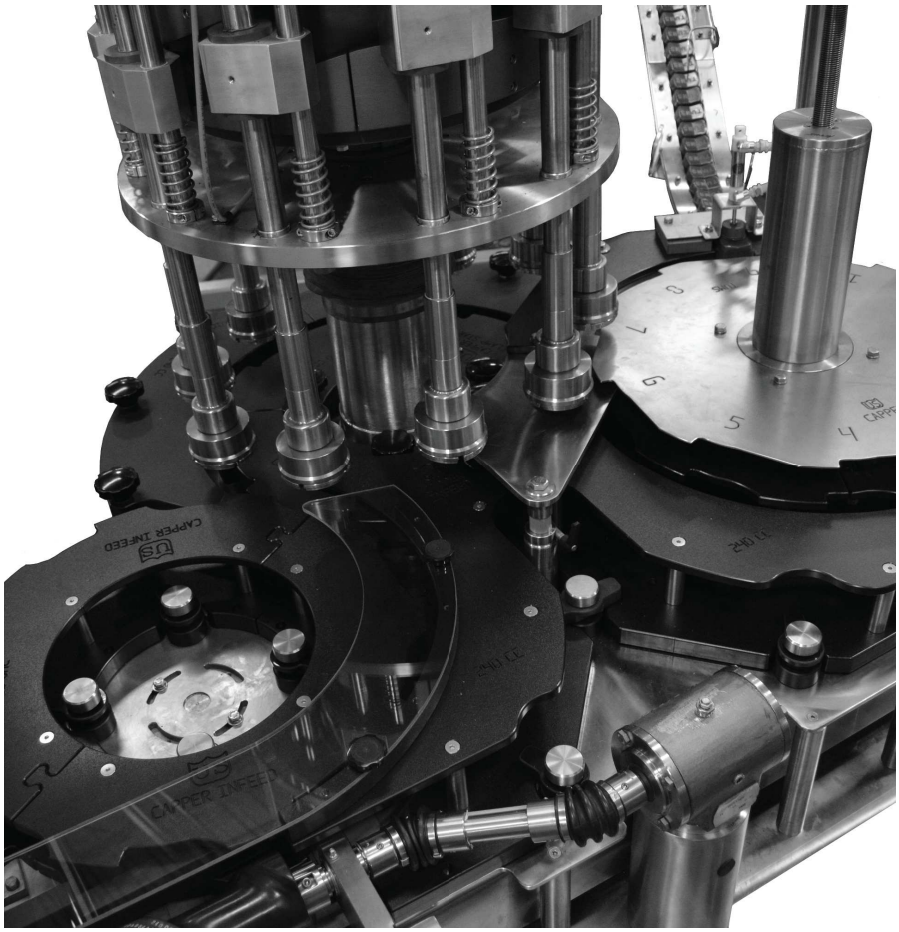
U. S. BOTTLERS MACHINERY CO.-CHARLOTTE

BOTTLING AND PACKAGING ENGINEERS

Creative Custom Packaging Equipment



Overcapper

ROC-10-22"

USB MACHINE NO: 98000

Installation/Operation/Maintenance Manual for

GlaxoSmithKline

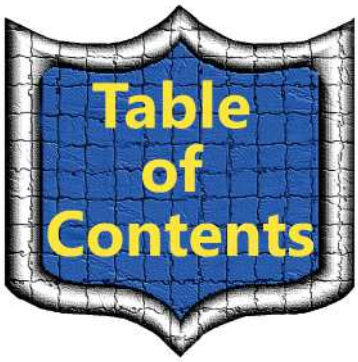


Table Of Contents

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About The Company

US Bottlers Machinery Company was founded in 1912 in Chicago, Illinois. During its 68 years in Chicago, the company developed a tremendously broad line of equipment including the industry leading Sanitair Air Cleaner, Rotary Vacuum, Gravity Filler, Container Feeder, and the Siphon Filler, which are all still present in today's production.

The company relocated to Charlotte, North Carolina in 1980. With this move came advancements, including the introduction of the Rotary Net Weigh Filler and the Rotary Capper. The company expanded to approximately twice the size it had been in Chicago, facilitated by modernized equipment and improved layout.

With greater production capabilities and design advantages in Charlotte, the company established itself as a leader in the hot pack juice industry during the 1990's. Consequently, the company marketed itself as a custom packager and support team for unique applications. This allowed for growth in the area of unique applications and production of machinery capable of higher volumes. US Bottlers Machinery became recognized for building some of the largest and strongest stainless steel machinery available.

An attitude of flexibility has allowed US Bottlers to progress in the design of advanced packaging concepts and options. Over the past decade, the company has added equipment lines for snap-on cap applications, ROPP caps, inserts, overcaps, mag-flow filling, rinsing, and the revolutionary volumetric piston filler.

US Bottlers Machinery continues to make advancements in the packaging field. Founded in 1912 as a private, family owned packaging firm, the company remains true to its roots of private ownership and is currently owned and operated by the fourth generation in this line of succession. US Bottlers Machinery continues to provide quality products paired with professional support, just as it has from the start.

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A Letter From The Owner

In 1906 my great grandfather established his packaging engineering enterprise, which eventually was reconfigured as US Bottlers Machinery Co in 1912. Since that time we have seen our company, as well as our industry, evolve many times over to become what we are today. That journey has taught us a lot about what it means to be a successful company and how reputation, quality, and loyalty impact our business and our future.

Personally, I take tremendous pride in our history and our roots from each of the four generations that have been involved with our family and our company. I value the employees of our company and the customers over these many years; in a manner that I think often gets lost in corporate big business. If you are a new customer of ours – thank you for supporting a modern American manufacturing and design company; and if you are one of our loyal customers from the past – thank you for your continued support. Together we believe that we can work towards simply the best possible relationship in terms of personal service, quality innovation, and superior design and manufacturing capability.

To help assure that goal, US Bottlers has spent the last few years investing in state-of-the-art technology to improve our manufacturing capabilities, restructuring our organization to provide valued customer service, and have increased personnel to improve efficiency in responding to the needs of our growing customer base. All of these moves, I feel, have enhanced the character and image of our company. We have made a commitment to be truly a unique source of modern packaging machinery as well as a full service oriented company for our customers' needs in this demanding business environment.

We invite you to come visit our inspiring facility here in Charlotte, NC and I think you will be witness to what is possible with a flexible and very capable organization that focuses on our business with talent, passion, pride, and integrity. It is my goal to continue to make our ancestors proud of where we are today; and of course where we are headed in the future.

Thomas Risser
President, US Bottlers Machinery Company

Customer Care, Aftermarket Sales And Parts

Our outstanding Service Department prides itself on satisfying all your needs as a customer, including helping ensure that your production is uninterrupted once you own US Bottlers equipment. US Bottlers Customer Care Staff cheerfully provides answers to your questions and helps you resolve any bottling/capping/parts issues by referring your call to the right personnel or department.

- **Customer Care** - Schedules equipment installation & maintenance service calls or answers operational questions about your machinery
- **Aftermarket Sales** - Provides general or specific information about our equipment including training, service, quotes, rebuilds, and modifications on existing equipment
- **Parts** - Provides support when ordering replacement and spare parts

Customer Care

US Bottlers technicians have the training and experience necessary to service the electrical, mechanical, and programming features of our bottling systems. Our technicians maintain the highest levels of technical skills through ongoing vendor training, studying technical bulletins, and attending in-house seminars.

The service department provides machine installation, start up coverage, training, modifications, audits, preventative maintenance, and troubleshooting services.

Customers have 24-hour access to our skilled Service Technicians for troubleshooting issues. More than 90% of our troubleshooting calls are solved over the phone. This service can save you the cost of an unnecessary service trip and eliminate unnecessary production down time spent waiting for a service technician to arrive.

Parts

Our **Parts Department** can fill your orders for replacement and spare parts quickly, accurately, and at competitive prices - often cheaper than your local suppliers. In-stock items are shipped the day you call (overnight if you need it). Our parts department also makes it easy to process warranty claims.

About The Manual

The instructions contained in this documentation must be read, understood, and followed. In order to utilize the full performance of your new machine, it is necessary to thoroughly understand its capabilities, performance levels, and the possibilities of its use. In order to obtain maximum lifespan and optimal efficiency from this machine, it is necessary to comply with the information contained in this documentation.

It is important that ***everyone involved*** (Supervisors, Maintenance Personnel, and Operators) receive instruction on the "SAFETY STANDARDS" described in this documentation, before machine start-up and operation.

Before starting work, the operator must:

1. Read this documentation in full
2. Understand machine layout
3. Understand operation of machine controls
4. Understand machine characteristics
5. Must continue to have access to this documentation in its entirety

All instructions, warnings, and accident prevention regulations contained in this documentation must be complied with. Failure to so may result in machine damage, severe bodily injury, or death.

IOM Manual Availability

This documentation is available online through the Customer Portal via www.usbottlers.com and will be updated as the machine is modified by USB or with USB notification and approval.

An "As Built" file will be provided on CD-ROM with purchase, but will not be updated.

Paper hard copies are available by request at an additional cost.

Any modifications to or replacement of any of the machine's parts, without the express authority of the manufacturer, may constitute the potential risk of an accident and therefore relieves the manufacturer from any and all penal and civil responsibilities.

No part of this documentation should be removed or re-written.

The documentation provided via the Customer Portal shall be considered the only current documentation. The customer is held responsible for updating any additional digital or hard copies in their possession as modifications are made.
This documentation supplies the information and detailed instructions required for installation, operation, and maintenance of the machine. Subsequent users or owners of the machine must notify US Bottlers Machinery Co. and request access to on-line documentation available for the machine.

NOTE: US Bottlers Co. declines responsibility for any errors or damage resulting from the failure to update any documentation not supplied online.

Explanation Of Terms Used

OPERATOR: This is an individual who is responsible for the installing, operating, adjusting, and the day-today maintaining and cleaning of the machine.

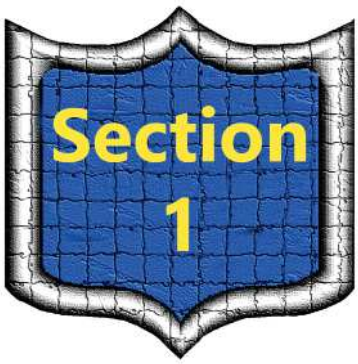
QUALIFIED TECHNICIAN: This is an individual who is qualified and specifically trained and capable of performing maintenance or repair operations that require a specialized knowledge of the machine, its parts, its operation, its safety devices, and their methods of operation.

WARNING: PROVIDES INFORMATION THAT, IF UNHEEDED, MAY RESULT IN PERSONAL INJURY OR DEATH

CAUTION: Provides information that, if unheeded, may result in equipment damage

ATTENTION: Provides information that is deemed of special importance

NOTE: Provides helpful hints to assist in performing the tasks at hand



Technical Information

98000 Overcapper

About The Product

The product addressed in this manual was designed and manufactured to specific customer defined specifications relative to function and speed.

In manufacturing this machine, US Bottlers Machinery has employed decades of expertise and cutting edge technology, paired with a sense of personal pride in product outcome and customer satisfaction. For this reason, special attention is paid to material selection to ensure a long machine life with low maintenance.

This machine comes to you with all attachments necessary to handle the full range of containers listed on your order.

All attachments are marked or otherwise identified for pairing with the containers submitted.

For the use of attachments capable of handling several different containers,"Table 1-2: Overcapper Attachments" on page 20.

Theory Of Operation

US Bottlers' Overcapper is designed to efficiently cap containers without rotating shafts or torque control. Custom chucks allow a proper "pick and place" approach, ensuring high efficiency and constant uptime.

The machine's onboard operator panel controls all electrical and pneumatic activities. The main drive train, a motor and gearbox combination, provide torque to the capper's center turret.

Back-to-back, containers travel along the infeed conveyor chain until they are fed to the capper's feed worm. The feed worm is a cylindrical auger specifically designed to separate incoming containers and guide them into the infeed star. The infeed star and feed worm must rotate in unison for containers to transfer properly. A pulley and belt configuration drives the star shafts and feed worm. Ratio change from pulley to pulley is designed to ensure feed worm and infeed star turn with cooperative timing.

The infeed star is a circular plate attachment with "pocket" cutouts around its periphery. These pockets are positioned to catch each container the feed worm presents. Pocket size and shape is designed to accommodate the corresponding container. The infeed star rotates to transfer containers consecutively to the capper turret's turntable.

An infeed center guide plate ensures proper transfer and prevents centrifugal force from tipping containers. The center turret rests upon a large radial bearing with four-point contact that allows for rotation of the machine's central portion, including the carousel turntable. The turret assembly includes a clamp star and backup rail that keep containers properly positioned during the filling process.

As containers feed into the clamp star, the cap feed star presents a single cap to each revolving chuck jaw. As containers move into the capping position, they align with capper chucks mounted on the turret.

The cap chute feeds a cap through the feed star to each chuck jaw that rotates past.
A cap gate at the bottom of cap chute is actuated by a combination of two electric sensors.
A bottle present sensor is used to detect a container entering the capper and a proximity sensor is used to track the pockets in the cap star. The number of star pockets between the bottle present sensor and the cap gate is entered in the CAP SHIFT register which is used by the process control to delay the cap release until the container is in position. This function allows for a "no bottle no cap" scenario. An electric air solenoid mounted in the capper's pneumatic panel actuates the cap chute gate which releases a cap.

Each chuck shaft assembly includes rollers that allow travel around the carousel along a stationary cam ring. As rollers descend on the cam, the capper chuck lowers. A motorized hoist permits raising and lowering of the cam track to accommodate different container heights. The cap chuck jaw grabs the cap from the cap chute and carries it until the jaw lines up with the next container. When container and jaw are aligned, the capper presses the cap onto the container. The capper chuck assembly then begins to rise as the cam ring ascends. At this time, the cap jaw raises away from the container and the capping operation is complete.

Theory Of Operation (continued)

The container travels to the discharge star before exiting the machine. Like the infeed star, the discharge star is a circular plate attachment with “pocket” cutouts around its periphery. Each pocket size and shape is designed to accommodate the appropriate container. The discharge star turns concentrically on a drive shaft and is positioned to catch each capped container as it exits the clamp star. The discharge center guide ensures that containers remain engaged with the transfer star until they rotate onto the discharge conveyor.

Technical Data	
FACILITY REQUIREMENTS	
Environmental Conditions	Enclosed structure, climate controlled, free of visible atmospheric pollutants
Electrical Supply	208 VAC, 30 Amps, 3 Phase
Pneumatic Supply	80 psi, 20 cfm, 0.5 inch diameter inlet piping
MACHINE SPECIFICATIONS	
Machine Dimensions	Capper: 113" H x 88-1/2 " L x 58" W (approximate) Vibratory Sorter: 91" H x 50" L x 50" W (estimated)
Machine Weight	Capper: 5000 lbs (estimated) Vibratory Sorter: 2750 lbs (estimated)
Production Capacity	215 BPM
LUBRICATION	
Bearing Grease	630-AA Grade
Gearbox Oil	Shell HD220/Mobile SHC630
MAIN DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	3
Revolutions Per Minute (RPM)	1800
Enclosure/Application	Inverter Duty / 1000:1 Constant Torque
TURRET LIFT MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1
Revolutions Per Minute (RPM)	1740
Enclosure/Application	TENV / w/Brake

Table 1-1: ***Technical Data***

Attachment Reference & Setup Parameters

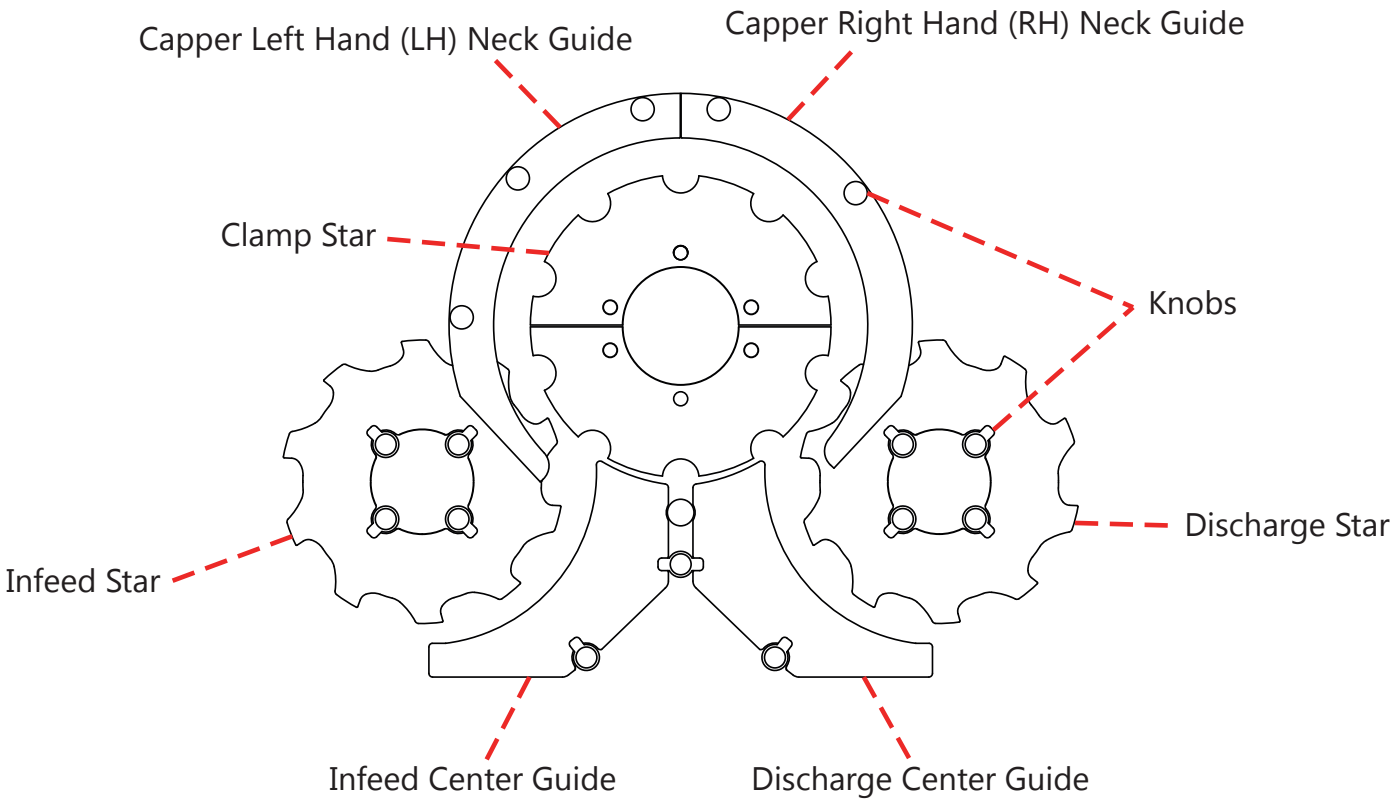


Figure 1-1: *Attachments Layout*

Attachment Reference & Setup Parameters (continued)

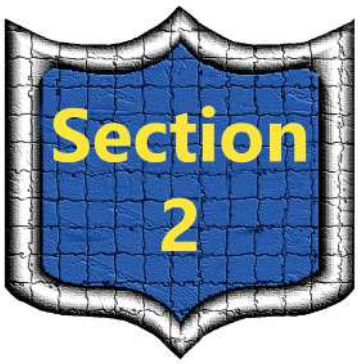
ATTACHMENT SHEET - U.S.B. OVERCAPPER

MODEL ROC 10-22″ ENGR # 98000-1 ORDER # 98000-1

CUSTOMER GLAXOSMITHKLINE DATE: 3/30/15 SHEET 1 OF 1

	BOTTLE SIZE	**240 cc**		
	CAP	**TUMS**		
	DESCRIPTION	Rectangular plastic bottle 2.746″ length x 1.572″ width x 4.904″ height 98000-6		
FEED WORM	MARK	240 cc		
	CODE	98000-6-1		
	PART	A18540		
NECK GUIDE	MARK	240 cc		
	CODE	98000-6-3		
	PART	X75897SP		
CENTER GUIDE ASSEMBLY	MARK	240 cc		
	CODE	Top Inf: 98000-6-7 Bot Inf: 98000-6-8 Top Disch: 98000-6-9 Bot Disch: 98000-6-10		
	PART	A19849SP		
STAR, INFEED & DISCHARGE	MARK	240 cc		
	CODE	Top: 98000-6-15 Bottom: 98000-6-14		
	PART	A18755SP		
CLAMP STAR	MARK	240 cc		
	CODE	98000-6-16		
	PART	X70115SP		
CAP STAR	MARK	TUMS		
	CODE	98000-6-17		
	PART	A19376		
CLAMP STAR BOLTS	PART	A16462 (6)		

Table 1-2: *Overcapper Attachments*



Machine Setup
98000 Overcapper

Unpacking

1. **Uncrate the machine carefully.**
   All crates and boxes are to be placed right side up, as determined by the printing on their sides, and opened in manner that does not damage their contents. Shipping containers must be placed on a flat and stable surface to prevent property damage and personal injury.

> **NOTE:** Most machines are shipped FOB (free on board) Charlotte which places responsibility with the customer to look for damaged equipment due to shipping or weather and to address those issues with the trucking firm and insurance agencies.

2. **Check all attachments and parts against the main packing slip.**
   Upon delivery, the customer is to obtain a copy of the Bill Of Lading from the trucker and verify that all items are received. Upon unpacking, ensure that all equipment, assemblies, and components are present. If it is discovered that an item or items are missing and is not listed as a part delivered, contact US Bottlers Machinery immediately.

3. **Use extreme care to see that no instruction tags are lost or parts misplaced in the wrapping or packing material.**
   When unpacking, keep property organized to assist location and identification during the installation process. Do not remove any identifying labeling or tags from the property until after it has been installed, unless such identification poses a hindrance to their installation.

> **ATTENTION:** It is advised that the machine feet be located and isolated first in order to prevent loss and to facilitate a timely installation.

This machine has been shipped with major electronic components removed. The main power source is packaged separately.

> **ATTENTION:** Instruct your shipping and machinery rigging personnel not to attempt to unpack any of the items from the containers marked "Open by U.S.B. Service Personnel Only".
>
> **DO NOT** make any attempt to install electronic components on the machine. These boxes contain electronic components and MUST be properly handled to prevent damage.

The U.S. Bottlers service engineer assigned to assist you with machine set up will check and install these components. The engineer will also train your operators and service personnel regarding proper care and operation of this machinery.

4. **If the machine has been uncrated in an area distant from the final installation point, move the machine on the skid to the final location before removing the machine from the skid.**

Transport

It is very important to observe all transport instructions and safety warnings to prevent possible personal injury or damage to the equipment.

ATTENTION: To prevent possible damage, it is recommended that the machine's doors closest to the forklift be removed prior to lifting.

CAUTION: When transporting the machine for the purpose of installation, it is advised that the unit be lifted and positioned at the correct angle.

Only qualified or experienced personnel may transport and unloading the equipment.

WARNING: ONLY LIFT AND MOVE PALLETIZED EQUIPMENT USING A FORKLIFT OR PALLET JACK APPROVED FOR THE PACKAGED WEIGHT.

Once unpacked, the machinery can usually be lifted from the bottom using a forklift and then moved. If transporting by forklift, the operator is to ensure that the forks traverse fully from one side of the machine to the opposite side and that the forks only make contact with the machine's frame structure.

