

OPERATING INSTRUCTIONS **BELCO CELL PRODUCTION ROLLER APPARATUS**

Stock Numbers

100V/50 Hz	115 V/60 Hz	230 V/50 Hz	Description
Modular Units:			
7630-71000*	7630-75000	7630-75220	Base Only
7630-71010*	7630-75010	7630-75010	Deck Only
7630-71011*	7630-75011	7630-75221	Base & 1 Deck
7630-71012*	7630-75012	7630-75222	Base & 2 Decks
7630-71013*	7630-75013	7630-75223	Base & 3 Decks
7630-71014*	7630-75014	7630-75224	Base & 4 Decks
7630-71015*	7630-75015	7630-75225	Base & 5 Decks
7630-71016*	7630-75016	7630-75226	Base & 6 Decks
7630-71017*	7630-75017	7630-75227	Base & 7 Decks
7630-71018	7630-75018	7630-75228	Base & 8 Decks

Non-Modular Units (Fixed Frame):

7630-00509	7630-22509	9 Deck
7630-00510	7630-22510	10 Deck

* Non-Stock Item - Contact International Sales Department

Belco Glass, Inc.
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Website: www.bellcoglass.com

IS# 29
Rev: 7/05

WARNING:

Use of this equipment is limited to conventional laboratory applications. It is not intended for use in adverse environments outside the environmental conditions listed below. It is also not intended for use with corrosive or explosive solutions.

Environmental Conditions, operating: indoor use, pollution degree 2, 4° to 50° C
relative humidity 0-90% non-condensing

Environmental Conditions, non-operating: -10° to 60° C, relative humidity 95% maximum

SAFETY SYMBOL DEFINITIONS:

 **Electrical Hazard.** Be extremely careful. Do not remove cover while the unit is connected to a power supply. There are voltages within the unit which could, if contacted, cause personal injury.

 **Protective Earth Ground (Safety Ground):** Do not operate if green screw is loose or missing. Screw provides an uninterruptible safety earth ground from the mains. (power source)

 **Caution or Warning Note.** Denotes a hazard. Included text gives proper procedures. Failure to follow directions could result in minor personal injury and/or property damage.

 **Do not modify the unit in any way if you are not a trained certified electrician. All user modifications and/or repairs must receive prior approval from Bellco Glass Service & Repair Department. Failure to do so not only voids the warranty, but also presents the risks of shock, fire and electrical damage.**

GENERAL DESCRIPTION

The Bellco Cell Production Roller Apparatus has been designed for production of animal cells, viruses and cell products. Modular units are available from 5 to 45 bottle positions and allow easy expansion with modular add-on decks. Non-modular production units come in 45 and 50 bottle positions with over 80,000 cm² of surface area. Rollers have a key design to eliminate slipping and are easily removable for servicing of bearings. Rollers are formulated from a chemical-resistant non-slip EDPM. All units feature a solid-state control with heavy-duty DC motor and analog tachometer. Non-modular production models feature rubber bumpers, handles and a slotted rear guard.

Optional All Position Drives are available for use with plastic roller bottles to prevent slipping of the light-weight bottles. An **optional** Stand By Drive and Alarm System provides motion and power failure alarms and has a redundant drive system that automatically drives the unit should the primary fail.

SPECIFICATIONS

Bottle Speed: 0.1 - 4.0 RPM Standard or 0.085-1.7 RPM when specified on the order.

Drive and Control System: Solid-state electronic control with precision full-range tachometer.

Tolerance: +/- 5%

Electrical Rating: (Base number)	7630-71000	100±10 VAC @ 50 Hz line voltage 1.0 Amp @ 100V, 50 Hz power consumption
	7630-75000	115±10 VAC @ 60 Hz line voltage 1.0 Amp @ 115V, 60 Hz power consumption
	7630-75220	230±10 VAC @ 50/60 Hz line voltage 0.5 Amp @ 50/60 Hz power consumption

Roller Shaft Construction: Non-transferring chemical-resistant rubber rollers with key shape.

Clearance between Decks for Bottle Placement: 134 mm

Construction Material: Aluminum, enamel finish.

