

# Still "the pumper's dream" Model LD Chemical Pump

by **WESTERN**

LD

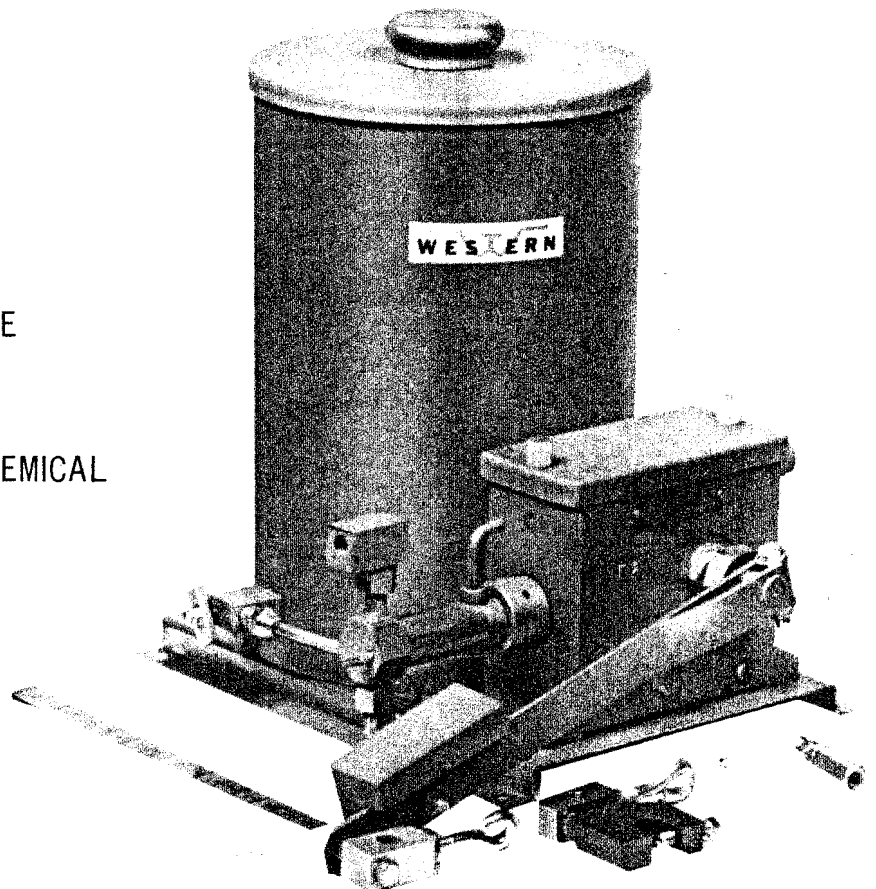
*Why ?*

**It's simple—dial in your feed rate & that's it!**

**No other adjustments to make. Complete control in one knob. Set any feed volume from zero to twelve quarts a day—one turn per quart at 15 strokes a minute.**

*Plus-*

- STAINLESS STEEL PISTONS & CHECKS FOR LONGER LIFE
- INTERCHANGABLE INLET & DISCHARGE CHECKS TO SIMPLIFY MAINTENANCE
- DOUBLE PISTON SEALS WITH VENTED ISOLATION CHAMBER TO PREVENT CHEMICAL FROM ENTERING PUMPBOX
- EITHER ROD OR CABLE DRIVE
- LINE CHECK INCLUDED WITH ALL ASSEMBLIES



*That's Why!!*

## **WESTERN CHEMICAL PUMPS**

603 SOUTH KANSAS AVENUE OLATHE, KANSAS 66061-4524

Phone: 913-829-1888

# WESTERN

## MODEL LD

### NO. 1 ASSEMBLY

Complete pump, beam clamp assembly & line check. No base. No tank.

