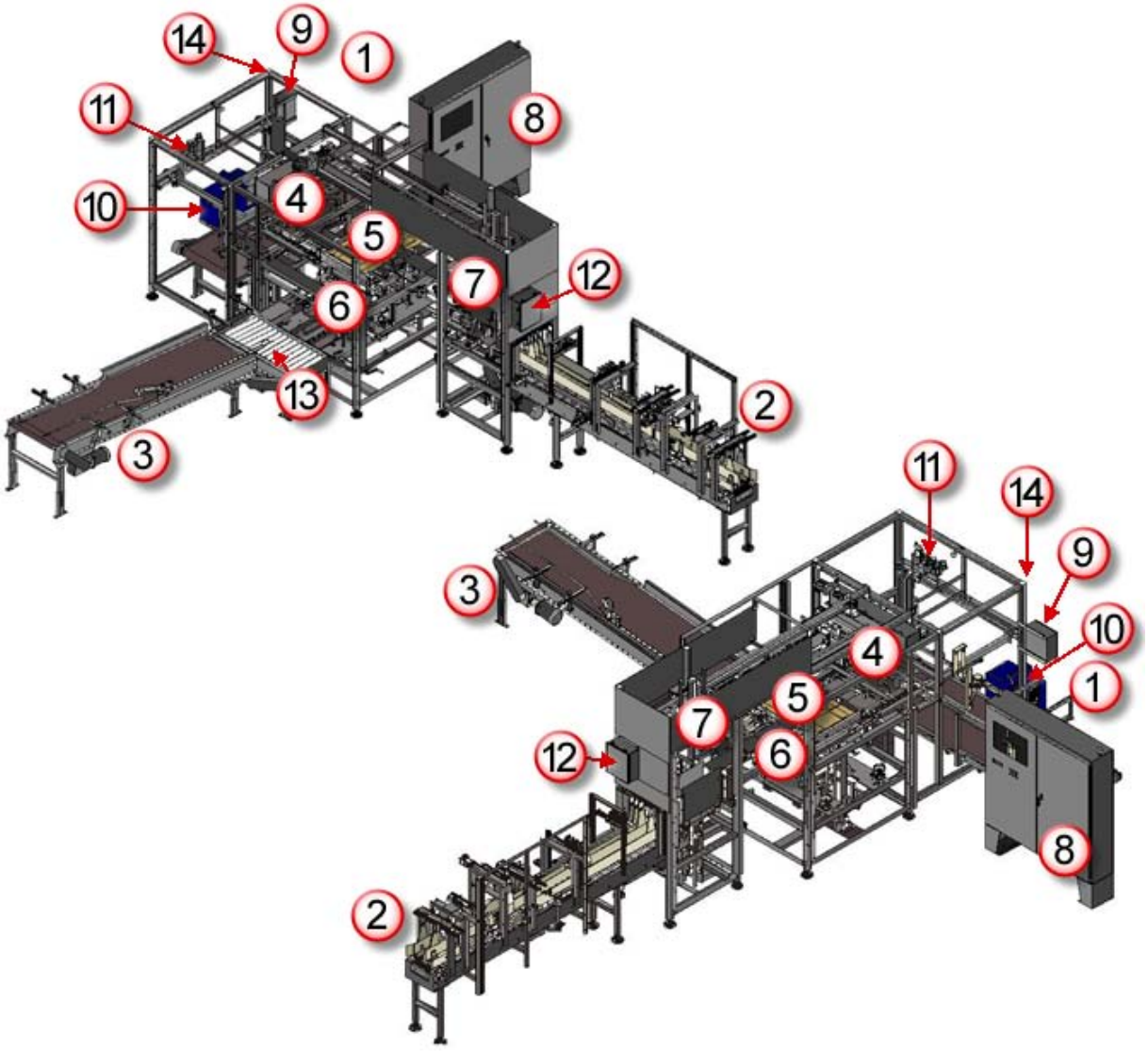
The Air Supply connection is made at the manual shut-off valve located on the incoming side of the Filter Regulator. The incoming line should have a minimum i.d. of 1/2" (13mm). The line pressure should be a minimum of 80 psi. The pressure regulator should be set at 70 psi.

Electrical Connections

Power is brought directly to the Main Control Box. See wiring diagram for terminal connections. The voltage is provided through a control transformer.

Operation

Machine Layout



1. Infeed Area / Blank Magazine
2. Product Infeed Conveyor
3. Discharge Conveyor
4. Glue Section
5. Formation Section – Product Load
6. Formation Section – Wrap & Compression
7. Product Transfer Station
8. Main Electrical Cabinet
   (Main Power, E-Stop, GFCI Outlet, Laptop Interface)
9. Control Panel
   (On/Off Key, Touch Screen, E-Stop)
10. Glue Unit
11. Air System Controls
12. Auxiliary Wiring Cabinet
13. Side Shift Conveyor
14. Status Tower

Operational Overview

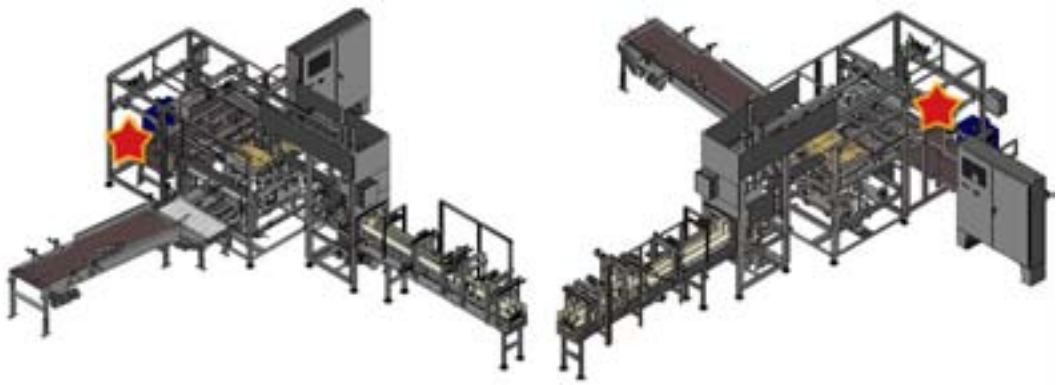
The RAM 350 machine is designed to take a multi-flap, multi-scored Blank, apply adhesive, load the customer's product onto the waiting Blank, form the Blank into a Box around the product, compress and seal the Box, and discharge the final, sealed product Box from the machine.

- ➔ Blanks are manually placed on the Infeed Magazine Conveyor.
- ➔ A set of Vacuum Cups grab the top-most Blank, and feed the Blank into the Formation Section of the machine.
- ➔ The Blank is fed through Pinch Rollers and into the machine, and Stage 1 Glue is applied to the Blank.
- ➔ The Blank travels to the Upper Formation Section. Here it waits for the Product Loader to deliver the product.
- ➔ On the other side of the machine, the customer's product is loaded, processed through a 4 lane system, upstaged to the level of the Blank, and then pushed onto the awaiting Blank.
- ➔ After the product is placed onto the Blank, the formation of the Box begins.
- ➔ From below, a second set of Vacuum Cups pull the Blank and product down into the Lower Formation Section.
- ➔ In the Lower Formation Section, the Blank is folded around the product, Stage 2 Glue is applied, and the flaps and lid are compressed and sealed.
- ➔ The final, completed Box processes out of the Formation Section onto a side-shift conveyor, and then is transferred to the Discharge Conveyor.

The following pages further describe this process.

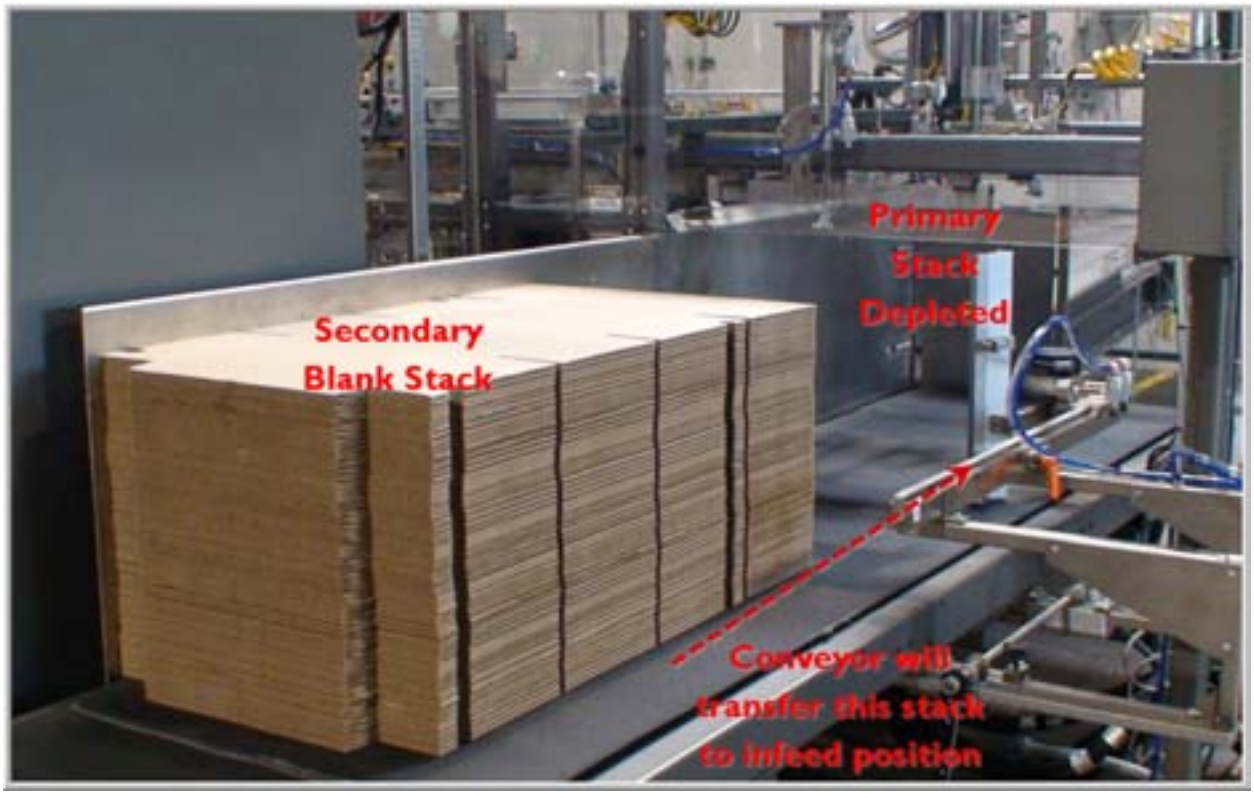
Sequence of Operation

Infeed Magazine Conveyor

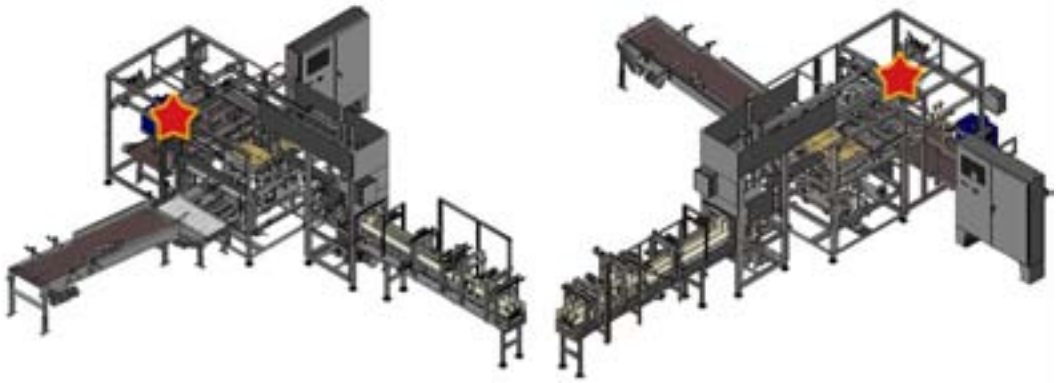


➔ Blanks are manually placed on the Infeed Magazine Conveyor.

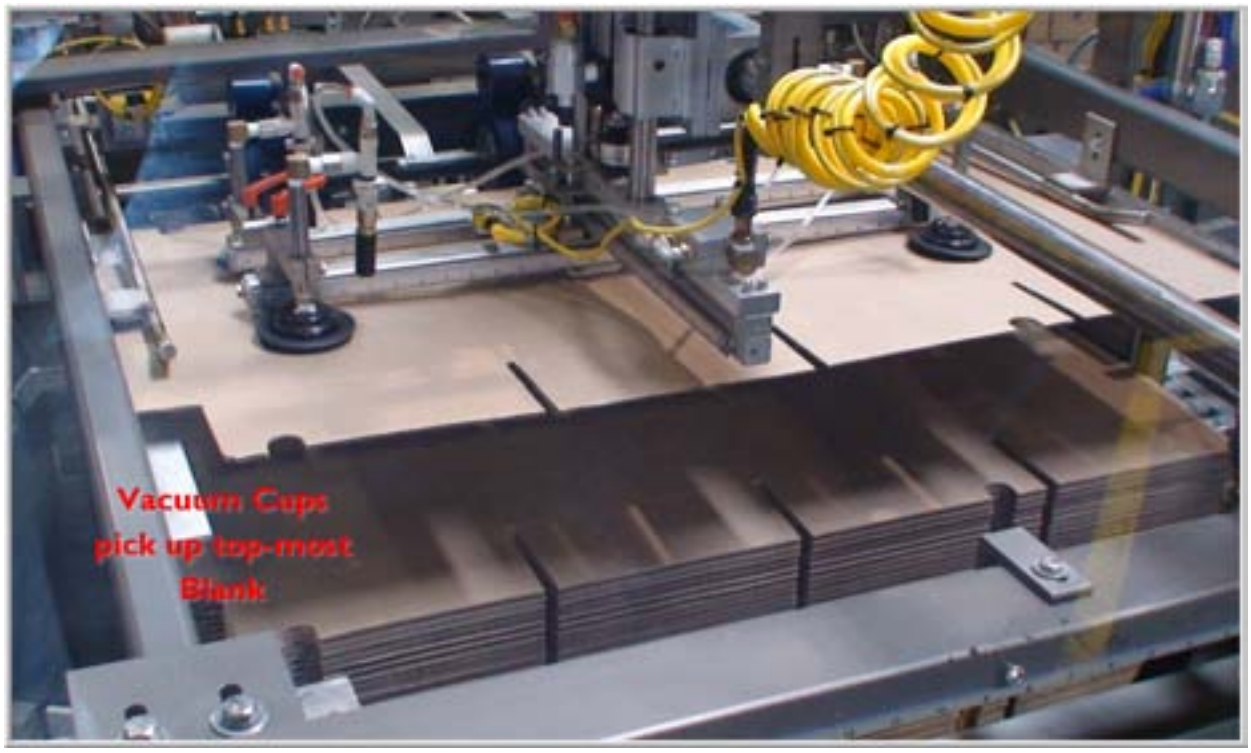
★ The conveyor can hold multiple stacks of Blanks. When the primary stack is depleted, the conveyor automatically moves the secondary stack into its place.



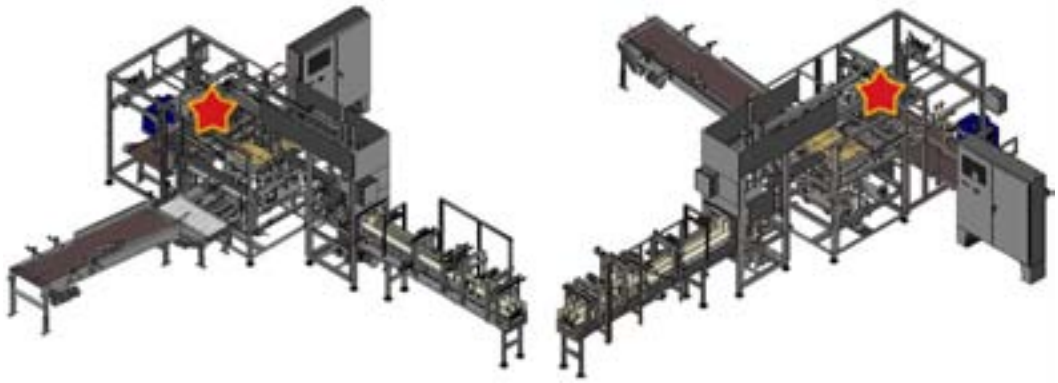
Vacuum Cup Infeed



➔ A set of Vacuum Cups grab the top-most Blank, and feed the Blank into the Formation Section of the machine.



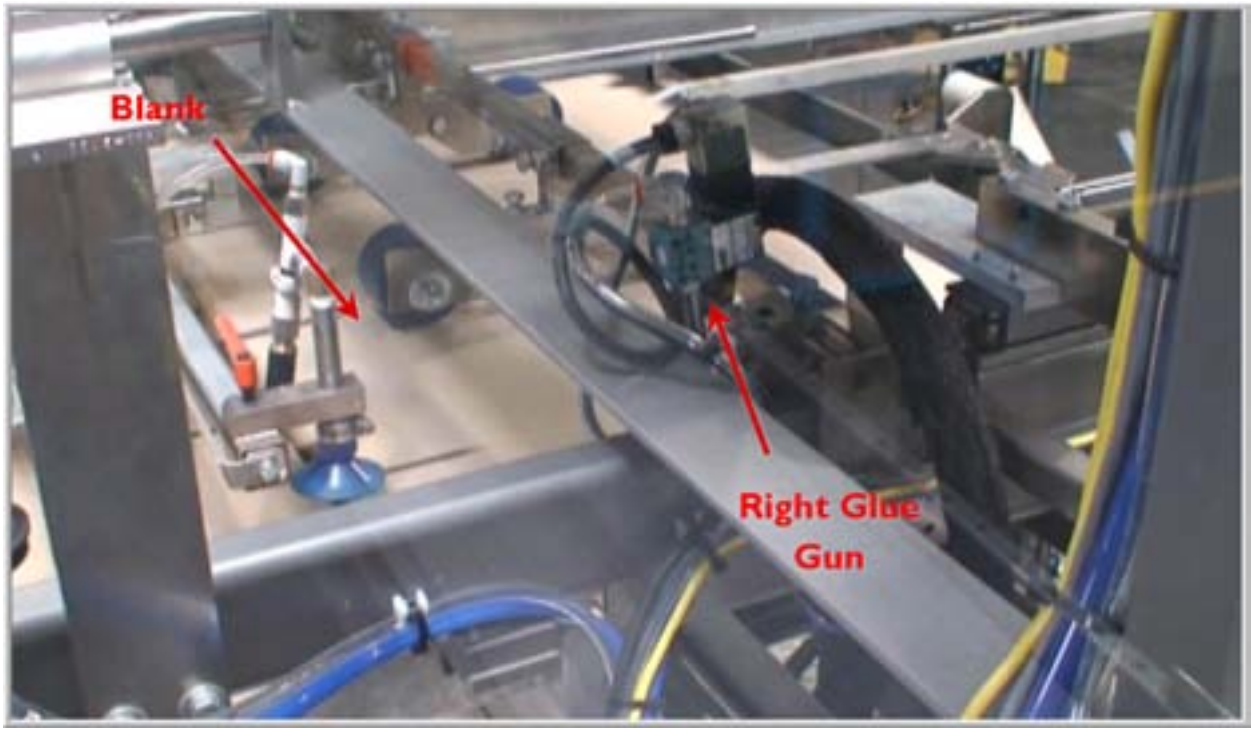
Stage 1 Glue



➔ The Blank is fed through Pinch Rollers and into the machine, and Stage 1 Glue is applied to the Blank.

★ Stage 1 Glue is applied to the bottom side of the Top Panel (Lid).

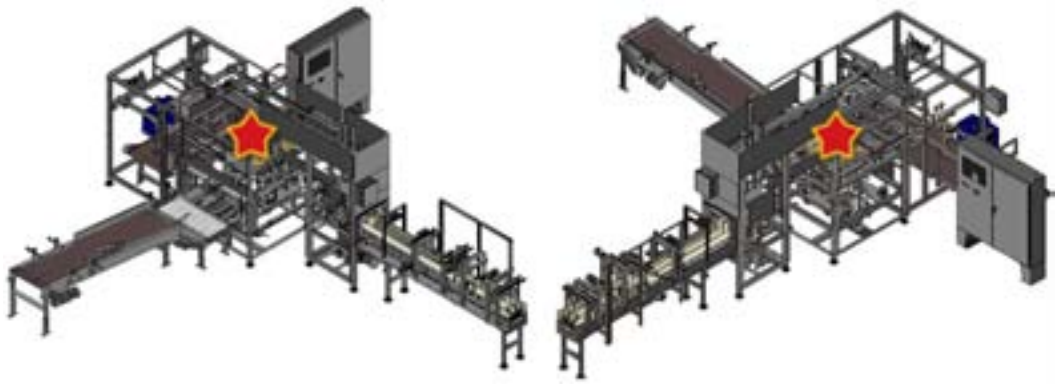
★ Pinch Rollers provide a stable transfer process of the Blank and a consistent platform for Glue application.



Glue and Glue Guns can be extremely HOT during production.

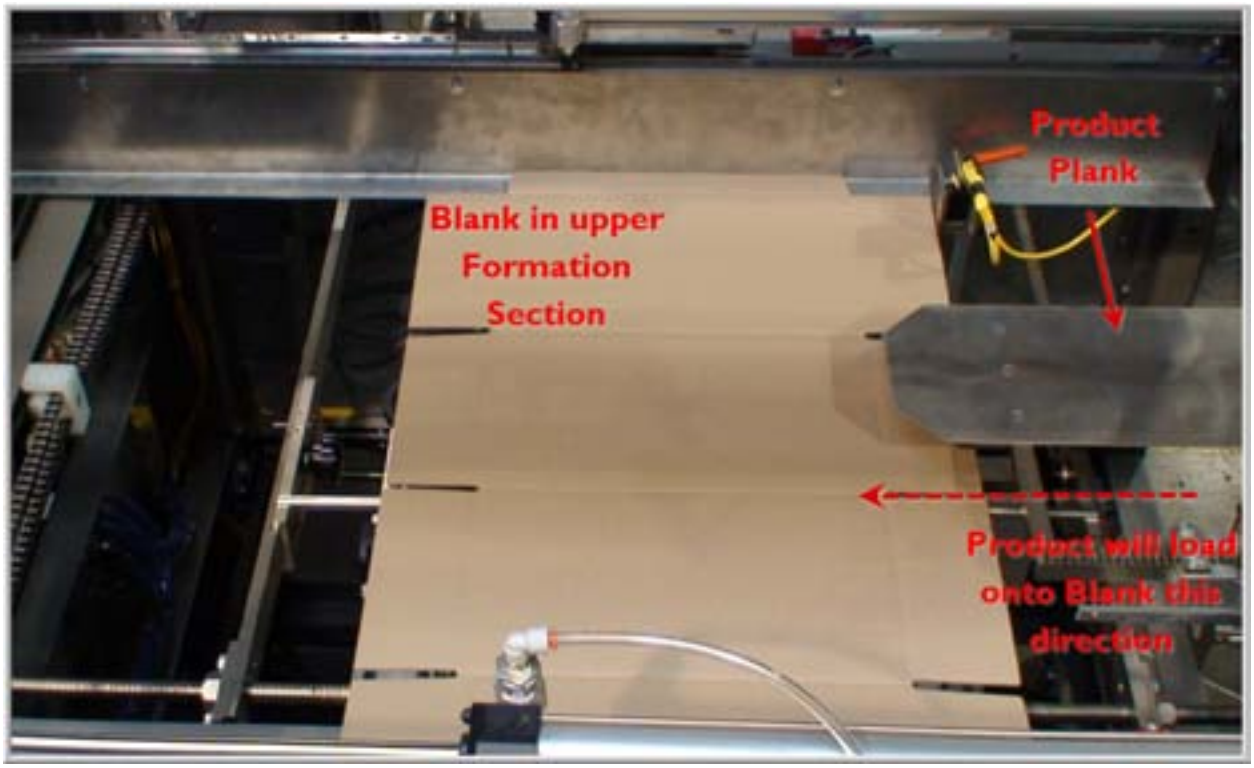
Use Safety and common sense at all times.

Formation Section - Arrival



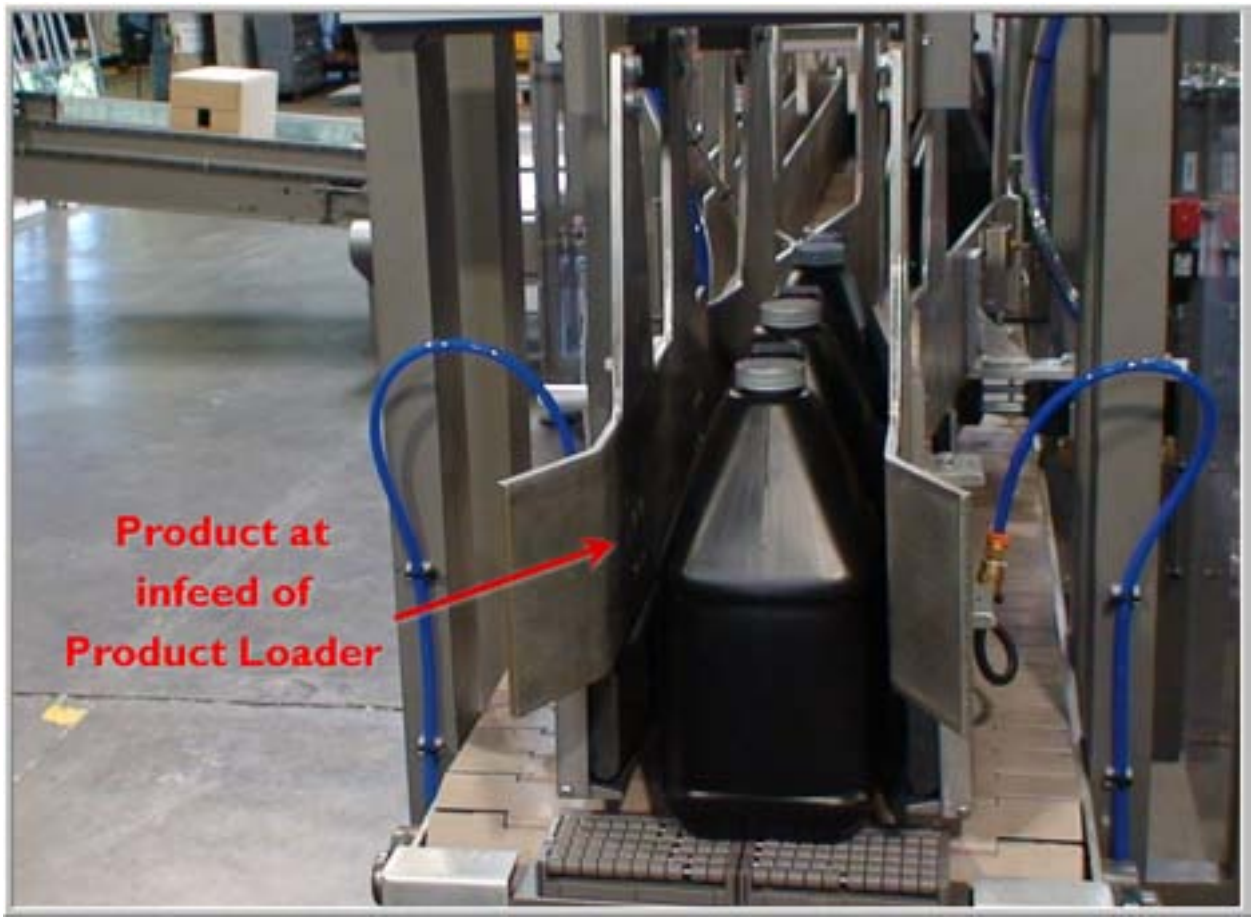
➔ The Blank travels to the Upper Formation Section. Here it waits for the Product Loader to deliver the product.

★ From the Loader, the product will be pushed across the Product Plank and onto the top, center of the Blank.



Product Loader - Infeed

➔ From the customer's conveyor, the product will arrive at the Infeed Area of the Product Loader.

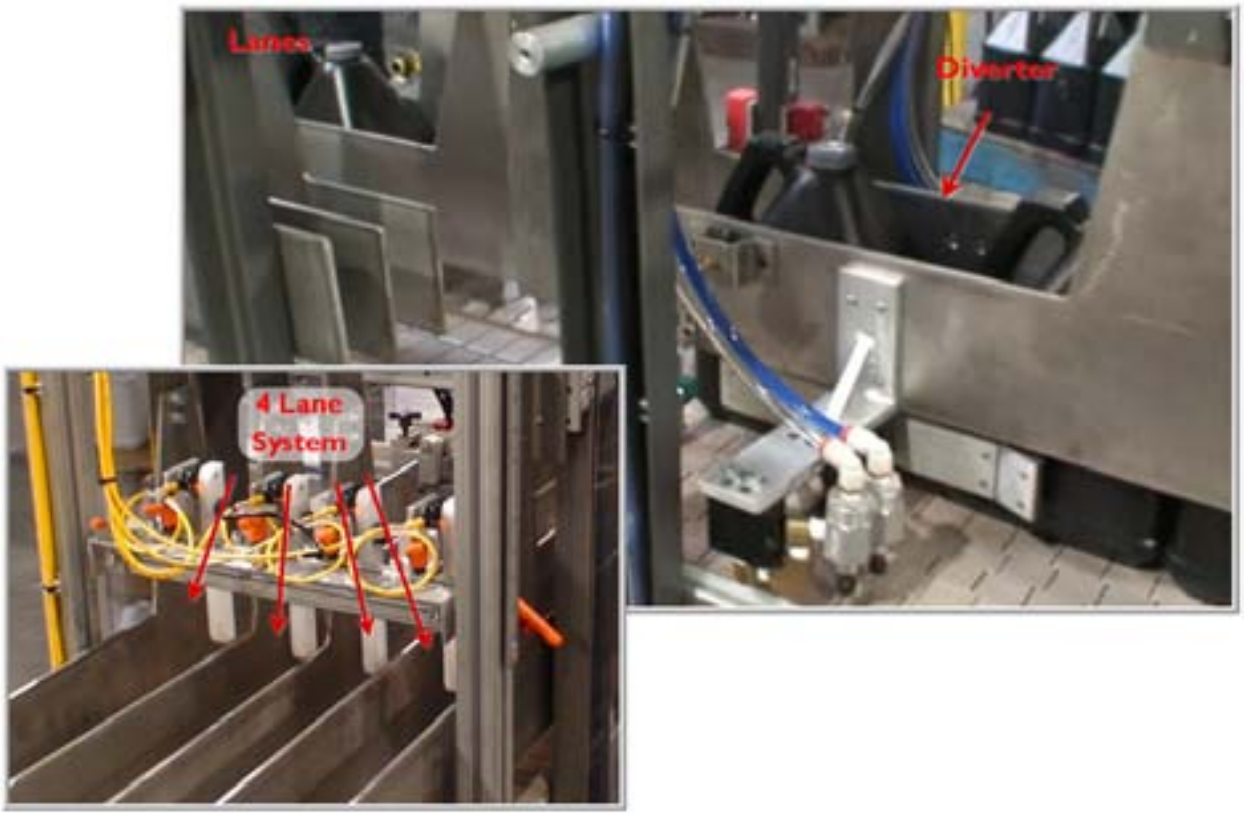


Product Loader - Conveyor

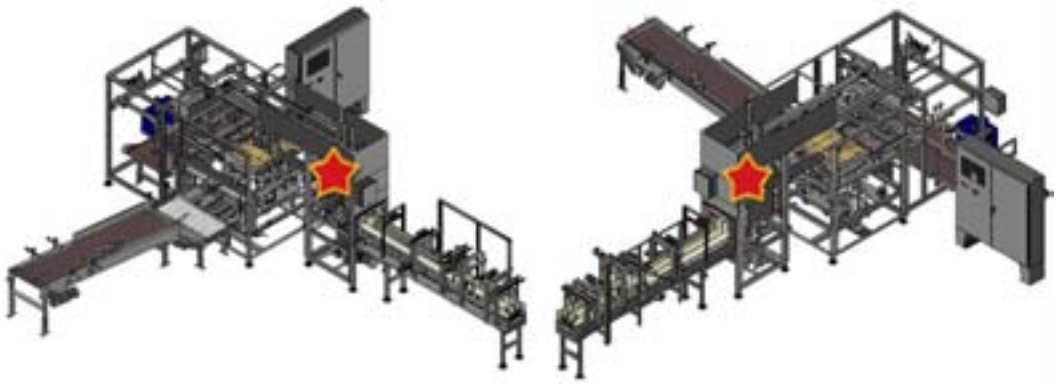
➔ The product processes along the Product Loader Conveyor.

★ Mid-way down the conveyor is a lane system. This lane system can accommodate up to 4 lanes of product flow. This system helps align and distribute the product onto the Blank in correct fashion.

★ Just past the Infeed Area of the Loader, a Lane Diverter automatically keeps the product distributed among the available lanes.



