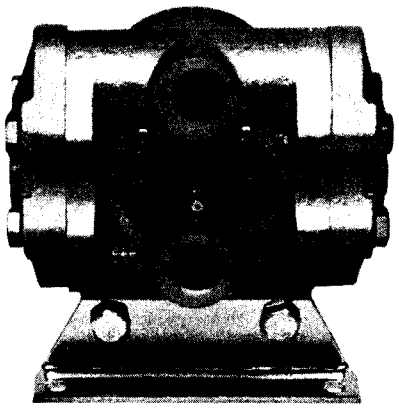


MODEL 15
OPERATING INSTRUCTIONS

MODEL	FLOW	PRESSURE	SHAFT
15.011	2.2 GPM	1000 PSI	Hollow w/keyway
15.010	2.2 GPM w/injector	1000 PSI	Hollow w/keyway

CAUTION: CAT PUMPS are positive displacement pumps. Therefore, a properly designed pressure relief mechanism MUST be installed in the discharge piping. Failure to install such relief mechanism could result in personal injury or damage to the pump or system. Cat Pumps Corporation does not assume any liability or responsibility for the operation of a customer's high pressure system.

WARRANTY

WARRANTY: CAT PUMPS CORPORATION (hereafter called the Corporation) warrants that the goods sold hereunder will be free from defects in materials and workmanship for 90 days from the date of original shipment to the buyer. It is expressly agreed that the Corporation's liability hereunder shall in no event exceed the purchase price paid for any defective goods, and the Corporation's sole obligation, and the buyer's exclusive remedy, shall be limited, at the Corporation's election, to the Corporation's repairing, replacing, or refunding the purchase price paid for the defective goods. In no event shall the Corporation be liable for any damages, including but not limited to loss of use and loss of profits, caused by any defects in the goods sold hereunder, whether such damages occur, or are discovered, before or after repair or replacement. Moreover, all warranty claims are subject to inspection at CAT Pumps facilities in Minneapolis, Minnesota. If goods returned for inspection have been disassembled or otherwise tampered with, all warranty commitments by the Corporation shall be null and void.

No agent, employees, or representative of CAT Pumps has any authority to bind the Corporation to any affirmation, representation, or warranty concerning the goods sold hereunder, and unless an affirmation, representation, or warranty made by an agent, employee, or representative is specifically included in writing within these Conditions of Purchase, it shall not be enforceable by the buyer. In addition, IT IS EXPRESSLY AGREED THAT THE WARRANTY CONTAINED HEREIN SHALL BE THE EXCLUSIVE AND ONLY WARRANTY TO PASS WITH THE GOODS SOLD HEREUNDER AND SAID WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF MERCHANTABILITY AND FITNESS.

SPECIFICATIONS

Inlet Pressure	Flooded to 60 PSI
R.P.M.	1800 RPM
Bore	0.75"
Stroke	0.370"
Max. Temperature	160°F
Inlet Port	1/2"
Discharge Port	1/2"
Weight (carton of 4)	48 lbs.

LUBRICATION

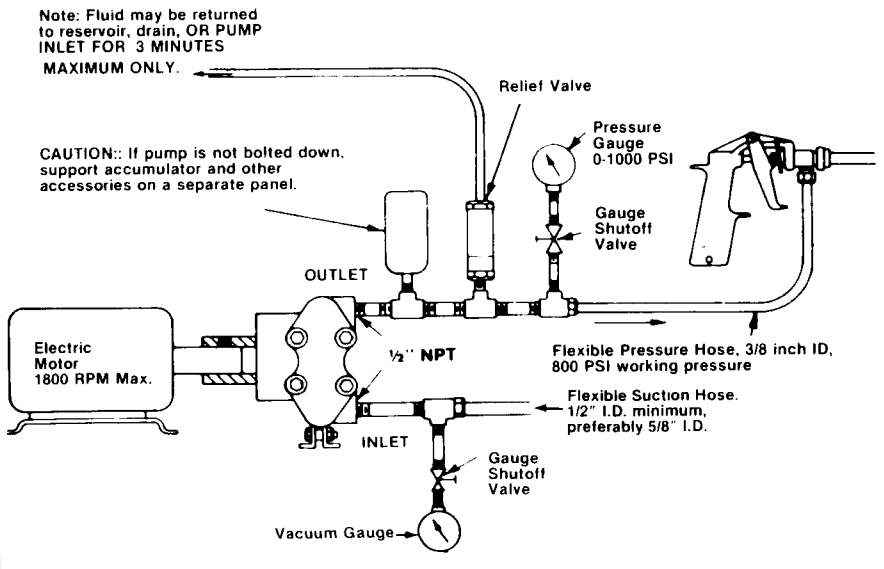
The Model 15 comes ***pregreased*** from the factory with a Lithium base, high temperature NLGI No. 2 grease.

