



DIVISION OF THE GORMAN-RUPP COMPANY  
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# SERVICE DATA SHEET

## BEL O JUST® THREE TANDEM BELLOWS METERING PUMP

### DESCRIPTION

The BEL O JUST® pump size is the actual outside diameter of the bellows. The pump operates on an adjustable stroke, positive displacement principle. Output is changed by adjusting the stroke with knob on side. This can be done while pump is running. The pump is driven by a thermally protected gearmotor which is attached to a pivot arm and operates adjustable pivot lever action assembly. The bellows, pump body, valve seats and tubing connectors are made of polypropylene.

Exposure of the motor to extremely dusty or corrosive environment may reduce life.

### PRIMING

The pump is self-priming under most conditions: however, the priming ability lessens with greater suction lift, higher discharge head, or with reduced stroke. For dry start up on pumps with anti-siphon spring adjusted at low stroke, pump may not prime. Remove anti-siphon spring, prime pump and replace spring.

After the pump has been primed and is full of liquid, subsequent repriming ability will be improved.

### FLOW ADJUSTMENT

Regulate output flow of bellows pump with adjusting knob on side of pump assembly. Rotate knob clockwise to increase flow and

counter-clockwise to decrease flow. An indicator scale is provided for a proportional average. The pump output is adjustable down to 20% of maximum flow for ½" and ¾" bellows, 10% for 1", 1½", 2" and 2½" pumps.

**Do not reduce output flow by restricting suction or discharge as this will cause excessive pressure within the pump.**

### PRESSURE

The bellows pump has the ability to discharge into a pressurized system; however, if system or discharge pressure exceeds maximum psi rating of bellows, it may cause damage to the bellows or gearbox.

#### Maximum PSI Rating:

- ½" modules pump – 50 psi
- ¾" modules pump – 5 psi
- 1" modules pump – 40 psi
- 1½" modules pump – 20 psi
- 2" modules pump – 5 psi
- 2½" modules pump – 5 psi

**NOTE:** Pumps are designed for use with liquid up to 120°F (49°C) at catalog rated pressure. Reduce the maximum psi rating by 50% for temperatures over 120°F. Not applicable in liquids over 140°F.

### VISCOSITY

The pump has been designed to handle a wide range of liquid viscosities. It should be noted,

however, that when pumping thicker liquids it may be necessary to increase the size of connectors and tubing to relieve the pressure buildup within the pump assembly. It is good practice when pumping the heavier liquids to keep the liquid velocity (pump speed) as low as possible.

When pumping heavy suspensions which may tend to settle out, extremely corrosive solutions or any liquid which may tend to become more viscous with time, flush pump after use to increase pump life.

### CHEMICAL SERVICE

The bellows pump will handle many different kinds of liquids. For specific chemical service, refer to our Full Line Catalog, Form No. 86216.

Special bellows materials (chlorine resistant and acid resistant) are available. Chlorine resistant bellows are available in ½", ¾", 1", 1½", 2" and 2½" sizes. Pumps using chlorine resistant bellows should have pressure ratings shown in the paragraph under pressure heading reduced by 50%. Acid resistant bellows are available in 1" and 1½" sizes only, and standard pressures apply.

### TEMPERATURE

Pumps are designed to operate in 80°F (27°C) ambient temperature. For higher ambient temperature operations, consult the factory.

## TROUBLESHOOTING GUIDE

The troubleshooting guide is a suggestion or aid in helping solve problems that might arise.

**NOTE: Never work on pump without making certain power is off.**

### PUMP LEAKS

1. Bellows loose – Turn adjusting knob to full stroke, then rotate crank assembly to maximum bellows compression. Tighten plastic nut on crank assembly to 14 in.-lbs. maximum. **CAUTION:** Overtightening will distort bellows and cause leaks.
2. Connectors loose – Tighten to 5½ to 6½ in.-lbs. torque (finger tight).
3. O-ring defective or missing – See illustration.

