

# 4-Ball Repair and Conversion Kits

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To replace pump seals and throat packings in Enclosed Wet Cup Lowers, Sealed 4-Ball Lowers, and Open Wet Cup Lowers. For professional use only.



## Important Safety Instructions

Read all warnings and instructions in your 4-Ball Lower Instruction Manual. Save these instructions.

750cc, 1000cc, 1500cc, and 2000cc Lowers

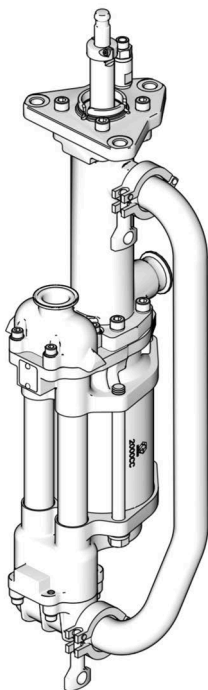
3000cc and 4000cc Lowers

Sealed

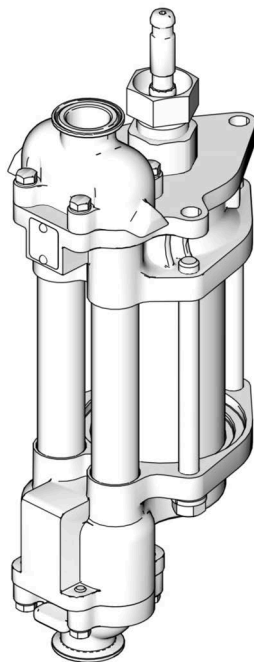
Open Wet Cup

Enclosed Wet Cup

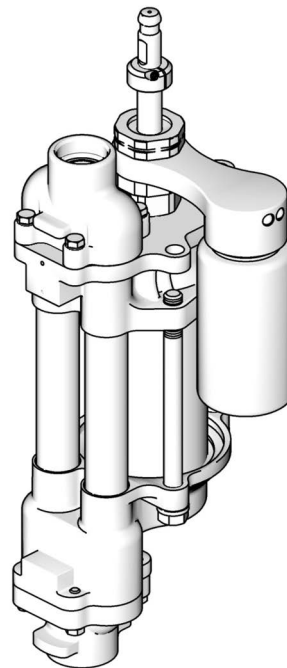
Enclosed Wet Cup



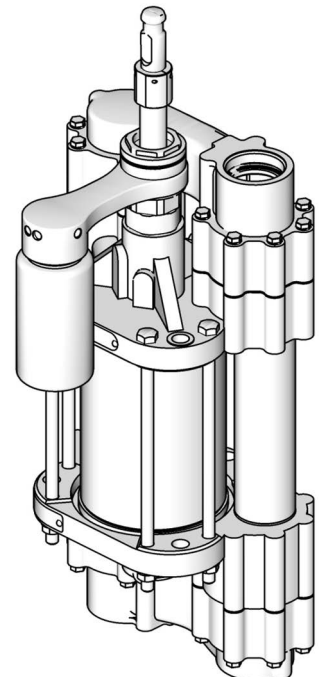
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# Complete Pump Repair Kits for 750cc, 1000cc, 1500cc, and 2000cc Lowers

## Enclosed Wet Cup Lowers

**NOTE:** The lowers listed in this manual **must** use the pump repair kits listed below. **Do not** use kits for older-style lowers (see manual 311690) with these lowers. The throat packing gland height has changed.

### Pump Repair Kit 24F660

**For 750cc Lowers:** Part Nos. 24F413, 24F414, 24F415, 24F416, 24F417, 24F418, 24F420, 24F421, 24F422, and 24F423.

Ref. No.	Description	Qty.
2*	PACKING, o-ring; 1.25 in. (31 mm) OD; PTFE	6
4*	SEAL, gasket, cylinder	2
7*	GASKET, seat, valve	4
11*	PACKING, piston; 2.5 in.; UHMWPE	1
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING; leather	3
26†	GLAND, female	1
35†	PACKING, o-ring; PTFE; 1.5 in. (38 mm) OD	1
42†	PACKING, o-ring; PTFE; 1.63 in. (41 mm) OD	1
45◆	SPRING, compression	1
46◆	SEAL, piston, TSL pump	1
47◆	O-RING; fluoroelastomer; 1.88 in. (48 mm) OD	2

\* These parts are included in Seal Repair Kit 16E904.

† These parts are included in Throat Packing Repair Kit 24F245.

◆ These parts are included in TSL Pump Repair Kit 24F617.

### Pump Repair Kit 24F661

**For 1000cc Lowers:** Part Nos. 24F424, 24F425, 24F426, 24F427, 24F428, 24F429, and 24F431.

Ref. No.	Description	Qty.
2*	PACKING, o-ring; 1.25 in. (31 mm) OD; PTFE	6
4*	SEAL, gasket, cylinder	2
7*	GASKET, seat, valve	4
11*	PACKING, piston; 3.0 in.; UHMWPE	1
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING; leather	3
26†	GLAND, female	1
35†	PACKING, o-ring; PTFE; 1.5 in. (38 mm) OD	1
42†	PACKING, o-ring; PTFE; 1.63 in. (41 mm) OD	1
45◆	SPRING, compression	1
46◆	SEAL, piston, TSL pump	1
47◆	O-RING; fluoroelastomer; 1.88 in. (48 mm) OD	2

\* These parts are included in Seal Repair Kit 277360.

† These parts are included in Throat Packing Repair Kit 24F245.

◆ These parts are included in TSL Pump Repair Kit 24F617.