Thereafter, grease ***every 100 hours of operation,*** at least two shots of grease or until appearance of grease on bearing face.

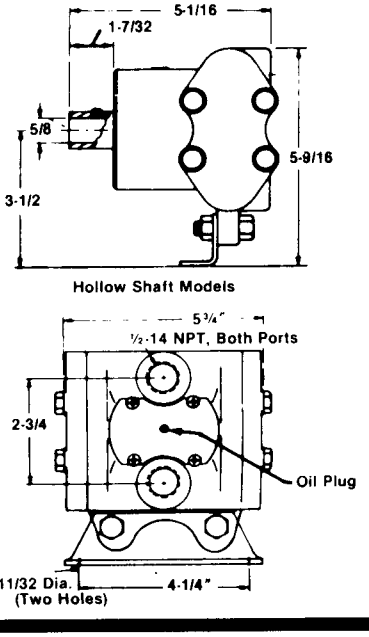
HORSEPOWER REQUIREMENTS

600 PSI	800 PSI	1000 PSI
.96	1.28	1.5

TYPICAL INSTALLATION



DIMENSIONAL DRAWING



Before Installation

1. Leave plastic port plugs in place until ready to connect lines.
2. Carefully review the Typical Installation Drawing for recommended hookup and specifications of other components in the system.
3. For hollow shaft models make sure the motor has a 5/8" straight shaft.
4. If pump will not be bolted down, use a torque arm to keep it from rotating. Free end of torque arm must bear against a rigid surface.
5. Support accumulator and other heavy accessories on a separate panel to avoid damaging motor bearings.
6. Suction strainer should be 40 mesh.
7. Be certain the nozzle is properly sized for the system to meet the requirements.
8. If vacuum and pressure gauges are not used provide a fitting so they can be installed for troubleshooting.
9. Mount an accumulator in the discharge line close to the pump to dampen pulsations in the systems.
10. A relief valve, regulating valve or unloader valve must be in the discharge line of the system to relieve excessive pressure should clogging occur.
11. By-pass flow can be returned:

    To the Reservoir: This should be done only when a single liquid is pumped. If detergents are added by means of an injector, for example, this would contaminate the reservoir.

    To the Floor Drain: This is used when the valve functions only as a safety device to relieve the outlet line should clogging occur.

    To the Pump Inlet: This procedure is not recommended and should be limtied to a maximum THREE MINUTE CONTINUOUS BY-PASS. Returning to the inlet permits using a gun without contaminating the resrevoir or wasting liquid. The liquid recirculates when the gun is closed and this small amount of liquid will increase in temperature.

Operation

1. Before operating check to see if there is any leakage at the High Pressure Seals.
2. Before starting, open all valves in the piping system. Then start pump. If the pump does not prime, remove the nozzle until the pump delivers full outlet flow. Filling inlet line before starting will avoid any priming problems.
3. Pump requires a flooded inlet liquid level must not fall below top of inlet.
4. Do not operate pumps with a liquid temperature above 160°.
5. Limit pressure to 500 PSI measured at the pump and limit operating speed to 1800 RPM.

Maintenance

1. Clean strainer often enough to prevent starving pump inlet. Restricted inlet flow will result in cavitation damage to pump.
2. Regrease cam follower bearing every 100 hours of operation. Apply a small amount of grease on outer race of cam follower bearing.
3. After operation with chemicals, thoroughly rinse pump with clear water.

