

Check-Mate[®] Displacement Pumps

312375N
EN

With priming piston and Severe Duty[®] or MaxLife[®] rod and cylinder.
For professional use only.

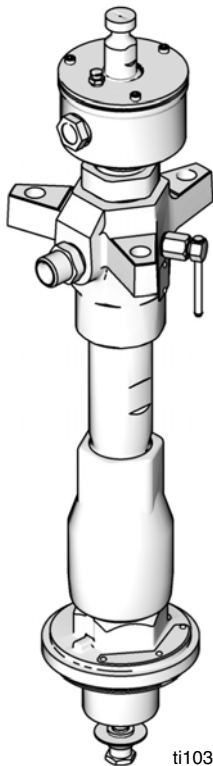


Important Safety Instructions

Read all warnings and instructions in this manual.
Save these instructions.

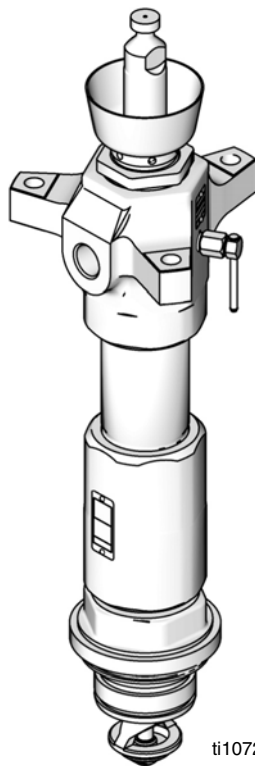
See page 3 for model information. See page 42 for maximum working pressure and approvals.

L100CM Model



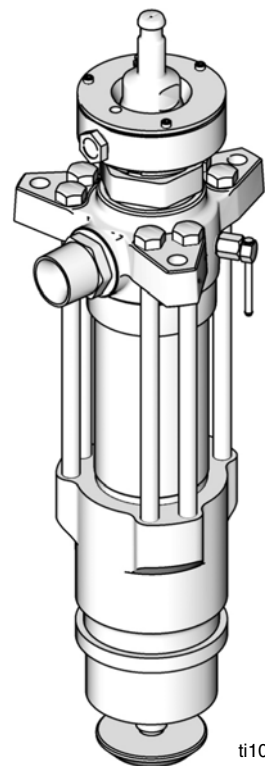
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L200CS Model



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L500CM Model



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Contents

Related Manuals 2
Models 3
Warnings 4
Component Identification 6
Repair 7
 Troubleshooting 7
 Disassembly and Reassembly of Throat Packings
 and Cartridge 7
 Disassembly 8
 Reassembly 12
Parts 18
 60cc Displacement Pumps 18
 100cc Displacement Pumps 19
 200cc and 250cc Displacement Pumps 25
 500cc Displacement Pumps 35
Dimensions 40
Outlet Housing Mounting Hole Layout 41
Technical Data 42
Graco Standard Warranty 44

Related Manuals

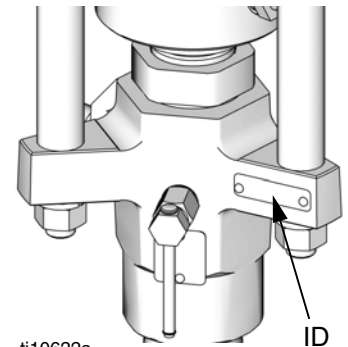
Component Manuals in U.S. English:

| Manual | Description |
|---------------|--|
| 312376 | Check-Mate® Pump Packages Instruction-Parts |
| 313526 | Supply Units Operation |
| 313527 | Supply Units Repair-Parts |
| 313528 | Tandem Supply Units Operation |
| 313529 | Tandem Supply Units Repair-Parts |

Models

Check your displacement pump's identification plate (ID) for the 6-digit part number of your displacement pump. Use the following matrix to define the construction of your displacement pump, based on the six digits. For example, displacement pump Part No. **L250CM** represents the displacement pump (**L**), output volume in cc per cycle (**250**), carbon steel construction (**C**), and MaxLife[®] coatings, packings, and enclosed wet cup (**M**).

To order replacement parts, see **Parts** section starting on page 18. The digits in the matrix do not correspond to the Ref. Nos. in the Parts drawings and lists.












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| L | 250 | C | | M | |
|---------------------------------|--|--------------------|-----------------|--------------------|---|
| First Digit | Second, Third, and Fourth Digits | Fifth Digit | | Sixth Digit | |
| | Displacement Pump Volume per cycle (cc) | | Material | | Coatings, Packings, Enclosed Wet Cup |
| L (displacement pump) | 60 | C | Carbon Steel | S | Severe Duty |
| | 100 | S | Stainless Steel | M | MaxLife |
| | 200 | | | | |
| | 250 | | | | |
| | 500 | | | | |

Warnings

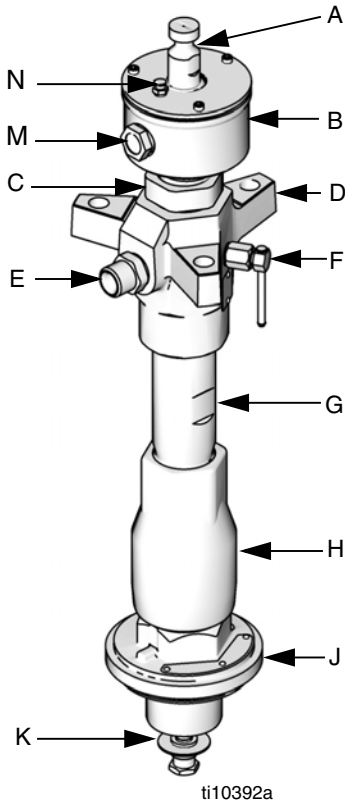
The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

|  WARNING | |
|--|---|
|  | <p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point gun at anyone or at any part of the body. • Do not put your hand over the spray tip. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Do not spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment. |
|  | <p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure in this manual. Disconnect power or air supply. |
|  | <p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area. |

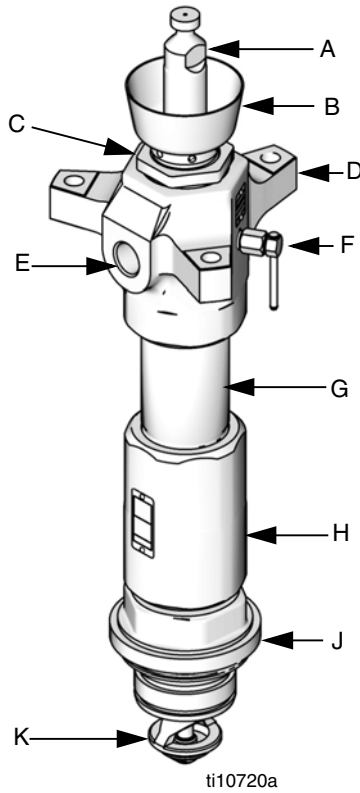
|  WARNING | |
|--|---|
|  | <p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations. |
|  | <p>ELECTRIC SHOCK HAZARD</p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power cord before servicing equipment. • Use only grounded electrical outlets. • Use only 3-wire extension cords. • Ensure ground prongs are intact on sprayer and extension cords. • Do not expose to rain. Store indoors. |
|  | <p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read MSDS's to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. • Always wear impervious gloves when spraying or cleaning equipment. |
|  | <p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection |

Component Identification

L060CM and L100CM Models



L200CS and L250CS Models



L500CM Model

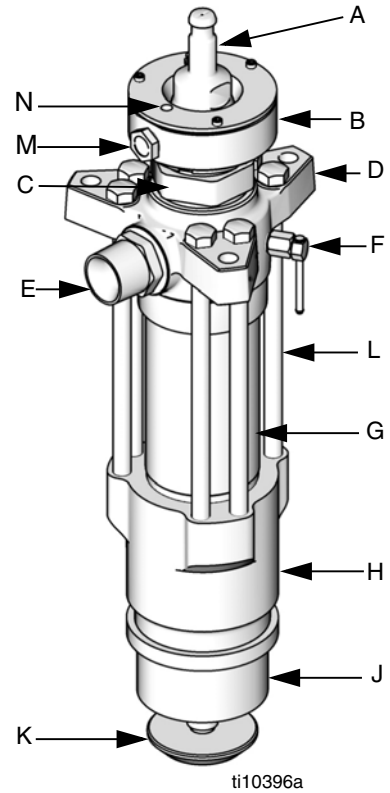


FIG. 1

Key:

- A Displacement Rod
- B Wet Cup
- C Throat Packing Cartridge
- D Outlet Housing
- E Fluid Outlet
- F Pump Bleed Valve
- G Pump Cylinder
- H Intake Valve Housing
- J Intake Cylinder
- K Priming Piston Assembly
- L Hex Head Bolt (500cc displacement pumps only)
- M Wet Cup Sight Glass (MaxLife models only)
- N Wet Cup Fill Cap (MaxLife models only)

Repair

Troubleshooting

See Check-Mate Pump Packages manual 312376.

Required Tools

- Torque wrench
- Bench vise, with soft jaws
- Rubber mallet
- Hammer
- 400 mm (15.8 in.) adjustable wrench
- O-ring pick
- Flat head screwdriver
- 13 mm (1/2 in.) dia. brass rod
- Set of socket wrenches
- Set of adjustable wrenches
- Packing nut wrench (supplied with pump package)
- 24 in. (610 mm) adjustable wrench
- M4 hex key wrench
- Thread lubricant
- Thread sealant
- Loctite® 2760™ or equivalent

Disassembly and Reassembly of Throat Packings and Cartridge

All new Check-Mate displacement pumps are equipped with a throat packing cartridge (3) that enables easy removal and replacement of throat packings without the complete disassembly of the displacement pump.

1. Run air motor and displacement pump to bottom of stroke.
2. Relieve pressure. See Check-Mate Pump Packages manual 312376 for instructions.
3. Remove air motor coupling assembly from displacement rod. See Check-Mate Pump Packages manual 312376 for instructions.
4. Push air motor piston rod up to top of stroke.
5. Remove wet cup cover (present on enclosed wet cups only).
6. Place an absorbent cloth in wet cup (9) to absorb Throat Seal Liquid (TSL).

7. Use packing nut wrench (supplied) to loosen and remove packing nut/enclosed wet cup (9).

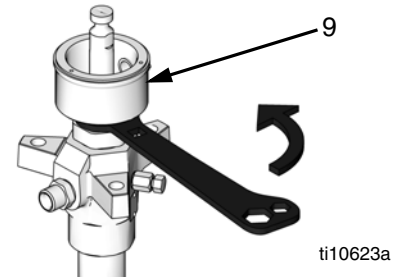


FIG. 2

8. Use an adjustable wrench to loosen cartridge (3); slide it and throat packings (P) up and off displacement rod (1).

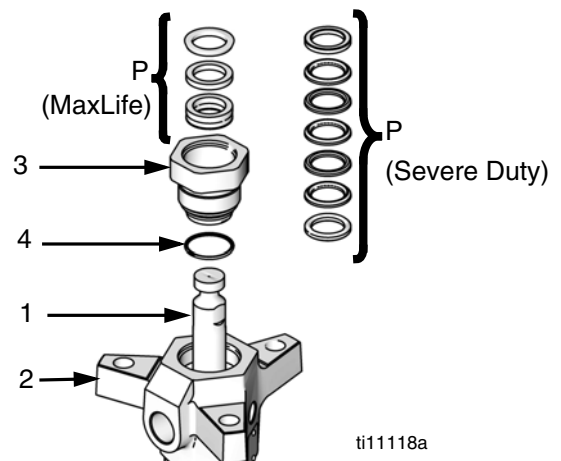


FIG. 3

9. Replace throat packings (P) according to specific packing kit into cartridge (3). See Packing Kits in **Parts** starting on page 18.
10. Remove and replace o-ring (4).
11. Slide cartridge (3) and throat packings (P) back on to displacement rod (1). Be careful to not damage packings.

- Torque cartridge (3) to specified torque listed in the following table.

| Displacement Pump | Torque |
|-------------------|------------------------------|
| 60cc and 100cc | 90-130 ft-lbs (122-173 N•m) |
| 200cc and 250cc | 130-190 ft-lbs (176-258 N•m) |
| 500cc | 149-261 ft-lbs (203-355 N•m) |

- Slide packing nut/wet cup (9) over displacement rod (1) and torque to specified torque listed in the following table.

| Displacement Pump | Torque |
|-------------------|-----------------------------|
| 60cc and 100cc | 28-44 ft-lbs (38-59 N•m) |
| 200cc and 250cc | 95-115 ft-lbs (128-155 N•m) |
| 500cc | 95-115 ft-lbs (128-155 N•m) |

- Fill wet cup (9) 1/3 full of TSL or compatible solvent.

Disassembly

When disassembling displacement pump, lay out all removed parts in sequence to ease reassembly. Clean all parts with a compatible solvent and inspect them for wear or damage.



- Relieve pressure. See your Check-Mate Pump Packages manual 312376 for instructions.
- Disconnect displacement pump from air motor as illustrated in your Check-Mate Pump Packages manual 312376.
- Place displacement pump in a vise, with jaws on outlet housing (2).

- Use packing nut wrench (supplied) to loosen and remove packing nut/enclosed wet cup (9).

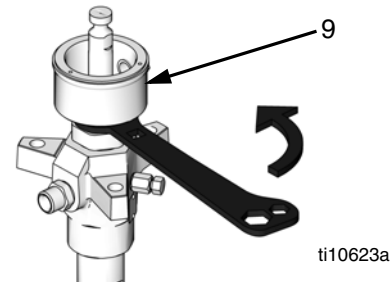



FIG. 4

- On displacement pumps with enclosed wet cups (9), use an M4 hex wrench to remove the three screws (14) from wet cup cover (10) and remove cover. Drain and clean out the wet cup (9). See FIG. 5.
- On displacement pumps with enclosed wet cups (9), use o-ring pick to remove o-ring (11), and a flat head screwdriver to remove snap ring (61), wiper (15), and seal (16).

 The snap ring (61) is applicable only to 60cc and 100cc displacement pumps.

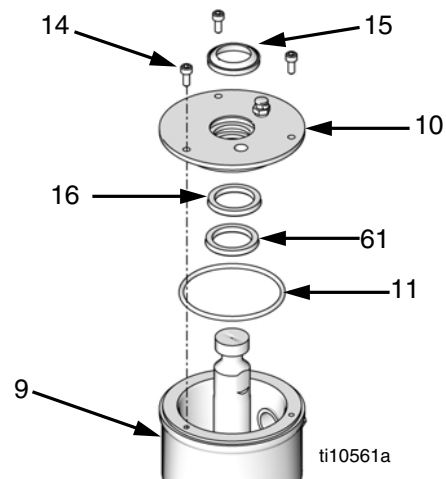

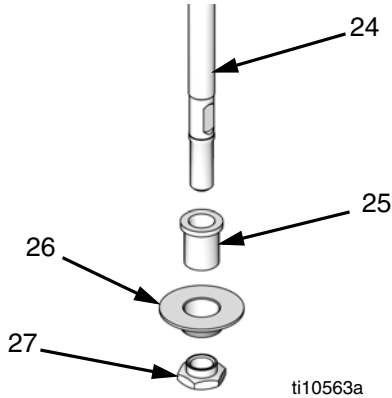


FIG. 5

7. Hold flats of the priming piston rod (24) with an adjustable wrench, and use a second wrench to unscrew priming piston seat (27) from rod. Slide priming piston (26) off rod. Inspect surfaces of guide (25) and piston (26) for scoring, wear, or other damage.

 The guide (25) is applicable only to 100cc and 500cc displacement pumps.