### MOTOR WILL NOT RUN

1. Cord, plug or switch defective.
2. Wires pulled loose.
3. Motor overtemperature thermostat open, motor overheating or poor ventilation.

### UNIT WILL NOT PRIME

1. Pump leaks on suction side (see "Pump Leaks" section).
2. Bellows ruptured.
3. O-ring defective or missing – See illustration.
4. Valves inverted or reversed.
5. Pump air-locked – Temporarily bleed off discharge pressure.
6. Stroke too short – Adjust knob to increase stroke.
7. Viscosity too high.
8. Anti-siphon spring with pump adjusted at low stroke.

### PUMP NOISY

1. Fan hitting.
2. Gearmotor worn out.

### ERRATIC OR LOW FLOW

1. Valves dirty – Dirt or foreign material in valves.
2. Crank set screw broken.
3. Valves not seating.
4. Connectors loose.

### UNIT WILL NOT PUMP

1. Bellows ruptured.
2. Crank broken.
3. Crank set screw broken.
4. Valves dirty – Dirt or foreign material in valves.
5. Valves may have deteriorated.

### WARRANTY

Gorman-Rupp Industries warrants to Buyer that products sold by it will upon shipment conform to the description on the face hereof and any written specifications expressly approved by Seller and be free from defects in title, material and workmanship. NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH ANY PRODUCTS SOLD BY SELLER, AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED.

### WARNING

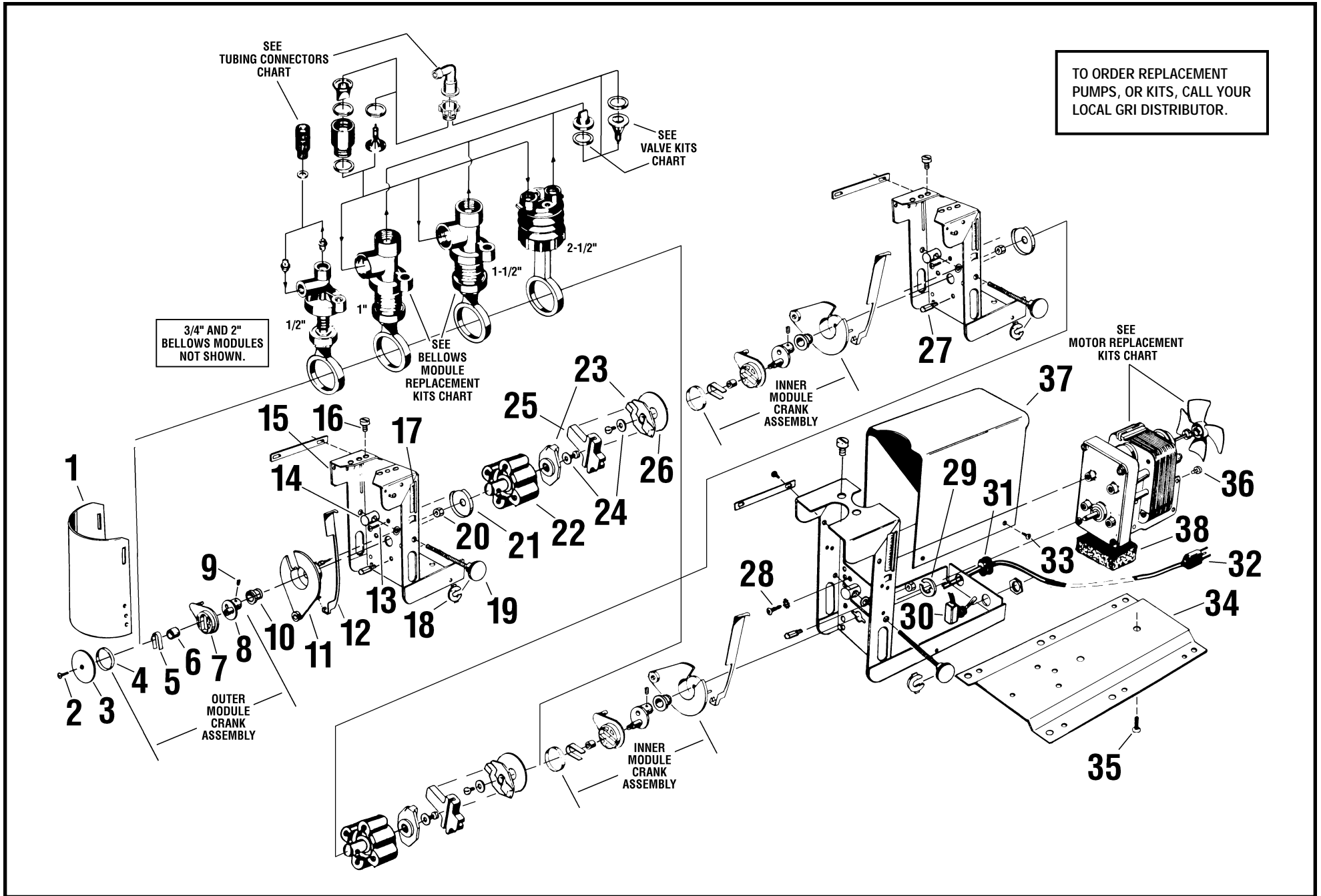
#### DANGER:

Improper application, installation, adjusting, or servicing can result in serious injury or death. Always disconnect power source before working on these products.

#### Caution:

Products with electric motors must be properly grounded and may start automatically at any time. For product information, consult Gorman-Rupp Industries, Bellville, Ohio 44813, Phone (419) 886-3001.

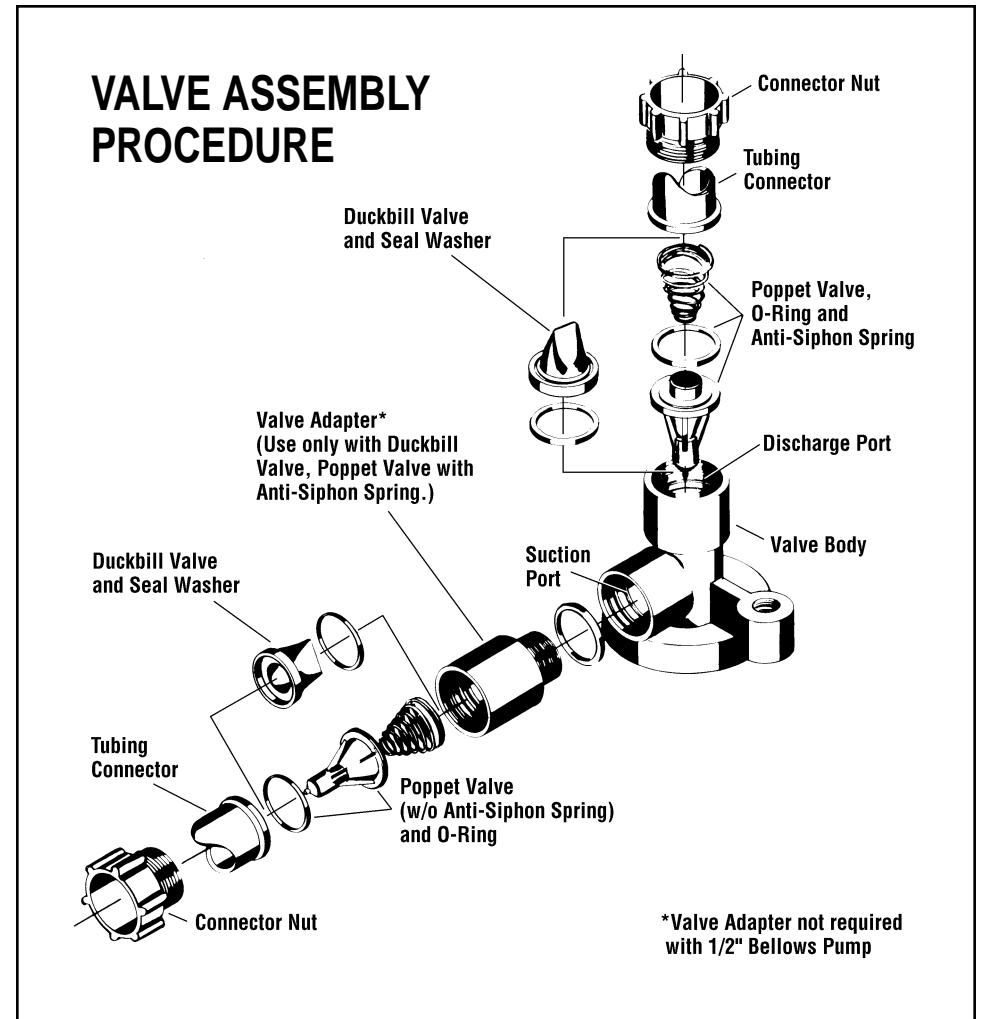
# EXPLODED VIEW – BEL O JUST® THREE TANDEM BELLOWS METERING PUMP



**PARTS LIST**

ITEM	REQ.	DESCRIPTION	ORDERING INFORMATION
1	1	Splash Shield	See note below
2	1	8-32 Screw	See note below
3	1	Flat Washer	See note below
4	3	Rod Bushing	Included in Crank Assembly Replacement Kit - See Chart
5	3	Bearing Bushing	Included in Crank Assembly Replacement Kit - See Chart
6	3	Bearing	Included in Crank Assembly Replacement Kit - See Chart
7	3	Drive Arm	Included in Crank Assembly Replacement Kit - See Chart
8	3	Crank	Included in Crank Assembly Replacement Kit - See Chart
9	3	Set Screw 8-32	Included in Crank Assembly Replacement Kit - See Chart
10	3	Bushing	Included in Crank Assembly Replacement Kit - See Chart
11	3	Control Arm	Included in Crank Assembly Replacement Kit - See Chart
12	3	Indicator	See note below
13	6	Bearing Mounting Screw	See note below
14	3	Adjusting Nut	See note below
15	3	Mounting Bracket	See note below