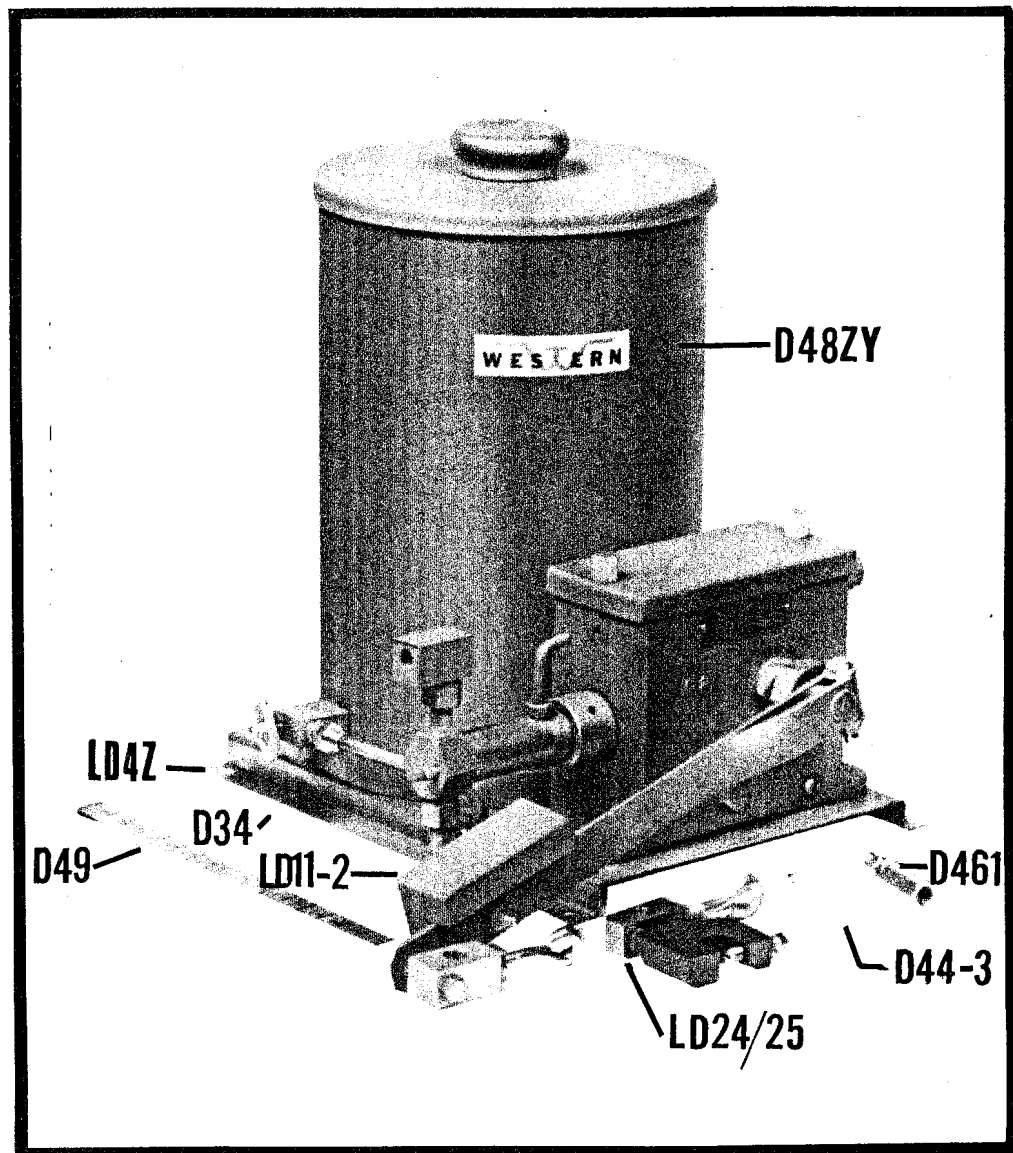
### NO. 2 ASSEMBLY

As shown at right,

### PERFORMANCE

0 to 12 quarts per 24 hours at 15 strokes per minute.

Discharge pressure to 500 psi.



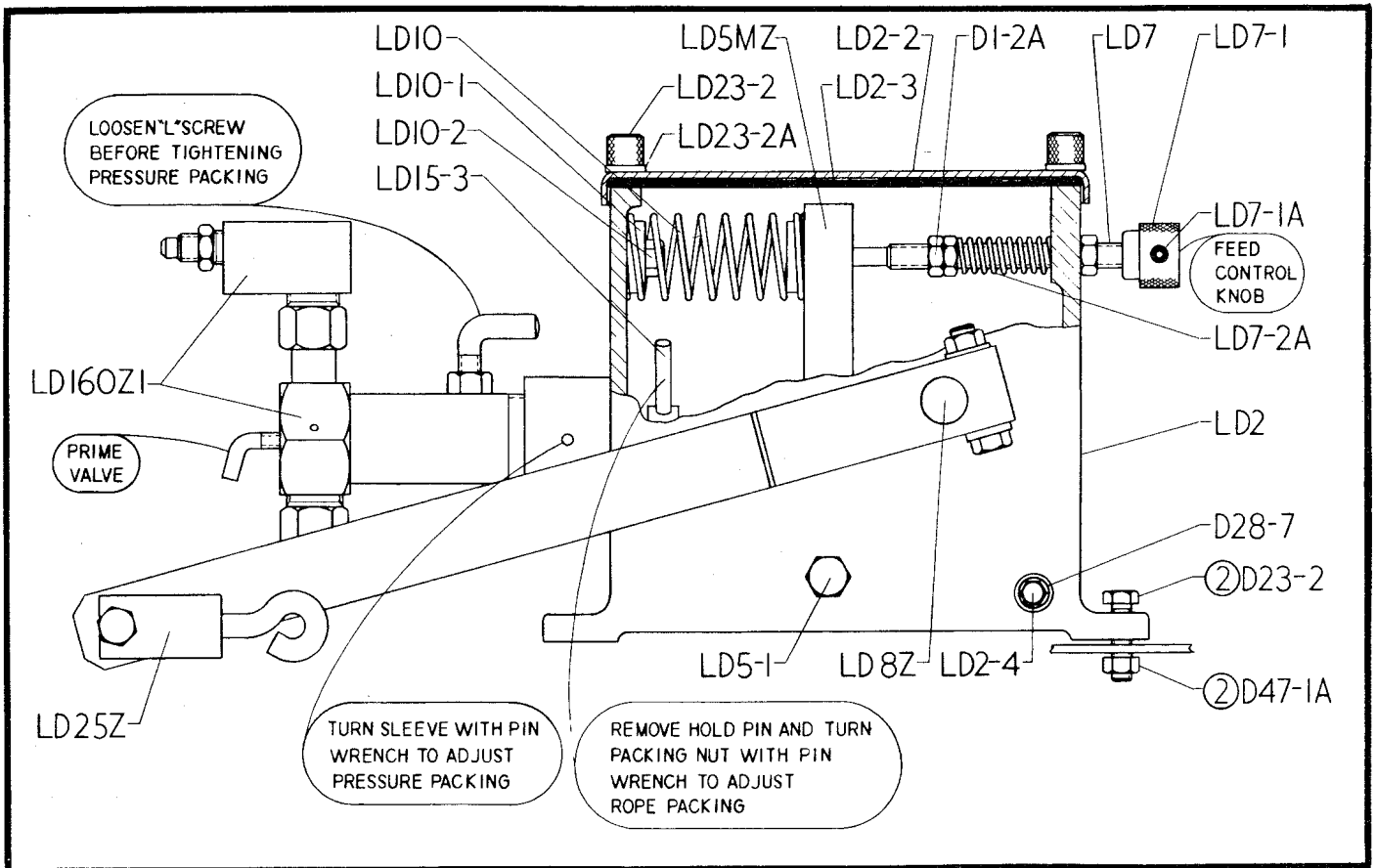
### SPECIFICATIONS :

Piston	-----	3/8" diameter Stainless Steel
Checks	-----	3/8" diameter Ceramic Balls, Stainless Cages
Fluid End	-----	Cold Rolled Steel
Pressure Packing	-----	5 V-Rings per set, Buna-N
Pumpbox	-----	Grey iron casting
Tank	-----	Stainless Steel
Line check	-----	Stainless Steel & Teflon O-ring.