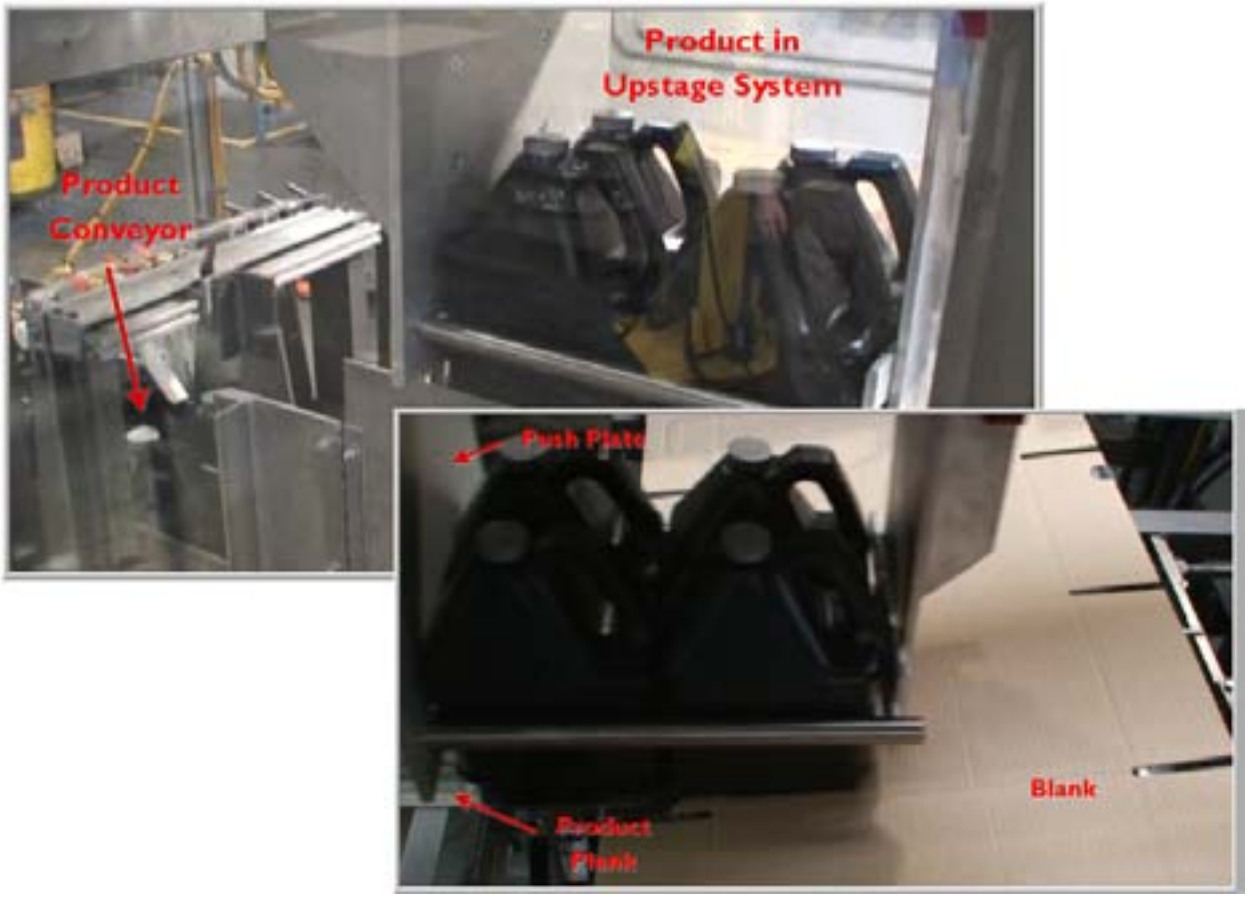
Product Loader – Upstage & Transfer



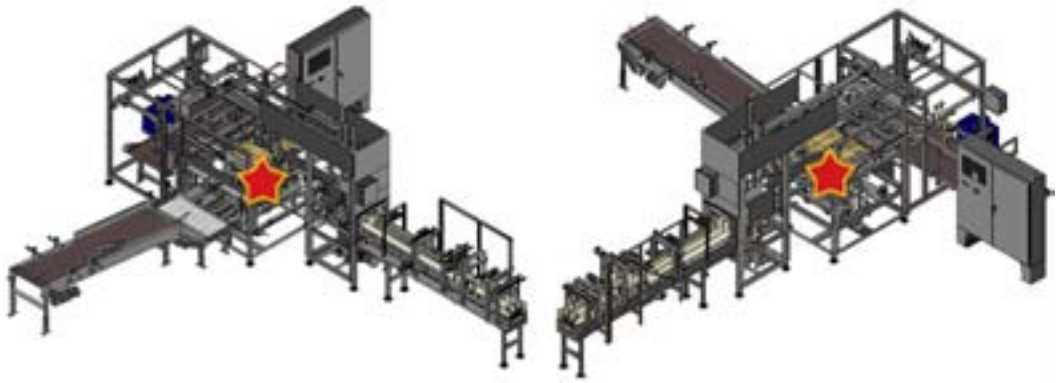
➔ As the product arrives at the end of the Product Loader, it is upstaged, then transferred into the Formation Section and onto the awaiting Blank.

★ Upstaging is the process of raising the product from a lower level (the Product Loader Conveyor) to a higher level (the Product Plank). This allows the bottom of the product to be slightly above the top surface of the Blank.

★ The product is transferred across the Product Plank by a Push Plate. The Push Plate moves the product smoothly across the Plank, while side bars (pictured below) help keep the product from shifting.

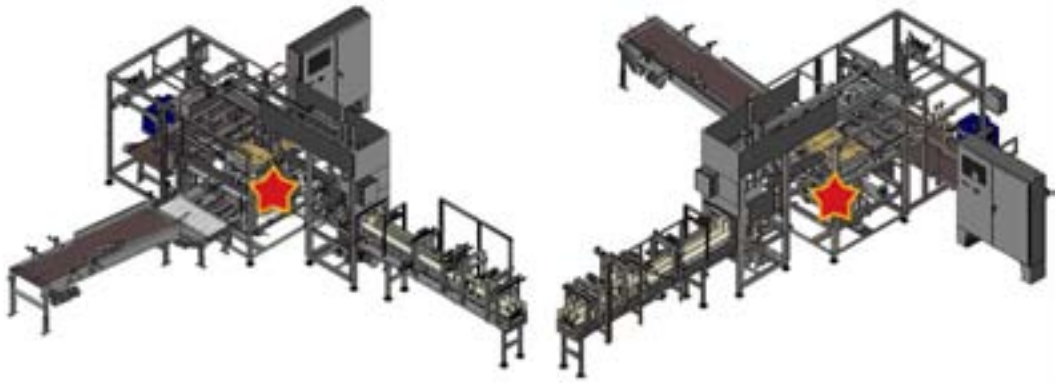


Formation Section – Vacuum Cup Pull-down



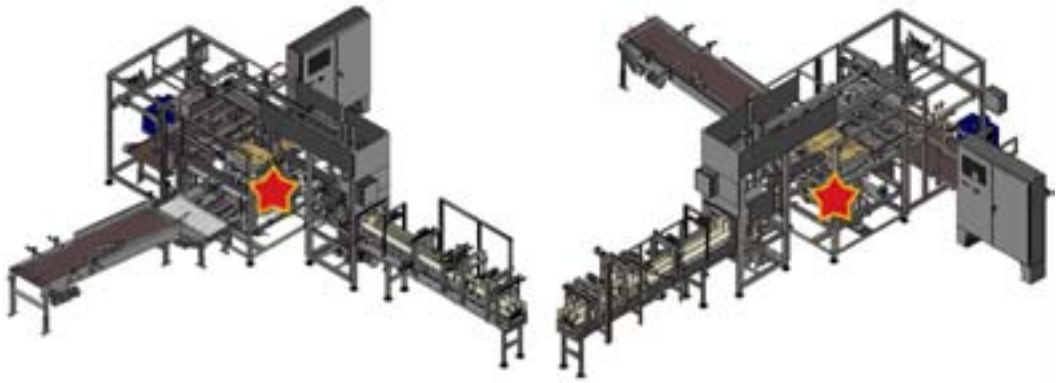
- ➔ Prior to the product being loaded onto the Blank, a Vacuum Cup Plate rises from the Lower Formation Section, directly below the center of the Blank.
- ➔ The Vacuum Cup Plate then pulls the Blank and product downward, into the Lower Formation Section.
- ➔ As the Blank is pulled downward, the Box begins to take shape.

Lower Formation Section – Initial Formation

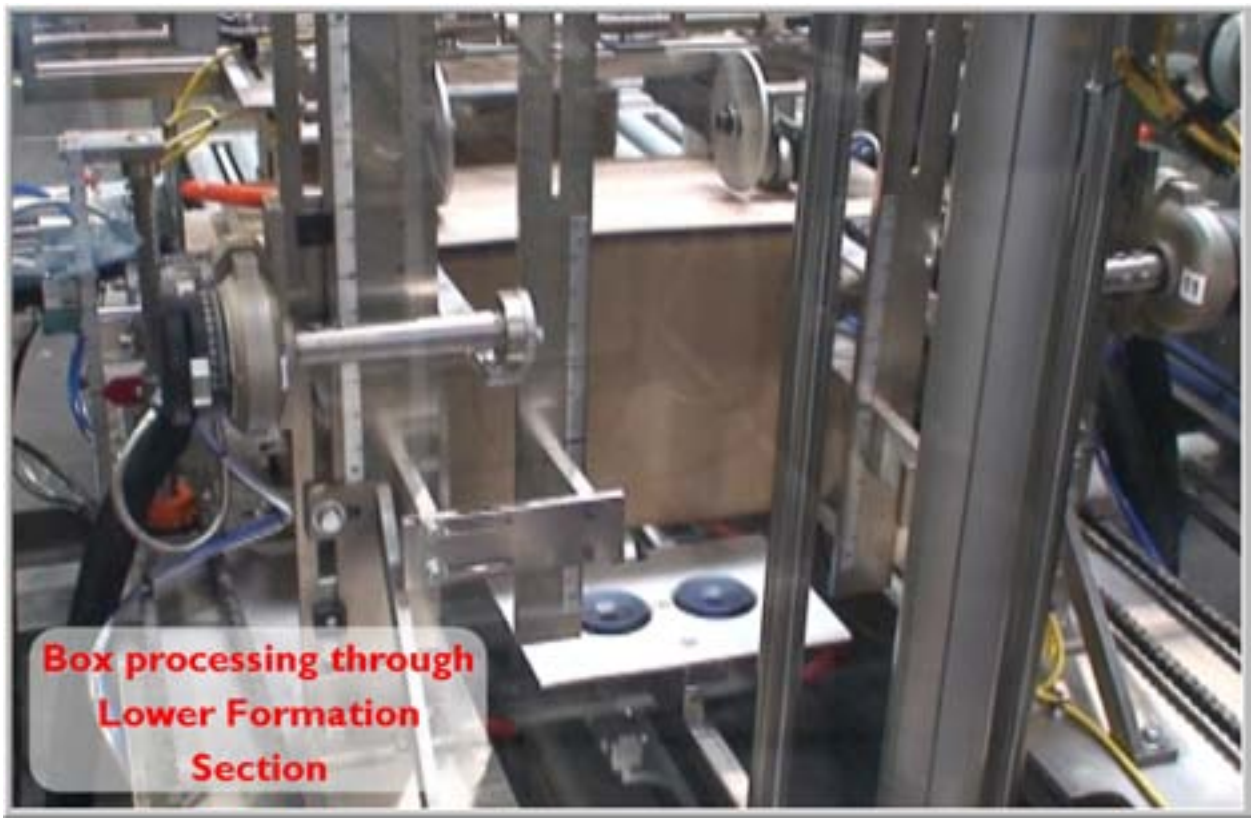


➔ As the Blank and product are pulled downward into the Lower Formation Section, the Minor Flaps are plowed inward, and the Bottom Majors are plowed upward.

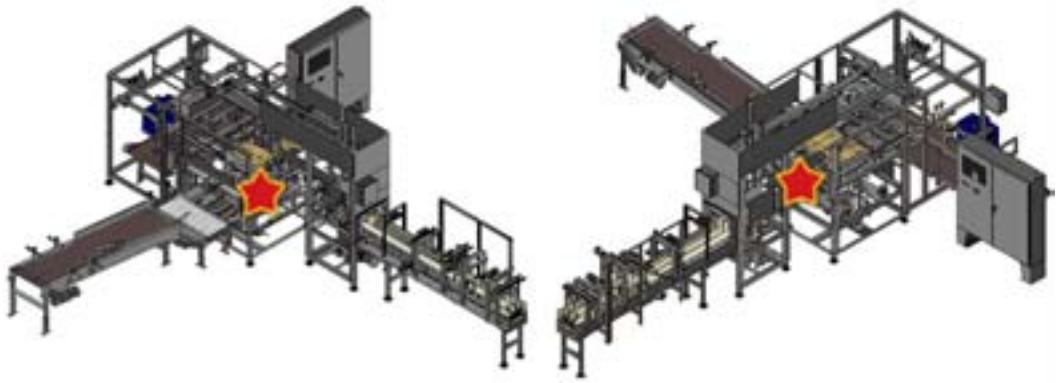
Lower Formation Section – Secondary Formation



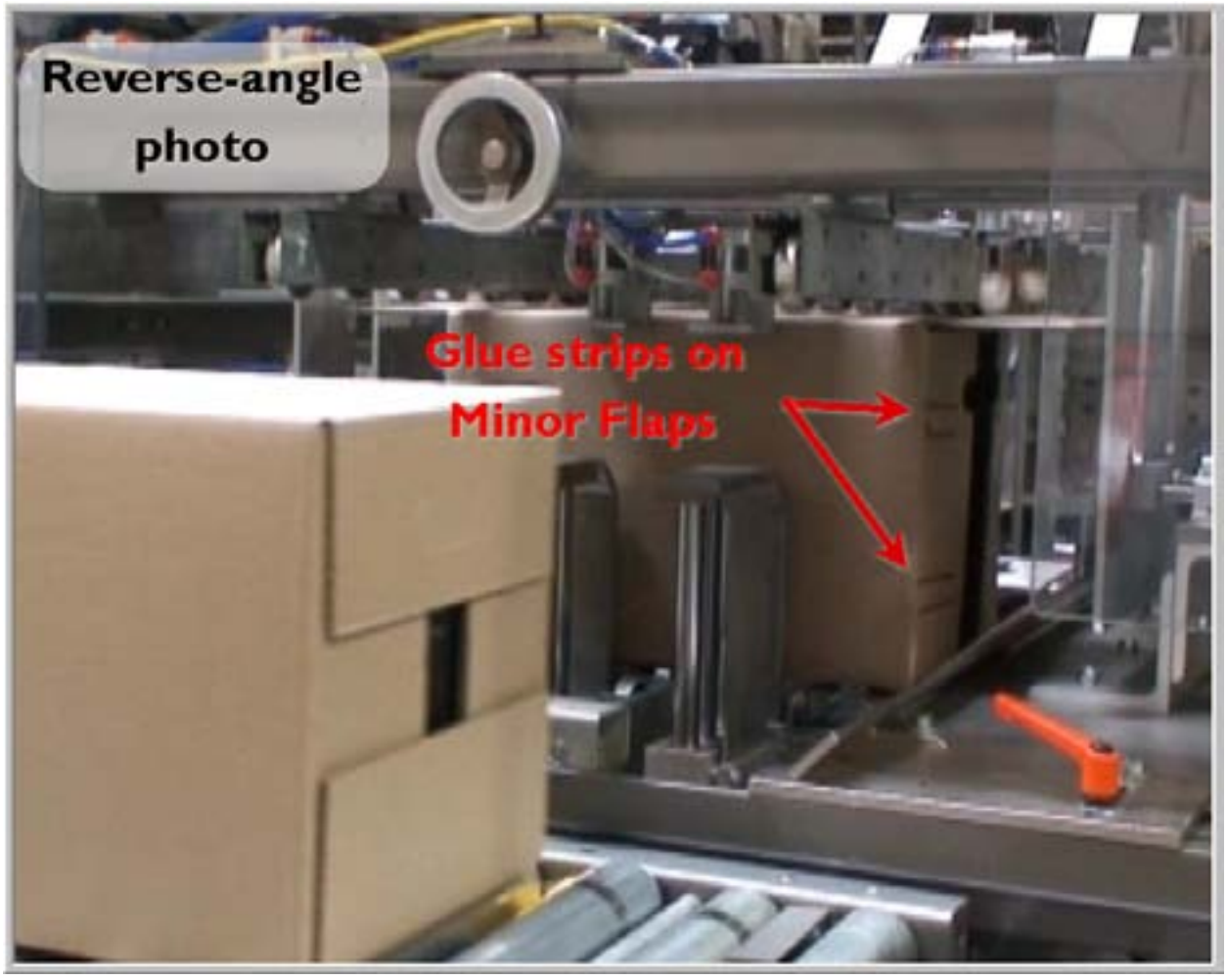
- ➔ As the Box arrives at the lowest point of the Formation Section, it now begins processing in a horizontal direction.
- ➔ The Bottom Major Flaps release back downward, the Manufacturer's Flap is folded, and the Top Panel (Lid) is plowed over.



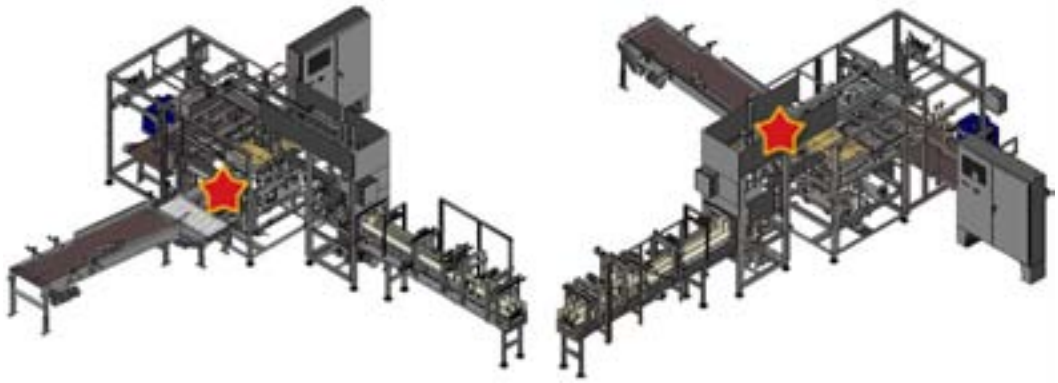
Lower Formation Area – Stage 2 Glue



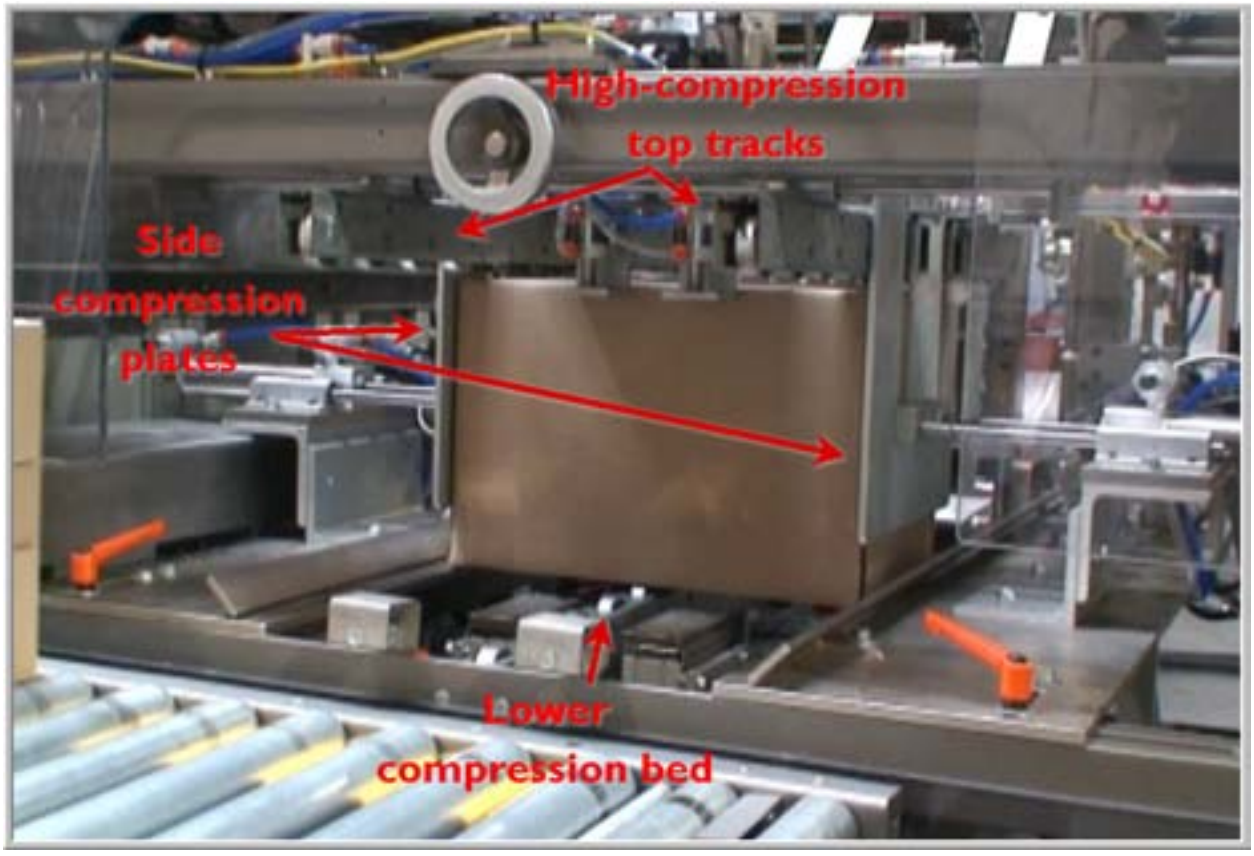
➔ As the Box continues through the Lower Formation Section, Stage 2 Glue is applied to the outside of the (already folded) Minor Flaps.



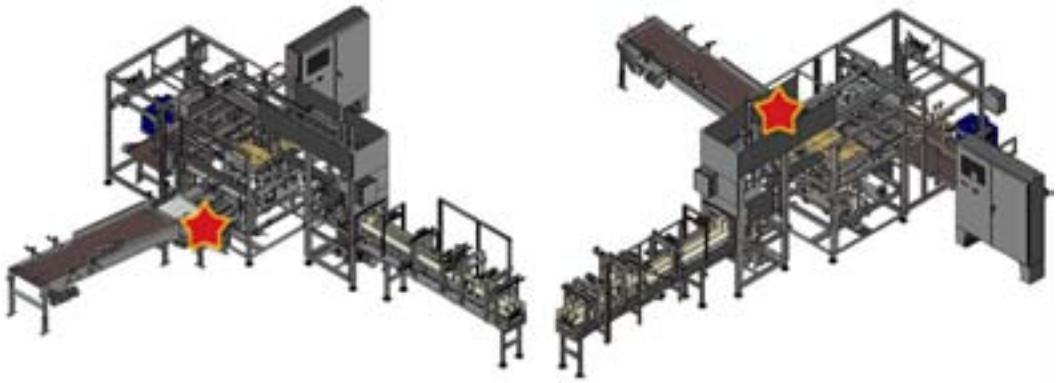
Lower Formation Area – Compression Run



- ➔ At the end of the Lower Formation Section is the Compression Run. After Stage 2 Glue is applied, the Box enters the Compression Run.
- ➔ While the Box is held securely between the Lower Compression Bed and the upper, High-compression Tracks, Side Compression Plates press and hold the Top and Bottom Panels – forming the final, solid Box.



Side-shift Conveyor



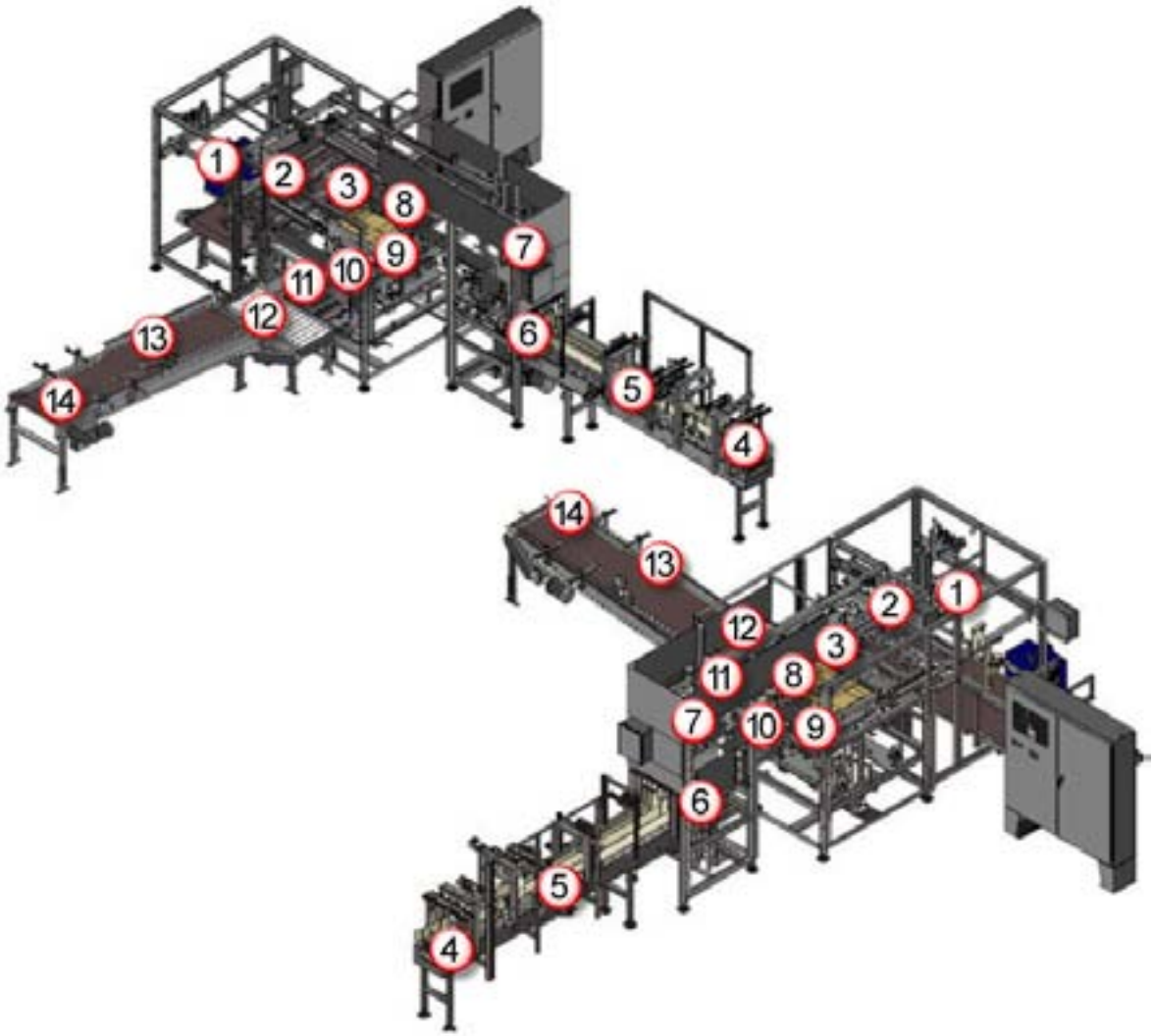
- ➔ The Side Compression Plates release, and the finished Box is pushed onto the Side Shift Conveyor.
- ➔ As soon as the Box hits the conveyor rollers, it begins to move to its right, toward the lower opening of the Discharge Conveyor.
- ➔ As the Box arrives at the opening of the Discharge Conveyor, the Push Beam pushes the Box onto the Discharge Conveyor.

Discharge Conveyor

➔ The Box travels at a slight up-angle toward final discharge.

➔ About 2/3 of the way up the conveyor, the Box lightly bumps into the Box Turn, which rotates the Box to the desired alignment for final discharge.

Operational Review



1. Vacuum Cup Pick-up and Blank Infeed.
2. Stage 1 Glue application – Top Lid.
3. Blank arrival in Formation Section.
4. Product Infeed on Product Loader Conveyor.
5. Product split into 4 Lane System.
6. Product awaiting upstage.
7. Product upstaged.
8. Product transferred onto Blank.
9. Blank / Product pulled down into Lower Formation Section – Box formation begins.
10. Stage 2 Glue application – outside of Minor Flaps.
11. Compression Run – Box formation is completed.
12. Box transferred to Side Shift Conveyor.
13. Box rotates 90° at Box Turn (Discharge Conveyor).
14. Box is discharged from the machine.

Machine Controls

Control Panel

➔ The Operator Control Panel consists of three items:

- **CONTROL POWER OFF / ON** - This Key Switch is used to supply control power to the machine.
- **EMERGENCY STOP** – The Emergency Stop Push Button shuts down all control power to the machine when pushed. The air is dumped to all cylinders and power is removed from all outputs to the programmable controller. A remote E-Stop Button is located on the opposite side of the machine from the Control Panel.

E-Stops MUST be pulled out before resuming production.

Power should be off, and the key removed, when performing adjustments on this machine.

- **TOUCH SCREEN** – The Touch Screen is the primary interface between Operator and Machine. See the Touch Screen section for more detail.

Emergency Stops

Emergency Stops (E-Stops) provide emergency or non-emergency shut-down control for the Machine.

Main system power remains active,
but control power is disabled.

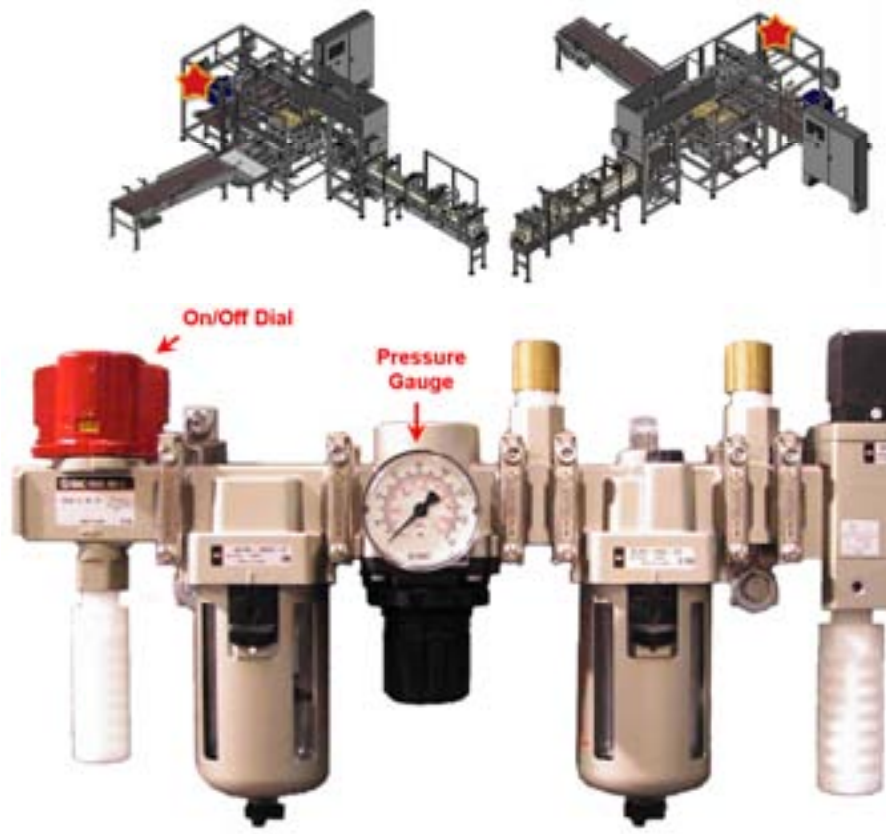
- **E-STOP ACTIVE/ON** – E-Stop active means Control Power is OFF.
  - To activate, simply push in the E-Stop button.

- **E-STOP DISABLED/OFF** – E-Stop disabled means Control Power is ON.
  - To disable, rotate the knob and pull out.

E-Stops MUST be pulled out before resuming production.

Air System

The Air System provides a number of pneumatic operations – critical to the operation of the Machine.



- **AIR SYSTEM SUP/EXH** – This red selector dial can be rotated left or right to set the Air System On or Off.
  - **SUP** (Supply) is ON
  - **EXH** (Exhaust) is OFF
- **PRESSURE GAUGE** – This gauge should read the proper air pressure indicated in the Specifications Section of this Manual. If not, contact Maintenance personnel to troubleshoot the Air System.

For additional information on the Air System – refer to the Maintenance Section of this Manual.

Main Disconnect / Power

The Main Disconnect supplies or disables main system power for the Machine.

Located on the Main & Auxiliary Electrical Cabinets – the Main Disconnect also locks/unlocks the cabinet when On/Off.

- **MAIN DISCONNECT** – Rotate to the right to turn ON, to the left for OFF.