16	6	1/4-14 Screw	Included in Bellows Module Replacement Kit - See Chart
17	3	Scale Plate	See note below
18	3	E Retaining Ring	See note below
19	3	Screw Assembly	See note below
20	3	Nut w/Lock Washer	See note below
21	2	Retaining Guide	See note below
22	2	Bearing Assembly	See note below
23	4	Drive Coupling	See note below
24	4	Flat Washer & Machine Screw	See note below
25	2	Floating Coupling	See note below
26	2	Retainer	See note below
27	3	Pivot Pin	See note below
28	4	8-32 Motor Mounting Screw	Included in Motor Replacement Kit - See Chart
29	3	Retaining Ring for Item 10	Included in Crank Assembly Replacement Kit - See Chart
30	1	Switch	See note below
31	1	Strain Relief	See note below
32	1	Cord & Plug 115V (240V w/o plug)	See note below
33	4	6-32 Screw	See note below
34	1	Mounting Base	See note below
35	8	Mounting Base Screw	See note below
36	1	8-32 Ground Screw	Included in Motor Replacement Kit - See Chart
37	1	Cover	See note below
38	1	Felt Pad	Included in Motor Replacement Kit - See Chart

NOTE: Parts not available unless stocked by GRI Distributor or purchased in OEM quantities.



**MOTOR REPLACEMENT KITS**

115 VOLT		240 VOLT	
MOTOR	KIT NUMBER	MOTOR	KIT NUMBER
60 RPM	02500-995	60 RPM	02501-004
90 RPM	02500-999	90 RPM	02501-005

Kit includes Motor, Fan, Felt Pad, Ground Screw and Mounting Screws.

