

LD Grease Pump Repair Kits

3A1495C
EN

Instructions for repairing the LD Grease Pump.

Maximum Fluid Pressure - 7500 psi (51.7 MPa, 517 bar)
Maximum Air Pressure - 150 psi (1.03 MPa, 10.3 bar)



Important Safety Instructions

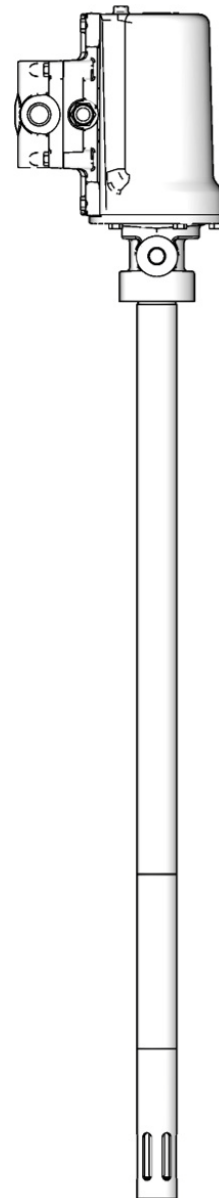
Read all warnings and instructions in this manual and in your LD Series Oil or Grease Pump manual. Save all instructions.

Repair Kits:

24H854: Throat and Piston Seal Replacement Kit






24H856: O-Ring and Seal Replacement Kit

24U984: 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.

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

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



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:

- are instructed to relieve pressure
- stop dispensing
- check, clean, or service any system equipment
- install or clean dispensing devices.

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 grease 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) upside down in a vise as shown in Fig. 1.

NOTE: 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.

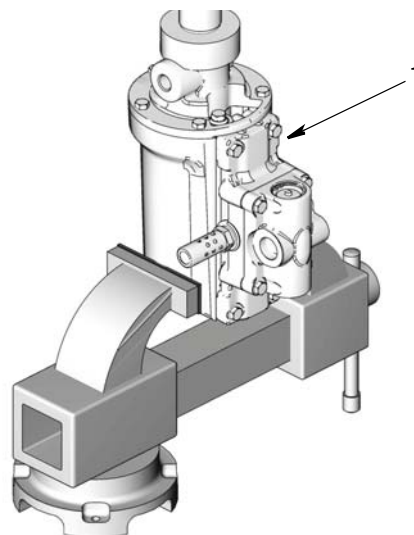


Fig. 1

If you are only servicing the air valve (40) and seals (18) or air piston (15), skip Steps 4 - 14.

- Secure a strap wrench around the shovel cylinder (27). Use the strap wrench to turn the shovel cylinder counter-clockwise to loosen and remove it from the pump assembly (Fig. 2).

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

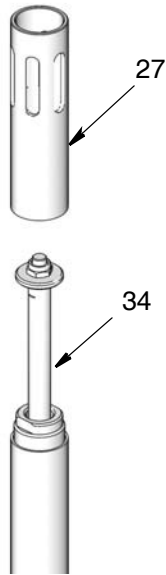


Fig. 2

- Use an adjustable wrench to hold the priming rod (34) securely. Use a second adjustable wrench to loosen and remove the nut (19) and priming piston (35) (Fig. 3, Fig. 4).

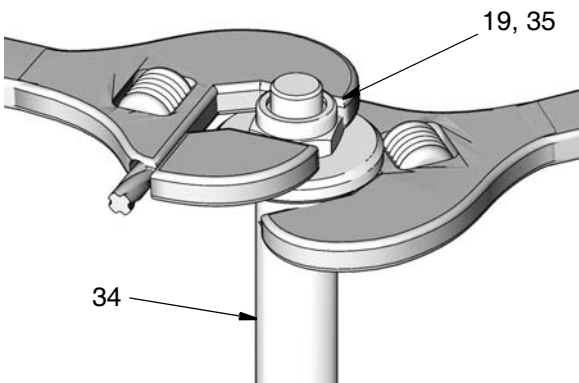


Fig. 3

- Use a wrench to loosen and remove the seal retainer (29) (Fig. 4).

