US Bottlers Machinery Co.

Creative Custom Packaging Equipment

LUXCO

I.O.M. MANUAL

TRI-BLOCK

(RR42-78”)(PG42-78”)(RC14-26”)

WO: 84910

US Bottlers Machinery Company, Inc

11911 Steele Creek Road
Charlotte, NC 28273

PO Box 7203
Charlotte, NC 28241

Customer Care Department
Phone: 704.588.4750
Fax: 704.588.3808
support@usbottlers.com

Parts Department
Phone: 704.588.4750
Fax: 704.588.3808
parts@usbottlers.com

24-Hour Service
Phone: 704.588.4750 x200

www.usbottlers.com

US BOTTLERS MACHINERY COMPANY
TECHNICAL DATA

WORK ORDER: 84910

FACILITY REQUIREMENTS	
Environmental Conditions	Enclosed structure, climate controlled, free of visible atmospheric pollutants.
Electrical Supply	480 VAC, 30 Amps, 3 Phase.
Pneumatic Supply	80 psi, 20 cfm, .50 inch diameter inlet piping.
Water Supply	.50 inch inlet piping, municipal pressure

MACHINE SPECIFICATIONS	
Machine Dimensions	Filler: 9' 2" H x 8' W x 9' L Capper: 9' 10" H x 5' W x 7' L Rinser: 7' H x 7' W x 11' L Transfer Tables: 5' H x 5' W x 13' L Vacuum: 6' H x 3' W x 5' L Prefeeder: 9' 2" H x 5' W x 12' L Elevator: 6' H x 4' W x 12' L Electrical Panel: 2' H x 8' W x 8' L Tank: 3' H x 5' W x 5' L
Machine Weight	Filler: 9,000 lbs. Capper: 8,000 lbs. Rinser: 4,000 lbs. Transfer Tables: 5,000 lbs. Vacuum: 300 lbs. Prefeeder: 1500 lbs. Elevator: 1500 lbs. Electrical Panel: 1,000 lbs. Tank: 500 lbs.
Production Capacity	750 ML: 325 BPM 1 Liter: 300 BPM 1.75 Liter: 200 BPM

LUBRICATION	
Bearing Grease	Food Grade: Lubricate FGL-1 Standard: 630-AA Grade (G-81322 Compliant)
Gearbox Oil	APG-80W-140
Chain Lubricant	Customer Determined

FILLER MAIN DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	5.0
Revolutions Per Minute (RPM)	1800
Enclosure / Application	Inverter Duty / Washdown / w/Encoder

FILLER LIFTING JACK MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1.0
Revolutions Per Minute (RPM)	1725
Enclosure / Application	TENV / Continuous

CAPPER MAIN DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	5.0
Revolutions Per Minute (RPM)	1800
Enclosure / Application	Washdown / Inverter Duty / w/Encoder

CAPPER SPINDLE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	3.0
Revolutions Per Minute (RPM)	1755
Enclosure / Application	TENV / Continuous

CAPPER TURRET LIFT MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1.0
Revolutions Per Minute (RPM)	1740
Enclosure / Application	TENV

RINSER MAIN DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	2.0
Revolutions Per Minute (RPM)	1800
Enclosure / Application	Washdown / Inverter Duty / w/Encoder

CONVEYOR MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1.0
Revolutions Per Minute (RPM)	1725
Enclosure / Application	TENV / Continuous

RETURN PUMP MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	2.0
Revolutions Per Minute (RPM)	1750
Enclosure / Application	TEFC

ELEVATOR SORTER DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1.0
Revolutions Per Minute (RPM)	1100
Enclosure / Application	TENV

US BOTTLERS MACHINERY COMPANY
ATTACHMENT REFERENCE & SETUP PARAMETERS

WORK ORDER: 84910

ATTACHMENT REFERENCE

BOTTLE	CAP	ATTACHMENT	
750ML BOORDS Round Glass 3.000" Dia x 11.469" Tall	28mm	Feed Worm:	750ML RD
		Rinser Infeed Center Guide:	750ML RD
		Rinser Infeed Star:	750ML RD
		Filler Infeed Center Guide:	750ML RD
		Filler Infeed Star:	750ML RD
		Filler Infeed Guide Finger:	750ML RD
		Filler Center Star:	750ML RD
		Capper Transfer Rear Rail:	750ML BOORDS
		Capper Transfer Star:	750ML BOORDS
		Capper Neck Guide:	750ML BOORDS
		Capper Center Star:	750ML BOORDS
		Capper Discharge Rear Rail:	750ML BOORDS
		Capper Discharge Star:	750ML BOORDS
		Capper Cap Feed Star:	28MM
750ML RD Round Glass 3.026" Dia x 11.172" Tall	28mm	Feed Worm:	750ML RD
		Rinser Infeed Center Guide:	750ML RD
		Rinser Infeed Star:	**750ML RD**
		Filler Infeed Center Guide:	750ML RD
		Filler Infeed Star:	750ML RD
		Filler Infeed Guide Finger:	750ML RD
		Filler Center Star:	750ML RD
		Capper Transfer Rear Rail:	750ML RD
		Capper Transfer Star:	750ML RD
		Capper Neck Guide:	750ML RD
		Capper Center Star:	750ML RD
		Capper Discharge Rear Rail:	750ML RD
		Capper Discharge Star:	750ML RD
		Capper Cap Feed Star:	28MM

1L RD Round Glass 3.364" Dia x 11.847" Tall	28mm	Feed Worm:	1L RD
		Rinser Infeed Center Guide:	1L RD
		Rinser Infeed Star:	1L RD
		Filler Infeed Center Guide:	1L RD
		Filler Infeed Star:	1L RD
		Filler Infeed Guide Finger:	1L RD
		Filler Center Star:	1L RD
		Capper Transfer Rear Rail:	1L RD
		Capper Transfer Star:	1L RD
		Capper Neck Guide:	1L RD
		Capper Center Star:	1L RD
		Capper Discharge Rear Rail:	1L RD
		Capper Discharge Star:	1L RD
		Capper Cap Feed Star:	28MM
1L BOORDS Round Glass 3.453" Dia x 11.594" Tall	28mm	Feed Worm:	1L BOORDS
		Rinser Infeed Center Guide:	1L BOORDS
		Rinser Infeed Star:	1L BOORDS
		Filler Infeed Center Guide:	1L BOORDS
		Filler Infeed Star:	1L BOORDS
		Filler Infeed Guide Finger:	1L BOORDS
		Filler Center Star:	1L BOORDS
		Capper Transfer Rear Rail:	1L BOORDS
		Capper Transfer Star:	1L BOORDS
		Capper Neck Guide:	1L BOORDS
		Capper Center Star:	1L BOORDS
		Capper Discharge Rear Rail:	1L BOORDS
		Capper Discharge Star:	1L BOORDS
		Capper Cap Feed Star:	28MM
1.75L PEARL Round Plastic 4.250" Dia x 12.756" Tall	33mm	Feed Worm:	1.75L PEARL
		Rinser Infeed Center Guide:	1.75L PEARL
		Rinser Infeed Star:	1.75L PEARL
		Filler Infeed Center Guide:	1.75L PEARL
		Filler Infeed Star:	1.75L PEARL
		Filler Infeed Guide Finger:	1.75L PEARL
		Filler Center Star:	1.75L PEARL
		Capper Transfer Rear Rail:	1.75L PEARL
		Capper Transfer Star:	1.75L PEARL
		Capper Neck Guide:	1.75L PEARL
		Capper Center Star:	1.75L PEARL
		Capper Discharge Rear Rail:	1.75L PEARL
		Capper Discharge Star:	1.75L PEARL
		Capper Cap Feed Star:	33MM TALL

1.75L PET Round Plastic 4.480" Dia x 12.100" Tall	33mm	Feed Worm:	1.75L PET
		Rinser Infeed Center Guide:	1.75L PET
		Rinser Infeed Star:	1.75L PET
		Filler Infeed Center Guide:	1.75L PET
		Filler Infeed Star:	1.75L PET
		Filler Infeed Guide Finger:	1.75L PET
		Filler Center Star:	1.75L PET
		Capper Transfer Rear Rail:	1.75L PET
		Capper Transfer Star:	1.75L PET
		Capper Neck Guide:	1.75L PET
		Capper Center Star:	1.75L PET
		Capper Discharge Rear Rail:	1.75L PET
		Capper Discharge Star:	1.75L PET
		Capper Cap Feed Star:	33MM
1.75L Round Glass 5.114" Dia x 12.328" Tall	33mm	Feed Worm:	1.75L
		Rinser Infeed Center Guide:	1.75L
		Rinser Infeed Star:	1.75L
		Filler Infeed Center Guide:	1.75L
		Filler Infeed Star:	1.75L
		Filler Infeed Guide Finger:	1.75L
		Filler Center Star:	1.75L
		Capper Transfer Rear Rail:	1.75L
		Capper Transfer Star:	1.75L
		Capper Neck Guide:	1.75L
		Capper Center Star:	1.75L
		Capper Discharge Rear Rail:	1.75L
		Capper Discharge Star:	1.75L
		Capper Cap Feed Star:	33MM

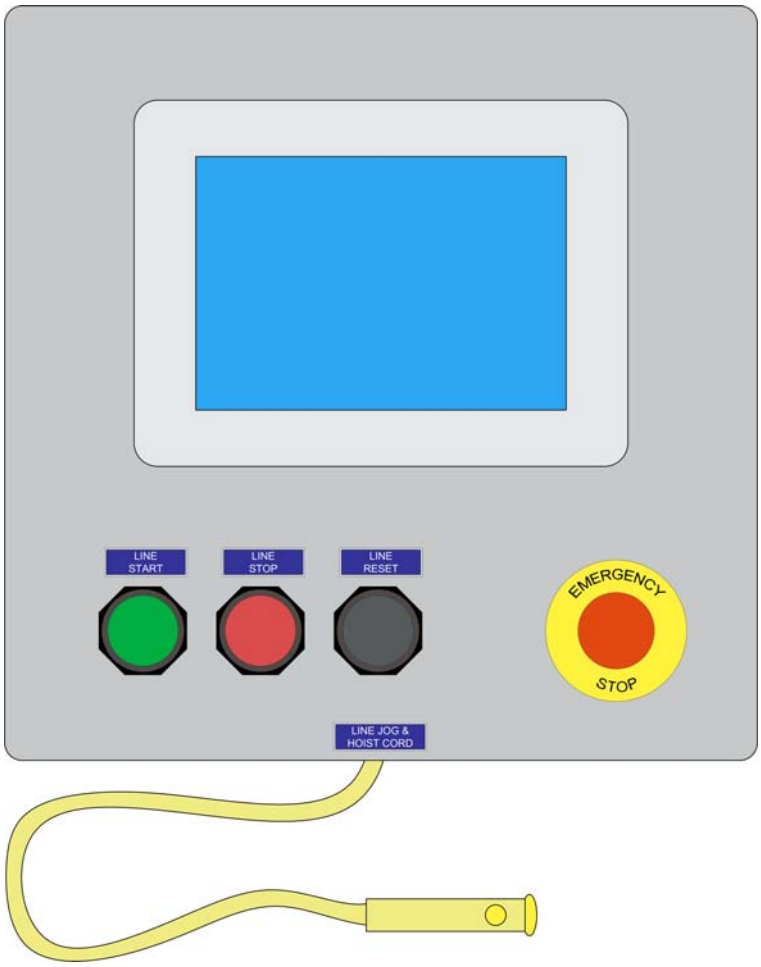
SETUP PARAMETERS

Container	Slide Plate Spacer	Chuck Gauge	Cap Star	Filler Scale
750ML BOORDS	7-3/4"	.390	4-5/8"	--
750ML RD	7-7/16"	.390	4-7/8"	--
1L RD	8-3/16"	.390	4-1/8"	--
1L BOORDS	7-7/8"	.390	4-7/16"	--
1.75L PEARL	7-5/16"	.937	3-13/16"	--
1.75L PET	8-3/16"	.468	4-1/8"	--
1.75L	8-17/32"	.468	3-3/4"	--

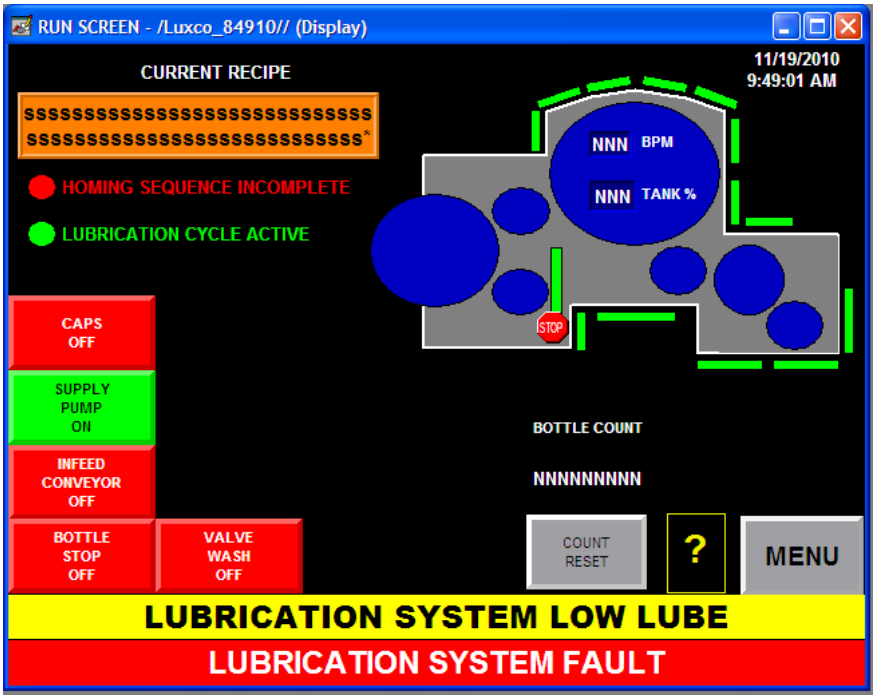
US BOTTLERS MACHINERY COMPANY
OPERATOR PANEL DESCRIPTION

Work Order: 84910

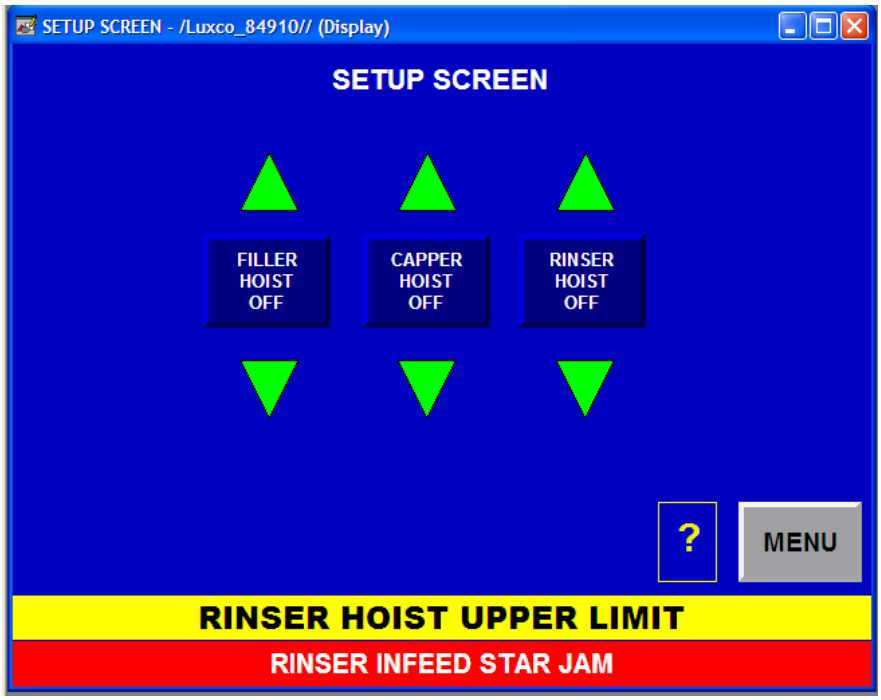
OPERATOR PANEL BUTTONS	
BUTTONS	**DESCRIPTION**
START	Initiates machine operation when pressed. Pressing the LINE or MACHINE STOP button will pause machine operation.
STOP	Ceases machine operation when pressed. Pressing the LINE or MACHINE START button will activate machine operation.
RESET	Clears the machine's memory of a fault condition if it has been corrected. If a fault exists and it hasn't been corrected, the machine will not be reset and the fault condition will not be cleared from memory.
EMERGENCY STOP	Shuts the machine down in emergency situations where expediency is required.
HOIST & LINE JOG CORD	Used during testing and changeovers for metered movement. When the LCD hoist button is off, the button on the side rotates the turret. When LCD hoist button is selected for up or down, the button on the side raises and lowers the hoist.



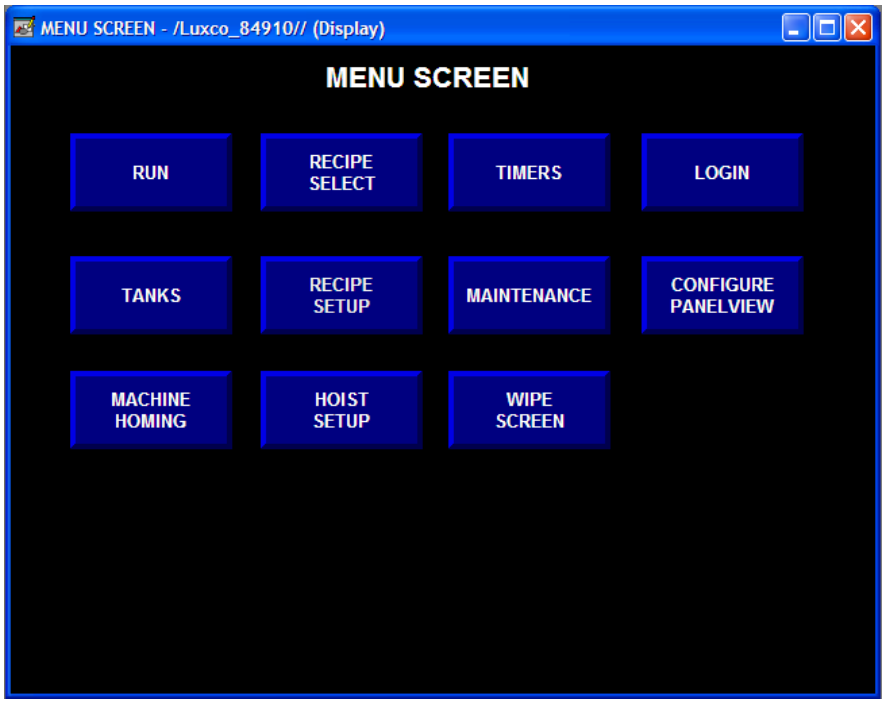
RUN MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
CURRENT RECIPE	Read only display of the current recipe.
HOMING SEQUENCE INCOMPLETE	Appears when the homing is interrupted. Press Reset to clear.
LUBRICATION CYCLE ACTIVE	Appears when the lubrication system is active.
CAPS AUTO/OFF	When in AUTO, enables the cap sorter to run until the upper chute eye is blocked with caps. Also allows the cap gate to open to apply caps to containers running through the machine.
SUPPLY PUMP ON/OFF/AUTO	When ON, the pump is energized and not energized when OFF. When in the AUTO mode, the pump runs when the level is above low level, the machine is running, and the bottle stop is open.
INFEED CONVEYOR HAND/OFF/AUTO	Turns the filler infeed conveyor on. When in AUTO, the conveyor will run whenever the machine is running.
BOTTLE STOP HAND/OFF/AUTO	Controls the bottle stop. When in AUTO, warnings will engage the bottle stop.
VALVE WASH HAND/OFF/AUTO	When ON, rinses valves and valve rods continuously. When in Auto mode, rinses only when not running bottles.
BOTTLE COUNT	Displays the current bottle count number.
COUNT RESET	Resets the Bottle Count to zero.
BPM	Displays the actual production speed.
TANK %	Displays the current setting of the supply tank.
?	Advances to an instructional screen that provides functional information for each screen option.
MENU	Returns the operator to the Menu screen.



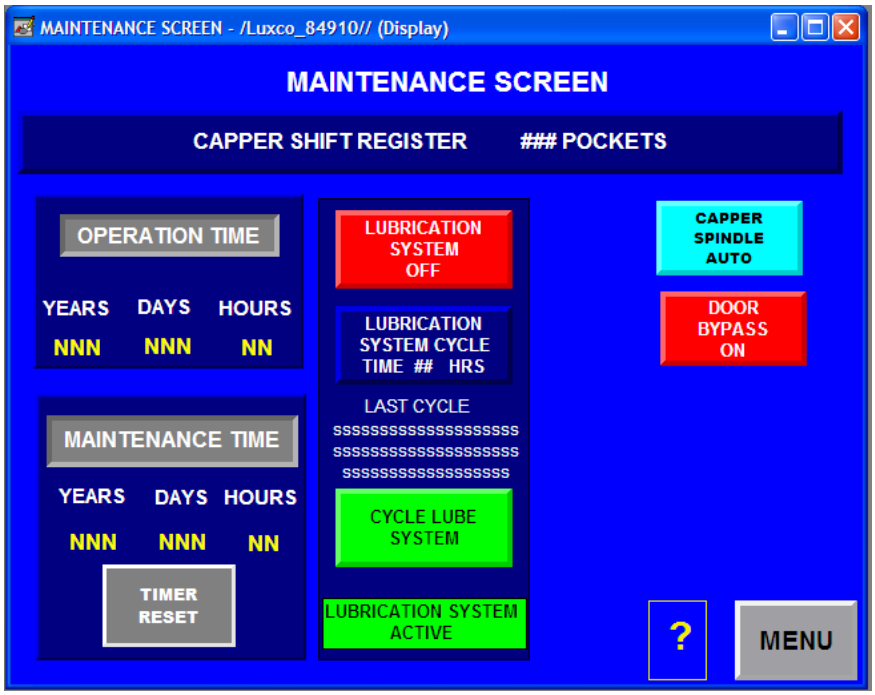
SETUP MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
FILLER HOIST OFF/UP/DOWN	When in the UP or DOWN position, the jog cord is used to activate the hoist for the filler. Once the filler is at the proper height, turn the button to OFF or just go back to the main menu.
CAPPER HOIST OFF/UP/DOWN	When in the UP or DOWN position, the jog cord is used to activate the hoist for the capper. Once the capper is at the proper height, turn the button to OFF or just go back to the main menu.
RINSER HOIST OFF	When in the UP or DOWN position, the jog cord is used to activate the hoist for the rinser. Once the rinser is at the proper height, turn the button to OFF or just go back to the main menu.
?	Advances to an instructional screen that provides functional information for each screen option.
MENU	Returns the operator to the Menu screen.



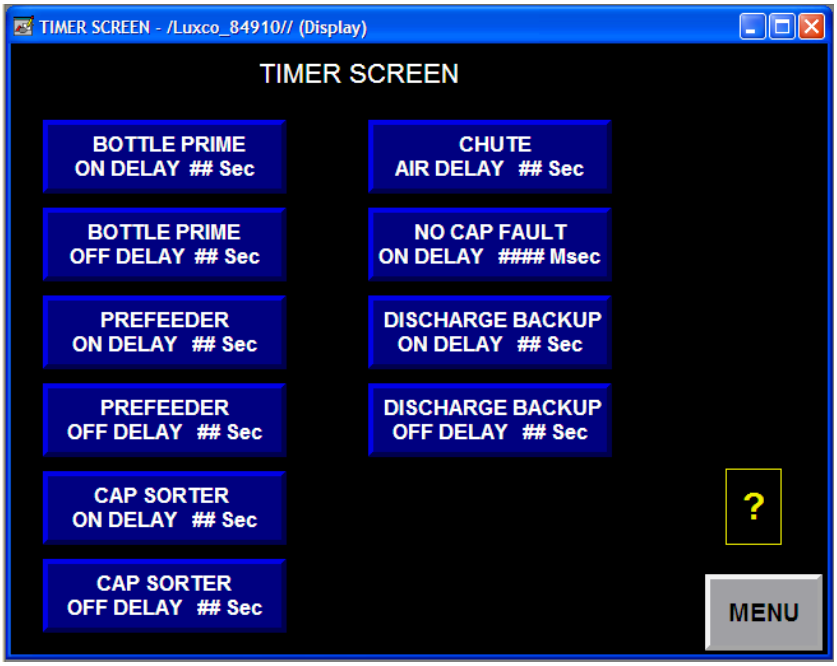
MAIN MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
RUN	When pressed, advances to the Run Screen menu. Is the primary screen for machine operation.
RECIPE SELECT	Advances to the Recipe Select Screen.
TIMERS	Advances to the Timers Screen.
LOGIN	Advances to a screen that permits user login for parameter adjustment.
TANKS	Advances to the Tanks Screen.
RECIPE SETUP	Advances to the Recipe Setup Screen.
MAINTENANCE	When pressed, advances to the Maintenance menu. This menu allows features to be bypassed and counters to be reset. Contains controls for machine setup and troubleshooting.
CONFIGURE PANELVIEW	Advances to the Panelview Configuration Screen. Allows access to the touch screen configuration functions.
MACHINE HOMING	Advances to the Machine Homing Screen.
HOIST SETUP	Advances to the Hoist Setup Screen.
WIPE SCREEN	Advances to the Wipe Screen. Used to wipe the screen.



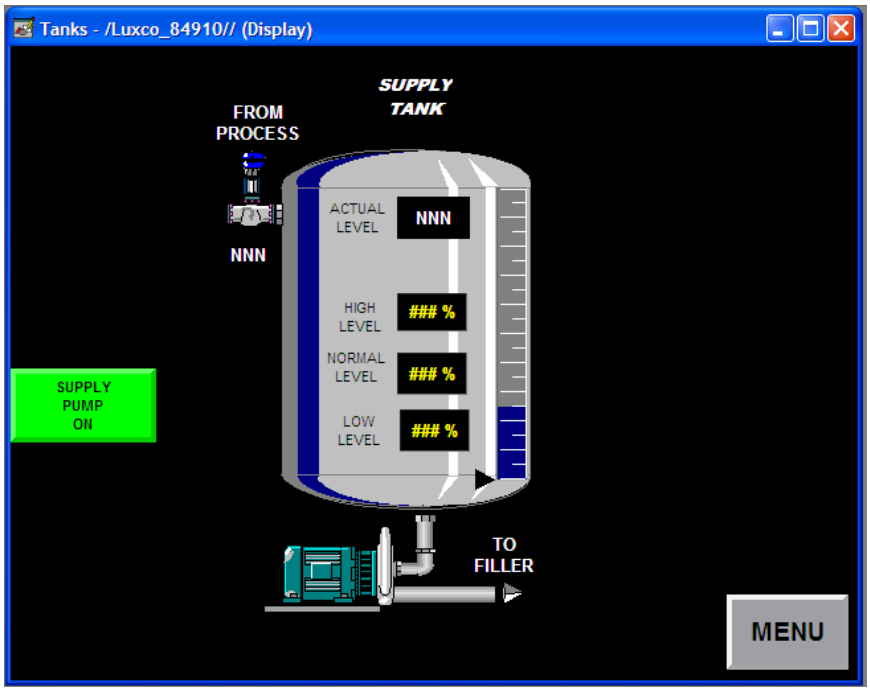
MAINTENANCE MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
CAPPER SHIFT REGISTER	This number sets the delay from the bottle present sensor to the release of the cap. This number should not normally change, once set at startup.
OPERATION TIME	Displays the amount of time the machine has been in operation.
MAINTENANCE TIME	Displays the time the machine has been running since the Maintenance Time was last reset.
LUBRICATION SYSTEM OFF/ON	Activates/Deactivates the lubrication system.
LUBRICATION SYSTEM CYCLE	Inputs the time interval between lubrication cycles.
LAST CYCLE	Displays time & date of last lubrication cycle.
CYCLE LUBE SYSTEM	Manually cycles the lubrication system.
LUBRICATION SYSTEM ACTIVE	Appears when the lubrication system is active.
CAPPER SPINDLE OFF/AUTO/ON	Should normally be set in the AUTO mode, which will run the spindle drive whenever the machine is running. The ON position can be used to check the rotation of the spindle system as a maintenance function.
DOOR BYPASS OFF/ON	When ON, all door switches are disabled.
?	Advances the operator to the help screen.
MENU	Returns the operator to the Menu screen.



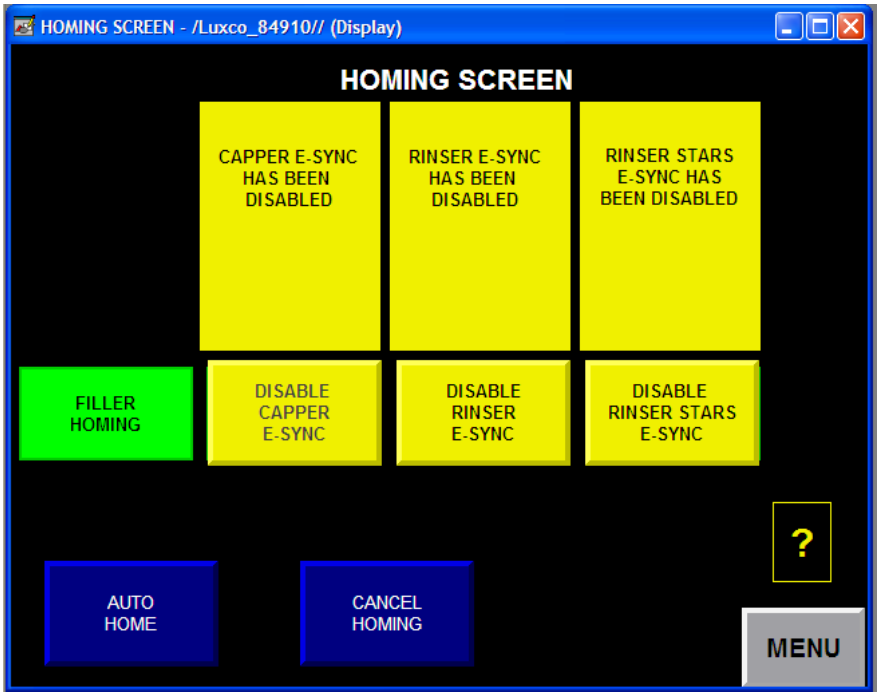
TIMERS MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
BOTTLE PRIME ON DELAY	Sets the length of time the Bottle Prime Empty eye has to be clear before engaging the bottle stop. Numbers in 1/100 second.
BOTTLE PRIME OFF DELAY	Sets the length of time the Bottle Prime Full eye has to be blocked before releasing the bottle stop. Numbers in 1/100 second.
PREFEEDER ON DELAY	Set the time length the prefeeder waits to activate once the upper chute eye is not blocked by caps. Numbers in 1/100 second.
PREFEEDER OFF DELAY	Sets the time length the prefeeder remains running after the chute is full. Numbers in 1/100 second.
CAP SORTER ON DELAY	Sets the length of time the Upper Chute Eye has to be clear before starting the cap sorter. Numbers in 1/100 second.
CAP SORTER OFF DELAY	Sets the length of time the upper chute eye has to be blocked before stopping the cap sorter. Numbers in 1/100 second.
CHUTE AIR DELAY	Sets the length of time the air remains on after no more caps are needed. Numbers in 1/100 second.
NO CAPS FAULT ON DELAY	Sets the length of time the upper chute eye has to be clear and the cap sorter running before stopping the machine and indicating a No Cap Fault. Numbers in 1/100 second.
DISCHARGE BACKUP ON DELAY	Sets length of time the Discharge Backup sensor has to be blocked before engaging bottle stop. Numbers in 1/100 second.
DISCHARGE BACKUP OFF DELAY	Sets the length of time the Discharge Backup sensor has to be clear before releasing the bottle stop. Numbers in 1/100 second.
?	Advances to an instructional screen that provides functional information for each screen option.
MENU	Returns the operator to the Menu screen.



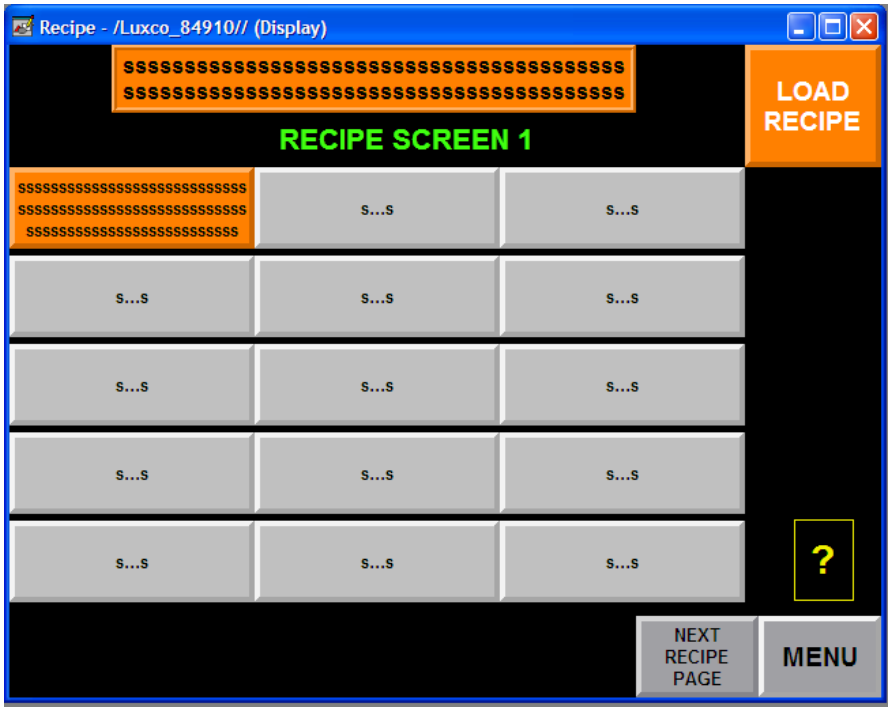
TANKS MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
FROM PROCESS NNN	Percent value of the valve position.
ACTUAL LEVEL	Displays the actual liquid level within the supply tank.
HIGH LEVEL	When the tank level exceeds the established high point, a warning message is displayed.
NORMAL LEVEL	Desired “normal” operation setpoint.
LOW LEVEL	When the tank level exceeds the established low point, a warning message is displayed.
SUPPLY PUMP ON/OFF	Turns the supply pump on/off.
MENU	Returns the operator to the Menu screen.



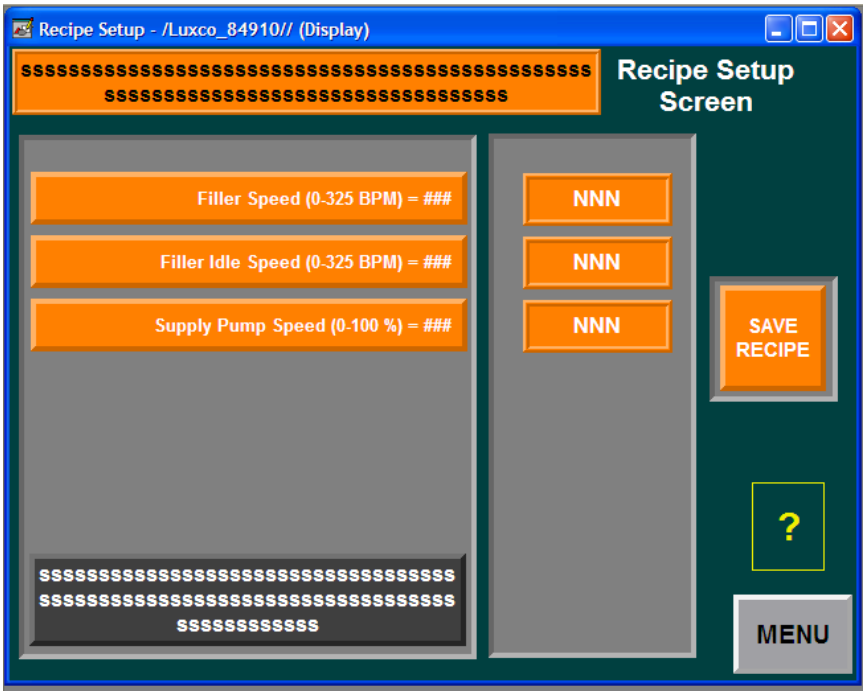
HOMING MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
FILLER HOMING	Indicates that the Filler Homing is in progress.
DISABLE CAPPER E-SYNC	Allows the capper drive to be disabled.
DISABLE RINSER E-SYNC	Allows the rinser drive to be disabled.
DISABLE RINSER STARS E-SYNC	Allows the rinser star drive to be disabled.
AUTO HOME	Starts the Auto Home sequence to bring the filler, capper, and rinser to the home position.
CANCEL HOMING	Cancels the homing sequence.
?	Advances to an instructional screen that provides functional information for each screen option.
MENU	Returns the operator to the Menu screen.



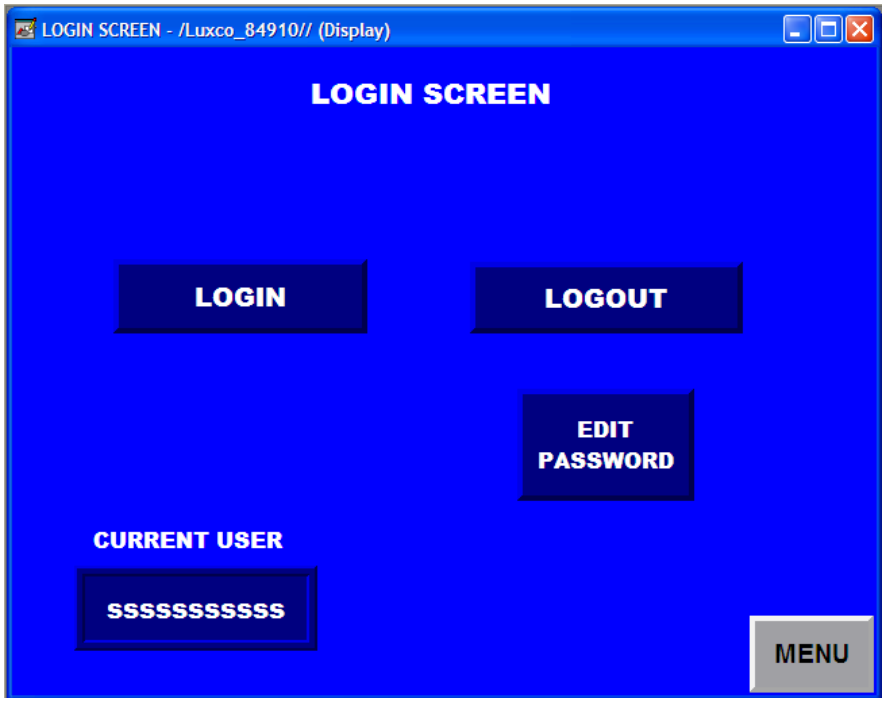
RECIPE SELECT MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
RECIPES	Each of these buttons represents a pre-established recipe that may be loaded. Select the desired recipe, followed by the Load Recipe button.
LOAD RECIPE	Press this button to load a selected recipe for use.
NEXT/PREVIOUS RECIPE PAGE	Advances to the second recipe menu page or if on the second recipe page, returns to the previous one.
?	Advances to an instructional screen that provides functional information for each screen option.
MENU	Returns the operator to the Menu screen.



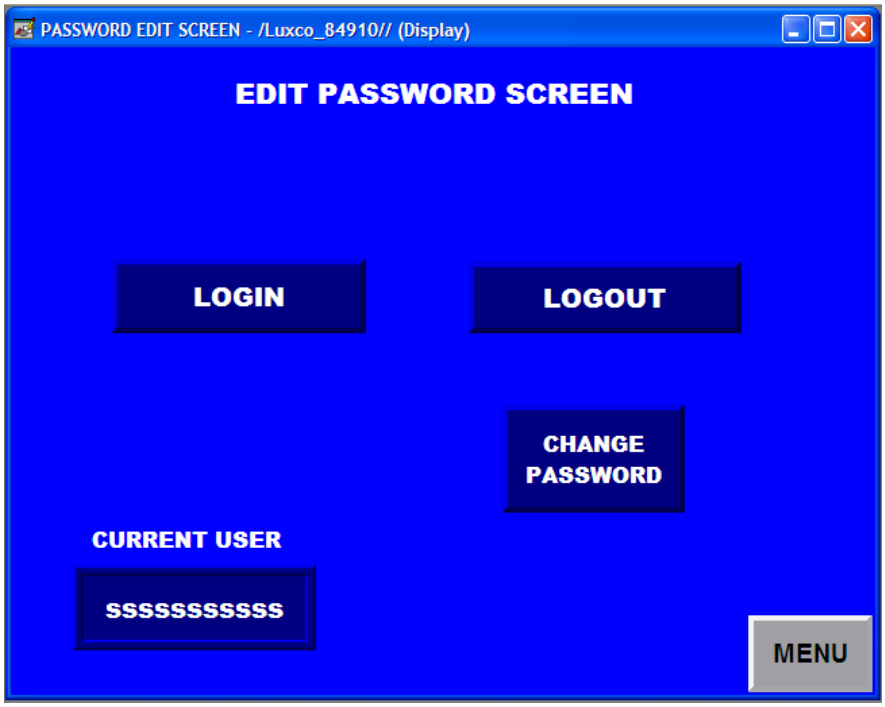
RECIPE EDIT MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
sssssssssss	Displays the recipe name.
FILLER SPEED	Press to alter the Filler Speed.
FILLER IDLE SPEED	Press to alter the Filler Idle Speed.
SUPPLY PUMP SPEED	Button permits the editing of the supply pump speed. Press to alter.
SAVE RECIPE	Saves the recipe edits and applies them.
?	Advances the operator to the help screen.
MENU	Returns the operator to the Menu screen.



LOGIN MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
LOGIN	Activates the popup screen to allow entry of a username and password.
LOGOUT	Sets the current user to “Default”
EDIT PASSWORD	Active only when the security level is at an administrator level. This allows the user to modify the current passwords.
CURRENT USER	Shows the name of the Current user
MENU	Returns the operator to the Menu screen.

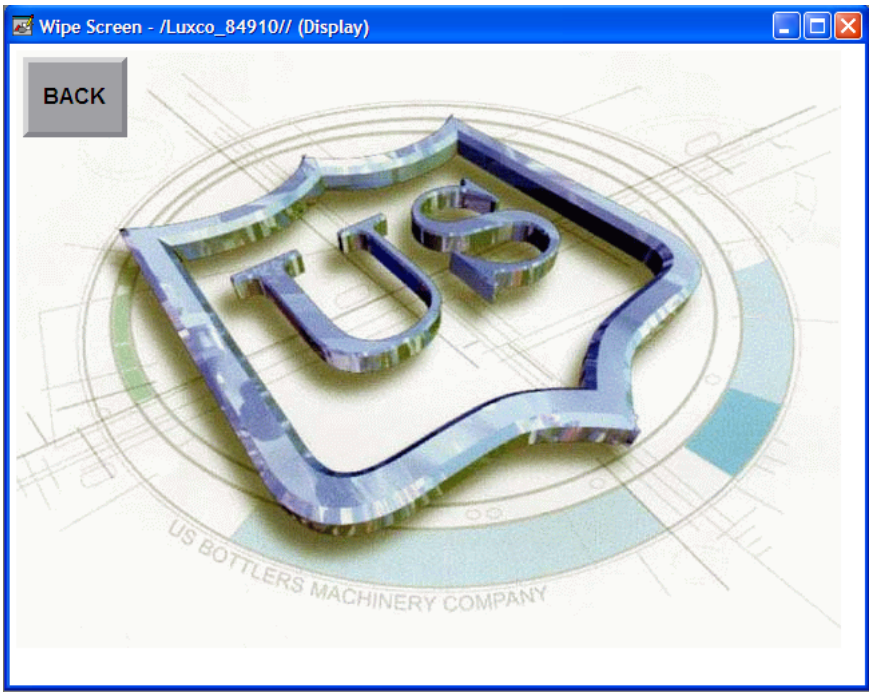


EDIT PASSWORD MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
LOGIN	Activates the popup screen to allow entry of a username and password.
LOGOUT	Sets the current user to “Default”.
CHANGE PASSWORD	Activates the popup screen to allow the current password to be changed.
CURRENT USER	Shows the name of the Current user.
MENU	Returns the operator to the Menu screen.