### OPTIONS AVAILABLE

(some at no extra cost)

- Severe Chemical — fluid end and line check made from 300 series stainless steel
- V-Ring Material — Alternate materials available at no extra charge are Butyl, Teflon, Neoprene.
- O-Ring checks — Teflon, Buna-N, Neoprene, Or Viton O-Rings held into cage by spring clip to give resilient ball seat in addition to hard seat.
- 1/4" diameter piston for low feed rate



### PARTS LIST

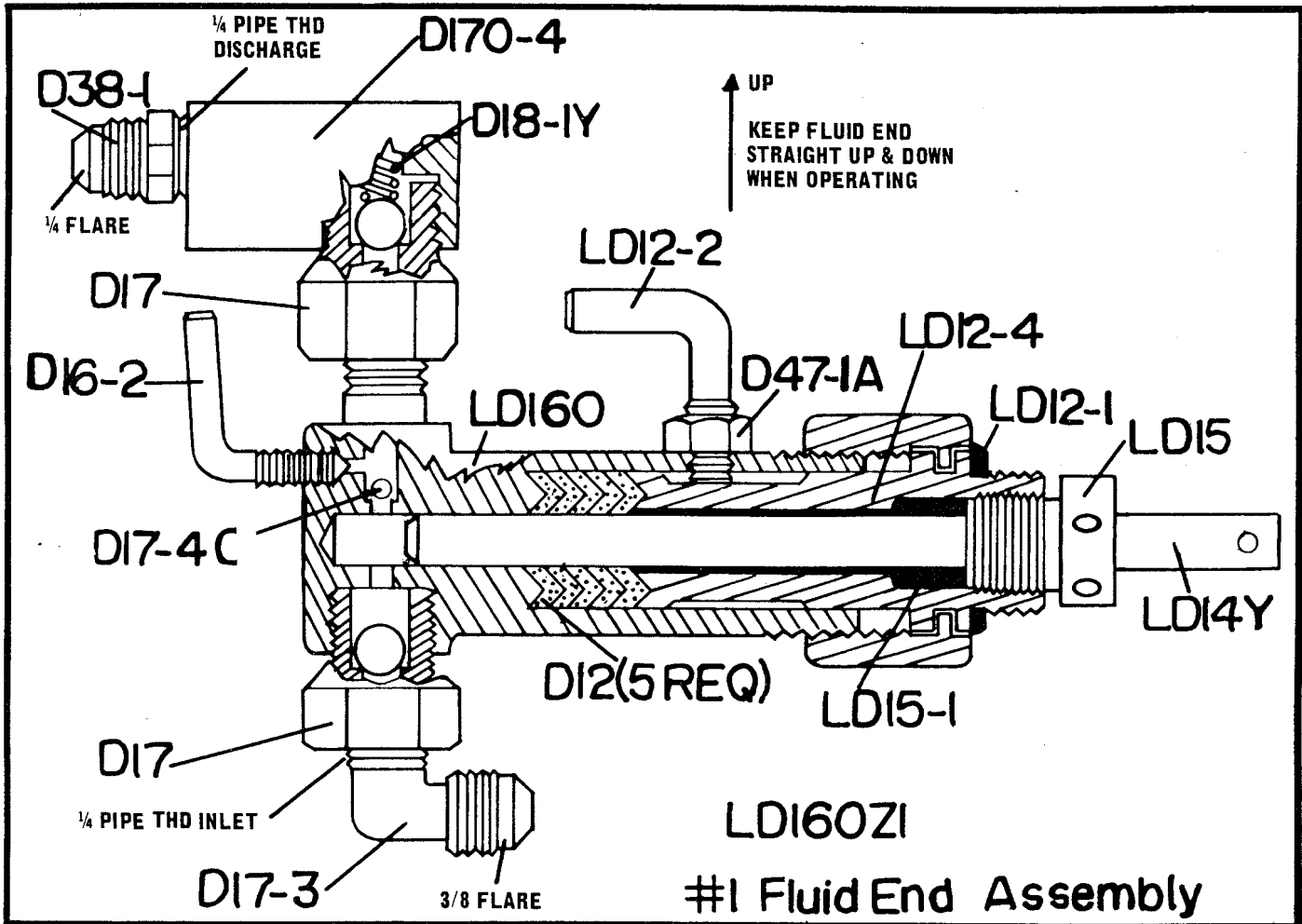
Part No.	Name	Part No.	Name
D1-2A	Nut	LD5MZ	*Yoke Ass'y
D23-2	Cap Screw	LD5-1	Pivot Shaft
D28	Tank Valve Ass'y	LD7	Control Screw
D28-7	Gasket	LD7-1	Knob
D34	Tube & Nuts	LD7-1A	Set Screw
D44-3	Packing Wrench	LD7-2A	Spring
D46	*Line Check	LD8Z	**Cam Shaft Ass'y
D47-1	Cap Screw	LD10	Spring
D47-1A	Nut	LD10-1	Slug
D48Y	Tank	LD10-2	Cap Screw
D48-1Y	Lid & Knob	LD11-2Z	Weight Ass'y
D49	Gage Stick	LD15-3	Hold Pin
LD1	Base	LD23-2	Thumb Screw
LD2	Pumpbox	LD23-2A	Gasket
LD2-2	Cover	LD25Z	*Swivel Block Ass'y
LD2-3	Gasket	LD24/25	*Beam Clamp Ass'y
LD2-4	Drain Screw	LD160Z1	*No. 1 Fluid End Ass'y

\*These sub-Assemblies shown in detail on following pages.  
 \*\*This sub-Assembly not sold as a complete sub-assembly.

SERVICE AND PARTS IMMEDIATELY AVAILABLE--SEE YOUR AREA DISTRIBUTOR OR CONTACT:

## WESTERN CHEMICAL PUMPS

# MODEL LD Fluid End Assemblies



## #2 FLUID END ASSEMBLY

LD160Z2 Standard, LD160Z2Y Sev. Like #1 but no piston, packing rope, or packing nut.