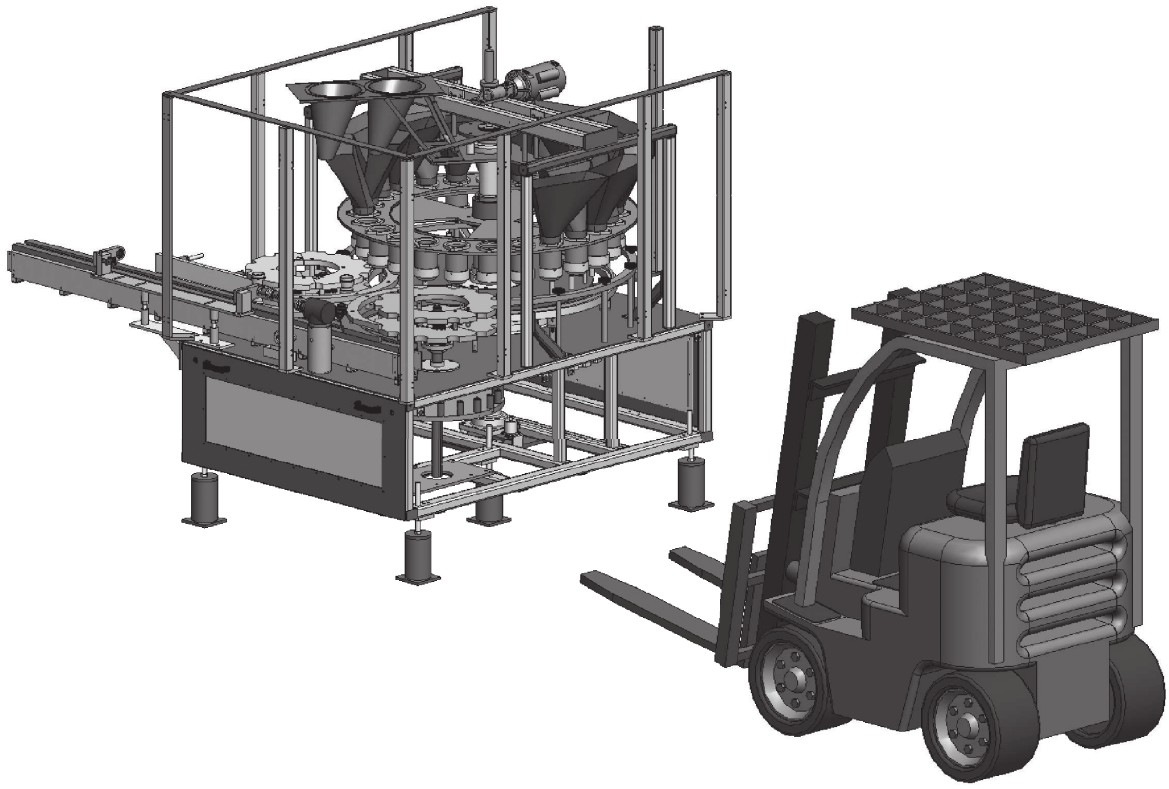


Figure 2-1: ***Transport by forklift***

Transport (continued)

CAUTION: Before moving the equipment, ensure there is adequate clearance in passages and doorways.

NOTE: Figure 2-1 is a representation displaying a typical machine to be transported. The machine displayed is not the machine ordered.

WARNING: ONLY USE LIFTS AND LIFTING GEAR CERTIFIED TO ACCOMMODATE A LOAD CAPACITY THAT EXCEEDS THE EQUIPMENT BEING MOVED.

If a gantry crane is the transport method, insert cross members through the frame structure at each end of the equipment. Chokers used are to be of equal length and must comply with weight requirements. All transport equipment, cross members, chokers, and shackles are to be supplied by the customer and are the customer's responsibility in the manner of use and performance ability.

WARNING: NEVER STAND UNDER A SUSPENDED LOAD. THERE SHOULD ALWAYS BE A PERSON STATIONED ON EACH SIDE OF THE EQUIPMENT TO ENSURE THE PATH IS CLEAR OF OBSTRUCTION.

Machine Installation

Installation must be carried out in accordance with these instructions and must only be performed by experienced contractors or personnel to ensure a safe and correct installation.

WARNING: KEEP FINGERS AWAY FROM POSSIBLE PINCH POINTS TO AVOID INJURY. WORK WITH CARE.

Before beginning installation:

1. Ensure that access to the machine's installation site is clear and reasonably level
2. Ensure that adequate power supply is available
3. All lifting equipment and hardware must be available
4. Work area must be free of debris

WARNING: ONLY BEGIN INSTALLATION AFTER ALL LITERATURE HAS BEEN REVIEWED. FOLLOW ALL INSTRUCTIONS AS DIRECTED. CONTACT US BOTTLERS MACHINERY IF ANY DRAWINGS OR LITERATURE ARE MISSING.

Move the uncrated machine into position and place it in line with the proper conveyor. Adjust the jack screws so that the machine is level by using a finished surface such as the capper cabinet or bridge plate as a reference. It will not be necessary to attach the machine to the floor when weight is properly distributed because machine weight will eliminate vibrations. Ensure that the jack screws used for leveling the machine are positioned in the center of the foot pedestals and that the load of the machine is equally distributed between the machine feet.

Your machine bridge plate is built to accommodate the type of conveyor chain specified on your order. Connect the feed and discharge conveyor tracks and carefully check their alignment. Run conveyor chain through machine and feed return back through return plate support beneath the bridge plate.

Once the machine is positioned properly on the packaging line and the conveyor system is installed, proceed to installation of the main machine control enclosure. Provide power to the electronic power source and connect this unit to the main machine junction box terminal strip. Ensure that all motor control wires are run in a separate conduit.

After machine installation is complete, rotate capper and observe the action of all rotary and moving parts to ensure smooth movement throughout the whole cycle. Pay particular attention to cam followers and rollers to ensure they flow smoothly along the cam track. Abnormal rapid wear can occur on a machine that has been improperly installed.

Machine Installation (continued)

After all primary services are installed and connected to the capper, the U.S.B. service engineer should be scheduled. In one to two days, this engineer will be able to install the remaining items on the capper and run necessary diagnostic tests.

During this period, personnel responsible for service of the machine should be present to work with the U.S.B. engineer. Personnel will receive instruction on operation and maintenance of the system. Bottle handling and product testing should be scheduled for the third day and generally the service engineer should complete work on the fourth day.

Pneumatics

ATTENTION: If you have doubts regarding proper installation, contact a local field engineer who supplies compressors and filters. A good field engineer should be fully acquainted with your requirements and able to provide proper recommendations.

This machine requires clean, dry, oil-free air. The amount of compressed air required depends mainly on the pressure used. The size of the container being filled and capped does not affect the volume of compressed air required.

CAUTION: IF THE MAIN AIR LINE PRESSURE IS IN EXCESS OF OUR MAXIMUM RECOMMENDED OPERATING PRESSURE OF 100 PSI, A REDUCING VALVE MUST BE USED AT THE MACHINE.

Carefully run the air line to the machine. The line should not have pockets or bends that will permit the collection of moisture or oil vapors that may be carried over from your compressor. Corrosion resisting fittings are required.

CAUTION: DO NOT EXCEED 15 PSI AT ANY BLADDER STYLE BOTTLE STOPS. THE BLADDERS WILL BURST.

Carefully select a good air filter, oil filter, and a separator with capacity sufficient to handle nearly double the volume of your air requirements.

CAUTION: SUPPLY ONLY CLEAN, DRY AIR TO THE MACHINE - NEVER SUPPLY LUBRICATED AIR.

Electrical Installation

A wiring diagram and cable schedule are provided as part of the literature package included with this machine. All cable work between the machine, control panel, junction box, and power supply connection must be in accordance with information provided in the wiring diagram.

WARNING: ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES WHEN PERFORMING ANY ELECTRICAL ACTIVITY.

WARNING: LEGALLY QUALIFIED PERSONNEL MUST PERFORM ALL ELECTRICAL ACTIVITY IN ACCORDANCE WITH APPLICABLE REGULATIONS.

WARNING: DO NOT APPLY POWER TO MACHINE UNTIL ALL WIRING CONNECTIONS HAVE BEEN VERIFIED. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY OR COMPONENT FAILURE.

CAUTION: Any terminal sleeves removed during lead connection must be replaced afterwards.

CAUTION: Ensure to use only the recommended wiring and cabling specified in this document or in other material provided with the machine.

CAUTION: To ensure proper machine operation, each level of wiring must be run in its own conduit or separated in the wireway with the appropriate barriers to ensure adequate isolation.

CAUTION: Ensure all ground wires are connected as directed in the schematics provided.

Electrical Installation (continued)

Stop Buttons

It is often advantageous to be able to stop this machine from either end of the production line. Installing additional stop buttons wherever desired can do this.

WARNING: INSTALLATION OF ADDITIONAL START BUTTONS MAKE IT POSSIBLE TO RESTART THE MACHINE WHILE ANOTHER PERSON IS PERFORMING MAINTENANCE, WHICH COULD LEAD TO SEVERE INJURY OR DEATH.

DO NOT INSTALL ADDITIONAL START BUTTONS.

Installation Checklist

Installation Checklist		
Machinery		Position overcapper
		Adjust overcapper height and lock feet
		Connect conveyor frames
		Install conveyor chain
Electrical		Mount main PLC panel
		Run and mount high voltage conduit
		Run and connect power supply cable(s)
		Run and connect point to point I/O wiring
Pneumatics		Run, mount, and connect facility supply
		Connect point to point lines
		Test for leaks

Table 2-1: *Installation Checklist*

Machine Operation

98000 Overcapper

Pneumatic Regulator Blocks

The desired minimum air supply pressure for input to the regulator is 80psi. A respective pressure adjustment dial allows for manual pressure regulation by turning the dial until the desired or optimum pressure is achieved. Air pressure is displayed on the supply pressure gauge which is attached to the face of the regulator.

Filter
The input pneumatic regulator is equipped with a filter to collect excess fluids from air supply lines. Periodically, the filter must be emptied. Unscrew knurled filter bleed valve located at the bottom of the vessel to drain the accumulated fluids.

Low Air Sensor
The low air pressure switch is preset at just under 50psi and should not require adjustment unless the switch is replaced.

Cap Gate Regulator
Regulates the speed at which the cap gate opens and closes.

Cap Chuck Regulator
Regulates the air pressure used to close chuck jaws. Pressure settings vary depending on grip pressure and closing speed needed for current application.

Capper Chute Air
Controls air supply delivered to cap chute air jets used to assist the movement of caps through the chute.

Plugger Chute Air
Controls air supply delivered to plugger cap chute air jets used to assist the movement of caps through the chute.

Flow Regulator Valves
Flow regulator valves control air supply. There is an adjustment knob for upper and lower valve control. Valve thresholds may require adjustment from one cap type to another.

Bottle Stop Regulator
Controls the air pressure to the bottle stop device.

CAUTION: DO NOT SET THE BOTTLE STOP PRESSURE HIGHER THAN 12 PSI OR THE BLADDER WILL BURST.

Pneumatic Regulator Block (continued)

Main Air Solenoid
Supplies air to system as long as all doors and the e-stop are clear.

Supply Air Lockout
Provides manual shutoff for air supply.

Attachment Changeover

A container change will require substitution of machine attachments to allow for container and cap variations. Each attachment set is stamped with applicable container/cap identifiers to assist with the changeover process.

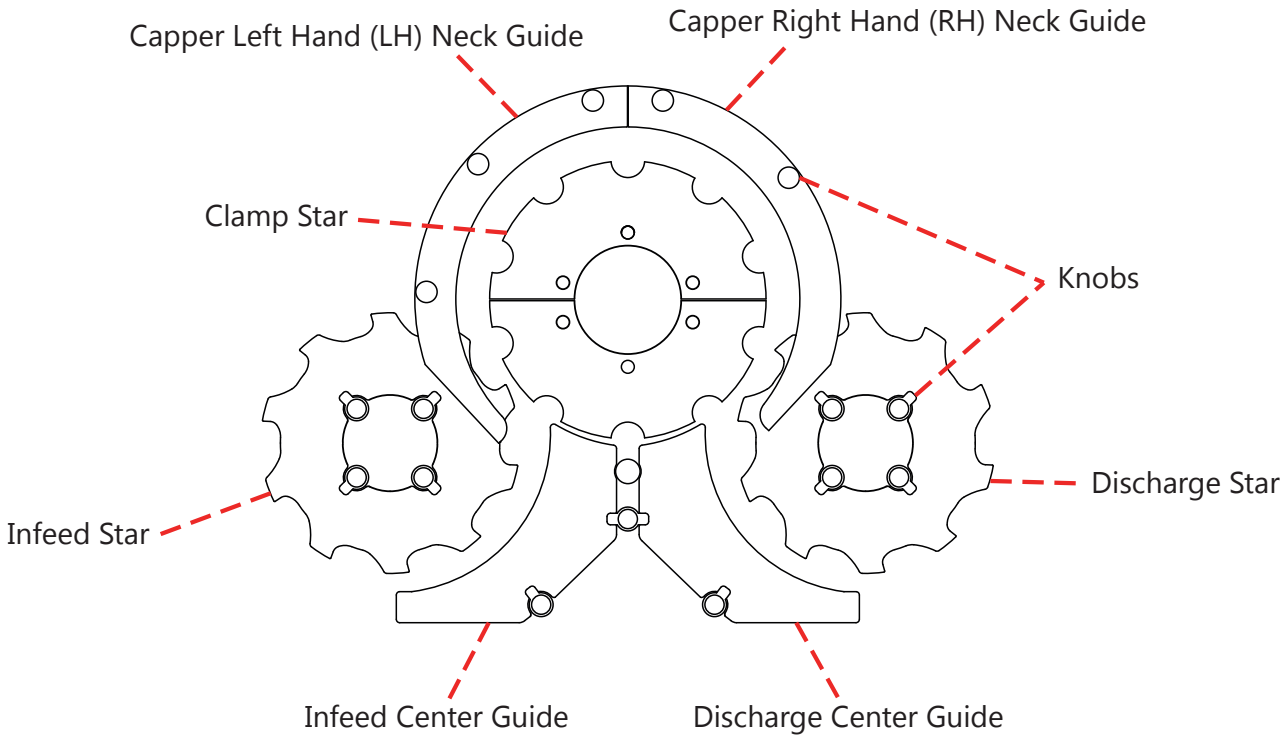


Figure 3-1: ***Attachment Changeover Diagram***

To change attachments:

1. Fully raise capper turret
2. Place machine in "Door Bypass" mode

> **NOTE:** Door Bypass mode allows only one door to be open at any given time. If multiple doors are opened, the machine will E-Stop.

> **NOTE:** Refer to "Operation Screens" on page 37 for specific menu information.

3. Open safety doors as necessary to access the changeover attachments
4. As applicable, change operator panel settings to correspond with new setup
5. Turn three knob bolts that secure LH Neck Guide counterclockwise until removed
6. Lift and remove LH Neck Guide
7. Turn three knob bolts that secure RH Neck Guide counterclockwise until removed
8. Lift and remove RH Neck Guide
9. Turn six knob bolts that secure Clamp Star counterclockwise until removed
10. Lift and remove Clamp Star
11. Turn four knob assemblies that secure Infeed Star counterclockwise until removed
12. Lift and remove Infeed Star

Attachment Changeover (continued)

13. Turn four knob assemblies that secure Discharge Star counterclockwise until removed Lift and remove Discharge Star
14. Turn three knob assemblies that secure Infeed Center Guide and Discharge Center Guide counterclockwise until removed
15. Lift and remove two Center Guides
16. Insert two alternate Center Guides
17. Secure Center Guides by inserting three knob assemblies
18. Turn knob assemblies clockwise by hand until tight
19. Insert alternate Discharge Star
20. Secure Discharge Star by inserting four knob assemblies
21. Turn knob assemblies clockwise by hand until tight
22. Insert alternate Infeed Star
23. Secure Infeed Star by inserting four knob assemblies
24. Turn knob assemblies clockwise by hand until tight
25. Insert alternate Clamp Star
26. Secure Clamp Star by inserting six knob bolts
27. Turn knob bolts clockwise by hand until tight
28. Insert alternate RH Neck Guide
29. Secure RH Neck Guide by inserting three knob bolts
30. Turn knob bolts clockwise by hand until tight
31. Insert alternate LH Neck Guide
32. Secure LH Neck Guide by inserting three knob bolts
33. Turn knob bolts clockwise by hand until tight
34. Remove feed worm as necessary and install alternate - see “Feed Worm Change” on page 72 for instructions
35. Adjust rear rail adjustment plate
36. Adjust height of cap slide plate
37. Use set up gauge to set chuck height
38. Ensure that all attachments are properly installed and secure
39. Remove machine from “Door Bypass” mode
40. Lower capper turret

Operator Panel Buttons

Figure 3-2: ***Operator Control Panel***

Buttons	Description
LINE START	Initiate machine operation.
LINE STOP	Stop machine operation.
LINE RESET	Clear fault from machine memory once fault is corrected. If fault exists machine will not reset and fault condition will not be cleared from memory.
EMERGENCY STOP	Shut down machine in emergency situations where expediency is required.
AUTO/JOG	AUTO mode allows for routine machine operation. JOG mode activates line jog cord. Press button on jog cord to move machine at preset jog speed. JOG FORWARD - Machine will jog forward when button is depressed. JOG REVERSE - Machine will jog in reverse for 3 seconds maximum.

NOTE: In JOG MODE, machine will jog if all doors are shut.
In DOOR BYPASS MODE machine will still jog if only one door is open.
If more than one door is open, in any mode, the machine will E-STOP.

Operation Screens

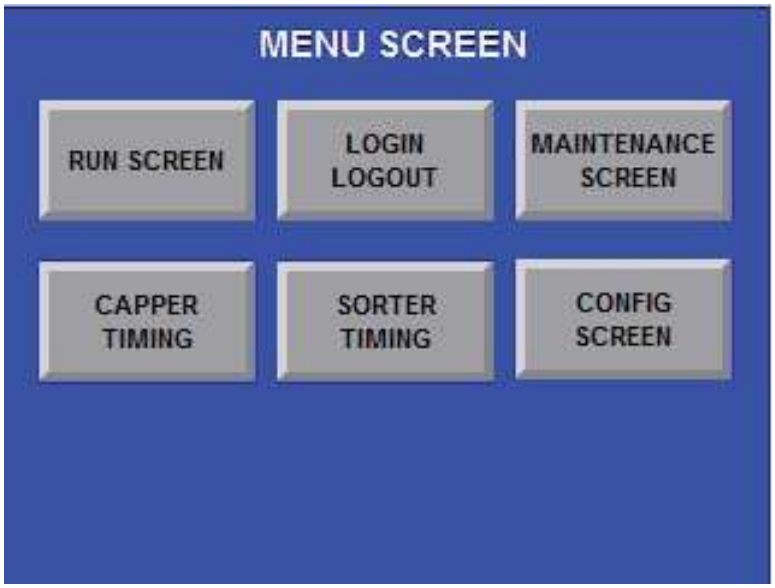


Figure 3-3: ***Menu Screen***

BUTTONS/DISPLAYS	DESCRIPTION
RUN	Advance to Run Screen Menu Primary screen for machine operation
LOGIN LOGOUT	Press to advance to user Login Screen for parameter adjustment or to logout current user
MAINT SCREEN	Press to advance to Maintenance Screen
CAPPER TIMING	Press to advance to Capper Timing Screen
SORTER TIMING	Press to advance to Sorter Timing Screen
CONFIG SCREEN	Press to advance to Configuration Screen

Operation Screens (continued)

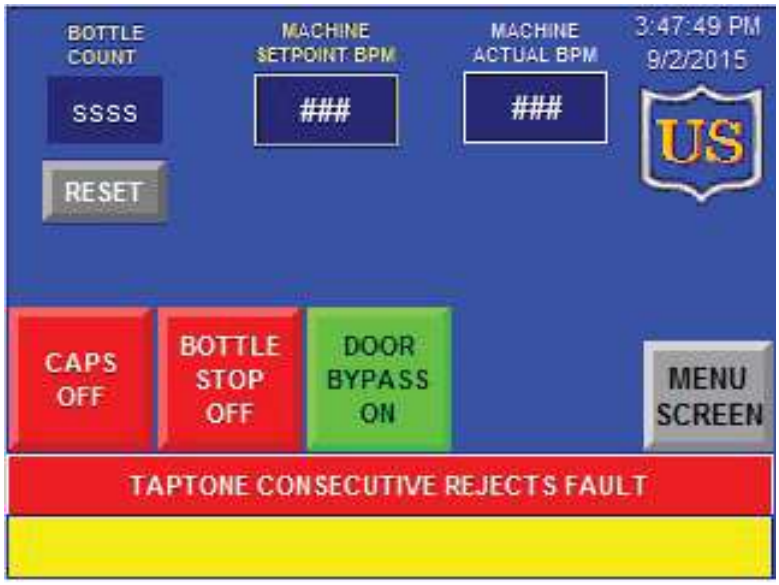


Figure 3-4: ***Overview screen***

BUTTONS/DISPLAYS	DESCRIPTION
BOTTLE COUNT	Displays number of bottles run through machine
RESET	Press to reset bottle counter display
MACHINE SETPOINT BPM	Press to enter bottles per minute rate to set machine speed
MACHINE ACTUAL BPM	Displays actual run speed in bottles per minute
CAPS OFF/AUTO	Press to toggle cap delivery - OFF/AUTO OFF - Cap delivery stopped AUTO - Caps are delivered in time with machine bottle delivery
BOTTLE STOP OFF/ON	Press to toggle bottle stop - OFF/ON/AUTO OFF - Bottles delivered in time with machine ON - Bottle delivery halted AUTO - Bottle stop automatically opened and closed by bottle prime and discharge back-up eyes to maintain line function
DOOR BYPASS STATUS	Press to toggle door bypass ON/OFF ON: Machine will not run. Machine will only jog and one door may be open OFF: Machine will run normally. All doors must be closed
MENU SCREEN	Press to return to Menu Screen
RED NOTIFICATION BANNER	Displays active notifications for issues that prevent machine operation
YELLOW NOTIFICATION BANNER	Displays active notifications for machine warnings

NOTE: In JOG MODE, machine will jog if all doors are shut.
In DOOR BYPASS MODE machine will still jog if only one door is open.
If more than one door is open, in any mode, the machine will E-STOP.