Usable Roller Length: 51 cm

FEATURES

- { Heavy-duty DC motor with greased gear head
- { Power Switch with neon indicator
- { Front access fuse for convenient servicing
- { Analog speed meter
- { Heavy duty ball bearing casters for smooth, easy movement through production facility
- { Speed set and locked from front panel
- { Accepts all Bellco Roller Bottles (glass or plastic* in 110mm or 120mm diameter)

*** 7630-50555 All Position Drive is recommended for use with plastic bottles**

UNPACKING INSTRUCTIONS

Unpack your Bellco Cell Production Roller Apparatus carefully. **Note:** Be certain to retain the warranty information, packing materials and these instructions. Claims for shipping damages require that packing materials be retained for inspection. *All damage claims must be initiated with the delivering carrier within five (5) days of receipt of merchandise.*

MODULAR UNITS

Description	No. of Vessels	Dimensions (cm)* H x W x D	Dimensions (in.)* H x W x D
Base Only	5	37 x 76 x 63	14.5 x 30 x 24 ³ / ₄
Deck Only	5	18 x 76 x 63	7.1 x 30 x 24 ³ / ₄
Base and 1 Deck	10	55 x 76 x 63	21.6 x 30 x 24 ³ / ₄
Base and 2 Decks	15	73 x 76 x 63	29 x 30 x 24 ³ / ₄
Base and 3 Decks	20	91 x 76 x 63	36 x 30 x 24 ³ / ₄
Base and 4 Decks	25	109 x 76 x 63	43 x 30 x 24 ³ / ₄
Base and 5 Decks	30	127 x 76 x 63	50 x 30 x 24 ³ / ₄
Base and 6 Decks	35	145 x 76 x 63	57 x 30 x 24 ³ / ₄
Base and 7 Decks	40	163 x 76 x 63	64 x 30 x 24 ³ / ₄
Base and 8 Decks	45	180 x 76 x 63	71 x 30 x 24 ³ / ₄

NON-MODULAR UNITS

Description	No. of Vessels	Dimensions (cm)* H x W x D	Dimensions (in.)* H x W x D
Fixed Frame 9 Decks	45	180 x 76 x 63	71 x 30 x 24 ³ / ₄
Fixed Frame 10 Decks	50	206 x 76 x 63	78 x 30 x 24 ³ / ₄

* Dimensions shown are without side bumpers. Add 5.1cm (2") to Width if bumpers are installed.



NOTE: To determine clearance heights of unit loaded with bottles, add 9 cm to listed height.

OPERATING INSTRUCTIONS

Your new cell production roller apparatus is shipped fully assembled and ready for use. The 230V units need the appropriate mains connector attached. Plug into any appropriate outlet. Refer to your Stock Number and Serial Number label for correct power rating. Press the power switch to the ON position. The neon indicator will light and indicate that the unit is in operation.

Adjust the rolling speed by rotating the speed control shaft clockwise to increase speed. Adjust the speed by loosening the hex lock nut and adjust the speed control with a slotted screwdriver. After adjustment, tighten the locknut to prevent inadvertent speed changes.

Variation in load, fluctuations in power and motor or circuit differences affect speed. Final speed adjustment should be made when unit is loaded and run at temperature for at least 1 hour for best speed stability.

BOTTLE PLACEMENT

Roller bottles should be carefully placed between the roller apparatus rollers with the cap pointing toward the front of the unit. This ensures that the cap will not become entangled in the drive belts at the rear of the instrument.



Caution: If two vessels per roller position are used, the vessels must be placed top to bottom for proper operation. Bottles placed incorrectly on this instrument can cause damage and may void warranty.

The bottle speed is indicated on the analog meter. The unit is calibrated for bottles that are 110 mm in diameter. For bottles having different diameters, the displayed bottle speed will vary proportionately to actual diameters. The displayed value can still be used for reference so that identical speeds can be set for each production run.

Follow preventive maintenance schedule for best continued operation of the CPRA. Avoid rough handling or bumping of machine as this could affect the electronic drive components.

⚡ Note: 230V units require the attachment of a receptacle plug compatible with local supply.

ADDITIONAL DECK ATTACHMENT (7630-75010)

⚡ WARNING: Disconnect power cord from electrical source.