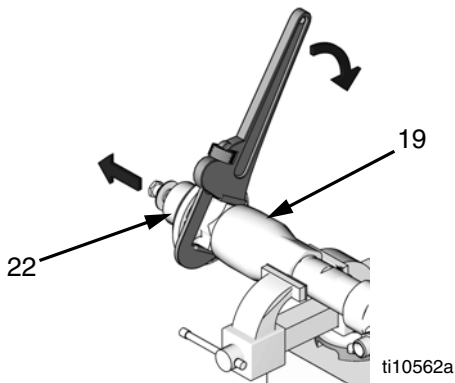


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FIG. 6

 **Steps 8-13 apply to 60cc, 100cc, 200cc, and 250cc displacement pumps only.**

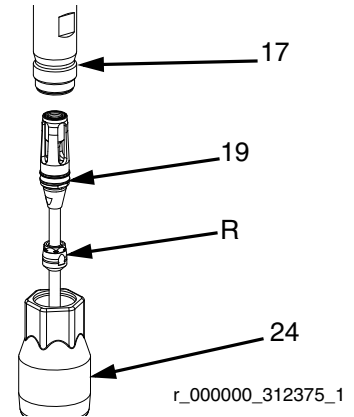
8. Use an adjustable wrench on hex of intake cylinder (22) to unscrew it from intake valve housing (19).



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FIG. 7

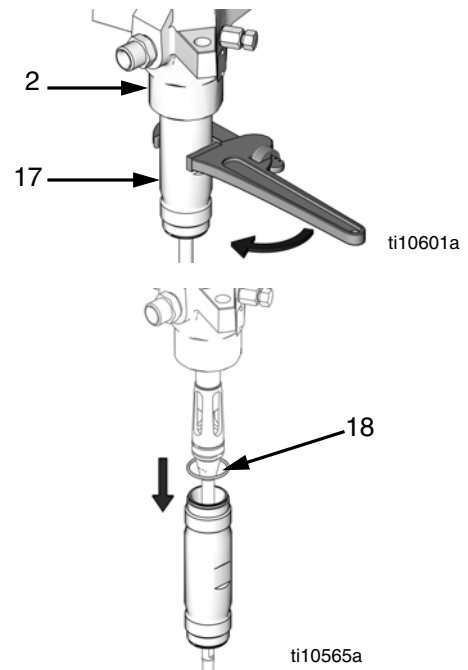
9. Use an adjustable wrench to unscrew intake valve housing (19) from cylinder (17) and outlet housing (2). Pull intake valve housing off cylinder. Intake check valve assembly (R) should slide down priming piston rod (24) as you remove housing; if it does not slide easily, firmly tap on top of housing (19) with a rubber mallet to loosen.



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FIG. 8

10. Use a 400 mm adjustable wrench on flats of displacement pump cylinder (17) and unscrew cylinder from outlet housing (2). Remove o-rings (18). Inspect inside surface of cylinder for wear, scoring or other damage by holding it up to light at an angle or running a finger over the surface.




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FIG. 9

11. Use an o-ring pick to remove seal (21) from intake valve housing (19). Discard seal; use a new one for reassembly. See FIG. 10.
12. Pull intake seat (20) out bottom of intake valve housing (19). Take care not to drop intake valve assembly (R) as it comes free, and set it aside for later.

 If seat (20) is difficult to remove, insert a hammer and brass rod through the top of housing (19) and drive seat out.

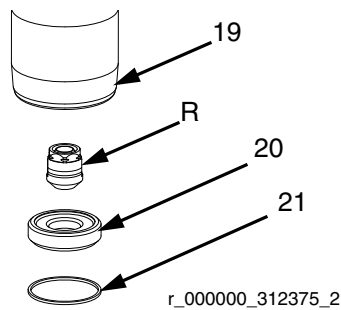


FIG. 10

13. Use a rubber mallet to drive displacement rod (1) and priming piston rod (24) out of outlet housing (2). Inspect outer surfaces of rods for damage by running a finger over the surface.

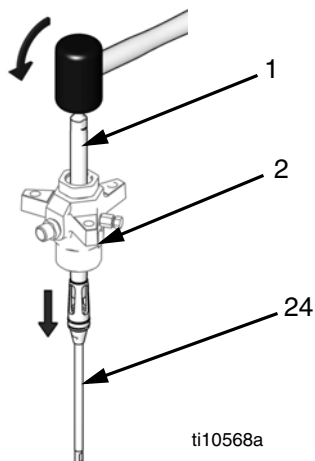


FIG. 11

 **Steps 14-19 apply to 500cc displacement pumps only.**

14. 500cc Displacement Pumps Only: use a socket wrench to remove six capscrews (45).

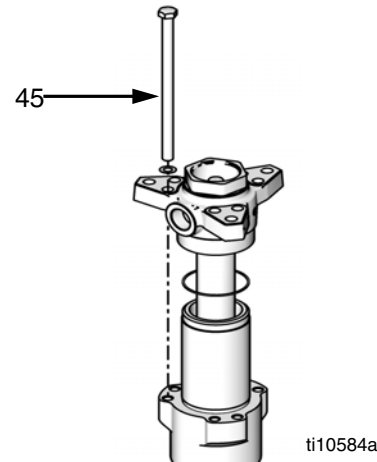


FIG. 12

15. Tap underside of outlet housing (2) with a rubber mallet to loosen housing from cylinder (17). Lift outlet housing off displacement pump and set it aside. Be careful not to scratch displacement rod (1) while removing housing. Remove seal (18) from top of cylinder.
16. Lift cylinder (17) up off intake housing (22). Displacement rod (1), piston assembly, intake valve assembly, and priming piston rod (24) will come with cylinder.
17. Place cylinder (17) sideways in a vise with soft jaws. Using a rubber mallet on end of priming piston rod (24), drive displacement rod (1) and piston assembly out of the top of the cylinder. Continue to pull rod out of cylinder until priming piston rod (24) comes free.
18. Remove seal (18) from bottom of cylinder (17). Hold cylinder up to light at an angle to examine inside surface for scoring and damage.

- Pull seal (18) and seat (20) out the top of the intake housing (22). If seat is difficult to remove, turn housing upside down and drive seat out using a hammer and brass rod.

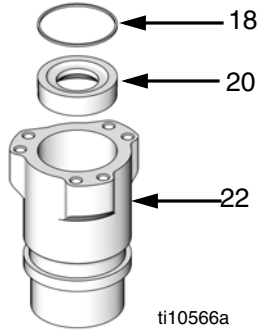


FIG. 13

- Examine mating surfaces of seat (20) and intake valve body (32) for damage.
- To access throat packings and glands, use an adjustable wrench to remove the throat cartridge (3).
- Remove cartridge o-ring (4). Then remove throat packings (P) from throat cartridge (3). Some models include a fluid outlet nipple (43) and o-ring (44). Do not remove these parts from housing unless they need replacement.

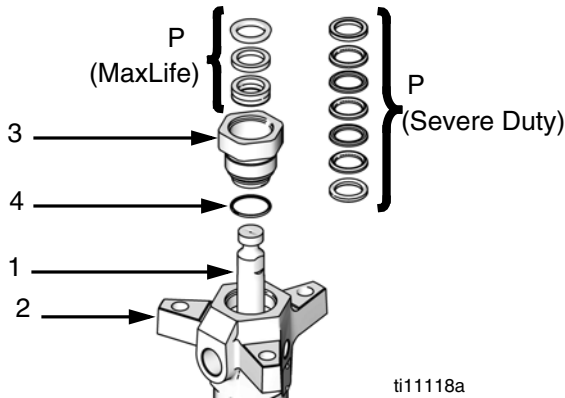


FIG. 14

- Place flats of displacement rod (1) in a vise. Unscrew piston (23) from displacement rod; priming piston rod (24) will come with it. Slide piston guide (28) and seat (30) off piston (23).

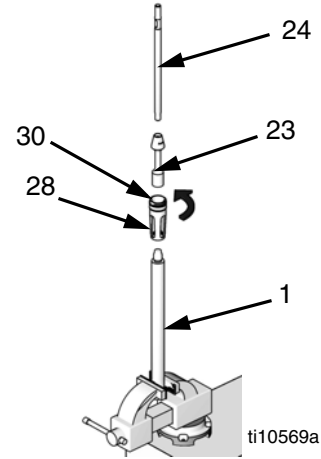



FIG. 15

- Inspect outer surfaces of displacement rod (1) and priming piston rod (24) for wear, scoring or other damage by holding them up to light at an angle or running a finger over the surface.
- It is not necessary to remove priming piston rod (24) from piston (23) unless your inspection reveals scoring, wear, or other damage to either part. To disassemble, place piston flats in a vise and unscrew the rod.
- Place piston seat (30) and guide (28) in vise. Slide a brass rod through openings in piston guide and unscrew it from seat. Remove piston seal (31) and guide bearing (29).

 Guide bearing (29) is press-fit into the piston guide (28), and may require cutting to ease removal.

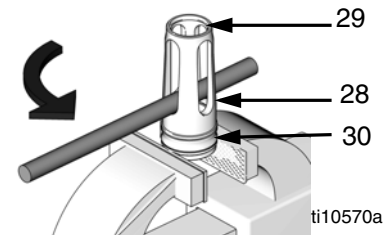



FIG. 16:

27. To disassemble intake check valve assembly, place intake valve body (32) in a vise and unscrew packing nut (33). Remove seal (38) from nut, and intake valve packings (S) from valve body. Inspect mating surfaces of intake valve body (32) and seat (20) for damage or wear.

 The seal (38) is press-fit in the nut (33) and may require cutting to ease removal.

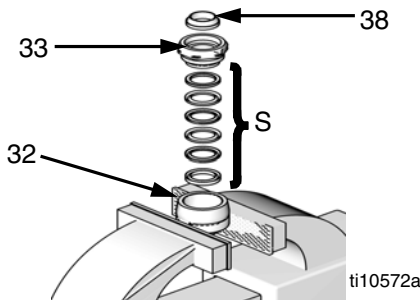


FIG. 17

28. Unscrew bleeder valve plug (40) completely from valve body (39). Clean valve threads and bleed hole. It is not necessary to remove valve body from displacement pump outlet housing (2).

29. Inspect all parts for damage. Clean all parts and threads with a compatible solvent. Reassemble as explained in the **Reassembly** section.

Reassembly

1. Lubricate the intake valve packings (S) and install them in valve (32). See FIG. 18. See Packing Kits sections for the correct intake valve packing configuration.
2. With beveled side facing up, press intake valve seal (38) in to recess of intake valve packing nut (33) until it snaps into place. The nose of the seal should be flush with or slightly recessed into the face of the packing nut. See FIG. 18.
3. Place flats of valve body (32) in a vise. Screw packing nut (33) into valve body handtight. Set intake housing assembly aside.

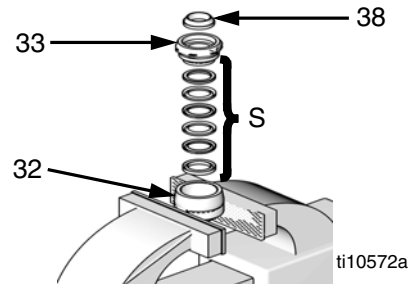


FIG. 18

4. Lubricate piston seal (31) and install it on piston seat (30). Screw piston guide (28) onto seat (30). Place piston seat in a vise and use a brass rod to torque guide; see the following table for correct torque. Snap guide bearing (29) into piston guide (28).

| Displacement Pump | Torque |
|-------------------|-----------------------------|
| 60cc and 100cc | 26-30 ft-lbs (35-41 N•m) |
| 200cc and 250cc | 57-63 ft-lbs (77-85 N•m) |
| 500cc | 90-100 ft-lbs (122-135 N•m) |

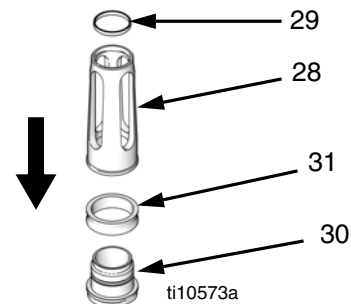


FIG. 19

- If it was necessary to remove the priming piston rod (24) from the piston (23), apply thread sealant to threads of the rod. Place flats of piston in a vise. Hold flats of rod with an adjustable wrench, and screw rod into piston; see the following table for correct torque. Be careful not to create burrs on flats of rod.

| Displacement Pump | Torque |
|-------------------|-----------------------------|
| 60cc and 100cc | 34-38 ft-lbs (46-51 N•m) |
| 200cc and 250cc | 92-102 ft-lbs (124-138 N•m) |
| 500cc | 90-100 ft-lbs (122-135 N•m) |

- Place flats of displacement rod (1) in a vise. Install piston seat/guide assembly onto the piston (23). Apply thread sealant to threads of rod and screw piston assembly onto rod; see the following table for correct torque.

| Displacement Pump | Torque |
|-------------------|------------------------------|
| 60cc and 100cc | 85-95 ft-lbs (115-128 N•m) |
| 200cc and 250cc | 239-271 ft-lbs (323-366 N•m) |
| 500cc | 327-363 ft-lbs (441-490 N•m) |

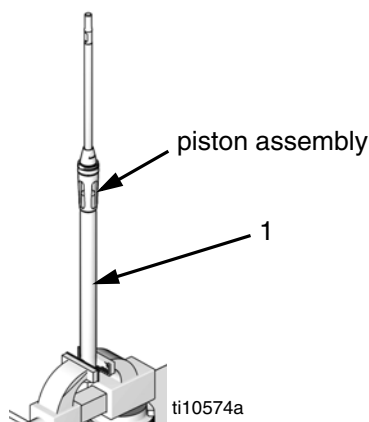


FIG. 20

Steps 7- 13 apply to 60cc, 100cc, 200cc, and 250cc displacement pumps only.

- Lubricate seal (18) and place it on top of the cylinder (17). Screw cylinder handtight into outlet housing (2). The cylinder is symmetrical so either end can be the top.

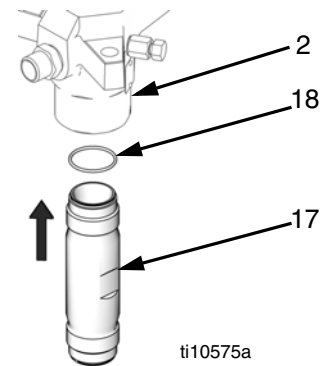


FIG. 21

- Carefully insert displacement rod (1) into bottom of cylinder (17). Push rod up into cylinder and through outlet housing (2). Be careful not to damage piston seal (31) while performing this step.

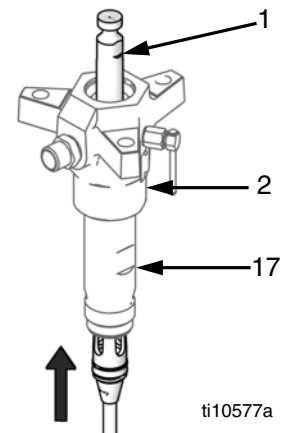


FIG. 22

- Lubricate seal (18) and install it on the bottom of cylinder (17). Slide intake valve housing (19) onto priming piston rod (24). Ensure smooth surface of valve stop faces displacement pump intake. Screw housing onto cylinder.

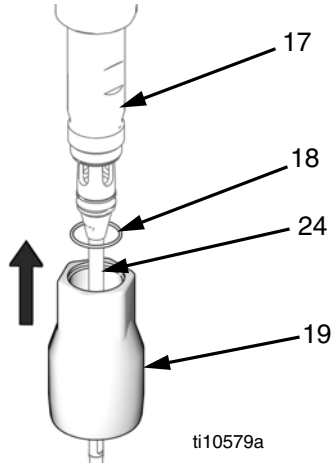


FIG. 23

- Lubricate priming piston rod (24), then slide assembled intake valve onto rod. Ensure packing nut (33) goes on rod first. Push valve assembly up rod, stopping before it reaches intake valve housing (19). See FIG. 24.