Operation Screens (continued)

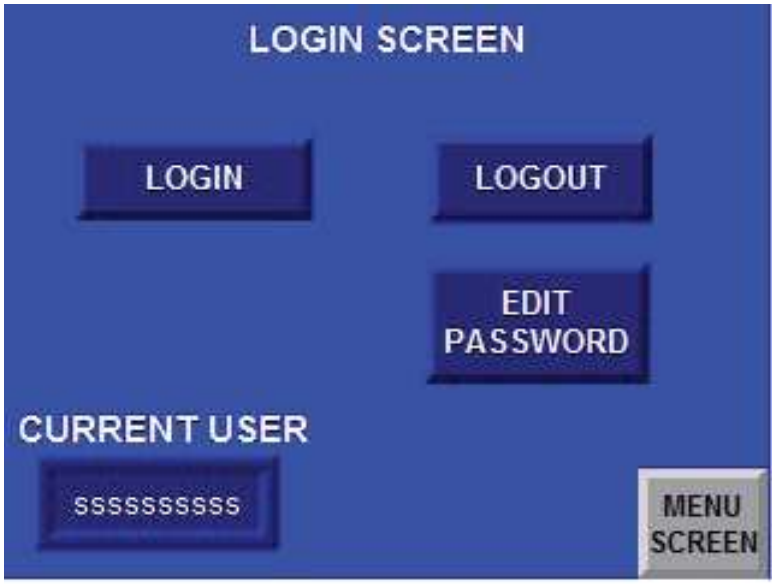


Figure 3-5: ***Login/Logout Screen***

BUTTONS/DISPLAYS	DESCRIPTION
LOGIN	Press to enter login information
LOGOUT	Press to logout current user
EDIT PASSWORD	Advances to Edit Password Screen
CURRENT USER	Displays current user name
MENU	Press to return to Menu Screen

Operation Screens (continued)

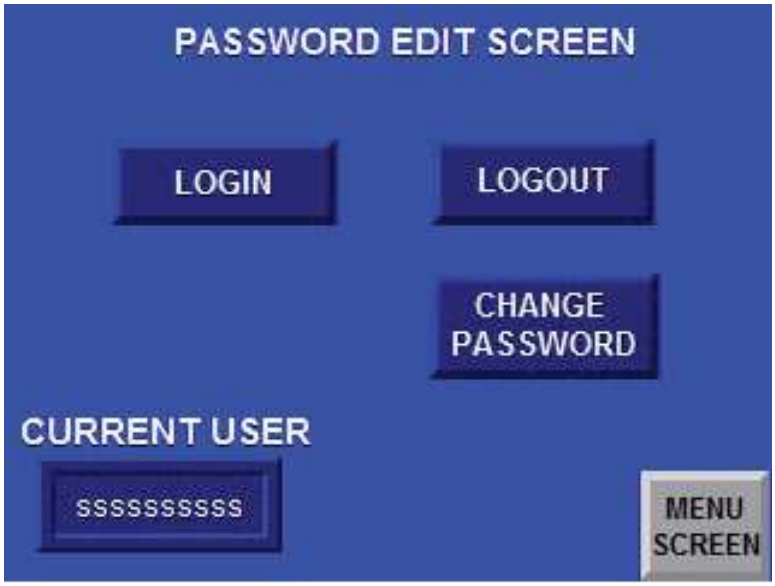


Figure 3-6: ***Edit Password Screen***

BUTTONS/DISPLAYS	DESCRIPTION
LOGIN	Press to enter login information
LOGOUT	Press to logout current user
CHANGE PASSWORD	Press to change password
CURRENT USER	Displays current user name
MENU	Press to return to Menu Screen

Operation Screens (continued)

Figure 3-7: ***Maintenance Screen***

BUTTONS/DISPLAYS	DESCRIPTION
CAP SHIFT REGISTER	Press to enter number of bottle pockets between bottle present sensor and cap release point. This value is usually constant once set at start up.
OPERATION TIME	Displays the time machine has been in operation
MAINTENANCE TIME	Displays the time machine has been in operation since the Maintenance Time was last reset
HOURS RESET	Press to reset Maintenance Time
CAPPER HOIST OFF/UP/ DOWN	OFF: Capper hoist is inactive and machine can run normally UP: Jog cord can be used to raise capper hoist, machine will not run DOWN: Jog cord can be used to lower capper hoist, machine will not run
DOOR BYPASS STATUS	ON: Machine will not run. Machine will only jog and one door may be open. OFF: Machine will run normally
MENU	Return to Menu Screen

Operation Screens (continued)

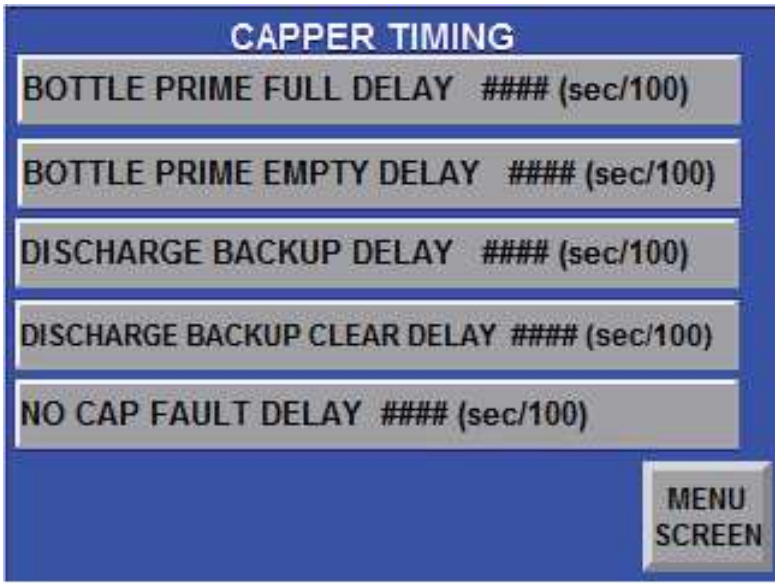


Figure 3-8: ***Capper Timing Screen***

BUTTONS/DISPLAYS	DESCRIPTION
BOTTLE PRIME FULL DELAY	Press to enter amount of time machine will wait before feeding bottles after a bottle prime warning - enter value in 1/100 sec
BOTTLE PRIME EMPTY DELAY	Press to enter amount of time machine will wait before closing the bottle stop after receiving a prime empty warning - enter value in 1/100 sec
DISCHARGE BACKUP DELAY	Press to enter amount of time machine will wait after discharge backup is detected before shutting down and displaying a discharge backup alarm - enter value in 1/100 sec
DISCHARGE BACKUP CLEAR DELAY	Press to enter amount of time machine will wait after discharge backup is cleared before starting to run - enter value in 1/100 sec
NO CAP FAULT DELAY	Press to enter amount of time machine will wait after sensor detects no caps before stopping and displaying a no overcap alarm - enter value in 1/100 sec
MENU SCREEN	Press to return to Menu Screen

Operation Screens (continued)

Figure 3-9: ***Cap Sorter Timing Screen***

BUTTONS/DISPLAYS	DESCRIPTION
CHUTE AIR STOP DELAY	Press to enter amount of time air will remain on after a cap is detected by sensor - enter value in 1/100 sec
MENU SCREEN	Press to return to Menu Screen

Operation Screens (continued)

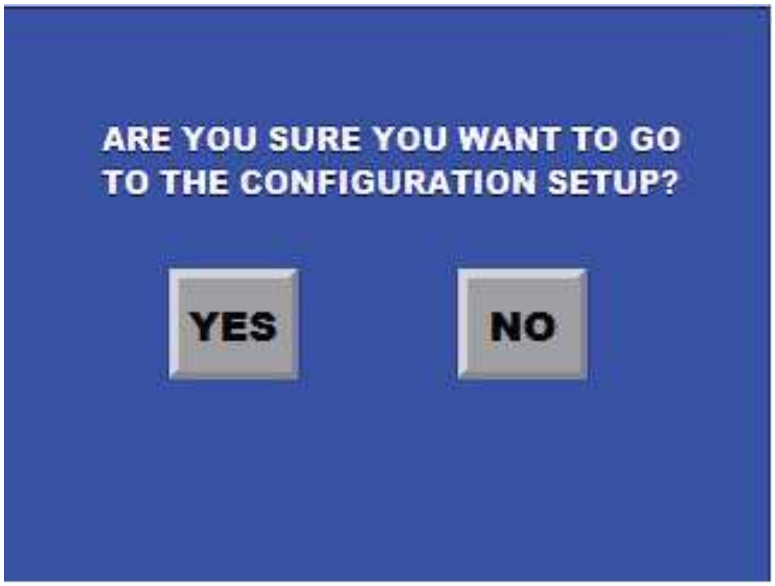


Figure 3-10: ***Configuration Access Screen***

BUTTONS/DISPLAYS	DESCRIPTION
YES	Press to enter Configuration Setup Screen
NO	Press to return to Menu Screen

Maintenance

98000 Overcapper

Preventive Maintenance Schedule

Regularly scheduled maintenance is required to keep the machine running smoothly and safely. Failure to perform regular maintenance can result in costly machine damage and injury, or even death, to workers. The following schedule should serve as a maintenance guide, however workers should always be alert for changes in machine operation or machine damage. If any damage occurs, the machine should be pulled from service and any damage should be repaired before operating the machine.

WARNING: ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ACTIVITIES.

Overcapper Preventive Maintenance Schedule	
DAILY	
Part	**Action**
Limit Switch & Mounting Bracket	▷ Verify electrical control logic
Clutch Keyways	▷ Inspect for wear ▷ Tighten screws and keyless bushings
Bull Gear & Pinion Gear	▷ Inspect for worn or missing teeth ▷ Inspect for corrosion ▷ Check for excessive backlash
Roller Bearings	▷ Check for flat spots ▷ Ensure proper positioning on cam lift sections
Crossover Plate	▷ Inspect for wear ▷ Ensure proper shimming in relation to rotary table segments and conveyor chain
Guard Doors, Switches, Hinges	▷ Verify switches function properly ▷ Inspect hinges for damage ▷ Hand clean
Feed Worm Gearbox	▷ Inspect for vibration, grinding, or excessive heat ▷ Check for increased backlash between input and output shaft ▷ Check shaft rotation for tight spots
Chuck Assembly	▷ Check for worn parts ▷ Inspect for loose hardware
Feed Worm Drive Assembly	▷ Check U-joints for wear, binding, excessive slop, or backlash ▷ Check bearing for wear ▷ Ensure feed worm mounting bracket is secure ▷ Ensure limit switches are functional and properly positioned ▷ Inspect worm gearbox for backlash between input/output shafts ▷ Check shaft rotation for tight spots

Table 4-1: ***Maintenance Schedule (1 of 3)***

Overcapper Preventive Maintenance Schedule (continued)	
WEEKLY	
Part	**Action**
Entire Machine	▷ Apply light coat of oil to all unpainted surfaces - rub on by hand ▷ Check for bent knobs, broken plates, and damaged attachments
Detent Clutch	▷ Check for proper mechanical function ▷ Check shaft key and keyway for excessive wear
Cap Feed Assembly	▷ Inspect air connections and lines for pinching, damage, and wear ▷ Inspect pivot bushing for swelling and ream if necessary ▷ Check pistons for proper stroking and cleanliness
Head Assembly	▷ Check for loose, worn, or broken roller assemblies
Conveyor Assembly	▷ Inspect conveyor wear strips for wear or damage ▷ Ensure guide rail hardware is firmly tightened ▷ Ensure limit switches are functional ▷ Ensure electronic control circuits are active ▷ Check parallel shaft reducer for backlash between input and output shafts ▷ Check parallel shaft reducer for corrosion on top housing plate ▷ Check universal joints and slide couplings for wear ▷ Check timing belt for wear and excessive stretching ▷ Inspect worm idler and bearing for wear ▷ Check worm mounting for binding between worm and support hardware ▷ Check feed worm gearbox for backlash between input and output shaft ▷ Rotate input shaft and check for tight or rough spots
Chuck Shaft Assembly	▷ Check for bent shafts ▷ Check rollers and bearings for wear, corrosion, and flat spots
Star Drive	▷ Inspect belts for wear and proper tension ▷ Ensure manifold lubricant lines are in place and without leaks ▷ Check star and drive shaft bearings for sloppy contact

Table 4-2: ***Maintenance Schedule (2 of 3)***

Overcapper Preventive Maintenance Schedule (continued)	
SEMI-ANNUALLY	
Part	**Action**
Entire Machine	▷ Check gears for uneven wear, broken teeth, or other damage ▷ Check for excessively sloppy bushings
Feed Worm Gearbox	▷ Rebuild or replace
Capper Head Assembly	▷ Check lifting jack for binding ▷ Check pneumatic cam for wear ▷ Check roller carrier bearings for wear, corrosion, and damage

Table 4-3: ***Maintenance Schedule (3 of 3)***

Grease Point Locations

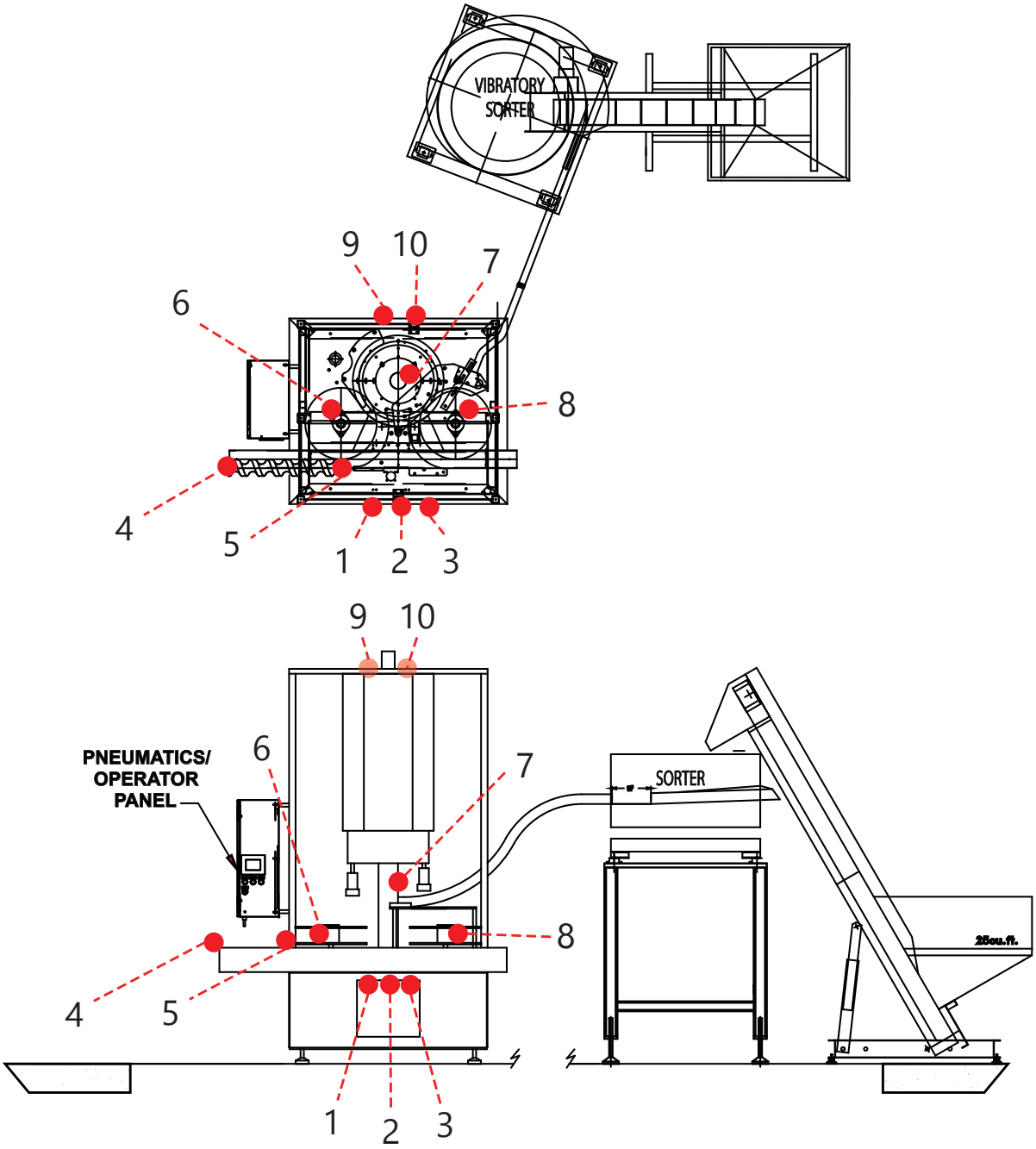


Figure 4-1: ***Grease Point Locations Diagram***

Grease Points List			
1	Infeed Star Bottom Bearing	6	Infeed Star Top Bearing
2	Capper Main Bearing	7	Capper Center Column
3	Discharge Star Bottom Bearing	8	Discharge Star Top Bearing
4	Feed Worm Idler Bearing	9	Capper Lower Bearing
5	Feed Worm Drive Bearing	10	Capper Upper Bearing

Table 4-4: ***Grease Points List***

Recommended Lubrication Schedule

Part Name	Lubrication Type	Method	Points/ Frequency	Location	Amount
(2) Capper Main Bearing	FG-L1 Grease	Alemite	1 / Weekly	Capper Turret Base	3cc
(6&8) Star Shaft Bearing (top)	FG-L1 Grease	Alemite	2 / Weekly	Above Cabinet	1cc
(1&3) Star Shaft Bearings (bottom)	FG-L1 Grease	Alemite	2 / Weekly	Front of Cabinet	1cc
(7) Capper Column	FG-L1 Grease	Alemite	1 / Weekly	Midway Capper Column	1cc
(4&5) Feed Worm Brackets	FG-L1 Grease	Alemite	2 / Weekly	Feed Worm Brackets	1cc
(10) Upper Capper Bearings	FG-L1 Grease	Alemite	1 / Weekly	Upper Guard Rail	1cc
(9) Lower Capper Bearings	FG-L1 Grease	Alemite	1 / Weekly	Upper Guard Rail	1cc
Capper Main Gearbox: SEW	Shell HD220 Mobile SHC 630	Oil Bath	1 / Monthly	Within Cabinet	To level
Capper Main Gearbox: Hub City & Winsmith	Spirex Exp 140	Oil Bath	1 / Monthly	Within Cabinet	To Level
Worm Drive Gearbox (upper)	Spirex Exp 140	Oil Bath	1 / Monthly	Cabinet Top	To Level
Worm Drive Gearbox (lower)	Spirex Exp 140	Oil Bath	1 / Monthly	Within Cabinet	To Level
Bull / Star Gear	FG-L1 Grease	Brush	1 / Monthly	Bull / Star Gear	Light Coat

Table 4-5: *Lubrication Schedule*

NOTE: 1 day is equal to 12-20 hours run time.

Lubrication

WARNING: DISCONNECT POWER SUPPLY AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SEVERE INJURY OR DEATH.

Proper lubrication is mandatory for mechanical machinery to operate at full capacity. Lubrication should be performed on a regular basis. Follow all instructions and guidelines. Improper lubrication can damage machinery as much as running an unlubricated machine.

This section provides basic information relative to maintaining proper lubrication of the machine. Information provided here is as specific as possible, however much of the information is intentionally vague so as to not conflict with customer requirements or government regulations.

CAUTION: Do not apply any lubricant that attacks Nylatron GSM to any part of the machine. Component damage will occur.

CAUTION: Do not allow corrosion and rust to build up as it can destroy non-stainless steel components such as gears, slide rings, sprockets, and gearboxes.

Gearboxes

Each gearbox has a lubrication fill port with an associative overfill port. Apply lubrication to the gearbox through the fill port. The over-fill port indicates when the proper fill level is reached.

To fill a gearbox:

1. Remove fill port
2. Remove overfill port plugs
3. Refer to the "Recommended Lubrication Schedule" on page 49 of this manual for the required lubricant type
4. Pour the specified lubricant into fill port until it begins to run from the over-fill port
5. Re-plug each port

Lubrication (continued)

Oil Points

Points on this machine benefit from periodic oil application as either a lubricant or rust inhibitor. However, due to unique applications and possible government regulations, the lubrication schedule, lubrication method, and lubrication type is left to the discretion of the customer.

Apply a small amount of light mineral oil or light machine oil to the slide shafts. Excessive oil is counter-productive because it collects dirt from the air and produces a gummy material that clogs bushings and affects slide shaft action. In a dry environment, the oil film does not need to be applied. Apply oil to the ground-strap to prevent corrosion.

CAUTION: Never apply anything to slide rod surfaces that will build up a sticky residue and ultimately attract sugar and debris. The presence of such residue will score its bushings and bind the machine.

Exposed Gears

Locate all exposed gears and periodically spray or brush grease onto their contact surfaces.

CAUTION: Use only food-grade grease and lubricants on this machine.

The most severe point for a bearing assembly is immediately following machine operation under high temperature conditions. The bearing housing cavity, which is already full of moist ambient air, begins to cool which generates additional moisture through condensation. This accumulative moisture inevitably finds its way into the bearing housing and, if allowed to remain, eventually mixes with bearing lubricants and ultimately reduces corrosive resistance. Therefore, selecting the proper lubricant type is very important, especially regarding the machine's main bearing.

CAUTION: Always verify that the mechanical assembly is receiving pumped grease and that the grease lines are not clogged preventing lubrication transfer.

Most of the lubricated components under the basic chassis of the machine, up to and including the main bearing, are fed from the main grease manifold. The lubrication lines that feed out from this manifold feed and lubricate all of the elements associated with the vertical rotational shafts of the machine including the cam adjusting screw hardware, the main bearing, and the bearings located under the rotational drive pinions. This manifold supplies lubrication to other components located within the cabinet that are necessary as part of the main machine drive.

Lubrication (continued)

The manifold fittings are connected to grease points inside the cabinet, moving from left to right. The required grease point found furthest to the right inside the cabinet should be attached to the right most grease manifold fitting. The main bearing fitting should be near the center of the manifold fittings. The main bearing fitting is the only manifold fitting labeled with an exact component name.

Main Bearing

The main bearing is a sealed, four-point contact bearing in an enclosed housing. It is designed with a single grease point located on the front of the machine cabinet, centered behind the front removable door panel or directly on the bearing housing. Lubricate main bearing while machine is slowly rotating. Allow a full rotation to properly grease. Be sure to maintain a lubrication schedule and grease machine at the proper intervals.

Other Lubrication Points

A small amount of lubricant should be wiped on the threads of the cam stud bearing to maintain operation.

Within the machine cabinet, are several flange bearings that require periodic lubrication.

Brush lubrication onto the roller chain sprocket system.

Feed Worm Drive Assembly

Inspect timing belt and pulleys regularly for wear and replace as necessary. Lubricate the drive gearbox and the right-angle gearbox regularly. Check worm shaft bearings often to ensure that the internal bearing rotates and has not seized. If the bearing runs hot, consider replacing the unit with a new bearing. Inspect worm drive assembly to ensure keys are not worn and gear box backlash is not excessive.

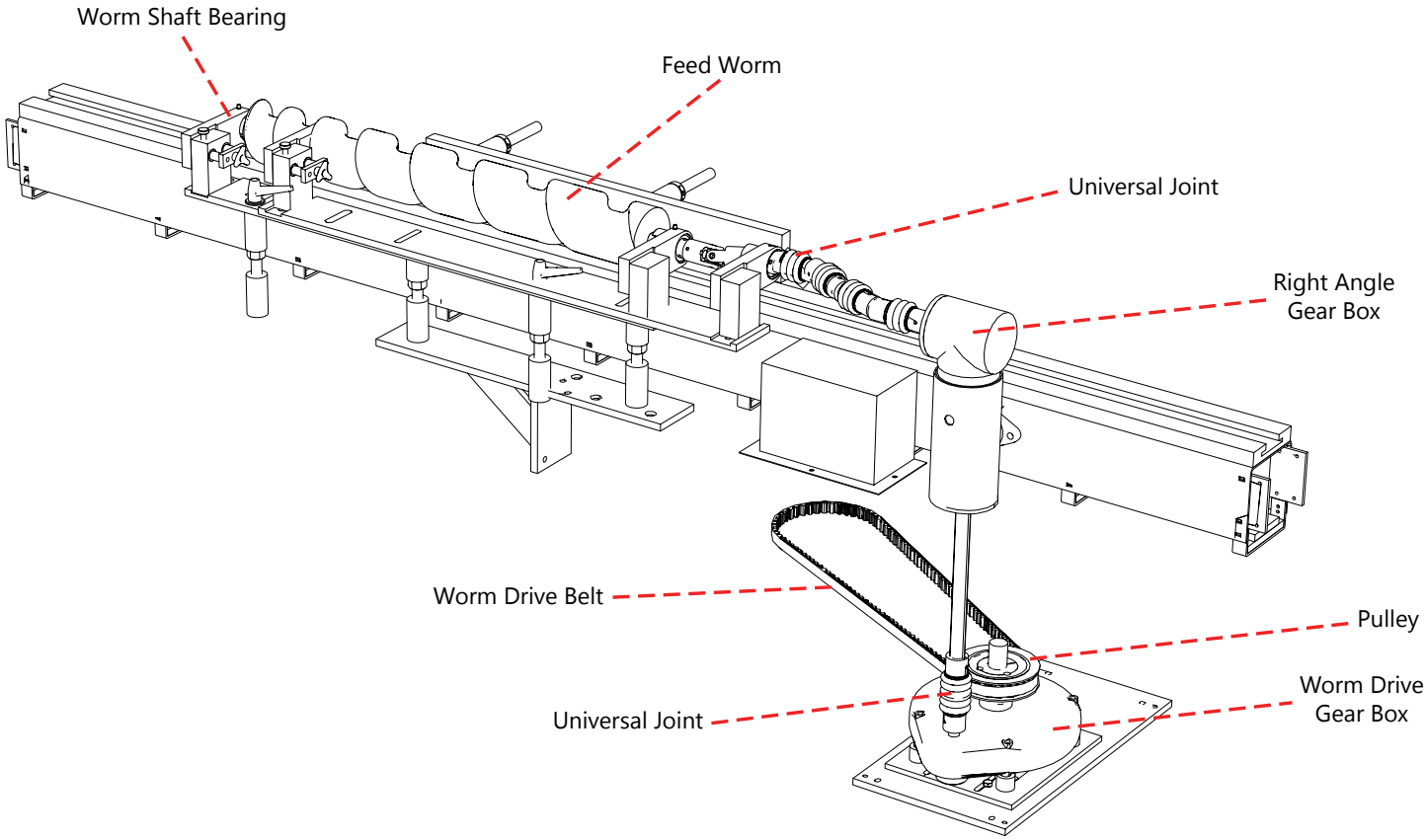


Figure 4-2: ***Feed Worm Drive Assembly***

Overcapper Chuck Assembly

Inspection of the capper chuck assembly should include wear surfaces and the pressure spring.

> **ATTENTION:** ENSURE SPARE SPRINGS ARE AVAILABLE IN CASE THE SPRING IS WORN OR BREAKS OVER AN EXTENDED PERIOD OF OPERATION.