1. Two people are normally required to install additional decks. Please refer to the attached drawings for assistance.
2. Remove all roller bottles and materials from the Roller Apparatus and disconnect from electrical power supply.
3. Remove the four (4) screws securing the rear guard from the upper-most deck (or base, if applicable) and remove the guard exposing the drive belt(s) and pulley(s).
4. Remove the top-most filler bracket (C507-39) by removing the two (2) bolts securing the filler bracket to the deck (or base.)
5. Locate the new deck over the machine and gently lower into position. Then using the bolts from Step 4 above, secure the new deck to the existing deck (or base.)

6. Attach drive belt(s) from existing deck (or base) to newly installed deck(s) using the supplied drive pulleys (A507-542). Drive belts should run vertically (i.e. Inside pulley position to inside pulley position, etc.), using the spacer (A507-56) from the existing deck (or base) as necessary.
7. Tighten all drive pulleys (A507-542) using a hex drive and replace rear guard(s). Unit is now ready for operation.

MAINTENANCE

WARNING: Disconnect power cord from electrical source.

1. Remove rear deck guard(s) and check set screws in all drive belt pulleys annually. (See the Trouble Shooting section below and attached drawings for additional information.)
2. Avoid rough handling and bumping of unit as this could adversely affect the electronic drive control circuitry.
3. Follow Preventive Maintenance schedule to keep your roller apparatus in the best possible operating condition. Although preventive maintenance takes time, routine servicing may eliminate costly production failures.

CLEANING

1. Please use no harsh abrasives or chemicals to clean the machine or the rubber rollers.
2. If the rubber rollers or metal parts should need cleaning, a commercial spray cleaner (Fantastik, Glass-Plus, Windex, etc.) may be used.

TROUBLE SHOOTING

In the event that a problem develops with your Cell Production Roller Apparatus, **DO NOT** attempt to perform any servicing on the unit without first contacting the Belco Equipment Service Department. **Unauthorized servicing may void warranty.** Belco will readily supply information regarding trouble shooting minor problems upon request. In any correspondence with Belco regarding your Cell Production Roller Apparatus, please refer to the appropriate Stock and Serial Numbers. This information can be found on the warranty serial plate attached to the unit.

COMMON TROUBLE SHOOTING HINTS:

Unit will not operate or continually blows fuses when turned on:

1. Blown Fuse - Blown fuse may occur if unit is turned on at high speed setting on speed dial.
2. Defective Speed Control Circuit Board - Have electrician check DC output voltage.
3. Worn Motor Brushes - Brushes should be checked once every three (3) months and should be replaced when worn to within 1/8" of spring.
4. Shorted Motor - Have electrician check armature and commutator.

A508-125 & A508-125B Speed Control Board Fuse

WARNING: Disconnect power cord from electrical source.

The A508-125 & A508-125B Speed Control Board Fuse protects the speed control circuit from overload conditions such as a defective motor, needed brush replacement or a motor stalled due to obstructions or mechanical failures. (SEE FIGURE 3) The fuse eliminates the need for board replacement should one of the above conditions occur.

The procedure for checking if the fuse needs replacement is given below.

1. Power Switch indicator does not light when the unit is switched ON. Check MAINS fuse.
2. Power Switch indicator lights when the unit is ON but the motor is not active when the speed control knob is turned to 10 or fully clockwise. The user should check for:
 - a. **Motor makes noise.** The motor runs or makes a humming noise. Check for a mechanical obstruction, loose linkage, or broken belt. If no obstruction is apparent then it will be necessary to open the unit and check for an internal obstruction, loose linkage such as pulley set screws or broken belt. Disconnect from the line power source prior to servicing.
 - b. **Motor is silent.** Check motor brushes to ensure that they have adequate length. Disconnect from the line power source prior to servicing. The speed control output to the motor will be live and approximately 90 Volts DC. Have an electrician check motor voltage.
 - c. **Motor is silent.** Check speed control board fuse (F1). The fuse can be visually inspected or checked for continuity with an ohm meter. If necessary, replace with Part No. A432-12 fuse for 100 V & 115 V and A432-16 for 230 V units. Need for fuse replacement indicates other problems which should be resolved prior to using the unit. Again, check for obstructions which may cause motor stalling or replace motor brushes. Check that all bearings rotate easily and lubricate or replace if necessary.
3. Inability to produce a DC voltage to the motor when the fuses are good indicates need for speed control board replacement. Have an electrician test for you or contact our Service and Repair Department for repair and return instructions.