## #3 FLUID END ASSEMBLY

LD160Z3 Standard, LD160Z3Y Sev. Like #2 at left but no Cyl Ass'y.

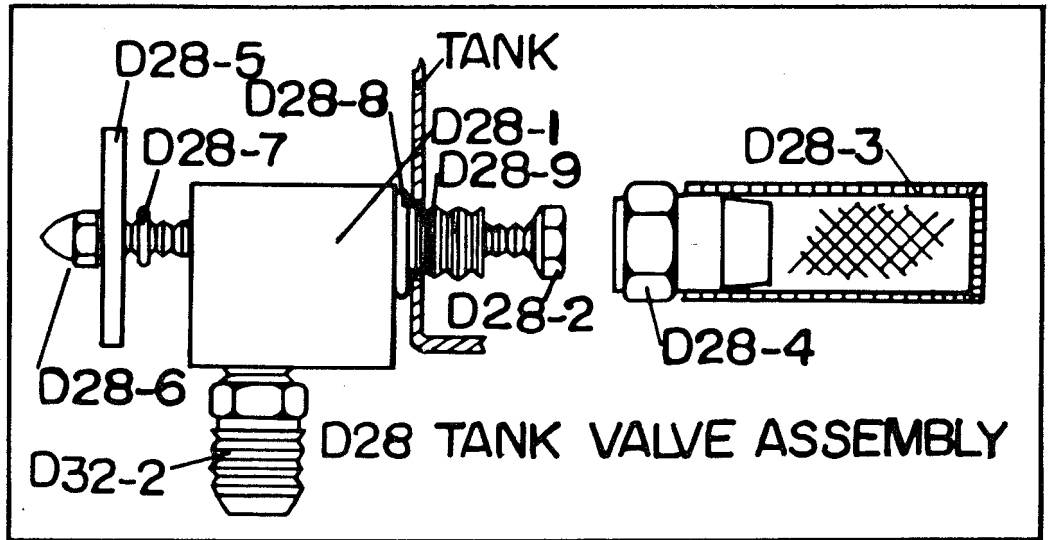
### PARTS LIST

Standard	Sev Chem		Standard	Sev Chem	
LD160Z1	LD160Z1Y	#1 Flu End Ass'y	D47-1A	D47-1A	Nut
D12H (Note 1)	D12B	V-ring packing	D170-4	D170-4Y	Square Ell
D17-4 C	D17-4C	1/4 Ball	LD12-1	LD12-1	Gasket
D16-2	D16-2Y	Prime Valve	LD12-2	LD12-2	"L" Screw
D17 (Note 2)	D17Y	Check & Ball	LD12-4	LD12-4	Cyl. Ass'y
D17-3	D17-3	Ell	LD14Y	LD14Y	Piston
D18-1Y	D18-1Y	Spring	LD15	LD15	Packing Nut
D38-1	D38-1	Adapter	LD15-1	LD15-1	Rope Packing
			LD160	LD160Y	Fluid End

### NOTES:

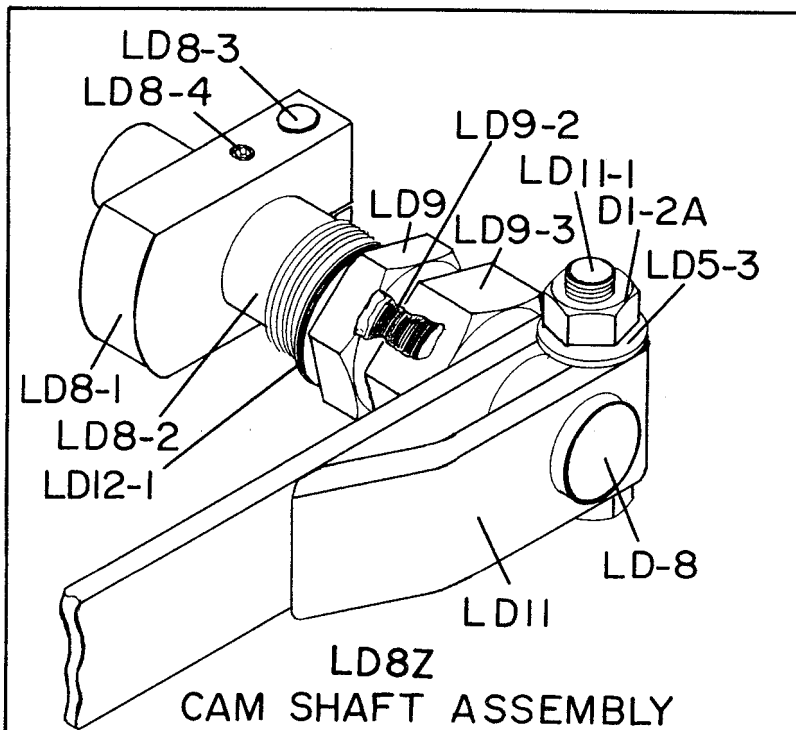
- Part Number shown is one V-ring, not a complete set. Set is 5 rings. No starter rings are required. Alternate ring materials are available. Order by letter after the part number: B-Butyl; H-Hycar; N-Neoprene; T-Teflon.
- D17 sold only as cage and ball combination. Alternate check assemblies with O'ring seats are available and interchangeable with D17. These checks are recommended for pumping light fluids such as Methanol or pumping low volume. Order D176Z plus letter for O'ring material same as note 1. All D176 cages are 300 series stainless.

