US Bottlers Machinery Co.

Creative Custom Packaging Equipment

GLAXO SMITH KLINE

I.O.M. MANUAL

CAPPER

RC-6-22”

USB MACHINE NO: 94900

US Bottlers Machinery Company, Inc

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A LETTER FROM THE OWNER

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

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

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

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

Thomas Risser

President, US Bottlers Machinery Company

CUSTOMER CARE, AFTERMARKET SALES AND PARTS

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

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

Customer Care

US Bottlers technicians are skilled in electrical, mechanical, and programming to work on stand-alone fillers, cappers, and monoblock systems. Our technicians maintain the highest level of technical skills through continuous vendor training, technical bulletins, and in-house seminars. The service department provides machine installations; start up coverage, training, modifications, audits, preventative maintenance, and troubleshooting.

Troubleshooting inquiries are handled by our skilled Service Technicians with 24-hour access. More then 90% of our troubleshooting calls are solved over the phone. These services can often save you the cost of an unnecessary service trip and eliminate the extra production down time waiting for a service technician to arrive!

Parts

Our Parts Department can fill your replacement and spare parts orders quickly, accurately, and at competitive prices - often less then your local suppliers**.** In-stock items are shipped the same day you call (overnight if you need it). Warranty claims are easier to process when you use our parts department.

ABOUT THE MANUAL

The instructions contained in this documentation must be read and followed. In order to take advantage of the capabilities of your new machine, it is necessary to thoroughly understand its capabilities, performance levels, and possibilities of use. In order to obtain the maximum lifespan and the best possible levels of service efficiency from this machine it is necessary to comply with the standards contained in this documentation.

It is important that everyone involved (Supervisors, Maintenance Personnel and Operators) receive instruction on the “SAFETY STANDARDS” described in this documentation, before the machine is put to use.
Before starting work, the operator must be aware of the machine’s layout, the operation of the controls, the machine’s characteristics, and must have read and have access to this documentation in its entirety. All of the instructions, warnings, and accident prevention regulations contained in this documentation must be complied with.
Any modifications to or replacement of any of the machine’s parts, without the express authority of the manufacturer, may constitute the potential risk of an accident and therefore relieves the manufacturer from any or all penal and civil responsibilities.
This documentation supplies the information and detailed instructions required for the installation, operation, and maintenance of the machine. Subsequent users or owners of the machine must notify US Bottlers Machinery Co. and request access to the on-line documentation available for the machine.

OPERATOR:
This is an individual who is responsible for the installing, operating, adjusting, and the day-today maintaining and cleaning of the machine.
QUALIFIED TECHNICIAN:
This is an individual who is qualified and specifically trained and capable of performing maintenance or repair operations that require a specialized knowledge of the machine, its parts, its operation, its safety devices, and their methods of operation.

This documentation is available on-line through the Customer Portal at www.usbottlers.com and will be updated as the machine is modified by USB or with USB notification and approval. An “As Built” digital file will be provided, but will not be updated. Paper “hard copies” are available at an additional cost. The documentation provided via the Customer Portal shall be considered the only current documentation and the customer is held responsible for updating any additional digital or hard copies in their possession as modifications are made.
No part of this documentation should be removed or re-written.

Note: US Bottlers Co. declines responsibility for any errors or damage resulting from the failure to update any documentation not supplied on-line.

ABOUT THE PRODUCT

The product addressed in this manual was designed and manufactured to specific customer defined specifications relative to function and speed. US Bottlers Machinery has employed decades of expertise, cutting edge technology, and a sense of personal pride in the product's outcome and in the customer's satisfaction. It is for this reason that special attention is paid to material selection to ensure a long, low maintenance life of the machine. This machine comes to you with all of the necessary attachments for handling the full range of containers on your order. All attachments are marked or identified for each of the containers submitted. If your order involves more than the set of attachments on the machine at the time of shipment, you may rest assured that each set has been properly installed on the machine and properly timed to handle the containers for which it was intended. For the use of those attachments capable of handling several different containers, refer to the Attachments Reference portion of this manual within the Technical Data unit. For the present, it is quite safe to assume that the attachments on the machine are properly adjusted for handling the container specified on the machine center feed and discharge guide. Therefore, when proceeding with our instructions for acquainting yourself with the machine, you can do so with the knowledge that these attachments have been properly timed for the required containers

THEORY OF OPERATION

Containers are fed back-to-back to the machine via a conveyor chain. An integrated feed worm conveyor specifically designed to work in time with the 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.

The infeed star is a circular plate attachment with cutouts around its periphery that are sized and shaped to accommodate the applicable container. The infeed star turns concentrically on a drive shaft and is positioned so that as each container is presented by the feed worm, becomes caught within the available cutout. The rotating motion of the infeed star transfers containers consecutively to the center star.

The center star is also a circular plate attachment with cutouts around its periphery that are sized and shaped for the same container as the infeed star. The clamp star turns concentrically on a drive shaft in unison with the infeed star and retrieves each container within its respective cutouts as they are presented.

As the containers travel in a circular motion, the cap feed star presents a single cap to each chuck jaw as it is rotated by the capper's turret. A cap limit switch is located at the bottom of cap chute and is actuated 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 cap feed star picks up a cap, the sensor under the cabinet indicates this timing fact, and the sensor at the worm looks for a container so that the next cap can be released to the cap feed star. A cap chute gate is actuated by an electric air solenoid mounted in the capper's pneumatic panel. This solenoid actuates the air-driven, double-acting gate air piston.

As the machine continues to rotate, the cap is torqued onto the container, reaching full torque near the back of the machine as it rotates around the center star. The cap spindle then begins to rise due to the overhead lift cam. At this time, the cap jaw is pulled away from the cap and the capping operation is complete.

Chuck assemblies are suspended vertically around the center star's drive shaft and spaced perfectly aligned with the star's cutouts. The chuck assembly shafts spin on axis through a centrally located gear mechanism and are designed so that each chuck jaw clasps a single cap and applies it to a container as rotated into position. Each container is then rotated and transferred to the discharge star.

The machine's onboard operator panel is the controlling force behind all electrical and pneumatic activities. The main drive train is comprised of a motor and gearbox combination providing torque to the capper's center turret. Each star shaft has a centrally located, and concentrically mounted gear which engages the much larger gear of the machine's center turret; thusly, keeping them timed. A series of proximity switches, belts, and gears are utilized to maintain proper timing between its primary components.

Like the infeed and center stars, 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 the same drive shaft as the cap star and keeps the containers in position during the capping process. The discharge star then rotates the capped container to the output end of the conveyor chain.

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.

MACHINE INSTALLATION

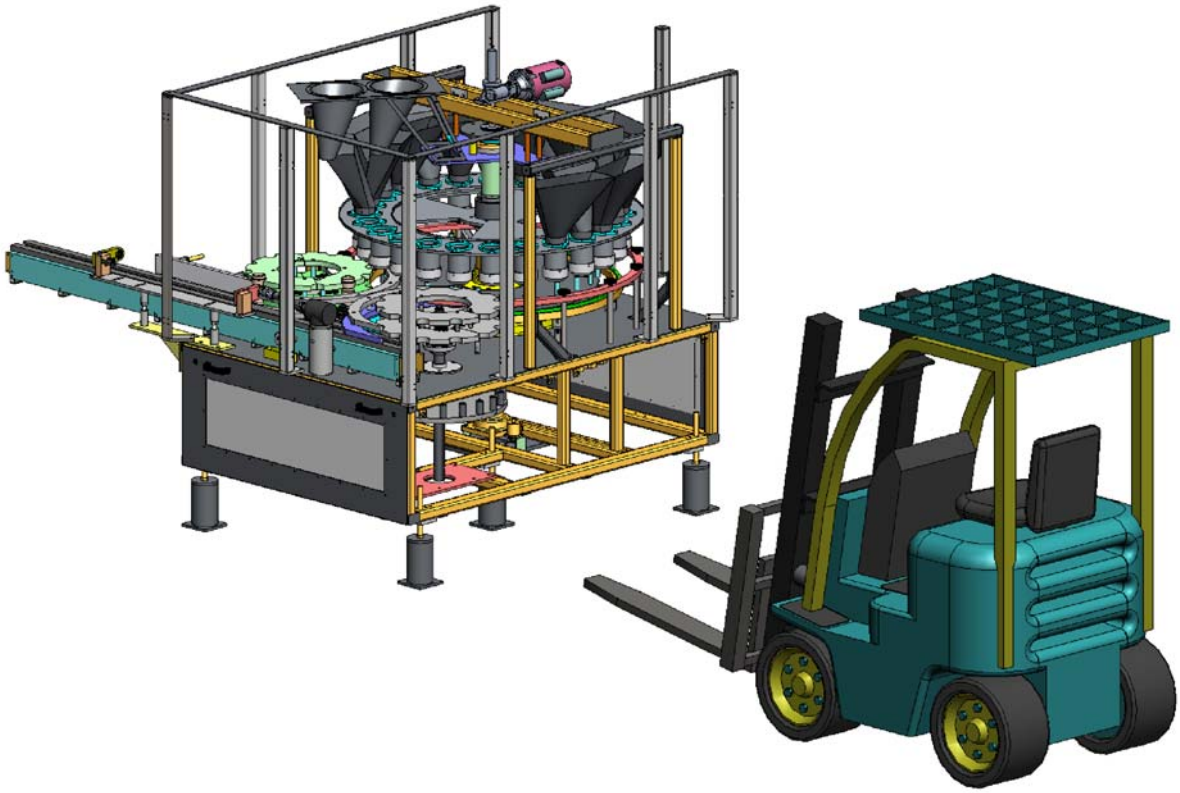
Installation must be carried out in accordance with these instructions and must only be performed by experienced contractors or personnel to ensure a safe and correct installation.

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.

ELECTRONIC POWER SUPPLY

US Bottlers has supplied the electronics power supply system required for generating the proper electrical power for the electronics system controlling the filling machine. The electronics package is in a free-standing NEMA-12 cabinet suitable for mounting at a location remote from the "wet" filler area but as close as possible to the filler operator panel. Do not install the power panel further than 75 electrical wire feet away from the mid-unit panel. This power panel cabinet is not waterproof and is not suitable for mounting near the filler.

Primary power to the UPS/power panel is to come from the plant's 115 VAC service. A separate 20 amp circuit should be provided for this power supply. The power circuit for the electronic system must be activated 24 hours per day. The UPS unit isolates the customer's 115 volt AC power from the filler and provides noise free, steady 24 volt DC power that contains a battery backup system. Depending upon the system size, it is possible to have a primary power failure for 10/15 minutes before affecting the filling logic system.

The customer is responsible for mounting the UPS/power panel and providing the wiring from this power panel to the machine electronics mid-unit junction box. The wiring required between these two areas must be a minimum 12 gauge weight. Nine separate wires are required between the master power panel and the filler junction box for power distribution. Insure that a proper earth ground exists at the power supply panel. One of the nine 12 gauge wires going to the filler junction box must have green insulation and be used as the main ground wire for the electronic system. This green earth ground wire must be continuously routed from the power supply to the electronic deck commutator ground lug to the electronic deck base.

A continuous earth ground cable running from the power supply to the electronic deck base is necessary for electronic signal stability. US Bottlers has provided the ground lead from the Mid-Unit to the electronic deck.

In a separate conduit between the power supply and the filler junction box run a single shielded 16 gauge twisted pair that will be used for power supply monitoring. This monitoring system is read by the mid-unit software and is displayed for the operator on the Host Computer screen.

Located inside the power panel is a temperature sensing circuit breaker which will shut down the power supply if the interior temperature of the enclosure gets so high that there is danger of damaging any of the components. A small sensing LED is wired across a pair of terminal strip points to indicate when this event has occurred. If the circuit breaker has tripped due to excessive interior heat this LED will be lit. When the temperature within the panel has dropped to an acceptable value the breaker will automatically reset and you will be able to start the power supply again.

You will need to provide a separate 115 VAC single cycle 60 Hertz 20 amp circuit to drive the UPS/Power supply that will produce the 24 volt DC power required to operate the filler electronics. The UPS will insure steady power with no fear of brownouts or power failures. The hardware is installed in a Nema-12 panel with an exhaust fan and air intake filter. The fan clears the potentially explosive gases that develop during battery charging. This non-watertight panel needs to located far enough from the filler to prevent liquid spillage from getting into the panel. At the same time care needs to be used to ensure that excessive voltage drops do not occur due to long cable distances from the mid-unit. The power system has been designed to operate within 75 electrical feet of the mid-unit using #12 gauge wire.

Nine #12 wires must be run in a separate metal conduit from the power panel to the filler junction box mounted on the filler roof. One of these leads should be attached to a good earth ground and then attached to the power panel ground case clip. This ground wire should have a green color insulation to identify it as the ground system lead. Route this lead with the other power leads to the mid-unit but do

not attach it to any of the terminal strip points within the junction box. Attach the green ground lead to the junction box ground lug.

CAUTION: IT IS NECESSARY TO PROVIDE PROPER EARTH GROUND AT THE UPS/POWER SUPPLY CABINET AND CARRY THE GROUND WIRE THROUGHOUT FIELD WIRING TO MID-UNIT PANEL.

Separate monitoring wires and conduit system is also required between the UPS and the mid-unit for detection of UPS and power supply problems. This conduit is to contain a single shielded twisted pair of #16 wires. Make sure that the cable is connected as shown on drawing 121599S1 and that the shield on this cable is only connected at the power supply panel. In addition to the wiring drawing 121599S2 that has been provided with this filler, a special pamphlet covering unique considerations that should be considered when installing the filler has also been included. This book helps the installer understand the concerns relative to electrical noise and interference that must be understood when locating computer driven logic systems in industrial locations. Pay particular attention to insure that no other leads are routed through the power or communication conduits than those required to operate this electronic filler. Do not locate the filler power supply or host computer within 10 feet of any electrical noise generating unit.

ELECTRICAL WIRING MACHINE COMPONENTS

CAUTION: UNDER NO CIRCUMSTANCES IS THE POWER TO BE APPLIED TO THE MACHINE UNTIL THE CORRECT MOTOR ROTATION HAS BEEN DETERMINED.

IT IS RECOMMENDED THAT THE BELT IS REOMVED UNTIL ALL WIRING AND TESING OF THE MOTOR IS COMPLETED.

When viewing the drive motor from the shaft end, the motor should rotate in a counter-clockwise direction if the machine has been supplied with the standard left-to-right bottle flow. When wiring the drive motor control circuit, provide for a start and stop button at the front of the machine. These control buttons are to be located where they will be readily accessible to the line operator and convenient to anyone who changes attachments on the machine.

This filler may have been provided with a separate liquid supply system which includes a variable speed product pump and motor. If provided, the product pump requires a motor starter properly sized for the motor. Ensure that proper motor rotation is effected before attempting to run this piece of equipment during testing or in production.

ELECTRICAL WIRING MACHINE COMPONENTS

Standard machines are supplied only with motors. In addition to the drive motor, the only other electrical device associated with the main machine drive supplied as a standard electrical component, is the retractable limit switch or worm feed safety switch assembly. No magnetic or manual starters or auxiliary electrical equipment other than safety micro-switches have been incorporated in the machine.

The micro-switch device is adjusted so that, in the event of a jam in the feed worm of the filler, this switch will be activated and stop the machine. In order for this safety switch to function properly, a magnetic starter of the proper type and size must be used for the machine drive motor. The magnetic starter for the machine drive must be able to permit the use of a remotely located start/stop button. The safety switch must be wired in series in the stop button circuit making use of the common lug and the normally open lug provided on the limit switch.

In addition to the feed worm limit switch, which should be wired into the prime mover start/stop circuit, there is also a relay switch in the electronic power supply housing. This relay can also be wired in series with the worm limit switch to act as an auxiliary stop button for stopping the filler rotation if activated by the electronic filler computer logic.

Should the filler be provided with any other electrical safety switches or electrical components due to special requirements specified in the order, the wiring methods and concepts to be used in installing the machine will be provided by your own engineering staff.

It is recommended that the drive motor be wired first. Use a piece of flexible conduit at the motor since it may be moved a considerable distance to vary the machine speed through its complete operating range. It is advisable to remove the belt before attempting to adjust the motor as it is nearly impossible to increase the center distance between the drive pulley and the motor pulley unless the high-low pulley is turning. This also provides the added safety of preventing the machine from being rotated while someone is working on the unit.

CAUTION: UNDER NO CIRCUMSTANCES IS THE POWER TO BE APPLIED TO THE MACHINE UNTIL THE CORRECT MOTOR ROTATION HAS BEEN DETERMINED.

IT IS RECOMMENDED THAT THE BELT IS REOMVED UNTIL ALL WIRING AND TESING OF THE MOTOR IS COMPLETED.

When viewing the drive motor from the shaft end, the motor should rotate in a counter-clockwise direction if the machine has been supplied with the standard left-to-right bottle flow. When wiring the drive motor control circuit, provide for a start and stop button at the front of the machine. These control buttons are to be located where they will be readily accessible to the line operator and convenient to anyone who changes attachments on the machine.

A piece of flexible cable should be used at the worm feed safety switch. This assembly will be moved in and out for container adjustment. At least 18 inches of flexible cable is desired to completely remove this switch when changing feed stars and attachments.

This filler may have been provided with a separate liquid supply system which includes a variable speed product pump and motor. If provided, the product pump requires a motor starter properly sized for the motor. Ensure that proper motor rotation is effected before attempting to run this piece of equipment during testing or in production. Ensure that liquid is present at the pump suction before operating the pump to protect the liquid pump seal.

ELECTRICAL WIRING MACHINE COMPONENTS

Standard machines are furnished with all motors, sensors and other components needed for functioning. It will be necessary to interwire these components to the PLC control enclosure also provided.

All components on the machine, except for the motors, are prewired to either the main operators panel, the filler pneumatic junction box, the product tank level, and pressure control boxes or some other junction box on the machine. Drawings in the manual provide a guide to interwire terminals in these boxes to terminals in the PLC control. All terminals in all junction boxes will be marked and must be wired to a terminal in the PLC enclosure which carries matching markings.

The same wiring practice that applies to the electronics applies to the electrical controls, that is, power wiring and signal wiring must be kept separate as much as possible and must always be run in separate conduit. Therefore, at a minimum, there will be one conduit run for each motor and at least one conduit run to each of the junction boxes.

Under no circumstances should power be applied to the machine drive until the correct motor rotation has been determined. We, therefore, recommend removing the coupling or drive sheave until rotation has been confirmed.

This filler may have been provided with a separate liquid supply level and pressure control system. If provided, it must be interwired to the PLC enclosure.

Stop Buttons

It is often advantageous to be able to stop this machine from either end of the production line. This can be done by installing additional stop buttons wherever desired.

WARNING: IT IS RECOMMENDED THAT ADDITIONAL START BUTTONS ARE NOT INSTALLED DUE TO THE POSSIBILITY THAT THE MACHINE MAY RESTARTED WHILE ANOTHER PERSON IS PERFORMING MAINTENANCE.

PNEUMATICS

This 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. 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 required.

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

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.

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.

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:	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
TECHNICAL DATA

WORK ORDER: 94900-1

FACILITY REQUIREMENTS	
Environmental Conditions	Enclosed structure, climate controlled, free of visible atmospheric pollutants.
Electrical Supply	208 VAC, 40 Amps, 3 Phase.
Pneumatic Supply	60 psi, 20 cfm, .50 inch diameter inlet piping.
Water Supply	Not Applicable.

MACHINE SPECIFICATIONS	
Machine Dimensions	Capper: 113”H x 88-1/2”L x 58”W (approximate) Vibratory Sorter: 91”H x 50”L x 50”W (approximate)
Machine Weight	Capper: 5,000 lbs (estimated) Vibratory Sorter: 2,750 lbs (estimated)
Production Capacity	150 BPM

LUBRICATION	
Bearing Grease	630-AA Grade
Gearbox Oil	Shell HD220/Mobile SHC630

MAIN DRIVE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	3
Revolutions Per Minute (RPM)	1800
Enclosure / Application	Inverter Duty / 1000:1 Constant Torque

TURRET LIFT MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	1
Revolutions Per Minute (RPM)	1740
Enclosure / Application	TENV / w/Brake

CAPPER SPINDLE MOTOR SPECIFICATIONS	
Volts	230 / 460
Hertz	60
Phase	3
Horsepower	3.0
Revolutions Per Minute (RPM)	1800

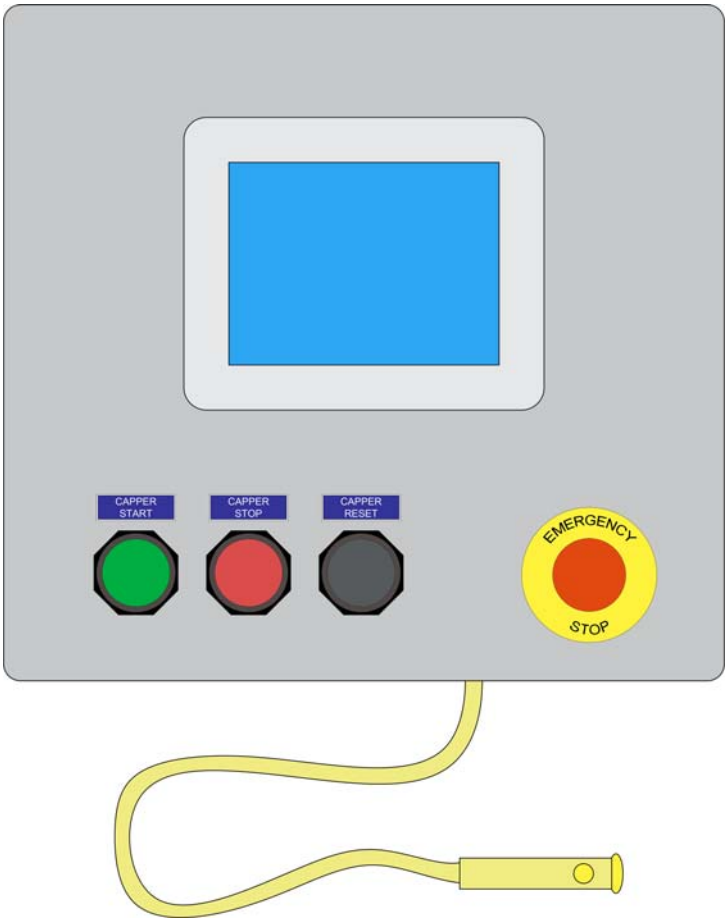
ATTACHMENT REFERENCE

BOTTLE	CAPS	ATTACHMENT
240 cc Rectangular plastic bottle 2.746” wide x 1.572” wide x 4.904” tall	TUMS	Feed Worm: 240 cc Neck Guide Assembly: 240 cc Centerguide Assembly: 240 cc Infeed Star: 240 cc Discharge Star: 240 cc Clamp Star Assembly: 240 cc Cap Feed Star TUMS
275 cc Rectangular plastic bottle 2.746” wide x 1.686” wide x 5.216” tall	TUMS	Feed Worm: 275 cc Neck Guide Assembly: 275 cc Centerguide Assembly: 275 cc Infeed Star: 275 cc Discharge Star: 275 cc Clamp Star Assembly: 275 cc
300 cc Round plastic bottle 2.552” dia x 4.926” tall	TUMS	Feed Worm: 300 cc Neck Guide Assembly: 300 cc Centerguide Assembly: 300 cc Infeed Star: 300 cc Discharge Star: 300 cc Clamp Star Assembly: 300 cc
150 cc Round plastic bottle 2.180” dia x 3.690” tall	TUMS	Feed Worm: 150 cc Neck Guide Assembly: 150 cc Centerguide Assembly: 150 cc Infeed Star: 150 cc Discharge Star: 150 cc Clamp Star Assembly: 150 cc
250 cc Round plastic bottle 2.616” dia x 4.074” tall	TUMS	Feed Worm: 250 cc Neck Guide Assembly: 250 cc Centerguide Assembly: 250 cc Infeed Star: 250 cc Discharge Star: 250 cc Clamp Star Assembly: 250 cc
400 cc Round plastic bottle 2.860” dia x 5.120” tall	TUMS	Feed Worm: 400 cc Neck Guide Assembly: 400 cc Centerguide Assembly: 400 cc Infeed Star: 400 cc Discharge Star: 400 cc Clamp Star Assembly: 400 cc

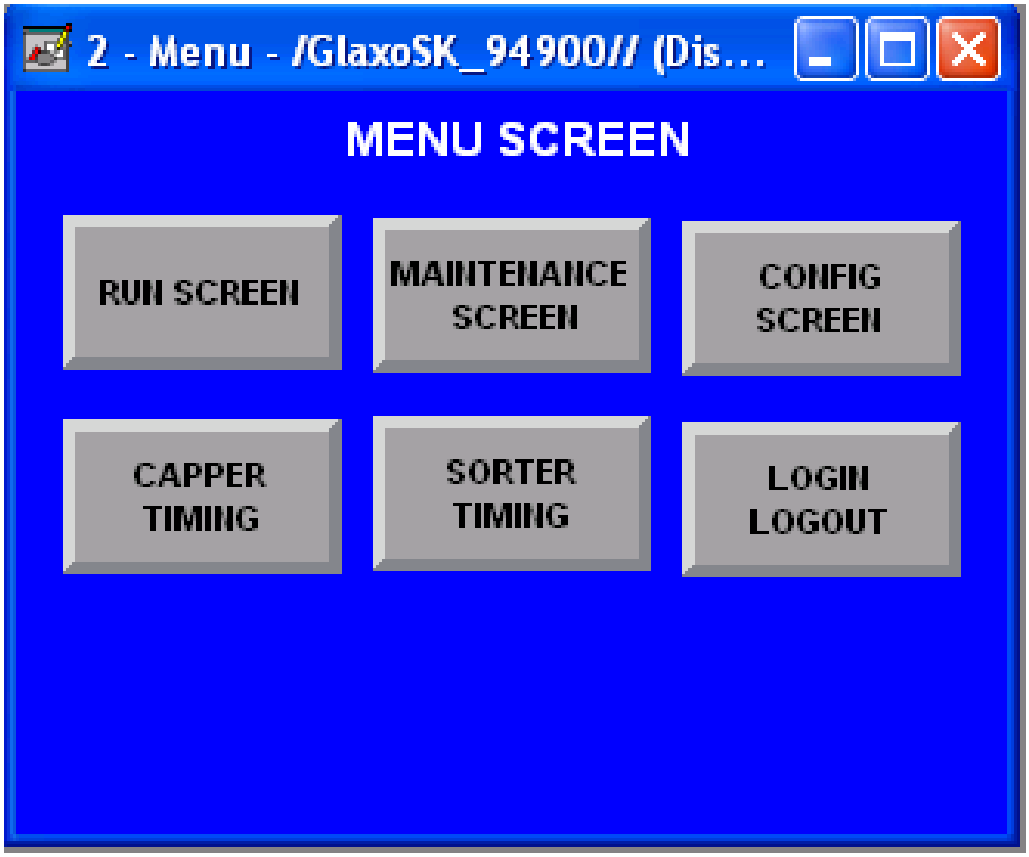
US BOTTLERS MACHINERY COMPANY
OPERATOR PANEL DESCRIPTION

Work Order: 92330

OPERATOR PANEL BUTTONS	
BUTTONS	**DESCRIPTION**
CAPPER START	Initiates machine operation when pressed. Pressing the CAPPER STOP button will pause machine operation.
CAPPER STOP	Ceases machine operation when pressed. Pressing the CAPPER START button will activate machine operation.
CAPPER 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.
CAPPER JOG & HOIST 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.