Preventive Maintenance Schedule

Motor Brushes	3 Months (inspect for wear - replace if necessary)
Roller Bearings	1 Year
Main Fuse	2 Years
Speed Control Fuse	2 Years

Figure 1: 100 V & 115 V WIRING DIAGRAM (A500-42)

Drive Belts 2 Years

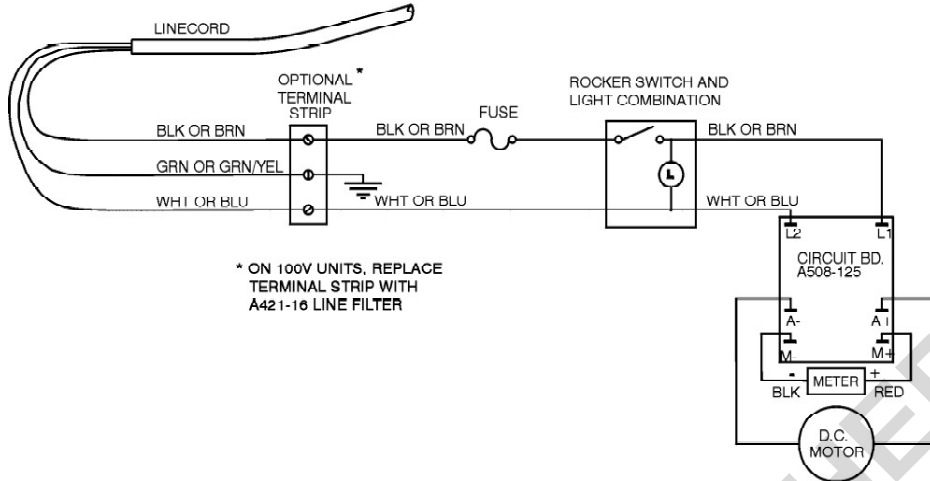


Figure 2: 230 V WIRING DIAGRAM (A500-674)

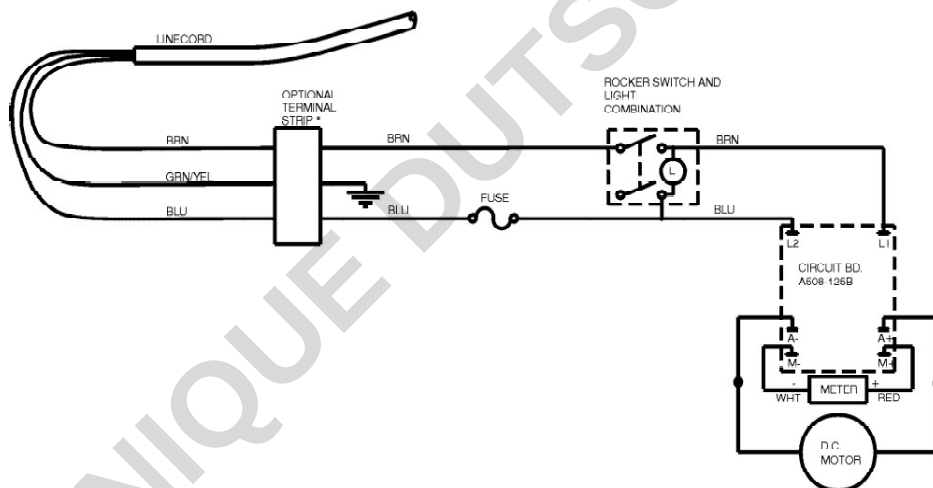
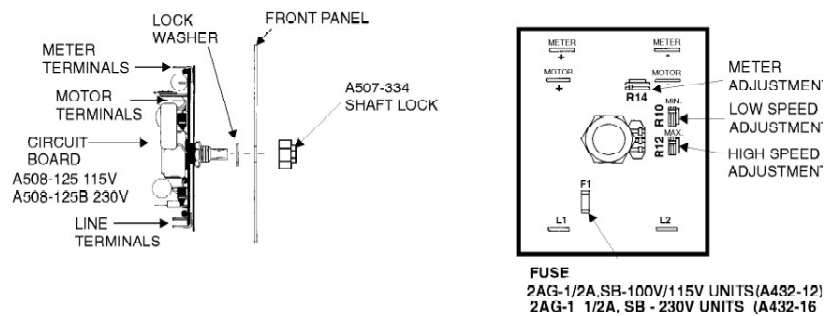


Figure 3: CIRCUIT BOARD INSTALLATION (A508-125L)



Replacement of MAINS Fuse

⚡ Disconnect power cord from electrical source.

