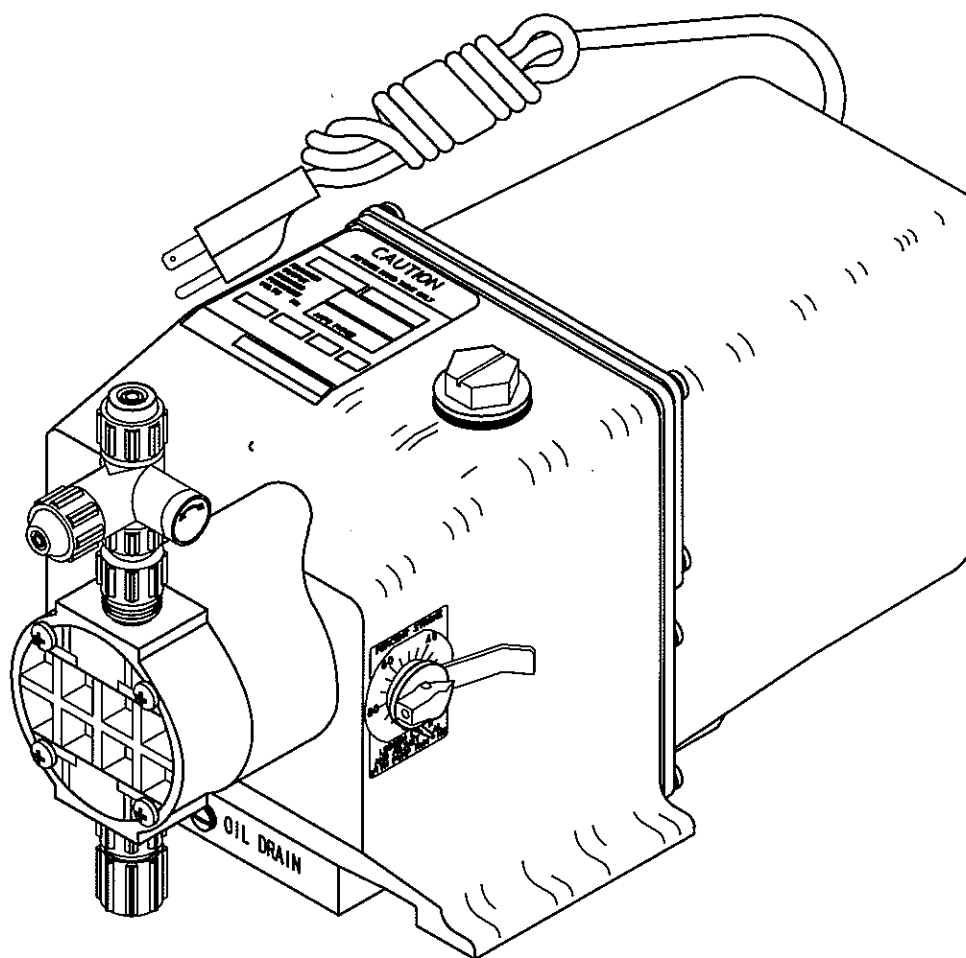


**SERIES 200**  
**Installation, Operation and**  
**Maintenance Manual**



**LIQUID CHEMICAL SOLUTION &**  
**SLURRY METERING PUMPS**  
**Series 200 Models**

**READ ALL WARNINGS CAREFULLY BEFORE**  
**INSTALLING PUMP**

**PUMP DATA/SPECIFICATIONS**  
**Fill in information from pump data label**

**Series:** \_\_\_\_\_  
**Serial #:** \_\_\_\_\_  
**Model #:** \_\_\_\_\_  
**Nominal output:** \_\_\_\_\_  
**Maximum pressure:** \_\_\_\_\_  
**Volts/Hz/Amps/Phase:** \_\_\_\_\_  
**KOPkit® #:** \_\_\_\_\_  
**Tubing material/size:** \_\_\_\_\_

**NOTES:**

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**WARRANTY:**

The manufacturer warrants its equipment of its manufacture to be free of defects in material or workmanship. Liability under this policy extends to eighteen(18) months from the date of purchase or one(1) year from date of installation or whichever comes first. The manufacturer's liability is limited to repair or replacement of any device or part, which is returned, prepaid, to the factory and which is proven defective upon examination. This warranty does not include installation or repair costs and in no event shall the manufacturer's liability exceed the selling price of such part.

The manufacturer disclaims all liability for damage to its products through improper installation, maintenance, use or attempts to operate such products beyond their functional capacity, intentionally or otherwise, or any unauthorized repair. Replaceable elastomeric parts are expendable and are not covered by any warranty either expressed or implied. The manufacturer is not responsible for consequential or other damages, injuries or expense incurred through use of its products.

The above warranty is in lieu of any other warranty, either expressed or implied. The manufacturer makes no warranty of fitness or merchantability. No agent of ours is authorized to make any warranty other than the above.

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## SAFETY INSTRUCTIONS

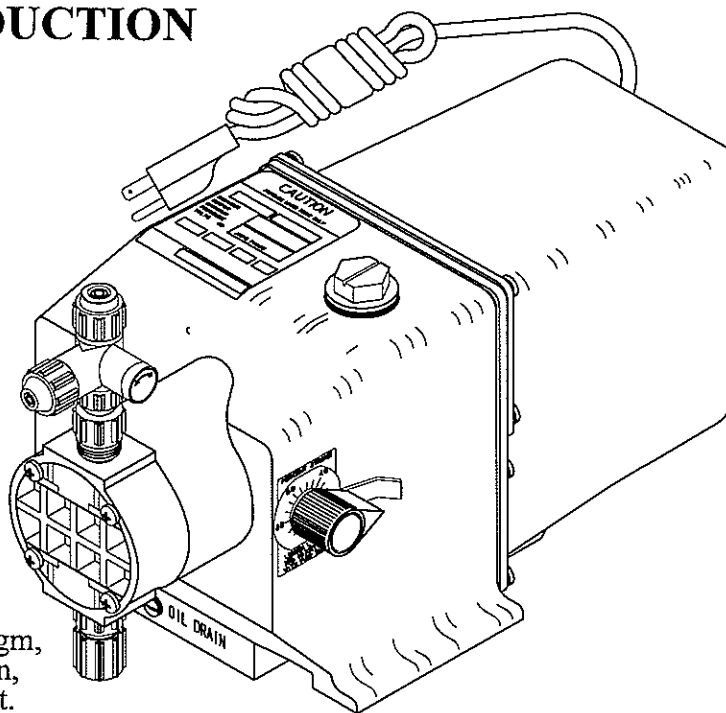
### READ ALL INSTRUCTIONS PRIOR TO USE

- \*\*\* **⚠ DANGER** Secure chemicals & metering pumps, making them inaccessible to children and pets.
- \*\*\* **DO NOT PUMP FLAMMABLE LIQUIDS.**
- \*\*\* To reduce the risk of electric shock -before maintenance, repair, or moving pump- disconnect the power cord.
- \*\*\* Do not cut the plug or ground lug off the electrical cord. Consult a licensed electrician for proper installation.
- \*\*\* If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or similarly qualified person in order to avoid a hazard.
- \*\* **⚠ WARNING** Always wear protective clothing, including gloves and safety glasses, when working on or near chemical metering pumps; consult manufacture for protective equipment recommendations.
- \*\* Inspect tubing regularly for cracking or deterioration and replace as necessary. **(Always wear protective clothing and safety glasses when inspecting tubing.)**
- \*\* If the pump is exposed to direct sunlight, use a U.V. resistant tubing.
- \*\* Follow directions and warnings provided from the chemical manufacturer. The user is responsible for determining the chemical compatibility with the chemical feed pump.
- \*\* Make sure the voltage on the pump data label matches the installation voltage. If pump fails to start, check line voltage.
- \*\* Consult with local health officials and/or qualified water conditioning specialists when treating potable water.
- \*\* Always depressurize system and drain prior to installation or maintenance.
- \*\* If injection point is lower than the chemical tank and pump, install an anti-siphon valve.
- \*\* **DO NOT MODIFY PUMP.** This poses a potentially dangerous situation and will void the warranty.
- \* **⚠ CAUTION** All pumps are factory tested with water. Remove tubing and thoroughly dry if the chemical being pumped will react with water (i.e. sulfuric acid).
- \* Hand tighten plastic connections only, **(Do not use a wrench).**
- \* Consult a licensed plumber and electrician before installation to conform to local codes.
- \* **NOTE:** For accurate volume output, the pump must be **calibrated** under **all** operating conditions.