- Hold valve body (32) steady with a wrench while using an adjustable wrench to tighten packing nut (33); see the following table for correct torque. Use a rubber mallet on priming piston rod (24), to drive valve assembly up to stop.

| Displacement Pump | Torque |
|-------------------|---------------------------|
| 60cc and 100cc | 43-47 ft-lbs (58-63 N•m) |
| 200cc and 250cc | 71-79 ft-lbs (96-107 N•m) |

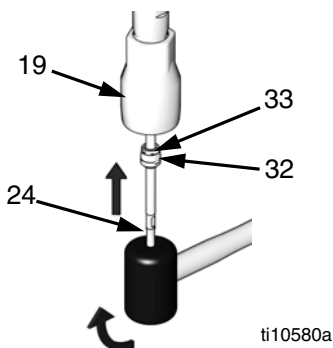



FIG. 24

- The intake seat (20) is reversible on the 200cc and 250cc displacement pumps. Inspect both sides of seat and install it with the best side facing into housing (19). Push it into housing until it seats securely. Lubricate seal (21) and install in the bevel around the bottom of the seat.

 For 60cc and 100cc displacement pumps, install intake seat (20) so large beveled side faces down toward pump intake.

- Lubricate threads of intake cylinder (22). Use an adjustable wrench to screw intake cylinder into intake valve housing (19). Torque intake cylinder; see the following table for correct torque. This will also torque intake valve housing (19) and displacement pump cylinder (17) into outlet housing (2).

| Displacement Pump | Torque |
|-------------------|------------------------------|
| 60cc and 100cc | 213-287 ft-lbs (288-387 N•m) |
| 200cc and 250cc | 345-435 ft-lbs (466-587 N•m) |

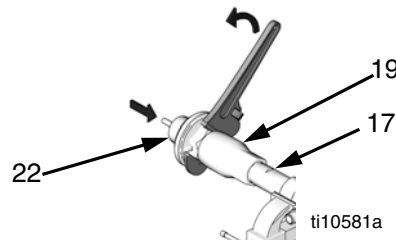


FIG. 25

 **Steps 14-21 apply to 500cc displacement pumps only.**

- Slide rod guide (19) onto priming piston rod (24) ensuring the end nearest valve stop goes on rod first.
- Slide assembled intake valve onto priming piston rod (24) ensuring packing nut (33) goes on rod first. Push valve assembly up rod, stopping before it reaches rod guide (19).
- Hold valve body (32) steady with a wrench while using an adjustable wrench to tighten packing nut (33). Torque to 71-78 ft-lbs (97-106 N•m). Use a hammer and a brass rod to carefully drive valve assembly further up rod until it reaches the stop.

17. Place cylinder (17) sideways in a vise with soft jaws.
18. Lubricate seal (18) and place it on bottom of cylinder (17). (Cylinder is symmetrical so either end can be the bottom.)
19. Slide displacement rod (1), piston assembly (T), intake valve assembly (R), and priming piston rod (24) into cylinder (17) from bottom until mating surfaces of rod guide (19) and cylinder (17) meet.

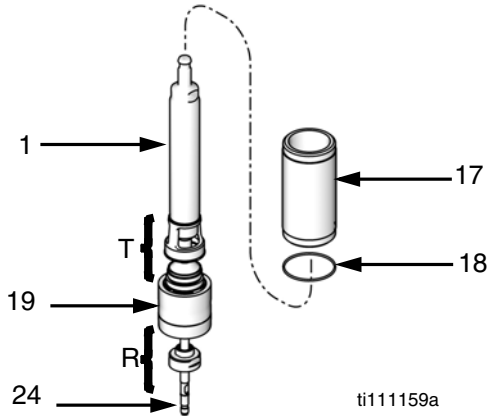


FIG. 26

20. Put intake housing (22) upright in a vise, making sure it is off-center so there is a sufficient clearance for priming piston rod (24) to be lowered through housing. Insert intake seat (20) into intake housing (22) so the flat seat is facing up. Lubricate seal (18) and place it on top of intake seat (20). Lower rod and cylinder assembly into intake housing until rod guide (19) bottoms on intake seat (20) and priming piston rod (24) protrudes from bottom of intake housing (22).

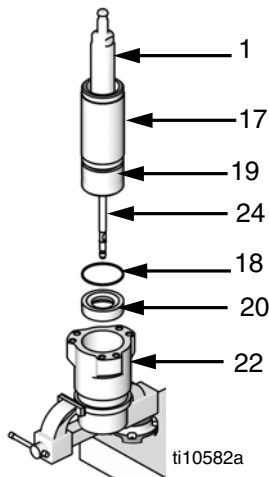



FIG. 27

21. Lubricate seal (18) and place it on top of cylinder (17). Insert outlet housing (2) on to cylinder. Install six long capscrews (45) through outlet housing (2) and into intake housing (22). Using a socket wrench, torque screws oppositely and evenly to 180-195 ft-lbs (244-264 N•m).

 L500SS and L500SM models: install washer (46) between capscrews (45) and outlet housing (2).

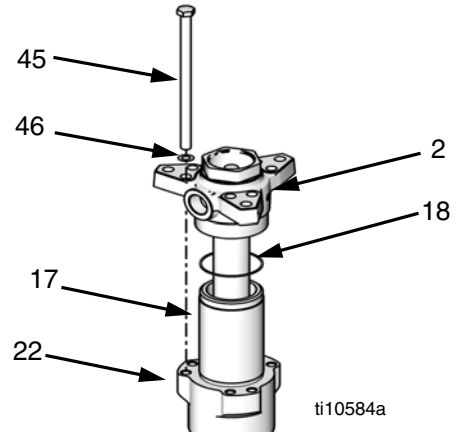


FIG. 28

22. Lubricate throat packings (M), and install them in throat cartridge (3) one at a time with the lips of the v-packings or u-cup facing down. Refer to Packing Kit sections for each displacement pump size for the correct throat packing configuration for your displacement pump.

23. Partially thread wet cup (9) into cartridge (3) to hold packings in place during installation. Install new cartridge o-ring (4) on cartridge (3). Apply thread lubricant to cartridge (3) and carefully slide down over displacement rod and into outlet housing (2). Torque cartridge to the following torque. Be careful not to damage throat packings on leading edge of rod.

| Displacement Pump | Torque |
|-------------------|------------------------------|
| 60cc and 100cc | 90-130 ft-lbs (122-176 N•m) |
| 200cc and 250cc | 130-190 ft-lbs (176-257 N•m) |
| 500cc | 150-261 ft-lbs (203-355 N•m) |

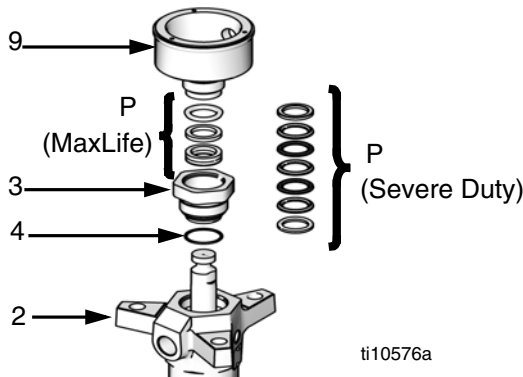


FIG. 29

24. Use packing nut wrench (supplied) to tighten wet cup (9) to specified torque; refer to the following table.

| Displacement Pump | Torque |
|-------------------|-----------------------------|
| 60cc and 100cc | 28-44 ft-lbs (38-59 N•m) |
| 200cc and 250cc | 95-115 ft-lbs (128-155 N•m) |
| 500cc | 95-115 ft-lbs (128-155 N•m) |

25. Lubricate the threads of the bleeder valve plug (40). The plug has two sets of threads. Be sure to screw the plug completely into the valve body (39). Torque the plug to 9-11 ft-lbs (12-15 N•m)

Some models include an outlet nipple (43) and o-ring (44). It is not ordinarily necessary to remove these parts. However, if they were replaced because of damage, lubricate o-ring and place it on nipple. Screw nipple into outlet housing (2). Torque to 44-62 ft-lbs (60-84 N•m).

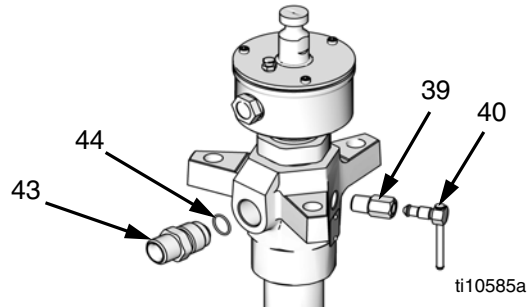


FIG. 30

Steps 26-27 apply only to displacement pumps with enclosed wet cups.

26. Install new o-ring (11), wet cup wiper (15), seal (16), and snap ring (61) into wet cup cover (10). See FIG. 31.

The snap ring (61) is applicable only to 60cc and 100cc displacement pumps.

27. Carefully slide wet cup cover (10) over displacement rod. Line up holes in cover and wet cup. Insert screws (14). Use a hex head screwdriver to tighten screws. See FIG. 31.

Use caution when sliding wet cup cover (10) over displacement rod (1) to avoid damaging seals (15, 16).

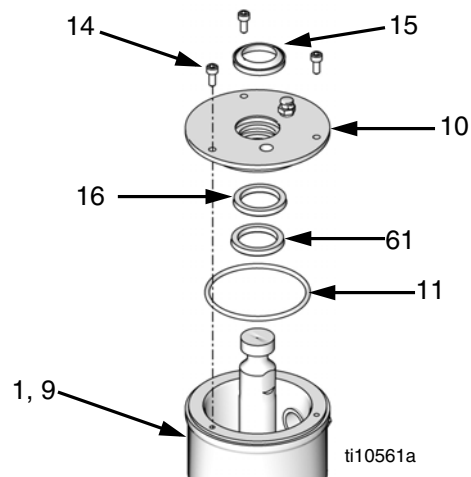


FIG. 31

28. Check that flats of priming piston rod (24) are accessible below intake cylinder (22). If not, tap on top of displacement rod (1) with a rubber mallet until flats are exposed.

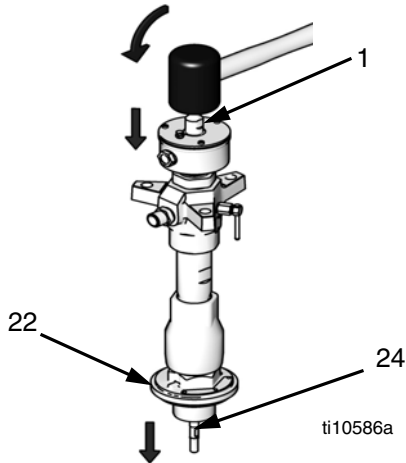


FIG. 32

29. Slide priming piston (26) and priming piston guide (25) onto rod (24) until it stops. Hold rod (24) steady with an adjustable wrench on flats, and screw seat (27) onto rod with another wrench. Torque to specified torque; refer to the following table.

| Displacement Pump | Torque |
|-------------------|---------------------------|
| 60cc and 100cc | 34-38 ft-lbs (46-51 N•m) |
| 200cc and 250cc | 57-63 ft-lbs (77-85 N•m) |
| 500cc | 71-79 ft-lbs (96-107 N•m) |

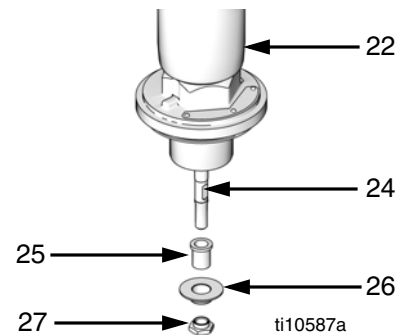


FIG. 33

30. Reconnect displacement pump to the air motor as explained in Check-Mate Pump Packages manual 312376.
31. Allow 2 hours for thread sealant to cure before returning pump to service.

Parts

60cc Displacement Pumps

KEY:

- △1 Torque to 85-95 ft-lb (115-128 N•m)
- △2 Torque to 28-44 ft-lb (38-59 N•m)
- △3 Torque to 213-287 ft-lb (288-387 N•m)
- △4 Torque to 43-47 ft-lb (58-63 N•m)
- △5 Torque to 34-38 ft-lb (45-51 N•m)
- △6 Torque to 26-30 ft-lb (35-41 N•m)
- △7 Torque to 90-130 ft-lb (122-173 N•m)
- △8 Torque to 44-62 ft-lb (60-84 N•m)

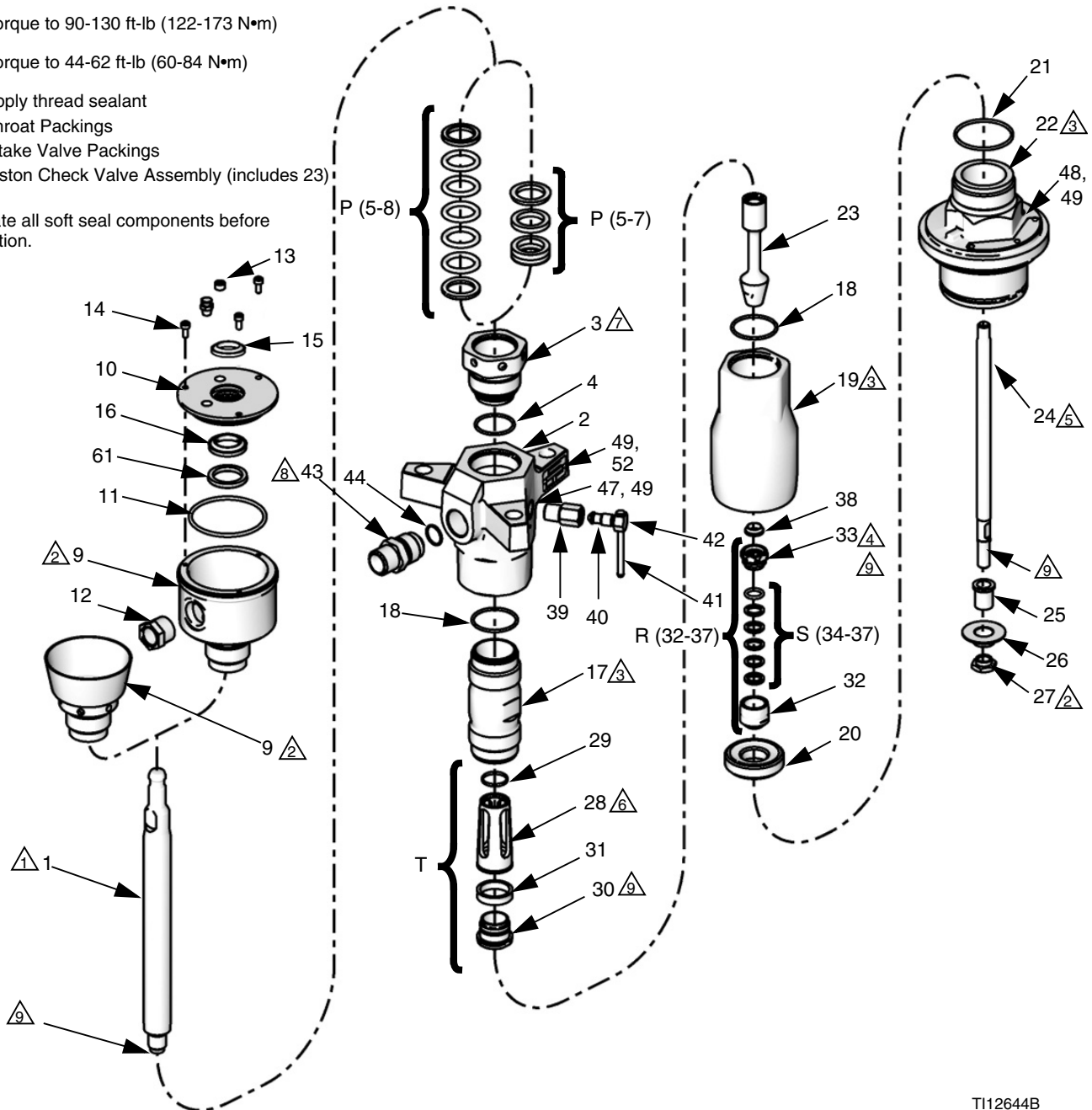
△9 Apply thread sealant

P: Throat Packings

S: Intake Valve Packings

T: Piston Check Valve Assembly (includes 23)

Lubricate all soft seal components before installation.