PANELVIEW CONFIGURATION SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
YES	Advances to the Panelview Configuration Screen.
NO	Returns to the Main Menu Screen.

WIPE MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
BACK	Returns to the Main Menu.



THEORY OF OPERATION

The machine's onboard operator panel is the controlling force behind all electrical and pneumatic activities. The machine has three main drive trains, with one each driving the rinser, filler, and capper. They are comprised of motor and gearbox combinations providing torque from their respective drive shafts and gear combinations to the other shaft and gear combinations located throughout.

Containers are fed back-to-back to the machine via a conveyor chain. An integrated feed worm specifically designed to work in time with the rinser infeed star, separates the incoming containers. The feed worm is a cylindrical auger apparatus mounted parallel to the conveyor chain and rotates on axis so that each container, when encaptured, is moved forward within the auger's recess to the infeed star.

Motion is transferred to the feed worm from the rinser transfer star shaft through a pulley and belt configuration. The ratio change from pulley to pulley ensures feed worm and rinser infeed star concerted timing.

The rinser infeed star is a circular plate attachment with cutouts around its periphery and is positioned so that as each container is presented by the feed worm, becomes caught within the available cutout. The cutouts are sized and shaped to accommodate the applicable container. The rotating motion of the infeed star transfers containers consecutively to the rotary rinser. A center guide plate ensures proper transfer and prevents the containers from flying away through the centrifugal force of the infeed star's rotation.

The rotary rinser utilizes a controlled amount of water or rinsing solution to provide a thorough cleaning and draining of the containers. The containers are fed to the rotary rinser, then separated and positioned onto individual rinsing stations. The containers are then inverted and the rinsing tube releases a pre-determined quantity of rinsing solution. Once the rinsing operation is completed, the containers continue to travel in an inverted orientation until thorough draining is achieved. After the rinsing/draining cycle, the containers are repositioned and discharged from the machine.

The rinser transfer star is a circular plate attachment with cutouts around its periphery and is positioned so that as each container is presented by the rotary, becomes caught within the available cutout. The cutouts are sized and shaped to accommodate the applicable container. The rotating motion of the rinser transfer star, transfers containers consecutively to the filler carousel. A center guide plate ensures proper transfer and prevents the containers from flying away through the centrifugal force of the transfer star's rotation.

The filler's center turret rests upon a large four-point contact radial bearing allowing the rotation of the machine's central portion, including it's carousel turntable. As the containers move into position, so are the turret mounted filling valves. Rollers attached to each valve rod are driven around within the rotational carousel and track upon a stationary cam ring. The cam raises and lowers the filling valves via the rods by way of sliding bushings of two parallel plates referred to as slide rings. An integrated hand-wheel or gear motor permits the raising and lowering of the cam track to accommodate different container heights. The rollers on the cam allows the valves to lower onto the top of the container.

As the filling valve descends toward a container, a seal and clamp apparatus connected to the outer tube also descends until contacting the top of the container. At this time, the seal, clamp, outer tube, tube body, tube bushing, and overflow hose cease descent while the tube head and inner tube continue, compressing a spring located between the two units. This action forces the inner tube downward beyond the outer tube to expose the opening of the inner tube.

The inner tube slides through a non-metallic bushing seal to provide proper valve alignment during stroking. The upper portion of the valve strokes the inner tube open while the outer tube, with its seal securely positioned, remains atop the bottle allowing product to pass from the inner tube into the bottle.

Product is pumped to the supply dome from an atmospheric tank through a single supply line and then distributed into separate filling lines for each valve as allowed by the supply manifold. The supply atmospheric tank provides a reservoir for the product to settle and reduce frothing before traveling onward to the container.

The supply manifold is comprised of a shutoff shoe plate system that prevents product from being supplied to certain filling valves. An integrated rotary union allows the shutoff shoe to remain stationary while the manifold rotates. This rotational activity permits filling by the alignment of orifices within the manifold and the shoe. When these orifices are not aligned, supply flow is obstructed.

The product travels under gravitational pressure down the open product supply hose to the tube head, through the inner tube to the tip of the valve and into the container. Overflow product is discharged to an externally placed atmospheric tank via an overflow manifold, rotary union, and pipe. The overflow manifold is fixed to the carousel and the rotary union permits its rotation. A coupled pump located on the output side of the overflow tank transfers the discharged liquid back into the supply system for container filling.

The filling valve system is comprised of two functional sub-assemblies: the tube head (upper portion) and the tube body (lower portion). The tube head is connected to the supply hose and upper supply manifold, and the tube body is connected to the overflow hose and corresponding discharge manifold.

Space between the inner tube and the outer tube provides a path to displace the air within the bottle allowing the product to flow into the container until it reaches the end of the outer tube. Excess product flows through the overflow hose and out into the atmospheric return tank. Extension of the outer tube past the sealer rubber traps some air at the top of the bottle and prevents any product to rise past that compression level to establish the product fill height. Extension and retraction of the outer tube relative to the sealer rubber permits adjustment of the fill height.

Upon reaching the lift cam, the bottom of the inner tube makes contact with the outer tube and the valve closes. The tube head along with the tube body and outer tube rise, withdrawing the valve from the bottle. The container is rotated via the carousel to the plugger transfer star.

Like the rinser infeed and transfer stars, the capper transfer star is a circular plate attachment with cutouts around its periphery that are sized and shaped to accommodate specific containers. The capper transfer star turns concentrically on a drive shaft and is positioned so that as the machine presents each filled container, it becomes caught in its available cutout. The capper transfer star then rotates the filled container to the capper center star.

The capper’s center star captures the filled container as fed from the capper transfer star. A neck guide apparatus keeps the containers within the center star’s cutouts as they travel around the capper’s turret. The capper is designed so that its chuck assemblies are vertically aligned with the containers’ opening while encaptured within the cutouts of its center star.

Caps are supplied via a cap-feed device with an integrated cap-feed gate. The cap-chute gate is controlled by a dual combination of electric sensors. One sensor is located within the cabinet area and the other is located at the feed worm. When the chuck jaw assembly retrieves a cap, a sensor under the cabinet indicates this timing fact, and the sensor at the worm looks for a container so that the next insert can be released. The cap chute gate is actuated by an electric air solenoid mounted in the machine's pneumatic panel. This solenoid actuates the air-driven, double-acting gate air piston.

As the containers travel around the capper's turret, each chuck shaft assembly sequentially descends, lowering the chuck, with a cap onboard, onto the container's opening. The cap is torqued onto the container, reaching full torque near the back of the machine. An integrated anti-rotation belt prevents the container from rotating during the torquing process. Upon completion of the torquing process, the cap spindle then begins to rise lifting the cap jaw away from the cap and the container is transferred to the discharge star.

Like the other star assemblies, the discharge star is a circular plate attachment with cutouts around its periphery that are sized and shaped to accommodate specific containers. The discharge star turns concentrically on a drive shaft and is positioned so that as the machine presents each rinsed, filled, and capped container, it becomes caught in its available cutout. The discharge star assembly transfers the containers onto the discharge conveyor system.

US BOTTLERS MACHINERY COMPANY					
Procedure:	Unpacking - IS				
Procedure No.:	80150	**Revision:**	A	**Date:**	01 Jan 10

UNPACKING

Most machines are shipped FOB Charlotte which places the responsibility to the customer to look for damaged equipment due to shipping or weather and to address those issues with the trucking firm and insurance agencies.

Upon arrival, 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 those items are not listed as parts delivered, immediately contact US Bottlers Machinery as to their disposition.

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. All such containers are to be placed on a flat and stable surface to prevent property damage or personal injury.

Unpackaged property is to remain organized to assist in their location and identification during the installation process. Do not remove any identifying labeling or tags from the property until it has been installed unless such identification poses a hindrance to their installation.

ATTENTION: It is advised that the machine's feet be located and isolated first to prevent loss and to facilitate a rapid installation.

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

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

The U.S.Bottlers service engineer who will be assisting you in setting up the machine will install and check these components for correctness. This engineer will also train your operators and service personnel in the proper care and use of this machinery.

Uncrate the machine carefully checking all attachments and parts against the main packing slip. Use extreme care to see that no instruction tags are lost or parts misplaced in the wrapping or packing material. If the machine has been uncrated in a distant area from the final installation point, move the filler and 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. Transport and unloading must only be performed by qualified or experienced personnel.

All palletized equipment may only be lifted and moved using a forklift or pallet jack approved for the packaged weight.

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

If a gantry crane is the transport method, cross members are to inserted through the frame structure at each end and chokers of equal lengths are to be used that 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.

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

CAUTION: WHEN TRANSPORTING THE MACHINE FOR THE PURPOSE OF INSTALLATION, IT IS ADVISED THAT THE UNIT BE LIFTED AND POSITIONED AT THE CORRECT ANGLE.

CAUTION: BEFORE MOVING THE EQUIPMENT, ENSURE THERE IS ADEQUATE CLEARANCE IN PASSAGES AND DOORWAYS.

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

US BOTTLERS MACHINERY COMPANY					
Procedure:	Machine Installation - IS				
Procedure No.:	80152	**Revision:**	A	**Date:**	20 Sep 09

MACHINE INSTALLATION

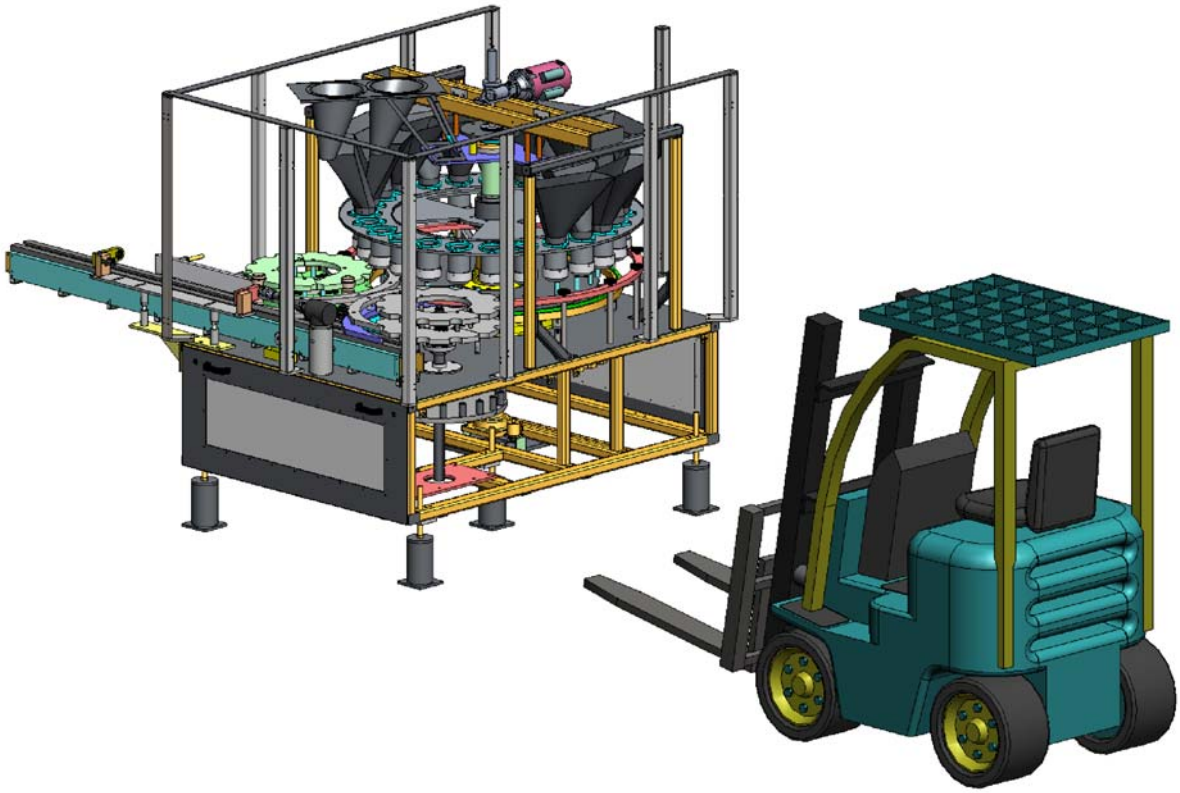
Installation must be carried out in accordance with these instructions and must only be performed by experienced contractors or personnel to ensure a safe and correct installation.

Before beginning installation, it is wise to ensure that access to the machine's installation site is clear and reasonably level. Ensure that adequate power supply is available, all lifting equipment and hardware is available, and the work area is free of debris.

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

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

NOTE: Figure 3-1 below is a representation displaying a typical machine to be transported. The machine displayed is not the machine ordered.



Move the uncrated machine into position and, after placing it in line with the proper conveyor, level the filler making use of the jack screws. Adjust the jack screws so that the machine is level using a finished surface such as the filler cabinet or bridge plate as a reference. See to it that the weight of the filler is evenly distributed upon each foot It will not be necessary to attach the machine to the floor when the weight is properly distributed because the machine is heavy enough to 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 on each jack screw.

Your machine has been provided with the bridge plate built to accommodate the type of conveyor chain that you specified on your order. Connect the feed and discharge conveyor track and check carefully for alignment of these sections of conveyor. Run your conveyor chain through the machine and feed the return back through the return plate support beneath the bridge plate.

After the final machine installation is complete, rotate the filler and observe the action of all rotary or moving parts to see that they move smoothly through their complete cycle. Pay particular attention to cam followers and rollers that should flow smoothly from one cam track into another cam track. Abnormal rapid wear can occur on a machine that has been improperly installed.

After the machine has been installed in the proper position in the packaging line and the conveyor system has been installed, proceed to install the liquid piping system, and the main machine control enclosure, and 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. Do not allow any additional electrical conduit or cable to run next to the power conduit from the filler power panel to the Host Computer console.

Please read carefully the separate USB pamphlet concerning electrical grounding techniques and understanding electrical noise. This booklet has been included with this operating manual and is important in order to insure correct machine installation.

After all the primary services have been installed and connected to the filler, the U.S.B. service engineer should be scheduled. This engineer will be able to install the remaining items on the filler and run the necessary diagnostic tests within 1 to 2 days. During this period, the personnel responsible for the service of the machine should be present to work with the U.S.B. engineer and receive instruction in the 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 his work on the fourth day.

ELECTRICALS

A wiring diagram and cable schedule is provided as part of the literature package included with this machine. All cable work between the machine, control panel, junction box, and the power supply connection must be in accordance to the 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: ALL ELECTRICAL ACTIVITY MUST BE PERFORMED IN ACCORDANCE WITH APPLICABLE REGULATIONS BY LEGALLY QUALIFIED PERSONNEL.

WARNING: DO NOT APPLY POWER TO THE MACHINE UNTIL ALL WIRING CONNECTIONS HAS 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 AFTERWARD.

CAUTION: ENSURE TO USE ONLY THE RECOMMENDED WIRING AND CABLING SPECIFICIED 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.

LIQUID SUPPLY SYSTEM

The supply line dead-end product pressure cannot exceed 30 psig. The product valve is controlled by the air operated liquid level control. A supply of filtered air at 30 to 35 psig is required. Refer to the manufacturer's instructions for adjusting the level control and servicing the valve and control.

CAUTION: DO NOT CHANGE THE PIPE SIZE FROM WHAT IS RECOMMENDED. DO NOT ADD FILTERS OR SPECIAL SENSORS. DO NOT RESTRICE OR REDUCE THE OVERFLOW CONNECTION. DON NOT EXCEED 40 PSI PRODUCT PRESSURE AT THE TANK INLET VALVE.

The product to be supplied by your line should be at a near constant pressure, not exceeding 30 psig when the filler throttling valve is completely closed. The product being supplied to the filler must be reasonably free of entrained air and foam-free. The pressure in the line must be reasonably constant from full flow to near zero flow. There should be no hammering of the supply line when the filler throttling valve opens and closes.

LIQUID SUPPLY SYSTEM (Dual Tank)

Supply Tank
The machine is provided with a stand alone product supply tank equipped with a liquid level controller to be connected to the supply pipe using a 2 or 3 inch Tri-Clover fitting and clamp. The supply tank is to be placed close to the filler at floor level with the product level not to exceed conveyor height. The pump should not have to deliver product through a long distance or over a large number of pressure drops or devices to create agitation.

> **ATTENTION:** When securing the product supply tank, ensure the feet threads are greased so they no not gall and that the lock nuts are secure. Ensure all feet are in position and contacting the floor.

Product from this tank is fed to the filler liquid manifold under pressure via the HMI. Use only as much product pressure as required to operate the machine at the required production speeds. Excess pressure can produce foam and high forces against the bottle. Erratic pressures acting on the bottle will affect the accuracy of the filler and its repeatability will suffer. Product pressures of 2-4 pounds should normally be sufficient to operate the filler properly.

Overflow Tank
The overflow tank is to placed very close to the filler to allow entrapped air escape from the system. Keep a flexible connection on the overflow to allow the rotary union to float.

> **ATTENTION:** Do not allow the fluid level to climb above halfway on the overflow connection. This will choke the overflow and backpressure the system.

> **CAUTION:** IF THE OVERFLOW CONNECTION IS HARDPIPED, IT MAY BIND THE UNION AND LEAD ITS FAILURE. POSSIBLE FATIGUE OF THE FERRULE MAY ALSO OCCUR CAUSING THE BOTTOM OF THE MANIFOLD TO BREAK OFF.

Piping
The supply line dead-end product pressure cannot exceed 30 psig. The product valve is controlled by the air operated liquid level control. A supply of filtered air at 30 to 35 psig is required. Refer to the manufacturer's instructions for adjusting the level control and servicing the valve and control.

> **CAUTION:** DO NOT CHANGE THE PIPE SIZE FROM WHAT IS RECOMMENDED. DO NOT ADD FILTERS OR SPECIAL SENSORS. DO NOT RESTRICE OR REDUCE THE OVERFLOW CONNECTION. DON NOT EXCEED 40 PSI PRODUCT PRESSURE AT THE TANK INLET VALVE.

The product to be supplied by your line should be at a near constant pressure, not exceeding 30 psig when the filler throttling valve is completely closed. The product being supplied to the filler must be reasonably free of entrained air and foam-free. The pressure in the line must be reasonably constant from full flow to near zero flow. There should be no hammering of the supply line when the filler throttling valve opens and closes.

PNEUMATICS

Exercise care in running the facility airline to the machine. This line should not have pockets or bends that will permit the collection of moisture or oil vapors that may be carried over from the compressor.

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

Carefully select a good air and oil filter and separator of sufficient capacity to handle nearly double the volume of your air requirements. Install it as close to the cleaner as possible and provide it with a well-located blow-down valve.

ATTENTION: If you have doubts as to the proper installation, it is recommended that you contact a local field engineer supplying compressors and filters. A good field engineer should be fully acquainted with your requirements and be able to provide the proper recommendations.

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

Care should be used in running your airline to the machine. This 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 to used required.

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

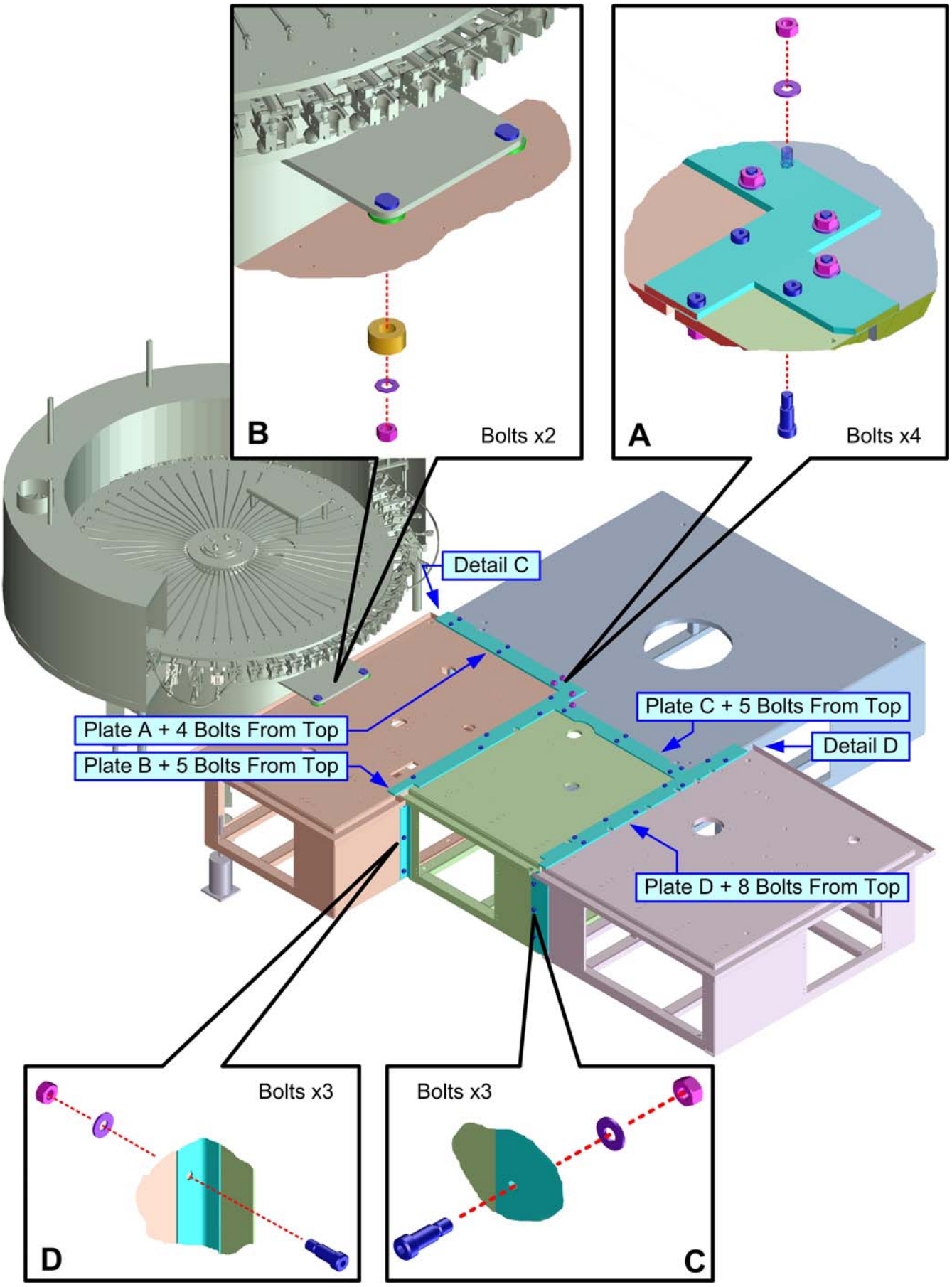
CAUTION: SUPPLY ONLY CLEAN, DRY AIR TO THE MACHINE - NEVER SUPPLY LUBRICATED AIR.

US BOTTLERS MACHINERY COMPANY

Procedure:	Typical Triblock Cabinet Interconnection - IS				
Procedure No.:	80156	**Revision:**	A	**Date:**	24 Jul 09

After all machine cabinets have been set into place and their heights adjusted as prescribed, they are to be bolted together. Follow the procedure below:

1. Insert four bolts from the bottom into plates A, B, C and secure with four washers, nuts (Detail A).
2. Apply four bolts from the top side to plate A and secure with four washers, nuts.
3. Apply five bolts from the top side to plate B and secure with five washers, nuts.
4. Apply five bolts from the top side to plate C and secure with five washers, nuts.
5. Apply eight bolts from the top side to plate D and secure with eight washers, nuts.
6. Apply two bolts to rinser mounting plate with two thin bushings placed between the plate and cabinet and thick bushings beneath the cabinet. Secure with two washers, nuts (Detail B).
7. Apply three bolts to each side plate (2 locations) and secure with three washers, nuts (Detail C).
8. Apply three bolts to each corner plate (2 locations) and secure with three washers, nuts (Detail D).


B
Bolts x2
A
Bolts x4
Detail C
Plate A + 4 Bolts From Top
Plate B + 5 Bolts From Top
Plate C + 5 Bolts From Top
Detail D
Plate D + 8 Bolts From Top
Bolts x3
D
Bolts x3
C

US BOTTLERS MACHINERY COMPANY

Procedure:	Installation Checklist - IS				
Procedure No.:	80159	**Revision:**	A	**Date:**	01 Oct 09

INSTALLATION CHECKLIST

Machinery	❑ Filler & Capper positioned and attached to each other. ❑ Filler & Capper height adjusted and feet locked. ❑ Conveyor frames connected. ❑ Conveyor chain installed.
Tanks	❑ Product supply tank positioned. ❑ Overflow tank positioned. ❑ Product & Overflow tanks height adjusted and feet greased/locked.
Electrical	❑ Main PLC panel mounted. ❑ High voltage conduit run and mounted. ❑ Power supply cable/s run and connected. ❑ Point to point I/O wiring run and connected. ❑ DC wiring complete.
Hydraulic Piping	❑ Piping run and mounted. ❑ Flex connection. ❑ Tested for liquid seal.
Pneumatics	❑ Facility supply run, mounted, and connected. ❑ Point to point lines connected. ❑ Tested for leaks.

US BOTTLERS MACHINERY COMPANY

Procedure:	Cap Feed & Chuck Height Adjustment - OP				
Procedure No.:	80200	**Revision:**	A	**Date:**	02 Jun 09

To establish the height adjustment of the capper chucks, the correct cap slide plate must be mounted to the slide plate posts. Position a chuck over the cap slide plate on the last drop of the lifting cam and lowered to the cap retrieve depth and with the jaw closed.

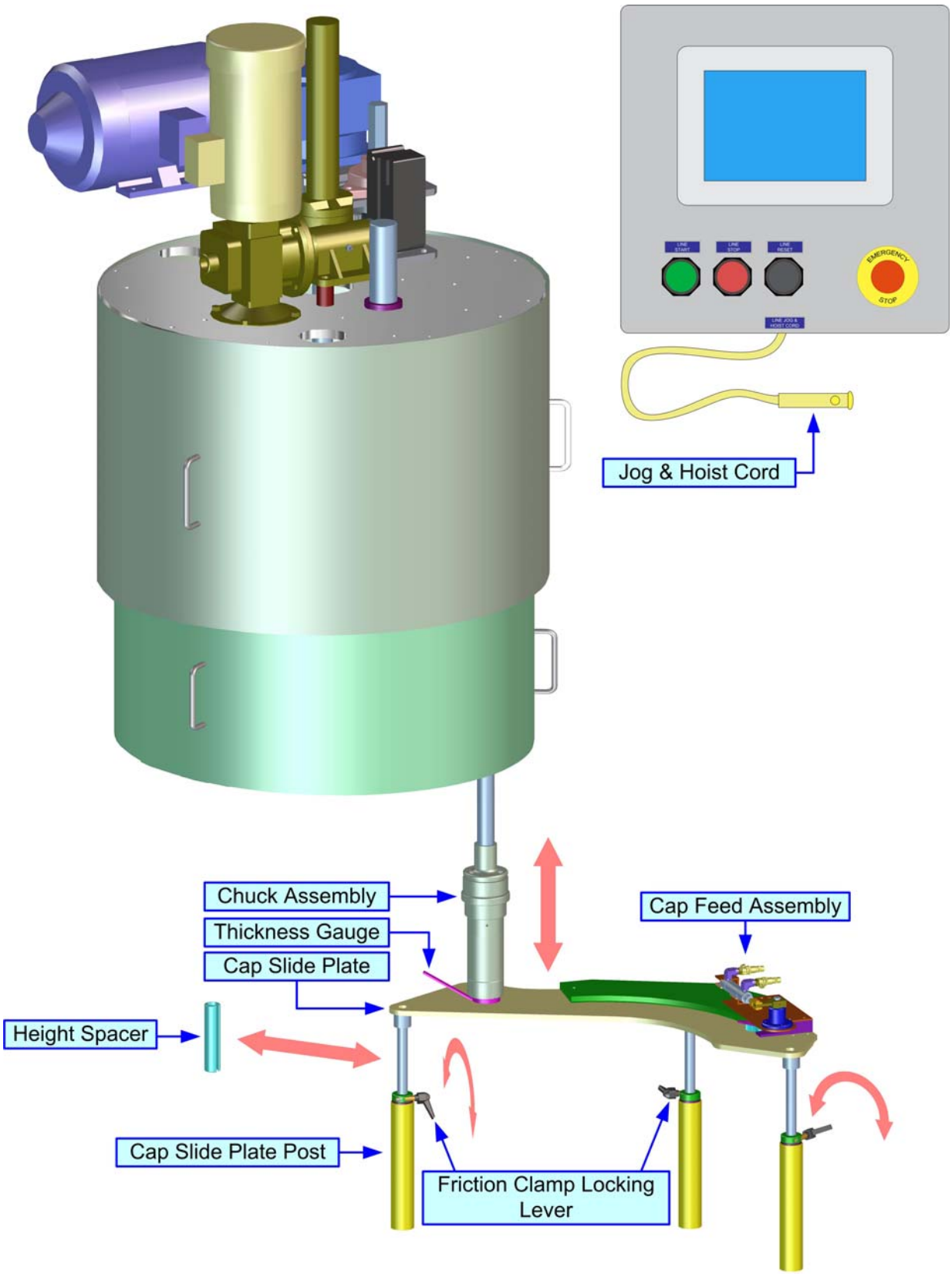
CAUTION: EXERCIZE CARE WHEN PERFORMING THIS PROCEDURE. IF THE CHUCKS ARE NOT SET AT THE PROPER HEIGHT, MECHANICAL DAMAGE CAN OCCUR WHEN ROTATING THE MACHINE UNDER POWER.

1. Open safety doors as necessary to access the cap feed assembly.
2. Use the jog & hoist cord of the machine's operator panel to fully raise the chuck assembly.
3. Remove the height spacers from each of the three cap slide plate posts.
4. Loosen the friction clamp locking levers of each cap slide plate post.
5. Insert alternate height spacers to upper portion of each cap slide post to establish proper plate height. Retighten each friction clamp locking lever to secure.

NOTE: A set of height spacers has been supplied to accommodate each changeover configuration. Ensure to select the applicable set.

NOTE: For some applications each of the height spacers of a given set may be of different lengths. For those applications, ensure that each spacer is placed onto its respective post.

6. Use the jog & hoist cord to rotate a chuck assembly over the cap slide plate stopping at its lowest point.
7. Place the thickness gauge flatly onto the top surface of the cap slide plate centered beneath the chuck assembly.
8. Use the jog & hoist cord to lower the capper's chuck assembly toward the cap slide plate until almost making contact. Remove thickness gauge.


Jog & Hoist Cord
Chuck Assembly
Thickness Gauge
Cap Slide Plate
Cap Feed Assembly
Height Spacer
Cap Slide Plate Post
Friction Clamp Locking Lever

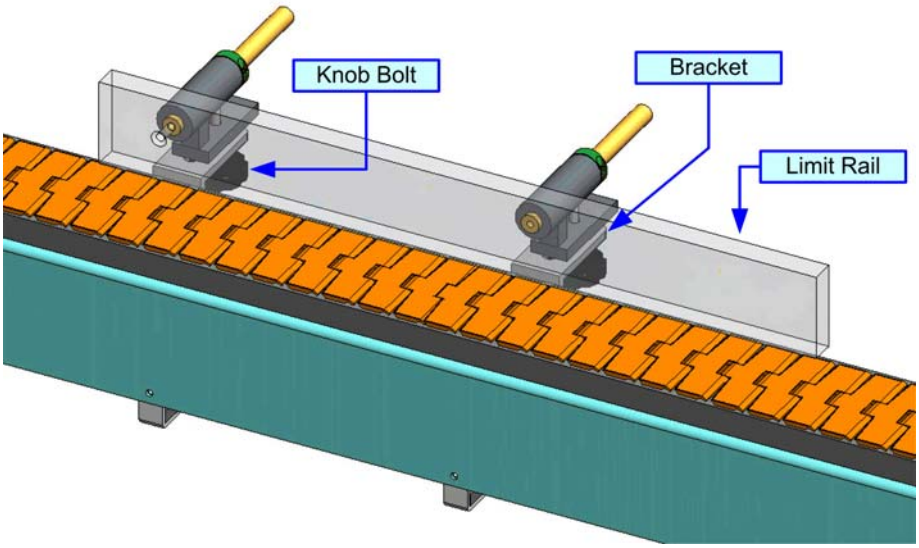
US BOTTLERS MACHINERY COMPANY

Procedure:	Limit Rail & Feed Worm Adjustment - OP				
Procedure No.:	80203	**Revision:**	A	**Date:**	30 Jun 09

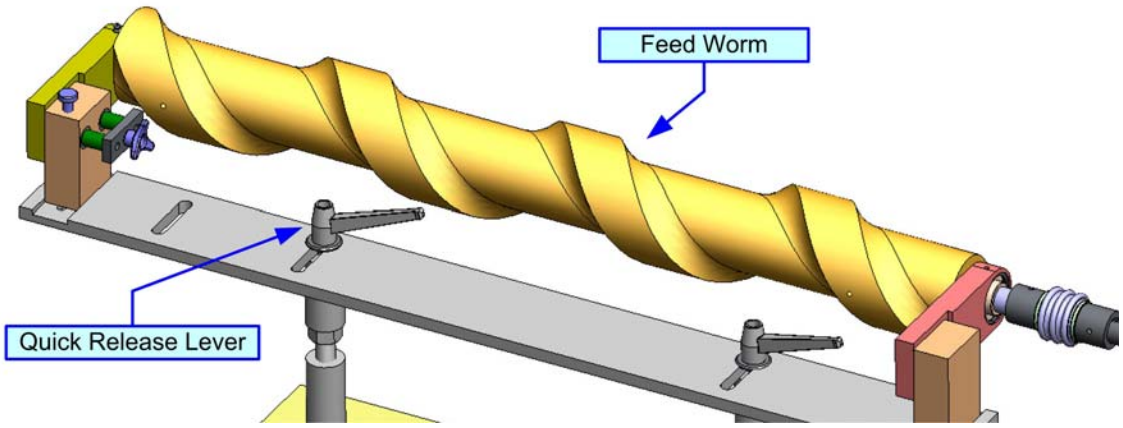
Most container size changes will require the position adjustment of the limit rail and the feed worm. Their proper positioning will allow the container to travel on the conveyor chain without any lateral movement due to contact with either components.

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 1/8 to 1/4 inch space on either side of the container will suffice.

The limit rail is secured into position by two knob bolts located underneath their respective brackets. Slightly loosen these bolts to freely move the limit rail inward or outward as required. Retighten the bolts when proper positioning is achieved.



The feed worm is secured into position by two quick release levers. Slightly loosen these levers to freely move the feed worm inward or outward as required. Retighten the levers when proper positioning is achieved.



US BOTTLERS MACHINERY COMPANY

Procedure:	Conveyor Rail Adjustment - OP				
Procedure No.:	80204	**Revision:**	A	**Date:**	30 Jun 09

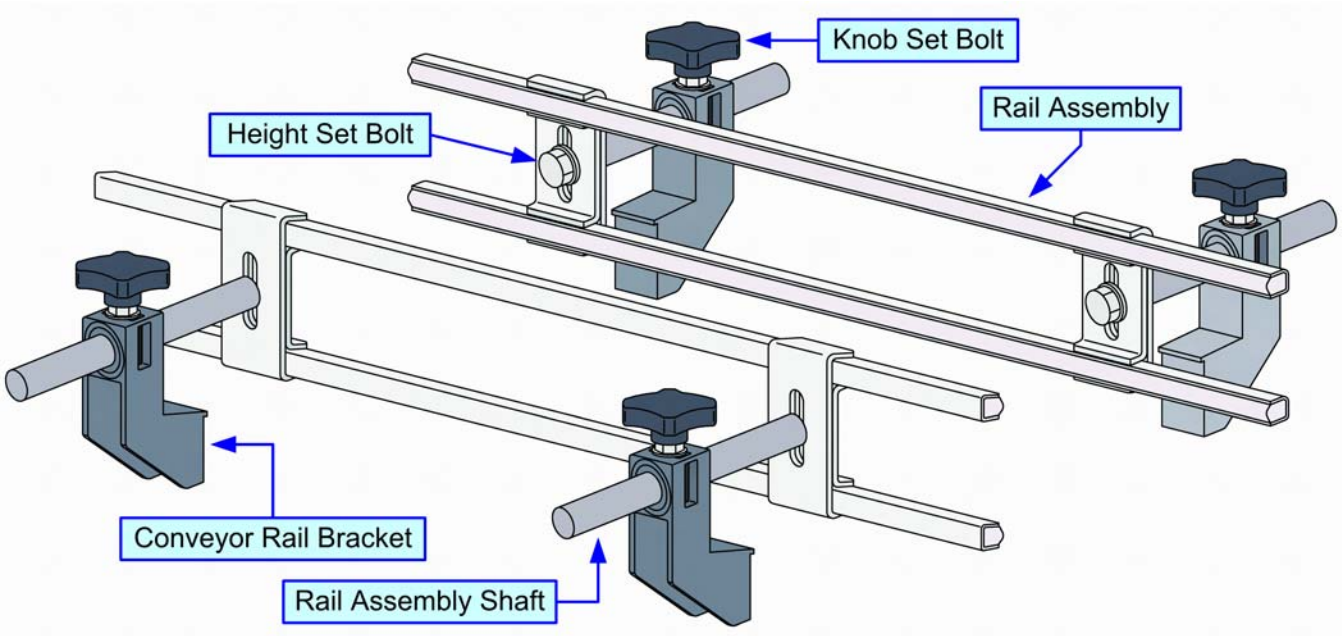
CONFIGURATION A

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 1/8 to 1/4 inch space 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. Retighten 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 retightening the height set bolts.



US BOTTLERS MACHINERY COMPANY

Procedure:	Machine Timing & Homing Procedure (E-Sync)				
Procedure No.:	80205	**Revision:**	A	**Date:**	15 Jul 09

The following machine synchronization and homing procedure applies to most of US Bottlers machines that are driven by a SEW E-Sync system. The drive system consists of a master drive, usually the filler, and one or more slave drives. Homing is an automatic way to get the master and slaves timed without having to do it manually.

ATTENTION: THIS PROCEDURE IS ONLY APPLICABLE TO MACHINES WITH THE E-SYNC FEATURE PROVIDED. THIS IS VERIFIABLE BY THE PRESENCE OF THE E-SYNC MENU SCREEN ON THE MACHINE'S OPERATOR PANEL.

Step 1: Ensure the machine is in a state ready to operate – there cannot be any alarms present, etc.

NOTE: Some machines may require them to be in Jog mode to operate. If unable to initiate homing activity, place the machine in Jog mode and reinitiate.

Step 2: Press the Home button.

NOTE: The Home button is located on the E-Sync Menu Screen of the machine's operator panel.

Step 3: The entire machine, master and all slaves, will slowly begin to move forward. They will move at this very slow speed until the master sees the leading edge of the filler's Home proximity sensor, then will stop.

Step 4: Each of the machine's slave drives will automatically to advance incrementally every second until each slave has detected the leading edge of its respective home proximity sensor, then will stop. Once all the slaves have stopped, homing is complete.

The accuracy of the Homing system is absolutely dependent on the position of the Home sensors and their sprockets. The capper usually uses the capper timing proximity sensor as its home sensor, therefore it cannot be adjusted or it would affect the cap release. So to adjust the Home timing between the filler and capper, the filler sprocket must be adjusted. Once the filler and capper can be homed to be in time, then move on to the next slave closest to the filler, and so on.

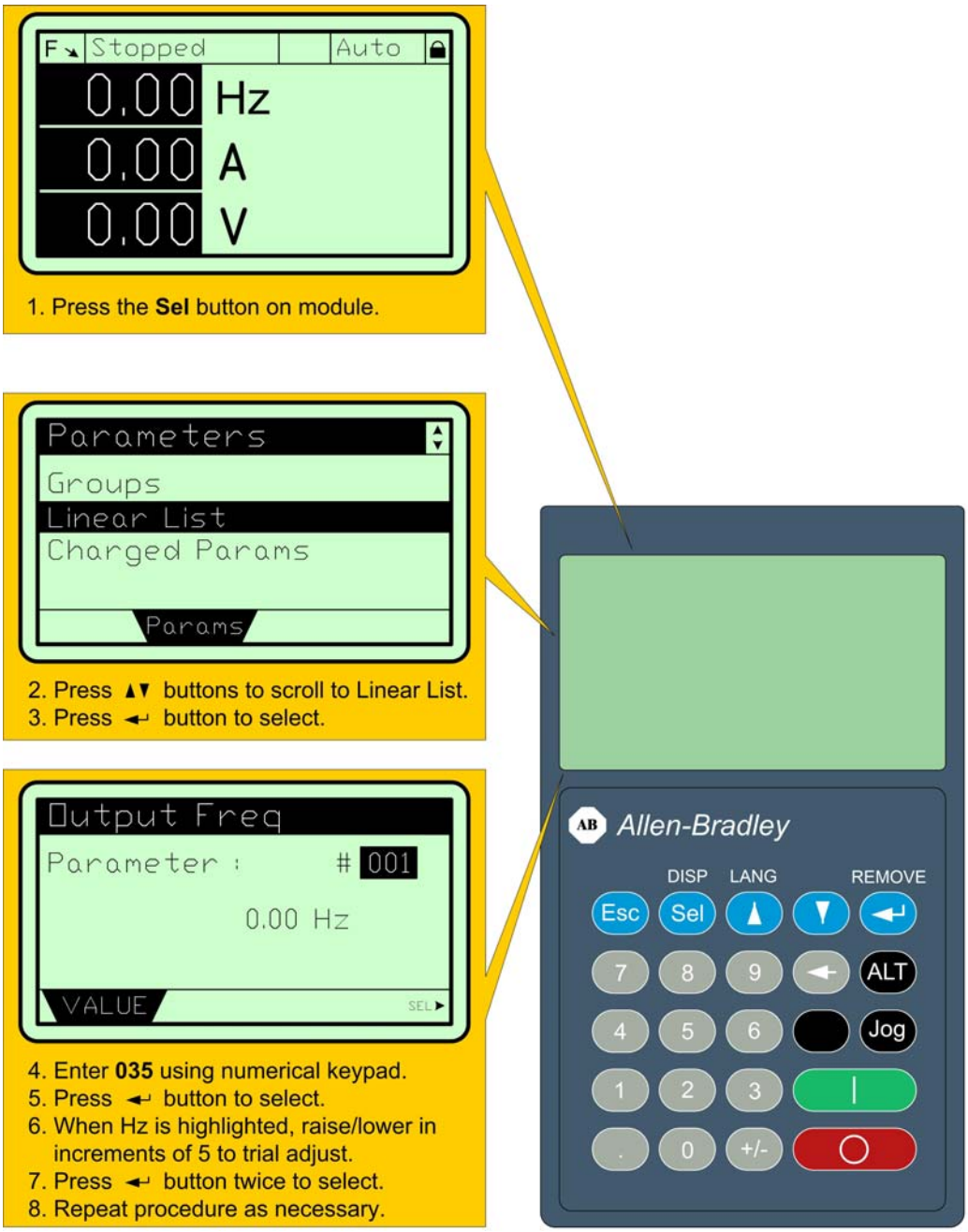
Once all the Homing sensors and sprockets are set, you should be able to home the machine and get all drives in time. Problems with the system could happen if the Home sensors are not correctly positioned. If a sensor gets a double signal due to vibration or backlash, then the position will not be correct. Either retry to Home or adjust the sensor. If any of the stars or worms are manually adjusted by changing their position on the shaft, then this could make the position of the homing sensors incorrect and they would need to be set again.