# INTRODUCTION

Series 200 metering pumps are diaphragm-type feed pumps. A fluid is pumped from a chemical storage tank to the point of injection by the pulsing action of the diaphragm. The four check valves (top and bottom of pump head, strainer assembly, and injection assembly) keep the fluid flowing toward the point of discharge. To insure the solution being pumped can only go forward it is important that all check valves provide a positive, non-leaking backflow prevention.

The wetted end ( those parts that contact the solution being pumped) is constructed of acrylic, PVC, Teflon, hypalon, and polyethylene. These materials are very resistant to most chemicals. However, there are some chemicals, such as strong acids or organic solvents, which cause deterioration of some elastomer and plastic parts, such as diaphragm, valve seat, or head. Alternate materials such as viton, polypropylene, and 316-SST are available on request.



## PRECAUTIONS FOR OPERATION

Each Series 200 metering pump has been tested to meet prescribed specifications and certain safety standards. However, a few precautionary notes should be adhered to at all times.

### **CAUTION** THOROUGHLY READ ALL CAUTIONS PRIOR TO INSTALLING METERING PUMP.

1. Install the pump in a place convenient for its future maintenance and inspection, then fix it to prevent vibration.
2. Protective caps must be removed prior to installing tubing onto valve assemblies. Use tubing of specified size. Connect the tubing to the suction side securely to prevent the entrance of outside air. Make sure that there is no liquid leakage on the discharge side.
3. Each pump is equipped with a three-prong plug. Always be sure the pump is grounded. To disconnect, do not pull wire, but grip the plug with fingers and pull out.
4. Chemicals used may be dangerous and should be used carefully and according to warnings on the label. Follow the directions given with each type of chemical. Do not assume chemicals are the same because they look alike. Always store chemicals in a safe location away from children and others. We cannot be responsible for the misuse of chemicals being fed by the pump. Always have the material safety data sheet (MSDS) available for any fluid being pumped.
5. Arrows on the pump head and injection fitting indicate chemical flow. When properly installed, these arrows should be pointing upward.
6. When metering hazardous material **NO NOT** use plastic tubing. Strictly use proper rigid pipe. Consult supplier for special adaptors or valve assemblies.
7. Standard white discharge tubing is not recommended for installations exposed to direct sunlight. Consult supplier for special black tubing.
8. When using pump with pressurized systems, make sure the pressure of the system does not exceed the maximum pressure rating on the pump data label. Be sure to de-pressurize system prior to hookup or disconnecting the metering pumps.
9. If the discharge point is below the liquid level of the source or if the discharge pressure is less than the suction pressure, siphoning may occur. To correct this condition, install an anti-siphon valve or other anti-siphon device. Check local regulations which may apply. (Ref. Figure H).

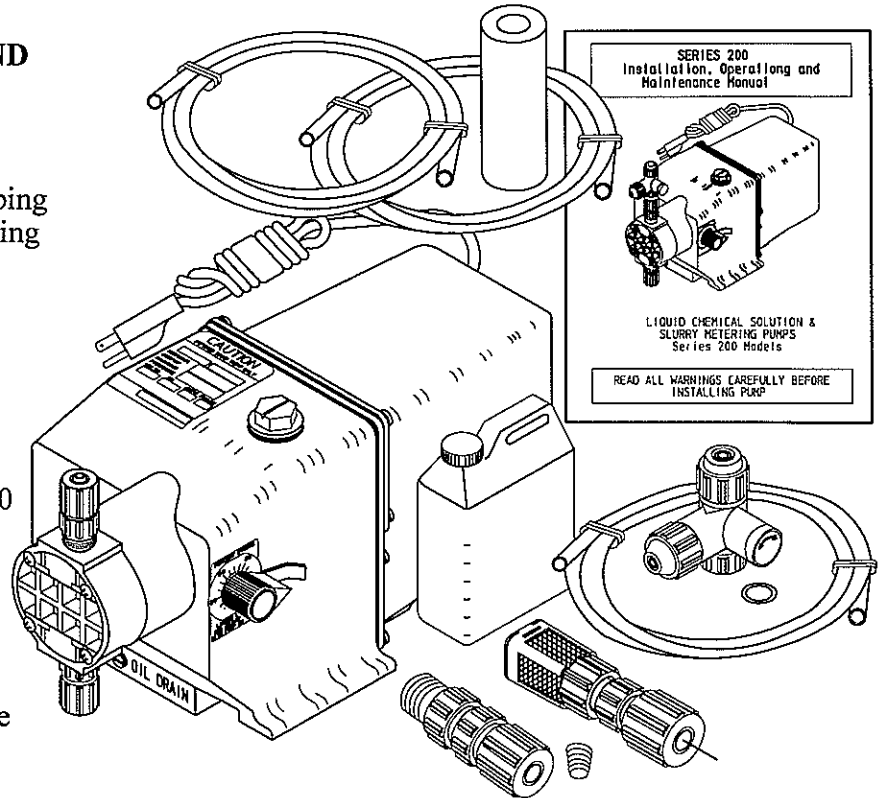
# INSTALLATION, PIPING AND WIRING

## UNPACKING, ASSEMBLING AND MOUNTING:

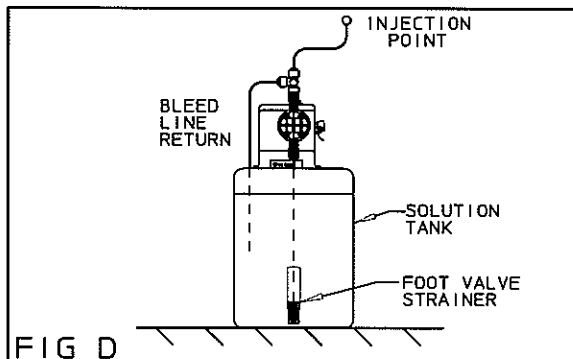
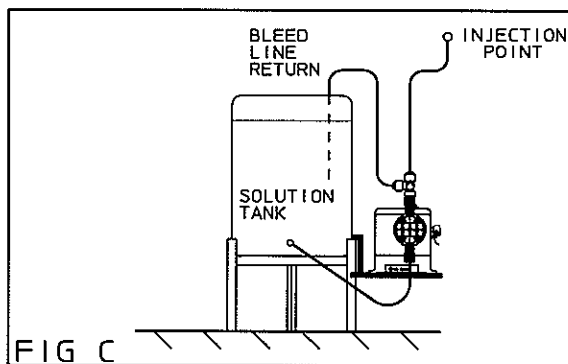
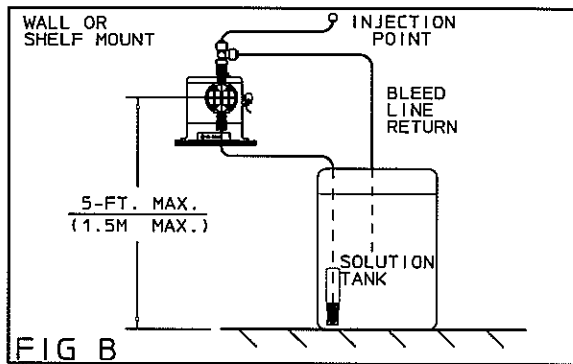
The carton should contain:

- Metering Pump
- 4-ft. Clear Flexible Suction Tubing
- 8-ft. Stiff White Discharge Tubing
- (Optional Tubing available from the factory)
- Back Check Valve Assembly
- Strainer Assembly w/ Tube Weight
- Instructions
- Anti-siphon Spring
- 750cc (25.4 oz.) of SAE 80w-90 Non-detergent Oil
- Bleed Valve Assembly
- Bleed Valve Tubing

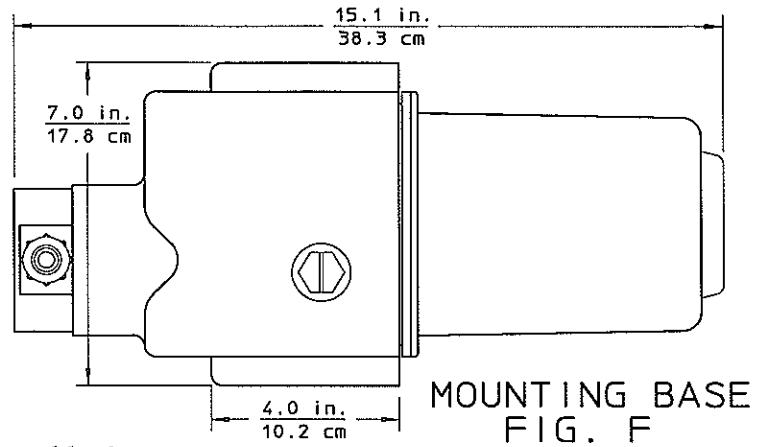
Feeder can be mounted on a wall shelf bracket (Figure B), tank stand platform (Figure C), or directly on the tank cover (Figure D).