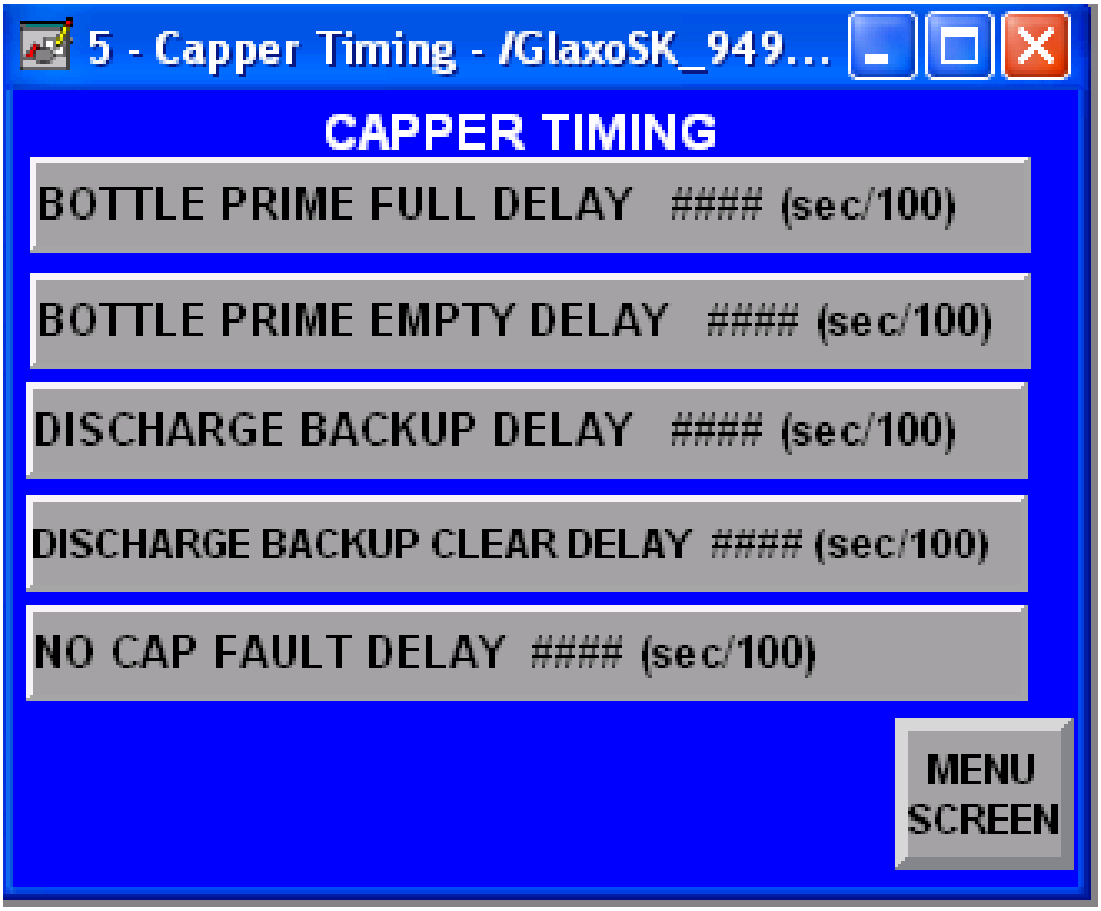


MENU SELECTION SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
RUN SCREEN	When pressed, advances to the Run Screen menu. Is the primary screen for machine operation.
MAINTENANCE SCREEN	When pressed, advances to the Maintenance menu. This menu allows features to be bypassed and counters to be reset. Contains controls for machine setup and troubleshooting.
CONFIG SCREEN	When pressed, advances to the Configuration menu. Allows access to the touch screen configuration functions.
CAPPER TIMING	When pressed, advances to the Capper Timing menu. This menu allows adjustment of the timers for the machine.
SORTER TIMING	When pressed, advances to the Sorter Timing menu. This menu allows adjustment of the timers for the machine.
LOGIN/LOGOUT	Advances the user to the Login Menu to log in or log out.

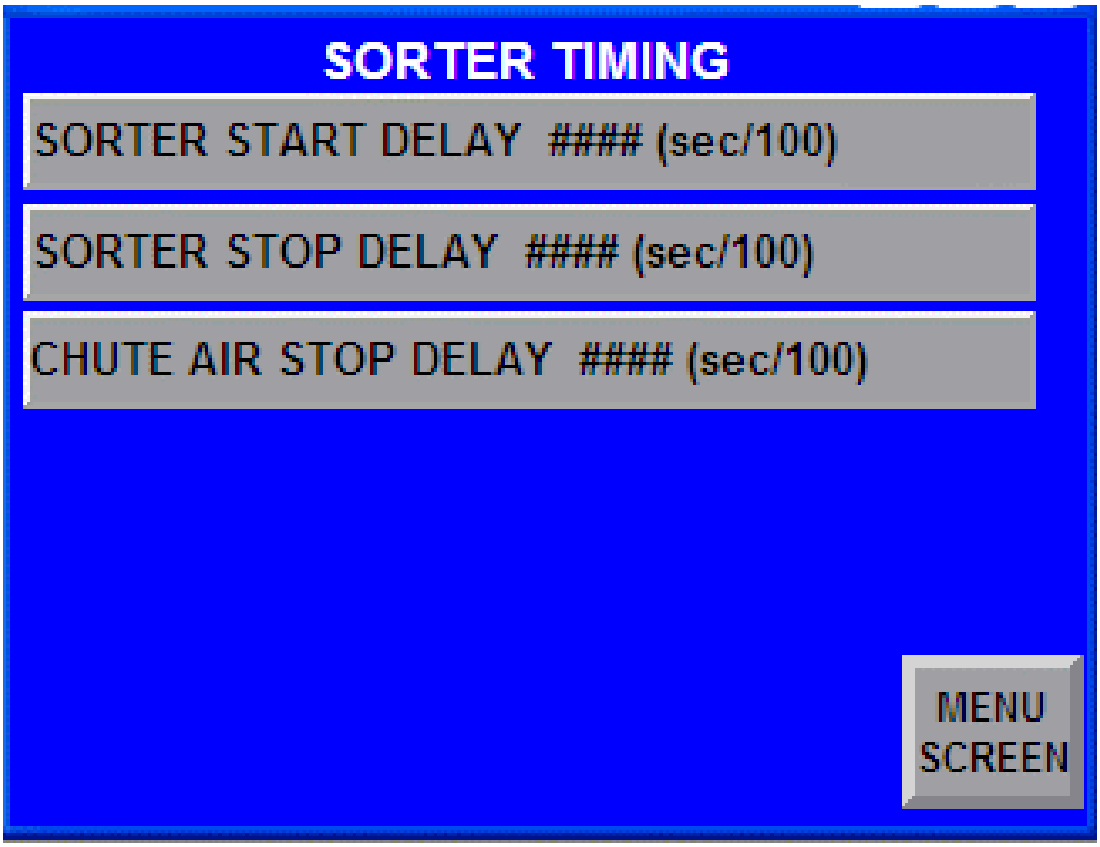


RUN MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
BOTTLE STOP ON/OFF	Controls the bottle stop.
CAPS OFF/AUTO	Controls the cap feed system
SPINDLE ON/OFF	Spindle ON: The Independent Spindle Motor is in operation, which allows the chuck rotational speed to be controlled. Spindle OFF: The Independent Spindle Motor is not in operation.
MACHINE SETPOINT BPM	Displays the desired production rate in bottles per minute (BPM).
MACHINE ACTUAL BPM	Displays the current production rate in bottles per minute (BPM).
MENU SCREEN	Returns the operator to the Menu screen.
RED BANNERS	(Infeed Screw Guard is just one example.) Show machine faults that prevent the machine from running and need corrective action.
YELLOW BANNERS	Show machine warnings, which are items that require operator attention but do not keep the machine from running.

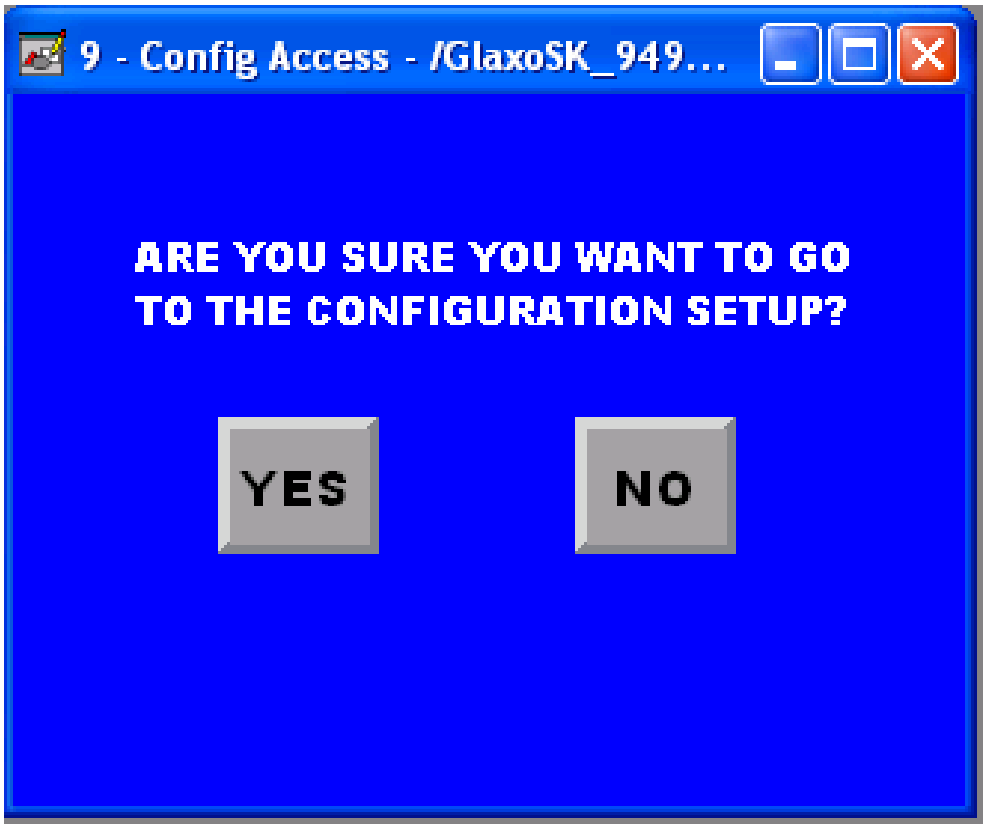
CAPPER TIMING SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
BOTTLE PRIME FULL DELAY	Sets the length of time the Bottle Prime Full eye has to be blocked before releasing the bottle stop.
BOTTLE PRIME EMPTY DELAY	Sets the length of time the Bottle Prime Empty eye has to be clear before engaging the bottle stop.
DISCHARGE BACKUP DELAY	Sets the length of time the Discharge Backup sensor has to be blocked before engaging the bottle stop.
DISCHARGE BACKUP CLEAR DELAY	Sets the time length the machine waits once the backup eye is clear before resuming normal operation.
NO CAP FAULT DELAY	Sets the timer for the “no caps” fault.
MENU SCREEN	Returns the operator to the Menu screen.



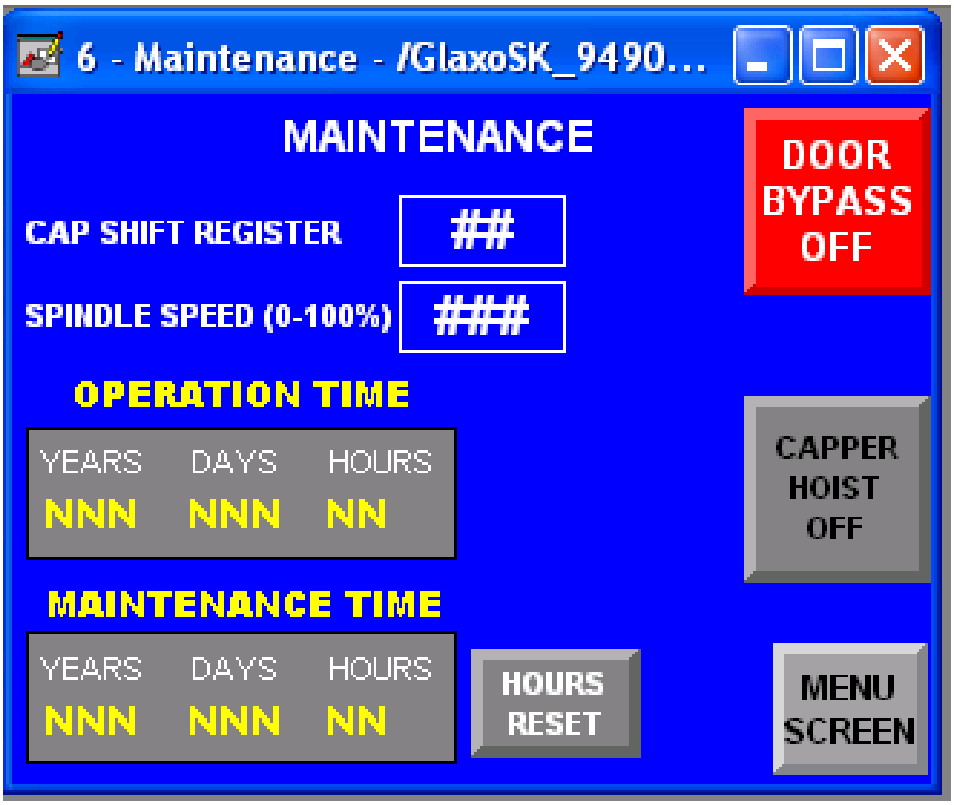
SORTER TIMING SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
SORTER START DELAY	The length of time the sorter waits to start once the chute cap sensor doesn't detect caps.
SORTER STOP DELAY	The length of time the sorter continues to run once the chute cap sensor detects caps.
CHUTE AIR STOP DELAY	The amount of time the chute air will remain on after the chute is full.
MENU SCREEN	Returns the operator to the Menu screen.



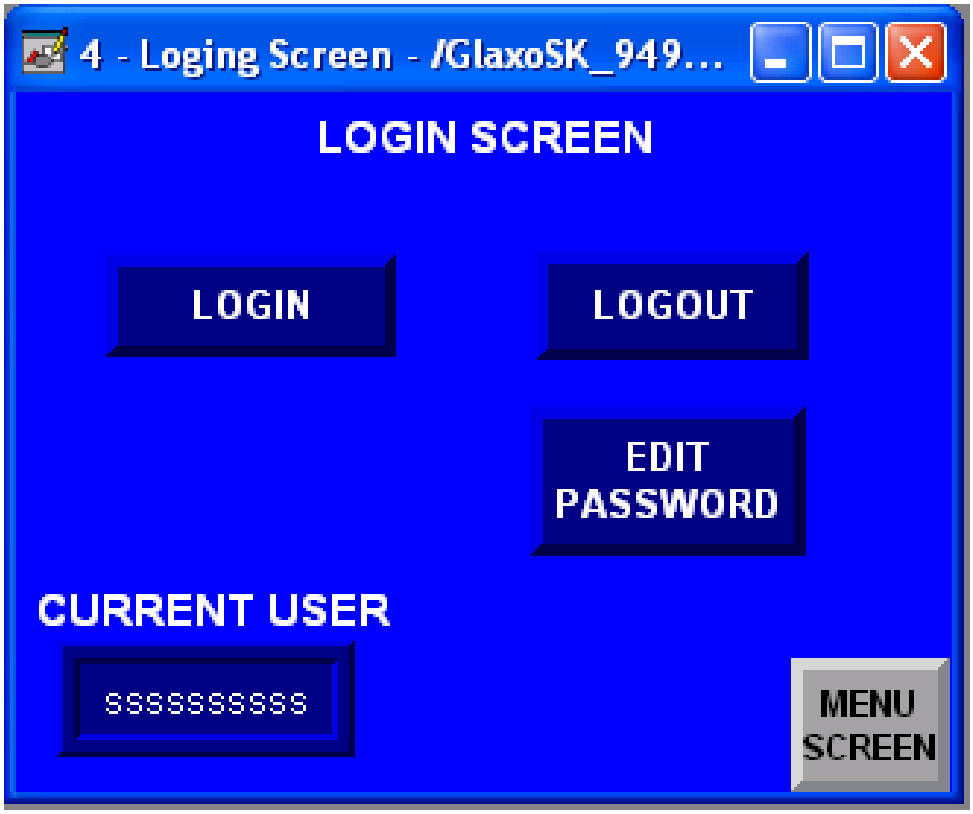
CONFIGURATION ACCESS SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
YES	Advances to the Panelview Configuration Screen.
NO	Returns to the Main Menu.



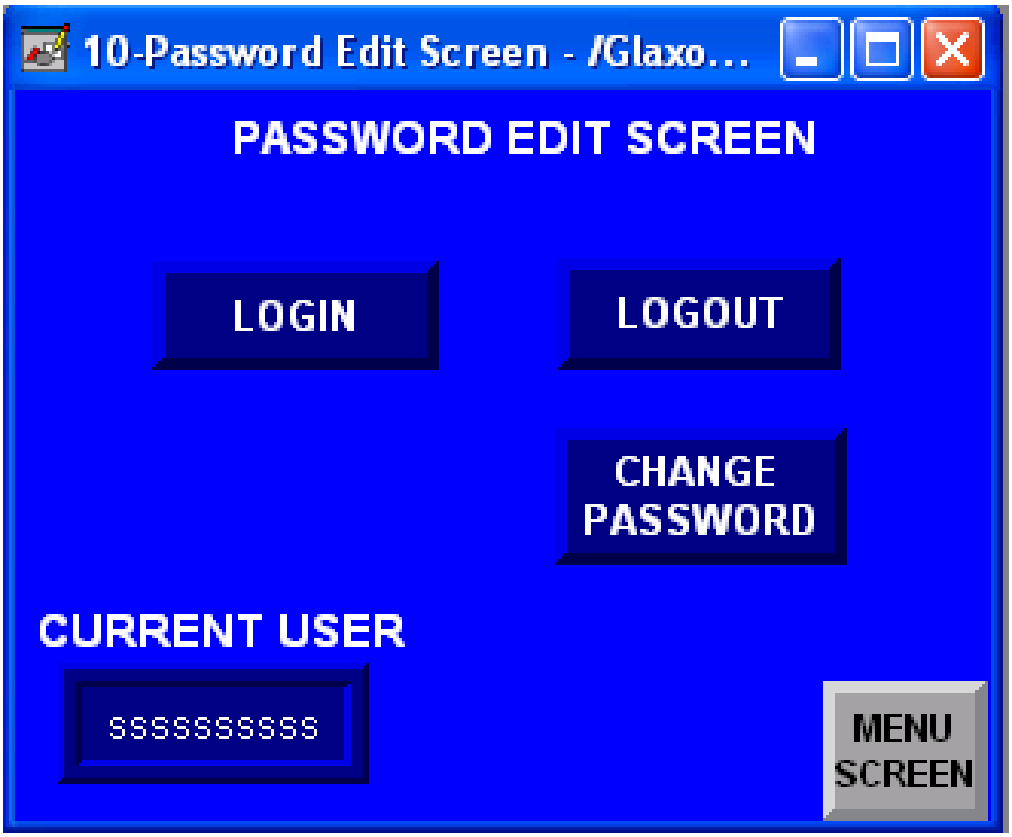
MAINTENANCE MENU SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
DOOR BYPASS OFF/ON	Door Bypass ON: The machine can only function in the JOG mode and one door can be open. Door Bypass OFF: The machine is in normal operation mode. If a door is open, it will create a machine fault.
CAPPER HOIST OFF/UP/DOWN	When 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.
OPERATION TIME	Displays the total time that the machine has been running.
MAINTENANCE TIME	Displays the time the machine has been running since the Maintenance Time was last reset.
HOURS RESET	Allows the Maintenance Time counter to be reset.
MENU SCREEN	Returns the operator to the Menu screen.



LOGIN SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
LOGIN	Advances to password screen. Will prompt for correct password.
LOGOUT	Will remove current user access.
EDIT PASSWORD	Advances to password edit screen.
CURRENT USER	Displays name of current logged in user.
MENU SCREEN	Advances to menu screen.



PASSWORD EDIT SCREEN	
BUTTONS/DISPLAYS	**DESCRIPTION**
LOGIN	Advances to password screen. Will prompt for correct password.
LOGOUT	Will remove current user access.
CHANGE PASSWORD	Allows current logged in user the ability to change their password.
CURRENT USER	Displays name of current logged in user.
MENU SCREEN	Advances to menu screen.



US BOTTLERS MACHINERY COMPANY
SPARE PARTS LIST

Product: RC-6-22" ROTARY CAPPER

Customer: Glaxo Smith Kline **Work Order No.:** 94900-1

When ordering spare parts, it is important to provide the work order number for the machine order followed by the part number and description of each part to be ordered.

P/N	QTY	DESCRIPTION	CODE	UNIT$$	EXTENDED
B11520	1	Bearing, Main	D		
B11982	1	Gear, Bull, 22" PD	D		
A18462	1	Bearing, 2" Bore, 2-Bolt	C		
A16631	1	Sensor, Proximity	A		
B12324	1	Star Gear	D		
A21179	1	Clutch, Mechanical, 2"	A		
A90110	1	Gearbox, Main Drive	D		
A90170	1	Motor, Main Drive	D		
A16118	1	Bearing Assy, Ball, 3-7/16"	C		
C11504	2	Roller Carrier	A		
A18957	6	Bushing, 1-1/4", Plain Bearing	B		
X74210	4	Shaft, Chuck	B		
A17357	2	Roller Sleeve, Urethane	B		
A17744	2	Bearing, Roller Assy, SS	B		
A19874	3	Spring, Chuck Release	C		
C11023	3	Chuck Jaw Body	C		
B11335	3	Jaw Stem	C		
C11033	3	Chuck Jaw, Lined	C		
A16178	1	Stop Arm, Cap/No-Cap Device	B		
A90552	1	Cylinder, 3/4" Bore, 1" Stroke	B		
A16179	2	Pivot Bushing	A		
A16155	1	Rotary Air Joint	A		
A18064	1	Switch, Roller Activated	A		
A18062	1	Hose, 1/8" OD Coiled	A		
A18063	2	Fitting, Recoil Hose	A		
A91808	1	Chute Air Valve	A		
A90818	1	Jog Cord, 12", H20 Tight	A		
A19303	9	Pin, Drive	C		
X83169	2	Chuck Jaw, "Tums"	A		
C11024	2	Chuck Jaw Body	C		
B11336	2	Jaw Stem	C		
A16355	3	Snap Ring	A		
A18259	3	Linear, Chuck	A		

P/N	QTY	DESCRIPTION	CODE	UNIT$$	EXTENDED
A21328	1	Magnetic Clutch	C		
A17744	2	Bearing, Clamping Belt Pulley	A		
A16197	1	Clamping Belt	A		
X82898	1	Gear, 3”, Pinion	A		
A91944	1	Door Switch	A		

Estimated Total:

CODE DESIGNATIONS	
A	Items critical to machine operation and inventory is imperative.
B	High wear items that will require replacement within the first year.
C	Low wear items that will require replacement beyond the first year.
D	Non-shelf items that require long lead times for delivery.