PUMP ASSEMBLY

A. Servicing the Valves

1. Remove the cover (2) by unscrewing the four screws (1).
2. Remove both cylinder heads (24) and cylinder head o-rings (23) from both sides of the pump by unscrewing the four capscrews (25).
3. NOTE: Two valve assemblies are on each side of the pump: an inlet valve (bottom) and an outlet valve (top). ALTHOUGH THE PARTS ARE THE SAME IN EACH, THE ORDER IS REVERSED.
4. The valve seat (12) of the OUTLET ASSEMBLY can be lifted out with a screwdriver or a puller tool. The o-ring (13), valve (11), spring (10) and retainer (9) should be removed next.
5. For the INLET ASSEMBLY lift out the spring retainer (9), spring (18) and valve (11). If the valve seat (12) is tight, apply a few drops of penetrating oil around edge of seat. Let oil soak a few minutes. Then using a screwdriver or puller tool. Remove valve seat (12) from opposite side of pump. Tap gently, moving rod or screwdriver from side to side of seat to force valve seat out. Remove o-ring (13) from valve seat (12).

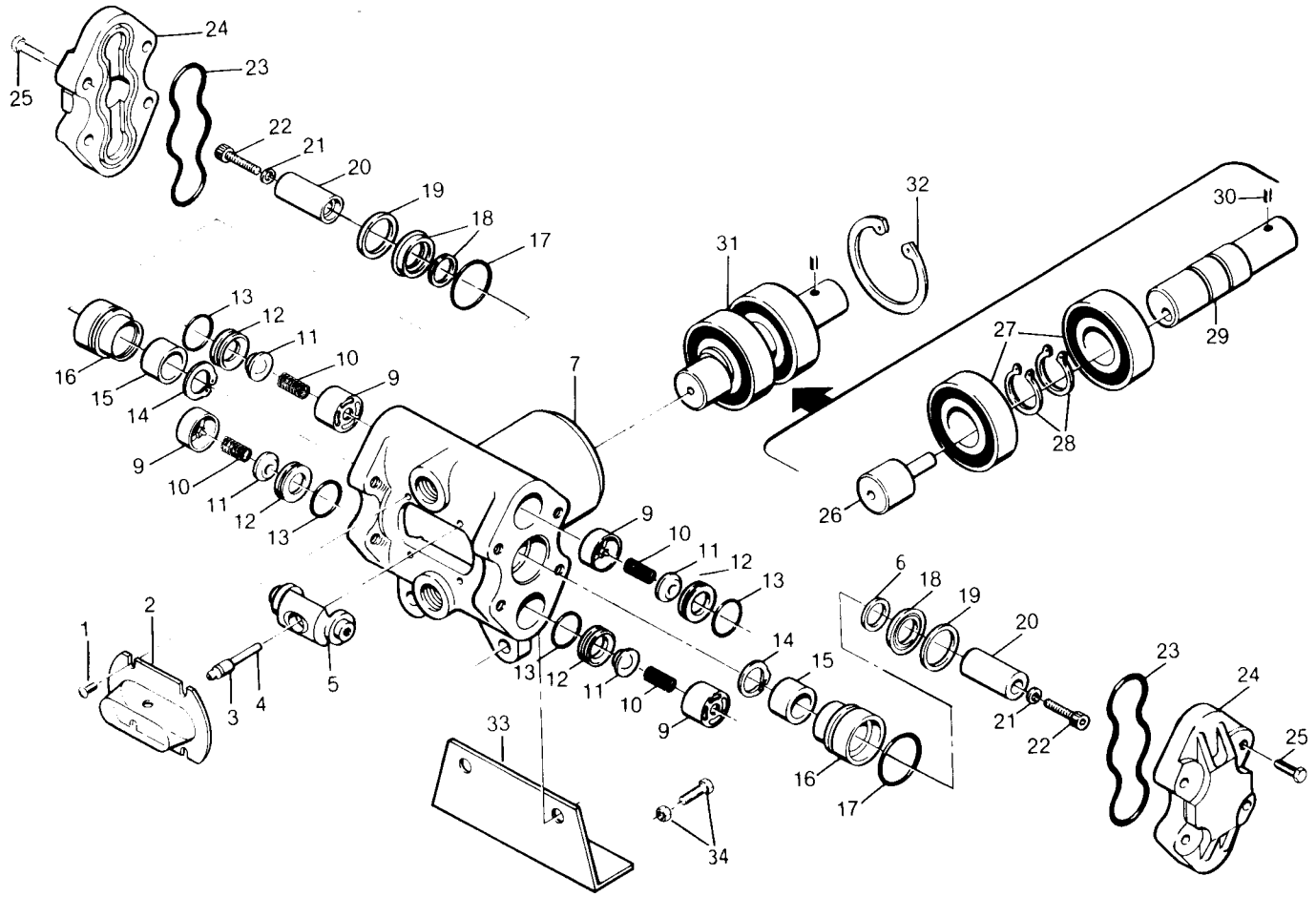
B. Servicing the Piston Cup

1. Unscrew retaining screw (22) and remove using a blade screwdriver that fits screw slot.
2. Push out sleeve (16); containing high pressure seal (18), back-up ring (6), retaining ring (14), plunger bearing (15), o-ring (17), high pressure seal (18) and seal retainer (19). If sleeve is tight, apply a few drops of penetrating oil around edge of sleeve. Let soak a few minutes, then tap out using a wood dowel and hammer against inner edge of sleeve. Remove o-ring (17) from sleeve (16). Carefully remove plunger (10) from sleeve assembly. Inspect plungers for wear, cracks or chips. Replace if necessary.
3. Repeat same procedure for opposite side of pump.
4. Then left out connecting rod (5).
5. With snap ring pliers, remove retaining ring (32).