US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Independent Spindle Speed Adjustment (Allen-Bradley PowerFlex HIM) - OP				
Procedure No.:	80206	**Revision:**	A	**Date:**	24 Jul 09

This feature allows the capper's spindle rotational speed to be independently adjusted from the turret's rotational speed to accommodate the application profile of various cap types through the increase or decrease of spindle/chuck revolutions.

This procedure requires the use of the Allen-Bradley, PowerFlex, 4-Class, Series A Human Interface Module. Connect the module to the drive controller within the machine's electrical panel.



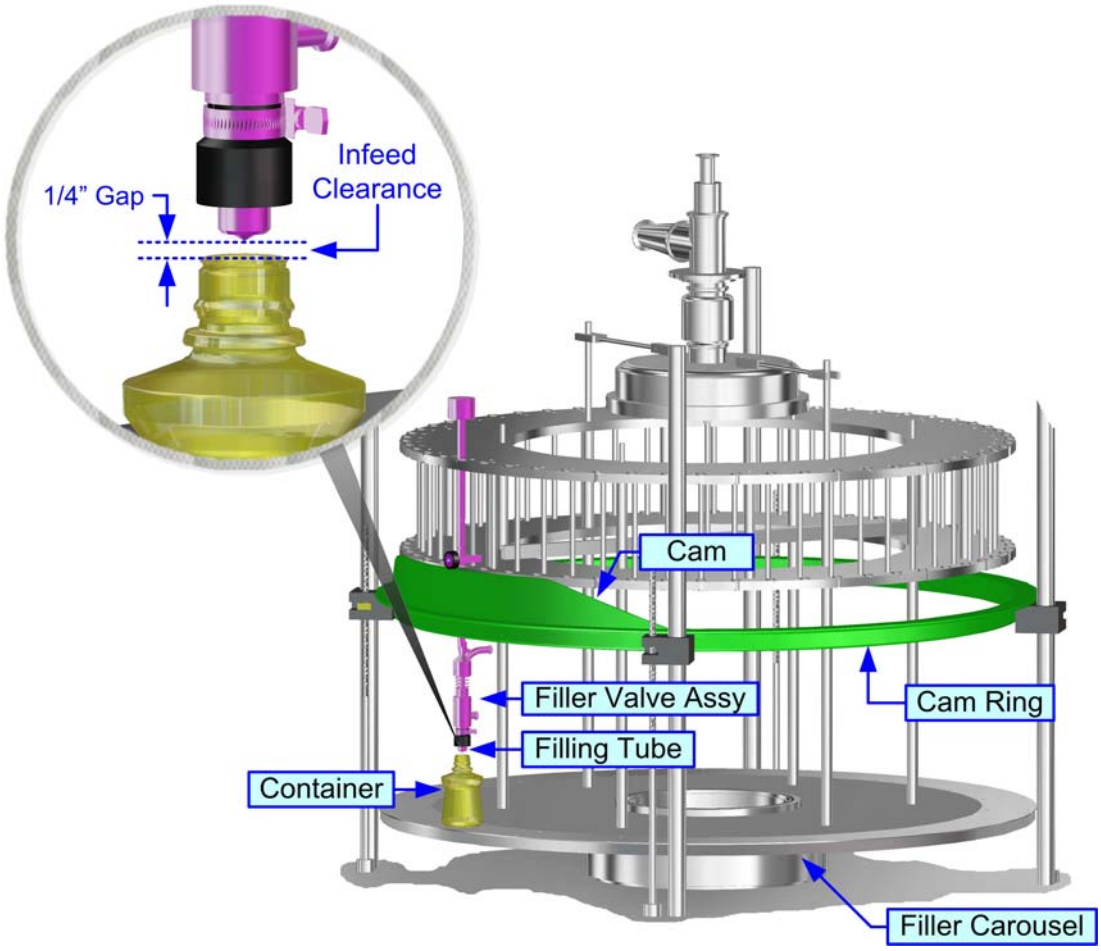
US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Cam Height Adjustment - OP				
Procedure No.:	80208	**Revision:**	A	**Date:**	16 Feb 10

Infeed clearance is a measurement from the top of the container to the tip of the filling stem when the tube or bell (whichever suspends the lowest) is at the highest possible position on the cam's lift section. This occurs at the front of the machine when the filling tube is midway between the feed and discharge stars. Adjust the cam height so that approximately 1/4 inch of space is available between the valve and the top of the container. This dimension varies depending upon the shape and size of the container and model of the filler, but a basic starting dimension is approximately 1/4 inch.

It is important that the cam be set high enough so that the tube does not begin to enter the bottle opening until the container is properly positioned below the tube and is no longer being moved by the feed star. Do not set the cam so high that the valve does not locate the bottle until the container is no longer in contact with the feed star. This type of setting encourages free-wheeling and also reduces the available filling time.

It is practical to look along an imaginary line of sight extending from the center of the machine to the center of the feed star. At this angle, the filling valves are beginning to drop, thus allowing the tubes to enter the bottles. The centering action of the feed star is complete and if properly timed, the container is positioned on the filler carousel and waiting to receive the filling tube. Changes in bottle handling can be produced by slight increases or decreases in infeed clearance (cam height adjustment) or timing changes in the feed star.



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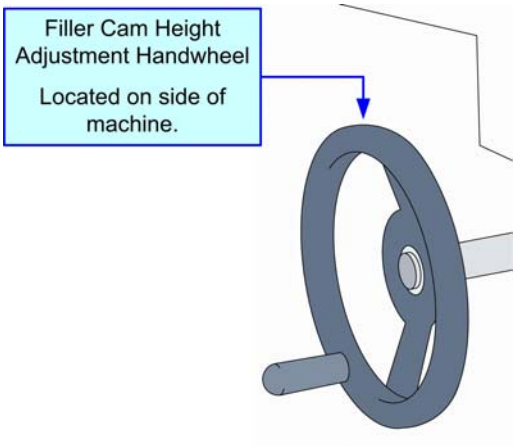
To adjust the filler cam height, locate the handwheel on the side of the machine and rotate it as required to achieve the setting as directed above or make the adjustment from the operator panel. The manner of adjustment is dependent on the equipment option of the machine's purchase.

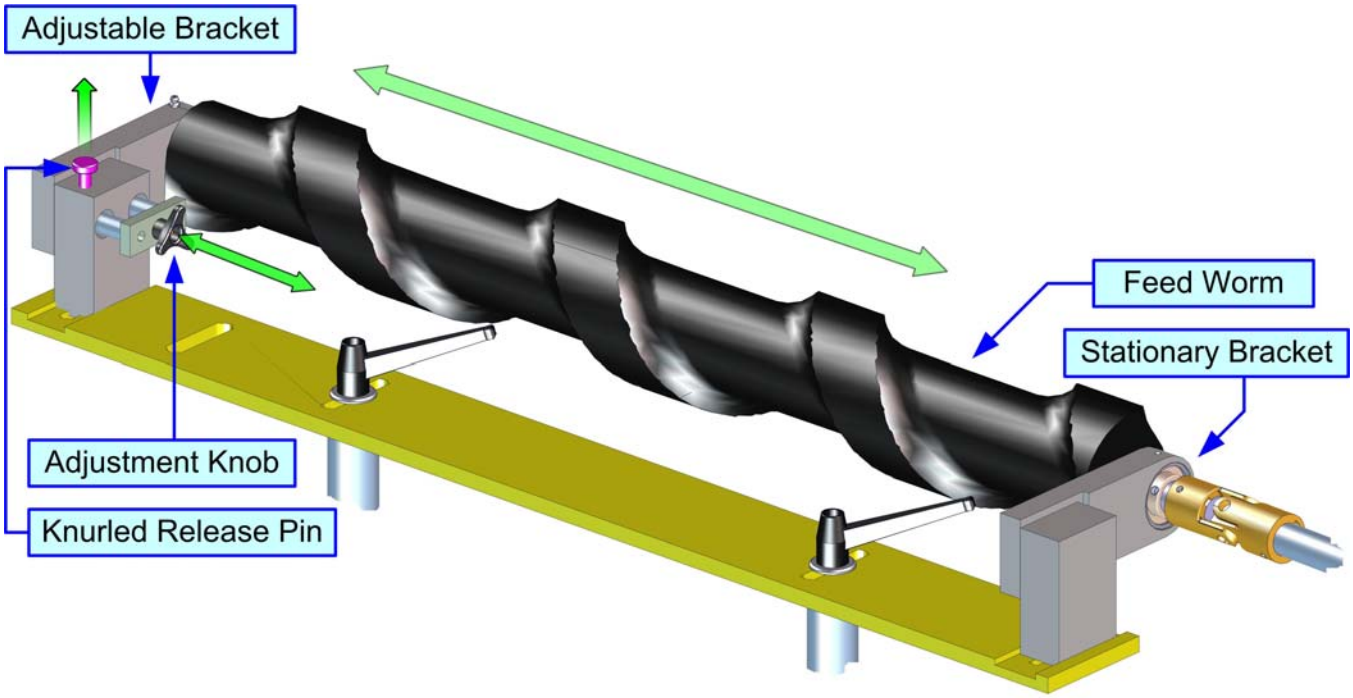


US BOTTLERS MACHINERY COMPANY

Procedure: Feed Worm Change - OP		
Procedure No.: 80209	**Revision:** A	**Date:** 18 Jan 10

To remove the feed worm, lift upward on the knurled release pin, then push outward on the adjustment knob while supporting the feed worm. When the adjustable bracket is clear of the feed worm, lift upward on its free end and pull it outward from the stationary bracket.

To install the alternate feed worm, insert one end into the stationary bracket, then lower the worm's free end to align with the adjustable bracket. Grasp the adjustment knob and pull inward to move the adjustable bracket to couple with the feed worm. Lower the knurled release pin.



CLEANING

Due to customer specific requirements relative to machine cleanliness, the information here as to the method and type of cleaning activity, is intentionally vague. However, cleaning activities and their frequency should minimally be sufficient so as to not inhibit proper machine functionality.

ATTENTION: The information provided in this chapter is limited to the machine's exterior and is not intended to provide guidance on the cleaning of the machine's liquid system.

A good way to remove dust and debris is to install a flexible air hose to the machine and use compressed air to blow it off.

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

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

CHANGEOVER CLEANING

The path for product through the liquid system is also the primarily the path for cleaning. Feed your CIP (Clean In Place) solutions through the filler just as if this were product; therefore, using the same piping and pumps. Due to the velocity requirement through the system, the pump speed can now be increased for higher pressures and flow. Furthermore, the spray balls in the supply and overflow tank is incorporated to clean the walls of these larger areas.

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 what is clean varies widely from plant to plant dependent on the unique local requirements. The following are tips to assist in the cleaning process.

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

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

Back Flush

Don't be afraid to intentionally backpressure the overflow leg and actually back up the level in the return tank to cover the overflow line. This may promote some leakage at the tube bushings which assists in cleaning these areas. It is common to cycle this level up and down and therefore assist in the velocity through the line.

External Cleaning

The machine is highly resistant to chemical washdowns; however, this is not a license to blast away with no regard to effect. When selecting the cleaning solution, consider what concentration and temperature of chemical is being used, and what materials it may attack component materials. Pay special care to ensure the solution does not deteriorate the hosing. Chemical corrosion is not covered under warranty.

Pressure

The liquid system is not a rated system should not be pressurized over 15 psig. Typically, 7-9 psi is satisfactory for efficient cleaning. If further velocity is required, for example in the overflow pipe, use backflushing or even install a separate spray ball for cleaning in the overflow elbow.

CIP Cups

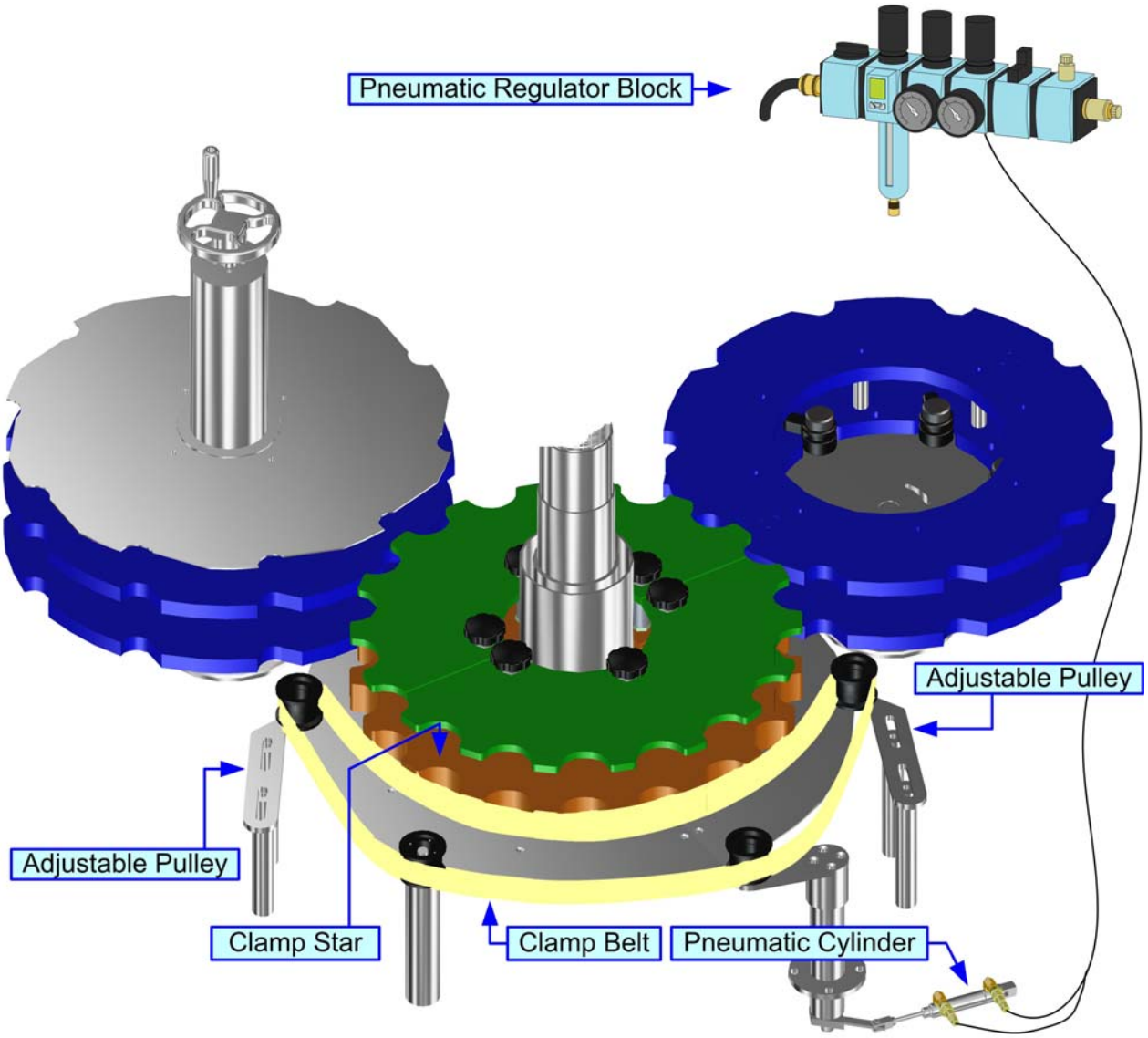
A variety of styles are available to help keep the valve open during cleanup and promote higher rates of overflow and clean the tip of the valve. This can also be accomplished by using containers and removing the stars and center guide. Then the machine can be slowly rotated and help clean the system under the shoe.

US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Clamping Belt Tension Adjustment - OP				
Procedure No.:	80211	**Revision:**	A	**Date:**	24 Feb 10

The belt tension air pressure can be adjusted on the pneumatics panel to ensure that containers do not spin during the capping process. If the container is lightweight plastic and subject to squeezing, the belt tension may be too great. If this cannot be resolved through pneumatic adjustment, a special attachment may be required.

If the belt's tension is too tight or too loose and it cannot be remedied through pneumatic means, one or both of the adjustable pulleys may be loosened and moved toward or backward as necessary to remedy the problem.



US BOTTLERS MACHINERY COMPANY

Procedure:	Pneumatic Regulator Block - OP				
Procedure No.:	80212	**Revision:**	A	**Date:**	03 Feb 10

The minimum desired input air supply pressure to the regulator is 80psi. Its respective pressure adjustment dial allows manual pressure regulation by turning the dial clockwise until the desired or optimum pressure is achieved. The pressure level may be read by the supply pressure gauge attached to the face of the regulator.

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

Low Air
The low air pressure switch is preset at a little less than 50psi and should not require adjustment unless the switch is replaced.

Cap Gate
Regulates the open and close speed of the cap gate.

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

Flow Regulator Valves
There is an adjustment knob for the upper and lower valve control. These thresholds may require adjustment from one cap type to another.

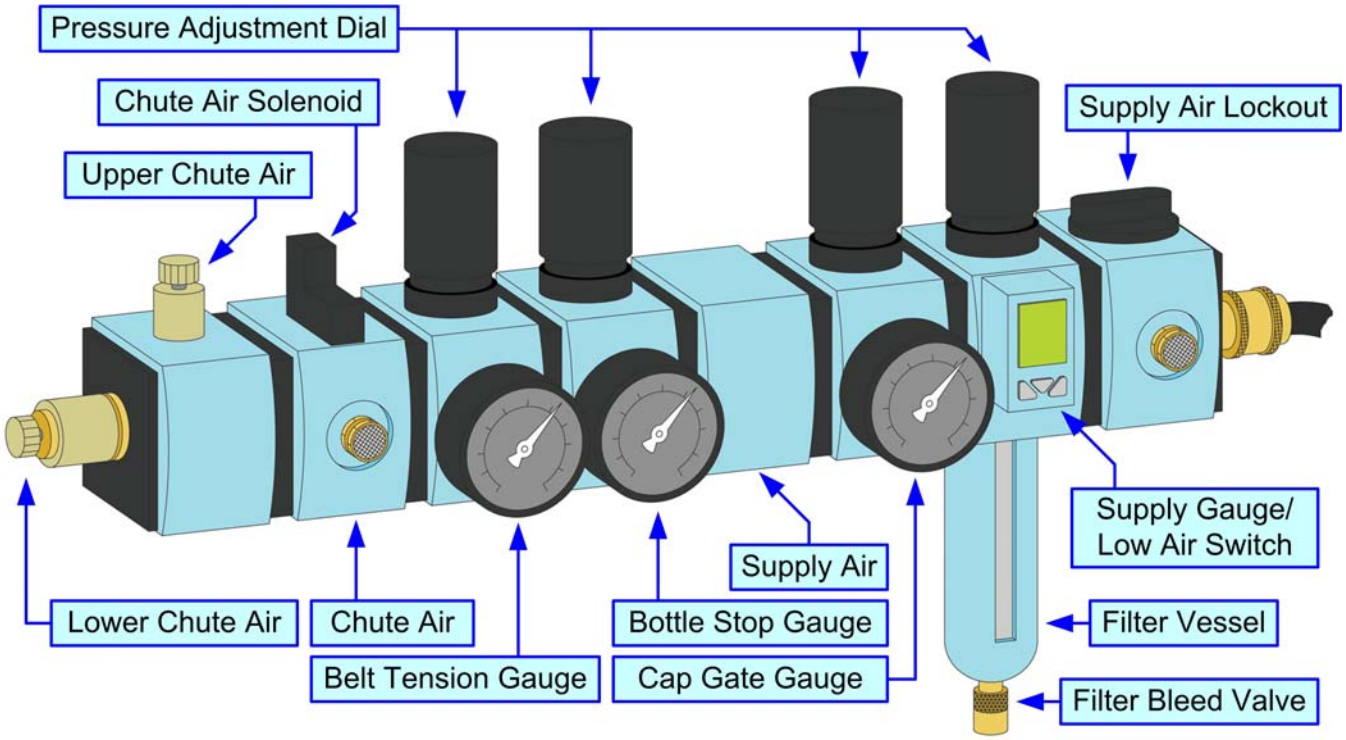
Bottle Stop
Controls the air pressure to the bottle stop device.

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

Belt Tension
Controls the tension of the bottle clamping belt located on the capper.

Main Air Solenoid
Supplies air to system when all doors and e-stop is clear.

Supply Air Lockout
Provides manual shutoff for air.


Pressure Adjustment Dial
Chute Air Solenoid
Upper Chute Air
Supply Air Lockout
Supply Gauge/
Low Air Switch
Supply Air
Lower Chute Air
Chute Air
Belt Tension Gauge
Bottle Stop Gauge
Cap Gate Gauge
Filter Vessel
Filter Bleed Valve

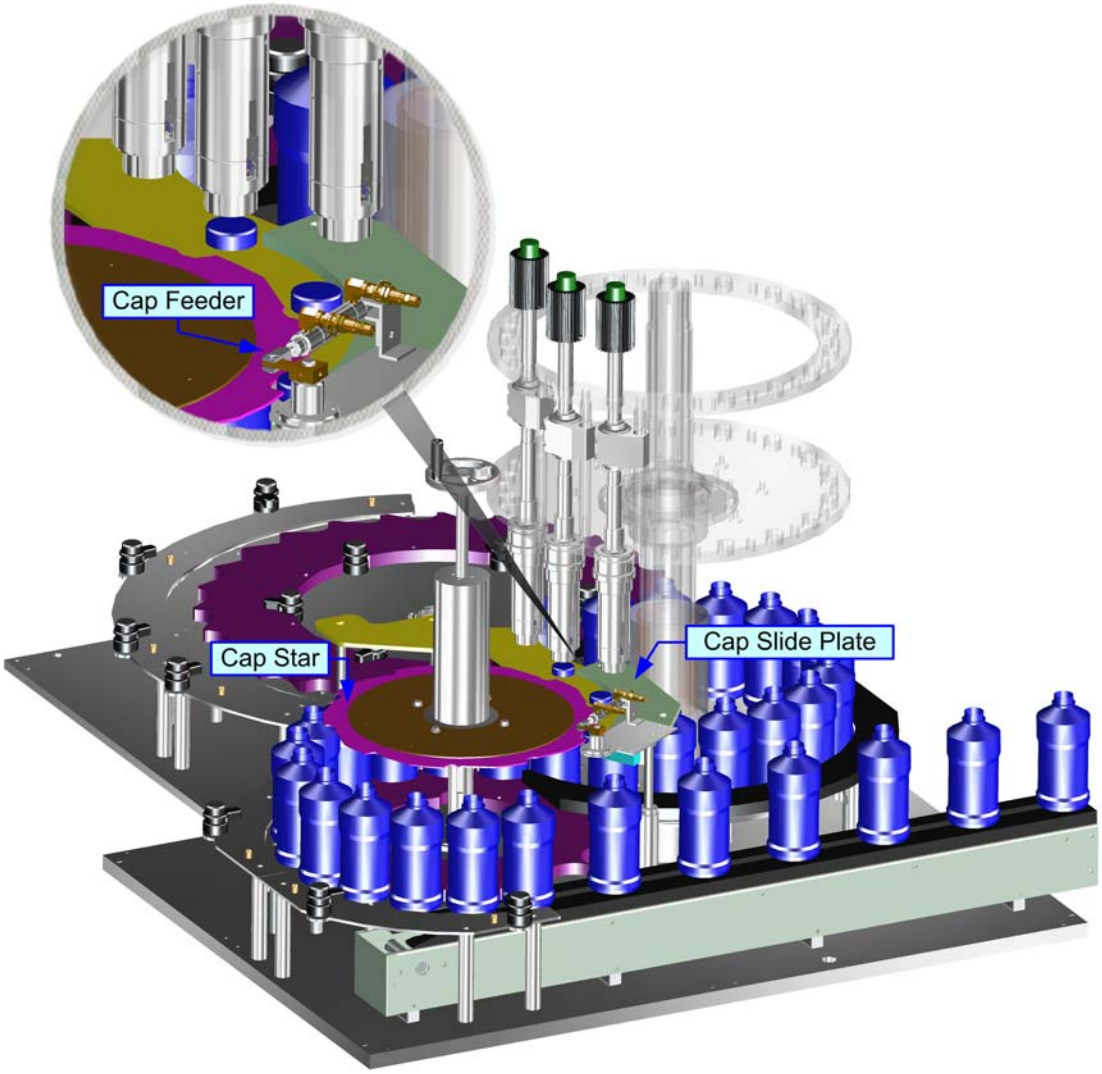
US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Lifting Hoist Adjustment - OP				
Procedure No.:	80213	**Revision:**	A	**Date:**	20 Sep 09

The capper incorporates a lifting jack on the roof of the machine to enable a quick change-over for bottle height adjustment. When the capper is not rotational, the switch on the front of the operator panel can be used to raise or lower the lifting jacks by activating the reversing motor on the roof of the machine. There is only a total of six inches of adjustment and the rotary actuator limit switch will signal when the limit has been reached and will not allow the operator to move further in that direction. At this point, the only other option is to reverse the motor direction and run the other way.

To establish the height adjustment of the capper chucks, the correct cap transfer slide plate must be set to the correct height. Positioned a chuck over the cap slide plate on the last drop of the lifting cam and lowered to securely retrieve a cap with the chuck jaw at the appropriate depth and with the jaw closed.

At this point, the chuck jaw should have the cap fully encapsulated. This is to be considered the proper setting so that when the capper is rotated forward, the roller will move along the cam and lift up off of the cap slide plate. Then, when it descends in the rear of the machine, it will fully and properly apply the cap to the container with the roller 1/32” above the cam.



CAUTION: EXERCIZE 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.

For the capper lift mechanism to operate, the:

- capper must be stopped,
- direction selector switch must be set to the correct direction,
- capper lift light must be off,
- button on the cord must be pressed for operation.

If a limit switch is encountered during operation, the PLC will stop movement in that direction and initiate movement in the opposite direction for one second and then stop. This action will clear the limit switch and another operation may then be started.

ATTENTION: During normal operation, the lift limit light should never be continuously illuminated. If so, the operator controls will become inoperable until corrective action is taken to eliminate this condition.

CAPPER CHUCK ADJUSTMENT

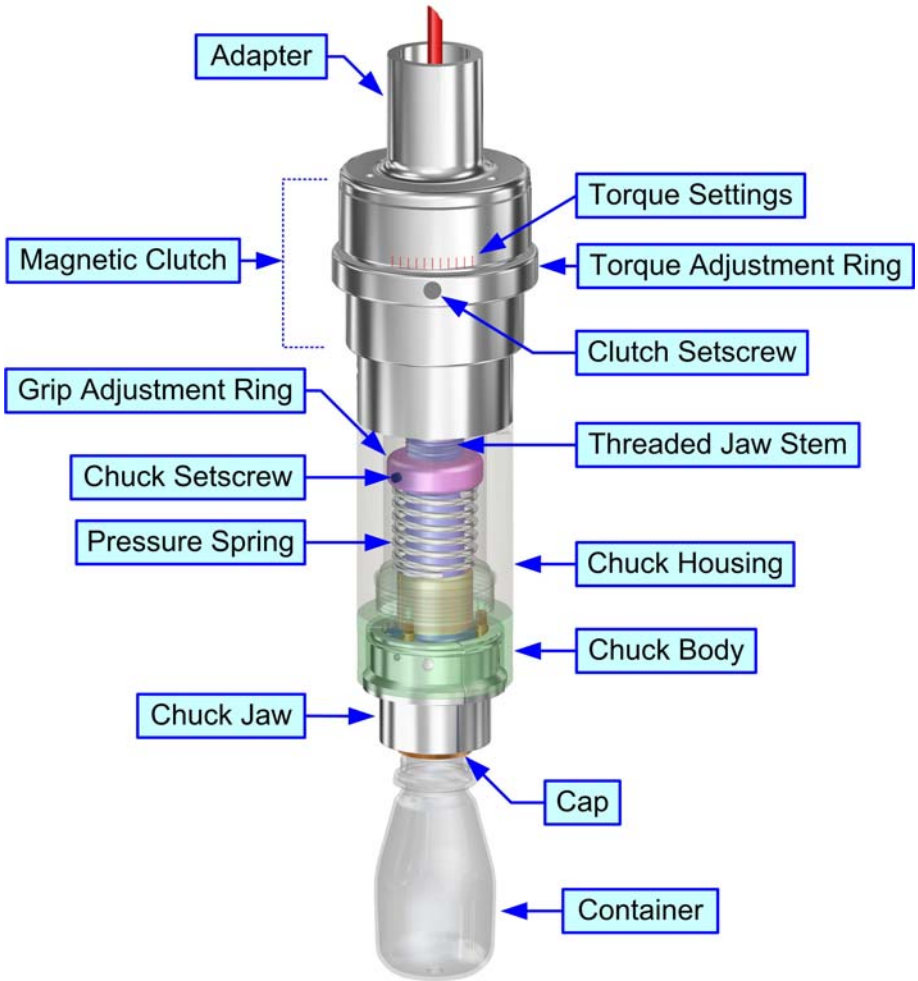
This chapter provides instruction on how to independently increase/decrease the chuck's gripping strength and tightening strength.

Torque Adjustment (Mechanical Clutch Only)

On the magnetic clutch, loosen the clutch setscrew and then adjust the torque adjustment ring to the desired torque setting. The exterior housing has numbers laser-etched in the stainless steel exterior, and each number represents an increase in the amount of available applied torque based on the internal magnetic components. These numbers represent rough settings for each chuck and can be used as a starting point when attempting to set chuck jaw torque. After testing, a particular chuck may need to be fine-tuned so that the entire machine runs at a consistent torque setting from chuck to chuck. Retighten the clutch setscrew following adjustment.

Grip Adjustment (Single Piece Jaws/Mechanical Clutch Only)

To adjust the chuck's gripping and releasing strength of the cap, unscrew the chuck body from the chuck housing to access the threaded jaw stem. Loosen the two chuck setscrews, then turn the grip adjustment ring to increase/decrease tension on its pressure spring. Retighten the two chuck setscrews, then thread the chuck body onto the chuck housing when complete.



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US BOTTLERS MACHINERY COMPANY

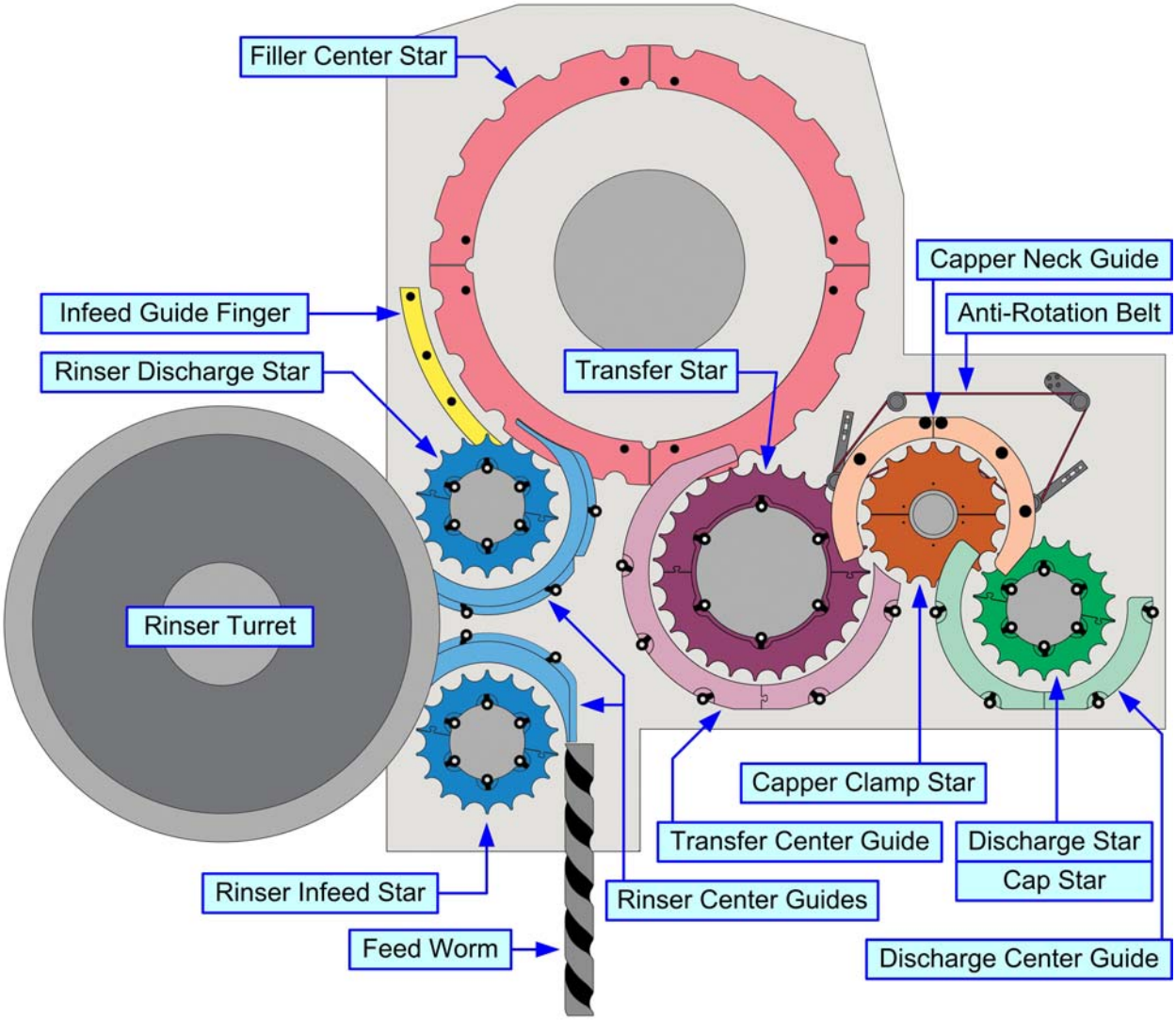
Procedure:	Filler & Capper Setup/Changeover Procedure - OP				
Procedure No.:	80215	**Revision:**	A	**Date:**	24 Nov 09

This document covers the physical activities required to prepare the machine for a typical product change. Refer to the Troubleshooting unit of this manual for non-typical adjustments that may be relative to a changeover.

CAUTION: ALWAYS START THE CONVEYOR BEFORE THE MACHINE AND ALWAYS STOP THE MACHINE BEFORE THE CONVEYOR. THE CONVEYOR IS TO ALWAYS KEEP THE CONTAINERS TIGHT TO PREVENT THEIR JAMMING AND THROWING THE MACHINE OUT OF SYNC WILL BE REDUCED.

Each changeover requires the substitution of certain machine attachments to allow for container variations. Each set of attachments is stamped with their applicable container identifiers to assist in the changeover process.

NOTE: Refer to the Technical Data unit of this manual for configuration details.



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CHANGEOVER PROCEDURE

1. Changeover the cap sorter in accordance with the manufacturer's specifications.
2. Open safety doors as necessary to access the changeover attachments.
3. As applicable, change the operator panel settings.

> NOTE: Refer to the OPERATOR PANEL chapter of this unit for specific menu details.

4. Raise the capper turret to its highest possible position.
5. Detach the existing cap chute, then disconnect the cap gate pneumatic lines.
6. Remove three hex bolts and spacers securing cap slide plate. Lift away existing cap slide plate.
7. Remove four hex bolts securing cap star to discharge star assembly. Lift away existing cap star.
8. Detach anti-rotation belt.
9. Remove four knob bolts securing capper neck guide. Lift away existing capper neck guide.
10. Remove six knob bolts securing capper clamp star. Lift away existing capper clamp star.
11. Screw existing chuck jaws from chuck assemblies and apply alternates.
12. Detach existing discharge center guide, then existing discharge star.
13. Detach existing transfer center guide, then existing transfer star.
14. Raise filler turret to its highest possible position, then remove each filler valve centering bell.
15. Remove all knob bolts securing existing filler center star. Lift away existing filler center star.
16. Remove all knob bolts securing existing infeed guide finger. Lift away existing infeed guide finger.
17. Remove quick disconnect pin from bottle present sensor bracket and lift upward.
18. Detach existing rinser infeed center guide, then existing rinser infeed star.
19. Detach existing rinser discharge center guide, then existing rinser discharge star.
20. Detach existing feed worm and install alternate.
21. Remove existing bottle grippers from rinser and install alternates.
22. Install alternate rinser discharge star, then alternate rinser discharge center guide.
23. Install alternate rinser infeed star, then alternate rinser infeed center guide.
24. Lower bottle present sensor and adjust height for alternate bottle. Apply quick disconnect pin.
25. Apply alternate infeed guide finger and secure using knob bolts.
26. Apply alternate filler center star and secure using knob bolts.
27. Apply alternate centering bells to filler valves.
28. Apply alternate transfer star, then alternate transfer center guide.
29. Apply alternate discharge star, then alternate discharge center guide.
30. Apply alternate capper clamp star, then secure using six knob bolts.
31. Apply alternate capper neck guide, then secure using four knob bolts.
32. Attach anti-rotation belt to pulleys.
33. Apply alternate cap star to discharge star assembly, then secure using four hex bolts.

34. Apply alternate cap slide plate, then secure using three hex bolts.
35. Loosen cap slide plate quick release levers, apply spacers, then adjust height.
36. Reconnect cap gate pneumatic lines, then attach cap chute.
37. Adjust capper, filler, rinser heights for alternate container size.
38. Close safety doors and test cycle to ensure proper function.

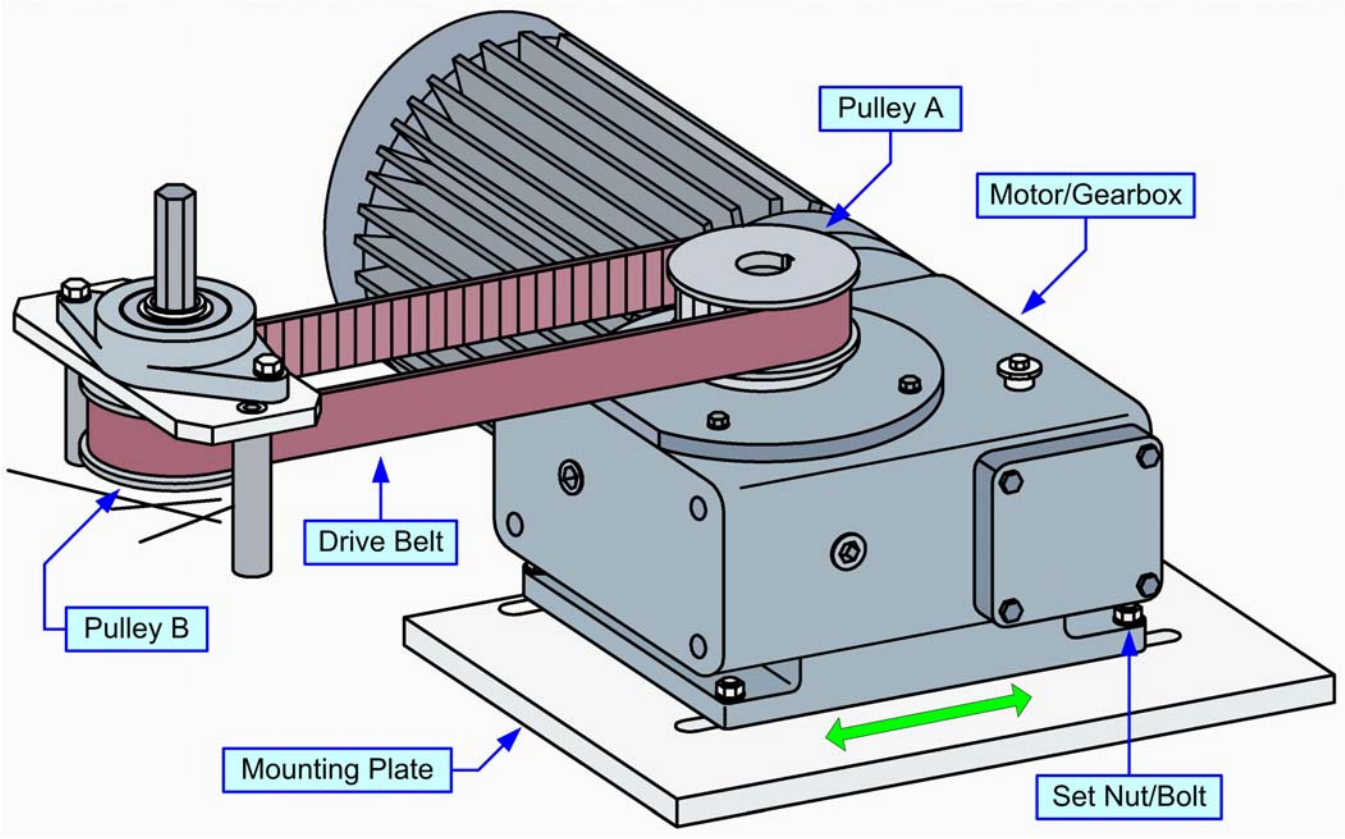
US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Spindle Drive Belt Adjustment - PM				
Procedure No.:	80301	**Revision:**	A	**Date:**	22 Apr 09

Over operational time, the drive belt will stretch and require tension adjustment. To tension the drive belt, loosen the four set nut/bolts securing the motor/gearbox to its mounting plate and manually pull the assembly to increase the distance between its pulleys A and B. Retighten the four set nut/bolts.

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

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



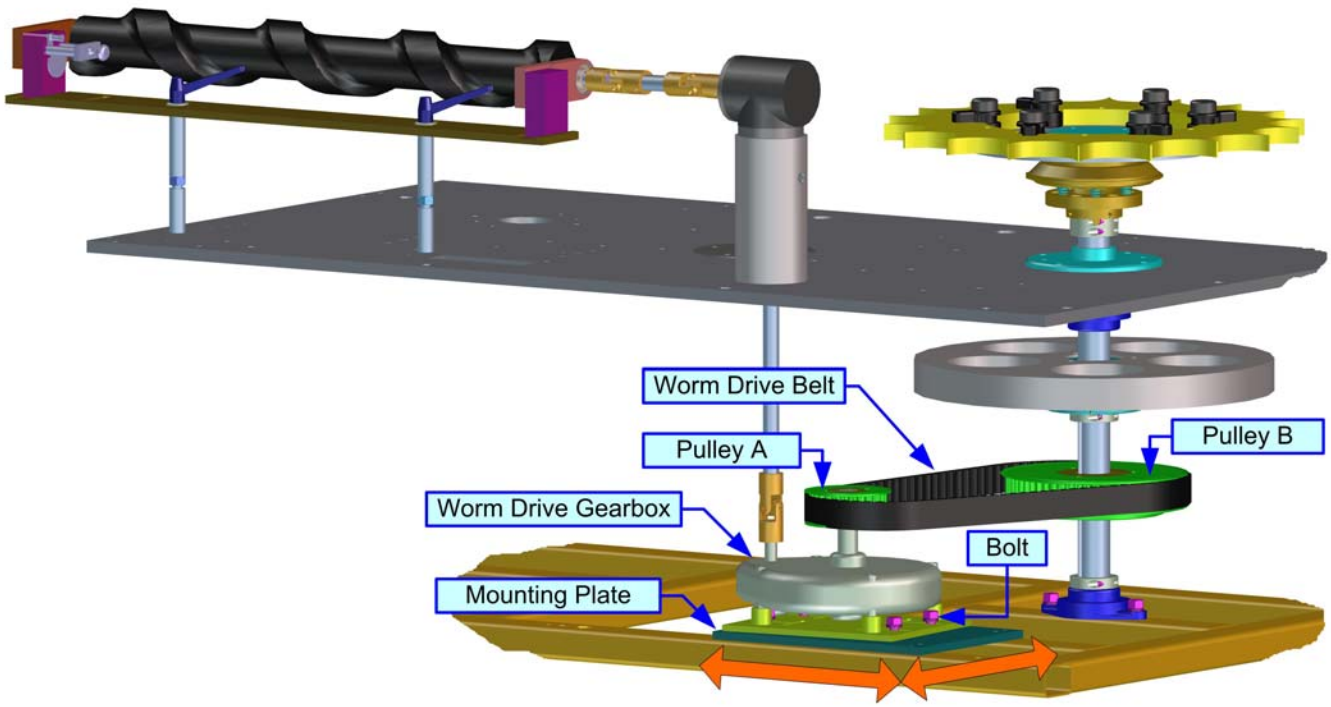
US BOTTLERS MACHINERY COMPANY

Procedure:	Feed Worm Drive Belt Adjustment - PM				
Procedure No.:	80302	**Revision:**	A	**Date:**	21 Apr 09

Over operational time, the worm belt will stretch and require tension adjustment. To tension the belt, loosen the four bolts securing the worm drive gearbox to its mounting plate and manually pull the gearbox outward to increase the distance between its two pulleys. Retighten 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.



