

# LD Oil Pump Repair Kits

3A1494D  
EN

## *Instructions for repairing the LD Oil Pump.*

**Maximum Fluid Pressure - 750 psi (5.17 MPa, 51.7 bar)**

**Maximum Air Pressure - 150 psi (1.03 MPa, 10.3 bar)**



### **Important Safety Instructions**

Read all warnings and instructions in this manual and in your LD Series Oil or Grease Pump manual. Save all instructions.

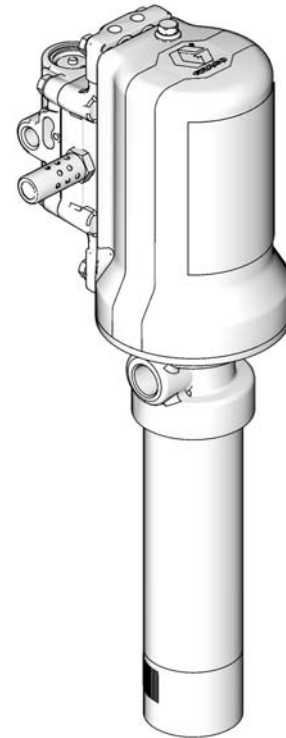
## **Repair Kits:**

**24H853: Throat and Piston Seal Replacement Kit**

**24K293: O-Ring Replacement Kit for 3:1 pumps**






**24H855: O-Ring Replacement Kit for 5:1 pumps**

**24U230: Air Piston Replacement Kit**



# 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 symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.




|  <b>WARNING</b>   |   |
|--|---|
| <br> | <p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from dispense valve, 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. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point dispense valve at anyone or at any part of the body.</li> <li>• Do not put your hand over the end of the dispense nozzle.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses and couplings daily. Replace worn or damaged parts immediately.</li> </ul> |
|    | <p><b>PRESSURIZED ALUMINUM PARTS HAZARD</b></p> <p>Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.</p> <ul style="list-style-type: none"> <li>• Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.</li> <li>• Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.</li> </ul>  |
|    | <p><b>PERSONAL PROTECTIVE EQUIPMENT</b></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, hearing loss, inhalation of toxic fumes, and burns. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear, and hearing protection.</li> <li>• Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.</li> </ul>   |

# Instructions

Always use all new parts included in your kit and dispose of replaced parts according to all state and local regulations for disposal of discarded components.

Inspect all parts when disassembling the pump. Replace any and all worn and damaged parts.

## Pressure Relief Procedure

|  |   |   |  |  |  |  |
|--|---|---|--|--|--|--|
|   |  |  |  |  |  |  |
| <p>The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, fluid from the valve, or splashing fluid, follow the procedure whenever you:</p> <ul style="list-style-type: none"> <li>• are instructed to relieve pressure</li> <li>• stop dispensing</li> <li>• check, clean, or service any system equipment</li> <li>• install or clean dispensing devices.</li> </ul> |   |   |  |  |  |  |

1. Close the pump's bleed-type master air valve.
2. Close the pump air regulator and disconnect the air supply hose.
3. Open the dispensing valve and dispense fluid into a waste bucket/container until pressure is fully relieved.

*If you suspect that the dispensing valve is clogged, or that pressure has not been fully relieved after following the steps above, **very slowly** loosen the dispensing valve coupler or hose end coupling to relieve pressure gradually, then loosen completely.*

## Disassembly

The following disassembly instructions describe the procedure for completely disassembling the LD oil pump. Depending on the repair/maintenance procedure you are performing on the pump, it may not be necessary to entirely disassemble the pump or perform all steps in this procedure.

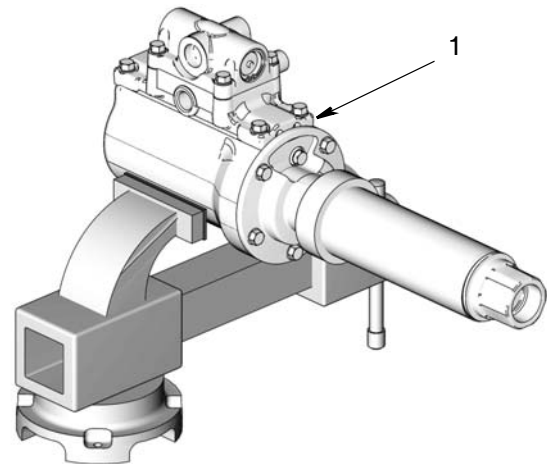
The reference numbers used in the following instructions correspond to the reference numbers used in the LD Series Oil and Grease Pump instruction manual.



1. Stop the pump. Follow Pressure Relief Procedure, page 3.
2. Disconnect and remove the pump from its installed location.
3. Clamp the pump (1) horizontally in a vise as shown in Fig. 1.

**NOTICE**

Take care to only use enough clamping force to hold the pump in position. The pump cylinder is aluminum and could be damaged by using excessive clamping force.



**Fig. 1**

- Secure a strap wrench around the fluid cylinder (32) and a large adjustable wrench on the intake valve housing (28). Turn the adjustable wrench counter clockwise to loosen and remove the valve housing (28) from the fluid cylinder (32) (Fig. 2).

**NOTE:** After a few turns, the valve housing should be loose enough to finish loosening it with your hand to remove this part.

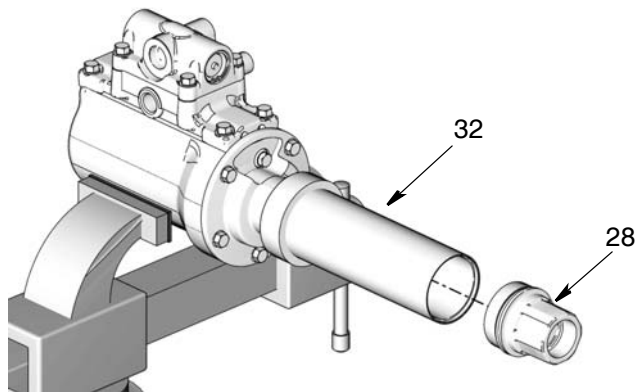


Fig. 2

- Secure a strap wrench around the fluid cylinder (32). Use the strap wrench to turn the fluid cylinder counter-clockwise to loosen and remove it from the flange (29) (Fig. 3).