6. Push drive assembly (31) from pump. This can best be done with an arbor press.
7. Use an arbor press and yoke support to remove outer main bearing (29) from shaft. Remove both snap rings (28) and press inner bearing (27) from shaft.
8. Cam follower bearing (26) and shaft (29) assembly should now be examined for wear and replaced if necessary.

   NOTE: The numbers in parentheses ( ) used throughout this text refer to items in the exploded view of the pump and in the parts list.

EXPLODED VIEW
March 1989

PLUNGER MODEL 15

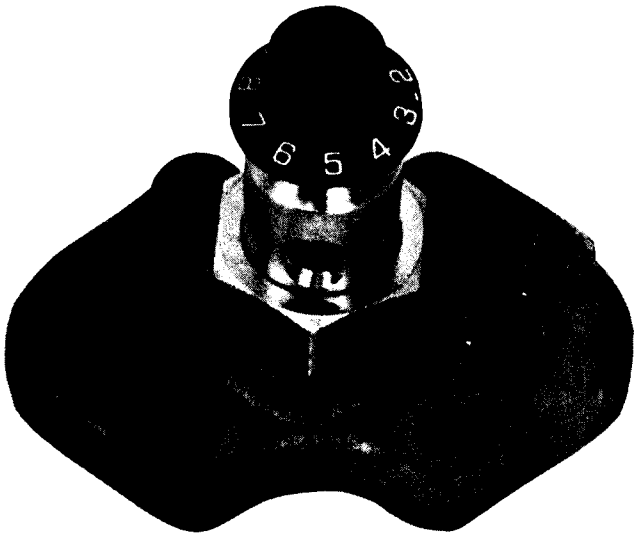


PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	937724	Phillips Head Screw (8-32"x 1/4")	4	22	937741	★ Plunger Retaining Screw	2
2	937712	Cover, Grease Fitting	1	23	926615	O-Ring, Cylinder Head (Buna-N)	2
3	937702	Grease Fitting	1	24	937710	Cylinder Head	2
4	937701	Grease Extension	1	25	937711	Hex Head Screw, 3/8" uncx	4
5	937743	★ Connecting Rod	1	26	937682	Cam Follower	1
6	937719	■ Back-up Ring, Hi-Pressure Seal	2	27	920217	Bearing	2
7	923250	Body	1	28	920219	Snap Ring	2
9	926606	• Valve Spring Retainer	4	29	937740	Drive Shaft 2.2 GPM Hollow w/keyway	1
10	920969	• Valve Spring	4				
11	937737	• Valve	4	30	937731	Set Screw (1/4-20 x 1/4)	1
12	919450	• Valve Seat	4	31	937713	Drive Assembly	1
13	931350.019	• O-Ring, Valve Seat (Buna-N)	4	32	918249	Retaining Ring	1
14	937707	■ Retaining Ring	2	33	919972.004	Mounting Bracket	1-2
15	937704	■ Plunger Bearing	2	34	926794	Hex Nut & Bolt Assembly	1
16	937703	■ Adapter Sleeve	2	—	937715	Sleeve Assembly (■Included in Kit)	2
17	931350.024	■ O-Ring, Adapter (Buna-N)	2	—	937714	Valve Assembly (•Included in Kit)	1
18	937705	■ Hi-Pressure Seal (Buna-N)	2	—	920373	Valve Puller Tool	1
19	937706	■ Seal Retainer	2	—	937723	Chemical Injector Head	1
20	937742	★ Solid Ceramic Plunger	2	—	937716	Plunger Assembly (★Included in Assembly)	1
21	931350.012	★ O-Ring, Retaining Screw	2				