US BOTTLERS MACHINERY COMPANY

Procedure:	Hoses, Gaskets, Seals and O-ring Materials - PM				
Procedure No.:	80303	**Revision:**	A	**Date:**	20 Sep 09

The o-rings, gaskets, hoses, and seals are all rubber components (unless Teflon is used) that must be reviewed. Look for cracking, deformations, and breakdown of integrity with these items and keep spares on hand. When replacing hoses, ensure to make replacements the same length and ensure the fittings are properly secured for cleaning requirements. Do not interchange hose manufacturers without knowing that they are in fact interchangeable. Wall thickness and ID tolerances are critical in working with the supplied fittings. Be careful also not to use non-FDA components in the liquid system.

US BOTTLERS MACHINERY COMPANY

Procedure:	Pinion & Bull Gears - PM				
Procedure No.:	80304	**Revision:**	A	**Date:**	12 Nov 09

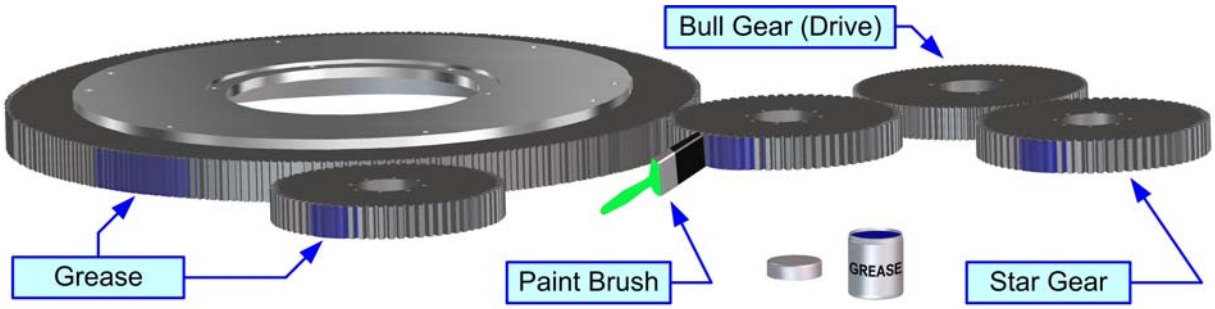
The pinion drive gears and bull gear are to be inspected to ensure that wear or corrosion has not reduced the surface areas of these gears, and that they have not developed cracked or broken teeth.

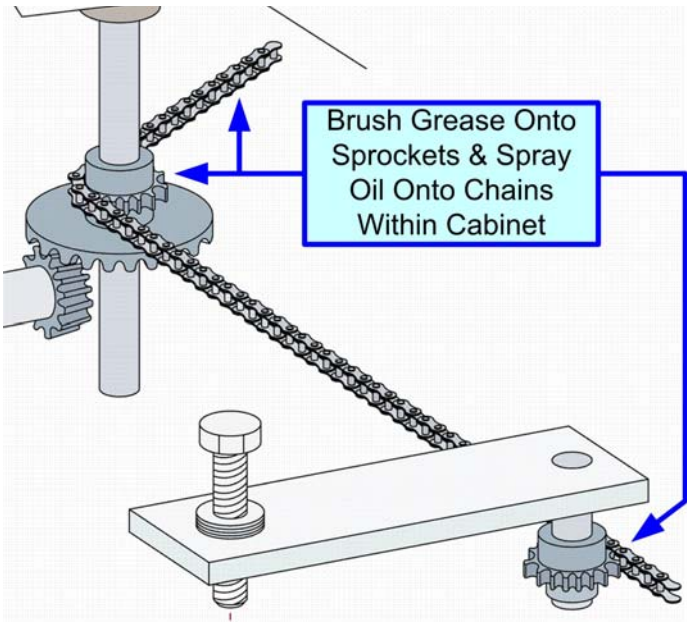
Pay particular attention to the strength of pinion gear teeth when reviewing because they turn multiple times that of the bull gear. Replace pinion gears as soon as wear is identified.

The bull gear of the machine is subjected to less wear than the pinion gears. Replacing a bull gear is a big job, but if properly serviced, it should have a long operational life. Normally, it is considered good practice to change all gears of any gear set whenever the drive is overhauled. In this case, since the bull gear is so large and costly, and requires so much effort to replace, every attempt should be made to service the pinion gears and replace them separately before they can damage the bull gear.

Use a brush to apply a heavy coating of grease that resists water and steam to the teeth of the gears. If the gears are plastic, do not use a lubricant that will attack nylatron GSM. Inspect the existing grease on the gears for broken glass or any other object that could damage the teeth if left in place.

Check the drive system for backlash. Increasing backlash indicates tooth wear and suggests a possible need for pinion gear and/or bull gear replacement.





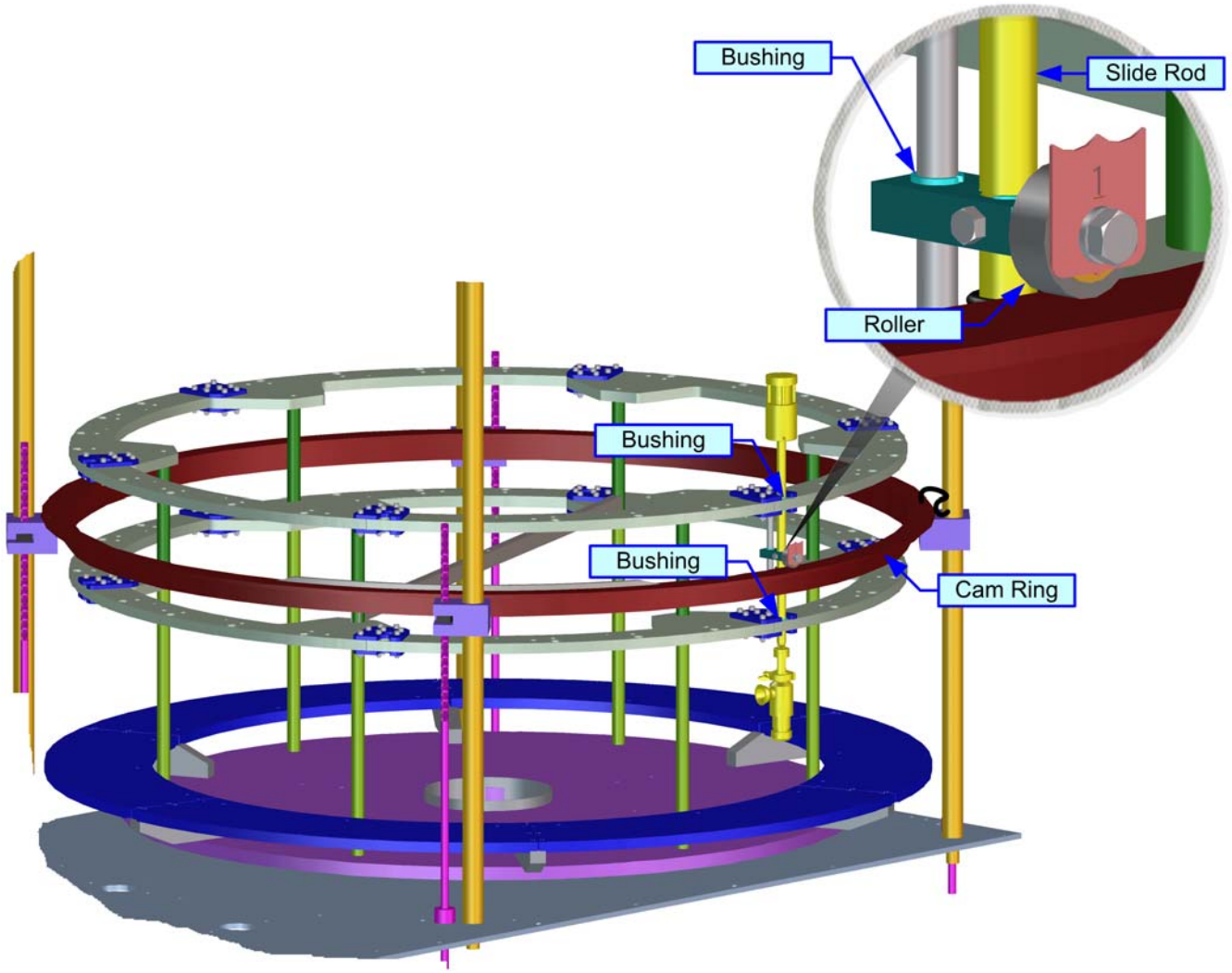
US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Slide Rods, Bushings, & Rollers - PM				
Procedure No.:	80305	**Revision:**	A	**Date:**	20 Sep 09

The filler's slide assembly, including its bushings, roller assemblies, backup rods, and snap rings, are to be reviewed as specified. The bushings are semi self-lubricating and the slides work well without lubricants; however, cleaning is very important.

Binding slides can cause the machine to jump or jerk. Sometimes if enough slides are sticking or binding, they can cause the filler to stop rotating. This condition often is misdiagnosed as a faulty main bearing. Slide bushings are the wear items and frequently require replacement. Slides, on the other hand, need only be replaced if they are physically bent due to a jam. Generally, slides do not wear out.

Roller assemblies are constructed using an acetron inner sleeve with a urethane outer wear surface. The wheel should be replaced whenever the rollers show signs of not operating properly. Ensure that the rollers turn during their passage around the cam. Rollers that stop turning quickly develop flat spots and will never operate properly afterward. Flat spots on rollers will also quickly wear the cam.



US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Chuck Shafts & Rollers - PM				
Procedure No.:	80306	**Revision:**	A	**Date:**	05 Feb 10

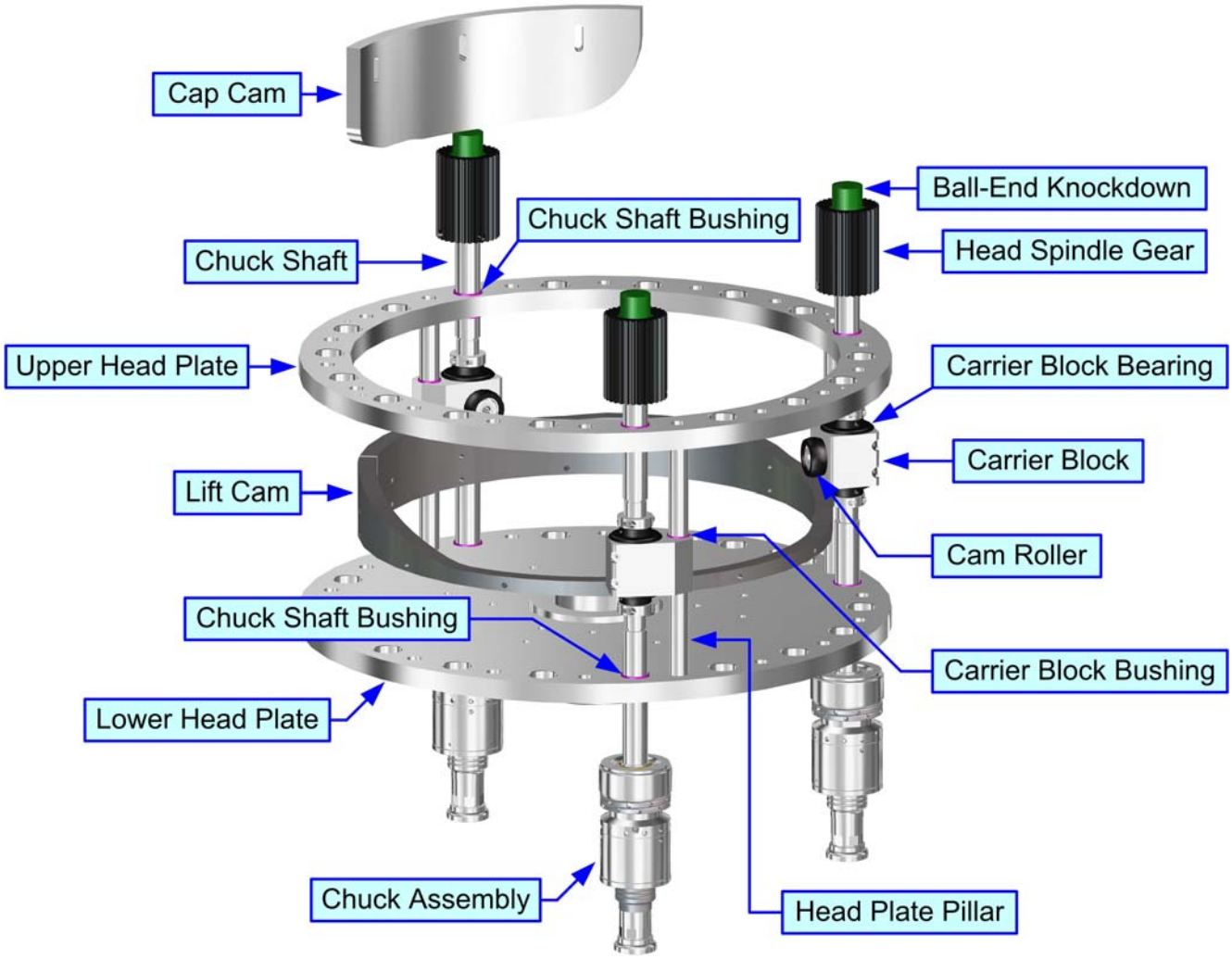
There are numerous preventive maintenance activities that must be performed relative to the capper's chuck shaft and rollers. Perform the activities identified below in the frequency identified in the preventive maintenance and lubrication schedules of this chapter. Refer to the Repair Maintenance unit of this manual if determined that components or sub-assemblies must be replaced.

- Visually inspect the cam rollers for excessive wear and flat spots on their cam contact surfaces. If flat spots are present on a cam roller, this is an indication that the roller is seizing. Ensure that all rollers rotate freely and that their attaching hardware is not loose.
- Visually inspect the head spindle gear for tooth wear and brush grease onto their full lengths. The gear must properly engage its mate without slippage or sloppiness.
- Visually inspect the ball-end knockdowns (if present) for excessive wear. The knockdowns require replacement if the chuck jaws cease to fully open and close. If deemed acceptable, brush grease onto their button ends.
- Visually inspect the cap and lift cams to ensure that the roller hardware has not worn a groove in their contact surfaces. If the cam begins to show signs of wear, it can be reshaped in order to ensure proper rolling action – they can also be adjusted downward since they are slotted. Also, since the width of the knockdown cam is wider than the contact point; it can be spaced out or moved in to wear on unworn surfaces to extend its life. In the event that it is worn excessively, the lift section is to be replaced. Brush a slight film of grease onto the roller and knockdown contact surface of the cams to reduce friction, corrosion, and wear.
- Visually inspect the chuck shafts and head plate pillars for scratches and grooves indicating that their bushings are worn. Manually shake each shaft and pillar for play in the bushing area, this is also a sign that wear is occurring and that the bushings may require replacement.

  Note that the shaft bushings do not require lubrication and more specifically, it is recommended that they are not lubricated so as to prevent the attraction and retention of debris. Indeed, some bushing materials may adversely react to the chemical compositions of some lubricants and also, impede desired material transfer for some bushing types.

  NOTE: If flakes of material is noticed around the capper's bushings, this is not cause for concern. Some types are designed to transfer part of its material composition to the shaft during normal operation.

- Apply a straight edge to the shafts and pillars to determine if any have become bent. Any shafts or pillars discovered to be bent, must be replaced immediately to ensure proper capping and to prevent damage to other components during operation.
- Manually shake each chuck shaft in the area of the carrier block bearings. Movement in this area is indicative of worn bearings. If these are determined to be in acceptable condition, fill with grease if fittings are present.
- Visually inspect the upper and lower head plates metal shavings indicating that abnormal wear is incurring. If none is detected, wipe down their surfaces, then rub oil onto them to prevent rust.


Cap Cam
Ball-End Knockdown
Chuck Shaft Bushing
Chuck Shaft
Head Spindle Gear
Upper Head Plate
Carrier Block Bearing
Carrier Block
Lift Cam
Cam Roller
Chuck Shaft Bushing
Carrier Block Bushing
Lower Head Plate
Chuck Assembly
Head Plate Pillar

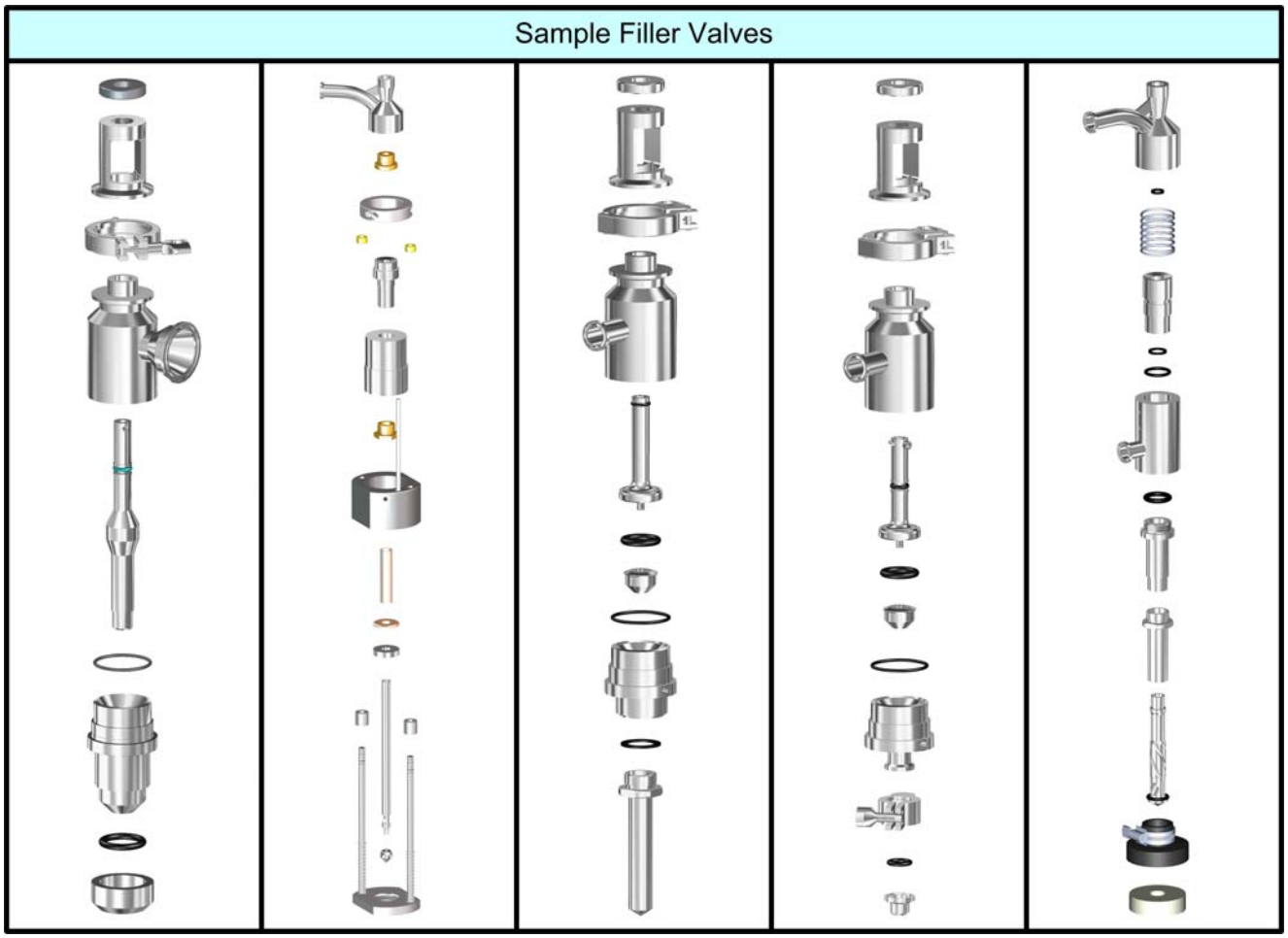
US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Valves - PM				
Procedure No.:	80307	**Revision:**	A	**Date:**	16 Feb 10

Valves must have their inner and outer tubes penetrate the opening of the container and are, therefore, subject to the stability and quality of the container. Choke neck bottles, round bottoms, unstable containers, and bad bottle handling practices all contribute to the damage of filling valves. The hardware provided takes into account the need for high product flow rates in conjunction with the necessity for mechanical strength in the filing tube assembly.

Valves need to be reviewed to ensure that they are opening and closing smoothly and not sticking or jamming in the open or closed position. Any o-rings or seals that are damaged need to be replaced. When liquid appears at the top of the tube bushing, the lip seals need to be replaced. Sealer rubbers that are worn need to be replaced in order to maintain the proper liquid level fills. As hoses become old, they become dried, stiff, and cracked, and also must be replaced.

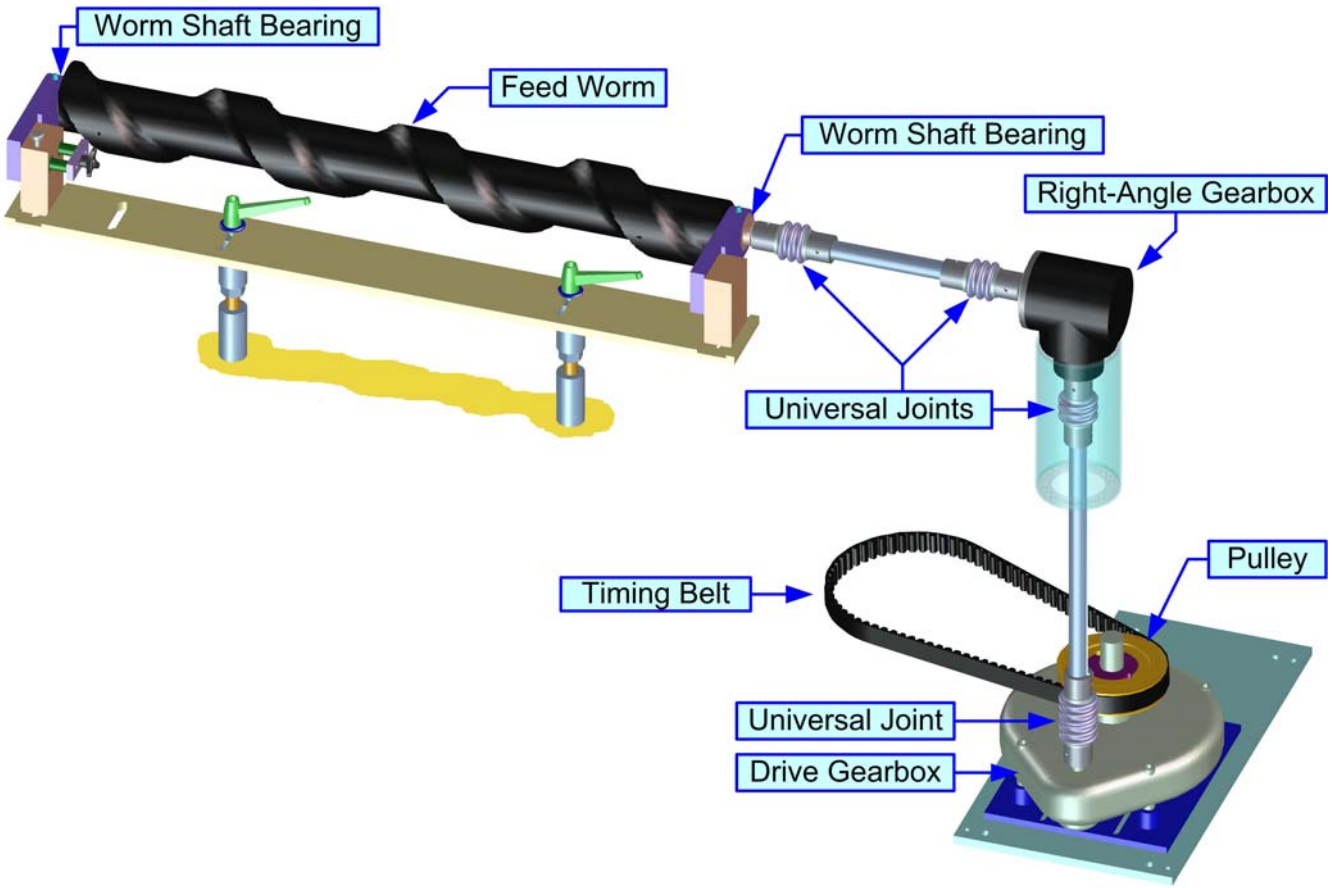
If the filling valves are assembled and disassembled often for cleaning and inspection, the threads tend to wear. The pounding action of the valve also accelerates this process. The valves should be checked to ensure that the inner tubes are tight into the tube head and the tube head is attached properly to the slides. Outer tubes are to be tight and the gaskets need to be properly functional. Sealer rubbers and gaskets must to be in good working order. If difficulty is experienced in maintaining the tightness of the mechanical hardware, the use of a food grade lock tight material will often help.



US BOTTLERS MACHINERY COMPANY

Procedure:	Feed Worm Drive Assembly - PM				
Procedure No.:	80308	**Revision:**	A	**Date:**	08 Feb 10

Periodically inspect the timing belt and pulleys for wear and replace them as necessary. Ensure that both the drive gearbox and right-angle gearbox are both lubricated regularly as prescribed. The worm shaft bearings are to be checked often to ensure that the internal bearing is rotating and has not seized. If the bearing appears to run hot, consider replacing the unit with a new bearing. Also ensure that the keys are not worn and that backlash in the gearboxes isn't excessive.



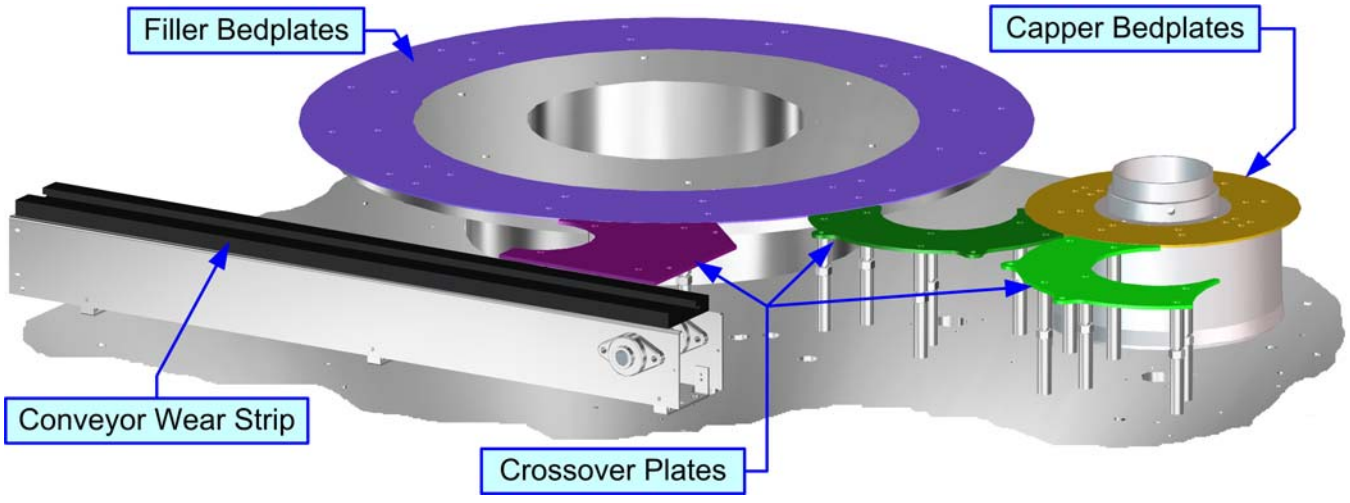
US BOTTLERS MACHINERY COMPANY					
Procedure:	Crossover Plates, Bedplates, and Conveyor Wear Strips - PM				
Procedure No.:	80309	**Revision:**	A	**Date:**	11 Feb 10

Review the crossover plate to ensure that the bottle action of moving on and off the conveyor is smooth. When necessary, replace the crossover plate or adjust it upwards to ensure proper transfer. The crossover plate is to always be vertically positioned so that it is slightly higher so the container traveling off the plate doesn't trip.

If the bedplates are badly worn, three things can occur:

1) the containers will jostle on the bed plate when entering the filler causing the filling tube to have difficulty aligning with the opening of the bottle;
2) 2) spilled liquid can become trapped on the bed plate and drip down through the attachment screws accelerating corrosion; and
3) 3) properly filled bottles will not smoothly exit the machine.

Conveyor wear strips that support the conveyor motion and the return conveyor chain section must be inspected to ensure that they have not worn through. Only chain lubricant is necessary for the conveyor wear strips.



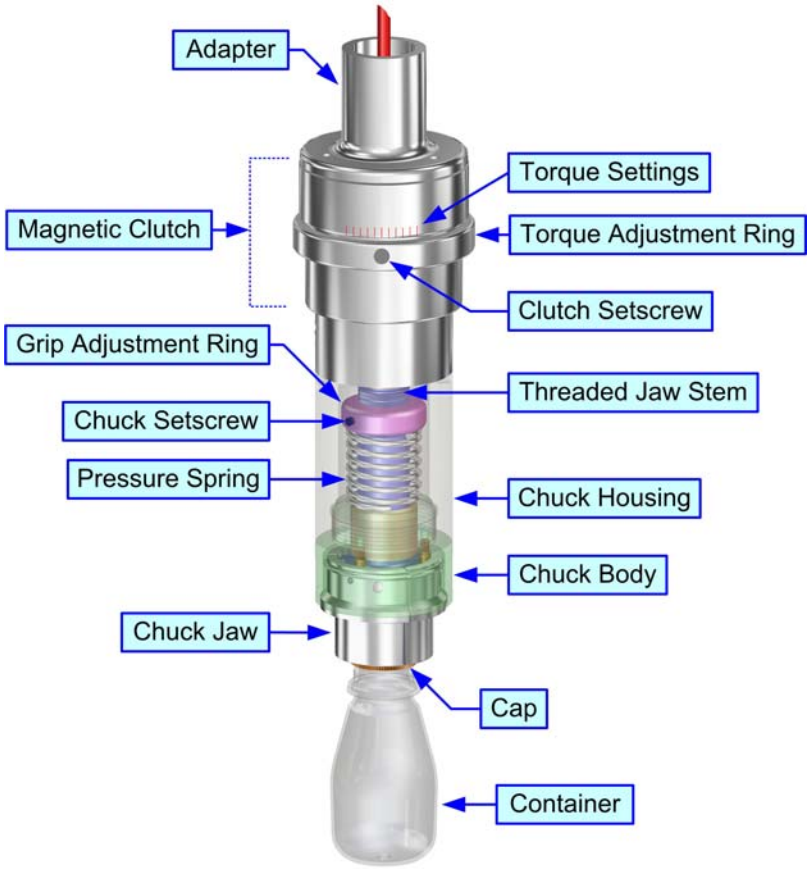
The maintenance areas to review deal with wear surfaces and the single spring.

> **ATTENTION:** Ensure that plenty of spare springs are available should the spring wear or break over an extended period of operation.

Wear areas at the chuck jaw, in particular where the stripper contacts the backside of the jaw and the body closes on the exterior of the jaw, should be evaluated. A small amount of lubrication is to be added to these surfaces to help prevent excessive wear. The serrations of the jaws themselves are be evaluated since these will wear over time; particularly if the settings of the gripping pressure and the release point are out of tune.

Ensure the nylon-tipped setscrews do not need replacement. If metal-to-metal set screws are used on the threads, they can damage the jaw stem.

Another wear area to review is the jaws themselves. Naturally, some wear will occur from the original sharpness of the jaw, but it is important to ensure that they hold the cap properly when reaching their final torque. While running the capper, view the operation from the capper. Assuming that all the magnetic clutches are correctly set and the bottle is not spinning and the cap jaws grip the cap tightly, you would normally see all magnetic clutches come to a slip point at approximately the same angle based on the thread of the cap and the appropriate applied torque. If you continue to see a particular chuck assembly that does not reach its torque, it should be evaluated as to whether the chuck is slipping on the cap or the bottle is rotating in the pocket.



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US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Rotary Unions - PM				
Procedure No.:	80311	**Revision:**	A	**Date:**	15 Feb 10

During normal operation, it is recommended that lubricant be applied at the grease fittings at least once every 40 hours. Apply grease until it is observed escaping through the upper split spacer ring. When the cavity within the rotary union is full, grease will be forced up and out through this spacer ring, rather than through the seal rings.

It is important to maintain a film of lubricant over the seal to metal contact surface to prevent the seal from prematurely wearing. Make sure grease (FDA as required) is applied before and after CIP procedures to ensure the rubber is not running directly on the metal surface without lubricant.

ATTENTION: There is now a version of this size union which eliminates the rubber seals and use a lubricant impregnated Teflon packing gland system. In this version, regular greasing is not required and does not incorporate rubber quad seals. If interested in testing this newer design, please consult with our sales team.

LUBRICATION

Proper lubrication is an absolute necessity for any piece of mechanical machinery to operate at full capacity. Improper lubrication can be as harmful to the equipment as without lubrication.

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

CAUTION: DO NOT APPLY ANY LUBRICANT TO ANY PART OF THE MACHINE THAT ATTACKS NYLATRON GSM. COMPONENT DAMAGE WILL OCCUR.

CAUTION: DO NOT ALLOW CORROSION AND RUST TO BUILD UP TO DESTROY NON-STAINLESS STEEL COMPONENTS SUCH AS GEARS, SLIDE RINGS, SPROCKETS, AND GEARBOXES.

WARNING: THE LUBRICATION ACTIVITIES IDENITIFED IN THIS CHAPTER DOES NOT ADDRESS THE CAPPER TURRET. REFER TO THE APPENDIX UNIT OF THIS MANUAL FOR THOSE INSTRUCTIONS RELATIVE TO THE CAPPER TURRET.

GEARBOXES

Each of the machine's gearboxes has a lubrication fill port with an associative over-fill port. The fill port is the location where lubrication is applied to the gearbox, and the over-fill port lets the technician know when the proper fill quantity is reached.

To fill a gearbox, remove the fill port and over-fill port plugs. Pour the specified lubricant into the fill port until it begins to run from the over-fill port. Then replug each port. Refer to the Technical Data unit of this manual for the required lubricant type.

OIL POINTS

There are points on this machine that would benefit from periodically having oil applied as either a lubricant or rust inhibitor. However, due to unique applications and possible governmental regulations, the determination if to lubricate, the method of lubrication, and the type of lubrication is left to customer discretion.

Applying a small amount of light mineral oil or light machine oil to the slides is often helpful; however, excessive oil is counter-productive because It collects dirt from the air and produces a gummy material that clogs the bushings and affects the slide action. In a dry environment, the oil film need not even 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

All exposed gears are to be located and have grease sprayed or brushed onto their contact surfaces.

CAUTION: USE ONLY FOOD-GRADE GREASE ON THIS MACHINE

GREASE FITTINGS

The most severe point for a bearing assembly is immediately following machine operation under high temperature conditions. As the machine cools to room temperature, the bearing housing cavity which is already full of moist ambient air, begins to cool generating additional moisture through condensation. This accumulative moisture will inevitably find its way into the bearing housing and if allowed to remain, will eventually mix with bearing lubricants and ultimately reduce its corrosive resistant characteristics. Therefore, the lubricant type is of utmost importance, 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 components that can be lubricated 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 will feed and lubricate all of the elements associated with the vertical rotational shafts of the machine, the cam adjusting screw hardware, the main bearing, and the bearings located under the rotational drive pinions. This manifold supplies lubrication to other component units located within the cabinet that are necessary as part of the main machine drive.

The fittings on the manifold are then connected from left to right to grease point requirements inside the cabinet as they are found moving from left to right. Using this method, 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 that is labeled with an exact component name.

Rotary Union

During normal operation, it is recommended that a food grade lubricant be applied at the grease fitting at least once every 40 hours. Grease until it is observed escaping through the upper split spacer ring. When the cavity within the rotary union is full, grease will be forced up and out through this spacer ring, rather than through the seal rings.

Main Bearing

The main bearing is a sealed, four-point contact bearing in an enclosed housing. It is designed with a single lubricant grease point located on the front of the machine cabinet, centered behind the front removable door panel or directly on the bearing housing. The main bearing is to be lubricated at startup, while the machine is running, and also at the end of the operating cycle when the bearing is cooling down if it will not be operated in the near future. Lubrication is to be pressed into the bearing housing with at least 15 solid strokes of a pneumatic or hand operated grease gun.

CAUTION: FOR HOT JUICE APPLICATIONS, USE GREASE THAT CONFORMS TO MILITARY SPECIFICATION G-81322.

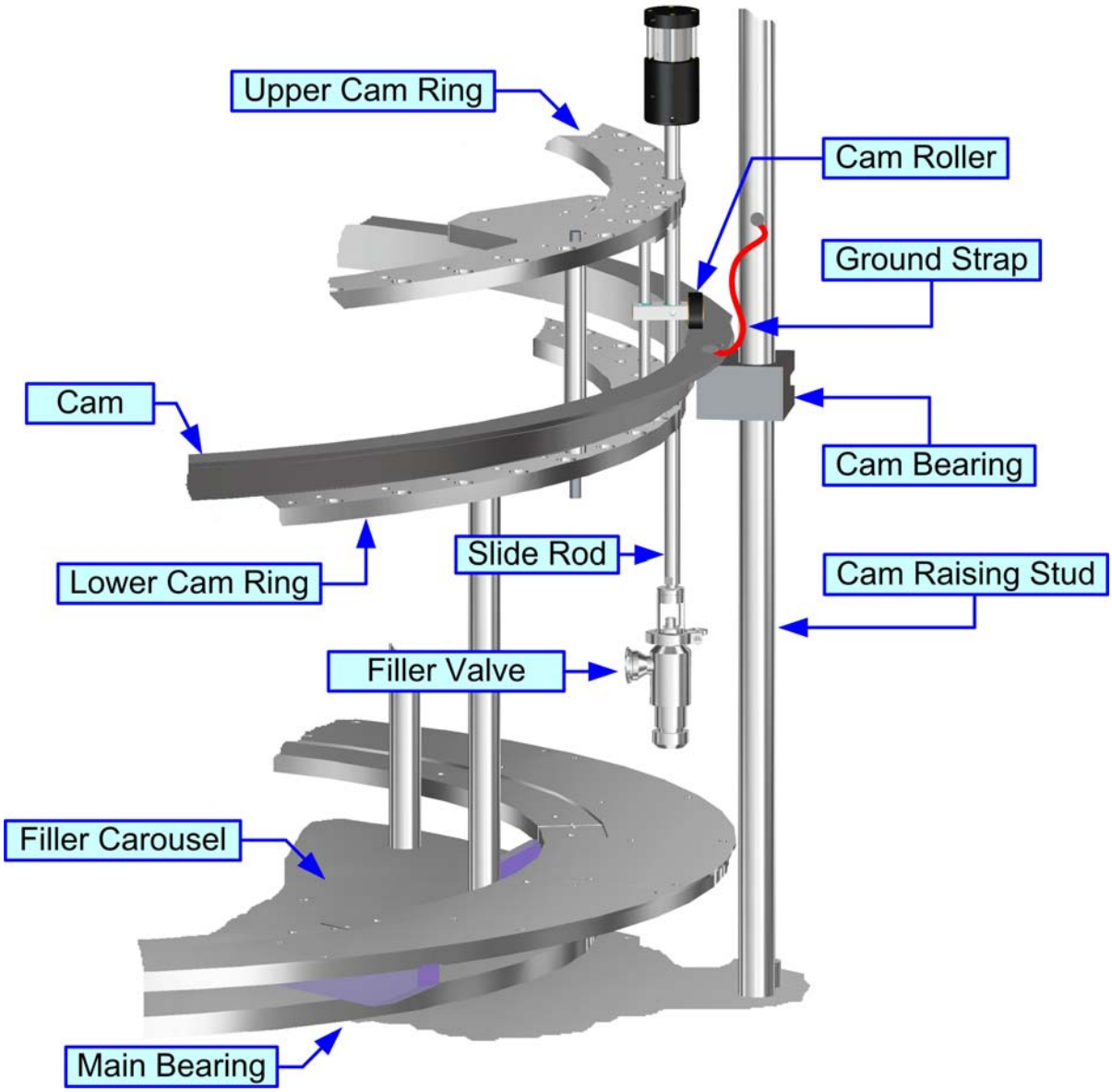
Cam Adjustment Bearings

A small amount of lubricant wiped on the threads of the cam stud bearing is all that is necessary to maintain the operation of this unit. Within the machine cabinet, are several flange bearings that require periodical lubrication. Also brush lubrication onto the roller chain sprocket system.

US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Cam Bearings & Ground Strap - PM				
Procedure No.:	80414	**Revision:**	A	**Date:**	09 Feb 10

Over time, the rotation of the filler carousel produces an electric charge. Since there is a fine film of oil on the main bearing balls, an electrical discharge path needs to be provided. If the ground strap is not in place, an electrical charge jumps across the gap between the upper and lower race housing of the bearing. The balls will slowly become pitted from this electrical discharge, thus promoting premature failure of the main bearing. The ground strap prevents this from occurring by providing a proper electrical discharge path from the cam and rotational parts of the machine down to the grounded base cabinet of the filler. Ensure that the machine base is properly grounded.



US BOTTLERS MACHINERY COMPANY

Procedure:	Preventive Maintenance Schedule (PG-RC) - PM				
Procedure No.:	80370	**Revision:**	A	**Date:**	01 Oct 09

PREVENTIVE MAINTENANCE SCHEDULE

EACH SHIFT	
Filling Valve O-Rings	❑ Visually inspect for swollen or damaged.
Inner Tube O-Rings	❑ Visually inspect for swollen or damaged.
Tube Body	❑ Visually inspect for leaks around inner tube seal.
Filling Valve Hoses	❑ Ensure are flexible. ❑ Overflow hoses are properly placed.
Filling Valve Tubes	❑ Visually inspect for bending. ❑ Visually inspect for leaks around inner tube seal.
Filler Valve Tube Gaskets	❑ Visually inspect for product leakage.
DAILY	
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.
Filler Slides & Bushings	❑ Check for wear, binding, or sticking. ❑ Inspect for bent slides.
Backup Rods	❑ Check for wear, binding, or sticking. ❑ Inspect for bent slides. ❑ Verify snap rings are in place.
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 are properly functional. ❑ Inspect hinges for damage. ❑ Hand clean.
Product Supply	❑ Inspect for contaminated liquid in filler container.
Product Pressure	❑ Ensure adjusted to match required filling application.
Rotary Union	❑ Inspect for product leakage at relief vent holes. ❑ Listen and observe for binding or interference during rotation.
Feed Worm Gearbox	❑ Inspect for vibration, grinding, or excessive heat. ❑ Check for increasing backlash between input and output shaft. ❑ Check shaft rotation for tight spots.