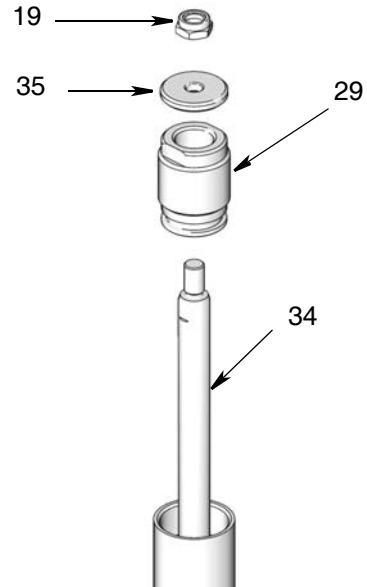


Fig. 4

- Tighten a strap wrench on the spacer cylinder (36) and use it to prevent this part from moving. Secure a strap wrench around the cylinder (26) and use it to turn the cylinder to loosen and remove it from the pump assembly. (Fig. 5). Remove the intake seal (28).

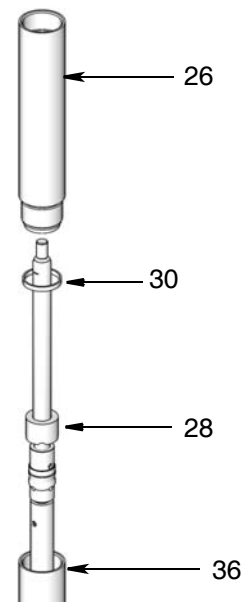


Fig. 5

8. If the gasket (30) is still inside the spacer cylinder (36) use a pick to remove.
9. Secure a strap wrench around the spacer cylinder (36) and use it to turn the cylinder counter clockwise to loosen and remove it from the flange (22) (Fig. 6).

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

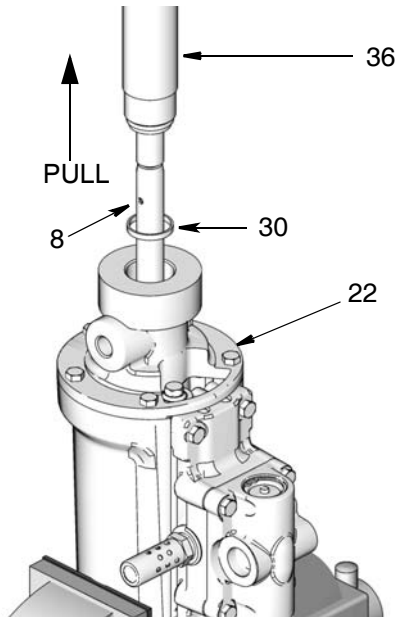


Fig. 6

10. Use a pick to remove gasket (30) from inside the flange (22).
11. Use a rubber hammer and small punch to drive out pin (8), holding together the piston rod (23) and the connection rod (32). Turn the piston rod (23) counter clockwise to loosen and remove it from the connection rod. Remove the piston seal (24) from the piston rod (Fig. 8).
12. Remove the pump assembly from the vise and set it down on a clean, hard work surface.

NOTE: When removing the pin (8) in Steps 12 - 14, it is helpful to place a support such as a piece of wood, below the rods.

13. Use a rubber hammer and small punch to drive out pin (8), holding together the priming rod (34) and piston rod (23). Turn the priming rod (34) counter clockwise to loosen and remove it from the piston rod (Fig. 7).

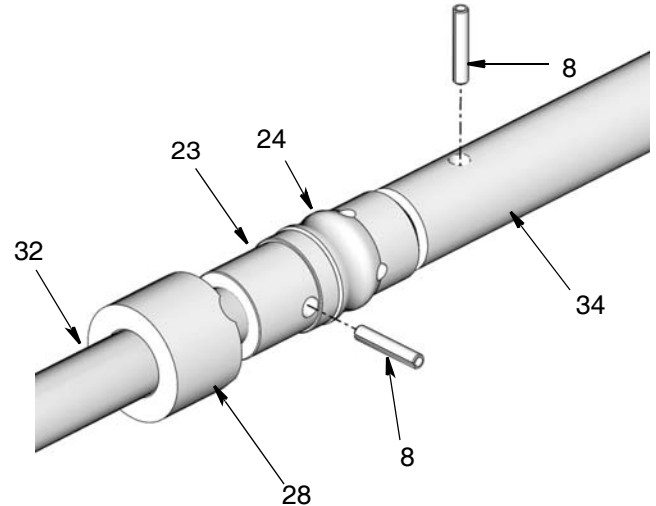


Fig. 7

14. Use a rubber hammer and small punch to drive out pin (8), holding together the connection rod (32) and displacement rod (25). Turn the connection rod (32) counter clockwise to loosen and remove it from the displacement rod (Fig. 8).