ALL PRICES ARE HONORED FOR 30 DAYS FROM DATE OF QUOTATION
ALL PRICES ARE IN US DOLLARS

US Bottlers Machinery Company, Inc
11911 Steele Creek Road, Charlotte, NC 28273 <> PO Box 7203, Charlotte, NC 28241
Phone: 704.587.0231 / 704.587.023 Fax: 704.588.3808
parts@usbottlers.com
www.usbottlers.com

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.

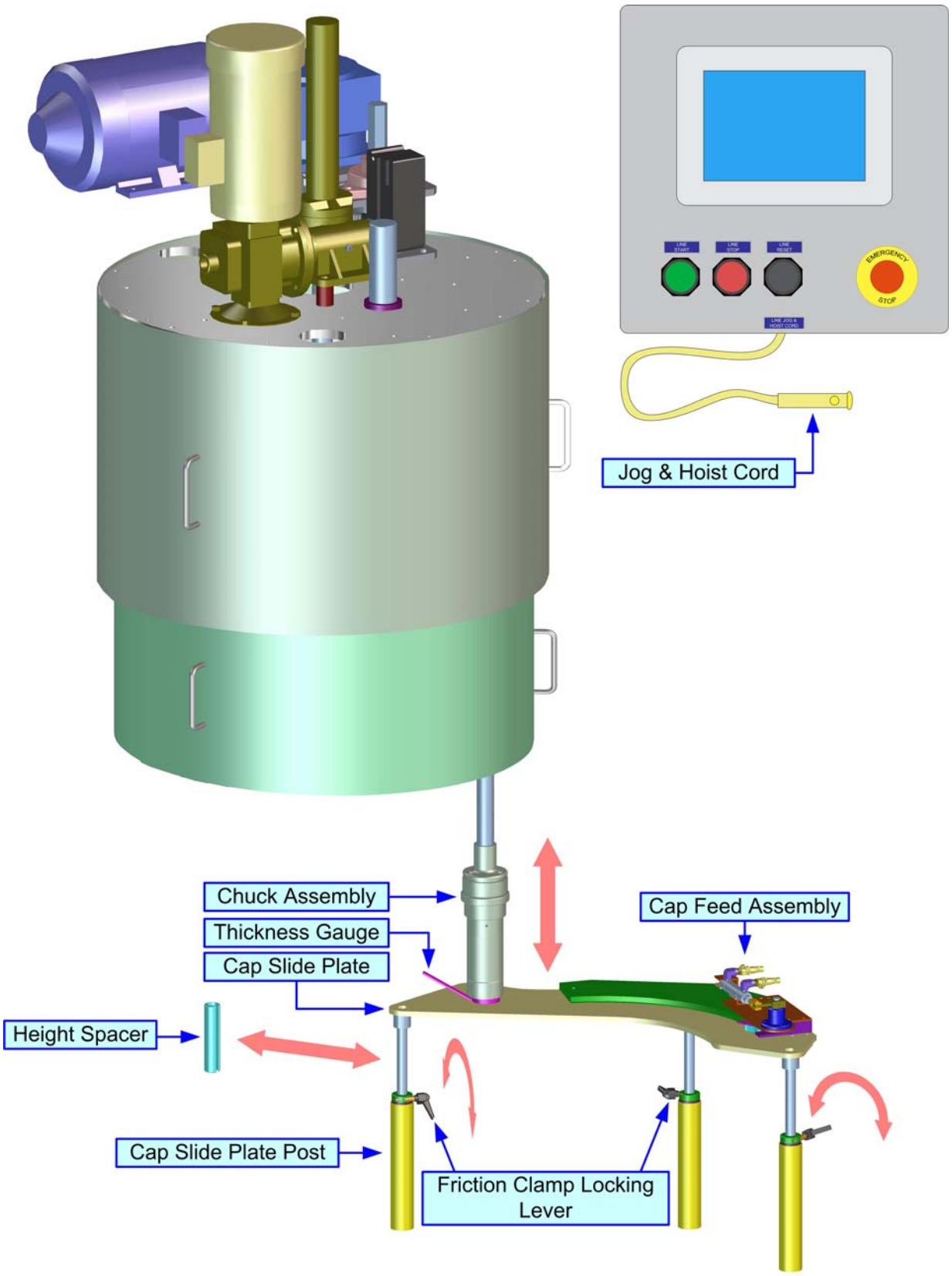
CAUTION: EXERCIZE CARE WHEN PERFORMING THIS PROCEDURE. IF THE CHUCKS ARE NOT SET AT THE PROPER HEIGHT, MECHANICAL DAMAGE CAN OCCUR WHEN ROTATING THE MACHINE UNDER POWER.

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.

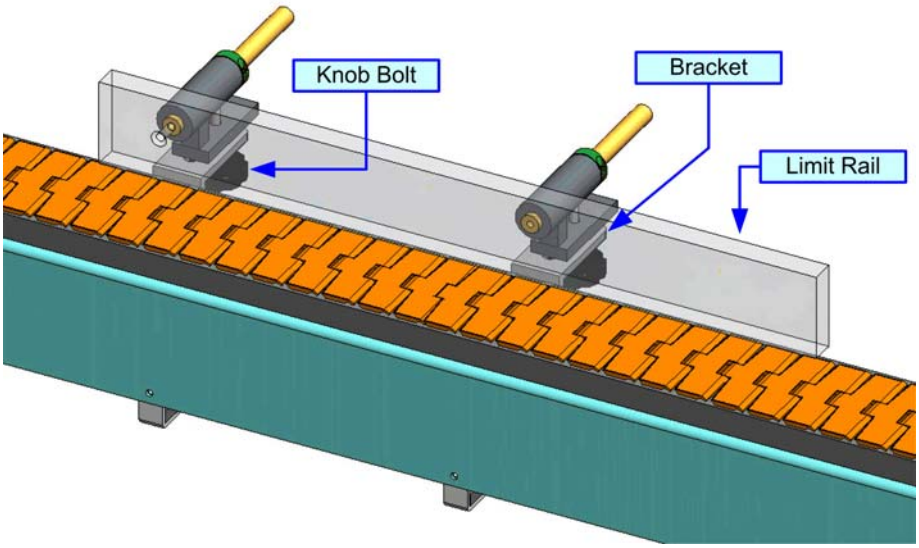
6. Use the jog & hoist cord to rotate a chuck assembly over the cap slide plate stopping at its lowest point.
7. Place the thickness gauge flatly onto the top surface of the cap slide plate centered beneath the chuck assembly.
8. Use the jog & hoist cord to lower the capper's chuck assembly toward the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

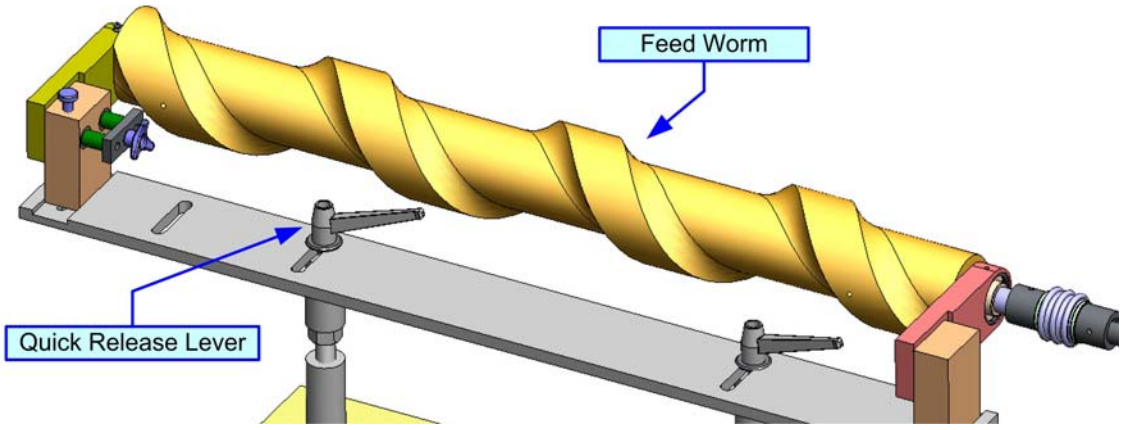
Most container size changes will require the position adjustment of the limit rail and the feed worm. Their proper positioning will allow the container to travel on the conveyor chain without any lateral movement due to contact with either components.

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.

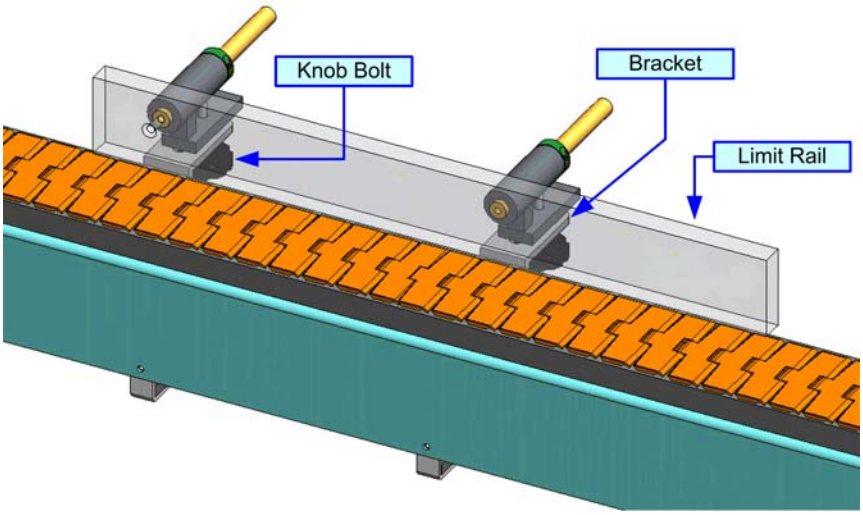


LIMIT RAIL & FEED WORM ADJUSTMENT

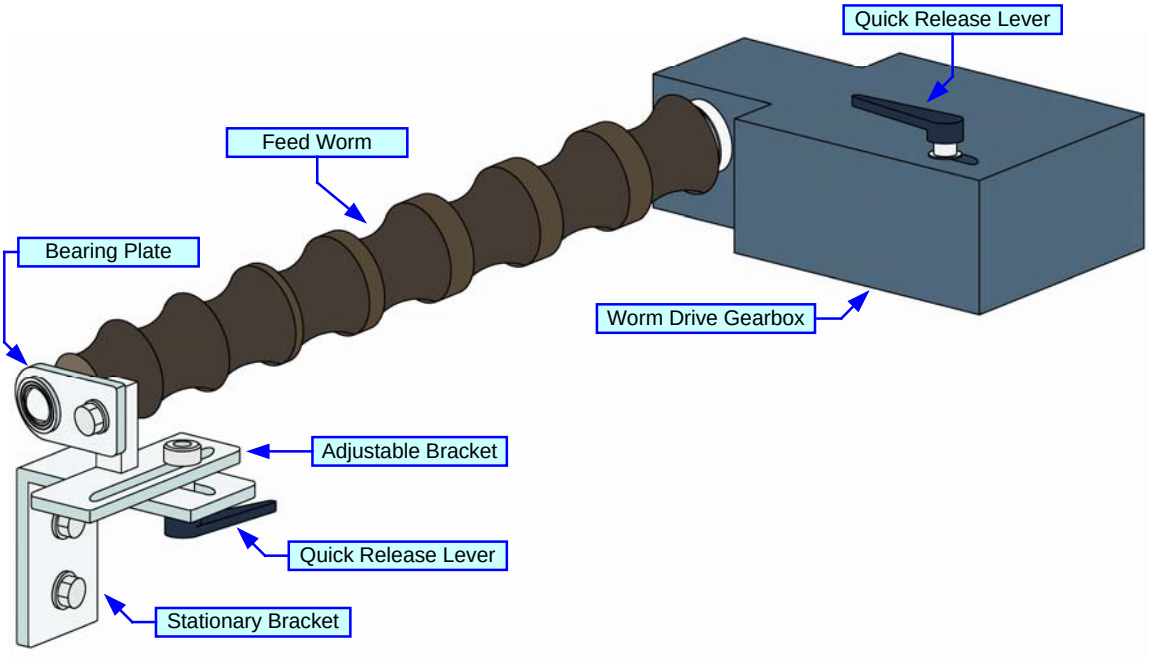
Most product size changes will require the position adjustment of the limit rail and the feed worm. Their proper positioning should allow the container to travel on the conveyor chain without any lateral movement due to contact with either components.

> **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.



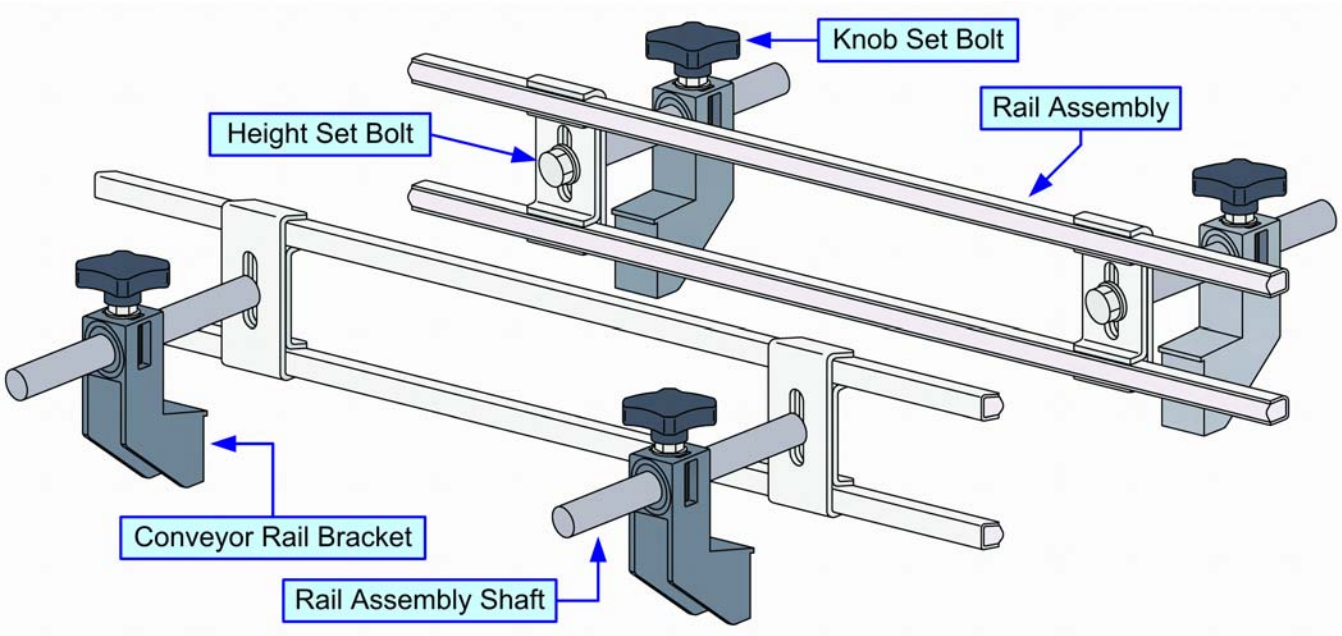
CONFIGURATION A

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.



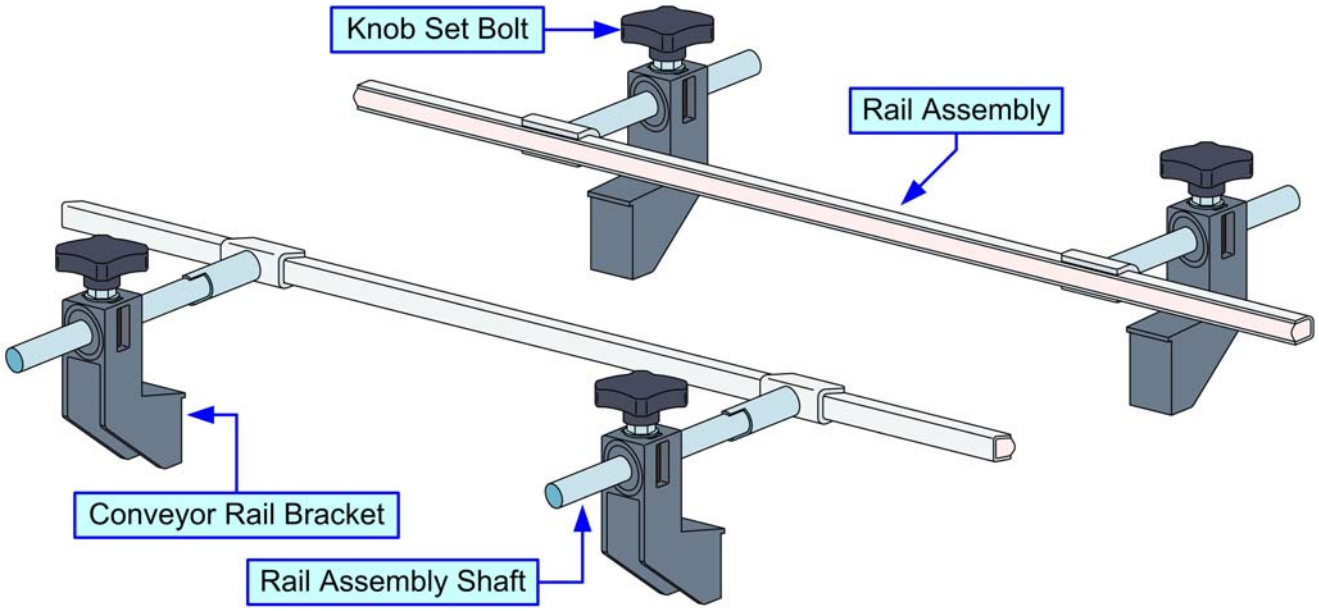
CONFIGURATION B

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.

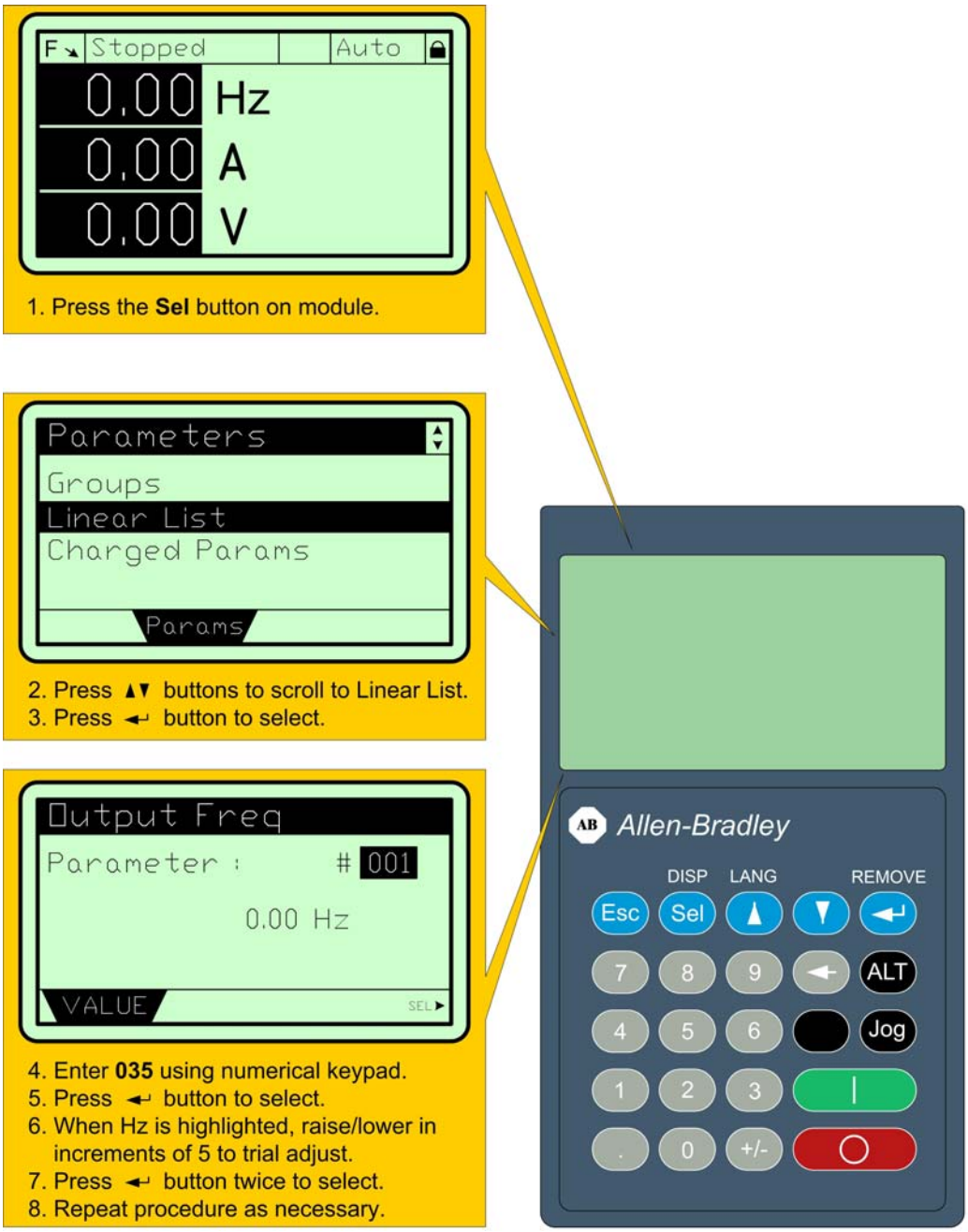
If vertical adjustment is required to improve container stability while being conveyed, loosen the bolts securing the conveyor rail brackets to the conveyor channel, then manually raise or lower as desired. Hold each rail assembly in position while retightening the bolts.



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

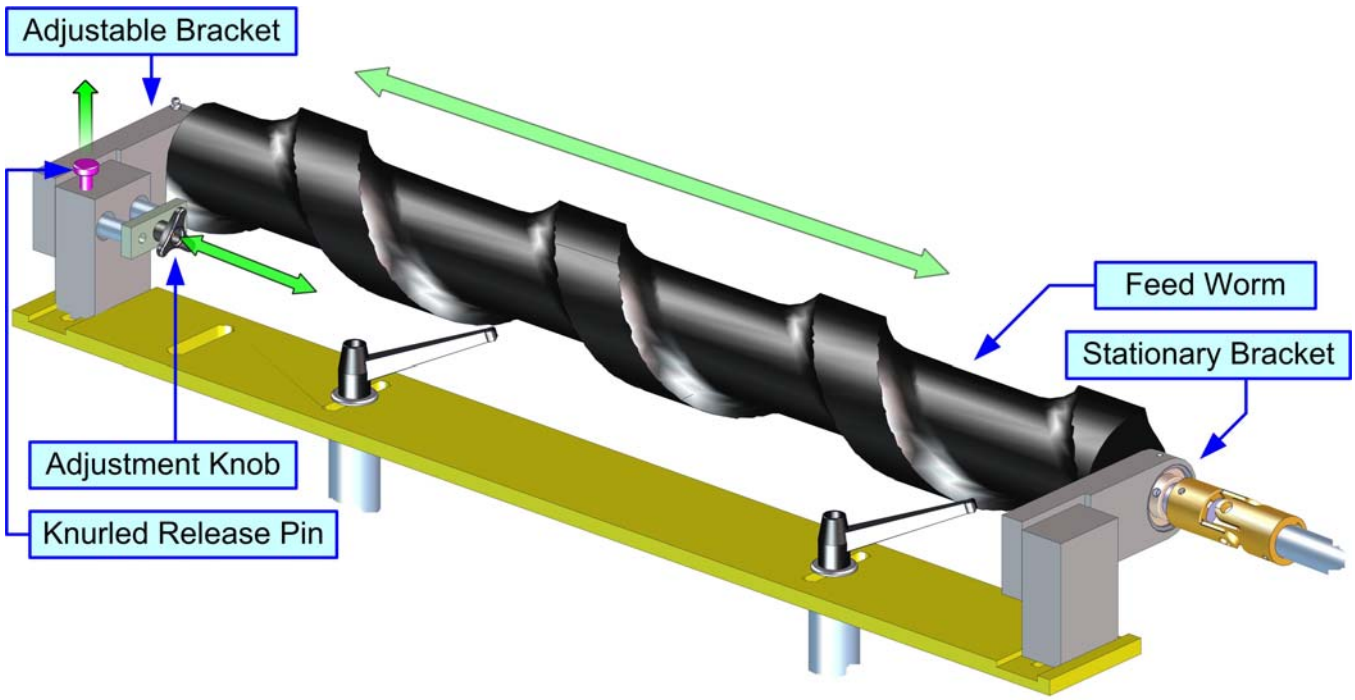
This feature allows the capper's spindle rotational speed to be independently adjusted from the turret's rotational speed to accommodate the application profile of various cap types through the increase or decrease of spindle/chuck revolutions.

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.



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.

