70 CPH Farm Packer

Model: MM70

Service Manual

Serial Number: _____

Made in The U.S.A.
(Lancaster County, Pennsylvania)

Simply The Best

Distributed by Automated Ag Solutions LLC
Phone: 717-879-9219
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www.automatedagllc.com
Address: 20 Doe Run Rd. Manheim PA 17545

Warning

Do Not Operate Any Part of The Machine Unless All Guards Are In place.

NEVER service, clean, repair, and/or adjust any part of the machine while power is applied.

STOP the machine and lock out tag out before servicing, cleaning, repairing, and/or adjusting. If any guards are removed for service, cleaning, repairing, and/or the machine, replace all guards and secure them before restarting the machine.

Keep floors dry and free of broken egg, water, oil, and debris in the traffic area of the processing operation.

Employees should not operate or service the equipment with loose clothing or long hair.

Make sure all supervisors and employees understand the importance of keeping all guards in place and keeping the floor clean and dry.

Electrical Requirements

It is recommended that
Main Power Disconnect
Be switched **off** after each use of the machine.

Note: Electrical power supply to machine must include a **Main Power Disconnect** within 5ft. of the operator location.
The **Main Power Disconnect** must interrupt the power supply to the farm packer and all takeaway belts.

70CPH Farm Packer
Voltage: 120 Vac
Frequency: 50/60 HZ
Phase: 1(Single)
Current: 5.4 Amp Max. Draw
Motor: ½ HP, 240 VAC, 50-60 HZ, 3Phase Inverter Duty Motor with On-Board Inverter.

10' Takeaway Belt
Voltage: 120 Vac
Frequency: 50/60 HZ
Phase: 1(Single)
Current: 3 Amp Max. Draw
Motor:120 VAC, 50-60 HZ, 1Phase.

3' Takeaway Belt for 180 Degree Takeaway
Voltage: 120 Vac
Frequency: 50/60 HZ
Phase: 1(Single)
Current: 3 Amp Max. Draw
Motor:120 VAC, 50-60 HZ, 1Phase.

MM70 Service Manual Index

Requirements

Electrical Requirements **2**

Machine Overview **6**

Run / Stop / Jog 6

Remote / Start / Stop Switches 6

Operation / Setup Screens

Operating Screen **8**

Menu 8

Input/Output. 8

Empty 8

Set operating speed 8

Actual Case / Hr. 8

Total Case Egg Counter 8

Egg Count **9**

Reset 9

Display 9

Ledger 9

Setup #1 Screen **10**

Takeaway Full Delay 10

Takeaway Shut down Delay 10

Flow Control Off Delay 10

Flow Control on Delay 10

Setup #2 Screen **11**

Flat High Toggle 11

One Touch Toggle 11

Flat Missing Restart 11

One Touch Preset #1 11

One Touch Preset #2 11

Setup #3 Screen **12**

Fault Speed 12

Jog Speed 12

Empty Cycle Count 12

SW. Version 12

Diagnostics

Maintenance **13**

Stop Conditions/ Messages/ Alarms

Clutch Slipping **14**

Cycle Stop Overrun **15**

Egg Pile Up **16**

Flat High **17**

Flat Missing **18**

Pusher Chain Jam **19**

Takeaway Full **20**

VFD Alarm **21**

VFD Error Codes **22**

MM70 Service Manual Index

Maintenance

1.0- Cleaning.....23

2.0- Lubrication 24

2.1- Lubrication Summary..... 29

3.0- Chain Tension 30

4.0- Maintenance Reminder Reset.....31

E. Mechanical Timing & Sensor Adjustments

1.0- Sensor Locations & Diagnostics 32

2.0- Egg Infeed

2.1- Adjusting 6 Eggs Present (Flag Sensitivity). 33

2.2- Adjusting 6 Eggs Present (Flag Location) … 34

2.3- Adjusting 6 Eggs Present (Flag Height) 34

2.4- Adjusting Egg Gate Width 35

2.5- Adjusting Egg Gate Height 35

2.6- Infeed Components & Feed Wires… 36

2.7- Adjusting Slip Clutch for Egg Reservoir..... 37

2.8- (Double Egg Prevent) Z Tab… 37

3.0- Head Timing

3.1- What is Bottom Dead Center 38

3.2- Adjusting Egg Pointer Rollers 39

3.3- Adjusting Transfer Pad 40

3.4- Adjusting Egg Chute Trapdoor Release… 41

3.5- Adjusting Egg Chute Trapdoor Gap 42

3.6- Adjusting Cycle Stop/Wait Position.....43

4.0- Soft-Set Adjustments

4.1- Adjusting Height… 44

4.2- Adjusting Clamshell Gap 45

4.3- Adjusting Clamshell Release Time.....46

5.0- Carton Transport Adjustments

5.1- Carton Transport Overview.....47

5.2- Adjusting Long & Short Advance..... 49

5.3- Adjusting Carton Position under Clamshells 50

MM70 Service Manual Index

6.0- Carton Denester Adjustments

6.1- Pusher Chain Position on Idler Shaft 51

6.2- Adjusting Denester Carton Placement… 52

6.3- Adjusting Denester Start Trigger Position 52

6.4- Adjusting Denester Start Trigger Length… 53

6.5- Adjusting Splitter Fingers 54

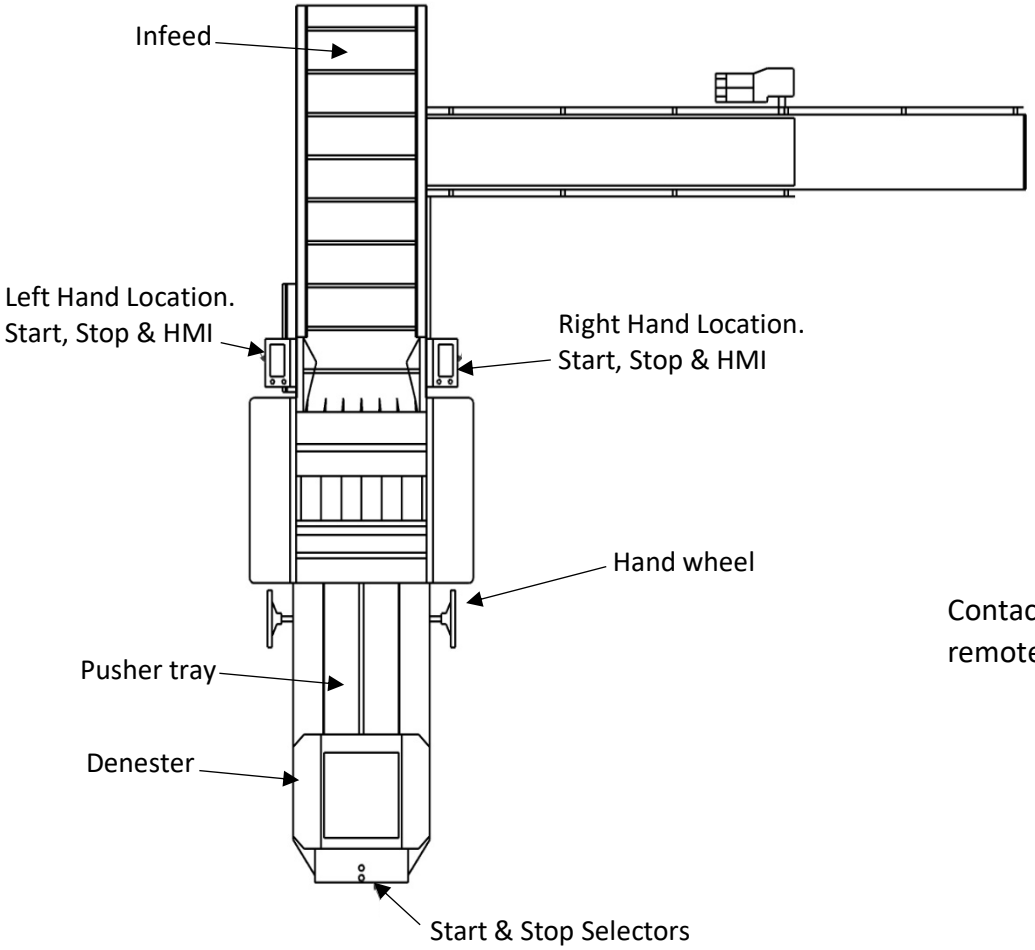
6.6- Adjusting Gripper Control Arm 55

F. Trouble Shooting 57

G. Misc. Electrical Info 60

Farm Packer Overview

Be certain the machine is clear and all guards are in place prior to power on!

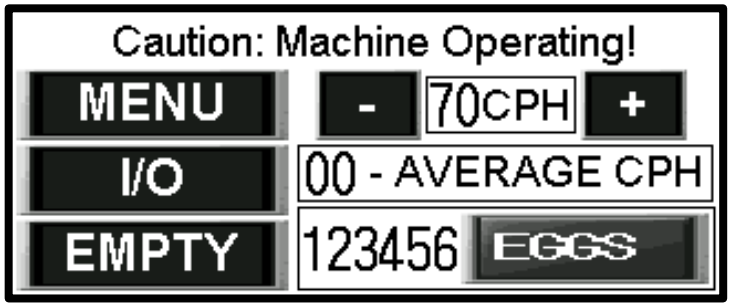


Contact your dealer for additional remote switch stations.

- Press the **Red button** to **stop** the machine.

- Press the **Green button** to **start** the machine.
- Press the **Green button** to clear an alarm and restart the machine.
- To **Jog** the machine press and hold the **Green button**. (Note: This overrides all sensors!)

Operation / Setup Screens



- Press to enter setup menu.

- Press to enter Diagnostics Menu. The status of Input / Output functions can be viewed.

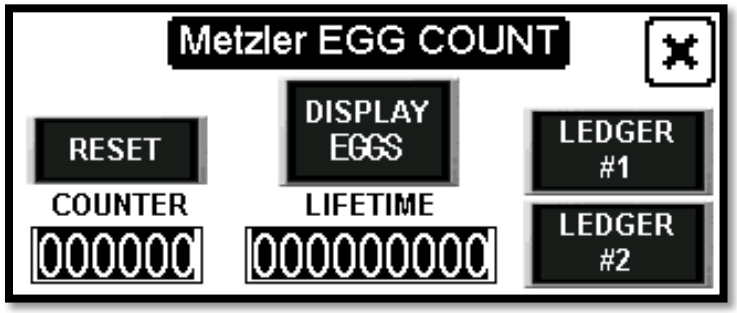
- Press to empty machine. The number of cycles to force run can be set in the [MENU].
- The machine must be running to activate this feature.

- Displays the operating speed of the machine as "**Cases per Hour**".
- Press **[-]** to decrease the current operating speed.
- Press **[+]** to increase the operating speed.

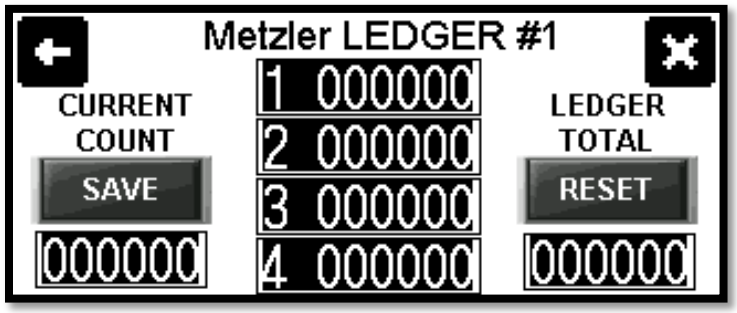
- Displays the **"Average Cases Per Hour"** packed in the last minute.

- Press [EGGS] to enter "Egg Count Menu".

Operation / Setup Screens



- Press **[Reset]** to reset counter.
- Press **[Display]** to toggle between **Eggs, Dozens** and **Cases.**
- Press **[Ledger]** to enter the respective ledger to view or save current egg counts.



- Press **[Save]** will save the **current count** to ledger. The new save will display as entry #1, and the prior counts will all move down one entry.
- Press **[Reset]** to reset **Ledger Total.**

Operation / Setup Screens

- Press [**Takeaway Full Delay]** to change delay time.
- If the takeaway full sensor is blocked longer than the time entered the packer will slow down to Fault Speed, stop advancing trays and display the alarm **Takeaway full clear Machine.**

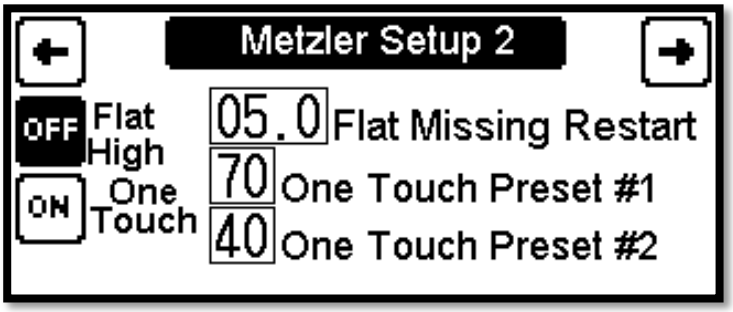
- Press [**Takeaway Shutdown Delay]** to change delay time.
- After **Takeaway full delay** expires the **Takeaway Shut Down Delay** will begin.
- When this delay expires the packer will shutdown and stop the house belts, if the trays are cleared before the **Takeaway Shutdown Delay** expires the packer will resume packing at the set speed**.**

- Press [**Flow Control Off Delay]** to change delay time.
- The flow control sensor needs to see an uninterrupted signal for the set time before it restarts the house belts.

- Press [**Flow Control On Delay]** to change delay time.
- The flow control sensor needs to see an uninterrupted blocked signal for set time before it stops the house belts.

- ✓ **Do not overfill egg reservoir!** Optimize your House Belt speed and Machine speed so the flow control rarely needs to stop the House Belts.

Operation / Setup Screens



- Press to disable or enable the flat high sensor. (May need to disable for paper trays if they are warped).

- Press to enable or disable “One Touch” preset speeds. When “One Touch” is enabled, pressing the start selector will toggle the preset speed. When the first started, Preset #1 will always load first.

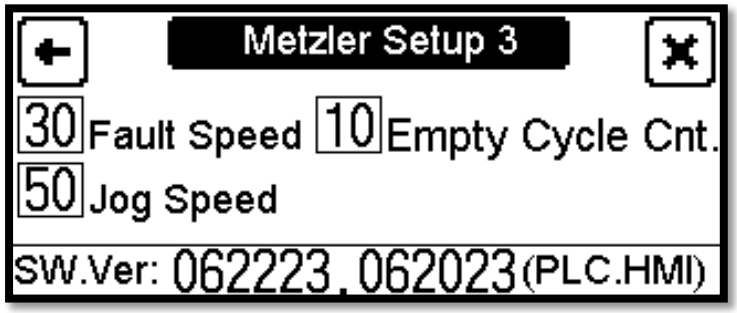
- Press to change **Flat Missing Restart**.
- If a Flat is missing, the packer will display **Flat Missing** alarm. When this delay expires the packer will shutdown and stop the house belts, if the tray is placed before the **Flat Missing Restart** expires, the packer will resume packing at the set speed**.**

- Press to set desired CPH for **One Touch Preset #1**. P

- Press to set desired CPH for **One Touch Preset #2**.

- ✓ If the packer is running and **One Touch** is **On** press the **Green Start Button** to toggle between **One Touch Preset #1** and **One Touch Preset #2.**

Operation / Setup Screens



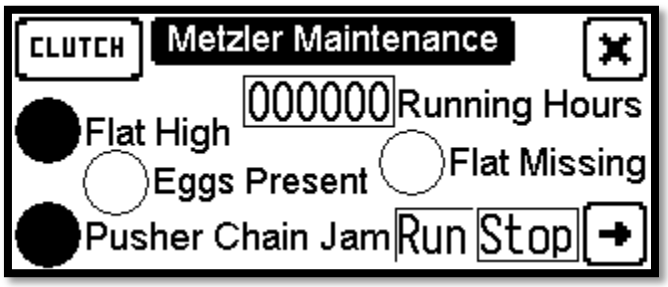
- Press to change the **Fault Speed** of the packer.
- The packer will slow to this speed if there is an **Alarm**.

- Press to change the **Jog Speed** of the packer.
- The packer will run at this speed when the [**START**] selector is pressed and held.

- Press to change the number of cycles the packer runs when the [**EMPTY**] function is activated.

- This code indicates the software version the Packer is using.

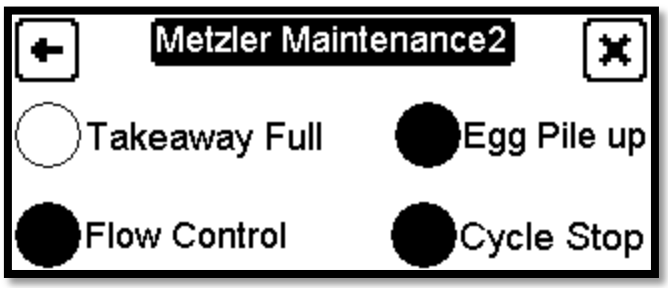
Diagnostics



- Press the [**Clutch**] button to engage and disengage the clutch for diagnostics.

- **Running Hours** Displays machine total run time.

- **Flat High** Appears dark when blocked.
- **Eggs Present** Appears light when blocked.
- **Pusher Chain Jam** Appears dark when blocked.
- **Flat Missing** Appears dark when blocked.
- **Run** Appears dark when blocked.
- **Stop** Appears dark when blocked.



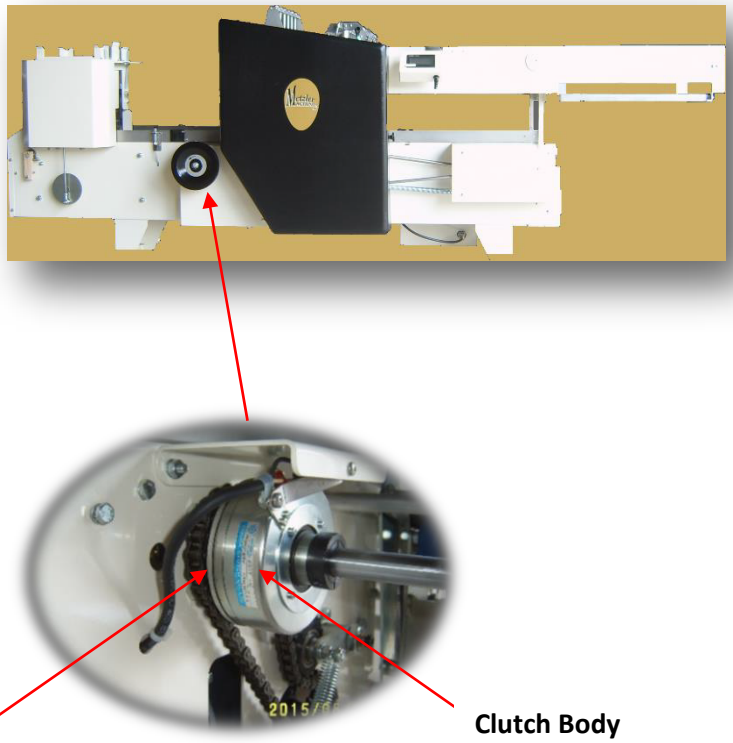
- **Takeaway Full** Appears light when blocked
- **Flow Control** Appears dark when blocked
- **Egg Pile Up** Appears dark when blocked
- **Cycle Stop** Appears dark when blocked.

Alarm Screens

- **Clutch Slipping** alarm will display if the clutch slipping timer expires, indicating the packer head did not advance in a normal time frame.
- In detail, a watchdog timer begins when a cycle starts, and is reset at the rising edge of the cycle stop sensor.
- This timer is factory set to 7/10 of a second. Consult your distributor if this setting needs to be changed.

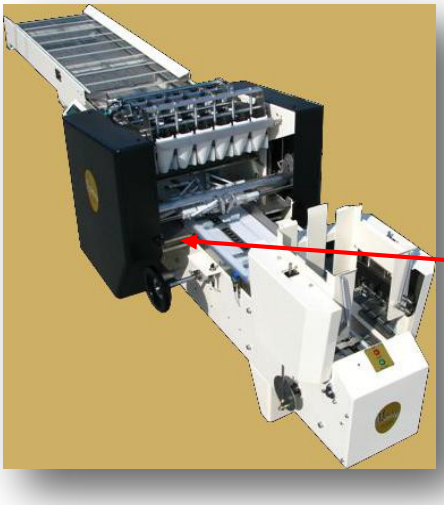
Remove 5/16” bolt in the center of the Handwheel allowing it to detach from shaft.