Glue System

The Glue System controls the adhesive functions of the machine.

Refer to the Nordson Manual for instructions on the proper Operation and Maintenance of the Glue Unit.

Glue and Glue Guns can be extremely HOT during production.

Use Safety and common sense at all times.

Touch Screen

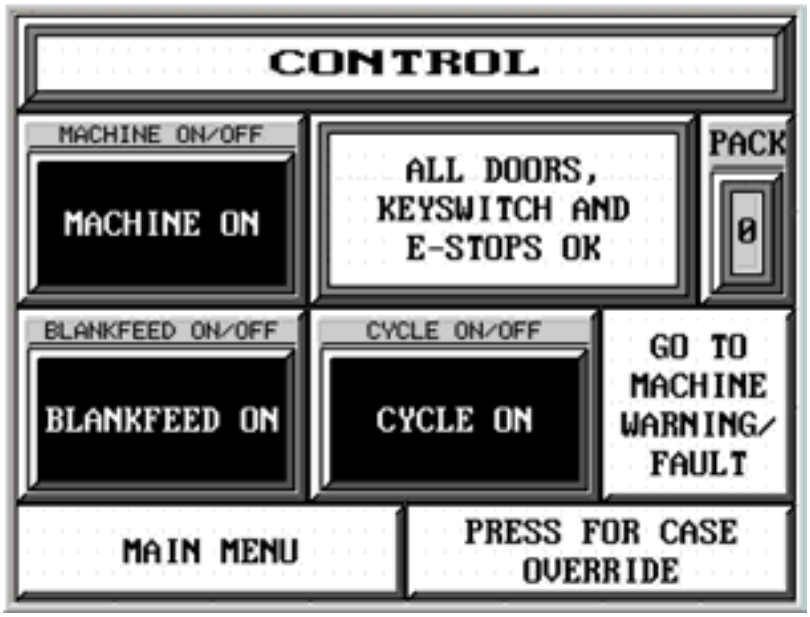
The primary interface between Operator and Machine.

★ The Touch Screen is used to:

- Monitor the machine
- Detail existing conditions and set-ups
- Inform the Operator of warning and/or fault messages

Control Screen

The Control Screen is the first screen to be displayed when power is initially supplied to the machine, or when and E-stop is first operated. This is the screen where most 'running' of the machine will occur.



★ The Control Screen consists of:

- **MACHINE ON/OFF BUTTON** - Press this to turn the machine ON or OFF. The Machine ON state activates all conveyors, and puts all other motors and systems in a 'ready' state.
- **MACHINE STATUS** – Gives a text readout of the machine's current condition. In the above image, the status is "ALL DOORS, KEYSWITCH AND E-STOPS OK." This screen will also display warnings and Fault Messages. Touching these Fault Messages will lead you to the Alarm Screen – in order to help resolve the issue.
- **PACK** - Displays the current Box Size selected.
- **BLANKFEED ON/OFF BUTTON** – Press this to start the Blankfeed and begin cycling Blanks. Blanks will process from Infeed to the Upper Formation Section. At this point, they will wait for product to be loaded.
- **CYCLE ON/OFF BUTTON** – Press this button to activate the Product Elevator upstage and transfer process. Product will convey to the Elevator, but will not process beyond, until Cycle is ON.
- **GO MACHINE WARNING / FAULT** – Pressing this button will access the Troubleshooting Menus.
- **MAIN MENU**– Pressing this button will access the Main Menu Screen.
- **PRESS FOR CASE OVERRIDE** – Press this button to release the last Box in a series from the Compression Run of the Lower Formation Section. Boxes normally release from the Compression Run due to another Box moving in from behind. The final Box will not release until Case Override is pressed.

For more detail on Faults- see the Fault Screen in the Appendix.

Main Menu

From the Main Menu, you can access all available sub-menus and all features of the Touch Screen.

★ For the RAM 350 machine, the Main Menu consists of the following available sub-menus:

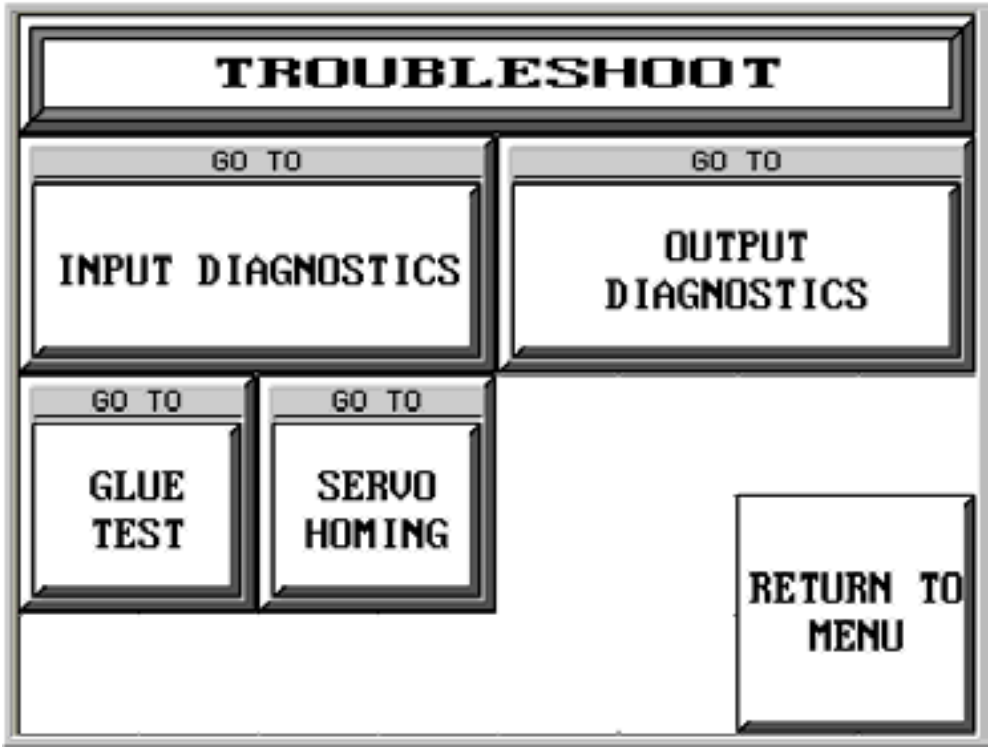
- Control
- Fault or History
- Sequence
- Case Count
- Timers
- Troubleshoot
- Box Select
- Glue Control
- Reset Loader

You may also adjust the contrast of your screen.
Simply touch the Contrast buttons
at the lower right of the screen.

Troubleshoot Screens

Troubleshoot Screens assist in identifying and resolving issues with the machine that may be interrupting normal production.

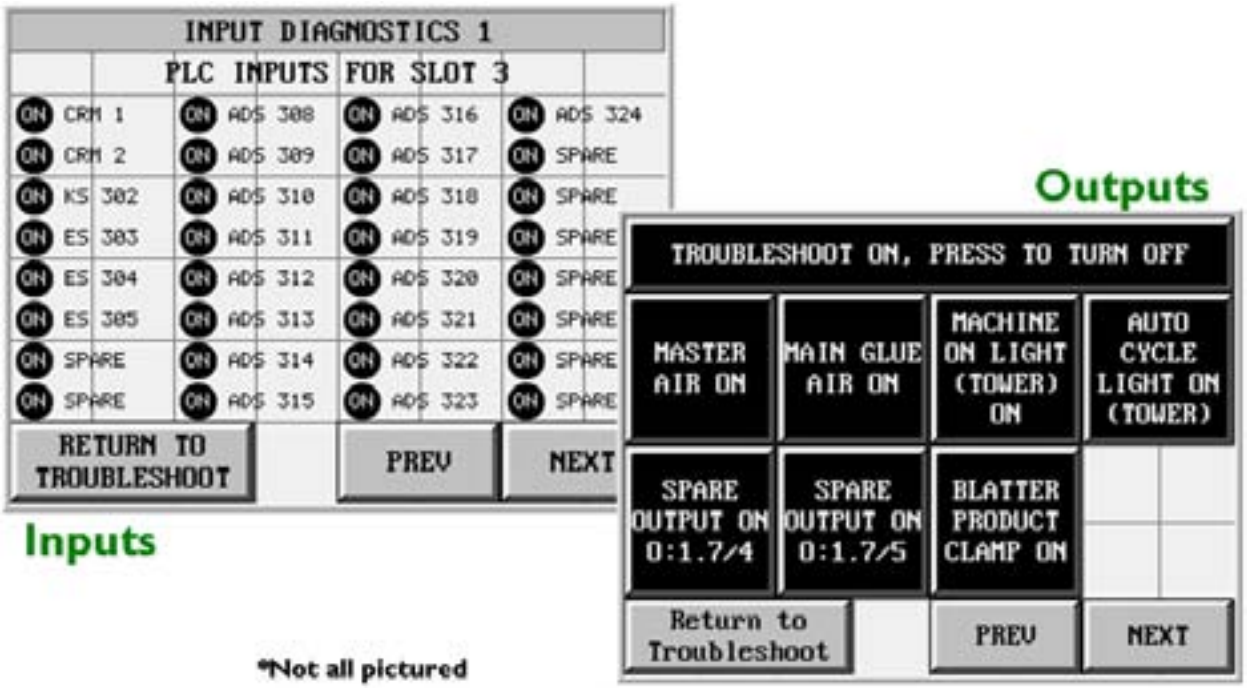
Troubleshoot Main Screen



- Turns the Troubleshoot Mode ON/OFF. (Machine must be OFF and all doors and E-Stops in normal position)
- Allows access to Input and Output diagnostics
- Access for Glue Test and Servo Homing.

Input & Output Screens

Input & Output Screens provide critical information to aid in troubleshooting issues with the machine.



★ Terms:

- **Input** – A signal/communication from a Machine component, such as a Photo Eye, Proximity Switch, Reed Switch, etc.
- **Output** – A signal/communication from the Touch Screen/Program to a component, such as a Solenoid, VFD Motor, Servo Motor, etc.

For more information on these and other terms, see the Glossary in the Appendix.

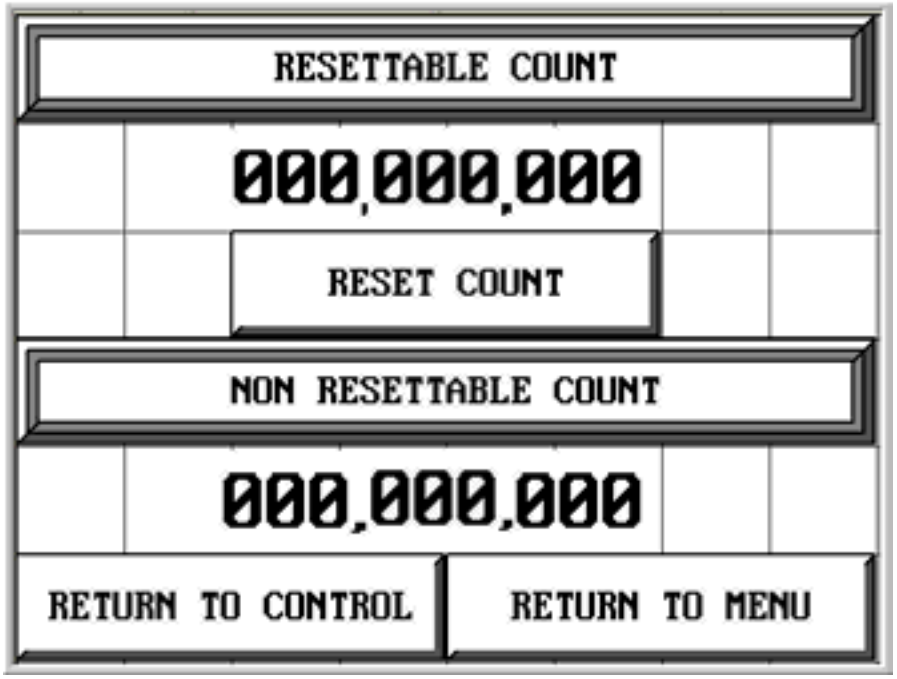
➔ Press to Turn Outputs On / Off – pressing this button will turn the Outputs (Troubleshoot Sub-Menus On or Off. If they are Off, the Sub-Menus WILL NOT display on this screen.

- Machine MUST be OFF to turn Troubleshoot Outputs ON.

➔ Each Sub-Menu or Output will take the Operator to a different screen, displaying the details of that particular group. (see following)

Case Count Screen

This screen displays two case counters that are capable of counting to 999,999,999. This screen is a useful tool for tracking and monitoring production numbers.



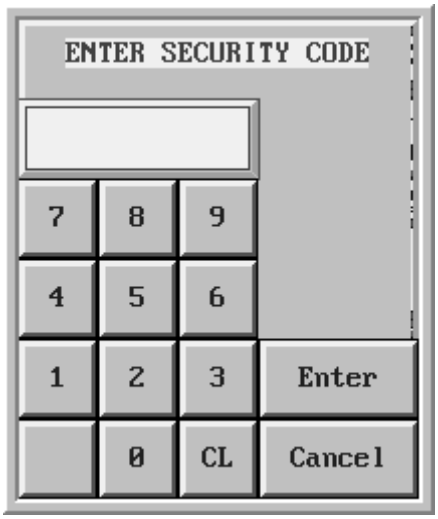
★ One counter can be zeroed by pressing the RESET button on the screen.

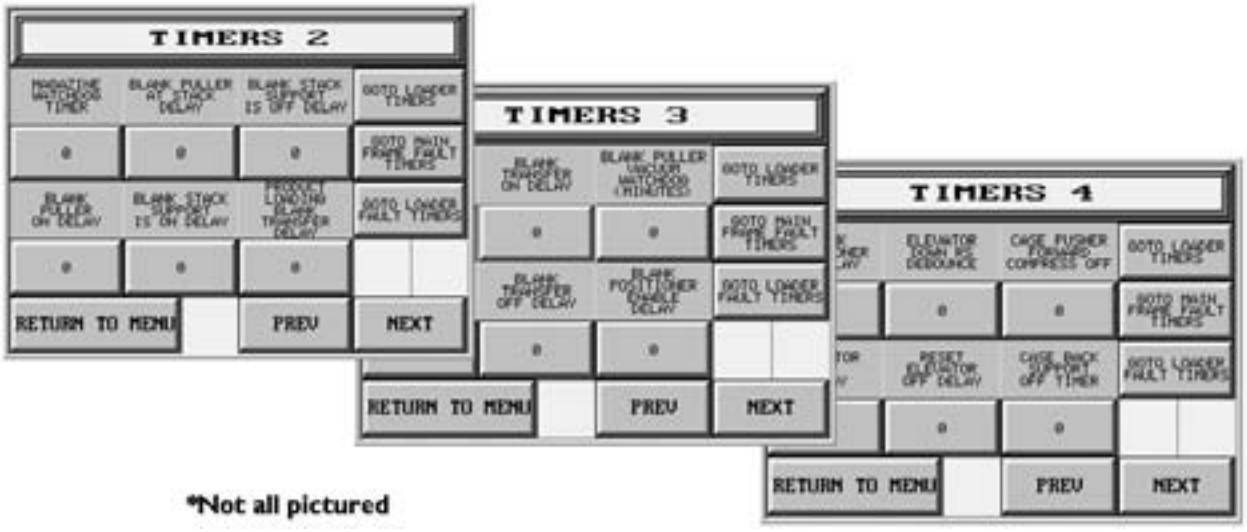
★ The other counter cannot be reset.

Timer Screens

This screen is protected by passcode entry. Only authorized personnel are able to access and adjust timers.

➔ Authorized Personnel – enter your passcode and touch the ENTER key.





*Not all pictured

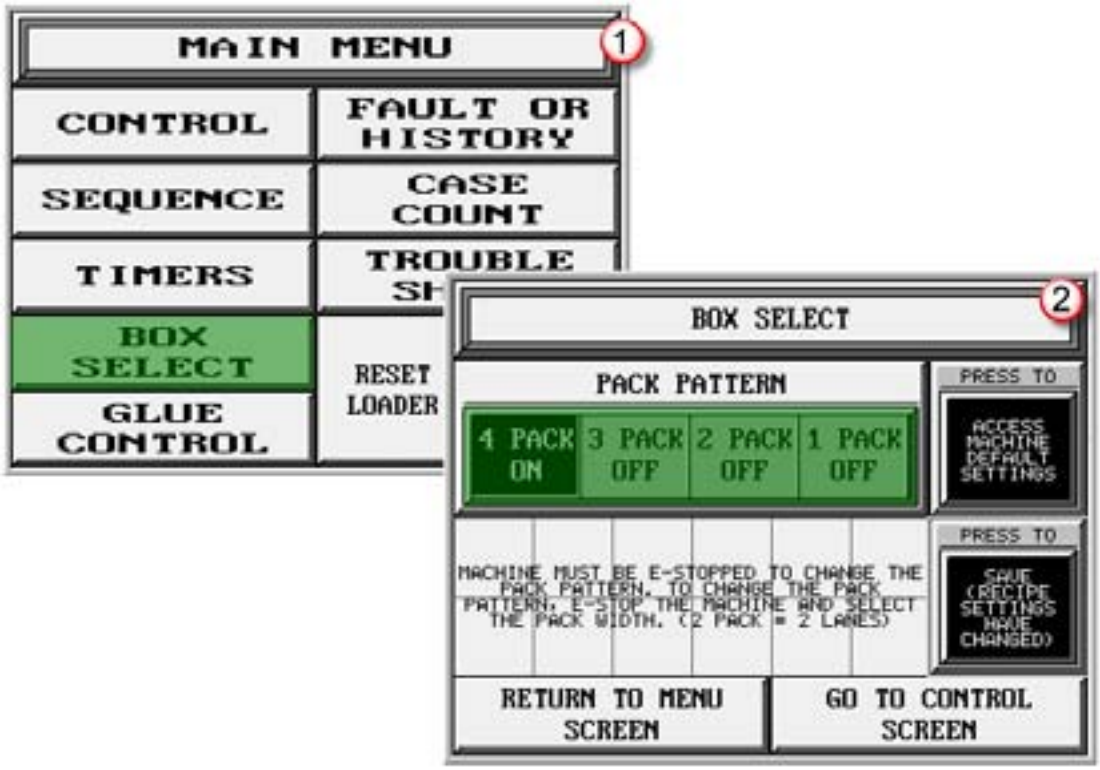
★ Buttons on Timer Screens allow Authorized Personnel to adjust timing of actions not related to a specific box type.

★ Timers adjust delays, sequences, pauses for events, and faults.

★ Values entered and displayed on timers are always in seconds, unless noted otherwise.

Box Select Screen

The Box Select Screen allows for the change of box settings, updating of information and restoration of factory defaults. Most of this area is password protected and for Authorized Personnel only.



★ The Box Setting will adapt the timing of numerous machine operations for the desired Blank to be processed.

➔ From the *Main Menu*, touch **Box Select**.

➘ The *Box Select* Screen will appear.

➔ Press E-Stop IN.

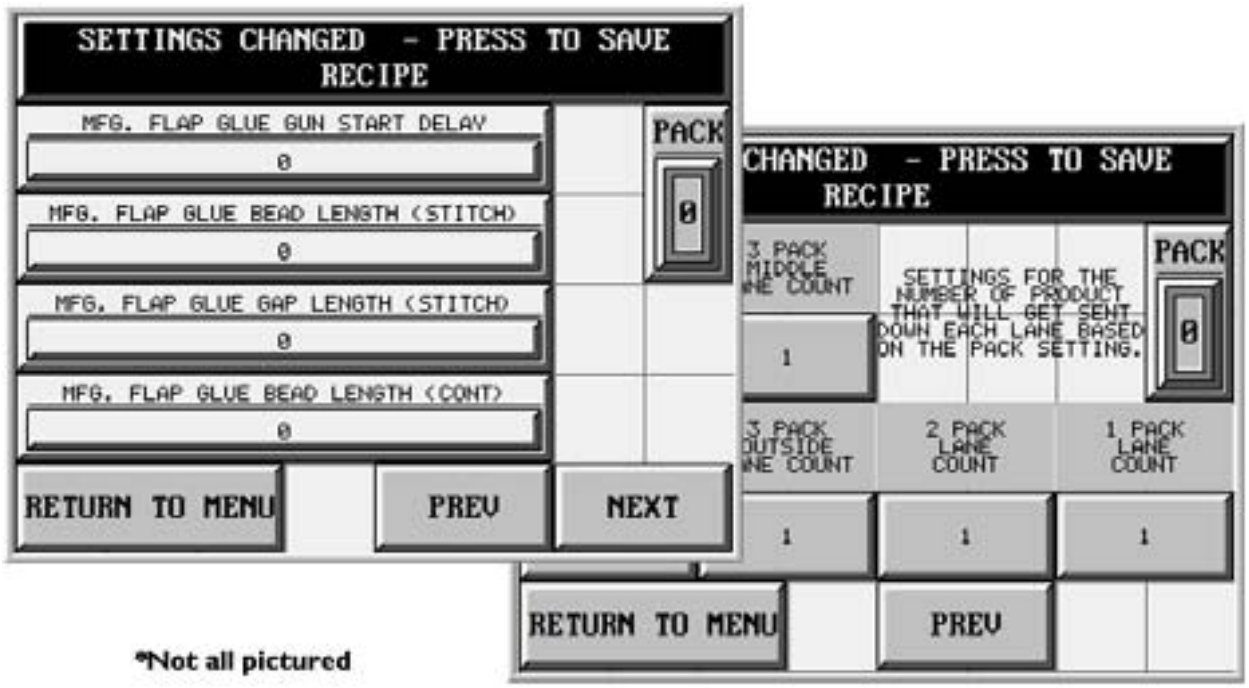
➔ Press the numerical **Pack Pattern** bar to select the desired pattern.

NOTE: The numerical bar (highlighted in image # 2 above) will cycle in descending order (4,3,2,1) with each touch. Keep touching the bar until the desired selection is ON.

★ Updating of box settings and restoring factory defaults is for Authorized Personnel ONLY.

Sequence Screens

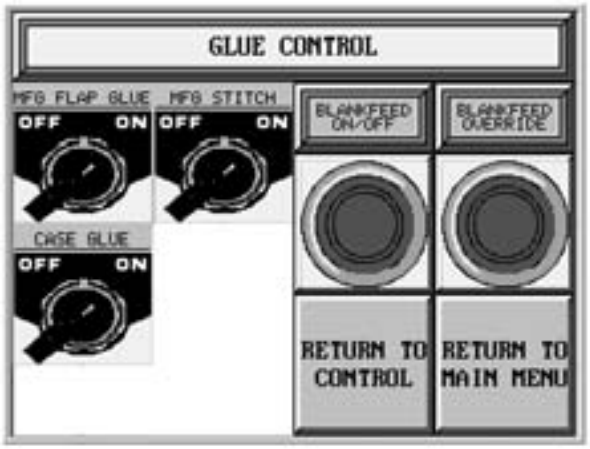
The Sequence Screens (which are also password protected) allow Authorized Personnel to adjust machine timing based on box size and pack pattern.



★ Values entered in Sequence Screens effect ONLY the recipe currently selected.

Glue Screens

Glue Screens allow for the testing and control of glue function in various areas of the machine.



★ Glue Control – This screen allows the Operator to turn various Glue Systems ON or OFF.

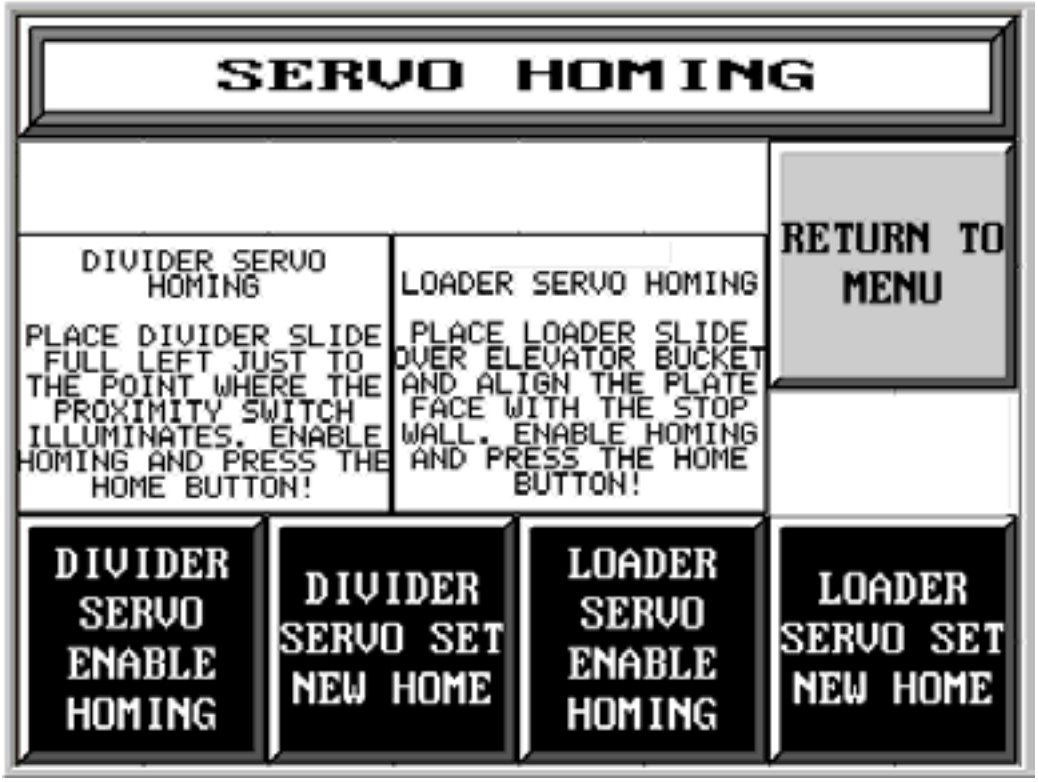
➔ Touch and move the ON/OFF switch to the desired position.

★ Glue Test – This screen allows for testing of the various Glue Systems. Each individual Glue Gun on the machine can be tested through this process.

➔ Touch and move the Glue Text OFF/ON to the ON position.
➔ Press the button for the desired Glue Gun.

Servo Homing Screen

The Servo Homing Screen allows maintenance personnel to home the Servo motors.



★ Divider Servo Homing –

- ➔ Place Divider slide fully to the left, until the proximity switch is triggered and illuminates.
- ➔ Press the **Divider Servo Enable Homing** button.
- ➔ Press **Divider Servo Set New Home** button.
  - o The Divider Servo is homed.

★ Loader Servo Homing –

- ➔ Place Loader slide over the Elevator Bucket, align the plate face with the Stop Wall.
- ➔ Press the **Loader Servo Enable Homing** button.
- ➔ Press **Loader Servo Set New Home** button.
  - o The Loader Servo is homed.

Start-Up

Follow this procedure to begin production mode.

1. Turn on **Glue Unit**, and allow to reach desired temperature.

2. Set the **Main Power / Disconnect** in the ON position.

3. Set the **Air System** control in the ON position. Check to see that the Main Air Pressure regulator is set at 80psi.

4. Place stacks of **Blanks** on the **Infeed Magazine Conveyor**.

5. Set **Control Power Off/On** Key to the ON position.

6. Pull out all **E-Stops**, if necessary.

On Touch Screen:

7. Press **Machine On/Off** to ON to activate running power to the machine..

8. Press **Blankfeed On/Off** to ON to begin the cycling of Blanks.

9. Press **Cycle On/Off** to ON to begin transfer of product to Blank.

Shut Down

Follow this procedure to end production mode.

On Touch Screen:

1. Press **Cycle On/Off** to OFF to stop the processing of product upstage.
2. Press **Blankfeed On/Off** to OFF to stop the cycling of blanks and trays .
3. Press **Machine On/Off** to OFF to stop the machine.

On Control Panel:

1. Set **Control Power Off/On** Key to the OFF position, if necessary.

On Electrical Panel:

2. Set the **Main Power / Disconnect** to the OFF position, if necessary.

To immediately stop the machine, press any Emergency Stop (E-Stop) button.
Once pressed, E-Stop buttons remain in - until pulled out.

Monitoring the Machine

Status Tower

The machine has been equipped with a **Status Tower** to keep the Operator informed of Machine conditions.

This tower consists of five lights (Red, Amber, Blue, Green, and White).

Meanings

RED – The Red Light will be on when an Emergency Stop Push Button is pressed or if an Access Door is open.

AMBER LIGHT –

- ➔ **Solid ON** – Low Blank Warning
- ➔ **Continuous Flashing** (1 sec intervals) – A warning or fault exists - Refer to the screen for diagnostic message.

★ **Two Flashes** (two 1 second flashes with a 2 second interval) – Downstream photo eye is blocked.

BLUE – The blue light indicates issues with the Glue System. Generally, a blue light will indicate that Glue is either low or not up to operating temperature.

GREEN – Machine Cycle Start is on – Cycle Start on enables the Elevator and loader to begin processing the product and loading the case. If Cycle Start is off the product will only load up to the elevator area.

- ➔ Note: Blankfeed On will operate with the Cycle Start off.

WHITE – This light indicates whether the machine's power is on. If this light is lit, it signifies that the machine is on and is running. It will flash during the 3 second safe start-up.

Refer to the Fault Screen & Computer Program
in the Appendix for more detail on
faults, warnings and machine conditions.

Changeover

The following information is necessary when changing the machine to process different blank sizes.

For more detail
refer to the Changeover Matrix,
located in the Appendix.

Tools

- ★ Several common components are used in most machine changeovers:
- ★ The use of several of these – in any one changeover element – may be necessary.

-designed to assist with the Changeover process

Lock Handle

Lefty loosey
Righty tighty

Crank Handle

Ratchet style
both ways

Lock Knob

Lefty loosey
Righty tighty

Turn Wheel

Turn to
move item

Scale

Use for
precise alignment

Important Notes

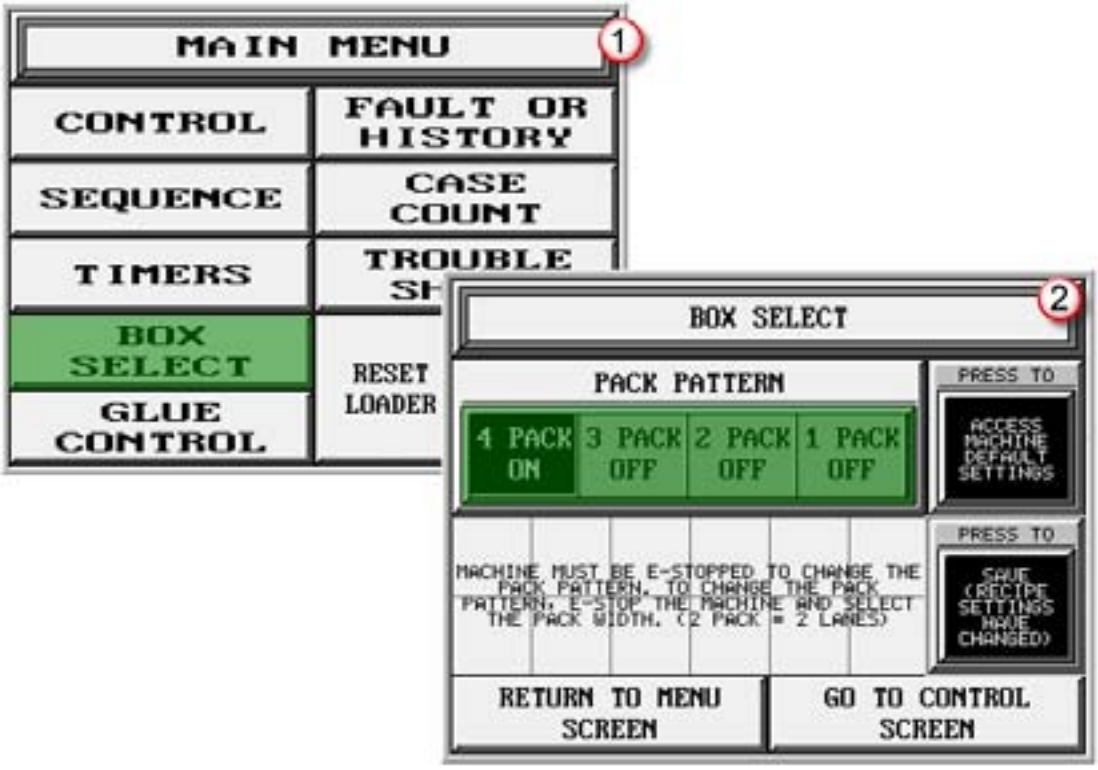
- Changeover locations (i.e. front, back, left, right) are based on the flow of the Blank/Case/Tray - as it moves through the Machine.
- To ensure Safety, make sure power is fully disabled before performing Changeover.
- Re-tighten all components firmly before resuming production.

Machine Numbering

- ★ To assist in the Changeover process, numbers have been placed on the Machine and on the Changeover Matrix.
- ★ These labels correspond to the numerical sequence of elements on the following pages.

Changeover Items

1. Box Setting – Touch Screen



★ The Box Setting will adapt the timing of numerous machine operations for the desired Blank to be processed.