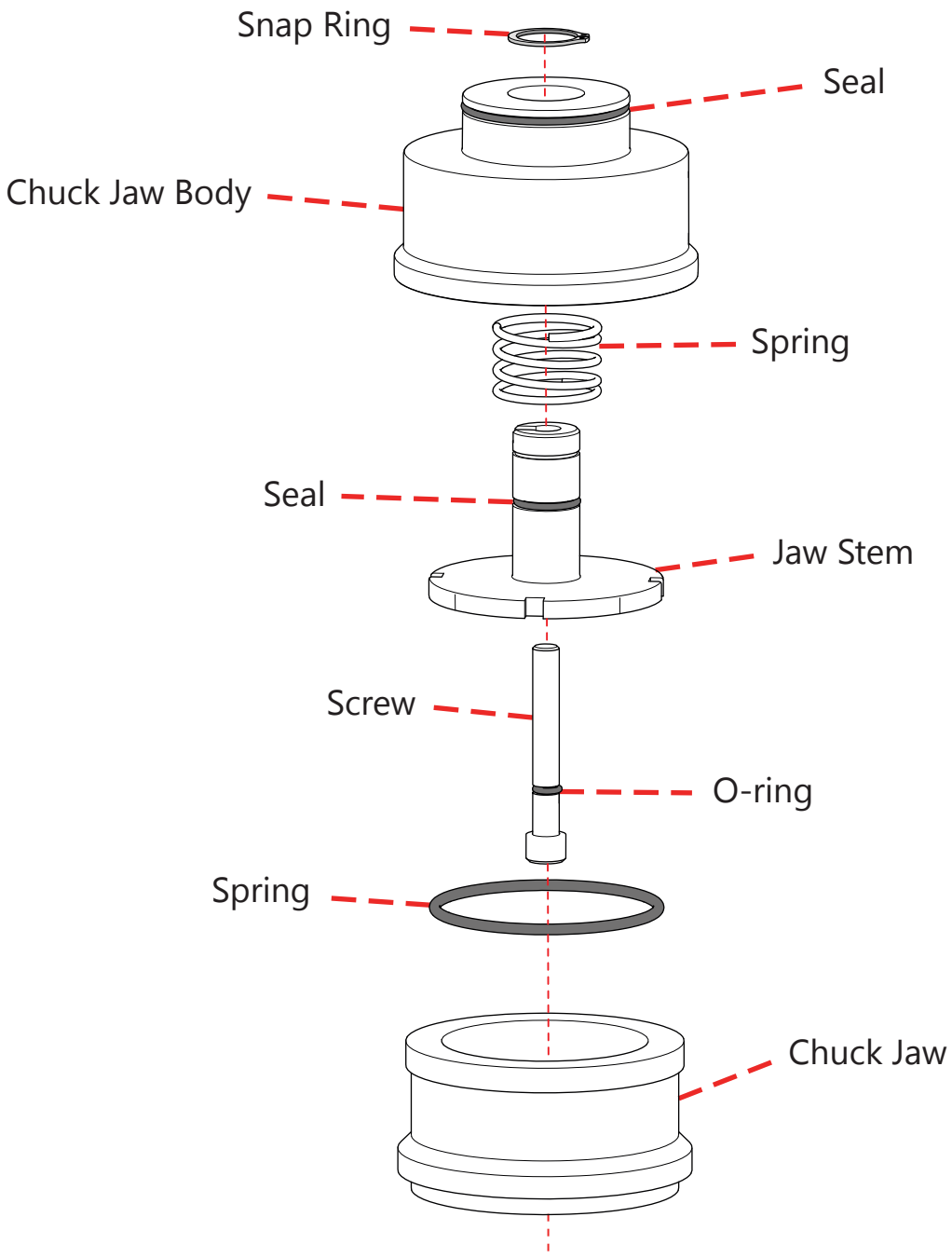


Figure 4-3: ***Overcapper Chuck Assembly***

Overcapper Chuck Assembly (continued)

The point where the body closes on the exterior of the jaw is a wear area and should be inspected regularly. Add a small amount of lubrication to this surface to help prevent excessive wear. Wear will increase if gripping pressure and release point settings are not properly adjusted.

Chuck jaws are also wear areas and must be regularly inspected. Some normal wear will dull the sharpness of the jaw, but it is important to ensure that jaw wear has not progressed to a point that the jaw cannot grasp the cap. Jaws must properly hold the cap when closed.

Run the overcapper and observe machine operation. If the machine is running properly, all parts should move smoothly and the jaws should grip caps tightly.

Overcapper Chuck Shafts And Rollers

Several preventive maintenance activities must be regularly performed to keep the overcapper's chuck shafts and rollers operational. Refer to the "Recommended Lubrication Schedule" on page 49 for more information regarding lubrication. Refer to "Troubleshooting Procedures" on page 64 if components or sub-assemblies need to be replaced.

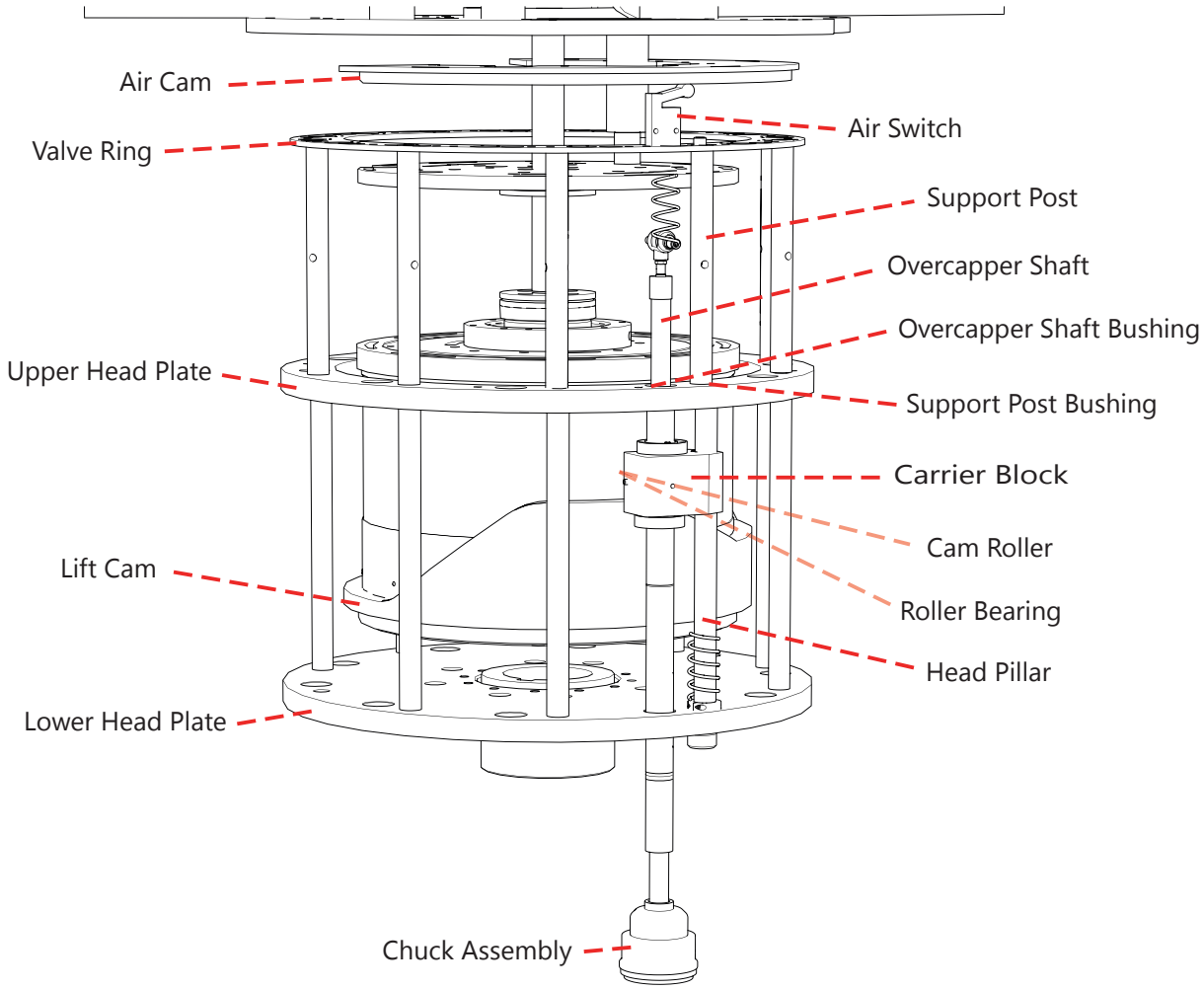


Figure 4-4: *Chuck Shafts and Rollers*

1. Visually inspect cam rollers for excessive wear and flat spots on cam contact surfaces. Flat spots present on a cam roller are an indication that the roller is seizing. Ensure that all rollers rotate freely and that attachment hardware is not loose.
2. Visually inspect the air and lift cams to ensure that the roller hardware has not worn a groove in their contact surfaces.
3. Visually inspect chuck shafts and head pillars for scratches and grooves which indicate worn bushings. Manually shake each shaft and pillar to check for play in the bushing area, which is a sign that wear is occurring and that bushings may require replacement.

Overcapper Chuck Shafts And Rollers (continued)

4. Shaft bushings do not require lubrication and it is recommended that they are not lubricated in order to prevent attraction and retention of debris. Some bushing materials may react adversely to chemical compositions of some lubricants and impede desired material transfer.
5. Visually inspect air switches on the chuck shaft assembly for excessive wear. Air switches require replacement if chuck jaws cease to fully open and close.
6. Apply a straight edge to shafts and pillars to determine if any have become bent. Any bent shafts or pillars must be replaced immediately to ensure proper capping and prevent damage to other components during operation.
7. Manually shake each chuck shaft assembly in the area of the carrier block bearings. Movement in this area is indicative of worn bearings that must be replaced. If bearings are not worn, fill with grease if grease fittings are present.
8. Visually inspect upper and lower head plates for metal shavings, which indicate abnormal wear is occurring. If no abnormal wear is detected, wipe down head plate surfaces and then rub oil onto them to prevent rust.

Crossover Plates, Bedplates, And Conveyor Wear Strips

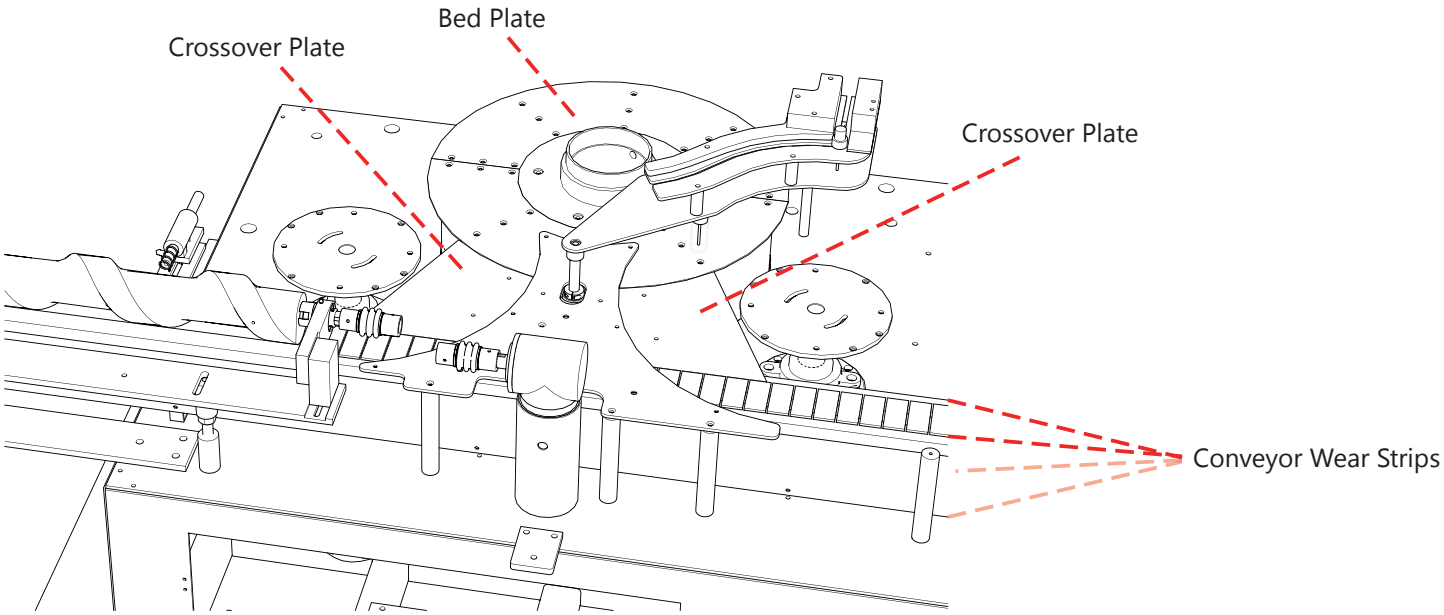


Figure 4-5: *Crossover Plates, Bedplates, and Conveyor Wear Strips*

Crossover Plate

Inspect the crossover plate to check for smooth bottle transfer. Bottles should travel freely onto and off of the conveyor. When necessary, replace crossover plate or adjust crossover plate height to restore proper transfer. Crossover plates should be set up so that as a container descends as it moves from one plate to the next. Each plate should be set slightly lower than the previous plate so containers may travel without getting caught.

Bedplate

Three things can occur if bedplates are badly worn:

1. Containers jostle on the bed plate when entering capper which causes misalignment between the capper chuck shaft and the bottle opening
2. Spilled liquid is trapped on the bed plate and drips down through the attachment screws which accelerates corrosion
3. Properly filled bottles do not exit the machine smoothly

Regularly inspect bedplates for wear and damage. Replace bedplates if necessary.

Crossover Plates, Bedplates, And Conveyor Wear Strips (continued)

Conveyor Wear Strip

Conveyor wear strips support the conveyor and must be inspected to ensure that they have not deteriorated. Be sure to inspect wear strips on the top and bottom of the conveyor assembly. Chain lubricant is necessary for the conveyor wear strips.

Cleaning

Due to customer specific requirements relative to machine cleanliness, information provided here as to methods and types of cleaning, is intentionally vague. However, cleaning procedures and frequency should be sufficient so as to not inhibit proper machine functionality.

WARNING: DO NOT PRESSURE WASH OPERATOR PANEL, DRIVE MOTORS, OR ANY OTHER ELECTRICAL CIRCUITRY. COMPONENT DAMAGE AND/OR ELECTROCUTION MAY OCCUR.

ATTENTION: The specific process for cleaning solutions, temperatures, concentrations, etc, must be established by the customer's own quality control and cleaning standards. The definition of clean varies widely from plant to plant depending on unique local requirements.

External Cleaning

Although the machine is highly resistant to chemical wash downs, consider chemical concentration, temperature, and what component materials may be attacked when selecting a cleaning solution. Pay special attention to ensure solution does not deteriorate machine hosing. Chemical corrosion is not covered under warranty. Install a flexible air hose to the machine and use compressed air to easily remove debris.

WARNING: ALWAYS WEAR SAFETY GOGGLES WHEN USING COMPRESSED AIR TO CLEAN THE MACHINE.

Cleaning Stainless Steel

The stainless steel components in US Bottlers equipment are machined, welded, and assembled by skilled craftsmen using manufacturing methods that preserve the corrosion-resistant quality of the stainless steel. To retain the corrosion-resistant qualities requires regular attention to the following precautions:

1. Hydrochloric acid, even with inhibitors added, should not be used for cleaning stainless.
2. When a layer of protective oxide film is formed on stainless steel, corrosion resistance is greatest. Should this protective film be disturbed or destroyed, the stainless steel can become active and considerably less resistant to corrosion.
3. Stray currents caused by damaged insulation, improper grounding, or other defects can cause pitting. Regularly check all electrical components connected to the equipment. Pitting can occur when current comes in contact with moist stainless steel.
4. Never leave tools, fittings, rubber mats, etc. in contact with stainless steel. Objects left on the equipment can slow the drying process and prevent reformation of a protective oxide film. Galvanic action occurs when two dissimilar metals are touching when wet.
5. The use of water conditioners is suggested when the water supply contains foreign objects that may cause discoloration or deposits. Deposits can counteract even the best cleaning practices and cause corrosion of the highest quality stainless steel.

Cleaning (continued)

6. Clean equipment manually or with CIP as soon as possible after rinsing. Product deposits can cause pitting beneath the particles.
7. Use only cleaning compounds recommended for use with stainless steel. Purchase chemicals from reputable chemical manufacturers familiar with stainless steel equipment and check effects their products have on stainless steel.
8. Use all cleaning chemicals exactly as specified by the manufacturer. Permanent damage can occur from incorrect temperatures, chemical concentrations, or exposure times.
9. For cleaning manually, use only soft brushes, pads, or sponges that are nonmetallic. Brush with the grain of the stainless steel on polished surfaces and avoid scratching the surface. Metal brushes or sponges can scratch the surface and create corrosion over time. Particles of metal allowed to remain on the stainless steel will cause pitting.
10. Inspect pipeline joints on a regular basis. Be sure all fitting connections are tight and not binding. Small crevices can be caused by improperly seated gaskets and can promote crevice corrosion. Stainless steel under stress can develop stress cracking, especially with the use of bactericides containing chlorine.
11. Regularly inspect equipment for surface corrosion such as deposits, pitting, stress cracks, etc. If color corrosion or deposits are detected, remove immediately using detergents and a mild scouring powder. Rinse thoroughly and air dry. Examine all cleaning and production procedures to determine the cause of corrosion. If corrosion is not removed, the protective oxide film cannot be restored and corrosion will continue to grow at an accelerated rate.

Troubleshooting And Repair

98000 Overcapper

Troubleshooting Procedures

This section provides information intended to help evaluate and resolve various performance problems.

Immediately contact the Service Department of US Bottlers Machinery for issues not listed here or issues that your service personnel cannot remedy.

Troubleshooting Table

Symptom	Possible Cause : Solution
Containers not properly separated by feed worm	▷ Incorrect feed worm in use : Ensure feed worm and container type match ▷ Incorrect clearance between feed worm and limit rail : Ensure feed worm and limit rail are properly positioned with proper spacing ▷ Conveyor speed set too low : Adjust timing speed of feed worm ▷ Leading edge of worm excessively worn : Order replacement and send three samples containers to USB
Containers not properly entering feed star	▷ Worm improperly timed : Adjust feed worm timing speed ▷ Conveyor speed too fast or too slow : Adjust conveyor timing to match feed worm timing ▷ Incorrect feed worm in use : Ensure feed worm and container type match ▷ Feed worm and limit rail improperly positioned : Properly position feed worm and limit rail ▷ Limit switch incorrectly set : Reset as necessary ▷ Uneven worm crossover plate : Check for smoothness and shim if needed
Container not properly leaving container	▷ Improper timing of discharge star : Adjust discharge star timing ▷ Improper setting of discharge guide finger : Adjust guide finger positioning
Cap not centering on container opening	▷ Improperly adjusted feed star : Adjust feed star as necessary ▷ Use of incorrect attachments : Ensure attachments and container type match ▷ Head improperly timed : Loosen clamp bolts, adjust as required, tighten bolts ▷ Cap cocked in chuck jaws : Check for proper gripping. Inspect for excessive flash on cap
Chuck jaw dropping caps	▷ Worn chuck jaw : Replace chuck jaw ▷ Machine running above designated speed : Decrease speed
Missing Caps	▷ Jammed cap chute : Clear jam ▷ Cap gate not releasing caps : Check that the correct gate assembly is installed, gate air lines are connected, the photo eye is adjusted to see containers in infeed, and that sensors on discharge star are not defective ▷ Use of incorrect attachments : Ensure attachments and container type match ▷ Incorrect cap for container : Ensure container and cap type match

Table 5-1: ***Troubleshooting Table (1 of 3)***

Troubleshooting Table (continued)

Symptom	Possible Cause : Solution
Rocking condition	▷ Worn keyways on drive shaft : Replace all worn parts ▷ Worn detent clutch : Replace detent clutch ▷ Worn pinion gear/bull drive : Replace pinion gear/bull drive ▷ Worn main gearbox components : Rebuild gearbox
Jerking action while capper rotates	▷ Slides binding on lift cam : Check for bent shafts and rods. Check for worn bushings
Capper station noise	▷ Slide binding : Check for bent shaft and bushing. Clean and lubricate ▷ Worn or high point in gear : Inspect gear and adjust or replace ▷ Interference between rotating table and a fixed part : Eliminate interference
Unable to turn machine under power	▷ Malfunctioning detent clutch : Replace detent clutch ▷ Capper slides binding on lift cam : Inspect for bent slides and worn bushings. Clean capper slides and cam ▷ Main bearing failure : Ensure adequate clearance between capper cabinet top and rotary base. Replace bearing as required. ▷ Feed worm binding : Check for worn bearings
Noise in center of machine when at rest	▷ Main bearing failure : Ensure proper lubrication or replace main bearing if necessary
Machine timing out of sync	▷ Stretched chain or belt : Check belt or chain tension ▷ Worn gear teeth : Replace gears ▷ Improper roller chain tension : Check and adjust as required ▷ Worn roller chains and/or sprockets : Replace as required ▷ Improper timing belt tension: Check and adjust as required ▷ Gear tooth damage: Determine cause. Replace as required ▷ Damaged electric/electronic leads and circuits: Repair or replace as required
Machine operating erratically	▷ Electronic short possible : Inspect for machine short to ground. Inspect all electrical devices for short to ground
Sorter not feeding caps	▷ Incorrect sorter wheel : Install correct sorter wheel ▷ Incorrect discharge guide : Install correct discharge guide ▷ Upper chute eye not detecting caps : Ensure that sensor eyes are properly adjusted to see reflector and chute rails and that sensors are not blocked or damaged. ▷ Low air pressure : Check for leaks. Ensure flow valves are open. Replace damaged air lines. Replace supply line with larger line.

Table 5-2: ***Troubleshooting Table (2 of 3)***

Troubleshooting Table (continued)	
Stars loose on shafts	▷ Worn key or keyway on feed star flanges : replace as required ▷ Loose or worn key in belt sprocket or pinion gear driving star shaft : Tighten or replace as necessary ▷ Worn bushings in star shaft bearings : Replace as required ▷ Worn star shaft : Replace as required ▷ Driving gear or bull gear worn or missing teeth : Replace as required
Main drive gearbox failure	▷ Improper lubrication type or frequency : Change as required ▷ Product or cleaning solution entering gearbox due to faulty seal : Replace all components as required
Skipping conveyor	▷ Conveyor requires lubrication : Lubricate machine ▷ Worn return rail and conveyor wear strips : Replace as required
Premature failure of belt bearing	▷ Excessive tension on belts: Adjust as required.

Table 5-3: ***Troubleshooting Table (3 of 3)***

Capper Cap Feed Assembly

The cap feeder cap gate system has a small stainless steel gate. The cap gate logic signals for the cap gate to open only when a bottle is present on the conveyor and the timing sprocket below the capper indicates to open the gate. The cap gate is powered by compressed air and gate speed can be adjusted for opening as well as closing back against incoming caps. A double acting air piston provides power to allow the cap arm to move quickly. An electrical solenoid, mounted in the pneumatics panel, controls the air piston signal that pilots a 5-port air valve. The air valve routes the proper air signals to the air piston.

When the gate is open, the pressure of gravity-fed caps and chute air jets, moves the caps through the cap chute into the cap star. Excessive cap gate air pressure should not be used as it can slam the gate against the cap with damaging force. Caps remain in place until an empty star pocket is presented. The cap moves with the cap star pocket, guided by the backup guide rail, until positioned under the chuck jaw. The chuck jaw then lowers and closes around the exterior surface of the cap, grabs the cap, and moves it away from the cap star towards the incoming bottles.

The cap star must be properly positioned, even, and level to ensure cap star and a gate come in contact with the small surface of the cap to allow cap retrieval and proper placement underneath the chuck assembly. This system allows for a no bottle-no cap feature so that the cap gate will remain open when bottles are continuously present, but hold caps as required when a container is not available. The bottle-present eye should always be used and caps should not be continuously fed when containers are not present.

Rotating the capper slowly by hand, until a single cap is released from the cap chute into the cap star pocket, demonstrates that an additional small angular movement of the cap star allows the arm of the air actuator at the chute to move forward and stop the next cap from entering into the following cap star pocket. The cap star must turn enough to prevent the arm from striking the cap that has just been released into the star pocket. This represents the angular position when the signal for the “no bottle/ no cap” logic should be transmitted to the air solenoid that operates the air piston used to control the cap flow into the cap star.

Two pieces of hardware are required to provide the logic that operates the “no bottle/no cap” mechanism: the bottle present sensor and the timing sensor. The bottle present sensor detects bottles to signal for cap delivery. The timing sensor simultaneously check timing teeth on an adjustable sprocket mounted on the star shaft. This sprocket has one tooth for each capper pocket and can be fine tuned, forward or backward, to speed up or slow down rotation of the star shaft for proper timing.

If the cap gate malfunctions, first check the timing of the bottle-present eye and the timing sprocket. These two signals must be present to open the gate.

Obstruct the bottle-present eye to keep the cap gate in the open position and check that caps flow properly from the chute, to the transfer plate, and into the cap star. Any tight-fitting areas may prevent caps from properly traveling to the cap star pocket. It is important that appropriate cap back pressure is available to deliver top rated machine speed to caps and to ensure their flow through the chute.