★These items must be replaced as a set when servicing production models prior to 2/89.

LIQUID INJECTOR
Model 937723



Specifications

Inlet Pressure ..... 5 to 20 PSI
Flow Rate ..... Up to 10 Oz./MN.
Inlet Barb Size ..... 1/4"
Maximum Temperature ..... 180° F
Weight ..... 26 Oz.
Dimensions ..... 3-1/2"x 2-1/2"x 4-1/8"

INSTALLATION

If your pump has injector installed, start with Step 7.

1. Remove either head from the piston pump.
2. Remove inlet valve assembly. This consists of the spring retainer, spring, valve and valve seat. Valve seat is sometimes difficult to remove and may require a gentle pull from side to side "working" it out a little at a time.
3. Install **restrictor orifices** in the valve opening. Make sure the correct one is used for your pump. Use Restrictor 2 for 2 GPM model and Restrictor 3 for 3 GPM model. Use Restrictor 2 for 2.2 GPM.
4. Install **special valve seat**, with O-ring, valve, spring and spring retainer in that order.
5. Install cylinder head seal in groove of cylinder head.
6. Attach injector to pump. Injector inlet barb may be positioned as desired. Secure with four bolts removed from pump. Tighten evenly until injector and pump body are flush.
7. Install a 1/4" I.D. clear plastic hose from detergent supply tank and injector barb. Install a shut off valve in detergent line for added convenience.

OPERATION

The chemical injector adjustment knob comes set at the **minimum injection** position with adjustment knob turned completely into the injector body and the reference number "0" toward the hose barb. Start the pump and begin adjusting the injector to the desired flow. Turning the adjustment knob counter-clockwise increases the flow, while clockwise decreases flow. **Two complete turns** through the reference numbers will bring you to the **maximum injection** position. CAUTION: **Do not exceed two and one half turns of the adjustment knob as the injector will malfunction and begin sucking air.** Flow may be stopped by turning the adjustment knob clockwise into the body until it seats lightly. Do not over tighten as the adjustment needle will be damaged.

DISASSEMBLY

1. Unthread retaining color several turns to loosen from injector head.
2. Next pull injector body from injector head and remove both collar and body from the head.
3. The ball and spring will be loose in valve retainer.
4. Next, unthread needle valve from body and examine o-ring and valve for wear.
5. Examine all parts for wear and replace with new valve kit.

NOTE: Valve kit includes special, valve seat and restrictor which are installed in pump. Examine both and replace if worn. Remember to install restraictor first, then valve seat.

937722	VALVE KIT including:	
	Valve seat — pump	1
	O-ring	1
	Restrictor — 2 G.P.M.	1
	Restrictor — 3 G.P.M.	1
930991	Adjusting Knob	1

ASSEMBLY

1. Lubricate o-rings for ease of installation and install on needle valve and valve seat end of body.
2. Replace needle valve and thread completely into body.
3. Install spring then ball into retainer.
4. Press body into retainer. Be certain it is compeltely seated.
5. Thread collar onto retainer and tighten completely onto head.

TROUBLE SHOOTING

1.	No detergent flow	A. Connection not tight. B. Inlet pressure too high. C. Foreign particles lodged between the check valve and valve seat (Flow will be reversed from pump to detergent tank on pressure stroke.)
2.	Air in detergent line	A. End of supply line not submerged in detergent reservoir. B. Too many restrictions in detergent line. C. Loose hose barb.