

**MAINTENANCE MANUAL  
FOR  
TUMBLE BLENDERS  
VACUUM TUMBLE DRYERS  
FORMULATORS**



**GEMCO®**

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# GEMCO

## Company Profile

The General Machine Company of New Jersey (a name later shortened to GEMCO) began operations in 1916 as a general machine shop to the growing industry around Newark, NJ. In the 1930s, John L. Muench, Sr. was at a local government arsenal when he was asked about a safer machine to blend gun powder. The double cone tumble blender was the result with the original patent being issued in 1937.

The unique concept of the tumble blender created a demand such that it blossomed into a product line that ended Gemco's days as a job shop. Product development followed customer's needs and requests. A center band was added in the early '40s to be able to insert an agitator. A special segmented spherical disc valve solved leaking powder problems in the later 40s. Agitators were modified to provide liquid injection in the '50s. Simultaneously vessels were jacketed to create dryers. The '60s added the Slant Cone shape for better, faster blends and the Porta-Hopper for semicontinuous operations. The valve was improved with the double eccentric bushing design for field adjustments of clearance.

The award winning Gemcomatic drum loading/unloading system was perfected in the '70s. The '80s brought the Airless I spray which provided the capability to handle viscous, high-surface-tension, heated and/or minute-additive liquids. The '80s also added fabrication (and later ASME code qualification) to our capabilities as quality was harder to control with outside vendors. And in the '90s Gemco has continued the tradition with enhanced process monitoring/control, integrated material handling, process step consolidation and dust/fume containment systems to

limit worker exposure as well as product contamination. And the valve designs have been expanded to include high pressure, high temperature and abrasive applications from every industry.

Concurrent with the product line development has been Gemco's internal operating systems and capabilities. Gemco maintains a modern 55,000 square foot facility in Middlesex, NJ where state of the art systems combine to provide a quality product at a competitive price. Today Gemco is highly computerized from computer aided design (CAD) in engineering to production planning, scheduling, purchasing. Much of the machining is done with CNC equipment to reduce cost and ensure repeatable quality. The sales department uses a set of CD-ROMs for presentations and proposals as well as the Web to inform and stay in touch with its' far flung sales organization.

Above all, what has evolved is a philosophy of providing innovative custom equipment from proven concepts and component designs, a seasoned and dedicated management team committed to customer needs through conservative designs, and a responsive team able to both anticipate and react to customer needs in a timely and professional manner. The proof of that statement is found in our extensive base of repeat customers ranging from Fortune 500 companies to small start-ups that rely on our technology, support and craftsmanship.

Gemco, the most respected name in powder blenders, dryers and valves, enters the new millennium with the confidence, focus and commitment necessary to meet the ever more stringent requirements of industry.

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## RECORD OF ACHIEVEMENTS

- 
- ◆ First Tumble Blender Manufacturer - Patented Double cone - 1937

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  - ◆ First in Providing Internal Agitation - 1945

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  - ◆ First in Providing Cantilever Agitator Shaft Design

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  - ◆ First in Providing 4-5 Step Shaft Seal for Longer Life

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  - ◆ First to Provide Air Purge Seal on Agitator Shafts

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  - ◆ First to Provide Pharmaceutical Seal Preventing Carmelization

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  - ◆ First to Provide True Running Agitator Shafts Using Ball Bearings

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  - ◆ First to Provide Auto Drum Load/Discharge System - Gemcomatic Patented - 1970

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  - ◆ First to Provide Portable Hopper Blender System - Patented - 1965

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  - ◆ First to Provide D/3 Design - 55% Fill Level - More Internal Surface

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  - ◆ First to Provide Slant Cone Blender - Patented 1968

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  - ◆ First to Provide Airless Liquid Spray System - Trademarked Airless #1 - 1983

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  - ◆ First to Provide Dimpled Jacket to Vacuum Tumble Dryer

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  - ◆ First to Provide Full Stop Pneumatic Brake Assembly on All Tumble Units

