

Manual & Training Guide

Q16036 HPE220(RH)AB

Case Erector Bottom Sealer
with Continuous Feed Bundle Hopper

Built for:

QVC

Ontario, CA



Warranty Information

This information is needed for your warranty.
Please fax to MARQ c/o Shawna Frank (fax# 509-452-3307) after initial installation. If no date is received, then the company will use the shipping date for the date the warranty begins.

Machine# _____

Company Name _____

Company Address _____

Phone# _____

FAX# _____

E-Mail Address _____

Date of Installation _____

Purchased From _____

Head of Maintenance _____

MARQ Packaging Systems, Incorporated
PO Box 9063, Yakima, WA 98909
Phone: (509) 966-4300, FAX (509) 452-3307
Email: info@marq.net



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Company

MARQ Packaging Systems, Inc. was founded in 1965 by Ted Marquis to design and manufacture economical and reliable case erector / bottom sealers. We have expanded our manufacturing to produce a complete line of case erectors, adjustable case sealers, random case sealers, case vibrators and trayforming equipment available with or without the Q.C. (Quick Change) option. MARQ machines seal cases with either hot melt, cold glue, pressure sensitive tape or any combination thereof. MARQ innovations have helped establish new standards in many areas of the packaging industry. Each MARQ machine is designed to adjust to case sizes outside its standard making MARQ's line of basic machines adaptable to hundreds of uses.

MARQ's 150,000 square foot plant, located near the Yakima Air Terminal, is staffed with design engineers, craftsmen, and a sales force who team up for a one-on-one effort with each of MARQ's customers. We at MARQ Packaging Systems, Inc. take pride in the fact that our products bear the MARQ of Quality and Excellence.

Over 50 years of complete customer satisfaction has proven the reliability of the combined forces of the case erector and the programmable logic controller (computer).

Programmable Logic Controllers provide flexibility and dependability for controlling case sealing and packaging equipment. The programmable logic controller eliminates the maintenance required on standard, electromechanical controllers. They permit instant on-line modification of programs to adjust to varied case sizes and other production requirements without costly down time. Many programmable logic controllers also have built-in protection of programs in case of power failure.

If parts are required for your MARQ Case Erector, they may be obtained from MARQ Packaging, 3801 W. Washington Ave, Yakima, WA 98903.



Introduction

Manual Overview

This manual contains information needed to operate, maintain, and troubleshoot your machine. The following page describes the general safety precautions you should take when you operate the Case Erector. Following the safety precautions are the specifications for this machine.

The remainder of your manual is divided into three parts, Operation, Preventative Maintenance, and Service and Troubleshooting. The Operation Section contains general information about the machine operation and a complete description of the controls. Step by Step operation procedures and changeover procedures are located in the operation section. The Preventative Maintenance Section includes maintenance checklists for daily, weekly and semiannual maintenance. Also in the Preventative Maintenance section you can find a detailed description of each interface screen, a list of suggested fluid choices for lubrication, a list of suggested spare parts, and vendor information. The Service and Troubleshooting portion of the manual contains installation information as well as a detailed sequence of operation based on program flow and the electrical schematic. The various components are gone over in detail. Service Procedures and a Troubleshooting guide comprise the last segment the manual. Each section concludes with a training guide for the appropriate personnel (operators, maintenance, and service).

Warranty information is contained on the final page of the manual.

Throughout this manual:

- The names of all **BUTTONS**, **KEYS** and **SWITCHES** will appear in **BOLD CAPITAL LETTERS**.
- Left and right references are made when standing at the user interface and looking at the discharge end of the machine.

Satisfactory operation of the MARQ Case Erector depends on proper application, correct installation, and proper maintenance. In addition, modifications to the equipment may result in less than satisfactory performance.

Contact Information:

MARQ Packaging
3801 W. Washington Ave.
Yakima, WA 98903
Phone: (509) 966-4300
FAX: (509) 452-3307

24 Hour Service
1-800-998-4301, ext 399
Cell: 509-728-3238

Email: info@marq.net
Internet: www.marq.net

**PLEASE READ YOUR MANUAL
BEFORE OPERATING YOUR MARQ EQUIPMENT**



Precautions: Always maintain operator safety!

Before working on your Case Erector, disconnect all incoming power.

Turn off all electrical and air connections to this equipment before repairing, cleaning or removing jammed cases.

Do not put your hands or tools into equipment while the Case Erector is operating.

Do not operate the Case Erector without all guards and safety mechanisms in place.

Do not wear neckties, jewelry, loose clothing, or other items that can become caught in moving parts or mechanisms in the vicinity of the Case Erector.

Wear all company-specified personal protective equipment while operating the Case Erector.

Do not operate, troubleshoot, or maintain the Case Erector while under the influence of any type of drug or alcohol.

Always observe all safety warnings and notices on the machine and in this manual.

Do not use flammable or toxic cleaning fluids such as gasoline, benzene, or ether when cleaning and maintaining the Case Erector.

Safety Features

This Case Erector is equipped with an Emergency Stop button. This red pushbutton is located on the main control panel on the right hand side of the machine near the hopper. Press the Emergency Stop button to immediately stop machine operation. This button must be released by hand before the machine can be restarted.

Safety Guarding with interlocks is available for all MARQ machines. Machines equipped with Safety Gaurding cannot be started unless ALL guard doors are closed. If any doors are opened while the machine is running the system will immediately shut down. The doors must be shut and the machine must be reset in order to restart.

Special Caution

Do not tamper with any interlock guard switches.

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Specifications

Voltage:460V, 3 Phase 60 Hz

Transformers: 0.5 KVA

Air Required: 1.56 CF per cycle @ minimum 80 psi

Sealing System:..... Dekka 2in. High Speed Tape Head with tape roll mandrel

Production Rate:..... 17-20 Cases Per Minute (CPM)

Paint:Medium Gray Powder Coat

Options:

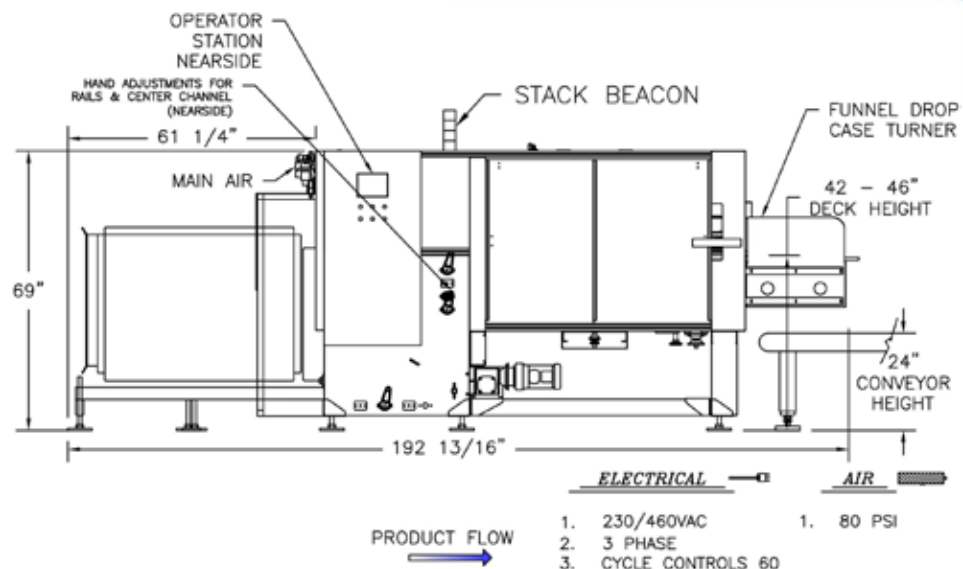
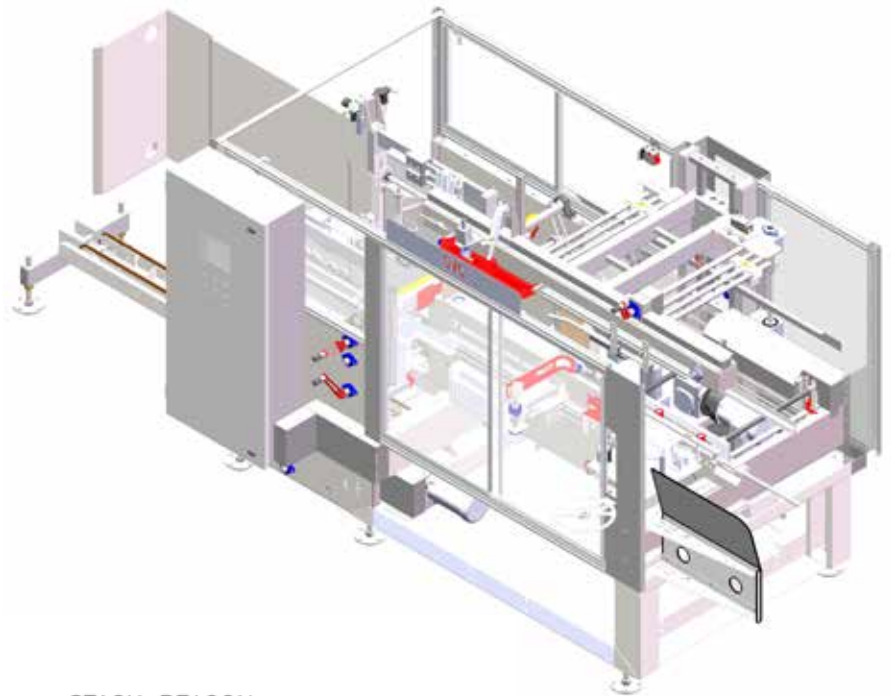
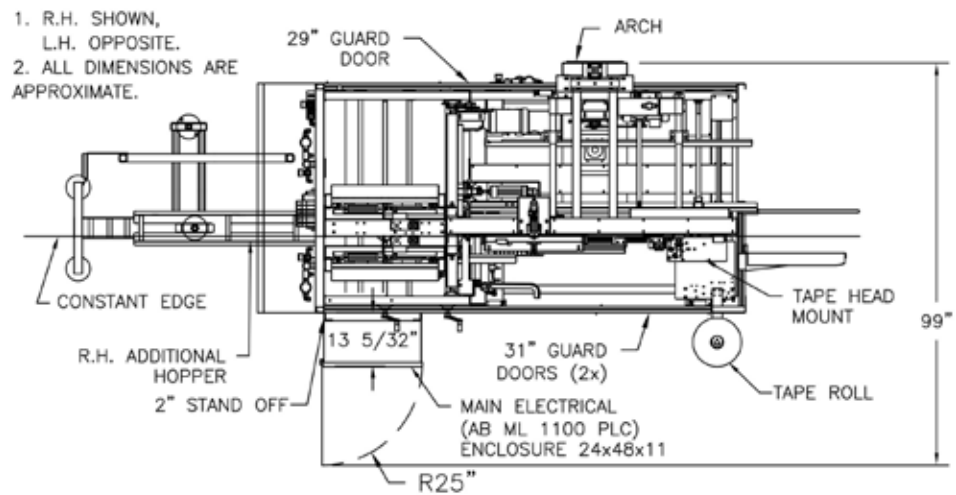
The following is a list of included options for machines Q16036 HPE220(RH)AB, built for QVC.

Hopper	Additional hopper capacity
PLC	Allen Bradley MicroLogix 1400 PLC with 6" Panelview color display, diagnostics and ethernet capability
Case Turner	Funnel drop case turner to upright case on discharge.
Flap Assist	Top Major flap folder vacuum assist (depends on case length - keeps flaps out of the way when folding) - required when case width is 12" and greater
Maintenance Package	Includes Low Tape - Tape Out - Tape Movement - Low Hopper with Stack Beacon.
Adjustments	Ruler scribe indicators for ease of changeover adjustments include Right hand rail, leading minor flap tucker, box stop, bottom vacuum cup, top rail, arch, left hand rail and center channel (dial indicator on this adjustment only)
Relays	Interface Intelligrated Machine Controller and Erector Estop- Estop condition on Erector will emergency stop conveyors Fault - Fault condition present at Erector Running/Ready - Erector is running (status) Estop - Estop condition on intelligrated conveyor will emergency stop Erector Start - Start signal from intelligrated will start machine Stop - Normal stop condition, will stop machine Ready to Receive - Upstream conveyor is ready for the next case

Operation

Operation Manual & Operator Training Guide

HPE220 Case Erector Bottom Sealer

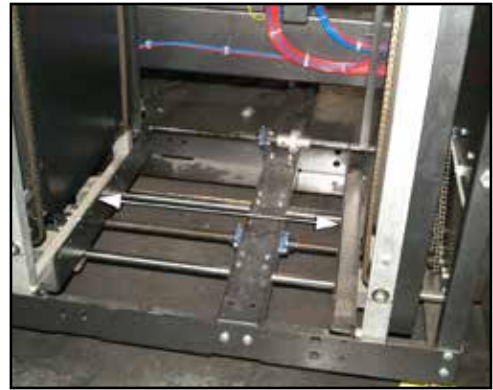


Machine Operation

Bundles of knockdown cases are placed in the bundle hopper on the stack supports, top side to the left

The bundle is then raised by lift plates to the nip rolls of the machine.

A sensor, mounted near the vacuum cups on the right side, detects the height of the cases and causes the motors to stop lifting the bundle.



*figure 14-1
Hopper*

The hopper vacuum cups are applied to the top case. These cups lift the case and slide it into the nip rollers.

The nip rollers feed the case into the erecting station.



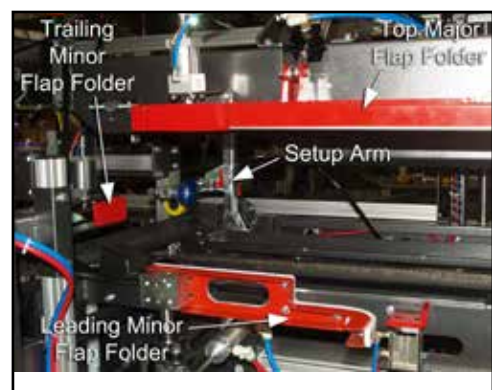
*figure 14-2
Feeding the knockdowns*

A bottom vacuum cup lifts up to the bottom of the case and holds the case while it is being erected.

The vacuum cup, mounted on the pickup arm, comes down on the top of the case and erects it.

After the case is erected the two minor flaps are folded.

The top major flap is folded and held by the major flap folding plate as the flight lugs push the case towards the sealing station.



*figure 14-3
Case Setup*

Machine Operation

Just before the case goes through the tape head the bottom major flap is folded. A photo eye senses the case and actuates the bottom major flap folder.

MARQ machines are available with a variety of tape heads. A 3M tape-head is shown. For parts and maintenance please refer to the manufacturer's manual that was shipped with your machine.



figure 15-1
Bottom Major Folder and Sealing

Controls

Main Disconnect

The Main Disconnect is a red switch located on the front of the main electrical panel. The switch must be set to the on position for the machine to run.

Note: The door latches on the electrical panel must be in the closed position before the machine power can be turned on

This switch should be locked into the off position before repairing or maintaining the machine. Pull out the white inset and insert locking device.



*figure 16-1
Main Disconnect Switch*

These controls are located on the main electrical panel, unless otherwise indicated. These buttons allow the operator to start and stop the machine.

