# BELVAC MODEL NECKERS

## PRODUCT UPGRADE & CONVERSIONS

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480 INTEGRATED PRE-NECK CAN LUBRICATOR
(Waxer Infeed)
Part Number assigned when order is placed

Qualifying Neckers:
Any 595 Necker Fixed-Base or any Modular “K” or “SK” Necker

Function:
The 480 Waxer replaces existing 440 designed waxers and Non waxed infeed trackwork and starwheel for the first transfer station. It applies a strip of hot wax or mineral oil on the outside edge of the can by rolling the open end of the can over a wick assembly.
Note: When replacing a 440 waxer, existing trackwork will have to be modified.

Objective & Benefits:
• May Reduce can damage due to can handling
• Integrates with existing machine, eliminating need for in-line pre-neck lubricator unit
• Offers easy operator & maintainer access
• Hot wax or mineral oil options available
• Capability of matching all rated speeds of existing 595 Necker
• Adjustable wick assembly for lubricant placement for the die necking process.
• Converting from hot wax to mineral oil is accomplished without any additional parts.
• Can size conversions are completed very quickly.
• Starwheel assemblies for alternate can sizes are shipped completely assembled.
• The Waxer retrofit kit includes a starwheel assembly for one can size and all guarding to integrate the 480 Waxer to the existing necker.

Installation:
Requires approximately 8 hours for installing a complete Waxer Assembly

To Order:
Contact Belvac with current Necker machine serial numbers, can size(s), with trim can heights, or fax the convenient form at the end of this section.

480 Integrated Waxer Infeed

(Normal Rotation shown above, Reverse Rotation available upon request)
595 ADJUSTABLE UPPER GUIDE CONVERSION

Part Number assigned when order is placed

Qualifying Machines:
Any 595 Welded Fixed-Base or Modular Necker.

Objective & Benefits:
- Directly replaces the existing two-piece upper guides without modifying machine
- Quickly changes between can sizes
- No change parts required for Height Only Conversions
- Saves time converting between can sizes
- Quick Change Brush Assembly mounts without removal of rails.

To Order:
Contact Belvac with existing Necker machine serial numbers, can size, and trim can height or fax the convenient form at the end of this section.
440 WAXER CAN STOP UPGRADE
P/N 4410105 Clamp Stop Conversion, 211 Diameter, Normal Rotation
P/N 4410106 Clamp Stop Conversion, 211 Diameter, Reverse Rotation
P/N 4410107 Clamp Stop Conversion, 202 Diameter, Normal Rotation
P/N 4410108 Clamp Stop Conversion, 202 Diameter, Reverse Rotation

Objective & Benefits:
- Replaces the double acting cylinder rod with a substantially more robust, diaphragm air cylinder.
- Designed to withstand increased can stack weight
- Incorporates a 2.50" (64mm) long contact surface with a maximum stroke of 0.2" (5mm), which ensures secure clamping of the can as well as ease of positive retraction.

To Order:
Use part number above with corresponding can diameter and machine rotation.
Belvac Production Machinery, Inc.  

**Product Upgrades & Conversions: Maintenance Enhancements & Tools**

**211 Ø 595 NECK HEIGHT GAUGE**  
*Part Numbers and change parts assigned when order is placed*

Belvac's neck height gauge is a precision measuring tool used to precisely determine the pin dimension between the necker push plate and the front of a necking die. The repeatability and accuracy of this measuring tool saves time and adds confidence when setting neck depths on all necking turrets. Verification of this dimension is easily determined without the use of conventional ID micrometers.

**Objective & Benefits:**
- Gauge and Fixture Assembly come fully assembled with change parts for one (1) can height.
- Optional can height change parts are available.
- Gage offers spring loaded pins to consistently seat the push ram assembly to the cam.
- The ability to adjust the push plate position while keeping the gauge intact. This negates the need to compensate for thread clearances since the absolute position is digitally displayed during the adjustment process.
- Ease of usage; the gauge body rests directly in the main turret starwheel pocket.
- A programmable display provides versatility for height changes in conjunction with Belvac's Fixture Assembly (P/N 2702589).
- Height Range: 330 ml (408) through 500 ml (609) inclusive.
- Gage offers 211 diameter: (other diameters available upon request)

**To Order:**
Provide pin dimension @ TDC to order gauge with change parts.

![Neck Height Gauge Assembly](Fixture not shown)

Additional Information available on Technical Bulletin Issue 19, Volume 1
SEAL INSTALLATION TOOL
P/N 2703024

Objective & Benefits:
- Assist in the installation of grease seals on Necker Ram Assemblies
- Reduces assembly time when performing normal preventive maintenance of the ram assembly.
- Eliminated the need to "tap in" seals using a hammer and drift.