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  - ◆ First to Provide Stainless Steel Support Enclosures for Sanitary Easy Clean Assemblies

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  - ◆ First to Provide Spherical Solids Flow Valves - Patented - 1966

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  - ◆ First to Provide Telescoping Retractable Sleeves

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  - ◆ First to Provide Over-Shaft Rotary Union for Multi Air/Liquid Passages Onto Unit for Remote Operation
- 

## GEMCO's COMMITMENT TO SERVICE

GEMCO maintains an independent Service Department, which specializes in customer support. They provide operating instructions, maintenance schedules, parts lists, and stocking recommendations. GEMCO offers a complete range of personnel training programs; both in house and at your site. Most important, the Service Department is always there to help solve problems and provide the extra attention that's required. Call GEMCO for complete details on our training programs and start-up assistance.

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## **WARRANTY**

A one (1) year warranty will apply to defective materials or workmanship covering all fabrications produced by GEMCO.

Component equipment and accessories furnished by other manufacturers and/or suppliers will be subject to each individual supplier's parts and service warranty.

If the malfunction has been determined to be caused by defective materials or workmanship covering GEMCO fabrication and within the one (1) year warranty period after confirmation by GEMCO serviceman at customer's plant; there will be No charge for parts and labor. Travel and living expenses will be charged to the customer.

All parts and labor F.O.B. Middlesex, NJ. All units sold are tested and are run in our factory before shipment. See GEMCO's Standard Terms and Conditions for more information.

## **CAUTIONS**

- ◆ Normal safety precautions should be observed when installing and maintaining this unit.
- ◆ Main circuit breaker should be turned off and your lock and tag out procedures followed when working on unit.
- ◆ If air supply is turned off, vessel should be secured to avoid rotation.
- ◆ All air-operated devices should be secured and unable to operate when cleaning and servicing.

Due to custom work some components may vary on different units. Please call GEMCO customer service if any clarification is necessary.

## **SAFETY INSTRUCTIONS**

You are about to operate one of the world's finest blenders. Follow these safety rules.

We urge that this machine be operated and equipped in strict accordance with all local, state, and federal safety regulations.

**DO NOT** neglect your responsibility to see that this machine is operated, maintained, and equipped with total regard for operator safety.

## **SAFETY CONSIDERATIONS**

- ◆ Study maintenance and operating manuals before attempting to run this unit.
- ◆ Be alert for loose, worn, or broken parts. Report all of these items.
- ◆ Keep unit properly maintained. Perform all maintenance in accordance with this manual.
- ◆ Keep unit clean. Keep work areas clear.
- ◆ Be alert whenever operating unit.
- ◆ **NEVER** reach or stand in area of unit while vessel is rotating.
- ◆ All guards should be in place when unit is under power. See OSHA standards covering machinery and guarding.
- ◆ Only authorized electricians should correct any electrical component failure. The power supply installation connectors, cables, etc. should be installed for this service in accordance with local electrical codes.
- ◆ It is impossible to foresee all uses, misuses and applications of this unit. Your best protection against injuries or damage to unit is to use common sense and to think before attempting any questionable uses of this unit.

## **PARTS ORDERING**

Please supply when ordering:

- ◆ Manufacturers number located on name plate.
- ◆ Part number, description and drawing number.
- ◆ Quantity required.
- ◆ Purchase Order Number or Credit Card Number

## 1. MOTORS

- (A) All motors are tagged and marked (Fig. 1-A) by the manufacturer. Check each motor for maintenance procedure. Most motors require little maintenance.