Chuck Assembly	❑ Inspect for loose hardware.
Pump	❑ Visually inspect for leaks. ❑ Ensure not running too hot.
Feed Worm Drive Assembly	❑ Check u-joints for wear, binding, excessive slop, backlash. ❑ Check bearing for wear. ❑ Ensure feed worm mounting bracket is secure. ❑ Ensure limit switches are functional and properly positioned. ❑ Inspect worm gearbox for vibration, grinding, or excessive heat. ❑ Check worm gearbox for backlash between input/output shafts. ❑ Check shaft rotation for tight spots.
Capper Grease Cartridge Batteries x2	❑ Check that are properly energized. ❑ Replace as manufacturer specifies.
EVERY TWO DAYS	
Roller Chain Worm Drive	❑ Inspect bevel gear for backlash and wear. ❑ Inspect roller chain for excessive stretching.
Main Chassis Bevel Gear	❑ Inspect cam adjustment for backlash and wear. ❑ Inspect roller chain for excessive stretching.
Filler Components	❑ Clean. ❑ Inspect cam for wear and grooves.
WEEKLY	
Entire Machine	❑ Hand rub light covering of oil to all unpainted surfaces. ❑ Check for bent knobs, broken plates, and damaged attachments.
Detent Clutch	❑ Ensure slippage during high speed motor starts. ❑ Check for proper mechanical function. ❑ Check keyless bushings for tightness. ❑ Check shaft key and keyway for excessive wear.
Main Chassis	❑ Inspect cam stud shafts for corrosion. ❑ Ensure roller chains are not excessively stretched. ❑ Ensure cam ring and studs are level. ❑ Ensure cam adjusting hardware moves freely. ❑ Inspect bed plate covers for wear. ❑ Check pinion shaft for excessive looseness. ❑ Ensure static charge eliminator ground strap is connected.
Main Chassis Bevel Gear	❑ Inspect cam adjustment for backlash and wear. ❑ Inspect roller chain for excessive stretching.
Main Bearing	❑ Check for deterioration by slowly rotating machine and checking for jerking or rumbling noise.
Star Drive	❑ Inspect belts for wear and proper tension. ❑ Check micro-switch for correct setting and proper electronic control logic. ❑ Ensure manifold lubricant lines are in place and without leaks. ❑ Ensure star and drive shaft bearings for sloppy contact.
Chuck Shaft Assembly	❑ Check for bent shafts. ❑ Check rollers and bearings for wear, corrosion, and flat

	spots.
Conveyor Assembly	❑ Inspect conveyor wear strips for wear. ❑ Ensure guide rail hardware is firmly tightened. ❑ Ensure limit switches are functional and that the electronic control circuits are active. ❑ Check the 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 the worm idler end 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.
Filler Components	❑ Clean. ❑ Inspect cam for wear and grooves. ❑ Ensure limit switches are functional and properly positioned.
Head Assembly	❑ Check for loose, worn, or broken roller assemblies.
Cap Feed Assembly	❑ Inspect air connections and lines for pinching, damage, and degradation. ❑ Inspect the pivot bushing for swelling and ream. ❑ Check pistons fro proper stoking and cleanliness.
Chuck Assembly	❑ Check for broken or damaged chuck release springs.
Manifold Shutoff Shoe Pad	❑ Visually inspect for wear.
QUARTERLY	
Capper Turret Grease Cartridge	❑ Replace cartridge.
SEMI-ANNUALLY	
Entire Machine	❑ Check gears for uneven wear or broken teeth. ❑ Check for excessively sloppy bushings.
Feed Worm Gearbox	❑ Rebuild or replace.
Motor Drive Train	❑ Replace worn or excessively stretched belts. ❑ Replace worn, corroded, or excessively stretched chains. ❑ Replace worn chain sprockets.
Rotary Union	❑ Replace bearings, liquid seal, and o-rings.
Clamping Belt Assembly	❑ Check pulley bearings for wear and corrosion. ❑ Check take-up assembly for wear, corrosion and damage.
Capper Head Assembly	❑ Check lifting jack for binding. ❑ Check pneumatic cam for wear. ❑ Check roller carrier bearings for wear, corrosion, and damage.
Filler Main Gearbox	❑ Replace gearbox oil.
Capper Main Gearbox	❑ Replace gearbox oil.
Rinser Main Gearbox	❑ Replace gearbox oil.

Capper Independent Spindle Gearbox	❑ Replace gearbox oil.
ANNUALLY	
Capper Turret Keyway Grease Cartridge	❑ Replace cartridge.

US BOTTLERS MACHINERY COMPANY

Procedure:	Lubrication Schedule (PG-RC)				
Procedure No.:	80385	**Revision:**	A	**Date:**	01 Oct 09

LUBRICATION POINTS

Lubrication Points (Filler Cabinet - Left Side)	
Main Manifold	Capper Spindle Drive Bearings (third from right)
	Capper drum Bearing & Bushing (center)
	Filler Main Bearing (first from right)
1	Conveyor Drive Outer Bearings
2	Conveyor Drive Inner Bearings
3	Capper Discharge Star Shaft Upper Bearing
4	Capper Discharge Star Shaft Lower Bearing
5	Transfer Star Shaft Upper Bearing
6	Transfer Star Shaft Lower Bearing
7	(spare)
8	(spare)
Lubrication Points (Filler Cabinet - Right Side)	
11	Filler Main Drive Shaft Upper Bearing
12	Rinser Discharge Star Shaft Lower Bearing
13	Rinser Discharge Star Shaft Upper Bearing
14	Rinser Main Drive Shaft Upper Bearing
15	Conveyor Drive Outer Bearing
16	Conveyor Drive Inner Bearing
17	Rinser Infeed Star Shaft Lower Bearing
18	Rinser Infeed Star Shaft Upper Bearing
Lubrication Points (Rinser Cabinet)	
21	(spare)
22	Upper Bearing
23	Upper Bearing
24	Upper Bearing
25	Jack Screw Bearing #3
26	Jack Screw Bearing #2
27	Jack Screw Bearing #1
28	(spare)

Capper Turret (Capper Cabinet)	
Capper Turret Bearings	Battery Powered Lubricators x2

US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Cap Feed Assembly - TS				
Procedure No.:	80401	**Revision:**	A	**Date:**	17 Aug 09

The cap feeder consists of a cap gate system that allows the opening and closing action of a small stainless steel gate. When this gate is open, the cap attempts to move through the chute into the cap star due to the pressure of the gravity-fed caps, as well as the air pressure of chute air jets. However, the cap will not be able to penetrate the pocket of the star until a pocket presents itself. If at that point the gate is still open, the cap will move out into the cap star and rotate between the cap star and the backup guide rail until it moves into position under the chuck jaw.

The chuck jaw will lower itself onto the cap and close around the exterior surface to pull the cap out of the cap star and away from the capping star plate. The logic of the cap gate is such that a signal will be provided for the cap gate to open only when a bottle is present on the conveyor and the timing sprocket below the capper indicates that the time has come to open the gate.

The cap gate is powered by compressed air and can be adjusted for the appropriate speed of the gate, as well as the pressure to close back against incoming caps. Excessive cap gate air pressure can slam the gate against the cap with such force that cap damage can occur. A flat cap star is critical in ensuring that the appropriate stack-up allowing a cap star and a gate to come in contact with the small surface of the cap will allow cap retrieval and proper placement underneath the chuck assembly. This system allows a nice, no bottle, no cap feature to exist. The cap gate will remain open when bottles are continuously present, yet still have the ability to hold back a cap randomly as required when a container is not available for capping purposes. The bottle-present eye should always be used, and caps should not be allowed to be continuously fed when containers are not present.

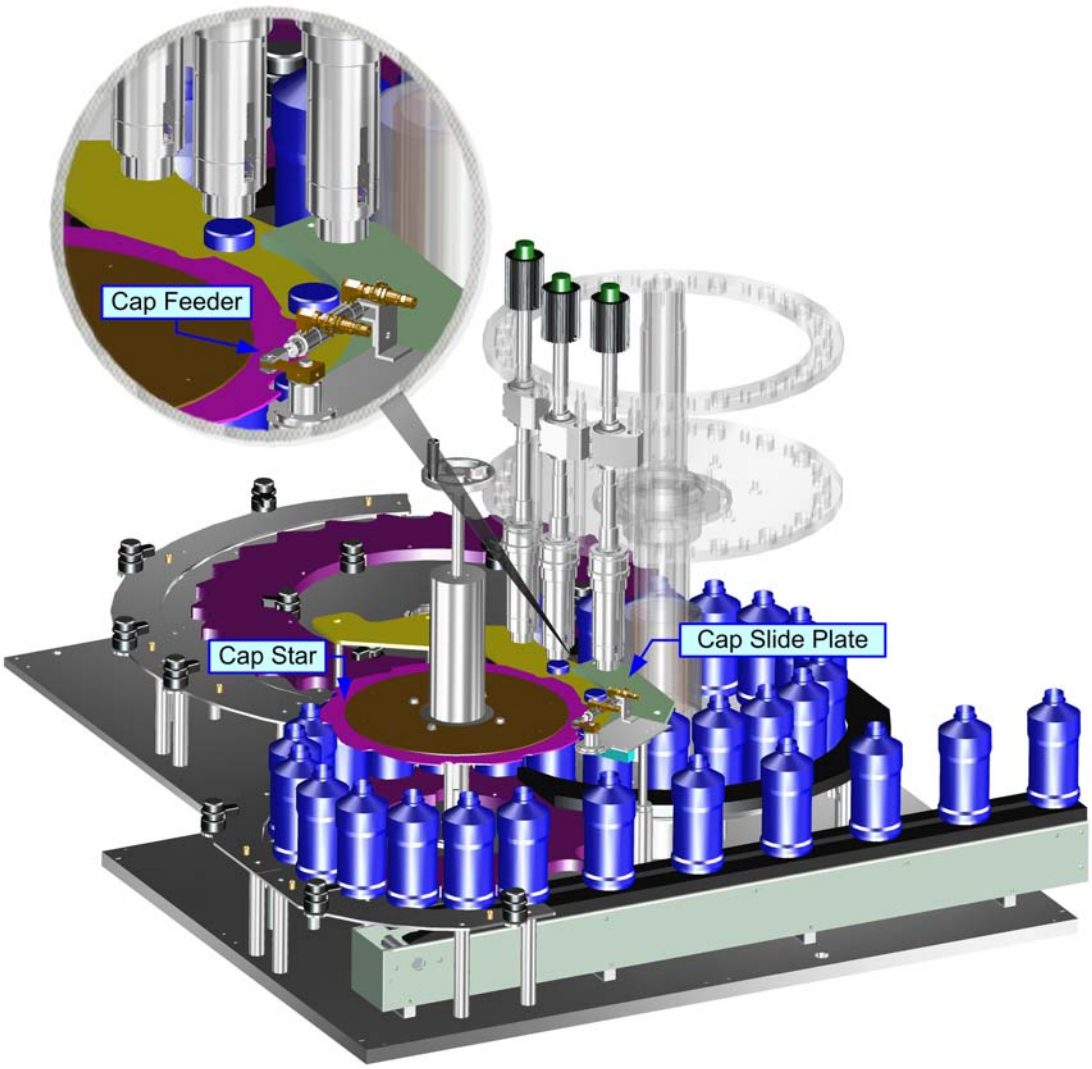
If the capper is slowly rotated by hand until a single cap is released from the cap chute into the cap star pocket, the operator will observe that an additional small angular movement of the cap star will allow the arm of the air actuator at the chute to move forward and stop the next cap from entering into the following cap star pocket. The cap star must have turned 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. When required, the bottle present sensor looks for the presence of a container so that a cap can be delivered.

At the same time that the bottle present sensor searches for a container, a sensor mounted on underneath also checks a timing tooth in an adjustable sprocket mounted on the star shaft. This sprocket contains one tooth for each of the capper pockets. This sprocket can be turned forward or backward to advance or retard the signal as required for proper fine tuning of the signal.

Since the cap arm must move quickly, the power is provided by a double acting air piston. The signal is controlled through an electrical solenoid mounted in the pneumatics panel which pilots a 5 port air valve. The air valve then routes the proper air signals to the air piston.

If the cap gate appears not to function properly, the first concern should be with the timing of the bottle-present eye and the timing sprocket underneath the capper. These two signals must exist together to ensure that the gate opens.



The bottle-present eye can be obstructed to maintain the cap gate in the open position in order to ensure that caps flow properly from the chute, transfer plate, and into the cap star. Any tight-fitting areas may be enough to prevent the caps from flowing properly into the cap star. It is also important that the appropriate cap back pressure be available for top rated machine speed on a given cap to ensure their flow through the chute.

CAUTION: DO NOT ALLOW THE CAP CHUCK ASSEMBLIES TO COME IN CONTACT WITH THE CAP STAR. COMPONENT DAMAGE WILL OCCUR.

It also must be evaluated as to how the 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 area of the cap gate, 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.

REDUCING FOAM AND AERATION

This section provides useful information to foam and aeration during the process of filling the container.

Supply

A larger tank on the supply side will allow the product to settle longer if it is subject to easier foaming in piping transfers. The product level should be kept high in the tank and a baffle system used to help stabilize product on the opposite side from the inlet. The pump should be run as slow as possible and large piping will help reduce turbulence and velocity. Ensure that unnecessary bends, filters, etc; are not in the piping that can add to the agitation on the way to the manifold.

The supply control throttling valve should be checked to ensure that it can maintain control of the liquid level within the tank at a +/- 1/2-inch range. Excessive up and down conditions within the tank cause aeration of the product and also affects the way the product pump system handles the incoming pressure. The pump suction head variance can produce significant problems in maintaining final container liquid level control. Also, if the liquid level in the tank is cycling up and down, it shows that the product flow rate into the tank is changing drastically and inconsistently. It is far better for the customer to provide a liquid supply system that sends liquid to the supply tank at a rate just slightly faster than the requirements of the machine. Under these conditions, the throttling valve can work at a near open position, maintaining an almost perfect flow of liquid matching the rate the filler discharges the liquid into the containers.

Machine Speed

Ensure the machine has time to clear the foam off the top. Do not run the machine so fast that the bottles are filled but the foam isn't cleared before engaging the shoe.

Outer Tube And Inner Tube Clearance

Ensure the length of the outer tube relative to the inner tube allows the gap between the two permits plenty of clearance for the overflow path. In the case of a spiral inner tube, ensure this path is sufficient. If the product has some pulp, this may be creating a restriction or clogging that will prevent this natural flow from occurring.

Choking

Ensure that the tube is not swirling the product flow in the top of the container. It should be flowing smoothly across the inside of the container for a very gentle fill. If it is too high in the neck, it may also be trapping air in the container and not allowing it to freely pass.

Restricted Overflow Leg

If the overflow hose is not clearing, this can cause delays in the fill cycle. Ensure the overflow tank is not back pressuring the liquid system.

Return Mixing With Supply

If the foam seems to build up in the run or fill levels, and become more aerated the longer the run, this means the overflow is affecting the supply. The overflow is a combination of product and air from the evacuated bottle; therefore it must be allowed to settle before being re-introduced into the supply stream. The filler can only fill clean product if it is delivered clean product.

Cleaning

The pumps need not be dismantled for cleaning and cleaning solutions can be flushed through the tank and the pump. The seals and impellers in the pump should be inspected weekly. If the pump seals begin to wear, the pump will begin to suck air into the liquid, thus aerating the product.

US BOTTLERS MACHINERY COMPANY

Procedure:	Reducing Product Overflow - TS				
Procedure No.:	80404	**Revision:**	A	**Date:**	10 Feb 10

There are several methods that may be employed to reduce product overflow. The application of a restrictor valve mounted to the tee at the top of the filler where product enters the filler may be used to restrict flow when overflow conditions are at the highest. This is when the filling valve is open and the machine stops, or when there are not bottles present. In these cases, use the restrictor valve or bi-flow valves to radically restrict flow and then open these when flow is required.

If the machine is designed for gallons but only now runs 10 oz size, increase the shoe or add restrictors to the supply hoses to reduce flow by increasing resistance. Ball valves are also sometimes used on the hose for variable shutoff.

Ensure the pump is not running too high. Accelerating the pump speed does not increase flow nor lead to faster fills.

CAUTION: ATTEMPTING TO REDUCE OVERFLOW BY CHANGING PUMP SPEED IS NOT RECOMMENDED. THIS CAN RESULT IN LOSS OF FLOW AND AIR ENTRAPMENT IN THE VERTICAL PIPING. IT CAN ALSO RESULT IN MORE AGITATION AND FOAMING WHICH REQUIRES MORE TIME TO SETTLE .

With some insightful programming, the customer can do a lot of things to reduce the rate of return. For example, the overflow tank pump can be used to recirculate the product to the supply tank if the temperature allows. The bottle stop control can interface with the restrictor valve to slow product flow. Consult with the service team at US Bottlers for suggestions that would apply to your type of filler.

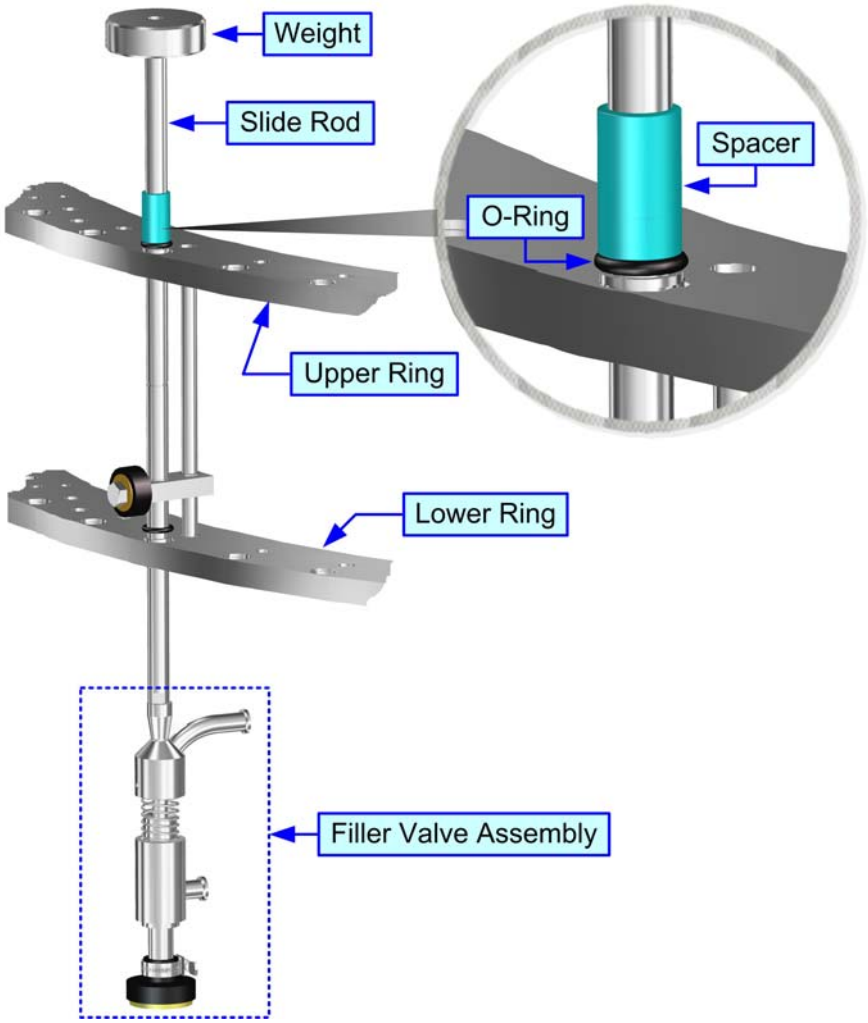
US BOTTLERS MACHINERY COMPANY

Procedure:	Reducing Plastic Bottle Expansion - TS				
Procedure No.:	80405	**Revision:**	A	**Date:**	04 Feb 10

With lighter-weight containers and especially with higher fill temperatures, plastic containers tend to change shape with less pressure being exerted upon them. The top weight is necessary to maintain a seal on the finish of the container, but this can be reduced by placing a spacer onto the slide rod below the weigh to rest upon the upper ring. Cutting this spacer to the correct length, will prevent the container from collapsing. An o-ring under this spacer will also help cushion the weight as it falls off the cam and onto this stop.

Stopping the filler with containers in the machine also leads to ballooning containers. So take care to avoid this condition. Spraying cold water on the containers to keep them stable can lead to thermal shock and separation if made from layered plastics. It can also lead to thermal shock in the filling valve hoses due to the same reason. If your bottle supplier approves of spraying the containers, be careful not to cool the outside of the hose when running hot liquids.

Round containers will always be more stable than rectangular shapes because the pressure inside is uniform and pushing against the weaker sides trying to create a round shape. A round bottle is already preformed into that shape.



US BOTTLERS MACHINERY COMPANY

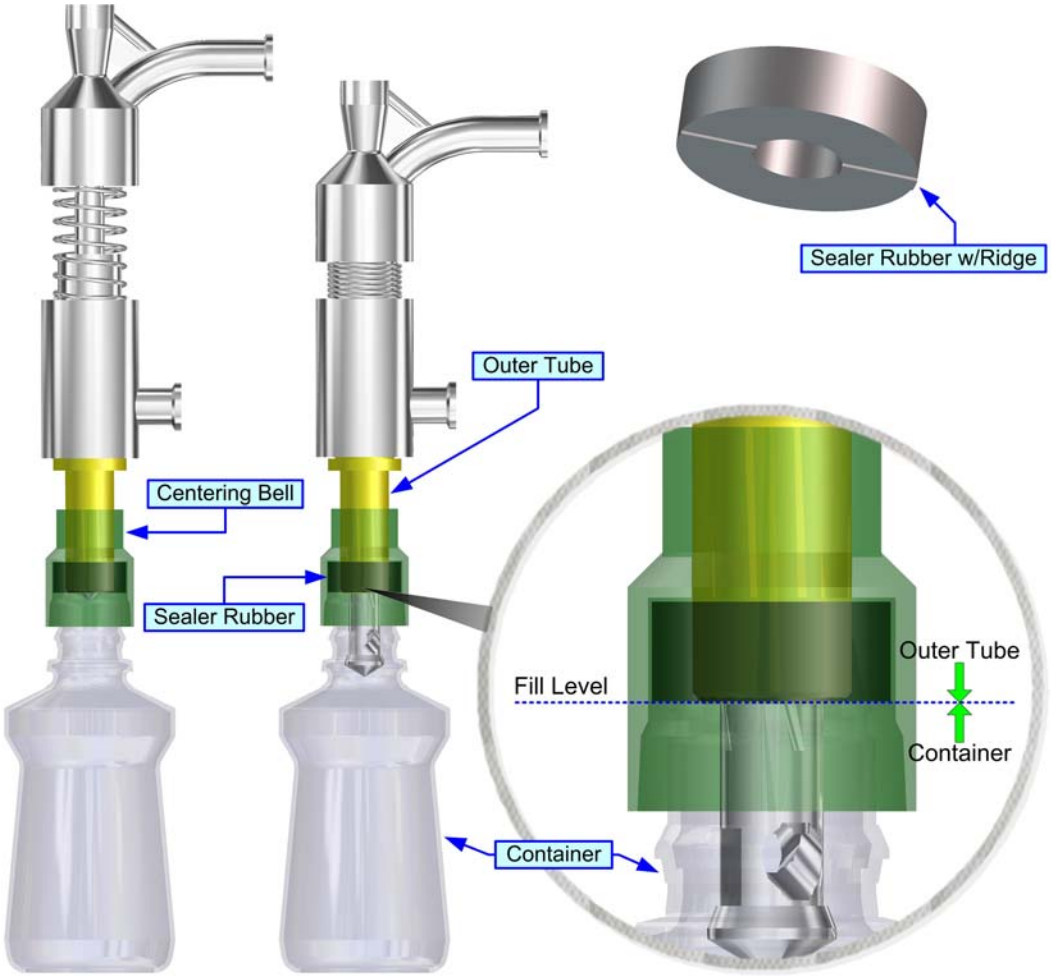
Procedure:	Brim Filling - TS				
Procedure No.:	80406	**Revision:**	A	**Date:**	04 Feb 10

Often a customer will set up the sealer rubber on the end of the outer tube thereby not allowing an air space at the top of the container. This is termed a “brim fill”. It is practically a standard in some customer’s plants. However it leads to some concerns that should be noted here.

First of all, we cannot guarantee a brim fill or any fill less than 1/4” from the top. It leads to a significant likelihood of spillage when the tube is withdrawn and when the bottle transfers out of the filler. Spillage not only results in lost product but can lead to premature corrosion issues. Also, when the tube is pulled from the bottle, it hasn’t air to replace it and can lead to a vacuum that can actually lift a bottle off of the table. This is why many sealer rubbers incorporate a thin raised ridge or ”vacuum breaker” on the underside for these applications. If these breakers wear away they can lead to bottles being lifted and bent filling valves.

Some customers actually move the shoe out of position to squirt product into the bottle at the discharge to top off the container. Keep in mind, the machine is not designed to operate in this manner, but it has been used in this way by customers who wanted to strive for an overfilled final product.

If the same finish and fill heights can be standardized on from bottle to bottle, then this changeover can be made extremely quickly and efficiently.



US BOTTLERS MACHINERY COMPANY

Procedure:	Feed Worm/Conveyor Timing - TS				
Procedure No.:	80407	**Revision:**	A	**Date:**	20 Sep 09

There are two socket head cap screws located in the worm-driving flange. Loosen these setscrews so that the feed worm can be revolved by hand.

Time the feed worm so that when a container is in the last thread of the worm (closest thread to the feed star), and the machine is rotated by hand, the bottle moves into the pocket of the feed star with about 1/8 or 1/4 inch clearance behind the back of the preceding star pocket at the instant the last worm thread releases the container. When proper timing is achieved, retighten the setscrews.

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

The conveyor speed is to be slightly faster than the final lead of the feed worm so the bottle is always held against the leading front edge of the worm.

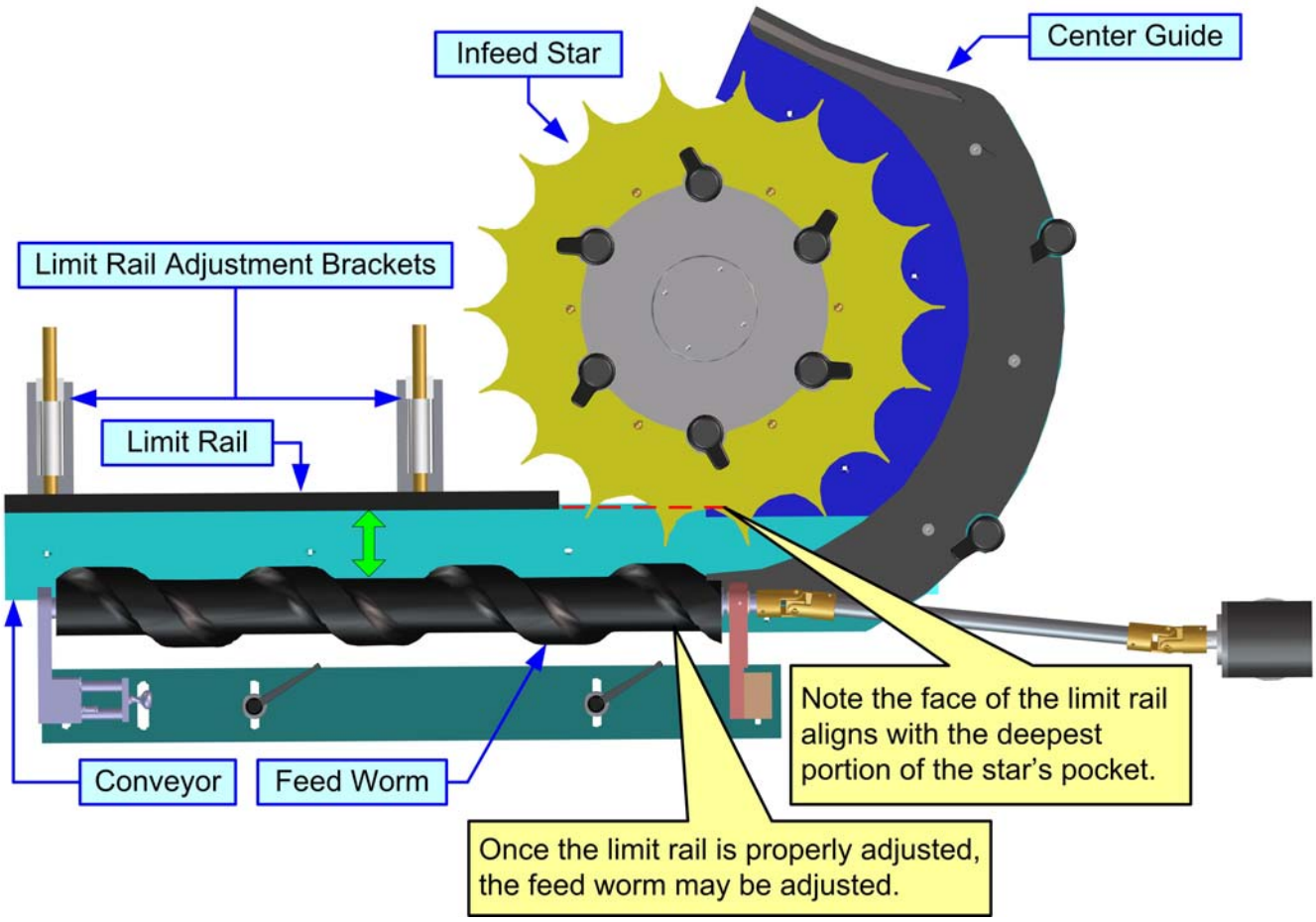
Set the feed worm so that its diameter is in line with the radius of the center guide. Adjust the worm bracket so as to achieve a smooth transition from the worm to the center guide. Adjust the feed worm parallel with the conveyor and the limit rail, and then retighten all setscrews.

NOTE: Following feed worm adjustment, the limit switch may also require adjustment.

US BOTTLERS MACHINERY COMPANY

Procedure:	Limit Rail Adjustment - TS				
Procedure No.:	80408	**Revision:**	A	**Date:**	20 Sep 09

A properly positioned limit rail is oriented so that its face rests just behind the deepest portion of the infeed star's pocket. Loosen the quick release levers located on each adjustment bracket to adjust the limit rail forward or backward as required. Retighten the levers to secure its position.



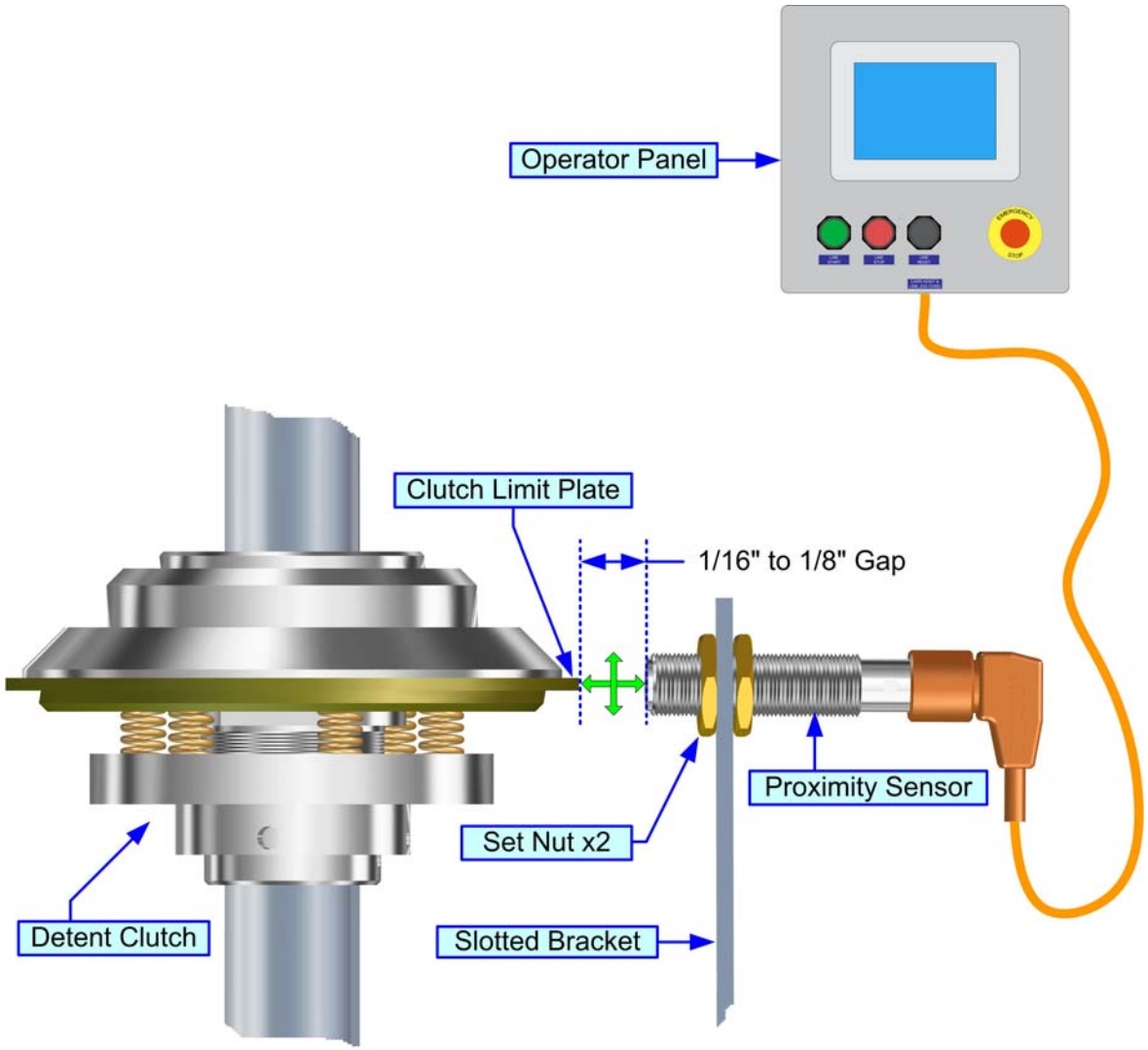
US BOTTLERS MACHINERY COMPANY

Procedure:	Detent Clutch Sensor Adjustment - TS				
Procedure No.:	80409	**Revision:**	A	**Date:**	08 Feb 10

This switch must be accurately positioned in order to register the disengagement of the clutch. Maximum movement of the clutch limit switch plate is less than sixty thousandths. Therefore, it is important that the detent be properly set to ensure that when the detent clutch does disengage and that it trips the limit switch (proximity sensor) that is wired into the operator panel to activate emergency stop conditions. This will be required since, at the point when the detent does disengage, the machinery is no longer synchronous with the rest of the packaging line.

To adjust the sensor, loosen the two set nuts and manually adjust the sensor both vertically and laterally. Adjust vertically to position the tip of the sensor directly adjacent to the end of the clutch limit plate. Adjust laterally to provide a 1/16” to 1/8” gap between the end of the limit plate and the tip of the sensor. When complete, retighten the two set nuts and test functionality by tripping the detent clutch and checking for the error of the machine’s operator panel.

NOTE: A properly set limit switch will only require a small amount of pressure to activate.



US BOTTLERS MACHINERY COMPANY

Procedure:	Mechanical Detent Clutch - TS				
Procedure No.:	80411	**Revision:**	A	**Date:**	08 Feb 10

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 and connected by a number of balls resting in dimples in the flanges. Manual adjustment determines the amount of torque required to force the balls from the dimples that holds the flanges apart.

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 ITS PREVENTIVE MAINTEANCE SCHEDULE. LUBRIATE LIGHTLY TO PREVENT SLIPPAGE DURING OPERATION.

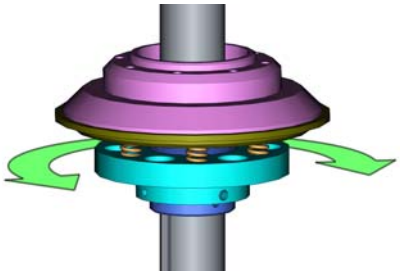
A proximity switch and mounting bracket is provided with the detent clutch. This switch must be accurately positioned in order to register the disengagement of the clutch. It is important that the detent be checked occasionally to ensure that when the detent clutch does disengage, it trips the proximity switch to stop the machine.

Under normal operation, when the clutch is under high pressure, there is a slight separating 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 inch.

If the machine can be rocked forward and back with a large amount of backlash, one may assume that the detent clutch is beginning to wear or is loose. When the clutches' dimpled driving flange plate begins to wear, the angular alignment 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 HARWARE INOPERABLE AND VOID ALL WARRANTIES RELATIVE TO THESE DRIVE TRAIN COMPONENTS.

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



F-0001A

US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Rotary Unions - TS				
Procedure No.:	80412	**Revision:**	A	**Date:**	10 Feb 10

The filler rotary union is designed to act as a controlled alignment device using two rotary bearings with product seal rings, and retainer snap rings. The union is to be installed in the upper portion of pressure gravity fillers so that the upper manifold ferrule has its tri-clamp at the top of the assembly, allowing for product drainage at the end of an operational cycle. A rotary union is located within all filler cabinets, centered within its main bearing.

Product under pressure enters the upper ferrule and passes through to the rotary lower housing. Liquid is contained within these elements by the seal rings. It is important to maintain a film of lubricant over the seal to metal contact surface to prevent the seal from prematurely wearing.

WARNING: ROTARY UNIONS ARE NOT DESIGNED TO SUPPORT WEIGHT. ASSEMBLY DAMAGE AND PERSONAL INJURY MAY OCCUR IF IMPROPER LOADS ARE PLACED ON THEM. ENSURE THE MACHINE'S SUPPORT STRUCTURE IS PROPERLY IN PLACE AND ADJUSTED TO ALEVIATE EXCESSIVE WEIGHT LOADS.

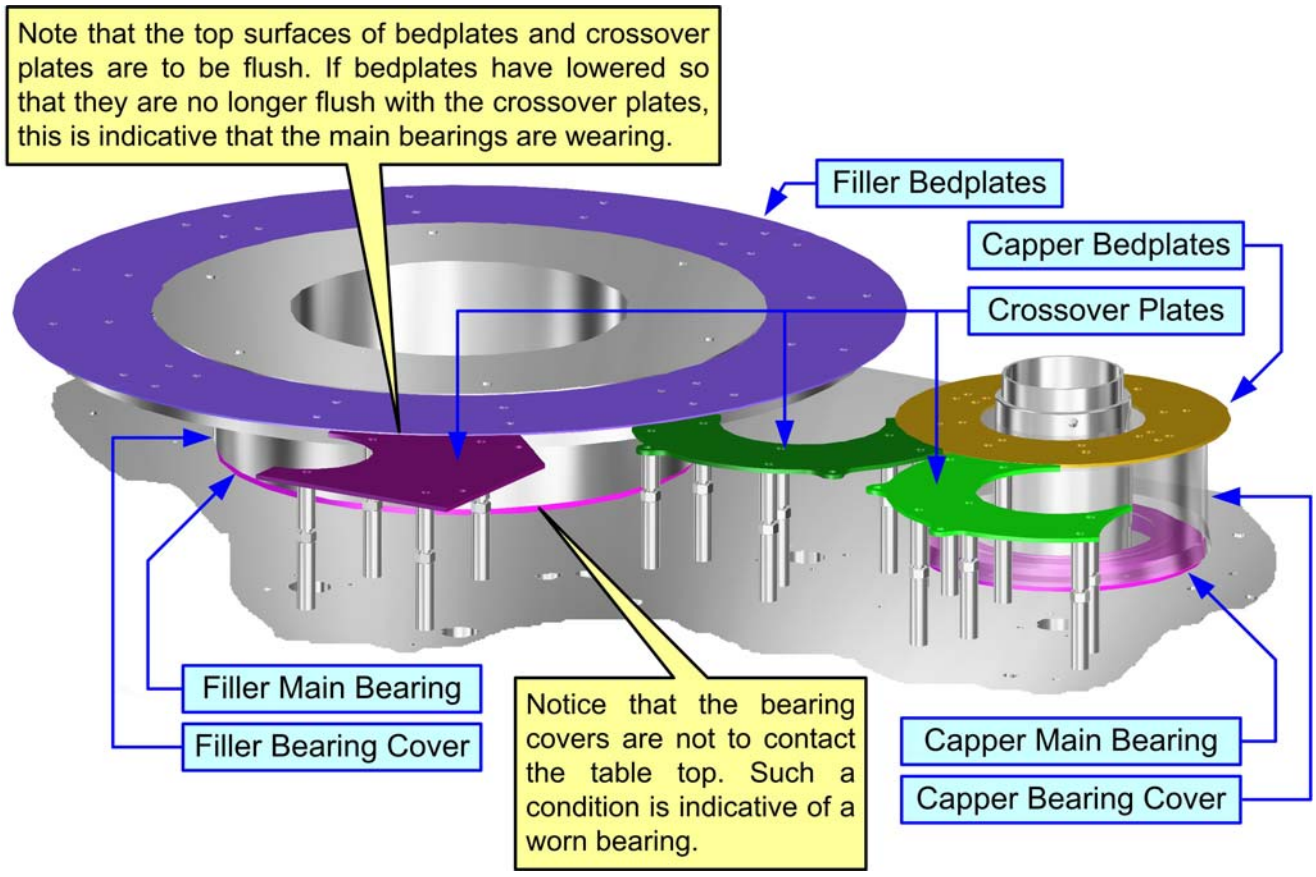
The rotary union is designed to act as a seal system between a stationary and a rotary liquid environment. It is not meant to support heavy loads. If the rotary union is forced to support weight, it may incur an additional thrust load that could eventually wear the retaining sleeves, causing the unit to separate slightly and leak. If significant wear on these rings is observed, this would be the first area to review.

US BOTTLERS MACHINERY COMPANY

Procedure:	Main Bearing - TS				
Procedure No.:	80413	**Revision:**	A	**Date:**	10 Mar 10

If the main bearing begins to fail it is identifiable by several conditions. Firstly, it will be necessary to use more than normal power to rotate the machine. Secondly, rotational motion of the machine will exhibit a vibration or a bumping action. In addition, the rotational part of the machine may actually have dropped down as much as 1/32 inch 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. Check the crossover plate where the bottles enter and leave the filler against the bed plate sectional covers that the bottles sit on. If the sectional segments of the rotary machine appear lower then the bed plate crossover, 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 they move freely up and down. If the problem disappears, the bearing is more than likely in good working shape.