**NOTE:** After a few turns, the fluid cylinder should be loose enough to finish loosening it with your hand to remove this part.

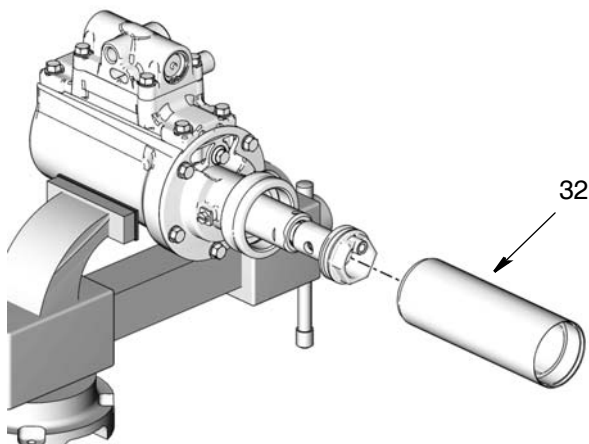


Fig. 3

- Using a 10 mm socket wrench, remove the 4 screws (43) from the air valve (38) and completely remove air valve assembly from air cylinder (27). Also remove the two cover gaskets (25). If you are replacing these parts, discard gaskets. (Fig. 4).

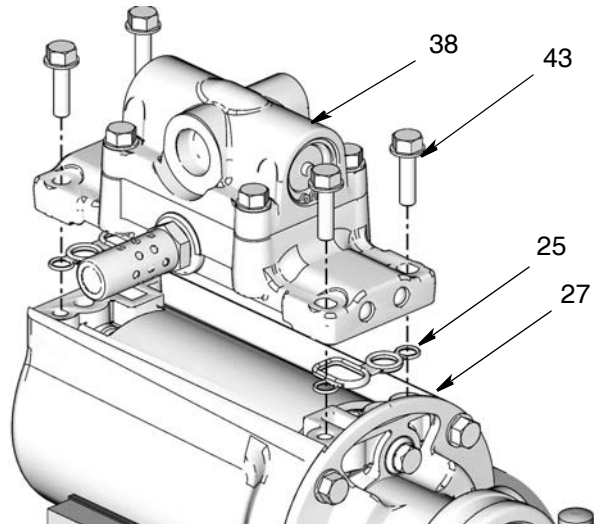


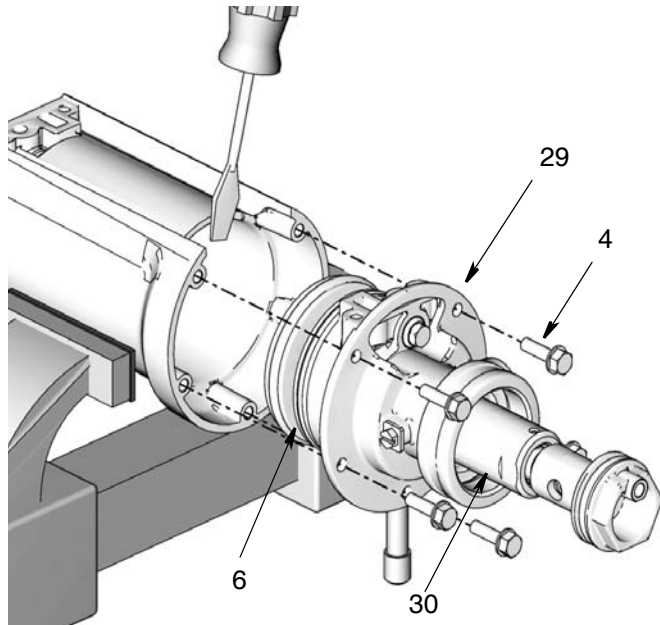
Fig. 4

**Repair and replacement instructions for the Air Valve are included in a separate repair manual included with the kit:**

- Air Valve Replacement Kit - 24H848, 24H849, 24H850
- Air Valve Repair Kit - 24H798
- Air Motor Service Kit - 24J757, 24J758, 24J759
- Pilot Valve Kit - 24H749
- Air Valve Seal Kit - 24H851
- Air Valve End Cap Kit - 24H852

- Using a 10 mm socket wrench, remove the 5 screws (4) from the flange (29). Using your hand, firmly grasp the end of the displacement rod (30) and remove the entire assembly from the air cylinder (27) (Fig. 5).

**NOTE:** Sliding the flat blade of a screw driver between the flange (29) and air cylinder (27) will help separate the two parts. Exercise caution, however, to not damage the o-ring (6).

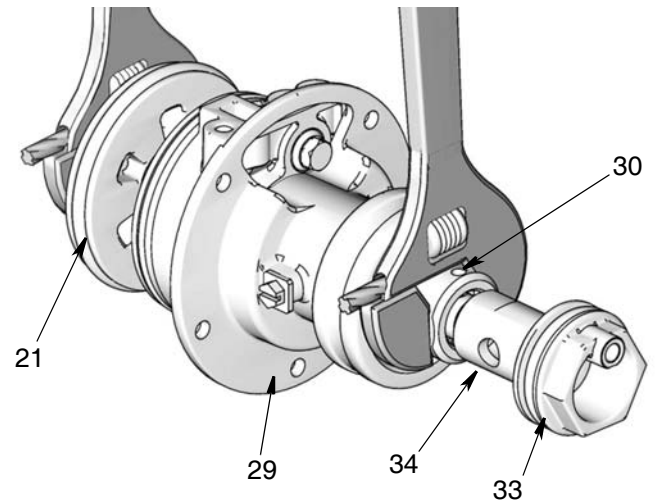


**Fig. 5**

- Remove the air cylinder (27) from the vise.