### Pump Repair Kit 24F662

**For 1500cc Lowers:** Part Nos. 24F432, 24F433, 24F434, 24F435, 24F436, 24F437, and 24F439.

Ref. No.	Description	Qty.
2*	PACKING, o-ring; 1.25 in. (31 mm) OD; PTFE	6
4*	SEAL, gasket, cylinder	2
7*	GASKET, seat, valve	4
11*	PACKING, piston; 3.5 in.; UHMWPE	1
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING; leather	3
26†	GLAND, female	1
35†	PACKING, o-ring; PTFE; 1.5 in. (38 mm) OD	1
42†	PACKING, o-ring; PTFE; 1.63 in. (41 mm) OD	1
45◆	SPRING, compression	1
46◆	SEAL, piston, TSL pump	1
47◆	O-RING; fluoroelastomer; 1.88 in. (48 mm) OD	2

\* These parts are included in Seal Repair Kit 277362.

† These parts are included in Throat Packing Repair Kit 24F245.

◆ These parts are included in TSL Pump Repair Kit 24F617.

### Pump Repair Kit 24F663

**For 2000cc Lowers:** Part Nos. 24F440, 24F441, 24F442, 24F443, 24F444, 24F445, and 24F447.

Ref. No.	Description	Qty.
2*	PACKING, o-ring; 1.25 in. (31 mm) OD; PTFE	6
4*	SEAL, gasket, cylinder	2
7*	GASKET, seat, valve	4
11*	PACKING, piston; 4.0 in.; UHMWPE	1
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING; leather	3
26†	GLAND, female	1
35†	PACKING, o-ring; PTFE; 1.5 in. (38 mm) OD	1
42†	PACKING, o-ring; PTFE; 1.63 in. (41 mm) OD	1
45◆	SPRING, compression	1
46◆	SEAL, piston, TSL pump	1
47◆	O-RING; fluoroelastomer; 1.88 in. (48 mm) OD	2

\* These parts are included in Seal Repair Kit 277358.

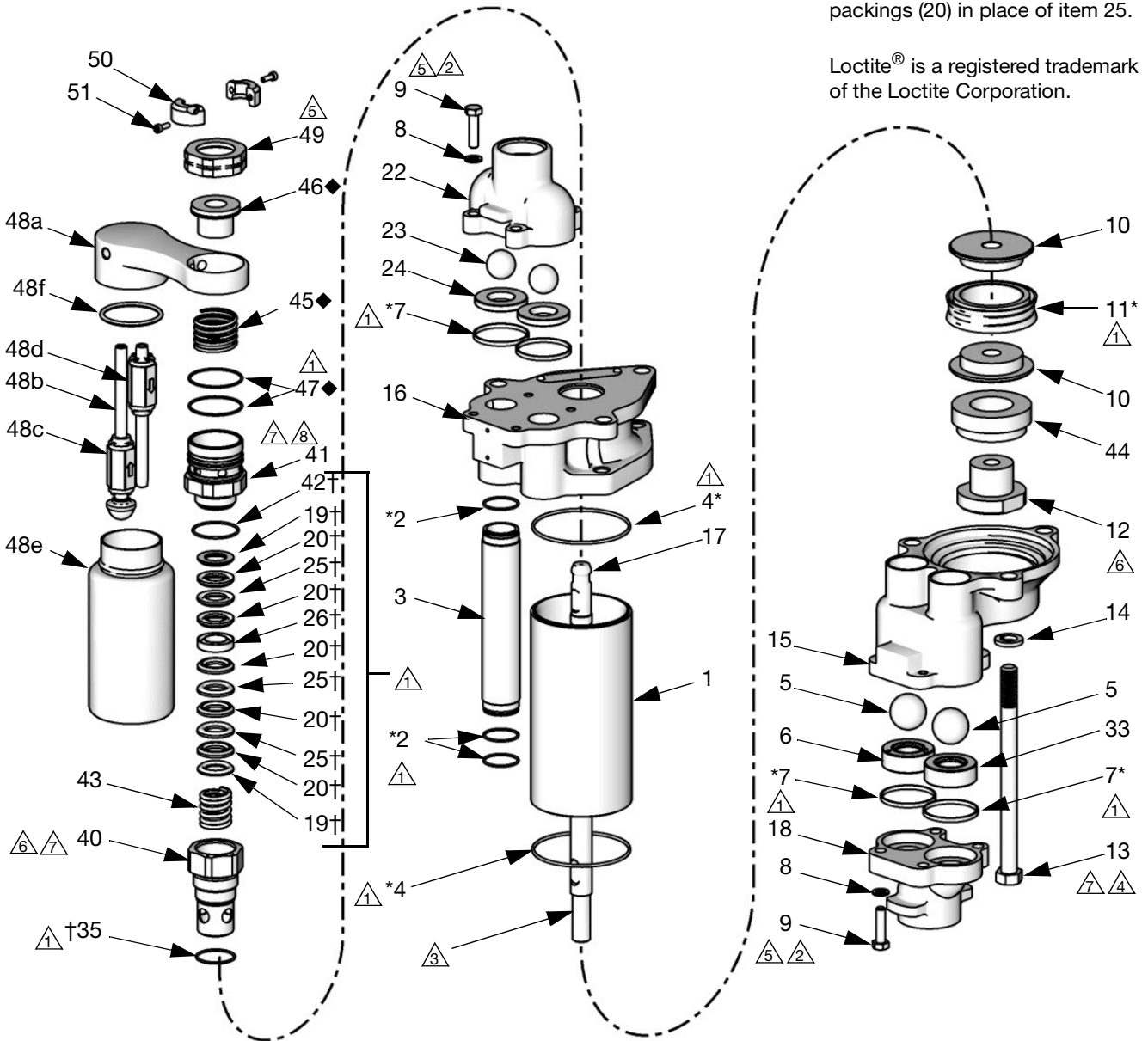
† These parts are included in Throat Packing Repair Kit 24F245.