**WESTERN**  
MODEL LD



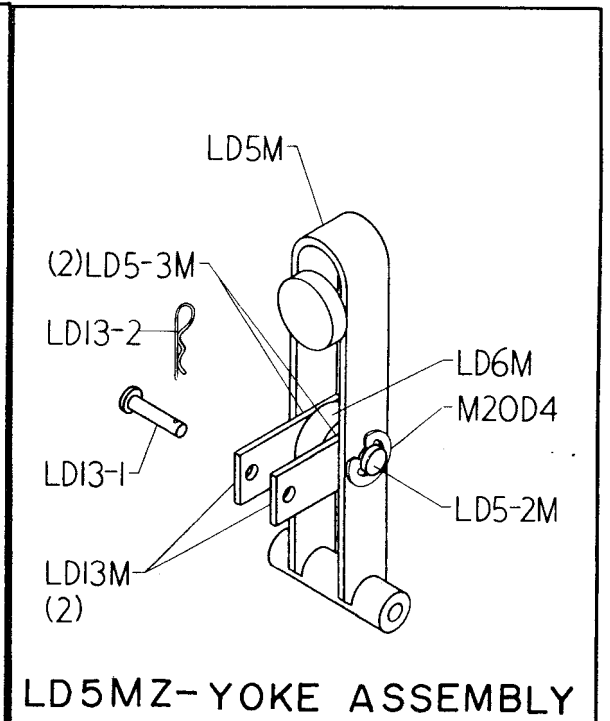
• D28 TANK VALVE ASSEMBLY

D28-1	Body	D28-6	Cap Nut
D28-2	Stem	D28-7	Gasket
D28-3	Strainer	D28-8	Gasket
D28-4	Strainer Nut	D28-9	Nipple
D28-5	Wing Nut	D32-2	Adapter



• LD8Z CAM SHAFT ASSEMBLY

D1-2A	Nut	LD9	Stuffing Box
LD5-3	Washer	LD9-2	Rope Packing
LD8	Shaft	LD9-3	Packing Nut
LD8-1	Cam	LD11	Lever
LD8-2	Spacer	LD11-1	Cap Screw
LD8-3	Cap Screw	LD12-1	Gasket
LD8-4	Set Screw		



• LD5MZ YOKE ASSEMBLY

THIS YOKE ASSEMBLY FOR METRIC SIZE BEARING USED ON ALL LD PUMPS WITH SERIAL NUMBERS P200 AND UP.

LD13-2	Clip	LD6M	Bearing
LD5M	Yoke	LD13M	Link
LD5-2M	Pin	LD13-1	Pin
LD5-3M	Spacer	M20D4	Ret. Ring

## INSTALLATION, OPERATION & MAINTENANCE

### INSTALLATION:

1. Bolt feeder securely to the well head platform positioned to give a straight upward pull to the feeder lever as the walking beam rises.
2. Attach the LD24/25 beam clamp assembly to the walking beam. Position for approximately 10 inches total travel measured at the tip hole of the feeder lever. (A minimum of 9 inches is required for maximum feed volume)
3. Connect the feeder lever to the beam clamp assembly using either cable through the eye bolts or 1/4 pipe (9/16 max. O.D.) through the holes in the swivel blocks. Hold pipe in place using eye bolts as set screws. When cable is used attach weights to the lever arm at the second bolt hole to keep cable taught. Weight, LD11-2, may be purchased from your Western dealer for this purpose.
4. Fill gearbox with oil to cover the cam. (1 1/4 qts., SAE 20 or 30)

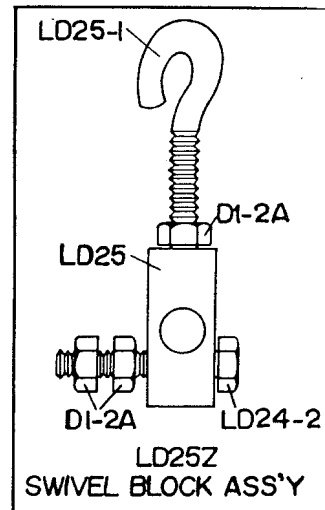
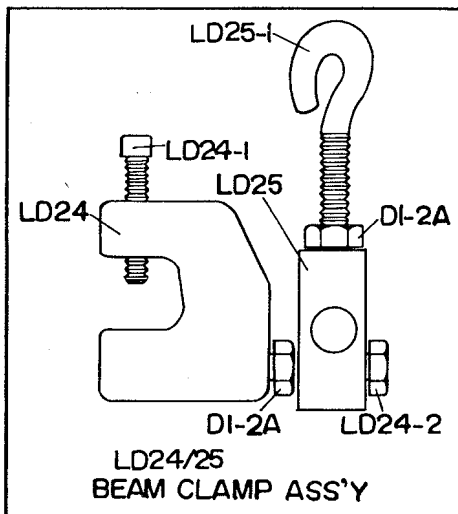
### OPERATION:

1. Turn feed adjustment all the way out to the stop (counterclockwise)
2. Open chemical tank valve by turning handle all the way in.
3. Open prime valve, D16-2, and work piston by pushing on the yoke, LD5, and allowing the spring to return it.
4. Close prime valve when you see a continuous flow of chemical with each forward stroke of the piston. (This process can be speeded up by using a trigger oil can to force oil through the prime valve bleed hole)
5. Set the feeder for the feed volume desired. With pump running at 15 strokes per minute, one turn of the

control knob equals 1 quart per day. Clockwise (in) decreases feed volume, counter clockwise (out) increases feed volume. Count the number of threads between the pumpbox and control knob to get the approximate feeder setting in quarts per day. Fractions of a turn give fractions of a quart as needed. Pumps running faster than 15 strokes will feed proportionately more chemical and those running slower feed proportionately less. **EXAMPLE:** A pump running 8 strokes per minute will pump  $8/15 \times 12 = 6 \frac{2}{5}$  quarts per day maximum with 3/8 piston. For 1/4 piston multiply feed rate by .444.

### MAINTENANCE:

1. To tighten main piston packing, (D12 V-rings) first loosen LD12-3 locknut and "L" screw, LD12-2. Using wrench, D44-3, in holes of packing nut, LD12-4, turn to tighten onto fluid end, LD160. Hold fluid end upright at all times. Tighten packing just enough to stop leaks. If packing is too tight spring cannot return piston for the next full stroke. When packing is adjusted tighten "L" screw and locknut.
2. Packing, LD15-1, is graphite rope and is tightened from inside the pumpbox by tightening packing nut, LD15. This packing nut should never be more than hand tight. It holds back only the gearbox oil which is never under pressure.
3. Packing, LD9-2, is graphite rope and is held in place by nut, LD9-3. LD9-3 is always tightened onto the stuffing box so the only way to tighten this packing is to add more rope. Pack only tight enough to retain the gearbox oil.
4. Disassembly is straight forward and may be done using the cutaway views as a guide. Two items that do not show clearly are: (1) Completely remove bolt, LD11-1, from the lever arm before attempting to remove lever from shaft (2) Cam, LD8-1, has both a set screw and clamp bolt holding it in place.