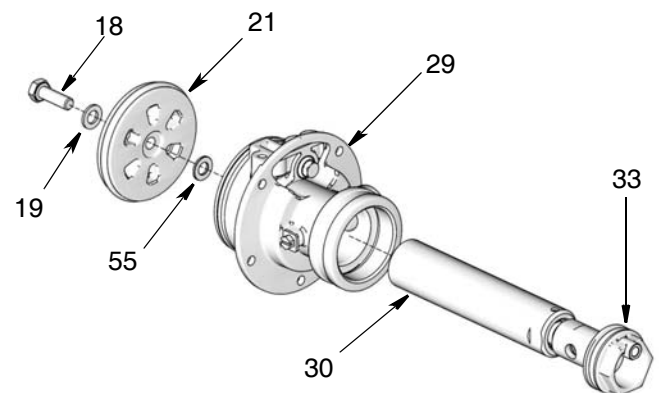
- Lay the flange assembly on a hard, clean work surface. Use an adjustable wrench to hold the displacement rod (30) securely in place. Use a 13 mm wrench to loosen bolt (18). Remove bolt (18) and washer (19) (Fig. 6 and Fig. 7).

**NOTE:** Do not use a hex wrench on the oil piston (33) or ball holder (34) to loosen or tighten. Using a hex wrench on this part could cause the pin (10) (Fig. 7) to fail.



**Fig. 6**

- Pull the air piston (21) and o-ring (55) off the displacement rod (30).
- Pull the displacement rod (30) out of flange housing (29).



**Fig. 7**

12. Check displacement rod (30) for excessive wear or damage. If displacement rod (30) is damaged, replace the pump.
13. Using a 5 mm socket wrench remove the 3 screws (3) from the bottom cover (26) (Fig. 8).

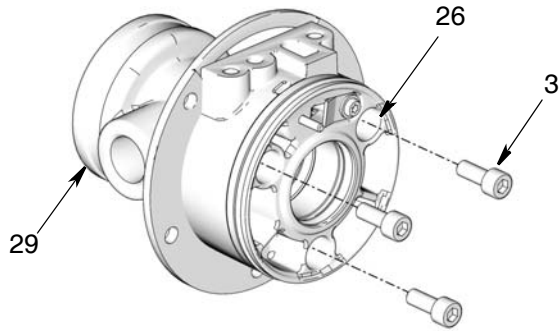


Fig. 8

14. Separate the bottom cover (26) from the flange (29) (Fig. 8).

***If you are replacing the o-rings and seals installed in the flange, bottom cover, and air piston continue instructions with the Throat and Piston Seal Replacement Kit 24H853 instructions beginning on page 9 and then Step 1, page 6 of the Reassembly instructions.***

## Pump Reassembly

**NOTE:** The following instructions describe the procedure to follow to reassemble a completely disassembled LD oil pump. Depending on the repair/maintenance procedure you are performing on the pump, it may not be entirely disassembled. See the specific section(s) related to your repair/replacement kit.

### For all reassembly procedures:

- Clean all the parts carefully in a compatible solvent, and inspect for wear or damage. Use all the repair kit parts during reassembly, and replace other parts as necessary.
  - Check the polished surfaces for scratches or wear.
  - Lubricate all parts with a light, water-resistant grease.
1. Install new o-rings and seals in bottom cover (26) and flange (29) as described in the Throat and Piston Seal Replacement Kit 24H853, page 9. Be sure to apply a thin coat of water-resistant grease to all o-rings and seals.

2. Apply a thin coat of grease round the top of the displacement rod (30) and install the rod assembly in the flange assembly as shown in Fig. 9.

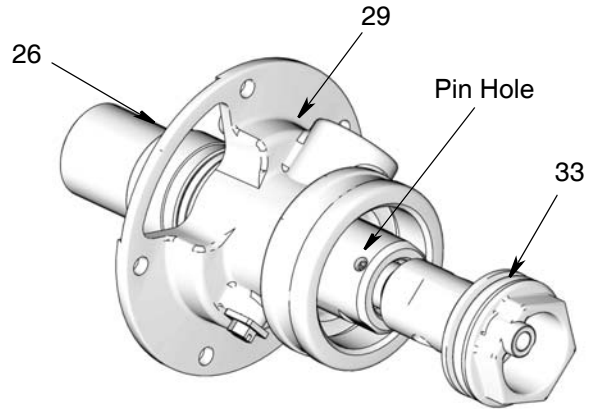


Fig. 9

3. Install bottom cover (26) over displacement rod (30). Align pilot valve (20) installed in bottom cover with opening (a) in flange (29) as shown in Fig. 10. Compress the bottom cover (26) and flange (29) together.