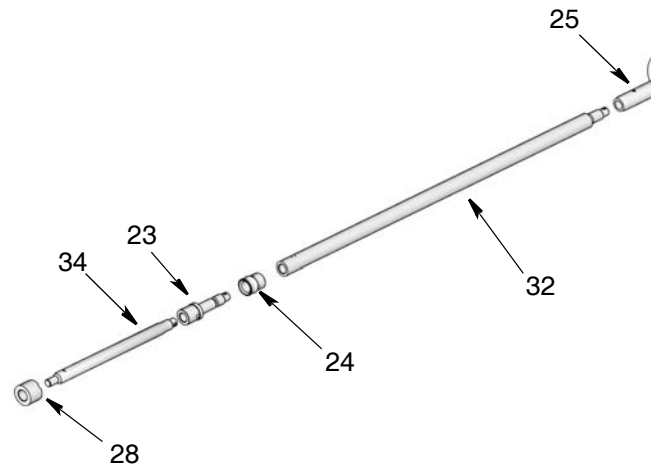


Fig. 8

If you are only replacing or repairing the pump lower continue instructions beginning with Step 14, page 8 of the Reassembly instructions and the related O-Ring and Seal Replacement Kit 24H856, page 12.

15. Clamp the air cylinder (21) horizontally in a vise as shown in Fig. 9.

NOTE: 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.

16. Using a 10 mm socket wrench, remove the 4 screws (43) from the air valve (40) and completely remove air valve assembly from air cylinder (21). Also remove the two cover gaskets (18). If you are replacing these parts, discard gaskets. (Fig. 9).

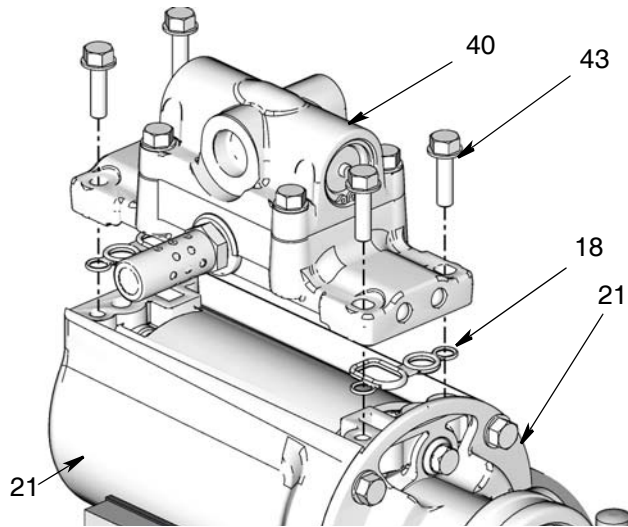


Fig. 9

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

17. Using a 10 mm socket wrench, remove the 5 screws (4) from the flange (22).
18. Using your hand, firmly grasp the flange (22) and remove the entire assembly from inside the air cylinder (21).

NOTE: Sliding the flat blade of a screw driver between the flange (22) and air cylinder (21) will help separate the two parts. Be careful not to damage the o-ring (6) (Fig. 10).