Capper Cap Feed Assembly (continued)

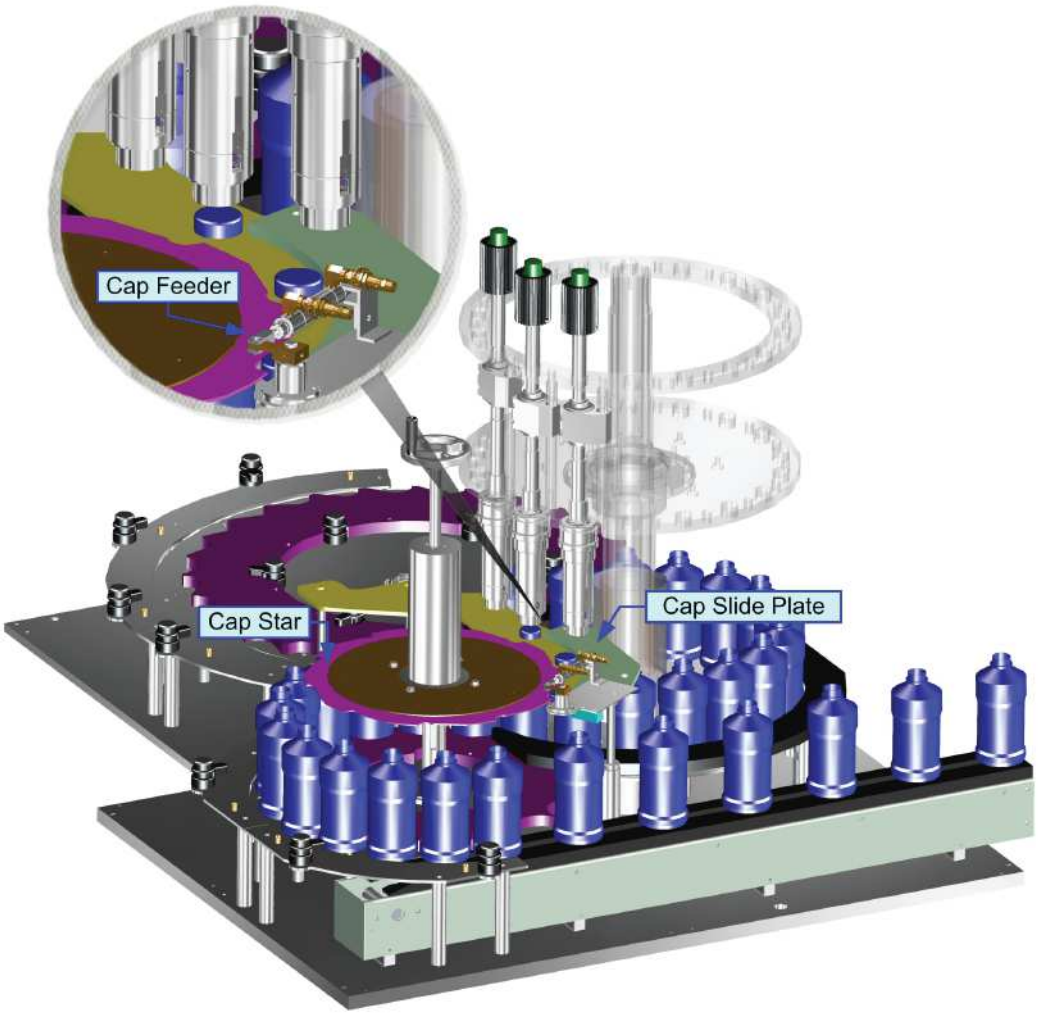


Figure 5-1: ***Capper Feed Assembly***

Obstruct the bottle-present eye to keep the cap gate in the open position and check that caps flow properly from the chute, to the transfer plate, and into the cap star. Any tight-fitting areas may prevent caps from properly traveling to the cap star pocket. It is important that appropriate cap back pressure is available to deliver top rated machine speed to caps and to ensure their flow through the chute.

> **CAUTION:** Do not allow cap chuck assembly to come in contact with cap star. Component damage will occur.

Check that chuck assembly properly locates above the cap at jog speed as well as full speed, since the pneumatic system activating the closure of the chuck assembly will change slightly as speeds increase.

If the customer has steam in the cap gate area, the cap pivot arm bushing should be checked to determine if it is swollen and ream this I.D. as necessary to ensure that it does not bind the capping gate pivot arm. The Bimba cylinder should also be reviewed to ensure that it has not developed any corrosion along the stroking piston, so that it properly strokes.

Limit Rail & Feed Worm Adjustment

WARNING: DISCONNECT POWER SUPPLY AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SEVERE INJURY OR DEATH.

Most product size changes will require position adjustment of the limit rail and feed worm. Proper positioning should allow containers to travel on the conveyor chain without any lateral movement due to contact with either component.

ATTENTION: A properly adjusted limit rail and feed worm will allow the containers to move freely and in single file without applying pressure on either side. A space of 1/8" to 1/4" on either side of the container will suffice.

Adjust Limit Rail

1. Loosen limit rail bolts/set screws
2. Place one puck/container (from batch to be run) in center of conveyor
3. Orient limit rail so that its face rests just behind the deepest portion of the infeed star's pocket
4. Tighten limit rail bolts/set screws

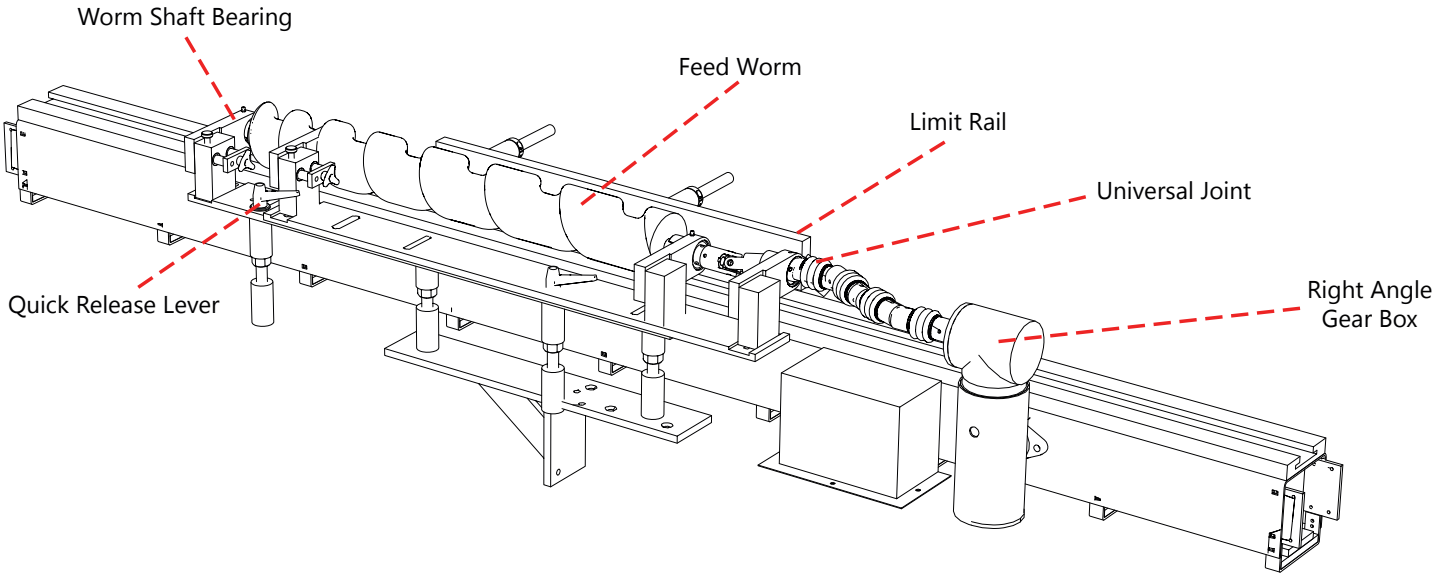


Figure 5-2: ***Limit Rail and Feed Worm***

Limit Rail & Feed Worm Adjustment (continued)

Feed Worm/Conveyor Timing

The worm feed must be properly positioned for correct timing in order to guide containers into the infeed star.

Adjust Feed Worm

1. Turn quick release levers on worm feed adjustment brackets
2. Center container to be run on conveyor belt between first infeed worm thread and limit rail
3. Adjust feed worm so container is centered and able to rotate freely
4. There should be about 1/8" clearance on either side of the puck/container
5. Set container to be run in the last discharge thread of worm, closest to feed star
6. Adjust feed worm so that container is centered and able to rotate freely
7. There should be about 1/8" clearance on either side of the puck/container
8. Loosen set screws until feed worm can be rotated by hand
9. Rotate feed worm until leading edge of feed worm pocket lines up with leading edge of infeed star pocket

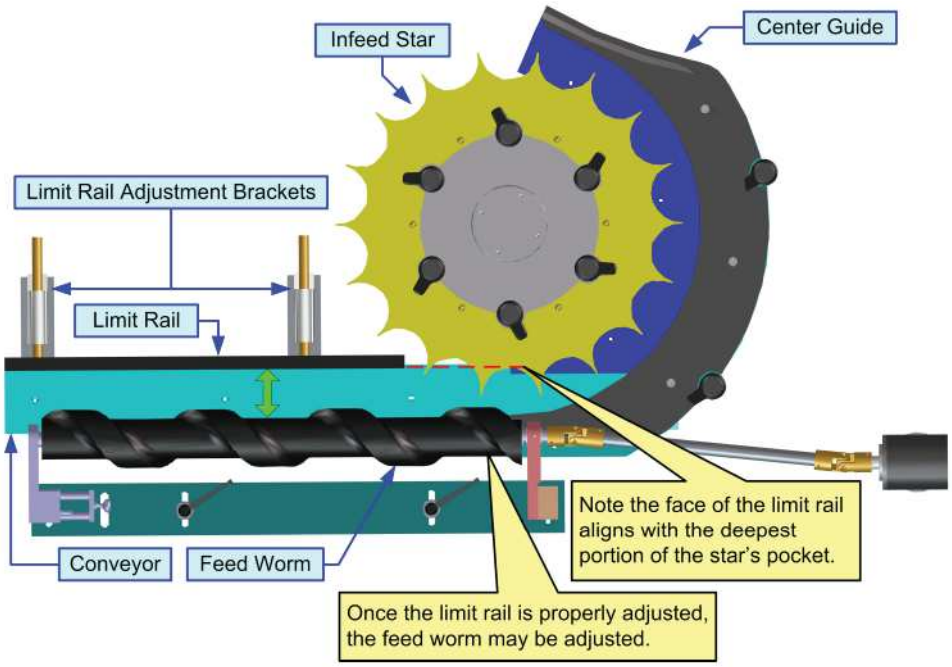


Figure 5-3: ***Feed Worm and Limit Rail Adjustment***

Limit Rail & Feed Worm Adjustment (continued)

1. Puck/Container should start to enter feed star pocket just as it is starting to leave the feed worm pocket
2. Ensure that puck/container will travel length of feed worm guided but without pressure on the container
3. If puck/container bumps star or will not travel freely, repeat steps 9-11
4. When proper timing is achieved, tighten the set screws

NOTE: Container shape differences may have an affect on the proper timing setting.

Feed Worm Change

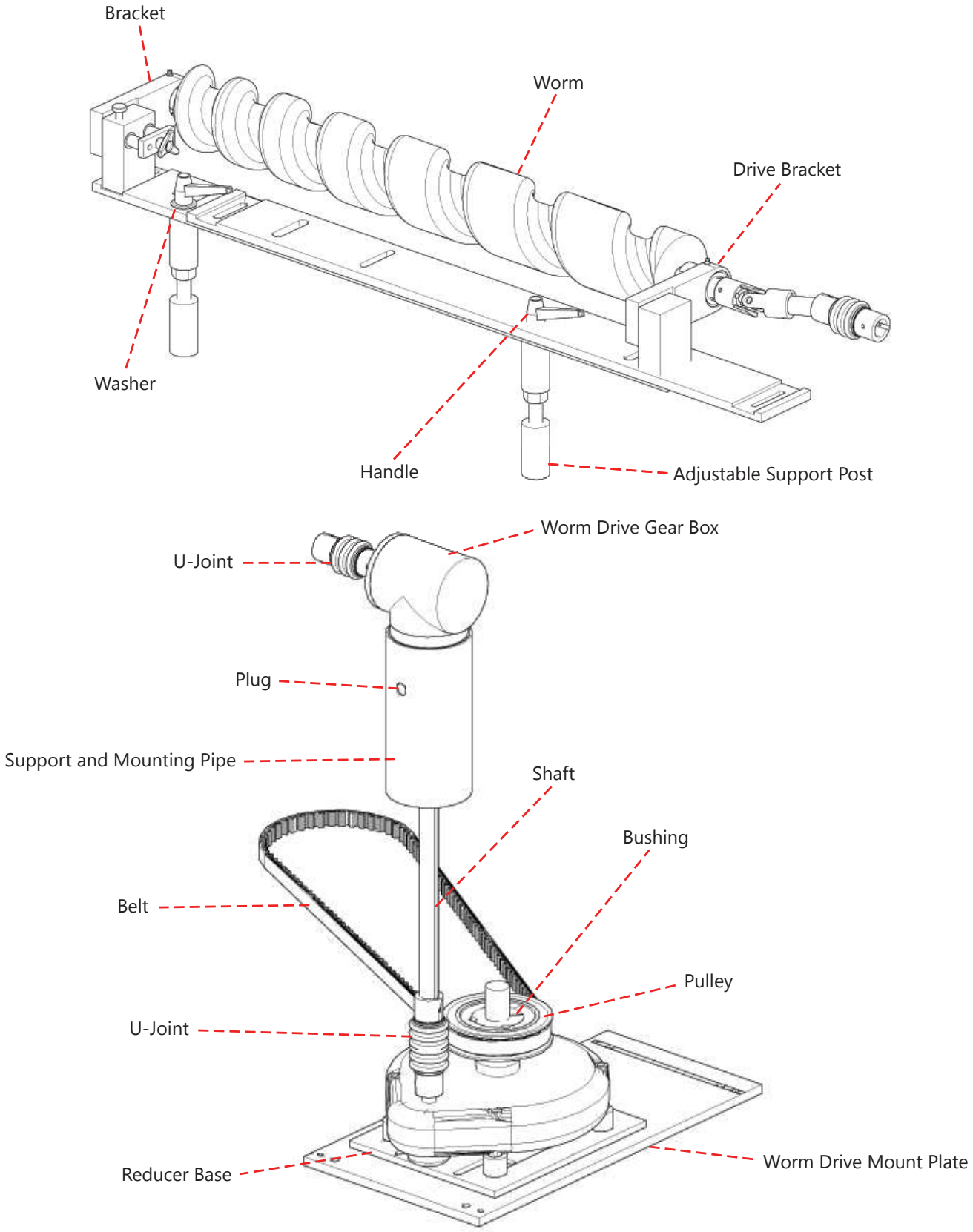


Figure 5-4: *Feed Worm Assembly*

Feed Worm Change (continued)

WARNING: ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ACTIVITIES.

To remove feed worm:

1. Open access door
2. Lift knurled release pin up
3. Support feed worm
4. Push adjustment knob towards release pin
5. Ensure adjustable bracket is clear of feed worm
6. Pull feed worm away from assembly

To install feed worm:

1. Locate stationary bracket on idle end of feed worm, which has a positioning peg to keep feed worm in timing with star gear
2. Position feed worm so that it lines up with positioning peg
3. Insert feed worm into stationary bracket
4. Lower free end of feed worm towards adjustable bracket
5. Line up feed worm with adjustable bracket
6. Pull adjustment knob away from adjustable bracket
7. Ensure feed worm is properly aligned with adjustable bracket
8. Lower knurled release pin
9. Close access door

The worm feed must be properly positioned for correct timing in order to guide containers into the infeed star. To adjust positioning use the procedure on"Limit Rail & Feed Worm Adjustment" on page 69 of this manual.

Feed Worm Drive Belt Adjustment

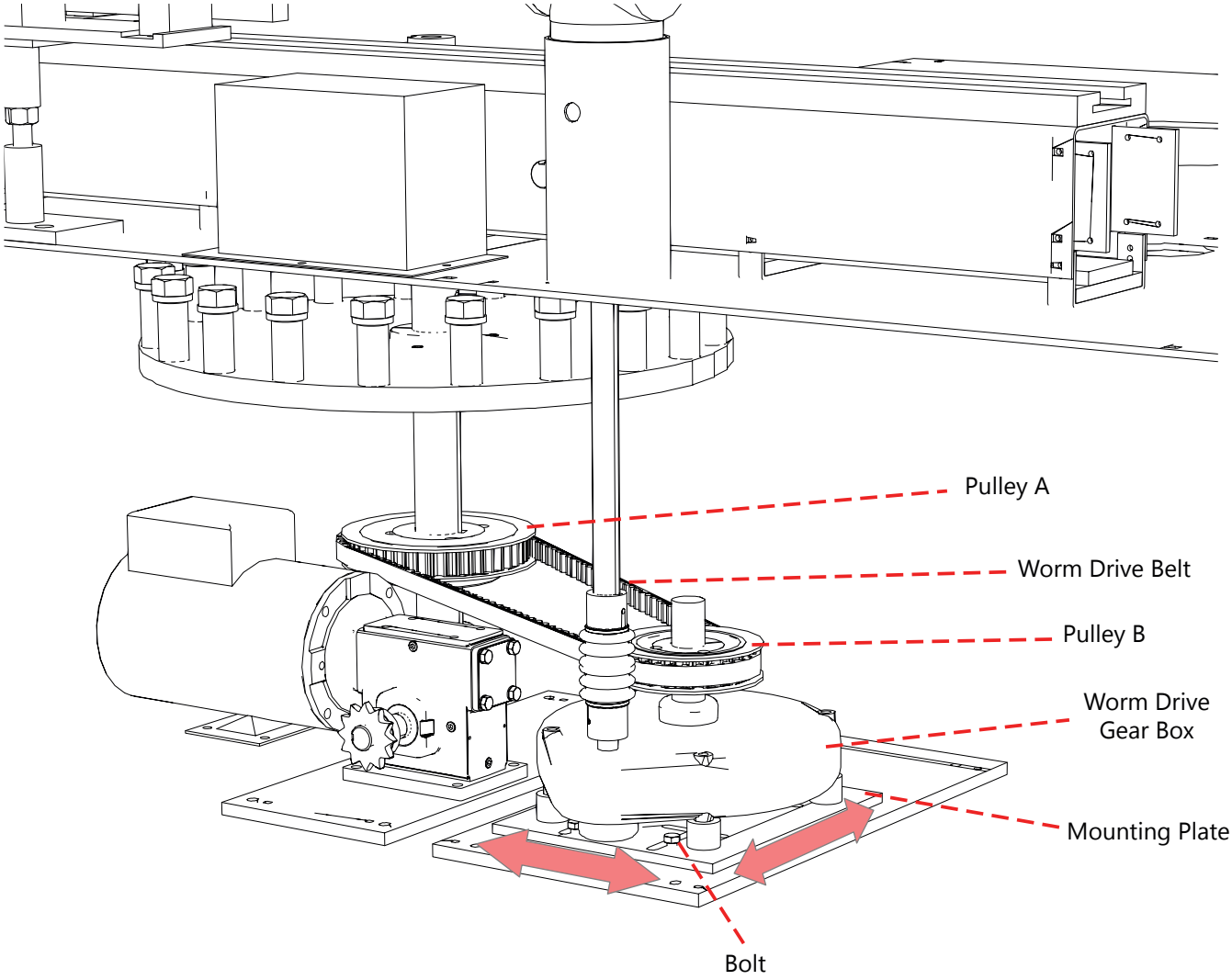


Figure 5-5: ***Feed Worm Drive Belt Assembly***

Over time, normal operation stretches the worm belt and tension adjustment is required. To adjust the belt, loosen the four bolts that secure the worm drive gearbox to its mounting plate and manually slide the gearbox outward to increase the distance between its two pulleys. When proper tension is achieved, tighten the four bolts.

WARNING: ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ACTIVITIES.

NOTE: A properly adjusted belt will be tensioned so as to prevent slippage, but not provide excessive drag on the drive mechanisms.

Feed Worm Drive Belt Replacement

CONFIGURATION A

1. Power down the machine

WARNING: DISCONNECT POWER SUPPLY AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SEVERE INJURY OR DEATH.

2. Open cabinet doors to access worn belt (1)
3. Loosen four bolts (2) securing gearbox base (3) to mounting plate (4)
4. Manually slide gearbox & base inward to relieve belt tension
5. Loosen set collar (5) and raise upward on star shaft (6)
6. Disconnect grease line connector (not shown) from flanged bearing (7)
7. Remove two bolts (8) securing flanged bearing to chassis (9)
8. Lift flanged bearing
9. Manipulate worn belt from pulleys (A) and (B) then through the gap between flanged bearing and chassis
10. Compare worn belt with replacement to ensure specifications match
11. Discard worn belt
12. Manipulate replacement belt through the gap between chassis and flanged bearing
13. Lower flanged bearing (7) and secure using two bolts (8)
14. Connect grease line (not shown) to flanged bearing
15. Lower set collar (5) to rest upon flanged bearing and tighten to star shaft (6)
16. Apply replacement belt around pulleys (B) and (C), hold in place while manually pulling gearbox base (3) outward
17. Tighten four bolts (2) to secure gearbox base to mounting plate (4)

NOTE: A properly adjusted belt will be tensioned so as to prevent slippage, but not provide excessive drag on the drive mechanisms. A deflection calculator can be found here:

HTTP://WWW.GATES.COM/CATALOGS-AND-RESOURCES/RESOURCES/REPOSITORY/ENGINEERING-BUSINESS-APPLICATIONS/POLY-CHAIN-GT-CARBON-TENSION-CALCULATOR/POLY-CHAIN-GT-CARBON-TENSION-CALCULATOR

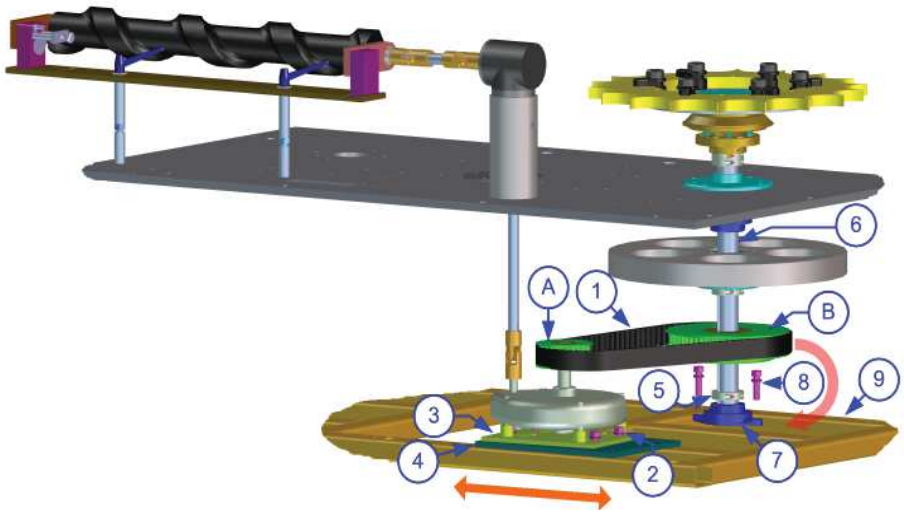


Figure 5-6: ***Feed Worm Drive Belt (configuration A)***

Feed Worm Drive Belt Replacement (continued)

CONFIGURATION B

1. Power down the machine

> **WARNING:** DISCONNECT POWER SUPPLY AND FOLLOW ALL LOCKOUT/ TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SEVERE INJURY OR DEATH.

2. Open cabinet doors (not shown) to access worn belt (1)
3. Loosen four bolts (2) securing pancake gearbox (3) to mounting plate (4)
4. Slide mounting plate to release tension on worn belt
5. Disconnect grease line connector (not shown) from lower shaft bushing (5)
6. Remove two bolts with washers (6) securing two spacers (7) to bushing
7. Withdraw two spacers from bushing to provide a gap between bushing and frame (8)
8. Manipulate worn belt from pulleys (A) and (B) then through the gap between flanged bearing and chassis
9. Compare worn belt with replacement to ensure specifications match
10. Discard worn belt
11. Insert replacement belt through the gap between bushing and frame
12. Secure two spacers to bushing using two bolts with washers
13. Lift replacement belt (1) to wrap around pulleys (A), (B) and pull pancake gearbox (3) back to provide tension

> **NOTE:** A properly adjusted belt will be tensioned so as to prevent slippage, but not provide excessive drag on the drive mechanisms.