Note: The button layout may vary from that shown.

EMERGENCY STOP

The EMERGENCY STOP is a red, mushroom-shaped, button that immediately stops the machine when pushed down. In order to start the machine this button must be released. To release the button turn it clockwise.

The EMERGENCY STOP button will be lit when it is pushed down.

There is a second EMERGENCY STOP button on the left side of the machine.

SAFETY RESET

The SAFETY RESET button resets the safety circuitry after the EMERGENCY STOP has been pulled back up and all Guard Doors have been closed.

When the machine has been reset and is ready to run the light in this button will be on.

There is a second SAFETY RESET button on the left side of the machine, however only the button on the selected station will operate.



*figure 16-2
Control Panel Button*

CYCLE START

Push the CYCLE START button to begin processing cases.

The light in this button is on when the machine is processing or ready to process cases.

There is a second CYCLE START button on the left side of the machine, however only the button on the selected station will operate.

CYCLE STOP

When the CYCLE STOP button is pushed the machine will complete the current cycle and then stop. There is a second CYCLE STOP on the left side of the machine.

ARCH UP DOWN

The ARCH UP DOWN switch is used to make adjustments to the Arch position during case changeover. Turn the switch to the desired direction and hold until the Arch nears the desired position. Release the switch to stop motion (allow about 1/8 - 1/4 inch for the arch to stop).

STACK LOADED

If there is not a new stack in the hopper when the Load Height Proximity switches have been made, this button will flash. Load cases and then push the STACK LOADED button.

STATION SELECTOR MAIN REMOTE

The STATION SELECTOR switch sets the station from which the machine can be started. The SAFETY RESET and CYCLE START buttons will affect machine operation only from the station set by this switch.

Operating Procedures

NOTE: The SAFETY RESET buttons and CYCLE START buttons will operate only from the panel set by the STATION SELECTOR switch.

Startup

1. Verify that the electrical and the pneumatic connections are established according to the instructions in the installation section (page 53).
2. Push the Main Air Valve up to the Open or On position.
3. Check the air pressure gauge above the air regulator and make sure the air pressure maintains a constant 80 psi while the machine is in operation.
4. Release the EMERGENCY STOP button on the main control panel by turning the button clockwise.
5. Push the SAFETY RESET button on the main control panel.
6. Push the CYCLE START button on the main control panel.

Refer to the Troubleshooting section of this manual if there are any problems regarding the machine start.

Normal Shutdown

1. Push the CYCLE STOP button.
2. Push the EMERGENCY STOP button after the machine stops.
3. Turn the Main Air Valve to exhaust to remove the air supply from the machine.

Emergency Shutdown

1. Push the EMERGENCY STOP button on the main control panel. This will stop the machine immediately, and not in its normal cycle.
2. Physically remove the cases in the machine.
3. When you are ready to restart the machine release the EMERGENCY STOP button and push the SAFETY RESET button.

Clear Out

1. Push the CYCLE STOP button.
2. When a setup case is waiting, press the CLEAR OUT button on the operator panel once. The case moves forward to the sealing station.
3. Press the CLEAR OUT button again, the case is moved out of the erector.
4. Press the EMERGENCY STOP button.



*figure 18-1
Air Gate*



*figure 18-2
Air Pressure Gauge*



*figure 18-3
Emergency Stop
Button*



*figure 18-4
Safety Reset Button*



*figure 18-5
Cycle Stop Button*

Operating Procedures

Clearing Jams

1. Shutdown the Case Erector by pushing down the EMERGENCY STOP button or opening a guard door.
2. Remove the case and any debris or corrugated fiber. Be careful not to allow any debris to fall into any part of the machine.
Note: Refer to the Troubleshooting Section for possible corrective actions to prevent future jamming.
3. Carefully inspect the machine for any debris fallout.
4. Account for all tools, parts, and materials.
5. Startup the Case Erector as described in the Startup Procedure (page 17) and check for proper operation.

Loading the Hopper

1. Load the knockdowns so that the manufacturer's seam is up. The bottom of the case should be against the back wall of the hopper.
2. Load cases onto the bundle chain. **Do Not** load cases into the bundle elevator.
3. Make sure the cases are loaded squarely and evenly on the hopper, and that they are all facing the same way.
4. If the **STACK LOADED** light is flashing then the button must be pressed, when the stack has been loaded.

Caution:
Use care when adding knockdowns to the hopper while the Case Erector is running.

CAUTION
Turn Off All Electrical and Air Connections To This Equipment Before Repairing, Cleaning, or Removing Jammed Cases.
Do Not Put Hands or Tools Into Equipment While Case Erector Is Operating.

Operating Procedures

Changeover

1. Shutdown the Case Erector as described under Normal Shutdown (page 18).
2. Remove any remaining knockdowns from the hopper.
3. Using a knockdown sample, perform the following adjustments for the next case to be run. Each adjustment is described on the following pages.

Long Rail / Left Hopper Wall / Center Channel, page 21

Short Rail / Right Hopper Wall, page 21

Arch, page 22

Top Rail, page 22

Pickup Arm, page 22

Bottom Vacuum Cup, page 23

Leading Minor Flap Folder, page 23

Box Stop, page 23

Note: some adjustments may not be necessary for every case size.

4. On the Machine Setup Screen change the Current Case Number to the case to be run.
5. Press Load Variables to load the parameter set for the case to be run.
6. Load the hopper as described on page 19.
7. Run a few cases and examine the results to verify correct adjustments.

Rulers

Suggested adjustment positions for scaled adjustments are shown on the next page.

Operating Procedures / Adjustments

Case Number	1	2	3	4	5
Name	Q1	Q2	Q6	Q7	Q11
<u>Rulers</u>					
Top Rail	8.250	10.100	21.5	12.5	20.375
Center Channel	5.687	5.500	9.75	6.1	10.5
Long Rail	8.375	10.500	21.625	12.6	20.75
Short Rail	4.0	3.500	7.2	6.75	9.2
Leading Minor	3.0	3.750	6.5	10.0	15.0
Case Stop	12.87	12.620	24.5	26.62	37.0
Arch	7.125	6.800	11.8	12.2	18.0

Case Number	6	7	8	9	10
Name	Q16	Q17	Q18	Q19	Q20
<u>Rulers</u>					
Top Rail	20.0	15.8	16.6	13.0	13.75
Center Channel	9.5	8.25	9.5	7.5	7.6
Long Rail	20.3	16.125	16.75	13.0	14.0
Short Rail	8.8	7.625	8.875	7.8	8.375
Leading Minor	10.5	12.6	12.6	12.6	12.1
Case Stop	32.0	32.30	35.5	32.0	35.20
Arch	16.9	15.1	16.6	15.1	16.75

Case Number	11	12	13	14	15
Name	Q21	Q26	Q32	Q43	Q49
<u>Rulers</u>					
Top Rail	13.5	12.75	25.2	23.0	10.4
Center Channel	5.75	7.3	11.0	9.7	6.0
Long Rail	13.7	12.9	25.5	23.5	10.75
Short Rail	7.375	8.2	8.6	8.9	4.8
Leading Minor	19.5	10.25	8.6	12.7	6.2
Case Stop	39.37	30.50	30.10	33.6	18.2
Arch	14.4	15.4	16.7	17.4	18.4

Case Number	16	17	18	19	20
Name	Q51	Q52	Q53	Q59	
<u>Rulers</u>					
Top Rail	12.0	16.6	12.85	11.0	
Center Channel	6.75	7.75	7.2	7.375	
Long Rail	12.25	16.75	13.25	11.25	
Short Rail	6.3	5.7	4.2	6.7	
Leading Minor	5.2	7.0	15.25	7.75	
Case Stop	21.4	21.40	26.0	20.90	
Arch	12.4	11.0	8.0	10.25	

Adjustments

Most machine adjustments are locked down by optional Quick Release handles or bolts that are loosened with a wrench (not shown).

Long Rail / Left Hopper Wall / Center Channel

Place a case in between the rails. Manually erect the case and push it in front of the bottom major flap folder. (Adjust the arch if it is needed). Move the long rail so that when the bottom major flap folder is up, the case is up against it, the Bottom Major Flap should be folded up at 90 degrees, closing the case. To manually check, set the case in the machine and manually fold the minor flaps, then fold the top major flap down, and the bottom major flap up. While holding pressure against the top and bottom major flap folders, try pushing against the back of the case. The case should be able to travel with just a minimum drag.



figure 22-1
Bottom Major Flap Folder

Short Rail / Right Hopper Wall

Move the Short Rail / Right Hopper Wall out. Place a Knockdown into the hopper area (into the Nip Rolls). Adjust the Short Rail / Right Hopper Wall as needed to allow solid support by the Lift Plates and smooth transition into the Erecting Station.

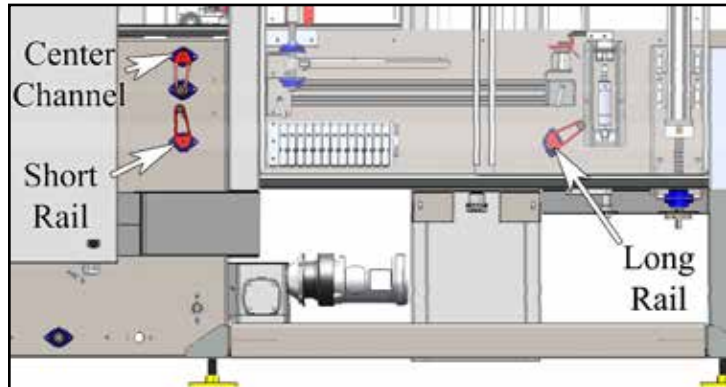


figure 22-2
Adjustment Handles

Adjustments

Arch

Before adjusting the arch, make sure the pick up arm is moved completely out of the way. Loosen the red quick release handle holding the Pickup Arm vertical position and slide the assembly down. If the arch is moved without moving the pick up arm, the pick up arm assembly may get damaged.

Manually erect the case in the erecting station. Using the Arch Adjustment control, located on the main control panel, move the arch assembly up or down until it holds the case in the erect position. Move the arch up until the case falls, this gives approximately 1/8" gap between the arch and the case.

The adjustment for the Arch is motorized. This adjustment is made using the adjustment control switch on the main control panel.

When making adjustments turn the direction select switch to the desired direction of movement. The assembly will move in the direction selected. Hold the switch until the assembly nears the desired position. Release the switch to stop the movement.

NOTE: Allow about 1/8-1/4" when releasing the switch for the movement to stop completely.

Top Rail

Use the handle on the arch above the tape head to move the top rail so that it touches the case.

Pick-Up Arm

Manually place the pick-up arm on the knock-down case.

Loosen the quick release handles and adjust the arm approximately 1" from the score line and as close to the center of the case as possible.

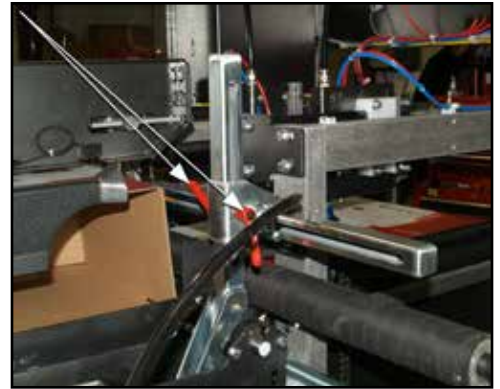


figure 23-1
Pick Up Arm Adjustment Bolts

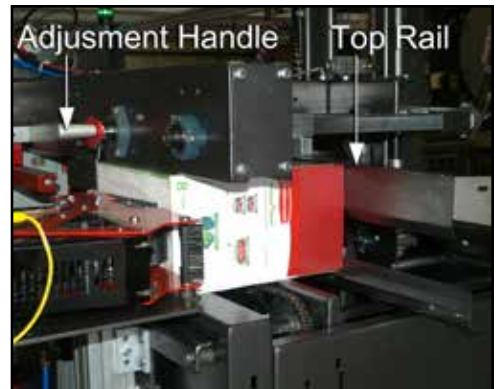


figure 23-2
Top Rail



figure 23-3
Pick Up Arm

Adjustments

Bottom Vacuum Cup

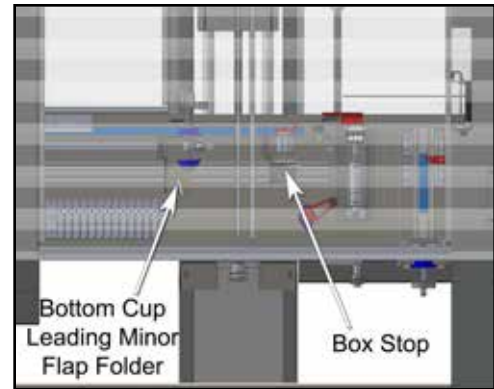
The bottom vacuum cup should be just past the cup on the pickup arm. Loosen the black quick adjust handle slide the bottom cup into position. Tighten the handle to secure the adjustment

Leading Minor Flap Folder

The Leading Minor Flap Folder can be adjusted by loosening the quick release handle and sliding the flap folder assembly. Tighten the handle to lock the adjustment in place.

Box Stop

The Box Stop should come up just ahead of the knockdown case to stop it for setup. Lay the knockdown in the center channel, positioned as for setup. Loosen the Quick Release Handle and slide the box stop to the desired location. Tighten the Quick Release Handle to secure the position.



*figure 24-1
Adjustment Handle and Bolt for Bottom
Vacuum Cup and Leading Minor Flap
Folder*

Operator Training

Operator Training

Trainee prerequisites: Knowledge of basic mechanical operations and reading.
 Classroom hours: ½ hour
 Hand-on-training: 3½ hours
 Total training hours: 4 hours

Instructor Materials: VCR or Windows Media Player.

Trainee Materials: Setup Video (available on VHS or CD-ROM), Operation Manual (pages 11-23 of this manual), Tape Head Manual

Task or Teaching Point	Additional Information
<u>CLASSROOM</u>	
I. INTRODUCTION	
A. Briefly describe the course and what each trainee will learn.	
II. MANUAL TRAINING	Service Manual - You may want to run copies or print the appropriate pages to hand out.
A. Normal Machine Operation	Pg. 13-15
B. Controls	Pg. 16-17
C. Startup	Pg. 18
D. Shutdown & Emergency Shutdown	Pg. 18
E. Clear Out	Pg. 18
F. Clearing Jams	Pg. 19
G. Loading the Hopper	Pg. 19
H. Changeover	Pg. 20-21
I. Adjustments	Pgs. 22-24
<u>HANDS-ON-TRAINING</u>	
I. NORMAL MACHINE OPERATION	
A. Controls / User Interface	Show the trainees the locations of all controls.
B. Demonstrate Startup.	
C. Run 1 or 2 cases and discuss the machine processes.	
1. Hopper	
2. Case Setup	
3. Transfer	
4. Sealing	
C. Demonstrate Shutdown.	
II. CHANGEOVER	Be sure to have 2 different case sizes for demonstration purposes.
A. Demonstrate the changeover procedure carefully explaining each adjustment.	Be sure to explain all adjustments, whether they are to be performed for this changeover or not.
1. Left Rail	
2. Right Rail	

Operator Training

Task or Teaching Point		Additional Information
	3. Arch (Top Carriage) 4. Top Rail 5. Pickup Arm 6. Bottom Vacuum Cup 7. Trailing Minor Flap Tucker 8. Hopper Length	
	B. Startup and run 1 or 2 cases to verify correct adjustments.	Allow a trainee to startup the machine and when the discussion is done have a trainee shut the machine down.
III.	JAMS	Set the machine up to jam before proceeding.
	A. Start the machine.	Have a trainee start the machine.
	B. Run a case and demonstrate the proper steps to clear the jam.	
	C. Repeat 'B' and allow the operator(s) to clear the jam.	
	D. Discuss what caused the jam and the proper steps to prevent future jamming.	
	E. Shut the machine down (if it is running).	
IV.	DAILY MAINTENANCE	
	A. Wipe Down the Machine	
	1. Dust 2. Product Accumulation 3. Grease 4. Vacuum Filters 5. Vacuum Cups	
	B. Check Safety Switches	
	1. Stop Button 2. All Guard Doors (optional)	
V.	TAPE HEAD	See the Documentation included with your tape head for roll changing, threading, and maintenance information.
	A. Replacing the roll of tape.	
	B. Threading the tape.	
	C. Oiling the blade.	