D1-2A	Nut	LD24-2	Cap Screw
LD24	Beam Clamp	LD25	Swivel Block
LD24-1	Set Screw	LD25-1	Eye Bolt

D1-2A	Nut	LD25	Swivel Block
LD24-2	Cap Screw	LD25-1	Eye, Bolt



# CHEMICAL PUMPS

603 S. KANSAS AVE., OLATHE, KS 66061

AUGUST, 27 1996 LDAINST1.DOC

## SPECIAL INSTRUCTIONS FOR THE MODEL LDA CHEMICAL PUMP

THE MODEL LDA IS EQUIPPED WITH A RENEWABLE CAMSHAFT PILOT BUSHING AND A CARTRIDGE TYPE REPLACEABLE OIL SEAL WHICH IS INSTALLED IN THE MAIN JOURNAL BEARING.

THIS "A" CHANGE, OF THE LD PUMP SERIES, IS INCORPORATED ON SERIAL NUMBER "Z 1067" AND THEREAFTER.

NEW PARTS ARE IDENTIFIED AS FOLLOWS WITH ITEM NUMBERS FROM DRAWING LD-A:

<u>ITEM NO.</u>	<u>REF NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1.	LD2A	D0198700	PUMP BOX LDA
2.	LD2P	A0007600	PIPE PLUG 1/8" NPT
3.	LD9A	B0198600	JOURNAL BEARING, CAM SHAFT LDA
4.	LD9S	A0198500	LIP SEAL
5.	LD2BB	A0198400	PILOT BUSHING
6.	LD2BD	A0144200	DISK, KNOCKOUT LDA
7.	LD8AZ	A0198900	SHAFT ASSY, CAM LDA

ITEM NO. 7 IS MADE OF THE FOLLOWING PARTS:

•	D1-2A	A0000400	NUT, HEX 3/8-16
•	D21-2	A0004100	WASHER FLAT
•	LD24-2	A0002200	HEX HEAD CAPSCREW
•	LD8	A0146200	CAM SHAFT
•	LD8-1	B0146300	Text CAM LONG
•	LD8-2	A0146400	SPACER
•	LD8-3	A0002100	HEX HEAD CAPSCREW
•	LD8-4	A0001000	SOCKET HEAD SETSCREW
•	LD9A	B0198600	PILOT BUSHING, CAM SHAFT LDA
•	LD9S	A0198500	LIP SEAL
•	LD11	B0104100	LEVER
•	LD12-1	A0147500	GASKET

TO REMOVE AND REPLACE THE CAM PILOT BUSHING (ITEM 5), FOLLOW THESE STEPS:

1. DRAIN THE PUMP BOX OIL.
2. REMOVE THE YOKE RETURN SPRING.
3. REMOVE THE CONTROL SCREW.
4. LOOSEN THE HEX HEAD CAP SCREW ON THE CAM.
5. ROTATE THE LEVER OVER TO THE BACK SIDE OF THE PUMP.
6. LOOSEN THE SOCKET SET SCREW IN THE CAM.
7. IF THE OIL SEAL IS NOT TO BE REPLACED AT THIS TIME, UNSCREW THE PILOT BUSHING FROM THE PUMP BOX KEEPING THE SHAFT AND PILOT BUSHING TOGETHER.

8. REMOVE THE CAM AND SPACER. (NOTE) IF THE SHAFT IS WITHDRAWN THROUGH THE SEAL, THE SEAL WILL NEED TO BE REPLACED.
9. REMOVE THE 1/8" PIPE PLUG ( ITEM 2 ) (FROM THE OPPOSITE SIDE OF THE PUMP BOX.
10. USING A PUNCH, TAP THE KNOCKOUT DISK REMOVING THE BUSHING FROM THE PUMP BOX.
11. KEEP AND REUSE THE KNOCKOUT DISK.
12. PLACE THE KNOCKOUT DISK IN THE BUSHING BORE.
13. PRESS THE NEW PILOT BUSHING INTO THE BUSHING BORE, WITH THE EXTERNALLY CHAMFERED END TO GO INTO THE BUSHING BORE FIRST.
14. REASSEMBLE THE CAM SHAFT , JOURNAL BEARING, SPACER AND CAM INTO THE PUMP BOX. TIGHTEN THE JOURNAL BEARING.
15. REPLACE THE 1/8" PIPE PLUG ( ITEM 2) (ON THE OPPOSITE SIDE OF THE PUMP BOX).
16. FINALLY, POSITION THE CAM AS FOLLOWS:
  - PLACE THE PUMP ON A FLAT WORK SURFACE 4-1/8 INCHES FROM AN EDGE AS SHOWN IN DRAWING LDACAM.
  - ROTATE THE LEVER AWAY FROM THE FLUID END, TO REST ON THE EDGE OF THE WORK SURFACE.
  - PUSH THE YOKE ALL THE WAY TOWARD THE FLUID END UNTIL THE LINKS ARE AGAINST THE PACKING NUT.
  - TAP THE END OF THE CAMSHAFT INWARD WITH PLASTIC OR RUBBER Mallet UNTIL IT SEATS AGAINST THE KNOCK OUT DISK IN THE BOTTOM OF THE BORE, (OR PLACE A PIECE OF WOOD AGAINST THE SHAFT IF YOU USE A STEEL HAMMER).
  - ROTATE THE CAM TO A POSITION AS SHOWN IN DRAWING LDACAM TO ALIGN THE SETSCREW WITH THE TOP OF THE YOKE WHILE FORCING THE CAM TOWARD THE LEVER AND TIGHTEN THE SETSCREW.
  - CHECK TO SEE IF THE CAMSHAFT IS STILL ALL THE WAY IN AGAINST THE KNOCK OUT DISK.
  - ROTATE THE LEVER TOWARD THE FLUID END TO A POSITION THAT THE HEX HEAD CAPSCREW CAN BE TIGHTENED.
  - CHECK THE LEVER ANGLE AT THE POINT THE CAM DWELL BEGINS. IT SHOULD BE APPROXIMATELY 45 DEGREES ABOVE HORIZONTAL CENTER.
  - REPLACE THE DRAIN PIPE PLUG.
  - REPLACE THE RETURN SPRING.
  - REPLACE THE PUMP BOX OIL. A GOOD GRADE OF 30W30 TO 50W50 MINERAL OIL OR 80W80 GEAR OIL IS RECOMMENDED. ( FILL UNTIL THE OIL JUST COVERS THE PISTON)