14. Tighten four bolts (2) to secure worm drive gearbox into position
15. Close cabinet doors
16. Restore power to the machine, and test cycle to ensure proper function

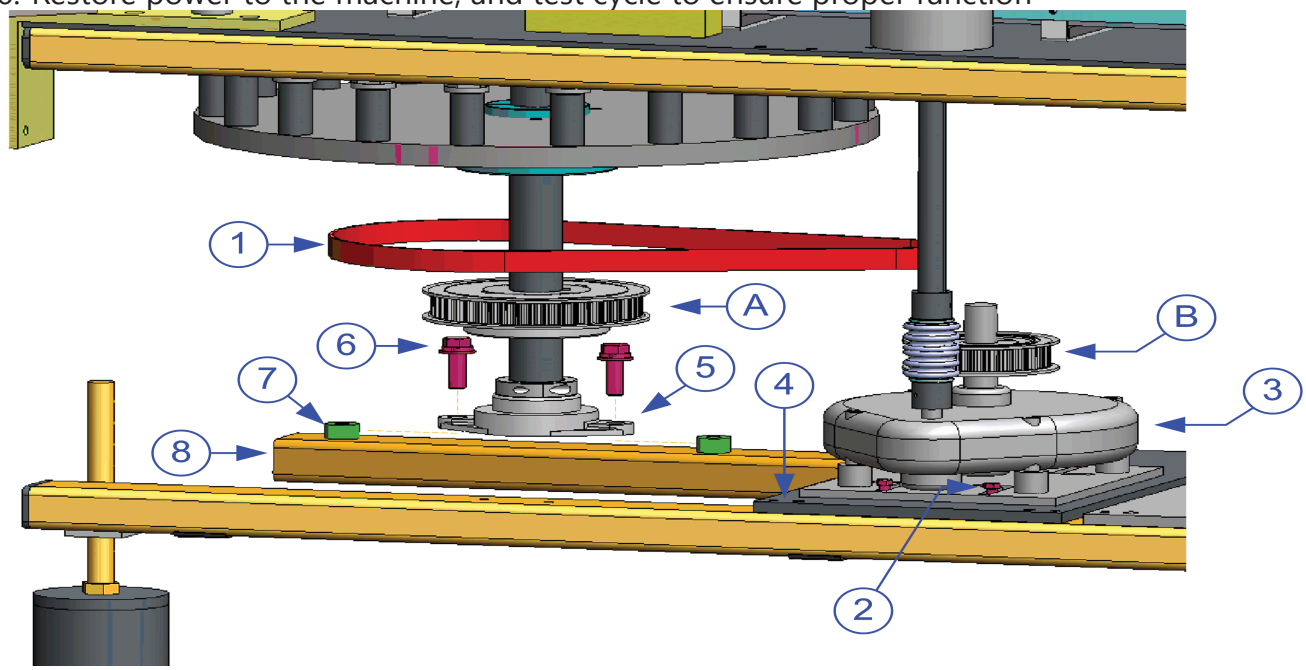


Figure 5-7: ***Feed Worm Drive Belt (configuration B)***

Conveyor Rail Adjustment

To determine if the conveyor rails are properly set, place a container onto the center of the conveyor at each end of the rail assemblies. Visually regard the rail assemblies in relation to the container to determine if the spacing and height is desirable.

> **NOTE:** Properly adjusted conveyor rails will allow the containers to move freely and in single file without applying pressure on either side. A space of 1/8" to 1/4" on either side of the container will suffice.

If horizontal adjustment is required, loosen the knob set bolts and manually adjust the rails assemblies inward or outward as necessary to achieve equal and proper spacing to the bottles on each end. Tighten the knob set bolts onto their respective rail assembly shafts when complete.

If vertical adjustment is required to improve container stability while being conveyed, loosen the height set bolts to vertically free the conveyor rails and manually raise or lower as desired. Hold each rail assembly in position while tightening the height set bolts.

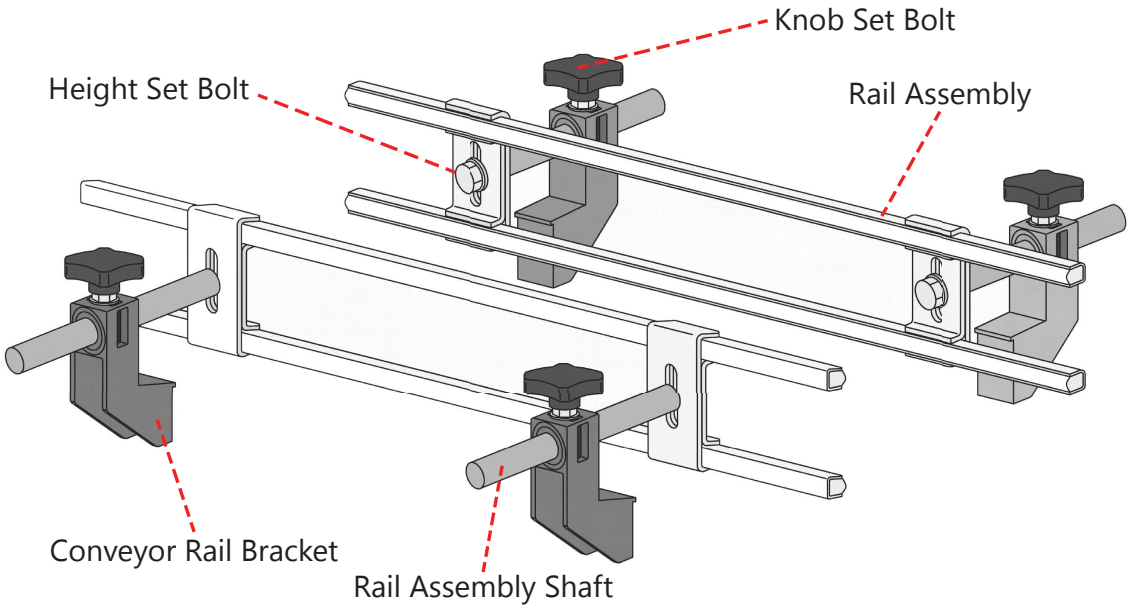


Figure 5-8: ***Conveyor Rail***

Cap Gate Setup Procedure

This procedure allows synchronization of the cap release with the infeed of containers. All machines are shipped with correct synchronization, so this procedure should not be required unless the sensors have been relocated due to the addition of another container type that requires a feed worm change.

> **ATTENTION:** Only perform this procedure after it has been determined to be absolutely necessary. Refer to the Cap Gate Troubleshooting procedure for determination.

1. Rotate overcapper so trailing edge of a cap star pocket just stops a cap from entering a pocket
2. Ensure that infeed sensor is looking between two worm grooves and not at a worm groove
3. Ensure that timing sprocket sensor is looking at the trailing edge of the last gear tooth that passed
4. Position timing proximity sensor (sync prox) so that it triggers when cap sits at trailing edge of cap transfer star pocket

> **NOTE:** This is the point at which the cap release solenoid will open and close.

5. Without moving capper, position bottle present sensor to aim between bottle pockets

Determine shift register number by subtracting the number of closures between the cap stop and the application point from the number of bottles between the bottle present sensor and the application point

> **NOTE:** The shift register number is the number of pockets from the bottle detect point to the cap release point, also taking into account the number of pockets required to get the cap in the chuck over the bottle.

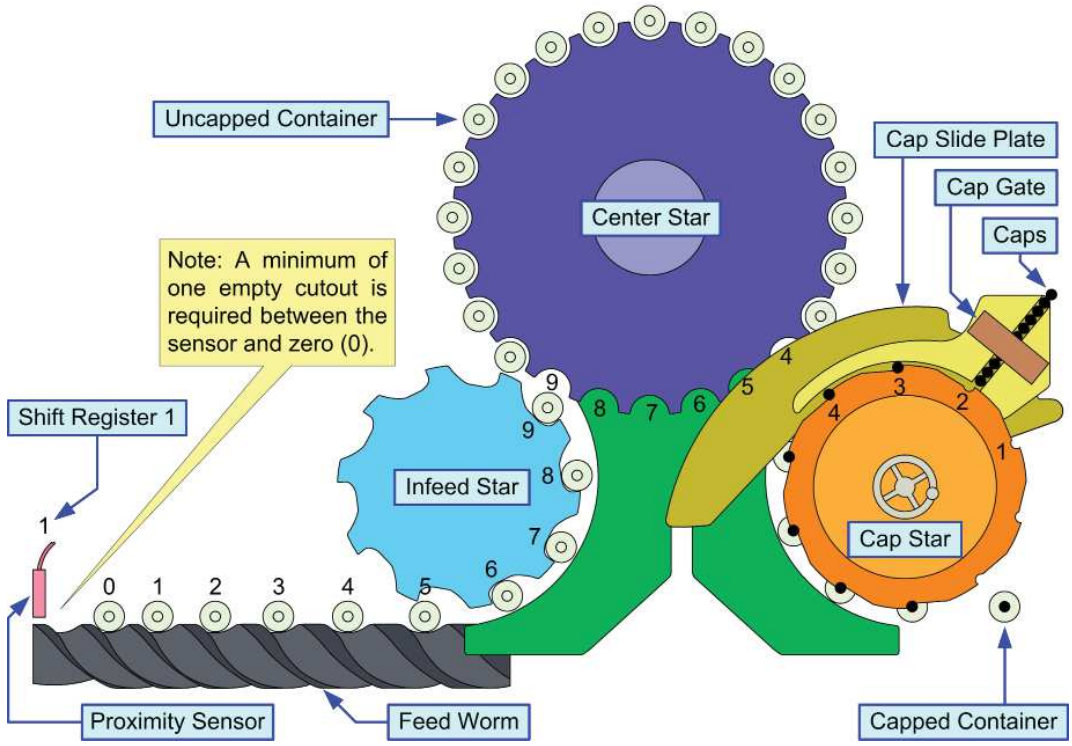


Figure 5-9: ***Cap Gate Setup***

Cap Gate Cylinder Replacement

The cap gate cylinder is the mechanical device that opens and closes the cap gate assembly through pneumatic supply from the pneumatic regulator block. Since the cylinder is constantly opening and closing during machine operation, eventually the cylinder's piston seals will deteriorate and the cylinder in turn, will fail. To replace the cylinder, follow the instructions below.

1. Locate pneumatic regulator block (1) and remove pneumatic supply to the cap gate assembly
2. Detach pneumatic connectors (2) from fittings (3)
3. Unscrew fittings (3) from defective cylinder (4)
4. Withdraw cotter pin (5) and washer (6) from pivot pin (7)
5. Withdraw pivot pin (7) from bracket (8) followed by defective cylinder (4)
6. Unscrew adjustment nut (9) then unscrew defective cylinder (4) from clevis (10)
7. Thread replacement cylinder (4) into clevis (10)
8. Swing replacement cylinder free end into bracket (8)
9. Insert pivot pin (7) into bracket (8) and cylinder (4)
10. Secure pivot pin (7) using washer (6) followed by cotter pin (5)
11. Spread ends of cotter pin (5)
12. Apply thread tape to threads of fittings (3)
13. Screw onto cylinder (4)
14. Connect pneumatic connectors (2) to fittings (3)
15. Restore pneumatic supply at block (1)
16. Adjust cylinder (4) piston as necessary for proper function
17. Secure piston using nut (9)

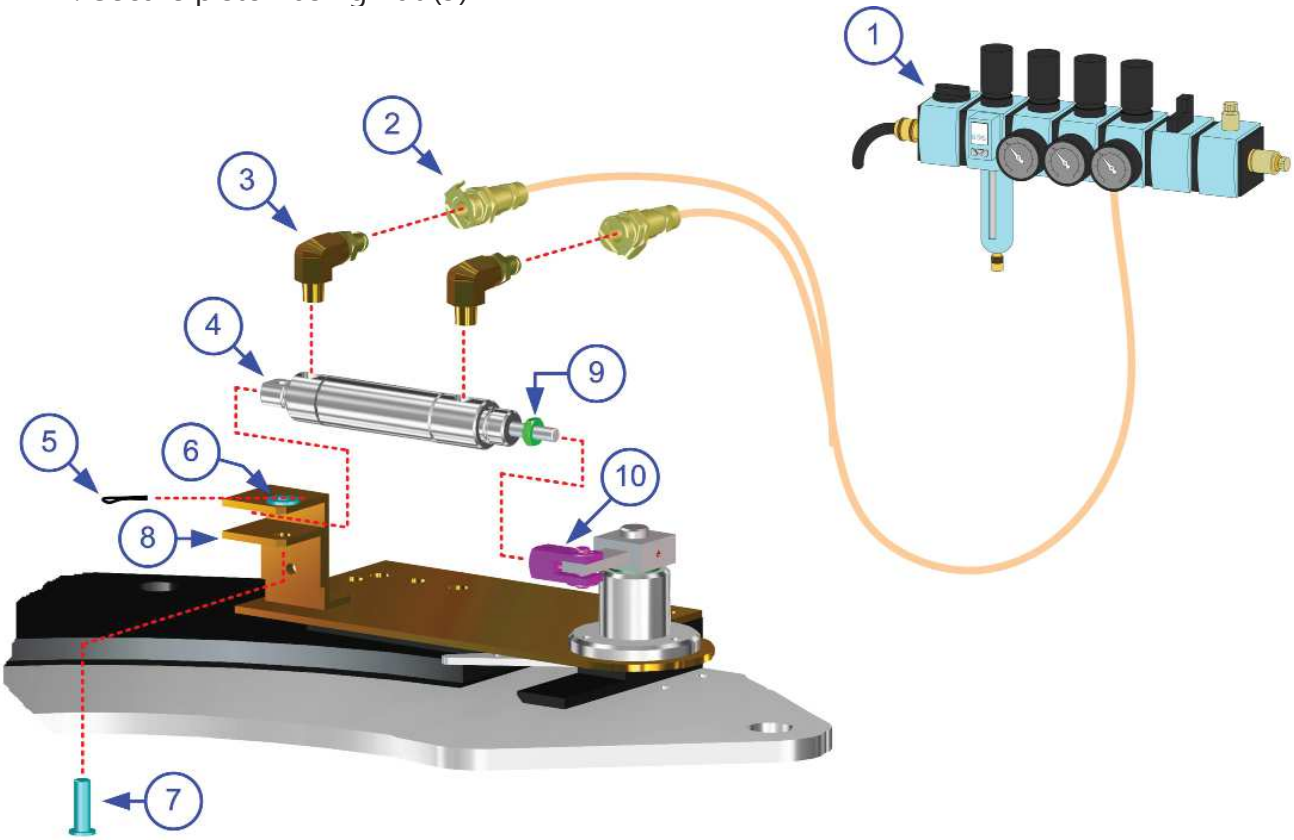


Figure 5-10: ***Cap Gate Assembly***

Cap Feed & Chuck Height Adjustment

In order to properly set capper chuck height, the correct cap slide plate must be mounted on the slide plate posts.

> **CAUTION:** Exercise care when performing this procedure. If the chucks are not set at the proper height, mechanical damage can occur when rotating the machine under power.

To adjust chuck height using height spacers:

1. Open safety doors as necessary to access cap feed assembly
2. Fully raise chuck assembly using jog and hoist cord, connected to machine's operator panel
3. Remove height spacers from all three cap slide plate posts
4. Loosen friction clamp locking levers on each cap slide plate post
5. Insert alternate height spacers on upper portion of each cap slide post to establish proper plate height
6. Tighten each friction clamp-locking lever to secure

> **NOTE:** A set of height spacers has been supplied to accommodate each changeover configuration. Make sure to select the proper set.

> **NOTE:** Some applications require height spacers of a given set to be different lengths. For those applications, ensure that each spacer is placed onto its respective post.

7. Use jog and hoist cord to rotate a chuck assembly over the cap slide plate
8. Stop chuck at lowest point of the lifting cam
9. Place thickness gauge flat onto top surface of cap slide plate
10. Center gauge beneath chuck assembly
11. Use jog and hoist cord to lower chuck assembly toward cap slide plate until almost making contact
12. Remove thickness gauge

Cap Feed & Chuck Height Adjustment (continued)

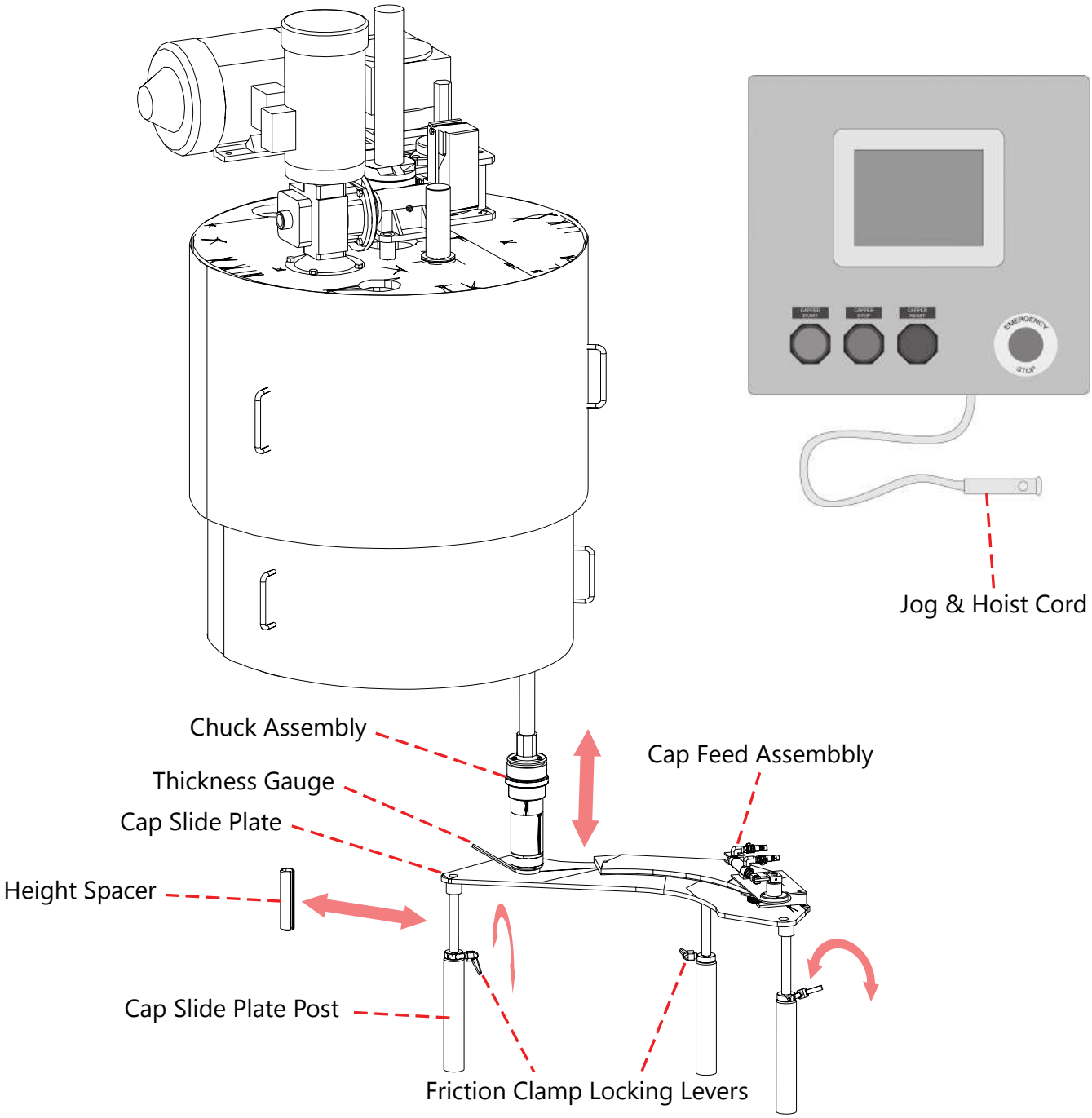


Figure 5-11: ***Cap Feed and Chuck Height Adjustments***

Chuck Head & Cap Slide Plate Adjustment

1) To Set Overcapper Head Height:

1. Fully raise capper turret
2. Locate a cap and a container from batch to be run
3. Place proper cap in a chuck jaw
4. Place proper container in Infeed Star Pocket that aligns with loaded chuck jaw
5. Use jog cord to rotate overcapper chuck assembly around to back of machine until loaded chuck sits at the lowest point on lift cam
6. Use jog cord to lower capper head until cap is fully seated on bottle

2) To Set Overcapper Slide Plate Height:

7. Set overcapper head height first
8. Use jog cord to rotate overcapper turret until designated head rests over lowest point of cap slide plate
9. Manually lift cap chuck to place proper cap in designated cap chuck
10. Raise slide plate until cap makes contact with slide plate
11. When slide plate is correctly set, with a fully seated cap loaded, jaws will be visibly closed

Star Timing Adjustment

In order for the overcapper to run properly and smoothly, the stars must be aligned properly with the chucks. Improper alignment could lead to machine damage.

Infeed Star Adjustment

1. Loosen two bolts on driving flange of infeed star
2. Place one container (from batch to be run) in front infeed star pocket
3. Jog machine until container aligns at tangent point with valves/chucks
4. Manually rotate star until container is perfectly centered under bell
5. Tighten bolts on driving flange

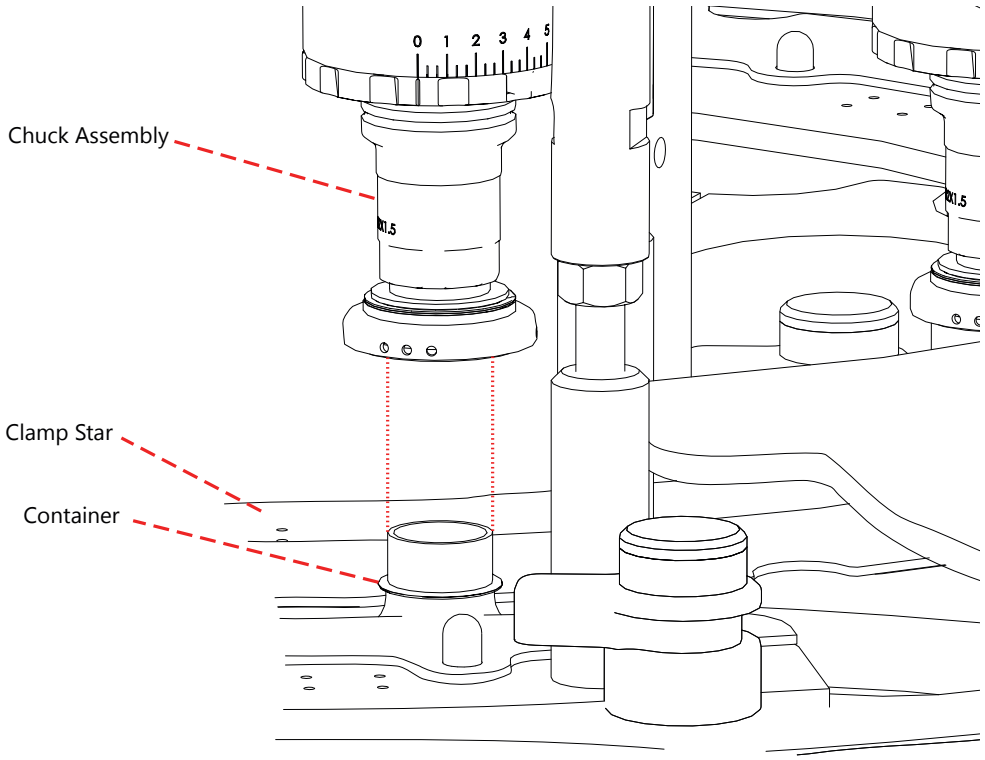


Figure 5-12: *Clamp Star Timing*

Infeed Star Timing Adjustment (continued)

Discharge Star Adjustment

1. Loosen bolts on discharge star
2. Carefully jog container around to discharge star
3. Align so that discharge star is tangent with valve/chuck
4. Manually rotate star until star pocket is aligned 1/16” behind bottle
5. Lock down discharge star

When properly aligned, container will travel through cleaner without bumping star corners or rail edges. The valve/chuck should fit over container without bumping or scraping.