US BOTTLERS MACHINERY COMPANY

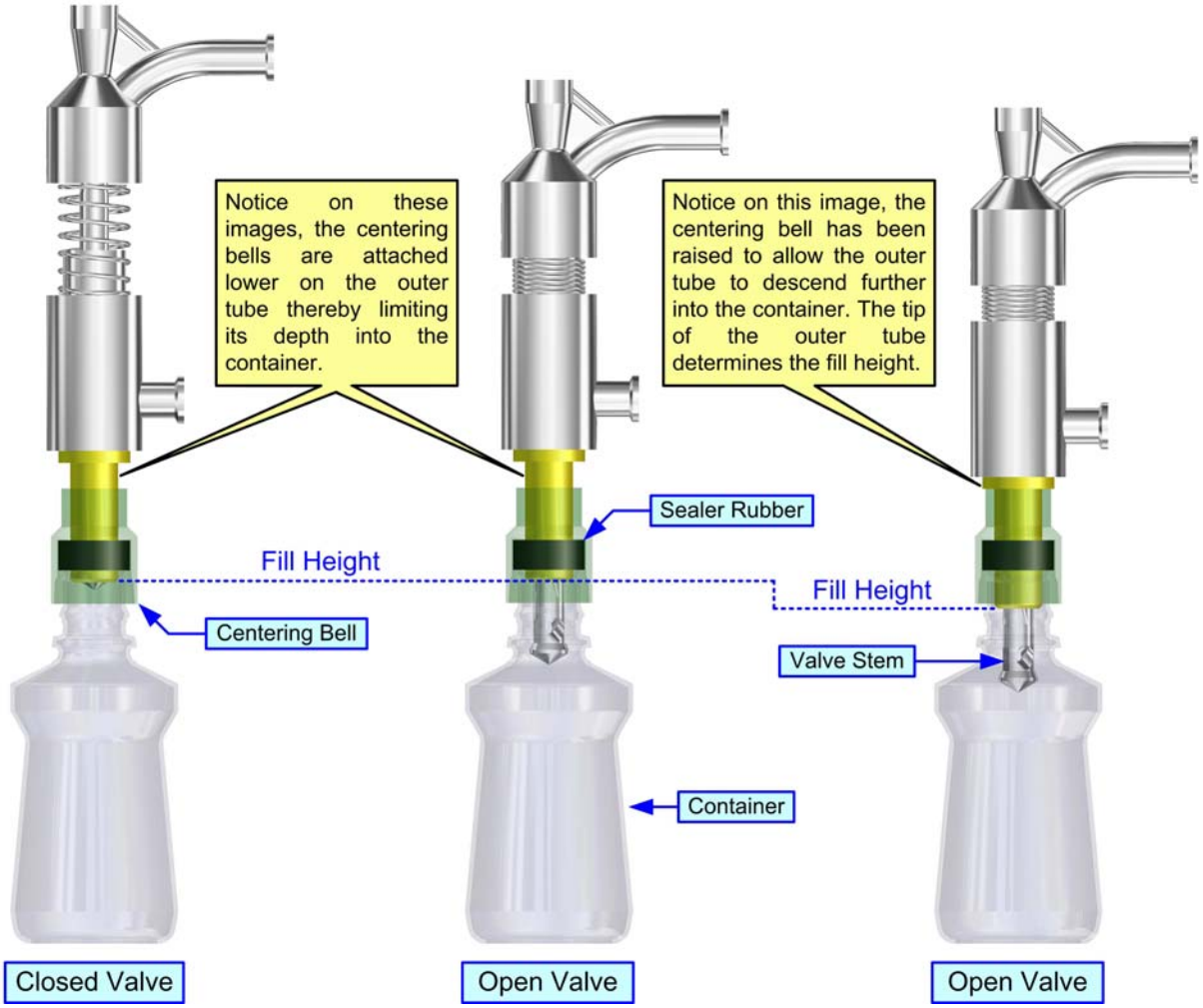
Procedure:	Fill Height-Filler Valve Adjustment - TS				
Procedure No.:	80414	**Revision:**	A	**Date:**	05 Feb 10

The method used to support the sealer rubber and properly position it on the outer tube depends on the design of the valve. The distance between the sealer rubber and the lower end of the outer tube represents the vertical distance from the top of the container to the liquid level at the end of the cycle.

To lower the fill point, raise the sealer rubber to expose more of the outer tube. To raise the fill point, the sealer rubber must be lowered. The sealer rubber may either be secured via a clamp or is part of the centering bell housing.

When the fill heights are fairly high and uniform across a range of containers, a centering bell system may be used. The centering bell is often removable and can easily be changed depending on the size of the container opening. The length of the bell may need to be cut in the field for the proper fill height under temperature. Ensure these are all cut the same and the integrity of the bell action is not compromised leading to chipped glass.

ATTENTION: For some containers and valves, moving the centering bell excessively upward will render the bell ineffective. In such cases, a different valve is required.

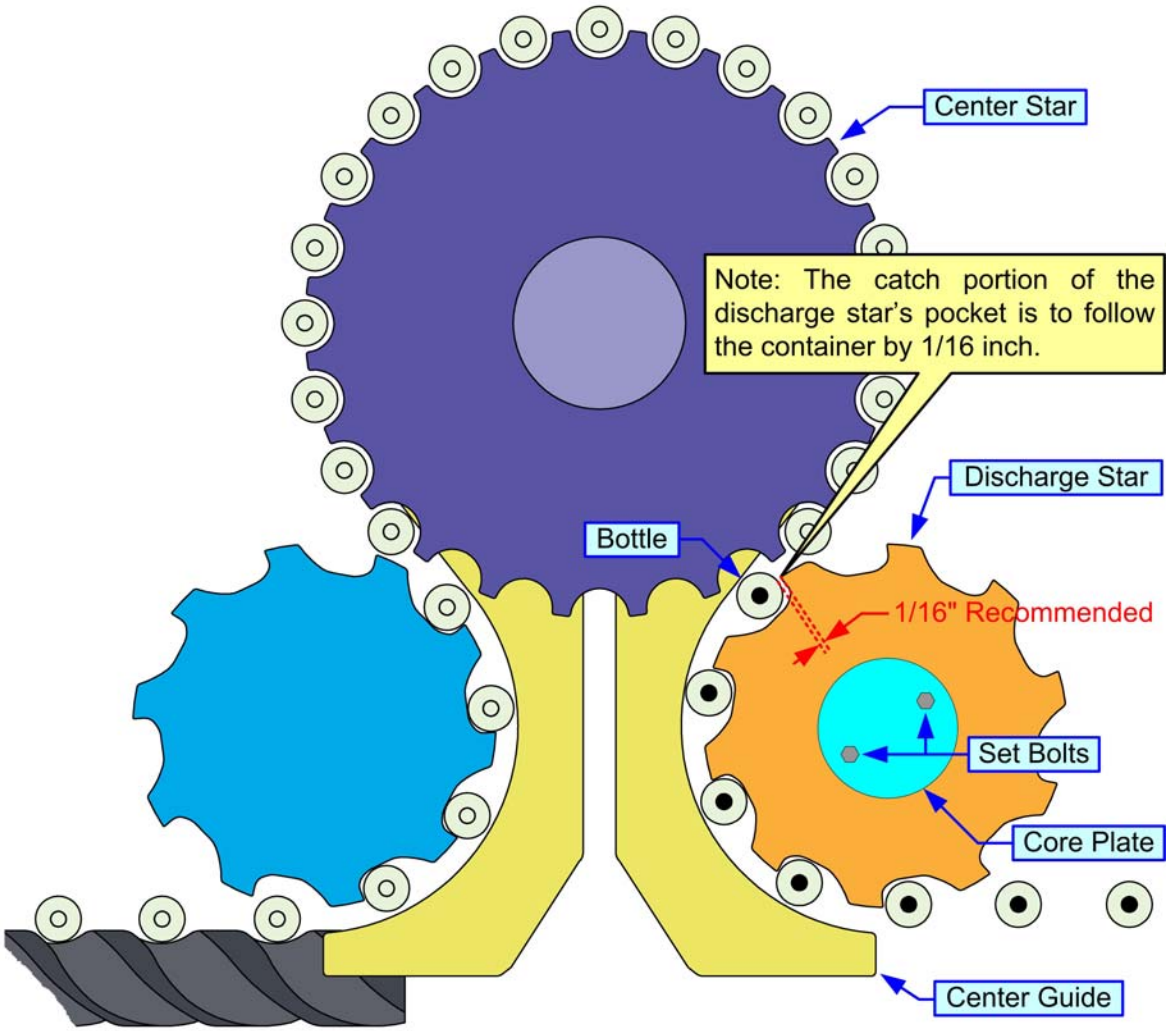


F-0001A

US BOTTLERS MACHINERY COMPANY					
Procedure:	Discharge Star Timing - TS				
Procedure No.:	80415	**Revision:**	A	**Date:**	20 Sep 09

DISCHARGE STAR TIMING (For Core Mounted Stars)

A properly positioned discharge star is oriented so that the star's pocket is aligned 1/16" behind the bottle. To adjust, loosen two set bolts to rotate the star to the proper position on the core plate and retighten the set bolts.



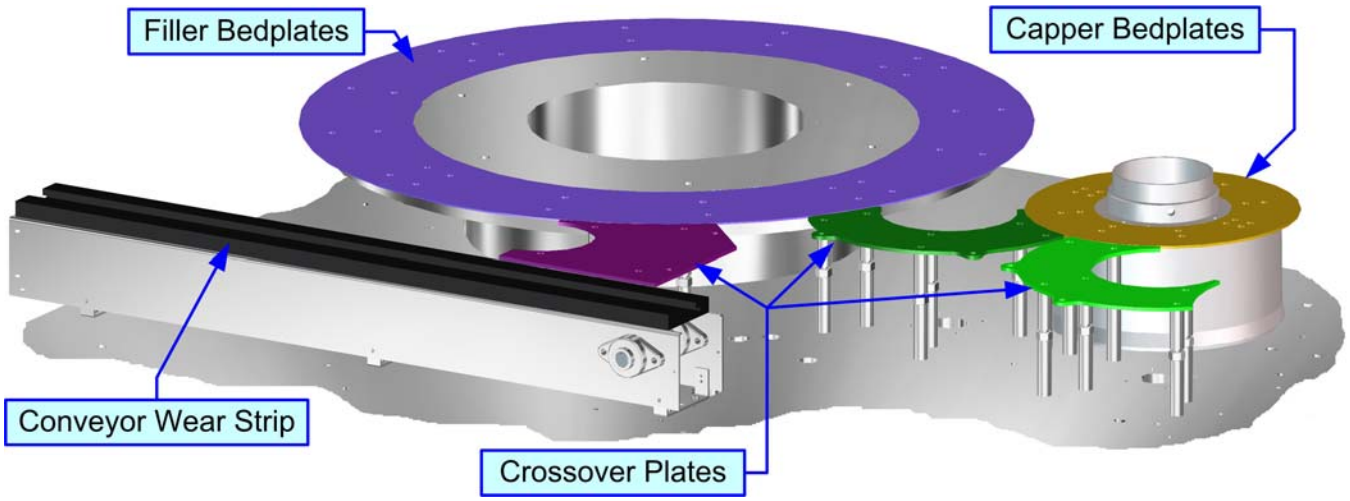
US BOTTLERS MACHINERY COMPANY					
Procedure:	Crossover Plates, Bedplates, and Conveyor Wear Strips - TS				
Procedure No.:	80417	**Revision:**	A	**Date:**	11 Feb 10

Review the crossover plate to ensure that the bottle action of moving on and off the conveyor is smooth. When necessary, replace the crossover plate or adjust it upwards to ensure proper transfer. The crossover plate is to always be vertically positioned so that it is slightly higher so the container traveling off the plate doesn't trip.

If the bed plate covers become worn or warped, they should be replaced. If the bedplates are badly worn, three things can occur:

1) the containers will jostle on the bed plate when entering the filler causing the filling tube to have difficulty aligning with the opening of the bottle;
2) 2) spilled liquid can become trapped on the bed plate and drip down through the attachment screws accelerating corrosion; and
3) 3) properly filled bottles will not smoothly exit the machine.

Conveyor wear strips that support the conveyor motion and the return conveyor chain section must be inspected to ensure that they have not worn through. Only chain lubricant is necessary for the conveyor wear strips.



US BOTTLERS MACHINERY COMPANY

Procedure:	Hoses, Gaskets, Seals and O-ring Materials - TS				
Procedure No.:	80419	**Revision:**	A	**Date:**	20 Sep 09

Depending on your particular product, the machine has been selected with what was felt to be the correct materials. However, it is very difficult to anticipate all of the chemicals and products that the customer may choose to use throughout the lifetime of the machine that may have an adverse affect on these materials.

For example, a typical gravity juice filler will be supplied with silicone tri-clamp gaskets and silicone hosing material and sealer rubbers, since these are best suited for the citrus acid environment, and a lightweight flexible material is required in the hosing material. However, silicone can be attacked by various chemicals in cleaning solutions, and these should be reviewed prior to use on the equipment.

For applications such as the liquor industry, Teflon-lined hosing may be incorporated. In unique applications, unusual style o-rings and seals have been customized for each individual job. It is the guarantee of U.S. Bottlers Machinery Company to provide materials of quality, free of defects or faults in workmanship. However, it is the customer's responsibility that they do not adversely affect these materials with chemicals or caustics, which may lead to their degradation. All of these items are, in their nature, wear items and eventually will need to be replaced.

US BOTTLERS MACHINERY COMPANY					
Procedure:	Supply Manifold Shoe Adjustment (Gravity Filler) – TS				
Procedure No.:	80423	**Revision:**	A	**Date:**	23 Feb 10

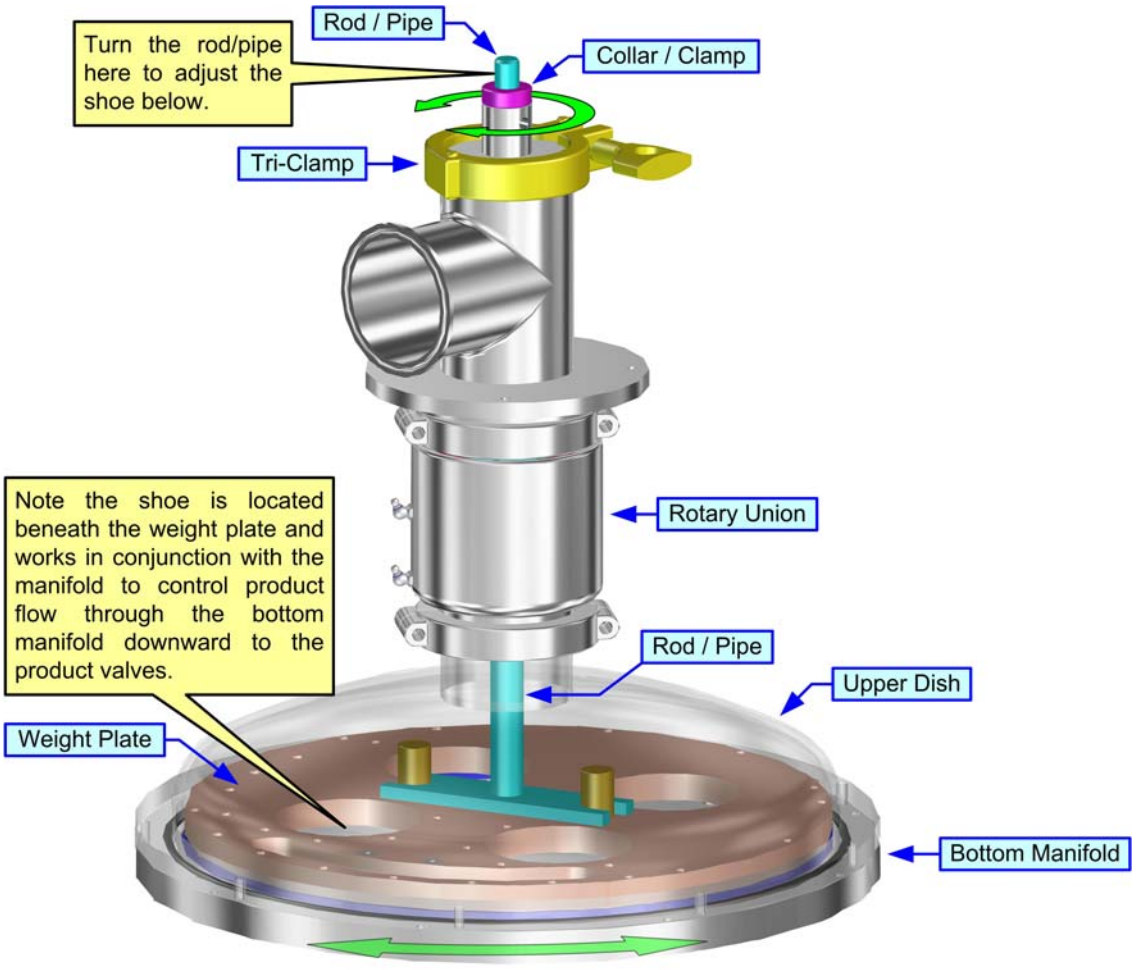
SUPPLY MANIFOLD SHOE ADJUSTMENT

The supply manifold shoe is to be set to allow internal container pressure to stabilize before withdrawing the filling valve. This is most critical for plastic containers to prevent burping.

The gravity filler incorporates a shaft or pipe through the upper rotary union as a holding mechanism for the manifold shut-off shoe plate. This rod or pipe must be held from rotating to keep the shoe in the proper angular alignment.

To adjust the shoe position, the locking collar must be loosened to allow the shoe to turn. This is usually the collar or clamp on the roof at the top of the 4" tri-clamp cap. The set collar or set of locking bolts must be loosened to allow the rod to be turned with a wrench and then retightened. Another approach is to loosen the 4" tri-clamp at the base of this cap and to turn the cap and the shaft together. This is not recommended if there is product pressure on the liquid system at the time.

ATTENTION: If it appears that a group of bottles in a row are not filling, this could be a sign that the shut-off shoe has been spinning with the rotation of the filler or has moved out of position.



US BOTTLERS MACHINERY COMPANY

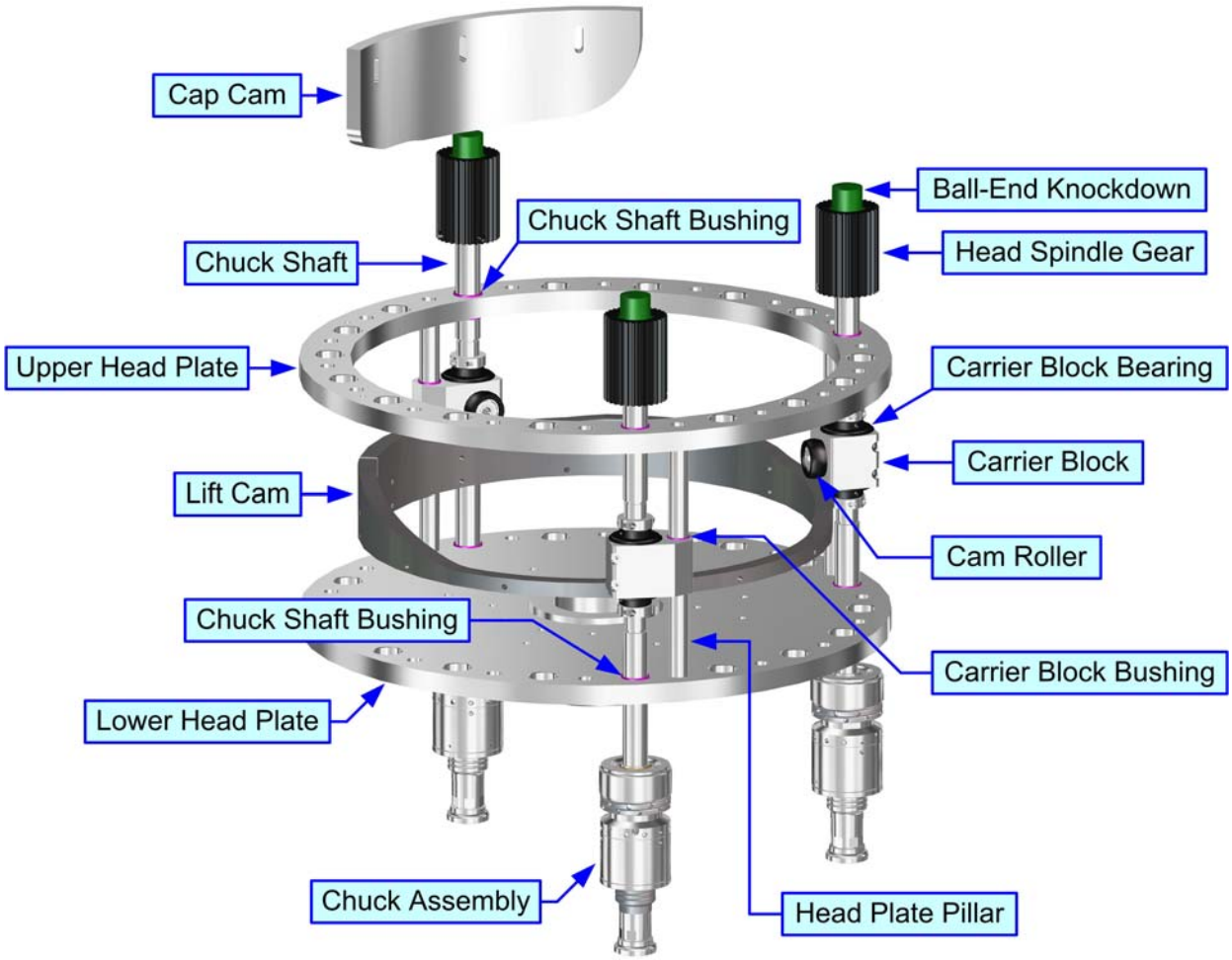
Procedure:	Capper Chuck Shafts & Rollers - TS				
Procedure No.:	80427	**Revision:**	A	**Date:**	05 Feb 10

Improper cap applications can be the result of worn or damaged capper head components. It is critical that each chuck shaft remain straight and undamaged for proper vertical movement of the head assembly. Inspect the cam rollers to ensure that they have not developed flat spots and that they properly roll on the cam.

ATTENTION: In a reverse capper application, it is critical to ensure that these have not become loose and remain tight to the carrier roller block so that the rollers do not disengage, causing the chuck shaft to drop.

Ensure the bushings that are pressed into each head plate where the chuck shafts and head plate pillars slide in and out, are not worn and are free of product. Excessive slop in these areas will also lead to improper cap applications.

Review the cam and cam lift sections to ensure that the roller hardware has not worn a groove in the cam. If the cam begins to show signs of wear, it can be reshaped in order to ensure proper rolling action. In the event that it is worn excessively, these sections are to be replaced.



US BOTTLERS MACHINERY COMPANY

Procedure:	Troubleshooting Table (PG-RC) - TS				
Procedure No.:	80480	**Revision:**	A	**Date:**	01 Oct 09

TROUBLESHOOTING TABLE

SYMPTOM	POSSIBLE CAUSE/SOLUTION
✶✶✶✶✶✶ **Gravity Filler** ✶✶✶✶✶✶	
Containers not properly separated by feed worm.	• Incorrect feed worm in use: Ensure the feed worm and the container type match. • Incorrect clearance between worm and limit rail: Ensure positioning with proper spacing. • Leading edge of worm excessively worn: Order replacement sending three sample containers to USB. • Conveyor speed set too slow or fast: Adjust to work in unison with the feed worm.
Containers not properly entering feed star.	• Worm improperly timed: Adjust the timing speed of the feed worm. • Conveyor speed too fast or slow: Adjust to work in unison with the feed worm. • Incorrect feed worm in use: Ensure the feed worm and the container type match. • Incorrect infeed star in use: Ensure the infeed star and the container type match. • Feed worm and limit rail improperly positioned: Reposition the feed worm. Reposition the limit rail. • Limit switch incorrectly set: Reset as necessary. • Uneven worm crossover plate: Check for smoothness and shim if needed.
Container not properly leaving filler.	• Improper timing of discharge star: Adjust discharge star timing. • Improper setting of discharge guide finger: Adjust guide finger setting. • Improper conveyor speed: Adjust to work in unison with the feed worm. • Bent filling tube: Check straightness and replace as necessary. • Improper crossover plate height: Ensure flush height, shim or adjust shim as required.

Filling tube not centering on bottle opening.	• Feed star improperly adjusted: Adjust as necessary. • Filling stems are too long or short: Refer to attachment reference to ensure correct setup. • Incorrect center guide: Refer to attachment reference to ensure correct setup. • Infeed guide finger is improperly set: Adjust as necessary. • Bent or worn filling tubes: Check straightness and replace as necessary. • Container centering pockets out of position: Realign with valve assembly. • Worn crossover plate: Replace as necessary. • Worn tube slide bushings: Replace. • Failure to use infeed guide finger on non-round containers: Install. • Cam improperly adjusted: Adjust.
Erratic fill levels.	• Incorrectly positioned seals: Reposition. • Seals leaking air at container's top: • Seals leaking air around outer tube: • Air entrapped in supply manifold: • Excessive product pressure: • Restricted overflow: • Bent inner and outer filling tubes: • Mal-adjusted or damaged shutoff shoe: • Aerated product:
Low fill volume.	• Slow product flow: • Machine speed too high: • Shoe not properly adjusted: • Seal and clamp not properly set: • Overflow system clogged: • Filling tube supply hose restricted:
High fill volume.	• Air leak between container and tube: Replace seal as required. • Seal incorrectly set: Adjust as required.

Excessive foam during fill.	• Product liquid entering container at wrong position: Return to manufacturer for testing/replacement. • Product pressure and tube tip liquid velocity too high: Reduce product pressure. Alter first/second stage fill levels. • Aerated overflow mixing with product supply: • Pressure feeding tank too high: • Erratic supply tank level control: • Machine speed too high relative to fill speed: • Incorrect filling stem design:
Liquid spillage at discharge.	• Fill level too high: • Transfer at crossover not smooth: • Conveyor speed too fast or slow: • Discharge rail improperly set: • Discharge star not properly timed: • Lift cam extension causing tube to exit bottle too soon: • Drip pan too high above container top: • Choke neck bottle detector too far from discharge star:
Liquid spraying out of container top during tube withdrawal.	• Fatigued tube springs: • Bent inner and outer tubes: • Supply manifold shoe improperly set: • Excessive product pressure: • Restricted overflow:
Erratic supply tank levels.	• Product supply capacity too high: • Non-controllable supply product pump: • Product pump pressure too high for control tank throttling valve: • Improper setting of pneumatic control valve actuator: • Electronic sensors place too far apart:
Foreign material in filled containers.	• Plastic shavings: Worn supply manifold shoe. • Rubber shavings: Worn o-rings at tube tip.

Tube Drippage.	• Air leak at tube connector: Replace defective gasket at tube head. • Hoses overlapping: Re-arrange to eliminate problem. • Restricted overflow: • Overflow hoses too long: • Excessive product pressure: • Valve stem not properly closing: Replace valve seat o-ring. Check valve stroke for correct over travel. • Damaged inner tube: • Product tube holes too large or tube too long: Return to manufacturer for testing/replacement. • Cam and tube action at discharge too rough: Adjust cam so the roller slide at discharge contacts cam at shallowest angle for smoothest release. • Damaged product valve seat: Visually inspect for nicks or foreign material. Replace as required.
Difficult cam adjustment.	• Vertical cam stud shaft corroded or dirty: • Improper roller chain tension: • Worn bearings on cam adjusting shaft: • Worn bevel gear set:
Jerking action while machine rotates.	• Slides binding on lift cam:
Noise in center of machine.	• Main bearing failure: Replace and ensure proper lubrication in future.
Slide rollers skipping/sliding on cam.	• Worn roller: Locate and replace all rollers as required.
Noise at certain station.	• Binding slide: • Interference between rotating table and a fixed piece: • Cam stud bolt hitting cam: • Worn or high point in a gear: • Star shaft or pinion gear shaft bushing or bearing malformed:
Worm drive backlash.	• Excessive backlash in worm gearbox: • Sloppiness in universal joint: • Sloppiness in parallel shaft reduction box: • Play in keys between timing belt sprockets and drive shafts: • Worn bevel gear: • Stretched roller chain:
✷✷✷✷✷✷ **Rotary Capper** ✷✷✷✷✷✷	

Container not leaving capper properly.	• Improper timing of discharge star: Adjust discharge star timing. • Improper setting of discharge guide finger: Adjust guide finger setting. • Improper conveyor speed: Adjust the conveyor timing speed to work in unison with the feed worm. • Improper crossover plate height: Ensure flush height, shim or adjust shim as required.
Cap not centering on container opening.	• Feed star improperly adjusted: Adjust as required. • Use of incorrect attachments: Ensure correct attachments for product. • Head improperly timed: Adjust head as required. • Cap cocked in jaws: Ensure proper chuck jaws for cap. Excessive flash on cap. Lower cap jaw air pressure.
Low cap torque.	• Low clamp belt air pressure: Increase air pressure as required. • Low cap jaw air pressure: Increase air pressure as required. • Clutch slipping: Increase pressure on cap clutch. Shoulder worn on cap clutch. Lubrication on clutch cone. Replace clutch. • Machine running below setup speed: Increase machine speed as required.
Scored cap.	• Low cap jaw air pressure: Increase air pressure as required. • Over torquing of cap: Decrease air pressure on cap clutch. • Incorrect chuck jaws: Install as required. • Machine running above setup speed: Decrease machine speed as required. • Foreign material on chuck jaws: Clean jaw assembly.
Dropping caps.	• Low cap jaw air pressure: Adjust air pressure as required. • Seals in jaw/clutch assembly are dry: Disassemble and lubricate. • Machine running above setup speed: Decrease machine speed as required. • Pneumatic switches are defective: Replace as required. • Hole in air line to chuck: Replace air line as required. • Damaged o-ring in clutch/chuck assembly: Replace o-rings or seals as required. • Discharge star out of time: Set timing of star.

Missing caps.	• Chuck chute jammed: Clear chute. • Cap gate not releasing caps: Incorrect gate assembly. Gate air lines not connected. Photo eye not sensing container in worm. Timing sensor on discharge star shaft defective. • Incorrect feed worm: Install correct worm. • Use of incorrect attachments: Ensure correct attachments for product. • Incorrect cap for container and attachments: Load proper caps.
✷ ✷ ✷ ✷ ✷ ✷ **General Machine** ✷ ✷ ✷ ✷ ✷ ✷	
Rocking condition.	• Worn keyways on drive shaft: Replace as required. • Loose keyless bushings: • Worn detent clutch: Replace as required. • Worn Drive pinion gear/bull gear: Replace as required. • Worn coupling parts: Replace as required. • Worn main gearbox components: Rebuild or replace as required. • Detent clutch engaging and dis-engaging:
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: • 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..
Unable to turn machine.	• Prime motor has inadequate power: • Main machine clutch malfunctioning: • Slides binding at lift cam: • Inadequate clearance between cabinet top and rotary tank base: Failure in main bearing. • Worm binding:

Poor bottle handling.	• Incorrect attachments for container: Refer to attachment reference and install correct attachments. • Worn attachments: Replace as required. • Attachments improperly set: Adjust as required. • Worn crossover plate: Replace as required. • Worn bedplate covers: Replace as required. • Bent filler tubes: Straighten or replace. • Variations in containers: Verify container quality. • Container neck not square with base: Verify container quality. • Uneven container bottom: Verify container quality. • Infeed clearance too great: Adjust as required. • Center guide improperly positioned: • Conveyor rails too loose or tight: • Rail improperly positioned: • Incorrect worm pitch:
Skipping conveyor.	• Conveyor requires lubrication: • Worn return rail and conveyor wear strips: Replace as required.
Machine as a whole goes out of time.	• 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.
Premature failure of belt bearing.	• Excessive tension on belts: Adjust as required.

1. Remove clamps and gaskets from the top and bottom of the rotary union. Lift away the rotary union.

> **WARNING: ENSURE THE LIQUID MANIFOLD IS SUPPORTED BEFORE RELEASING ITS MOUNTING HARDWARE.**

2. Pry snap ring (1, Diagram A) from rotary union (2) using a large standard screwdriver (A).

> NOTE: To release the snap ring, pry inward, then upward on its free end and continue around its circumference until totally withdrawn.

3. Withdraw two ring spacer halves (3) from within rotary union (2).
4. Pry o-rings (4) and (5) from within rotary union (2) using a jewelers standard screwdriver (B). Discard removed o-rings.
5. Place a flat bar onto the rim of rotary union (2, Diagram B) and pry ferrule (6) along with seal support (7) and snap ring (8) from union (2) using large standard screwdriver (A).

> NOTE: Relocate the bar and screwdriver to different quadrants around the ferrule's flange to prevent binding while prying upward.

6. Inspect the sleeve surface of ferrule (6) for wear grooves.

> NOTE: Run a fingernail down the ferrule's sleeve to determine if wear grooves are present. If grooves are deep enough to be noticed, the ferrule is to be replaced.

7. If grooves are present, remove snap ring (8) followed by seal support (7) from ferrule (6).
8. Insert seal support (7) onto replacement ferrule (6) and secure with snap ring (8).

> NOTE: A properly installed seal support will be oriented so that its smaller outside diameter will face the ferrule's flange.

9. Flip rotary union (2) and manually withdraw one tri-lobe seal (9) and one quad seal (10). Discard seals.
10. Tap two bearing assemblies (11) and one spacer (12) from within rotary union (2) using brass bar (C).

> NOTE: Begin with the outer-most bearing assembly and using the brass bar and a hammer, tap around its circumference to prevent binding as being removed. Manually withdraw the spacer, then tap out the remaining bearing assembly.

> **CAUTION:** EXERCISE CARE WHEN TAPPING OUT THE BEARING ASSEMBLIES TO PREVENT BURRS AND SCRATCHES FROM OCCURRING ON THEIR FERRULE CONTACT SURFACES.

11. Test each removed bearing assembly (11) for wear and grit. Discard as necessary.

NOTE: To test the removed bearing for wear or grit, hold its inner ring while spinning its outer ring. If any snagging is noticed, the bearing assembly is to be replaced. The outer ring should spin freely.

12. Thoroughly clean the interior of rotary union (2).

NOTE: Use a rag to wipe all grease and foreign matter from the unit's interior surfaces.

13. Brush grease onto the interior surfaces of rotary union (2) until thoroughly covered.

NOTE: Only use food grade grease and apply using an approximately one inch wide paint or basting brush. Ensure that loose brush bristles do not contaminate the brushed on grease.

14. Insert two bearing assemblies (11) into rotary union (2) separated by spacer (12).

NOTE: The orientation of the bearings assemblies and the spacer is unimportant in their installation. The spacer must only separate the two bearings.

15. Apply replacement quad seal (10) and tri-lobe seal (9) into their respective grooves within union (2).

NOTE: The orientation of the two seals is unimportant in their installation. The tri-lobe seal (9) is to be inserted into the groove located closest to the ferrule's flange and the quad seal (10), further into the rotary union.

16. Brush grease onto all exposed interior surfaces within rotary union (2) until thoroughly covered.

NOTE: Only use food grade grease.

17. Brush grease onto the exterior of ferrule sleeve (6).
18. Insert ferrule assembly (6, 7, 8) into rotary union until it makes contact with the first tri-lobe seal (9).
19. Using jeweler's screwdriver, pull edge of tri-lobe seal (9) back so that ferrule may continue to travel.

CAUTION: EXERCISE CARE IN PRYING BACK THE SEALS EDGE TO PREVENT DAMAGE.

20. Repeat step 19 so that ferrule (6) may continue to travel past quad seal (10).
21. Place a plate onto the flange of ferrule (6) and tap with a hammer until the ferrule is fully inserted.

NOTE: Tap the ferrule down in a manner as to prevent binding.

22. Apply o-ring (5, Diagram A) onto its respective groove of seal support (8), then press into the groove using large screwdriver (A).

NOTE: Press the o-ring into the groove at one inch intervals around the entire circumference and then repeat the process again to press in the remainder.

CAUTION: EXERCISE CARE IN PRESSING IN THE O-RING TO PREVENT DAMAGE.

23. Apply o-ring (4) onto its respective groove of seal support (8), then press into the groove using large screwdriver (A).

24. Insert two ring spacer halves (3) within rotary union (2) and secure using snap ring (1).

ATTENTION: The break between the spacer halves is to be aligned with grease fittings (13) located on the rotary unions outer body. The break of the snap ring is to be positioned between the break of one of the spacers.

25. Install the assembly, apply extra grease, and test for functionality and leaks.

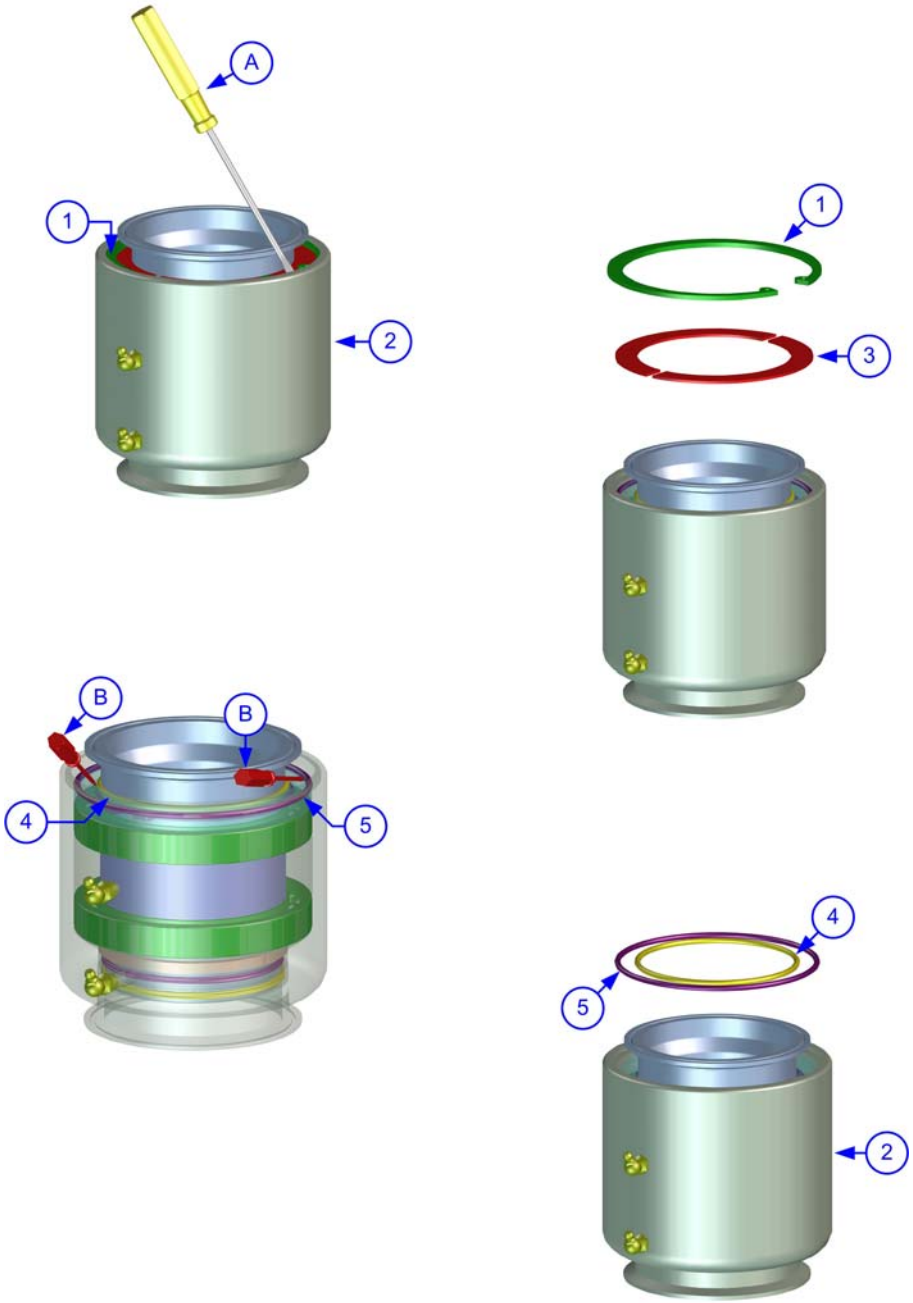


Diagram A

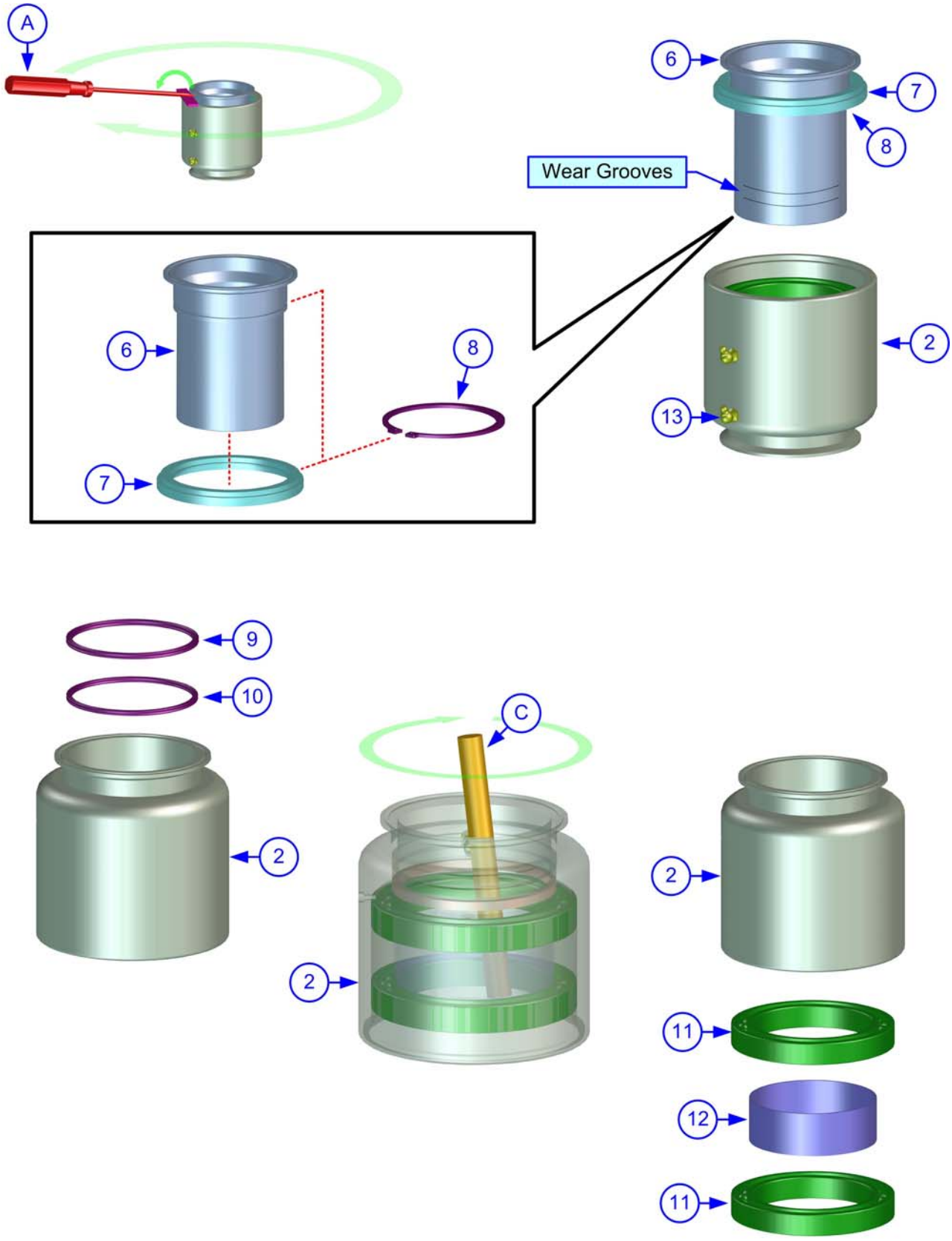


Diagram B

F-0001A

4/4

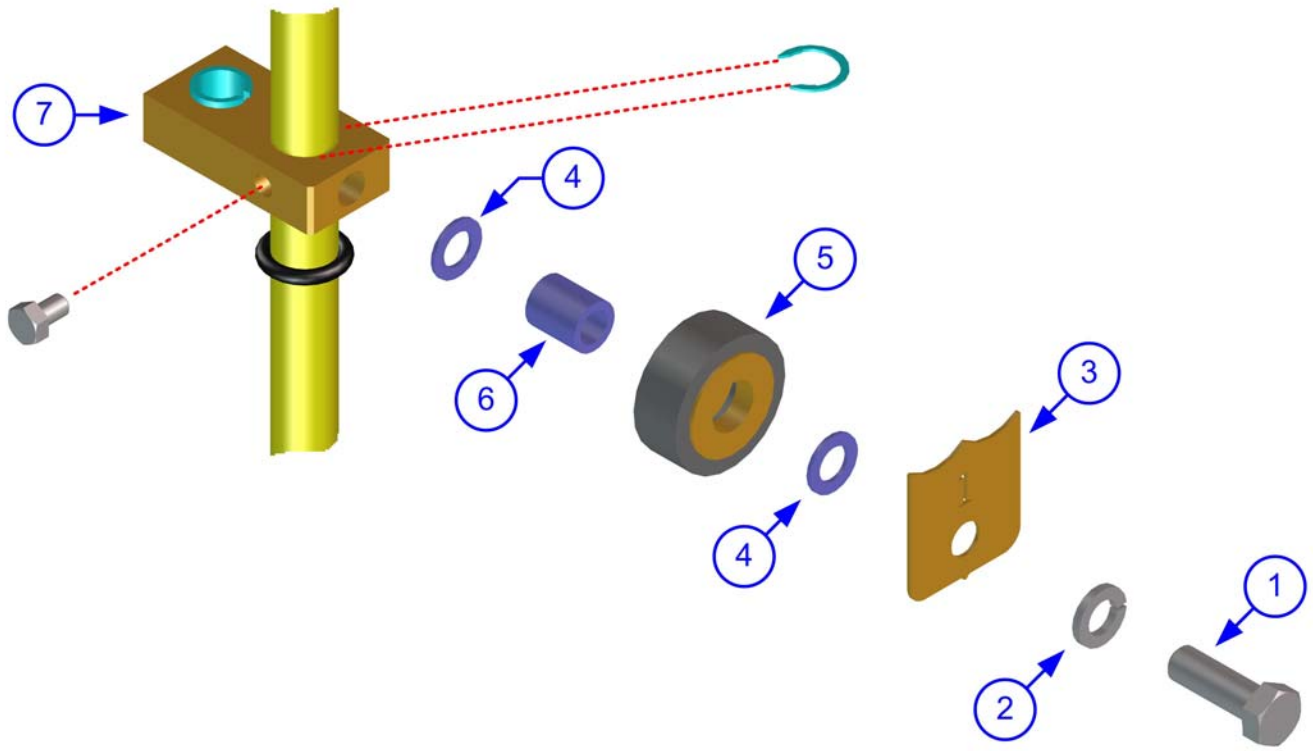
US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Slide Rod Roller Replacement - RM				
Procedure No.:	80502	**Revision:**	A	**Date:**	20 Apr 09

1. Power down the machine.

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

2. Remove bolt (1) with lock washer (2) followed by indicator plate (3), flat washer (4), roller (5), bushing (6), and second flat washer (4) consecutively from block (7).
3. Discard worn components.
4. Assemble components bolt (1) with lock washer (2) followed by indicator plate (3), flat washer (4), roller (5), bushing (6), and second flat washer (4) consecutively to block (7).
5. Repeat step 2 through 4 for each applicable roller assembly.
6. Restore power and test cycle machine.