This will allow the removal of the clutch shield.



Alarm Screens

- **Cycle Stop Overrun** warning will display if the machine over travels its stop position.
- In detail, this alarm will display if the cycle stop signal falls without a cycle start command.
- This indicates the packer is receiving a cycle stop signal to late or there is a mechanical failure.



Remove Small Drip Tray
To Locate Sensor

3/16" Allen Screw
Loosen to Adjust Stop
Cam

Cycle Stop
Prox. Sensor

Alarm Screens

- **Egg Pile Up** alarm will display if there is any type of interruption between the *egg pile up sensor* and its reflector.
- Indicates there is an obstruction in the egg plow area.

An obstruction within the highlighted area will cause this stop condition.

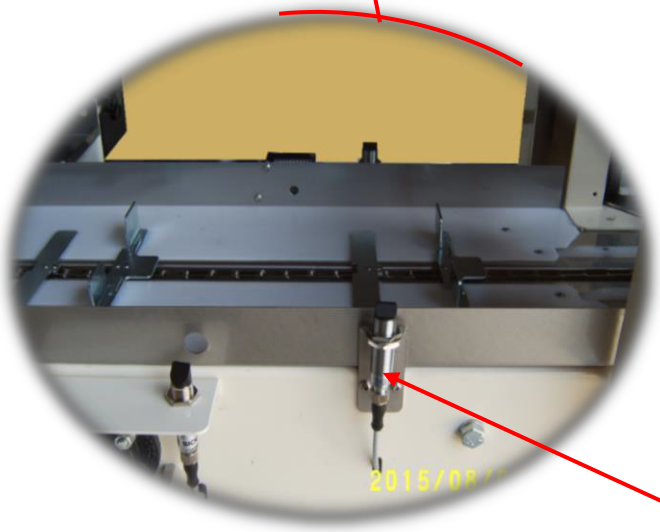
If feathers on eggs cause too many false alarms, simply un-couple the cord at the sensor base.

Pile up function will be disabled. Machine will continue to operate.

Egg Pile up Sensor Location.

Alarm Screens

- **Flat High** alarm will display if there is any type of interruption between the *flat high sensor* and its reflector while the pusher chain is in motion.
- Indicates there is a flat not positioned correctly between the pusher chain paddles.



NOTE:

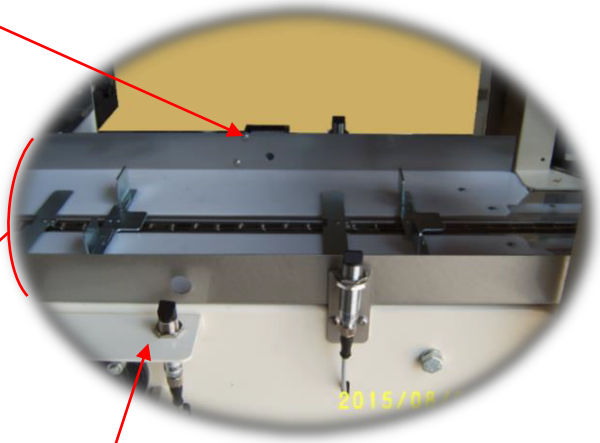
The **Flat High Alarm** function is temporarily disabled during an active **Missing Tray Alarm**. This allows the operator to correct a missing tray issue without causing a **Flat High Alarm**.

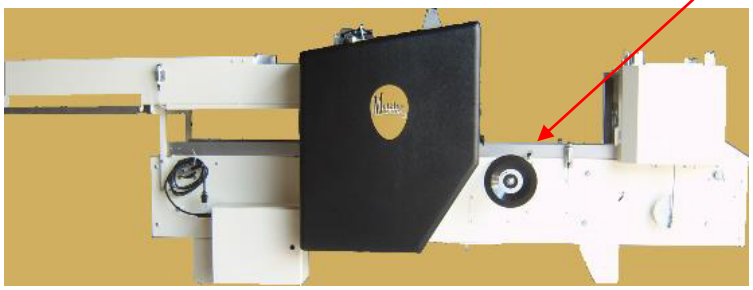
Alarm Screens

- **Flat Missing** alarm will display if the *flat missing sensor* receives a signal back from its reflector.
- Indicates a flat is not positioned correctly between pusher chain paddles or is missing.

✓ Flat missing reflector can be flipped up to run the machine without flats while cleaning.

Missing Flat Reflector behind small hole in S.S. side rail.

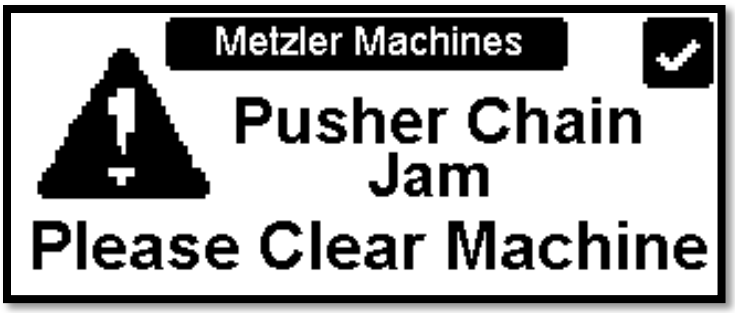




Missing Flat Sensor

23.07.11

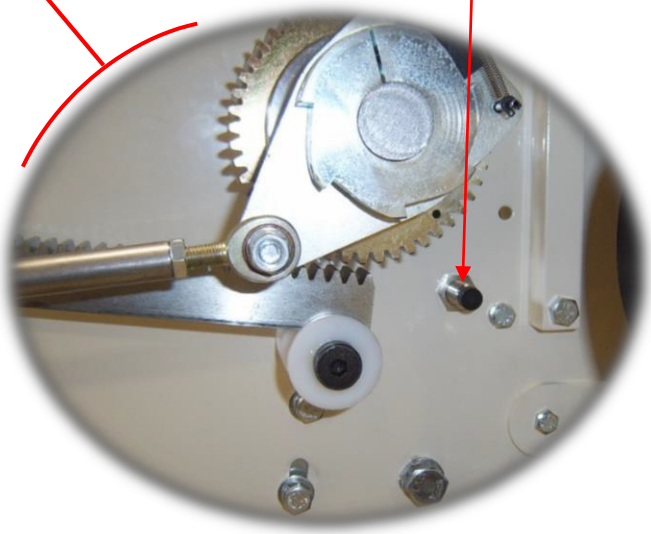
Alarm Screens



- **Pusher Chain Jam** alarm will display when the pusher chain is obstructed or does not move freely.
- This alarm also activates when the *Pusher Chain Jam Sensor* and the *Cycle Stop Sensor* are covered at the same time. During normal operation this should not occur.
- To reset an alarm condition, clear all obstructions then, grasp the top most rod of the pusher assembly and move it towards the center of the machine, until it clicks in to place.
- Then clear the alarm.

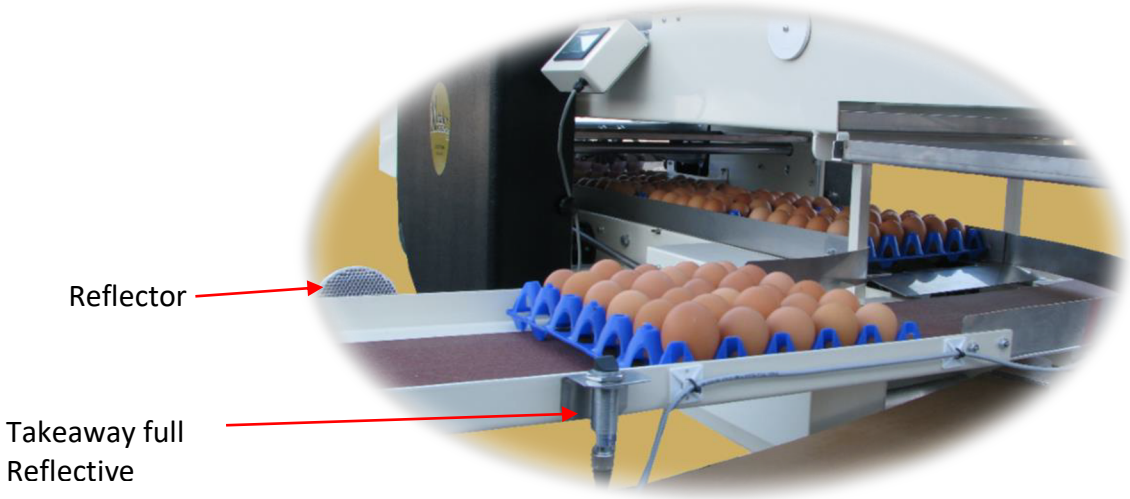
To reset an alarm condition, grasp the (Top most rod) and move it towards the center of the machine until it “clicks” back into place.

Pusher Chain Jam Sensor



Alarm Screens

- **Takeaway Full Clear Machine** alarm will be display if the flat takeaway belt becomes to full of flats filled with eggs and the machine will stop packing.

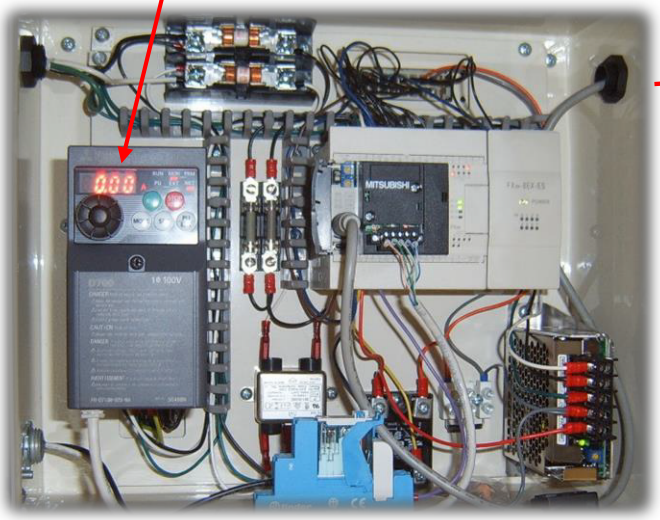


- **Tray Stacker Fault Clear Machine** alarm will display if there is a fault on the tray stacker.

Alarm Screens

- **VFD Alarm** indicates a failure or overload condition with the Variable frequency Drive that operates the 3 Phase Packer Motor.
- During normal operation the V.F.D. display indicates the current motor amperage typically between 1.35 to 1.80 amps.
- If this alarm occurs. Check the V.F.D. Display for an error code then reference to V.F.D. Error Codes chart and Contact your Distributor.
- To reset the error code turn off the Main Power Disconnect for 30 seconds.
- Note; V.F.D. error codes are displayed only on the V.F.D. Read Out in the Main Control box.

V.F.D. Readout



Refer to the next page for various fault codes and their descriptions.

Notice: Fault Codes will only display on the V.F.D. Read-out.

23.07.11

VFD Error Codes

5.2 List of fault or alarm indications

Operation Panel Indication			Name	Refer to Page
Error message	E - - -	E---	Faults history	244
	HOLd	HOLD	Operation panel lock	250
	LOCd	LOCd	Password locked	250
	Er 1 to Er4	Er1 to 4	Parameter write error	250
	Err.	Err.	Inverter reset	251
Warnings	OL	OL	Stall prevention (overcurrent)	251
	oL	oL	Stall prevention (overvoltage)	251
	rb	RB	Regenerative brake prealarm	252
	TH	TH	Electronic thermal relay function prealarm	252
	PS	PS	PU stop	252
	MT	MT	Maintenance signal output	252
	Uu	UV	Undervoltage	252
	SA	SA	Safety stop	253
Alarm	Fn	FN	Fan fault	253
Fault	E.OC 1	E.OC1	Overcurrent trip during acceleration	253
	E.OC2	E.OC2	Overcurrent trip during constant speed	253
	E.OC3	E.OC3	Overcurrent trip during deceleration or stop	254
	E.Ou 1	E.OV1	Regenerative overvoltage trip during acceleration	254
	E.Ou2	E.OV2	Regenerative overvoltage trip during constant speed	254
	E.Ou3	E.OV3	Regenerative overvoltage trip during deceleration or stop	254
	E.THT	E.THT	Inverter overload trip (electronic thermal relay function)	255
	E.THM	E.THM	Motor overload trip (electronic thermal relay function)	255
	E.FIn	E.FIN	Fin overheat	255

Operation Panel Indication			Name	Refer to Page
Fault	E.ILF	E.ILF *	Input phase loss	256
	E.OLT	E.OLT	Stall prevention	256
	E. bE	E. BE	Brake transistor alarm detection	256
	E. GF	E.GF	Output side earth (ground) fault overcurrent at start	256
	E. LF	E.LF	Output phase loss	256
	E.OHT	E.OHT	External thermal relay operation	257
	E.PTC	E.PTC*	PTC thermistor operation	257
	E. PE	E.PE	Parameter storage device fault	257
	E.PUE	E.PUE	PU disconnection	257
	E.rET	E.RET	Retry count excess	257
	E. 5 / E.CPU	E.5 / E.CPU	CPU fault	258
	E.CdO	E.CDO*	Output current detection value exceeded	258
	E.IOH	E.IOH *	Inrush current limit circuit fault	258
	E.AIE	E.AIE *	Analog input fault	258
	E.SAF	E.SAF *	Safety circuit fault	258

* If a fault occurs when using with the FR-PU04, "Fault 14" is displayed on the FR-PU04.

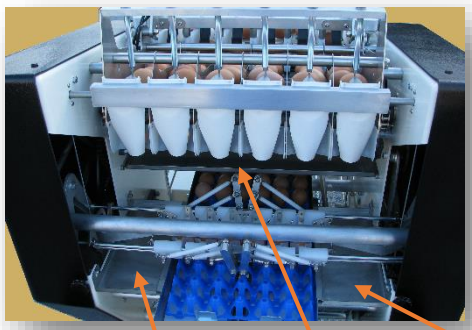
23.07.11

D. Maintenance

(D) 1.0- Cleaning

For best results, use compressed air to blow all feathers, dust, egg shells and debris from machine daily.

Empty all five S.S. Drip trays as needed.

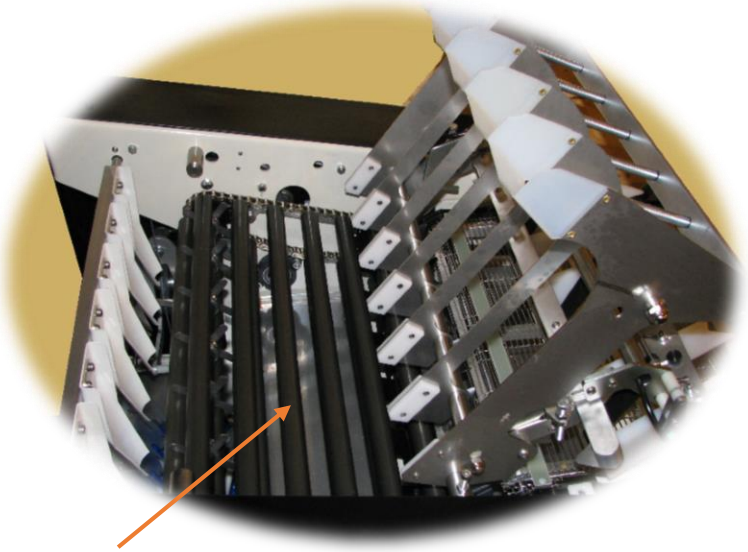


Tray #1 **Tray #2** **Tray #3** **Tray #4** **Tray #5**

Lift Up Divider Assembly and Clean All Pointer Rollers Weekly

Please Note:
Do not allow pointer rollers to build up with dirt.
Dirt Buildup will cause a points-up problem as, the eggs can not orient properly.

Pointer rollers can usually be cleaned by simply using a damp cloth.



Pointer Rollers

Please Note: This Machine Is Not Designed for Water Wash-down.

D. Maintenance

(D) 2.0 Lubrication

Red Captions Indicate 50 Hour Interval Maintenance

Blue Captions Indicate 100-150 Hour Interval Maintenance

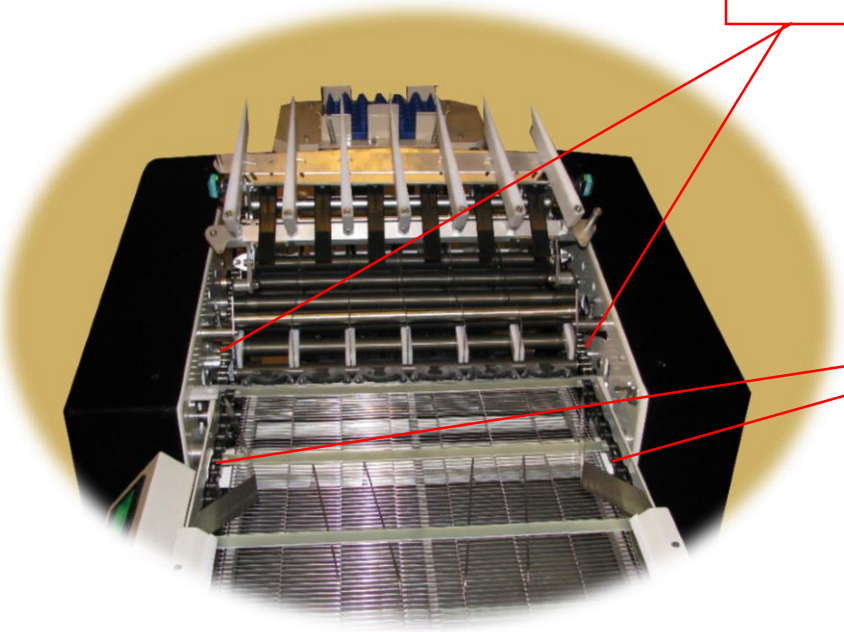
Recommended Lubricants

Chains subject to broken eggs ("*Fluid Film*")
All other chains (30W Oil or a Quality Chain Lube)
Bearings & Pivot Points ("*Super Lube*" Synthetic Grease or Other Quality Medium Weight Grease)
Where lubricants may contact eggs (Use an Approved Food Grade Oil)

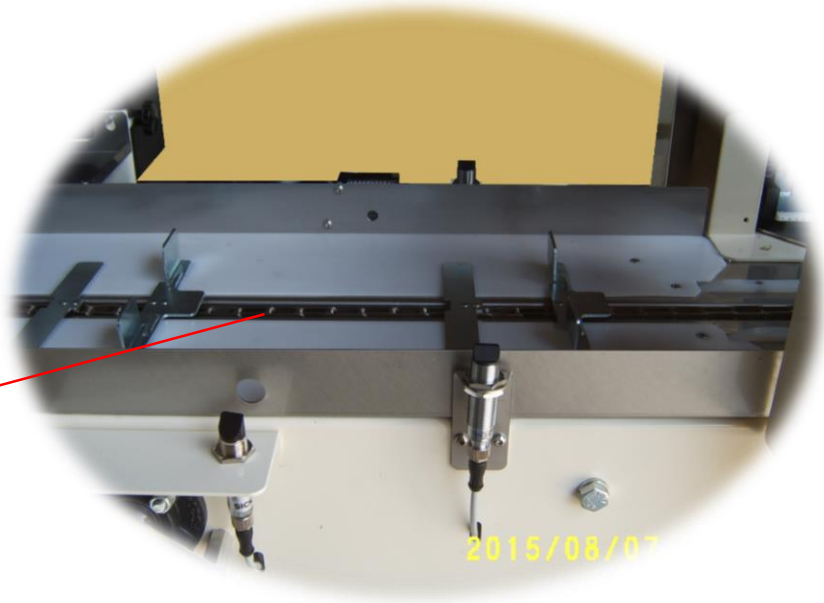
WARNING

Do not use Vegetable Oil – Vegetable Oil will leave a hard to remove residue.