(Fig. 1-A)

## 2. MAIN DRIVE REDUCER

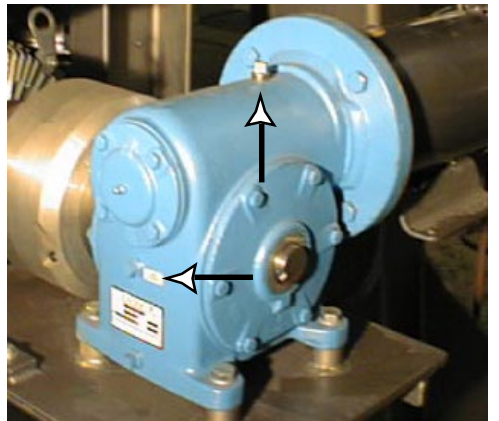
- (A) Units are shipped *WITHOUT* oil. A high grade industrial gear oil should be used; usually 30 or 40 weight should be used for temperatures of 30 degrees to 100 degrees Fahrenheit. Refer to manufacturers tag for detailed explanation.
- (B) Take care that the oil level is not above the upper red line on the oil gage (Fig. 2-A), when the unit is not operating; and not below the lower red line during operation.
- (C) The first oil change is to be made after 500 hours of operation.
- (D) After leveling and aligning have been completed, bull and opinion gear should be lubricated with general purpose, open face gear grease.



(Fig. 2-A)

## 3. RIGHT ANGLE REDUCER (If so equipped)

- (A) Remove level plug and fill unit until oil runs out of oil level plug. (Fig. 3-A) Fill with 90 weight oil.
- (B) Change initial oil fill after two weeks of operation. Refer to maintenance chart for greasing of unit. (NLG1#2 bearing grease. Do not over-lubricate.)



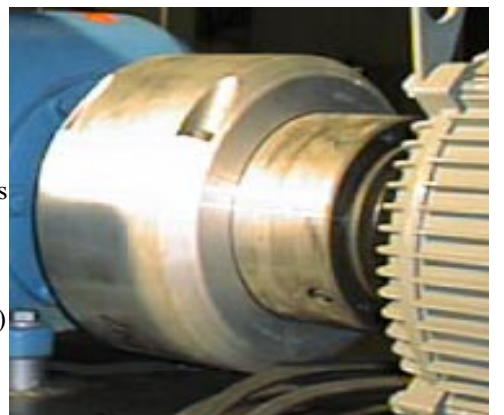
(Fig. 3-A)

## 4. MECHANICAL CLUTCHES (If so equipped)

- (A) This unit is filled at factory. Type "A" automatic transmission fluid must be used for optimum results. Do not use lubricants if the E P type (extreme pressure characteristics), or those containing slippery additives, such as molybdenum disulfide and graphite.

### CAUTION

- (A) The temperature range for type "A" automatic transmission fluid is - 15 degrees Fahrenheit to 250 degrees Fahrenheit. Varnishing occurs at temperatures above 250 degrees Fahrenheit which adversely affects clutch performance.
- (B) Refer to maintenance chart for recommended intervals to check unit for oil.
- (C) The clutch should be flushed periodically (refer to maintenance chart) with mineral spirits such as soluasol (socony-mobil) or equivalent solvents. Carbon tetrachloride should not be used. Flush more frequently if clutch is subject to severe operations or abrasive dust.
- (D) Do not attempt to take this unit apart.
- (F) Chain Coupling (Fig. 4-A). Inside cover walls should contain 1/8" thick coat of grease. Check periodically.



(Fig. 4-A)

## 5. V-BELTS

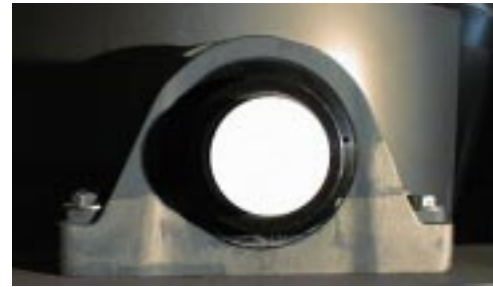
- (A) The V-belts (Fig. 5-A) provided are subject to standard engineering practices involving belt tension, cleanliness, wear, etc., as provided by the V-belt manufacturer or supplier. See Maintenance Chart.