◆ These parts are included in TSL Pump Repair Kit 24F617.

**NOTE:** Kit 24F243 uses all ptfe packings (20) in place of item 25.

**NOTE:** Kit 24F244 uses all leather packings (20) in place of item 25.

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① Apply lubricant to all packings and seals.

② Apply removable (blue) Loctite® 243 to entire length of threads.

③ Apply high strength (red) Loctite® 263 or 2760 to entire length of threads. Sealant must be allowed to cure for a minimum of 12 hours before use.

④ Tighten uniformly until cylinder (4) is seated. Torque to 25-30 ft-lb (34-40 N•m).

⑤ Torque 25-30 ft-lb (34-40 N•m).

⑥ Torque 95-100 ft-lb (129-135 N•m).

⑦ Apply thread lubricant.

⑧ Torque 70-75 ft-lb (95-102 N•m).

**FIG. 1. 750cc, 1000cc, 1500cc, and 2000cc Enclosed Wet Cup Lowers**

## Sealed 4-Ball Lowers

### Pump Repair Kit 17K758

For Sealed 750cc Lower: Part No. 17K656.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, check valve	4
11*	SEAL, piston; ZXP	1
20†	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	2
21†	SEAL, lip	1
25	BEARING	1
35	O-RING; 1.5 in. (38 mm) OD; PTFE	1
51	SEAL, backup	1
53	BELLOWS	1
55	O-RING, bellows; 2.55 in. (65 mm) OD	1
57	O-RING; 0.7 in. (18 mm) OD; PTFE	1
58	GASKET, sanitary	2
61	O-RING	1
62	O-RING; 2.7 in. (69 mm) OD, PTFE	1

\* These parts are included in Piston Seal Kit 17K912.

† These parts are included in Lip Seal Kit 17K753

### Pump Repair Kit 17K760

For Sealed 1000cc Lower: Part No. 17K657.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, check valve	4
11*	SEAL, piston; ZXP	1
20†	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	2
21†	SEAL, lip	1
25	BEARING	1
35	O-RING; 1.5 in. (38 mm) OD; PTFE	1
51	SEAL, backup	1
53	BELLOWS	1
55	O-RING, bellows; 2.55 in. (65 mm) OD	1
57	O-RING; 0.7 in. (18 mm) OD; PTFE	1
58	GASKET, sanitary	2
61	O-RING	1
62	O-RING; 2.7 in. (69 mm) OD, PTFE	1

\* These parts are included in Piston Seal Kit 17K913.

† These parts are included in Lip Seal Kit 17K753.

### Pump Repair Kit 17K762

For Sealed 1500cc Lowers: Part No. 17K658.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, check valve	4
11*	SEAL, piston; ZXP	1
20†	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	2
21†	SEAL, lip	1
25	BEARING	1
35	O-RING; 1.5 in. (38 mm) OD; PTFE	1
51	SEAL, backup	1
53	BELLOWS	1
55	O-RING, bellows; 2.55 in. (65 mm) OD	1
57	O-RING; 0.7 in. (18 mm) OD; PTFE	1
58	GASKET, sanitary	2
61	O-RING	1
62	O-RING; 2.7 in. (69 mm) OD, PTFE	1

\* These parts are included in Piston Seal Kit 17K914.

† These parts are included in Lip Seal Kit 17K753.

### Pump Repair Kit 17K764

For Sealed 2000cc Lower: Part No. 17K659.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, check valve	4
11*	SEAL, piston; ZXP	1
20†	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	2
21†	SEAL, lip	1
25	BEARING	1
35	O-RING; 1.5 in. (38 mm) OD; PTFE	1
51	SEAL, backup	1
53	BELLOWS	1
55	O-RING, bellows; 2.55 in. (65 mm) OD	1
57	O-RING; 0.7 in. (18 mm) OD; PTFE	1
58	GASKET, sanitary	2
61	O-RING	1
62	O-RING; 2.7 in. (69 mm) OD, PTFE	1

\* These parts are included in Piston Seal Kit 17K915.

† These parts are included in Lip Seal Kit 17K753.