Oil the Two Exposed Pointer Roller Chains



Oil the Two Exposed Infeed Reservoir Chains

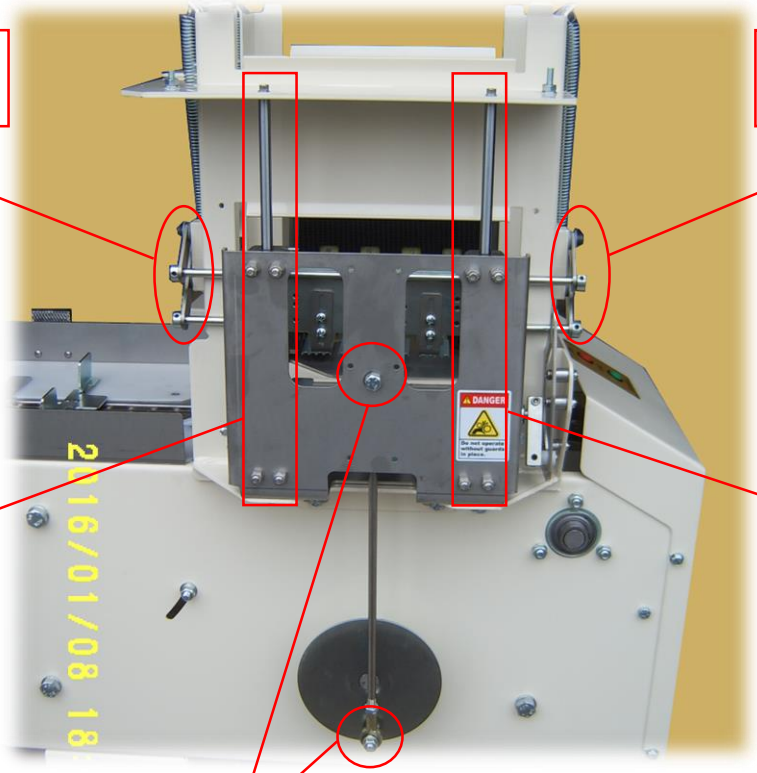


Oil the exposed Carton Transport Pusher Chains

(D) 2.0 Lubrication

Oil all Rubber Wedge Pad Pivot Points

Oil all Rubber Wedge Pad Pivot Points

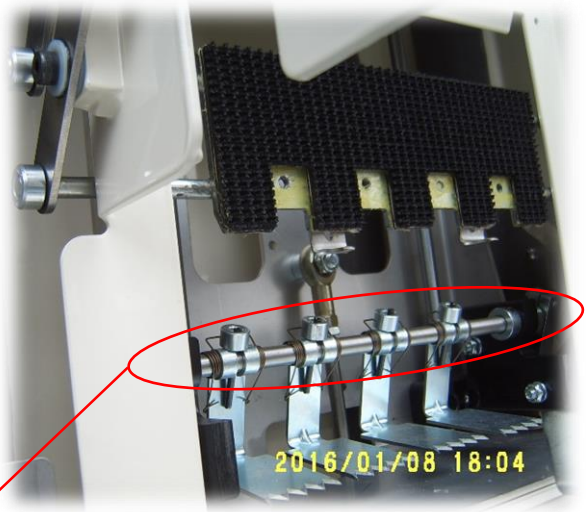


Oil Support Rods & Guide Blocks

Oil Support Rods & Guide Blocks

Oil Lift Arm Swivel Rod Ends

Be Aware:
All points of lubrication mentioned on this page will again need to be repeated on the opposite side of the Denester Assembly



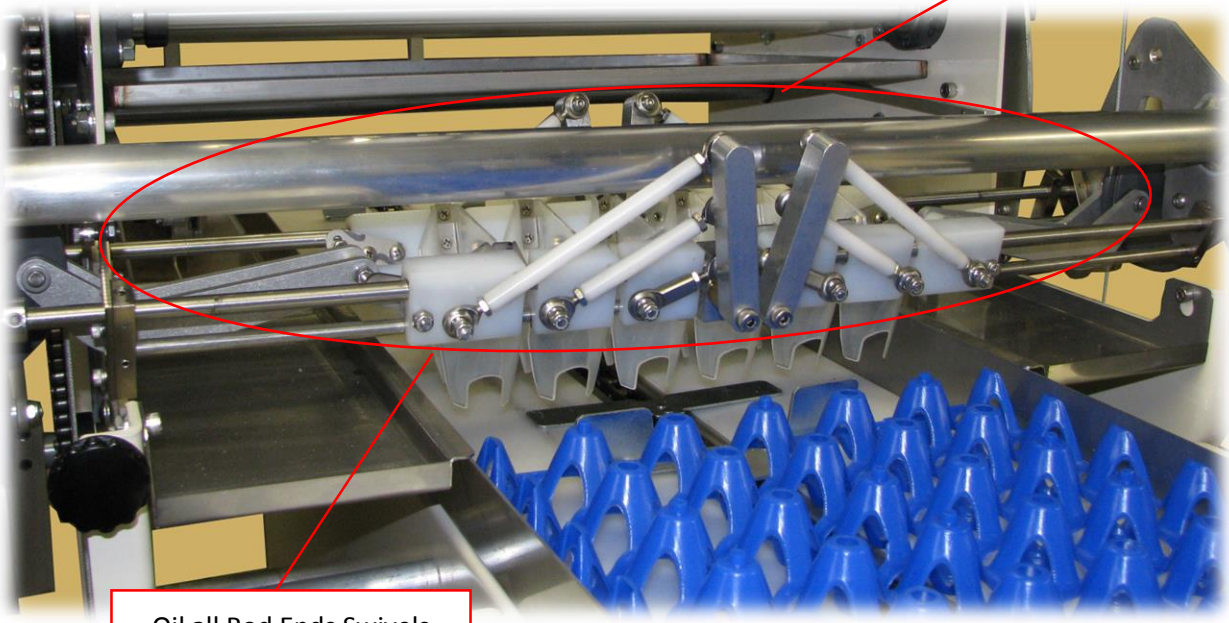
Oil all Gripper Shaft Pivot Points

D. Maintenance

(D) 2.0 Lubrication

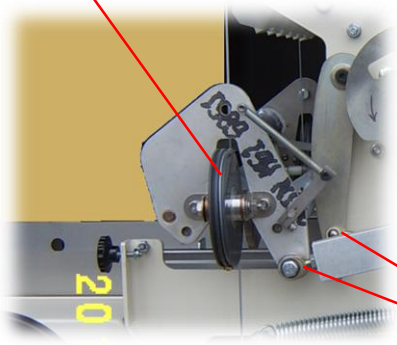
Use A Food Grade Oil
For parts in Contact with Eggs
"Super Lube" Aerosol Spray

VERY IMPORTANT:
Oil the Full Length of the Four Rods that Clamshell Supports Slide On.



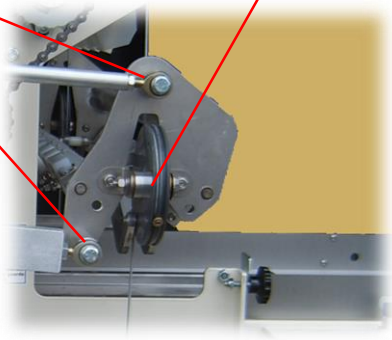
Oil all Rod Ends Swivels

Oil all Pivots Points on Cable Wheel



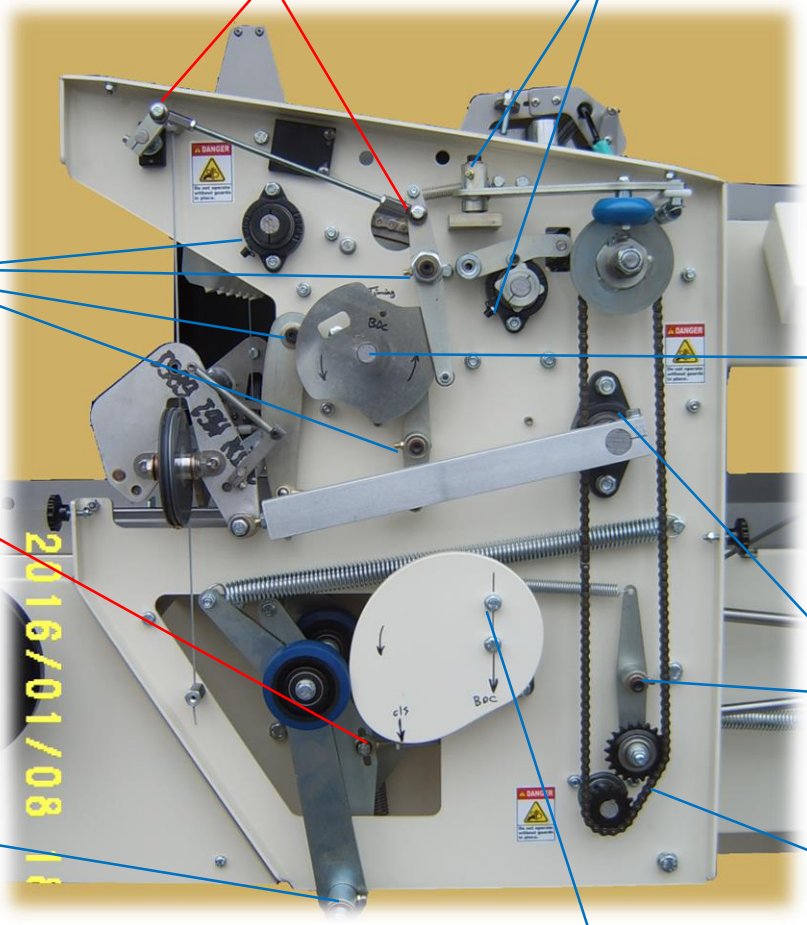
Oil all Rod Ends Swivels

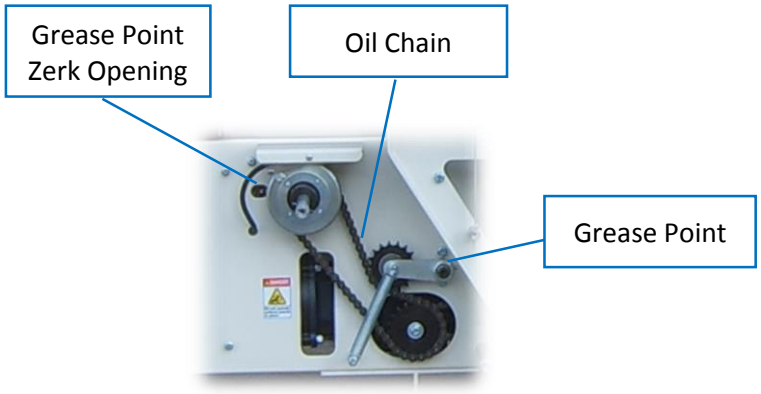
Oil all Pivots Points on Cable Wheel

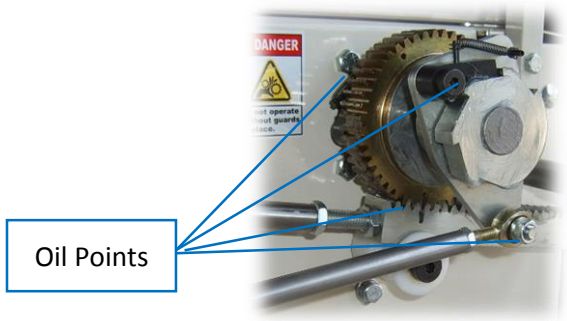


Oil all Rod Ends Swivels

(D) 2.0 Lubrication

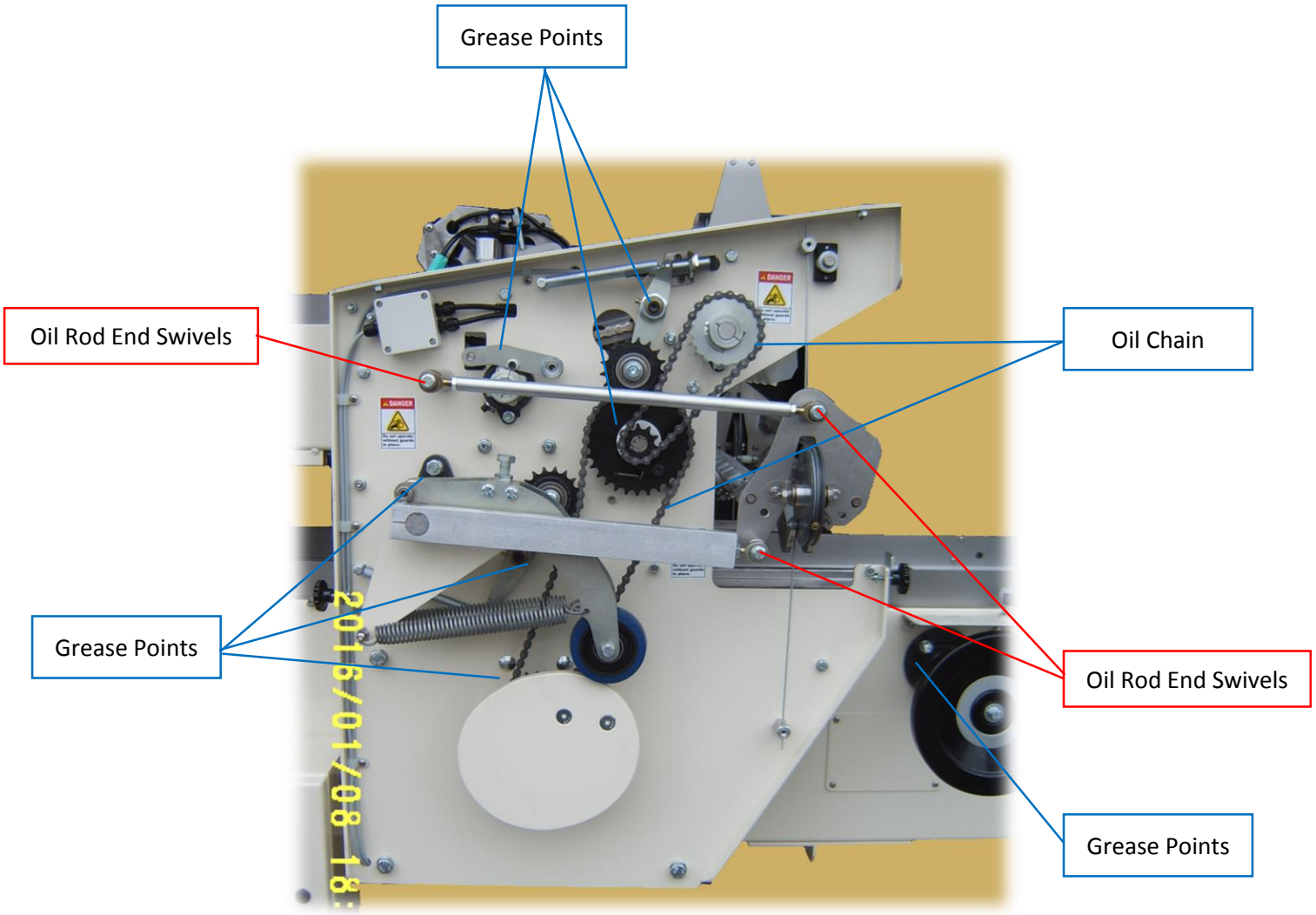


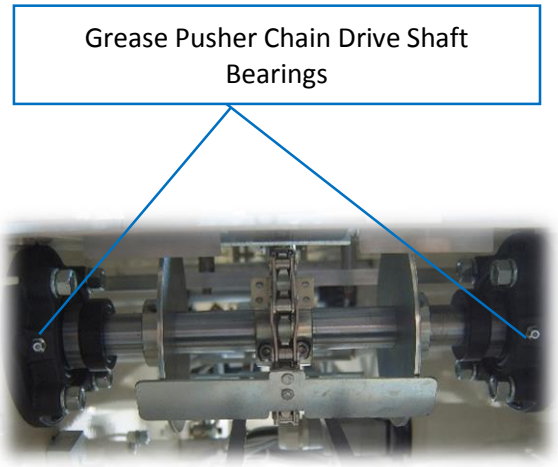


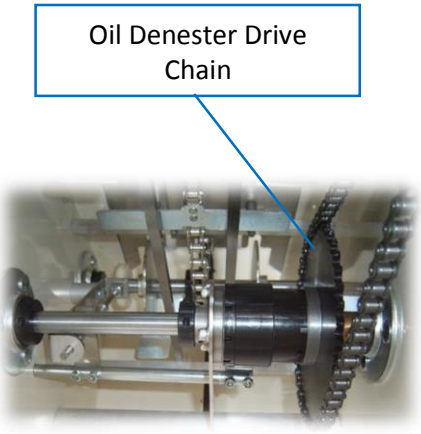


D. Maintenance

(D) 2.0 Lubrication







(D) 2.1 Lubrication Summary

Red Captions Indicate 50 Hour Interval Maintenance
Blue Captions Indicate 100-150 Interval Hour Maintenance

NOTICE: Do not over-grease chain tensioners & pivot points. Minimal lubrication required.

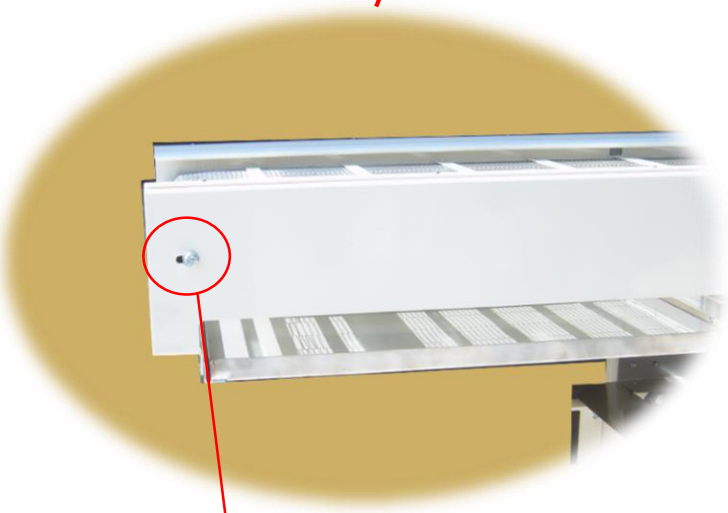
(2) Oil Infeed Reservoir Chains
(2) Oil Pointer Roller Chains
(1) Oil Carton Transport Pusher Chain
(1) Oil All Slides & Pivots & Rod End Swivels on Soft-Set Clamshell Assembly
(1) Oil All Slides & Pivots & Rod End Swivels on Denester Assembly
(2) Oil Rod End Swivels on Long Advance Rod & Short Advance Rod
(1) Oil Misc. Rod End Swivels & Pivots under Main Shield on L.H. Side
(1) Oil Misc. Rod End Swivels & Pivots under Main Shield on R.H. Side

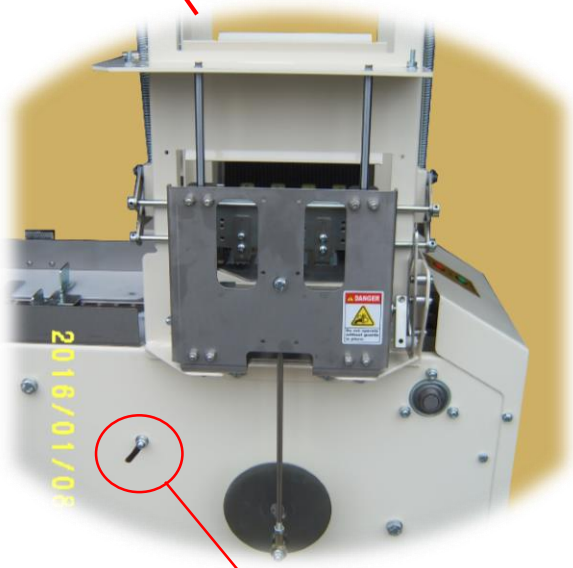
(1) Oil Denester Clutch Drive Roller Chain Inside Main Frame
(1) Oil Gearbox Drive Roller Chain Inside Main Frame
(1) Oil Main Clutch Roller Chain
(1) Oil Roller Chain under Main Shield on L.H. Side
(2) Oil Roller Chain under Main Shield on R.H. Side
(1) Oil Roller Chain on Takeaway Belt Drives
(1) Grease Advance Ratchets & Rack – Pinion Gear
(2) Grease Bearing Zerks for Carton Transport Drive Shaft
(2) Grease Bearing Zerks for Manual Handwheel Shaft
(2) Grease Bearing Zerks for Head Cam Shaft
(2) Grease Bearing Zerks for Pointer Rollers Drive Shaft
(2) Grease Bearing Zerks for Pointer Rollers Idler Shaft
(4) Grease Bearing Zerks for Main Shaft (Lift Cam & Balancing Cam Shaft)
(2) Grease Bearing Zerks for Takeaway Belt Drive Shafts
(1) Grease Pivot Zerk for Brake Arm
(2) Grease Pivot Zerks for Advance Pendulum
(6) Grease Pivot Zerks for Roller Chain Tensioners
(1) Grease Pivot Zerk for Egg Gate Movement Arm
(2) Grease Pivot Zerks for Clamshell Control Linkage
(1) Grease Pivot Zerks for Trap Door Control Linkage

(D) 3.0 Chain Tension

Manual Chain Tension Adjustments on the Farmpacker is very minimal. The chains with adjustable tension are as follows:

- 2- Infeed Reservoir chains.
- 1- Denester Clutch Chain.
- Takeaway Drives





Find Infeed Reservoir Chain Tension Adjustment Bolt on each side

Denester Chain Tension Adjustment Bolt

Adjust Bolt Down to tighten Chain

Be Aware
Do not Over Tension the Chains.