1. Grasp fuse holder with fingers and depress slightly while twisting counterclockwise. The fuse holder cap will pop free exposing the fuse. Replace the defective fuse with one of equal rating (Part No. A500-234 for 100 volt & 115 volt units and Part No. A432-3 for 230 volt units).
2. Replace the fuse holder cap by inserting into the fuse holder base, depressing slightly, and turning clockwise.

Replacement of Motor Brushes or Motor

⚡ Disconnect power cord from electrical source.

1. Remove four (4) sheet metal screws holding the base rear guard to control housing, motor is now accessible.
2. Extending from the motor are two (2) wires leading to a terminal strip located in the chassis over the right rear caster (looking from the back). Removing these two (2) wires will disconnect the motor from the electrical circuit. Note color and position of wires.
3. Loosen the four (4) screws securing the motor (A507-524) to the motor and control housing.
4. Slide the motor downward, loosening the tension on the drive belts and remove the drive belts from the motor drive pulley(s)
5. Loosen the set screw(s) on the motor drive pulley(s) and remove the pulley(s).
6. Finish removing the four (4) screws securing the motor to the control housing and remove the motor.
7. The motor brushes are now easily accessible by removing the brush screw caps on the sides of the motor. Pull out worn brushes, check, and install new brushes if necessary. Replace brush screw caps. Reinstall motor. Assemble unit reversing above disassembly procedure.

Replacement of Speed Control Circuit Board

⚡ Disconnect power cord from electrical source.

1. Remove the front control panel exposing the circuit board and other electrical components.
2. Unplug all six (6) wires to the circuit board: two AC lines, two to the meter, and two to the motor (see figures 1 & 2).
3. Remove locking hex nut on the speed control located on the front panel.
4. Remove the second hex nut on the front panel, thereby loosening the speed control potentiometer.
5. Note the orientation of the speed control circuit board to the other components in the housing prior to removal of the circuit board. It is imperative to orient the replacement circuit board in exactly the same way. Remove board from panel.
6. Replace with the new circuit board and potentiometer. Reassemble new circuit board into unit noting appropriate orientation. Connect appropriate line and motor leads prior to testing unit or reassembly.
7. Reassemble unit as described in Replacement of Motor.

Replacement of Roller Bearings

 Disconnect power cord from electrical source.

1. Remove belt guards from decks needing servicing or entire guard on non-modular units.
2. Remove drive pulleys or all position pulleys for rollers needing service.
3. Align pins on A507-589 tool with corresponding holes on the bottle stop-bearing holder and insert (See Figure 5).
4. Twist bottle stop/bearing holder 90° until pins/holes are in a vertical position.
5. Repeat for opposite bottle stop/bearing holder.
6. Gently pull upward on roller to remove from front and rear bearing bars.

NOTE: It is important to remove or insert both bottle stops/bearing holders at the same time to avoid cracking.

7. Reverse procedure to reassemble.

Drive Belt Replacement

 Disconnect power cord from electrical source.

1. Remove four sheet metal screws holding rear chassis/belt guard.
2. Loosen screws and remove rear belt guards.
3. Loosen the four screws securing the motor to the motor plate.
4. Slide the motor upward, loosening the tension on the drive belts and remove the drive belts from the motor drive pulleys.
5. Remove set screws securing pulleys to drive rollers.
6. Remove pulleys using a gear puller if necessary. Replace any pulleys that may break during removal.
7. Remove belts starting with the top deck and proceed downward to the base deck.
8. Reverse steps 2 through 8 to reassemble.