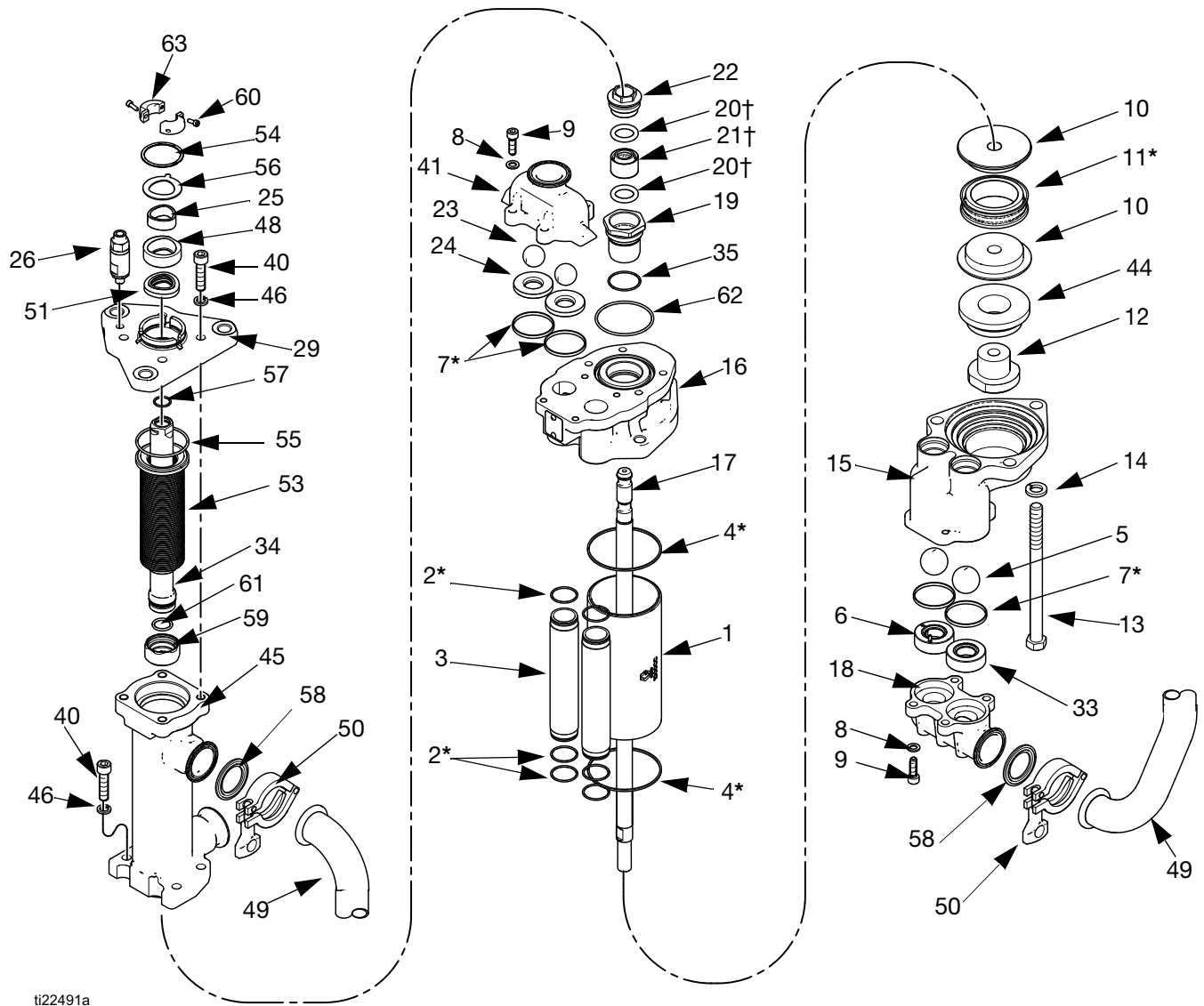
**Pump Repair Kit 25U310**

**For Sealed HP 750cc Lower: Part No. 26B217 and 26B218.**

Ref. No.	Description	Qty.	Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	6	53	BELLOWS	1
4*	GASKET, cylinder	2	55	O-RING, bellows; 2.55 in. (65 mm) OD	1
7*	GASKET, check valve	4	57	O-RING; 0.7 in. (18 mm) OD; PTFE	1
11*	SEAL, piston; ZXP	1	58	GASKET, sanitary	2
20†	O-RING; 1.25 in. (31 mm) OD; FX75 or CV75	2	61	O-RING	1
21†	SEAL, lip	1	62	O-RING; 2.7 in. (69 mm) OD, PTFE	1
25	BEARING	1			
35	O-RING; 1.5 in. (38 mm) OD; PTFE	1			
51	SEAL, backup	1			

\* These parts are included in Piston Seal Kit 25U311.

† These parts are included in Lip Seal Kit 17K753.



**FIG. 2 750cc, 1000cc, 1500cc, and 2000cc Sealed 4-Ball Lowers**

## Open Wet Cup Lowers

### Pump Repair Kit 17K759

**For Open Wet Cup 750cc Lowers:** Part Nos. 17K660, 17K664, and 17K668.

Ref.	Description	Qty
2*	O-RING; 1.25 in. (31 mm) OD, PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat, valve	4
11*	SEAL, piston, ZXP	1
19†	GLAND, male	2
20†	V-PACKING, throat; ZX	5
25†	V-PACKING, throat; leather	3
26†	GLAND, female	1
35†	O-RING; 1.5 in. (38 mm) OD	1

\* Parts are included in Piston Seal Kit 17K912.

† Parts are included in Throat Repair Kit 17K754.

### Pump Repair Kit 17K761

**For Open Wet Cup 1000cc Lowers:** Part Nos. 17K661, 17K665, and 17K669.

Ref.	Description	Qty
2*	O-RING; 1.25 in. (31 mm) OD, PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat valve	4
11*	SEAL, piston, ZXP	1
19†	GLAND, male	2
20†	V-PACKING, throat; ZX	5
25†	V-PACKING, throat; leather	3
26†	GLAND, female	1
35†	O-RING; 1.5 in. (38 mm) OD	1

\* Parts are included in Piston Seal Kit 17K913.

† Parts are included in Throat Repair Kit 17K754.

### Pump Repair Kit 17K763

**For Open Wet Cup 1500cc Lower:** Part Nos. 17K662, 17K666, and 17K670.

Ref.	Description	Qty
2*	O-RING; 1.25 in. (31 mm) OD, PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat valve	4
11*	SEAL, piston, ZXP	1
19†	GLAND, male	2
20†	V-PACKING, throat; ZX	5
25†	V-PACKING, throat; leather	3
26†	GLAND, female	1
35†	O-RING; 1.5 in. (38 mm) OD	1

\* Parts are included in Piston Seal Kit 17K914.

† Parts are included in Throat Repair Kit 17K754.