**IMPORTANT:** Injection point must be higher than top of solution tank to prohibit gravity feeding.



Flooded suction mounting (installing pump at the base of tank on a platform) is the most trouble free type of installation. (Tank stands and platforms are available for all size pumps and tanks.) The pump is secured on the platform, then the clear suction tubing is attached to a bulkhead fitting assembly and the suction valve housing on the pump head. Since the suction tubing is always filled with solution, priming is accomplished much more quickly and the change of losing prime on a installation, where the pump is used only a few hours a day, is greatly reduced.



The feeder comes with a optional bleed valve assembly that attaches to the discharge valve in the pump head. The bleed valve allows you to manually prime the feeder and de-pressurize the discharge line without disconnecting the feeder from the tubing connections.

**NOTE:** To operate without bleed, replace bleed valve (item #49) and .38"-tubing size discharge valve housing (item #42) with a 0.5"-tubing size discharge valve housing (item #42) and coupling nut (item #43). See page 15 (Wet End Assembly). Items # 42 and #43 are available from factory.

Remove red protective caps and assemble tubing and fittings to the feeder (Figure E). **Note:** The ceramic tube weight should be placed on the suction tube prior to installing the foot valve and strainer assembly.

**CAUTION** Do not force fittings--HAND TIGHTEN ONLY.

**CAUTION** If water is used to dissolve solid chemicals or create a dilute solution, the chemical tanks should be manually filled or an approved means must be used to prevent a cross connection between the chemical tank contents and the potable water line. Check local plumbing regulations.

**NOTE:** Series 200 pumps feature an oil immersed gear box for quiet operation and long component life. Be sure the pump is always mounted on a flat horizontal surface to prevent oil leakage.

**CHEMICAL INJECTION:**

Chemical injection into an open tank: The discharge tubing can be placed in an open tank with or without the injection valve assembly. Each pump is shipped with an anti-siphon spring (item #53) which should be used in the discharge fitting when pumping into an open reservoir or against atmospheric pressure or when viscous materials are being pumped. This spring will insure a positive seal on the discharge side of the pump head.

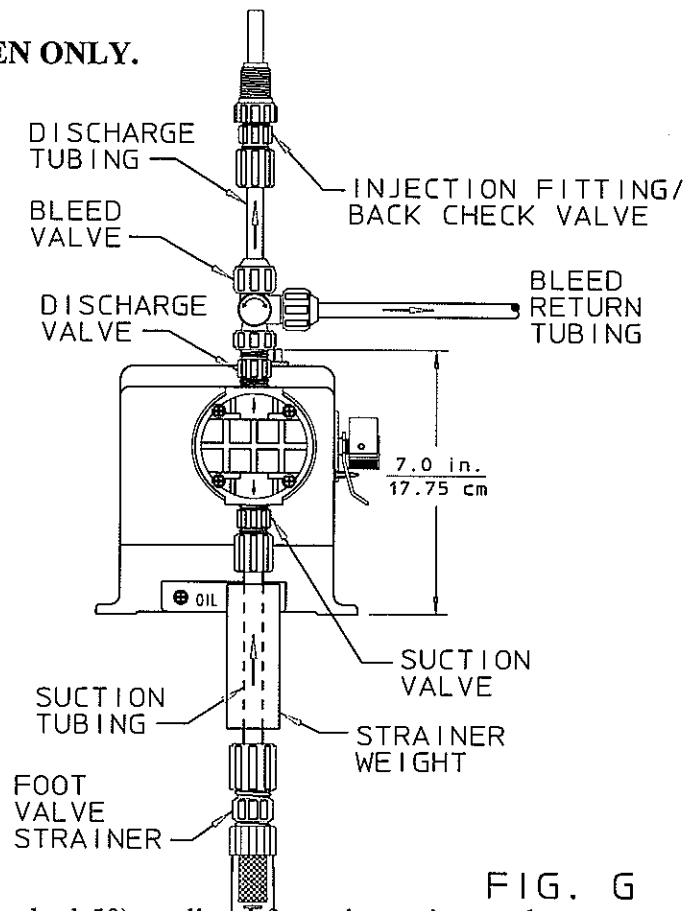


FIG. G

Pumps carrying the "ETL Sanitation" (tested to NSF standard-50) are listed for swimming pools, spas and hot tubs, and when proper materials are selected, are capable of handling but not limited to the following chemical solutions:

- |                           |                         |
|---------------------------|-------------------------|
| 12% ALUMINUM SULPHATE     | 5% SODIUM CARBONATE     |
| 10% SODIUM HYDROXIDE      | 2% CALCIUM HYPOCHLORITE |
| 12.5% SODIUM HYPOCHLORITE | 10% HYDROCHLORIC ACID   |

## INSTALLATION INTO A WELL PUMP SYSTEM:

Make sure the voltage of the feeder matches the voltage of the well pump. Install the injection fitting into a tee which is installed into the water line going to the pressure tank. The end of the injection check valve should be in the main stream of the water line. A typical installation is shown in Figure F.

**NOTE:** It is recommended to install the injection assembly in a vertical position on the bottom side of the water line (Figure H). This will insure proper sealing of the injection assembly check valve and prevent a back flow into the feeder's discharge line. Be sure arrow on injection fitting is pointing upward.

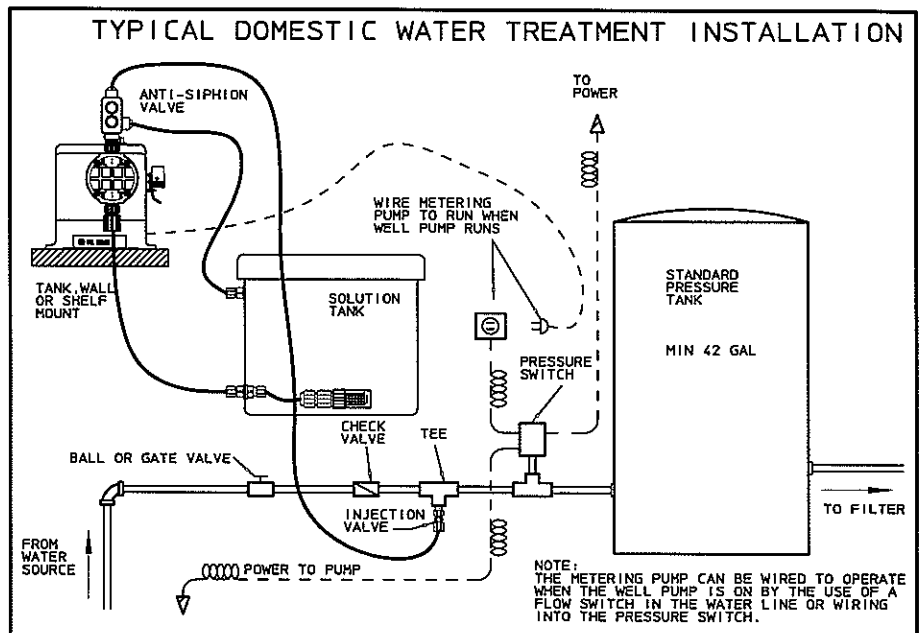


FIG. H

## DOWN-THE-WELL INSTALLATION:

Often it is desirable to provide chemical feed near the intake of the pump for additional retention time and mixing of the chemicals. An additional length of discharge tubing will be required for this installation. Tape the end of the discharge tubing to the pump cylinder drop pipe, or foot valve and lower it into the well. An anti-siphon valve must be installed on systems such as this where the discharge is lower than the pump and the chemical storage tank. Failure to install anti-siphon valve will cause siphoning to occur.