Operator Performance Assessment

Before the Performance Assessment

1. Verify that the work area conforms to all safety standards.
2. Set the machine up to jam.
3. A different case size, from the one the machine is currently set up for, should be available to the trainee.
4. Remove Tape Roll.

During the Performance Assessment

1. Stress the importance of following all safety standards.
2. Ask the trainee to complete each task on the checklist.
3. Check each block of the performance checklist as the trainee satisfactorily performs the step.
4. If the trainee fails to complete a task satisfactorily:
 - a. End the evaluation.
 - b. Review the correct procedure with the trainee.
 - c. Schedule a new assessment time for the trainee.

After the Performance Assessment

1. Verify that the work area has been cleaned up.
2. Verify that the work area is safe.
3. Review the Performance Checklist with the trainee.
4. Sign and date the Performance Checklist on the line provided.
5. Have the trainee sign and date the Performance Checklist on the line provided.
7. Forward all records to the appropriate department, for record maintenance (ie. Training Department, Personnel...)



Operator Performance Assessment

Tasks	Sat	Unsat
Install Tape Roll		
1. Threaded Tape Correctly.		
Startup the MARQ Case Erector		
1. Turn the Main Air Valve to the Supply Position.		
2. Check the Air Pressure.		
3. Pull up the STOP button.		
4. Push the START button.		
5. Turn the Hold/Run Switch to Run		
Clear a jam from the MARQ Case Erector		
1. Push the STOP button.		
2. Remove the case and any debris or corrugated fiber.		
3. Inspect for equipment damage or debris fallout.		
4. Account for all tools, parts, or materials.		
5. Press the START button.		
6. Check the next five cartons to make sure the machine is operating correctly.		
Clear Out the MARQ Case Erector		
1. Set the RUN/HOLD Switch to 'Hold'.		
2. Clear out the machine using the Clear Out Function on User Interface.		
3. Press the STOP Button.		
Changeover the MARQ Case Erector.		
1. Empty the Hopper.		
2. Adjust the machine to run the case size provided.		
Left Rail.		
Right Rail.		
Arch.		
Top Rail.		
Pickup Arm.		
Bottom Vacuum Cup.		
Trailing Minor Flap Folder.		
Hopper Length.		
3. Account for all tools, parts, or materials.		
4. Load the Hopper.		
5. Press the START button.		
6. Set the HOLD/RUN Switch to RUN.		
7. Press the STACK LOADED button if necessary.		
8. Check the next five cartons to make sure the machine is operating correctly.		
Comments:		

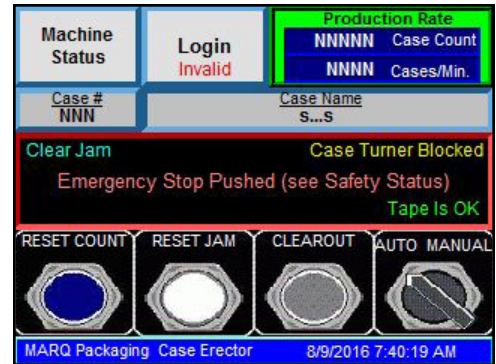
Evaluator Signature and Date
Trainee Signature and Date

Preventative Maintenance

Maintenance Manual & Training Guide



Some screens may vary slightly depending on machine status and access level.
On all screens (except the Main Screen) press **X** to return to the Main Screen.
To adjust parameter values press the existing value and enter the desired value.



Main Screen

The current Count and production rate in Cases Per Minute is displayed in the upper right corner of the screen. The Case Count can be reset to zero (0) by pressing the **RESET COUNT** button on the screen.

The current Case # and corresponding Case Name are displayed below the Production Rate.

In the center of the screen Current Machine Status (top left), Downstream Status (top right), Tape Supply Status (bottom left) and any Alarm Messages (center) are displayed.

Note: Downstream Status and Tape Supply Status are optional features.

Press:

Machine Status to transfer to the Machine Status Menu.

Login - Change access levels.

Machine Setup to transfer to the Machine Setup Menu (login required).

Case # to change to a different Case #

RESET COUNT to reset the Case Count to zero (0).

RESET JAM - when the machine is in a jam push this button after clearing any cases from the machine.

CLEAROUT to transfer cases in the machine forward without feeding in a new case.

MODE AUTO MANUAL to change machine modes.

AUTO - PLC control.

MANUAL - Operator control, diagnostic testing.

Machine Status (not shown)

Press one of the buttons to transfer to the corresponding screen.

Machine Setup - transfer to the Machine Setup Menu.

PLC I/O - view PLC I/O status.

Recipe List - view a list of recipes.

Alarm History to view a list of past and present alarms.

Logout - to change access levels.

Rulers - to view suggested positioning for each scaled adjustment.

Machine Setup (not shown)

Press one of the buttons to transfer to the corresponding screen.

Case Setup, Hopper Setup, Transfer Setup, Erector Setup, Tape Setup, Rulers Setup to setup parameters.

Maintenance to transfer to the Maintenance Menu.

Logout - to change access levels.

Machine Status - transfer to the Machine Status Menu.

Recipe List

Use the arrow buttons on the right side of the screen to move through the list of existing recipes.

Press the enter key to set one as the current recipe number.



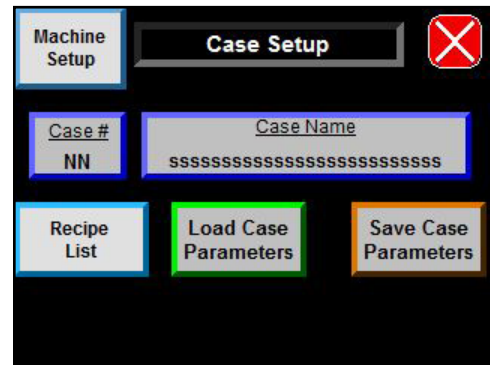
User Interface

Some screens may vary slightly depending on machine status and access level.

On all screens (except the Main Screen) press **X** to return to the Main Screen.

To adjust parameter values press the existing value and enter the desired value.

On all screens (except the Machine Setup Screen) press **Machine Setup** to return to the Machine Setup Screen.



The Case Setup screen features a top navigation bar with 'Machine Setup' and 'Case Setup' (highlighted in grey) and a red 'X' button. Below the bar, there are two input fields: 'Case #' with the value 'NN' and 'Case Name' with a string of 16 's' characters. At the bottom, there are three buttons: 'Recipe List' (blue), 'Load Case Parameters' (green), and 'Save Case Parameters' (orange).

Case Setup

Press:

Case # to change to a different case number.

Case Name to change the name of the current Case #.

Recipe List to view a list of recipes.

Load Case Parameters to load the stored values for the current Case #.

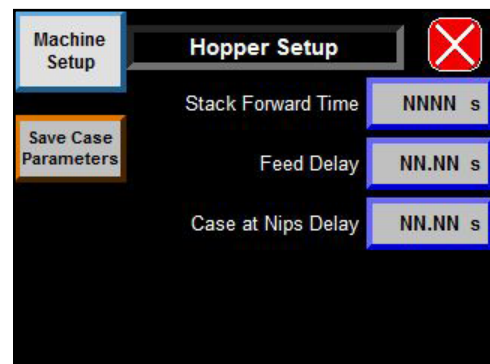
Save Case Parameters to save the current values for the current Case #.

Hopper Setup

Stack Forward Time - The amount of time expected for a new stack to make the stack forward sensor. If the sensor is not actuated the system will generate a load hopper warning.

Feed Delay - The amount of time after transfer begins at which the hopper may begin feeding the next blank. Adjust based on the size of the knock-down.

At Nips Delay - The amount of time after passing over the 'At Nips PE' when the hopper vacuum is released, allowing the case to be drawn into the machine for setup.



The Hopper Setup screen features a top navigation bar with 'Machine Setup' and 'Hopper Setup' (highlighted in grey) and a red 'X' button. Below the bar, there are three input fields: 'Stack Forward Time' with the value 'NNNN s', 'Feed Delay' with the value 'NN.NN s', and 'Case at Nips Delay' with the value 'NN.NN s'. At the bottom left, there is a 'Save Case Parameters' button (orange).

Transfer Setup (2 screens)

Flight Lug Stop Point - The distance past the sync switch at which the flight lugs stop for case setup.

Vacuum Arm Down Point - The encoder count, past sync, at which the setup arm will start moving down to contact the next case.

Top Major Off Point is the distance after the flight lugs start moving the setup case forward that the Top Major Folder retracts.

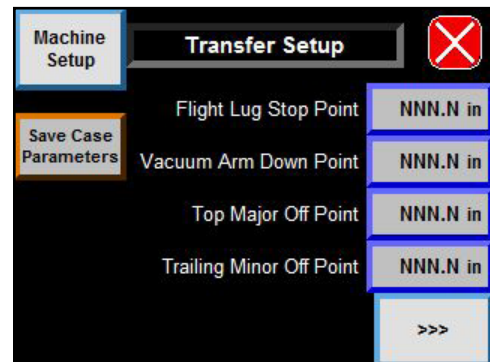
Trailing Minor Off Point - the distance after the flight lugs start moving the setup case forward that the Trail Minor Tucker retracts.

Case Stop Up Point - the point after the Front of Box sensor is actuated at which the Case Stop will come up to stop the knockdown for setup.

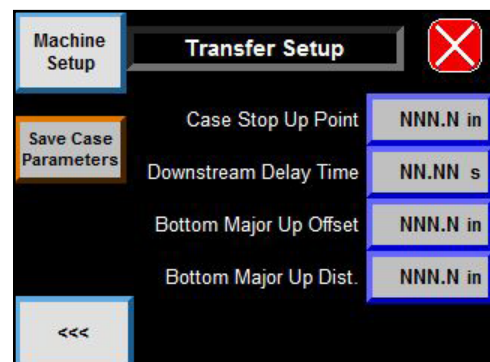
Downstream Delay Time - the amount time the Downstream Sensor (option) may be blocked before the machine will hold for downstream clearing.

Bottom Major Up Offset - The point after the Front of Box switch is actuated at which the Bottom Flap Folder will be fired.

Bottom Major Up Dist. - The distance the Bottom Flap Folder will remain up.



The first Transfer Setup screen features a top navigation bar with 'Machine Setup' and 'Transfer Setup' (highlighted in grey) and a red 'X' button. Below the bar, there are four input fields: 'Flight Lug Stop Point' with the value 'NNN.N in', 'Vacuum Arm Down Point' with the value 'NNN.N in', 'Top Major Off Point' with the value 'NNN.N in', and 'Trailing Minor Off Point' with the value 'NNN.N in'. At the bottom left, there is a 'Save Case Parameters' button (orange). At the bottom right, there is a '>>>' button (blue).



The second Transfer Setup screen features a top navigation bar with 'Machine Setup' and 'Transfer Setup' (highlighted in grey) and a red 'X' button. Below the bar, there are four input fields: 'Case Stop Up Point' with the value 'NNN.N in', 'Downstream Delay Time' with the value 'NN.NN s', 'Bottom Major Up Offset' with the value 'NNN.N in', and 'Bottom Major Up Dist.' with the value 'NNN.N in'. At the bottom left, there is a '<<<' button (blue).

Some screens may vary slightly depending on machine status and access level.

On all screens (except the Main Screen) press **X** to return to the Main Screen.

To adjust parameter values press the existing value and enter the desired value.

On all screens (except the Machine Setup Screen) press **MACHINE SETUP** to return to the Machine Setup Screen.

Erect Setup (2 screens)

Setup Arm Up Delay Time - the amount of time after the Setup Arm is Up before the Case Is Erect sensor is tested to verify case setup.

Flap Lift Delay Time - The amount of time after the case is determined to be erected before the Flap Lift cup and vacuum are activated.

Flap Lift Down Time - the amount of time the Top Major Flap Lift cups will remain down.

Flap Lift Up Time - The amount of time the Flap Lift cups will retract after capturing the major flaps.

VACUUM #2 Off On - disable or enable the second vacuum system as needed.

Minors In Time - The amount of time the Minor Flap Folders will remain extended.

Top Major Down Time - the amount of time the Top Major Flap Folder will remain down.

Vacuum Release Time - the amount of time after the case is determined to be erected before the Setup Vacuum is released.

Tape Setup

Tape Start Point - the point after the Front of Box sensor is actuated at which tape monitoring will begin.

Tape Test Point - the point after the Front of Box sensor is cleared by the case at which the Tape Actual Pulse Count is compared to the Tape Motion Test Count. If too many pulses are generated a Tape Cut Error will be generated. If not enough pulses are generated a Tape Apply Error will be generated. In either case the machine will hold and the appropriate message will appear on the display.

Expected Pulses - the number of pulses expected for correct tape application.

Tape Pulses Actual - (display only) the actual number of pulses generated for the last case processed.

Tape Enable Off On - Disable or Enable Tape Motion testing.

Rulers Setup (2 screens, one shown)

Use the placeholders on these two screens to enter suggested ruler/scale positions for each adjustments.

The values entered are displayed on the Rulers screen to ease adjustment to different case sizes.

User Interface

Some screens may vary slightly depending on machine status and access level.

On all screens (except the Main Screen) press **X** to return to the Main Screen.

To adjust parameter values press the existing value and enter the desired value.

Inputs / Outputs

The status of each input and output is displayed on these screens.

Press **Machine Status** to return to the Machine Status Menu.

Use the >>> / <<< buttons to transfer between the PLC screens.

Maintenance Menu (not shown)

Press one of the buttons to transfer to the corresponding screen.

Machine Setup - transfer to the Machine Setup Menu.

Hopper Diagnostics, Transfer Diagnostics, Erector Diagnostics, Tape Diagnostics to view input device status and test output devices.

Change Passwords - make adjustments to existing passwords (Administrator Access required)

Configure Display - Shutdown the program and go to Configuration Mode for the display.