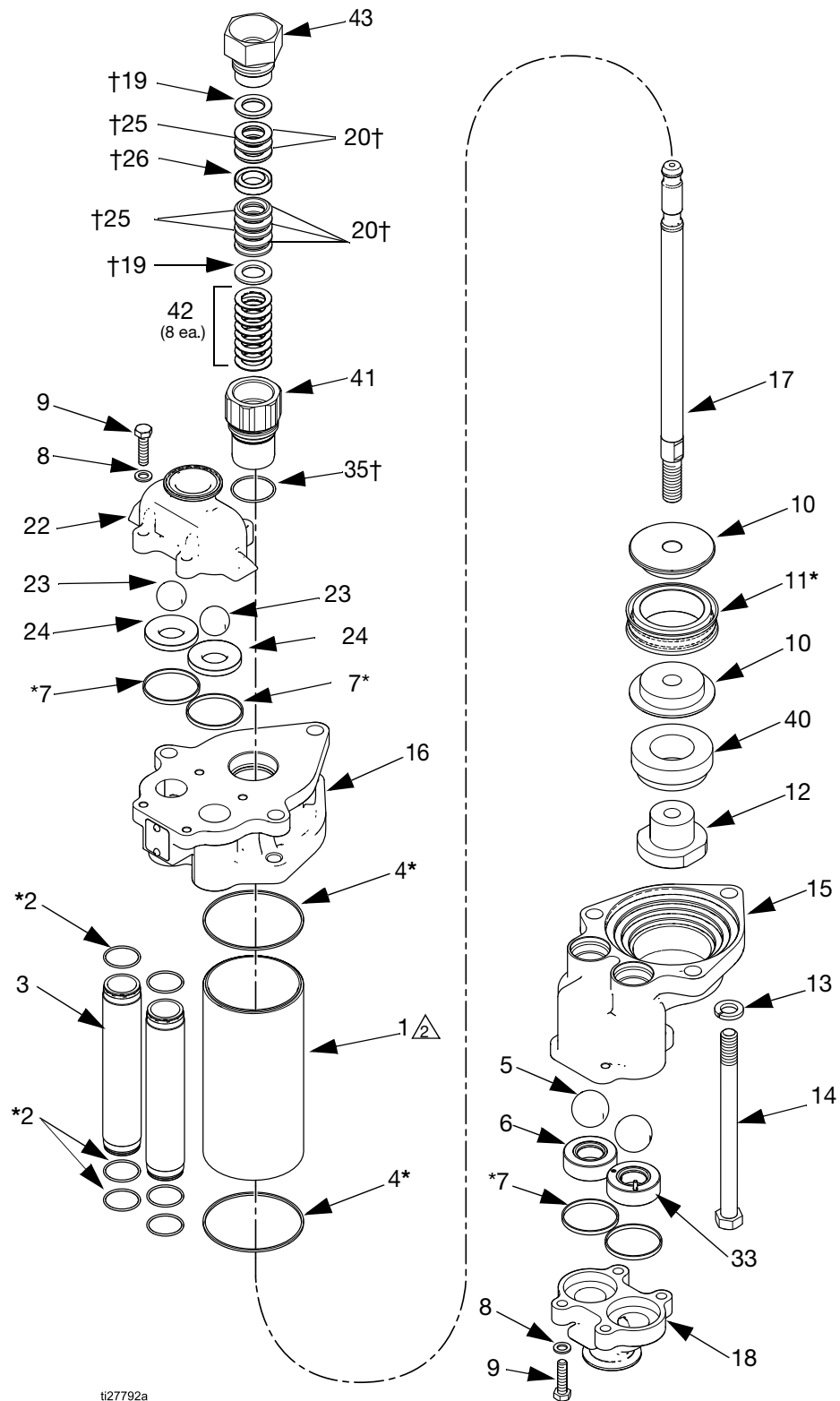
### Pump Repair Kit 17K765

**For Open Wet Cup 2000cc Lowers:** Part Nos. 17K663, 17K667, and 17K671.

Ref.	Description	Qty
2*	O-RING; 1.25 in. (31 mm) OD, PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat valve	4
11*	SEAL, piston, ZXP	1
19†	GLAND, male	2
20†	V-PACKING, throat; ZX	5
25†	V-PACKING, throat; leather	3
26†	GLAND, female	1
35†	O-RING; 1.5 in. (38 mm) OD	1

\* Parts are included in Piston Seal Kit 17K915.

† Parts are included in Throat Repair Kit 17K754.



**FIG. 3 750cc, 1000cc, 1500cc, and 2000cc Open Wet Cup Lowers**

# Piston Seal Kits for All 750cc, 1000cc, 1500cc, and 2000cc Lowers

See FIG. 1 on page 3 for Enclosed Wet Cup Lowers.

See FIG. 2 on page 5 for Sealed 4-Ball Lowers.

See FIG. 3 on page 7 for Open Wet Cup Lowers.

NOTE: ★ Use PTFE seals only when required for chemical compatibility. PTFE seals may result in a reduced cycle life.

## Seal Repair Kit 16E904

## Piston Seal Kit 17K912

## PTFE Seal Conversion Kit 16E895

**For 750cc Lowers:** Part Nos. 24F413, 24F414, 24F415, 24F416, 24F417, 24F418, 24F420, 24F421, 24F422, 24F423, 17K656, 17K660, 17K664, and 17K668.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat, valve	4
11*	SEAL, piston; 2.5 in.; UHMWPE (Kit 16E904)	1
11*	SEAL, piston; 2.5 in.; ZXP (Kit 17K912)	1
11*	SEAL, piston; 2.5 in.; PTFE (Kit 16E895)★	1

## Seal Repair Kit 277360

## Piston Seal Kit 17K913

## PTFE Seal Conversion Kit 277361

**For 1000cc Lowers:** Part Nos. 24F424, 24F425, 24F426, 24F427, 24F428, 24F429, 24F431, 17K657, 17K661, 17K665, and 17K669.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat, valve	4
11*	SEAL, piston; 3 in.; UHMWPE (Kit 277360)	1
11*	SEAL, piston; 3 in.; ZXP (Kit 17K913)	1
11*	SEAL, piston; 3 in.; PTFE (Kit 277361)★	1