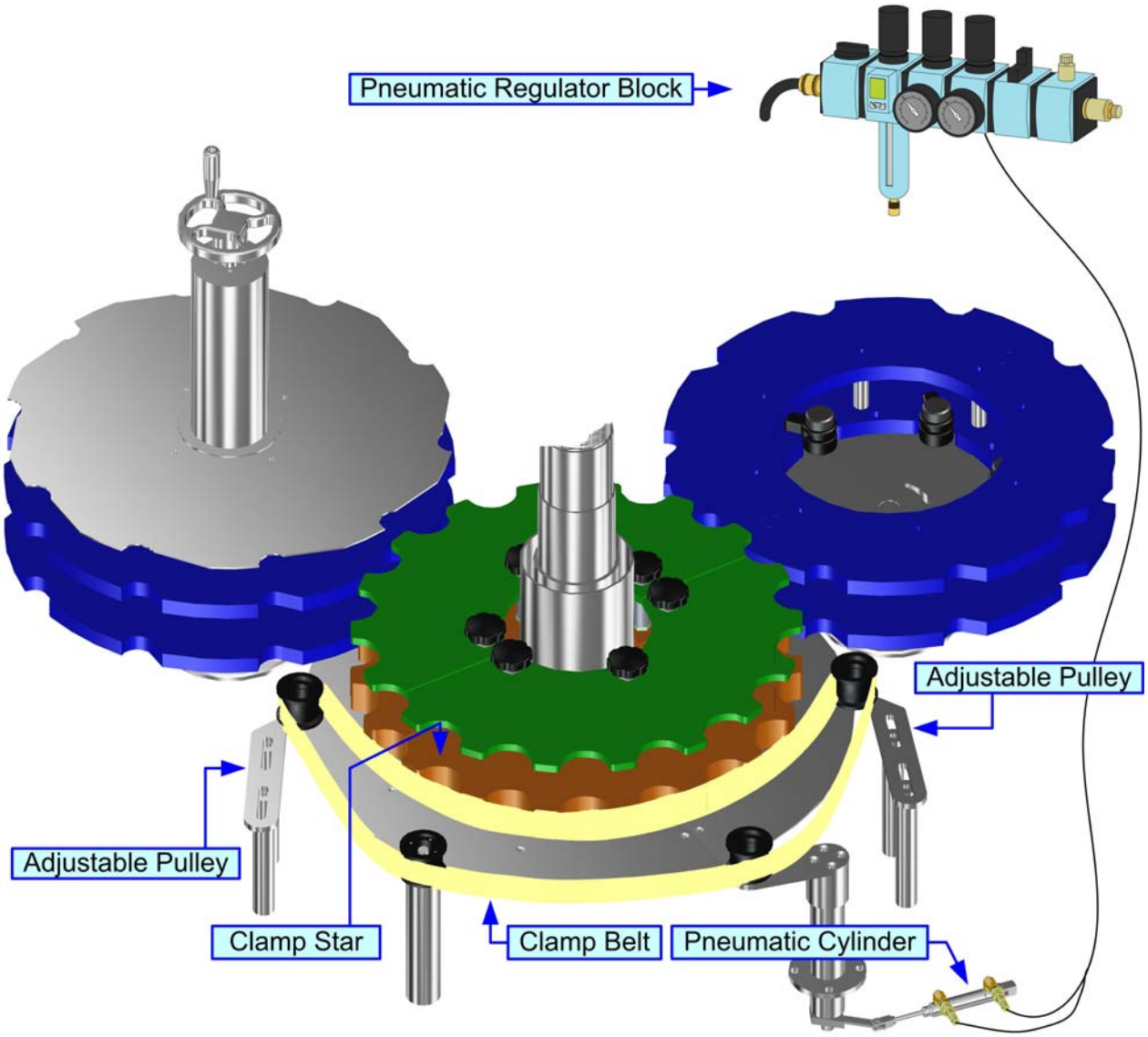
To install the alternate feed worm, insert one end into the stationary bracket, then lower the worm's free end to align with the adjustable bracket. Grasp the adjustment knob and pull inward to move the adjustable bracket to couple with the feed worm. Lower the knurled release pin.



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.



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.

Cap Chuck
Regulates the positioning of individual caps for the cap chuck. This switch setting will vary depending on the pressure required for proper positioning.

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

Plugger Chute Air
Controls the supply of air to the plugger 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

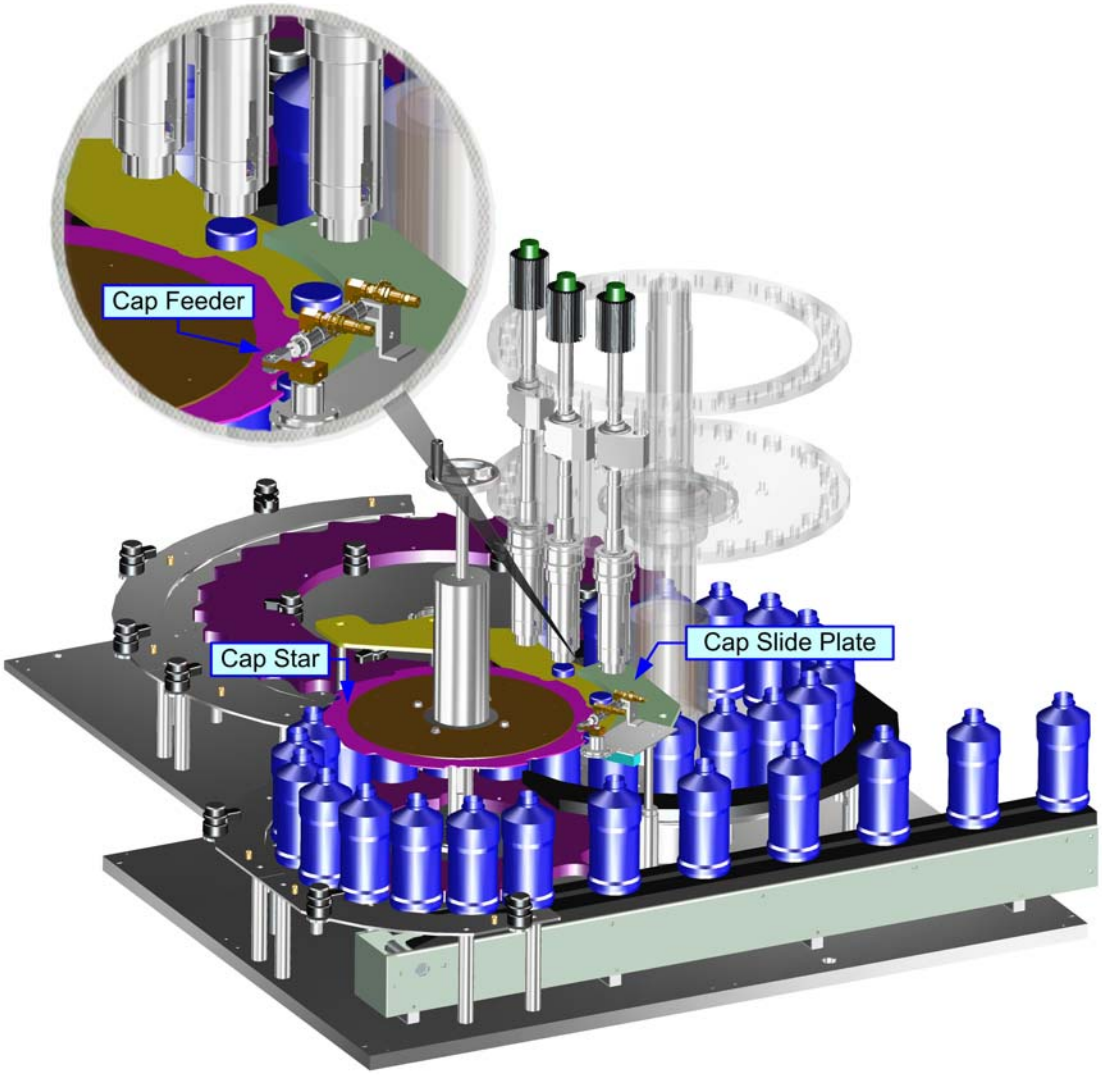
Provides manual shutoff for air.

Valve Wash Solenoid
Controls fluid flow to the slide ring wash nozzles and the filling valve wash nozzles located on the filler.

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

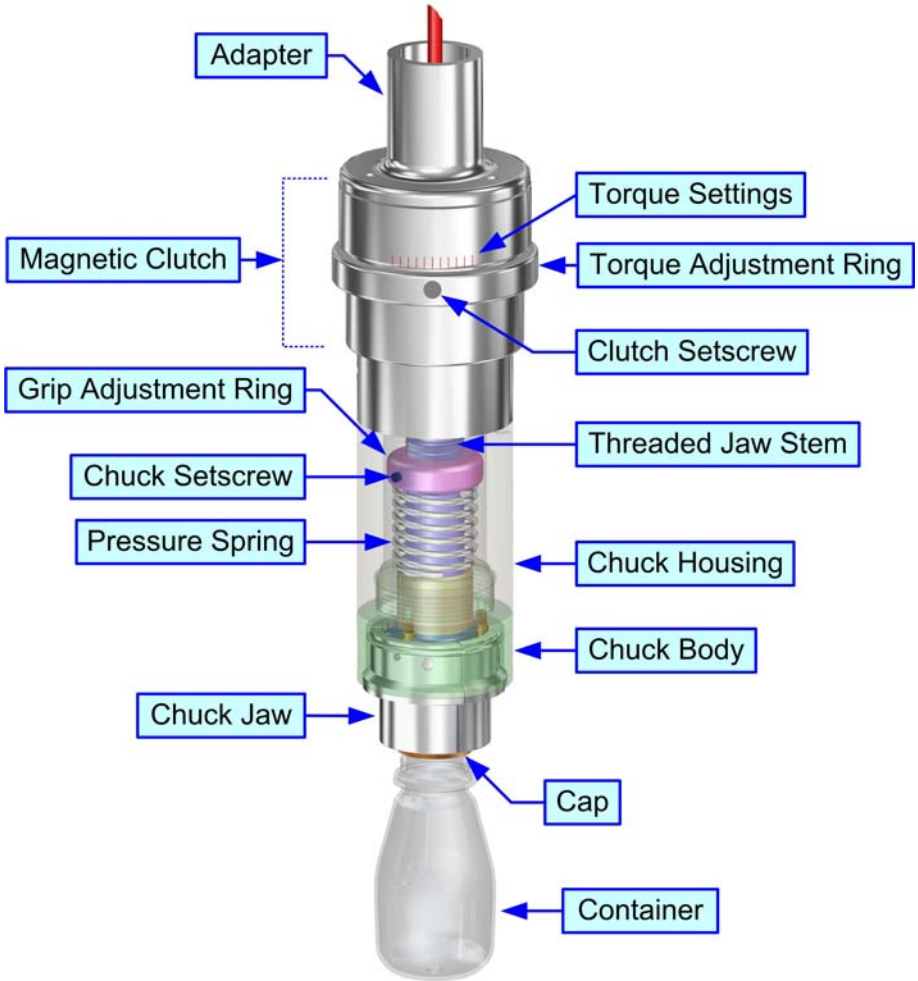
This chapter provides instruction on how to independently increase/decrease the chuck's gripping strength and tightening strength.

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.



ATTACHMENT CHANGE

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

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 safety doors as necessary to access the changeover attachments.
3. As applicable, change the setting of the operator panel for the changeover.

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

4. Remove three knob bolts securing **LH Neck Guide**. Lift away **LH Neck Guide**.
5. Remove three knob bolts securing **RH Neck Guide**. Lift away **RH Neck Guide**.
6. Remove six knob bolts securing **Capper Center Star**. Lift away **Capper Center Star**.
7. Rotate six **Knob Assys** securing **Infeed Star**. Lift away **Infeed Star**.
8. Rotate six **Knob Assys** securing **Discharge Star**. Lift away **Discharge Star**.
9. Rotate three **Knob Assys** securing **Infeed Center Guide** and **Discharge Center Guide**. Lift away guides.
10. Install alternates as described in steps 4 through 9.
11. Remove feed worm as necessary and install alternate.
12. Adjust rear rail adjustment plate.
13. Adjust height of cap slide plate.
14. Restore power and test cycle to ensure proper function.

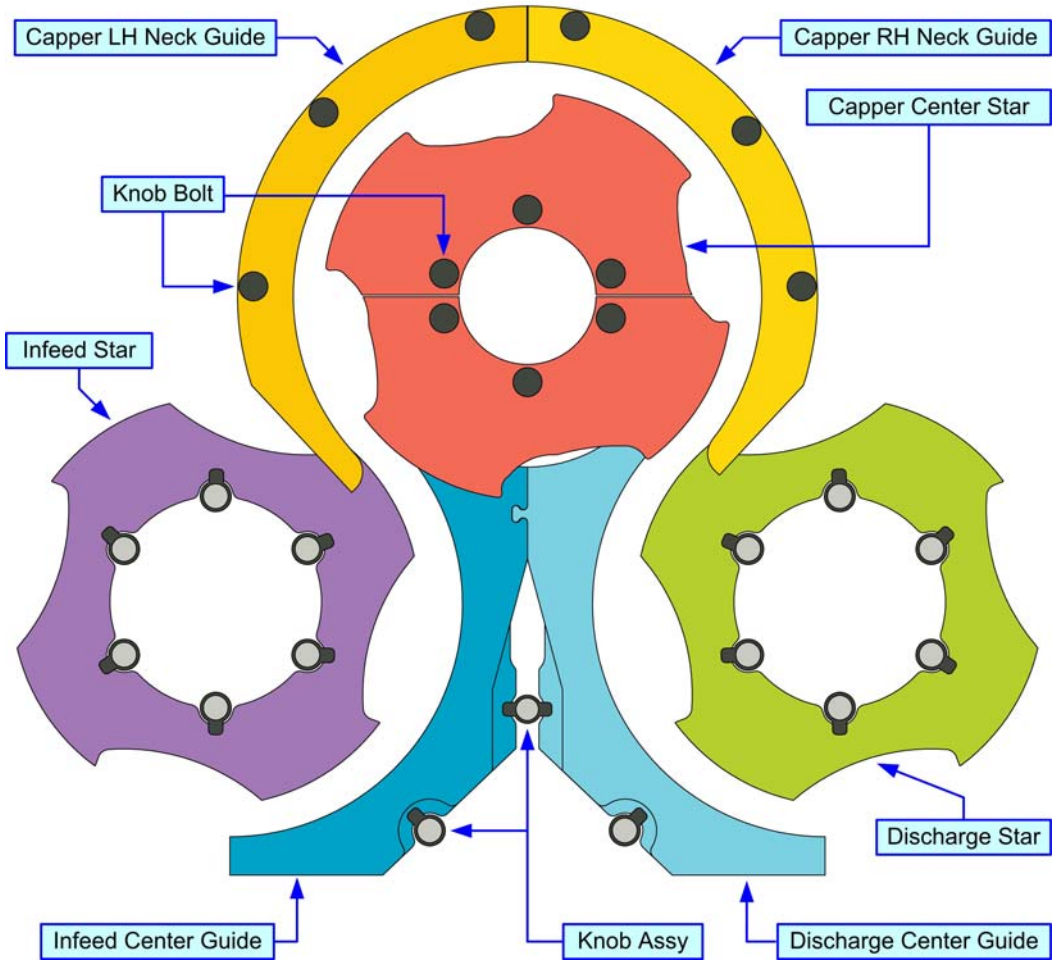


Figure 4-XX, Changeover Diagram

ATTACHMENT CHANGE

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

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 safety doors as necessary to access the changeover attachments.
3. Fully raise the turret (not shown).
4. Remove four knob bolts (1) securing two halves of neck guide (2). Lift away neck guide (2).
5. Remove four knob bolts (3) securing two halves of clamp star (4). Lift away clamp star (4).
6. Remove one knob bolt (5) and centering plate (6) securing cap star (7). Lift away cap star (7).
7. Remove two bolts with washers (8) securing cap slide plate (9). Lift away cap slide plate (9) along with two spacers (10).
8. Lift away discharge star assembly (11).
9. Remove one knob bolt (12) and centering plate (13) securing infeed star assembly (14). Lift away infeed star assembly (14).
10. Remove three knob bolts (15) securing center guide assembly (16). Lift away center guide assembly (16).
11. Unscrew to remove eight chuck jaws (17) from chuck shafts (18).
12. Install alternate feed worm (19) as applicable.
13. Thread eight alternate chuck jaws (17) onto chuck shafts (18). Hand tighten chuck jaws (17).
14. Install alternate center guide assembly (16) and secure using three knob bolts (15).
15. Install alternate infeed star assembly (14) and secure using centering plate (13), knob bolt (12).
16. Install alternate discharge star assembly (11).
17. Loosen two friction clamps (20) and install two alternate spacers (10) onto cap slide plate (9) and secure using two bolts with washers (8). Retighten two friction clamps (20).
18. Install alternate cap star (7) and secure using centering plate (6) and one knob bolt (5).
19. Install alternate two halves of clamp star (4) and secure using four knob bolts (3).
20. Install alternate two halves of neck guide (2) and secure using four knob bolts (1).
21. Restore power, lower turret to the correct height as determined by setup feeler gauge, and test cycle to ensure proper function.

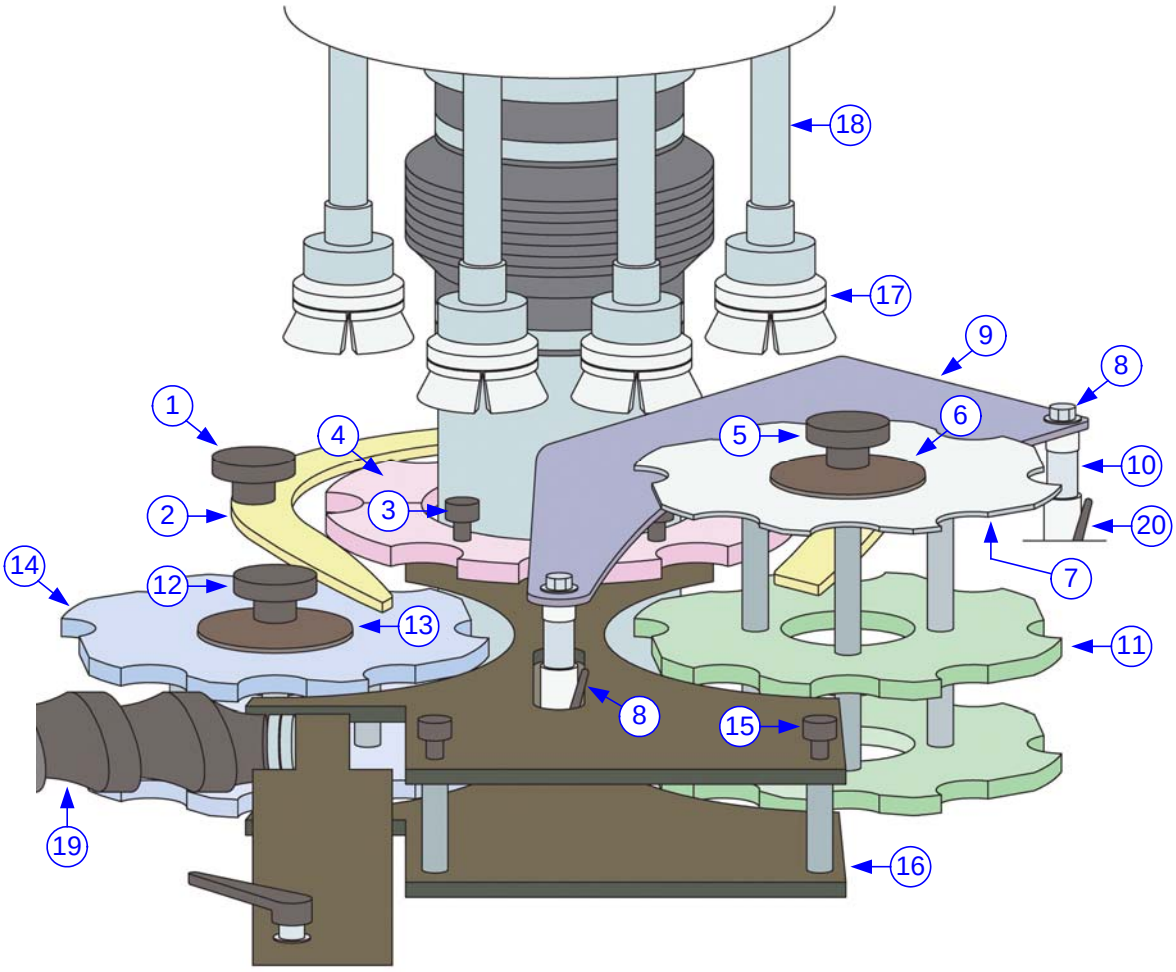


Figure 4-XX, Attachment Change

ATTACHMENT CHANGE

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

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 safety doors as necessary to access the changeover attachments.
3. As applicable, change the setting of the operator panel for the changeover.

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

4. Remove four bolts with washers (1, Figure 4-10a) securing cap transfer star (2) to shaft (3). Lift away star (2).

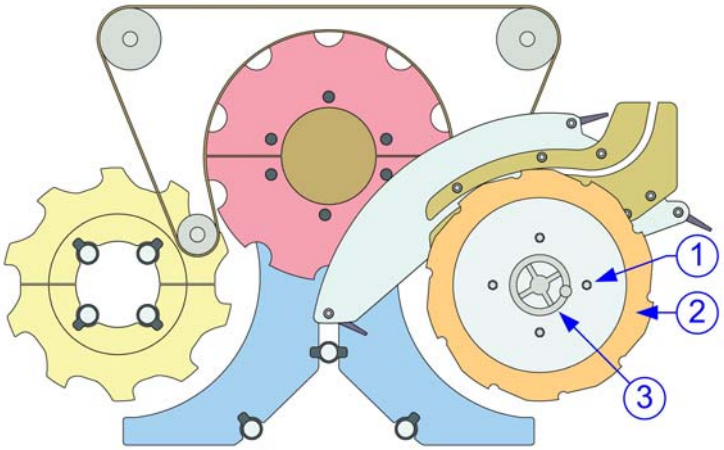


Figure 4-XXa, Changeover

5. Remove flathead bolts (4, Figure 4-10b) from the underside of lower cap slide plate (5) securing upper cap slide plate (6) and spacers. Lift away upper cap slide plate (6).

> NOTE: The lower cap slide plate never changes from product to product. The upper cap slide plate does require changing for some product types.

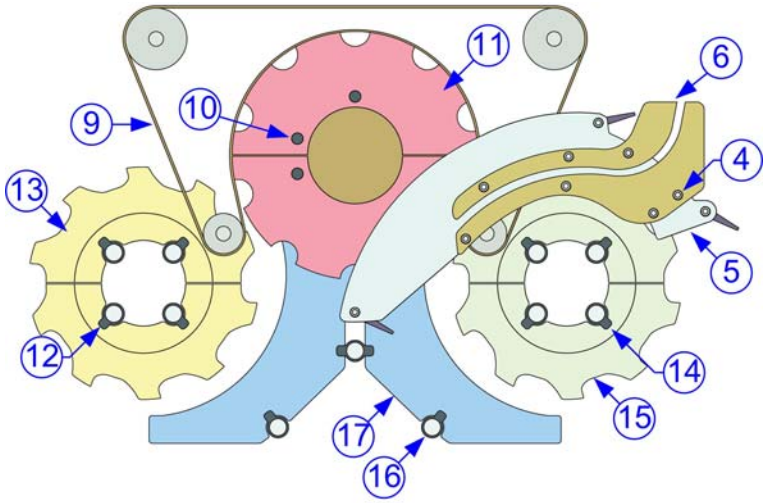


Figure 4-XXb, Changeover

6. Raise capper turret to its highest possible position.
7. As applicable, manually unscrew each of the chuck jaw assemblies (7, Figure 4-10c) from chuck shafts (8).

NOTE: A spanner wrench may be required.

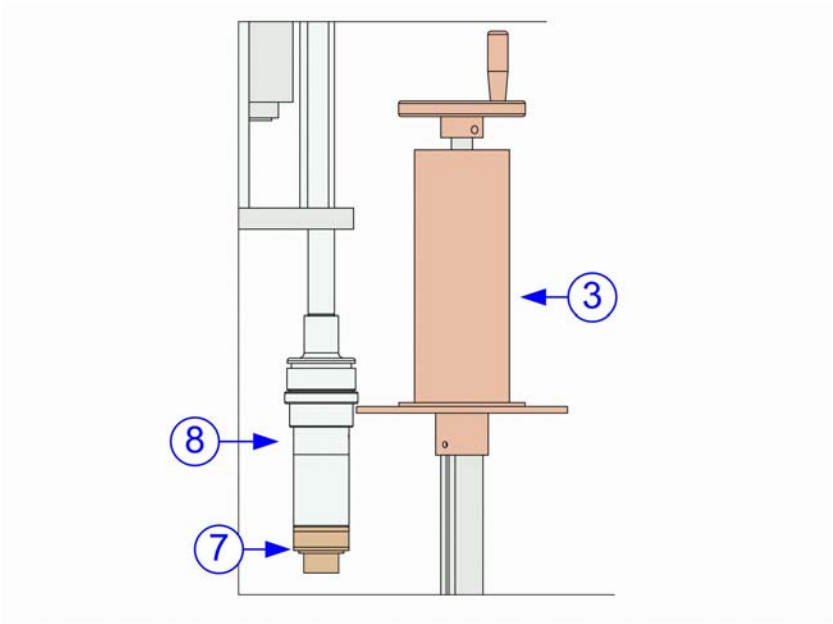


Figure 4-XXc, Changeover

8. Temporarily, detach anti-rotation belt (9) to replace other changeover components.
9. As applicable, remove knob bolts (10) securing clamp star halves (11). Install alternates (11).
10. Twist spring-loaded clamps (12) securing infeed star halves (13). Install alternates (13).
11. Twist spring-loaded clamps (14) securing discharge star halves (15). Install alternates (15).
12. Twist spring-loaded clamps (16) securing center guide halves (17). Install alternates (17).