➔ From the *Main Menu*, touch **Box Select**.

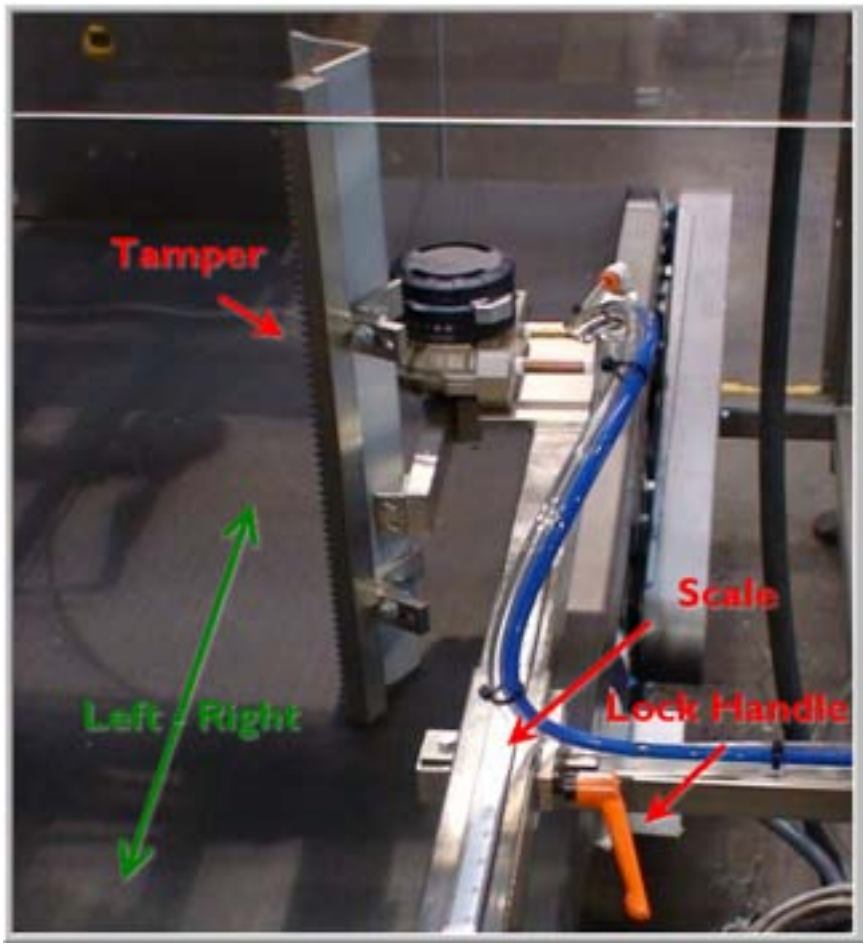
➘ The *Box Select* Screen will appear.

➔ Press E-Stop IN.

➔ Press the numerical **Pack Pattern** bar to select the desired pattern.

NOTE: The numerical bar (highlighted in image # 2 above) will cycle in descending order (4,3,2,1) with each touch. Keep touching the bar until the desired selection is ON.

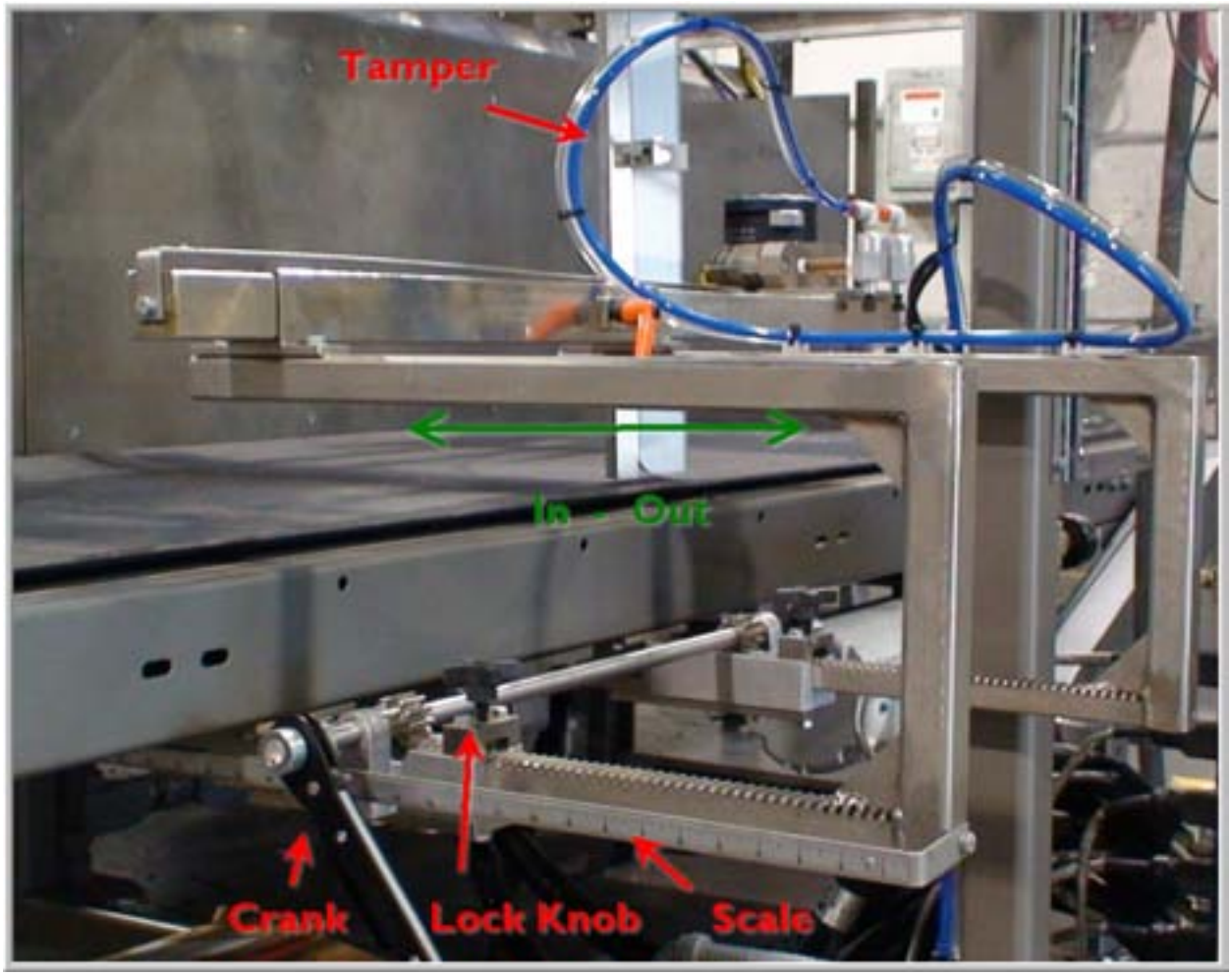
2. Blank Tamper (Left / Right)



★ The Blank Tamper provides a side support to the Blank stack on the Infeed Magazine.

➔ Loosen the Lock Handle.
➔ Slide in a Left/Right direction to the desired scale setting.
➔ Re-tighten the Lock Handle.

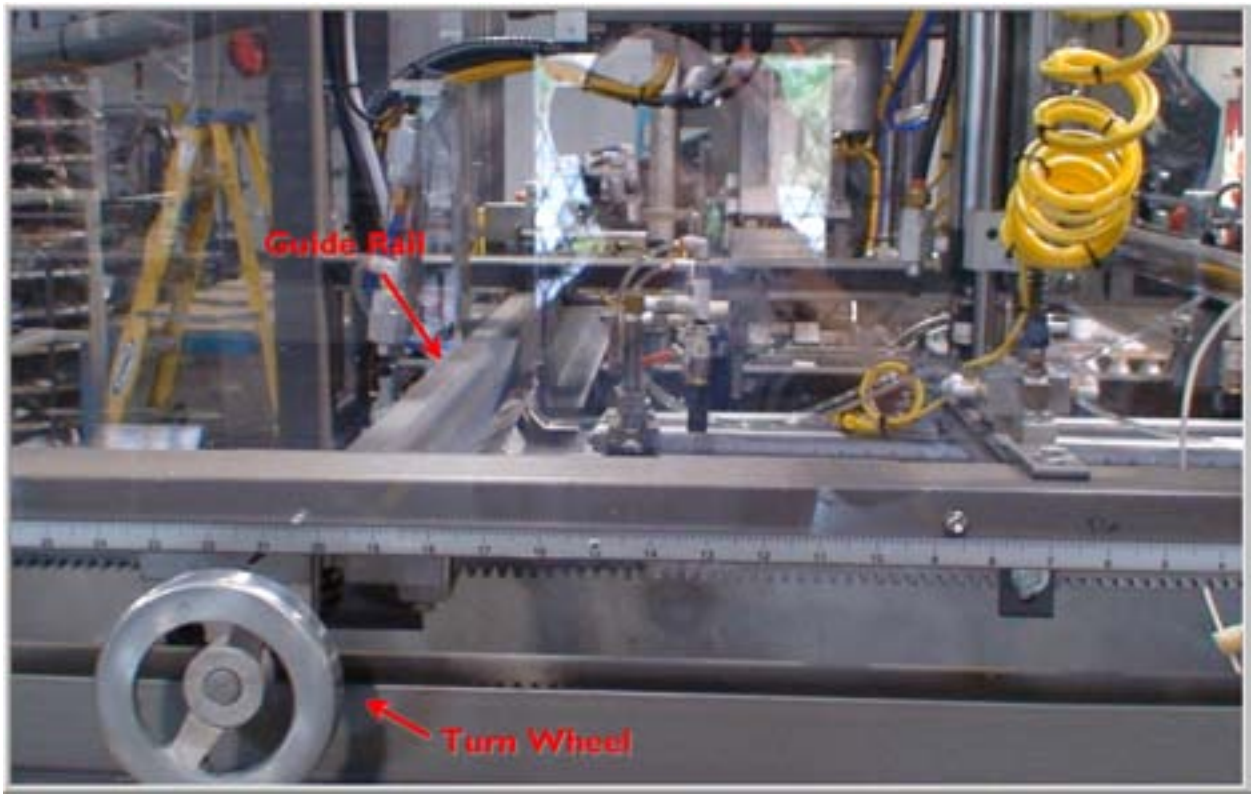
3. Blank Tamper (In / Out)



★ The Blank Tamper provides a side support to the Blank stack on the Infeed Magazine.

➔ Loosen the Lock Knob.
➔ Using the Crank Handle, rotate the Tamper In/Out to the desired Scale setting.
➔ Re-tighten the Lock Knob.

4. Blank Guide Rail – Left & Right

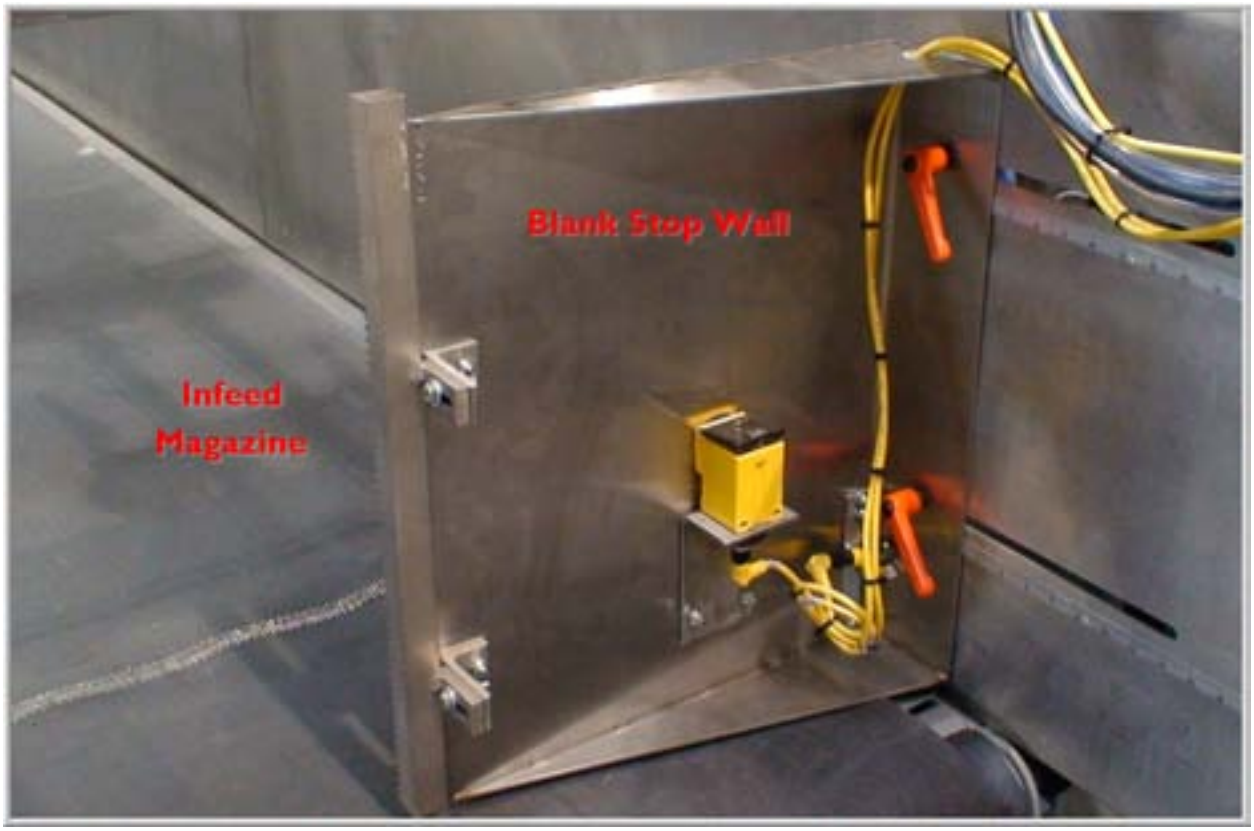


★ Guide Rails provide side support or a 'track' for the Blank, as it moves through the Machine.

★ Note that both the Left and Right Guide Rails require adjustment.

➔ Loosen the Lock Knob.
➔ Using the Turn Wheel, adjust to the desired Scale setting.
➔ Re-tighten the Lock Knob.

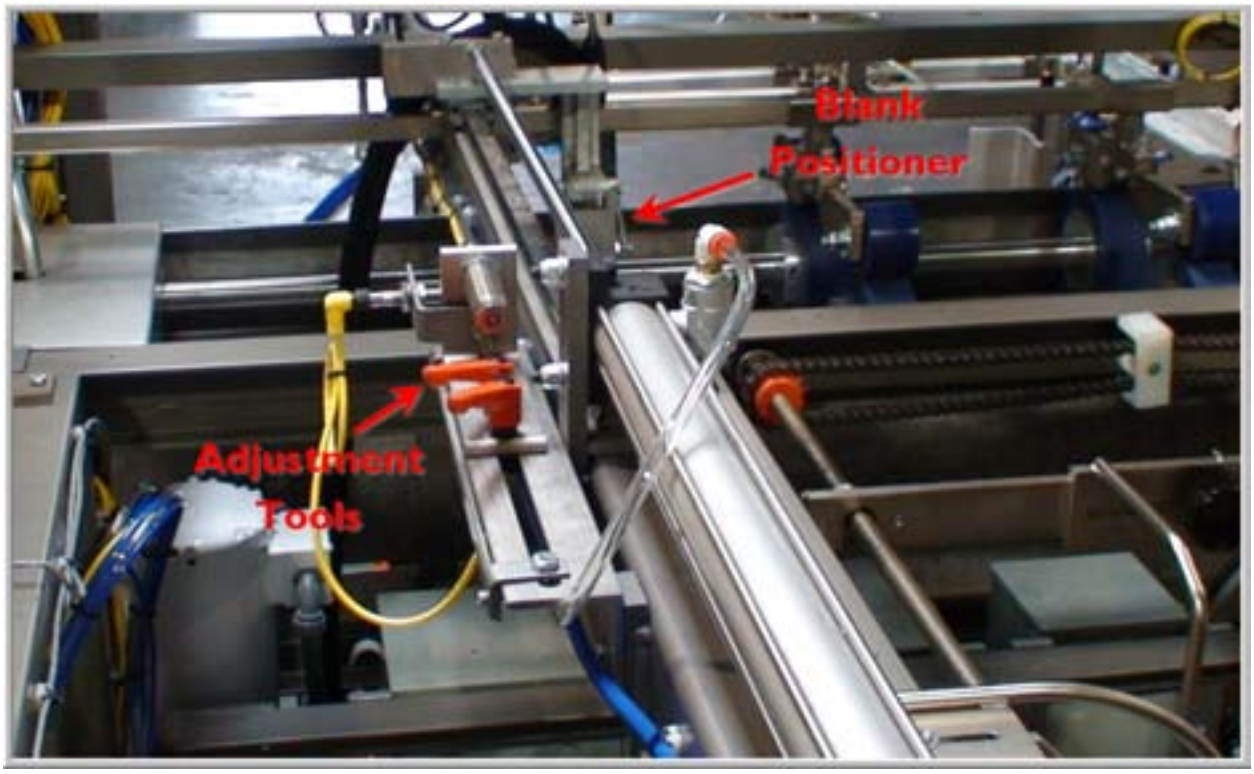
5. Blank Stop Wall



★ The Blank Stop Wall provides a back stop for the Blank stack on the Infeed Magazine.

➔ Loosen the Lock Handles.
➔ Slide to the desired Scale setting.
➔ Re-tighten the Lock Handles.

6. Blank Positioner – Left & Right

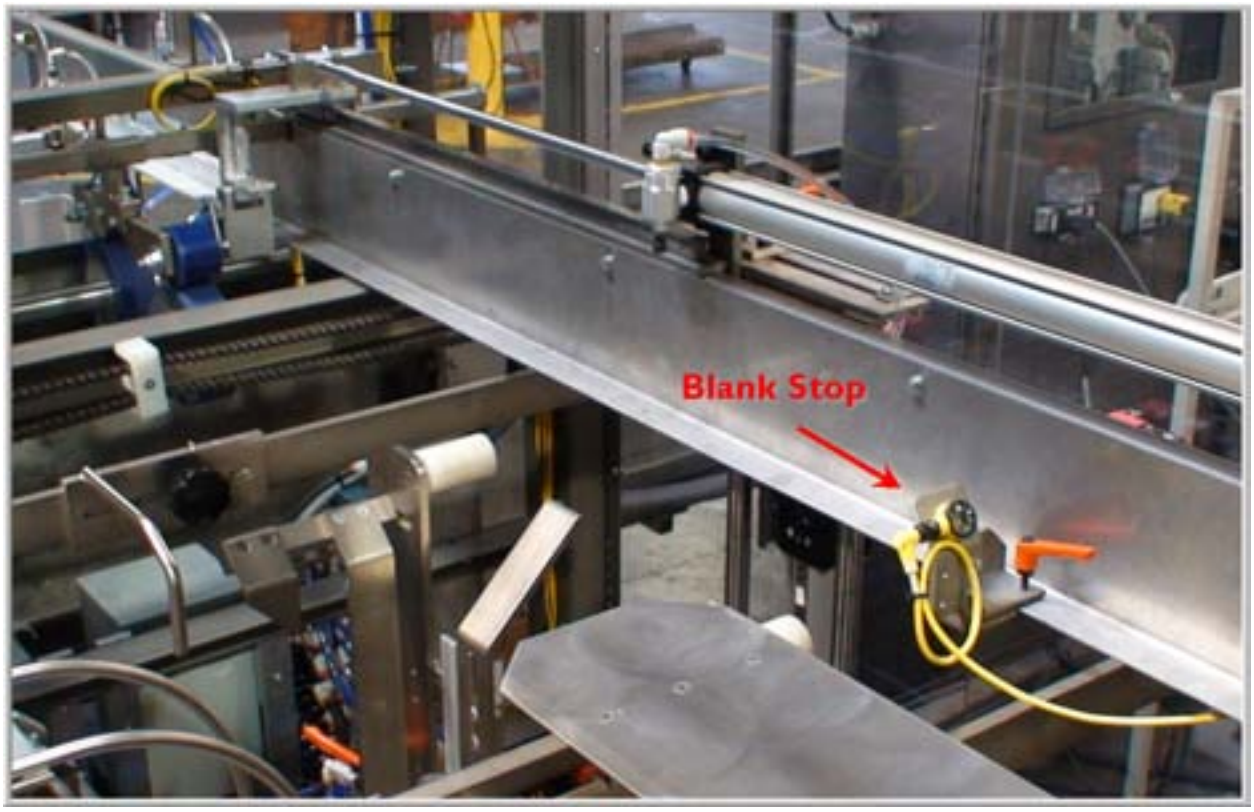


★ The Blank Positioner moves in behind the trailing edge of the Blank, as it enters the Formation Section. It helps position the Blank properly before product is loaded.

★ Both the Left and Right Blank Positioners will require adjustment.

➔ Loosen the Lock Handles.
➔ Slide to the desired Scale setting.
➔ Re-tighten the Lock Handles.

7. Blank Stops – Left & Right



★ The Blank Stops provide a stopping point for the Blank as it arrives in the Formation Section.

★ Both the Left and Right Blank Stops will require adjustment.

➔ Loosen the Lock Handle.
➔ Slide to the desired Scale setting.
➔ Re-tighten the Lock Handle.

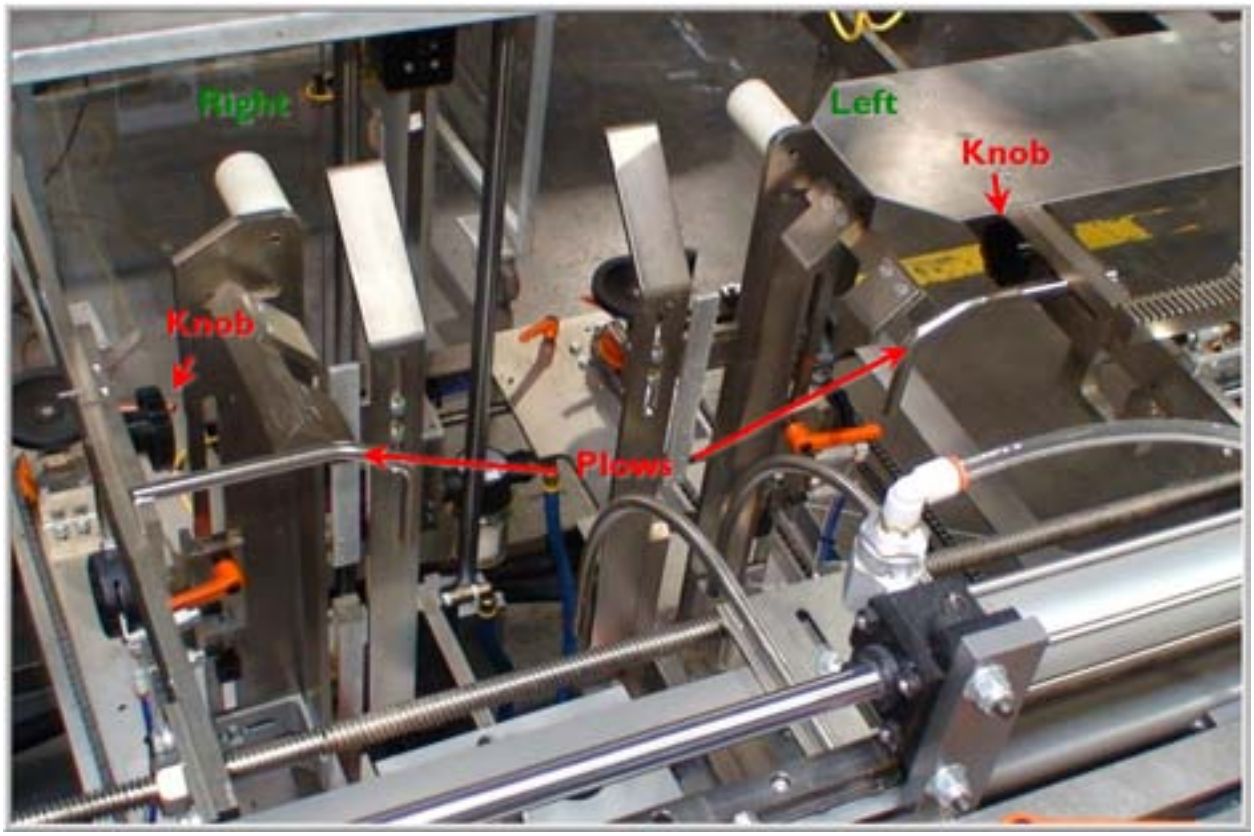
8. Compression Rails

★ Compression Rails form the ‘track’ for the Blank in the Formation Section.

★ The Crank Handle activates the Chain Drive, the Chain Drive moves both rails simultaneously.

➔ Using the Crank Handle, adjust to the desired Scale setting.

9. Plows – Left & Right

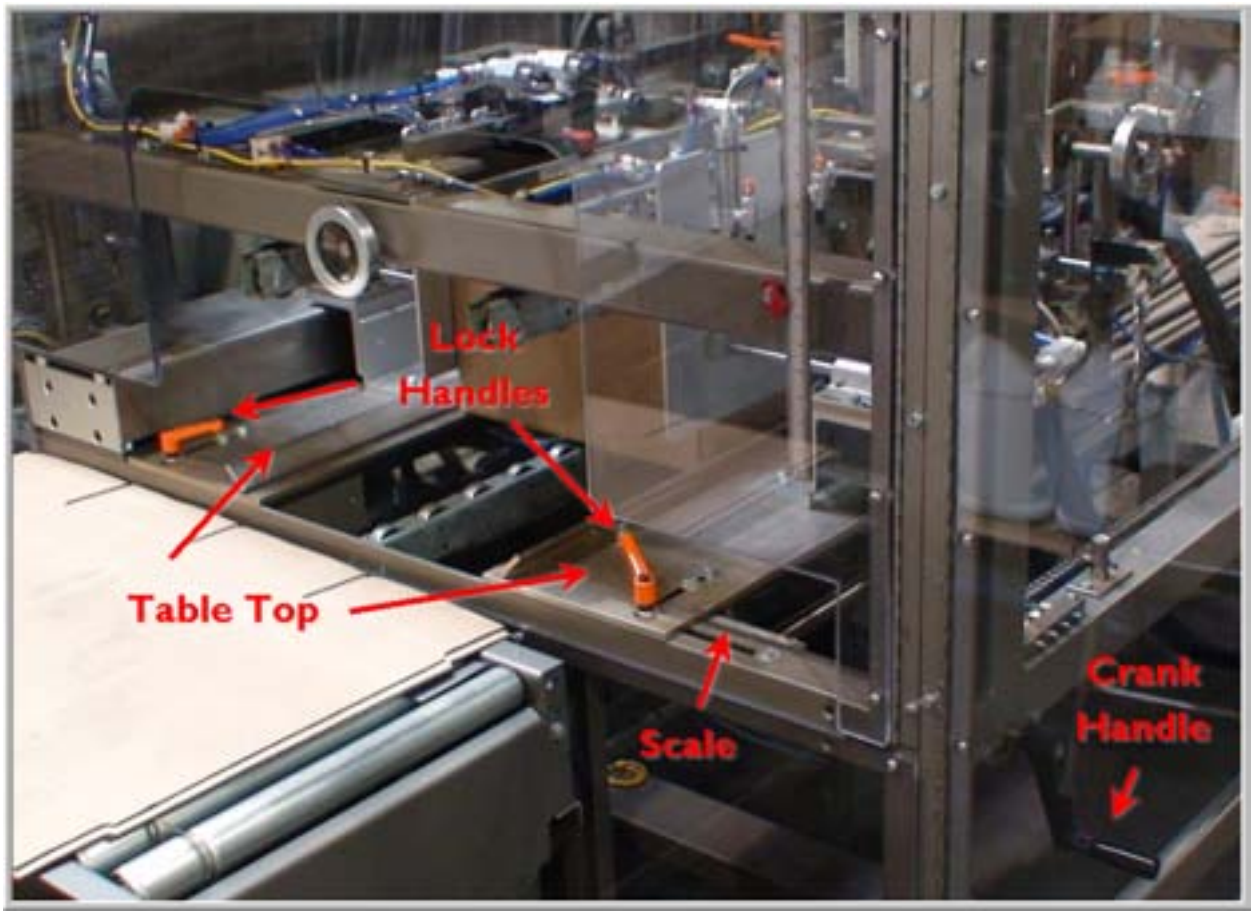


★ Plows assist with the formation of the Blank into a Box.

★ Both the Left and Right Plows will require adjustment.

➔ Loosen the Knob.
➔ Slide and adjust to the desired setting.
➔ Re-tighten the Knob.

10. Table Top

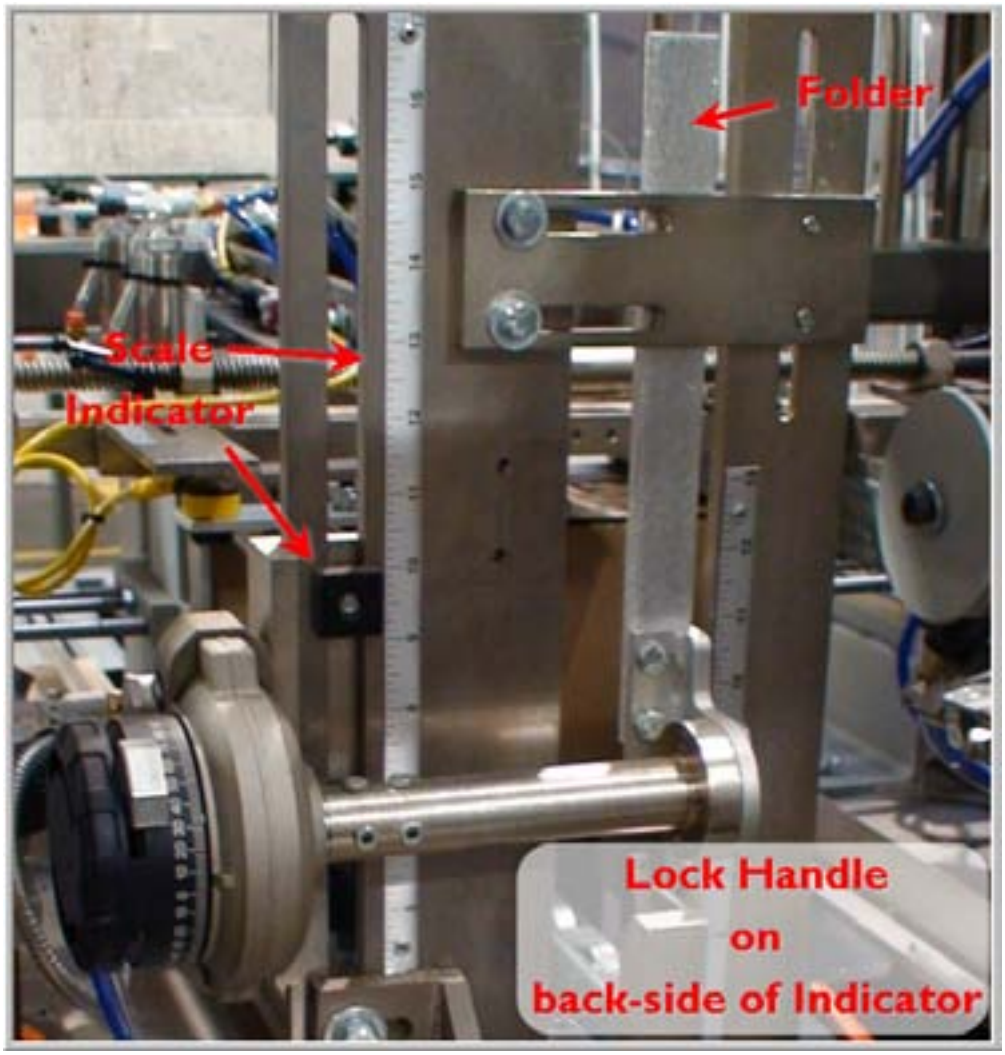


★ The Table Top is the base platform that holds many of the formation and compression components.

★ As with the Compression Rails, the Crank Handle will activate a Chain Drive, the Chain Drive will move both sides of the Table Top.

➔ Loosen the Lock Handles.
➔ Using the Crank Handle, adjust to the desired Scale setting.
➔ Re-tighten the Lock Handles.