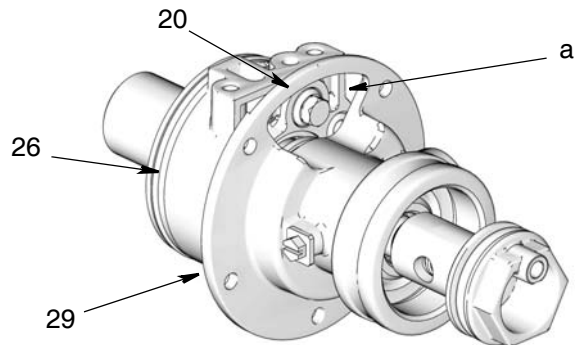


Fig. 10

4. Install 3 screws (3) (Fig. 11). Tighten with a 5mm socket wrench and torque to 60-70 in lbs (6.8 – 7.9 N.m).

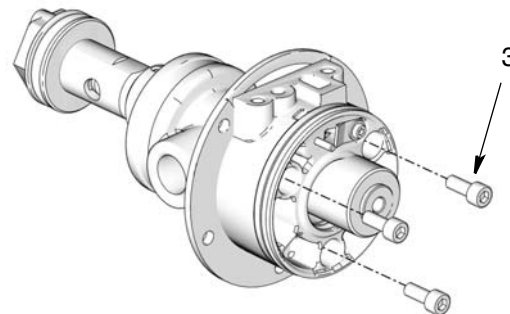
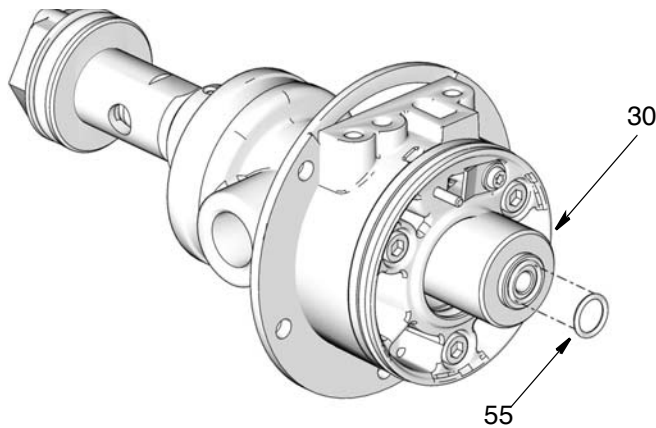


Fig. 11

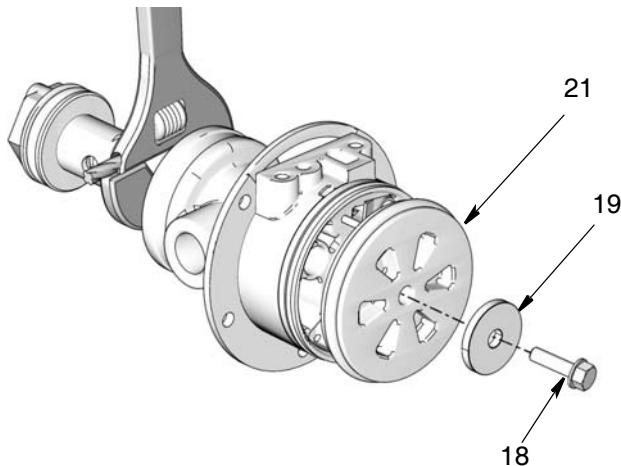
5. Install o-ring (55) in groove on the end of the displacement rod (30) (Fig. 12).



**Fig. 12**

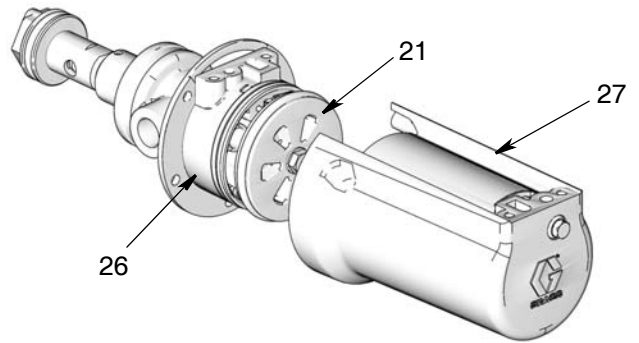
6. Push the air piston (21) over the end of the displacement rod (30). Apply Loctite® 262 to the bolt (18) shoulder. Install the washer (19) and bolt (18). Hold the displacement rod (30) with an adjustable wrench and use an 8mm hex wrench to tighten the bolt securely. Torque bolt to 155 - 160 in. pounds (17.5 - 18.0 N.m) (Fig. 13).

**NOTE:** Loctite® is a registered trademark of the Loctite Corporation.



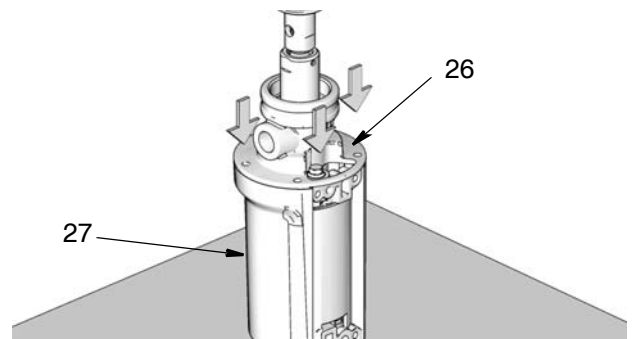
**Fig. 13**

7. Install new o-ring around air piston (21), and pump piston (33) as described in the Throat and Piston Seal Replacement Kit 24H853, page 9. Be sure to apply a thin coat of water-resistant grease to all o-rings and seals.
8. Slide air cylinder (27) over the bottom cover (26) (Fig. 14).



**Fig. 14**

9. Remove the assembly from the vise and place the top of the air cylinder down on a clean hard surface. Use the palms of your hands to press the bottom cover (26) firmly into the air cylinder (27) as shown in Fig. 15.