13. Attach the same anti-rotation belt (9) as was previously removed.

> NOTE: Whereas the same belt is always used and used in the same configuration, the type of changeover determines whether it will go into the upper or lower grooves of the respective pulleys.

14. Manually thread on the applicable chuck jaw assemblies (7).
15. Install the applicable upper cap slide plate (6), secure using flathead bolts (4).
16. Manually turn jackscrew (18) to raise/lower cap transfer star (2) to appropriate height.

> NOTE: The appropriate cap transfer star height is determined by a scale designation.

17. Install applicable cap transfer star (2) to shaft using four bolts with washers (1).
18. Adjust turret to correct height.
19. As applicable, change the setting of the operator panel for the changeover.
20. Close doors, restore power, and test cycle to ensure a proper setup/changeover.

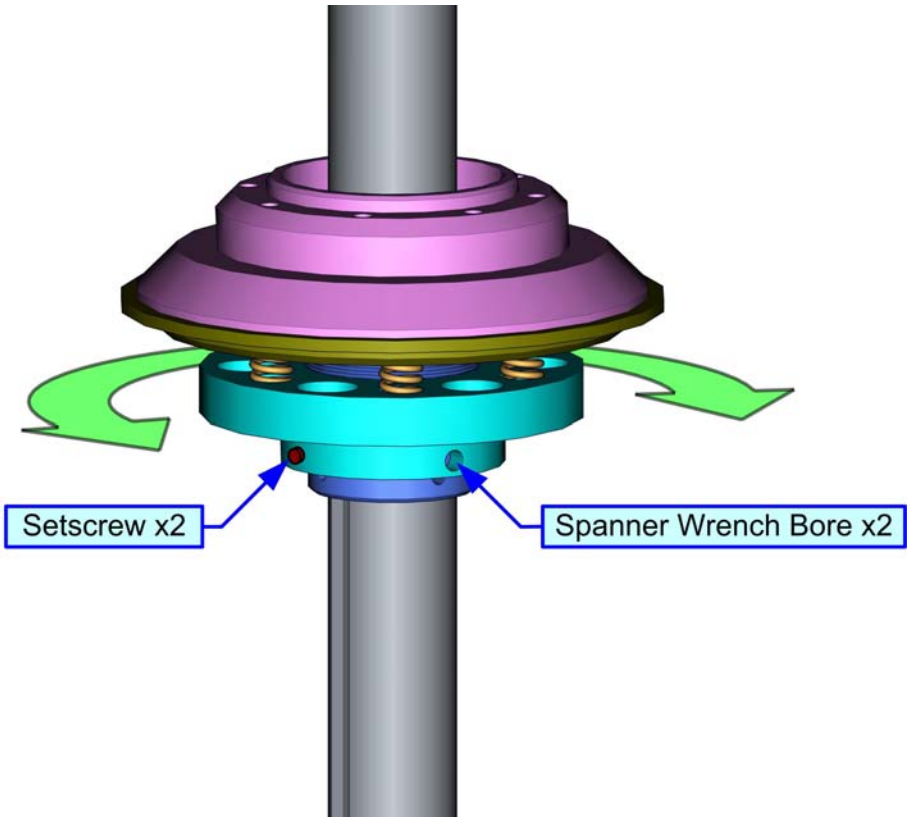
US BOTTLERS MACHINERY COMPANY					
Procedure:	Mechanical Detent Clutch Adjustment - PM				
Procedure No.:	80300	**Revision:**	A	**Date:**	21 Apr 09

To adjust the detent clutch, simply loosen its two setscrews located on the unit's lower flange. Apply a spanner wrench to one of it's respective bores also located on the detent clutches lower flange and turn horizontally to adjust.

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

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

CAUTION: RETIGHTEN AT LEAST ONE SETSCREW BEFORE TEST CYCLING THE MACHINE.



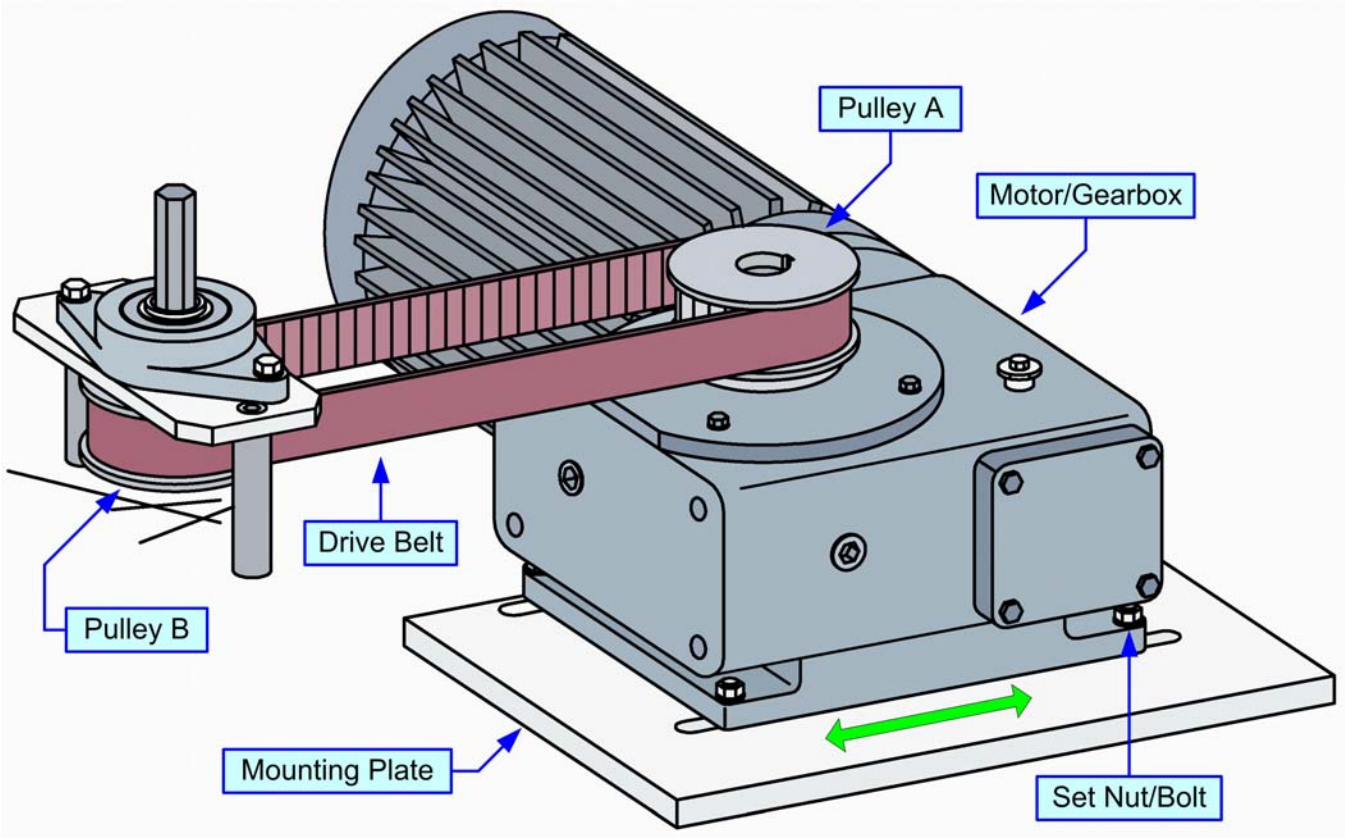
US BOTTLERS MACHINERY COMPANY

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.



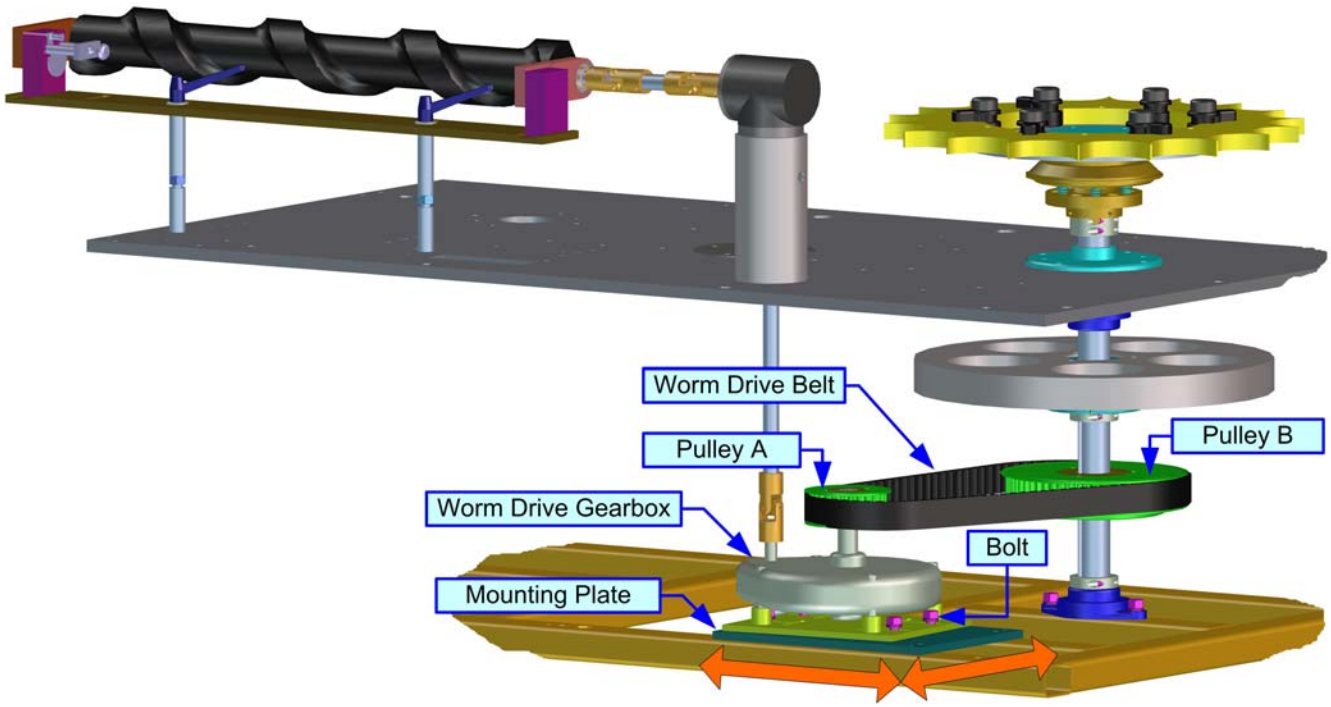
US BOTTLERS MACHINERY COMPANY

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.



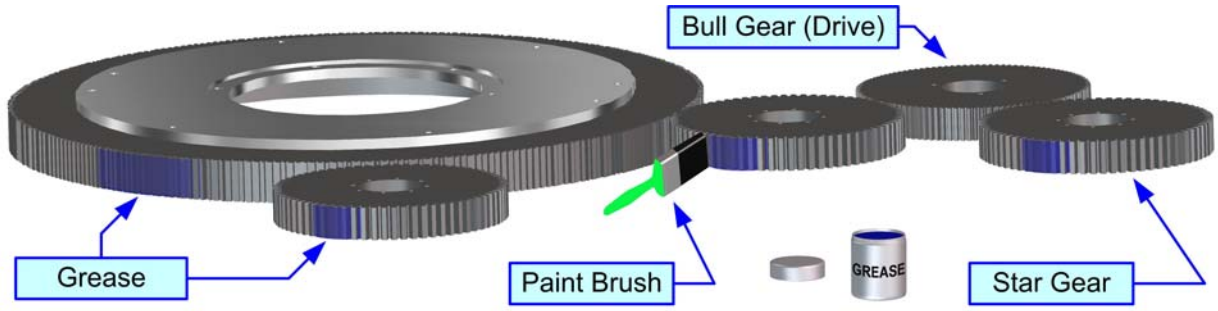
The pinion drive gears and bull gear are to be inspected to ensure that wear or corrosion has not reduced the surface areas of these gears, and that they have not developed cracked or broken teeth.

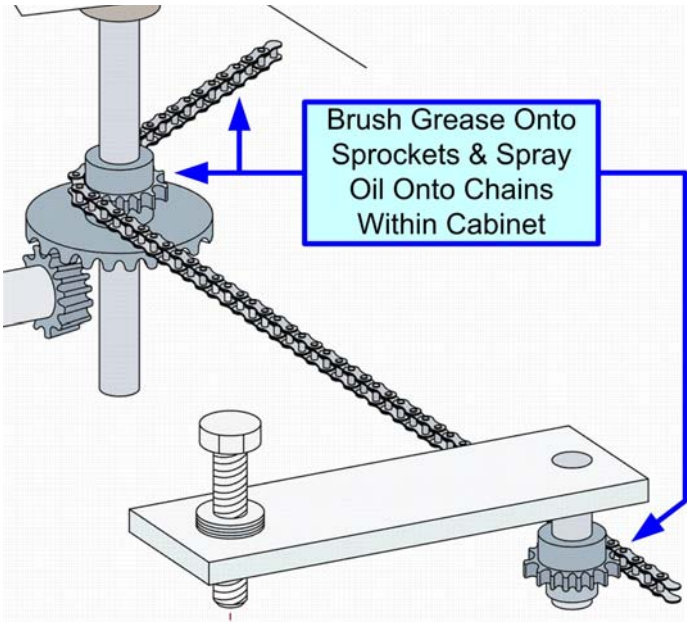
Pay particular attention to the strength of pinion gear teeth when reviewing because they turn multiple times that of the bull gear. Replace pinion gears as soon as wear is identified.

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.





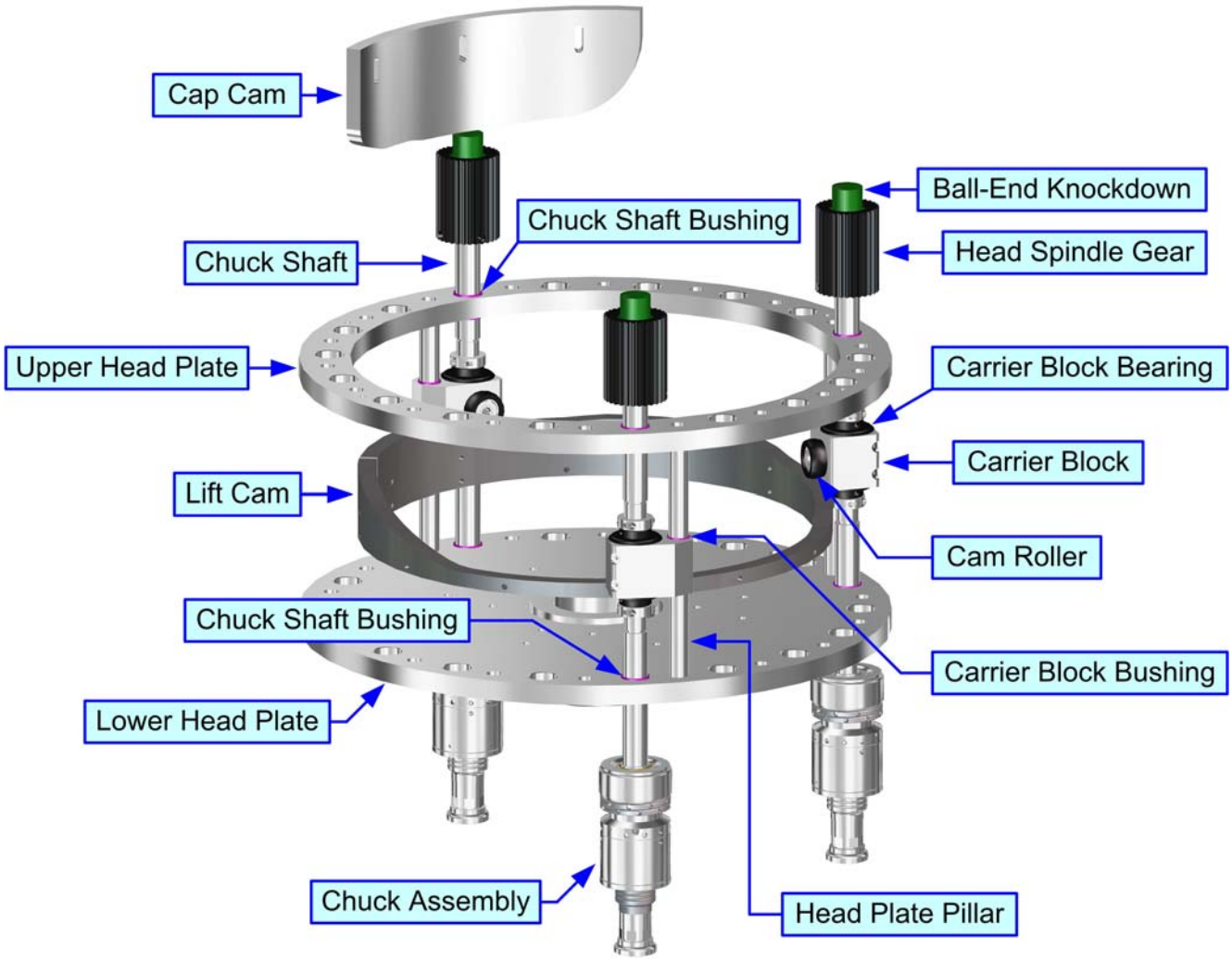
There are numerous preventive maintenance activities that must be performed relative to the capper's chuck shaft and rollers. Perform the activities identified below in the frequency identified in the preventive maintenance and lubrication schedules of this chapter. Refer to the Repair Maintenance unit 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.

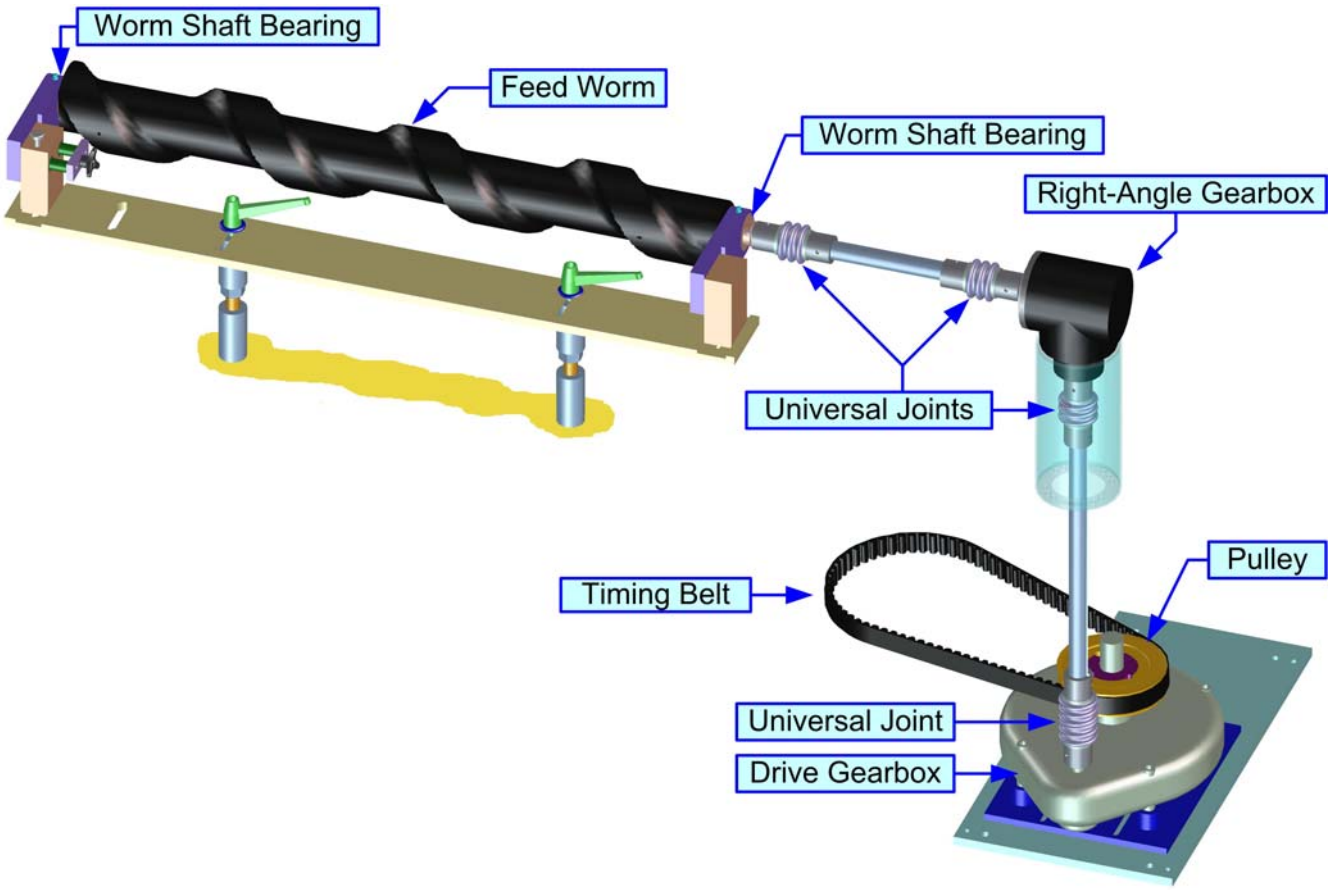
  NOTE: If flakes of material is noticed around the capper's bushings, this is not cause for concern. Some types are designed to transfer part of its material composition to the shaft during normal operation.

- 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:	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.

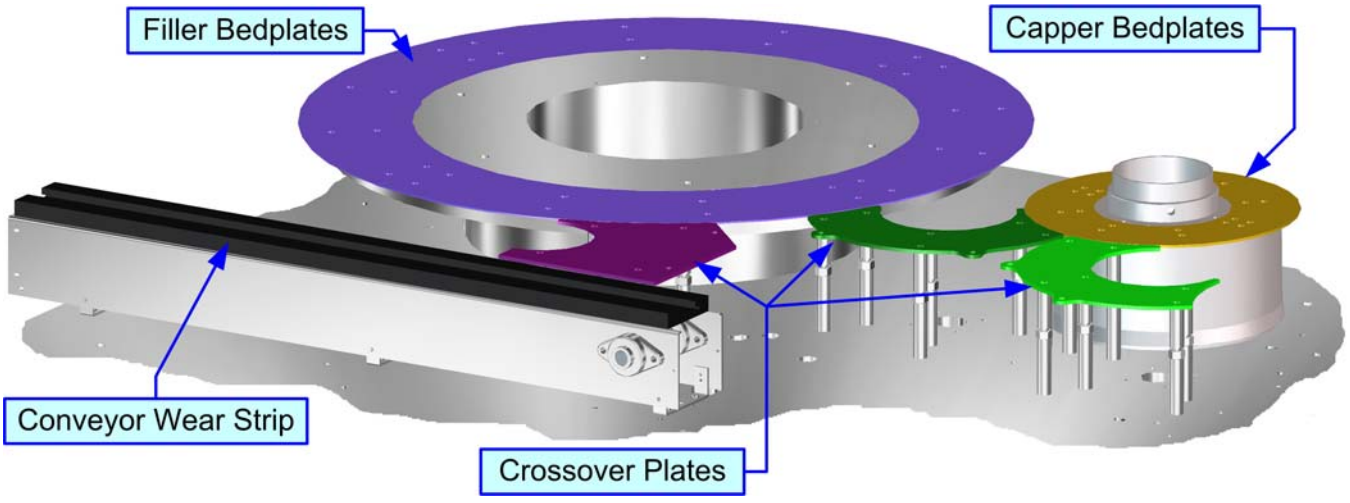


Review the crossover plate to ensure that the bottle action of moving on and off the conveyor is smooth. When necessary, replace the crossover plate or adjust it upwards to ensure proper transfer. The crossover plate is to always be vertically positioned so that it is slightly higher so the container 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.



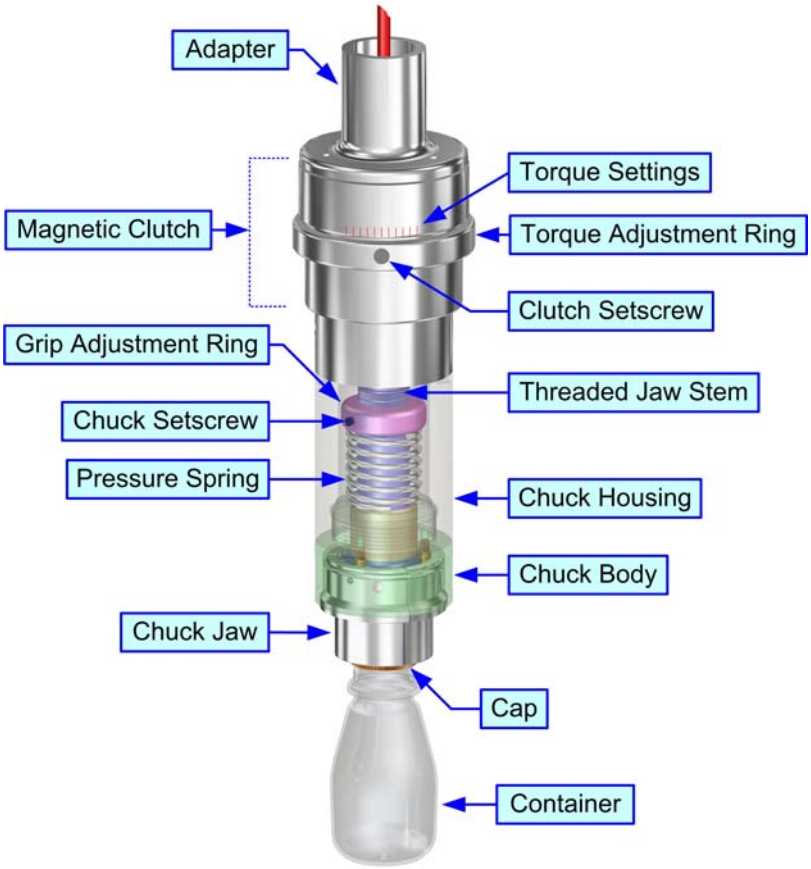
The maintenance areas to review deal with wear surfaces and the single spring.