FIXTURE, STARWHEEL ALIGNMENT
P/N 2704341

Objective & Benefits:
- Enhances the turret starwheel for proper alignment functionality.
  (Note: alignment differential between starwheel should be limited to 0.005” (0.13mm) maximum for proper process functioning.)
- Equipped with a pair of digital Brown & Sharp gages for precision measurement
- Directly interchangeable with an existing tooling side ram assembly for accurate assessment
"SPLIT" AIR MANIFOLD DESIGN UPGRADE

P/N 1001139 Air Manifold Rotor

Benefits:
- The split rotor design allows for ease of replacement without removing individual turrets from the machine.
- Replacement is less than one hour.
- Precisely doweled and machined in the assembled state, guaranteeing accuracy and minimal seam visibility.
- All size features and heat treat processing have remained the same, thus ensuring complete interchangeability.
DODGE BEARING UPGRADE

Main Turret
P/N 2753022 Bearing, 2.437" expansion

Main Turret:
Belvac has traditionally used a dual setscrew expansion bearing for all 595K and Non-K main turrets. This style of bearing has proved problematic over the years on our equipment due to the setscrews coming loose. When the setscrews become loose, the shaft can become severely damaged, creating considerable downtime for repair.

Belvac has field tested and patented a Clamp Style Bearing Locking Mechanism (U.S. Pt. 6,905,249) offering superior positive bearing clamp for this application. As indicated in the photos, the inner race has been split, allowing a precision-bored locking collar to form-fit around both the race OD on one side and the shaft OD on the other. When clamped together, the inner race of the bearing is securely attached to the main shaft.

Objective & Benefits:
- These bearings have been designed with a pair of jacking screw holes to assist in the disassembly from main bearing plate.
- An increased expansion capability up to 0.34" (8.6 mm), allowing swing line 206/202 adjustments without re-centering the bearing on the shaft.
- No special tools necessary to secure the bearing to the shaft: an ordinary torque wrench is utilized to tighten the SHCS (socket head cap screws) 50-60 ft-lbs (68-82 Nm).
- The assembly cannot be over-tightened causing damage to the bearing or its normal rated function.
- Expansion bearing application (as on our turrets) maintainers easily make adjustments.
- No requirement for flats or other special surface preparation as commonly required for setscrew.
- New bearing #2753022 is directly interchangeable with Belvac's standard bearing #C20114.

For additional information, contact Belvac or refer to Technical Bulletin Issue 10, Volume 1
FLANGER VACUUM MANIFOLD SPRING SUPPORT DESIGN
P/N 2704797 Plunger, Vacuum Spring
P/N 2704798 Housing, Vacuum Spring Support
P/N 2704799 Rework Drawing, Vacuum Flanger Manifold

Belvac redesigned the flanger vacuum manifold to include a die spring to support manifold weight. This feature originally designed for the welded push cam support, had 90% of the spring captured in the cavity of the manifold. When Belvac designed the cast cam support, incorporating a larger inside diameter, a spring spacer was added to maintain the same degree of compression as on the welded cam support assembly.

When properly assembled, the spring and spacer design functions adequately. Note: Caution when installing the manifold to keep manifold orientation. Rotating the manifold during assembly of the outer guard (anti-rotation device), will cause the spring spacer will fall out. The assembling of the anti-rotation devise to the manifold without rotating the manifold is completed by installing the top half first. Belvac has redesigned this spring support, using an existing spring (C21467) which will require a minor rework to all existing manifolds.