(D) 4.0 Maintenance Reminder Reset

The following is a reminder the operator will receive at 50 hr. intervals of machine run time.
Refer to section **(D) 2.0 Lubrication** for recommended lubrication procedure.

Press to ***temporarily*** clear reminder until, maintenance can be completed.
NOTE: This reminder will again display every time the machine is restarted until, the reminder is reset.

Press to reset reminder after maintenance has been completed.

When pressed the below screen will display.

Sequence to Reset Reminder

#1 Press [Complete] Button.

#2 Press Password Entry Block.

#3 Enter Code# 17546

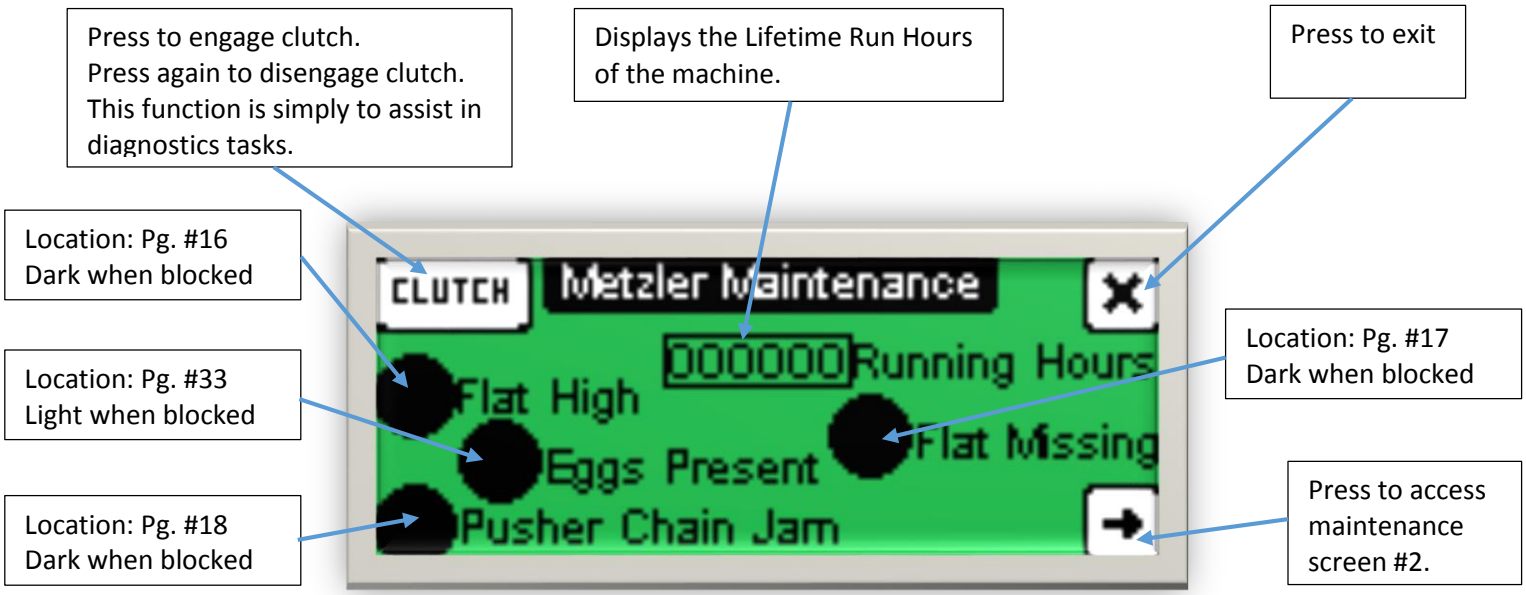
#4 If correct code is entered, circle will darken.

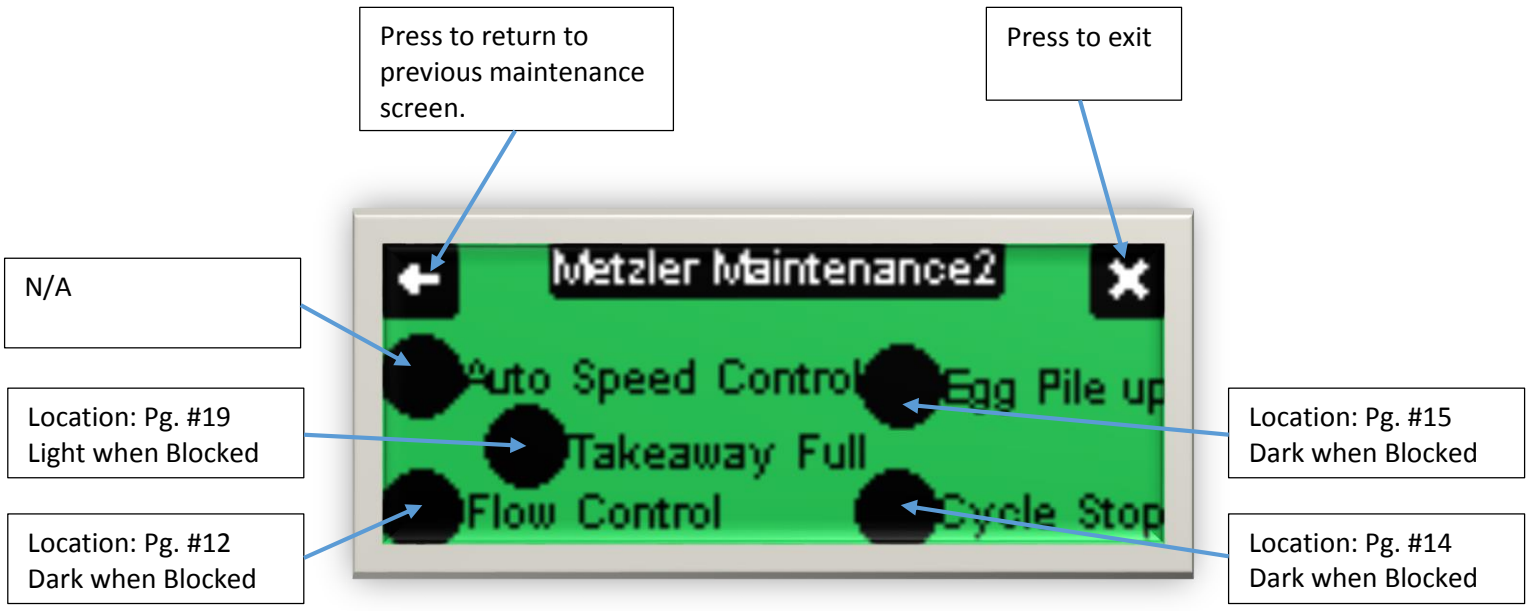
#5 Press [Clear Alarm] to reset reminder for another 50 hr. interval.

E. Mechanical Timing & Sensor Adjustments

(E) 1.0 Sensor Locations & Diagnostics

Press the [Wrench] button on the Main Screen to access the following displays.

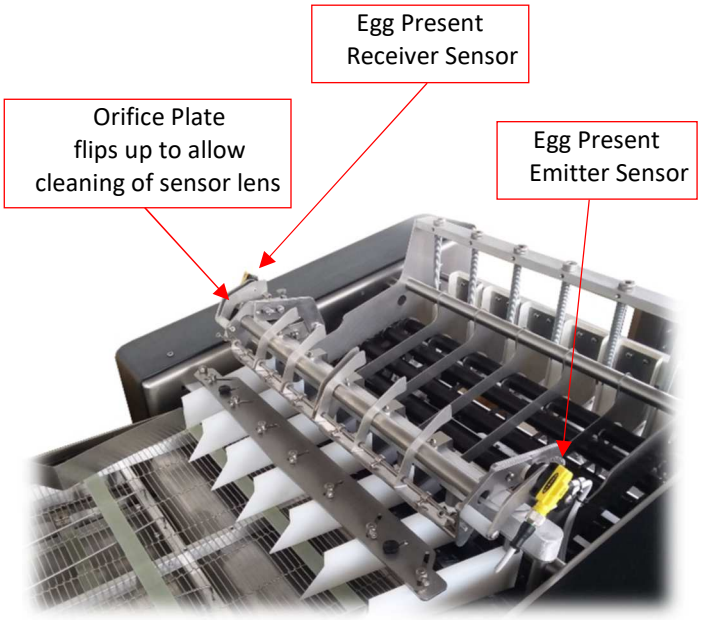




E. Mechanical Timing & Sensor Adjustments (Egg Infeed)

(E) 2.1 Adjusting 6 Eggs Present (Flag Sensitivity)

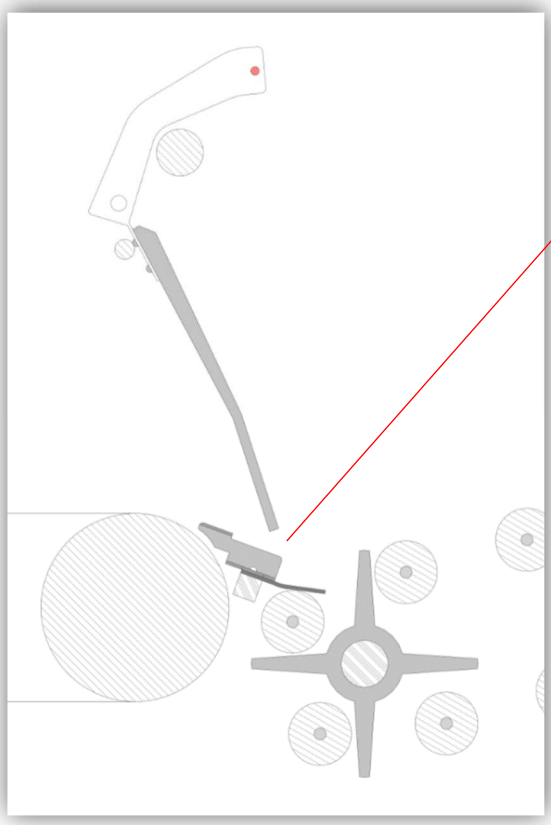
The Egg present sensor function allows the machine to detect when there are six eggs present. The Send Sensor emits a laser light detected by the Receive Sensor. When all six egg flag triggers are lifted by eggs in position, the laser can then signal the receive sensor. This signal will then cause the clutch to engage, thus causing another cycle. If all six egg flags remained lifted *(i.e. six more eggs in place)* the machine will continue to cycle.



Loosen this screw to adjust the height of the Egg Present Sensors.

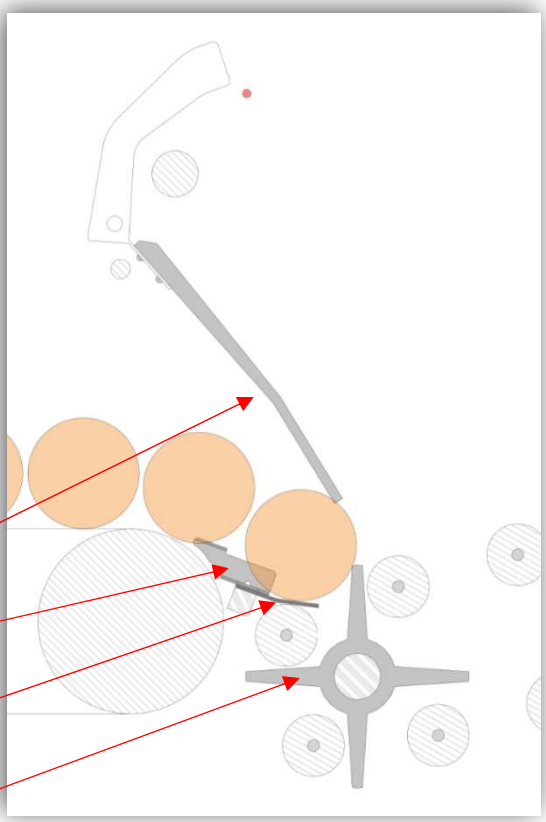
- ✓ Lower the sensor for smaller eggs.
- ✓ Raise the sensor for larger eggs or to prevent missing eggs.
- ✓ Adjust both sensors to similar height.
- ✓ Confirm that the laser beam is directed to the hole on the orifice plate.

Waiting for Eggs / Laser Blocked



When adjustments are correct, the bottom of the flag will align with the back edge of the transfer pad.

Eggs Present / Laser Open



Egg Present Flag

Plastic Transfer Pad

Rubber Transfer Flap

Four Paddle Star Wheel

E. Mechanical Timing & Sensor Adjustments (Egg Infeed)

(E) 2.2 Adjusting 6 Eggs Present (Flag Location)

This adjustment allows the *Egg Present Flag Assembly* to be positioned for optimum egg flow. A more forward adjustment (*towards Infeed*) causes egg entry to trigger the flags earlier and a more reverse adjustment (*towards pointer rollers*) prevents flag trigger before eggs are actually in place. Typical adjustment is as the picture below.

Loosen these screws to adjust the position of the Eggs Present Flag Assembly.

- ✓ Remember to adjust both sides to a similar position.

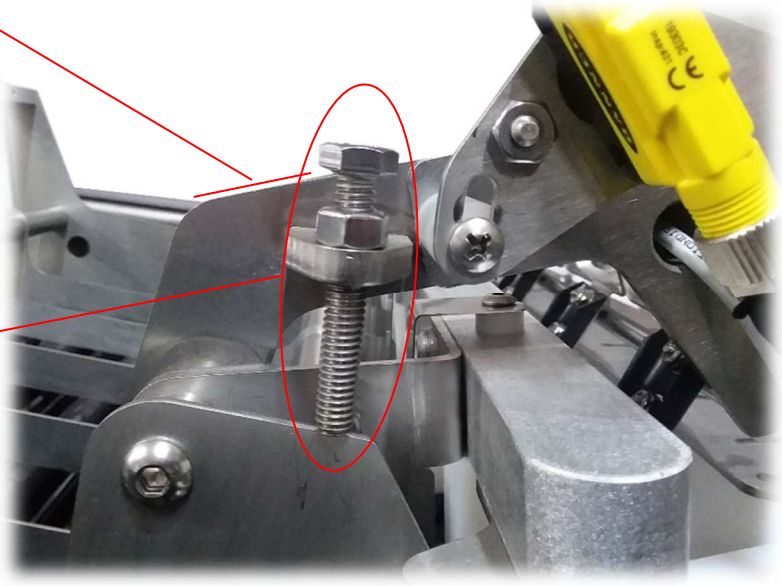
(E) 2.3 Adjusting 6 Eggs Present (Flag Height)

This adjustment allows the *Egg Present Flag Assembly* to be moved up or down.

Correct adjustment is when the frame is at a 10 degree angle.

This bolt adjusts the height of the Eggs Present Flag Assembly.

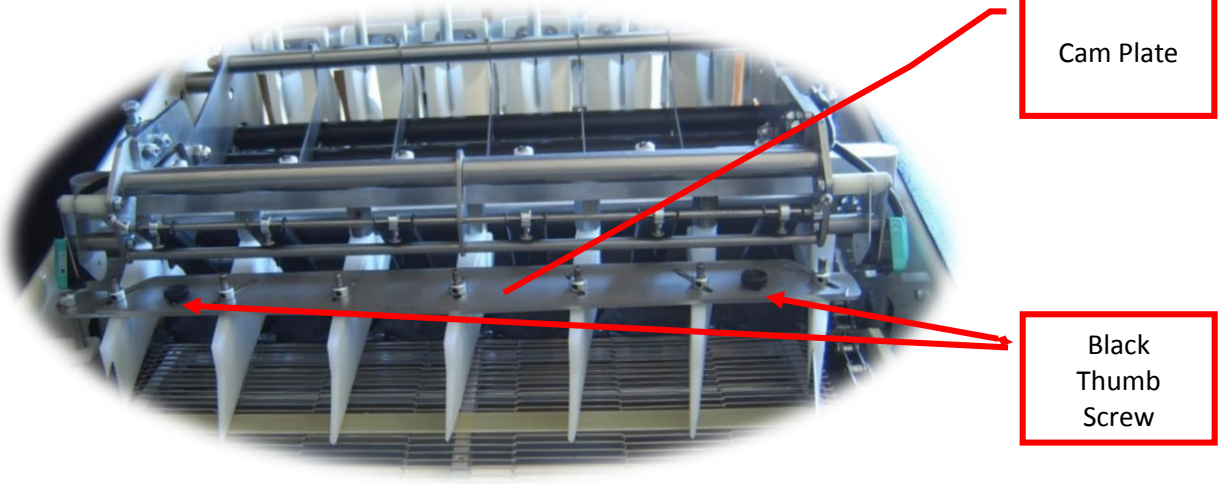
- ✓ Remember to adjust both sides to a similar position.



E. Mechanical Timing & Sensor Adjustments (Egg Infeed)

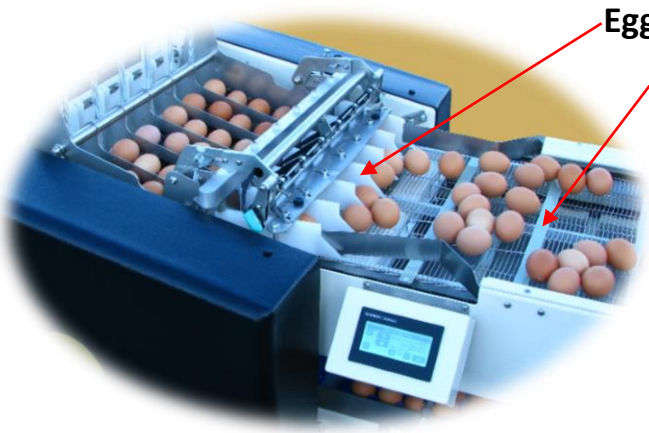
(E) 2.4 Adjusting Egg Gate Width

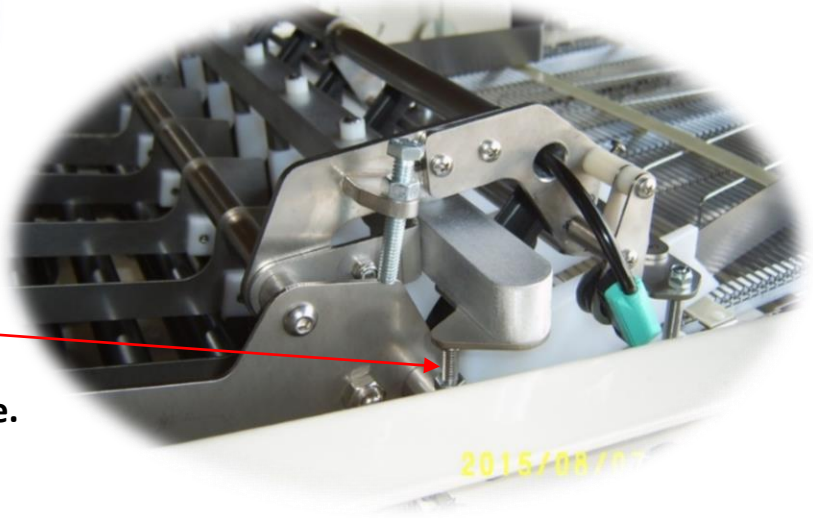
The *Egg Gate Width* can be adjusted to better accommodate larger or smaller eggs. Loosen the two *black thumb screws* and slide *cam plate* to set desired width.



(E) 2.5 Adjusting Egg Gate Height

The *Egg Gate Height* can be adjusted. Generally this is preset during factory assembly. If the *egg gates* are too low they will catch the pusher slats. Typical height setting is approximately 1/8" above the *pusher slats*.