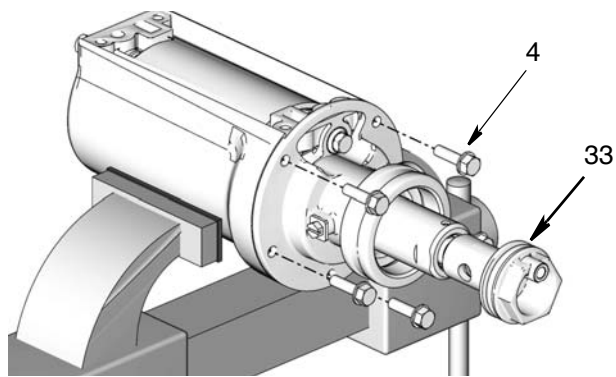
**Fig. 15**

10. Secure assembly in vise as shown in Fig. 16. Install 5 screws (4) wrench tight only.

**NOTE:** If installing a new air cylinder (27) the mating holes are not threaded by design. Use thread forming screws (4) to form threads as they are being installed. Torque to 95-105 in.-lbs (10.7 to 11.8 N.m) to ensure full thread formation.

11. To ensure there is a proper seal between the air valve and manifold, loosen all 5 screws (4) approximately 1/4 turn Fig. 16). These screws will be torqued **AFTER** the air valve is installed (38) (Step

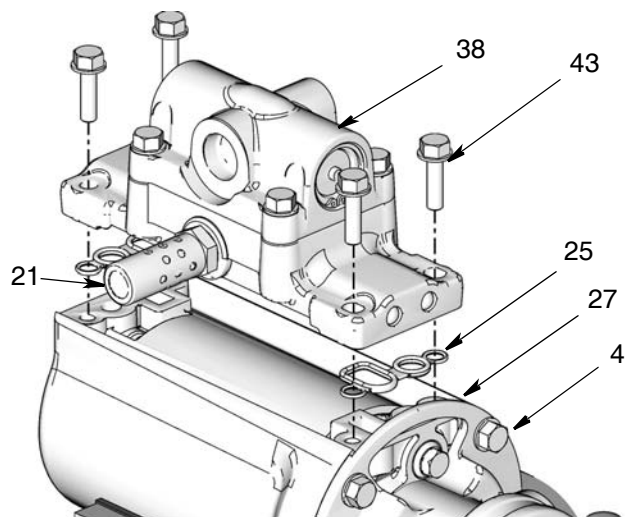
15).



**Fig. 16**

12. Perform any air valve repairs / maintenance needed. Instructions for these procedures are included in the separate repair manual included with the Air Valve repair kit.
13. Be sure seals (25) are lightly greased and installed on air valve (38). Install air valve on air cylinder (27) (Fig. 17).

**NOTE:** The air valve (38) can be installed in any configuration. There is not just one correct way to install these parts.



**Fig. 17**

14. Install screws (43). Torque to 60-70 in. lbs (6.8 - 7.9 N.m).
15. Torque bolts (4) installed in Step 10 to 60-70 in. lbs (6.8 - 7.9 N.m).

### Muffler (21) Installation (Fig. 17)

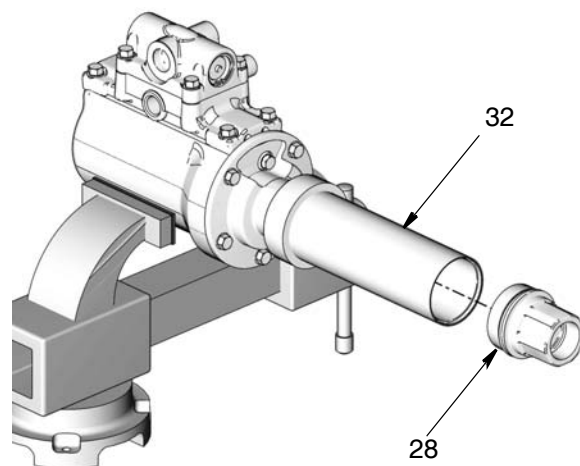
Depending on your installation, the air valve (38) can be mounted with the muffler (21) on either side of the air valve (38).

To change the installation location:

- a. Remove the 4 screws (43).
- b. Remove the air valve (38) from its current mounted position on the air cylinder (27) and rotate the air valve 180 degrees, which will reposition the muffler to face the other side of the pump.

16. Install new o-rings around pump piston (33) (Fig. 16) fluid cylinder (32) and intake valve housing (28) (Fig. 18) as described in the O-Ring Replacement Kit 24H855 or 24K293, page 11. Be sure to apply a thin coat of water-resistant grease to all o-rings and seals.
17. Install the fluid cylinder (32) over the displacement rod (3), threaded end first. Hand tighten and then torque to 20-25 ft. lbs (27-34 N.m) (Fig. 18).

**NOTE:** It is not necessary to torque the fluid cylinder in this step. Everything will be torqued simultaneously in Step 16 with the intake housing (28).



**Fig. 18**

18. Install the intake valve (28) housing on the end of the fluid cylinder (32). Hand tighten and then torque to 20-25 ft. lbs (27-34 N.m) (Fig. 18).



# Repair Kits

## All Repairs:



- Unless otherwise stated, entirely disassemble pump as described in the pump disassembly instruction section of this manual.
- Properly discard all replaced parts according to local and state regulations for disposal of discarded components.
- Always use all new parts included in the kit to replace the identical part on the pump.
- Grease all parts prior to reassembly with a thin coat of lightweight grease.
- Reassemble pump as described in the reassembly instructions, page 6.

## Throat and Piston Seal Replacement Kit - 24H853 (Fig. 19)

**NOTE:** When servicing the throat and piston seals, it is recommended to also replace seals in the pump lower. Order repair kit: 24K293 for 3:1 pumps or 24H855 for 5:1 pumps.