For additional information, contact Belvac or refer to Technical Bulletin Issue 21, Volume 1
ADJUSTABLE VACUUM FLANGER MANIFOLD
P/N 2704926  Adjustable Vac Flanger Manifold, Normal Rotation, Cast Design
P/N 2704927  Adjustable Vac Flanger Manifold, Reverse Rotation, Cast Design
P/N 2704928  Adjustable Vac Flanger Manifold, Normal Rotation, Weldment Design
P/N 2704929  Adjustable Vac Flanger Manifold, Reverse Rotation, Weldment Design

Typically, a lack of transfer into the discharge trackwork is due to snaking of the cans through the final transfer discharge starwheel after the flanger. The cause of this snaking appears to be two-fold:

- Lack of vacuum manifold timing capability for high-speed operation.
- Lack of vacuum venting/release during high-speed operation.

The present system was designed to have the vacuum pushplate shut off at the horizontal position, at which point the can would be transferred to the vacuum starwheel. With increasing speed, the time available for the vacuum to exhaust and effectively release the can becomes more critical. If the vacuum is not exhausted, the transfer starwheel is forced to "strip" the can off the pushplate, thus causing the can to become unstable as the vacuum is expelled. Belvac has provided the means to retard the vacuum timing, allowing venting to take place sooner, as well as create a greater vent capability. Both features allow the vacuum to be expelled prior to transfer to the take-away starwheel.

**To Order:**

Use the corresponding part number with type of machine base. Contact Belvac with Machine Serial numbers for part number verification.
PUSH CAM GREASE GUARD DESIGN UPGRADE

P/N 2751188 Necker, Reformer/Reprofiler Turret Kit No.
P/N 2751221 Flanger Turret Kit No.
P/N 2704908 Drilling Template N/R, F/R, Ref/Rep
P/N 2704909 Drilling Template Ref/Rep Spacer

Belvac has designed a quick access guard for the push rams (operator side). The original guard design required the Customer to unscrew fasteners to remove guards. The new guard design is very similar to that of the fixed base machinery where the guard slides in a set of tracks and is secured with a pair of quarter-turn security clamps.

To Order:
Please provide machine serial numbers with part numbers above upon ordering.

For additional information, contact Belvac or refer to Technical Bulletin Issue 8, Volume 2
**595 AUTOLUBE (2400 CPM) CONVERSION**

*Part Number assigned when order is placed*

**Qualifying Machines:**
All 595 “non-K” and “A” Necker turrets fixed-base rated at 1800 CPM

**Benefits:**
This conversion increases production by 25%
Automatically provides adequate lubrication to most existing manual lubrication places on the machine.

**Parts Included:**
New shafts (only on certain serial numbers), basic turret autolube kit, autolube panel for non-K, or panel upgrade for A model Necker’s, ribbed push cam, new push ram and knockout ram assemblies with the double cam followers and grease fittings.

**To Order:**
Please provide machine serial numbers, can size, and project details when requesting quotation and/or ordering.
Belvac Production Machinery, Inc.

Product Upgrades & Conversions: Maintenance Enhancements & Tools

595 GENERATION II FACE SEAL MANIFOLD
With FibreComp®

Part Number List

<table>
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<tr>
<th>PART NUMBERS FOR ORDERING NEW FSM ASSEMBLIES:</th>
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<tbody>
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<tr>
<td>595K Fixed Base____________________</td>
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<tr>
<td>595SK Fixed Base Normal Rotation______</td>
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<tr>
<td>595SK Fixed Base Reverse Rotation_____</td>
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<td>59K Link Turret______________________</td>
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<tr>
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<td>810K Necking System________________</td>
</tr>
<tr>
<td>595K-VE (Solid Rotor) Normal Rotation_</td>
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<tr>
<td>595K-VE (Solid Rotor) Reverse Rotation</td>
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</tbody>
</table>

The Belvac Face Seal Manifold (FSM) was designed and introduced in January 2002 to reduce the air consumption on all 595 Necker machinery (non-K, K, & SK). This unique air recirculation feature has become a proven design to successfully enable customers to significantly reduce ever-increasing utility costs with a dramatic 30% - 50% reduction in overall machine air consumption, as compared to the conventional Necker air manifold.

Belvac Production Machinery has successfully produced the original Face Seal Manifold (FSM) with a Rulon® lined wear surface. These units have a proven track record of exceeding the standard three-year warranty. Customer feedback has requested Belvac to explore alternate materials for even greater longevity.