US BOTTLERS MACHINERY COMPANY

Procedure:	Proximity Switch Replacement - RM				
Procedure No.:	80503	**Revision:**	A	**Date:**	20 Apr 09

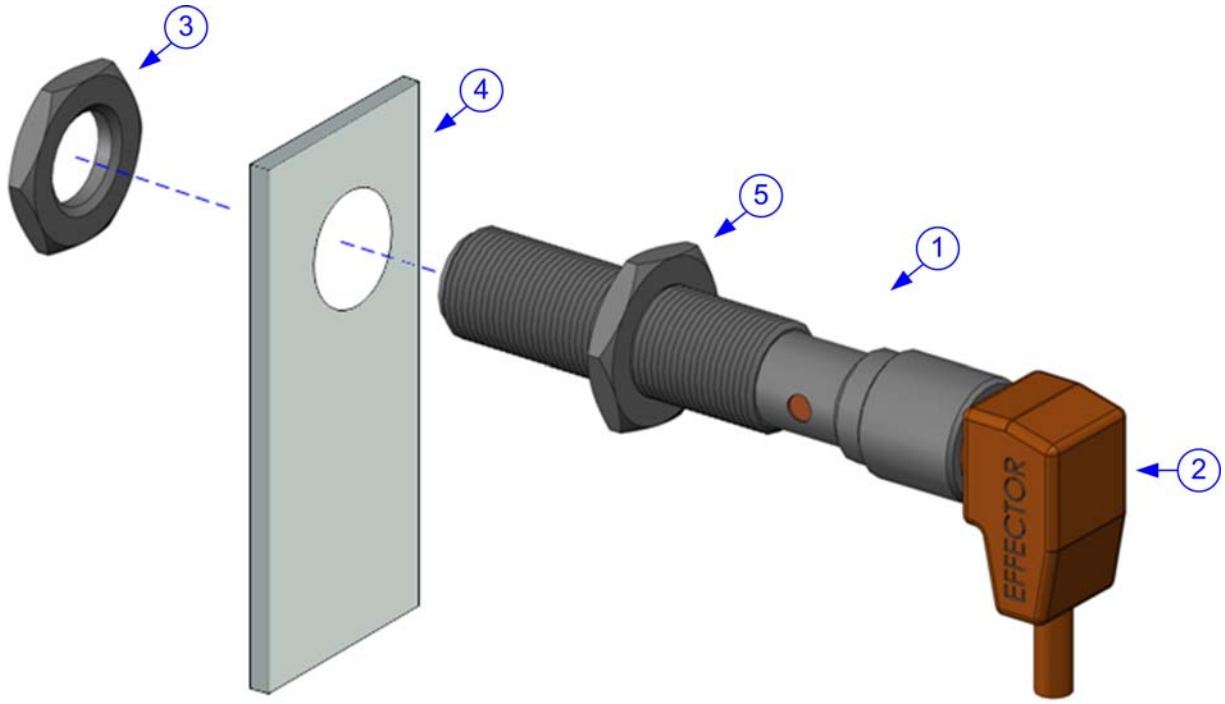
1. Power down the machine and remove pneumatic supply.

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

2. Locate defective proximity switch (1).
3. Unscrew power cord (2) from defective switch (1).
4. Unscrew front nut (3) securing defective switch (1) to bracket (4).
5. Withdraw defective switch (1) from bracket (4).
6. Adjust rear nut (5) of replacement switch (1) to an equal distance from the sensor's front edge as that of defective switch (1).
7. Insert replacement switch (1) into bracket (4) so that rear nut (5) rests against bracket (4).

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

8. Secure replacement switch (1) to bracket (4) from the front using nut (3).
9. Thread power cord (2) onto switch (1).
10. Restore power and pneumatic supply to the machine and test cycle to ensure proper function.



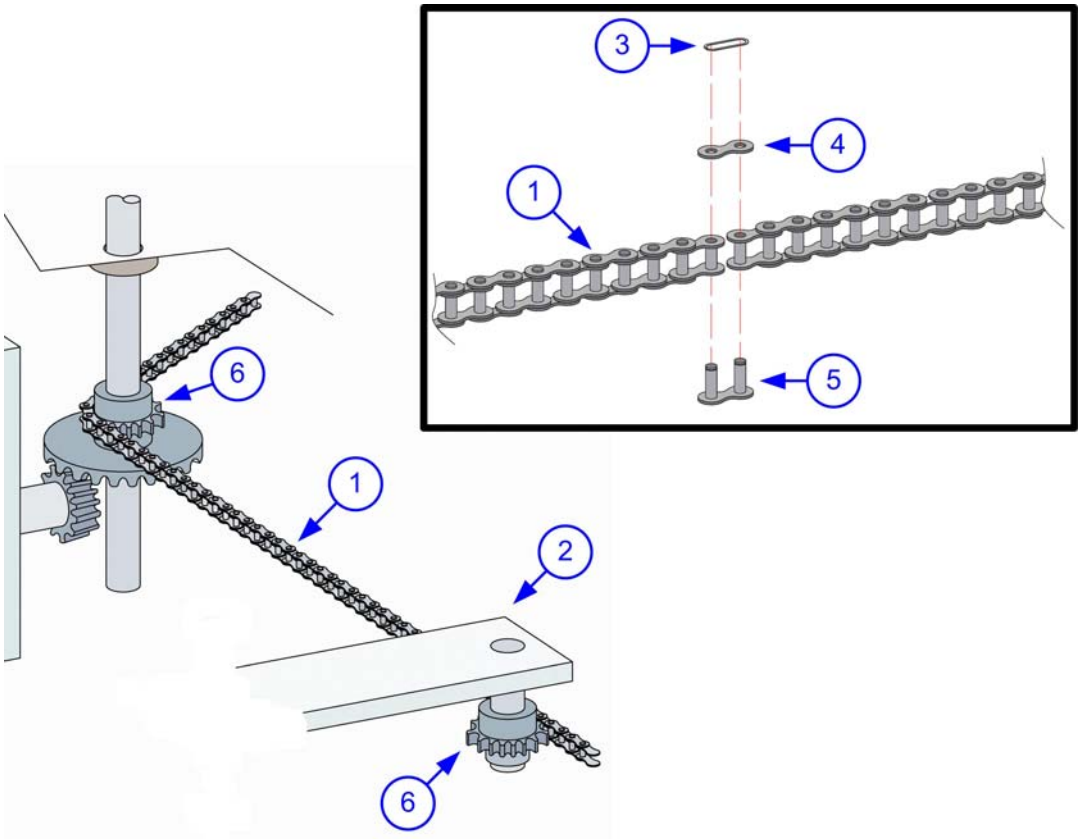
US BOTTLERS MACHINERY COMPANY

Procedure:	Roller Chain Replacement - RM				
Procedure No.:	80504	**Revision:**	A	**Date:**	20 Apr 09

1. 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 ACTIVIES.

2. Open cabinet doors to access roller chain (1).
3. Note the route of roller chain (1) to be replaced.
4. Loosen at least one chain tensioner (2) to release roller chain (1) tension.
5. Locate the connector link on chain (1).
6. Detach retaining clip (3) and withdraw female connector (4) from male connector (5).
7. Withdraw male connector (5) from worn chain (1).
8. Remove worn chain (1) from sprockets (6) and apply replacement chain (1) in its place.
9. Insert male connector (7) to connect each end of roller chain (1), apply female connector (4), and secure using clip (3).
10. Manually maneuver adjustable chain tensioner (2) inward to increase roller chain (1) tension.
11. Lubricate chain as directed in the Preventive Maintenance unit of this manual.
12. Restore power to the machine and test cycle.



US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Spindle Drive Belt Replacement - RM				
Procedure No.:	80505	**Revision:**	A	**Date:**	20 Apr 09

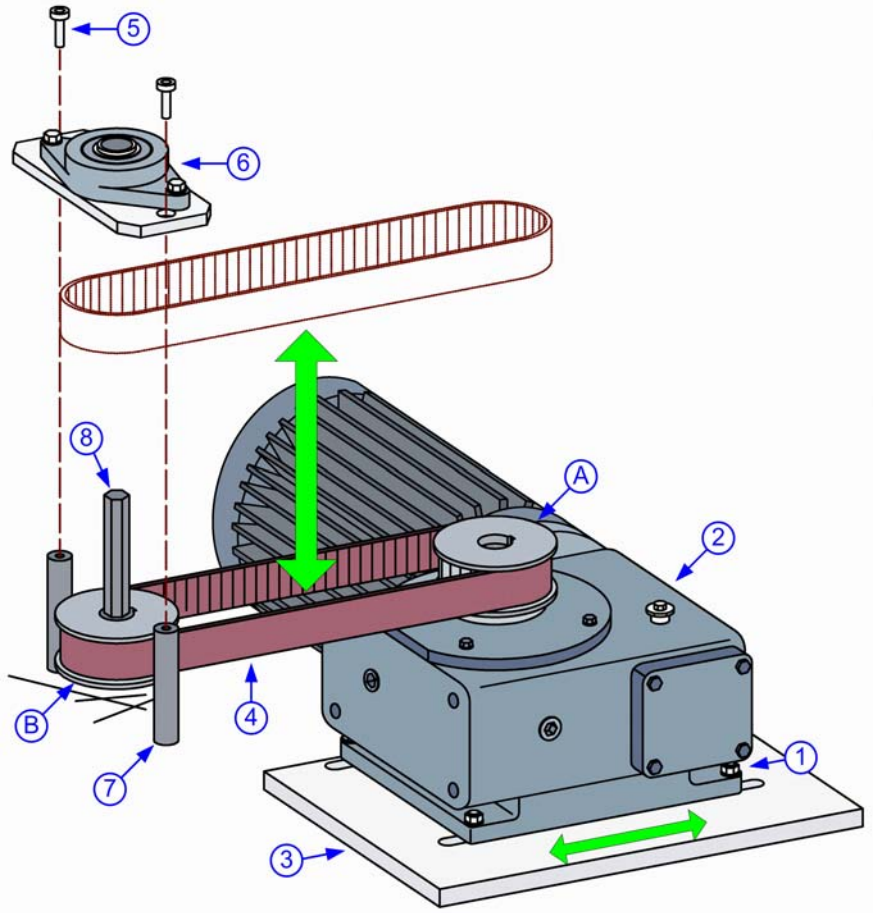
1. Power down the machine.

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

2. Loosen four set nuts/bolts (1) securing motor/gearbox (2) to mounting plate (3).
3. Manually move motor/gearbox (3) inward to relieve tension on worn drive belt (4) between pulleys (A) and (B).
4. Remove two bolts (5) securing bearing assembly (6) to spacers (7). Lift away assembly (6).
5. Withdraw worn drive belt (4) from pulleys (A) and (B) and install replacement belt (4) in its place.
6. Apply bearing assembly (6) onto spindle (9) and secure to spacers (8) using two bolts (5).
7. Manually maneuver motor/gearbox (2) outward to provide tension on replacement belt (4) between pulleys (B) and (A).

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

8. Tighten four set nuts/bolts (1) to secure motor/gearbox (2) in position on mounting plate (3).



US BOTTLERS MACHINERY COMPANY

Procedure:	Feed Worm Drive Belt Replacement - RM				
Procedure No.:	80516	**Revision:**	A	**Date:**	29 Apr 09

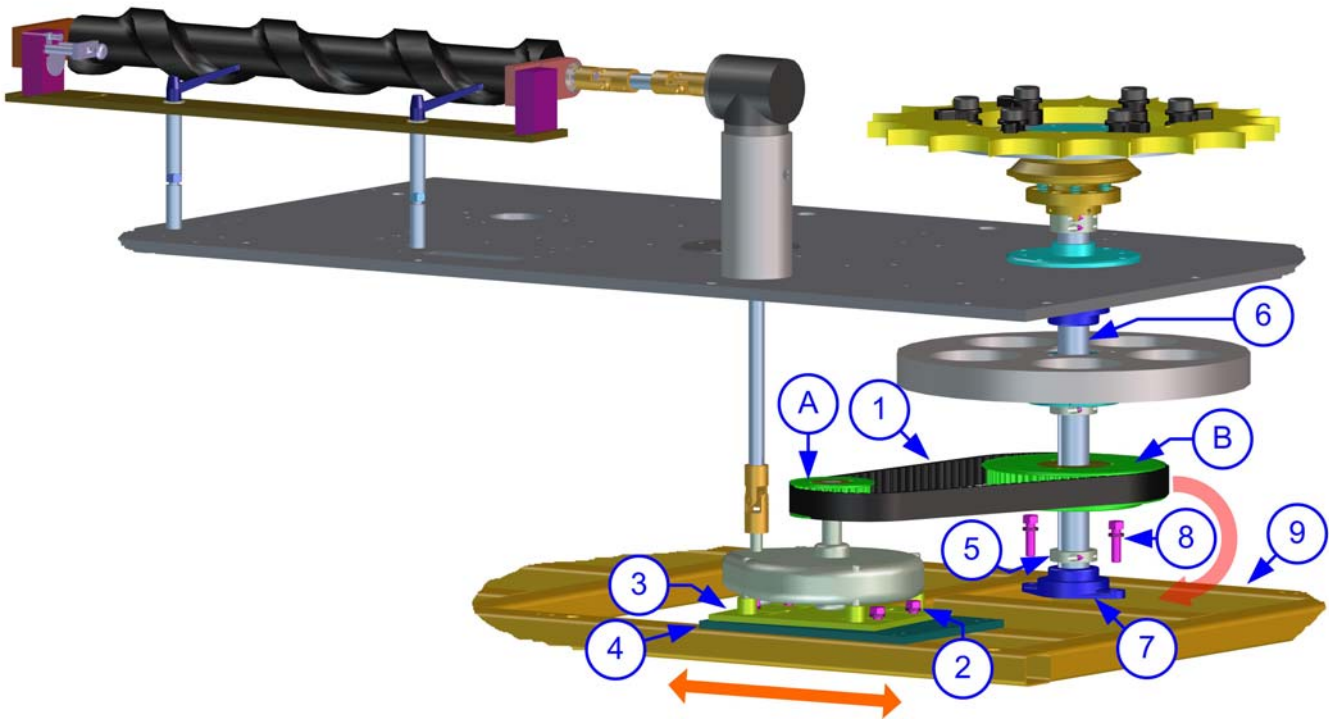
CONFIGURATION A

1. Power down the machine.

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

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 (3) inward to relieve belt (1) 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 (7) to chassis (9). Lift flanged bearing (7).
8. Manipulate worn belt (1) from pulleys (A) and (B) then through the gap between flanged bearing (7) and chassis (9).
9. Compare worn belt (1) with its replacement to ensure they are the same. Discard worn belt (1).
10. Manipulate replacement belt (1) through the gap between chassis (9) and flanged bearing (8).
11. Lower flanged bearing (7) and secure using two bolts (8).
12. Connect grease line (not shown) to flanged bearing (7).
13. Lower set collar (5) to rest upon flanged bearing (7) and tighten to star shaft (6).
14. Apply replacement belt around pulleys (B) and (C), hold in place while manually pulling gearbox base (3) outward.
15. Tighten four bolts (2) to secure gearbox base (3) 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
1
B
6
5
8
9
3
4
2
7

CONFIGURATION B

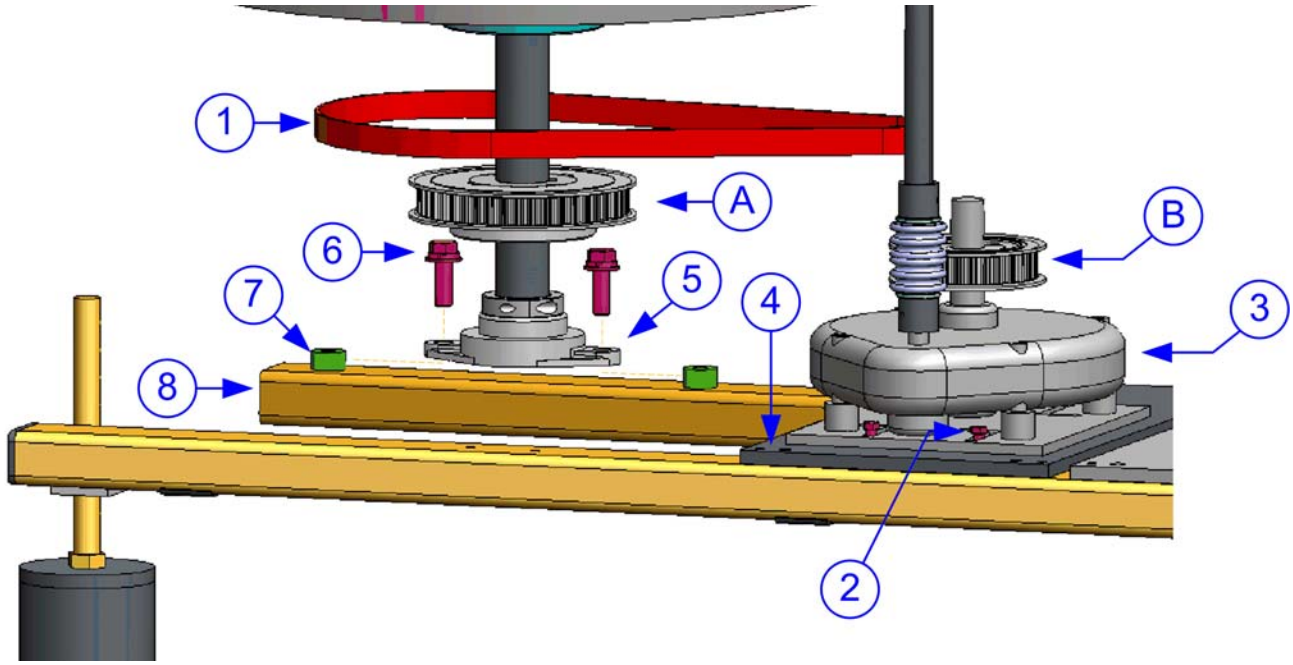
1. Power down the machine.

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

2. Remove applicable cabinet doors (not shown) to access worn belt (1).
3. Loosen four bolts (2) securing pancake gearbox (3) to mounting plate (4) to release tension on worn belt (1).
4. Disconnect grease line connector (not shown) from lower shaft bushing (5).
5. Remove two bolts with washers (6) securing two spacers (7) to bushing (5).
6. Withdraw two spacers (7) from bushing (5) to provide a gap between bushing (5) and frame (8).
7. Insert replacement belt (1) through the gap between bushing (5) and frame (8).
8. Secure two spacers (7) to bushing (5) using two bolts with washers (6).
9. 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.

10. Tighten four bolts (2) to secure worm drive gearbox (3) into position.
11. Install cabinet doors, restore power to the machine, and test cycle to ensure proper function.



US BOTTLERS MACHINERY COMPANY					
Procedure:	Cap Gate Setup Procedure - RM				
Procedure No.:	80521	**Revision:**	A	**Date:**	23 Sep 09

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.

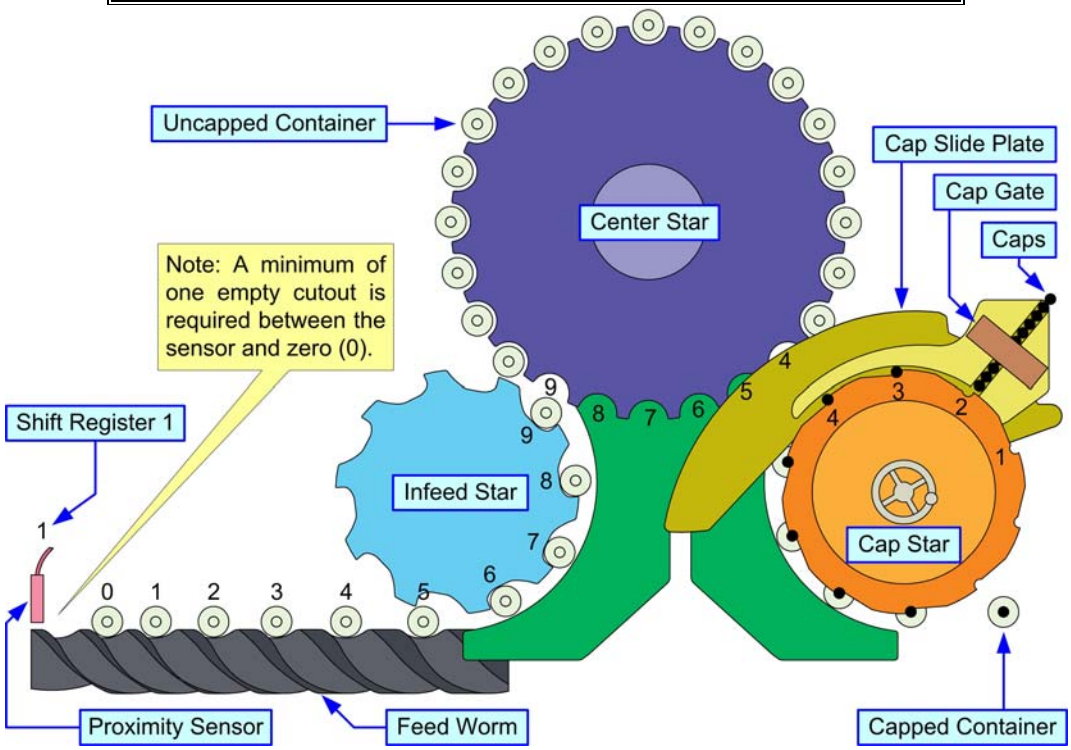
> **ATTENTION:** Only perform this procedure after it has been absolutely determined to be necessary. Refer to the Cap Gate Troubleshooting procedure for determination.

1. Rotate the capper so the trailing edge of a pocket in the cap star just stops a cap from entering a pocket.
2. Position the timing proximity sensor (sync prox) so that it triggers with the cap at the trailing edge of the cap transfer star pocket.

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

3. Without moving the capper, position the bottle present sensor so that it is between bottle pockets.
4. Determine the 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.



F-0001A

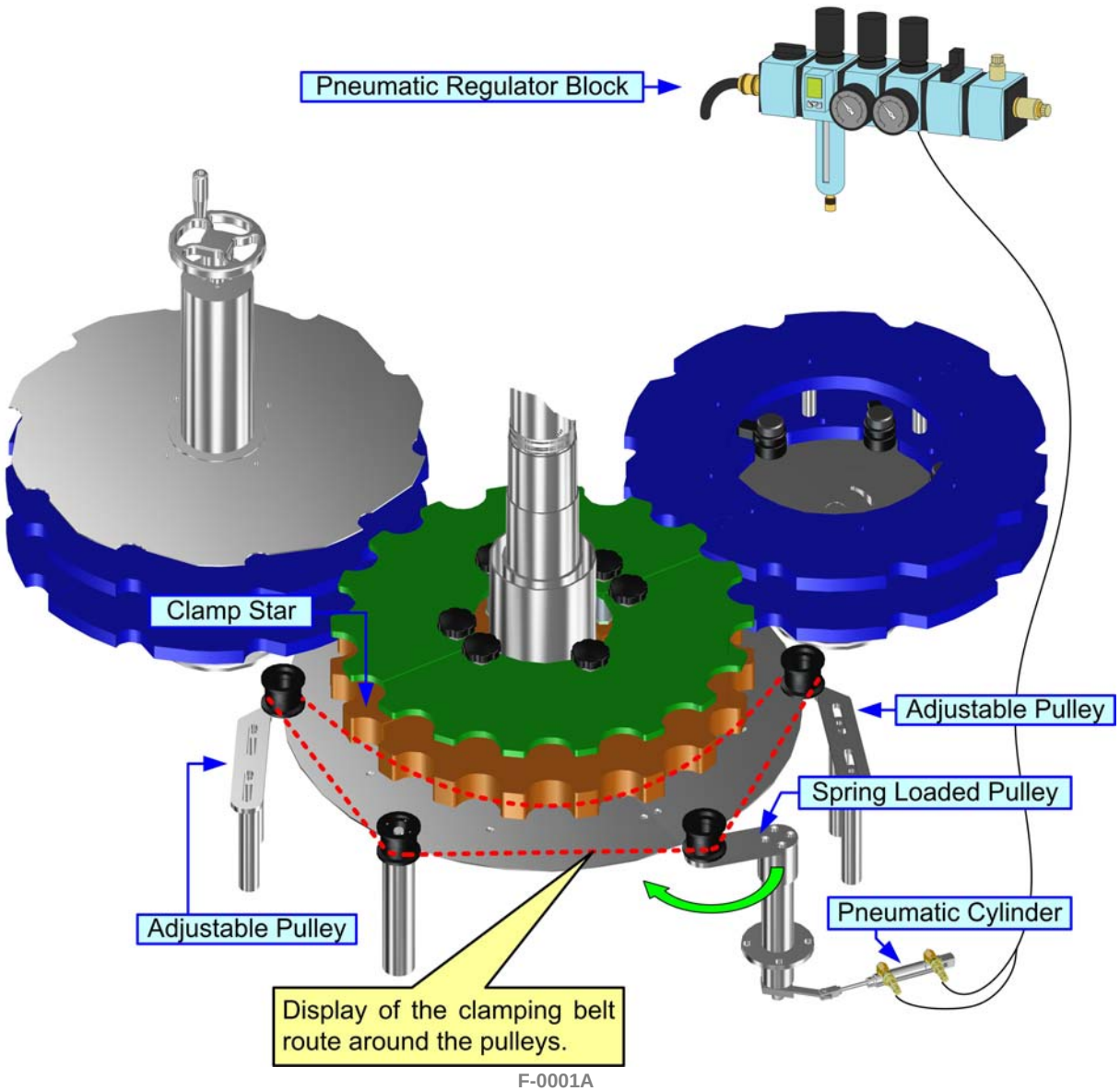
US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Clamping Belt Replacement - RM				
Procedure No.:	80524	**Revision:**	A	**Date:**	24 Feb 10

The spring loaded pulley assembly is the apparatus that provides tension to an installed clamping belt. To remove a clamping belt, manually twist the spring loaded pulley inward toward the clamp star thereby relieving pressure. Then lift the clamping belt upward and away from all of the pulleys.

To install a clamping belt, route the belt around all of the pulleys – saving the spring loaded pulley for last. Manually twist the spring loaded pulley toward the clamp star sufficiently to move the belt down and around that pulley. If the belt seems to be too loose or too tight, one or both of the adjustable pulleys may be loosened and adjusted as necessary. To fine tune the belt's tension, adjust pressure to the pneumatic cylinder at the machine's pneumatic regulator block.

ATTENTION: The capper's clamping belt is considered a high-wear item. Always ensure that spares are maintained in inventory.



US BOTTLERS MACHINERY COMPANY

Procedure:	Filler Hose Replacement - RM				
Procedure No.:	80525	**Revision:**	A	**Date:**	10 Mar 10

1. Power down the machine and remove product supply to the machine.

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

2. Remove the tri-clamp (1) from one end of the hose section (2) to be replaced.
3. Detach the ferruled hose section (2) along with ferrule (3) ferrule o-ring (4).
4. Repeat steps 2 and 3 for the opposite end of the hose.
5. Loosen hose clamps (5) from each end of hose (2) and detach each ferrule (3).
6. Thoroughly clean the fitting components.

> NOTE: If necessary, use a stiff bristle brush and detergent to clean the components.

7. Determine the desired length of replacement hose (2) to be installed.

> **CAUTION:** ONLY PURE FIT HOSE IS TO BE USED WITH PURE FIT HOSE FITTINGS. THE USE OF OTHER HOSE WILL RESULT IN VOIDED WARRANTIES AND POSSIBLE JOINT FAILURE.

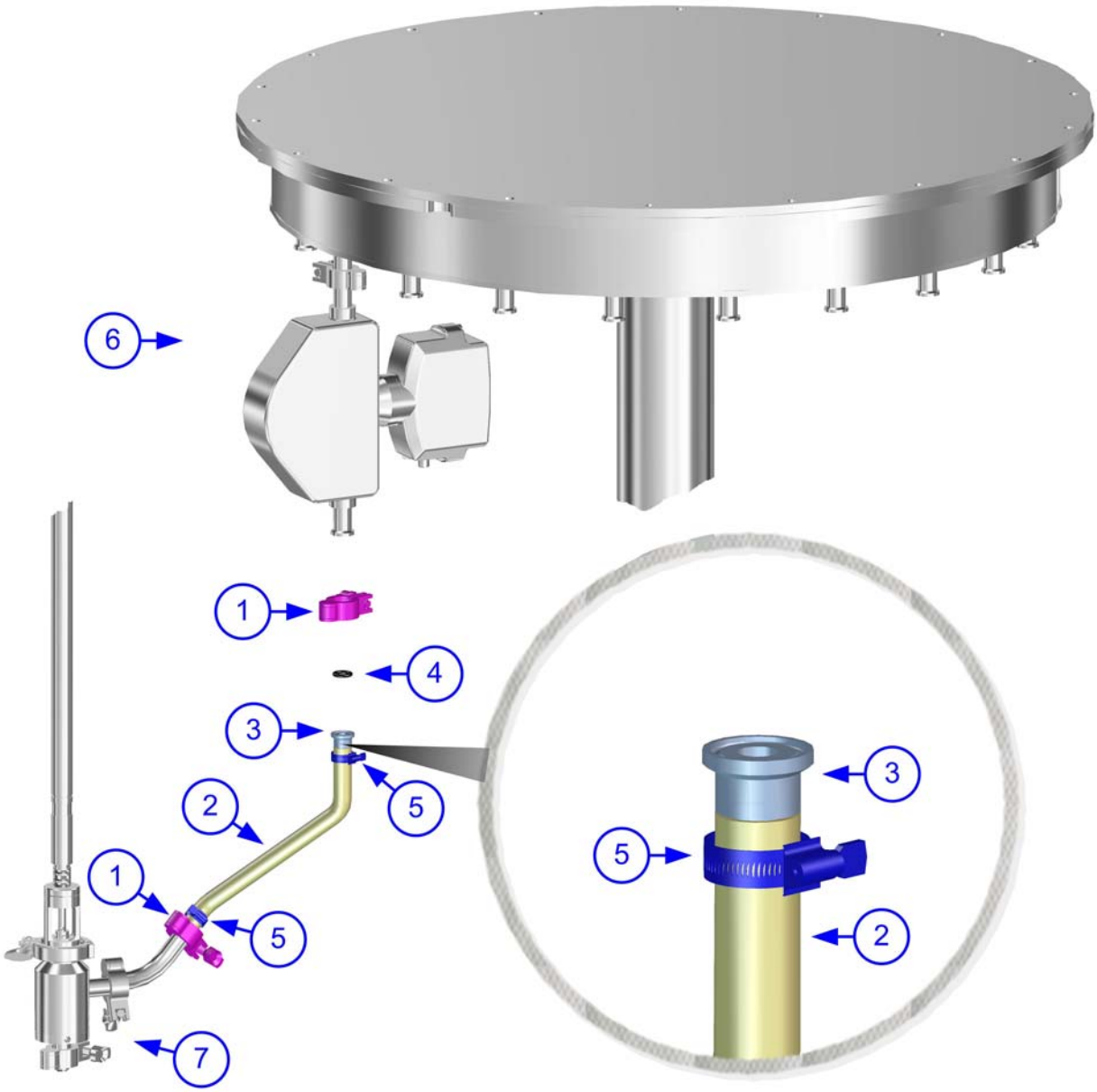
8. Cleanly cut the replacement hose on each end at a 90 degree angle to its length.
9. Apply a hose clamp or crimp clamp (5) to each end of replacement hose (2).
10. Manually screw a ferrule (3) fully into each end of replacement hose (2).
11. Tighten hose clamps or crimp clamps (5) to secure ferrules (3).

> NOTE: Hose clamps may be tightened using a screwdriver. A special tool sold by US Bottlers is required tighten crimp clamps.

12. Apply o-ring (4) to ferrule (3) and secure one end to the liquid system (6) using tri-clamp (1).
13. Repeat step 10 to secure the opposite end of replacement hose (2) to filler valve (7).
14. Repeat steps 2 through 10 for each hose (2) to be replaced.

> **CAUTION:** ENSURE THAT EACH HOSE IS ROUTED SO AS TO PREVENT ABRASION, KINKING, AND PINCHING. THE HOSE MUST ALSO ALLOW THE FILLING VALVE TO FULLY RAISE AND LOWER WITHOUT APPLYING TENSION TO THE HOSE.

> **ATTENTION:** Fully raise and lower each filling valve following hose replacement and observe for potential problems. Reroute hoses as necessary to remedy problem installations.


6
1
4
3
2
5
1
5
7
3
5
2

- **Lower the capper to its lower limit, then raise approximately 1-2”.**
- **Cut four support blocks of equal length to support the capper’s lower head plate above the capper’s bed plate.**

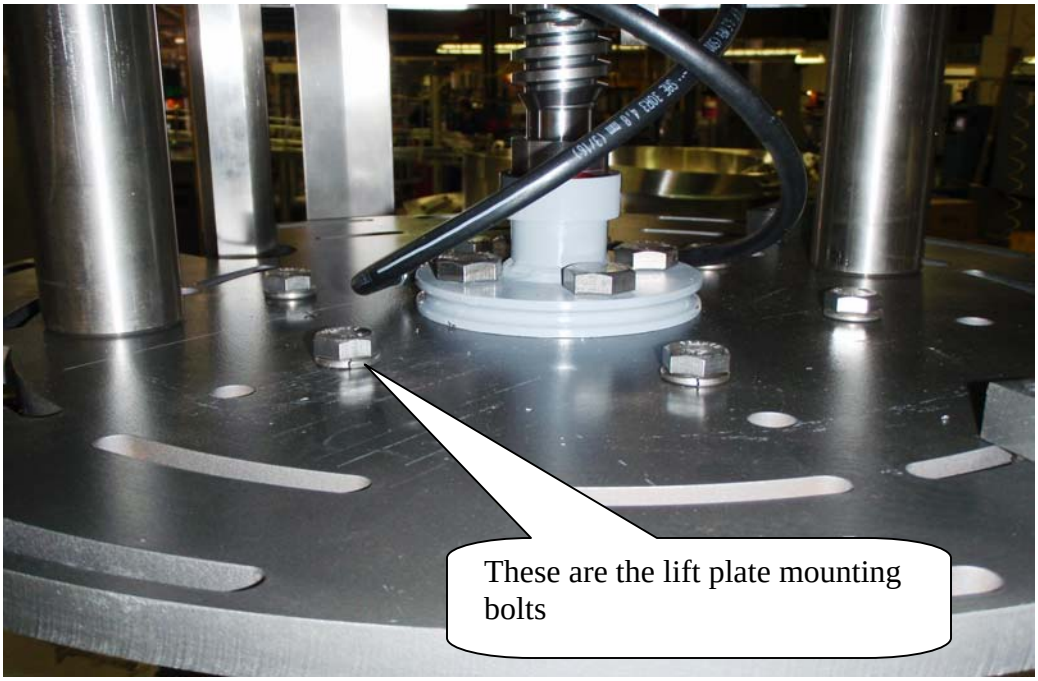
NOTE: this is extremely important to properly support the cappers head plate, if incorrectly supported the capper will fall down to the bed plates.

- **After the four supports are in place, lower the capper until the blocks are supporting the capper.**

NOTE: Lock out and tag out the machine at this point.

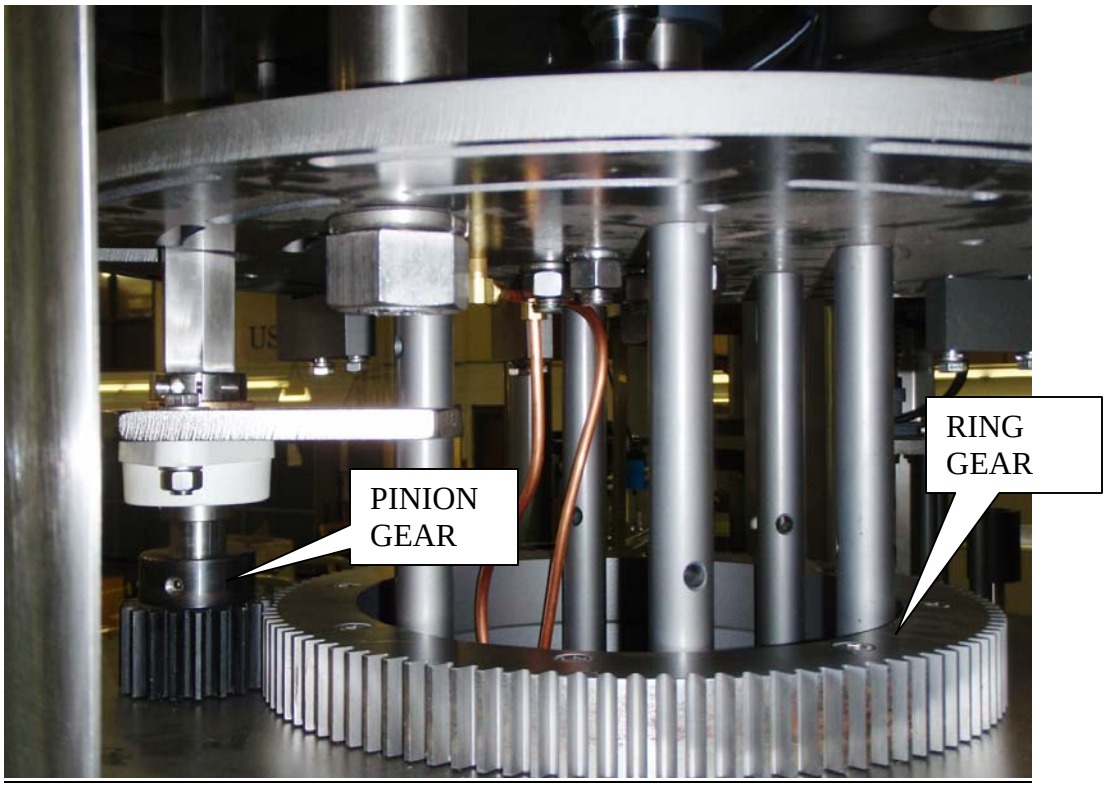
- **You can now remove all of the six lifting plate mounting bolts, and lubrication lines.**

<u>NOTE: At this point remove lock from lock out</u>



- **Power on the machine and raise the capper approximately 3-4", this will provide sufficient clearance to remove the ring gear.**

<u>NOTE: Lock out and tag out the machine once again.</u>



- **Remove the pillow block bearing bolts on the pinion gear shaft.**
- **Remove the pinion gear from the drive shaft.**

<u>NOTE: At this point you should have both the pinion gear and the ring gear removed from the machine.</u>

- **Install the new ring gear, hand tighten the bolts that attach the ring gear to the lower head plate, do not torque the bolts yet.**
- **Install the new pinion gear, and attach the bearing block but do not tighten the hardware yet.**

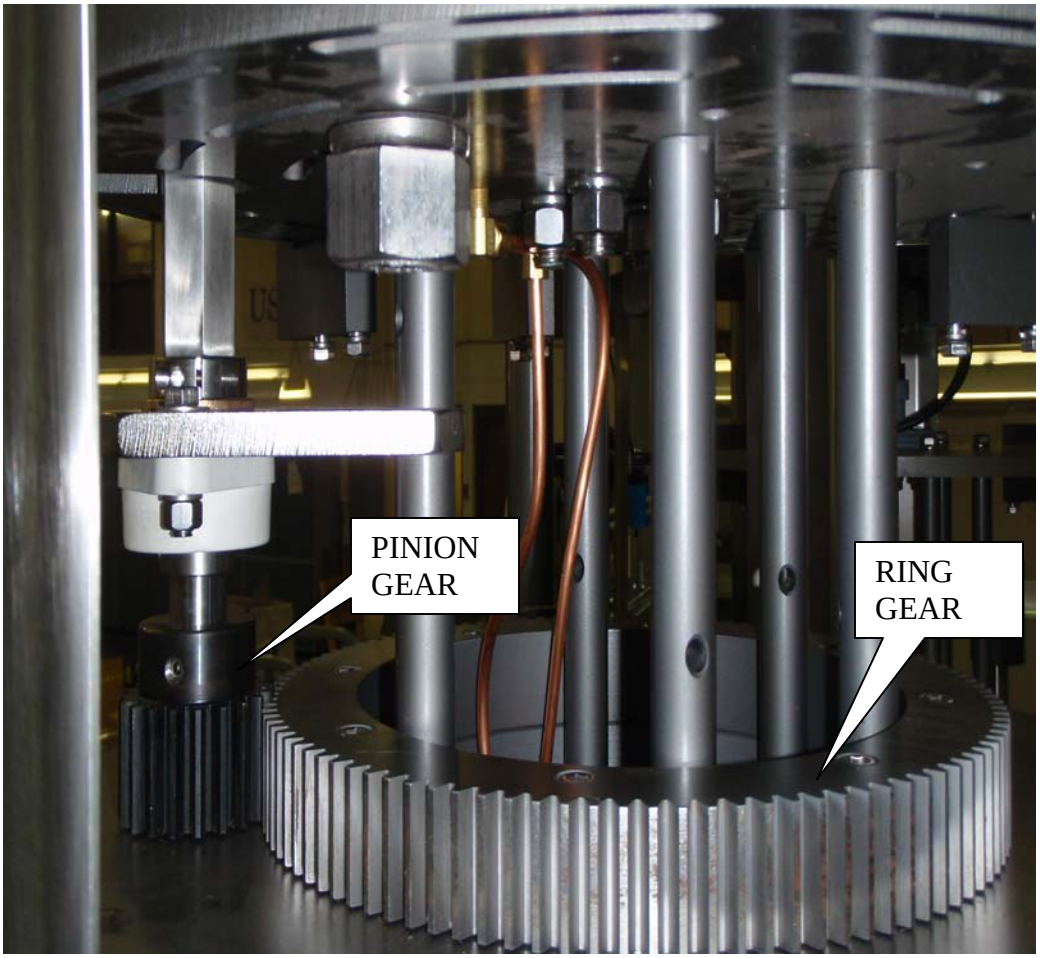
- ***<u>Note: Remove lock out</u>*, TURN OFF THE SPINDLE DRIVE, then lower the capper and install the 6 lifting plate mount bolts, torque these bolts using new lock washers.**

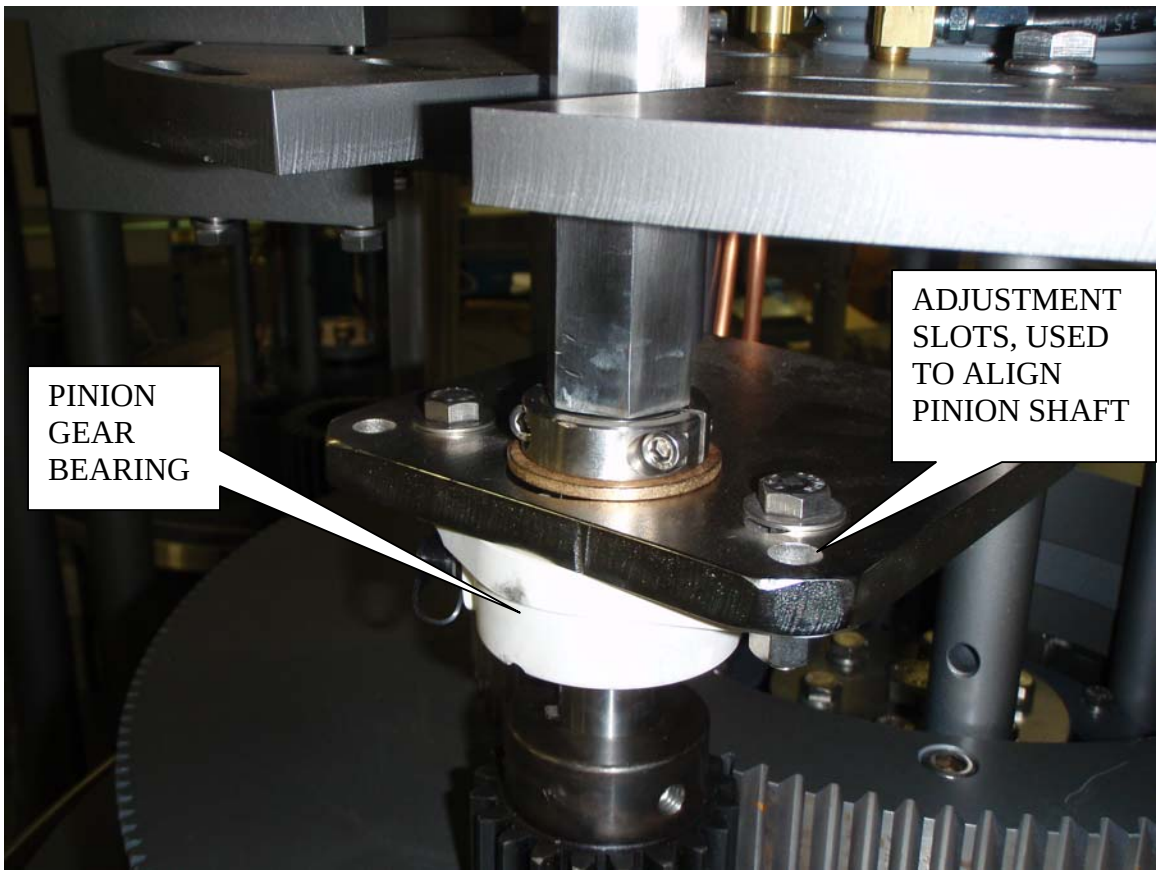
NOTE: You should now have the new ring gear in place but not tightened down, and the new pinion gear on the shaft with the hardware loose.