11. Manufacturer's Flap Folders – Left & Right

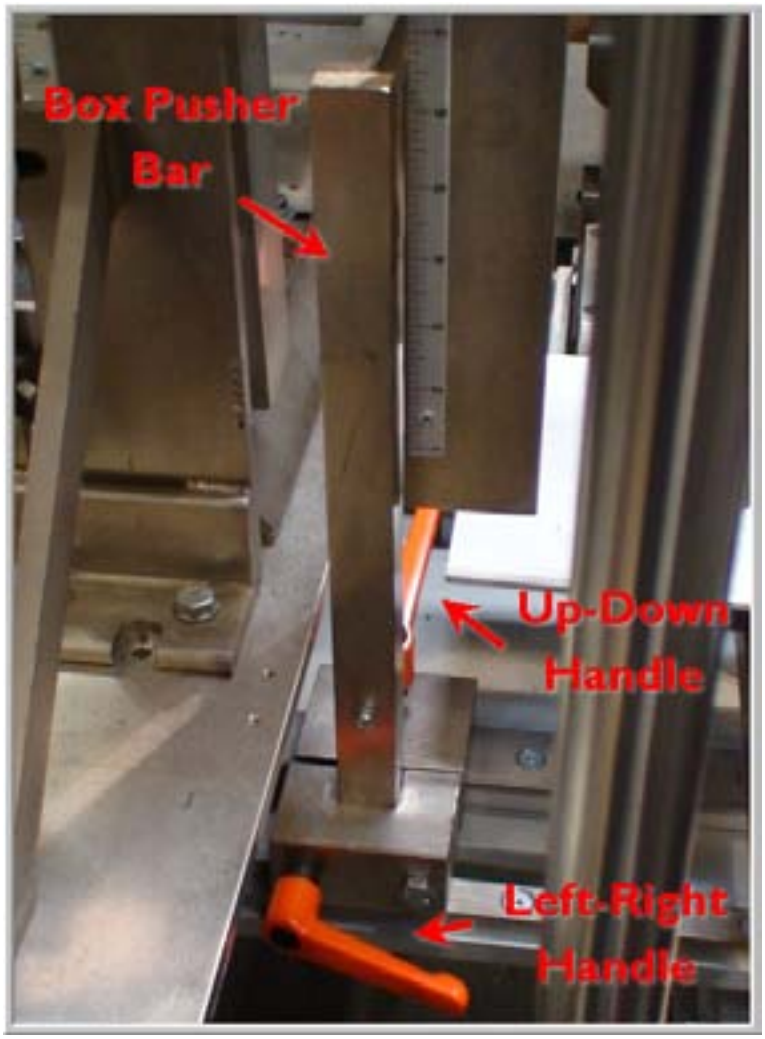


★ The Manufacturer's Flap Folders are a critical element in the formation of Blank to Box.

★ Both Left and Right folders will require adjustment.

➔ Loosen the Lock Handle.
➔ Slide Up/Down to the desired Scale setting.
➔ Re-tighten the Lock Handle.

12. Box Pusher Bars – Left & Right

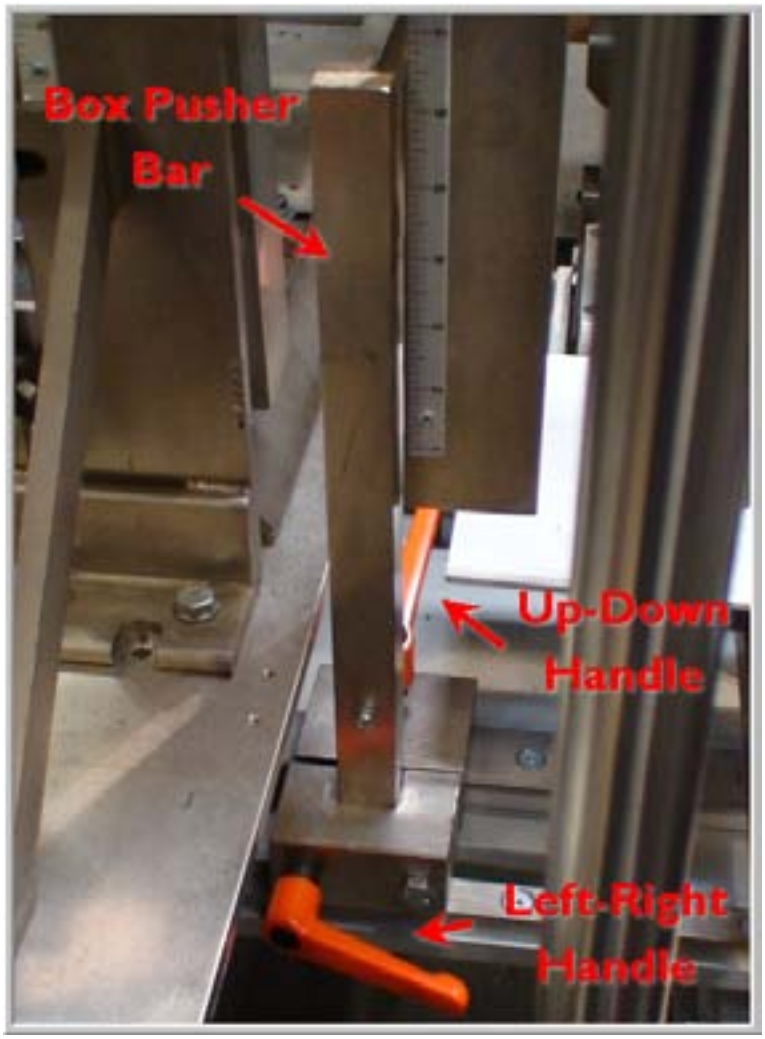


★ The Box Pusher Bar helps move the Box through the lower Formation Section of the machine.

★ Both Left and Right Box Pusher Bars require adjustment.

➔ Loosen the Lock Handle.
➔ Adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

13. Box Pusher Bars (Up / Down)



★ The Box Pusher Bar helps move the Box through the lower Formation Section of the machine.

★ Both Left and Right Box Pusher Bars require adjustment.

➔ Loosen the Lock Handle.
➔ Adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

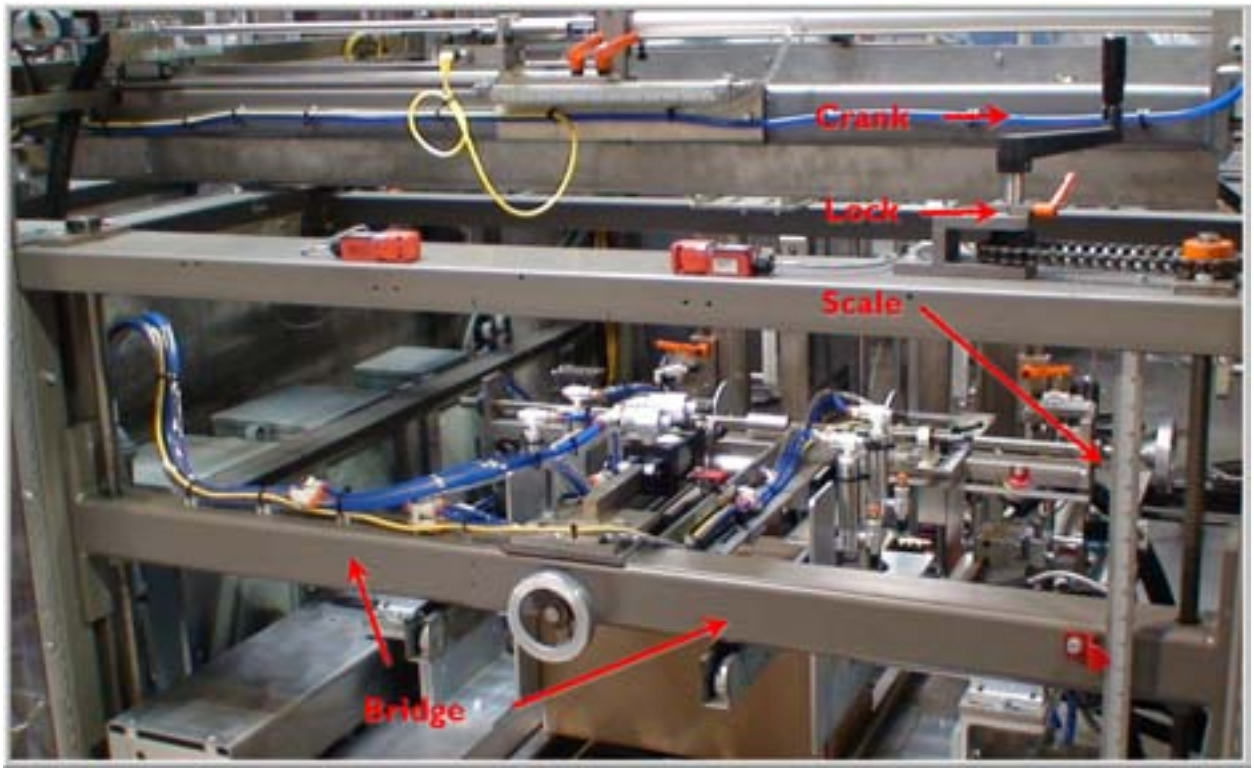
14. Glue Guns – Left & Right

★ The Glue Guns apply adhesive prior to the final compression of the Box.

★ Both the Left & Right Glue Guns require adjustment.

➔ Loosen the Lock Handle.
➔ Using the Crank Handle, adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

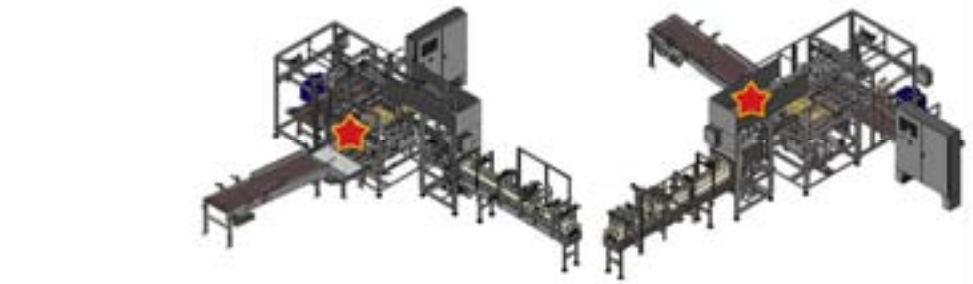
15. Bridge

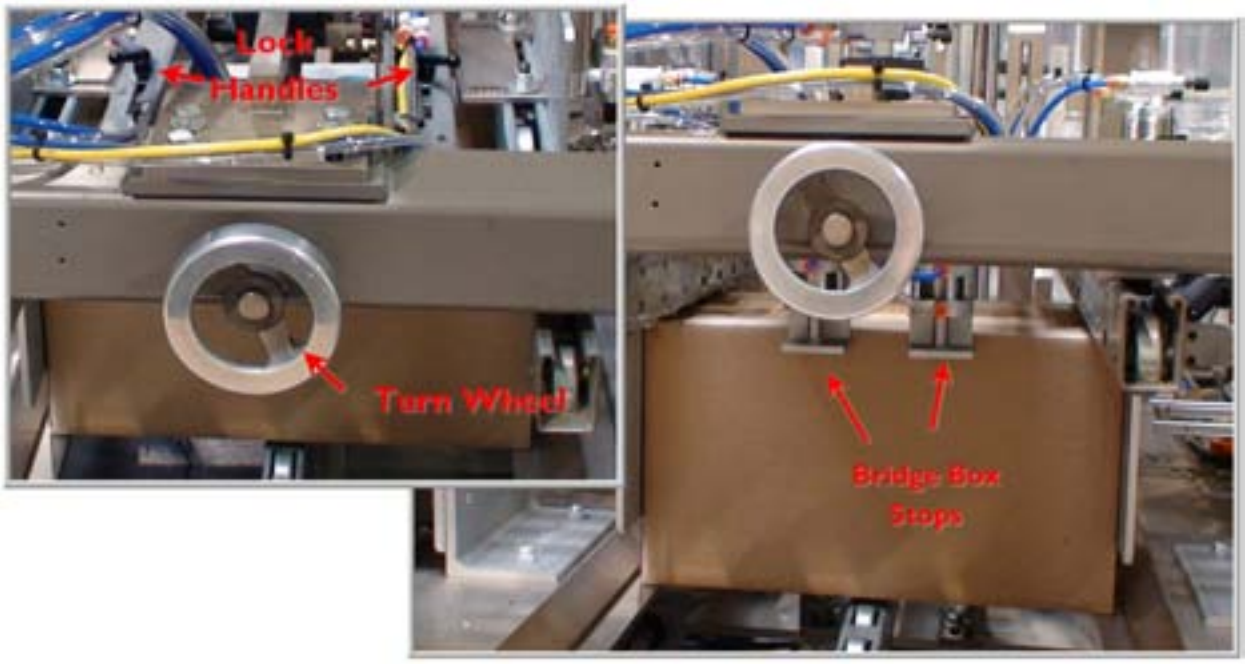


★ The Bridge is a horizontal assembly in the Formation Section that contains many components used in the formation and compression processes.

➔ Loosen the Lock Handle.
➔ Using the Crank Handle, adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

16. Bridge Box Stops

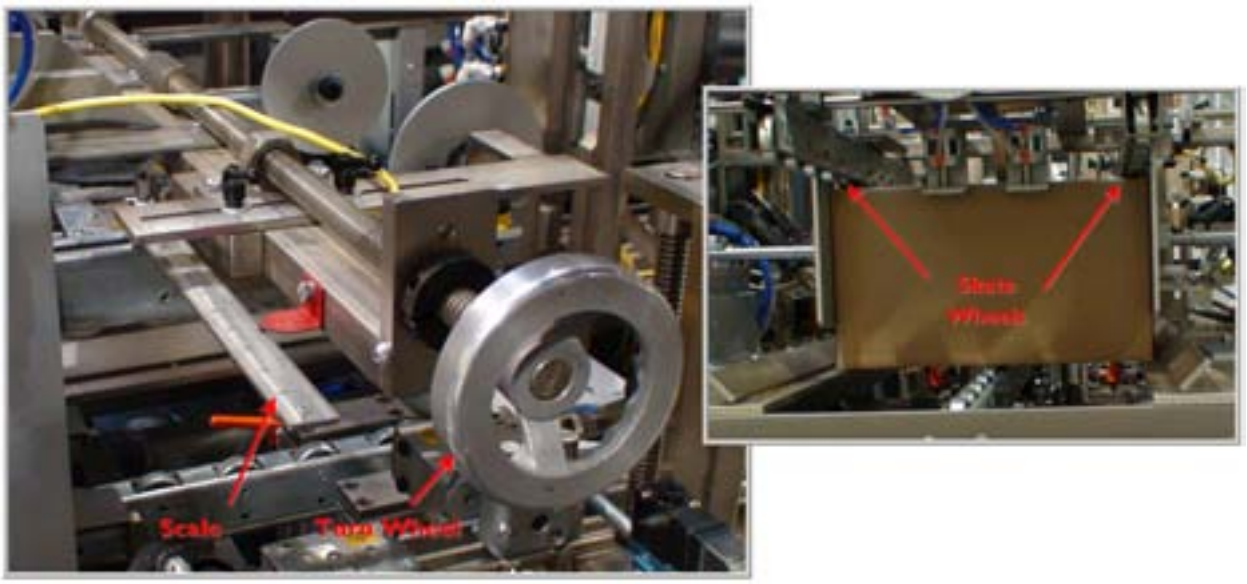




★ The Bridge Box Stops provide a back stop for the Box as it enters the Compression Section.

➔ Loosen the Lock Handles.
➔ Using the Turn Wheel, adjust to the desired setting.
➔ Re-tighten the Lock Handles.

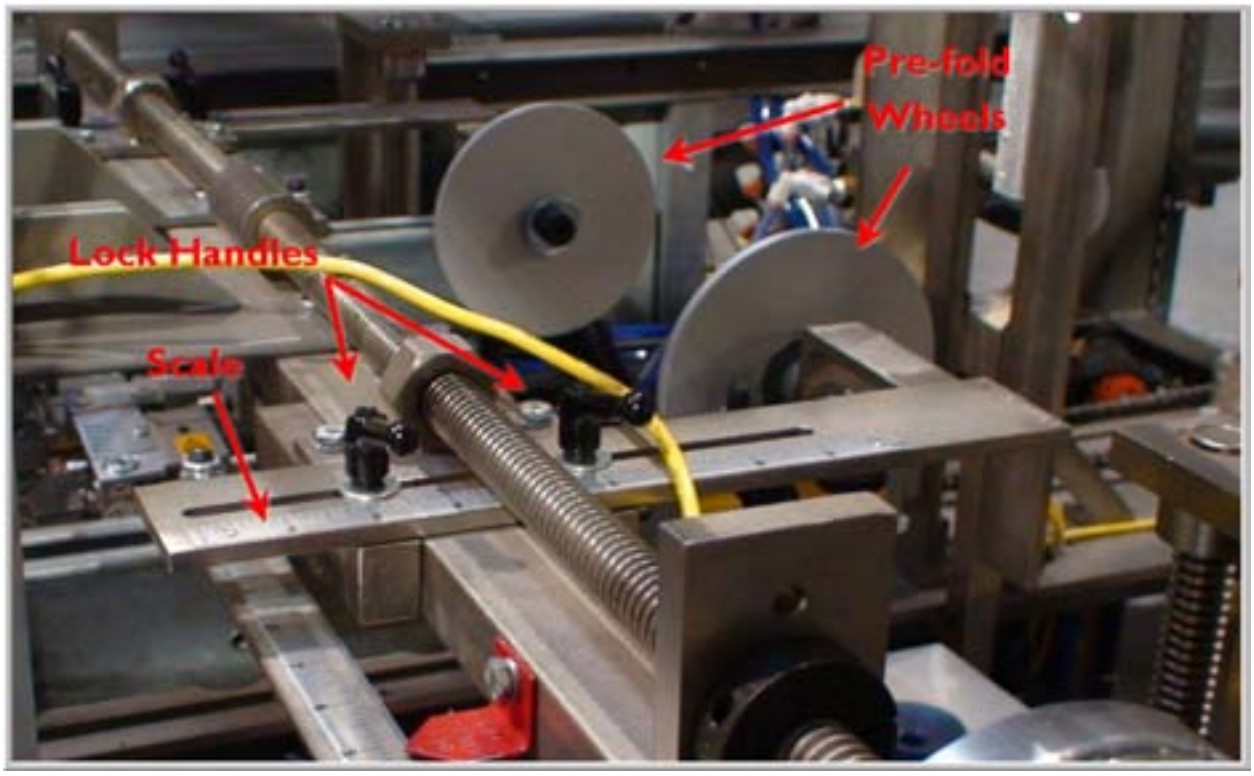
17. Upper Skate Wheels



★ The Upper Skate Wheels provide a firm, upper compression track to the Box in its final sealing stage.

➔ Using the Turn Wheel, adjust to the desired setting.

18. Pre-fold Wheels – Left & Right

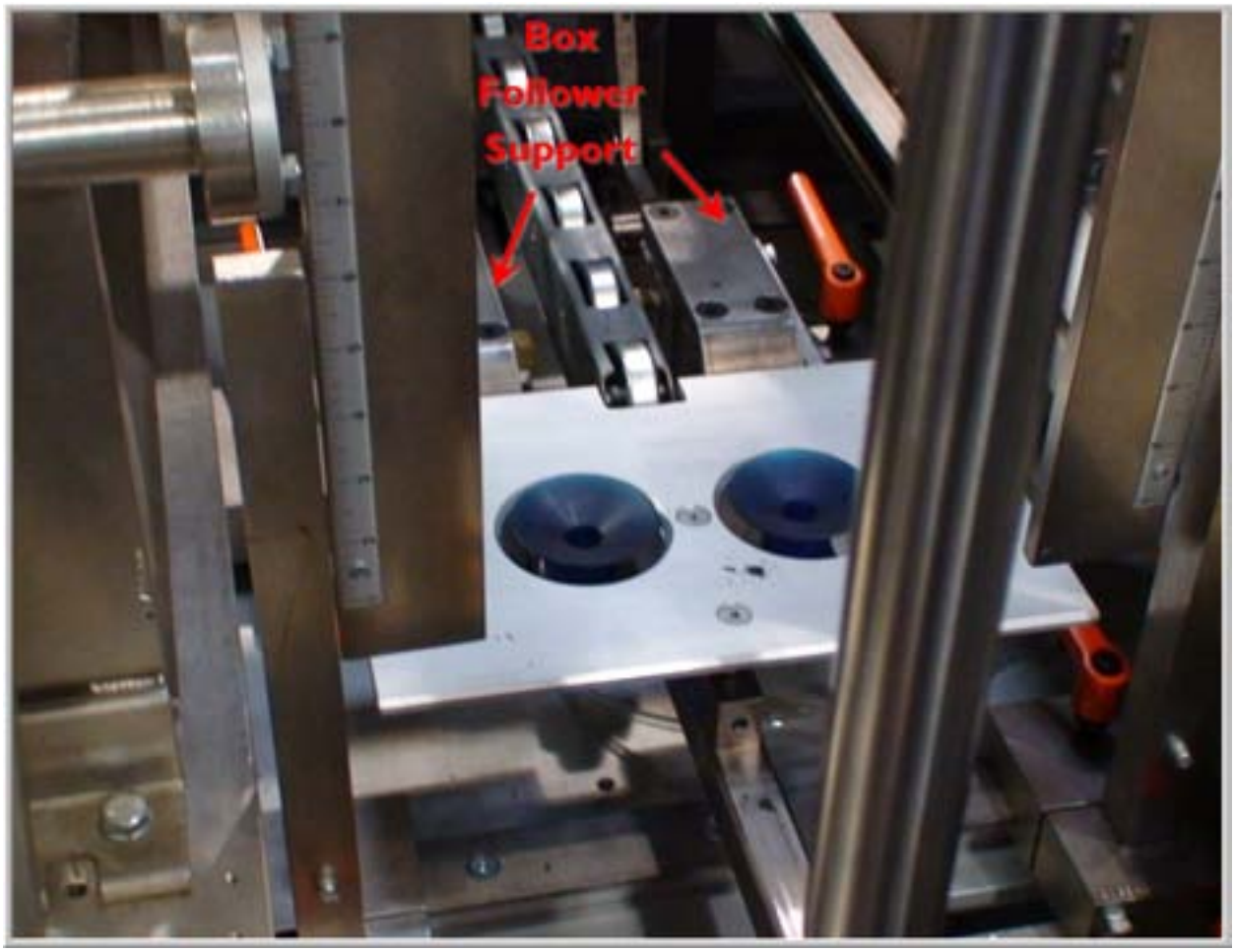


★ The Pre-fold Wheels are an integral element in the proper formation of the Box.

★ Both the Left & Right Pre-fold Wheels require adjustment.

➔ Loosen the Lock Handles.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handles.

19. Box Follower Supports – Left & Right

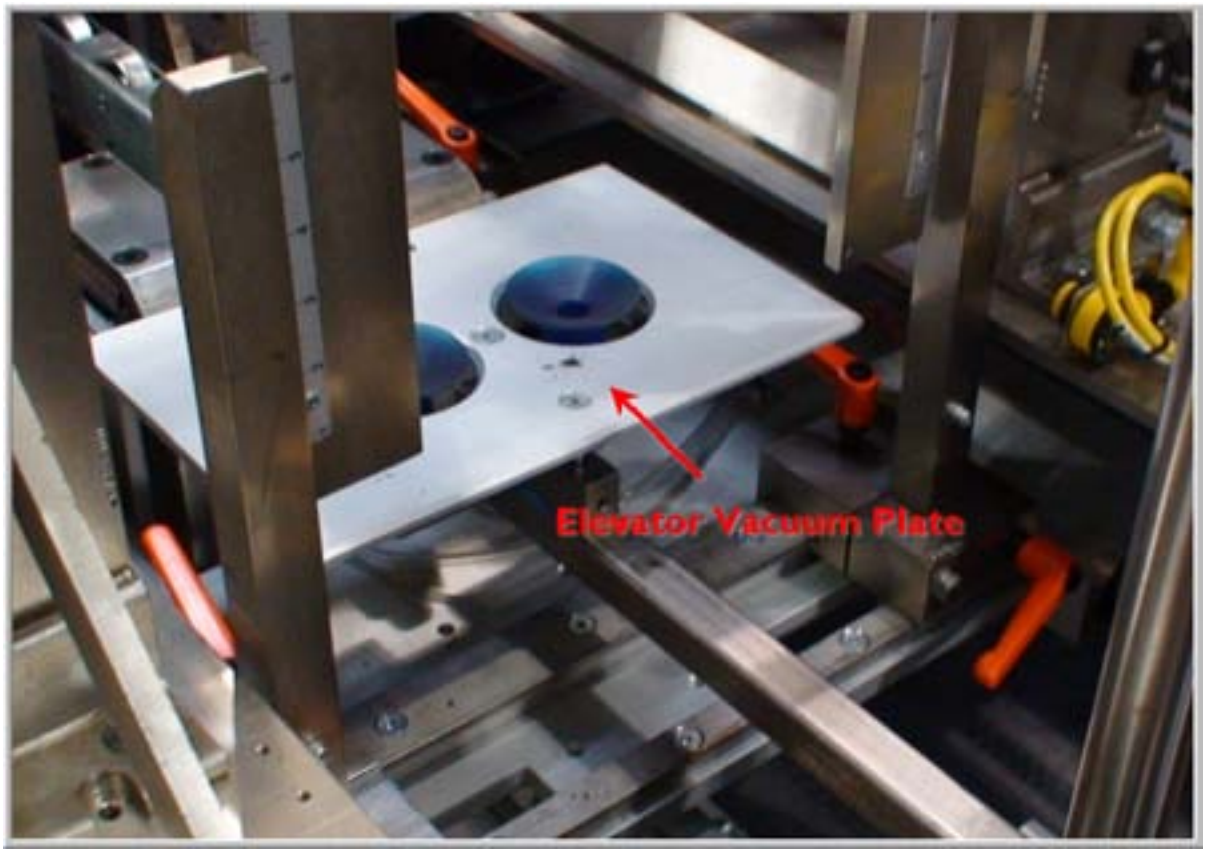


★ The Box Follower Supports provide and bottom-side and back support to the Box as it processes through the Lower Formation Section.

★ Both the Left & Right supports require adjustment.

➔ Loosen the Lock Handles.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handles.

20. Elevator Vacuum Plate



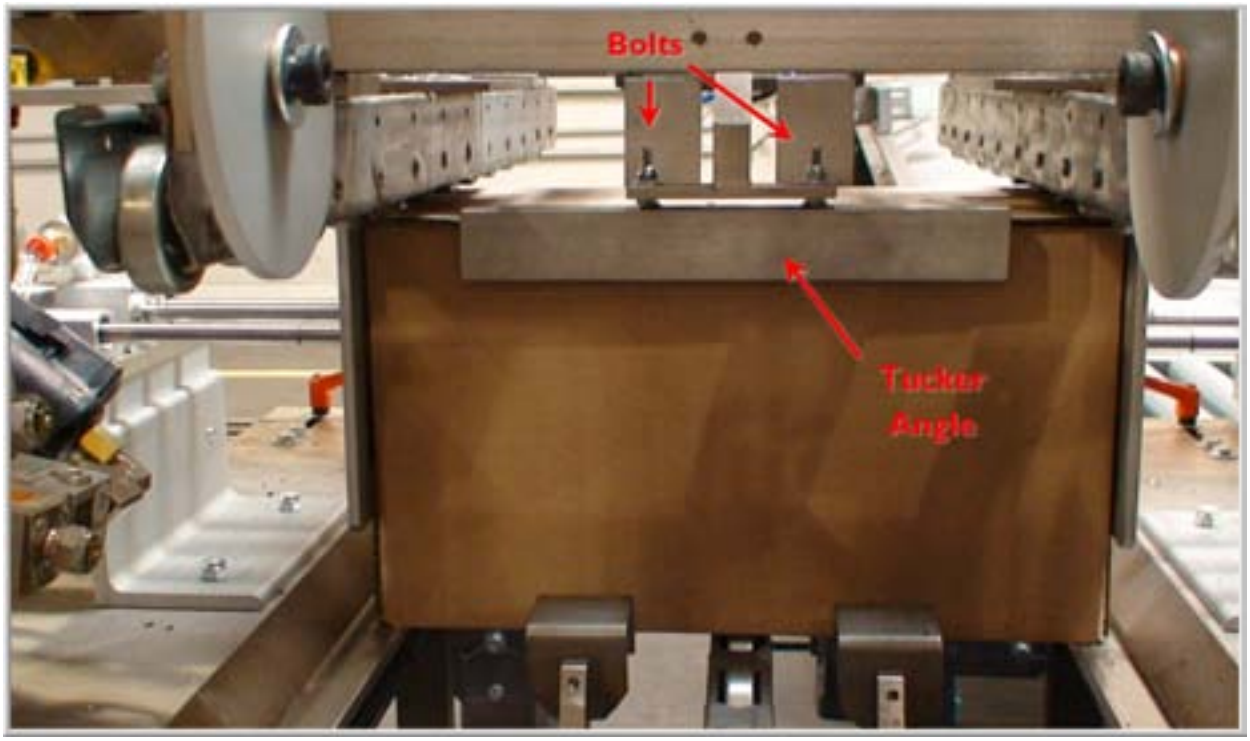
★ The Elevator Vacuum Plate rises and pulls the Blank down into the Lower Formation Section.

★ Adjustment of the Elevator Vacuum Plate requires the full removal of the existing plate - followed by replacement with the desired plate.

➔ Pull upward on the plate to remove.
➔ Move desired plate into position.
➔ Push down until plate 'snaps' into place.

To insure the longest life for components,
store replacement items in a clean and safe location.

21. Tucker Angle



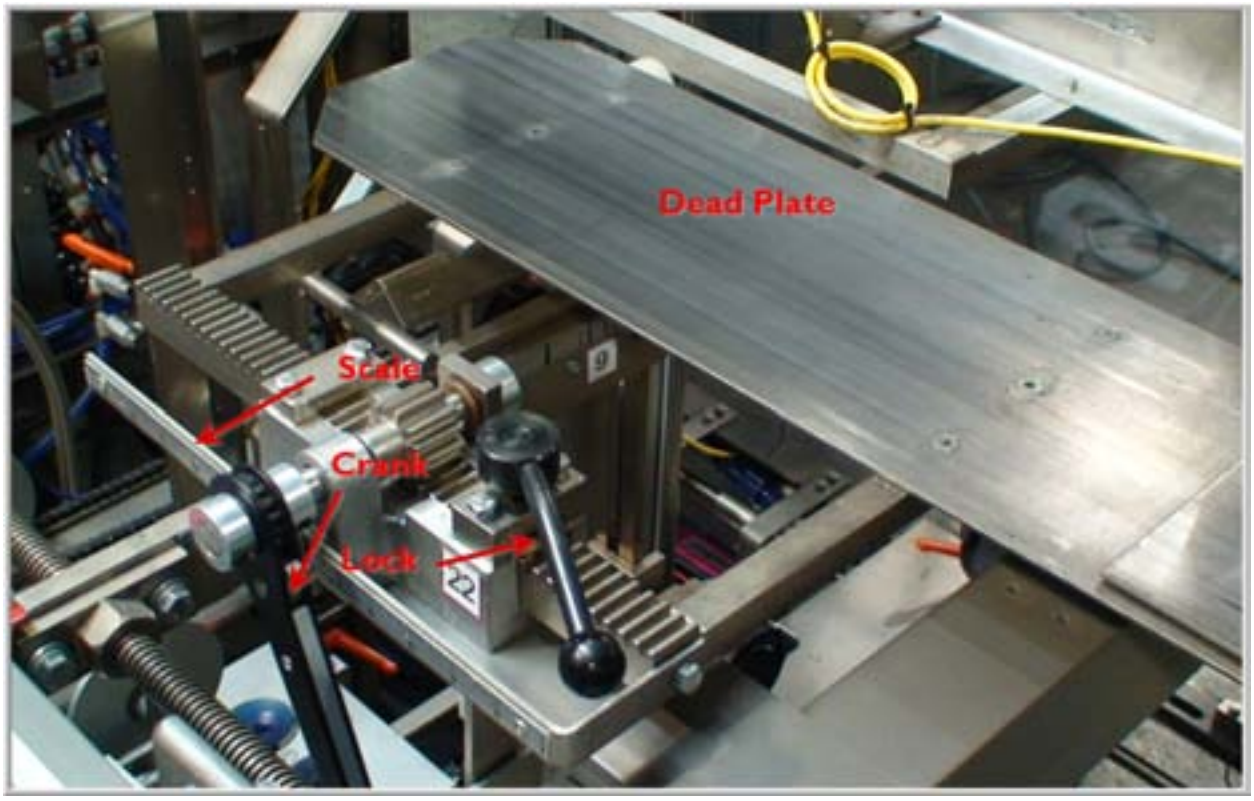
★ The Tucker Angle provides back support to the top of the Box during the compression run.

★ Adjustment of the Tucker Angle requires the full removal of the existing angle - followed by replacement with the desired angle.

➔ Loosen the two nut/bolt sets that mount the Tucker Angle.
➔ Remove and replace with the desired Tucker Angle.
➔ Re-tighten the nut/bolt sets.

To insure the longest life for components,
store replacement items in a clean and safe location.