**NOTE:** Series 200 pumps are employed for hundreds of different industrial and agricultural applications, due to the wide range of outputs, pressure ratings, and materials of construction available. When in doubt, consult the factory or your distributor for other specific application and installation information.

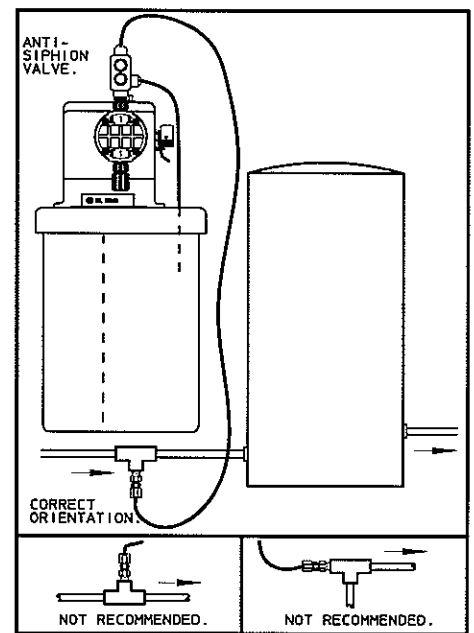


FIG. J

## ANTI-SIPHON VALVE (OPTIONAL):

Under any installation condition where the possibility of siphoning or suction may occur, install an anti-siphon valve on the discharge side of the feeder. The anti-siphon valve is not part of the standard package. This item can be furnished by the factory or the dealer at extra cost.

## PRESSURE RELIEF VALVE (OPTIONAL):

Series 200 metering pumps are rated to pump against a line pressure of 80 to 150 PSI, depending on model. If line pressure of an installation could fluctuate above the rated pressure, install a pressure relief valve on the discharge side of the pump head. Once the pressure reaches a certain level, the pre-set relief valve will return the solution being pumped back to the solution tank. This will prevent motor burnout or diaphragm rupture. The relief valve is not part of the standard package. This item can be furnished by the factory or your dealer at extra cost. Read relief valve instructions carefully before installing.

**NOTE:** Maximum pressure ratings for every model in the Series 200 are indicated on the pump data label. When in doubt, consult the factory or you dealer.

## POINT OF INJECTION:

Pipe corrosion can result if dilution at the injection point does not occur rapidly. This problem is easily prevented by observing this simple rule: install injection fitting so that the end is in the flow stream of the line being treated.

**NOTE:** Extended injection assemblies are available for large water lines. Consult the factory or your dealer.

## COMMON ERRORS IN THE INJECTION OF CHEMICALS:

Do not insert the injection fitting into a pipe stub in the tee. A full strength solution will often cause corrosion or scale in the pipe stub when it is not in the flowing stream. The maximum lift of the chemical feeder is five feet. Be sure not to exceed this height. **It is very important that arrow on injection fitting and head point straight upward in order to prevent backflow.** Arrow indicates the proper flow of the chemicals.

## POWER:

The standard metering pump is available in 115 volt 60 cycle single phase. 230 volt 60 cycle and 230 volt 50 cycle single phase can also be made available upon request.

**CAUTION** Be sure the voltage of the pump matches the power supply. (Figure L)

**NOTE:** All Series 200 pumps are equipped with a heavy duty fractional HP motor. Standard configuration is open, fan cooled. TEFC is readily available in the 115 volt 60 cycle single phase, 230 volt 60 cycle and 230 volt 50 cycle single phase.

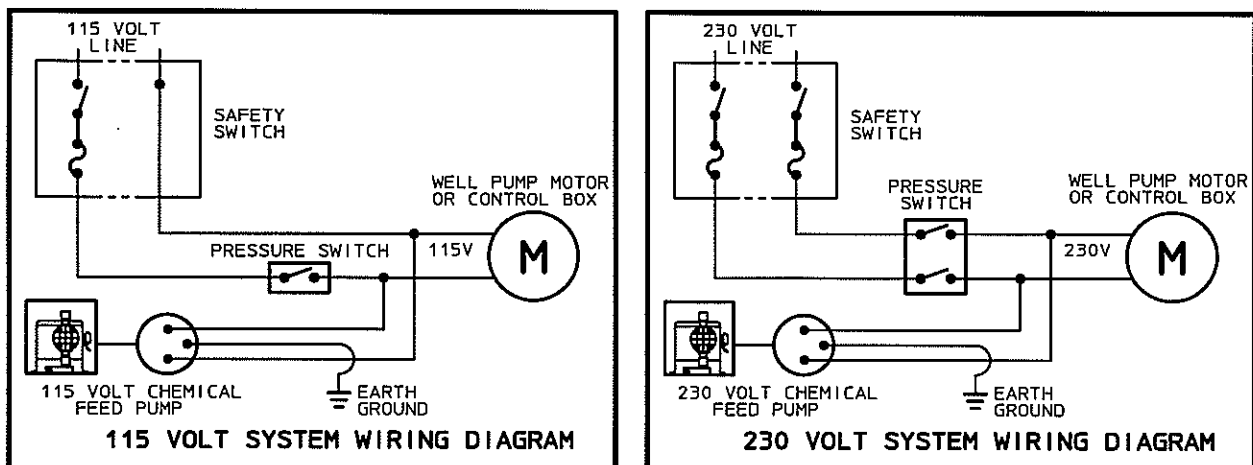


FIG M



## LUBRICATION:

Every Series 200 metering pump is provided with a container of lubrication oil for the gear train. The oil insures smooth running and long component life. It should be replaced approximately every year with any good SAE 30 non-detergent oil.

**NOTE: Never use more than 750cc (25.4 oz.) of oil at a time in a Series 200 metering pump. More than 750cc (25.4 oz.) of oil can cause oil leakage.**

## PRIMING:

**CAUTION** All pumps are tested with water. If the chemical to be pumped reacts when mixed with water (i.e. sulfuric acid, polymer) the pump head should be removed and dried thoroughly along with the diaphragm and valve seats.

If the discharge line is connected directly to a pressurized system it should be temporarily bypassed during priming of the pump. This pump is equipped with a bleed valve to simplify this operation by allowing easy bypass of the discharge fluid. All air must be purged from the pump head before the pump will pump against pressure. Turn ON the power to the pump. First loosen the locking lever by turning it counter-clockwise and then turn the output adjusting knob counter-clockwise to full capacity, (one full turn only) then tighten the locking lever by turning clockwise to a hand tight position. Solution should be primed to the head within a few minutes. (Refer to Figure K)

Air-Bleed operation:

- A) While pump is running, turn adjustment screw counter-clockwise.
- B) Run with valve open until a solid stream of fluid comes out of the bypass tubing ( $\frac{1}{2}$  x  $\frac{3}{8}$  supplied with valve), no air bubbles.
- C) Close air bleed valve by turning adjustment screw clockwise.

**NOTE:** The feeder is adjustable only while running, **never force the knob. Do not turn the adjustment knob while the pump is stopped.** If the solution hasn't reached the head in a few minutes, disconnect power to the pump, make sure the system is depressurized, remove the discharge tubing and discharge fitting and wet the discharge valve area (ball check and valve seats) with a few drops of solution being fed by the pump. For safety, use protective gloves and safety glasses and a proper container to hold chemical. Replace the fitting and tubing and restart the pump.

**CAUTION** When working on or around a metering pump installation, protective gloves and safety glasses should be worn at all time.

**CAUTION** Check calibration of the pump before leaving the installation site. A test for chemical residual in the treated water is the best indication of the correct pump setting.

## MAINTENANCE

### SCALE: GASKETS AND CHECK VALVES

When checking the metering pump or providing a routine maintenance, replace all valve seats or ball checks if any of them show any wear or deterioration. (Valve seats should be checked approximately every 4-6 months depending upon the application.) Repeated deterioration of valve seats and other rubber or plastic parts within a few months period usually indicates another material should be used for the effected part. Contact the supplier or see the parts list for possible alternate materials.