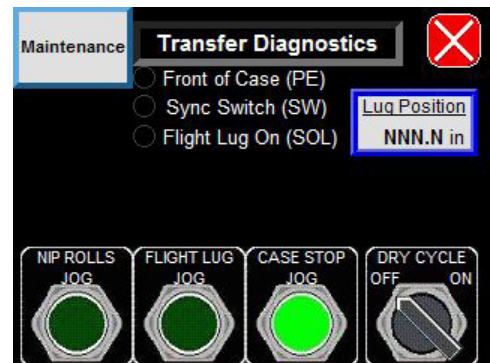
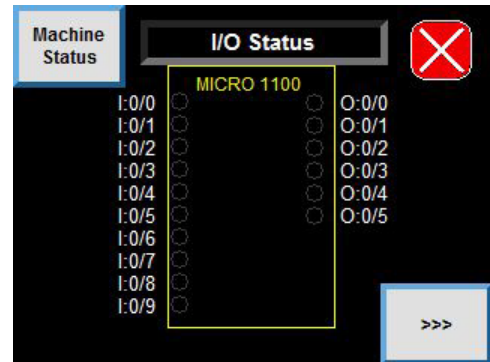
Logout - change access levels.

Diagnostics

Each diagnostics screen features indicators for input devices or buttons to test output devices or a combination of the two. The Transfer diagnostics screen also displays the current lug position.

Note: Output device testing can only be done when the machine is in Manual Mode.

Press the **Maintenance** buttons to return to the Maintenance Screen.



Case Programs (Recipes)

Load Variables for a pre-programmed case

1. On the Case Setup Screen, select the case number for the new case.
2. Press **LOAD PARAMETERS** to load the variable values for the new case or reset the machine by pushing down on the **EMERGENCY STOP** button, then pulling it back up and pushing the **START** button.

The values shown below were set during factory testing using customer cases.

Program a new case

1. On the Main Screen set the machine to Manual Mode.
2. On the Case Setup Screen, select a similar sized case.
3. Press **LOAD PARAMETERS** to load the variables for the selected case.
4. Change the Case Number to the new case.
5. Press **SAVE PARAMETERS** to save the variable values to the new case file.
6. Run cases and fine tune the values as necessary for best performance. Be sure to Save Case Variables (**SAVE PARAMETERS** on the Case Setup Screen) as they are changed. Each time the machine is reset the values will revert to the previously saved values.
7. Note all values for future reference.

User Interface

Change the values for a pre-programmed case

1. On the Case Setup Screen, select the case number for the new case.
2. Press **LOAD PARAMETERS** to load the variable values for the new case.
3. Make any changes necessary on the various setup screens.
4. Note all changes made for future reference.
5. Return to the Case Setup Screen and press **SAVE PARAMETERS** to save the changes made.
Variable changes must be saved before the next startup or they will revert to the previously saved values.

Case Number	1	2	3	4	5
Name	Q1	Q2	Q6	Q7	Q11
<u>Hopper Setup</u>					
Stack Forward Time (s)	15.0	15.0	15.0	15.0	15.0
Feed Delay Time (s)	0.60	0.60	0.60	0.60	0.60
At Nips Delay Time (s)	0.10	0.10	0.10	0.10	0.10
<u>Transfer Setup</u>					
Flight Lug Stop Point (in)	21.3	21.3	21.3	21.3	21.3
Vacuum Arm Down Point (in)	34.0	25.0	27.5	31.0	36.0
Top Major Off Point (in)	32.0	32.0	30.0	30.0	30.0
Trailing Minor Off Point (in)	0.5	0.5	0.5	0.5	0.5
Case Stop Up Point (in)	30.0	30.0	30.0	30.0	35.0
Downstream Delay Time (s)	4.00	4.00	4.00	4.00	4.00
Bottom Major Up Offset (in)	1.5	1.5	1.5	1.5	1.5
Bottom Major Up Dist. (in)	8.0	8.0	8.0	8.0	8.0
<u>Erector Setup</u>					
Setup Arm Up Delay Time (s)	0.02	0.02	0.02	0.02	0.02
Flap Lift Delay Time (s)	0	0	0	0	0
Flap Lift Down Time (s)	0	0	0	0	0
Flap Lift Up Time (s)	0	0	0	0	0
Vacuum #2	ON	ON	ON	ON	ON
Minors In Time (s)	0.40	0.40	0.40	0.40	0.40
Top Major Down Time (s)	0.20	0.20	0.20	0.20	0.20
Vacuum Release Time (s)	0.03	0.03	0.03	0.03	0.03
<u>Tape Setup</u>					
Tape Start Point (in)	10	10	10	10	10
Tape Test Point (in)	15	15	15	15	15
Expected Pulses	6	7	10	12	12
<u>Rulers</u>					
Top Rail	8.250	10.100	21.5	12.5	20.375
Center Channel	5.687	5.500	9.75	6.1	10.5
Long Rail	8.375	10.500	21.625	12.6	20.75
Short Rail	4.0	3.500	7.2	6.75	9.2
Leading Minor	3.0	3.750	6.5	10.0	15.0
Case Stop	12.87	12.620	24.5	26.62	37.0
Arch	7.125	6.800	11.8	12.2	18.0

User Interface

Case Number	6	7	8	9	10
Name	Q16	Q17	Q18	Q19	Q20
<u>Hopper Setup</u>					
Stack Forward Time (s)	15.0	15.0	15.0	15.0	15.0
Feed Delay Time (s)	0.60	0.60	0.60	0.60	0.60
At Nips Delay Time (s)	0.10	0.10	0.10	0.10	0.10
<u>Transfer Setup</u>					
Flight Lug Stop Point (in)	21.3	21.3	21.3	21.3	21.3
Vacuum Arm Down Point (in)	36.0	36.0	40.5	36.0	36.0
Top Major Off Point (in)	30.0	30.0	32.0	30.0	30.0
Trailing Minor Off Point (in)	0.5	0.5	0.5	0.5	0.5
Case Stop Up Point (in)	35.0	35.0	39.0	35.0	35.0
Downstream Delay Time (s)	4.00	4.00	4.00	4.00	4.00
Bottom Major Up Offset (in)	1.5	1.5	1.5	1.5	1.5
Bottom Major Up Dist. (in)	8.0	8.0	8.0	8.0	8.0
<u>Erector Setup</u>					
Setup Arm Up Delay Time (s)	0.02	0.02	0.02	0.02	0.02
Flap Lift Delay Time (s)	0	0	0	0	0
Flap Lift Down Time (s)	0	0	0	0	0
Flap Lift Up Time (s)	0	0	0	0	0
Vacuum #2	ON	ON	ON	ON	ON
Minors In Time (s)	0.40	0.40	0.40	0.40	0.40
Top Major Down Time (s)	0.20	0.20	0.20	0.20	0.20
Vacuum Release Time (s)	0.03	0.03	0.03	0.03	0.03
<u>Tape Setup</u>					
Tape Start Point (in)	10	10	10	10	10
Tape Test Point (in)	15	15	15	15	15
Expected Pulses	13	12	13	12	14
<u>Rulers</u>					
Top Rail	20.0	15.8	16.6	13.0	13.75
Center Channel	9.5	8.25	9.5	7.5	7.6
Long Rail	20.3	16.125	16.75	13.0	14.0
Short Rail	8.8	7.625	8.875	7.8	8.375
Leading Minor	10.5	12.6	12.6	12.6	12.1
Case Stop	32.0	32.30	35.5	32.0	35.20
Arch	16.9	15.1	16.6	15.1	16.75

User Interface

Case Number	11	12	13	14	15
Name	Q21	Q26	Q32	Q43	Q49
<u>Hopper Setup</u>					
Stack Forward Time (s)	15.0	15.0	15.0	15.0	15.0
Feed Delay Time (s)	0.60	0.60	0.60	0.60	0.60
At Nips Delay Time (s)	0.10	0.10	0.10	0.10	0.10
<u>Transfer Setup</u>					
Flight Lug Stop Point (in)	21.3	21.3	21.3	21.3	21.3
Vacuum Arm Down Point (in)	44.0	34.0	34.0	40.0	30.0
Top Major Off Point (in)	32.0	30.0	30.0	32.0	30.0
Trailing Minor Off Point (in)	0.5	0.5	0.5	0.5	0.5
Case Stop Up Point (in)	43.0	35.0	35.0	39.0	30.0
Downstream Delay Time (s)	4.00	4.00	4.00	4.00	4.00
Bottom Major Up Offset (in)	1.5	1.5	1.5	1.5	1.5
Bottom Major Up Dist. (in)	8.0	8.0	8.0	8.0	8.0
<u>Erector Setup</u>					
Setup Arm Up Delay Time (s)	0.02	0.02	0.02	0.02	0.02
Flap Lift Delay Time (s)	0	0	0	0	0
Flap Lift Down Time (s)	0	0	0	0	0
Flap Lift Up Time (s)	0	0	0	0	0
Vacuum #2	ON	ON	ON	ON	ON
Minors In Time (s)	0.40	0.40	0.40	0.40	0.40
Top Major Down Time (s)	0.20	0.20	0.20	0.20	0.20
Vacuum Release Time (s)	0.03	0.03	0.03	0.03	0.03
<u>Tape Setup</u>					
Tape Start Point (in)	10	10	10	10	10
Tape Test Point (in)	15	15	15	15	15
Expected Pulses	18	12	10	13	8
<u>Rulers</u>					
Top Rail	13.5	12.75	25.2	23.0	10.4
Center Channel	5.75	7.3	11.0	9.7	6.0
Long Rail	13.7	12.9	25.5	23.5	10.75
Short Rail	7.375	8.2	8.6	8.9	4.8
Leading Minor	19.5	10.25	8.6	12.7	6.2
Case Stop	39.37	30.50	30.10	33.6	18.2
Arch	14.4	15.4	16.7	17.4	18.4

User Interface

Case Number	16	17	18	19	20
Name	Q51	Q52	Q53	Q59	
<u>Hopper Setup</u>					
Stack Forward Time (s)	15.0	15.0	15.0	15.0	
Feed Delay Time (s)	0.60	0.60	0.60	0.60	
At Nips Delay Time (s)	0.10	0.10	0.10	0.10	
<u>Transfer Setup</u>					
Flight Lug Stop Point (in)	21.3	21.3	21.3	21.3	
Vacuum Arm Down Point (in)	30.0	30.0	30.0	30.0	
Top Major Off Point (in)	30.0	30.0	30.0	30.0	
Trailing Minor Off Point (in)	0.5	0.5	0.5	0.5	
Case Stop Up Point (in)	30.0	30.0	30.0	30.0	
Downstream Delay Time (s)	4.00	4.00	4.00	4.00	
Bottom Major Up Offset (in)	1.5	0.7	0.7	0.7	
Bottom Major Up Dist. (in)	8.0	10.0	10.0	10.0	
<u>Erector Setup</u>					
Setup Arm Up Delay Time (s)	0.02	0.02	0.02	0.02	
Flap Lift Delay Time (s)	0	0	0	0	
Flap Lift Down Time (s)	0	0	0	0	
Flap Lift Up Time (s)	0	0	0	0	
Vacuum #2	ON	ON	ON	ON	
Minors In Time (s)	0.40	0.40	0.40	0.40	
Top Major Down Time (s)	0.20	0.20	0.20	0.20	
Vacuum Release Time (s)	0.03	0.03	0.03	0.03	
<u>Tape Setup</u>					
Tape Start Point (in)	10	10	10	10	
Tape Test Point (in)	15	15	15	15	
Expected Pulses	8	8	13	9	
<u>Rulers</u>					
Top Rail	12.0	16.6	12.85	11.0	
Center Channel	6.75	7.75	7.2	7.375	
Long Rail	12.25	16.75	13.25	11.25	
Short Rail	6.3	5.7	4.2	6.7	
Leading Minor	5.2	7.0	15.25	7.75	
Case Stop	21.4	21.40	26.0	20.90	
Arch	12.4	11.0	8.0	10.25	

User Interface

Case Number					
Name					
<u>Hopper Setup</u>					
Stack Forward Time (s)					
Feed Delay Time (s)					
At Nips Delay Time (s)					
<u>Transfer Setup</u>					
Flight Lug Stop Point (in)					
Vacuum Arm Down Point (in)					
Top Major Off Point (in)					
Trailing Minor Off Point (in)					
Case Stop Up Point (in)					
Downstream Delay Time (s)					
Bottom Major Up Offset (in)					
Bottom Major Up Dist. (in)					
<u>Erector Setup</u>					
Setup Arm Up Delay Time (s)					
Flap Lift Delay Time (s)					
Flap Lift Down Time (s)					
Flap Lift Up Time (s)					
Vacuum #2					
Minors In Time (s)					
Top Major Down Time (s)					
Vacuum Release Time (s)					
<u>Tape Setup</u>					
Tape Start Point (in)					
Tape Test Point (in)					
Expected Pulses					
<u>Rulers</u>					
Top Rail					
Center Channel					
Long Rail					
Short Rail					
Leading Minor					
Case Stop					
Arch					

Maintenance

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Poly Carbonate Guarding - Cleaning

Wash with lukewarm water containing a neutral (**safe for plastics**) detergent using a soft sponge, a wool cloth or a chamois.

Rinse with water.

Never use razor blades, scrapers, squeegees, brushes, etc.

Suggested Fluids

Gear Box Shell Omala Oil, RL 460

Tol-O-Matic Gear Boxes..... Lithplex Grease #8052

Grease for Moving Parts Lithplex Grease #8052

DO NOT USE WD-40. WD-40 gums up and causes seals to wear out.

IMPORTANT NOTE:

The lubricant in the gear box must be checked and changed on a regular basis. Failure to do so may cause equipment damage or failure. Now is the time to set up a maintenance schedule and follow it closely. The following instructions are reprinted from BOSTON GEAR BOX:

“...it is important that the proper type of oil be used since many oils are not suitable for the lubrication of gears. Various types of gearing require different types of lubricants.