TI12644B

100cc Displacement Pumps

KEY:

Torque to 85-95 ft-lb (115-128 N•m)

Torque to 28-44 ft-lb (38-59 N•m)

Torque to 213-287 ft-lb (288-387 N•m)

Torque to 43-47 ft-lb (58-63 N•m)

Torque to 34-38 ft-lb (45-51 N•m)

Torque to 26-30 ft-lb (35-41 N•m)

Torque to 90-130 ft-lb (122-173 N•m)

Torque to 44-62 ft-lb (60-84 N•m)

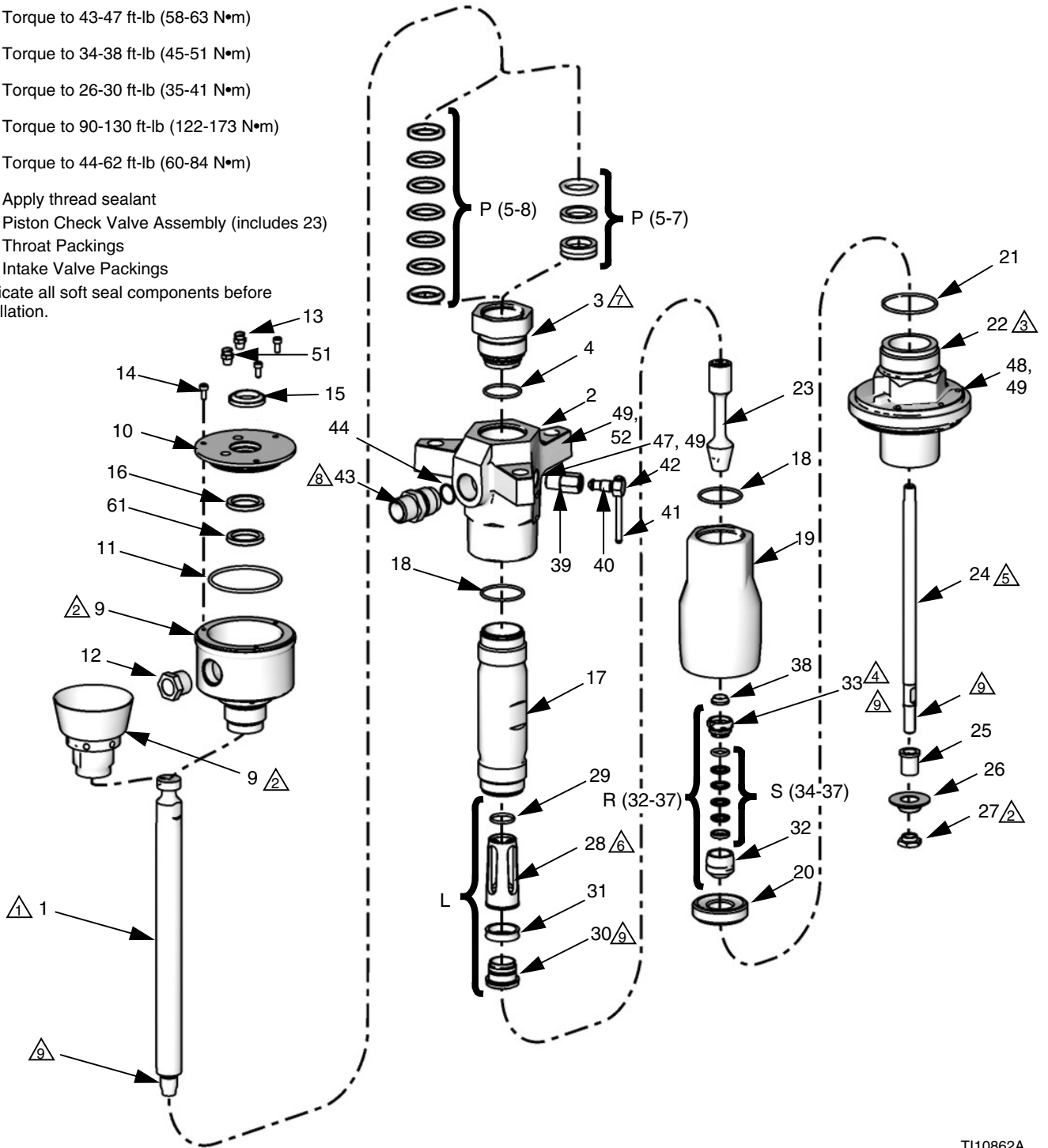
Apply thread sealant

L: Piston Check Valve Assembly (includes 23)

M: Throat Packings

N: Intake Valve Packings

Lubricate all soft seal components before installation.



T110862A

60cc and 100cc Displacement Pumps

| Ref. | Part | Description | Qty. | Ref. | Part | Description | Qty. |
|------|----------|--|------|------|----------|--|------|
| 1 | ★※257530 | KIT, rod, displacement; chrome (includes 18, 21); L060 only | 1 | 12‡ | ※※26A458 | SIGHTGLASS | 1 |
| | ★※184041 | ROD only, displacement; chrome; L060 | 1 | 13‡ | ※※102228 | COVER, oil hole | 1 |
| | ※※257531 | KIT, rod, displacement; MaxLife (includes 18, 21); L060 only | 1 | 14‡ | ※※117026 | SCREW, socket hd cap; M5 x 12 | 3 |
| | ※※26A476 | ROD only, displacement; MaxLife; L060 | 1 | 15‡ | ※※121129 | WIPER, wet cup cover | 1 |
| | ★※255569 | KIT, rod, displacement; chrome (includes 18, 21); L100 only | 1 | 16‡ | ※※121125 | SEAL, wet cup cover | 1 |
| | ★※26A464 | ROD, displacement; chrome; L100 | 1 | 17‡ | ★※26A470 | CYLINDER, pump; ss, 100 cc | 1 |
| | ※※255570 | KIT, rod, displacement; MaxLife (includes 18, 21); L100 only | 1 | | ★※15V122 | CYLINDER, pump; ss 60 cc | 1 |
| | ※※26A461 | ROD only, displacement; MaxLife; L100 | 1 | | ※※26A462 | CYLINDER, pump, MaxLife, 100 cc | 1 |
| 2 | ★※255604 | KIT, housing, outlet, (150 mm) (includes 18, 21, 44, 47, 49, 52) | 1 | | ※※26A472 | CYLINDER, pump, MaxLife; 60 cc | 1 |
| | ★※25C877 | HOUSING only | 1 | 18‡ | 109205 | O-RING | 2 |
| | ※※257561 | KIT, housing, outlet, (150 mm); sst (includes 18, 21, 44, 47, 49, 52) | 1 | 19 | ★※184044 | HOUSING, valve | 1 |
| | ※※25C878 | HOUSING only | 1 | | ※※15U586 | HOUSING, valve; sst | 1 |
| 3 | ★※15K751 | CARTRIDGE | 1 | 20‡ | ※※15U604 | SEAT, intake; sst | 1 |
| | ※※15U603 | CARTRIDGE; sst | 1 | | ★※184617 | SEAT, intake; cs | 1 |
| 4‡ | 104361 | O-RING, cartridge | 1 | 21‡ | 187860 | SEAL | 1 |
| 5‡ | ★※ | GLAND, packing female; see 60cc and 100cc Packing Kits on page 24 | 1 | 22 | ★※255610 | KIT, intake housing, cylinder; cs (includes 21, 48, 49) | 1 |
| | ※※ | GLAND, packing, u-cup; see 60cc and 100cc Packing Kits on page 24 | 1 | | ※※257560 | KIT, intake housing, cylinder; sst (includes 21, 48, 49) | 1 |
| 6‡ | ★※ | V-PACKING; UHMWPE; see 60cc and 100cc Packing Kits on page 24 | 3 | 23‡ | ※※15U590 | SEAT, piston; sst | 1 |
| | ※※ | SPACER, u-cup; see 60cc and 100cc Packing Kits on page 24 | 1 | | ★※184042 | SEAT, piston; cs | 1 |
| | ★※ | V-PACKING; PTFE; see 60cc and 100cc Packing Kits on page 24 | 2 | 24‡ | ★※187858 | ROD, piston | 1 |
| | ※※ | SPACER, u-cup; acetal; see 60cc and 100cc Packing Kits on page 24 | 1 | ‡ | ※※26A463 | ROD, piston; MaxLife | 1 |
| 7‡ | ★※ | GLAND, packing male; see 60cc and 100cc Packing Kits on page 24 | 1 | 25 | ★※184122 | GUIDE, piston; cs | 1 |
| | ★※ | NUT, packing, open wet cup SS | 1 | | ※※15U598 | GUIDE, piston; sst | 1 |
| | ★※236577 | NUT, packing, open wet cup CS | 1 | 26 | ★※184051 | PISTON; cs | 1 |
| | ※※15U974 | CUP, wet, enclosed; sm | 1 | | ※※15U597 | PISTON; sst | 1 |
| | ※※25C969 | CUP, enclosed; cm | 1 | 27 | ★※184121 | NUT, shovel; cs | 1 |
| 10‡ | ※※15U975 | COVER, wet cup; sm | 1 | | ※※15U596 | NUT, shovel; sst | 1 |
| | ※※25C970 | COVER, wet cup, enclosed; cm | 1 | 28 | ★※15M518 | GUIDE, piston; cs | 1 |
| 11‡ | ※※161446 | O-RING | 1 | | ※※257667 | GUIDE, piston; sst | 1 |
| | | | | 29‡ | 26A467 | BEARING, guide | 1 |
| | | | | 30 | ★※184052 | SEAT, piston; cs | 1 |
| | | | | | ※※15U591 | SEAT, piston; sst | 1 |
| | | | | 31‡ | 184053 | SEAL, piston | 1 |
| | | | | 32 | ★※15M485 | VALVE, intake; cs | 1 |
| | | | | | ※※26A475 | VALVE, intake; ss | 1 |
| | | | | 33 | ★※15M484 | NUT, packing; cs | 1 |
| | | | | | ★※15U599 | NUT, packing; ss | 1 |
| | | | | 34‡ | ★※ | GLAND, male, piston; see 60cc and 100cc Packing Kits on page 24 | 1 |
| | | | | 35‡ | | PACKING, UHMWPE; see 60cc and 100cc Packing Kits on page 24 | 2 |
| | | | | 36‡ | ※※ | PACKING; leather; see 60cc and 100cc Packing Kits on page 24 | 2 |
| | | | | | ★※ | PACKING, PTFE; see 60cc and 100cc Packing Kits on page 24 | 2 |

| Ref. | Part | Description | Qty. |
|------|----------|--|------|
| 37‡ | ★* | GLAND, female, piston; see 60cc and 100cc Packing Kits on page 24 | 1 |
| 38‡ | 184469 | SEAL, valve | 1 |
| 39 | 190126 | HOUSING, valve; cs | 1 |
| | 184392 | HOUSING, valve; ss | 1 |
| 40 | 190128 | PLUG, valve; cs | 1 |
| | 190293 | PLUG, valve; ss | 1 |
| 41‡ | 121133 | HANDLE, outlet bleed | 1 |
| 42‡ | 121134 | CLIP, outlet bleed | 1 |
| 43 | ★‡184037 | FITTING, outlet; cs | 1 |
| | *‡15U592 | FITTING, outlet; sst | 1 |
| 44‡ | 110135 | O-RING | 1 |
| 47▲ | 184090 | LABEL, warning | 1 |
| 48▲ | 184151 | LABEL, warning | 1 |
| 49 | 100508 | SCREW, drive | 7 |
| 50▲ | 172479 | TAG, instruction, safety | 1 |
| 51‡ | *‡110208 | PLUG, pipe; ss | 1 |
| 52‡ | 197561 | PLATE, identification | 1 |
| 61‡ | *‡26A471 | RING, retaining | 1 |

★ *CS Models only.*

* *SS Models only.*

‡ *CM Models only.*

*‡ *SM Models only.*

‡ *See 60cc and 100cc Kits table on page 22.*

▲ *Replacement Danger and Warning labels, tags, and cards are available at no cost.*

Kit Descriptions

| Kit | Description |
|--------|--|
| 255507 | Complete Seal Kit; Severe Duty, CS |
| 256866 | Complete Seal Kit; Severe Duty, SS |
| 255508 | Complete Seal Kit; MaxLife, CM |
| 256867 | Complete Seal Kit; MaxLife, SM |
| 255523 | Throat Seal Kit; Severe Duty |
| 255524 | Throat Seal Kit; MaxLife, CM |
| 257558 | Throat Seal Kit; MaxLife, SM |
| 255533 | Piston Seal Kit |
| 255539 | Intake Kit; Severe Duty, CS |
| 256865 | Intake Kit; Severe Duty, SS |
| 255540 | Intake Kit; MaxLife, CM |
| 256868 | Intake Kit; MaxLife, SM |
| 255551 | Piston Seal Metal and Soft Kit CS and CM |
| 257557 | Piston Seal Metal and Soft Kit SS and SM |
| 255557 | Intake Valve Seal Metal and Soft Kit; Severe Duty, CS |
| 256869 | Intake Valve Seal Metal and Soft Kit; Severe Duty; SS |
| 255558 | Intake Valve Seal Metal and Soft Kit; MaxLife, CM |
| 256870 | Intake Valve Seal Metal and Soft Kit; MaxLife, SM |
| 255577 | Priming Piston Rod Kit; Severe Duty, CS |
| 256871 | Priming Piston Rod Kit; Severe Duty, SS |
| 255578 | Priming Piston Rod Kit; MaxLife; CM |
| 256872 | Priming Piston Rod Kit; MaxLife, SM |
| 255604 | Outlet Kit, CS; see page 20 for parts included in kit |
| 257561 | Outlet Kit, SS; see page 20 for parts included in kit |
| 255610 | Intake Cylinder Kit, CS; see page 20 for parts included in kit |
| 257560 | Intake Cylinder Kit, SS; see page 20 for parts included in kit |
| 255615 | Bleed Valve Kit; CS |
| 255616 | Bleed Valve Kit; SS |
| 255618 | Enclosed Wet Cup Seal Kit; MaxLife |
| 255696 | Enclosed Wet Cup Kit; MaxLife, CS |
| 257559 | Enclosed Wet Cup Kit; MaxLife, SS |

| Kit | Description |
|---------------------------------|---|
| 16F205 | Complete Seal Kit; PTFE Alternative; includes all PTFE Alternative kits listed under 60cc and 100cc Packing Kits , page 24 |
| 60cc Displacement Pumps | |
| 257530 | Displacement Rod Kit; Severe Duty, L060CS and L060SS; see page 20 for parts included in kit |
| 257531 | Displacement Rod Kit; MaxLife, L060CM and L060SM; see page 20 for parts included in kit |
| 257532 | Cylinder Kit; Severe Duty, L060CS and L060SS |
| 257533 | Cylinder Kit; MaxLife, L060CM and L060SM |
| 100cc Displacement Pumps | |
| 255569 | Displacement Rod Kit; Severe Duty, L100CS and L100SS; see page 20 for parts included in kit |
| 255570 | Displacement Rod Kit; MaxLife, CM and SM; see page 20 for parts included in kit |
| 255591 | Cylinder Kit; Severe Duty, L100CS and L100SS |
| 255592 | Cylinder Kit; MaxLife, L100CM and L100SM |