## OUTSIDE INSTALLATION:

In many areas where freezing conditions are not a problem it is common to install a metering pump outside. Adequate protection should be provided to keep the pump from being exposed to direct sunlight or rain. Any simple covering adequately ventilated will afford the necessary protection from weather.

**NOTE: When discharge tubing is exposed to direct sunlight, black polyethylene tubing should be used in lieu of the stiff white translucent tubing supplied with each pump.**

## SOLUTION TANK:

Check the solution tank for settling of chemicals. If there is sludge on the bottom of the solution tank, clean the strainer, the foot valve, and the solution tank. Installing the foot valve a few inches above the bottom of the tank will prevent future clogging.

**NOTE: If the chemical being pumped regularly precipitates out of solution or does not dissolve easily or completely (calcium hydroxide), mixers are readily available in different motor configurations and mountings.**

## OUTPUT ADJUSTING KNOB:

Sometimes the output adjusting knob can move on its shaft and cause a false output indication. This can happen if the knob set-screw slips or if the unit is disassembled for any reason. The unit can be reset to "0" as follows:

1. Remove the dial stop.
2. With the pump running, loosen the locking lever and turn the adjusting knob counter-clockwise until it is "loose" to touch.
3. SLOWLY turn the knob clockwise, using very light finger pressure. It will soon start to advance in pulses as the internal cam comes in and out of contact.
4. When light finger pressure will no longer allow movement of the knob between cam contacts, grasp the knob securely and tighten the locking lever (turning clockwise) making sure that the knob does not move. To check for zero point, turn on pump. There should be no liquid coming out of discharge fitting.
5. Replace dial stop.
6. If the pointer is not at "0", loosen the set-screw on the knob (use a 5/64" Allen key), and turn pointer to "0", then re-tighten the set-screw while holding the knob in place.
7. A setting of "0" will now give zero output. One full revolution of the knob counter-clockwise will give maximum output. The knob should never be turned more than one full revolution.

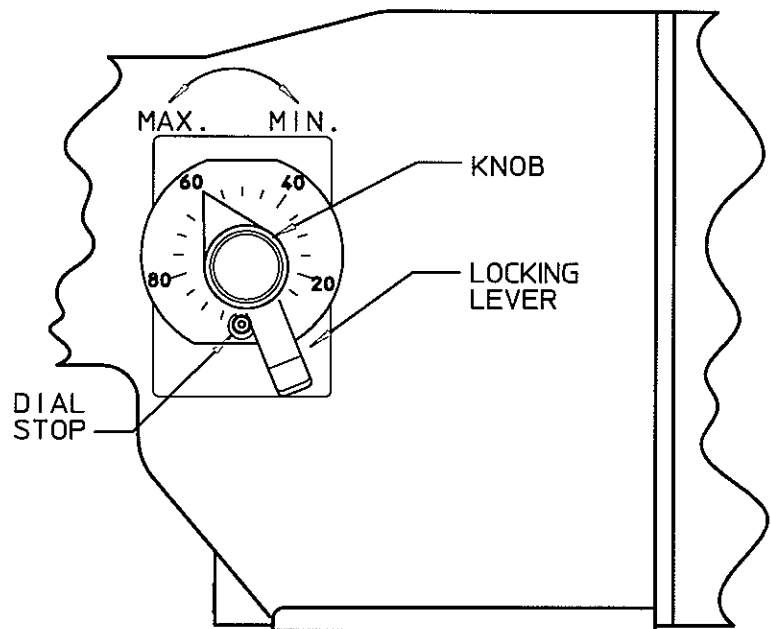


FIG. K

# SERVICING AND REPAIRS

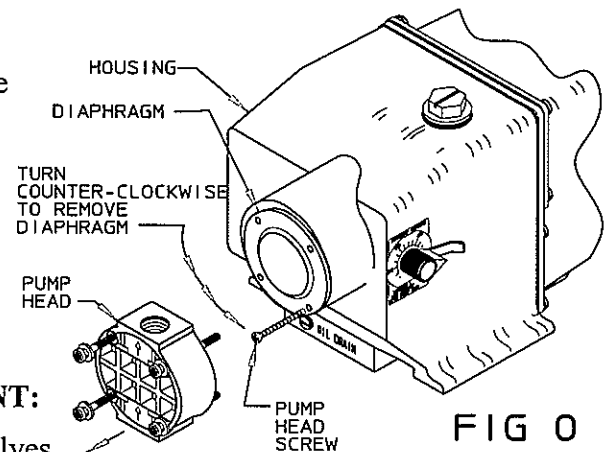
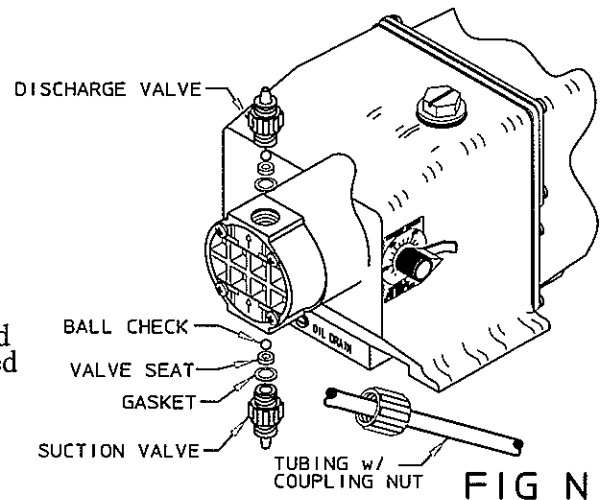
## REPLACEMENT OF PUMP HEAD ASSEMBLY OR DIAPHRAGM:

**CAUTION** Before performing any repairs on Series 200 metering pumps, be sure to disconnect all electrical connections and relieve pressure from suction/discharge tubing.

The Series 200 pump was designed so that servicing can be quick and simple. Proper part replacement procedures are described below.

**NOTE:** Use protective gloves and safety glasses when working on or around metering pumps.

1. Disconnect the tubing. Remove the suction valve and discharge valve being careful not to lose the ball checks and any other small parts. (Figure N)
2. Remove the four screws from the face of the head and remove the head.
3. Remove the diaphragm by inserting one or two of the head bolts into the holes of the diaphragm and turning counter-clockwise. (Figure O)
4. A new pump head or diaphragm should be installed if either is broken or cracked (see parts list at the end of this manual). The new pump head can be installed by going through the above steps in reverse.
5. Be sure the drive bracket assembly is in the **fully retracted position** when installing the new diaphragm. Install the new diaphragm by screwing it in hand tight, then back off one-fourth turn or until screw holes are lined up.
6. Replace the head and the head screws, being certain the discharge fitting is up. **NOTE:** Arrow on outside of pump head should be in vertical position pointing upward. Tighten the head screws evenly and carefully to prevent cracking the head.
7. Replace the suction and discharge fittings making sure all gaskets and valves are fitted properly. **HAND TIGHTEN ONLY.** Restart the system as in the 'INSTALLATION' procedures.



## BALL CHECKS AND VALVE SEAT REPLACEMENT:

The following procedure is the same for any of the four valves.

**CAUTION** Make sure all electrical connections are disconnected and relieve system pressure.

**NOTE:** Use protective gloves and safety glasses while replacing parts.

1. Unscrew compression nut and remove tubing.
2. Unscrew check valve body from pump head, foot valve, or injection fitting.
3. Remove all seats, ball checks, and gaskets and replace.
4. Replace the check valve body so fitting makes contact with the gasket and the pump head, foot valve or injection fitting, whichever the case may be. **HAND TIGHTEN FITTINGS ONLY.** Do not use Teflon tape or other sealants on these threads.
5. Re-install the tubing and tighten coupling nut **HAND TIGHT.**
6. Restart the system as in the 'INSTALLATION' procedures.