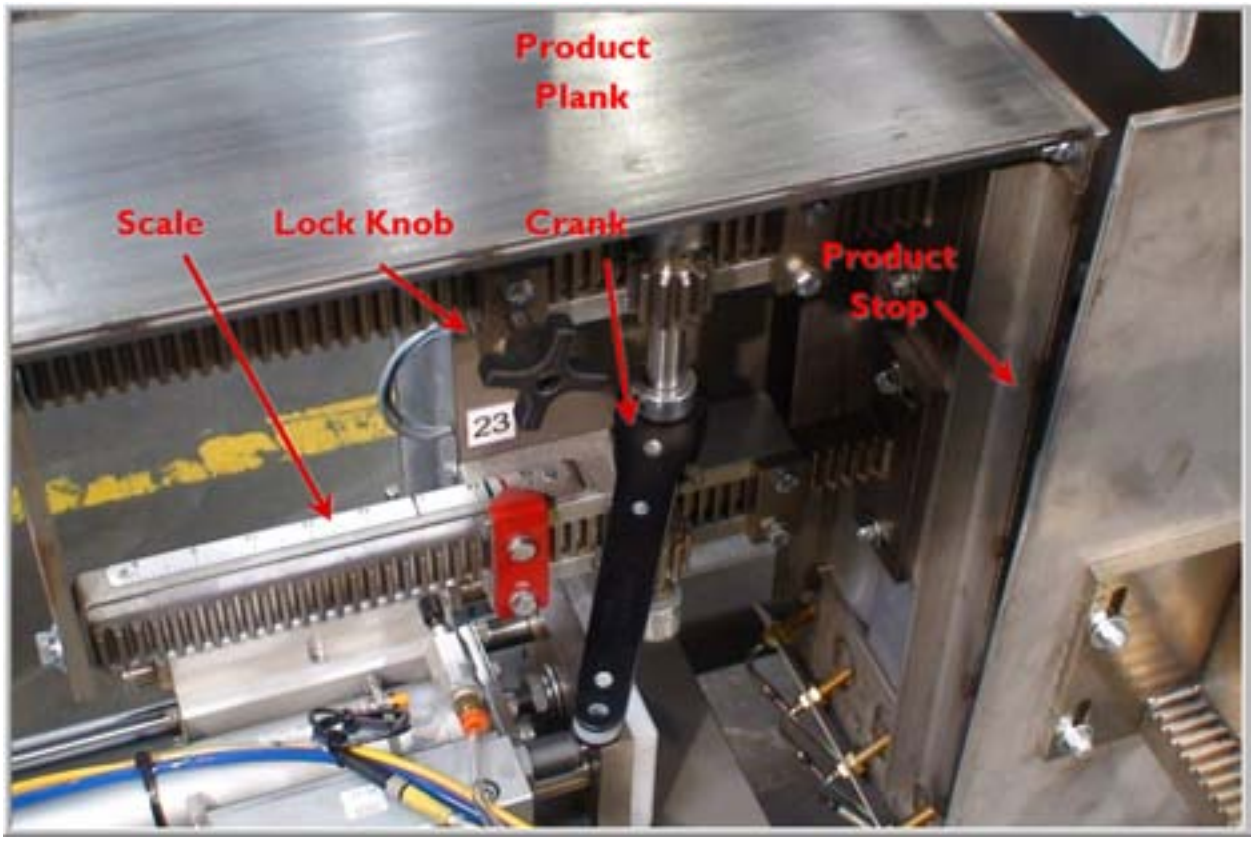
22. Dead Plate



★ The Dead Plate is at the very end of the Product Plank, in the Formation Section. The plate provides the final bottom support structure to the product as it is being transferred to the Blank.

➔ Loosen the Lock Handle.
➔ Using the Crank, adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

23. Product Stop



★ The Product Stop is located at the Loader-side end of the Product Plank. This is a back-stop wall for the product as it enters the upstaging Elevator.

➔ Loosen the Lock Knob.
➔ Using the Crank, adjust to the desired Scale setting.
➔ Re-tighten the Lock Knob.

24. Left Product Support on Bucket

★ The Left Product Support on Bucket is the Left side (from Product Loader view) support bar on the Bucket (the push plate system that transfers the product to the Blank).

★ The left support will adjust according to the width of the product in the Bucket, the right support always remains in the same position.

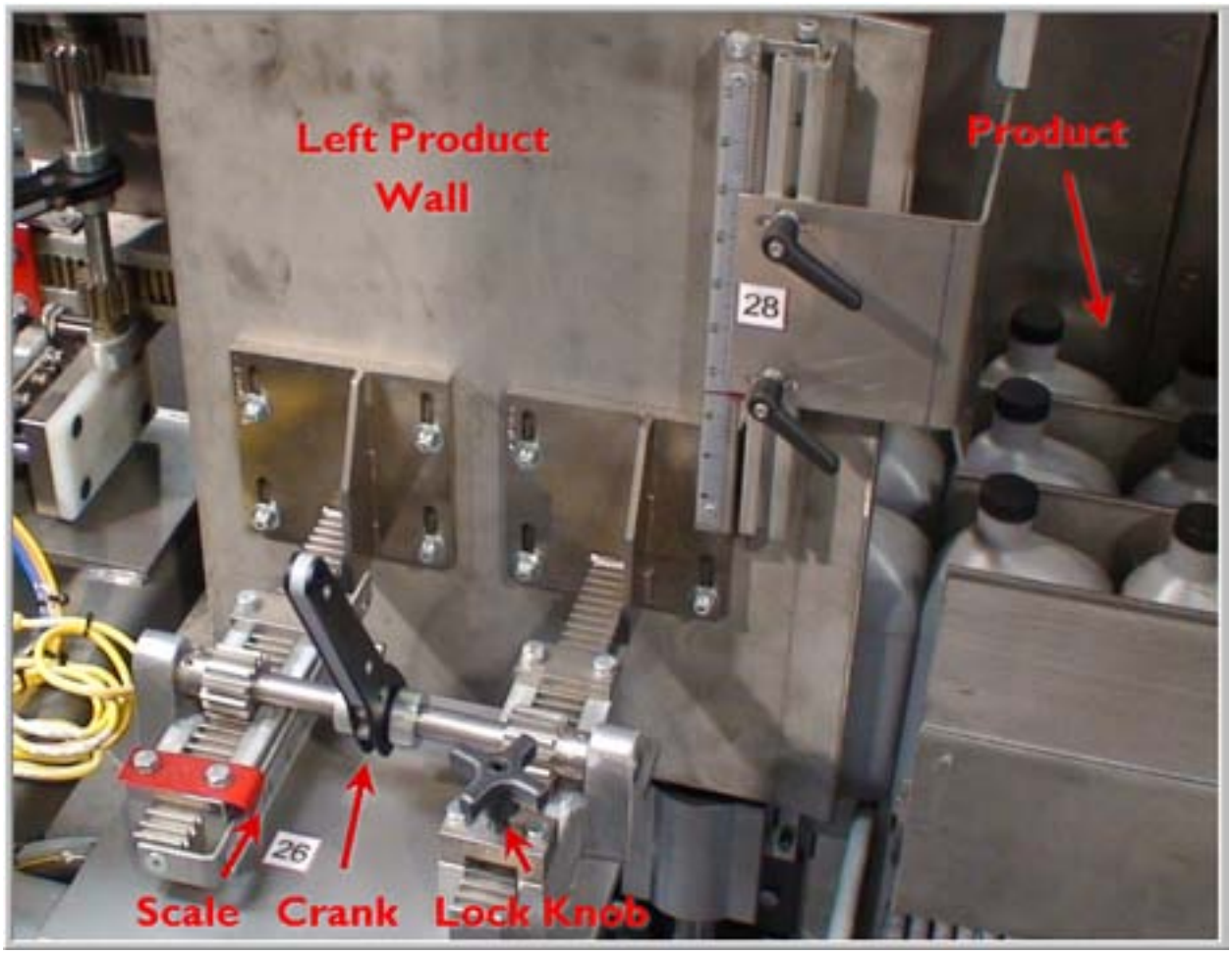
➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

25. Front Product Support on Bucket

★ The Front Product Support on Bucket provides front-side (toward Formation Section) support to the product, as it is transferred to the Blank.

➔ Loosen the Lock Handles.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handles.

26. Left Product Wall @ Elevator



★ The Left Product Wall @ Elevator provides left (from Product Loader direction) side support to the product in the Elevator, from entry through the upstage process.

➔ Loosen the Lock Knob.
➔ Using the Crank Handle, adjust to the desired Scale setting.
➔ Re-tighten the Lock Knob.

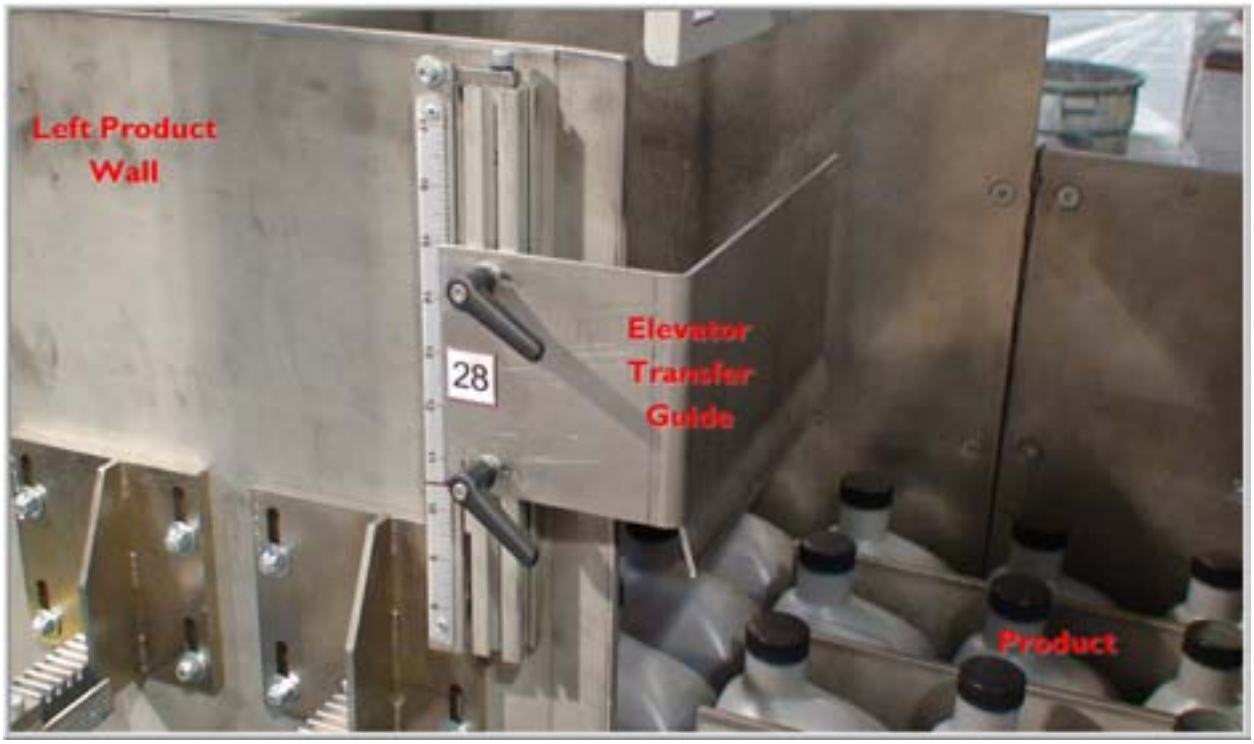
27. Left Product Wall

★ The Left Product Wall provides left (from Product Loader direction) side support to the product through the Product Loader Conveyor.

★ This item is ONLY used for the largest-sized product run.

➔ Loosen the Lock Knob.
➔ Using the Crank Handle, adjust to the desired Scale setting.
➔ Re-tighten the Lock Knob.

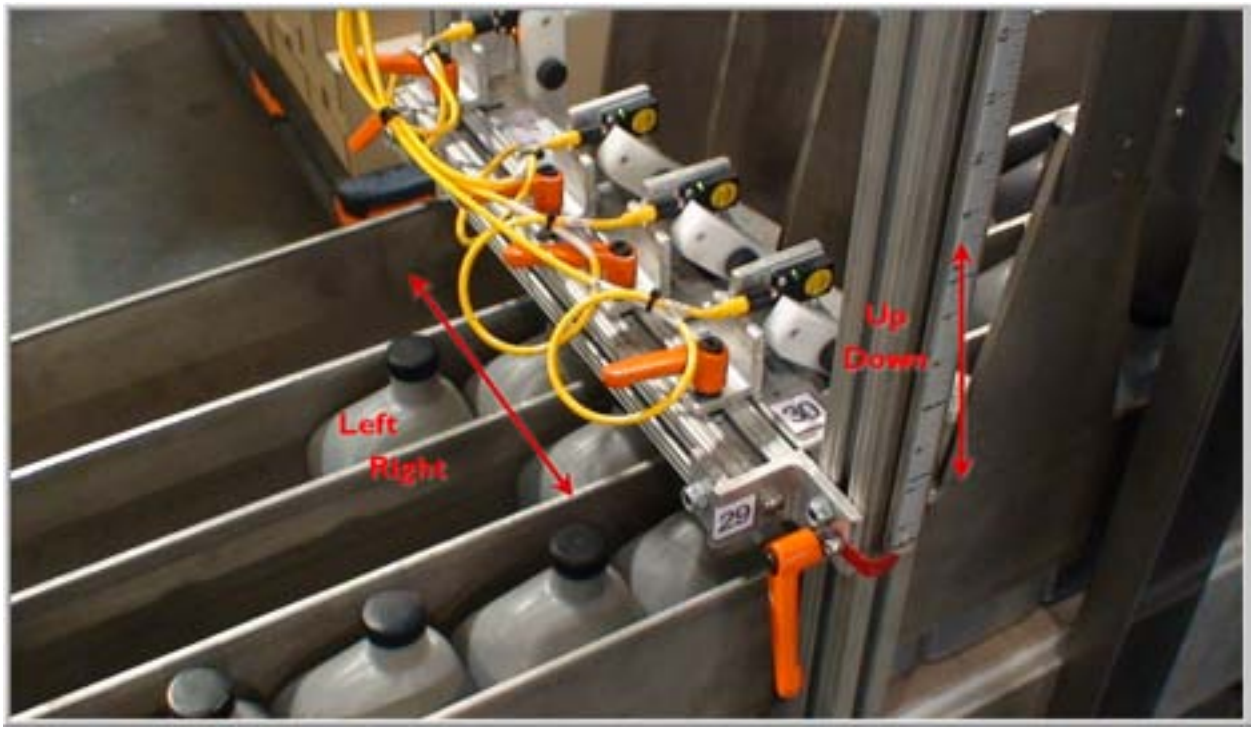
28. Elevator Transfer Guide



★ The Elevator Transfer Guide provides a top guide reference for the product as it enters the Elevator.

➔ Loosen the Lock Handles.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handles.

29. Minimum Product Detection (Up / Down)

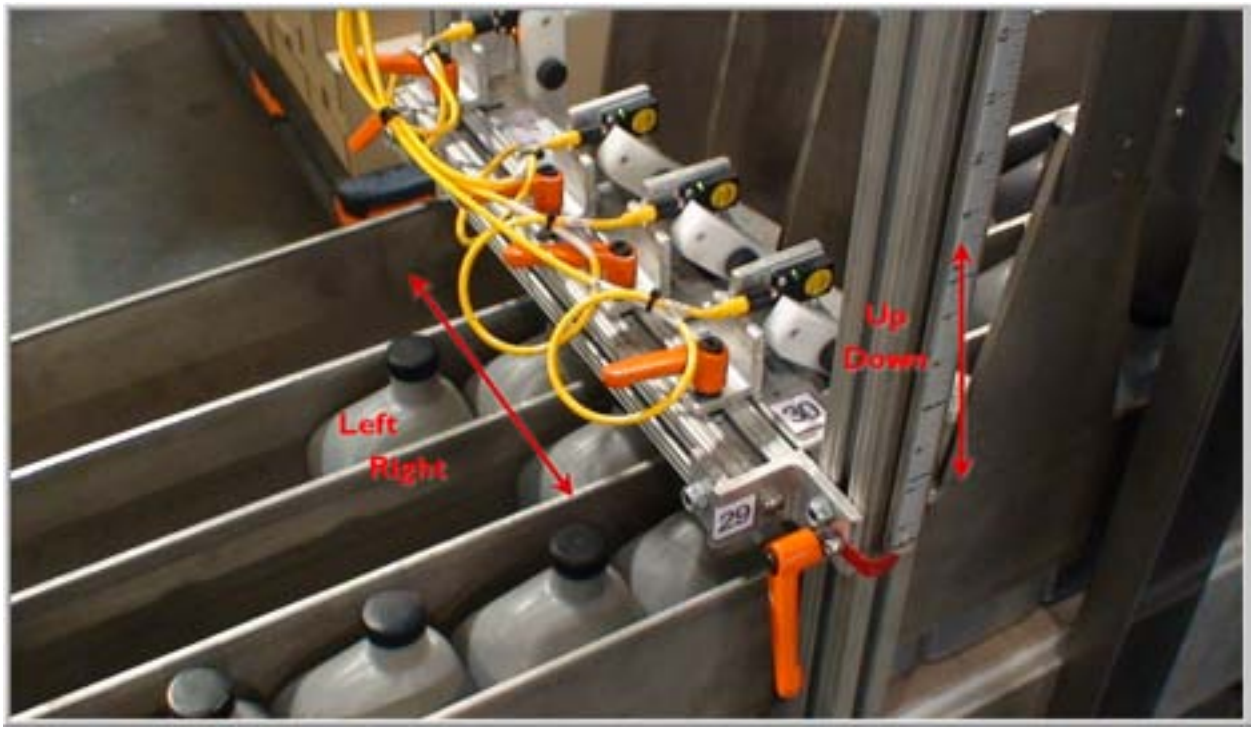


★ The Minimum Product Detection area of the Product Loader helps trigger the Elevator upstage process, by use of the white 'Tick Bars' shown above.

★ For the Up / Down setting, the Lock Handle to the far right is used.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

30. Minimum Product Detection – Lanes 1-4

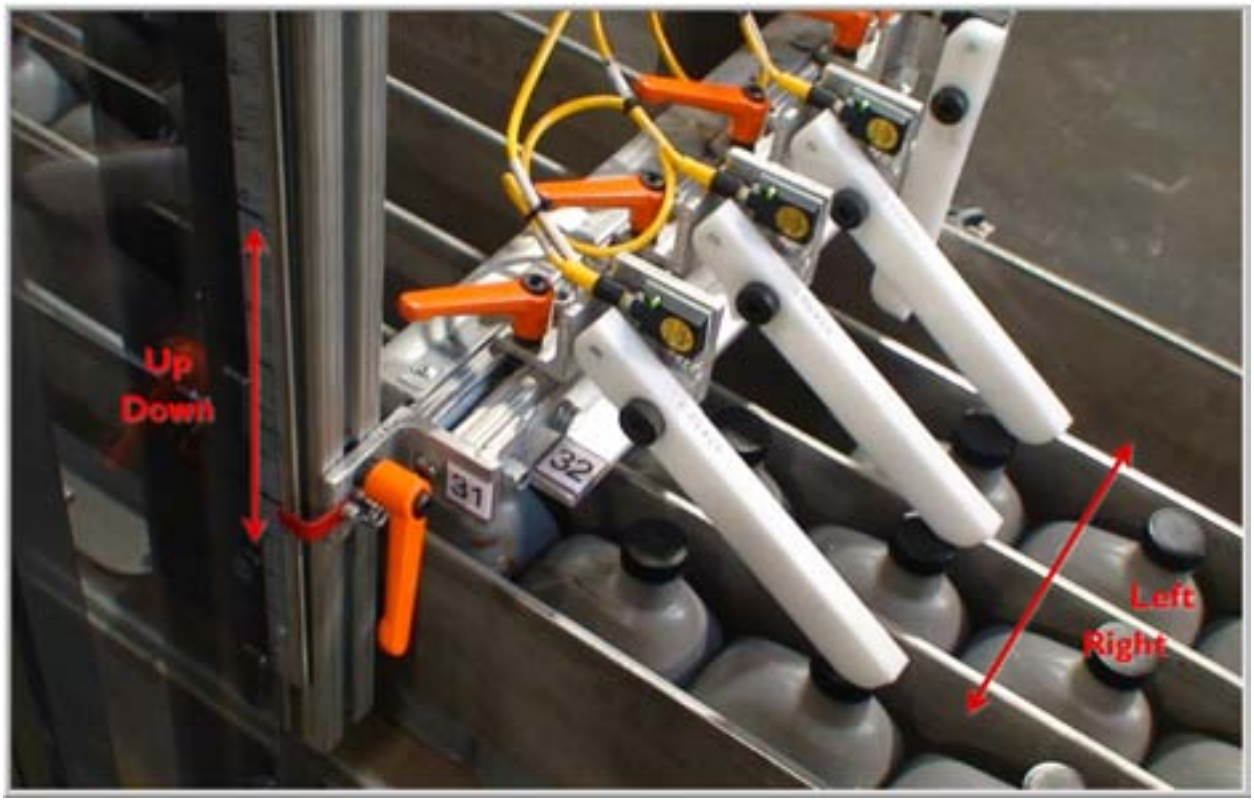


★ The Minimum Product Detection area of the Product Loader helps trigger the Elevator upstage process, by use of the white 'Tick Bars' shown above.

★ For the Left / Right settings on Lanes 1 - 4, the Lock Handles across the middle of the lanes are used.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

31. Maximum Product Detection (Up / Down)

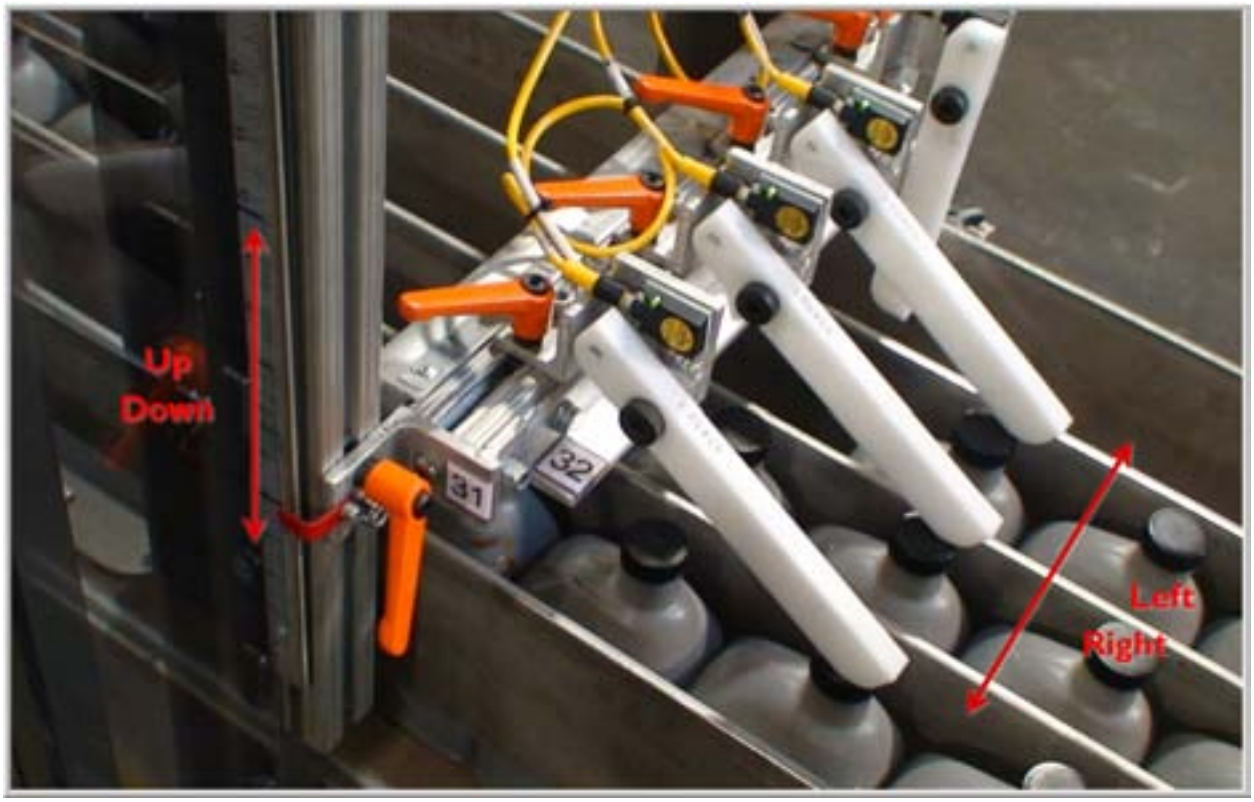


★ In conjunction with the Minimum Product Detection, the Maximum Product Detection area of the Product Loader helps trigger the Elevator upstage process, by use of the white 'Tick Bars' shown above.

★ For the Up / Down setting, the Lock Handle to the far left is used.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

32. Maximum Product Detection – Lanes 1-4

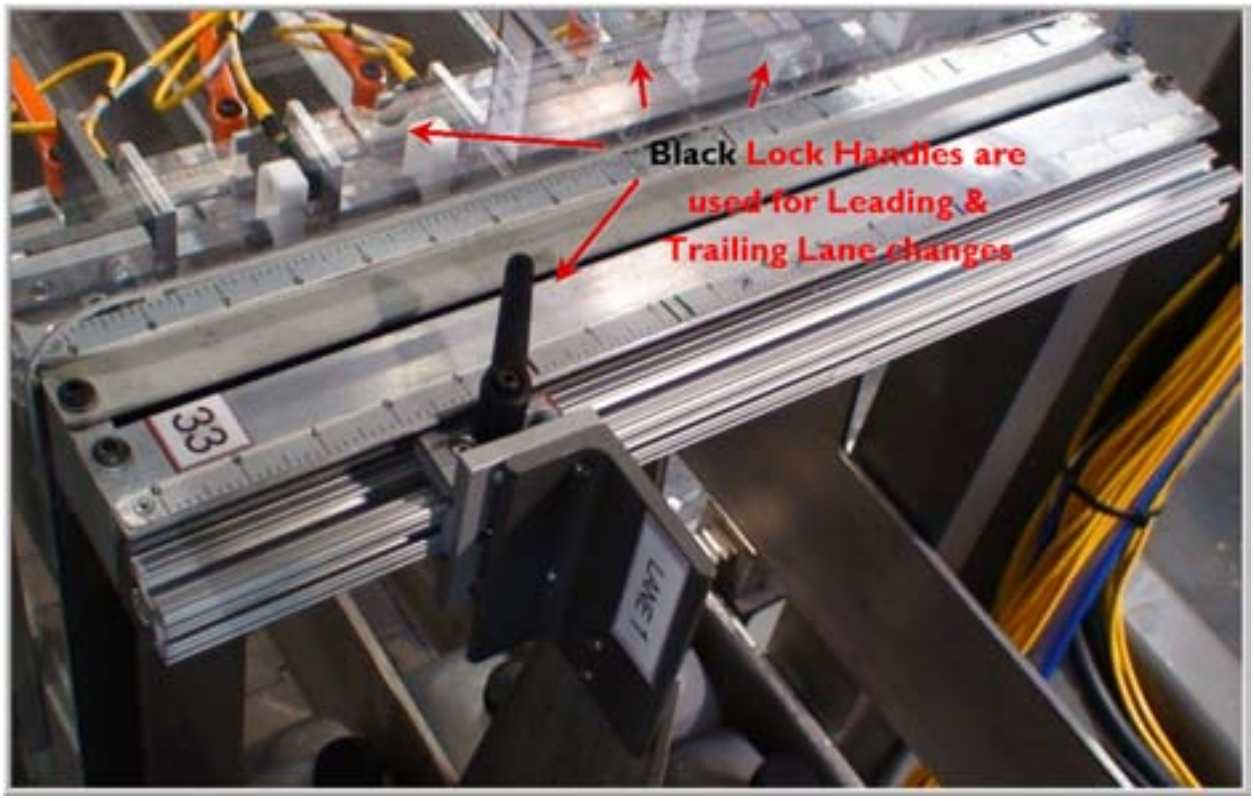


★ In conjunction with the Minimum Product Detection, the Maximum Product Detection area of the Product Loader helps trigger the Elevator upstage process, by use of the white 'Tick Bars' shown above.

★ For the Left / Right settings on Lanes 1 - 4, the Lock Handles across the middle of the lanes are used.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

33. Leading Lane – Lanes 1-4



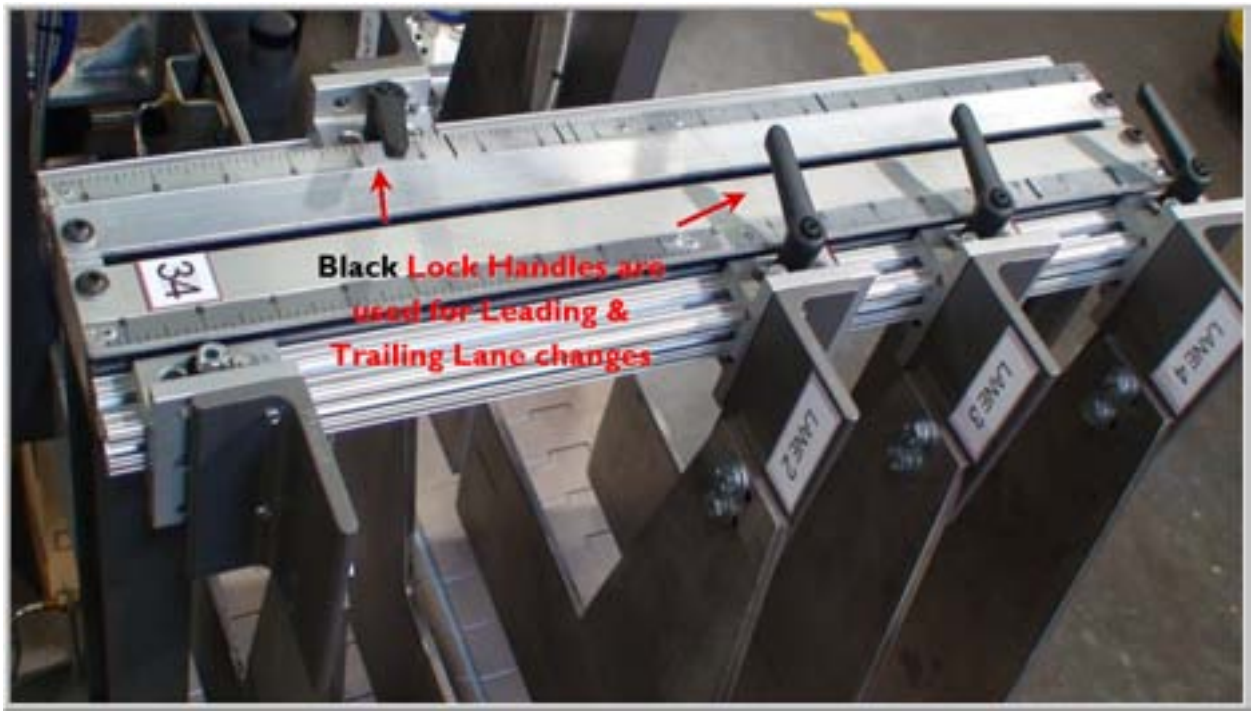
★ The Leading Lane adjusts the leading (closer to Formation Section) end of each lane's Lane Support Track.

★ The Leading Lane adjustment shifts each Lane Support Track in a Left/Right direction.