60cc and 100cc Packing Kits

Throat Packings

Severe Duty

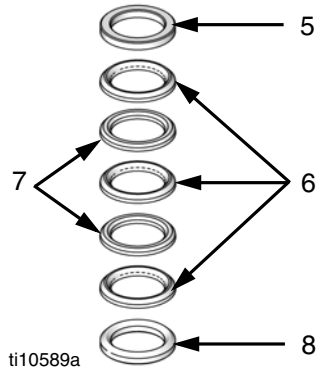
| Ref. | Part | Description | Qty. |
|------|-----------|-----------------------------|------|
| 5 | ★✱ 184172 | GLAND, packing female; SST | 1 |
| | ✱✱ 184172 | GLAND, packing, female; SST | 1 |
| 6 | 109252 | V-PACKING; UHMWPE | 3 |
| 7 | 109302 | V-PACKING; PTFE | 2 |
| 8 | ★✱ 184222 | GLAND, packing male; SST | 1 |
| | ✱✱ 184222 | GLAND, packing male; SST | 1 |

MaxLife

| Ref. | Part | Description | Qty. |
|------|-----------|----------------|------|
| 5 | 121100 | SEAL, u-cup | 1 |
| 6 | ★✱ 15V120 | SPACER, CST | 1 |
| | ✱✱ 15M488 | SPACER, SST | 1 |
| 7 | 26A469 | SPACER, acetal | 1 |

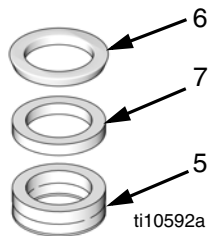
Severe Duty

* Lips face down



MaxLife

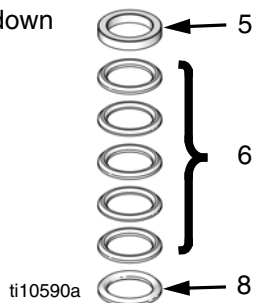
* Lips face down



PTFE Alternative

| Ref. | Part | Description | Qty. |
|------|--------|-----------------------------|------|
| 5 | 184172 | GLAND, packing, female; SST | 1 |
| 6 | 109302 | V-PACKING, PTFE | 5 |
| 8 | 184222 | GLAND, packing, male; SST | 1 |

* Lips face down



Intake Valve Packings

Severe Duty and MaxLife

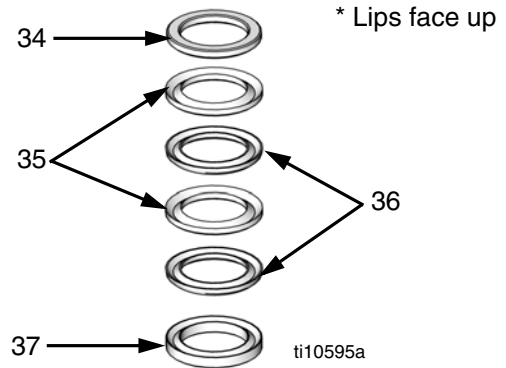
| Ref. | Part | Description | Qty. |
|------|-----------|------------------------------------|------|
| 34 | ★✱ 26A465 | GLAND, male, priming piston; CST | 1 |
| | ✱✱ 26A474 | GLAND, male, priming piston; SST | 1 |
| 35 | ✱✱ 26A460 | PACKING; UHMWPE | 2 |
| 36 | ★✱ 26A468 | PACKING; PTFE | 2 |
| | ✱✱ 26A459 | PACKING; leather | 2 |
| 37 | ★✱ 26A466 | GLAND, female, priming piston; CST | 1 |
| | ✱✱ 26A473 | GLAND, female, priming piston; SST | 1 |

★ CS Models only.

✱ SS Models only.

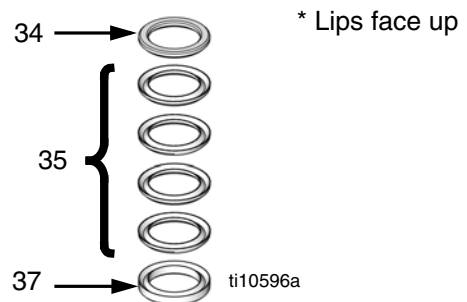
✱ CM Models only.

✱ SM Models only.



PTFE Alternative

| Ref. | Part | Description | Qty. |
|------|--------|------------------------------------|------|
| 34 | 26A474 | GLAND, male, priming piston; SST | 1 |
| 35 | 26A468 | PACKING, PTFE | 4 |
| 37 | 26A473 | GLAND, female, priming piston; SST | 1 |











Piston Packings

PTFE Alternative

| Ref. | Part | Description | Qty. |
|------|--------|--------------|------|
| 31 | 184053 | SEAL, piston | 1 |

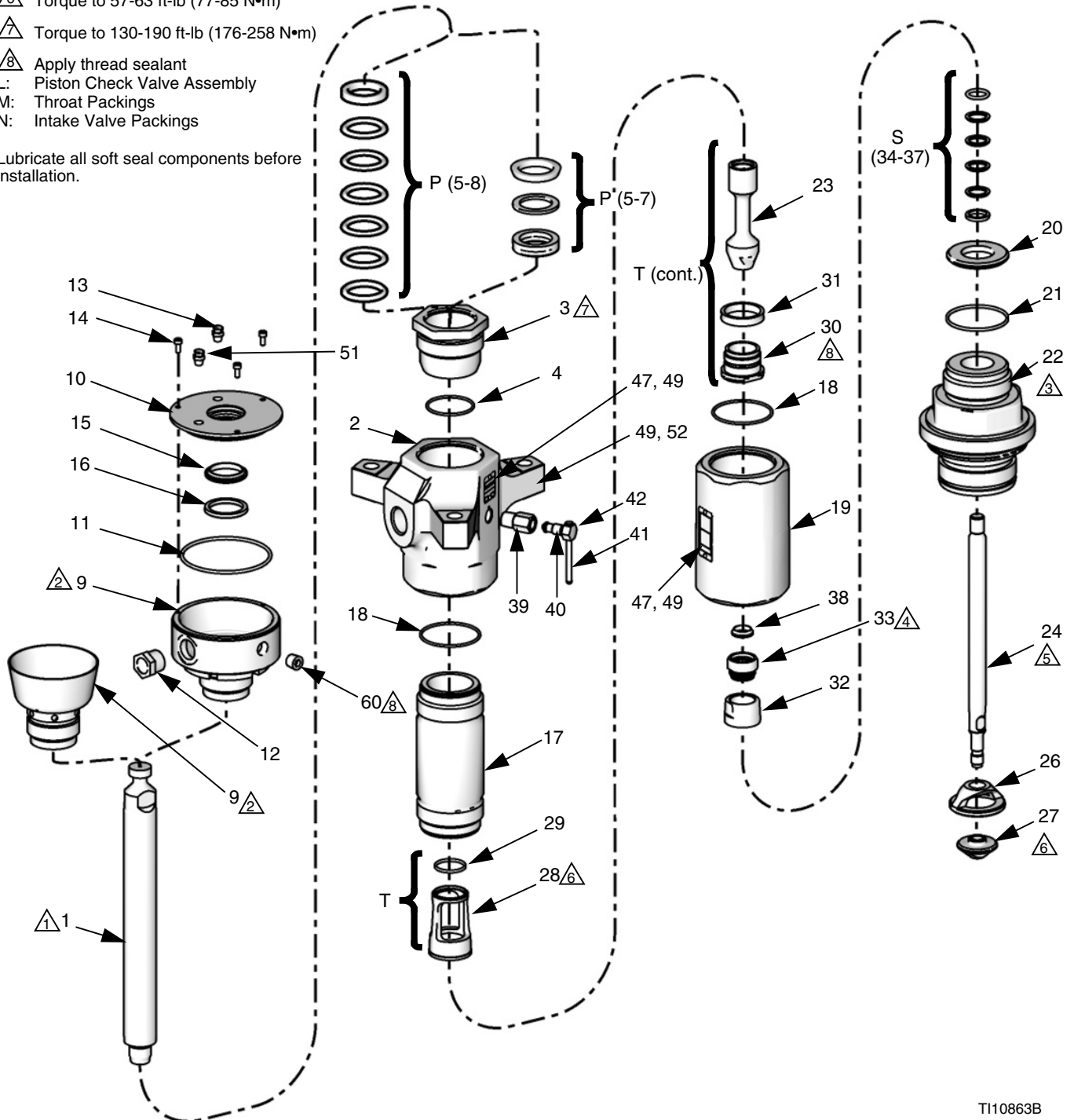
200cc and 250cc Displacement Pumps

KEY:

-  Torque to 239-271 ft-lb (323-366 N•m)
-  Torque to 95-115 ft-lb (128-155 N•m)
-  Torque to 345-435 ft-lb (466-587 N•m)
-  Torque to 71-79 ft-lb (96-107 N•m)
-  Torque to 92-102 ft-lb (124-138 N•m)
-  Torque to 57-63 ft-lb (77-85 N•m)
-  Torque to 130-190 ft-lb (176-258 N•m)
-  Apply thread sealant
- L: Piston Check Valve Assembly
- M: Throat Packings
- N: Intake Valve Packings

Lubricate all soft seal components before installation.

200cc Displacement Pump Shown



T110863B

200cc Displacement Pumps

| Ref. | Part | Description | Qty. | Ref. | Part | Description | Qty. |
|------|----------|---|------|------|----------|---|------|
| | | | | 31‡ | | SEAL, piston; see L200cc Packing Kits | 1 |
| 1 | ★*255571 | KIT, rod, displacement; chrome (includes 18, 21) | 1 | 32‡ | | VALVE, intake | 1 |
| | ⊠*255572 | KIT, rod, displacement; MaxLife (includes 18, 21) | 1 | 33‡ | ★⊠ | NUT, packing | 1 |
| 2 | ★⊠255605 | KIT, outlet, housing (includes 18, 21, 47, 49, 52) | 1 | | ✱* | NUT, packing; SST | 1 |
| | ✱*255606 | KIT, outlet, housing; SST (includes 18, 21, 47, 49, 52) | 1 | 34‡ | ★⊠ | GLAND, male, piston; see L200cc Packing Kits | 1 |
| 3 | ★⊠189641 | CARTRIDGE | 1 | | ✱* | GLAND, male, piston; SST; see L200cc Packing Kits | 1 |
| | ✱*189645 | CARTRIDGE; SST | 1 | 35‡ | | V-PACKING; see L200cc Packing Kits | 2 |
| 4‡ | 166073 | O-RING | 1 | 36‡ | ★* | V-PACKING; see L200cc Packing Kits | 2 |
| 5‡ | ★* | GLAND, packing female; see L200cc Packing Kits | 1 | | ⊠* | V-PACKING; see L200cc Packing Kits | 2 |
| | ⊠* | GLAND, packing, u-cup; see L200cc Packing Kits | 1 | 37‡ | ★⊠ | GLAND, female; see L200cc Packing Kits | 1 |
| 6‡ | ★* | V-PACKING; PTFE; see L200cc Packing Kits | 2 | | ✱* | GLAND, female, piston; SST; see L200cc Packing Kits | 1 |
| | ⊠* | SPACER, u-cup; see L200cc Packing Kits | 1 | 38‡ | | SEAL, valve | 1 |
| 7‡ | ★* | V-PACKING; UHMWPE; see L200cc Packing Kits | 3 | 39‡ | ★⊠ | HOUSING, valve | 1 |
| | ⊠* | SPACER, u-cup, bearing; see L200cc Packing Kits | 1 | | ✱* | HOUSING, valve; SST | 1 |
| 8‡ | ★* | GLAND, packing male; see L200cc Packing Kits | 1 | 40‡ | ★⊠ | PLUG, valve | 1 |
| | | | | | ✱* | PLUG, valve; SST | 1 |
| 9‡ | ★222995 | NUT, packing, open CS | 1 | 41‡ | | HANDLE, outlet bleed | 1 |
| | ✱236582 | NUT, packing, open; SST | 1 | 42‡ | | CLIP, outlet bleed | 1 |
| | ⊠ | CUP, wet, enclosed | 1 | 47▲ | ★⊠184090 | LABEL, warning | 2 |
| | ✱ | CUP, wet, enclosed, SST | 1 | | ✱*184462 | | |
| 10‡ | ⊠* | COVER, wet cup | 1 | 49 | ★⊠100508 | SCREW, drive | 6 |
| 11‡ | ⊠*104095 | O-RING | 1 | | ✱*109202 | | |
| 12‡ | ⊠* | SIGHTGLASS | 1 | 50▲ | 172479 | TAG, instruction, safety | 1 |
| 13‡ | ⊠* | COVER, oil hole | 1 | 51 | ⊠* | PLUG, pipe | 1 |
| 14‡ | ⊠* | SCREW, socket hd cap; M5 x 12 | 3 | 52 | 197561 | PLATE, identification | 1 |
| 15‡ | ⊠* | WIPER, wet cup cover | 1 | 60 | ⊠* | PLUG, pipe | 1 |
| 16‡ | ⊠* | SEAL, wet cup cover | 1 | | | | |
| 17‡ | ★* | CYLINDER, pump, Severe Duty | 1 | | ★ | <i>Model L200CS only.</i> | |
| | ⊠* | CYLINDER, pump, MaxLife | 1 | | ⊠ | <i>Model L200CM only.</i> | |
| 18‡ | 109499 | O-RING | 2 | | ✱ | <i>Model L200SS only.</i> | |
| 19 | ★⊠189442 | HOUSING, valve | 1 | | ✱ | <i>Model L200SM only.</i> | |
| | ✱*189512 | HOUSING, valve; SST | 1 | | ‡ | <i>See L200cc Kits table, page 27.</i> | |
| 20‡ | | SEAT, valve | 1 | | ▲ | <i>Replacement Danger and Warning labels, tags, and cards are available at no cost.</i> | |
| 21 | 189492 | SEAL | 1 | | | | |
| 22 | ★⊠255611 | KIT, intake housing (includes 21, 47) | 1 | | | | |
| | ✱*255612 | KIT, intake housing; SST (includes 21, 47) | 1 | | | | |
| 23‡ | | SEAT, piston | 1 | | | | |
| 24‡ | ★* | ROD, piston; Severe Duty | 1 | | | | |
| | ⊠* | ROD, piston; MaxLife | 1 | | | | |
| 26 | 276378 | PISTON | 1 | | | | |
| 27 | 190241 | SEAT, piston | 1 | | | | |
| 28‡ | ★⊠15M520 | GUIDE, piston | 1 | | | | |
| | ✱*15M654 | GUIDE, piston; SST | 1 | | | | |
| 29‡ | | BEARING, guide | 1 | | | | |
| 30‡ | | SEAT, piston | 1 | | | | |

L200cc Kits

The following table indicates which parts (according to reference number) are included in each kit.

| Kit | Reference Numbers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|--|--|--|--|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 20 | 21 | 23 | 24 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 51 | 60 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255509 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255510 | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | ✓ | | ✓ | | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255511 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255512 | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | ✓ | | ✓ | | | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255525 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255526 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255527 | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255534 | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255541 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255542 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255552 | | | | | | | | | | | | | | | ✓ | | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255559 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255560 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255579 | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255580 | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255581 | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255582 | | | | | | | | | | | | | | | ✓ | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255593 | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255594 | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255615 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 255616 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | |
| 255619 | | | | | | | | | | ✓ | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255622 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255623 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255625 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255626 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255693 | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | ✓ | | ✓ | | | | | | | ✓ | | | ✓ | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255697 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | |
| 255700 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | |

L200cc Kit Descriptions

| Kit | Description |
|------------|--|
| 255509 | Complete Seal Kit, L200CS |
| 255510 | Complete Seal Kit, L200CM |
| 255511 | Complete Seal Kit, L200SS |
| 255512 | Complete Seal Kit, L200SM |
| 255525 | Throat Seal Kit, L200CS |
| 255526 | Throat Seal Kit, L200SS |
| 255527 | Throat Seal Kit, L200CM and L200SM |
| 255534 | Piston Kit |
| 255541 | Intake Soft Seal Kit, L200CS |
| 255622 | Intake Soft Seal Kit, L200CM |
| 255542 | Intake Soft Seal Kit, L200SS |
| 255623 | Intake Soft Seal Kit, L200SM |
| 255552 | Piston Seal Metal and Soft Kit |
| 255559 | Intake Valve Seal Metal and Soft Kit; Severe Duty, L200CS |
| 255625 | Intake Valve Seal Metal and Soft Kit; MaxLife, L200CM |
| 255560 | Intake Valve Seal Metal and Soft Kit; Severe Duty, L200SS |
| 255626 | Intake Valve Seal Metal and Soft Kit; MaxLife, L200SM |
| 255571 | Displacement Rod Kit, L200CS and L200SS; see 26 for parts included in kit |
| 255572 | Displacement Rod Kit, L200CM and L200SM; see 26 for parts included in kit |
| 255579 | Priming Piston Rod Kit; L200CS |
| 255580 | Priming Piston Rod Kit; L200CM |
| 255581 | Priming Piston Rod Kit; L200SS |
| 255582 | Priming Piston Rod Kit; L200SM |
| 255593 | Cylinder Kit; L200CS, L200SS |
| 255594 | Cylinder Kit; L200CM, L200CS |
| 255605 | Outlet Kit; Carbon models; see 26 for parts included in kit |
| 255606 | Outlet Kit; SST models; see 26 for parts included in kit |
| 255611 | Intake Housing Kit; Carbon models; see 26 for parts included in kit |
| 255612 | Intake Housing Kit; SST models; see 26 for parts included in kit |
| 255615 | Bleed Valve Kit, all Carbon models |

| Kit | Description |
|------------|---|
| 255616 | Bleed Valve Kit, all SST models |
| 255619 | Enclosed Wet Cup Seal Kit; MaxLife, L200CM and L200SM |
| 255693 | Complete Seal Kit; PTFE Alternative; includes all PTFE Alternative kits listed under L200cc Packing Kits , page 29 |
| 255697 | Enclosed Wet Cup Kit; L200CM |
| 255700 | Enclosed Wet Cup Kit; L200SM |

L200cc Packing Kits

Throat Packings

Severe Duty

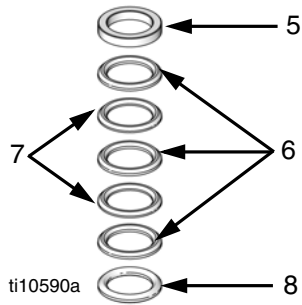
| Ref. | Description | Qty. |
|------|-----------------------------|------|
| 5 | ★ GLAND, packing female | 1 |
| | ✱ GLAND, SST | 1 |
| 6 | V-PACKING; UHMWPE | 3 |
| 7 | V-PACKING; PTFE | 2 |
| 8 | ★ GLAND, packing, male | 1 |
| | ✱ GLAND, packing, male; SST | 1 |

MaxLife

| Ref. | Description | Qty. |
|------|----------------|------|
| 5 | SEAL, u-cup | 1 |
| 6 | SPACER, metal | 1 |
| 7 | SPACER, acetal | 1 |

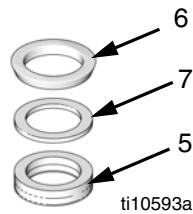
Severe Duty

* Lips face down



MaxLife

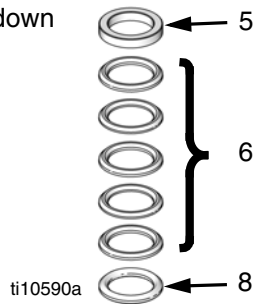
* Lips face down



PTFE Alternative

| Ref. | Description | Qty. |
|------|------------------------|------|
| 5 | GLAND, packing, female | 1 |
| 6 | V-PACKING, PTFE | 5 |
| 8 | GLAND, packing, male | 1 |

* Lips face down



Intake Valve Packings

Severe Duty and MaxLife

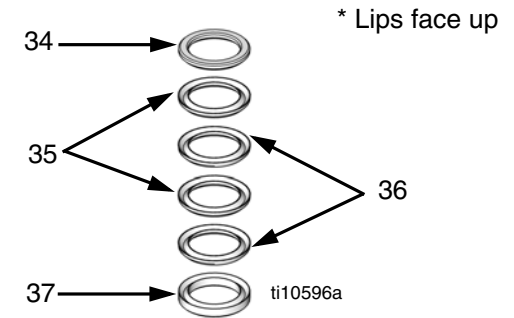
| Ref. | Description | Qty. |
|------|---------------------------------------|------|
| 34 | ★✱ GLAND, male, priming piston | 1 |
| | ✱✱ GLAND, male, priming piston; SST | 1 |
| 35 | PACKING; UHMWPE | 2 |
| 36 | ★✱ PACKING; PTFE (Severe Duty) | 2 |
| | ✱✱ PACKING; leather (MaxLife) | 2 |
| 37 | ★✱ GLAND, female, priming piston | 1 |
| | ✱✱ GLAND, female, priming piston; SST | 1 |

★ Model L200CS only.

✱ Model L200CM only.

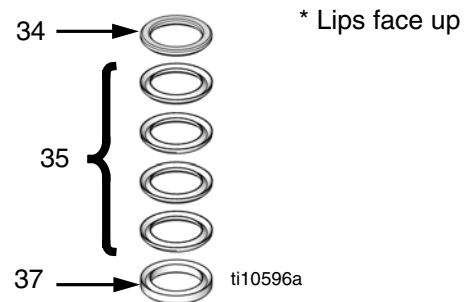
✱ Model L200SS only.

✱✱ Model L200SM only.



PTFE Alternative

| Ref. | Description | Qty. |
|------|-------------------------------|------|
| 34 | GLAND, male, priming piston | 1 |
| 35 | PACKING, PTFE | 4 |
| 37 | GLAND, female, priming piston | 1 |



Piston Packings

PTFE Alternative

| Ref. | Description | Qty. |
|------|--------------|------|
| 31 | SEAL, piston | 1 |

250cc Displacement Pumps

| Ref. | Part | Description | Qty. | Ref. | Part | Description | Qty. |
|------|----------|---|------|------|----------|---|------|
| | | | | 30‡ | | SEAT, piston | 1 |
| | | | | 31‡ | | SEAL, piston | 1 |
| 1 | ★※255573 | KIT, rod, displacement; chrome (includes 18, 21) | 1 | 32‡ | | VALVE, intake | 1 |
| | ※※255574 | KIT, rod, displacement; MaxLife (includes 18, 21) | 1 | 33‡ | ★※ | NUT, packing | 1 |
| 2 | ★※255605 | KIT, outlet, housing (includes 18, 21, 47, 49, 52) | 1 | | ※※ | NUT, packing; SST | 1 |
| | ※※255606 | KIT, outlet, housing, SST (includes 18, 21, 47, 49, 52) | 1 | 34‡ | | GLAND, male, piston; SST; see L250cc Packing Kits | 1 |
| 3 | ★※189641 | CARTRIDGE | 1 | 35‡ | | V-PACKING; see L250cc Packing Kits | 2 |
| | ※※189645 | CARTRIDGE; SST | 1 | 36‡ | ★※ | V-PACKING; PTFE; see L250cc Packing Kits | 2 |
| 4‡ | 166073 | O-RING | 1 | | ※※ | V-PACKING; leather; see L250cc Packing Kits | 2 |
| 5‡ | ★※ | GLAND, packing female; see L250cc Packing Kits | 1 | 37‡ | | GLAND, female, piston; see L250cc Packing Kits | 1 |
| | ※※ | GLAND, packing, u-cup; see L250cc Packing Kits | 1 | 38‡ | | SEAL, valve | 1 |
| 6‡ | ★※ | V-PACKING; PTFE; see L250cc Packing Kits | 2 | 39‡ | ★※ | HOUSING, valve | 1 |
| | ※※ | SPACER, u-cup; see L250cc Packing Kits | 1 | | ※※ | HOUSING, valve; SST | 1 |
| 7‡ | ★※ | V-PACKING; UHMWPE; see L250cc Packing Kits | 3 | 40‡ | ★※ | PLUG, valve | 1 |
| | ※※ | SPACER, acetal; see L250cc Packing Kits | 1 | | ※※ | PLUG, valve; SST | 1 |
| 8‡ | ★※ | GLAND, packing male; see L250cc Packing Kits | 1 | 41‡ | | HANDLE, outlet bleed | 1 |
| 9‡ | ★222995 | NUT, packing, open CS | 1 | 42‡ | | CLIP, outlet bleed | 1 |
| | ※236582 | NUT, packing, open SS | 1 | 47▲ | ★※184090 | LABEL, warning | 2 |
| | ‡ | CUP, wet, enclosed | | | ※※184462 | LABEL, warning | 2 |
| | ※※ | CUP, wet; SST | 1 | 49 | ★※100508 | SCREW, drive | 6 |
| 10‡ | ※※ | COVER, wet cup | 1 | | ※※109202 | SCREW, drive | 6 |
| 11‡ | ※※104095 | O-RING | 1 | 50▲ | 172479 | TAG, instruction, safety | 1 |
| 12‡ | ※※ | SIGHTGLASS | 1 | 51 | ※※ | PLUG, pipe | 1 |
| 13‡ | ※※ | COVER, oil hole | 1 | 52 | 197561 | PLATE, identification | 1 |
| 14‡ | ※※ | SCREW, socket hd cap; M5 x 12 | 3 | 60 | ※※ | PLUG, pipe | 1 |
| 15‡ | ※※ | WIPER, wet cup cover | 1 | | | | |
| 16‡ | ※※ | SEAL, wet cup cover | 1 | ★ | | <i>Model L250CS only.</i> | |
| 17‡ | ★※ | CYLINDER, pump | 1 | ‡ | | <i>Model L250CM only.</i> | |
| | ※※ | CYLINDER, pump, MaxLife | 1 | ※ | | <i>Model L250SS only.</i> | |
| 18‡ | 109499 | O-RING | 2 | ※ | | <i>Model L250SM only.</i> | |
| 19 | ★※190389 | HOUSING, valve | 1 | ‡ | | <i>See L250cc Kits table, page 31.</i> | |
| | ※※190390 | HOUSING, valve; SST | 1 | ▲ | | <i>Replacement Danger and Warning labels, tags, and cards are available at no cost.</i> | |
| 20‡ | | SEAT, valve | 1 | | | | |
| 21‡ | 189492 | SEAL, | 1 | | | | |
| 22 | ★※255611 | KIT, intake housing (includes 21, 47) | 1 | | | | |
| | ※※255612 | KIT, intake housing; SST (includes 21, 47) | 1 | | | | |
| 23‡ | | SEAT, piston | 1 | | | | |
| 24‡ | ★※ | ROD, piston | 1 | | | | |
| | ※※ | ROD, piston; MaxLife | 1 | | | | |
| 26 | 276378 | PISTON | 1 | | | | |
| 27 | 190241 | SEAT, piston | 1 | | | | |
| 28‡ | ★※15M655 | GUIDE, piston | 1 | | | | |
| | ※※15M523 | GUIDE, piston; SST | 1 | | | | |
| 29‡ | | BEARING, guide | 1 | | | | |

L250cc Kits

The following table indicates which parts (according to reference number) are included in each kit.

| Kit | Reference Numbers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|---|---|---|---|--|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 20 | 21 | 23 | 24 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 51 | 60 | | | | | | |
| 255513 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | | | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| 255514 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255515 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | ✓ | | | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255516 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255528 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255529 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255530 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255536 | | | | | | | | | | | | | | | ✓ | | ✓ | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | | |
| 255543 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255544 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255545 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255546 | | | | | | | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255554 | | | | | | | | | | | | | | | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| 255561 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255562 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255563 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255564 | | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255583 | | | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255584 | | | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255585 | | | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255586 | | | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | |
| 255597 | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | |
| 255598 | | | | | | | | | | | | | | | ✓ | ✓ | | ✓ | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | |
| 255615 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | |
| 255616 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | |
| 255620 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255694 | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | | ✓ | | ✓ | | | | | | ✓ | | | ✓ | | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255698 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | |
| 255701 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | |

L250cc Kit Descriptions

| Kit | Description |
|------------|--|
| 255513 | Complete Seal Kit, L250CS |
| 255514 | Complete Seal Kit, L250CM |
| 255515 | Complete Seal Kit, L250SS |
| 255516 | Complete Seal Kit, L250SM |
| 255528 | Throat Seal Kit, L250CS |
| 255529 | Throat Seal Kit, L250SS |
| 255530 | Throat Seal Kit, L250CM and L250SM |
| 255536 | Piston Kit |
| 255543 | Intake Soft Seal Kit, L250CS |
| 255544 | Intake Soft Seal Kit, L250CM |
| 255545 | Intake Soft Seal Kit, L250SS |
| 255546 | Intake Soft Seal Kit, L250SM |
| 255554 | Piston Seal Metal and Soft Kit |
| 255561 | Intake Valve Seal Metal and Soft Kit; L250CS |
| 255562 | Intake Valve Seal Metal and Soft Kit; L250CM |
| 255563 | Intake Valve Seal Metal and Soft Kit; L250SS |
| 255564 | Intake Valve Seal Metal and Soft Kit; L250SM |
| 255573 | Displacement Rod Kit, L250CS and L250SS |
| 255574 | Displacement Rod Kit, L250CM and L250SM |
| 255583 | Priming Piston Rod Kit; L250CS |
| 255584 | Priming Piston Rod Kit; L250CM |
| 255585 | Priming Piston Rod Kit; L250SS |
| 255586 | Priming Piston Rod Kit; L250SM |
| 255597 | Cylinder Kit; L250CS and L250SS |
| 255598 | Cylinder Kit; L250CM and L250SM |
| 255605 | Outlet Kit; Carbon models |
| 255606 | Outlet Kit; SST models |
| 255611 | Intake Housing Kit; Carbon models |
| 255612 | Intake Housing Kit; SST models |
| 255615 | Bleed Valve Kit, all Carbon models |

| Kit | Description |
|------------|--|
| 255616 | Bleed Valve Kit, all SST models |
| 255620 | Enclosed Wet Cup Seal Kit; MaxLife, L250CM and L250SM |
| 255694 | Complete Seal Kit; PTFE Alternative; includes all PTFE alternative kits listed under L250cc Packing Kits , page 33. |
| 255698 | Enclosed Wet Cup Kit; L250CM |
| 255701 | Enclosed Wet Cup Kit; L250SM |

L250cc Packing Kits

Throat Packings

Severe Duty

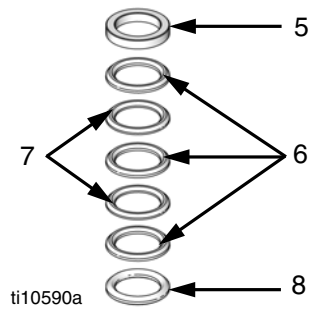
| Ref. | Description | Qty. |
|------|-------------------------------|------|
| 5 | ★ GLAND, packing, female | 1 |
| | ※ GLAND, packing, female; SST | 1 |
| 6 | V-PACKING; UHMWPE | 3 |
| 7 | V-PACKING; PTFE | 2 |
| 8 | ★ GLAND, packing, male | 1 |
| | ※ GLAND, packing, male; SST | 1 |

MaxLife

| Ref. | Description | Qty. |
|------|----------------|------|
| 5 | SEAL, u-cup | 1 |
| 6 | SPACER, metal | 1 |
| 7 | SPACER, acetal | 1 |

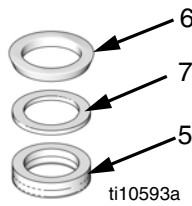
Severe Duty

* Lips face down



MaxLife

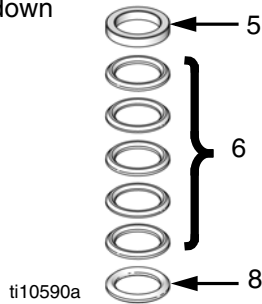
* Lips face down



PTFE Alternative

| Ref. | Description | Qty. |
|------|------------------------|------|
| 5 | GLAND, packing, female | 1 |
| 6 | V-PACKING, PTFE | 5 |
| 8 | GLAND, packing, male | 1 |

* Lips face down



Intake Valve Packings

Severe Duty and MaxLife

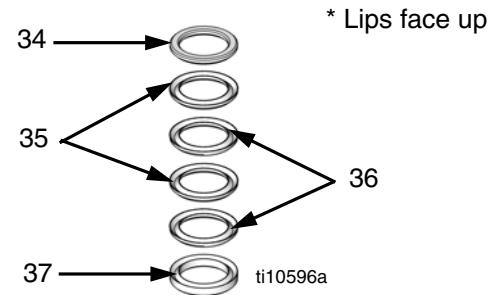
| Ref. | Description | Qty. |
|------|----------------------------------|------|
| 34 | GLAND, male, priming piston; SST | 1 |
| 35 | PACKING; UHMWPE | 2 |
| 36 | ★※ PACKING; PTFE (Severe Duty) | 2 |
| | ※※ PACKING; leather (MaxLife) | 2 |
| 37 | GLAND, female, priming piston | 1 |

★ Model L250CS only.