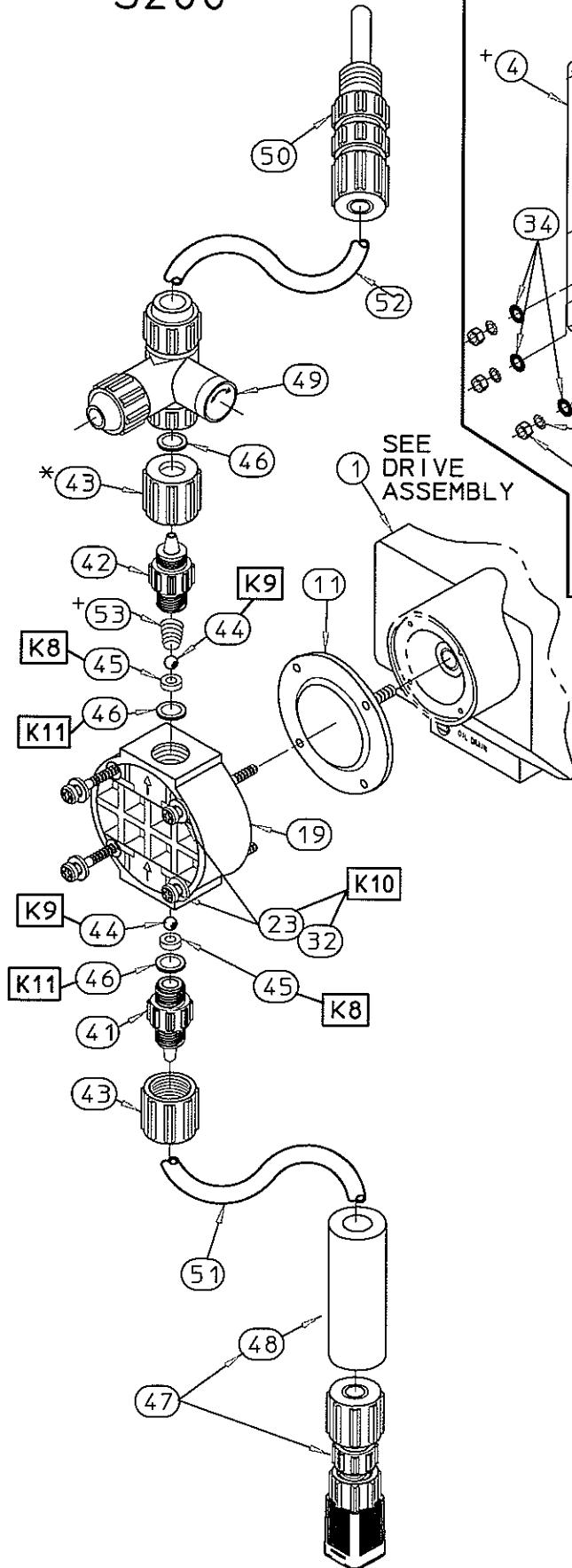
## TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
<b>LOSS OF CHEMICAL RESIDUAL</b>	<ol style="list-style-type: none"> <li>1. Pump setting too low.</li> <li>2. Scale at injection point.</li> <li>3. Solution container allowed to run dry</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust to higher setting. (Pump must be operating during the adjustment).</li> <li>2. Clean injection parts with 8% muriatic acid or undiluted vinegar. See Maintenance Section.</li> <li>3. Refill the tank with solution and prime. See Priming Section</li> </ol>
<b>TOO MUCH CHEMICAL</b>	<ol style="list-style-type: none"> <li>1. Feeder setting too high.</li> <li>2. Chemical in solution tank too rich.</li> <li>3. Siphoning of chemical into well or main line.</li> </ol>	<ol style="list-style-type: none"> <li>1. Lower feeder setting (feeder must be operating to adjust the dial).</li> <li>2. Dilute chemical solution. <b>NOTE:</b> For chemicals that reacts with water, it may be necessary to purchase a more dilute grade of chemical direct from chemical supplier.</li> <li>3. Test for suction or vacuum at the injection point. If suction exists, install an anti-siphon valve. See Figure J.</li> </ol>
<b>LEAKAGE AROUND TUBING CONNECTIONS</b>	<ol style="list-style-type: none"> <li>1. Worn tube ends.</li> <li>2. Chemical attack.</li> </ol>	<ol style="list-style-type: none"> <li>1. Cut off end of tubing (about 1") and then slip on as before or replace suction valve housing with compression fitting to prevent leakage.</li> <li>2. Consult your distributor or the factory for alternate material.</li> </ol>
<b>FAILURE TO PUMP OR FEED</b>	<ol style="list-style-type: none"> <li>1. Leak in suction side of pump.</li> <li>2. Valve seats not sealing.</li> <li>3. Low setting on feeder..</li> <li>4. Low solution level.</li> <li>5. Diaphragm ruptured.</li> <li>6. Pump head cracked or broken.</li> <li>7. Pump head contains air or chlorine gas.</li> </ol>	<ol style="list-style-type: none"> <li>1. Examine suction tubing. If worn at the end, cut approximately an inch off at end and replace suction valve housing with compression fitting.</li> <li>2. Clean valve seats if dirty or replace with proper material if deterioration is noted.</li> <li>3. When pumping against pressure, the dial should be set above 40% maximum rated capacity for a reliable feed rate.</li> <li>4. Solution must be above foot valve.</li> <li>5. Replace diaphragm as shown in "service" Section. Check the pressure above 100 PSI at the injection point. <b>NOTE:</b> Chemical incompatibility with diaphragm material can cause diaphragm rupture and leakage around the pump head.</li> <li>6. Replace pump head as shown in "SERVICE" Section. Do not use Teflon tape or other sealants. Make sure fittings are hand tightened only. Using pliers or wrench can crack pump head. Also, chemical incompatibility can cause cracking and subsequent leakage.</li> <li>7. While pump is running, turn bleed valve adjustment screw counter-clockwise until air is purged.. Close bleed valve.</li> </ol>