Mechanical Detent Clutch

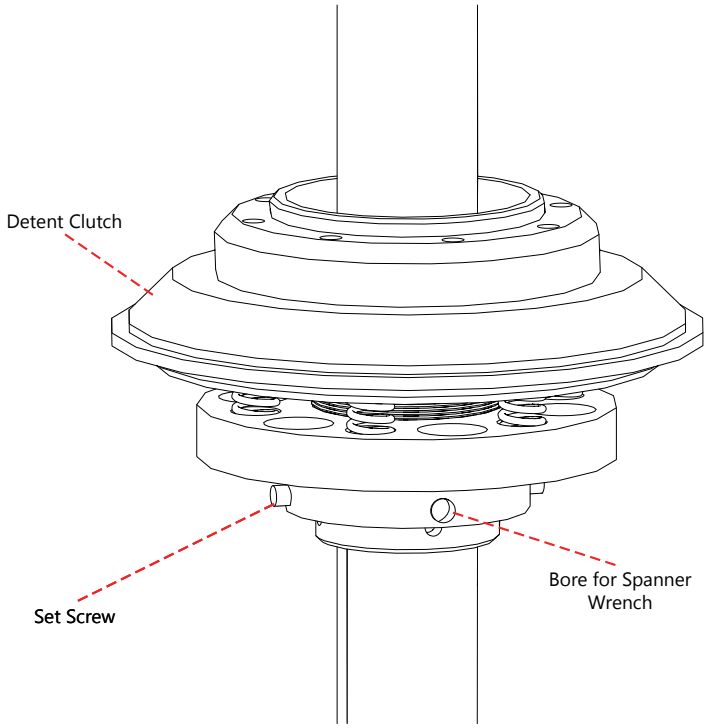


Figure 5-13: *Detent Clutch*

The detent clutch provides a means of varying the break away torque. Two flange units are attached to each of two concentrically located shafts. These two flanges are pushed together, with balls that rest in dimples in the flanges between them. Manual adjustment determines the amount of torque required to force the balls that hold the flanges apart from the dimples.

The clutch is factory lubricated and normally requires very little maintenance except occasional lubrication through fittings located on the side of the unit.

> **CAUTION:** Lubrication of the clutch is to be performed in accordance with the maintenance schedule. Lubricate lightly to prevent slippage during operation.

A proximity switch and mounting bracket are provided with the detent clutch. This switch must be accurately positioned in order to register the disengagement of the clutch. It is important that the sensor be checked occasionally to ensure that when the detent clutch does disengage, the sensor activates an emergency stop. See “Detent Clutch Sensor Adjustment” on page 85.

When the clutch is under high pressure during normal operation, there is a slight separation of the two clutch flanges. The design of the feed star shaft is such that a small vertical movement of the star shaft is not detrimental to the equipment. There are not any limiting devices on the star shaft that will pose problems. Loads are not transmitted to the input or output shaft due to this allowable float. The vertical movement of the shafts should be minimal - no more than 1/32”.

If the machine can be rocked forward and back with a large amount of backlash, one may assume that the detent clutch is worn or is loose. When the dimpled driving flange plate begins to wear, the angular alignment

Mechanical Detent Clutch (continued)

between the input shaft and the output shaft becomes excessive. Since the clutch no longer positions the load balls in a perfectly round dimpled pocket, the flange, as it wears, produces a groove in the pocket and the clutch turns greater amounts without disengaging. As the wear continues, the clutch allows backlash, and larger amounts of tension is necessary for the same engagement pressure.

CAUTION: Operation of this equipment without proper electrical controls may render this hardware inoperable and void all warranties relative to these drive train components.

WARNING: FAILURE TO PROPERLY USE THIS SAFETY SYSTEM MAY RESULT IN PERSONAL INJURY.

Mechanical Detent Clutch Adjustment

WARNING: ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ACTIVITIES.

To adjust detent clutch, loosen the two setscrews located on the lower flange. Then insert a spanner wrench into bore hole. Rotate bores horizontally to adjust. Rotate clockwise to increase holding pressure or counter clockwise to decrease.

NOTE: Adjustment of the detent clutch is a trial and error process. Test cycle the machine following each adjustment until the correct setting is found.

CAUTION: Tighten set screws before test cycling the machine.

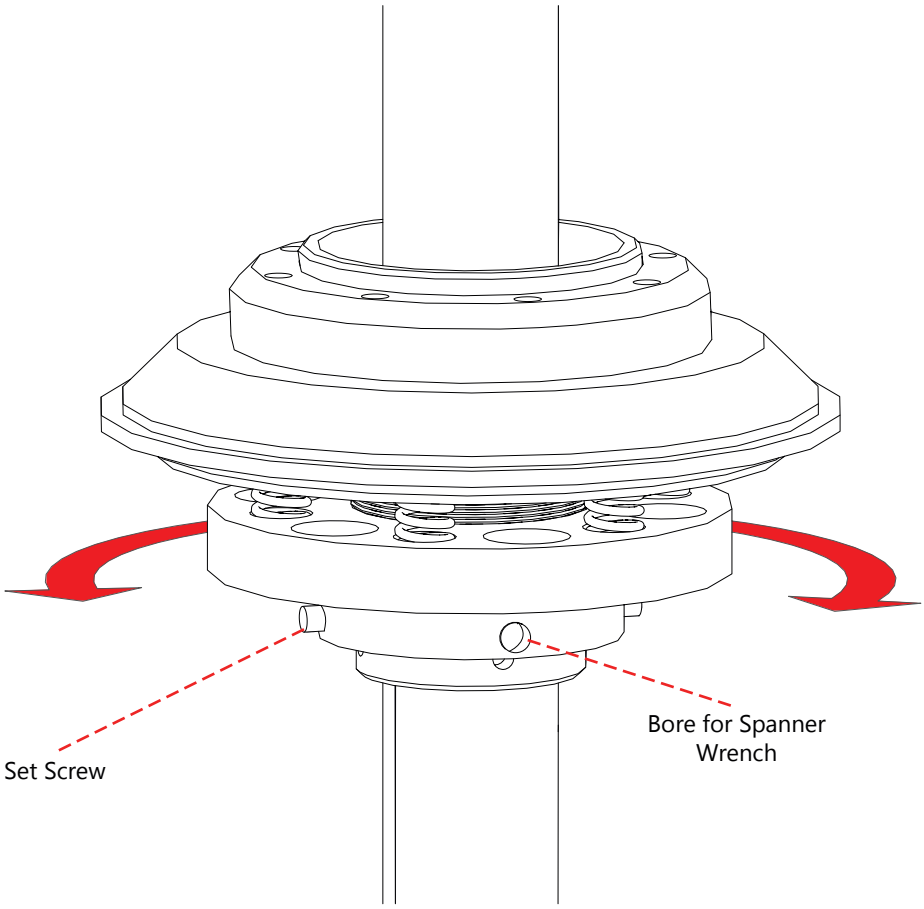


Figure 5-14: ***Mechanical Detent Clutch***

Detent Clutch Sensor Adjustment

The proximity sensor must be accurately positioned in order to register clutch disengagement. Maximum acceptable movement of the clutch limit switch plate is less than 1/16 of an inch. It is important that the sensor, which is wired into the operator panel, be properly set to ensure when the clutch disengages that it trips the proximity sensor, activating an emergency stop. When the sensor is tripped the machine will shut down immediately.

To adjust the sensor, loosen the two set nuts and manually adjust the sensor both vertically and laterally. Adjust vertically so that the sensor end and the edge of the clutch limit plate that it faces are parallel. Adjust horizontally so there is a 1/16" to 1/8" gap between the end of the limit plate and the tip of the sensor. When complete, tighten the two set nuts and test functionality by tripping the detent clutch. Ensure error message displays on machine's operator panel.

> **NOTE:** A properly set sensor will only require a small amount of movement to activate.

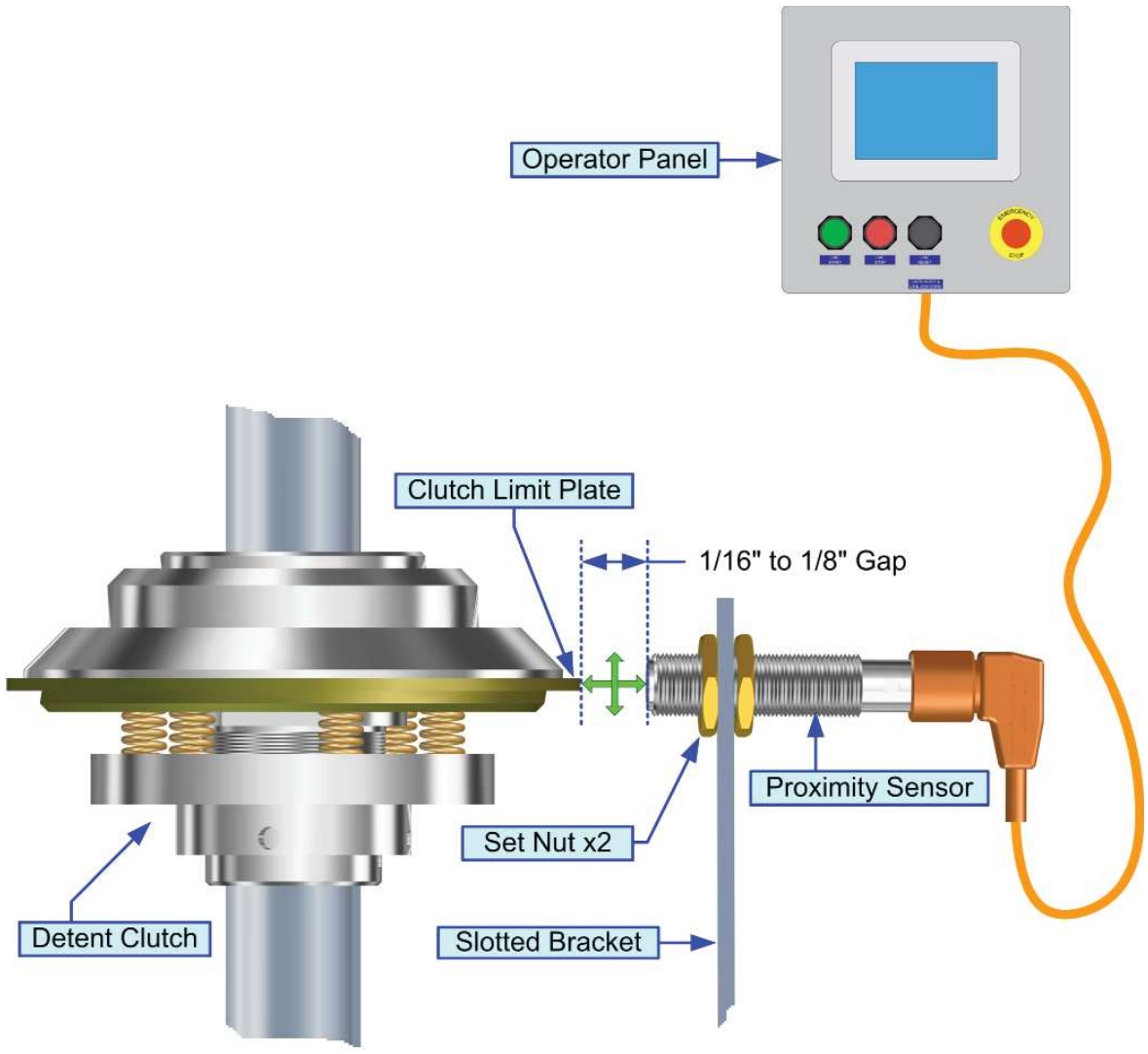


Figure 5-15: ***Detent Clutch Sensor Assembly***

Proximity Switch Replacement

1. Locate defective proximity switch (1)
2. Power down the machine and remove pneumatic supply

> **WARNING:** ENSURE THE POWER SUPPLY IS DISCONNECTED AND FOLLOW ALL LOCKOUT/TAGOUT PROCEDURES BEFORE PERFORMING ANY MAINTENANCE ACTIVITIES.

3. Unscrew power cord (2) from defective switch
4. Unscrew front nut (3) that secures defective switch to bracket (4)
5. Withdraw defective switch from bracket
6. Adjust rear nut (5) of replacement switch to an equal distance from the sensor's front edge as that of the defective switch
7. Insert replacement switch into bracket so that rear nut rests against bracket

> **NOTE:** A properly installed switch will be oriented so that its sensor faces the surface to be detected.

8. Secure replacement switch to bracket from the front using nut
9. Thread power cord onto switch
10. Restore power and pneumatic supply to the machine and test cycle to ensure proper function

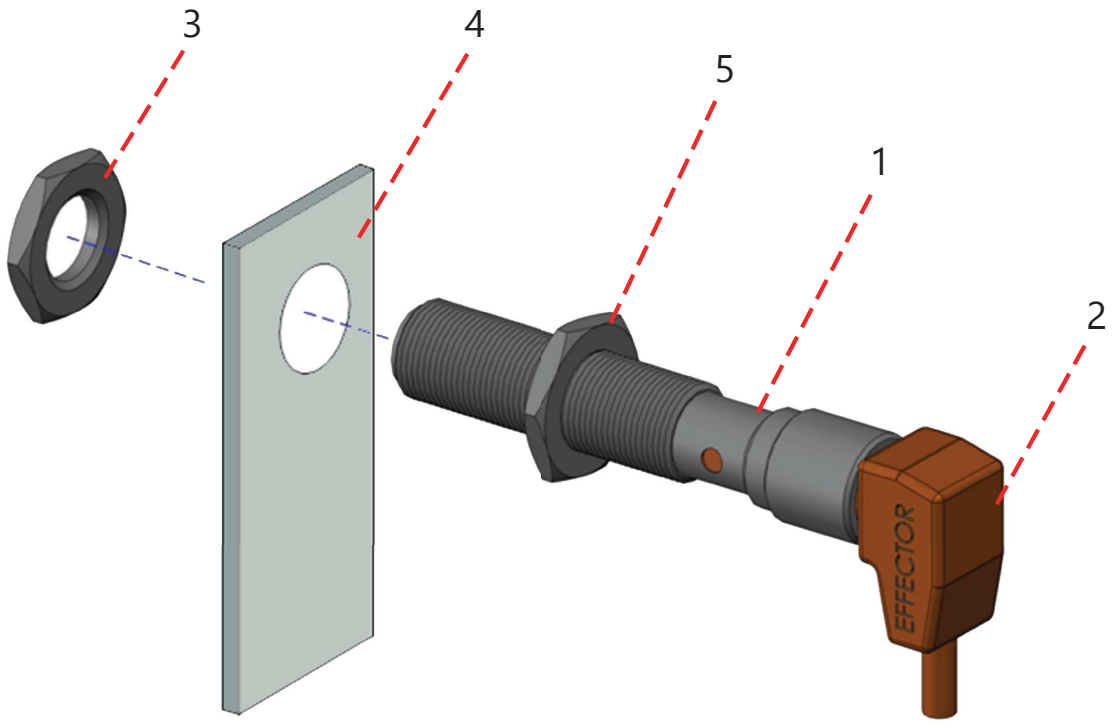


Figure 5-16: ***Proximity Switch***

Main Bearing

Several conditions identify a failing main bearing:

1. More power than normal is required to rotate the machine.
2. Rotational motion of the machine exhibits a vibrating or bumping action.
3. The bed plates have dropped down as much as 1/32" causing the main rotational part of the filler to sit on top of the cabinet. Under these conditions it is almost impossible to turn the machine. Compare the crossover plate where the bottles enter and leave the filler against the bed plates. If the bed plates appear lower then the crossover plate, the main bearing may have failed.

A false indication of bearing failure can occur if the filler slides become dirty and sticky. To eliminate slide concerns, wipe the slides clean, place a small amount of mineral oil on them, and verify that they move freely up and down. If the problem disappears, the bearing is most likely in good working order.

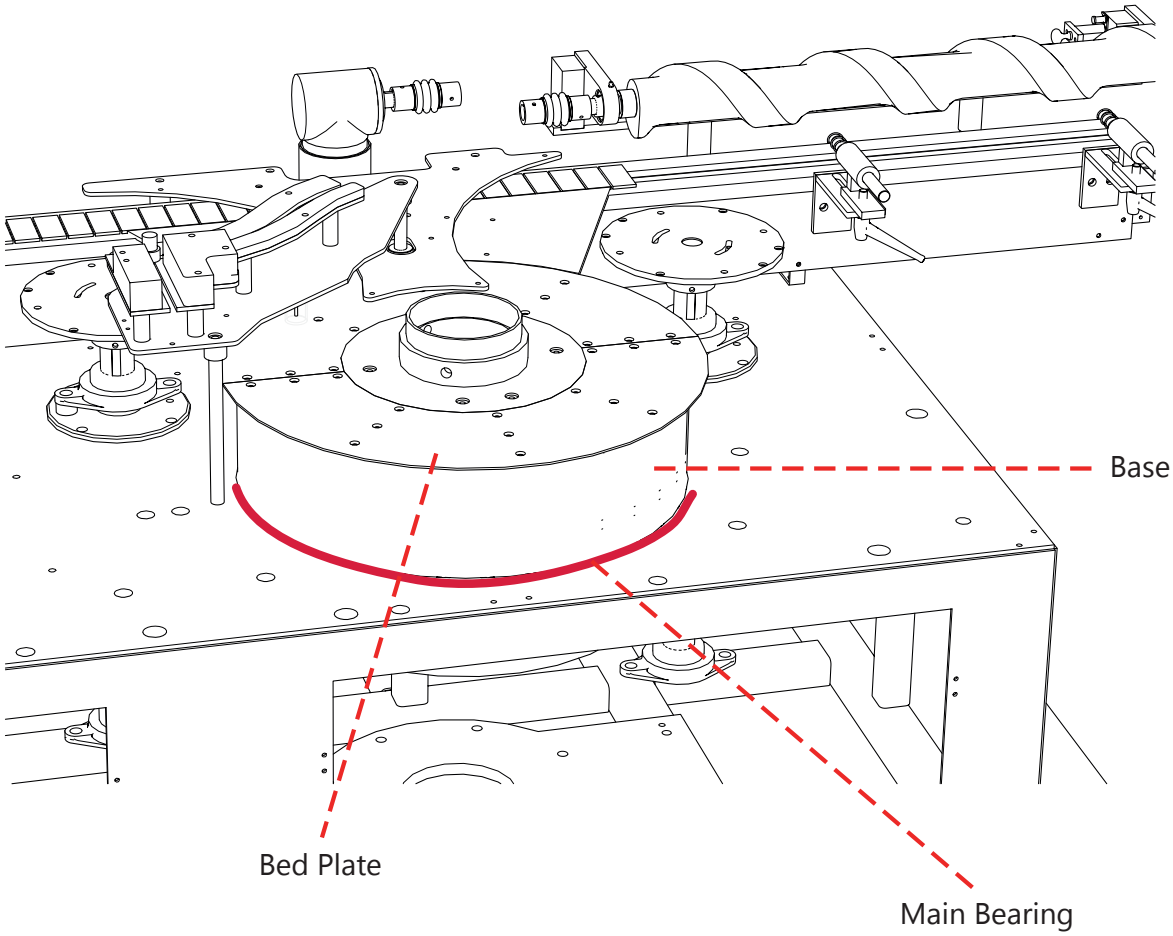


Figure 5-17: *Main Bearing Location*

Star Shaft Bearing Replacement

Star shafts vary in the components attached. The procedure below covers the most complex.

Upper Bearing

1. Remove star attachment
2. Remove two setscrews (1) securing core plate assembly (2) to star shaft (3)
3. Lift away core plate assembly (2)
4. Loosen or remove two screws (4) securing collar (5) to shaft (3)
5. Lift away collar (5)
6. Remove two bolts with washers (6) securing worn upper bearing (7)
7. Discard worn bearing (7)
8. Insert replacement bearing (7) onto shaft (3)
9. Secure replacement bearing using two bolts with washers (6)
10. Insert collar (5) onto shaft (3) and secure using two screws (4)
11. Insert core plate assembly (2) onto shaft (3)
12. Secure core plate using two setscrews (1)

Lower Bearing

1. Remove two bolts with washers (8) along with proximity sensor bracket (9), bracket spacers (10), and bearing spacers (11)
2. Lower worn bearing (12) from shaft (3)
3. Insert replacement bearing (12)

> **NOTE:** If spacers (12) are not present, lift upward on the shaft to provide the space needed to insert bearing (13) onto shaft (4).

4. Apply spacers (11) beneath bearing (12) and spacers (10) above, followed by brackets (9)
5. Secure using bolts with washers (8)

> **ATTENTION:** After replacing either bearing, reset the star timing.

Star Shaft Bearing Replacement (continued)

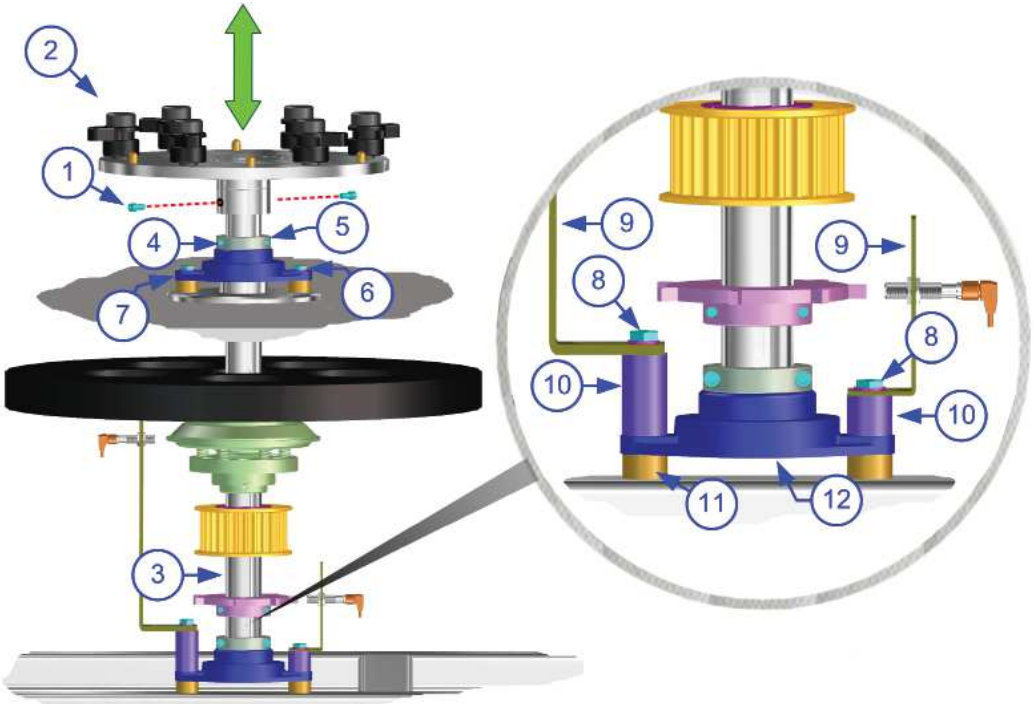


Figure 5-18: ***Star Shaft Assembly***

Overcapper Cam Roller Replacement

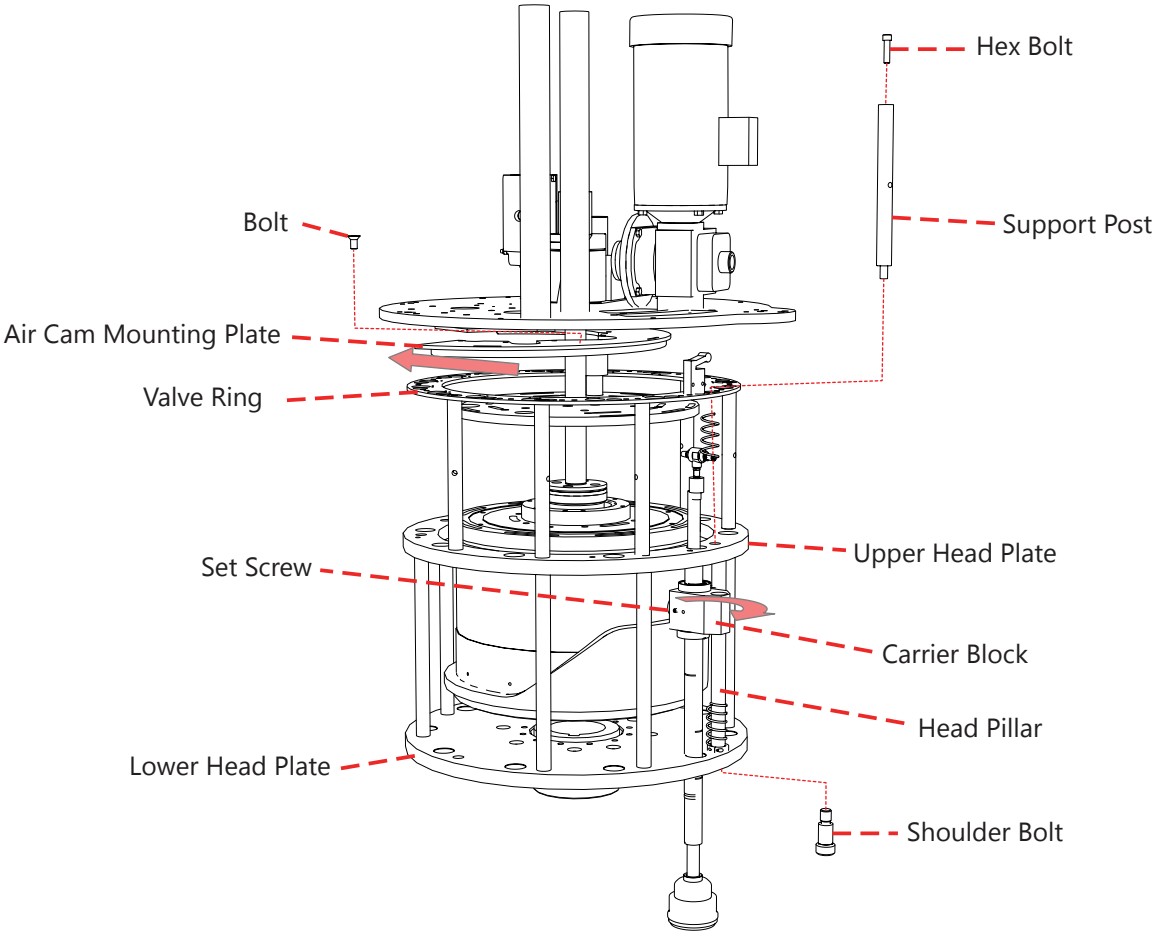


Figure 5-19: *Cam Roller Replacement*

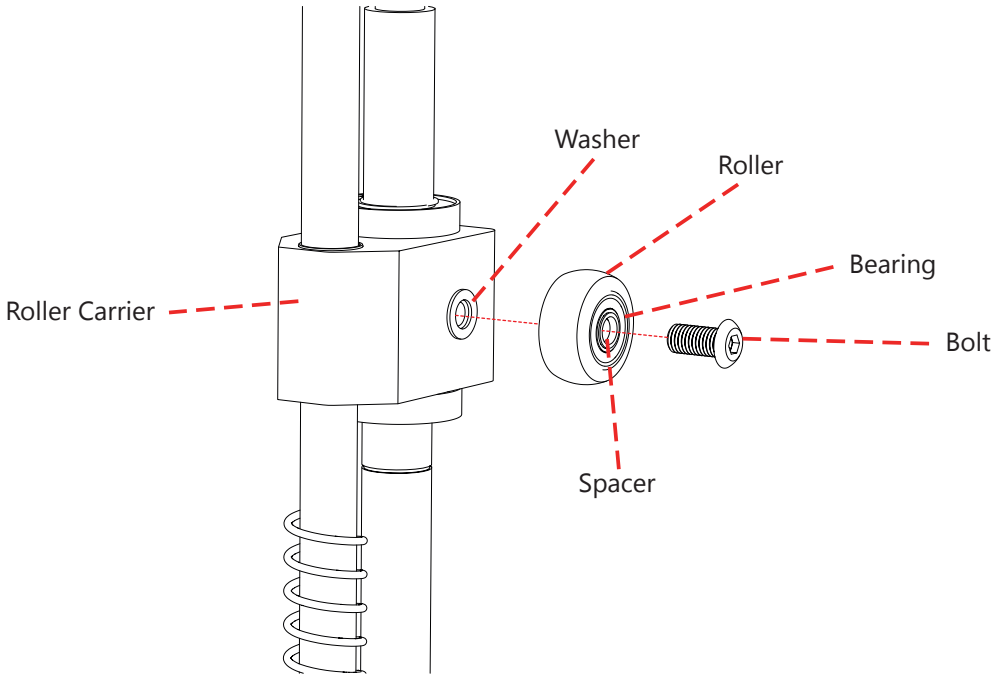


Figure 5-20: *Cam Roller Removal*

Overcapper Cam Roller Replacement (continued)

In order to replace a worn roller, the carrier block must be turned so that the capper's drum does not impede its removal. Cam rollers are considered high-wear components due to their continued revolution upon the capper's cam. Follow the procedure below to replace a worn cam roller.