★ BLACK Lock Handles are used to identify the lane change tools.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

34. Trailing Lane – Lanes 1-4



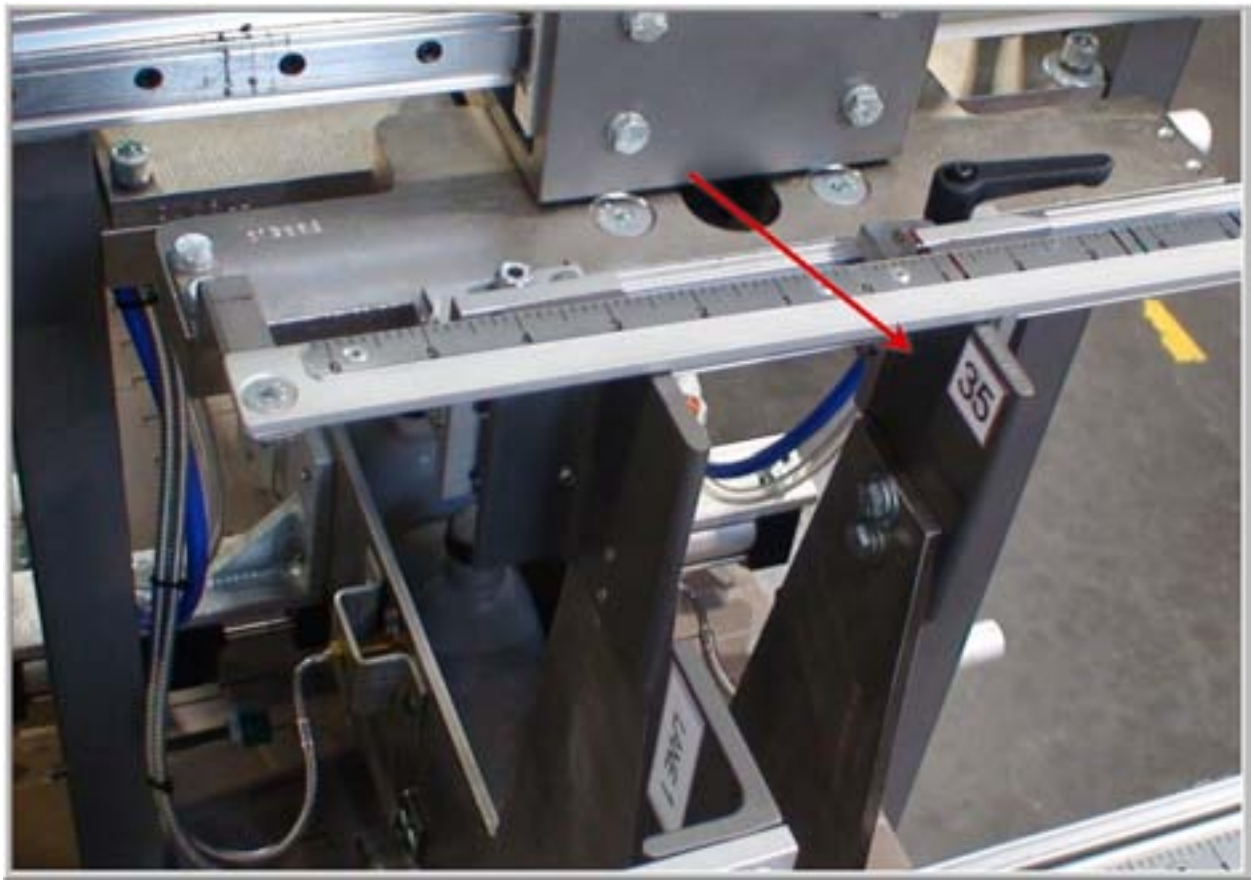
★ The Trailing Lane adjusts the trailing (closer to Product Loader Infeed) end of each lane's Lane Support Track.

★ The Trailing Lane adjustment shifts each Lane Support Track in a Left/Right direction.

★ BLACK Lock Handles are used to identify the lane change tools.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

35. Lane Diverter – Leading & Trailing

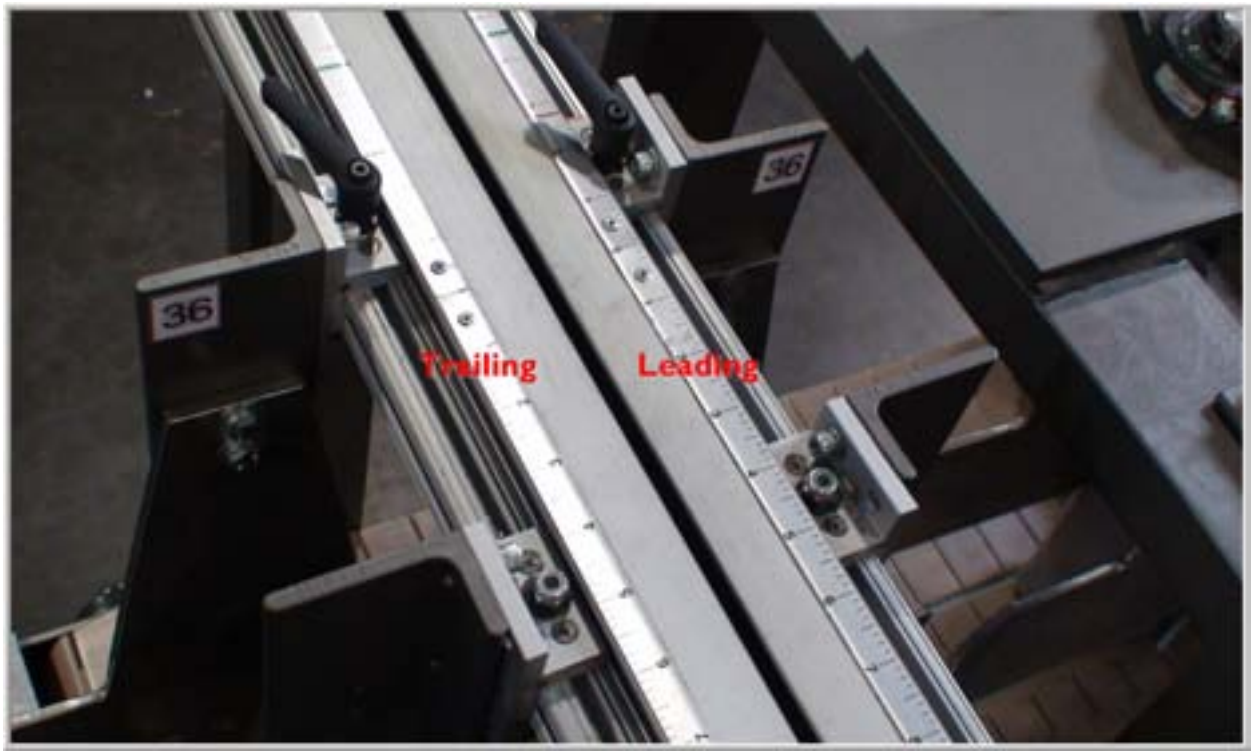


★ The Lane Diverter is a single track lane which sorts incoming product across all available lanes.

★ Both Leading and Trailing ends of the Lane Diverter require adjustment.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

36. Infeed Lane – Leading & Trailing

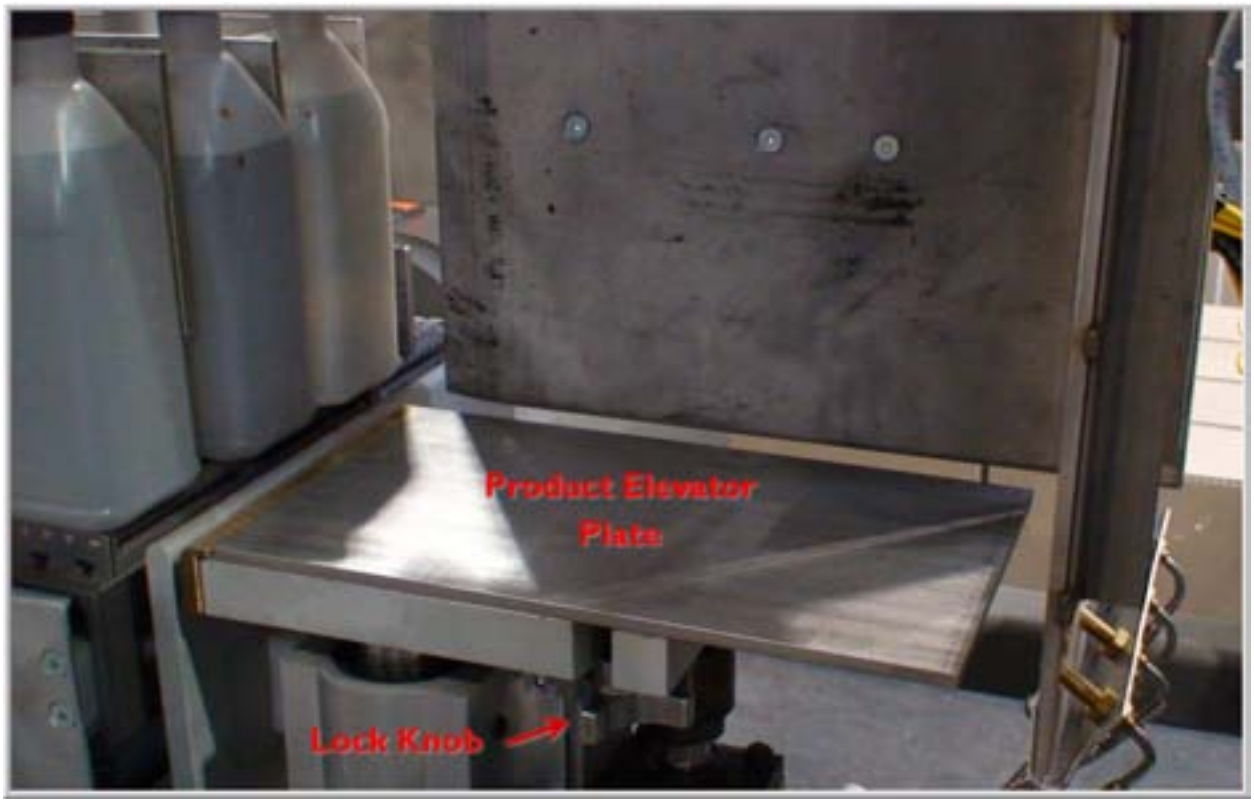


★ The Infeed Lane is the adjustment for the 'opening' of the Infeed Conveyor on the Product Loader.

★ Both Leading and Trailing Infeed Lanes require adjustment.

➔ Loosen the Lock Handle.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Handle.

37. Product Elevator Plate

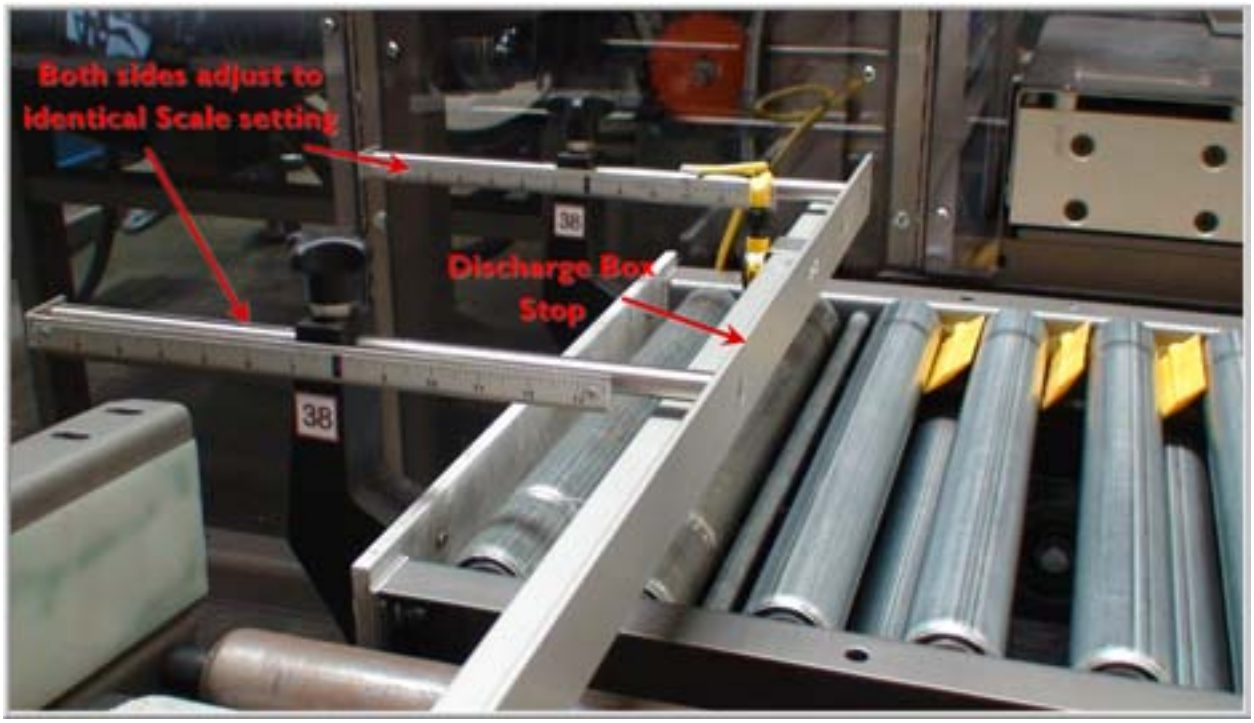


★ The Product Elevator Plate is the bottom plate in the Elevator.

★ This plate requires a FULL part change-out. Each plate is stamped/marked to help identify the correct plate for differing product loads.

➔ Loosen the Lock Knob.
➔ Slide the entire plate out from the Elevator.
➔ Replace with the desired plate.
➔ Re-tighten the Lock Knob.

38. Discharge Box Stop

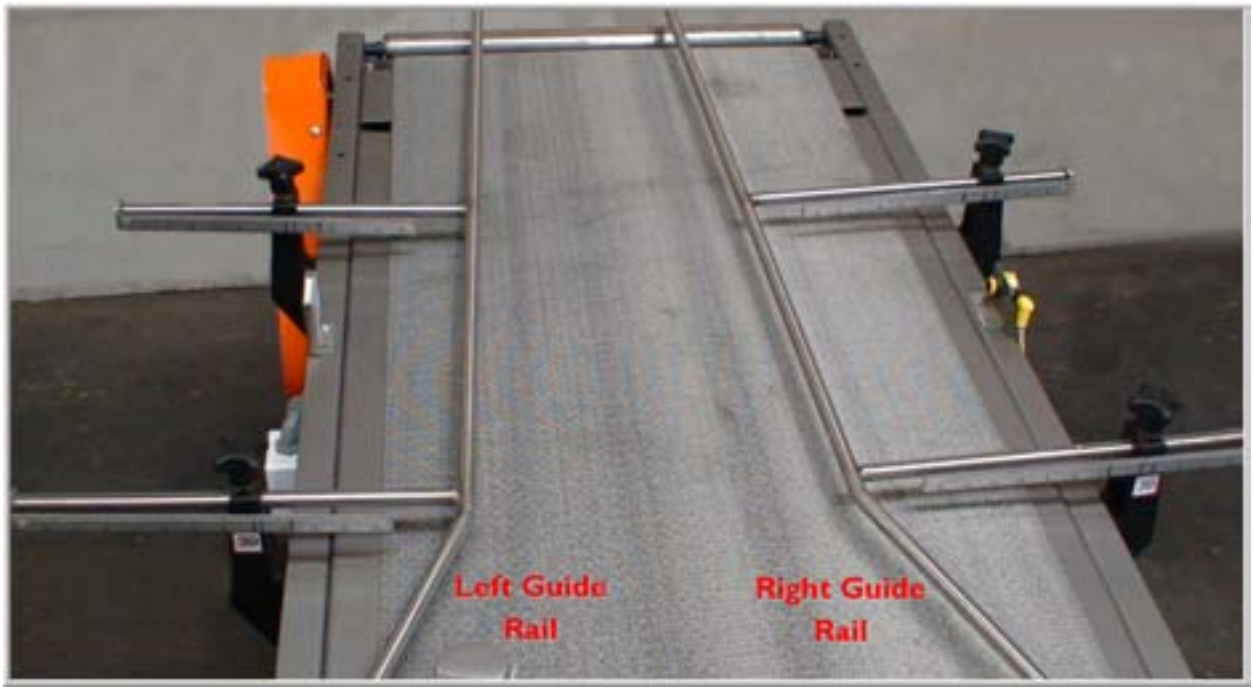


★ The Discharge Box Stop provides a stop point for the Box as it travels on the Side Shift Conveyor.

★ Both alignment rails require adjustment to the SAME Scale setting.

➔ Loosen the Lock Knobs.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Knobs.

39. Discharge Guide Rails – Left & Right



★ The Discharge Guide Rails provide side support to the Box as it travels and exits the Discharge Conveyor.

★ Both alignment rails on EACH side (Left & Right) require adjustment to the SAME Scale setting.

➔ Loosen the Lock Knobs.
➔ Slide and adjust to the desired Scale setting.
➔ Re-tighten the Lock Knobs.

Maintenance

The following section is a general maintenance overview. Some items may not apply to your particular Machine.

The PHOTOS in this section are for reference ONLY.

They may not be images of your particular Machine.

Keep Safety in mind at ALL TIMES when performing machine maintenance.

See appropriate vendor manuals for more detail on individual machine components.

Maintenance Highlights

All Maintenance should be done BEFORE Machine start-up

Use common sense.

Practice safety.

Establish a regular routine.

Maintenance Recommendations

The following maintenance recommendations should be followed, to insure the long-term performance of the machine and its components.

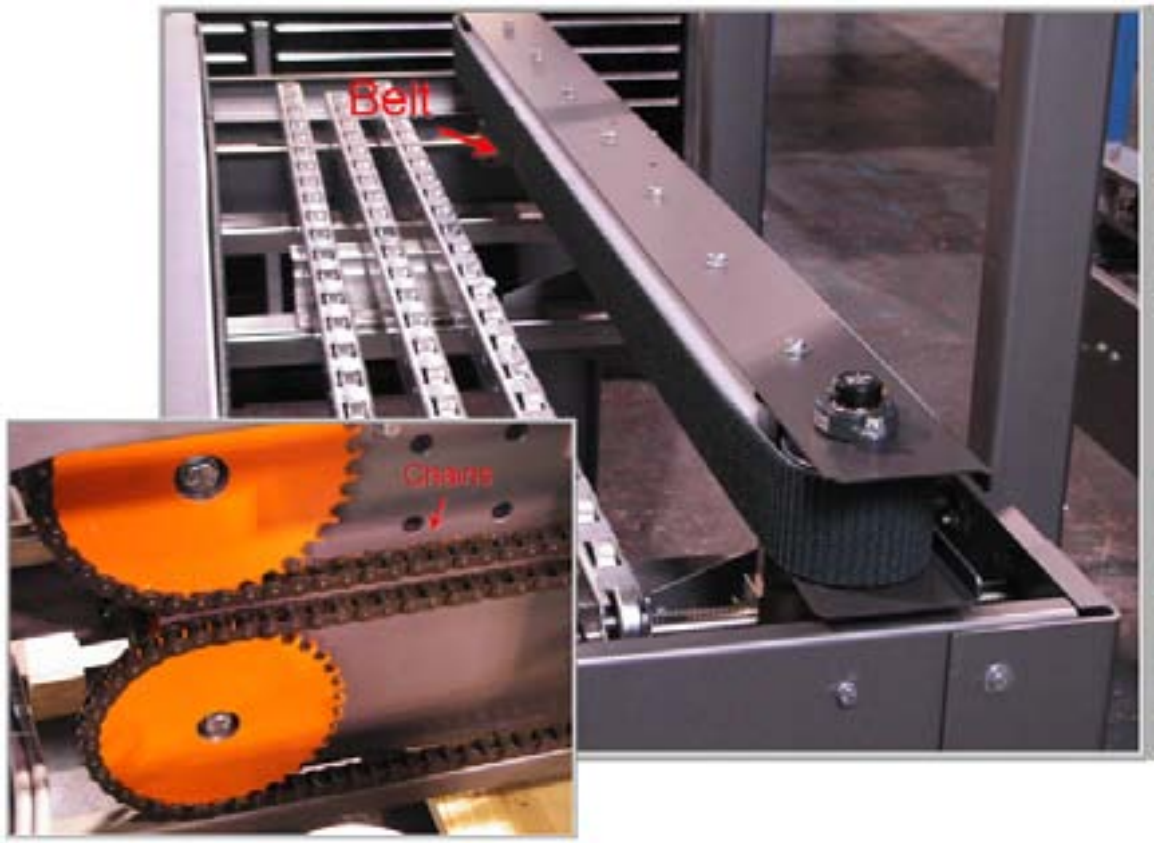
Daily Maintenance

Clear Machine and work area of dirt and debris.

- Use a broom and dust pan to keep the work area clear.
- Mop oily, sticky, and slick areas with water and soap. Allow to dry before working in Machine area.

Check tension on all belts and chains (if applicable).

- ➔ All belts and chains should be in good condition.
- ➔ Check for obvious signs of wear, such as fraying belts, dry rusty chains, etc.
- ➔ Unless noted – belts and chains should not be stressed to tight, but should not be too loose either.

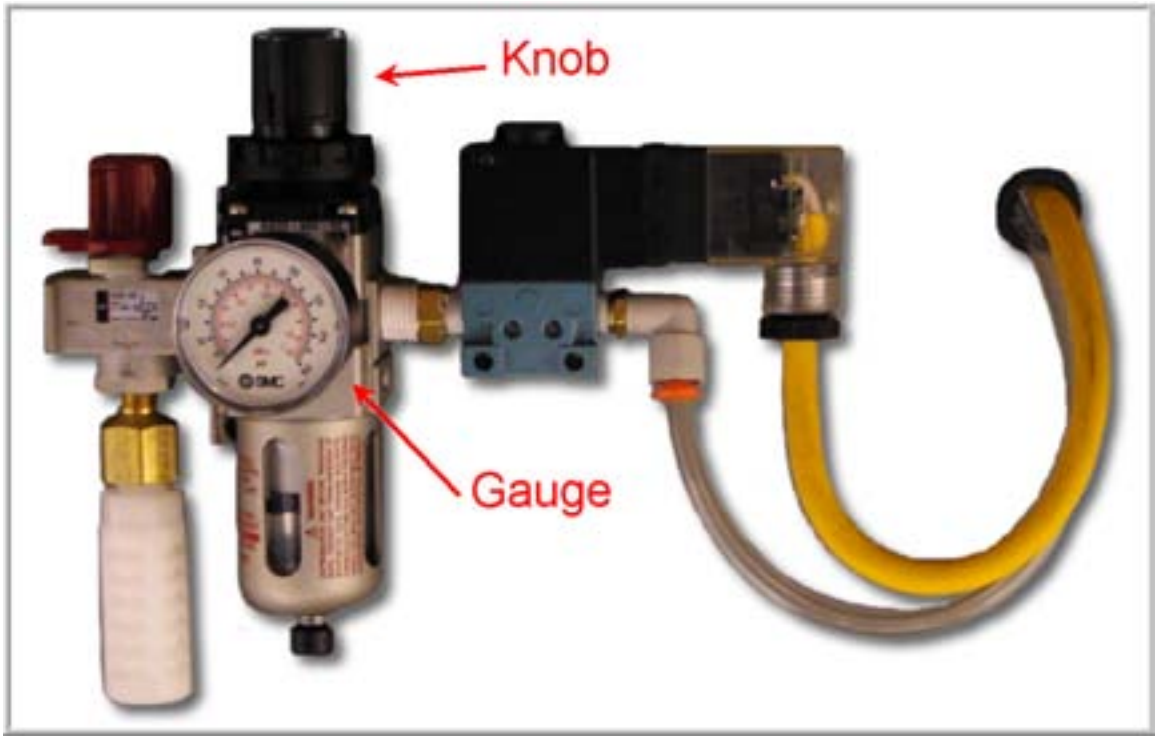


Lubricate chains as needed.

- ➔ Use either SAE-10, low foaming, non-detergent oil; Teflon chain oil; or High temperature machine grease.

Check for proper air pressure on regulator.

- The air pressure gauge should be set at the pressure indicated in the Specifications section of this manual.
- Use the dial knob on top of the regulator to adjust the pressure, if necessary.
- The dial knob may be located on the top or the bottom of the gauge.



See appropriate vendor manuals for more detail on individual machine components.

Check air filter sediment bowl.

- ➔ Clean if needed.

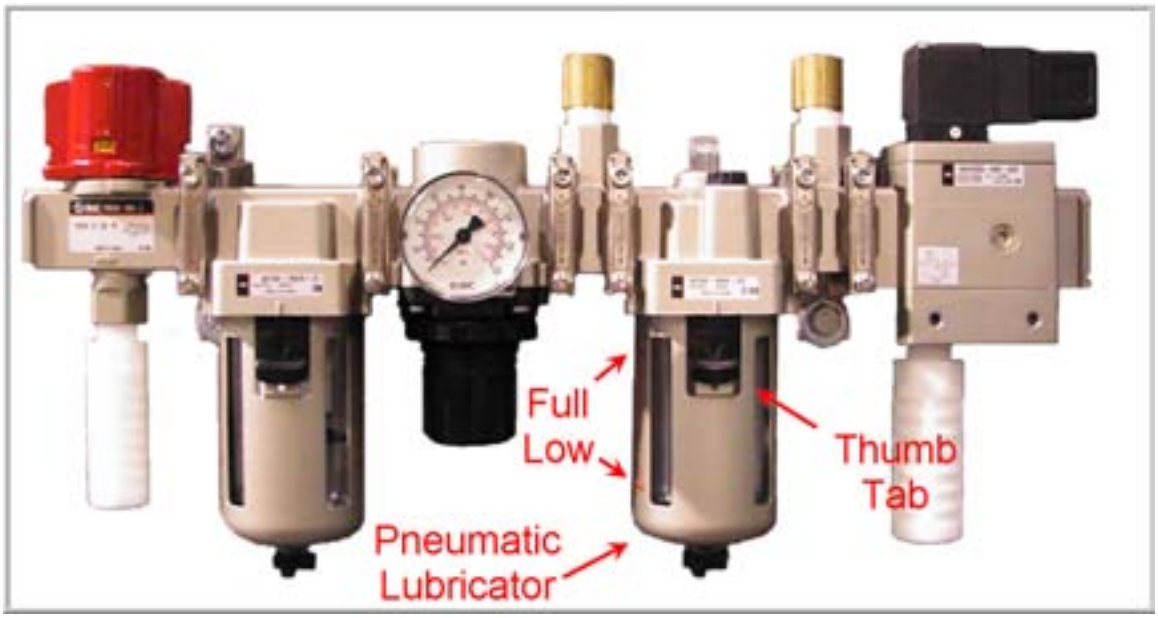
- ➔ Pull down on thumb tab.
- ➔ Rotate bowl and pull down to remove.
- ➔ Change white filter inside.

See appropriate vendor manuals for more detail on individual machine components.

Check reservoir in pneumatic lubricator.

- ➔ Fill if needed.

- ➔ Pull down on thumb tab.
- ➔ Rotate bowl and pull down to remove.
- ➔ Re-fill with oil. (SAE-10, low-foaming, non-detergent)



See appropriate vendor manuals for more detail on individual machine components.

Check glue unit for proper operation. (Glue Machines ONLY)

- ➔ Make sure glue unit is functioning properly.
- ➔ Desired temperature must be reached before production.

See the Nordson manual for more detail on glue unit maintenance.

CAUTION

Keep SAFETY in mind at ALL times – when working with the glue unit.

Remove excessive glue from Machine. (Glue Machines ONLY)

- ➔ Glue build-up on machine areas is a common occurrence, especially on components that interact with the glue application process.

- ➔ Make sure glue is dry.
- ➔ Use putty knife, light wire brush (nozzles only), or related implement to remove glue.
- ➔ Spray heavy glue areas with silicone for easier clean up.

Nozzle

Build-up

See the Nordson manual for more detail on glue unit maintenance.

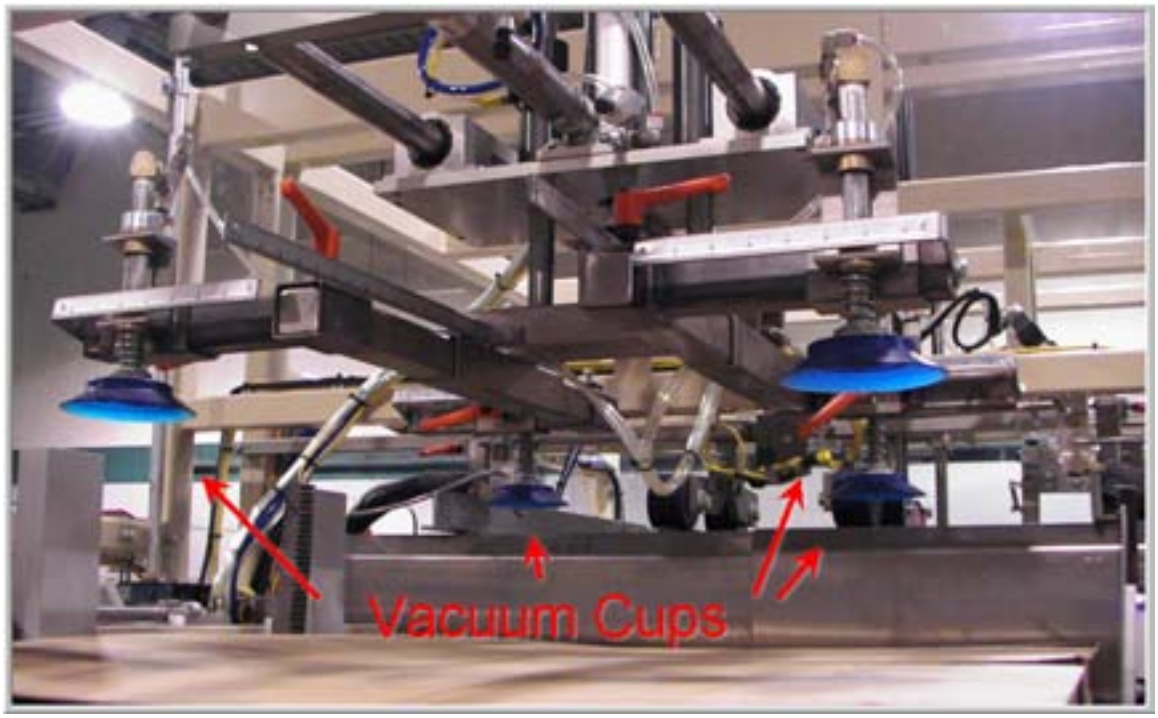
Keep SAFETY in mind at ALL times – when working with the glue unit.

Weekly Maintenance

Check ALL vacuum cups for wear (if applicable).

- ➔ Clean or replace if necessary.

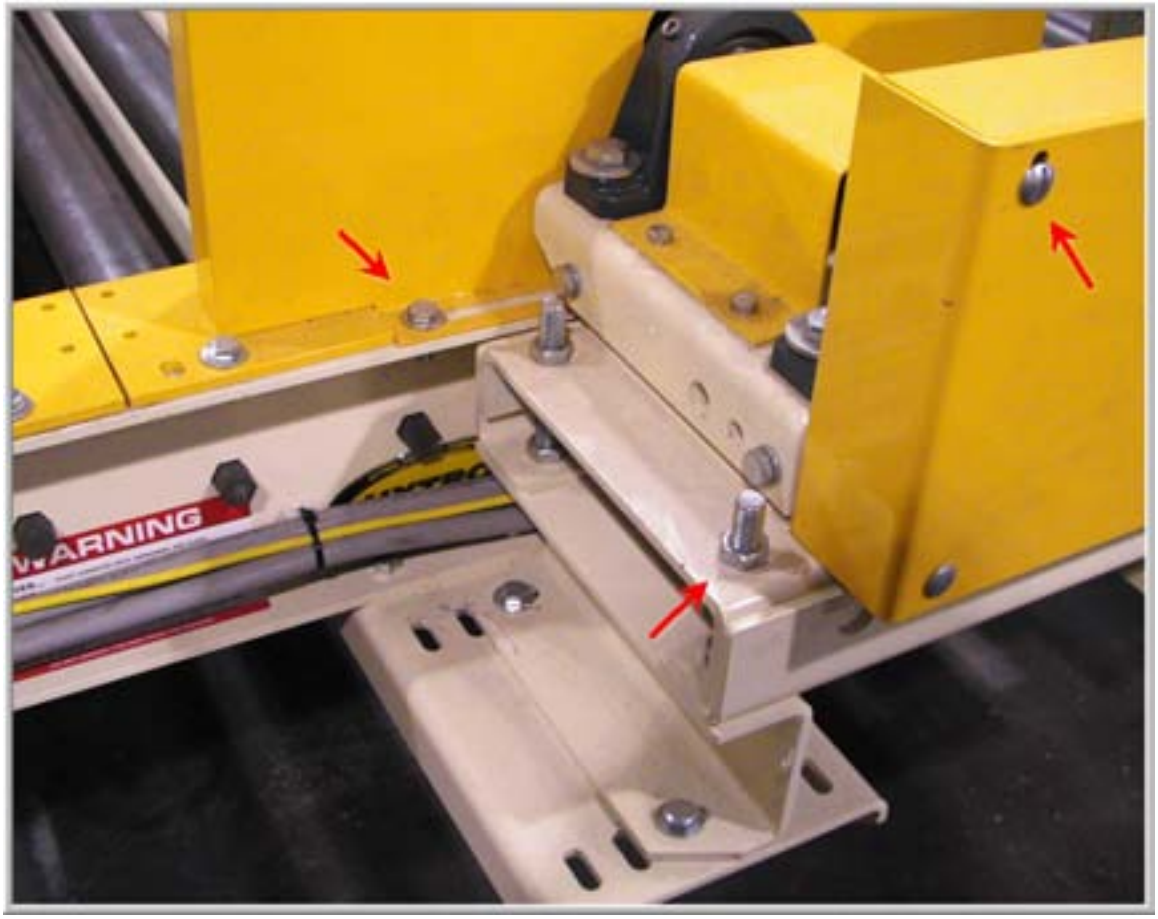
- ➔ Like any soft plastic/rubber item, vacuum cups will wear over time.
- ➔ Check for dried or cracked edges, holes, dust and dirt build-up.



See appropriate vendor manuals for more detail on individual machine components.