*The lubricant must remain free from oxidation and contamination by water or debris, **since only a thin film of oil stands between efficient operation and failure.** To assure long service life, the reducer should be periodically drained (preferably while warm) and refilled to the proper level with a recommended gear oil. Under normal environmental conditions oil changes are suggested after the initial 250 hours of operation and thereafter at regular intervals of 2500 hours.”*

This has to be done. **Failure to do so may void your warranty.**

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Suggested Fluids

From: http://www.lpslabs.com/product_pg/lubricants_pg/LPS1.html



LPS 1[®] PREMIUM LUBRICANT

Provides a dry, thin, greaseless lubricating film
Resists oil, dust and dirt build-up
Fast acting penetration
Displaces moisture on electrical components and delicate mechanisms
Loosens rusted or frozen parts
Provides a short term, light, corrosion resistant barrier
Non-conductive
Ideal for delicate mechanisms
Used worldwide in aviation
Safe on paint and most plastics
NSF registered category code H2, registration: #059847 (aerosol), #129040 (bulk)
Acceptable for use in Canadian Food Processing Establishments
Inverta Spray Valve

PACKAGES

Net Fill	Part No.	National Stock #
11 oz. (312 grams) aerosol	00116	7930-01-380-9028
1 gal. (3.78 liters)	01128	
5 gal. (18.93 liters)	00105	9150-01-142-9773
55 gal. (208 liters)	00155	
20 fl.oz (591 ml) trigger	00122	
312 grams (11 oz.) aerosol	C30116	

APPLICATIONS

- Cables
- Circuit Breakers
- Electric Motors
- Electronic Connectors
- Generators
- Hinges
- Ignition Systems
- Locks
- Micrometers
- Molds
- Nuts and Bolts
- Precision Open Gears
- Power Tools
- Relays
- Sliding Mechanisms
- Switch Gears

TECHNICAL DOWNLOADS

Technical Data Sheet (TDS)
Material Safety Data Sheet (MSDS) U.S. & Canada
French Canadian WHMIS
European English Safety Data Sheet (SDS) aerosol
European English SDS (bulk)
European French SDS (aerosol)
European French SDS (bulk)
中文版 MSDS
NSF Registration Letter (aerosol)
NSF Registration Letter (bulk)
Canadian Food Processors Acceptance Letter

MEETS OR EXCEEDS THESE SPECIFICATIONS

- Rolls Royce Aircraft Engine Overhaul Process 340
- Air Nippon Maintenance Manual 75-31-02
- Lockheed Martin EPSN G34.031
CPMC 79255 Rev.C
- Pratt & Whitney Canada
- Conforms to: Mil-C-23411A
- NSF Registered Category Code H2 Registration
059847 Aerosol, # 129040 Bulk

Maintenance

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Daily Preventative Maintenance

<u>Clean the machine</u>	
Clean off the dust, product accumulation, grease, etc.	
Blow out all vacuum filters	
Pick-up Arm	
Bottom Vacuum Cup	
Flap Assist *	
Clean out all vacuum cups	
Pick-up Arm	
Bottom Vacuum Cup	
Top Vacuum Cup	
Hopper Vacuum Cups	
<u>Check the electrical safety switches for correct operation</u>	
Stop Button(s)	
Main	
Remote *	
Guard Door Interlocks *	

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Weekly Preventative Maintenance

<u>Hopper Section</u>	
Remove Guards, inspect rail adjusting chains for wear and proper tension.	
Inspect adjusting shafts and bearings for excessive wear.	
Remove Guards, inspect lifting rail chains for wear and proper tension.	
Inspect all sensors for proper operation.	
Manually operate vacuum cup rails, look for binding, and insure proper forward speed synchronization between sides.	
Inspect vacuum cups.	
Check for proper lifting height of stack.	
Inspect entire assembly for loose or missing bolts, etc.	
<u>Erecting Section</u>	
Inspect upper and lower lug chains for wear, and proper tension.	
Adjust all axis full travel, check for binding.	
Inspect adjusting chains for proper tension or excessive wear.	
Manually operate all air driven devices check for proper operation and speed.	
Inspect vacuum cups for wear.	
Insure arch section is level.	
Check right angle gearboxes for excessive wear.	
Remove encoder guard, check for proper chain tension, and/or wear.	
Inspect all sensors for proper operation.	
<u>Sealing Section</u>	
Is tape centered on case?	
Inspect knife blade for excessive wear.	
Inspect all tapehead rollers for damage and proper operation.	
Insure anti backlash roll(s) are operating properly.	
Inspect low/no tape sensors.*	
Insure tape movement proximity switch is operating properly.	
<u>General</u>	
Lubricate/grease machine.	
Motor Gearbox.	
Bearings for the main drive shafts.	
Flight chain.	
Tol-O-Matic gear boxes.	
Inspect pneumatic tubing for leaks or clogs.	
Run several cases through machine, to insure system variables are optimized.	
Verify all guards have been replaced.	

Maintenance

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Semiannual Maintenance

Check the air cylinders and rebuild them if necessary	
Check all electrical connections in the panel	

Spare Parts Kit

HPE-220-SPK-6 is the suggested Spare Parts Kit for an HPE220

MARQ Part #	Qty.	Description	Brand
N914-4	1	A Cyl 1 1/2 Bore x 3 Stroke Round Body M Series	Numatics
2722	1	A Cyl Guided 1.5 Bore x 6 Stroke LCX Series	Numatics
2723	1	A Cyl Guided 1.5 Bore x 3 Stroke LC Series	Numatics
N9876-4	1	A Cyl 2 1/2 Bore x 5 Stroke Round Body M Series	Numatics
N7776-4A	2	A Sw-Reed Prox 24V QD (No Cable)	Adsens
329-1	1	Air Flow Control - 1/4 NPT - 3/8 Tube	SMC
101	1	Limit Switch - C54A2 Sync Switch	Square D
105	1	3" Switch Actuator Sync Switch	Square D
659-1	1	Rod End Bearing; 7/16" High Strength	Aurora
N9000	1	24V Solenoid Valve; Single w/Base and Speed Control, Series 2012	Numatics
7319	2	Vacuum Cups - VC106A Hopper and Bottom Cups	ViCase
1633	1	Vacuum Cup - VC27A Setup Arm Cup	ViCase
D3	2	Drive Sprocket, 40A25 w/Bearing Motor (Flight)	McGuire Bearing
[1A56PS]	2	Link Attachments, 40WK2	MARQ
[18C11-70PS]	1	Drive Roll - Special HPE 220	MARQ
2626	2	2.5 Diameter Roll, Rollflex, Yellow, 35 Durometer	MARQ
2322-1	2	Non Reflective Keyence Photo eye, Short Range (PNP)	Keyence
7709-4A	1	Micro Proximity Switch; DC QD	Allen Bradley
5226	1	E Contactor 4N/O 9A 3 Phase-120V Coil	Allen Bradley
6855-2	1	E Relay 2P/2T 24VDC	Automation Direct
1054-1	1	E Relay SPDT 24AC/DC-Term.Type Spring Clamp	Allen Bradley



Maintenance Training

Maintenance Training

Trainee prerequisites: Completion of Operator Training, Knowledge of basic maintenance operations, and reading.
 Classroom hours: ¾ hour
 Hands-on-training: 3 ¼ hours
 Total training hours: 4 hours

Instructor Materials: Two (2) Locks with keys for Air Dump and Main Electrical Panel, Screw Driver Set, Volt Meter, Basic Tool Kit, 1/4-3/8" driver set.

Trainee Materials: Preventative Maintenance Guide (pages 31-43 of this manual) and Vendor documentation showing maintenance information for machine components.

Task or Teaching Point	Additional Information
<u>CLASSROOM</u>	
I. INTRODUCTION	
A. Briefly describe the course and what each trainee will learn.	
II. MANUAL TRAINING	Service Manual - You may want to run copies or print the appropriate pages to hand out.
A. User Interface	Pgs. 33-37
B. Lubrication Fluids	Pg. 38-39
C. Daily Maintenance	Pg. 40
D. Weekly Maintenance	Pg. 41
E. Semi-Annual Maintenance	Pg. 42
<u>HANDS-ON-TRAINING</u>	Each task should be demonstrated for the trainees and whenever possible the trainees should be allowed to perform the tasks.
I. LOCK OUT PROCEDURES	
A. Panel	
B. Air System	
II. DAILY MAINTENANCE	
A. Clean the machine	
1. Dust, Product Accumulation, grease, etc.	
2. Blow out all vacuum filters	
3. Clean out all vacuum cups	
B. Check Safety Switches	
1. Stop Button(s)	
2. Guard Doors	
III. WEEKLY MAINTENANCE	
A. Hopper	
1. Remove Guards	
2. Inspect rail adjusting chains, adjusting shafts and lift rail chains for wear and tension.	Demonstrate procedure for chain tension adjustment.

Maintenance Training

Task or Teaching Point		Additional Information
3.	Inspect all sensors for proper operation	
4.	Manually operate vacuum cup rails - look for binding and proper forward speed synchronization	
5.	Inspect vacuum cups	
6.	Check for proper lifting height of stack	
7.	Inspect machine for missing bolts, etc.	
B.	Erecting Station	
1.	Inspect lug chains for wear and tension	Demonstrate procedure for chain tension adjustment.
2.	Adjust all axis full travel	
3.	Inspect adjusting chains for wear and tension.	
4.	Manually check air driven devices for proper operation	
5.	Inspect vacuum cups for wear	
6.	Insure Arch is level	
7.	Check gearboxes for wear	
8.	Check encoder for chain tension and wear	
9.	Inspect all sensors for proper operation	
C.	Sealing Section	Refer to tape head manual for maintenance and adjustment information.
1.	Tape centered?	
2.	Inspect knife blade for wear	
3.	Inspect tapehead rollers for damage	
4.	Inspect anti-backlash rollers	
5.	Inspect sensors (optional feature)	
D.	General	Indicate how to determine current oil level and the proper procedure for adding oil.
1.	Lubricate / grease machine	
	Gearbox	
	Bearings	
	Flight Chain	
	Tol-O-Matic gearboxes	
	Inspect air lines for leaks and clogs	
	Optimize system variables	Run serveral cases to verify operation
	Verify all guards have been replace	
V.	SEMI-ANNUAL MAINTENANCE	
A.	Check Air Cylinders	
C.	Check all electrical connections in the panel.	

Maintenance Performance Assessment

Before the Performance Assessment

1. Verify that the work area conforms to all safety standards.

During the Performance Assessment

1. Stress the importance of following all safety standards.
2. Ask the trainee to complete each task on the checklist.
Note: The machine may not require the completion of some maintenance tasks. In the case of these tasks the trainee should be able to demonstrate the ability to complete the task, by explaining the procedure or going through the motions as if completing the task.
3. Check each block of the performance checklist as the trainee satisfactorily performs or satisfactorily demonstrates the ability to perform the step.
4. If the trainee fails to complete a task satisfactorily:
 - a. End the evaluation.
 - b. Review the correct procedure with the trainee.
 - c. Schedule a new assessment time for the trainee.

After the Performance Assessment

1. Verify that the work area has been cleaned up.
2. Verify that the work area is safe.
3. Review the Performance Checklist with the trainee.
4. Sign and date the Performance Checklist on the line provided.
5. Have the trainee sign and date the Performance Checklist on the line provided.
7. Forward all records to the appropriate department, for record maintenance (ie. Training Department, Personnel...)



Maintenance Performance Assessment

Tasks	Sat	Unsat
Daily Maintenance		
1. Clean the machine.		
Clean off dust, product accumulation, grease, etc.		
Blow out all vacuum filters.		
Clean out all vacuum cups.		
2. Check the electrical safety switches for correct operation.		
Weekly Maintenance		
<u>Hopper Section</u>		
1. Remove guards, inspect rail adjusting chains for excessive wear and proper tension.		
2. Inspect adjusting shafts and bearings for excessive wear.		
3. Remove guards, inspect lifting rail chains for excessive wear and proper tension.		
4. Inspect all Limit Switches and Proximity sensors for proper operation.		
5. Manually operate vacuum cup rails, look for binding and insure proper synchronization.		
6. Inspect vacuum cups.		
7. Check for proper lifting height of stack.		
8. Inspect entire assembly for loose or missing bolts.		
<u>Erecting Section</u>		
1. Inspect upper and lower lug chains for wear and proper tension.		
2. Adjust all axis full travel, check for binding.		
3. Inspect adjusting chains for proper tension and excessive wear.		
4. Manually operate all air driven devices. Check for proper operation and speed.		
5. Inspect vacuum cups for wear.		
6. Insure arch is level.		
7. Check right angle gearboxes for excessive wear.		
8. Remove encoder guard, check for proper chain tension and excessive wear.		
9. Inspect all photoeyes and limit switches for proper operation.		
<u>Sealing Section</u>		
1. Is tape centered on case?		
2. Inspect knife blade for excessive wear.		
3. Inspect all tapehead rollers for damage and proper operation.		
4. Inspect anti-backlash roll(s) for proper operation.		
5. Inspect low/no tape sensors and tape motion sensor (option).		

Maintenance Performance Assessment

<u>General</u>		
1.	Lubricate/grease machine. Motor Gearbox. Bearings for the main drive shafts. Flight Chain. Tol-O-Matic gearboxes	
2.	Inspect pneumatic tubing for leaks or clogs.	
3.	Run several cases through machine, to insure system variables are optimized.	
4.	Verify all guards have been replace.	
Semi-annual Maintenance		
1.	Check the air cylinders.	
2.	Check all the electrical connections in the panel	
Comments:		
Evaluator Signature and Date		
Trainee Signature and Date		

Service & Troubleshooting

Service Manual & Training Guide



Installation

Each MARQ HPE is tested prior to shipping to ensure proper operation. Due to variations in case sizes, packing conditions, bulge and weight, it may be necessary to make minor changes in the settings discussed below to obtain optimum performance and operation.

NOTE: It is very important that once the machine arrives, it is checked carefully for any damage that may have occurred in transit. Since MARQ's terms are F.O.B. Yakima, it is your responsibility to contact the carrier and file any necessary damage claims with them.

Leveling and Adjusting Height

The machine is equipped with four adjustable pads that are located at the corners of the frame. The pads can be adjusted to obtain machine deck heights from 42 to 46 inches. Adjust and level the machine as follows:

- Use ½-ton or greater capacity jacks at the lift points located on the inner corners of the frame.
- Raise the infeed end of the machine to height desired.
- Loosen the locknuts on the footpads and lower the pad to the floor. Tighten the locknuts.
- Check for levelness across the leg frame.
- Remove the jacks and repeat the procedure on the discharge end of the machine.
- Make sure the machine is level front to back and side to side.

Electrical Connections

The following electrical connections are required:

- Connect to 460 VAC, 3 Phase 60Hz 15 amp service.
- Other voltages available on request.

Air Connections

An air supply capable of delivering the required volume of air at 80 psi should be connected to the machine using a filter / regulator / lubricator. Air line requirements between the compressor and the machine should be as follows:

- 0-25 ft. ----- ½" pipe
- 26-50 ft. ----- ¾" pipe
- Over 50 ft. ----- 1" pipe

Adjusting Air Cylinder Speed

The air valves on the machine have exhaust restrictors to control the speed of the air cylinders they operate. To increase the speed of an air cylinder, open the exhaust restrictor until the desired speed is reached. To decrease the speed of an air cylinder, close the exhaust restrictor until the desired speed is reached. For more information on the adjustment of the exhaust restrictors see page 61.

Conveyor

For optimal performance the discharge conveyor should be powered.

IMPORTANT - BREAK IN PERIOD

For the first 6 months of running check the chain tension weekly.
Tighten as necessary. See page 65 for adjustment information.

Sequence of Operation

Main Supply Power

1. 460VAC power is fed through fuses and a disconnect to a 0.5 KVA transformer to provide 110VAC power on wire #3 for control power.
2. 460VAC power is supplied to the Flight Lug Motor (MTR1111), the Stack Lift Motor (MTR1151), the Nip Roll Motor (MTR1191) and the Stack Forward Motor (MTR1231).
3. Wire #3 provides power to the Arch Lift Motor (MTR2521)
4. Wire #3 also powers the programming outlet, the PLC, the Control Relay and a 24VDC powers supply which produces 24VDC on wire #24.
5. Wire #24 powers up the Safety Relay - CRM3051.

Power On

1. Closing all guard doors and pulling up the EMERGENCY STOP button completes the circuit to the Safety Relay (CRM3051).
2. Selecting 'Main' or 'Remote' then pressing the selected SAFETY RESET button resets the Control Relay Master (CRM3051) and closes contacts 13 – 14 and 23 – 24. A set of contact from each closes to provide power for the SAFETY RESET button light and the Main Air Supply (SOL3191) which applies plant air to the system.
3. One of the energized wires from CRM3051 also turns on the flight lug motor starter (M2061), the Stack Lift Motor Starter (M2081), the Nip Roll Motor Starter (M2101) and the Stack Forward Motor Starter (M2121).