TO REMOVE AND REPLACE THE CAM SHAFT OIL SEAL (ITEM 4) FOLLOW THESE STEPS:

- A. DRAIN THE PUMP BOX OIL.
- B. REMOVE THE LEVER NUT AND CAPSCREW.
- C. REMOVE THE LEVER FROM THE SHAFT.
- D. REMOVE THE JOURNAL BEARING FROM THE PUMP BOX AND THE SHAFT.
- E. POP OUT THE OLD SEAL AND CLEAN THE JOURNAL BEARING.
- F. PRESS THE NEW SEAL INTO THE JOURNAL BEARING EVENLY WITH. (THE SPRING INWARD).
- G. CLEAN THE SHAFT AND COVER THE CAPSCREW SLOT WITH A PIECE OF TAPE.
- H. LUBRICATE THE SHAFT TAPE AND SEAL LIPS WITH A GOOD GREASE.
- I. REASSEMBLE THE JOURNAL BEARING ON THE SHAFT AND TIGHTEN THE JOURNAL BEARING IN TO THE PUMP BOX MAKING SURE THE COPPER GASKET IS IN PLACE.
- J. REASSEMBLE THE LEVER, CAPSCREW, WASHERS AND NUT.
- K. REPLACE THE DRAIN PIPE PLUG.
- L. REPLACE THE PUMP BOX OIL. A GOOD GRADE OF 30W30 TO 50W50 MINERAL OIL OR 80W80 GEAR OIL IS RECOMMENDED. ( FILL UNTIL THE OIL JUST COVERS THE PISTON)



Assembly Guide:

1. Assemble LD8-5 key into LD8K camshaft.
2. Install LD9BB bushing and LD9S lip seal into LD9A seal housing.
3. Assemble together all parts as shown, except for the cam and setscrew, tighten D1-2A nut to secure LD11 lever to camshaft, LD8K. ® 242® to LD8-4 setscrew and start it into the LD8-1K cam.
4. Insert the assembly through the threaded hole in the pump housing and at the same time slide the camshaft through the cam, guiding the key into the cam keyslot. Screw the LD9A seal housing into tapped hole. (Cam must be positioned as shown for pump to function on upstroke of lever.)
5. Tighten the LD9A seal housing with a 1 1/4 wrench securely against the LD12-1 copper gasket.
6. Push shaft all the way into far side of pump box until it bottoms in hole. Maintain pressure.
7. Slide cam until it is snugly against the LD8-2 spacer, and while maintaining this position, securely tighten the setscrew (LD8-4).
8. Test rotate the assembly for smoothness and free operation. Finish installing the balance of parts into pump and test.

Note: This illustrated assembly, LD8Z, is compatible with prior LD (Lever Driven) model pumps. A retro-fit kit, LD8KAZ, is available as an upgrade, and includes the LD8K shaft, LD8-1K cam, LD8-5 key and LD7-1A setscrew.

CAM MUST BE POSITIONED ON CAMSHAFT AS SHOWN FOR PUMP TO FUNCTION ON UPSTROKE OF LEVER.



~ C A U T I O N ~

USE CARE WHEN ROTATING LD11 LEVER AFTER ASSEMBLING TO PUMP. ENERGY STORED IN LD100 SPRING CAN ALLOW LEVER TO ROTATE QUICKLY CAUSING SEVERE INJURY.