**BELLOWS MODULE REPLACEMENT KITS**

BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	02500-445	02500-421	02500-424
3/4"	02501-445	02501-442	02501-446
1"	02500-427	02500-429	02500-432
1-1/2"	02500-435	02500-437	02500-440
2"	02501-453	02501-450	02501-454
2-1/2"	02500-631	02500-628	02500-632

NOTE: Kit includes Connecting Rod Assembly, Bellows Module, Displacement Cup, Screws and O-Rings.

**TUBING CONNECTORS (2 PER KIT) – POLYPROPYLENE**

BELLOWS SIZE	1/8" ID x 1/4" OD COMPRESSION (SMALL)	1/4" ID x 3/8" OD COMPRESSION (LARGE)	3/8" ID ELBOW	1/2" ID ELBOW
1/2"	T-001 (02500-312)			
3/4", 1", 1-1/2"		T-007 (02500-260)	T-008 (02500-261)	T-009 (02500-354)
2", 2-1/2"			T-008 (02500-261)	T-009 (02500-354)

**POPPET AND DUCKBILL VALVE KITS**

POPPET VALVE KITS			
BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	X-005 (02500-316)	X-002 (02500-318)	X-006 (02500-317)
3/4", 1", 1-1/2"	X-115 (02500-608)	X-112 (02500-605)	X-116 (02500-609)
2"	X-145 (02500-608)	X-142 (02500-605)	X-146 (02500-609)
2-1/2"	X-125 (02500-608)	X-122 (02500-605)	X-126 (02500-609)

DUCKBILL VALVE KITS			
BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	X-095 (02500-600)	X-092 (02500-597)	X-096 (02500-601)
3/4", 1", 1-1/2"	X-035 (02500-325)	X-032 (02500-322)	X-036 (02500-319)
2"	X-155 (02500-325)	X-152 (02500-322)	X-156 (02500-319)
2-1/2"	X-045 (02500-325)	X-042 (02500-322)	X-046 (02500-319)

NOTE: "X" codes are used for identification purposes only, to show elastomer in pump. Use "X" codes on pump label as a guide. Use 8-digit kit number beside corresponding "X" code when ordering replacement valve kit.

Example: If X-005 is on pump label, order kit number 02500-316.

**CRANK ASSEMBLY REPLACEMENT KITS**

BELLOWS SIZE	INNER MODULE	OUTER MODULE
1/2"	02501-036	02501-035
3/4"	02501-587	02501-588
1", 1-1/2", 2", 2-1/2"	02501-034	02501-033

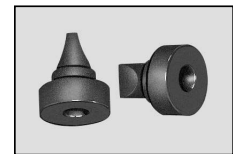
Kit includes items 4 thru 11.

NOTE: "T" codes are used for identification purposes only, to show tubing connectors used in pump. Use "T" code on label as a guide. Use 8-digit kit number beside corresponding "T" code when ordering replacement tubing connector kit.

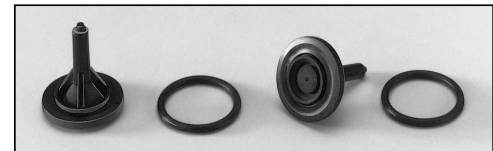
Example: If T-008 is on pump label, order kit number 02500-261. Kit includes (2) Connectors and (2) Connector Nuts.



1/2" Poppet Valve Kit



1/2" Duckbill Valve Kit



3/4", 1", 1-1/2", 2" & 2-1/2" Poppet Valve Kit



3/4", 1", 1-1/2", 2" & 2-1/2" Duckbill Valve Kit

**Registered Trademark Names**

VITON® ..... DuPont Dow Elastomers  
 HYPALON® ..... DuPont Dow Elastomers



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