Startup Sequence

1. To begin the startup sequence, Lift the EMERGENCY STOP button, press the blue SAFETY RESET button, and then press the green CYCLE START button.
2. If there is no case present at the Case Is Erected photoeye (PE4091), then the flight lugs (SOL6011) are turned on to sync the machine. This is done by the flight lugs actuating the sync switch (LS4041).
3. If there is a case present at the Case Is Erected photoeye (PE4091), the PLC assumes the machine is in sync, and from this point the operation sequence continues in the erect section, step #6.

Hopper - Elevator

1. The Stack Lift Motor Clutch Brake (SOL6651) is actuated to move the elevator lift plates, raising the stack toward the Stack Height sensor (PE5681). When the switch is made, the elevator lift plates stop. The vacuum cup sequence is allowed to proceed. No further lifting will occur until the vacuum cups remove enough cases so that the Stack Height sensor (PE5681) is released.
2. During lifting, the Load Height sensor (PRS5541) may be released.
3. If the lifting continues so that the 'Load Height' sensors are released, the lift plates are halted until a stack is loaded and the 'Stack Loaded' button is pressed.

Hopper Vacuum Cups / Transfer

1. When the elevator has brought blanks into the proper position and if the 'Run / Hold' and 'Downstream Demand' conditions allow, a blank is lifted from the stack by turning on the Cups Vacuum On (Short Rail, SOL6541 and Long Rail, SOL6531) and lowering the hopper vacuum cups by turning on Vacuum Cups Down (Short Rail, SOL6521 and Long Rail, SOL6511).
2. When a timer has timed out in the PLC, the hopper vacuum cups down Floating and Fixed are turned off to raise the case.
3. If there is no case in the Erect station the sequence is as follows. If there is already a case in the setup station, the sequence continues in the transfer section, #1.
4. When a case transfer is started and the **Feed Delay Time** is done, the vacuum cups are moved forward by the PLC turning on the Blank Feed Forward (Short Rail, SOL6561 and Long Rail, SOL6551), bringing the blank to the Nip Rolls, passing over the 'Case At Nips' photoeye (PE5551).
5. After the time set in **At Nips Delay Time** the blank is released by turning off the vacuum and the cups move back to their normal position by the PLC turning off SOL6551 and SOL6561, ready to get another blank.
6. The Nip Rolls transfer the case from the hopper into the setup area.

Sequence of Operation

Erect

1. As the knockdown case is being brought from the hopper section the setup arm area, at a position set by **Vacuum Arm Down Point** (a variable in the PLC), the Setup Arm Down is turned on (SOL6091), to start down toward the case. The position should be set so that the vacuum cup contacts the case just after it has come to a stop. When the case has stopped and the setup arm is in the down position (on the case), the Bottom Vacuum Cup Up (SOL6101) is turned on, and the Setup Arm Vacuum On (SOL6111) is turned on.
2. When the Setup Arm Down actuates the Setup Arm Down sensor (PRS4061, mounted on the Setup Arm Cylinder), has reached the fully down point a timer is started to insure a good seal.
3. When the timer times out the Setup Arm Down (SOL6091) will be turned off starting the arm back up while holding vacuum, setting up the case.
4. When the Setup Arm Up Sensor is actuated (PRS4081 mounted on the cylinder) indicating that the vacuum arm is back up the Case Is Erected Photoeye (PE4091) is checked to see if the case has really been erected.
5. If the case is not erected and the case did not actuate (or block) PE4091 then a counter is incremented and the vacuum arm is sent down again and the logic continues from step #2. If the counter reached 3, indicating the Setup Arm has tried three times to go down and erect the case, then a fatal jam is set.
6. Flap Lift Option - After the time in **Flap Lift Delay** the flap lift cylinder (SOL6571) is sent down and the vacuum (SOL6581) is turned on. After the time set in **Top Major Flap Lift Down Time** the flap lift cylinder is turned off raising the flap.
7. Flap Lift Option - After the time in **Top Major Flap Lift Up Time** the sequence continues.
8. The Minor Flap Folders, Leading and Trailing, (SOL6021 and SOL6031) are turned on.
9. When the **Leading Minor Extend Time** is done, indicating both leading and trailing flaps are tucked, the Top Major Folder (SOL6041) is sent down to capture the minor flaps. The time for the Top Major Folder to come down is set in **Top Major Flap Folder Down Time**, a variable in the PLC.
10. Flap Lift Option - The Flap Lift Vacuum is released.
11. When the timer times out in the PLC the minor flaps are released and the vacuum is shut off. After this time the case is ready to be transferred forward.

Transfer

1. If there is already a case erected in the set up area with the minor flaps and the top major flap folded when the next blank is picked up by the Hopper Vacuum cups and is ready to be transferred in, the Flight Lugs are started (SOL6011).
2. While the chain is moving, the number of encoder counts is continually being monitored. The encoder is being driven by a 35 pitch chain and is chained to the main drive shaft.
3. After the chain has started the PLC is looking at the Front of Case Photoeye (PE5501), waiting for it to be made by the leading edge of the case. At this point the encoder starts counting pulses, when the count reaches a number set in **Bottom Major Up Point** (a variable set in the PLC) the Bottom Major Flap Folder (SOL6051), is turned on by the PLC. A count of pulses from the setup position is also kept. When the count reaches the number set in **Bottom Major Up Distance** (a variable set in the PLC) the Bottom Major Flap Folder (SOL6051) is turned off.
4. If a set up case has not reached the PE in a reasonable number of encoder counts, a jam will be set.
5. While the flight bars are traveling the sync switch (LS4041) is looked for again. If the sync switch was not hit in a reasonable number of counts then a sync jam is set.
6. While transferring the Top Major Folder is allowed to return to its up position at the point set in **Top Major Off Point** (a variable set in the PLC).
7. At the point set by Case Stop Up the Case Stop (SOL6081) is sent up to capture the case which is being fed in.

Sequence of Operation

Low Tape / Tape Out / Tape Motion Option

1. If the Tape Low Sensor (PE4571) is not actuated a Low Tape Warning will be generated. The PLC will display a message indicating the tape supply is low and the Amber Beacon will come on.
2. If the Tape Empty Sensor (PE4561) is not actuated a No Tape Warning will be generated. The PLC will display a message indicating the tape is out and the Amber Beacon will flash. The machine will finish the current cycle and then hold until the tape roll is replaced.
(Stop the machine to replenish the tap. Pressing 'Jam Reset' on the display or restarting will clear the display message.)
3. The Tape Motion Sensor (PRS4551) generates pulses as tape is applied to the case. At a point in transfer the actual number of pulses generated is compared to a control figure. If not enough pulses were generated a Tape Apply Jam will occur. If, after this test point, more pulses are received then a 'Cut Jam' will occur. In either case the PLC will display the corresponding message and the machine will stop. The Red Beacon will flash.

Clear Out

If the operator Cycle Stop button is pushed the 'Clear Out' button on the operator display may be used to finish processing the case which is already set up. After the red 'Emergency Stop' button must be pressed before restarting.

PLC Lights

Allen-Bradley
PLC Base
MicroLogix 1400
20-PT DC SINK IN / 12-PT RELAY OUT

Beacon

Red	
Solid	Machine in E-Stop
Flash	Machine Fault
Amber/Yellow	
Solid	Warning / Low Tape
Flash	Warning / No Tape
Green	
Solid	Machine Run
Flash	Downstream Hold

Light	Description	Device
<u>20-PT DC SINK IN</u>		
I:0/00	Flight Lug Encoder	ENC4031
I:0/01	Sync	LS4041
I:0/02	+24VDC Safety OK	
I:0/03	Setup Arm Down	PRS4061
I:0/04	Setup Arm Up	PRS4081
I:0/05	Case Is Erected	PE4091
I:0/06	Spare	
I:0/07	Spare	
I:0/08	Spare	
I:0/09	Spare	
I:0/10	Spare	
I:0/11	Short Rail Hopper Vacuum On	PS4501
I:0/12	Long Rail Hopper Vacuum On	PS4521
I:0/13	Spare	
I:0/14	Guards Closed	
I:0/15	Tape Motion	PRS4551
I:0/16	No Tape Detect	PE4561
I:0/17	Low Tape Detect	PE4571
I:0/18	Stack In Lift	LS4581
I:0/19	Case Turner Jam Detect	PE4591
<u>12-PT RELAY OUT</u>		
O:0/00	Audible Alarm - Machine Start	ABU5001
O:0/01	Stack Beacon - Red	BEACON 5021
O:0/02	Stack Beacon - Amber	BEACON 5021
O:0/03	Stack Beacon - Green	BEACON 5021
O:0/04	Erector E-Stop Pressed	CR5081
O:0/05	Spare	
O:0/06	Spare	
O:0/07	Spare	
O:0/08	Spare	
O:0/09	Spare	
O:0/10	Spare	
O:0/11	Spare	

PLC Lights

Allen-Bradley
Module Exp.
MicroLogix
16-PT DISCRETE INPUT

Light	Description	Device
I:1/00	Front of Case Detect	PE5501
I:1/01	Downstream Demand	Reserved
I:1/02	Spare	
I:1/03	Hopper Stack Height Safety	CR5581
I:1/04	Hopper Load Height	PRS5541
I:1/05	Case At Nips	PE5551
I:1/06	Cycle Stop, Operator Station	PB5561
I:1/07	Cycle Start, Operator Station	PBLT5571
I:1/08	Low Hopper	PE5591
I:1/09	Stack Loaded, Operator Station	PBLT5601
I:1/10	Spare	
I:1/11	Conveyor Stop Pressed	CR4671
I:1/12	Conveyor Start Pressed	CR4681
I:1/13	Stack Loaded, Remote Station	Reserved
I:1/14	Upstream Conveyor Ready	CR4691
I:1/15	Overload Tripped	CR4641

PLC Lights

Allen-Bradley
Module Exp.
MicroLogix
16-PT DISCRETE OUTPUT

Light	Description	Device
O:2/00	Flight Lug Brake/Clutch	SOL6011
O:2/01	Leading Minor Flap Folder In	SOL6021
O:2/02	Trailing Minor Flap Folder In	SOL6031
O:2/03	Top Major Flap Folder In	SOL6041
O:2/04	Bottom Major Flap Folder In	SOL6051
O:2/05	Spare	
O:2/06	Bottom Cup #2	Reserved
O:2/07	Case Stop Up	SOL6081
O:2/08	Setup Arm Down	SOL6091
O:2/09	Bottom Cup Up	SOL6101
O:2/10	Setup Arm Vacuum On	SOL6111
O:2/11	Bottom Cup Vacuum On	SOL6121
O:2/12	Erector Faulted	CR6131
O:2/13	Erector Running/Ready	CR6141
O:2/14	Spare	
O:2/15	Spare	

Allen-Bradley
Module Exp.
MicroLogix
16-PT DISCRETE OUTPUT

Light	Description	Device
O:3/00	Long Rail Hopper Cups Down	SOL6511
O:3/01	Short Rail Hopper Cups Down	SOL6521
O:3/02	Long Rail Hopper Cups Vacuum On	SOL6531
O:3/03	Short Rail Hopper Cups Vacuum On	SOL6541
O:3/04	Long Rail Blank Feed	SOL6551
O:3/05	Short Rail Blank Feed	SOL6561
O:3/06	Top Flap Assist Cup Down	SOL6571
O:3/07	Top Flap Assist Vacuum On	SOL6581
O:3/08	Spare	
O:3/09	Cycle Start Light, Oper Station	PBLT5571
O:3/10	Stack Loaded Light, Oper Station	PBLT5601
O:3/11	Spare	
O:3/12	Spare	
O:3/13	Stack Forward Motor Enable	CR6641
O:3/14	Hopper Stack Lift Brake/Clutch via Hopper Stack Height Safety	SOL6651 CR5581
O:3/15	Nip Roll Enable	CR6661

Electrical Panel

Left to Right / Top to Bottom

PLC

Fuses

Power supply

Ethernet Port

Relays

Main Disconnect

Master Control Relay

Power Distribution Block

Motor Contact (Conveyor)

Fuses

Motor Contacts

Arch Motor Controller

110V Outlet for Programming

Relays/Contactors

CRM3051 Master Control Relay

CON2041 Conveyor E-Stop Pressed

CR3201 DC Motor Drive Power On

CR4641 Overload Tripped

CR4661 Conveyor E-Stop Pressed

CR4671 Conveyor Stop Pressed

CR4681 Conveyor Start Pressed

CR4691 Upstream Conveyor Ready

CR5081 Erector E-Stop Pressed

CR5681 Hopper Stack Height Safety

CR6131 Erector Faulted

CR6141 Erector Running/Ready

CR6641 Stack Forward Enable

CR6661 Nip Roll Enable

DC Motor Control Cards

DR2501 Adjustable Arch Motor Control

Motor Contacts

Flight Bar Drive Motor

M2061/OL1101 Starter/Overload

Hopper Stack Lift Drive Motor

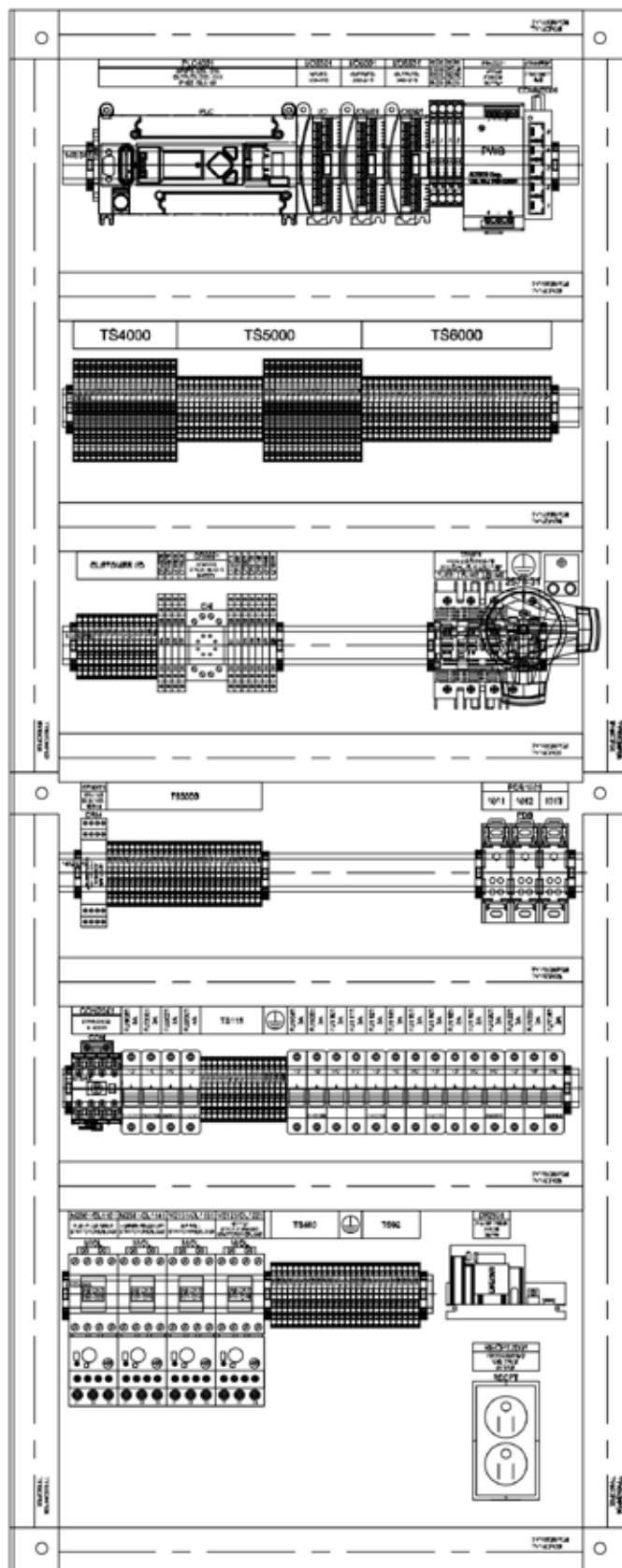
M2081/OL1141 Starter/Overload

Nip Roll Drive Motor

M2101/OL1181 Starter/Overload

Stack Forward Drive Motor

M2121/OL1221 Starter/Overload



Air System

Main Air Prep Unit

Soft Start

A soft start adjustment screw lets you adjust the speed of the air flow being applied to the machine.