## KEYED

### LD CAMSHAFT ASSEMBLY

**WESTERN** CHEMICAL PUMPS INC.

603 SOUTH KANSAS AVENUE

OLATHE, KANSAS 66061-4524

(913) 829-1888

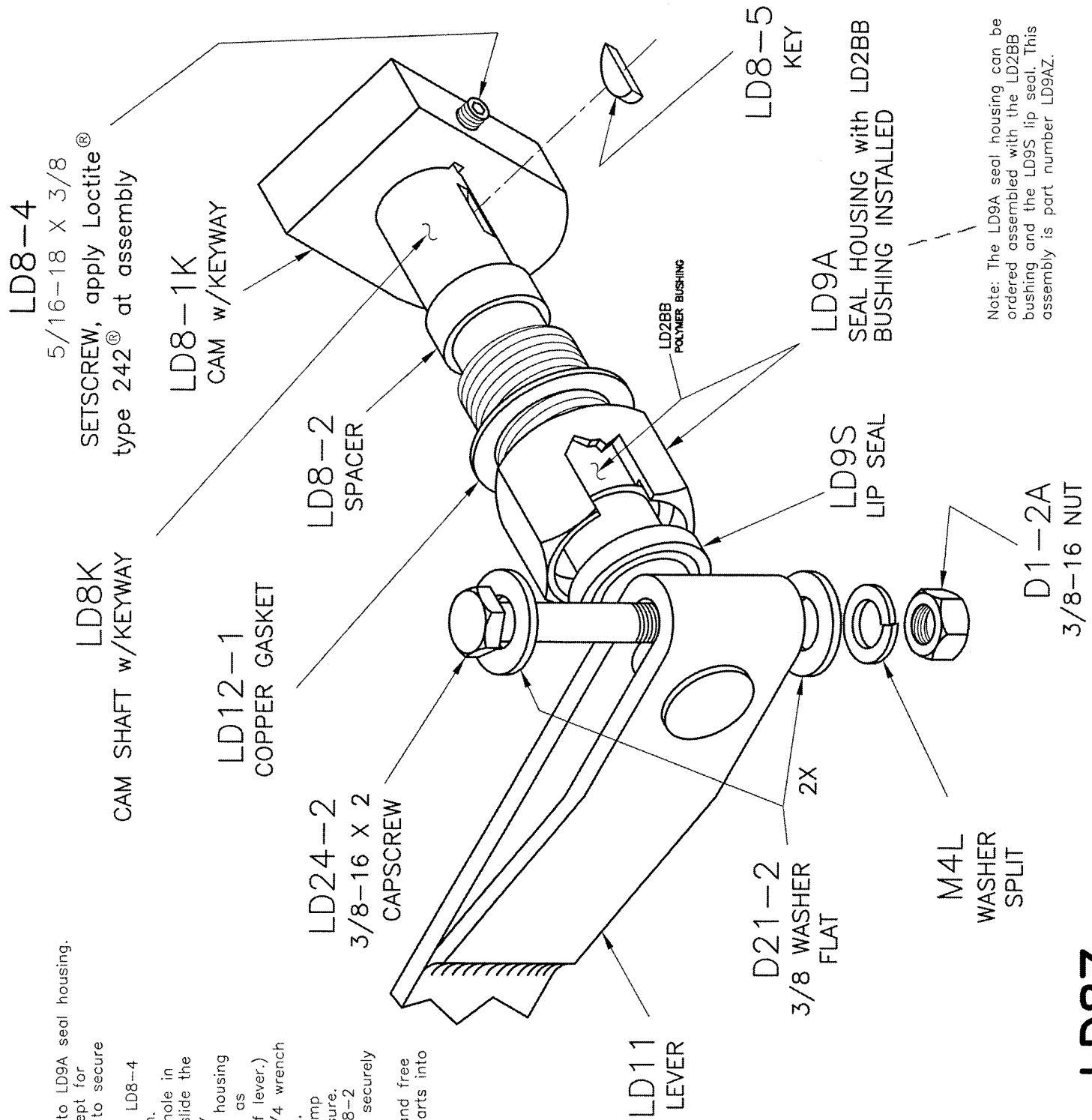
DRAWN BY  
CORY DAY

8-14-06

CHECKED BY  
G. MUELLER

# LD8Z

ASSEMBLY SHOWN ABOVE



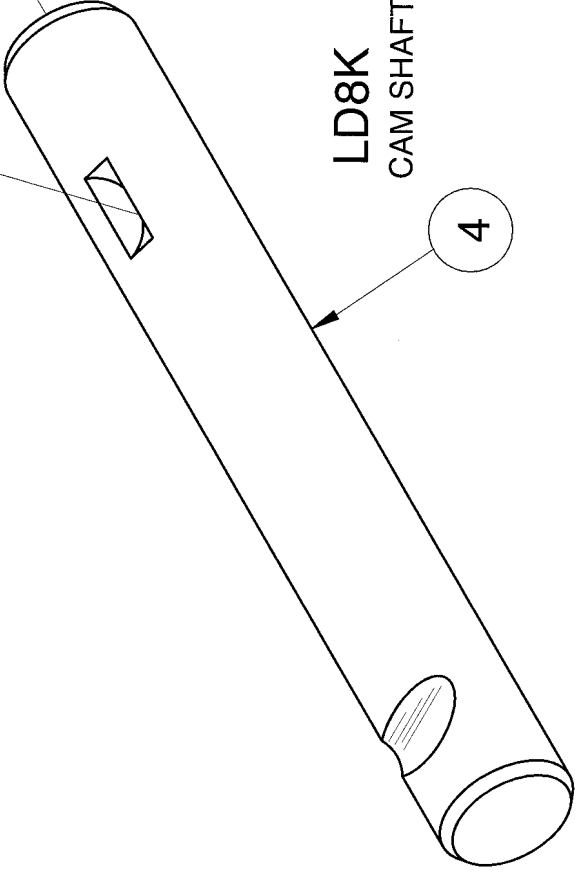
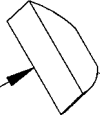
Note: The LD9A seal housing can be ordered assembled with the LD2BB bushing and the LD9S lip seal. This assembly is part number LD9AZ.

~CAUTION~

USE CARE WHEN ROTATING LD11 LEVER  
AFTER ASSEMBLING TO CAMSHAFT. ENERGY  
STORED IN LD100 SPRING CAN ALLOW  
LEVER TO ROTATE QUICKLY CAUSING  
SEVERE INJURY.

LD8-5  
KEY

1



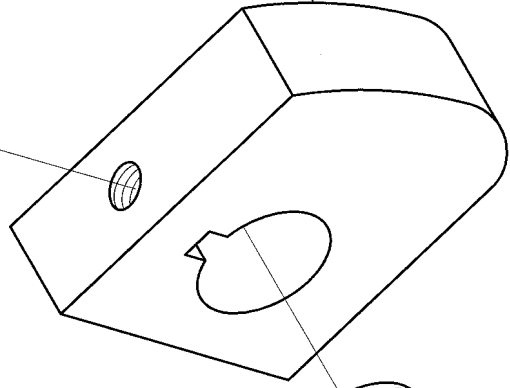
LD8K  
CAM SHAFT w/KEYWAY

2



LD8-4

SETSCREW, apply Loctite®  
type 242® at assembly



LD8-1K  
CAM w/KEYWAY

3

KEYED SHAFT  
LD CAMSHAFT KIT

LD8KAZ

NOTE: CAM MUST BE POSITIONED ON CAMSHAFT  
AS SHOWN FOR PUMP TO FUNCTION  
ON UPSTROKE OF LEVER.

DRAWN BY  
CORY DAY 5-21-04  
CHECKED  
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