Belvac is now pleased to inform the industry of our intent to convert to a self-lubricating bearing surface manufactured by HyComp. FibreComp® material is ideal for high speed, medium load applications and is widely accepted in the industry. The FibreComp® material will be supplied on all future FSM upgrades and new machinery shipped after January 1, 2009; Belvac will continue to offer our valued three-year warranty on new, complete FSM assemblies.
BELVAC’S FLANGER FACE SEAL MANIFOLD

Qualifying Machines: All 595 Flanger's.

P/N 2709057 Normal Rotation Fixed Base 595K w/ Welded Cam Supports
P/N 2709058 Reverse Rotation Fixed Base 595K w/ Welded Cam Supports
P/N 2709059 Normal Rotation Fixed Base 595K w/ Cast Cam Supports
P/N 2709060 Reverse Rotation Fixed Base 595K w/ Cast Cam Supports
P/N 2752729 Normal Rotation Modular 595K
P/N 2752737 Reverse Rotation Modular 595K
P/N _______ Swing Cam 595K Mod

Belvac has developed a face seal style vacuum manifold for 595K modular flanging turrets, increasing vacuum efficiency to the push plate. The conventional vacuum manifold provided clearance to the rotor which by design allows for a little air gap and a degree of lost vacuum.

Included in each kit listed above are the appropriate drawings and Bills of Materials.

The Flanger Face Seal Manifold incorporates the following design features & advantages:

- Minimum vacuum losses due to the manifold rotor interface.
- Self-supporting manifold that compensates for run-out and side loads.
- Directly interchangeable with existing Modular 595K and Non-K Flanging Turrets.
- Accommodates the full range of can heights ensuring consistent pressure between the rotor and the manifold.
- Only one replacement wear part (Manifold).
- Comes with a Three-year warranty and life expectancy of five years.

*Contact Belvac Aftermarket Sales for a Quotation or interest in fixed base 595K Flanger.
This Generation II (Gen II) FibreComp® designed FSM offers the following advantages:

- Re-workable timing shoe – long life and ease of refurbishment with no post heat-treated operations necessary after re-facing
- With the Face Seal Manifold properly installed the total air requirement will be 80 SCFM (2.32 m3/min) @ 60 PSIG (414 KPa) per Belvac 595 Necking Station.
- Recommended air pressure settings are 30 PSI high, 10 PSI medium (fixed) and 5 PSI low.
- All necessary hardware is included in Assembly kits

The **Face Seal Manifold** incorporates the following design features:

- Floating Pistons Accommodate Shaft Adjustments (Neck Depth Changes),
- Directly Retractable to both Fixed Base and Modular Necking Turrets,
- Manifold Pilots off the Knockout Cam for True Position,
- Adjustable Timing to Accommodate Specific Die-to-Can Contact Position,
- Closed Loop Piston Priming from Main Air Supply,
- Low, Medium and High Air Ports to Efficiently Use Supply Air,
- Split Rotor Design for Ease of Maintenance,
- Suited for both 1.375” and 1.500” Cam Strokes

The following shows the concept of the **Face Seal Manifold**:
LUBRIQUIP INJECTOR UPGRADE

P/N 2752187; CAM FOLLOWERS INJECTOR KIT
P/N 2752188; RAM BUSHINGS INJECTOR KIT

Belvac has introduced an injector upgrade for all 595K, fixed base and modular machines. The Lubriquip Injector upgrades listed above replace the SL33, Lincoln Injectors since January 2001. The Lubriquip injectors are a direct replacement to the existing Lincoln injectors, which were supplied on your machine.

Each kit comes complete with grease tubes, elbow adapter w/ indicator, preset metered injectors for each specific application.

The injectors in these kits have been factory set to meter the correct amount of grease for that specific application.

This design offers the same functionality, and installation, with the following attributes:

- **Installs to existing turrets without turret disassembly**
- **Indicator is mounted on ram or bushing in plain view not hidden beneath the ram**
- **Requires no turret modifications**
- **Replaces individually as required**
2-PIECE PUSHPLATE DESIGN FOR HEIGHT CONVERSIONS

*Part Numbers assigned when order is placed*

Belvac currently offers an innovative design for all 595K Necker and Flanger push plates. Height changes can now be made without resetting or indicating the push plates. This design still maintains the adjustability feature for changing neck sizes from 211/202 and 211/206 at the push plate.