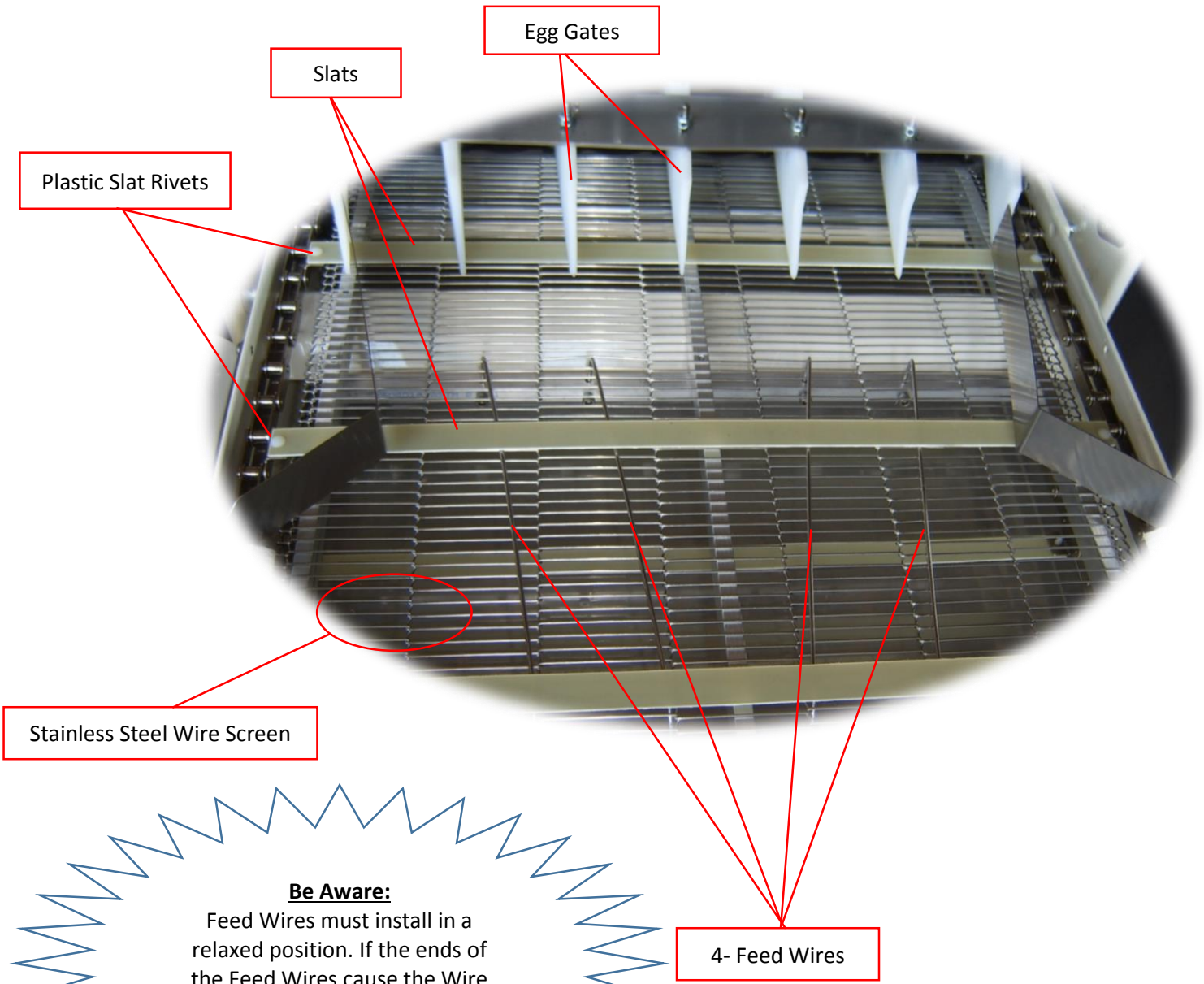
Adjustment Bolt.
Used to adjust the Height of the Egg Gates.
NOTICE: There is a bolt for each side.

E. Mechanical Timing & Sensor Adjustments (Egg Infeed)

(E) 2.6 Infeed Components & Feed Wires

The following example points out the various Infeed components & Feed Wires.

The Feed Wires assist in guiding the eggs into the Egg Gates. They also cause “head Pressure” by lifting the Slats, which will give the eggs a more aggressive forward pressure. This helps to maintain an even flow of eggs into Egg Gates. The Feed Wires are especially helpful when packing large eggs. When running smaller eggs it may be necessary to remove Feed Wires if eggs are repeatedly “doubling up”.



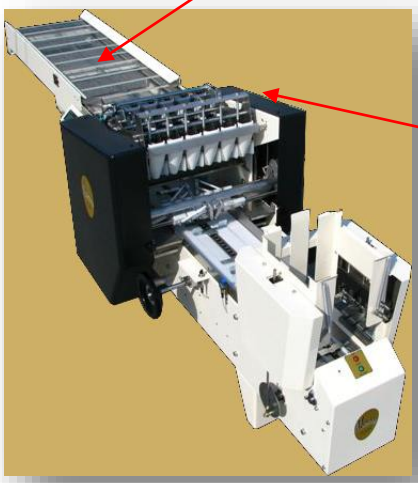
Be Aware:
Feed Wires must install in a relaxed position. If the ends of the Feed Wires cause the Wire Screen to lift, the Slats will catch.

E. Mechanical Timing & Sensor Adjustments (Egg Infeed)

(E) 2.7 Adjusting Slip Clutch for Egg Reservoir

This adjustment allows the point of slip for the Infeed Reservoir Pusher Chain to be adjusted.

Infeed Reservoir Pusher Chain



Tension Nut

Adjust C.W. if the Pusher Chain slips to easy.
Do not over tension as this may cause damage to the infeed components.
Chain can be stopped with firm hand pressure when adjusted correctly.

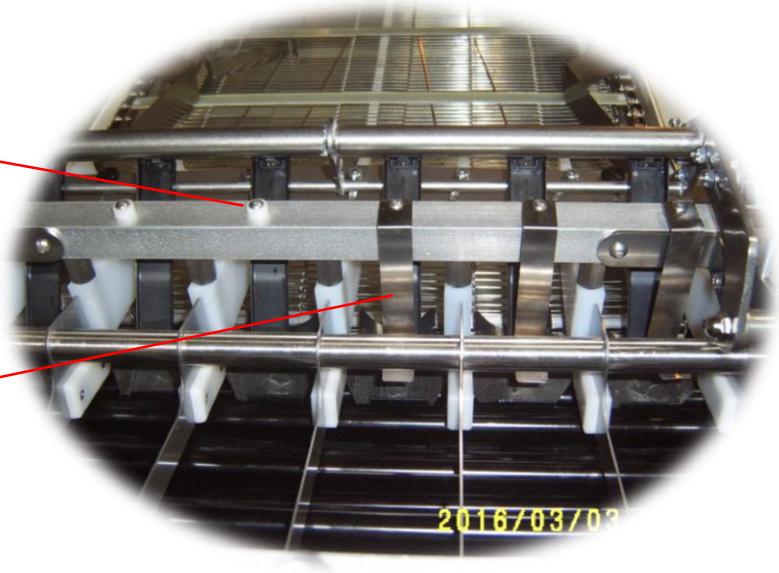
(E) 2.8 (Double Egg Prevent) Z Tab

Install the Z tab when packing small eggs, typically below 45 lb. case weight, to prevent double eggs on the pointer rollers. Remove the Z tab when packing larger eggs, as the tab will likely restrict egg flow when the case weight exceeds 45lb.

Install Z Tabs just above the white nylon spacer.

Install a Z tab for each lane (6 total).

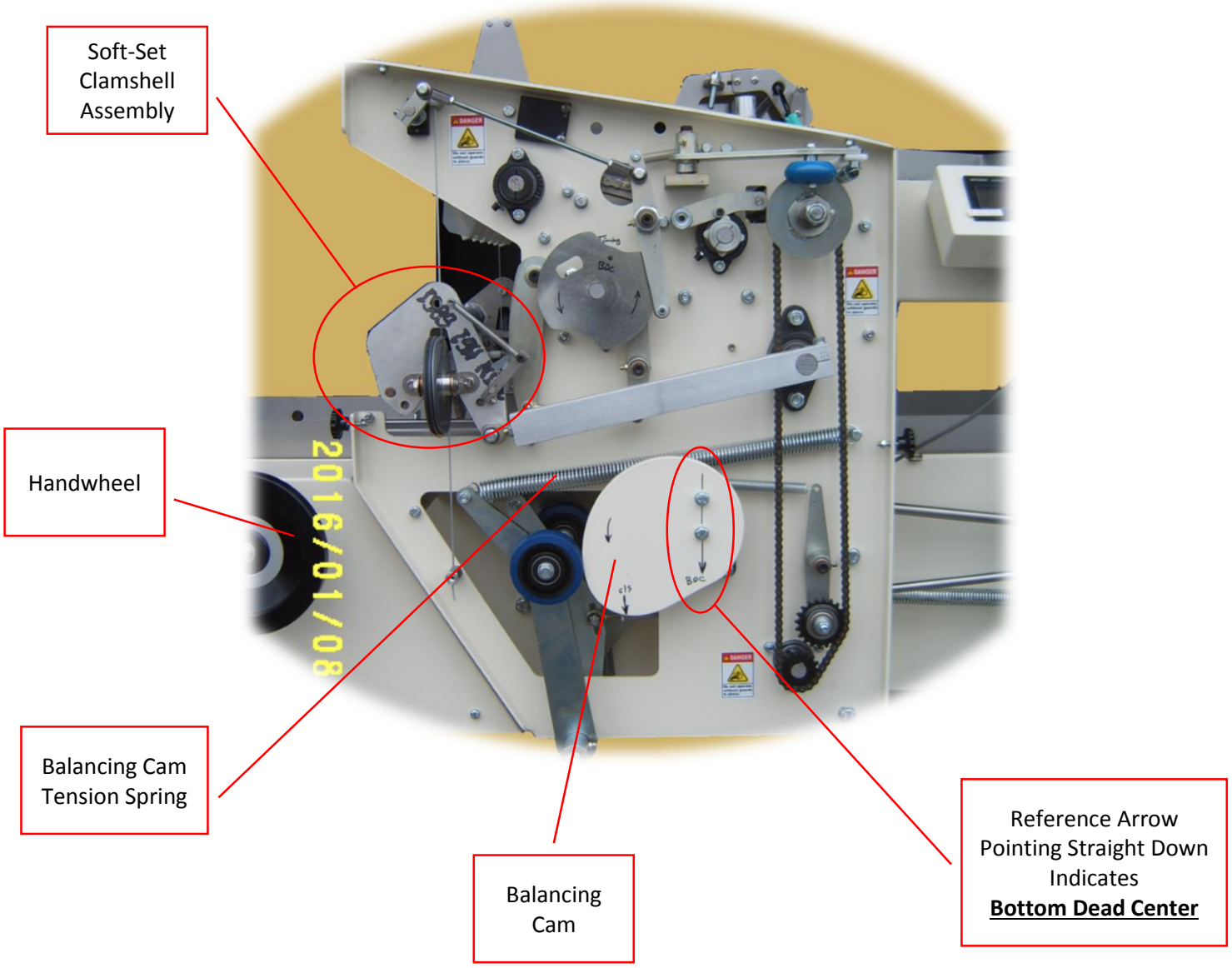
Example of Z tabs installed.



E. Mechanical Timing & Sensor Adjustments (Head Timing)

(E) 3.1 What is (Bottom Dead Center)?

Through-out the following section of this manual there will be references made to **Bottom Dead Center**. When this is indicated, the *Handwheel* needs to be turned until this reference is reached, allowing for a common set-point for timing set-up. This also represents the bottom-most point of travel for the *soft-set clamshell assembly*. The picture below represents cam locations at **bottom dead center**. Look for the *reference arrow* on the *balancing cam*.



E. Mechanical Timing & Sensor Adjustments (Head Timing)

(E) 3.2 Adjusting Egg Pointer Rollers

This adjustment allows for correct positioning of *pointer rollers*.
*To adjust *pointer roller* position, loosen the *Allen Screw* on the *Drive Sprocket*.

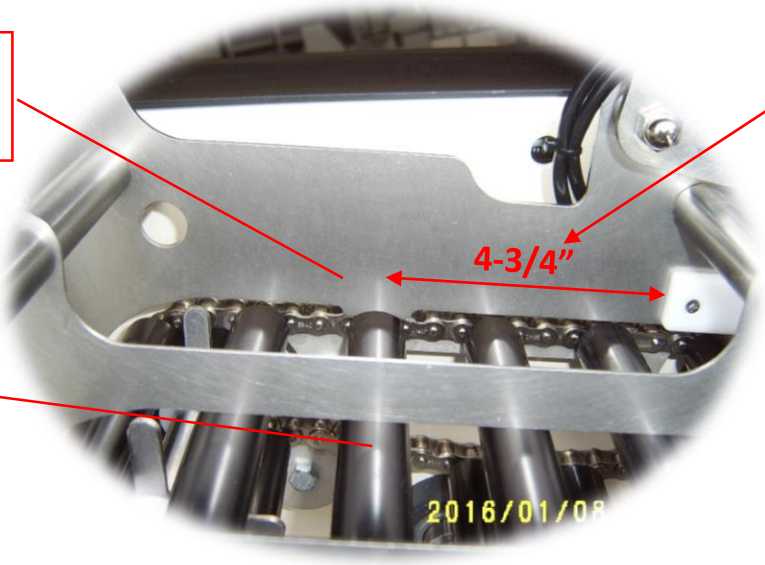
*With *Allen Screw* loose, grasp *Drive Sprocket* to prevent unintentional rotation and move *pointer rollers* to desired location.

*Retighten *Allen Screw*.

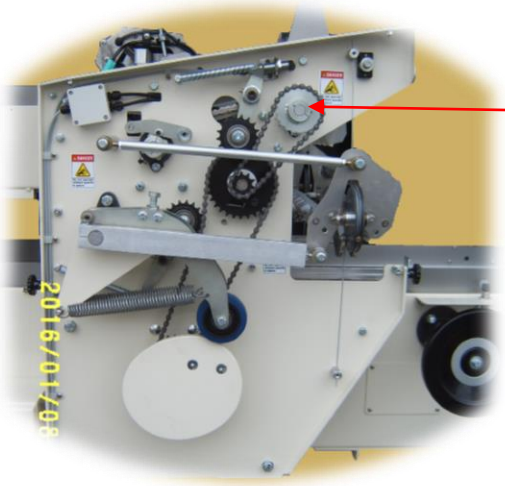
For machines built prior to Nov.01-2015 the *pointer rollers* will match the *timing mark* when the machine is at its **Cycle Stop/Wait Position**. For machines built after Nov.01-2015 the *pointer rollers* will match the *timing mark* at **Bottom Dead Center**.

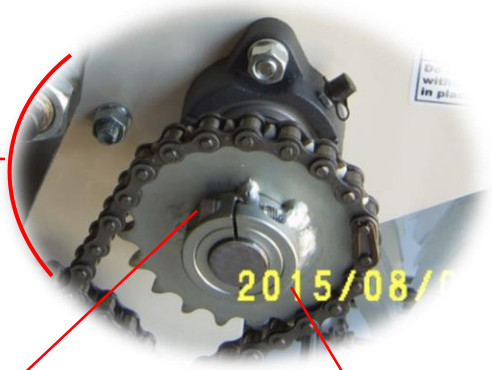
Timing Mark Radius Matches Pointer Rollers

If your machine does not have a *Timing Mark*: Measure against the White Plastic spacer and make a mark at 4-3/4". At **Bottom Dead Center** a *Pointer Roller* should be centered below mark.



Pointer Rollers





Allen Screw

Drive Sprocket

E. Mechanical Timing & Sensor Adjustments (Head Timing)

(E) 3.3 Adjusting Transfer Pad

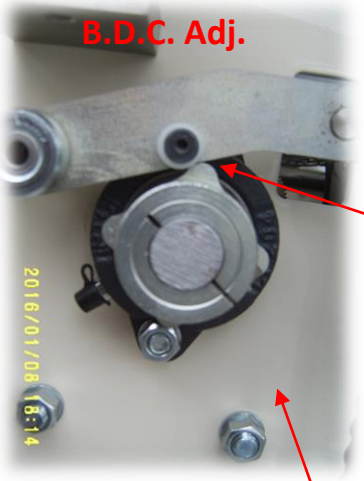
This adjustment sets the lift point of the transfer bar. The bar should only begin to lift at the beginning of a cycle, causing the eggs on the transfer bar to transition to the pointer rollers & also prevent other eggs from entering until the transition is complete.

*To adjust lift point: Loosen *Allen Screw* on *Four-Lobe Cam*.

*With *Allen Screw* Loose rotate *Four-Lobe Cam* to correct location.

*Retighten *Allen Screw*

***NOTE: There is a Four-Lobe Cam on both sides of the machine**.

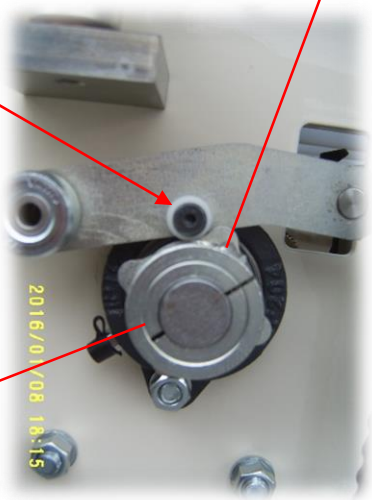


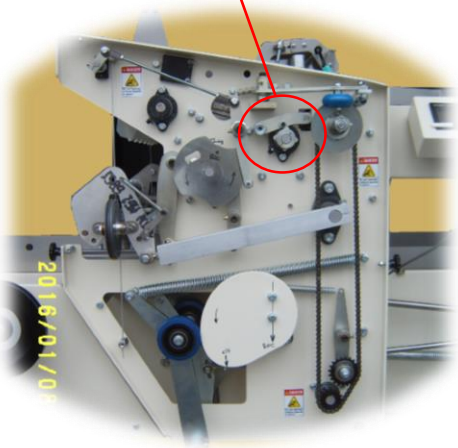
Correct Adjustment @
Cycle Stop/Wait Position
White roller is just before lobe.

Correct Adjustment @
Bottom Dead Center
White Roller is near top of lobe

Four-Lobe Cam

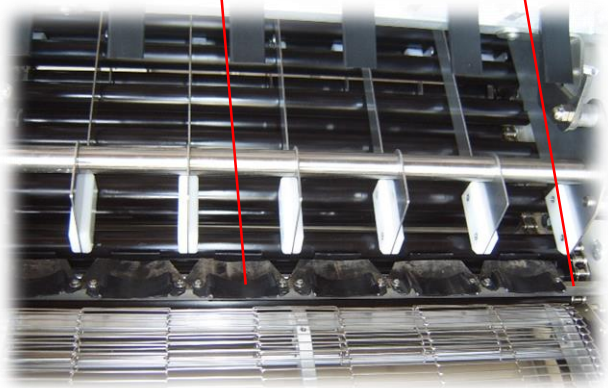
Allen Screw





Transfer Pad

Transfer Bar



The Tilt of the Transfer Pads can be adjusted.
Loosen the two shaft collars located at the ends of the Transfer Bar.
Set desired tilt and retighten shaft collars.
If the Transfer Pads are tilted to far down, the Infeed Slats will catch.

E. Mechanical Timing & Sensor Adjustments (Head Timing)

(E) 3.4 Adjusting Egg Chute Trapdoor Release

Use this setting to adjust release moment of the trapdoor. Trap door should begin to open at the same instant the Soft-Set Clamshell assembly reaches its top-most point of travel.
To adjust Trap Door Release Moment:

*Loosen Allen Screw on *Trap Door Release Cam*.