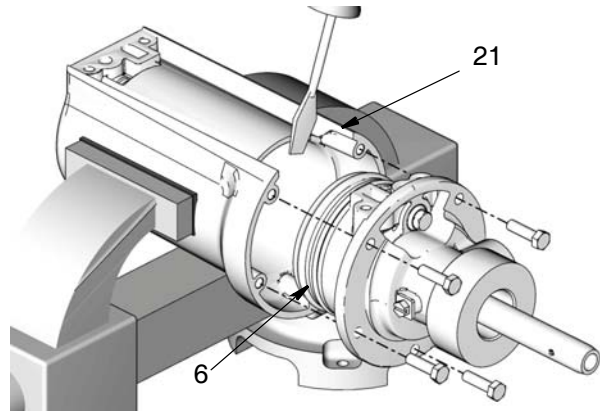


Fig. 10

19. Pull the flange assembly off the displacement rod (25). Set the displacement rod aside. You will not need it until you reassemble the pump.
20. Using a 5 mm socket wrench remove the 3 screws (3) from the bottom cover (14) (Fig. 11).

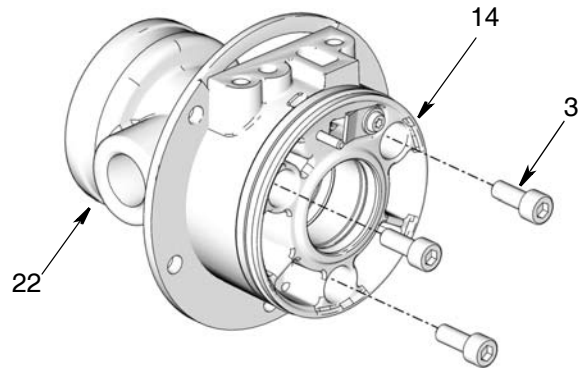


Fig. 11

21. Separate the bottom cover (14) from the flange (22) (Fig. 11).

NOTE: Insert the flat blade of a screwdriver between the flange and bottom cover to help loosen the seal between these two pieces and pull them apart more easily.

If you are replacing the o-rings and seals installed in the flange, bottom cover, and air piston continue instructions with Step 1, page 7 of the Reassembly instructions and the Throat and Piston Seal Replacement Kit 24H854 instructions beginning on page 11.

Pump Reassembly

NOTE: The following instructions describe the procedure to follow to reassemble a completely disassembled LD grease 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 all 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 (14) and flange (22) as described in the Throat and Piston Seal Replacement Kit 24H854, page 11. Be sure to apply a thin coat of water-resistant grease to all o-rings and seals.
 2. Align pilot valve (20) installed in bottom cover with opening (a) in flange (22) as shown in Fig. 12. Compress the bottom cover (14) and flange (22) together.

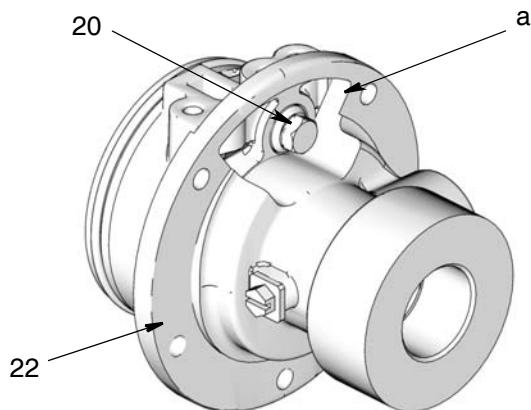


Fig. 12

3. Install 3 screws (3) (Fig. 13). Tighten with a 5 mm socket wrench and torque to 60-70 in lbs (6.8 – 7.9 N.m).

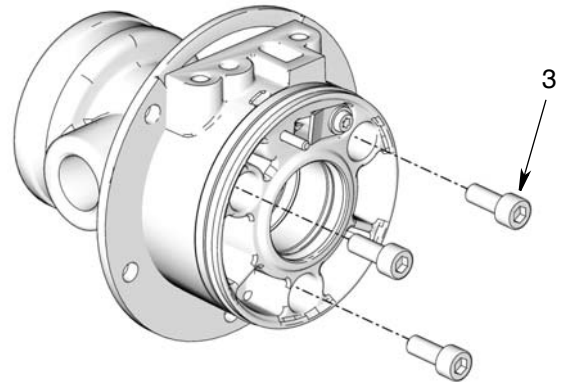


Fig. 13

4. Apply a thin coat of grease round the top of the displacement rod (50). Push the displacement rod through the opening in the bottom cover and into the flange assembly as shown in Fig. 14.