*Replacement parts for o-ring (5) installed on air piston (21), o-rings and u-cup seal (6, 7, 9, and 17) installed in bottom cover (26), o-ring (8) installed on flange (29) and gasket (25) used later in reassembly of the air valve (38).*

*O-ring (55) is installed between the air piston (21) and displacement rod (30).*

| Ref. | Description          | Qty |
|------|----------------------|-----|
| 5    | O-RING, air piston   | 1   |
| 6    | O-RING               | 1   |
| 7    | O-RING               | 1   |
| 8    | O-RING, wiper        | 1   |
| 9    | SEAL, u-cup          | 1   |
| 10   | PIN, spring          | 1   |
| 17   | O-RING               | 3   |
| 25   | GASKET, cover, small | 2   |
| 55   | O-RING               | 1   |

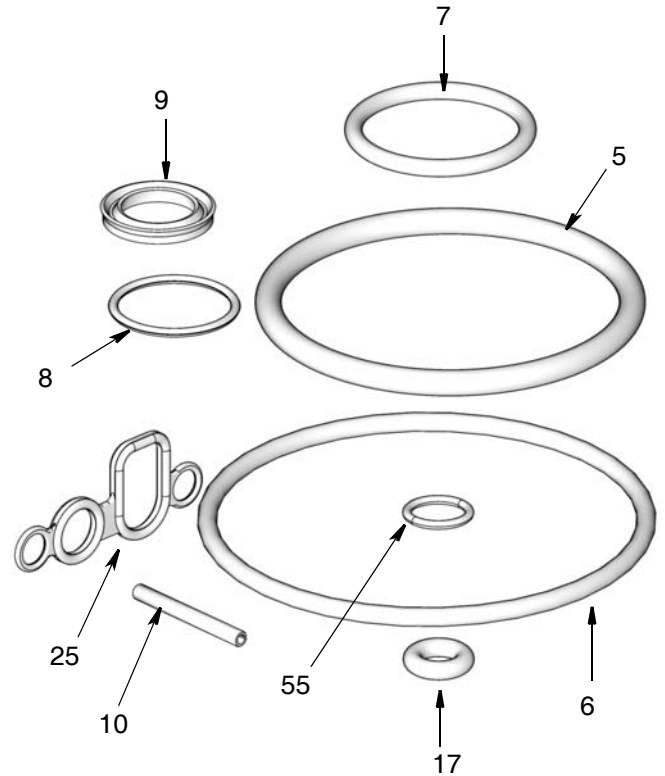


Fig. 19

1. Use a pick to remove the o-ring (5) installed around the circumference of the air piston (21) (Fig. 20). Grease the new o-ring included in the kit and install it around the air piston.

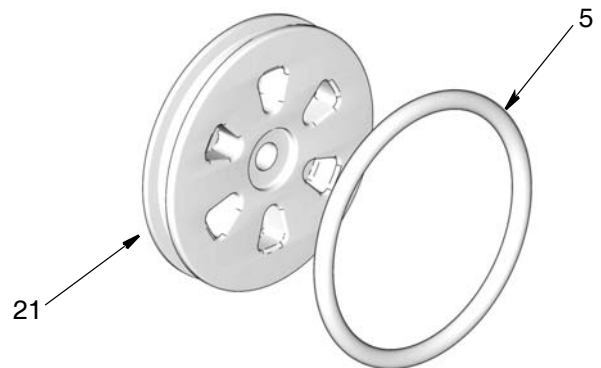
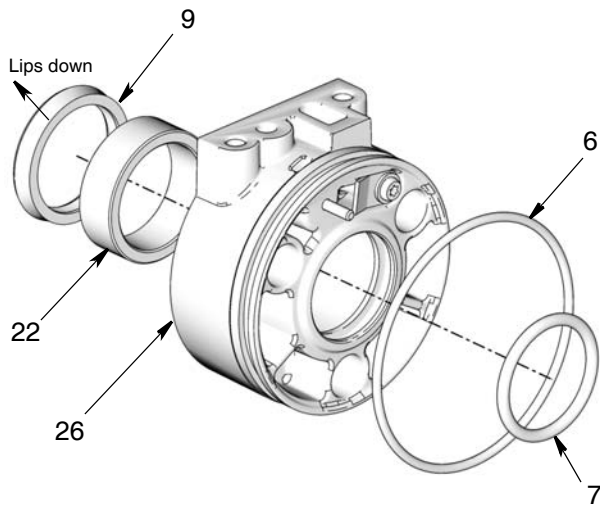


Fig. 20

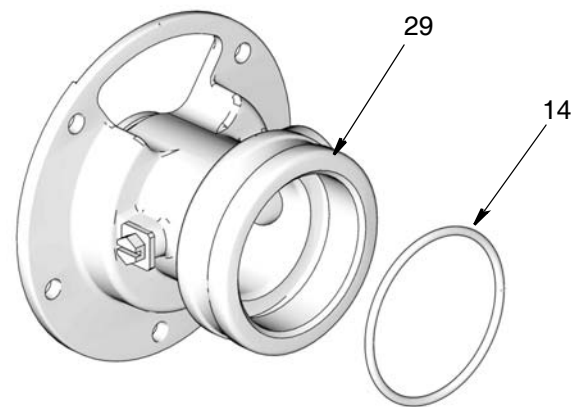
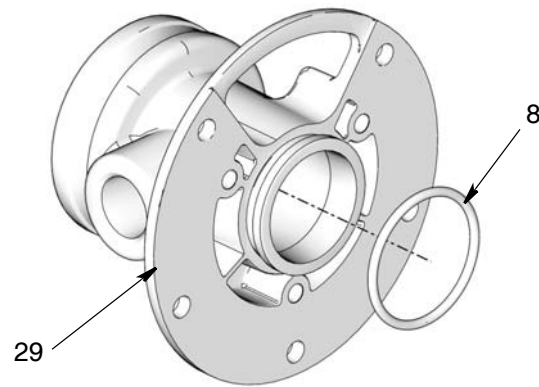
2. Use a pick to remove o-rings (6, 7), bearing (22) and u-cup seal (9) from the bottom cover. (Fig. 21). Grease and replace the o-rings and u-cup seal with the new parts included in the kit and install them in the order shown in Fig. 21.