## Seal Repair Kit 277362

## Piston Seal Kit 17K914

## PTFE Seal Conversion Kit 277363

**For 1500cc Lowers:** Part Nos. 24F432, 24F433, 24F434, 24F435, 24F436, 24F437, 24F439, 17K658, 17K662, 17K666, and 17K670.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat, valve	4
11*	SEAL, piston; 3.5 in.; UHMWPE (Kit 277362)	1
11*	SEAL, piston; 3.5 in.; ZXP (Kit 17K914)	1
11*	SEAL, piston; 3.5 in.; PTFE (Kit 277363)★	1

## Seal Repair Kit 277358

## Piston Seal Kit 17K915

## PTFE Seal Conversion Kit 277359

**For 2000cc Lowers:** Part Nos. 24F440, 24F441, 24F442, 24F443, 24F444, 24F445, 24F447, 17K659, 17K663, 17K667, and 17K671.

Ref. No.	Description	Qty.
2*	O-RING; 1.25 in. (31 mm) OD; PTFE	6
4*	GASKET, cylinder	2
7*	GASKET, seat, valve	4
11*	SEAL, piston; 4 in.; UHMWPE (Kit 277358)	1
11*	SEAL, piston; 4 in.; ZXP (Kit 17K915)	1
11*	SEAL, piston; 4 in.; PTFE (Kit 277359)★	1

## Piston Seal Kit 25U311

**For HP 750cc Lowers:** Part Nos. 26B217 and 26B218.

Ref. No.	Description	Qty.
2*	O-RING, #024, FX75	6
4*	O-RING, 70 MM x 2 MM	2
7*	GASKET, seat, valve	4
11*	SEAL, piston; (750cc)	1



# Throat Packing Kits for Enclosed Wet Cup and Open Wet Cup Lowers

**NOTE:** The lowers listed in this manual **must** use the throat packing kits listed below. **Do not** use kits for older-style lowers (see manual 311690) with these lowers. The throat packing gland height has changed.

See FIG. 1 on page 3 for pumps with Enclosed Wet Cup Lowers. For best results, install the TSL Pump Repair Kit 24F617 each time the throat packings are changed. See FIG. 3 on page 7 for Open Wet Cup Lowers.

**For 750cc Lowers:** Part Nos. 24F413, 24F414, 24F415, 24F416, 24F417, 24F418, 24F420, 24F421, 24F422, 24F423, 17K656, 17K660, 17K664, and 17K668.

**For 1000cc Lowers:** Part Nos. 24F424, 24F425, 24F426, 24F427, 24F428, 24F429, 24F431, 17K657, 17K661, 17K665, and 17K669.

**For 1500cc Lowers:** Part Nos. 24F432, 24F433, 24F434, 24F435, 24F436, 24F437, 24F439, 17K658, 17K662, 17K666, and 17K670.

**For 2000cc Lowers:** Part Nos. 24F440, 24F441, 24F442, 24F443, 24F444, 24F445, 24F447, 17K659, 17K663, 17K667, and 17K671.

## Kit 24F245

With leather and UHMWPE throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING, leather	3
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

## Kit 24F244

With leather throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING, leather	8
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

## Kit 24F243

With PTFE throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING; PTFE★	8
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

## Kit 17K916

## Kit 24F246

With UHMWPE and PTFE throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING; UHMWPE	5
25†	V-PACKING; PTFE★	3
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

## Kit 17K754

With leather and ZX throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING; ZX	5
25†	V-PACKING, leather	3
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

With ZX and PTFE throat packings.

Ref. No.	Description	Qty.
19†	GLAND, male	2
20†	V-PACKING; ZX	5
25†	V-PACKING, PTFE★	3
26†	GLAND, female	1
35†	O-RING; PTFE; 1.5 in. (38 mm) OD	1
42†	O-RING; PTFE, 1.63 in. (41 mm) OD	1

★ Use PTFE seals only when required for chemical compatibility. PTFE seals may result in a reduced cycle life.

## Lip Seal Kit For Sealed 4-Ball Lowers

NOTE: See FIG. 2 on page 5.

### Lip Seal Kit 17K753

Ref. No.	Description	Qty.
	O-RING	2
	SEAL, lip	1

## Additional Kit For Enclosed Wet Cup Lowers

NOTE: See FIG. 1 on page 3.

### TSL Pump Repair Kit 24F617

Ref. No.	Description	Qty.
45◆	SPRING, compression	1
46◆	SEAL, piston, TSL pump	1
47◆	O-RING; fluoroelastomer; 1.88 in. (48 mm) OD	2

## Additional Kit For Open Wet Cup Lowers

NOTE: See FIG. 3, page 7.

### Belleville Springs Kit 17K755

Ref. No.	Description	Qty.
42	SPRING, belleville	8

## Additional Kit For Sealed 4-Ball Lowers

NOTE: See FIG. 2 on page 5.

### Bellows Repair Kit 17K766

Ref. No.	Description	Qty.
25	BEARING	1
51	SEAL, backup	1
53	BELLOWS	1
55	O-RING, bellows	1
57	O-RING	1
61	O-RING	1

# Complete Pump Repair Kits for 3000cc and 4000cc Lowers

**NOTE:** The lowers listed in this manual **must** use the pump repair kits listed below. **Do not** use kits for older-style lowers (see manual 311832) with these lowers. The throat packing gland height has changed.