Air Dump (SOL3191)

Drops air to the machine.

Manual Air Gate

The main air prep unit has a two-position gate valve that directs or shuts off high-pressure air to the machine. This shut off valve is lockable in the off position.

When the air flow switch (Gate) is set to off a lock can be installed to prevent unauthorized access.

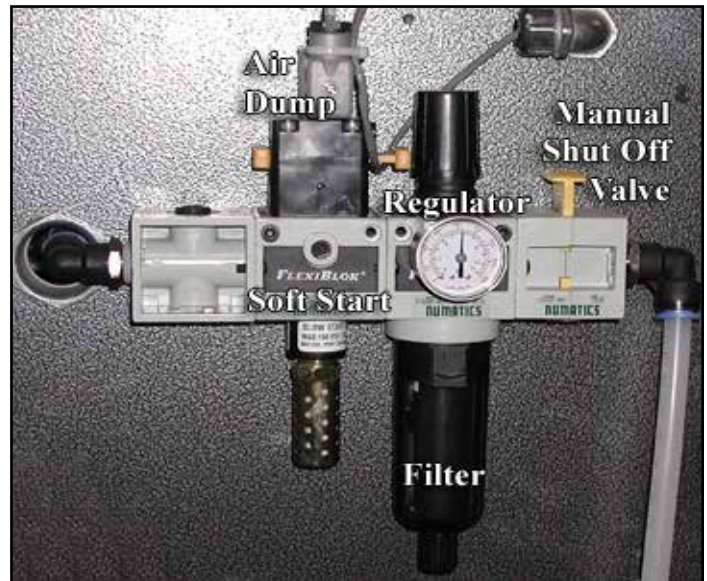
Regulator

A sight gauge shows the amount of air pressure in pounds per square inch (psi). For the machine to operate correctly this must read at a constant 80 psi.

Filter

The filter assembly removes debris from the air system.

On the bottom of the filter assembly casing there is a screw-type pet cock for draining accumulated moisture.



*Figure 65-1
Main Air Prep Unit*

The regulating hand knob adjusts the air pressure. It is located just above the sight gauge. Pulling up and turning the knob clockwise increases air pressure. Pushing the knob back down locks the adjustment in place.

Air System

Solenoid Valve

A solenoid valve (figure 66-1) receives an electrical signal from the controller to shuttle a plunger back and forth. The plunger directs air from the air lines to the air driven devices on the machine.

The manual override is a black button on the front of the solenoid valve (figure 66-2). It can be pushed to override the electrical signal, which causes the plunger to shift and direct air from the “B” port of the valve to the “A” port, causing the cylinder to actuate.

Each cylinder has an exhaust adjustment on the right end of the valve. This can be used to adjust the speed at which the corresponding device operates.



figure 66-1
Valve Bank

Valves (SOL)

- 6011 Flight Lug Brake/Clutch
- 6021 Leading Minor Flap Folder In
- 6031 Trailing Minor Flap Folder In
- 6041 Top Major Flap Folder In
- 6051 Bottom Major Flap Folder In
- 6081 Case Stop Up
- 6091 Setup Arm Down
- 6101 Bottom Cup Up
- 6111 Setup Arm Vacuum On
- 6121 Bottom Cup Vacuum On
- 6511 Long Rail Hopper Cups Down
- 6521 Short Rail Hopper Cups Down
- 6531 Long Rail Hopper Cups Vacuum On
- 6541 Short Rail Hopper Cups Vacuum On
- 6551 Long Rail Blank Feed
- 6561 Short Rail Blank Feed
- 6571 Top Flap Assist Cup Down
- 6581 Top Flap Assist Vacuum On
- 6651 Hopper Stack Lift Brake Clutch



figure 66-2
Manual Override Button

Air Cylinders

An air cylinder houses a piston that is driven back and forth by high-pressure that actuates the air-driven devices on the machine.

Flow Control valves mounted on either end of each cylinder allow for speed adjustment.



figure 66-3
Exhaust Restrictors Button

Main Drive Unit

Flight Lug Drive Assembly

- **Flight Lugs**
The flight lugs, L shaped metal pieces, are attached to motor driven chains that rotate. As the chains rotate the flight lugs push the cases through the machine.
- **Flight Lug Drive Motor**
The flight lug drive motor is a $\frac{3}{4}$ HP motor with an Air Brake Clutch that transfers the case through the machine.

Air Brake Clutch

The brake clutch module is an air assembly that starts and stops the side lugs as it transfers cases through the machine. This allows cases to be stopped at each station for the performance of various operations, without turning the motor on and off.



*figure 67-1
Grease Zerk on Tolo-Matic Gearcase*

Gear Box

The gear box is a set of gears that transfers the power and RPM's of the motor through the gears to a shaft at a ratio of 15:1 (or 30:1, depending on machine). PLEASE REFER TO THE MAINTENANCE SECTION OF THIS MANUAL FOR LUBRICATION INSTRUCTIONS. FAILURE TO LUBRICATE THE GEAR BOX PROPERLY MAY CAUSE MACHINE FAILURE AND VOID YOUR WARRANTY.

Sprocket and Chain Drive Assemblies

A set of motor driven, and idler sprockets, and chains, drive the machine's side lugs which transfer cases through the machine.

Tol-O-Matic Gear Box

This gear box transfers power from one shaft to another shaft at a 90° angle at a ratio of 1:1. PLEASE REFER TO THE MAINTENANCE SECTION OF THIS MANUAL FOR LUBRICATION INSTRUCTIONS.

Sensing Devices

Limit Switches

LS2531 Arch

Location: On top of the Arch Mount, by Arch support tubes
When this switch is actuated the selected movement is disabled.

LS4041 Sync Switch

Location: Inside the main machine at the hopper end. It is mounted underneath the center channel.

When a flight lug passes the sync switch, the encoder count is zeroed.

LS4581 Stack In Lift

Location: In hopper, bottom of machine price.

When this sensor is actuated the system recognizes a stack in the hopper. When the Hopper Load Height sensor is actuated the stack will be lifted for processing. If it is not actuated when the Hopper Load Height sensor is actuated the STACK LOADED light will flash and the button must be pressed after a stack is loaded.

Proximity Switches

PRS4061 Setup Arm Down

PRS4081 Setup Arm Up

Location: Within the setup arm cylinder housing, on the left side of the machine.

The Setup Arm Down input shows that the setup arm has reached the fully down point, and a timer is started to insure a good vacuum seal. The Setup Arm Up input indicates that the vacuum arm is back up and the case erected PE is checked.

PRS4551 Tape Motion

Location: Tape Thread Path

The Tape Motion Detect Proximity Switch generates pulses as tape is dispensed. The actual number of pulses for each case is compared to a control figure. If the number of pulses is too high, then the tape did not get cut after the case and a Tape Cut error is generated. If the number of pulses is too low, then the tape was not applied to the case as expected and a Tape Apply error is generated.

PRS5541 Hopper Load Height

Location: On short rail hopper support. This sensor hidden by the hopper guards.

When this switch is made, the Stack Lift Plate has reached a height, that a new stack can be safely loaded into the bundle hopper.

Photo eyes

PE4091 Case Is Erected

Location: On the arch at the hopper end.

This sensor detects if a case has been erected. If actuated, the flap folding sequence is started. If not, the case setup arm will try a total of three times to set the case up before going into a jam. After three tries a setup jam will be set.

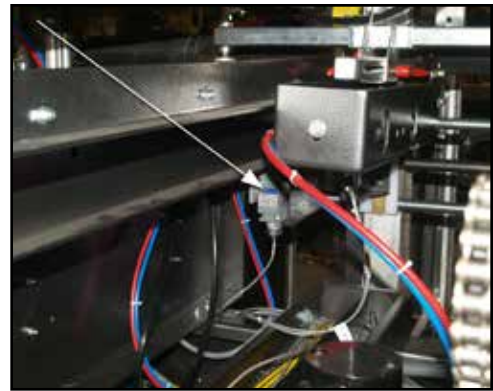


figure 68-1
Sync Switch



figure 68-1
Setup Arm Down / Up Sensors



figure 68-3
Case Is Erected Photo Eye

Sensing Devices

PE4561 No Tape Detect

Location: Under tape roll mount

When the signal from this eye is not blocked the yellow beacon will flash and the display will indicate a no tape situation. The machine will go into hold state until the tape roll is replaced and the machine is reset.

PE4571 Low Tape Detect

Location: Under tape roll mount

When the signal from this eye is not blocked the yellow beacon will come on and the display will indicate a low tape situation. The machine will continue to run as normal.

PE4591 Case Turner Jam Detect

Location: Case Turner Wall

When the signal from the eye is blocked the system will indicate a Case Turner Jam. The machine will hold and the red beacon will flash to indicate a jam. When the eye is cleared the machine will resume normal operation.

PE5501 Front of Case Detect

Location: Outside of the constant edge just before the bottom major folder.

When the Front of Case Detect Eye is made, the 'Bottom Major Up Time' is calculated. At the appropriate time the bottom major folder is sent up to capture the Bottom Major Flap.

PE5511 Downstream Demand (Option)

Location: Within 20' of the case erector (20' Cable included)

When this photoeye is blocked the case erector will go into a hold state until the eye is no longer blocked.

PE5551 Case At Nips

Location: On short rail hopper feed cylinder mount.

This photo eye tells the PLC when a case is at the nip rolls. When it is made the hopper vacuum is released.

PE5681 Hopper Stack Height

Location: On short rail hopper feed cylinder mount

When the switch is made, the Stack Lift Motor stops. Then the vacuum cups will lift the case and feed it into the nip rollers.

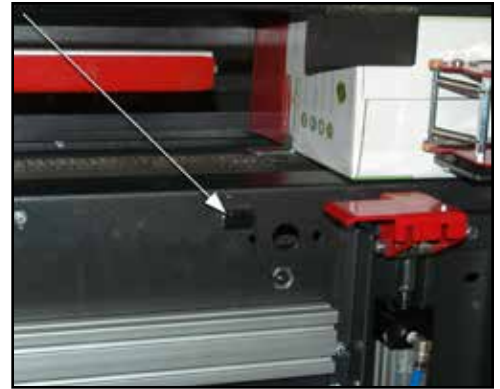
Pressure Sensors

PS4501 Short Rail Hopper Vacuum On

PS4521 Long Rail Hopper Vacuum On

Location: Hopper Vacuum System

These sensors detect when the cups have made solid contact with the case. When they are actuated the Hopper Cups will lift the knockdown case and feed it into the machine.



*figure 69-1
Front of Case Detect Photo Eye*



*figure 69-2
Case At Nips Photo Eye*

Service Procedures

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Lock Out

The Main Air Gate features Lock-Out capabilities. When pushed down to the Closed or Off position the switch can be locked into position to prevent air from being supplied to the machine.

The Main Disconnect features Lock-Out capabilities. When the switch is in the off position, pull out on the white inset in the handle. Insert a Lock-Out device to prevent power from being supplied to the machine.

Chain Tension

Pull up on the center of the chain. There should be approximately $\frac{3}{4}$ " of slack in the chain. If there is not enough tension, adjust the tension idler sprocket on the infeed end of the machine.

The idler tension sprocket is attached to an adjustment mount. **Do not loosen the idler sprocket.** Loosen the jam nut holding the adjustment. Using the adjustment bolt, tension the chain and retighten the jam nut, locking the adjustment in place.



*figure 70-1
Chain Tension*



*figure 70-2
Idler Sprocket*



*figure 70-3
Adjustment Mount*

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Aligning the Top and Bottom Drive Chains

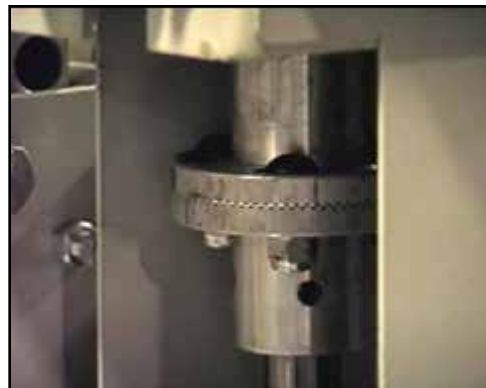
Adjusting the Coupler

Note: Make a mark across the teeth of the coupler before adjusting, to mark the starting point.

Loosen the three jam nuts on the bottom of the coupler, figure 71-1. Loosen the three bolts holding the coupler together. Separate the coupler and rotate the top shaft until the lugs line up top to bottom.

This can be checked with a case put in by hand and held firmly against the lugs. Check the back of the case to ensure the flaps are even.

Remesh the teeth on the coupler and tighten the bolts and the jam nuts.



*figure 71-1
Coupler*



*figure 71-2
Uneven*



*figure 71-3
Even*

Service Procedures

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Replacing Solenoid Valve

1. Stop the machine by pressing one of the Emergency Stop buttons.
2. Push the valve of the Main Air Prep Unit down to the Closed position.
3. Disconnect Air from the machine.
4. Remove the allen head screws on the face of the solenoid valve.
5. Unplug the solenoid valve from the manifold.
6. Plug a new solenoid into the manifold.
7. Make sure gaskets are installed, when replacing the valve.
8. Secure valve to the manifold with the allen head screws.
9. Reconnect Air
10. Reapply air and power to the machine and test the new solenoid valve.
11. Check for air leaks around new valve.

Replacing Air Regulator Diaphragm

1. Push the valve of the Main Air Prep Unit down to the Closed position.
2. Press the Emergency Stop button.
3. Unscrew the regulator's body.
4. Remove and check the condition of the regulator's diaphragm.
5. Install a new diaphragm in the regulator if needed.
6. Reassemble.
7. Reapply air and lift Stop, check air pressure and insure that it's 80psi.

Replacing Air Cylinder

1. Press the stop button and push the valve of the Main Air Prep Unit down to the Closed position.
2. Remove the air line to the cylinder.
3. Remove the cylinder from it's mount.
4. Secure the new cylinder to the mount.
5. Resecure the air line to the cylinder.
6. Reapply air to the machine by turning the valve on the Main Air Prep Unit in the Supply Position.
7. Lift the stop button, to engage the Air Dump Soft Start.
8. Manually actuate the cylinder by pressing the manual override on the appropriate valve, and check for proper operation.