**NOTE:**

- The bearing (22) is not included in the kit. This part is reused. The bearing can be installed with either side facing up. There is not just one way to install this part.
- The bearing (22) is a transitional fit and in some installations it may not be removed.
- Be sure u-cup seal (9) is installed with the lips facing down as shown in Fig. 21.

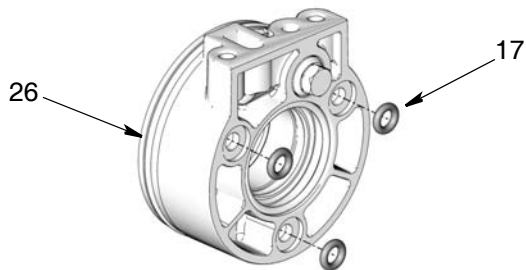


**Fig. 21**



**Fig. 23**

3. Remove and discard the 3 small o-rings (17) in the bottom cover (26) (Fig. 22). Grease the new o-rings (17) included in the kit and install them in the bottom cover housing.



**Fig. 22**

4. Use a pick to remove o-rings (8) and (14) from the flange (29). (Fig. 23). Grease and replace the o-rings as shown in Fig. 23.

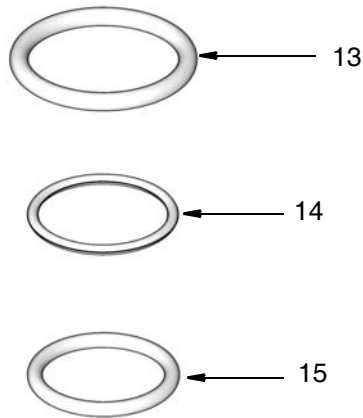
5. Reassemble the pump as described in the Reassembly instructions, page 6.

### O-Ring Replacement Kit - 24K293 for 3:1 pumps; 24H855 for 5:1 pumps (Fig. 24)

**NOTE:** When replacing seals in the pump lower also service the throat and piston seals. Order repair kit 24H853.

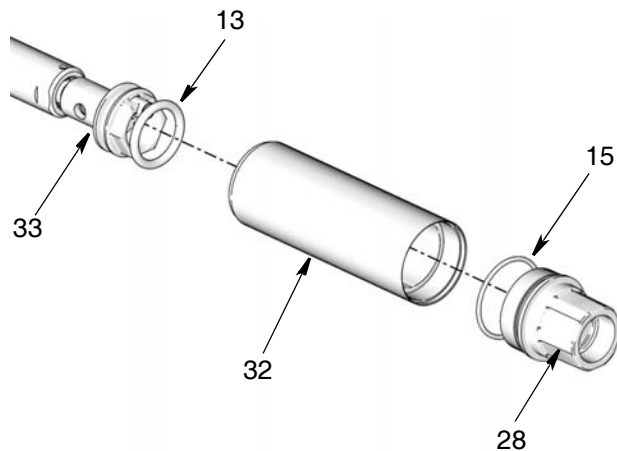
| Ref. | Description | Qty |
|------|-------------|-----|
| 13   | O-RING      | 1   |
| 14   | O-RING      | 1   |
| 15   | O-RING      | 1   |

Replacement parts for o-ring (13) installed on pump piston (33), o-ring (14) installed on fluid cylinder (32) and o-ring (15) installed in intake valve housing (28).



**Fig. 24**

1. Use a pick to remove the o-ring (13) installed around the circumference of the pump piston (33) (Fig. 25). Grease the new o-ring included in the kit and install it around the pump piston.

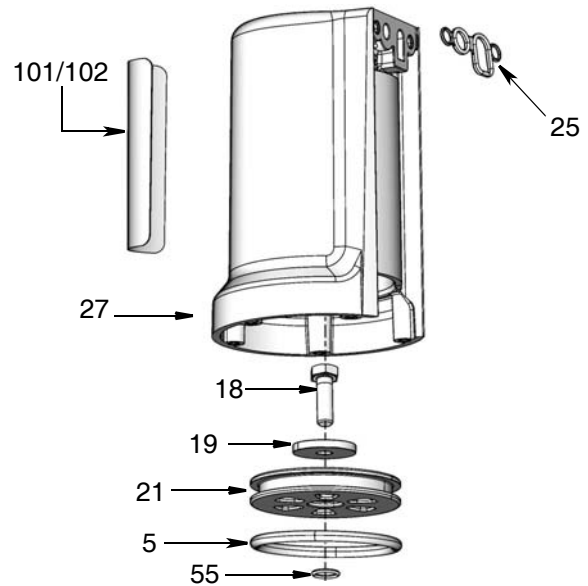


**Fig. 25**

2. Use a pick to remove the o-ring (15) installed on the intake valve housing (28) (Fig. 25). Grease the new o-ring included in the kit and install it inside the intake valve housing.
3. Reassemble the pump as described in the Reassembly instructions, page 6.

### Air Piston Replacement Kit - 24U230, Series B

| Ref. | Part No. | Description           | Qty |
|------|----------|-----------------------|-----|
| 5    |          | O-RING                | 1   |
| 18   |          | BOLT                  | 1   |
| 19   |          | WASHER                | 1   |
| 21   |          | AIR PISTON            | 1   |
| 25   | 15R001   | GASKET, cover, small  | 2   |
| 27   |          | AIR CYLINDER          | 1   |
| 55   |          | O-RING                | 1   |
| 101  |          | LABEL, Identification | 1   |
| 102  |          | LABEL, overlay, clear | 1   |



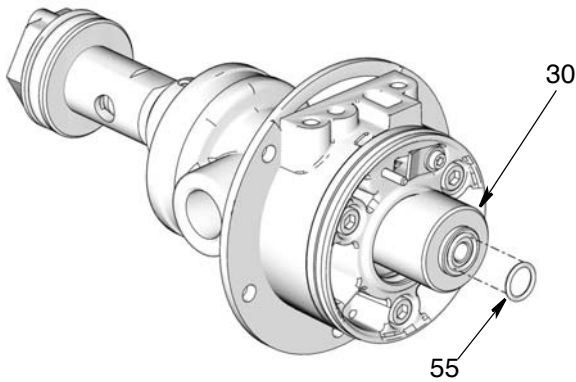
**Fig. 26**

**Pump Disassembly,**

Follow Pump Disassembly instructions Steps 1 - 10 only, pages 3 - 5.