The "Body" of the push plate is secured to the ram regardless of the specific height of the Push Plate. Belvac Engineering uses a common design to identify all can sizes so that once the operator installs push pads onto a turret, of a specific size, and indicating them to zero. Additional sizes would only require changing the pads. Belvac's thickness tolerance ensures accuracy with respect to all twelve (12) stations on that turret. Since the design uses common fasteners for all sizes, no extra mounting bolts need to be inventoried.

This new design push plate is standard on all new 595K Necker and Flanger turrets supplied by Belvac on Modular Machines after 1996. Since this new design is completely interchangeable with the present adjustable push plate, customers may order this new design for existing 595K Necker and Flanger turrets. This design is especially useful for customers planning to make a variety of height conversions on swing line machines.

**To Order:**
Please provide machine serial numbers, can size, and Trim Can Height when ordering. When ordering a conversion, please specify this style push plate.

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Push pad (only part needing replacement for height changes)
HEIGHT AND DIAMETER CHANGE PART KITS

Part Number assigned when order is placed

All 795 and 595 Neckers are capable of running cans ranging in height 307 to 610 with diameters ranging between 202 and 211. If additional sizes are required, contact Belvac Production Machinery. Each kit is engineered specifically for the customer’s machines.

Shipment Lead Times:
All Change Part Kits are engineered specifically for each machine and can size for each order. Please allow 9-10 weeks for delivery from receipt of purchase order and can specifications.

For quotation and/or ordering:
1. Please provide Serial Numbers of each machine (include each turret, and waxer if applicable)
2. Please provide Trim Can Height for current can size and proposed can size.
3. If the machine has a Flanger, please provide the Factory Finish Can Height.
LONG TERM 595 IDLE THRU KITS
See individual listings below for part numbers

A long term idle thru kit is required on a 595 turret of which cans must move through, but the turret's designed operation is not required. All kits below are used on fixed base and modular machines. Several variations exist according to the number of turrets required per machine as well as the specific style:

P/N 2702444 - Long Term 595K Kit, Necker Turret
• For idling-thru (1) Necker turret per machine, 3 weeks or longer
• For 595K (2400 cpm rated) and 595A (2000 cpm rated) model Neckers.
• Involves removal of the tooling, both push and knockout ram assemblies, and the air selector ring to save the wear of these parts. Two can guide plates would be installed to transport/guide cans through the turret. Conversion per kit requires approximately 3 to 4.5 hours.

P/N 2704240 - Long Term 595K Kit, Necker Turret
• For idling-thru (2) or more Necker turrets per machine, 3 weeks or longer
• For 595K (2400 cpm rated) and 595A (2000 cpm rated) model Neckers.
• Involves removal of the tooling, both push and knockout ram assemblies, and the air selector ring to save the wear of these parts. Two can guide plates would be installed to transport/guide cans through the turret. Conversion per kit requires approximately 3 to 4.5 hours.

P/N 2701140 - Standard Non-K Kit, Necker Turrets
• For idling-thru (1) or more Necker turrets per machines
• For non-K (1800 CPM rated) Necker turrets. This does not include "A" turrets.
• This kit involves removal of the push ram assemblies and the Necker tooling, with installation of a brush assembly, stabilizer nuts, and push side can guide plate. Conversion per kit requires approximately sixty (60) minutes. If a non-K turret is expected to be idled for an extended period of time, it is in the best interest of the plant to opt for a Long Term 595K Kit in order to save unnecessary wear on the cams and air manifold.

P/N 2704006 - 595K Long Term Flanger (Normal rotation)
P/N 2704007 - 595K Long Term Flanger (Reverse rotation)
• For idling-thru a Flanger turret, 3 weeks or more
• Involves removal of push side ram assemblies and installation of the pre-loaded push ram assemblies, transferring the existing push plates to the new ram assemblies. The upper compression fitting in their existing grease ring (nearest the operator side of the machine) is to be replaced with the conversion fitting and Branch-Y fitting. From the "Y" connector, attach the equal length tubes to the ram bushings. The customer will need to attach the "replacement" spin assemblies (PIN 2703832) using their existing flanger tool bolts. Also, the brush assembly must be attached to the upper center spacers.
595 IDLE THRU KITS (continued)

P/N 2704013 - 595 Non-K Long Term Flanger (Normal rotation)
P/N 2704014 - 595 Non-K Long Term Flanger (Reverse rotation)
- For idling-thru a Flanger turret, 3 weeks or more
- Involves removal of push side ram assemblies and installation of the pre-loaded push ram assemblies, transferring the push plates to the new ram assemblies. The customer will need to attach the "replacement" spin assemblies (PIN 2703832) using their existing flanger tool bolts. Also, the brush assembly must be attached to the upper center spacers.