SEE ATTACHED DRAWINGS FOR ADDITIONAL INFORMATION

Replacement Parts List

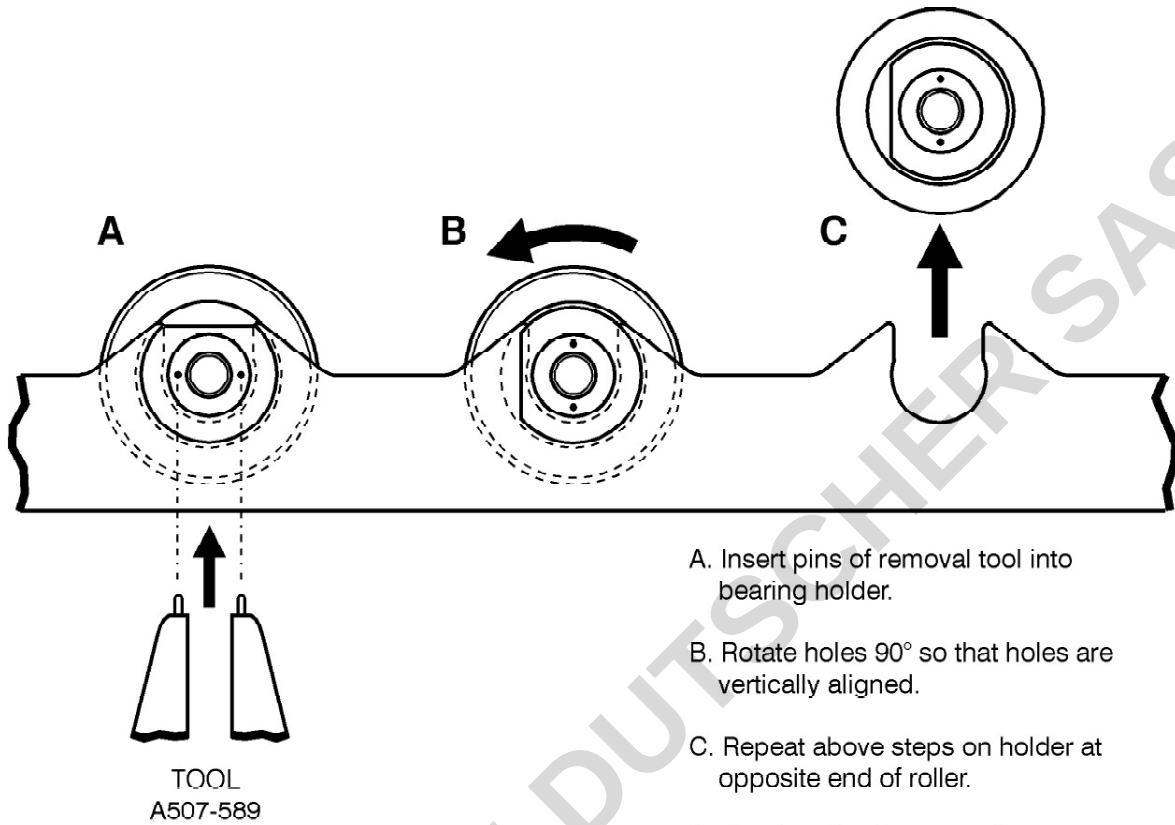
Part #	Qty.	Description
A432-12	1	Speed Control Board Fuse (100V, 115V)
A432-16	1	Speed Control Board Fuse (230V)
A432-3	1	Main Fuse (230V)
A500-107	1	Rocker Switch (100V, 115V)
A508-125	1	Speed Circuit Board (100V, 115V)
A508-125B	1	Speed Circuit Board (230V)
A500-234	1	Main Fuse (100V, 115V)
A500-486	2	Motor Brush
A500-68	1	Rocker Switch (230V)
A507-514	2/deck	Deck Belt
A507-524	1	Motor (115V)
A507-A45	1	Motor (100V, 230V)
A507-529	1	Timing Belt #225L
A507-571	1	Timing Belt #240L
A507-589	1	Roller Removal Tool
A421-16	1	Line Filter (100V, 230V)

To order, Contact Belco Customer Service Dept. @ 1-800-257-7043

Exploded view diagram of a rubber roller assembly. The diagram shows the main frame, rollers, and motor drive components. Key parts labeled include:

- A507-514 DECK-DECK BELT
- A507-542 PULLEY
- A507-234 SPACER
- A507-56 TOP DECK SPACER
- B507-52 BEARING BAR
- C507-38 CROSS MEMBER
- A507-35 RUBBER ROLLER AND SHAFT ASSY.
- C507-39 FILLER BRACKET
- A507-199 SPACER
- A507-143 STIFFENER ROD
- B507-51 BEARING BAR
- A507-199 SPACER
- A507-527A BEARING AND BEARING HOLDER
- B507-176 DECK REAR GUARD (NOT SHOWN)
- C507-37 CORNER POSTS
- A507-542 PULLEY (TYP)
- A507-571 INITIAL DRIVE BELT
- A507-597 MOTOR DRIVE PULLEY
- A507-529 INITIAL DRIVE BELT 1 EA.
- A507-542 DRIVE PULLEY
- A507-234 SPACER
- A507-6 CASTOR OR A507-149 FEET
- A507-129 MOTOR COVER
- A508-125(100V, 115V) A508-125B (230V) CIRCUIT BOARD
- A500-107 (100V, 115V) A500-68 (230V) SWITCH
- A507-334 LOCKING NUT
- A500-44 FUSE HOLDER
- A506-36 SPEED METER
- C507-25 FRONT PANEL
- B507-53 FRONT BEARING BAR (BASE ONLY)
- C507-39 FILLER BRACKET
- D507-28 BASE CABINET
- B507-54 REAR BEARING BAR (BASE ONLY)
- A507-397 MOTOR SPACER
- MOTOR A507-A4G(100V, 230V) A507-524(115V)
- B507-118 MOTOR PLATE

Figure # 5:
ROLLER / HOLDER REMOVAL



- A. Insert pins of removal tool into bearing holder.
- B. Rotate holes 90° so that holes are vertically aligned.
- C. Repeat above steps on holder at opposite end of roller.
- D. Gently pull roller up to disengage bearing holder.
- E. Reverse procedure to reinstall bearing holder.

BELCO WARRANTY AND LIMITATION OF LIABILITY

Bellco Glass, Inc. warrants to the original purchaser, its products to be free from defects in material and workmanship for a **period for one (1) year from the date of shipment, unless otherwise specified**. Our obligation under this warranty is limited to, at our option, repair, replace, or cause any necessary repairs to be made to, any defective part or parts, which shall be returned to us. **Bellco takes no responsibility for damage to merchandise in transit**. All such claims must be submitted to the carrier. This warranty shall not apply to any equipment or parts which shall have been repaired or altered outside our factory, or subjected to misuse, negligence, accidents, faulty installation by other parties, or **unauthorized** repairs or modifications. In addition, Bellco Glass, Inc., shall not be responsible to the original purchaser or any other party or parties for bodily or property loss, damages, or injuries of any kind or nature through either direct or indirect use of the product. This warranty is made expressly in lieu of any and all other warranties, expressed or implied, or statutory as to the merchantability, fitness for purpose sold, description, quality, productiveness or any other matter. All other such warranties are specifically excluded.

The provisions of this warranty and limitation of liability may not be modified in any respect except in writing signed by a duly authorized officer of Bellco. The liability of Bellco, if any, for damages relating to any allegedly defective product shall, under any legal or equitable theory, be limited to the actual price paid by purchaser for such product and in no event include incidental or consequential damages of any kind.

SHIPMENTS

All items are shipped F.O.B. Vineland, New Jersey with the charges prepaid and added to the invoice. Special shipping instructions should accompany your order. We will select the best method if none is specified. Air shipments are available for an additional charge. Delivery of large products shall be to the customer's loading dock. **It is the customer's responsibility to arrange movement from the loading dock to the site of use, unless otherwise agreed to by Bellco Glass, Inc.** Products requiring special or crating may incur additional handling fees.

Bellco takes every reasonable precaution to ensure that its products arrive without damage. However, occasionally damage will occur during the shipment of a product. For this reason, it is imperative that Purchaser examine each product **immediately** upon receipt in order to determine whether the product, has arrived in proper condition. In the event Purchaser detects any damage to the product, Purchaser shall **immediately** notify Bellco and the carrier who delivered the product. **Failure to notify Bellco and the carrier of any damage within five (5) days of receipt of the product shall constitute a waiver of any claim for damage to the product.** The freight carrier shall be exclusively responsible for any damage which occurs during shipment.