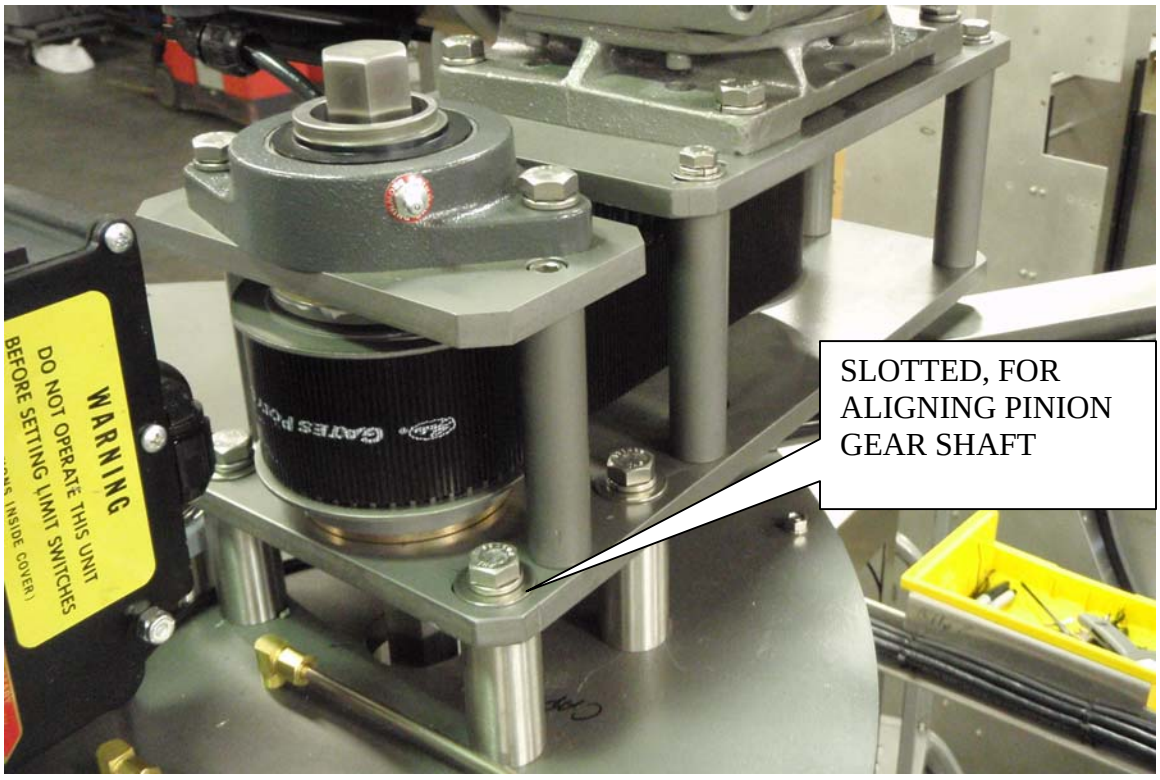
- **Align the new pinion gear teeth with the teeth on the new ring gear leaving a 2mm spacing under the pinion gear. Insert the pinion gear into the ring gear and ensure the gears securely mesh together, with a snug fit. Now hand tighten the hardware on the pinion gear assembly.**

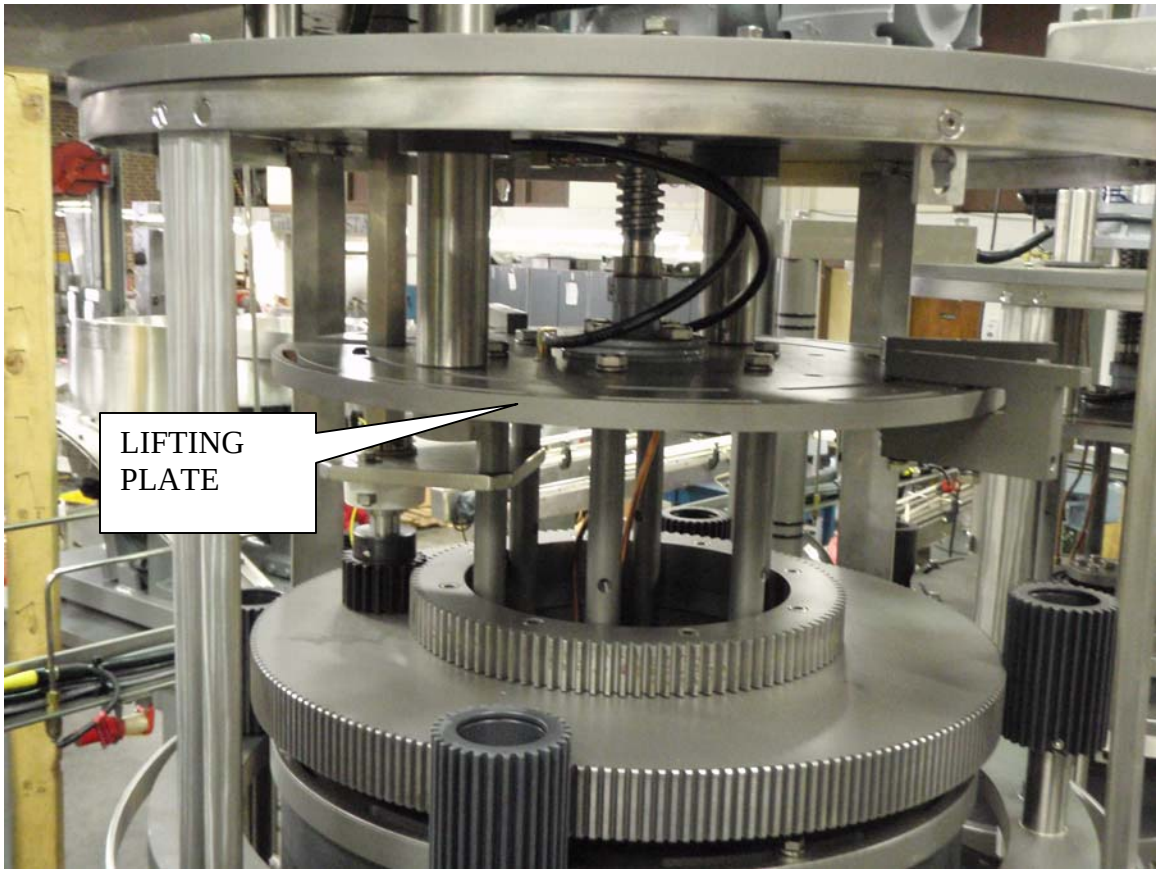
- **Remove the belt to the spindle drive motor and rotate the pinion gear shaft to check for free rotation with out binding. Make sure the shaft is perpendicular with out excessive run out; both gears should stay in contact with each other 360 deg. At this point all hardware can be tightened. And belt re-installed.**

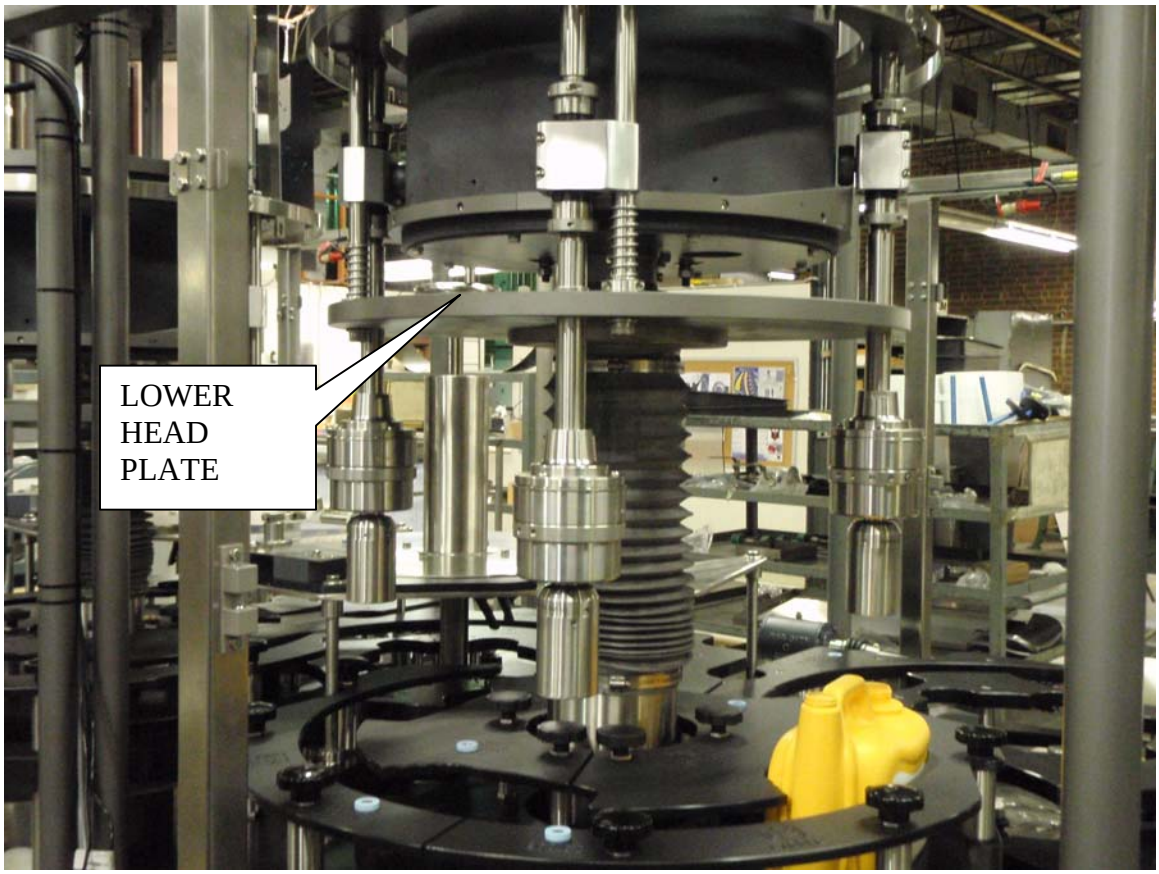
- **Before running the machine, once again double check all hardware is tight and Jog the machine several rotations before full run testing.**




PINION GEAR BEARING
ADJUSTMENT SLOTS, USED TO ALIGN PINION SHAFT


WARNING
DO NOT OPERATE THIS UNIT
BEFORE SETTING LIMIT SWITCHES
SLOTTED, FOR ALIGNING PINION GEAR SHAFT


LIFTING
PLATE


LOWER
HEAD
PLATE

FILLER SLIDE ROD, PILLAR, & BUSHING REPLACEMENT

Pillar & Pillar Bushing

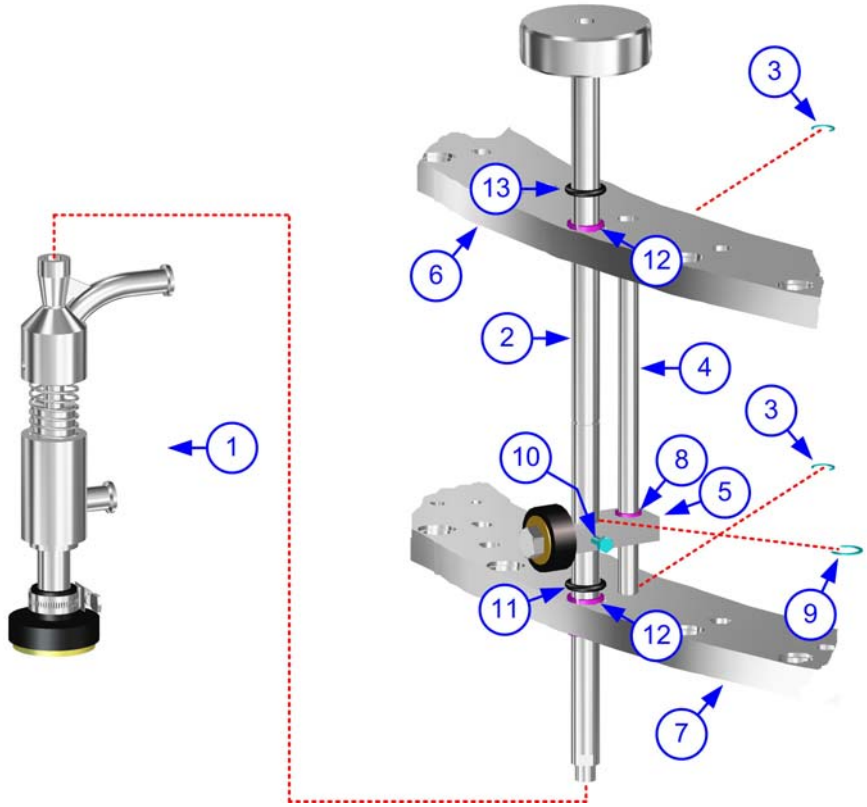
1. Remove filler valve (1) from slide rod (2).
2. Detach retaining clips (3) from each end of pillar (4).
3. Pivot roller block (5) so that pillar (4) clears rings (6) and (7). Withdraw pillar (4) from block (5).
4. Tap worn bushing (8) from block (5), then press replacement bushing (8) into roller block (5).
5. Insert pillar (4) into block (5), then pivot pillar (4) back between rings (6) and (7). Reapply retaining clips (3) to secure.

Slide Rod & Slide Rod Bushings

6. Detach retaining clip (9) from slide rod (2), then loosen setscrew (10) in roller block (5).
7. Withdraw slide rod (2) upward from upper ring (6), lower ring (7), roller block (5), and o-ring (11).
8. Tap bushings (12) from upper ring (6) and lower ring (7), then press in replacement bushings (12).
9. Insert slide rod (2) downward through upper ring (6), lower ring (7), roller block (5), o-ring (11).

> NOTE: If replacing slide rod (2), be sure to install o-ring (13).

10. Install filler valve (1) to lower end of slide rod (2), then reattach hoses, etc.
11. Apply retaining clip (9) to slide rod (2) above roller block (5), then retighten setscrew (10) to secure roller block (5) against bottom side of clip (9).



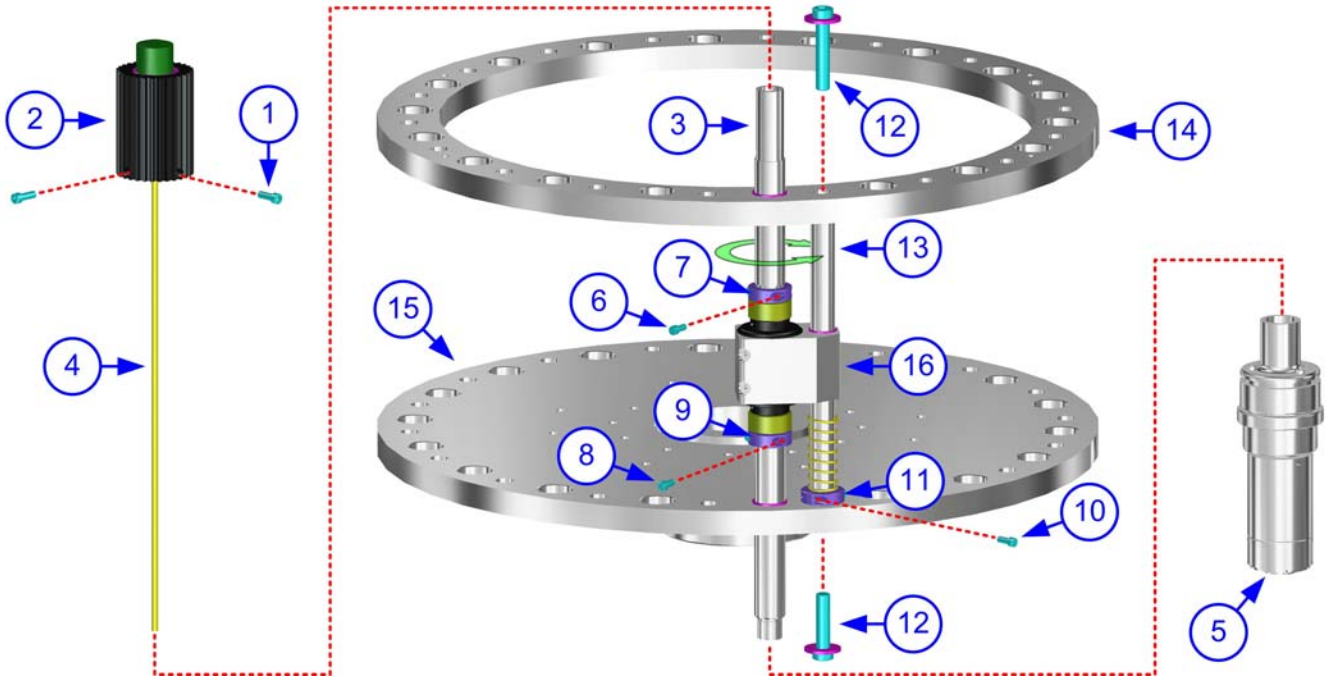
US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Chuck Shaft, Pillar, & Bushings Replacement - RM				
Procedure No.:	80541	**Revision:**	A	**Date:**	28 Apr 10

1. Remove two screws (1) securing spindle gear (2) to chuck shaft (3).
2. Lift spindle gear (2) along with rod assembly (4) from chuck shaft (3). Set aside to reinstall.
3. Unscrew chuck assembly (5) from chuck shaft (3). Set aside to reinstall.
4. Remove two screws (6) from upper collar (7). Lift away collar (7) and set aside to reinstall.

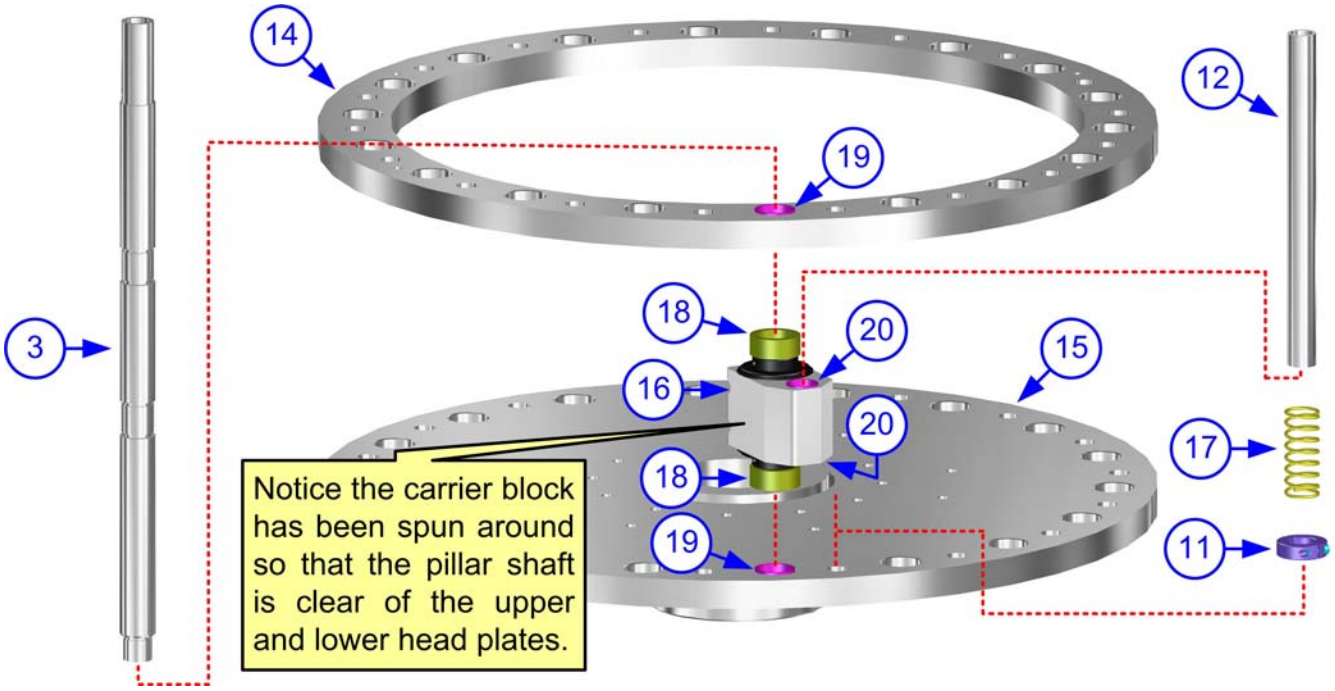
> NOTE: Upper and lower set collars (7) and (9) are different designs and must be kept separated during the disassembly process. Do not mix parts.

5. Remove two screws (8) from lower collar (9). Lift away collar (9) and set aside to reinstall.
6. Remove two screws (10) from lower collar (11). Lift away collar (11) and set aside to reinstall.
7. Remove two bolts with washers (12) securing pillar (13) to upper head plate (14) and lower head plate (15).
8. Pivot carrier block (16) so that pillar (13) is clear of head plates (14) and (15).



9. Withdraw pillar (13) along with spring (17) from carrier block (16). Discard pillar (11) if damaged, set aside to reinstall if not. Set aside spring (17).
10. Withdraw chuck shaft (3) from upper and lower spacers (18), carrier block (16), and upper and lower head plates (14)(15). Discard chuck shaft (3) if damaged, set aside to reinstall if not.
11. Press worn bushings (19) from upper head plate (14) and lower head plate (15) and discard.

12. Press replacement bushings (19) into head plates (15) and (14).
13. Tap worn upper and lower bushings (20) from carrier block (16) and discard.
14. Press replacement bushings (20) into each end of carrier block (16).
15. Insert chuck shaft (3) into bushings (19), carrier block (16), and spacers (18).
16. Insert pillar shaft (13) through bushing (20) in carrier block (16).
17. Insert spring (17) onto lower end of pillar (13).
18. Secure pillar (11) to lower head plate (13) and upper head plate (12).
19. Apply collar (11) to pillar shaft (13) at its base beneath spring (21), secure using two screws (10).
20. Apply lower collar (9) to chuck shaft (3) and secure using two screws (8).
21. Apply upper collar (7) to chuck shaft (3) and secure using two screws (6).
22. Screw chuck assembly (5) onto the lower end of chuck shaft (3).
23. Insert rod assembly (4) along with gear (2), into the upper bore of chuck shaft (3).
24. Align the setscrew bores of spindle gear (2) with those of the chuck shaft (3).
25. Apply Locktite 242 to the threads of screws (1).
26. Secure gear (2) to chuck shaft (3) using two screws (1).

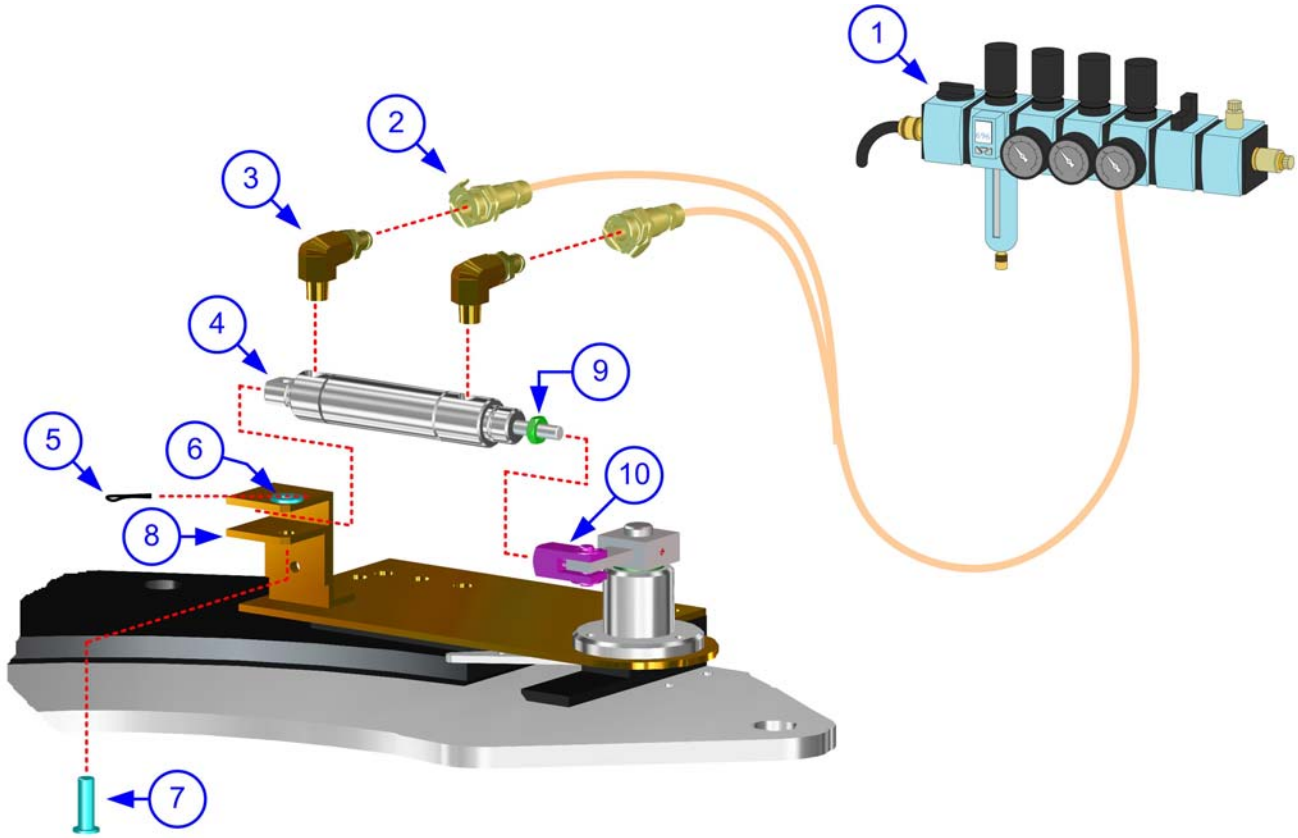


US BOTTLERS MACHINERY COMPANY

Procedure:	Cap Gate Cylinder Replacement - RM				
Procedure No.:	80543	**Revision:**	A	**Date:**	21 Apr 10

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.

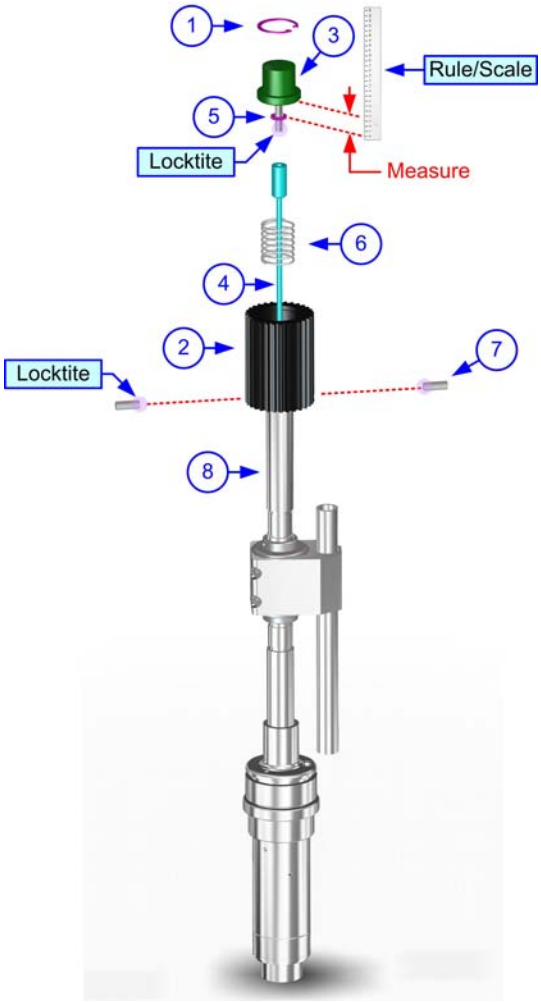
1. Locate pneumatic regulator block (1) and remove pneumatic supply to the cap gate assembly.
2. Detach pneumatic connectors (2) from fittings (3).
3. Unthread fittings (3) from defective cylinder (4).
4. Withdraw cotter pin (5) and washer (6) from pivot pin (7).
5. Withdraw pivot pin (7) from bracket (8) followed by defective cylinder (4).
6. Unthread adjustment nut (9) then unthread defective cylinder (4) from clevis (10).
7. Thread replacement cylinder (4) into clevis (10) and then swing its free end into bracket (8).
8. Insert pivot pin (7) into bracket (8) and cylinder (4).
9. Secure pivot pin (7) using washer (6) followed by cotter pin (5). Spread the ends of cotter pin (5).
10. Apply thread tape to threads of fittings (3) and screw onto cylinder (4).
11. Connect pneumatic connectors (2) to fittings (3), then restore pneumatic supply at block (1).
12. Adjust cylinder (4) piston as necessary for proper function, then secure using nut (9).



US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Knockdown Button, Rod, & Spindle Gear Replacement - RM				
Procedure No.:	80544	**Revision:**	A	**Date:**	21 Apr 10

1. Detach snap ring (1) from within spindle gear (2).
2. Lift cam button (3) along with rod (4) slightly from gear (2).
3. Measure and record the distance of set nut (5) from button (3).
4. Loosen set nut (5), then unscrew worn button assembly (3) from rod (4). Discard worn button (3).
5. Perform steps 6 and 7 only if spindle gear (2) requires replacement. Advance to step 10 if not.
6. Remove two setscrews (7) from gear (2), then lift spring (6) and gear (2) from chuck shaft (8).
7. Apply replacement gear (2) to shaft (8), then place spring (6) onto top.
8. Rotate replacement gear (2) on shaft (8) to align their respective holes.
9. Apply Locktite 242 to the threads of two setscrews (7), then tighten into gear (2) and shaft (8).
10. Apply Locktite 242 to the threads of replacement button (3), then screw into rod (4).
11. Adjust and tighten nut (5) to the same distance as that removed.
12. Lower button (3) into gear (2) and secure using snap ring (1).



US BOTTLERS MACHINERY COMPANY

Procedure:	Star Shaft Bearing Replacement - RM				
Procedure No.:	80547	**Revision:**	A	**Date:**	06 May 10

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

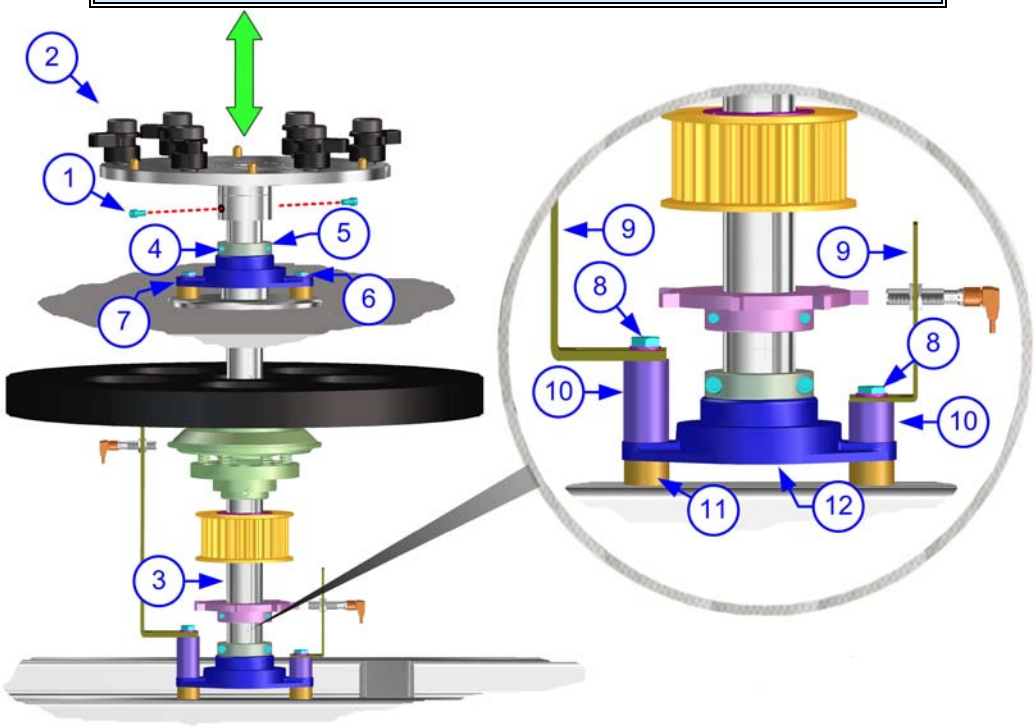
Lower Bearing

8. Remove two bolts with washers (8) along with proximity sensor bracket (9), bracket spacers (10), and bearing spacers (11).
9. Lower worn bearing (12) from shaft (3) and insert replacement bearing (12) in its place.

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

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

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

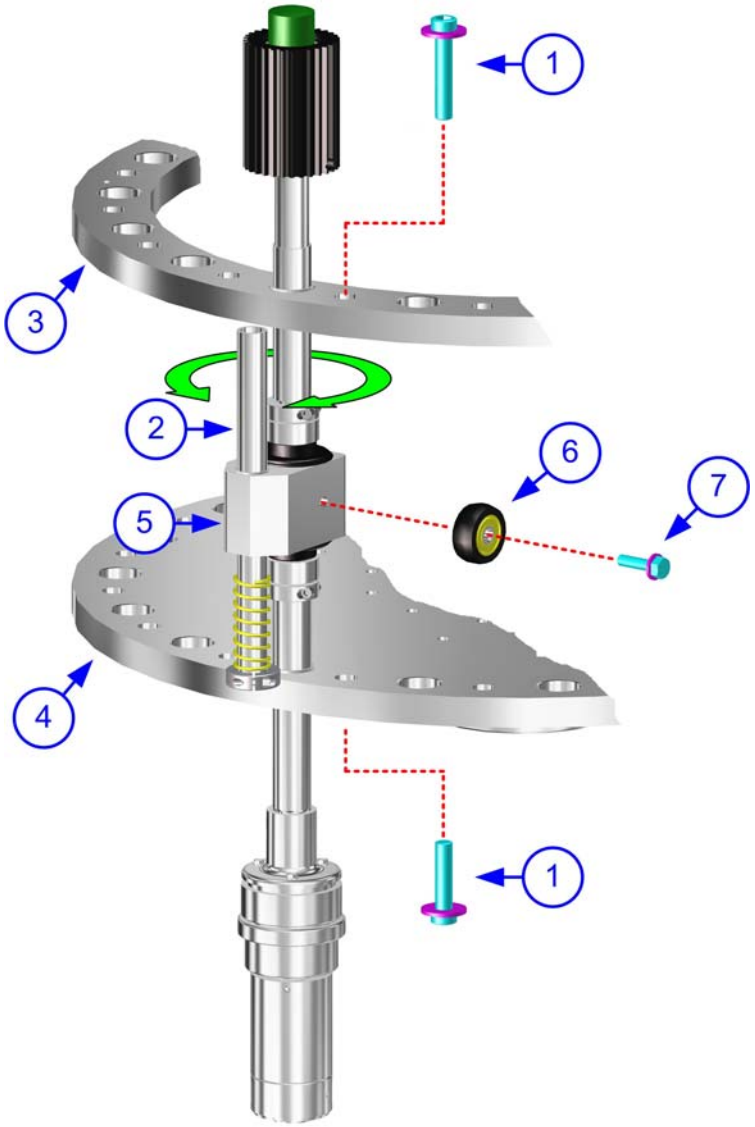


US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Cam Roller Replacement - RM				
Procedure No.:	80550	**Revision:**	A	**Date:**	06 May 10

In order to replace a worn roller, the carrier block must be spun around 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.

1. Remove two bolts with washers (1) securing pillar (2) to upper ring (3) and lower ring (4).
2. Pivot carrier block (5) along with pillar (2) to gain access to roller assembly (6).
3. Remove bolt (7) securing worn roller assembly (6) to carrier block (5).
4. Secure replacement roller assembly (6) to carrier block (5) using bolt (7).
5. Manually rotate carrier block (5) until pillar (2) is positioned between rings (4) and (3).
6. Secure pillar (2) to rings (4) and (3) using two bolts with washers (1).



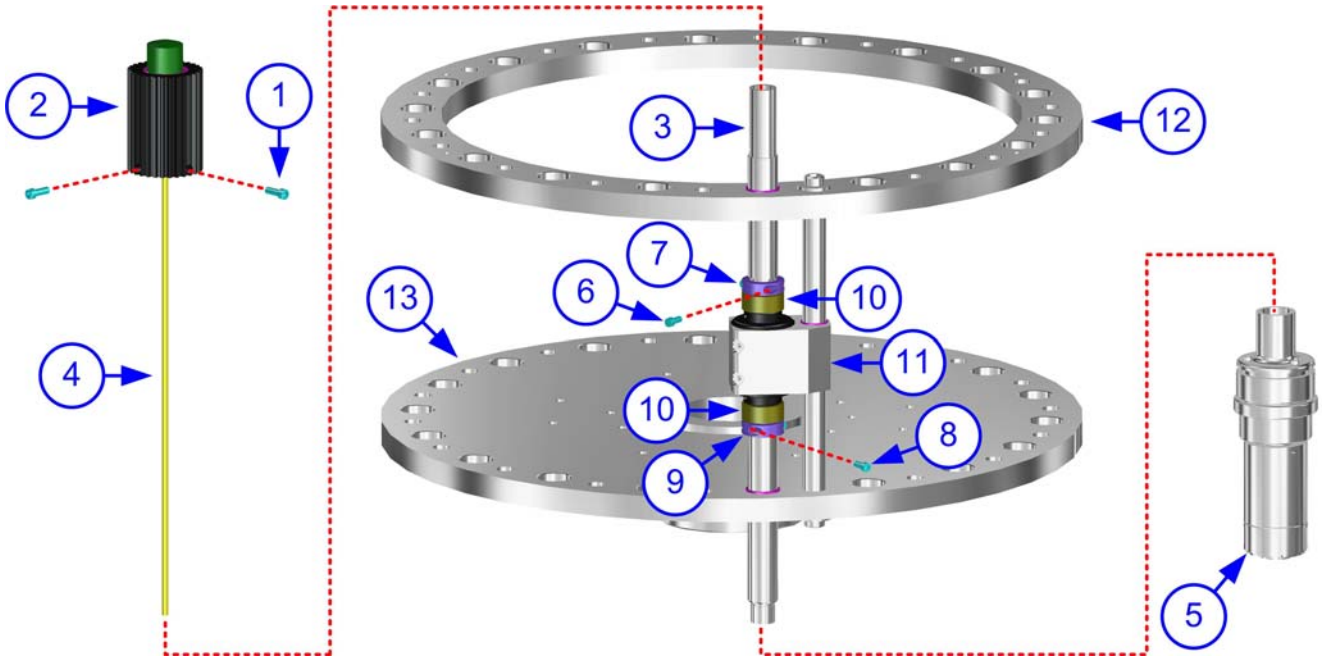
US BOTTLERS MACHINERY COMPANY

Procedure:	Capper Carrier Block Bearing Replacement - RM				
Procedure No.:	80552	**Revision:**	A	**Date:**	28 Apr 10

1. Remove two setscrews (1) securing spindle gear (2) to chuck shaft (3).
2. Lift spindle gear (2) along with rod assembly (4) from chuck shaft (3). Set aside to reinstall.
3. Unscrew chuck assembly (5) from chuck shaft (3). Set aside to reinstall.
4. Remove two screws (6) from upper collar (7). Lift away collar (7) and set aside to reinstall.

> NOTE: Upper and lower set collars (7) and (9) are different designs and must be kept separated during the disassembly process. Do not mix parts.

5. Remove two screws (8) from lower collar (9). Lift away collar (9) and set aside to reinstall.
6. Loosen setscrews (not shown) securing carrier block (11) to chuck shaft (3).
7. Withdraw chuck shaft (3) from upper and lower spacers (10), carrier block (11), and upper and lower head plates (12)(13). Set aside to reinstall.



8. Withdraw worn carrier bearings (14) from the top and bottom of carrier block (11).
9. Insert replacement carrier bearings (14) into the top and bottom of carrier block (11).
10. Insert chuck shaft (3) into upper head plate (12), spacers (10), carrier block (11), and lower head plate (13).
11. Tighten setscrews (not shown) to secure carrier bearings (14) to chuck shaft (3).
12. Apply lower collar (9) to chuck shaft (3) and secure using two screws (8).
13. Apply upper collar (7) to chuck shaft (3) and secure using two screws (6).

14. Screw chuck assembly (5) onto the lower end of chuck shaft (3).
15. Insert rod assembly (4) along with gear (2), into the upper bore of chuck shaft (3).
16. Align the setscrew bores of spindle gear (2) with those of the chuck shaft (3).
17. Apply Locktite 242 to the threads of setscrews (1).
18. Secure gear (2) to chuck shaft (3) using two setscrews (1).
19. Lubricate bearings (14).