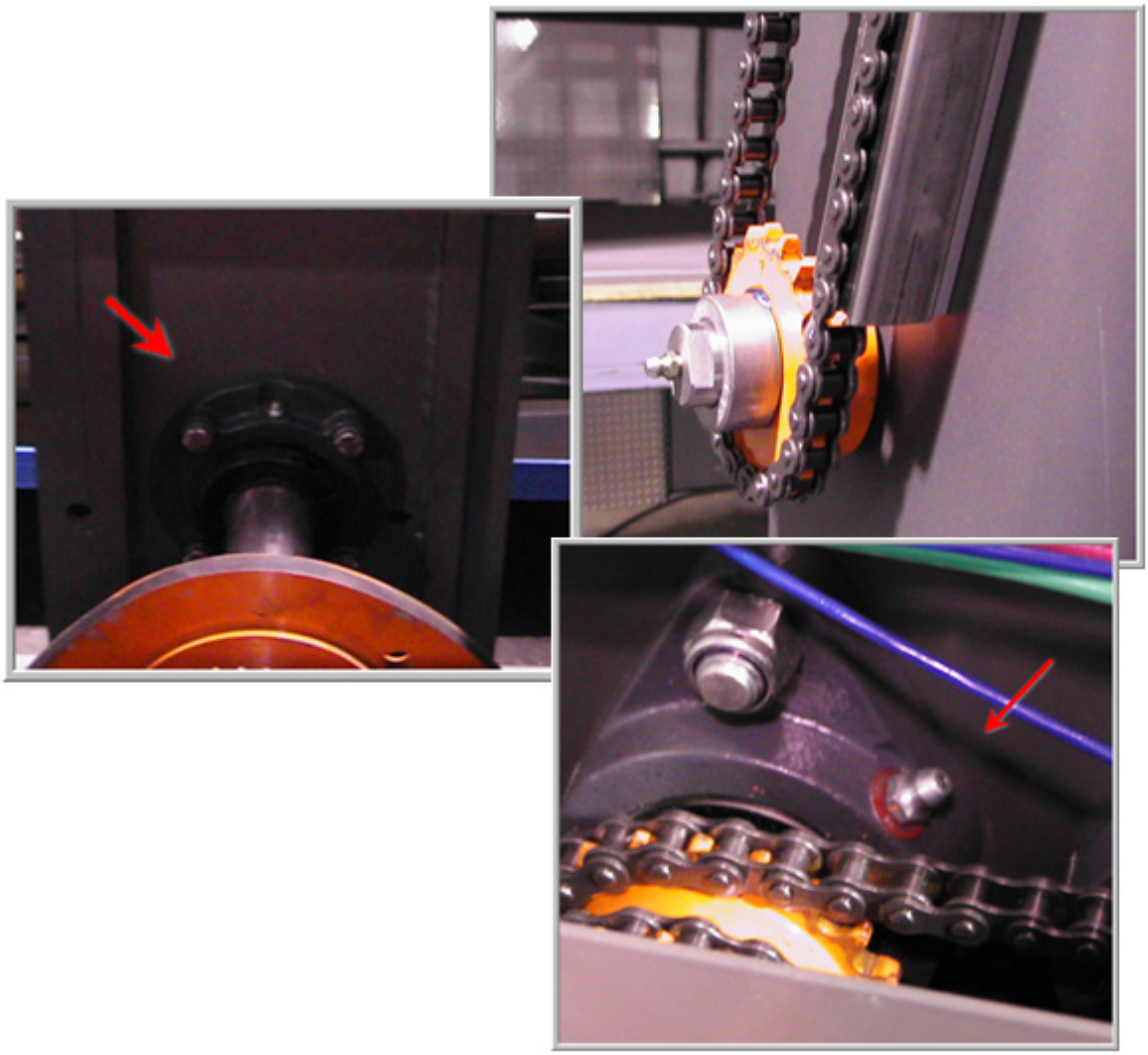
Check for and tighten all loose nuts and bolts.

- ➔ Loose items of any sort can be extremely dangerous.
- ➔ Make certain to have a thorough routine of checking over the entire Machine.



Check all lubrication points – bearings, sprockets, bushings, chains, etc.

➔ Lube, oil, or grease – as necessary.

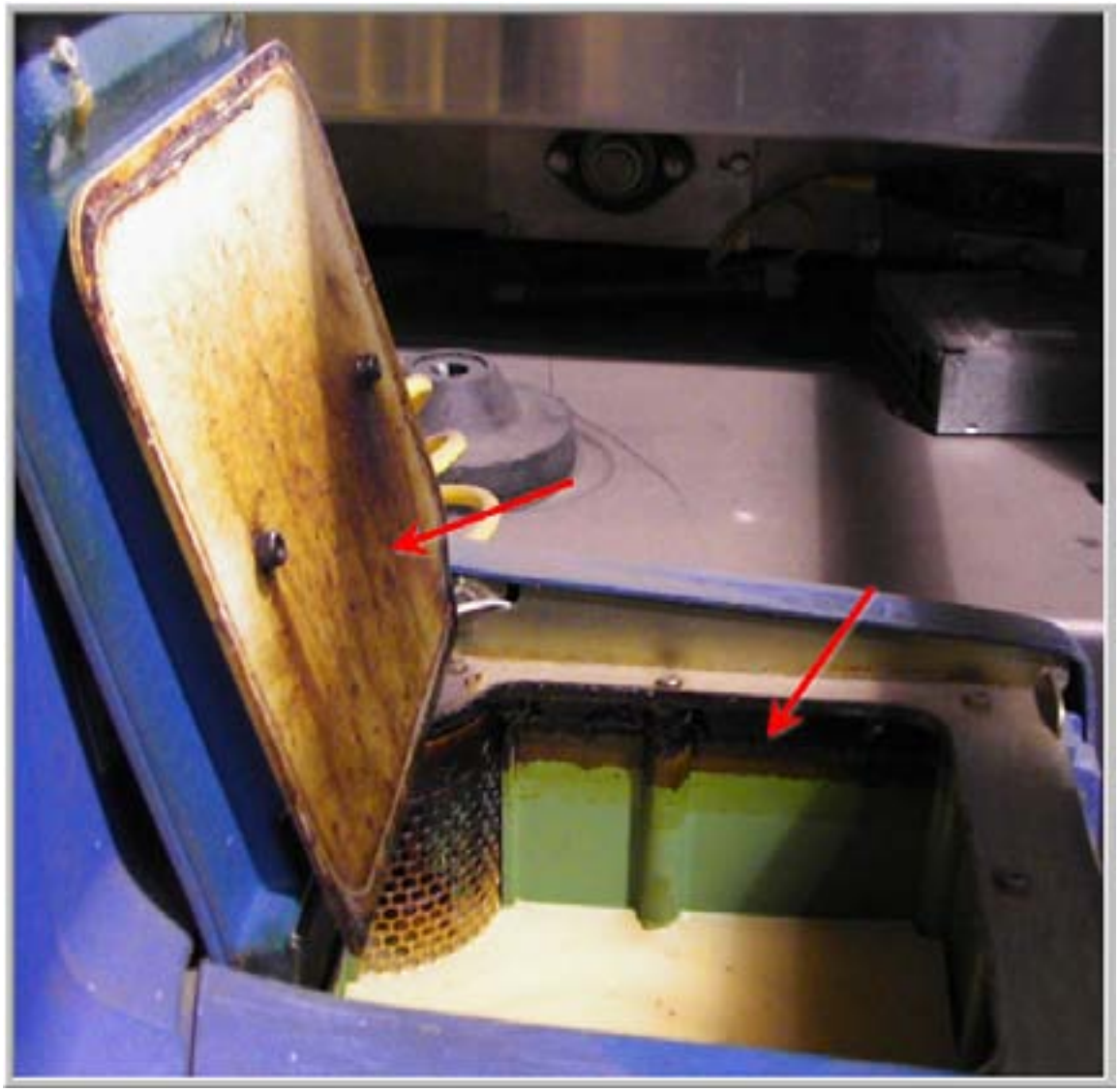


See appropriate vendor manuals for more detail on individual machine components.

Remove charred build-up on glue unit. (Glue Machines ONLY)

- ➔ To prevent heavy build-up and potential clogging issues, clean glue tank build regularly.
- ➔ Use putty knife, light wire brush, cloth, etc to remove build-up.

Make certain the glue is fully cooled before cleaning the tank.

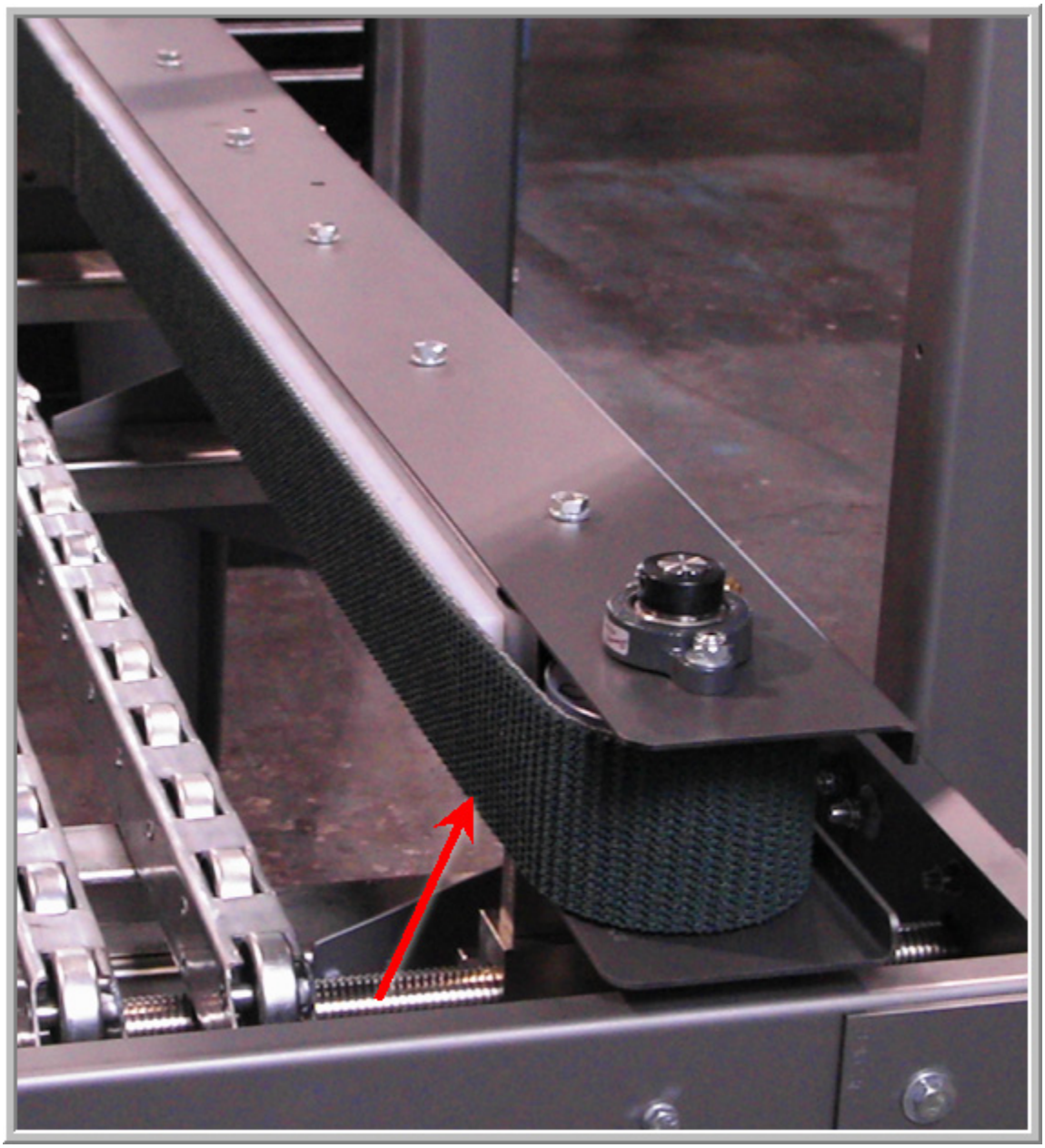


See the Nordson manual for more detail on glue unit maintenance.

Monthly Maintenance

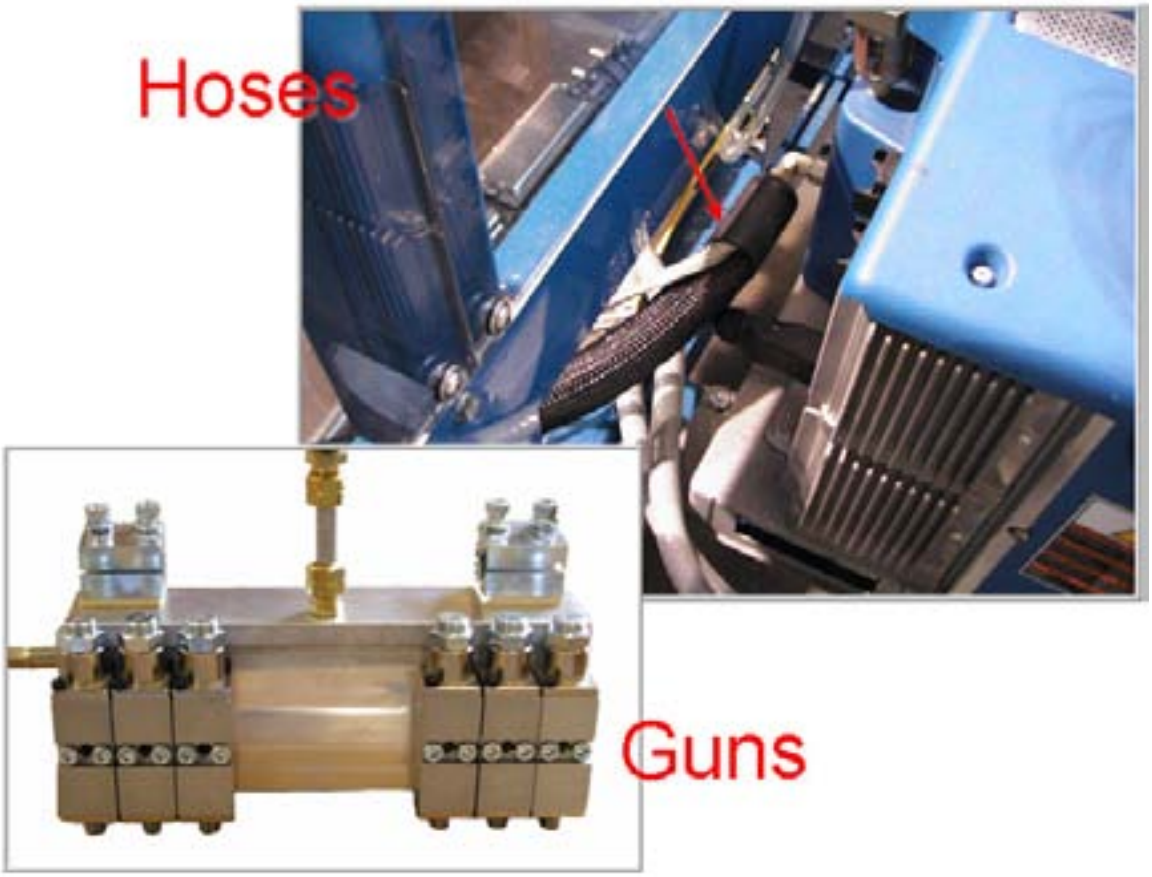
Check belts for wear (if applicable).

- ➔ Check for frayed edges, stretching, cracking, etc.
- ➔ Replace if necessary.



Inspect glue hoses and glue guns. (Glue Machines ONLY)

- ➔ Inspect hoses for wear, cracking, holes, etc.
- ➔ Inspect glue guns for build-up, clogging, etc.
- ➔ Replace if necessary.



See the Nordson manual for more detail on glue unit maintenance.

Check gear reducer oil level.

- ➔ The location and orientation of the unit(s) will vary by machine.
- ➔ Loosen and pull out the reservoir screw.
- ➔ Use thin implement – such as the handle of an Allen wrench – to dip and gauge oil.
- ➔ Fill if necessary.

See appropriate vendor manuals for more detail on individual machine components.

Maintenance Review

ITEM	INSPECTION	ACTION
DAILY		
Machine/Work Area	Dirt and Debris	Clear, Dust, Sweep, Mop
Belts and Chains	Tension	Adjust if needed
Chains	Lubrication	Lubricate if needed
Air Regulator	Proper Pressure	Adjust if needed
Air Sediment Bowl	Dirty Filter	Clean or replace
Pneumatic Lubricator	Fill Level	Fill if needed
Glue Unit	Proper Operation	Various
Machine	Glue Buildup	Remove
Tape Knife	Adhesive Buildup	Remove
WEEKLY		
Vacuum Cups	Wear	Clean or replace
Nuts, Bolts, Screws	Tightness	Tighten if necessary
Bearings, Sprockets, Bushings, etc	Lubrication	Lubricate if needed
Glue Unit	Buildup	Clean
MONTHLY		
Belts	Wear	Replace if needed
Glue Hoses/Glue Guns	Wear, Clogs, Leaks	Clean or replace if needed
Gear Reducer	Oil Level	Fill if needed
ADDITIONAL		
Magazine/Blank Infeed	Dust, Corrugated Pieces	Clean if needed
Motors/Bearings	Wear	Lubricate or replace if needed
Gear Box	Wear	Change Oil, replace if needed

Troubleshooting Procedures

NOTE: The following chart shows possible problems that MAY develop with this machine. For each problem, some of the most probable causes and their remedies are listed.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Machine will not start	Disconnect is in the Off position	*Turn to the On position*
	E-Stop button(s) pressed in	*Ensure all E-Stops are pulled out*
	Motor's Protection Circuit Breaker tripped	*Reset breaker*
	Control Circuit Breaker tripped	*Reset breaker*
	Access Doors open	*Ensure all doors are closed before trying to start machine*
Machine will start, but after running one case, the machine shuts off	RAM back proximity switch mis-adjusted	*Re-adjust*
Magazine will not feed cases after Machine On button has been pressed	Air supply shut off	*Turn on Manual Hand Valve*
	Pick-up Bar Switch or Pick-up Up improperly set	*Re-adjust*
	Blankfeed On/Off button has not been pressed – to turn feeding of blanks on	*Press Blankfeed button*
	Pick-up Reed switch is improperly set	*Adjust Reed switch properly*
	Blankfeed home Reed switch is improperly set	*Adjust Reed switch properly*
Machine will not cycle	Case in position eye is blocked	*Adjust eye*
	Motor controller fuse blown	*Replace fuse*
Insufficient or no vacuum at cups	Clogged muffler	*Clean or replace*
	Clogged transducer	*Clean or replace*
	Vacuum vale defective	*Repair or replace*
	Leaking air line	*Tighten or replace fitting and/or line*
Walking Stick damages case	Case Guides for depth adjustment are to tight	*Loosen (See Case Size Changeover Procedure in Chapter One)*
	Upper Section is set too tight on case	*Adjust (See Case Size Changeover Procedure in Chapter One)*
Machine will not stop when Walking Stick actuates reset on every cycle	Erector Safety Eye is either blocked or not functioning properly	*Clean and/or replace Photo Eye*
Walking Stick bearings wear rapidly	Walking stick is not 90^{O} to Side Plate	*See item #1 of Cam Adjustment Procedure*

PROBLEM	POSSIBLE CAUSE	CORRECTION
Tape tears off half-way across case	Knurled roller hitting against knife guard bracket	*Enlarge knife guard stop*
Rear Minor Flaps will not fold properly	Case is too far forward	*Move Case Stop toward Infeed*
Knives will not cut	Knives are dull	*Replace knives*
	Tape tension is improper	*Adjust*
	Broken or loose spring on Knife Arm	*Replace or re-fasten*
Knife cut is too ragged	See "Knives will not cut"	*See "Knives will not cut"*
	Tape and/or adhesive residue near cutting edges	*Clean thoroughly*
Tape does not track properly	Tracking adjustment is not set properly	*Readjust*
	Tape supply not against Hub Shoulder	*Move to proper position*
	Tape roll has run out or is telescoping	*Install new tape supply*
Tape Tail too short; not picked up by leading panel	Tape tension too tight	*Adjust*
	Improper threading	*Re-thread*
	Binding knurled rollers	*Determine cause, remove, and clean*
	Tape fingers too close to tape slide	*Adjust*
Tape Tail length is okay, but tape falls away from roller	Tape finger too far from tape slide	*Adjust*
Glue Guns will not apply glue	Glue Off/On selector switch in Off position	*Turn to On position*
	Glue valve open contacts are defective	*Repair or replace*
	Fiber-optic sensitivity improperly set	*Repair or replace*
	Insufficient pump pressure	*Increase pressure setting at glue unit*
	Dirty or clogged nozzle	*Clean or replace if necessary*
	Faulty glue valve	*Repair or replace*

Maintenance Checksheet

The following checksheet can be printed and used to maintain a regular maintenance schedule.

Item	Inspection	Action	Initials	Date	Notes
DAILY					
Machine/Work Area	Dirt and Debris	Clear, Dust, Sweep, Mop			
Belts and Chains	Tension	Adjust if needed			
Chains	Lubrication	Lubricate if needed			
Air Regulator	Proper Pressure	Adjust if needed			
Air Sediment Bowl	Dirty Filter	Clean or replace			
Pneumatic Lubricator	Fill Level	Fill if needed			
Glue Unit	Proper Operation	Various			
Machine	Glue Buildup	Remove			
Tape Knife	Adhesive Buildup	Remove			
WEEKLY					
Vacuum Cups	Wear	Clean or replace			
Nuts, Bolts, Screws	Tightness	Tighten if necessary			
Bearings, Sprockets, Bushings, etc	Lubrication	Lubricate if needed			
Glue Unit	Buildup	Clean			
MONTHLY					
Belts	Wear	Replace if needed			
Glue Hoses/Glue Guns	Wear, Clogs, Leaks	Clean or replace if needed			
Gear Reducer	Oil Level	Fill if needed			
ADDITIONAL					
Magazine/Blank Infeed	Dust, Corrugated Pieces	Clean if needed			
Motors/Bearings	Wear	Lubricate or replace if needed			
Gear Box	Wear	Change Oil, replace if needed			

Service

Support

Our Service Department is geared toward taking care of any needs you may have – with regard to your machine.

Smurfit Stone Automated Packaging Systems
Service Department offers:

- 24/7 On-Call Telephone Support

- On Site availability in 24 hours or less

- On Site Tech Support, Training and Preventative Maintenance

Ordering Repair Parts

NOTE: When ordering parts for your machine, please be sure to have the following information:

Machine Model: RAM 350
&
Machine Serial Number

Labels with the Model and Serial Number are included on the Machine:

This information will ensure your receipt of the correct part for your specific machine. Although a machine may be standard, parts may vary because of an individual customer's application or specifications.

We suggest that when ordering parts, you have available the Spare Parts List for this machine (See Appendix). Upon request, your Parts Department will furnish you the cost of this kit.

Please write or call:

Smurfit-Stone
Automated Packaging Systems
4364 34th Street
Orlando, FL 32811

Telephone:
800-338-6294 8AM – 5PM EST Monday through Friday
800-613-8854 All other times

Fax: 407-843-8459

Other Products

Smurfit-Stone Automated Packaging Systems offers a complete line of Machines

From Case Erectors to Case Packers
- Tray Formers to Sealers
- Custom and Complete Systems

Feedback

Smurfit-Stone Automated Packaging Systems is continually in the process of attempting to bring you the highest quality Machine Manuals possible.

As of January 2008, the Documentation Department has been under new management - and the new, singular goal is to provide the best Machine Manuals in the industry.

The feedback of our customers, technicians, operators and maintenance personnel is critical to achieving this goal.

If you would like to submit any comments, criticisms, suggestions or concerns – we would like to hear them.

Appendix

The Appendix contains critical details for the successful installation, operation and maintenance of your machine.

Please be familiar with the following information.

Specifications

This section contains the
parameters and specifications
to which this machine
has been designed and manufactured.

Spare Parts List

The following is the
recommended Spare Parts List
for your machine.

Call 800.338.6294 – 8 to 5 EST,
Monday to Friday – to place an order.

Changeover Matrix

Fault Screen

The Fault Screen
is a listing of all faults
that may occur during the operation
of the machine.

The following section lists each fault,
a description of the conditions,
and a resolution.

Computer Program

The following is the Computer Program written for this machine.

A separate file version is located on the Manual CD included with this machine.

Bill of Material

The Bill of Material
is a comprehensive listing
of all components used in the
manufacture of this machine.

Electrical Drawings

The Electrical Drawings are
the base schematics and diagrams
of the electrical systems
used to manufacture and operate
this machine.

Mechanical Drawings

The Mechanical Drawings are
the base schematics and diagrams
of the mechanical systems
used to manufacture and operate
this machine.

Glossary

This Glossary is standard in all Smurfit-Stone Automated Packaging Systems manuals – as of April 2008.
Some of these terms may not apply to your particular machine.

A

Adhesive - Substance capable of adhering one surface to another.

B

Banded Unit - A package or palletized load that has a band or bands applied to it.

Bending - The ability of containerboard or combined board to be folded along score lines – without rupture of the surface fibers to the point of seriously weakening the structure.

Belt - An endless flexible band passing about two or more pulleys, used to transmit motion from one pulley to the other or others - or to convey materials and objects.

Bill of Material (BOM) - A comprehensive listing of all parts used in the manufacture of the machine.

Blank – A flat sheet of corrugated or solid fiberboard that has been cut, slotted and scored so that, when folded along the score lines and joined, it will take the form of a container.

Board – Abbreviation for various paperboards.

Box – A rigid container having closed faces and completely enclosing its contents.

Bulk – Goods or cargo not in packages, boxes, bags or other containers.

Bundle – A shipping unit of two or more articles or boxes wrapped or fastened together by suitable means.

C

Carton – A folding box made from boxboard.

Case – A box or receptacle, or a filled box.

Caster - A small wheel on a swivel, attached under the machine - to make it easier to move and/or adjust.

Changeover – The process of adapting the machine to accommodate and process differing box dimensions.

Chipboard - A paperboard usually made of recycled paper stock.

Circuit Breaker- A device to open or close and electric power circuit – either during normal power system operation – or during abnormal conditions. Used to protect equipment and surroundings from possible damage due to excess current. Abnormal conditions are usually the result of short circuits created by lightning, accidents, equipment deterioration, or sustained overloads.

Cold-setting Adhesive – Adhesive that sets below 86 degrees Fahrenheit, or commonly room temperature.

Compression Area – The area of a machine where the majority of box, case and tray formation takes place. In the compression area, the item is held momentarily (compressed), while the adhesive seal is full achieved.

Container - A receptacle used to contain or hold goods.

Controls - Devices used for regulating and guiding the functions of the machine.

Conveyor - The main transport bed of the machine, which supports the lower side of the blank, box, carton or container throughout the machine's production process.

D

Dimensions - The three measurements of a box, given in sequence – length, width, depth (inside).

Discharge - The area of the machine where the finished container is output. The end of the machine.

Dunnage - Any unwanted material (generally corrugated) which may clog or jam the smooth operation of the machine. Dunnage is used to protect corrugated blank shipments, but should be removed prior to machine production.

E

Energy - Any source of usable power. In this manual - Electrical, Heat, Pneumatic, and Gravity.

E-Stop - Also known as Emergency Stop. Large push buttons or cords that will immediately stop the machine for safety purposes. Must be pulled out to re-start the machine.

F

Fault - A condition in which the machine is not operating at acceptable, efficient status. Faults are generally indicated through the use of the status tower, the touch screen and E-Stops. Minor Faults will only interrupt the flow of certain processes. Major Faults will trigger the entire machine to stop.

Flaps - Extensions of the side wall panels that close a box. Usually defined by one scoreline and three edges.

Frame - The main physical structure of the machine – upon which the mechanics and precision components are built.

G

Glue - A synonym for adhesive.

Glue Station - The area of a machine where the adhesive is applied to the forming box, case or tray.

Glue Unit - The holding tank and main operating device for all Glue functions on the machine.

Glued - Adherence of one surface to another with sufficient bonding that an attempt to separate the joined areas will result in mutilation of surface fibers.

Guards - A safety barrier – usually made of sheet metal or Lexan (clear plastic) – and around more hazardous components of the machine.

H

Hot-melt Adhesive – Polymer adhesive, solid at room temperature, which is liquefied by heat (usually in range of 250 – 400 deg. F), applied molten and forms a bond by cooling and solidifying.

HMI - Human-Machine Interface. Another term for the Touch Screen or other controls that allow the operator control over machine function.

I

Infeed - The area of the machine where the blank is introduced. The beginning point.

Inner Packing - Materials or parts used to support, position or cushion an item within a shipping container, to support the corners or top of the container, or to fill voids.

J

Joint - The part of the box where the ends of the scored and slotted blank are fastened together by taping, stitching or gluing.

K

Knock-Down (KD), Knocked-Down (KD) or Knocked-Down Flat (KDF) – A flat, unopened box – where the manufacturer's joint is sealed.

L

Left Hand – A Knock-Down flat, where the longer panel appears on the left.

Lockout - Required on any major electrical apparatus by OSHA, lockout is the ability to physically shut off power and to padlock the main switch handle in the off position.

Lubrication - The application of an oil or grease-based substance, the purpose of which is to diminish friction between machine parts.

M

Machine - An apparatus consisting of interrelated parts of separate functions, but with a common, overall purpose. In this industry, a term applied to any of a variety of automated packaging systems.

Magazine - The area on the machine where blanks or flats are stacked and waiting for the initial phase of processing.

Major Fault - See Fault.

Mandrel - A ramming device, similar to a Ram Plate, but usually designed with a plate that has more depth, or has sides to it.

Mandrel Area - The area of a machine where the majority of formation takes place. In the machine process, located just before the compression area.

Minor Fault - See Fault.

N

NEMA - National Electrical Manufacturers Association

O

Operator - Any individual responsible for the management, command and control of the machine.

OSHA - Occupational, Safety and Health Administration

Overlap - A design feature wherein the top and/or bottom flaps of a box do not butt, but extend one over the other. The amount of overlap is measured from flap edge to flap edge.

P

Package - A small to moderate-sized container.

Panel - Used to define various items. May refer to the face or side of a box, and also may refer to a designated area of the machine – where specific items are placed (i.e. Electrical Panel, Control Panel).

Partitions - Slotted corrugated fiberboard or chipboard, which interlock and form separate cells within a box.

Photo Eye - A sensory device that assists in the monitoring of proper machine function. A sensor functioning as the 'eye' of the machine, giving specific inputs to determine a machine function. A *photoelectric sensor* is an optical control that detects a visible or invisible beam of light, and responds to a change in the received light intensity.

Pneumatic - A compressed-air system used to operate certain components and operations within the overall machine process.

Product - The outcome of the machine's overall function, or what is being packaged.

Proximity Switch – A sensory device that assists in the monitoring of proper machine function. This device, senses metal targets within its zone, giving specific inputs to determine a machine function.

PSI (psi) - Pounds per square inch. A measure of air pressure.

Push Button - A control device that, when pushed, initiates or halts some process on the machine.

R

Ram Plate - A flat, metal plate, usually used to drive and help form an area of a box, case or tray.

Reed Switch - A sensory device that assists in the monitoring of proper machine function. A Reed Switch is a type of proximity switch and reacts to a magnetic field generated by an outside source (i.e. cylinder magnet). The magnetic action opens or closes a set of contacts within the switch, giving inputs to determine a machine function.

Regular Slotted Container (RSC) – A box manufactured from a single sheet of corrugated board. This sheet is scored and slotted to permit ease of folding. Flaps extending from the side and end panels from the top and bottom of the box. All flaps are the same size from the edge of the sheet to the flap scorelines. The two outer flaps are one-half the container's width – so that they meet at the center of the box when folded.

Right Hand - A Knock-Down flat, where the longer panel appears on the right.

S

Selector Switch - A multi-position switch that can be set to control any one of several machine functions.

Score (Scoreline) – A well-defined impression or crease in corrugated or solid fiberboard – made to position or facilitate folds.

Seam - The junction created by any free edge of a container flap or panel – where it abuts or rests on another portion of the container.

Solenoid - An electrically energized coil of insulated wire that produces a magnetic field within the coil, and thus attracts a plunger or armature to a position within the coil. Solenoids are used in air valves to direct air flow, based on plunger positions – or in relays, to move a set of contacts.

Stacker - A device or part of the greater assembly that is designed to stack product, containers, or empty pallets.

Straps - A binding and containing material. May be used to secure the machine for shipping purposes.

T

Tape - A narrow strip of cloth, paper or plastic – coated with adhesive on one side – and used to seal or reinforce the joint or flaps of a box.

Tape Unit (Tape Machine, Taper) – The apparatus that applies the tape to the joint or flaps.

Touch Screen - A touch-sensitive screen used as the main interface between the operator and the machine.

U

United Inches - Sum of the external dimensions of a box – the length, width and depth.

W

Walking Stick - A vertical bar or stick that “walks” the product through the entire machine process.

Water Resistant – Any item that has a relatively high safeguard against damage or deterioration from water.

Wrap-around Blank – A scored and slotted sheet of corrugated fiberboard that is formed into a box by folding around its contents.

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Automated Packaging Systems

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