P/N 2704861 - 595K Base Reformer Idle Thru Kit (413) Long Term
- For idling-thru a turret, 3 weeks or more
- Involves removal of the push side ram assemblies as well as the air manifold to save them from unnecessary wear. The tool side ram assemblies will remain in the turret. However, the tooling itself will need to be removed as in the case of the short-term kit.

Illustration above shows brush assembly mounting only. Some of the above kits require removal of ram assemblies, though they are pictured to the right.
STOP ASSEMBLY FOR SELECTOR RING

Belvac offers an Air Selector Ring Stop Assembly retrofit kit that will control the movement and increase the life of the Air Selector Ring Assembly. Previously, the Air Selector Ring Assembly had a tendency to move upward, prematurely wearing the bottom portion of the assembly when air pressure was applied. An installation drawing is included in the kit.

To Order:
Use the part number below. Kit comes with installation drawing.

- Kit # 2705105 Fixed Base Machinery, Normal Rotation
- Kit # 2705104 Fixed Base Machinery, Reverse Rotation
- Kit # 2751840 Modular Machinery, Normal Rotation
- Kit # 2751829 Modular Machinery, Reverse Rotation

For additional information, contact Belvac or refer to Technical Bulletin Issue 29, Volume 1
BASE REFORMER / REPROFILER: DOME EJECTOR UPGRADE
See part numbers & ordering options below

Objective & Benefits:
The base ejector upgrade for all Base Reformer and Base Reprofiler Turrets installs easily conserving wear on push pads and manifolds by eliminating vacuum. The customer can modify their existing upper guide, or has the option to order a full upgrade including a new upper guide.

To Order:
Select the desired option below:

**Full Upgrade Option for Reverse Rotation machines:**
1700771   Base Ejector Assembly, RR (211 diameter)
1700998   Base Ejector Assembly, RR (202 diameter)

**Full Upgrade Option for Normal Rotation machines:**
1700772   Base Ejector Assembly, NR (211 diameter)
1701015   Base Ejector Assembly, RR (202 diameter)

*Purchase option for In-field guide modification are available: Contact Belvac for part numbers*

*Note:* Belvac highly recommends purchasing a C31169 regulator gauge with all the above upgrade. Because this upgrade would result in a lesser vacuum requirement, installing this regulator would reduce plant push pad vacuum being supplied. Installing 2-piece push pads would help reduce maintenance time when worn pads are required to be replaced.
595K RAM ASSEMBLY REWORK PROGRAM

Part Number assigned when order is placed

Recommended Necker maintenance schedules suggest all rams be reworked on an annual basis, Belvac has designed a program to assist in this reworked ram assemblies:

- Minimizes maintenance downtime on multiple stage Neckers and Flangers
- Saves plant maintenance costs
- Saves plant inventory costs
- Coordinates with plant’s maintenance schedules to ensure scheduled rams are available

The program includes the following depending on plant’s level of participation:

- Belvac service engineer could audit entire machine and recommend replacement parts if necessary. The audit will ensure that all parts are on site prior to scheduled maintenance.
- On a pre-scheduled maintenance day, a Belvac service engineer would be available to install all serialized rebuilt ram assemblies along with items identified during the audit.
- Belvac service engineer would prepare a maintenance log for machine.
- Scheduled maintenance between Belvac and customer on an annual basis.
- Reworked ram assemblies include a 12-month warranty on parts and installation labor if installed by a Belvac Service Engineer.

To Order:
Contact a Belvac Sales Representative for more details and to schedule this program for your plant.

ALL STEEL AIR SELECTOR RING REWORK

P/N 1001227RWK (Flanger, Normal Rotation)
P/N 1001197RWK (Flanger, Reverse Rotation)

Belvac will rework all steel air selector ring assemblies for half the price of a new assembly. The rulon lining would be replaced provided the steel parts are not damaged.

To order:
Use part number above and contact Belvac's Sales Department for a return authorization number.