## Pump Repair Kit 24F664

**For 3000cc Lowers:** Part Nos. 24F448, 24F449, and 24F450.

Ref. No.	Description	Qty.
3*	SEAL, gasket, cylinder	2
5*	SEAL; UHMWPE	4
15*	GASKET, seat, valve	4
17*	SEAL; UHMWPE	4
22*	O-RING; PTFE encapsulated fluoroelastomer; 1.07 in. (27 mm) OD	1
23*	O-RING; PTFE; 2.32 in. (59 mm) OD	1
25*	PACKING, piston; 5.0 in.; UHMWPE	1
30†	V-PACKING; UHMWPE	6
31†	V-PACKING; leather	4
32†	GLAND, female	1
33†	GLAND, male	2
35◆	SPRING, compression	1
36◆	SEAL, piston, TSL pump	1
51◆	O-RING; fluoroelastomer; 2.25 in. (57 mm) OD	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD	2

\* These parts are included in Seal Repair Kit 243728.

† These parts are included in Throat Packing Repair Kit 24F247.

◆ These parts are included in TSL Pump Repair Kit 24F618.

## Pump Repair Kit 24F665

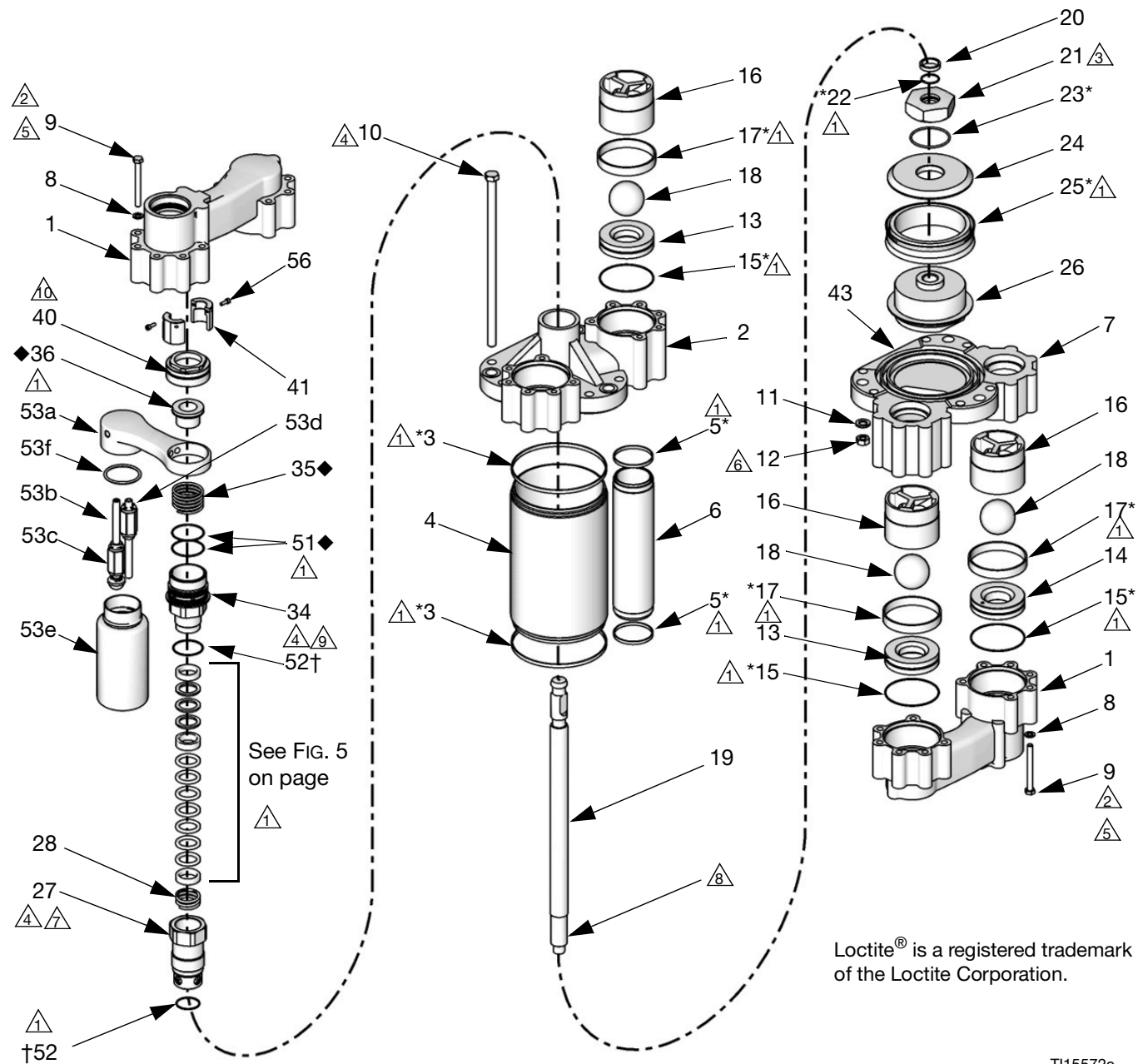
**For 4000cc Lowers:** Part Nos. 24F451, 24F452, and 24F453.

Ref. No.	Description	Qty.
3*	SEAL, gasket, cylinder	2
5*	SEAL; UHMWPE	4
15*	GASKET, seat, valve	4
17*	SEAL; UHMWPE	4
22*	O-RING; PTFE encapsulated fluoroelastomer; 1.07 in. (27 mm) OD	1
23*	O-RING; PTFE; 2.32 in. (59 mm) OD	1
25*	PACKING, piston; 5.75 in.; UHMWPE	1
30†	V-PACKING; UHMWPE	6
31†	V-PACKING; leather	4
32†	GLAND, female	1
33†	GLAND, male	2
35◆	SPRING, compression	1
36◆	SEAL, piston, TSL pump	1
51◆	O-RING; fluoroelastomer; 2.25 in. (57 mm) OD	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD	2

\* These parts are included in Seal Repair Kit 243729.

† These parts are included in Throat Packing Repair Kit 24F247.

◆ These parts are included in TSL Pump Repair Kit 24F618.