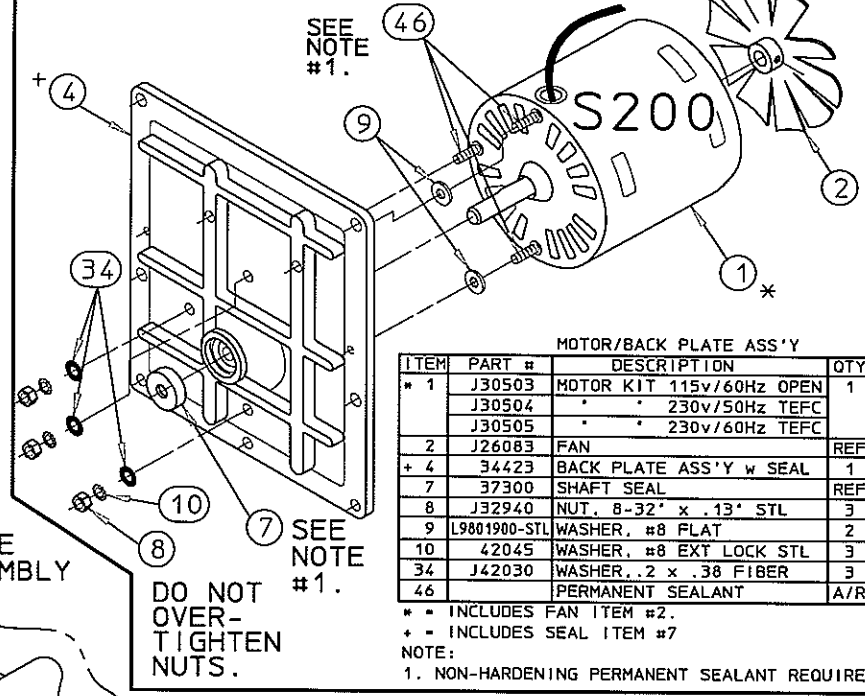
PROBLEM	PROBABLE CAUSE	REMEDY
<p><b>UNIT LOSES PRIME</b></p>	<ol style="list-style-type: none"> <li>1. Dirty check valve.</li> <li>2. Ball checks not seating or not sealing properly</li> <li>3. Solution container allowed to run dry.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove and replace or clean off any scale or sediment.</li> <li>2. Check seat and ball checks for chips; clean gently. If deformity or deterioration is noted, replace part with proper material. Chemical crystallization can hold check valves open, therefore the valves must be disassembled and cleaned. Be sure to replace all parts as shown in the Parts Diagram (at end of the manual).</li> <li>3. Refill container with proper chemical.</li> </ol>
<p><b>LEAKAGE AT FITTINGS</b></p>	<ol style="list-style-type: none"> <li>1. Loose fittings</li> <li>2. Broken or twisted gasket.</li> <li>3. Chemical attack.</li> </ol>	<ol style="list-style-type: none"> <li>1. All fittings can be hand tightened to prevent leakage. Clean off chemicals which have spilled on feeder.</li> <li>2. Check gaskets and replace if broken or damaged.</li> <li>3. Consult your distributor or the factory for alternate material.</li> </ol>
<p><b>PUMP WILL NOT PRIME</b></p>	<ol style="list-style-type: none"> <li>1. Too much pressure at discharge.</li> <li>2. Check valves not sealing.</li> <li>3. Output dials not set at maximum.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open bleed valve and circulate fluid until all air is purged from pump head assembly. Close bleed valve.</li> <li>2. Disassemble, loosen, clean and check for deterioration or swelling, reassemble and wet the valve assembly, then prime. See "Priming" Section.</li> <li>3. Always prime pump with output dial set at maximum rated capacity.</li> </ol>
<p><b>ANTI-SIPHON VALVE MALFUNCTION</b></p>	<ol style="list-style-type: none"> <li>1. Scale or particles have plugged diaphragm.</li> <li>2. Ruptured valves.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove, clean and reassemble, being careful not to wrinkle the diaphragm. Check sequence and position of parts to be sure reassembly is correct.</li> <li>2. Consult your distributor for replacement.</li> </ol>
<p><b>PUMP MOTOR STALLS</b></p>	<ol style="list-style-type: none"> <li>1. Pumping against excessive pressure.</li> <li>2. Low-voltage to pump.</li> </ol>	<ol style="list-style-type: none"> <li>1. Test pressure to determine if it exceeds pump specifications. If so, consult factory or your dealer.</li> <li>2. Make sure voltage of power source matches the voltage on the pump data label. If not, transformers are available.</li> </ol>
<p><b>MOTOR RUNNING VERY HOT</b></p>	<ol style="list-style-type: none"> <li>1. Low voltage</li> <li>2. If using step down transformer, it may be undersized for the feeder.</li> </ol>	<ol style="list-style-type: none"> <li>1. Power supply voltage should match voltage on pump data label.</li> <li>2. Check the transformer to be sure it has a least 100 watts capacity.</li> </ol>

PROBLEM	PROBABLE CAUSE	REMEDY
<p><b>OIL LEAKAGE</b></p>	<ol style="list-style-type: none"> <li>1. Too much oil.</li> <li>2. Worn oil seal.</li> <li>3. Pump not mounted in a horizontal position.</li> </ol>	<ol style="list-style-type: none"> <li>1. Never use more than 750cc of oil at a time in a Series 200 chemical pump.</li> <li>2. Consult the factory or your dealer for replacement.</li> <li>3. Make sure Series 200 metering pumps are mounted on a flat horizontal surface at all times.</li> </ol>

# WETEND ASS'Y, S200



# MOTOR/BACKPLATE ASSY./S200



MOTOR/BACK PLATE ASS'Y

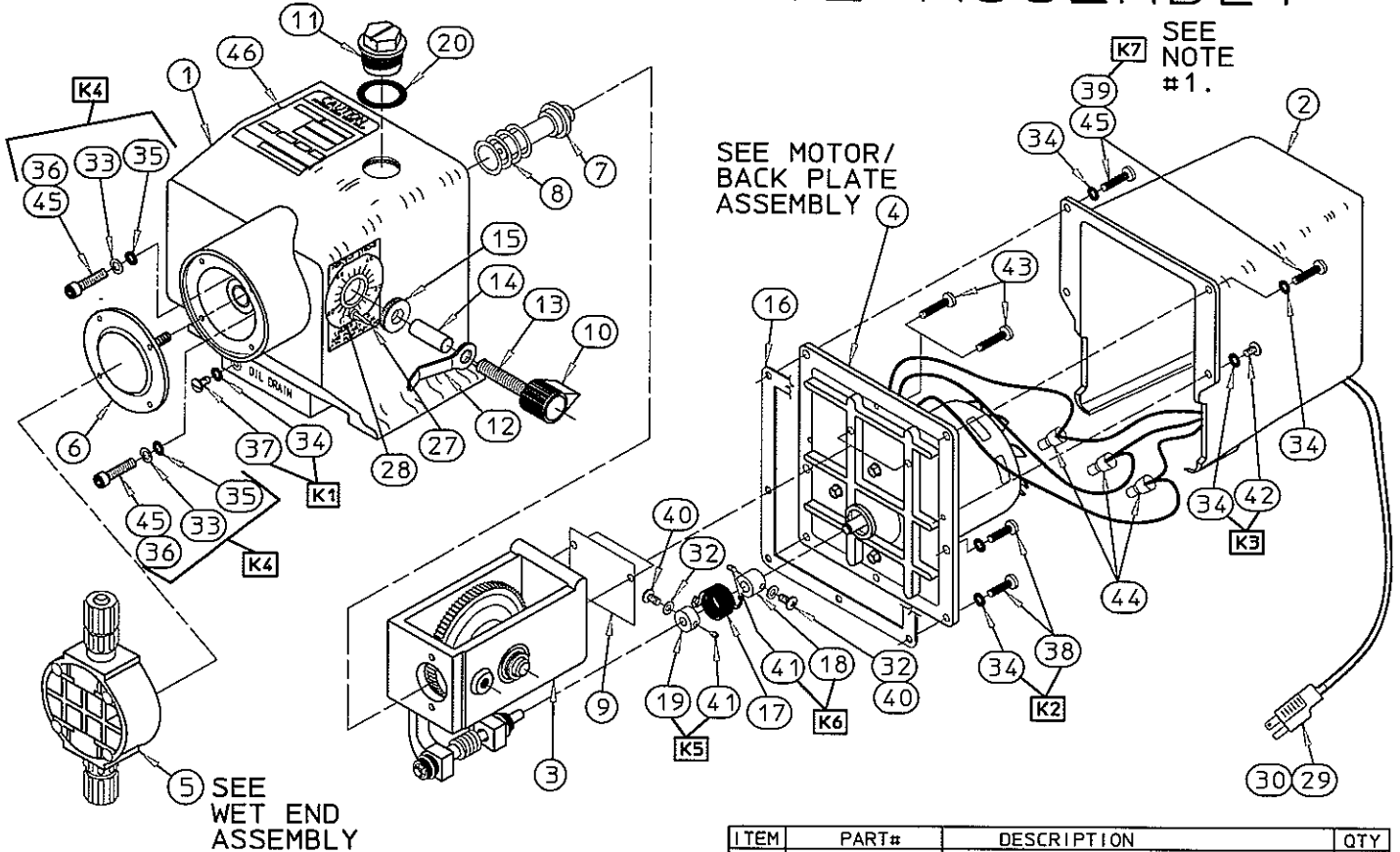
ITEM	PART #	DESCRIPTION	QTY
* 1	J30503	MOTOR KIT 115v/60Hz OPEN	1
	J30504	" " 230v/50Hz TEFC	
	J30505	" " 230v/60Hz TEFC	
2	J26083	FAN	REF
+ 4	34423	BACK PLATE ASS'Y w SEAL	1
7	37300	SHAFT SEAL	REF
8	J32940	NUT, 8-32" x .13" STL	3
9	L9801900-STL	WASHER, #8 FLAT	2
10	42045	WASHER, #8 EXT LOCK STL	3
34	J42030	WASHER, .2 x .38 FIBER	3
46		PERMANENT SEALANT	A/R

\* = INCLUDES FAN ITEM #2.  
 + = INCLUDES SEAL ITEM #7  
 NOTE:  
 1. NON-HARDENING PERMANENT SEALANT REQUIRED.