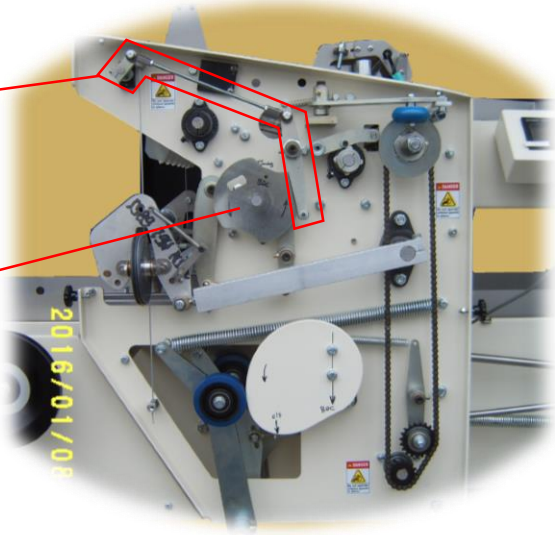
*Slip Cam C.W. to cause an earlier release moment.

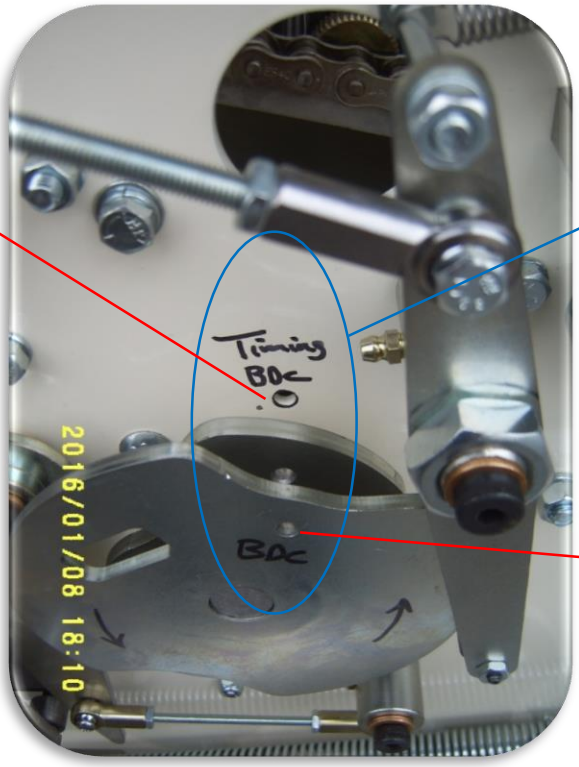
*Or Slip Cam C.C.W. to cause a later release moment.

*Retighten Allen Screw on *Trap Door Release Cam*.

Trap Door Release Linkage

Trap Door Release Cam
NOTICE: Allen Screw is located on backside of cam





Reference Hole in the Packer Frame

NOTICE:
At **Bottom Dead Center** the *Reference Hole in the Trap Door Release Cam* should be in-line with the *Reference Hole in the Packer Frame*.

Reference Hole in the Trap Door Release Cam

E. Mechanical Timing & Sensor Adjustments (Head Timing)

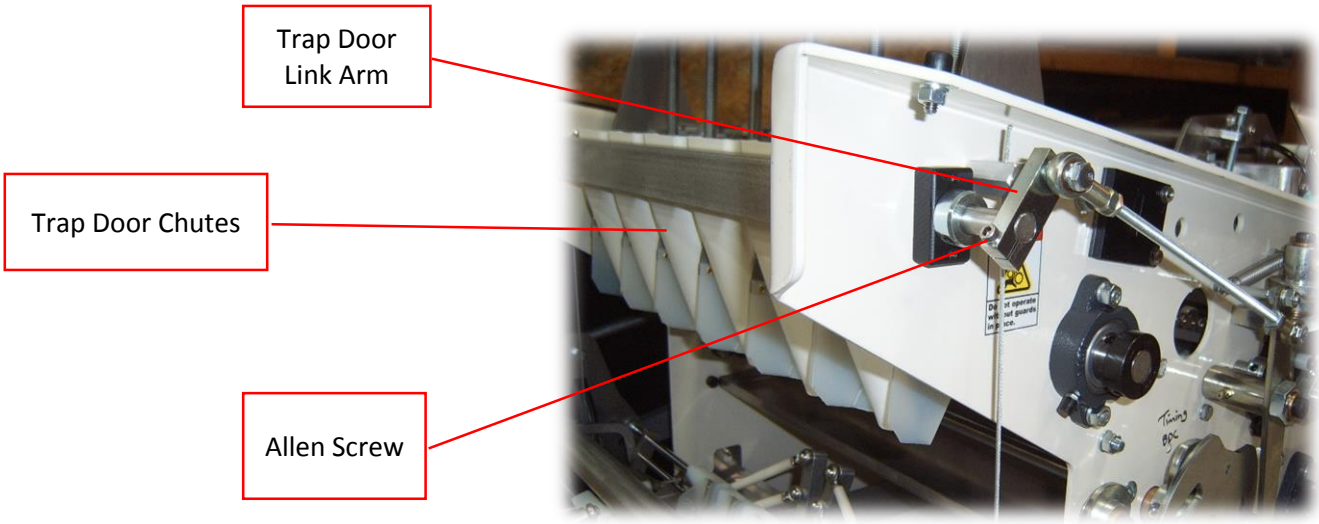
(E) 3.5 Adjusting Egg Chute Trapdoor Gap

To adjust the Egg Chute Trap Door Gap:

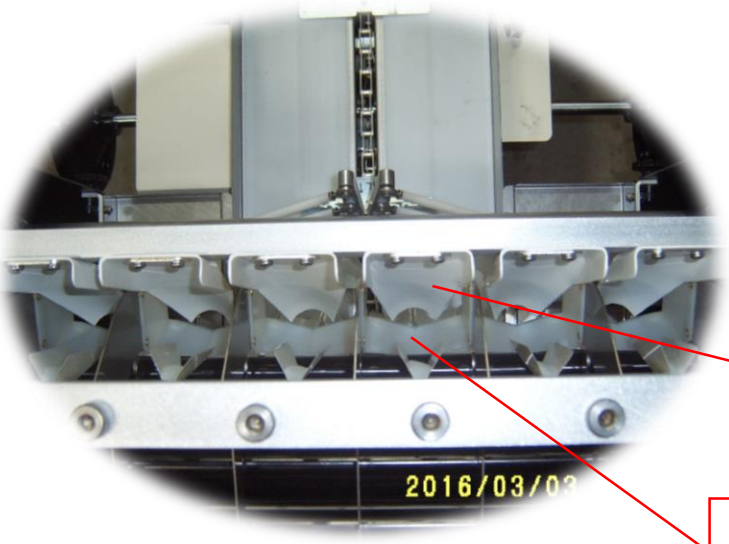
*Loosen *Allen Screw* on *Trap Door Link Arm*.

*Adjust *Trap Door Chutes* to Desired Location.

*Retighten *Allen Screw* on *Trap Door Link Arm*.



. Top View of Egg Chutes .



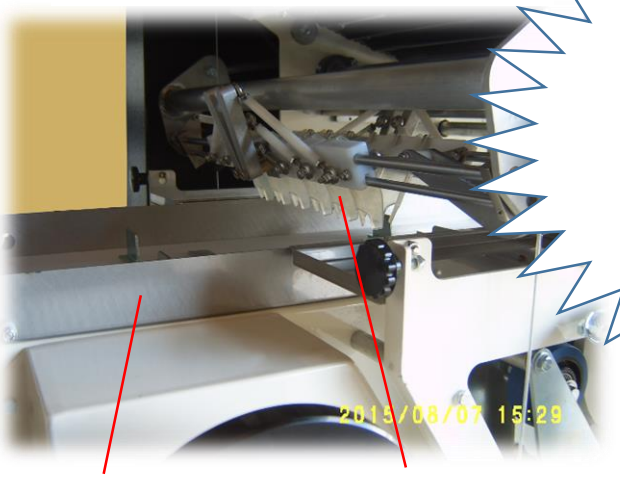
Be Aware:
This adjustment may vary dependent on the egg size currently being run. It may be necessary to allow more Trap Door Gap for Large Eggs.

E. Mechanical Timing & Sensor Adjustments (Head Timing)

(E) 3.6 Adjusting Cycle Stop/Wait Position

The Cycle Stop/Wait Position is the location the Soft-Set Clamshell Assembly will stop at when the clutch releases to wait for the 6 Eggs Present signal. It is also the stopping position when the stop button is pressed.

Example #1 of Typical Adjustment:
Lower edge of *clamshells* will level with *top-edge of S.S. Side Rails* at **Stop/Wait Position**

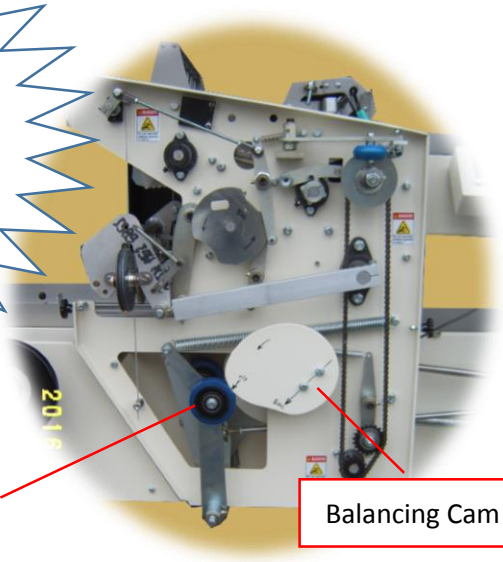


S.S Side Rails

Clamshells

Be Aware
This adjustment will vary dependent on the speed of the machine. Select the speed most used or top speed to fine-tune this adjustment.

Example #2 of Typical Adjustment:
The *Blue Wheel* will contact the *Balancing Cam* as in the example below at the **Stop/Wait Position**.

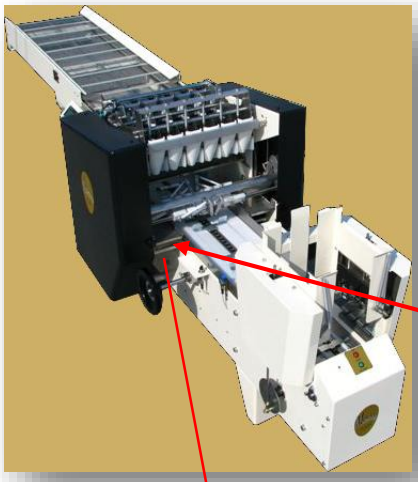


Blue Wheel

Balancing Cam

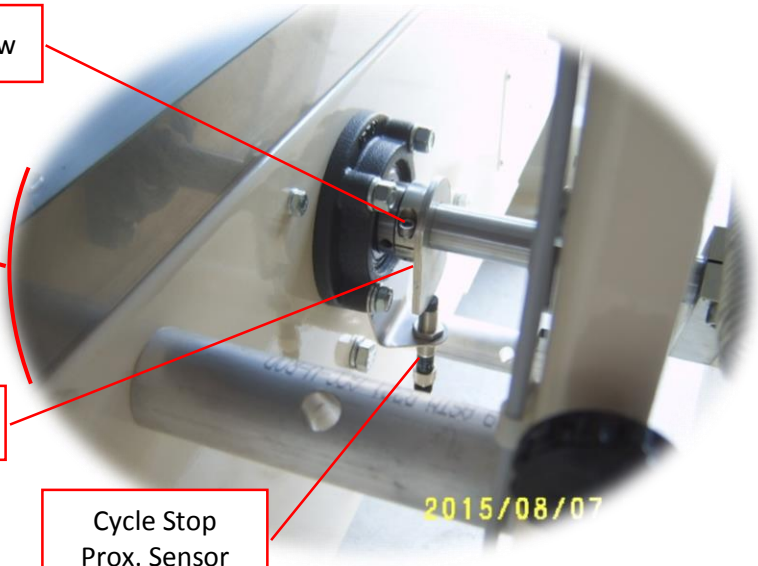
To Adjust:

*Loosen *Allen Screw* on *Cycle Stop Cam*.
*Slip Cam C.W. to cause an earlier stop position.
*Slip Cam C.C.W. to cause a later stop position.
*Retighten *Allen Screw.*



Remove small drip tray to locate Cycle Stop Sensor

Allen Screw



Cycle Stop Cam

Cycle Stop Prox. Sensor

E. Mechanical Timing & Sensor Adjustments (Soft-Set Adj.)

(E) 4.1 Adjusting Height

This adjustment allows the "window of travel" for the Soft-Set Clamshell Assembly to be set higher or lower.

BE AWARE: Too High of an adjustment will cause Soft-Set Clamshell Assembly to strike packer frame at the top-most point of its travel.

Also, Too Low of an adjustment could cause the last row of eggs packed to be broken when the Soft-Set Clamshell Assembly sets the next row of eggs.

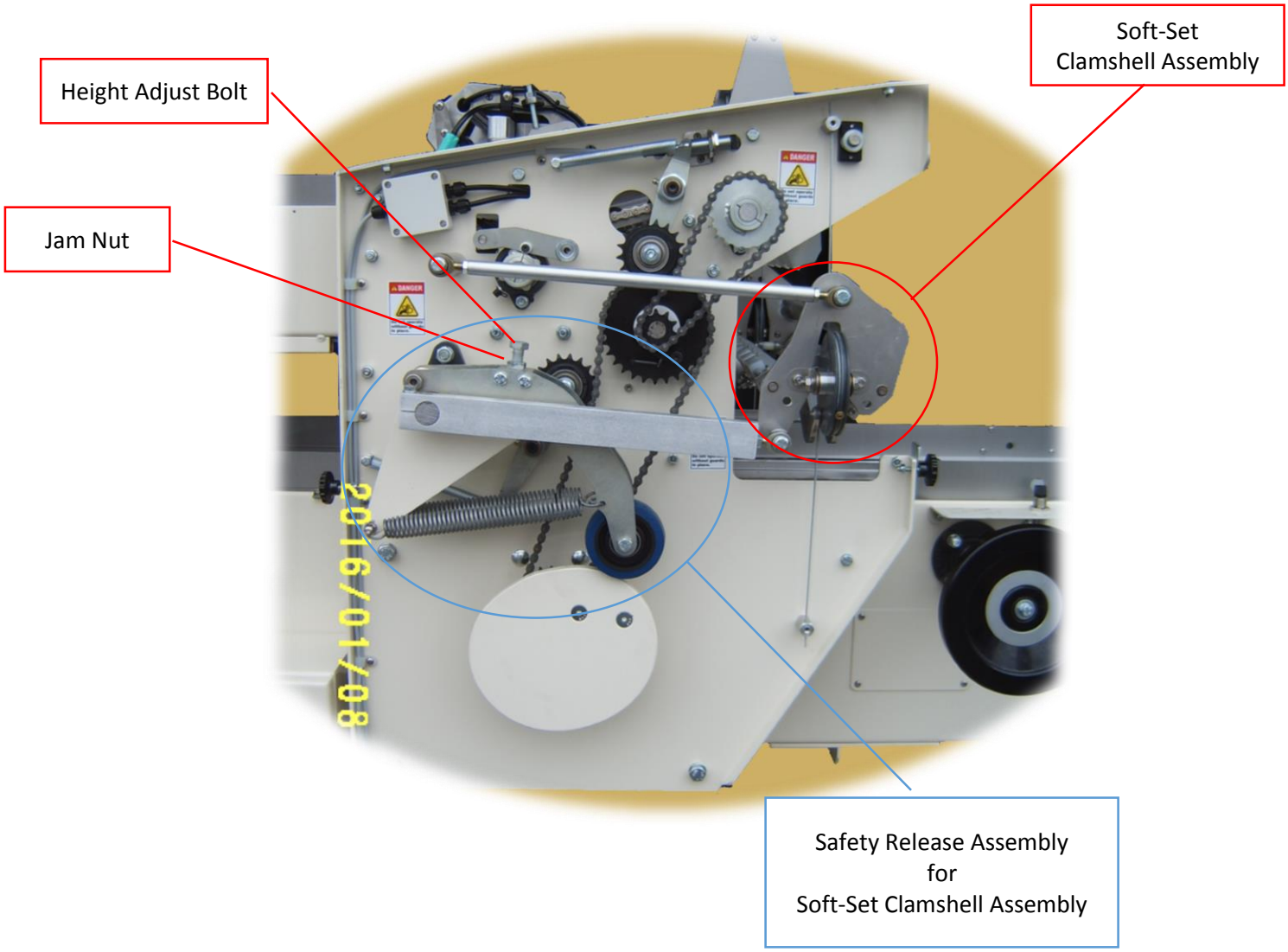
To Adjust Height:

*Loosen *Jam Nut*.

*Turn *Height Adjust Bolt* C.W. to lower range of movement.

*Turn *Height Adjust Bolt* C.C.W. to raise range of movement.

*Retighten *Jam Nut*.



E. Mechanical Timing & Sensor Adjustments (Soft-Set Adj.)

(E) 4.2 Adjusting Clamshell Gap

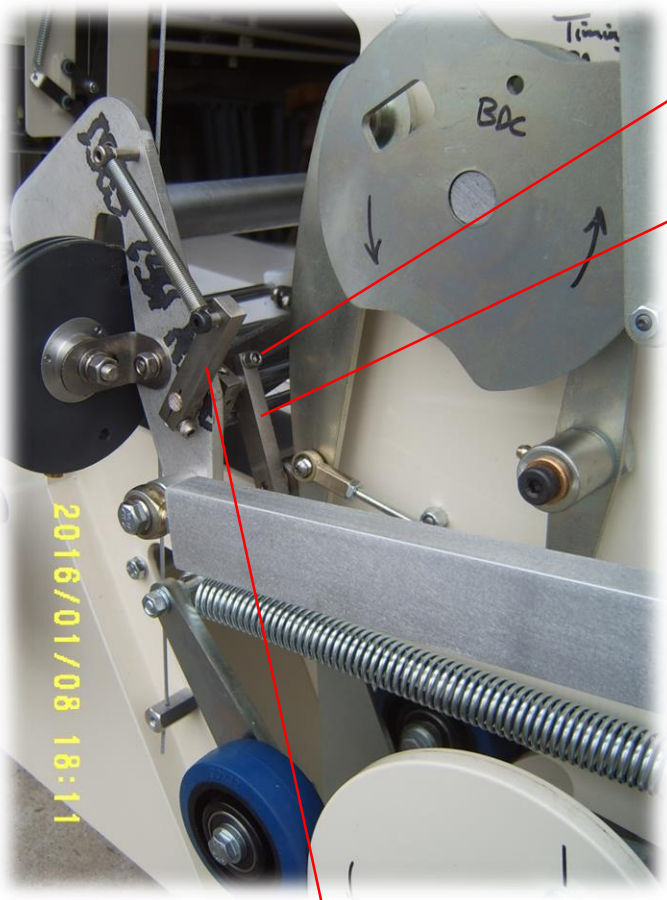
This adjustment allows the gap distance between the front & rear Clamshell to be set. Set Clamshell gap as wide as possible. NOTICE: Adjusting the gap to large will of course allow smaller eggs to slip through, thus an adjustment may be needed specific to the egg size currently being run.

Typical adjustment: Lower points of the front & rear clamshells are ¼" apart.

*To Adjust: Loosen *Allen Screw* on *Clamshell Control Arm*.

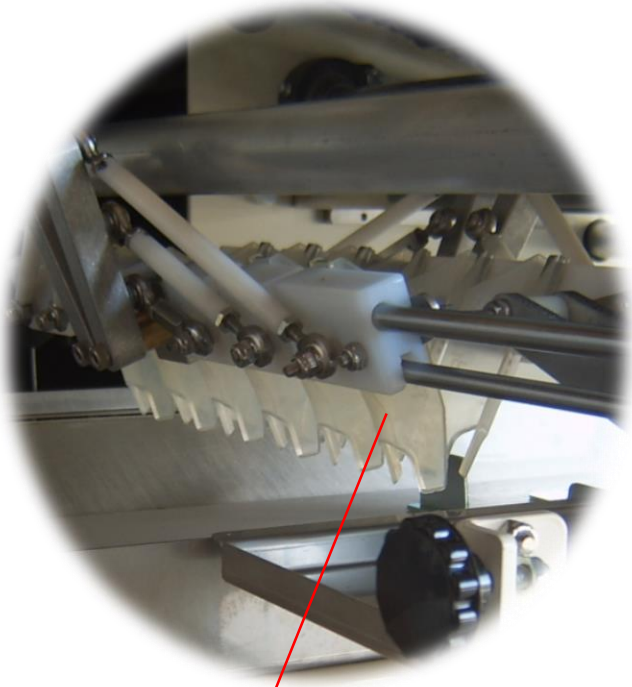
*Slip *Clamshell Control Arm* to desired setting.

*Retighten *Allen Screw* on *Clamshell Control Arm*.