- △1 Apply lubricant to all packings and seals.
- △2 Apply removable (blue) Loctite® 243 to entire length of threads.
- △3 Torque to 200-210 ft-lb (270-285 N•m).
- △4 Apply thread lubricant.

- △5 Torque to 18-20 ft-lb (24-27 N•m).
- △6 Tighten uniformly until cylinder is seated then torque to 60-65 ft-lb (81-88 N•m).
- △7 Torque to 95-100 ft-lb (129-135 N•m).

- △8 Apply high strength (red) Loctite® 263 or 2760 to entire length of threads. Sealant must be allowed to cure for a minimum of 12 hours before use.
- △9 Torque to 70-75 ft-lb (95-102 N•m).
- △10 Torque to 25-30 ft-lb (34-40 N•m).

Fig. 4. 3000cc and 4000cc Enclosed Wet Cup Lowers

# Seal Kits for All 3000cc and 4000cc Lowers

## Piston Seal Kits

**NOTE:** See FIG. 4 on page 12.

### Seal Repair Kit 243728 PTFE Seal Conversion Kit 235855

**For 3000cc Lowers:** Part Nos. 24F448, 24F449, and 24F450.

Ref. No.	Description	Qty.
3*	SEAL, gasket, cylinder	2
5*	SEAL; UHMWPE	4
15*	GASKET, seat, valve	4
17*	SEAL; UHMWPE	4
22*	O-RING; PTFE encapsulated fluoroelastomer; 1.07 in. (27 mm) OD	1
23*	O-RING; PTFE; 2.32 in. (59 mm) OD	1
25*	PACKING, piston; 5.0 in.; UHMWPE (Kit 243728)	1
25*	PACKING, piston; 5.0 in.; PTFE (Kit 235855)★	1

### Seal Repair Kit 243729 PTFE Seal Conversion Kit 235854

**For 4000cc Lowers:** Part Nos. 24F451, 24F452, and 24F453.

Ref. No.	Description	Qty.
3*	SEAL, gasket, cylinder	2
5*	SEAL; UHMWPE	4
15*	GASKET, seat, valve	4
17*	SEAL; UHMWPE	4
22*	O-RING; PTFE encapsulated fluoroelastomer; 1.07 in. (27 mm) OD	1
23*	O-RING; PTFE; 2.32 in. (59 mm) OD	1
25*	PACKING, piston; 5.75 in.; UHMWPE (Kit 243729)	1
25*	PACKING, piston; 5.75 in.; PTFE (Kit 235854)★	1

★ Use PTFE seals only when required for chemical compatibility. PTFE seals may result in a reduced cycle life.

## Throat Packing Kits

**NOTE:** The lowers listed in this manual **must** use the throat packing kits listed below. **Do not** use kits for older-style lowers (see manual 311832) with these lowers. The throat packing gland height has changed.

**NOTE:** See FIG. 4 on page 12. For best results, install the TSL Pump Repair Kit 24F618 each time the throat packings are changed.

**For 3000cc Lowers:** Part Nos. 24F448, 24F449, and 24F450.

**For 4000cc Lowers:** Part Nos. 24F451, 24F452, and 24F453.

### Standard Throat Packing Kit 24F247

With leather and UHMWPE throat packings.

Ref. No.	Description	Qty.
30†	V-PACKING; UHMWPE	6
31†	V-PACKING; leather	4
32†	GLAND, female	1
33†	GLAND, male	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD; (see FIG. 4)	2

### Throat Packing Conversion Kit 24F248

With PTFE throat packings.

Ref. No.	Description	Qty.
30†	V-PACKING; PTFE★	10
32†	GLAND, female	1
33†	GLAND, male	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD; (see FIG. 4)	2

### Throat Packing Conversion Kit 24J442

With leather and PTFE throat packings.

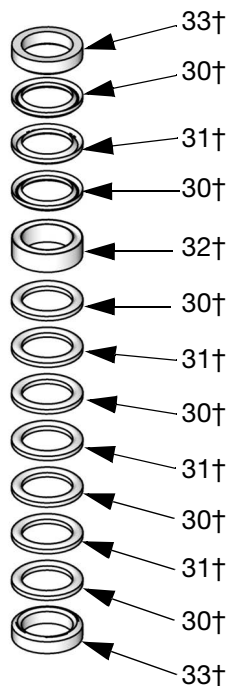
Ref. No.	Description	Qty
30†	V-PACKING; PTFE★	6
31†	V-PACKING; leather	4
32†	GLAND, female	1
33†	GLAND, male	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD	2

### Throat Packing Conversion Kit 26A030

With UHMWPE and PTFE throat packings.

Ref. No.	Description	Qty
30†	V-PACKING; UHMWPE	6
31†	V-PACKING; PTFE★	4
32†	GLAND, female	1
33†	GLAND, male	2
52†	O-RING; PTFE; 1.75 in. (44 mm) OD	2

★ Use PTFE seals only when required for chemical compatibility. PTFE seals may result in a reduced cycle life.



**NOTE:** Kits 24F247 and 24F248 also include item 52 (qty 2); see FIG. 4.

**NOTE:** Kit 24F248 uses all ptfе packings (30) in place of item 31.

TI15573a

**FIG. 5. Throat Packing Detail (3000cc and 4000cc)**

## TSL Pump Repair Kit 24F618

**NOTE:** See FIG. 4 on page 12.

**Ref.**

<b>No.</b>	<b>Description</b>	<b>Qty.</b>
35◆	SPRING, compression	1
36◆	SEAL, piston, TSL pump	1
51◆	O-RING; fluoroelastomer; 2.25 in. (57 mm) OD	2

## California Proposition 65

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Original instructions. This manual contains English. MM 3A0872

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