ITEM	PART #	DESCRIPTION	QTY
11	25704	DIAPHRAGM(HYPALON), ASS'Y	1
	25706	DIAPHRAGM(VITON), ASS'Y	
	25707	DIAPHRAGM(TEFLON), ASS'Y	
19	28800	HEAD, PUMP(SAN)ACRYLIC	1
	J28801	HEAD, PUMP(PVC)	
	28803	HEAD, PUMP(FPP)	
23	J37005	SCREW, #10-24 x 2"lg. P.H.P.SST	4
32	J42020	WASHER, #10 STL	4
41	J41548	BODY, SUCTION VALVE(PVC) Ø.5"-TUBE	1
	J41834	BODY, SUCTION VALVE(FPP) Ø.5"-TUBE	
	41551	BODY, SUCTION VALVE(PVC) Ø.38"-TUBE	
	J41835	BODY, SUCTION VALVE(FPP) Ø.38"-TUBE	
42	J41540	BODY, DISCHARGE VALVE(PVC) Ø.5"-TUBE	1
	41541	BODY, DISCHARGE VALVE(FPP) Ø.5"-TUBE	
	41543	BODY, DISCHARGE VALVE(PVC) Ø.38"-TUBE	
	41544	BODY, DISCHARGE VALVE(FPP) Ø.38"-TUBE	
43*	J24960	NUT, COUPLING(PVC) Ø.50" STD.	2
	24961	NUT, COUPLING(FPP) Ø.50"	
	24963	NUT, COUPLING(PVC) Ø.38"	
	24964	NUT, COUPLING(FPP) Ø.38"	
44	J20560	BALL, VALVE CERAMIC	2
45	J37440	SEAT, VALVE(HYP)	2
	J37442	SEAT, VALVE(VIT)	
46	J27903	GASKET, TFE	2-3
47	J40116	STRAINER ASS'Y/FOOT VALVE(FPP/HYP/C/Ø.38)	1
	J60524	STRAINER ASS'Y/FOOT VALVE(FPP/VTN/C/Ø.38)	
	J40117	STRAINER ASS'Y/FOOT VALVE(FPP/HYP/C/Ø.50)	
	J60509	STRAINER ASS'Y/FOOT VALVE(FPP/VTN/C/Ø.50)	
48	L9906700-000	WEIGHT, STRAINER	1
49	J30507	KIT, BLEED VALVE PVC/HYP/Ø.38"-TUBE	1
	J30509	KIT, BLEED VALVE PVC/VTN/ "	
	J30510	KIT, BLEED VALVE PVC/TFE/ "	
	J30511	KIT, BLEED VALVE FPP/HYP/ "	
	J30513	KIT, BLEED VALVE FPP/VTN/ "	
	J30514	KIT, BLEED VALVE FPP/TFE/ "	
	J30515	KIT, BLEED VALVE PVC/HYP/Ø.50"-TUBE	
	J30517	KIT, BLEED VALVE PVC/VTN/ "	
	J30518	KIT, BLEED VALVE PVC/TFE/ "	
	J30519	KIT, BLEED VALVE FPP/HYP/ "	
	J30521	KIT, BLEED VALVE FPP/VTN/ "	
	J30522	KIT, BLEED VALVE FPP/TFE/ "	
50	41693	INJECTION FITTING PVC/HYP/C Ø.38"	1
	J41694	INJECTION FITTING PVC/HYP/C Ø.50"	
51	00006	SUCTION TUBING(PVC) Ø.44"	4'
	00007	SUCTION TUBING(PVC) Ø.38"	
52	00008	DISCHARGE TUBING(PE) WHITE Ø.50"	8'
	00009	DISCHARGE TUBING(PE) BLACK Ø.50"	
	00010	DISCHARGE TUBING(PE) WHITE Ø.38"	
	00011	DISCHARGE TUBING(PE) BLACK Ø.38"	
53+	J38985	SPRING, VALVE, HEAVY S/200	1
61	J39010	SPRING, INJECTION VLV.BCKCK (not shown)	1

\* NOT USED WITH BLEED VALVE.  
 + USE AS REQUIRED

# SERIES 200 DRIVE ASSEMBLY



ITEM#	PART#	DESCRIPTION	QTY
1	29313	PUMP HOUSING ASSY(except 2-120)	1
	29314	PUMP HOUSING ASSY(only 2-120)	1
2	29230	MOTOR HOUSING	1
3	28210	GEAR HOUSING ASSY(MODEL #210)	1
	28211	" " (MODEL #215)	
	28212	" " (MODEL #220)	
	28213	" " (MODEL #230)	
	28214	" " (MODEL #240)	
	28215	" " (MODEL #260)	
	28216	" " (MODEL #280)	
	28217	" " (MODEL #2-100)	
28218	" " (MODEL #2-120)		
4		MOTOR/BACKPLATE ASS'Y	REF
5		HEAD ASSEMBLY(SEE WET END ASSY)	REF
6	25704	DIAPHRAGM ASSEMBLY, HYPALON	1
7	37886	DIAPHRAGM SHAFT	1
8	38980	DIAPHRAGM SPRING, RETURN	1
9	J38719	SHIM GEAR HOUSING SPACER S200	1
	J38723	SHIM GEAR HOUSING SPACER S250	1
10	30460	KNOB, OUTPUT ADJUSTMENT	1
11	34530	OIL FILLER PLUG	1
12	31081	LEVER, LOCK(215,230,260-MODEL)	1
	31082	" " (210,220,240-MODEL)	
	31083	" " (280,2-100,2-120-MODEL)	
13	37080	SCREW, ADJUSTMENT(210,220,240-MODEL)	1
	37081	" " (215,230,260-MODEL)	
	37083	" " (280,2-100,2-120-MODEL)	
14	38080	SLEEVE, LOCKING	1
15	28521	GROMMET, Ø.78 x .125	1
16	27911	GASKET, HOUSING	1
17	38981	SPRING, COUPLING	1

ITEM	PART#	DESCRIPTION	QTY
18	24967	COUPLING, .31" SHAFT	1
19	24966	COUPLING, .25" SHAFT	1
20	33099	O-RING,	1
27	33761	PIN, STOP, .625	1
28	25396	LABEL, DIAL	1
	25397	LABEL, DIAL (2-120)	
29	L9900700-000	CONNECTOR, STRAIN RELIEF	1
30	24820	CORD, 6ft, 18/3 SJT 115v	1
	24821	CORD, 6ft, 18/3 SJT 230v	
32	J42020	WASHER, .2 x .38 x .031hk, SST	2
33	J42083	WASHER, .423 x .254 x .031hk,	2
34	J42030	WASHER, .20 x .38 FIBRE BLK	10
35	42031	WASHER, .26 x .41 FIBRE RED S250	2
36	37021	SCREW, .25 x .28 x 1.0 SOC.HD.CAP	2
37	J37002	SCREW, #10-24 x .375 PH SST	1
38	J37017	SCREW, #10-24 x .75 FIBRE BLK	5
39	J37073	SCREW, #10-24 x .87 SST	2
40	37001	SCREW, #10-32 x .25 PH SST	2
41	37047	SET SCREW, #10-32 x .25	2
42	06-008-22-E	SCREW, #10-32 x .375 PH	2
43	37004	SCREW, #10-24 x 1.0 PHP STL	2
44	J40722	TERMINAL, NY END CONN 22-12	3
45		SEALANT	A/R
46		LABEL, DATA	1

REPLACEMENT KITS			QTY
K1	J61502	KIT, OIL DRAIN PLUG	1 ea.
K2	J61503	KIT, BACK PLATE SCREWS S200	5 ea.
K3	J61504	KIT, MOTOR COVER HARDWARE S200	2 ea.
K4	J61508	KIT, MAIN HOUSING SCREWS S200	2 ea.
K5	J61509	KIT, SHAFT COUPLING MOTOR S200	1 ea.
K6	J61510	KIT, SHAFT COUPLING GEAR S200	1 ea.
K7	J61511	KIT, MOTOR COVER SCREWS S200	2
K8	J61512	KIT, VALVE SEATS HYPALON(QTY-4)	4
K9	J61513	KIT, BALL CHECKS(QTY-4)	4
K10	J61516	KIT, HEAD MNT. HARDWARE(QTY-4)	4 ea.
K11	J61518	KIT, GASKET TEFLON(QTY-4)	4

NOTE: 1. PERMANENT NON-HARDENING SEALANT REQUIRED.