> **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.



PREVENTIVE MAINTENANCE SCHEDULE

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.
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.
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	❑ Check for worn parts. ❑ Inspect for loose hardware.
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.
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.
Cap Feed Assembly	❑ Inspect air connections and lines for pinching, damage, and degradation. ❑ Inspect the pivot bushing for swelling and ream. ❑ Check pistons for proper stoking and cleanliness.

Head Assembly	❑ Check for loose, worn, or broken roller assemblies.
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.
Chuck Shaft Assembly	❑ Check for bent shafts. ❑ Check rollers and bearings for wear, corrosion, and flat spots.
Star Drive	❑ Inspect belts for wear and proper tension. ❑ 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.
SEMI-ANNUALLY	
Entire Machine	❑ Check gears for uneven wear or broken teeth. ❑ Check for excessively sloppy bushings.
Feed Worm Gearbox	❑ Rebuild or replace.
Capper Head Assembly	❑ Check lifting jack for binding. ❑ Check pneumatic cam for wear. ❑ Check roller carrier bearings for wear, corrosion, and damage.

US BOTTLERS MACHINERY COMPANY

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

LUBRICATION POINTS

Part Name	Lubrication Type	Method	Points/Frequency	Location
Main Bearing	Grease	Alemite	1 / Daily	Front Cabinet
Infeed Star Shaft Bearing (top)	Grease	Alemite	1 / Daily	Cabinet Top
Infeed Star Shaft Bearing (bottom)	Grease	Alemite	1 / Daily	Front Cabinet
Discharge Star Bearing (top)	Grease	Alemite	1 / Daily	Cabinet Top
Discharge Star Bearing (bottom)	Grease	Alemite	1 / Daily	Front Cabinet
Feed Worm Brackets	Grease	Alemite	2 / Daily	Feed Worm Brackets
Upper Turret Bearing	Grease	Alemite	1 / Daily	Back Frame
Lower Turret Bearing	Grease	Alemite	1 / Daily	Back Frame
Carrier Bearing Blocks	Grease	Alemite	1 / Weekly	Lower Turret Cover
Capper Independent Spindle Gears	Grease	Brush	1 / Weekly	Upper Turret Cover
Capper Independent Spindle Gearbox	Spirex Exp 140	Oil Bath	1 / Weekly	Capper Roof
Main Gearbox	Spirex Exp 140	Oil Bath	1 / Monthly	Main Gearbox
Worm Drive Gearbox (upper)	Spirex Exp 140	Oil Bath	1 / Monthly	Cabinet Top
Worm Drive Gearbox (lower)	Spirex Exp 140	Oil Bath	1 / Monthly	Within Cabinet
Bull/Star Gear	Grease	Brush	1 / Monthly	Bull/Star Gear
Chuck Open/Close Cams	Grease	Brush	1 / Monthly	Upper Turret Cover
Spindle Drive Shaft Bearings (upper)	Grease	Alemite	1 / Monthly	Turret Roof
Spindle Drive Shaft Bearings (lower)	Grease	Alemite	1 / Monthly	Upper Turret Cover
Capper Center Column	Grease	Alemite	1 / Monthly	Column - Above Cabinet
Lifting Gearbox	Spirex Exp 140	Oil Bath	2 / Year	Turret Roof

US BOTTLERS MACHINERY COMPANY

Procedure:	Lubrication Schedule (RC)		
Procedure No.:	80399	**Revision:**	**Date:** Sep 17, 2012

NOTE:
1 day is equal to 12-20 hours run time.
Grease types:
Food Grade: F6L-1
Synthetic: Anderol 783

LUBRICATION POINTS

Part Name	Lubrication Type	Method	Points/Frequency	Location	Amount
Feed Conveyor Bearing (outside)	Grease	Alemite	1 / Daily	Conveyor End	1cc
Feed Conveyor Bearing (inside)	Grease	Alemite	1 / Daily	Conveyor End	1cc
Discharge Conveyor Bearing (outside)	Grease	Alemite	1 / Daily	Conveyor End	1cc
Discharge Conveyor Bearing (inside)	Grease	Alemite	1 / Daily	Conveyor End	1cc
Capper Main Bearing	Grease	Alemite	1 / Daily	Capper Turret Base	3cc
Drive Shaft Bearing (top)	Grease	Alemite	2 / Daily	Above Cabinet	1cc
Star Shaft Bearings (top)	Grease	Alemite	4 / Daily	Above Cabinet	1cc
Star Shaft Bearings (bottom)	Grease	Alemite	4 / Daily	Within Cabinet	1cc
Conveyor Drive Bearing (inside)	Grease	Alemite	1 / Daily	Within Cabinet	1cc
Conveyor Drive Bearing (outside)	Grease	Alemite	1 / Daily	Within Cabinet	1cc
Idler Bearing (inside)	Grease	Alemite	1 / Daily	Within Cabinet	1cc
Idler Bearing (outside)	Grease	Alemite	1 / Daily	Within Cabinet	1cc
Capper Column	Grease	Alemite	1 / Daily	Midway Capper Column	1cc
Capper Upper & Lower Turret Bearings	Grease	Alemite	2 / Weekly	Rear Capper Upper Guard Rail	1cc
Feed Worm Brackets	Grease	Alemite	2 / Daily	Feed Worm Brackets	1cc
Upper Bearings	Grease	Alemite	1 / Daily	Upper Guard Rail	1cc

Lower Bearings	Grease	Alemite	1 / Daily	Upper Guard Rail	3cc
Upper Capper Main Gear	Grease	Brush	1 / Weekly	Inside Upper Capper Cover	Light Coat
Capper Main Gearbox: SEW	Shell HD220 Mobile SHC 630	Oil Bath	1 / Monthly	Within Cabinet	To level
Capper Main Gearbox: Hub City & Winsmith	Spirex Exp 140	Oil Bath	1 / Monthly	Within Cabinet	To level
Center Column	Grease	Alemite	1/ Monthly	Lower Turret	1cc
Bevel Gear Set	Grease	Alemite	1 / Monthly	Bevel Gear Set	1cc
Chain Tensioner	Grease	Brush	3 / Monthly	Chain Tensioner	Light coat
Worm Drive Chain	Grease	Brush	1 / Monthly	Worm Drive Chain	Light coat
Carrier Bearing Blocks	Grease	Alemite	1 / Weekly	Lower Turret Cover	1cc
Worm Drive Gearbox (upper)	Spirex Exp 140	Oil Bath	1 / Monthly	Cabinet Top	To level
Worm Drive Gearbox (lower)	Spirex Exp 140	Oil Bath	1 / Monthly	Within Cabinet	To level
Bull/Star Gear	Grease	Brush	1 / Monthly	Bull/Star Gear	Light coat
Capper Chuck Shaft Spindle Gears	Grease	Brush	1 / Weekly	Capper Cabinet Top	Light Coat

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.

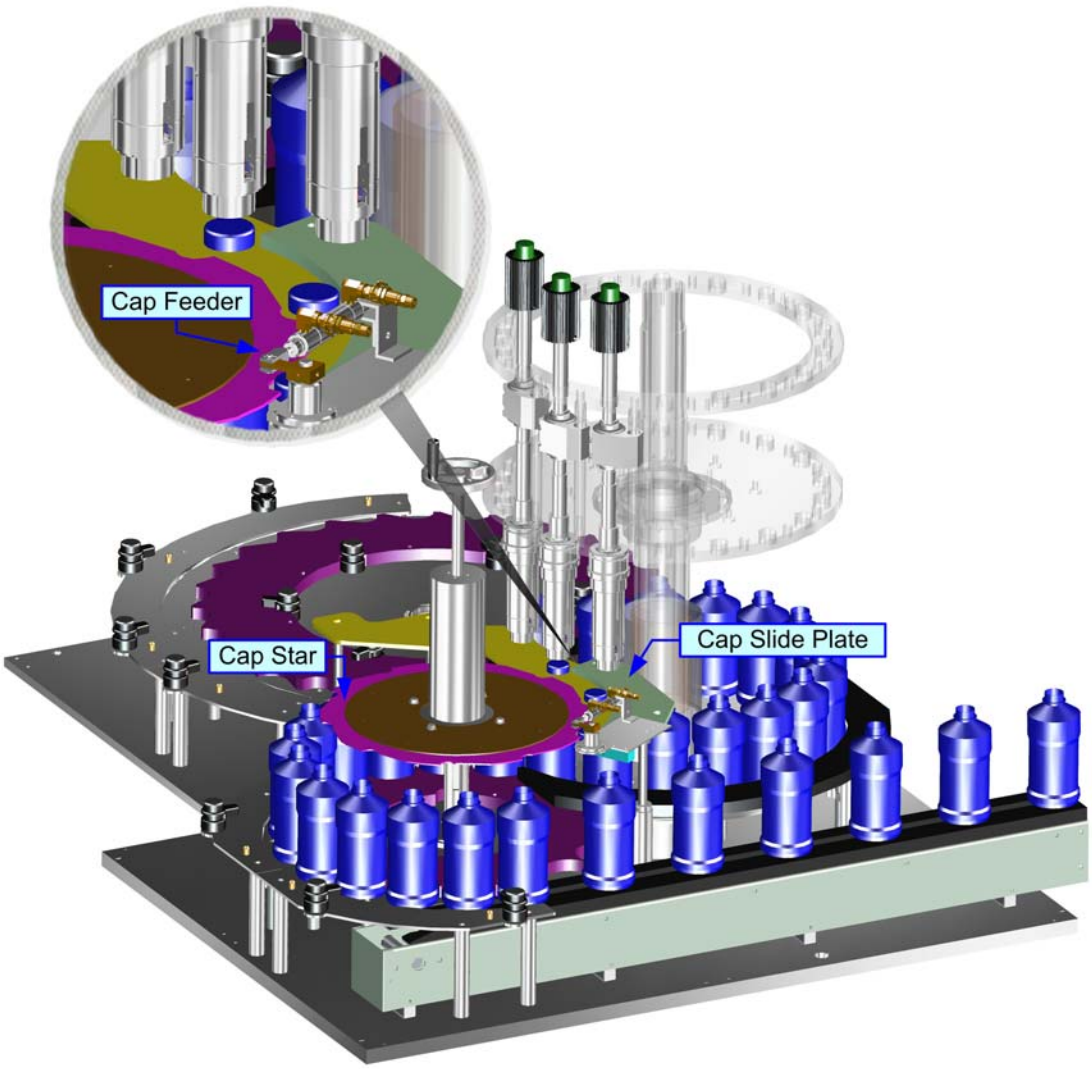
If the capper is slowly rotated by hand until a single cap is released from the cap chute into the cap star pocket, the operator will observe that an additional small angular movement of the cap star will allow the arm of the air actuator at the chute to move forward and stop the next cap from entering 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.

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.

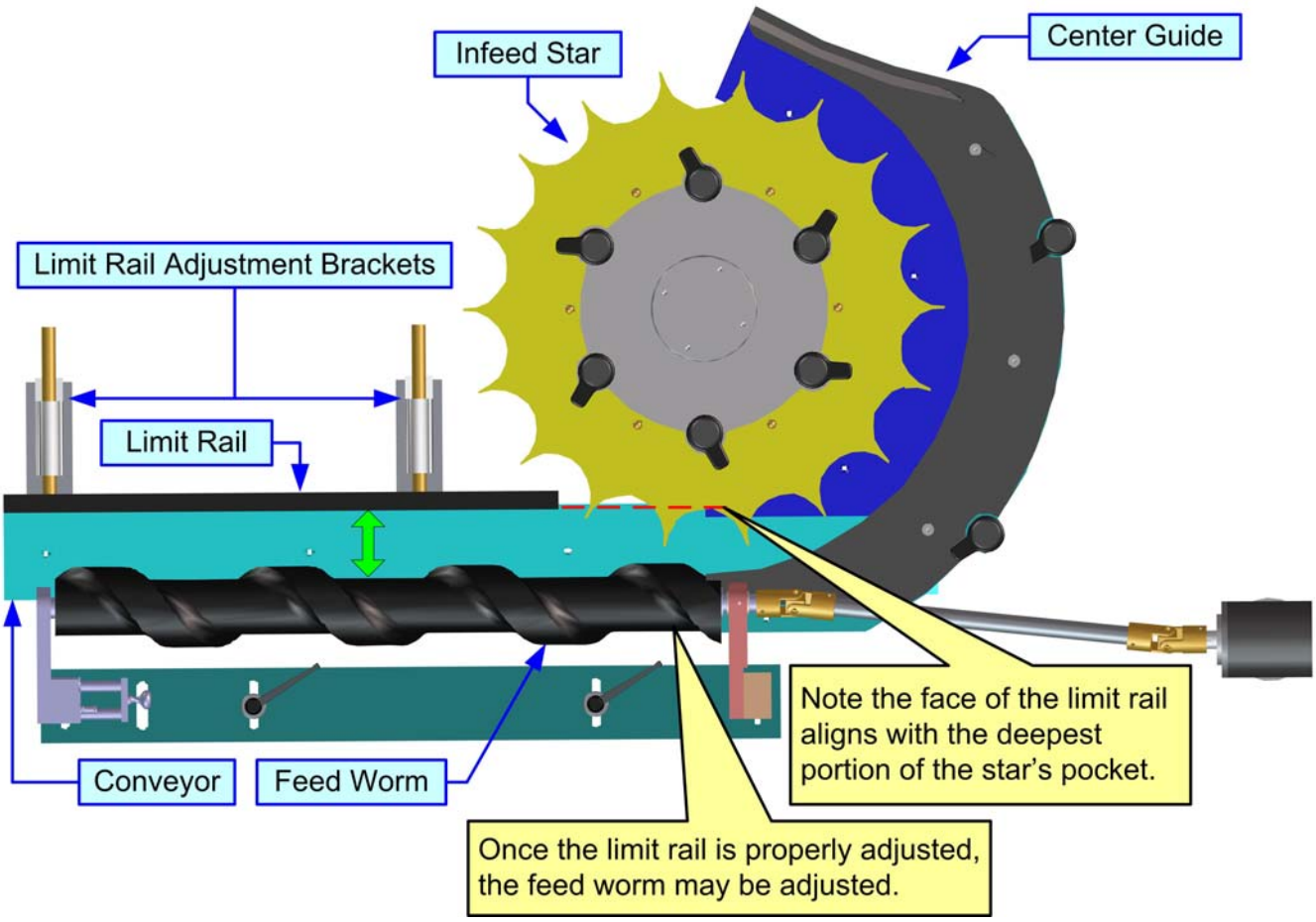
The conveyor speed is to be slightly faster than the final lead of the feed worm so the bottle is always held against the leading front edge of the worm.

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.

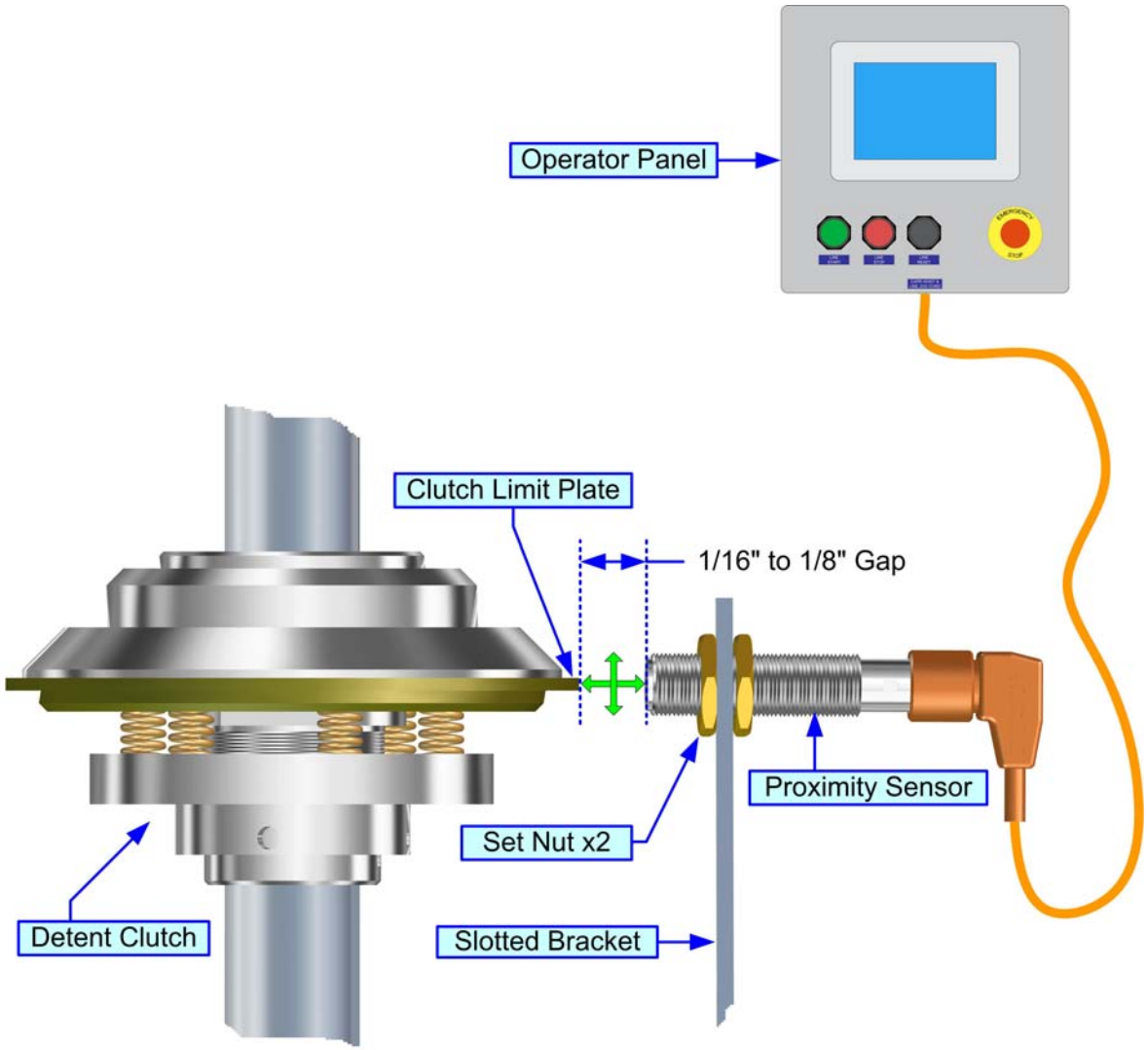


US BOTTLERS MACHINERY COMPANY					
Procedure:	Detent Clutch Sensor Adjustment - TS				
Procedure No.:	80409	**Revision:**	A	**Date:**	08 Feb 10

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.

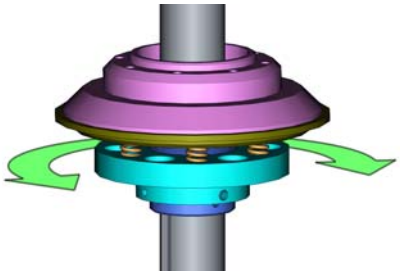
A proximity switch and mounting bracket is provided with the detent clutch. This switch must be accurately positioned in order to register the disengagement of the clutch. It is important that the detent be checked occasionally to ensure that when the detent clutch does disengage, it trips the proximity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

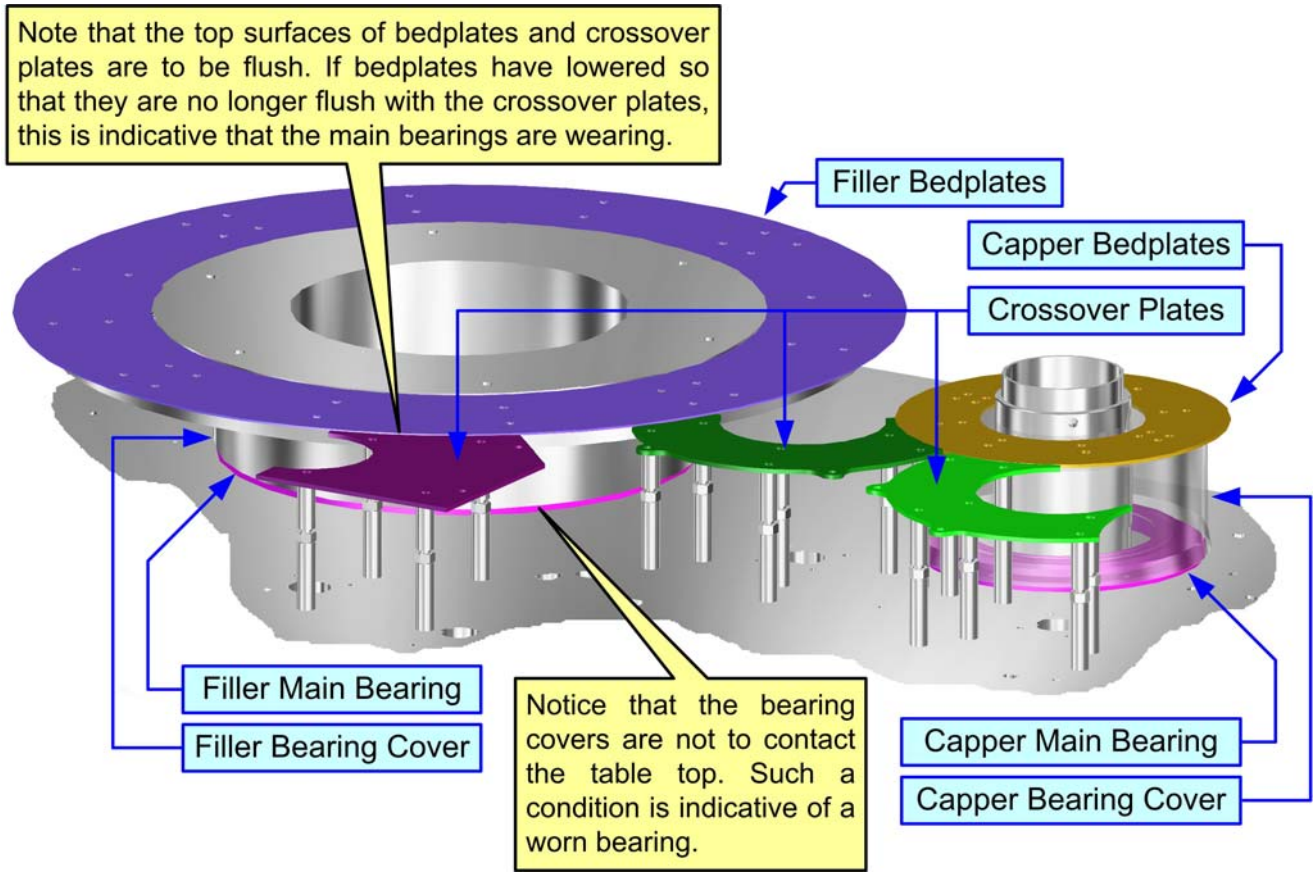


US BOTTLERS MACHINERY COMPANY

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

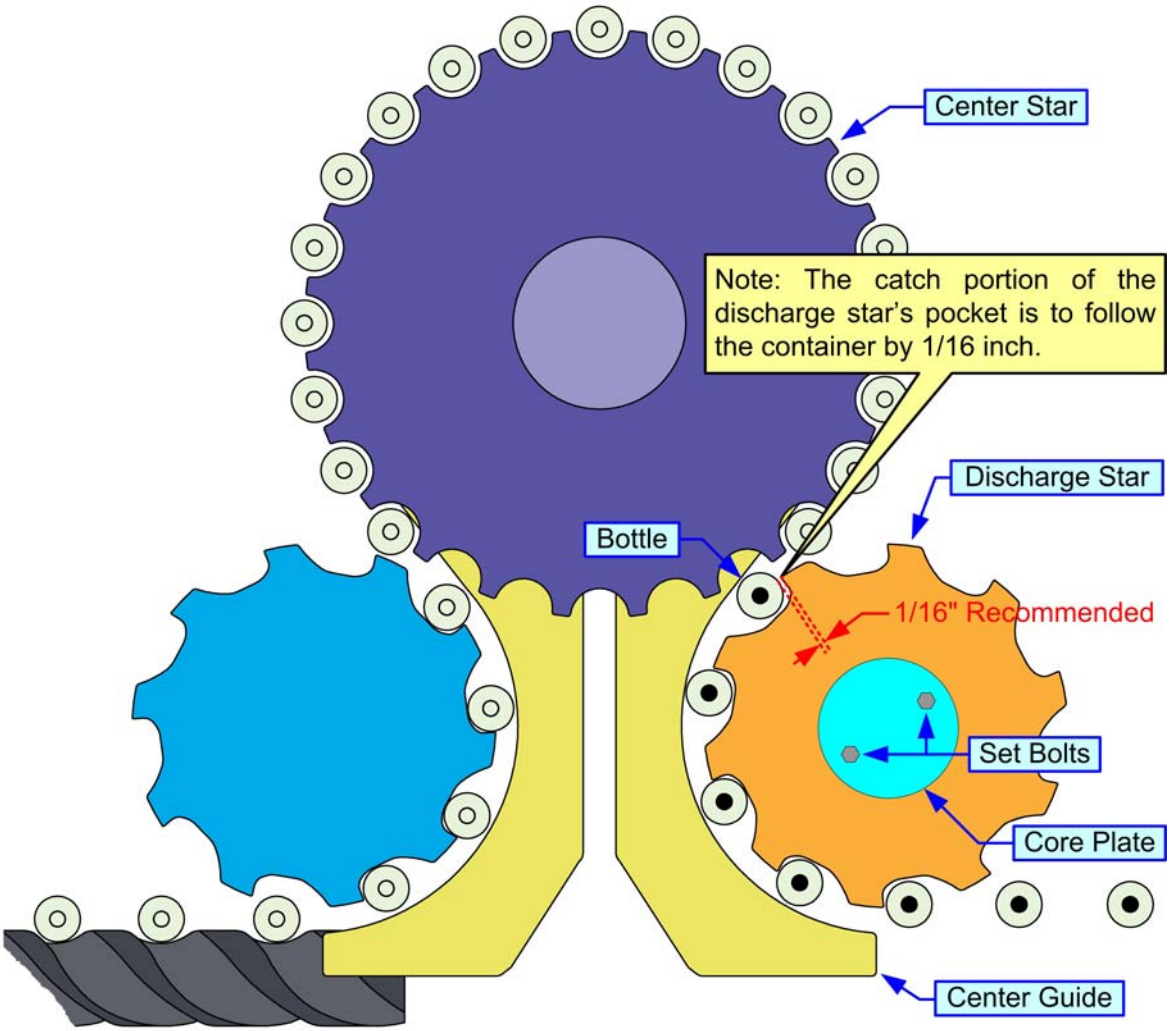
If the main bearing begins to fail it is identifiable by several conditions. Firstly, it will be necessary to use more than normal power to rotate the machine. Secondly, rotational motion of the machine will exhibit a vibration or a bumping action. In addition, the rotational part of the machine may 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.