(Fig. 5-A)

## 6. PILLOW BLOCK BEARINGS

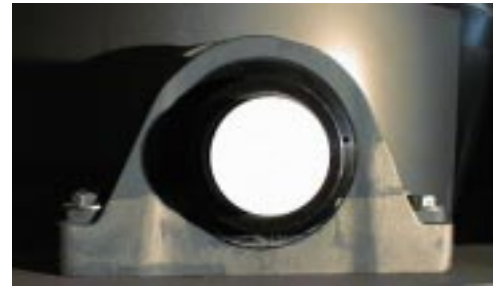
- (A) Pillow Block Bearings should be greased (Fig. 6-A). Check bearings periodically. Little maintenance required. See Maintenance Chart.



(Fig. 6-A)

## 7. ROTARY UNIONS (If so equipped)

- (A) This unit (Fig. 7-A) is pre-packed with “Hi-Temp” lubricant.
- (B) The unit may be lubricated by a grease gun with “Hi-Temp” lubricant. Do not over-lubricate. See Maintenance Chart.



(Fig. 6-A)

## 8. AIR SYSTEMS

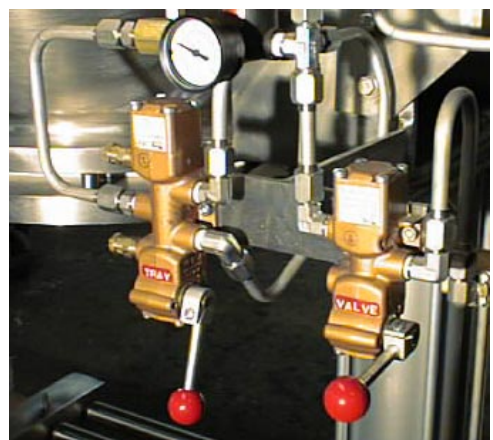
- (A) Fill oiler with #10 Weight machine oil. Unless clean air is required, then use special vegetable oil. (Fig. 8-A)
- (B) The air circuit and control valves require little maintenance, except that they have a clean air supply and periodically checked for leaks. See Maintenance Chart.
- (C) The air components are lubricated by the oiler, admitting a few drops of oil into the lines.
- (D) Operate the control valves until a mist of oil is observed in the exhaust of each control valve. (Fig. 8-B)



(Fig. 7-A)



(Fig. 8-A)



(Fig. 8-B)

## 9. AIR BRAKES

- (A) Inspect brake linings for wear (Fig. 9-A). If worn to a thickness of 1/16" to the piston, they should be replaced. (Always replace the complete set of linings) See Maintenance Chart.
- (B) Inspect "O" ring seals for damage or distortion. (It is recommended the "O" ring seals be replaced at each overhaul.)
- (C) Inspect cylinder wall in brake housing for rust or pits. If present, polish with wet or dry sand paper, 350 grit or finer, and clean thoroughly.
- (D) Brake disc should be free of nicks which may damage brake linings.
- (E) Lubricate cylinder walls, "O" ring seals and contacting surfaces of pistons with a light coat of MIL-L-7711 grease. (Bearing Grease)
- (F) Apply air pressure to brake, hold for two minutes and check for leaks. Release pressure and check to see that disc is free to move.
- (G) Spare part kits are available from GEMCO for replacement of wearable parts.



(Fig. 9-A)

## 10. AIR CYLINDERS (If so equipped)

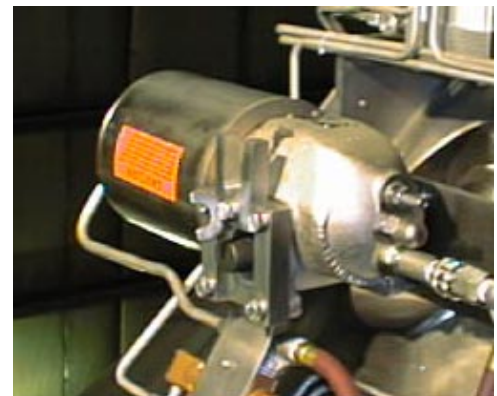
- (A) The cylinder rods (Fig. 10-A) should be kept as clean as possible.
- (B) Standard parts kits are available for convenient replacement of wearable parts which can be obtained through GEMCO.