Replacing Drive Chain

1. Remove master link on chain.
2. Count the number of pitches on the chain.
3. Cut new chain to the same length by counting the pitches.
4. Install new chain and reconnect with master link.
5. Tension chain using built in tensioner

Replacing Motor (drive chain)

1. Press the Emergency Stop and turn off the Main Disconnect on the Electrical Panel.
2. Remove the electrical conduit connected to the motor.
3. Remove the connector on the chain between the motor and the driven shaft.
4. Remove the mounting bolts of the motor, to the gear box.
5. Remove the motor from the gear box, by sliding motor away from the gear box.
6. Secure a new motor on the gear box with the mounting bolts.

**For more information on any of the above procedures
please refer to the appropriate vendor documentation.**

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

7. Reconnect the drive chain and electrical connections on the motor.
8. Restart and check for any excessive noise coming from the motor.

Replace Lug Chain

Note: Both the top and bottom drive chains should be replaced at the same time.

1. Loosen the tension on the drive chain.
2. Remove the connecting link and the old chain.
3. Cut a new chain identical to the old one.
4. Install the lugs off the old chain, being careful to keep the same # of pitches between the lugs.
5. Install the new chain and connecting link.
6. Tighten the chain tension.
7. Line up the lugs using the procedure described on page 67.
8. Run Flight Bar and check for excessive noise before running cases on the machine.

**For more information on any of the above procedures
please refer to the appropriate vendor documentation.**

Troubleshooting

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
Cases are jammed or are not being transferred through the Case Erector.		Removing the jammed cases: • Stop the machine by pushing the STOP button on the main control console. • Remove the jammed cases. • Check for worn or broken components, if none were found, look for other possible mechanical causes. • Restart the machine and check for smooth operation.
	An air driven device is not actuating	See page 74.
	The drive chain for the machine needs lubrication.	Use a chain lube on the drive chain to keep it lubricated.
	The chain tension needs to be adjusted.	• Loosen the 1/2" bolt in the idler sprocket (infeed end of the machine). • Move the mounting bracket in or out as needed using the 3/8" bolts (moving the bracket toward the chain will increase the tension). <i>Note: Loosen the nut on the sprocket mount before adjusting the chain tension. After the adjustment retighten the nut.</i>
	The drive chain is worn or broken.	Replace the drive chain. See page 68.
	The motor is bad.	Replace the motor that drives the drive chain if needed. See page 68.

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
Vacuum is not established to the vacuum arm cups in the machine	Poor vacuum	• Check the vacuum generator. • Clean any cardboard dust and debris from the vacuum filter • Clean any cardboard dust or debris from the inside walls of the vacuum cup. • Remove and replace the vacuum cup if it is worn, cracked, or torn.
	An air driven device is not actuating.	See page 74.
The vacuum is breaking before the case is erected, or the case has set up but the top of the case is being rolled.	The Bottom Vacuum Cup up/down doesn't reach the case in the up position.	Loosen the 2 bolts holding the cylinder mount to the frame and raise the cylinder so the cups touch the case securely in the up position.
	An air driven device is not actuating.	See page 74.
	The top or bottom vacuum cup is damaged.	Replace the damaged cup or cups.
	The vacuum filter is dirty or plugged.	Clean the vacuum filter.
	The Set Up Arm is contacting the case too early and rolling the vacuum cup.	• Increase the number for the Arm Down Point in the PLC.
	The Bottom Vacuum cup raise lower assembly is in the down position.	• Remove air from the machine and check the bottom vacuum cup assembly up and down. The cup should move freely. • Check to make sure the bottom cup comes up high enough to contact the case. • Make sure that when the bottom cup comes up, it doesn't (if at all possible) contact a score on the case. • Check the circuit to the solenoid valve that operates the bottom vacuum cup up/down cylinders.

Troubleshooting

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

Problem	Cause	Solution
The vacuum is breaking before the cae is erected, or the case has set up but the top of the case is being rolled.	The Pickup Arm is not square with the case.	• With the machine at sync, press the STOP button. Place a knockdown case in the setup section against the flight bar. • Rotate the Pickup Arm down until it contacts the case. Draw a circle around the Vacuum Cups. Refer to figure 76-1. • Rotate the Pickup Arm into the up position, then set the case up with the erected case against the flight bar. Check to make sure the circles that were drawn on the case now match the cups in the setup state (within ¼")-see figure 76-2. If the circles do not match: • Front/Back - Loosen 2 3/8" bolts and 4 1/4" bolts. Slide arm assembly until cups are even with trailing minor flap folder. • Side/Side - Loosen 1 1/2" bolt on the rail to hopper mount. • Arm til square - Match Alignment of hopper to rail edge.



figure 76-1
Draw Circle around
cups



figure 76-2
Match Circle

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
The minor flap folders do not come in to fold the flaps.	There is dirt or debris in the valve or the air lines.	• Press the STOP button to kill power and air to the machine. • Take out the 2 allen head screws hold the valve on, clean or replace the valve. • Blow out the air lines. • Check for kinked air lines.
	The air lines are kinked.	
	The exhaust restrictors are closed off too much.	
After the case is sealed, the top and bottom major flaps are uneven on the back of the case	The Case Setup Photoeye is not functioning or the Vacuum Arm Up Sensor is not functioning.	• Adjust the exhaust restrictors to increase the speed or flow. • Check the inputs to be sure that the Case Setup Photoeye is operating. • Check the input of the Vacuum Arm Up sensor for proper operation. • Check to ensure the photoeye's sensitivity is adjusted correctly. • Please refer to vendor documentation for further details.
	The top and bottom lug chains are different lengths.	Check to make sure all of the chain lengths are the same, top and bottom.
	The top and bottom lug chains are mis-aligned.	Adjust the chain alignment at the coupler. See page 67.

Troubleshooting

DANGER

TURN ELECTRICAL AND AIR OFF BEFORE
CLEANING OR REPAIRING MACHINE

DANGER

<u>Problem</u>	<u>Cause</u>	<u>Solution</u>
Air-driven device does not actuate on the machine.	Make sure that air is supplied to the machine.	• Check the plant air system. • Check the air lines to the machine for kinks or blockages.
For a list of air driven devices and their corresponding solenoid valves, see Solenoid Valves on page 62.	Not enough air pressure from the main air prep unit.	If pushing the MANUAL OVERRIDE does not actuate the cylinder (see page 62), check the air supply to the solenoid valve. (see page 62) • Make sure power is supplied to the main air prep unit. • Make sure the main air valve is in the supply (SUP.) position. • Make sure the air regulator gauge is set at 80 psi. • Make sure the air lines from the main air prep unit to the solenoid valve are not kinked or blocked. Please refer to vendor documentation for further details.
<i>Note: When manually checking the operation of the solenoid valve, the air must be on when pressing the MANUAL OVERRIDE button.</i>	The diaphragm in the air regulator is bad.	Change the regulator's diaphragm if the air pressure is still insufficient. See page 68.
	Air connections are poor.	Check to be sure the air lines are securely connected from the solenoid valve to the cylinder.
	The air lines are blocked.	Check to be sure the air lines are not kinked or blocked.
	A wire is loose in the solenoid valve, or in the electrical panel.	Check wiring connections. A orange LED light on the top of the solenoid valve illuminates when an electrical signal is received by the valve. <i>Note: There may be wire connections in the junction boxes, in the machine.</i>
	The solenoid valve is bad.	Change the solenoid valve if the cylinder still does not actuate. See page 68.
	The air cylinder does not actuate properly.	Replace the cylinder if it still does not actuate properly. See page 68.

Service Training

Service Training

Trainee prerequisites:	Completion of Operator Training, Maintenance Training, Completion of PLC Training for the Appropriate PLC System, and Knowledge of basic repair operations, and reading. PLC Training Materials can be obtained from the PLC Manufacturer.
Classroom hours:	½ hour
Hand-on-training:	3½ hours
Total training hours:	4 hours
Instructor Materials:	Two (2) Locks with keys for Air Dump and Main Electrical Panel, Screw Driver Set, Volt Meter, Basic Tool Kit, 1/4-3/8" driver set. May need a laptop with software for the machine.
Trainee Materials:	Service and Troubleshooting Manual (pages 51-74 of this manual) and Vendor documentation including service information for machine components.

Task or Teaching Point	Additional Information
<u>CLASSROOM</u>	
I. INTRODUCTION	
A. Briefly describe the course and what each trainee will learn.	
II. MANUAL TRAINING	Service Manual - You may want to run copies or print the appropriate pages to hand out.
A. Installation	Pg. 53 - Pay special attention to air line requirements.
B. Sequence of Operation	Pgs. 54-56
C. Components	Pgs. 57-66
D. Service Procedures	Pgs. 67-69
E. Troubleshooting	Pgs. 70-74
<u>HANDS-ON-TRAINING</u>	
I. The Machine Does Not Start	Each task should be demonstrated for the trainees and whenever possible the trainees should be allowed to perform the tasks.
A. STOP Button.	
B. Safety Features.	
C. Power supplied to the machine?	
D. Fuse.	
E. Motor.	
II. Case Jams.	
A. Clearing the Jam.	Brief Review of procedure covered in operator course.
III. An Air Driven Device Does Not Actuate.	
A. Electrical or Wiring Connections to the Valve.	Have the trainees locate electrical and wiring connections related to each valve operation.
B. Check Air Supply and Pressure.	Trainees should be able to verify air supply, air pressure, check all connections for leaks, and check all air lines for size, knks or blocks.

Service Training

Task or Teaching Point	Additional Information
C. Air Quality D. Replace the Regulator Diaphragm E. Replace the Solenoid Valve F. Adjust the Air Cylinder Cushion G. Replace the Air Cylinder	
IV. Mechanical Components. A. Drive Chain. 1. Chain Tension Adjustment. 2. Lubrication. 3. Replacement. B. Motor Replacement.	
V. Vacuum System Problems. A. Bottom Vacuum Cup Up/Down Adjustent 1. Doesn't reach the case in the up position. 2. Stays in the down position. B. Air Lines / Valves C. Vacuum Cups D. Vacuum Filter E. Setup Arm. 1. Too Fast 2. Too Slow	
IV. Minor Flap Folders Not Folding Flaps A. Insufficient Air Pressure B. Flow Controls on Valves (slow or fast) C. Case Setup Photoeye D. Vacuum Arm Up Switch not functioning	Trainees should be able to adjust the flow controls.
V. Not Sealing Case A. Correct Tape Threading	Demonstrate correct tape threading.
VI. Flaps Uneven at the Back of the Case A. Chain Length B. Chain Misalignment	

Service Performance Assessment

Before the Performance Assessment

1. Verify that the work area conforms to all safety standards.
2. Replace one fuse with spent fuse.
3. Decrease the Setup Arm Down Point value.
4. Decrease the air speed on one or both of the minor flap folder valves.

During the Performance Assessment

1. Stress the importance of following all safety standards.
2. Ask the trainee to complete each task on the checklist.
 - a. Hypothetical situations - have the trainee go through each step as though the problem is not resolved. Verbally indicate to the trainee that the problem has been resolved after the final step.
3. Check each block of the performance checklist as the trainee satisfactorily performs or satisfactorily demonstrates the ability to perform the step.
4. If the trainee fails to complete a task satisfactorily:
 - a. End the evaluation.
 - b. Review the correct procedure with the trainee.
 - c. Schedule a new assessment time for the trainee.

After the Performance Assessment

1. Verify that the work area has been cleaned up.
2. Verify that the work area is safe.
3. Review the Performance Checklist with the trainee.
4. Sign and date the Performance Checklist on the line provided.
5. Have the trainee sign and date the Performance Checklist on the line provided.
7. Forward all records to the appropriate department, for record maintenance (ie. Training Department, Personnel...)



Service Performance Assessment

Tasks	Sat	Unsat
Start the Machine		
1. Checked STOP Button(s).		
2. Checked Safety Features (if applicable).		
3. Checked Power to the Machine.		
4. Checked Fuses.		
5. What else would cause the machine not to start?		
Hypothetical Situation: The Setup Arm is not being fired - find the problem.		
1. Pressed the STOP button.		
2. Check electrical and wiring connections.		
3. Check the air supply.		
4. Check the air pressure.		
5. Check the air quality.		
6. Replace the Regulator Diaphragm.		
7. Replace the Solenoid Valve.		
8. Adjust the Air Cylinder Cushion.		
9. Replace the Air Cylinder.		
Hypothetical Situation: The case is not being transferred through the machine - find the problem.		
1. Check Lug Chain Tension.		
2. Check Drive Chain Tension.		
3. Check Chain Lubrication.		
4. Replace the Chain.		
5. Replace the Motor.		
Run the Case Erector		
1. Replaced Fuse.		
2. Determined vacuum problem.		
3. Adjusted Setup Arm Down Point Value.		
4. Determined Minor Flap Folding Problem.		
5. Checked Air Pressure on Flap Folder Valve.		
6. Increased Flow Control on Flap Folder Valve.		

Service Performance Assessment

Comments:
Evaluator Signature and Date
Trainee Signature and Date

Warranty

The warranty for parts or components not manufactured by seller is limited to the warranty as issued by the original equipment manufacturer. No warranties, either express or implied, are made by seller with respect to parts or components not manufactured by seller.

Seller warrants the equipment and parts manufactured by the seller to be free of defective workmanship and materials for a period of one year from the date of shipment from Yakima, Washington. Seller's sole obligation under this warranty is limited to replacing or repairing defective parts found by seller after seller's inspection to be defective, without charge, F.O.B. place of shipment, excluding installation. Seller reserves the right to inspect any claimed defect, repair defective part of install replacement parts, and to perform any adjustment incident satisfactory operation of the equipment.

This warranty applies only to the original customer-owner of the equipment and is not transferable with subsequent resale.

Seller's warranty shall not apply to any equipment or parts that have been improperly maintained, or repaired and/or altered by persons other than the seller. Seller's warranty shall not apply to any equipment and parts damaged by misuse, neglect, or accident. Seller's warranty shall not apply to any equipment and/or parts which have been improperly installed.

No other warranties, either express or implied, as to description, quality, merchantability, fitness for a particular purpose, or any other matter is made by seller. No course of dealing or usage or trade not expressly set forth in this section shall be admissible to explain, modify or contradict seller's warranty in any way.

Seller shall not in any event be liable for incidental or consequential damages or for loss of property resulting from any breach of warranty of this agreement or defect in the equipment or part.

Seller shall not in any event be liable for the failure of the equipment or parts to comply with any federal, state, or local law.



Password Access

Some screens on the User Interface require password entry for access.

7734 (Admin)

4300, 4000 (Maintenance)

Password Management

To change passwords:

1. On the Main Screen press Login.
2. Enter 7734 on the password entry screen.
3. Press Machine Setup on the Main Screen.
4. Press Maintenance on the Machine Setup Screen.
5. Press Change Passwords on the Maintenance Screen.
6. Change the passwords as needed on the Change Passwords screen.
Changes take effect immediately.
7. Press Maintenance to return to the Maintenance Screen.
8. Press Logout to restrict access.
9. Press the X in the upper right corner to return the Main Screen.

**To prevent unauthorized access to password protected information, please
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