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.

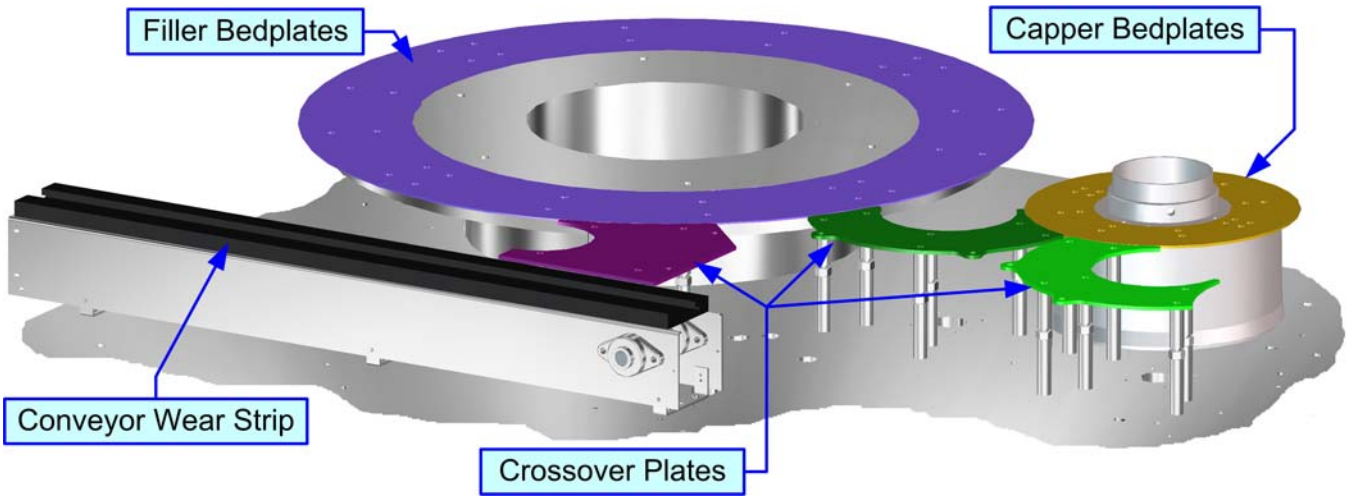


Review the crossover plate to ensure that the bottle action of moving on and off the conveyor is smooth. When necessary, replace the crossover plate or adjust it upwards to ensure proper transfer. The crossover plate is to always be vertically positioned so that it is slightly higher so the container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

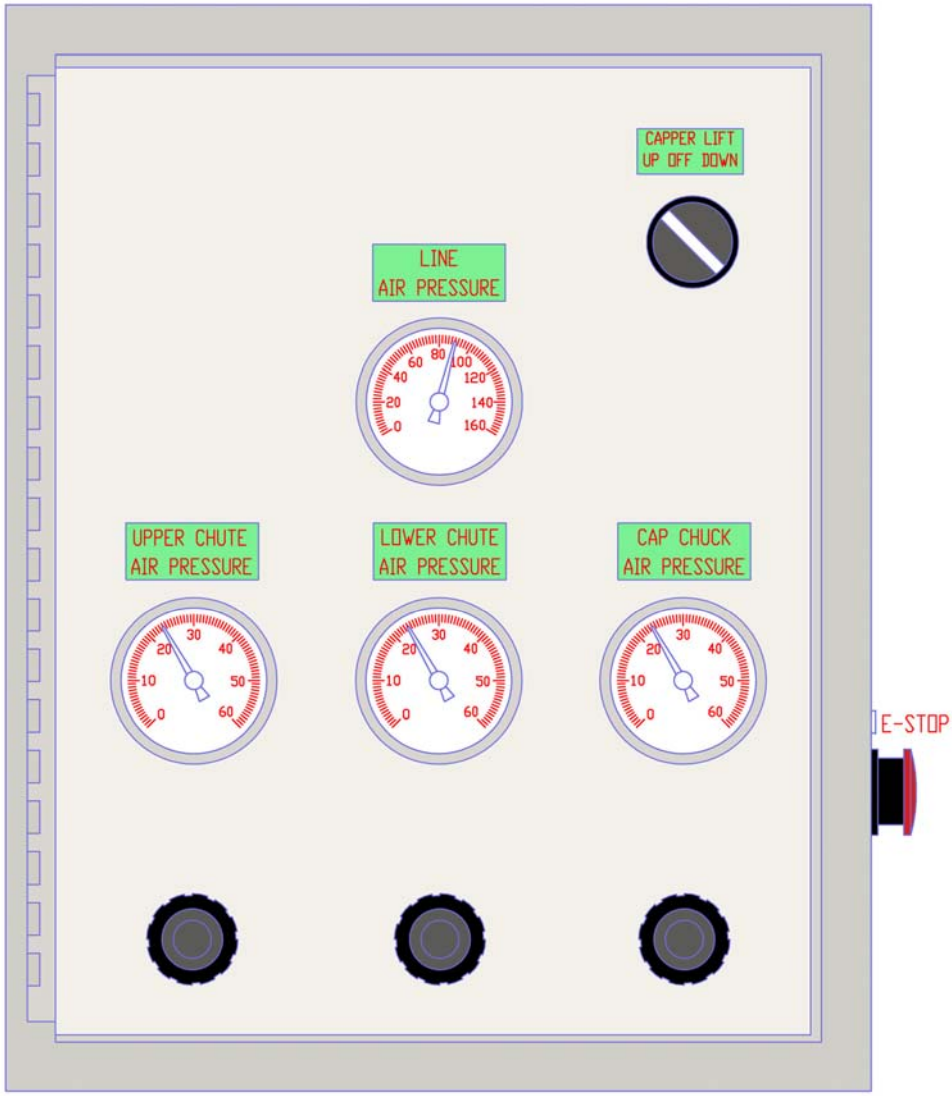
If the bed plate covers become worn or warped, they should be replaced. If the bedplates are badly worn, three things can occur:

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.



The only preventive maintenance or troubleshooting issues relate to the air fittings, air line connections, and replacement solenoids. There is a pressure switch mounted inside the pneumatics panel that can be adjusted by the customer to ensure that if the air pressure falls below an acceptable level the capper will stop. An indicator light will illuminate and the machine will not operate until this problem has been resolved.

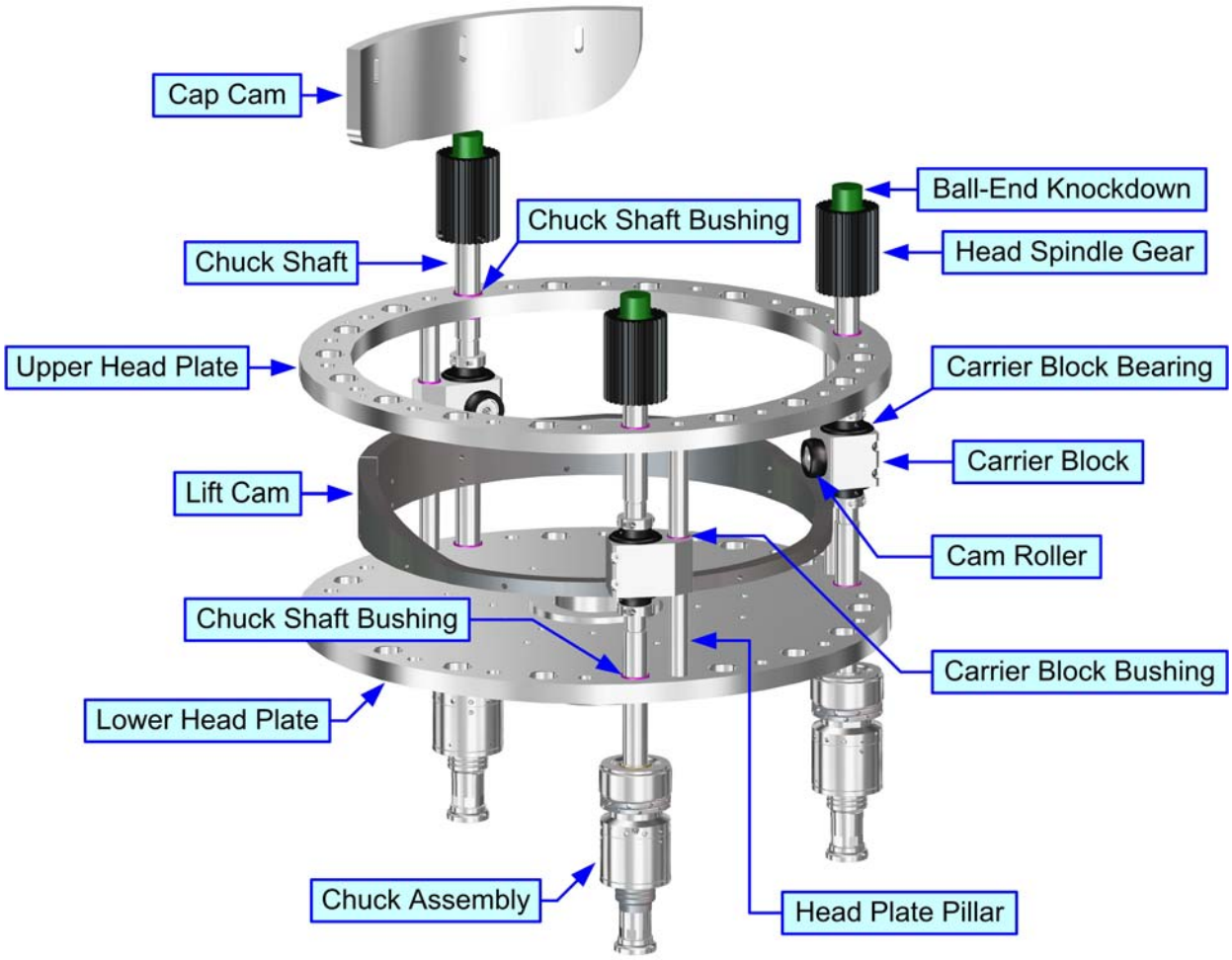


Improper cap applications can be the result of worn or damaged capper head components. It is critical that each chuck shaft remain straight and undamaged for proper vertical movement of the head assembly. Inspect the cam rollers to ensure that they have not developed flat spots and that they properly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



CAP STAR TIMING

Figure 1, Cap Star Timing

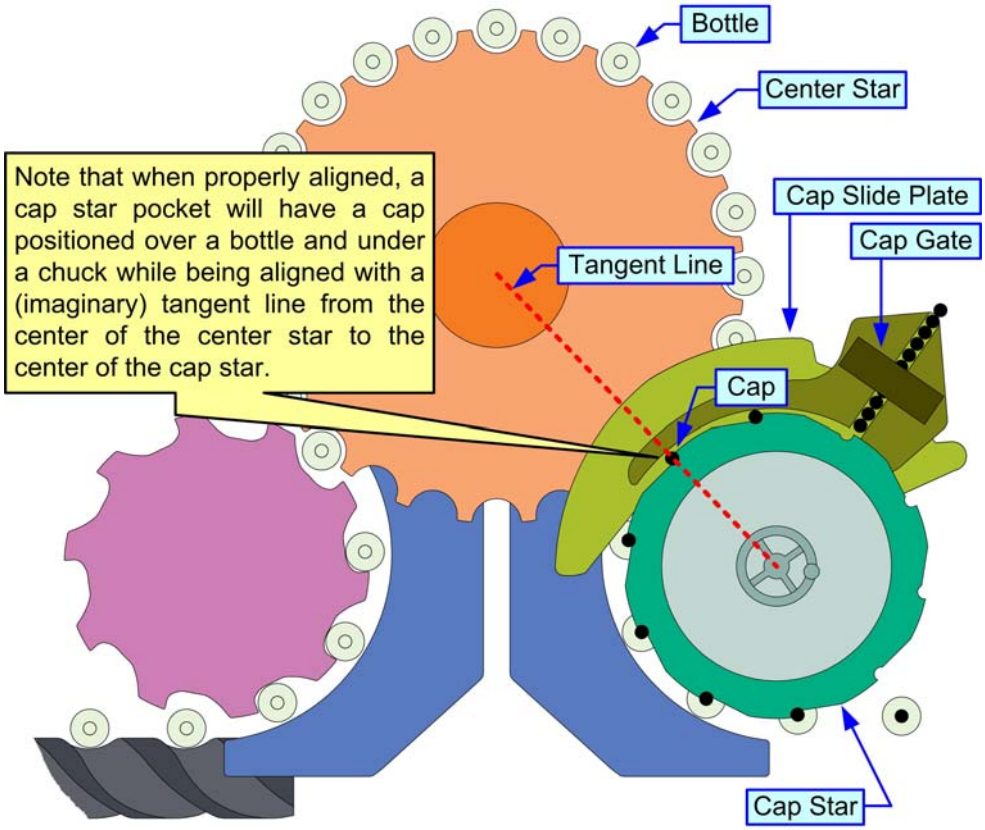


Figure 2, Cap Star Timing

TROUBLESHOOTING TABLE

Symptom	Possible Cause/Solution
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 low: Adjust the timing speed of 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 the conveyor timing speed 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 and limit rail. • Limit switch incorrectly set: Reset as necessary. • Uneven worm crossover plate: Check for smoothness and shim if needed.
Container not properly leaving capper.	• 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.	• Improperly adjusted feed star: Adjust as necessary. • Use of incorrect attachments: Change as required. • Head improperly timed: loosen clamp bolts, adjust as required, retighten. • Cap cocked in chuck jaws: Check for proper gripping. Inspect for excessive flash on cap.
Chuck jaw dropping caps.	• Worn chuck jaw: Replace. • Machine running above designated speed: Decrease speed.

Missing caps.	• Jammed cap chute: clear jam. • Cap gate not releasing caps: Incorrect gate assembly. Gate air lines not connected. Photo eye not seeing container in worm. Defective sensors on discharge star. • Use of incorrect attachments: change as required. • Incorrect cap for container: Load as required.
Rocking condition in capper.	• Worn keyways on drive shaft: Replace all worn parts. • Worn detent clutch: Replace as required. • Worn drive pinion gear/bull gear: Replace as required. • Worn main gearbox components: Rebuild as required.
Jerking action while capper rotates.	• Slides binding on lift cam: check for bent shafts and rods. Check for worn bushings.
Noise at certain capper station.	• Slide binding: Check for bent shaft and bushing. Clean and lubricate. • Worn or high point in gear: inspect and adjust or replace as required. • Interference between rotating table and a fixed piece: eliminate interference as required.
Unable to turn machine under power.	• Malfunctioning detent clutch: Replace as required. • Capper slides binding on lift cam: Inspect for bent slides and worn bushings. Clean. • Main bearing failure: ensure adequate clearance between capper cabinet top and rotary base. Replace bearing as required. • Feed worm binding: Check for worn bearings.
Noise in center of machine when not cycling.	• Main bearing failure: Replace as required. Ensure proper lubrication.
Machine as a whole goes out of time.	• Stretched chain or belt: Check tension. • Worn gear teeth: Replace gears as required.
Machine as a whole very erratic.	• Electronic short possible: Inspect for machine short to ground. Inspect all electrical devices for shorts to ground.
Sorter not feeding caps.	• Low air pressure: Replace kinked air lines. Open flow valves. Replace supply with larger pipes. • Incorrect sorter wheel: Install correct sorter wheel. • Incorrect discharge guide: Install correct guide. • Upper chute eye not detecting caps: Eye not aligned with reflector. Eye not aligned and sensing chute rails. Blocked or defective chute eye.

TROUBLESHOOTING TABLE

SYMPTOM	POSSIBLE CAUSE/SOLUTION
✶✶✶✶✶✶ **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. • 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.

US BOTTLERS MACHINERY COMPANY

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

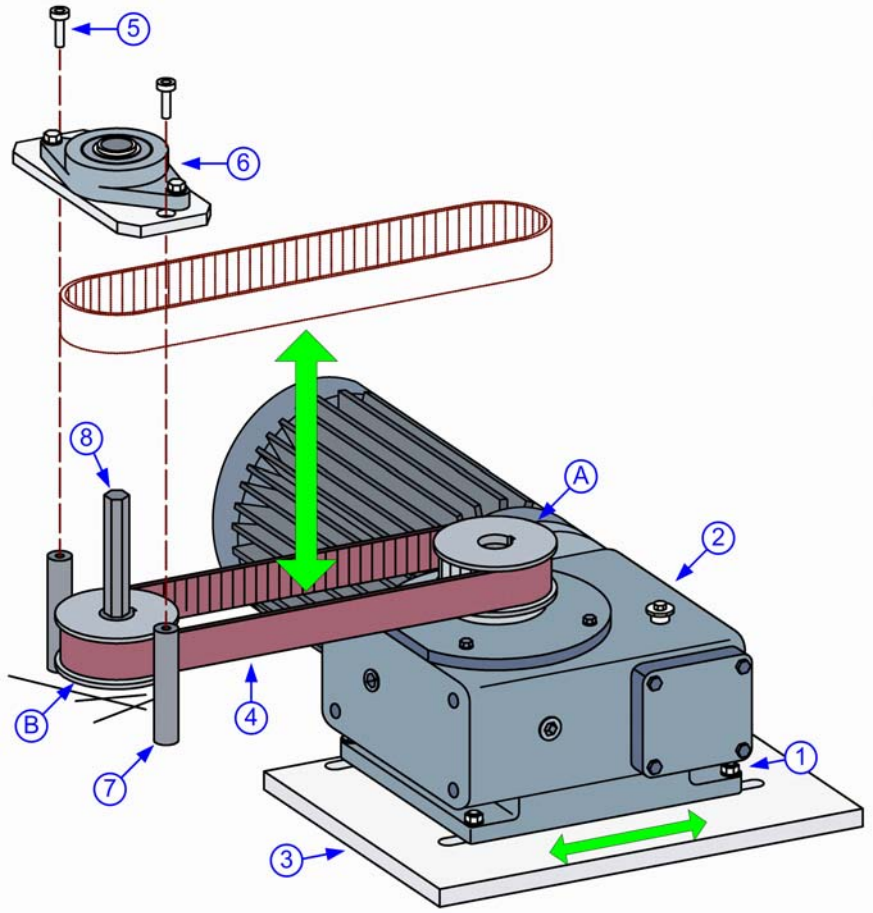
1. Power down the machine.

> **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

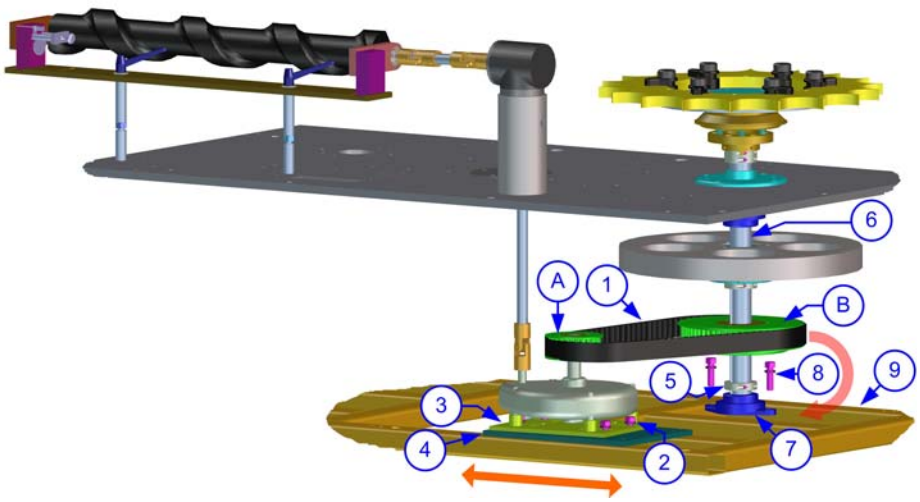
CONFIGURATION A

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.



CONFIGURATION B

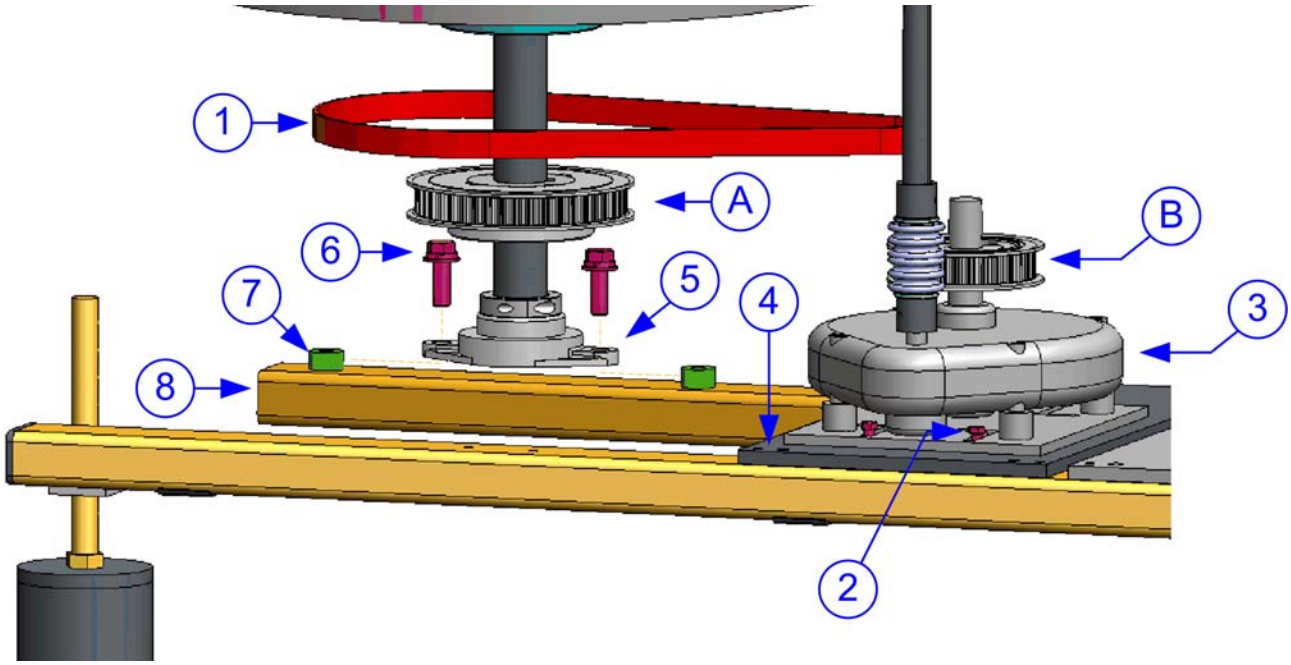
1. Power down the machine.

> **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.



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.