To replace cam roller:

1. Use control panel to set machine to jog mode
2. Use jog cord to rotate damaged cam roller to the rear of machine towards left rear door
3. Jog machine until desired support post lines up with roof access hole in back of machine
4. Open rear doors
5. Unfasten latch on top machine guard
6. Lift rear top machine guard upwards about a half inch and remove from machine
7. Go to front of machine and open doors
8. Lift front top machine guard upwards about a half inch and remove from machine
9. Unfasten latch on lower machine guard
10. Lift front lower machine guard upwards about a half inch and remove from machine
11. Go to rear of machine and lift rear lower machine guard upwards about a half inch and remove from machine
12. Note positioning of air cam assembly and valve ring
13. Remove 8 bolts from top of air cam mounting plate
14. Remove 10 hex bolts from the top of the 10 support posts
15. Slide valve ring and air cam assembly horizontally left or right to provide enough clearance to remove chuck assembly
16. Insert a screwdriver, or similar tool, into support post hole
17. Use screwdriver to turn support post counterclockwise about ¼ turn
18. Support post should release from head pillar
19. Lift support post upwards through valve ring and remove from assembly
20. Loosen head pillar socket head cap screw under lower head plate
21. Remove head pillar socket head cap screw from under lower head plate
22. Loosen set screw in side of carrier block to release roller bolt
23. Hold head pillar to secure (head pillar may be removed from assembly if needed)
24. Pivot carrier block and head pillar clockwise to access roller assembly
25. Remove roller bolt attaching worn roller to carrier block
26. Remove worn roller
27. Install new roller
28. Fasten new roller by inserting and tightening roller bolt
29. Ensure all roller parts are in place and that roller turns freely
30. If removed in step 23, insert head pillar into carrier block
31. Pivot head pillar and carrier block counterclockwise until roller rests on cam and head pillar rests between upper and lower head plates
32. Tighten set screw to hold roller bolt in place
33. Replace and tighten head pillar socket head screw under lower head plate
34. Insert support post through roof access hole
35. Attach bottom of support post to top of head pillar
36. Use screwdriver, or similar tool, to tighten support post by turning clockwise about ¼

Overcapper Cam Roller Replacement (continued)

37. Insert 10 hex bolts through valve ring and support posts
38. Tighten hex bolts
39. Move air cam horizontally to previously noted position
40. Insert 8 bolts into air cam and tighten
41. Place front and back lower guards onto machine
42. Fasten lower guard clasps and ensure that guards are secure
43. Place front and back upper guards onto machine
44. Fasten upper guard clasps
45. Close rear doors
46. Set machine to run mode

Overcapper Chuck Shaft, Pillar, and Bushings Replacement

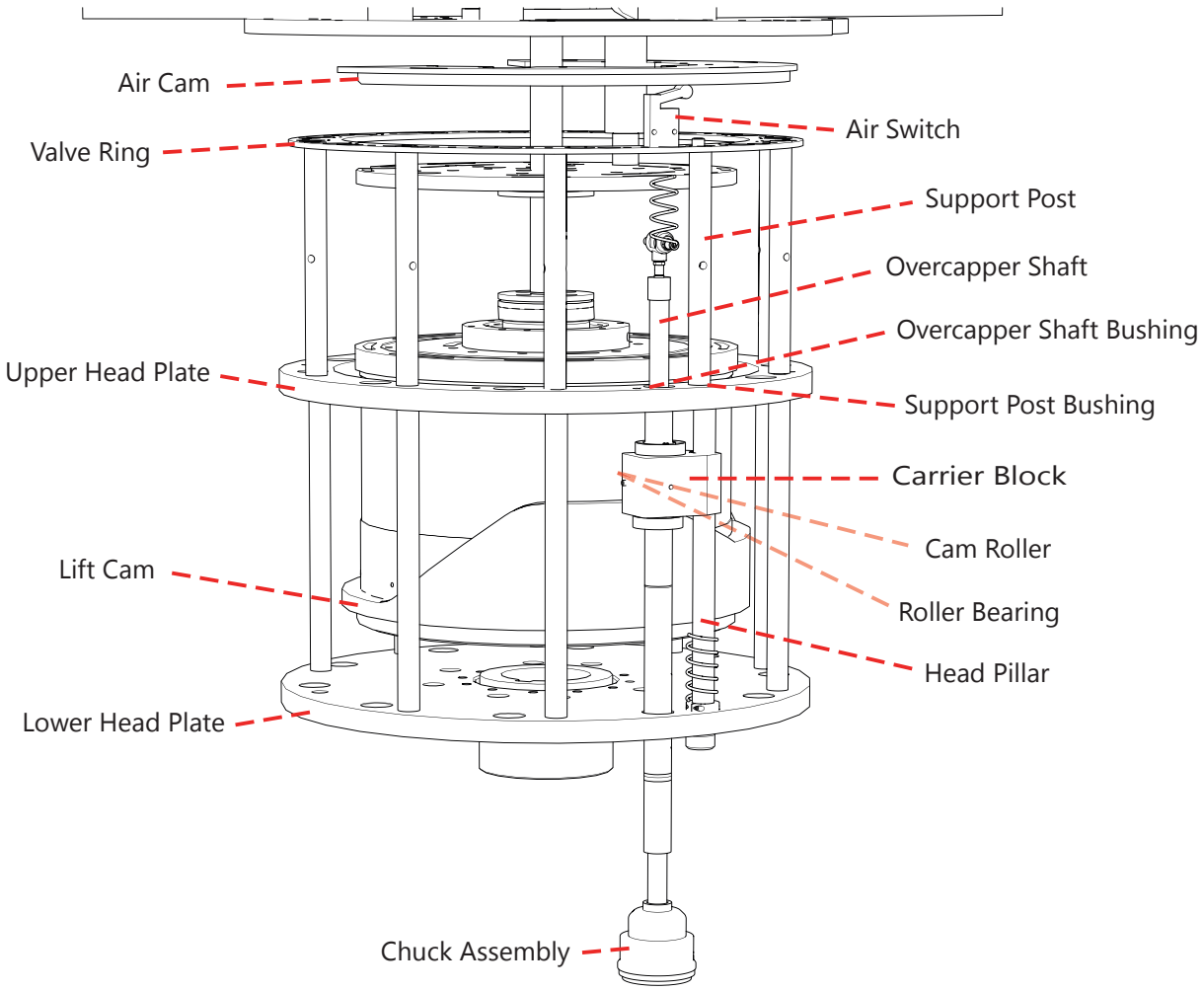


Figure 5-21: *Capper Cam and Shaft Assemblies*

To remove chuck shaft assembly:

1. Use control panel to set machine to jog mode
2. Use jog cord to rotate damaged cam roller to the rear of the machine towards the left rear door
3. Jog machine until desired support post lines up with roof access hole in back of machine
4. Open rear doors
5. Unfasten latch on top machine guard
6. Lift rear top machine guard upwards about a half inch and remove from machine
7. Go to front of machine and open doors
8. Lift front top machine guard upwards about a half inch and remove from machine
9. Unfasten latch on lower machine guard
10. Lift front lower machine guard upwards about a half inch and remove from machine
11. Go to rear of machine and lift rear lower machine guard upwards about a half inch and remove from machine
12. Turn off pneumatic air supply
13. Unscrew hose fitting from q-dump
14. Unscrew q-dump from bushing reducer

Overcapper Chuck Shaft, Pillar, and Bushings Replacement (continued)

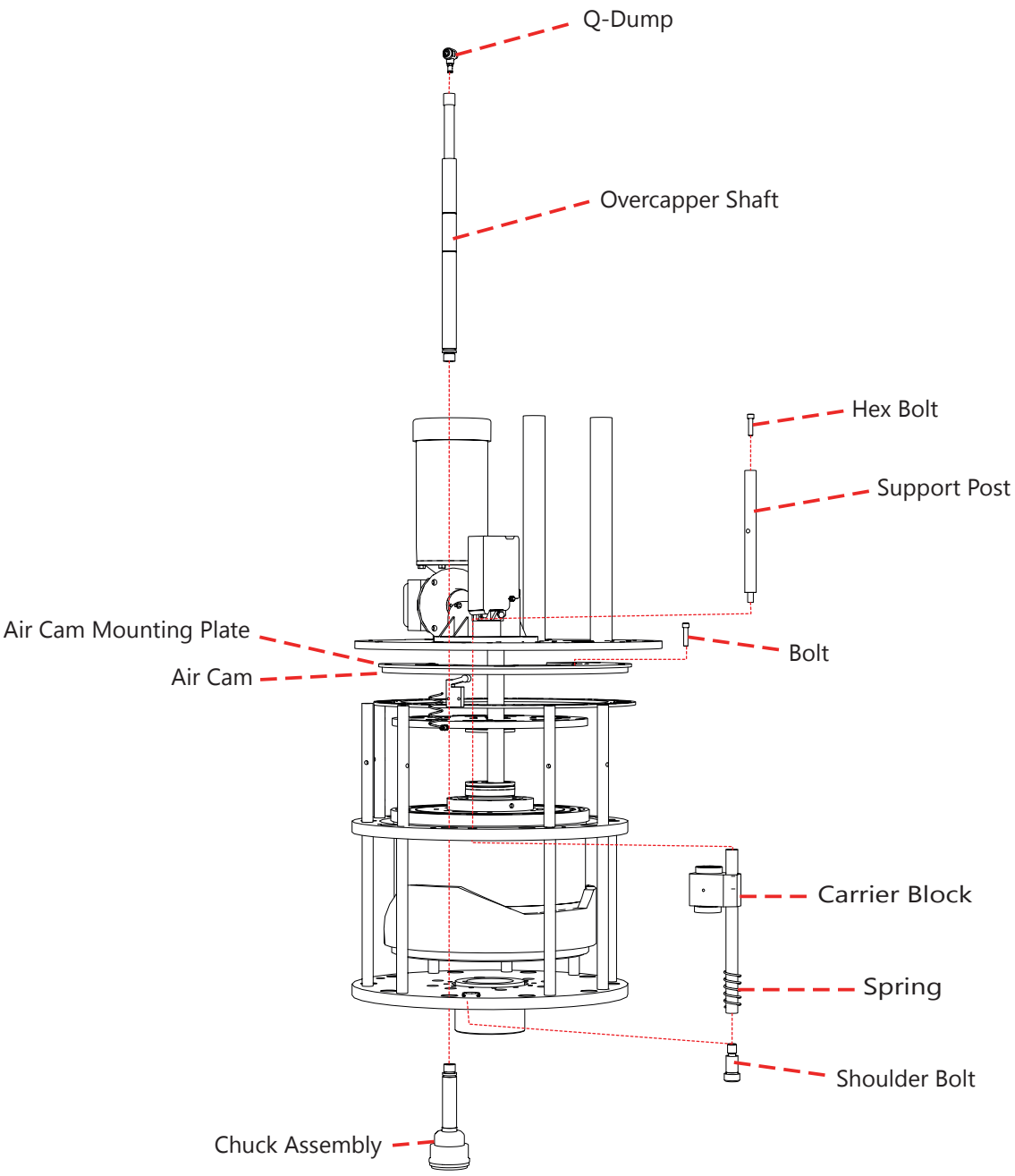


Figure 5-22: *Overcapper Shaft Removal*

15. Note positioning of air cam assembly and valve ring
16. Remove 8 bolts from top of air cam mounting plate
17. Remove 10 hex bolts from tops of the 10 head pillars
18. Slide valve ring and air cam assembly horizontally left or right to provide enough clearance to remove chuck assembly
19. Insert a screwdriver, or similar tool, into support post hole
20. Use screwdriver to turn support post counterclockwise about ¼ turn
21. Support post should release from head pillar
22. Lift support post upwards and remove from assembly through roof access hole

Overcapper Chuck Shaft, Pillar, and Bushings Replacement (continued)

23. Unscrew chuck assembly by hand and remove from overcapper shaft
24. Use snap ring pliers to remove one snap ring from above top plugger shaft spacer
25. Use snap ring pliers to remove one snap ring from below bottom plugger shaft spacer
26. Hold chuck shaft and loosen set screw in front of carrier block to release carrier block
27. Hold carrier block while sliding overcapper chuck shaft upwards through roof access hole
28. Remove overcapper chuck shaft
29. Loosen head pillar socket head cap screw under lower head plate
30. Remove head pillar socket head cap screw
31. Remove head pillar, spring, and carrier block

To remove carrier block components:

1. Slide carrier block off of head pillar
2. Remove one 1 1/4" overcapper shaft bushing from upper head plate
3. Remove one 1 1/4" overcapper shaft bushing from lower head plate
4. Remove two plugger shaft spacers
5. Remove two 1" bushings

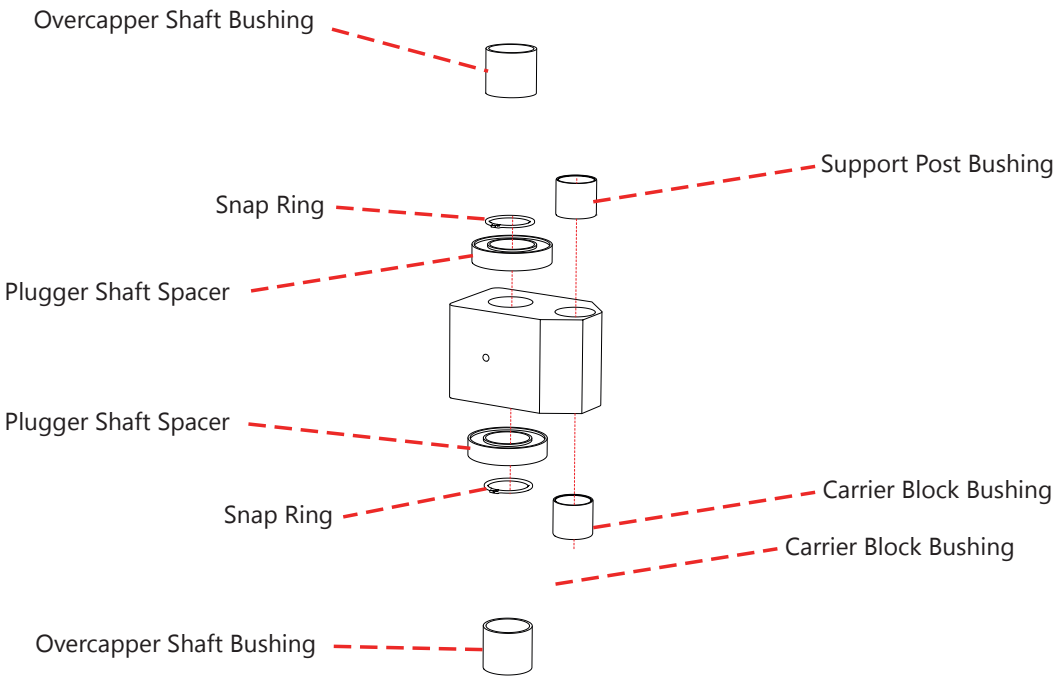


Figure 5-23: *Carrier Block Assembly*

To rebuild carrier block:

1. Insert two 1" bushings into head pillar side of roller carrier
2. Install two plugger shaft spacers

Overcapper Chuck Shaft, Pillar, and Bushings Replacement (continued)

To rebuild chuck shaft assembly:

1. Remove excess dirt and debris from assembly parts
2. Ensure any replacement parts match original part specifications
3. Insert one 1 1/4" overcapper shaft bushing into lower head plate
4. Insert one 1 1/4" overcapper shaft bushing into upper head plate
5. Insert head pillar into carrier block assembly
6. Place spring on lower section of head pillar
7. Place head pillar between upper and lower head plates
8. Insert socket head cap screw under lower head plate
9. Tighten socket head cap screw
10. Lower overcapper shaft through roof access hole and through carrier block
11. Properly position overcapper shaft
12. Use snap ring pliers to install one snap ring below bottom plugger shaft spacer
13. Use snap ring pliers to install one snap ring above top plugger shaft spacer
14. Tighten set screw in front of carrier block to secure overcapper shaft
15. Jog machine until support post can be installed through roof access hole
16. Insert support post through roof access hole
17. Attach bottom of support post to top of head pillar
18. Use screwdriver, or similar tool, to tighten support post by turning clockwise about ¼
19. Reposition valve ring and air cam assembly in previously noted position
20. Insert 10 hex bolts through valve ring into top of 10 head pillars and tighten
21. Insert 8 bolts into top of air cam mounting plate and tighten
22. Screw q-dump into bushing reducer
23. Screw hose fitting into q-dump
24. Turn on pneumatic air supply
25. Install upper machine guard
26. Install lower machine guard

Discharge Guide Alignment

An adjustable discharge guide is provided to guide clean containers onto the conveyor centerline at the end of the cycle. Most product size changes will require alignment adjustment of the discharge guide.

To adjust the guide, loosen knobs and then slide guide forward or back as needed.

Guide is positioned correctly when it guides the container onto the conveyor without bumping or rubbing. The discharge guide is to be positioned so that approximately 1/8" clearance exists between it and container sides as container is discharged onto conveyor chain.

Ensure knobs are tight before running machine.

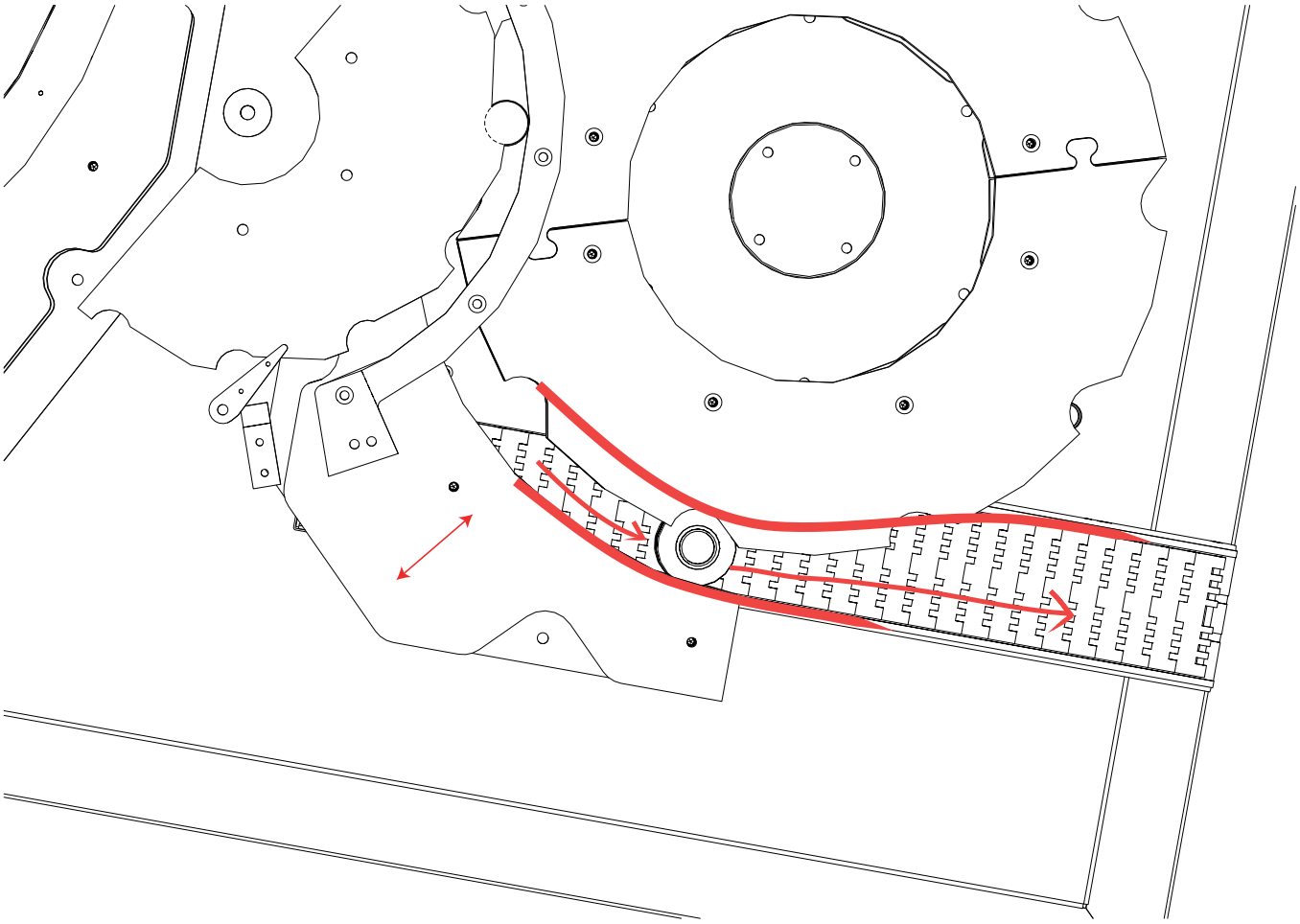


Figure 5-24: *Discharge Guide Alignment*

Machine Name

Overcapper

USB MACHINE NO: 98000

APPENDIX A - Figures List

Figure 6-1:*Figures List*

Machine Name

98000 Overcapper

USB MACHINE NO: 98000

APPENDIX B - Tables List

Table 7-1:*Tables Listing*