Allen Screw

Clamshell Control Arm



Clamshell Release Spring Arm
Loosen Allen Screw and slip Spring Arm C.W.to create a more aggressive clamshell open movement.

Clamshells

E. Mechanical Timing & Sensor Adjustments (Soft-Set Adj.)

(E) 4.3 Adjusting Clamshell Release Time

Use this setting to adjust release moment of the Clamshells. The Clamshells should open entirely just after the Soft-Set Clamshell Assembly reaches the bottom-most point of travel. Too early of a release causes the eggs to be thrown into the trays. Too late of a release causes the eggs to momentarily be lifted back out of the tray. Timing is correct when the egg release occurs at the same instant the Soft-Set Clamshell Assembly pauses to change direction at its bottom-most point of travel.
To adjust the Clamshell Release Moment:

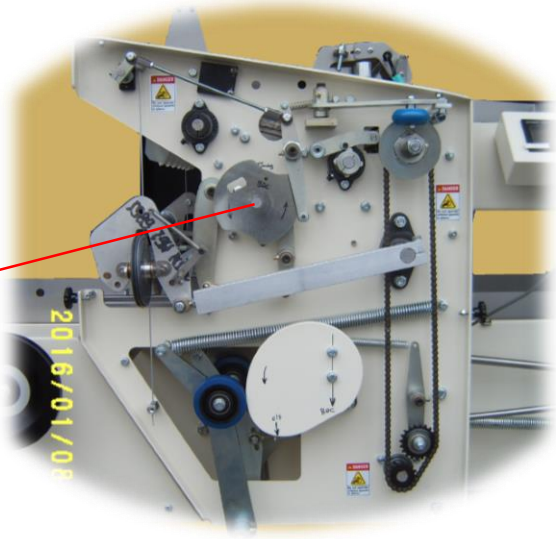
*Loosen Allen Screw on *Clamshell Release Cam*.

*Slip Cam C.W. to cause an earlier release moment.

*Slip Cam C.C.W. to cause a later release moment.

*Retighten Allen Screw on *Clamshell Release Cam*.

The *Clamshell Release Cam* is directly behind the Trap Door Release Cam.
NOTICE: *Allen Screw* is located on inside of Cam.



Reference Hole in the Packer Frame

NOTICE:
At **Bottom Dead Center** the *Reference Hole in the Clamshell Release Cam* should be in-line with the *Reference Hole in the Packer Frame*.

Reference Hole in the Clamshell Release Cam

E. Mechanical Timing & Sensor Adjustments (Carton Transport)

(E) 5.1 Carton Transport Overview

The Carton Transport uses a ratchet type assembly to drive the Pusher Chain that in turn moves the cartons through the machine to be filled.

Through-out the following section, references will be made to Short Advance & Long Advance.

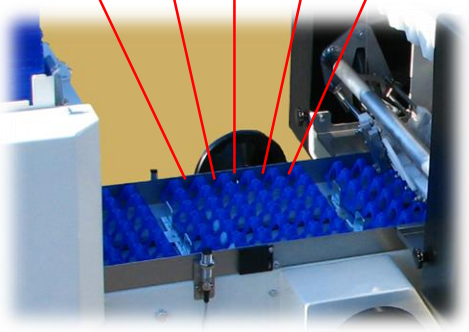
A Short advance is the four movements from Cell#1 – Cell#2 - Cell#3 - Cell#4 – Cell#5, within a carton.

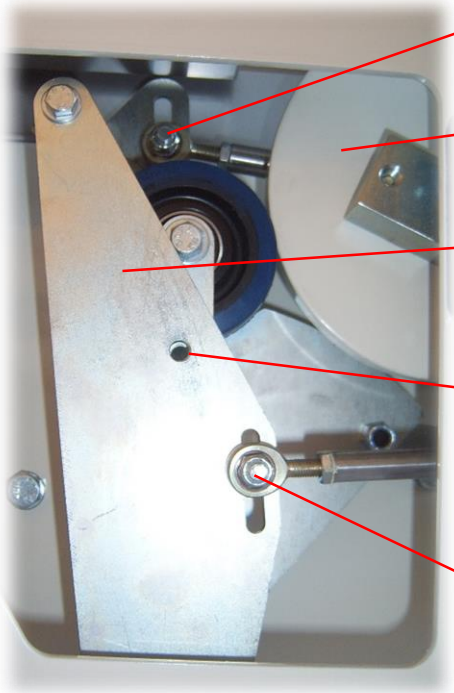
A Long Advance is the one movement from Cell#5 of a filled carton to Cell#1 of the next carton.

As the machine cycles, an *Eccentric Cam* turns one revolution for each advance. The *Short Advance Rod* & the *Long Advance Rod* are attached to a *Pendulum* that rides against the *Eccentric Cam* causing the rods to move.

Order of Cells:

#5 - #4 - #3 - #2 - #1





Long Advance Rod
&
Adjustment Slot

Eccentric Cam

Pendulum Arm

Emergency Safety Lock:
Place a bolt through these holes to disable the safety release function.

The safety bypass should only be used by a trained technician or as instructed by a trained technician.

Short Advance Rod
&
Adjustment Slot

E. Mechanical Timing & Sensor Adjustments (Carton Transport)

Carton Transport Overview (Continued)

* Both the *Long Advance Rod* & *Short advance Rod* will extend and retract with each advance. Only the *Short Advance Catch Paw* will catch when a short advance is needed and only *the Long Advance Catch Paw* will catch when a long advance is needed.

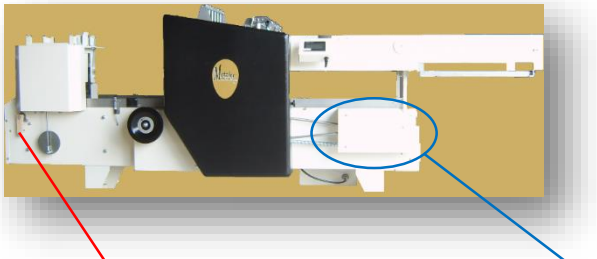
* When a Rods extends it causes it's respective *Catch Paw* to turn C.C.W., thus moving it back allowing the *Catch Paw* to drop into the next catch on it's Cam.

*When a Rod retracts, it drives the *Catch Paw* C.W., forward against the catch on the cam causing the Carton Transport Shaft to turn as the Cams are pinned to the Carton Transport shaft.

* The Cams are pinned on the shaft in such a way that, after the last catch is used on the *Short Advance Cam*, the Catch on the *Long Advance Cam* is in place to provide the next advance. After the Long Advance is completed, the *Short Advance Cam* is again in the correct position to allow the *Short Advance Paw* to drop into the first catch on the *Short Advance Cam* providing the next advance.

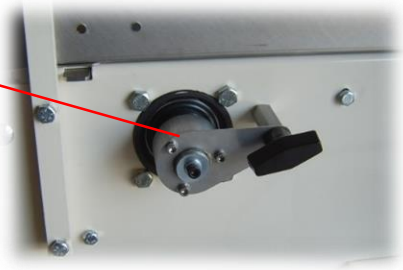
* The *Anti-Reverse Clutch, (located on the end of the Carton Transport Drive Shaft opposite the Ratchet Assembly)* prevents the Drive Shaft from rotating backwards as the Advance Rods extend.

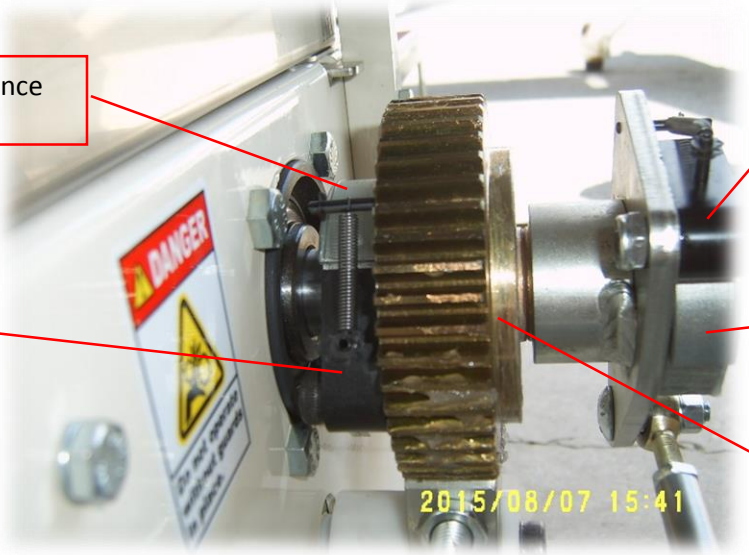
* A *Wooden Friction Brake* prevents forward coasting of the Carton Transport Pusher Chain after an advance is completed.



Wooden Friction Brake

Anti-Reverse Clutch





Long Advance Cam

Short Advance Catch Paw

Long Advance Catch Paw

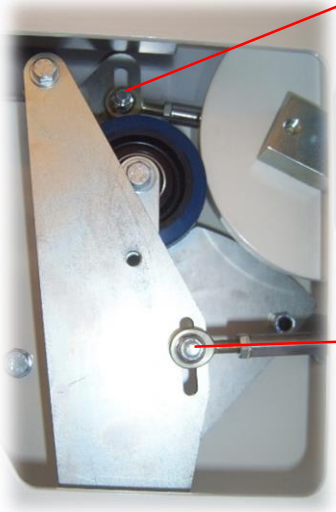
Short Advance Cam

Long Advance Cog Wheel

E. Mechanical Timing & Sensor Adjustments (Carton Transport)

(E) 5.2 Adjusting Long & Short Advance

NOTICE: If the advance is working correctly, but the trays are not in a correct position under clamshells, refer to the following section. (E 5.3 Adjusting Carton Position below Clamshells)



Long Advance Adjustment
Moving the adjustment bolt up will cause more ratchet stroke travel.
Example:
This will correct a problem where, after the Long Advance is complete the Short Advance Catch Paw cannot attain the first Catch on the Short Advance Cam.

Short Advance Adjustment
Moving the adjustment bolt up will cause more ratchet stroke travel.
Example:
This will correct a problem where, after the Short Advance is complete, the Long Advance Catch Paw cannot attain the Catch on the Long Advance Cam.

Catch Paw Gap
If adjustments are correct, as the Advance Rods Extend, the Catch Paws will rotate C.C.W. until the Catch Paw "Clicks" into the catch position on its respective cam. There should be approx. 1/8" Gap between the Catch Paw & the Catch on the Cam.

If Rack Gear Disengages from Cog Gear

*Turn Manual Handwheel until last Short Advance has just completed.

* Continue to turn Handwheel until the Rack Gear is fully extended.

*With Rack Gear still disengaged, rotate Cog Gear C.C.W. until Catch Paw has just "clicked" into Catch on Long Advance Cam.

* At this point, raise Rack Gear Support Roller to re-engage Cog Gear.

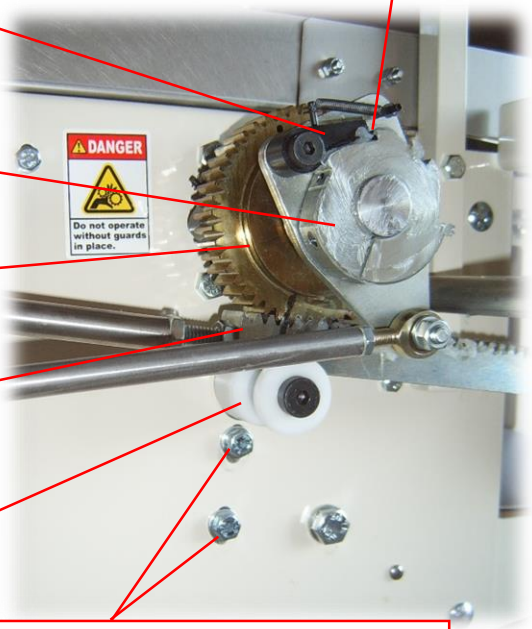
Short Advance Catch Paw

Short Advance Cam

Cog Gear

Rack Gear

Rack Gear Support Roller



NOTICE:
If the Short Advance Cam has 5 Catches cut into it, the Long Advance should over-travel the first catch. The first Short Advance will be done using Catch #2

Support Roller Up & Down Adjustment Bolts
Loosen these two bolts to allow the height of the Rack Gear Support Roller to be set. The Rack Gear needs to be snug with the Cog Gear.

E. Mechanical Timing & Sensor Adjustments (Carton Transport)

(E) 5.3 Adjusting Carton Position Under Clamshells

If the ratchet advance is working correctly, but trays cells are not centered below the clamshells, the only adjustment needed is to slip *the Pusher Chain Drive Sprocket* on its *Drive Shaft*.

The *Pusher Chain Drive Sprocket* is located near the end of the machine where the filled egg cartons exit.

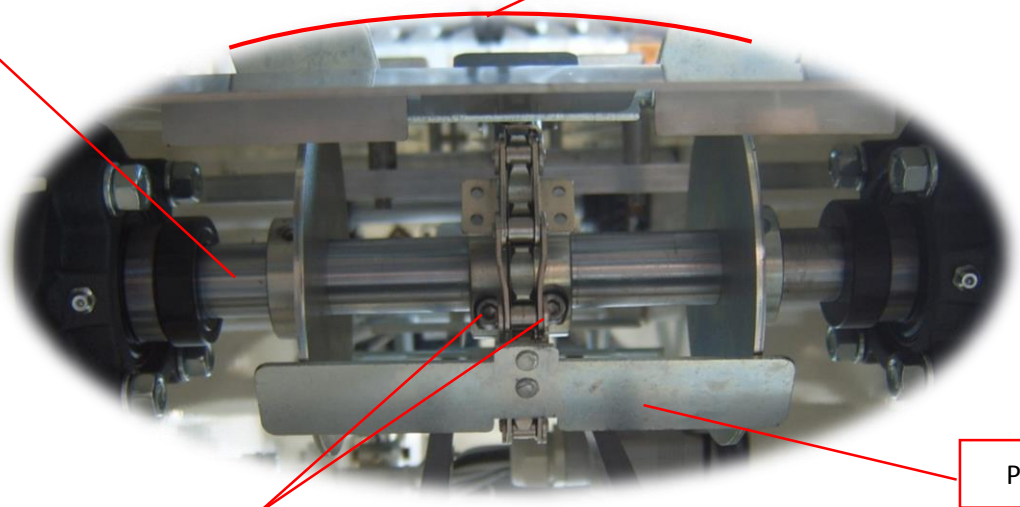
To adjust the Carton Cell location under Clamshells:

*Loosen ***Double*** *Allen Screws* on the *Pusher Chain Drive Sprocket.*

*With ***Double*** *Allen Screws* loose, grasp *Drive Shaft* to prevent unintentional rotation, and slip *Pusher Chain Drive Sprocket* C.W. or C.C.W. until pusher chain is in desired location in relation to current Advance Ratchet location.

*Retighten ***Double*** *Allen Screws* on *Pusher Chain Drive Sprocket.*

If pusher chain timing were lost entirely, turn manual Handwheel until the long advance ratchet has just finished and the Clamshell Assembly is almost Bottom Dead Center. At this point, slip the *Pusher Chain Drive Sprocket* on the *Drive Shaft* until *Cell #1 of a Carton* is centered under the Clamshells. Retighten *the Double Allen Screws* to complete the adjustment.

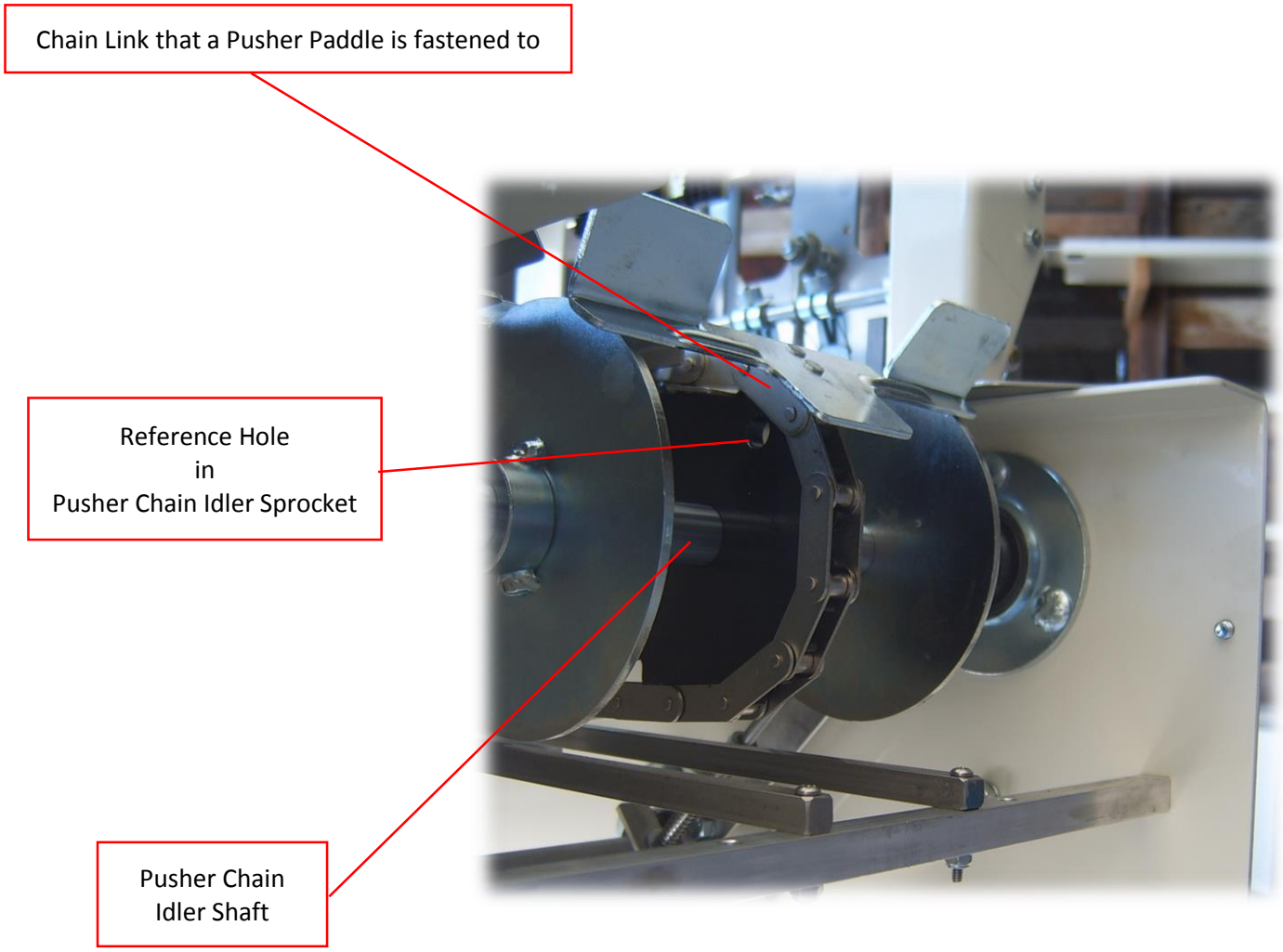


E. Mechanical Timing & Sensor Adjustments (Denester)

(E) 6.1- Pusher Chain Position on Idler Shaft

The following timing reference must be correct for the Denester to function correctly. Prior to making a significant Denester timing adjustment, first confirm correct timing of Pusher Chain Position on Idler Shaft Sprocket. This timing will affect the Denester Start Trigger in relation to the Pusher Chain.

Timing is correct when the *Chain Link that a Pusher Paddle is fastened too* is directly above the *Reference Hole in the Pusher Chain Idler Sprocket*. This holds true for any given Pusher Paddle.



E. Mechanical Timing & Sensor Adjustments (Denester)

(E) 6.2-Adjusting Denester Flat Placement

This adjustment allows the entire Denester Unit to be moved if necessary.

To Adjust Denester Unit:

* Loosen the *Four Set Bolts*.

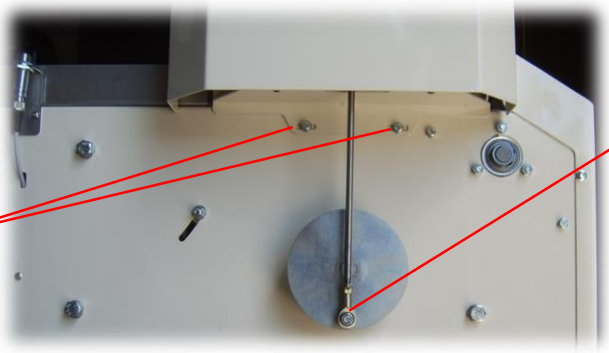
* Move Denester Unit Forward if cartons are catching on rear pusher paddle when loading.