**Pump Reassembly**

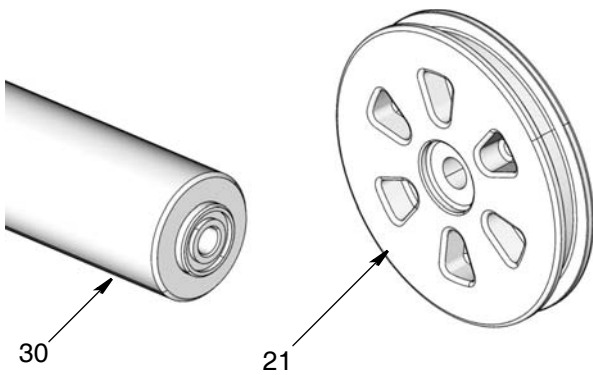
1. Install o-ring (55) in groove on the end of the displacement rod (30) (Fig. 27).



**Fig. 27**

2. To assemble the new air piston, push the air piston (21) over the end of the displacement rod (30).

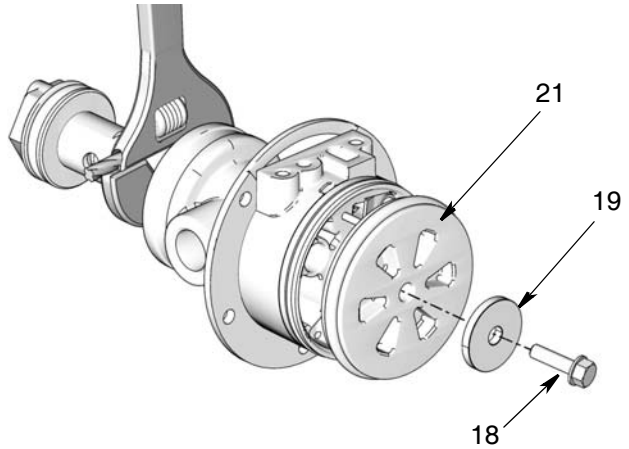
**NOTE:** The counter bored side of the piston (21) mates with the displacement rod (30) as shown in Fig. 28.



**Fig. 28**

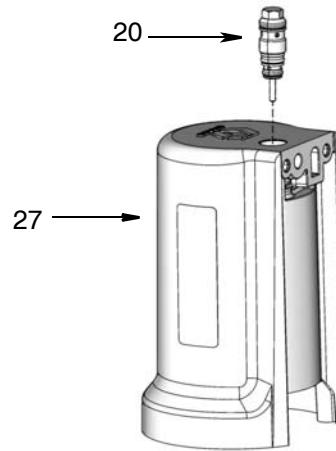
3. Apply Loctite® 262 to the bolt (18). Install the washer (19) and bolt (18). Hold the displacement rod (30) with an adjustable wrench and use a 13 mm wrench to tighten the bolt securely. Torque bolt to 155 - 160 in. pounds (17.5 - 18.0 N.m) (Fig. 29).

**NOTE:** Loctite® is a registered trademark of the Loctite Corporation.



**Fig. 29**

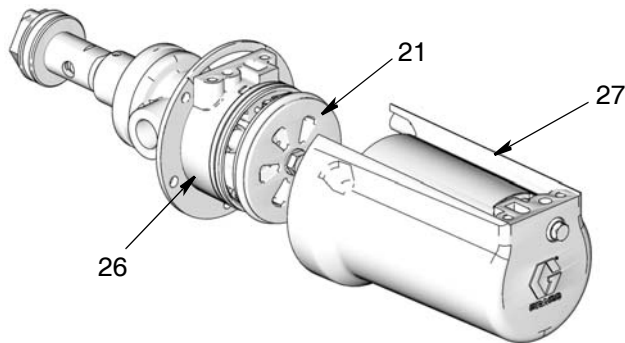
4. Remove pilot valve (20) from the old air cylinder (27). Apply a light coat of grease to o-rings.
5. Install into new air cylinder (27) (Fig. 30). Torque to 95-105 in. lbs (10.7-11.9 N.m).



**Fig. 30**

6. Install new o-ring (5) around air piston (21), Install new o-ring (6) into bottom cover (26). Be sure to apply a thin coat of water-resistant grease to all o-rings and seals.
7. Slide new air cylinder assembly (27) over the air piston (21) and bottom cover (26) (Fig. 31).

**NOTE:** The five screws (4) are thread forming screws and as a result the mating holes in the air cylinder (27) are not threaded by design.



**Fig. 31**

8. Continue reassembly instructions Steps 9 - 18, beginning on page 7.
9. Use a permanent marker to record the pump part number, serial number and series code shown the original label located on the old air cylinder, onto the new label (101) included in the kit.
10. Apply label (101) to the new cylinder. Apply the clear overlay (102) over the new label.

## Graco Information

For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

**TO PLACE AN ORDER**, contact your Graco distributor or call to identify the nearest distributor.

**Phone:** 612-623-6928 or **Toll Free:** 1-800-533-9655, **Fax:** 612-378-3590

*All written and visual data contained in this document reflects the latest product information available at the time of publication.  
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*For patent information, see [www.graco.com/patents](http://www.graco.com/patents).*

*Original instructions. This manual contains English. MM3A1494*

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441**

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November 2014