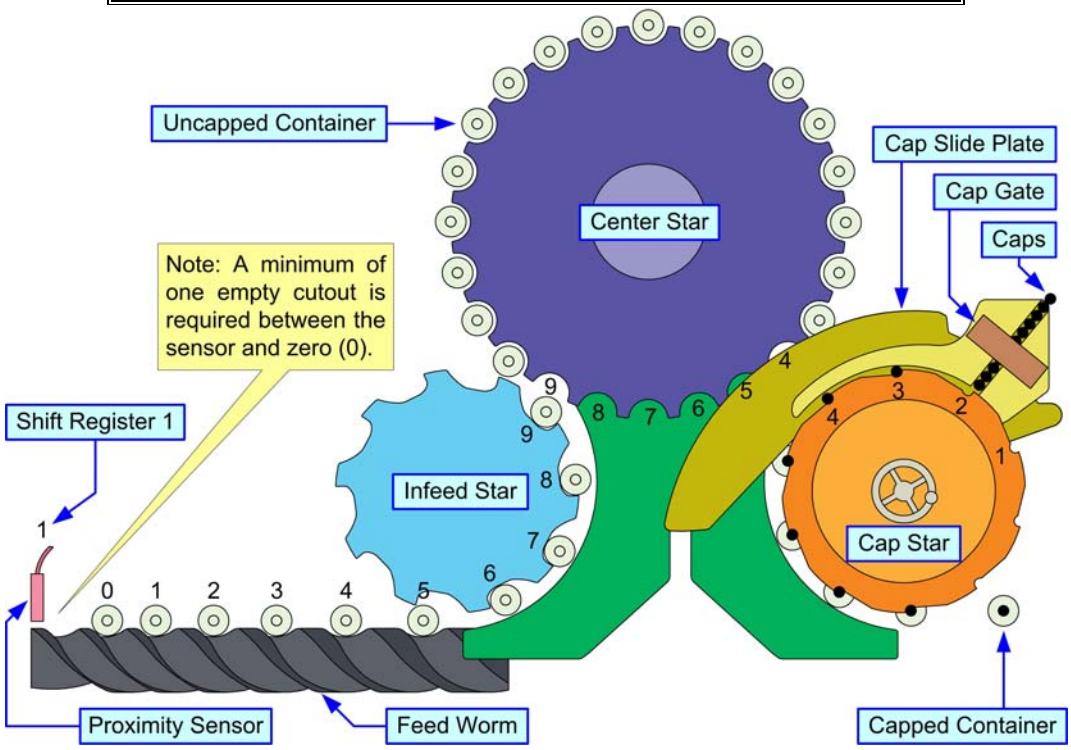
> **ATTENTION:** Only perform this procedure after it has been absolutely determined to be necessary. Refer to the Cap Gate Troubleshooting procedure for determination.

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.



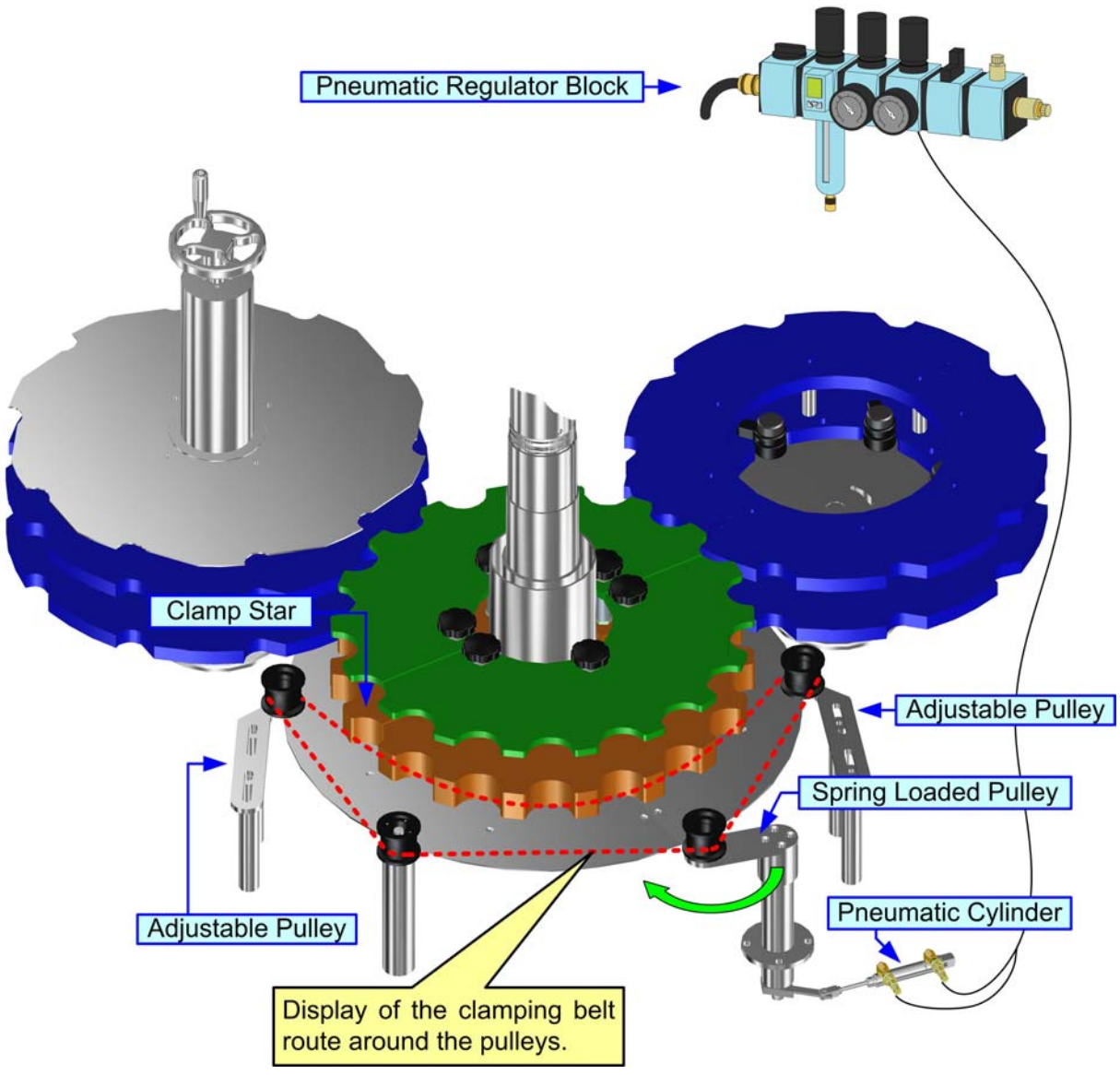
US BOTTLERS MACHINERY COMPANY

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.



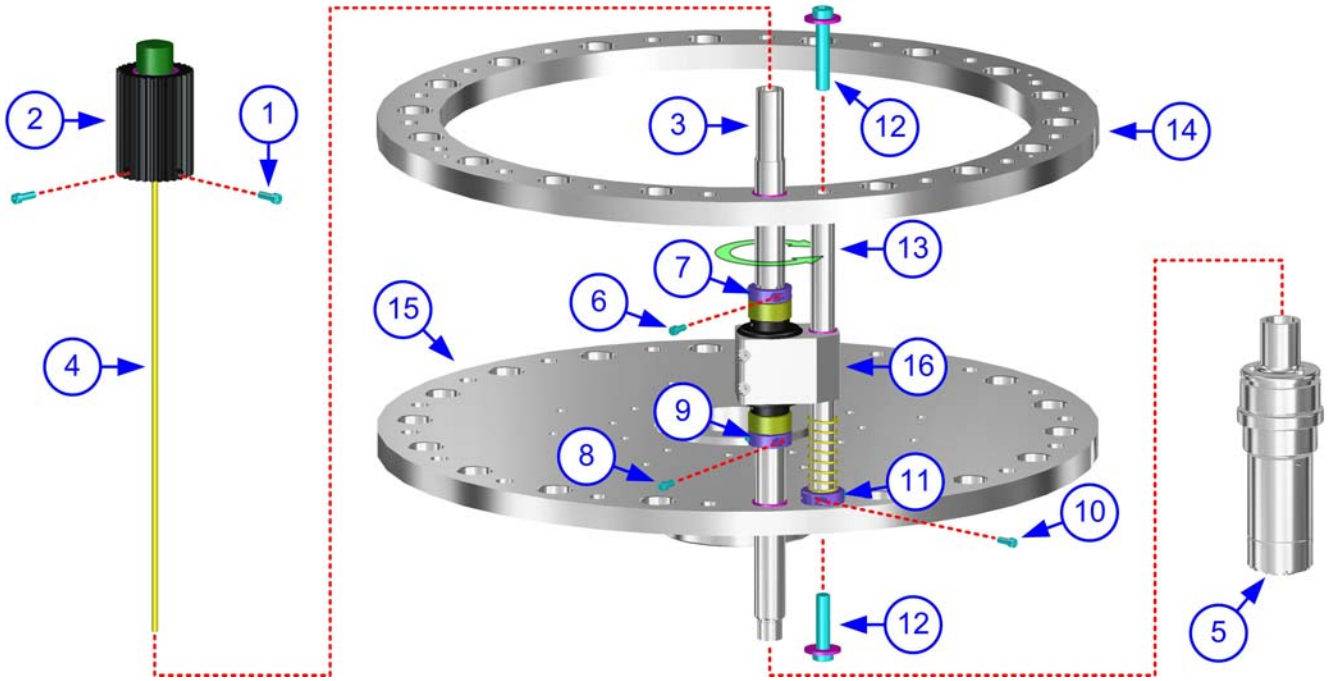
US BOTTLERS MACHINERY COMPANY

Procedure:	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.

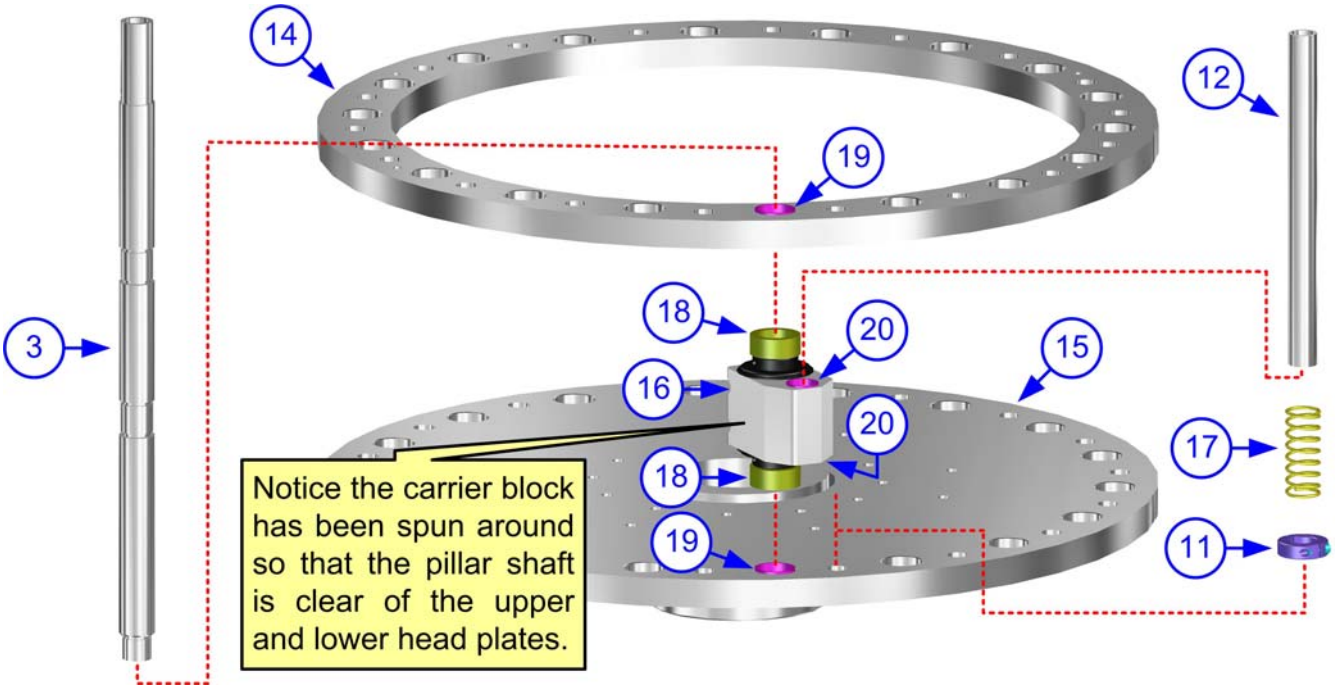
> NOTE: Upper and lower set collars (7) and (9) are different designs and must be kept separated during the disassembly process. Do not mix parts.

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. Tap 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).

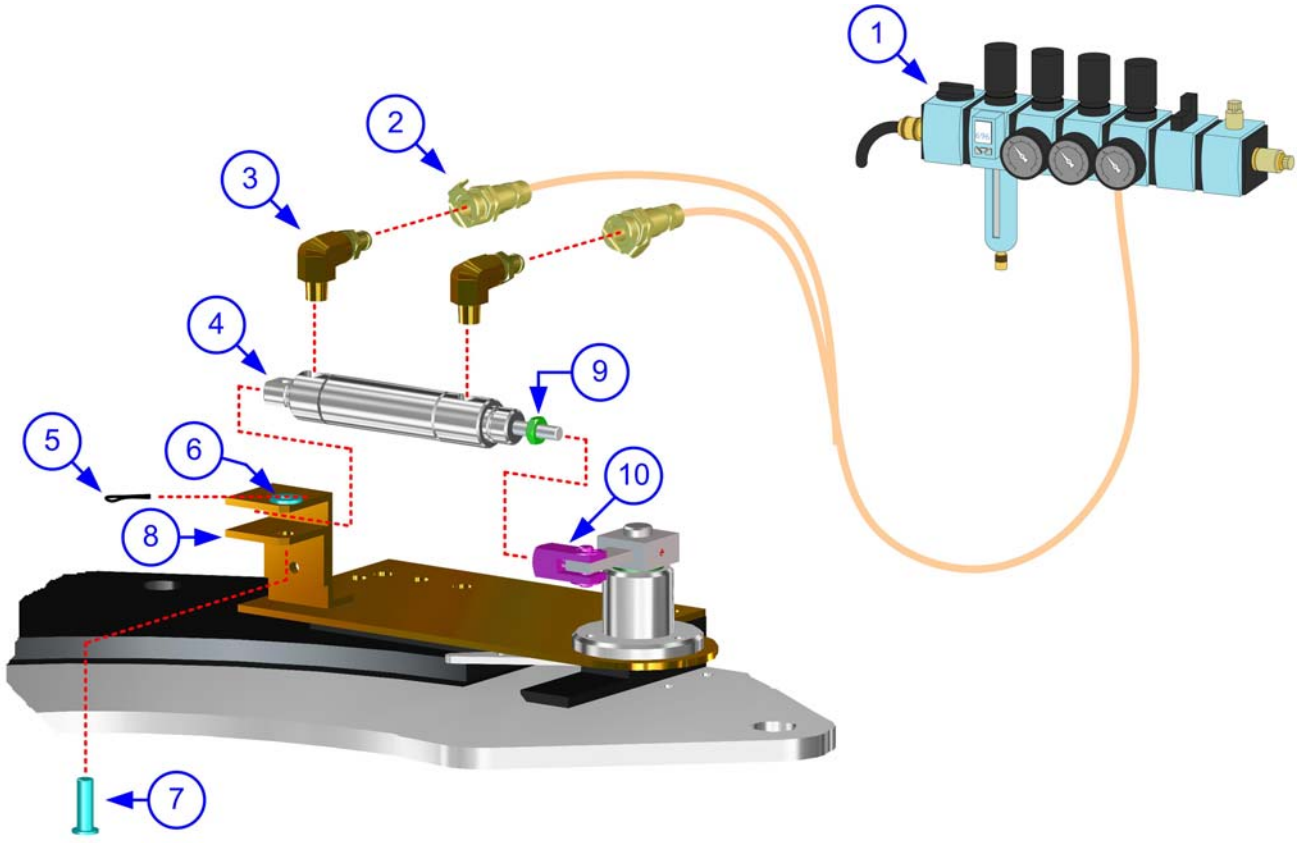


US BOTTLERS MACHINERY COMPANY

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

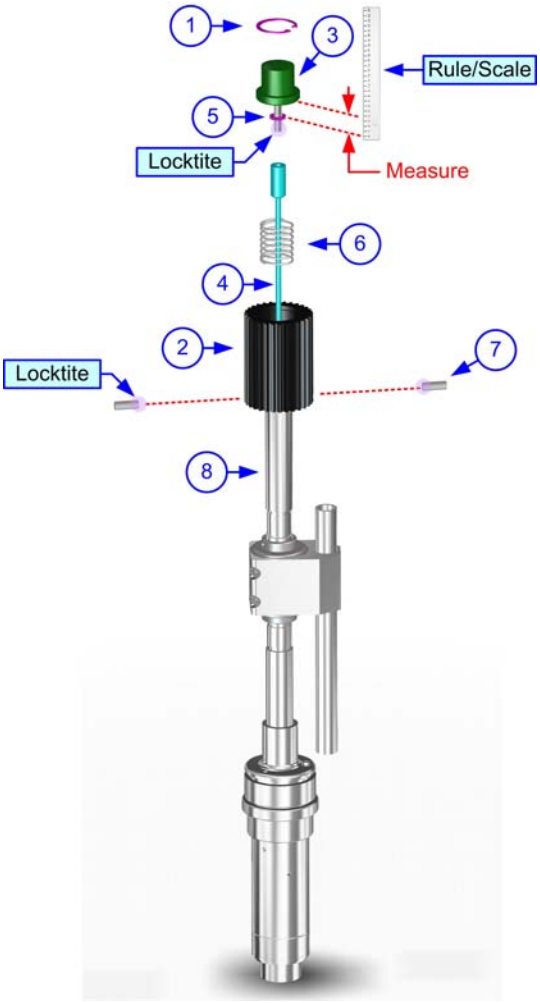
The cap gate cylinder is the mechanical device that opens and closes the cap gate assembly through pneumatic supply from the pneumatic regulator block. Since the cylinder is constantly opening and closing during machine operation, eventually the cylinder's piston seals will deteriorate and the cylinder 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).

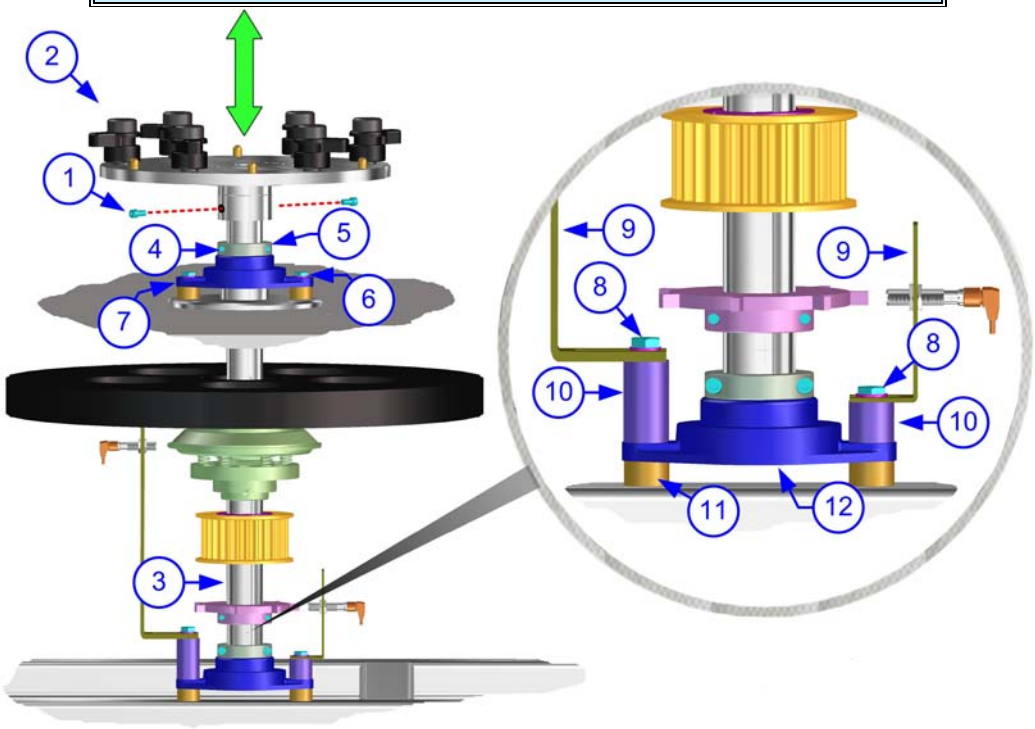
Lower Bearing

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.

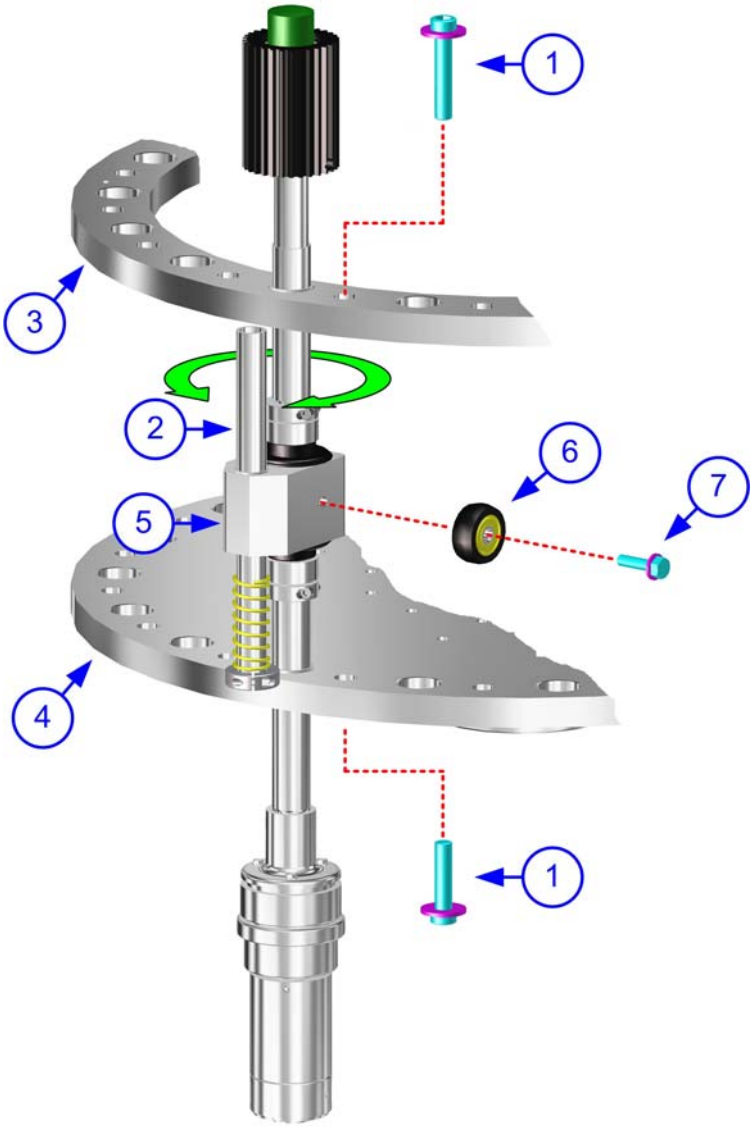


US BOTTLERS MACHINERY COMPANY

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).



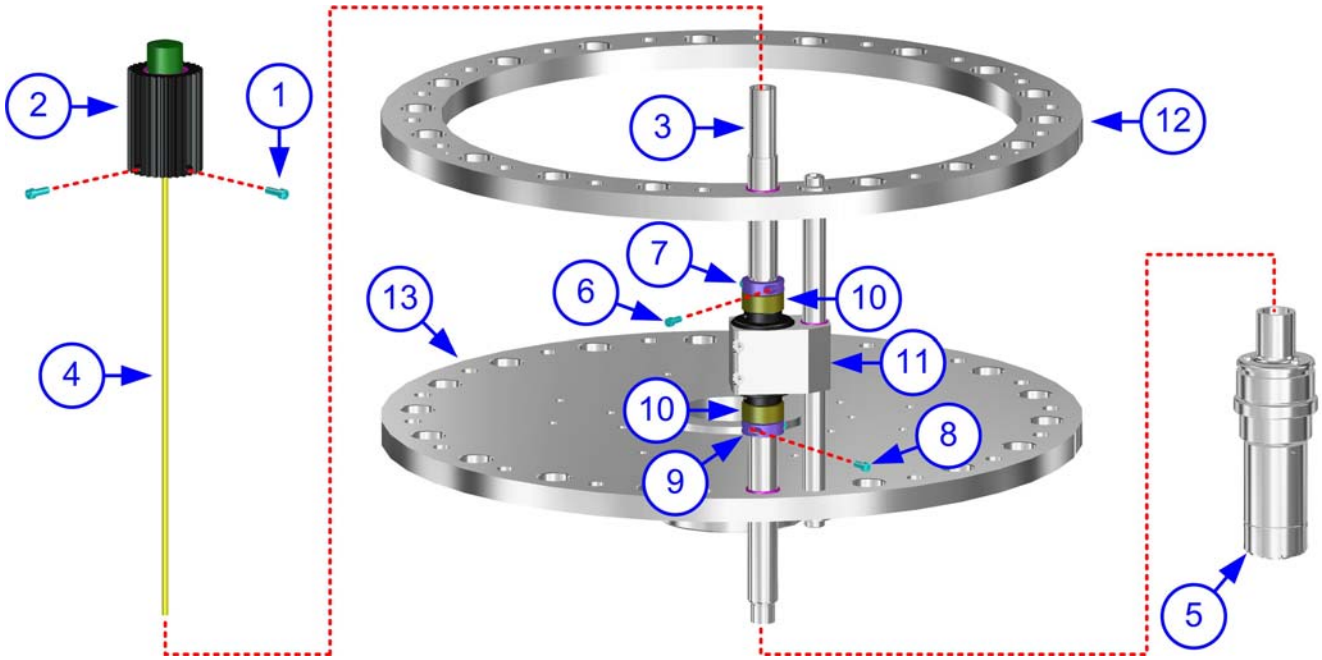
US BOTTLERS MACHINERY COMPANY

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).