* Move Denester Unit Backward if cartons are catching on front pusher paddle when loading.

* Retighten the *Four Set Bolts*.

Two of the *Four Set Bolts*

NOTICE: Find the other two bolts on the opposite side of Denester



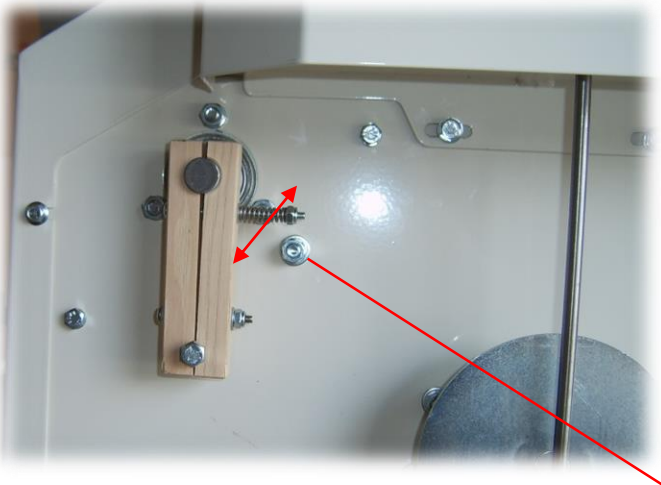
NOTICE:
Denester Lift Rods always need to start/stop at B.D.C. or 6:00 position.

As shown in example picture.

(E) 6.3-Adjusting Denester Start Trigger Position

If the above mentioned adjustment does not provide enough of travel to allow correct Denester location, refer to the following adjustment.

This adjustment will change the Start moment of the Denester in relation to the pusher chain.



To Adjust Denester Start Trigger Position:

* Loosen *Start Trigger Adjustment Bolt.*

* Move Adjustment Bolt up to cause an earlier Denester Start Moment.

* Move Adjustment Bolt down to delay the Start Moment of the Denester.

* Retighten *Start Trigger Adjustment Bolt.*

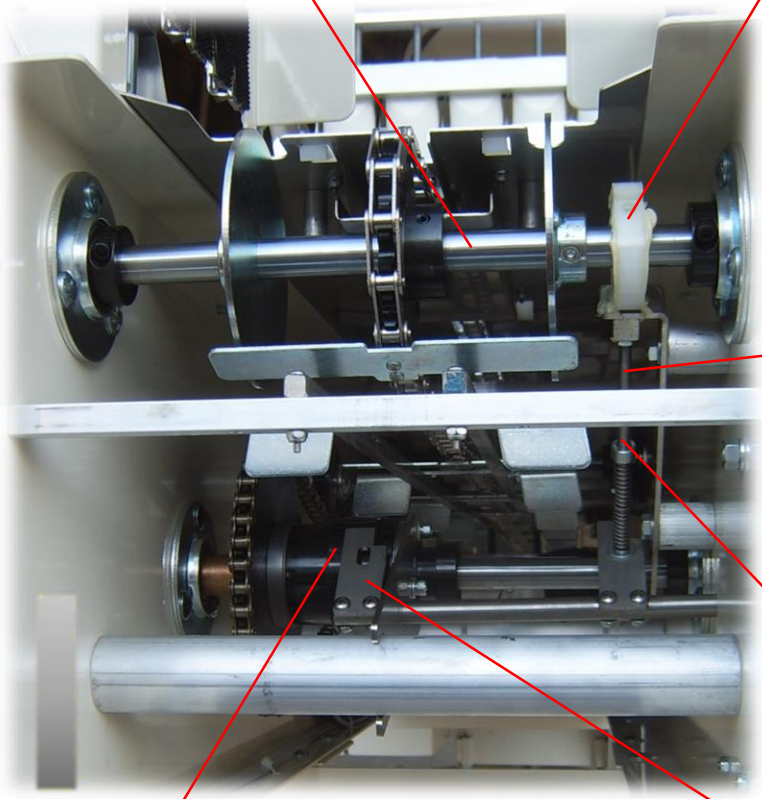
Start Trigger Adjustment Bolt

E. Mechanical Timing & Sensor Adjustments (Denester)

(E) 6.4 Adjusting Denester Start Trigger Length

Overview of Denester Operation:

The operation of the Denester is done by a simple (mechanical only) sequence.
The *White Nylon Trigger Cam* fastened to the *Pusher Chain Idler Shaft* causes the start of the Denester.
As *the Pusher Chain Idler Shaft* rotates, the inset on the *White Nylon Trigger Cam* allows the *Trigger Arm* to lift, thus engaging the Denester Clutch by releasing the *Catch Ring*. As the *Pusher Chain Idler Shaft* continues to rotate, the *Trigger Arm* is again lowered causing it to disengage the *Denester Clutch* as the rotating *Catch Ring* again comes in contact with the *Trigger Plate*.



To Adjust Trigger Arm Length:

*Loosen the Jam Nut

* Turn Rod to a shorter Length if the Denester Clutch slows or disengages during a cycle.

* Turn Rod to a longer length if the Denester Cycles repeatedly without waiting for correct Start Time.

*Retighten Jam Nut

This adjustment should only be used by a trained technician or as instructed by a trained technician

E. Mechanical Timing & Sensor Adjustments (Denester)

(E) 6.5 Adjusting Splitter Fingers

Use this adjustment to prevent Missing or Double Trays. The *Splitter Fingers* are fastened onto the outside of the *Rubber Wedge Pads*. As the Denester Assembly lifts to its top-most point it causes the *Rubber Wedge Pads* & *Splitter Fingers* to release the stack of trays. As the Denester Assembly begins to lower, the *Rubber Wedge Pads* & *Splitter Fingers* will again contact the trays to support the stack. If adjustments are correct, the *Splitter Fingers* will re-enter just above the bottom tray of the stack. This **"splits"** the bottom tray from the remaining stack. The *Grippers* will catch the bottom tray, taking it down as the Denester returns to its bottom-most position.

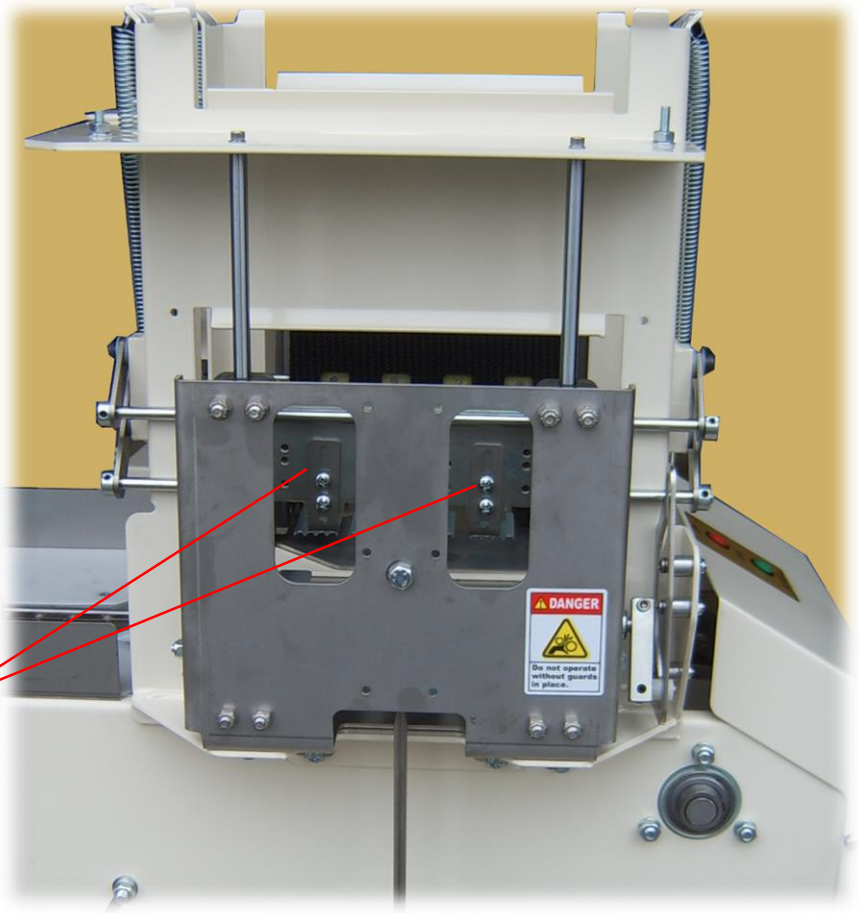
NOTICE: The correct position and count of the Splitter Fingers will vary dependent on the type of tray being used.

Prior to Adjusting:

* ALWAYS BE CERTAIN THAT THE SPLITTER FINGERS ARE NOT BENT DOWN OR OUTWARD.
Fingers should have "L" shape
* MARK INITIAL POSITION OF FINGERS PRIOR TO ADJUSTMENT. ONLY MINOR ADJUSTMENTS REQUIRED.

To Adjust Splitter Fingers height:

* Loosen the Two Philips Screws that fasten the Splitter Fingers.
* Move Splitter Fingers up to correct a missing tray problem.
* Move Splitter Fingers down to correct a double tray problem.
* Notice: there may be 1 or 2 Splitter Fingers on each side of the Denester.
* Retighten the Two Philips Screws.



Splitter Fingers

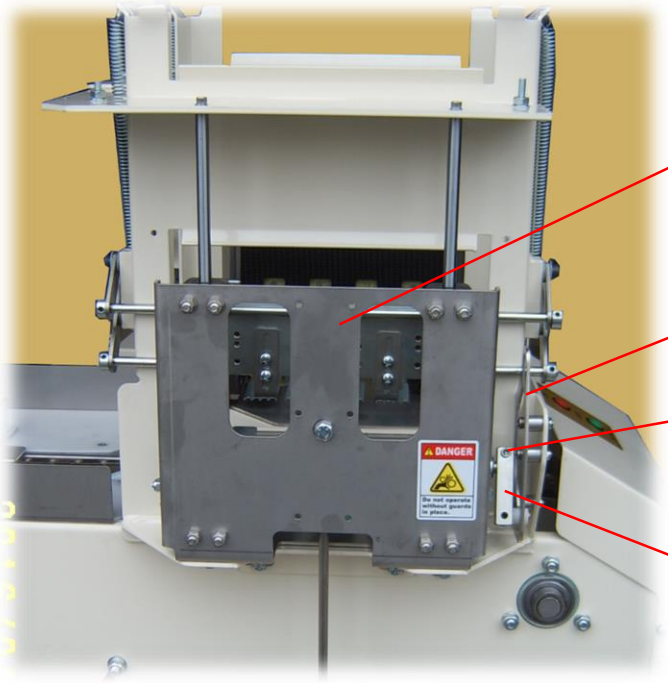
Notice: This example only displays the Splitter Fingers on the one side. Find an identical set-up on the opposite side of the Denester.

E. Mechanical Timing & Sensor Adjustments (Denester)

(E) 6.6 Adjusting Gripper Control Arm

During normal operation, the Gripper Control Arm movement is guided by its *Cam Plate*, thus, as the *Denester Assembly* lowers, the *Gripper Control Arm* is guided forward causing the *Grippers* to grip the tray. As the Denester returns to its Bottom-most point of travel, the *Gripper Control Arm* is guided backward causing the *Grippers* to release the tray.

This adjustment is typically factory set. If, in the instance that reassembly were needed, refer to the following notes to ensure correct set up.



Denester Assembly

Cam Plate

Allen Screw

Gripper Control Arm

To adjust *Gripper Control Arm*, loosen the *Allen Screw* and slip the *Gripper Control Arm* to desired location. Retighten the *Allen Screw*.

Correct adjustment is:
When the Denester is at its bottom-most point of travel, the **Grippers should not be in contact** with the tray that has just been lowered.
If *Grippers* are too far forward at this point, they will obstruct the tray as the Carton Transport Chain moves the tray out of the Denester Area.

Grippers

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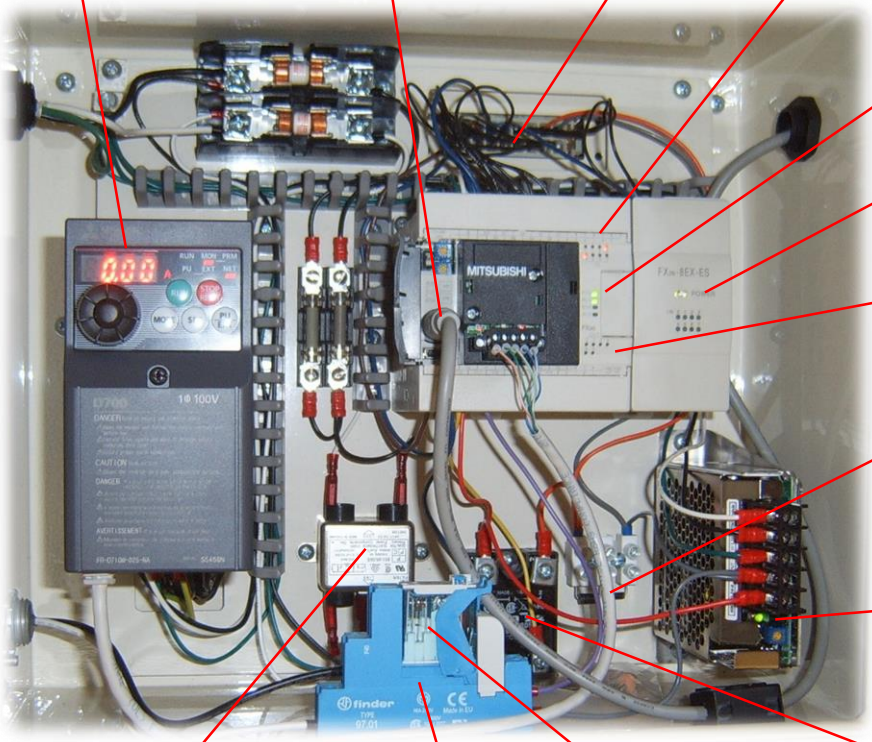
F. Troubleshooting Suggestions

If one of the following Reflector Sensor will not function properly. Missing Tray – Flat High – Flow Control – Takeaway Full Egg Pile Up.	• Be certain *Sensor Lens* & *Reflector* are clean. • Loosen Jam Nuts and Realign the Sensor with its respective reflector. The Green light on the sensors indicate that the sensor is aligned with its reflector. An obstruction between the sensor and its reflector should cause an Orange light on the sensor. • Replace Defective Sensor or Reflector. **NOTE:** The defective sensor can simply be unhooked to allow operation until it is replaced. • Refer to section **(E) 1.0 Sensor Locations & Diagnostics** to view inputs.
Denester will not set trays correctly between pusher paddles.	• Always refer to section **(E) 6.1- Pusher Chain Position on Idler Shaft** to first ensure correct timing. • Ensure that Denester Lift Rods are stopping at the 6:00 position. • Double Check all adjustments mentioned in the **Carton Denester Adjustment** section of this manual.
Packer Motor is running, but the Infeed Egg Reservoir Slats are not moving. Packer will "JOG", but Infeed Egg Reservoir Slats will not move.	• Infeed Slats are jammed. There will likely be some type of debris caught in sprockets causing the jam. **Stop Packer** and carefully pull Infeed Egg Reservoir Chains backwards slightly to release/clear debris. • Infeed Clutch is slipping. Refer to **section (E) 2.7 Adjusting Slip Clutch for Egg Reservoir** for proper adjustment.
Infeed Slats repeatedly pull off.	• Wire Screen is to loose causing it to "bunch up". Loosen anchor screws and re-tension the Wire Screen. • Feed Wires are lifting Wire Screen. Refer to section **(E) 2.6 Infeed Components & Feed Wires** for details. • Plastic Slat Rivet is weak or broken. Replace Plastic Rivets. • Inspect Infeed Slats for warp or twist.
Packer will not maintain a steady operation. (i.e. Clutch disengages and re-engages nearly every cycle.	• Eggs will not roll smoothly onto transfer Pads. Refer to section **(E) 3.3 Adjusting Transfer Pad** to verify correct adjustment of Transfer Pad. Transfer Pad must be in its bottom-most position at the Stop/Wait position. • Refer to section **(E) 2.1 Adjusting 6 Eggs Present (Flag Sensitivity)** to verify correct adjustment of egg flags. • If running large eggs, remove the (Double Egg Prevent "Z" Tabs).
6 Eggs Are present at Egg Gates, but packer will not cycle. No Amber Light on 6-Egg Present Receiver Sensor.	• Will Packer Cycle if the "JOG" button is pressed? If so refer to the following suggestions. • Be certain that Orifice Plate Holes are clean and open and plates are in there correct positions. • Verify that sensor lens are clean and are not scratched. • Refer to section **(E) 2.1 Adjusting 6 Eggs Present (Flag Sensitivity)** to verify correct adjustment of egg flags.

F. Troubleshooting Suggestions

V.F.D. Alarm Indicating An Overcurrent Issue	• Turn Manual Handwheel to "feel" if there is an unusual resistance. • Double Check Main Motor Power Cord Plug & all wire connections to Motor. • Observe Live Current display on VFD Readout as machine starts/runs. • Turn Off Main Power Supply for 30 sec. to Reset alarm
Repeated **Clutch Slipping Alarm**	• Be certain that the clutch is clean and free of oil or grease between the Clutch Body & Clutch Plate. (Clean sparingly using a Brake/Carb Cleaner)
Repeated **Drifting Alarm**	• Check if Balancing Cam Tension Spring is weak or broken. • Refer to section **(E) 3.6 Adjusting Cycle Stop/Wait Position** to verify correct adjustment.
Set *Packer Run Speed* changes every time the Machine is started.	• Refer to section **(B) 4.0- Metzler Setup #1 Screen** to turn off the **(B) 4.2- One Touch High/Low Speed Function.**
Eggs tend to cluster to one side of the Infeed Egg Reservoir.	• Adjust Packer Base Leg Bolts to Re-Level the machine.
Pusher Chain fails to advance	• Check Advance Rods for Movement. Check for broken Pendulum Return Spring or broken Catch Paw Springs. • Check Catch Paw Gap. If Catch Paw Gap is not correct, adjust Long Advance & Short Advance Rods as described in section **(E) 5.2 Adjusting Long & Short Advance** .
Pusher Chain "Screeches" every time it moves.	• Lubricate the Pusher Chain Return Support Rails. • Lightly Lubricate the Wooden Friction Brake.
Soft-Set Clamshell Assembly seems to hesitate or jolt when coming down causing eggs to miss the cartons.	• Lubricate the full length of the 4 Rods that the Clamshell Supports Slide on. The Left/Right Movement is also mechanically linked to the Up/Down Movement. If the one movement does not move freely, it also affects the other.
The tops of "Jumbo Eggs" are being broken.	• Refer to section **(E) 4.1 Adjusting Height.**

G. Misc. Electrical Info



V.F.D. Readout

Touch Screen Communication Cord

16 Terminal Plug Location

PLC Input Indicators

PLC Status Indicators

Expansion Module Status Indicators

PLC Output Status Indicators

Clutch Diodes

Clutch Power Supply 24VDC Output Status Indicator

Clutch Transistor

House Belt Flow Control Relay

House Belt Flow Control Relay Base

EMI Suppression Filter

16 Terminal Plug

Plug Terminal	PLC Input	Description
1	X1	Flat High
2	X2	Missing Flat
3	X3	Missing Eggs
4	X4	Cycle Stop
5	X5	Pusher Chain Jam
6	X6	Start Pushbutton
7	X7	Stop Pushbutton
8	X0	Flow Control
9	24V +	Brown's
10	24V+	Brown's
11	0V	Blue's
12	0V	Blue's
13	Expansion Card – X1	Take-Away Jam
14	Expansion Card – X2	Egg Pile-Up
15	Clutch Power	
16	Clutch Ground	

Fuses

Description	Part Number	Location
VFD	A3T15	2 Fuses in Large Fuseholder
PLC	ABC-1-R	Left Small Fuseholder
Clutch Power Supply	MDA-3-R	Right Small Fuseholder

VFD Parameters

P7	0.5
P8	0.5
P9	1.8
P72	15
P118	96
P119	10
P340	10