※ Model L250CM only.

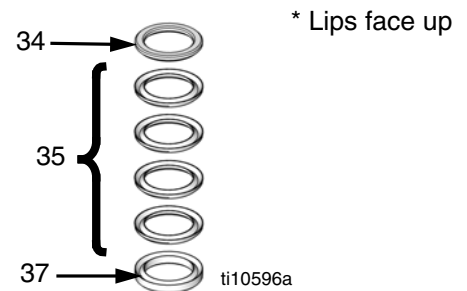
※ Model L250SS only.

※ Model L250SM only.



PTFE Alternative

| Ref. | Description | Qty. |
|------|-------------------------------|------|
| 34 | GLAND, male, priming piston | 1 |
| 35 | PACKING, PTFE | 4 |
| 37 | GLAND, female, priming piston | 1 |



Piston Packings

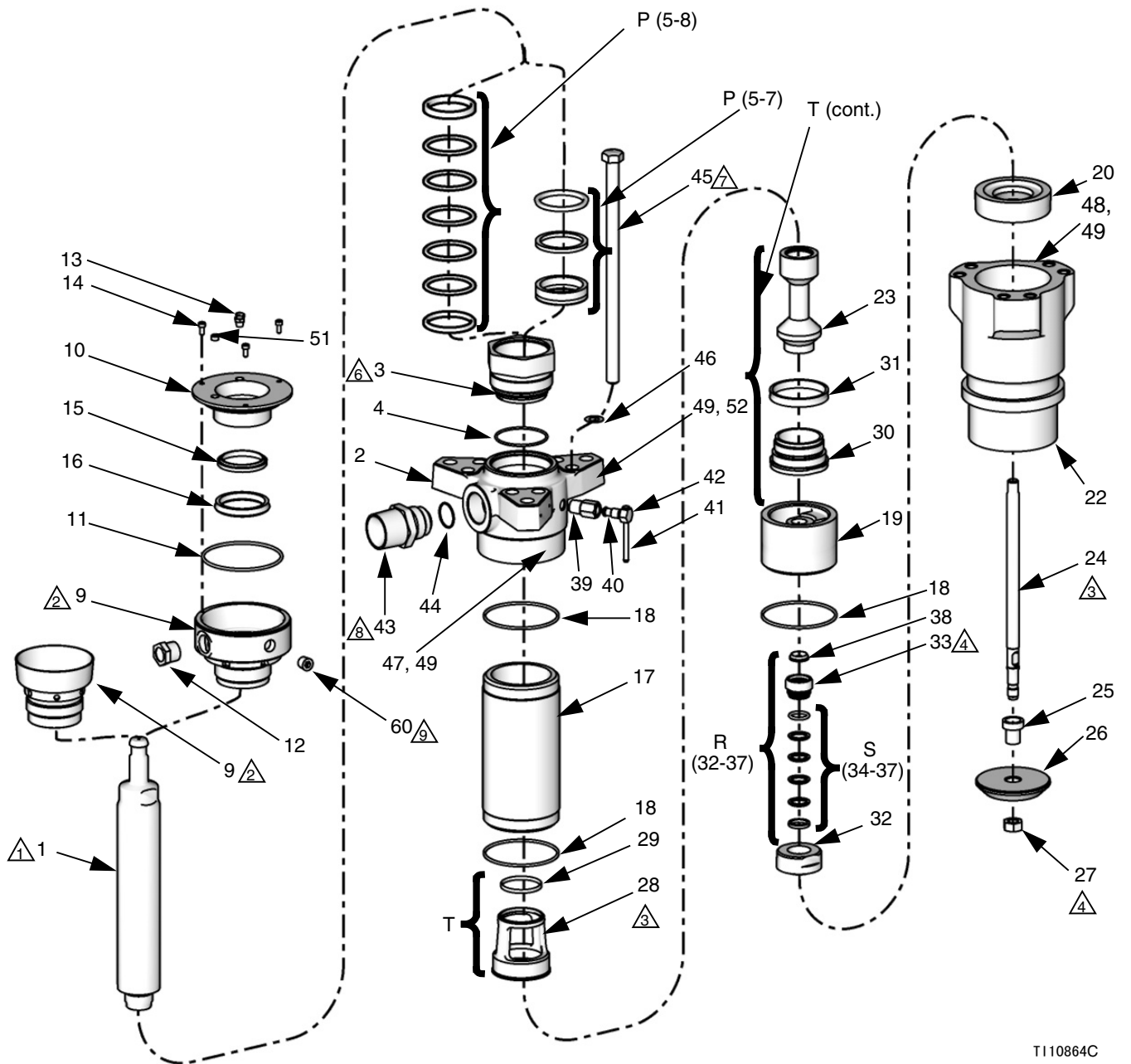
PTFE Alternative

| Ref. | Description | Qty. |
|------|--------------|------|
| 31 | SEAL, piston | 1 |

500cc Displacement Pumps

KEY:

- ⚠️ 1 Torque to 327-363 ft-lb (441-490 N•m)
- ⚠️ 2 Torque to 95-115 ft-lb (128-155 N•m)
- ⚠️ 3 Torque to 90-100 ft-lb (122-135 N•m)
- ⚠️ 4 Torque to 71-78 ft-lb (96-106 N•m)
- ⚠️ 6 Torque to 149-261 ft-lb (203-355 N•m)
- ⚠️ 7 Torque to 160-220 ft-lb (217-299 N•m)
- ⚠️ 8 Torque to 104-136 ft-lb (141-185 N•m)
- ⚠️ 9 Apply thread sealant



T110864C

L500cc Models

| Ref. | Part | Description | Qty. | Ref. | Part | Description | Qty. |
|------|----------|---|------|------|----------|--|------|
| | | | | 31‡ | | SEAL, piston; see L500cc Packing Kits | 1 |
| 1 | ★❄255575 | KIT, rod, displacement; chrome (includes 18) | 1 | 32‡ | ★❄ | VALVE, intake | 1 |
| | ❄❄255576 | KIT, rod, displacement; MaxLife (includes 18) | 1 | | ❄❄ | VALVE, intake; SST | 1 |
| 2 | ★❄255607 | KIT, outlet, housing (includes 18, 44, 47, 49, 52) | 1 | 33‡ | ★❄ | NUT, packing | 1 |
| | ❄❄255609 | KIT, outlet, housing (includes 18, 44, 47, 49, 52) | 1 | | ❄❄ | NUT, packing; SST | 1 |
| 3 | ★❄15K752 | CARTRIDGE | 1 | 34‡ | | GLAND, male, piston; SST; see L500cc Packing Kits | 1 |
| | ❄❄15M634 | CARTRIDGE; SST | 1 | 35‡ | | V-PACKING; see L500cc Packing Kits | 2 |
| 4‡ | 102857 | O-RING | 1 | 36‡ | ★❄ | V-PACKING; see L500cc Packing Kits | 2 |
| 5‡ | ★❄ | GLAND, packing female; see L500cc Packing Kits | 1 | | ❄❄ | V-PACKING; see L500cc Packing Kits | 2 |
| | ❄❄ | GLAND, packing, u-cup; see L500cc Packing Kits | 1 | 37‡ | | GLAND, female, piston; SST; see L500cc Packing Kits | 1 |
| 6‡ | ★❄ | V-PACKING; PTFE; see L500cc Packing Kits | 2 | 38‡ | | SEAL, valve | 1 |
| | ❄❄ | SPACER, u-cup; see L500cc Packing Kits | 1 | 39‡ | ★❄ | HOUSING, valve | 1 |
| | | | | | ❄❄ | HOUSING, valve; SST | 1 |
| 7‡ | ★❄ | V-PACKING; UHMWPE; see L500cc Packing Kits | 3 | 40‡ | ★❄ | PLUG, valve | 1 |
| | ❄❄ | SPACER; acetal; see L500cc Packing Kits | 1 | | ❄❄ | PLUG, valve; SST | 1 |
| 8‡ | ★❄ | GLAND, packing male; see L500cc Packing Kits | 1 | 41‡ | | HANDLE, outlet bleed | 1 |
| 9‡ | ★ 24U016 | NUT, packing, open CS | 1 | 42‡ | | CLIP, outlet bleed | 1 |
| | ❄ 24U018 | NUT, packing, open SS | 1 | 43 | ★❄184279 | FITTING, outlet | 1 |
| | ❄❄ | CUP, wet, enclosed | 1 | | ❄❄184387 | FITTING, outlet; SST | 1 |
| 10‡ | ❄❄ | COVER, wet cup | 1 | 44‡ | 109213 | SEAL, outlet | 1 |
| 11‡ | ❄❄104095 | O-RING | 1 | 45 | ★❄109203 | BOLT, hex | 6 |
| 12‡ | ❄❄ | SIGHTGLASS | 1 | | ❄❄109470 | BOLT, hex; SST | 6 |
| 13‡ | ❄❄ | COVER, oil hole | 1 | 46 | ❄❄184618 | WASHER, split | 6 |
| 14‡ | ❄❄ | SCREW, socket hd cap; M5 x 12 | 3 | 47▲ | ★❄184293 | LABEL, warning | 1 |
| 15‡ | ❄❄ | WIPER, wet cup cover | 1 | | ❄❄184462 | LABEL, warning | 1 |
| 16‡ | ❄❄ | SEAL, wet cup cover | 1 | 49 | ★❄100508 | SCREW, drive | 6 |
| 17‡ | ★❄ | CYLINDER, pump | 1 | | ❄❄109202 | SCREW, drive; SST | 6 |
| | ❄❄ | CYLINDER, pump, MaxLife | 1 | 50▲ | 172479 | TAG, instruction, safety | 1 |
| 18‡ | 184072 | O-RING | 3 | 51 | ❄❄ | PLUG, pipe | 1 |
| 19 | 184415 | HOUSING, valve | 1 | 52 | 197561 | PLATE, identification | 1 |
| 20‡ | ★❄ | SEAT, valve | 1 | 60 | ❄❄ | PLUG, pipe | 1 |
| | ❄❄ | SEAT, valve; SST | 1 | | | | |
| 22 | ★❄255613 | KIT, intake housing (includes 48) | 1 | | | | |
| | ❄❄255614 | KIT, intake housing; SST (includes 48) | 1 | | | | |
| 23‡ | | SEAT, piston | 1 | | | | |
| 24‡ | ★❄ | ROD, piston | 1 | | | | |
| | ❄❄ | ROD, piston; MaxLife | 1 | | | | |
| 25 | 189988 | GUIDE, piston, SST | 1 | | | | |
| 26 | ★❄190276 | PISTON | 1 | | | | |
| | ❄❄190277 | PISTON; SST | 1 | | | | |
| 27 | ★❄112733 | SEAT, piston | 1 | | | | |
| | ❄❄112734 | SEAT, piston; SST | 1 | | | | |
| 28‡ | 15M525 | GUIDE, piston | 1 | | | | |
| 29‡ | | BEARING, guide | 1 | | | | |
| 30‡ | | SEAT, piston | 1 | | | | |

★ *Model L500CS only.*❄ *Model L500CM only.*❄ *Model L500SS only.*❄ *Model L500SM only.*‡ *See **L500cc Kits** table, page 37.*▲ *Replacement Danger and Warning labels, tags, and cards are available at no cost.*

L500cc Kits

The following table indicates which parts (according to reference number) are included in each kit.

| Kit | Reference Numbers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------------------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 20 | 23 | 24 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 44 | 51 | 60 | | | | |
| 255517 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | ✓ | | | | |
| 255518 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | ✓ | | | |
| 255519 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | ✓ | | | |
| 255520 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | ✓ | | |
| 255531 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255532 | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 255538 | | | | | | | | | | | | | | | ✓ | | | | ✓ | | ✓ | | | | | | | | | | | | | | | | | | |
| 255547 | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255548 | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255549 | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255550 | | | | | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255556 | | | | | | | | | | | | | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | |
| 255565 | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255566 | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255567 | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255568 | | | | | | | | | | | | | | | ✓ | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255587 | | | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255588 | | | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255589 | | | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255590 | | | | | | | | | | | | | | | ✓ | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255601 | | | | | | | | | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | |
| 255602 | | | | | | | | | | | | | | ✓ | ✓ | | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | |
| 255615 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| 255616 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| 255621 | | | | | | | | | | | ✓ | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | |
| 255695 | ✓ | ✓ | ✓ | | ✓ | | | | | | | | | | ✓ | | | | | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | |
| 255699 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ |
| 255702 | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ |

L500cc Kit Descriptions

| Kit | Description |
|------------|--|
| 255517 | Complete Seal Kit, L500CS |
| 255518 | Complete Seal Kit, L500CM |
| 255519 | Complete Seal Kit, L500SS |
| 255520 | Complete Seal Kit, L500SM |
| 255531 | Throat Seal Kit, L500CS and L500SS |
| 255532 | Throat Seal Kit, L500CM and L500SM |
| 255538 | Piston Soft Seal Kit |
| 255547 | Intake Soft Seal Kit, L500CS |
| 255548 | Intake Soft Seal Kit, L500CM |
| 255549 | Intake Soft Seal Kit, L500SS |
| 255550 | Intake Soft Seal Kit, L500SM |
| 255556 | Piston Seal Metal and Soft Kit |
| 255565 | Intake Valve Seal Metal and Soft Kit; Severe Duty, L500CS |
| 255566 | Intake Valve Seal Metal and Soft Kit; MaxLife, L500CM |
| 255567 | Intake Valve Seal Metal and Soft Kit; Severe Duty, L500SS |
| 255568 | Intake Valve Seal Metal and Soft Kit; MaxLife, L500SM |
| 255575 | Displacement Rod Kit, L500CS and L500SS |
| 255576 | Displacement Rod Kit, L500CM and L500SM |
| 255587 | Priming Piston Rod Kit; L500CS |
| 255588 | Priming Piston Rod Kit; L500CM |
| 255589 | Priming Piston Rod Kit; L500SS |
| 255590 | Priming Piston Rod Kit; L500SM |
| 255601 | Cylinder Kit; Severe Duty, L500CS and L500SS |
| 255602 | Cylinder Kit; MaxLife, L500CM and L500SM |
| 255607 | Outlet Kit; Carbon, L500CS and L500CM |
| 255609 | Outlet Kit; SST, L500SM and L500SS |
| 255613 | Intake Housing Kit; Carbon models |
| 255614 | Intake Housing Kit; SST models |
| 255615 | Bleed Valve Kit, all Carbon models |

| Kit | Description |
|------------|--|
| 255616 | Bleed Valve Kit, all SST models |
| 255621 | Enclosed Wet Cup Seal Kit; MaxLife, L500CM and L500SM |
| 255695 | Complete Seal Kit; PTFE Alternative; includes all PTFE alternative kits listed under L500cc Packing Kits , page 39. |
| 255699 | Enclosed Wet Cup Kit; L500CM |
| 255702 | Enclosed Wet Cup Kit; L500SM |