(Fig. 10-A)

## 11. ROTARY ACTUATORS

- (A) Due to simplicity of the actuator, routine maintenance is unnecessary however, certain good instrument practices are recommended.
- (B) When actuator is first put into operation (Fig.11-A) slight leakage may be experienced. This is due to the packing having been held in one position, tending to cause a "set" in the lips of the packing cups. In such cases, the actuator should be operated through several cycles, thereby energizing the cup lips and resulting in "wearing in" of the packing.
- (C) For applications where the actuator is not operated for long periods of time, it is recommended that the actuator be cycled (3) times at monthly intervals. This will keep the packing flexible and will insure that the valve is free.
- (D) Spare part kits are available from GEMCO for replacement of wearable parts.



(Fig.11-A)

## 12 VARI-SPEED (Fig. 12-A) (If so equipped)

### (A) IMPORTANT REMINDERS

- 1 Change Vari-Speed only when the unit is running.
- 2 Some Vari-Speed units with reducers are shipped with reducers drained. **DO NOT OPERATE UNIT BEFORE ADDING PROPER AMOUNT OF LUBRICATING OIL.**
- 3 Reeves reducers are effectively vented. Do not allow reducer vent to become clogged.
- 4 **CAUTION:** Do not attempt to disassemble spring cartridge assembly. This contains a large spring under compression. Inspect and replace entire cartridge as necessary.
- 5 **NOTE:** Change speeds only when unit is running.



(Fig. 12-A)

### (B) OPERATION AND CARE

- 1 Keep belt contact surfaces of the discs clean.
- 2 When a Vari-Speed is not to be operated for a period of 30 days or more, before final stopping of the unit, shift into low speed position. (Tension spring will then place minimum pressure on the belt.)
- 3 Correct lubrication is essential to good Vari-Speed operation and care.

### (C) LUBRICATION INSTRUCTIONS

- 1 Refer to manufacturers manual for detailed explanation on maintenance procedure.

### (D) RIGHT ANGLE REDUCER

- 1 These reducers are shipped with oil in the unit.
- 2 Refer to manufacturers manual for detailed maintenance procedure.

### (E) PARALLEL REDUCER

- 1 Parallel reducers are shipped without oil. Refer to manual for detail maintenance procedure.

## 13. AIR CLUTCHES (PORTA HOPPERS)

### (A) WEEKLY SERVICE

- 1 (Fig. 13-A) Apply grease whenever fittings are installed. Naturally, too little grease is dangerous, but too much grease may also have adverse results. Suffice it to say that the grease is for bearings and should be confined to same.
- 2 Check carrier set screw to make sure it is secure, tightening if necessary.
- 3 If adjustment is needed, this is the ideal time to accomplish it.
- 4 Wipe off any dirt that has accumulated on shaft where cone travels. Then apply a coat of oil to cone track.



(Fig. 13-A)

### (B) ANNUAL SERVICE

- 1 Remove Clutch from drive and disassemble completely.
- 2 Submerge and soak every part in solvent and air dry.
- 3 Check all parts for wear.

# HOURLY MAINTENANCE CHART

Components	Oil Change	Grease	Inspect
Motors	(a)	X	900
Main Drive Reducer	2500	(a)	500
Right Angle Reducer	900	100	100
Mechanical Clutch	(b)400	X	100
V-Belts	X	X	100
Pillow Block Bearings	X	900	100
Rotary Union	X	150	100
Air System	(e)	X	40
Air Brakes	X	X	(c) 150
Vari-Speed	(a)	80	(a) 300
Air Clutch	X	40	(d) 2000

## NOTES

- (a) Refer to Manufacturers Manual or Tag.
- (b) Flush Every 900 Hours.
- (c) Replace After 300 Hours.
- (d) Remove and Disassemble Once a year-Submerge and soak every part in solvent and air dry.
- (e) One Drop through Oiler per Operation of Each Component.