L500cc Packing Kits

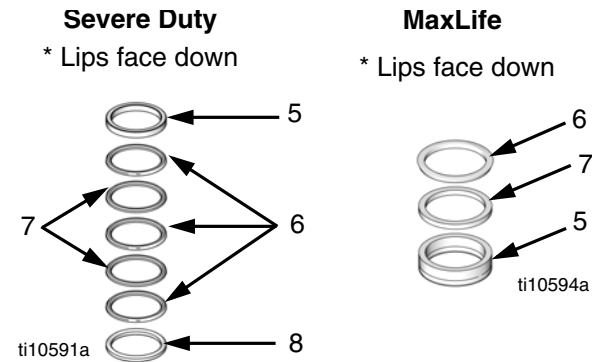
Throat Packings

Severe Duty

| Ref. | Description | Qty. |
|------|-----------------------|------|
| 5 | GLAND, packing female | 1 |
| 6 | V-PACKING; UHMWPE | 3 |
| 7 | V-PACKING; PTFE | 2 |
| 8 | GLAND, packing male | 1 |

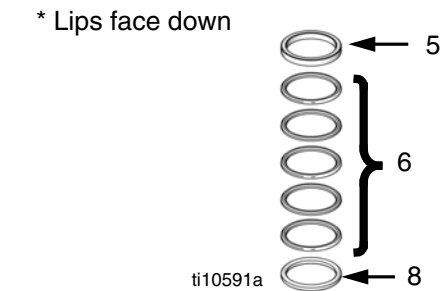
MaxLife

| Ref. | Description | Qty. |
|------|----------------|------|
| 5 | SEAL, u-cup | 1 |
| 6 | SPACER, metal | 1 |
| 7 | SPACER, acetal | 1 |



PTFE Alternative

| Ref. | Description | Qty. |
|------|------------------------|------|
| 5 | GLAND, packing, female | 1 |
| 6 | V-PACKING, PTFE | 5 |
| 8 | GLAND, packing, male | 1 |



Intake Valve Packings

Severe Duty and MaxLife

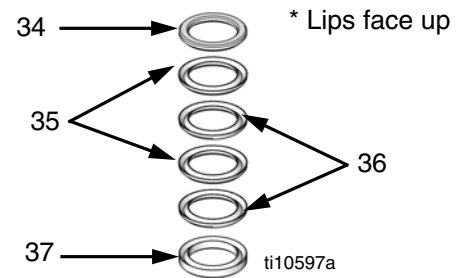
| Ref. | Description | Qty. |
|------|---|------|
| 34 | GLAND, male, priming piston | 1 |
| 35 | PACKING; UHMWPE | 2 |
| 36 | ★※ PACKING; PTFE (Severe Duty) ※※ PACKING; leather (MaxLife) | 2 |
| 37 | GLAND, female, priming piston | 1 |

★ Model L500CS only.

※ Model L500CM only.

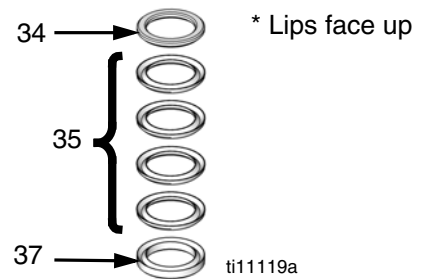
※ Model L500SS only.

※ Model L500SM only.



PTFE Alternative

| Ref. | Description | Qty. |
|------|-------------------------------|------|
| 34 | GLAND, male, priming piston | 1 |
| 35 | PACKING, PTFE | 4 |
| 37 | GLAND, female, priming piston | 1 |



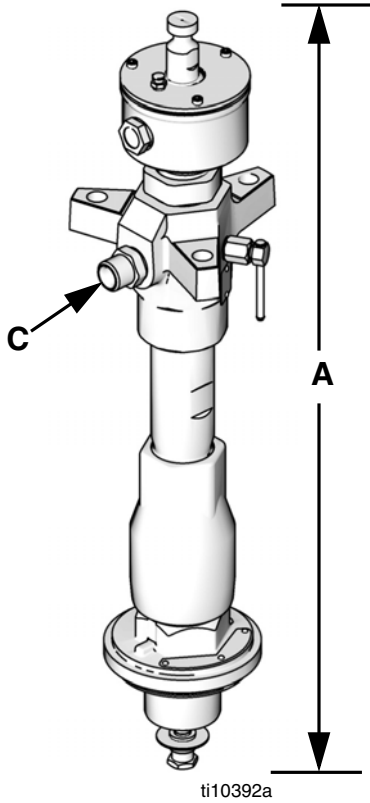
Piston Packings

PTFE Alternative

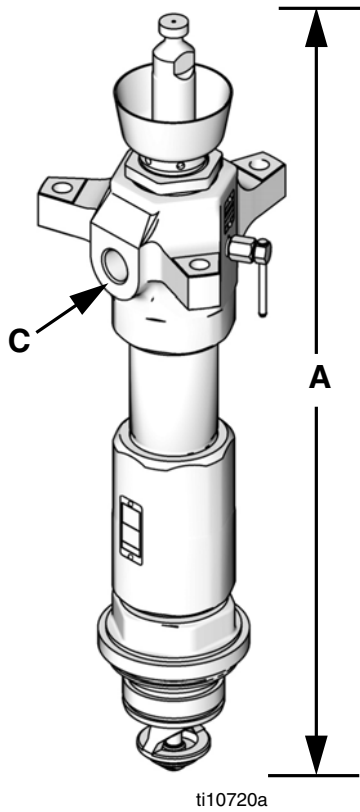
| Ref. | Description | Qty. |
|------|--------------|------|
| 31 | SEAL, piston | 1 |

Dimensions

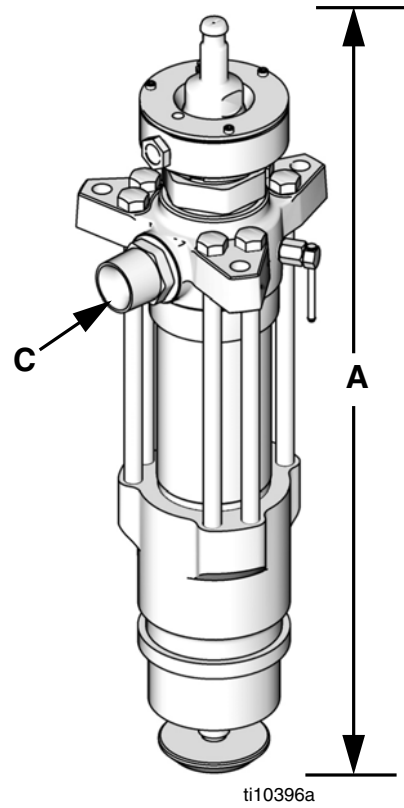
L060CM and L100CM Models



L200SM and L250SM Models



L500CM Model

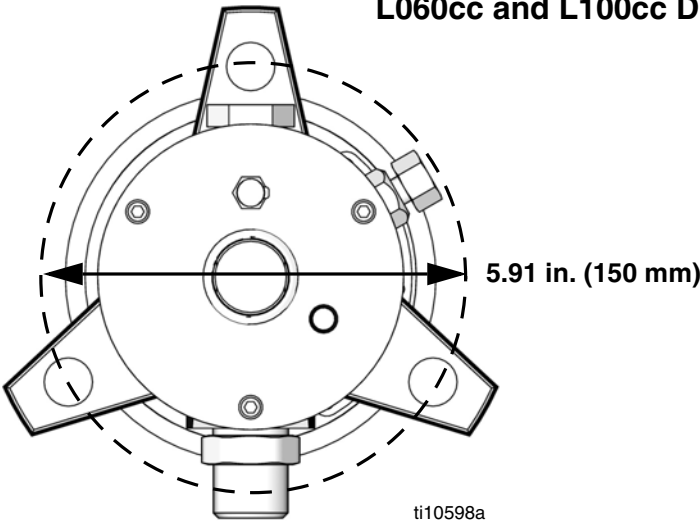


Displacement Pump Dimensions

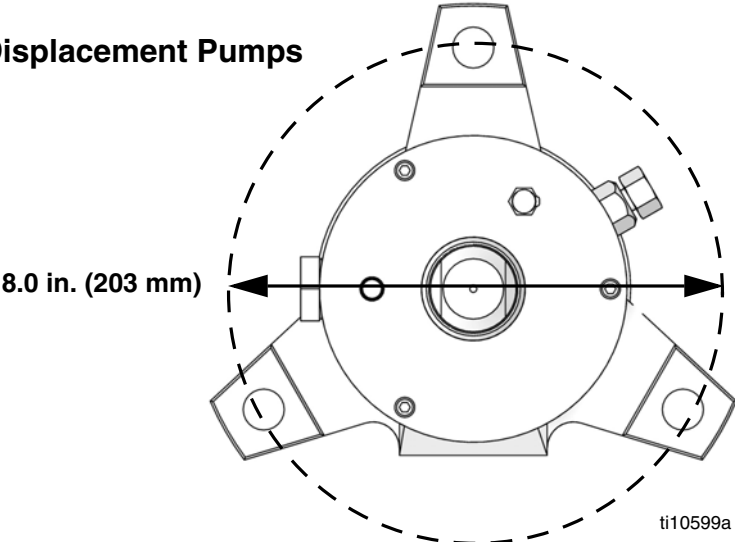
| Displacement Pump | A (Height) in. (mm) | C (Outlet Size) in. npt | Weight lbs (kg) |
|-------------------|---------------------------|-------------------------------|--------------------|
| 60cc | 27.2 (691.0) | 3/4 npt(m) | 34 (15.5) |
| 100cc | 28.62 (727.0) | 3/4 npt(m) | 35 (16) |
| 200cc | 29.75 (755.7) | 1 npt(f) | 64 (29) |
| 250cc | 29.68 (754.0) | 1 npt(f) | 64 (29) |
| 500cc | 29.88 (759.0) | 1-1/2 npt(m) | 86 (39) |

Outlet Housing Mounting Hole Layout

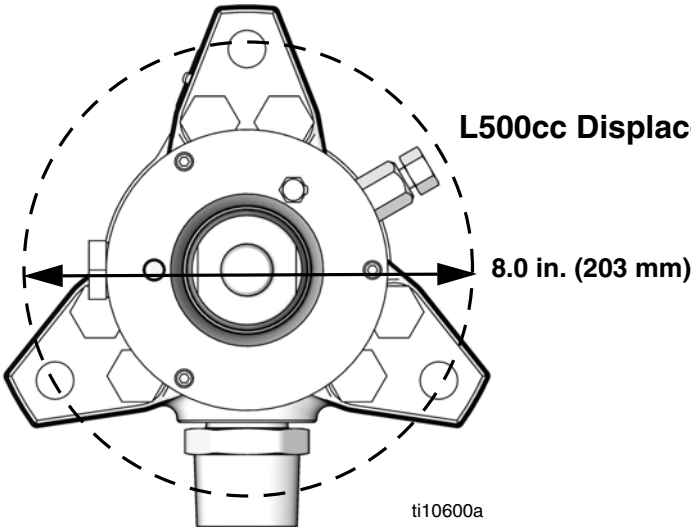
L060cc and L100cc Displacement Pumps



L200cc and L250cc Displacement Pumps



L500cc Displacement Pumps



Technical Data

All displacement pump models have the same maximum operating temperature.

| Displacement Pump | Maximum Fluid Working Pressure | Displacement per Cycle |
|-------------------|--------------------------------|------------------------|
| 60cc | 6100 psi (42 MPa, 421 bar) | 60cc |
| 100cc | 6300 psi (44.1 MPa, 441 bar) | 100cc |
| 200cc | 6200 psi (43.4 MPa, 434 bar) | 200cc |
| 250cc | 6200 psi (43.4 MPa, 434 bar) | 250cc |
| 500cc | 3900 psi (27.3 MPa, 273 bar) | 500cc |

Maximum operating temperature 180° F (80° C)

Stroke length NXT2200, NXT3400, and NXT6500 NXT air motors:
4.75 in. (120 mm)
NXT200, NXT400, NXT700, NXT1200, and NXT1800 air
motors: 2.5 in. (63 mm)

Wetted parts:

L060/100CS ETD 150, 41L40, and 4140 alloy steel; 304 and 17-4PH
grades of stainless steel; acetal; carbon-filled PTFE; carbon
steel; ductile iron; electroless nickel, zinc, and
chrome plating; high molecular weight polyethylene

L060/100CM ETD 150, 41L40, and 4140 alloy steel; 304, 316, and
17-4PH grades of stainless steel; acetal; carbon-filled
PTFE; leather; ductile iron; carbon steel; electroless
nickel, zinc, chrome and MaxLife coatings/plating; high
molecular weight polyethylene; nitrile rubber; polyurethane;
carbon steel, electroless nickel and zinc plated

L060/100SS 304, 316, and 17-4PH grades of stainless steel; acetal;
chrome and electroless nickel plating; UHMWPE; carbon-filled
PTFE; PTFE; carbon steel, electroless nickel
coated

L060/100SM 304, 316, and 17-4 PH grades of stainless steel; acetal;
PTFE; UHMWPE; carbon-filled PTFE; electroless nickel,
chrome and MaxLife coatings/plating; nitrile rubber;
leather; polyurethane; carbon steel, zinc and electroless
nickel plated

L200/250CS ETD 150, 41L40, and 4140 alloy steel; 304, 316, 17-4PH,
and 440C grades of stainless steel; acetal; carbon-filled
PTFE; carbon steel; ductile iron; electroless nickel, zinc,
and chrome plating; PTFE; UHMWPE

| | |
|----------------------|--|
| L200/250CM | 303, 304, 316, 17-4PH, and 440C grades of stainless steel; carbon steel; ductile iron, electroless nickel-coated; zinc, chrome, and electroless nickel plating; leather; UHMWPE; nitrile rubber; PTFE; polyurethane; carbon-filled PTFE; MaxLife coating; acetal |
| L200/250SS | 303, 304, 316, 17-4PH, 440C, and CF16F grades of stainless steel; UHMWPE; PTFE; carbon-filled PTFE; chrome and electroless nickel plating |
| L200/250SM | 303, 304, 316, 17-4PH, 440C, and CF16F grades of stainless steel; carbon steel/zinc-plated wet cup; nitrile rubber; leather; UHMWPE; PTFE; carbon-filled PTFE; polyurethane; acetal; ductile iron, electroless nickel plated; MaxLife coating; chrome-plating; ductile iron, PTFE-coated wet cup |
| L500CM | 303, 304, 316, 17-4PH, and 440C grades of stainless steel; carbon steel, electroless nickel plated and zinc plated; ductile iron, electroless nickel plated; nitrile rubber; PTFE; UHMWPE; polyurethane; carbon-filled PTFE; acetal; leather; E52100 and ETD 150 alloy steel; chrome and electroless nickel plating; MaxLife coating |
| L500CS | 303, 304, 316, and 17-4PH grades of stainless steel; ductile iron and carbon steel, electroless nickel plated; carbon steel, zinc and electroless nickel plated; E52100 and ETD 150 alloy steel; PTFE; UHMWPE; carbon-filled PTFE; acetal |
| L500SS | 303, 304, 316, 17-4PH, and 13-8 grades of stainless steel; chrome plating; PTFE; UHMWPE; carbon-filled PTFE; acetal |
| L500SM | 303, 304, 316, 17-4PH, and 13-8 grades of stainless steel; carbon steel, zinc plated; carbon steel, electroless nickel plated; ductile iron, electroless nickel and PTFE coated; leather; acetal; carbon-filled PTFE; UHMWPE; polyurethane; nitrile rubber; chrome plating; MaxLife coating |

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Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Phone: 612-623-6921 or Toll Free: 1-800-328-0211 Fax: 612-378-3505

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Original instructions. This manual contains English. MM 312375

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