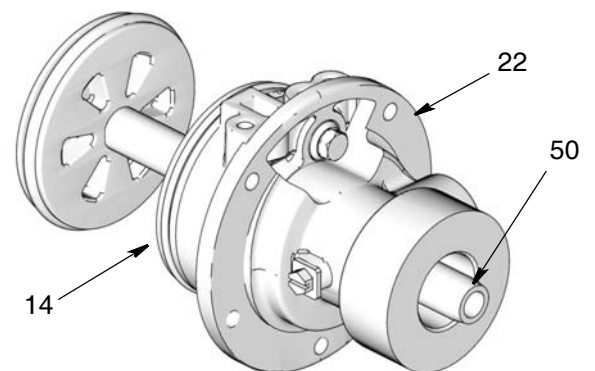


Fig. 14

5. Install the air cylinder (21) over the bottom cover (14). Place the top of the air cylinder down on a clean hard surface. Use the palms of your hands to press the bottom cover firmly into the air cylinder (Fig. 15).

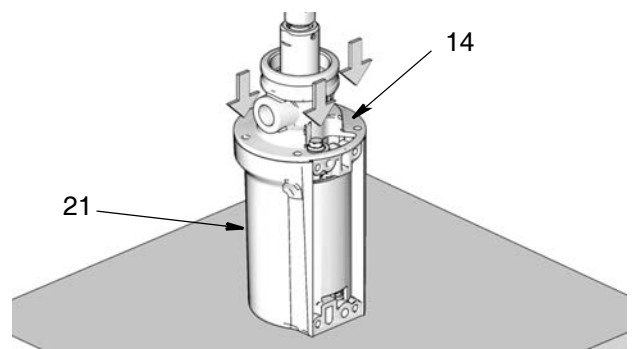


Fig. 15

- Install the 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 - 11.8 N.m) to ensure full thread formation.

- To ensure there is a proper seal between the air valve and manifold, loosen all 5 screws (Fig. 16) approximately 1/8 to 1/4 turn. These screws will be torqued in Step 12, **AFTER** the air valve (40) is installed.

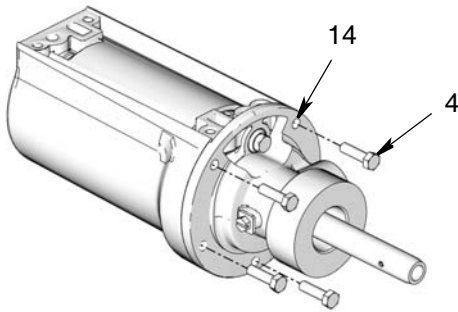


Fig. 16

- Secure pump assembly in a vise as shown in Fig. 17.
- Perform any air valve repairs / maintenance needed. See separate instruction manual included with the related air valve repair kit.
- Be sure seals (18) are lightly greased and installed on air valve (40). Install air valve on air cylinder (21).

NOTE: The air valve (40) can be installed in any configuration. There is not just one correct way to install these parts.

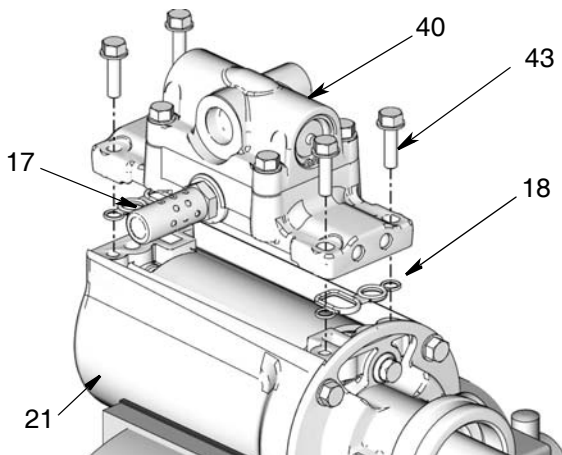


Fig. 17

- Install screws (43). Torque to 60-70 in. lbs (6.8 - 7.9 N.m).
- Torque screws (4) installed in Step 6 to 60-70 in. lbs (6.8 - 7.9 N.m).

Muffler (17) Installation (Fig. 17)

- Depending on your installation, the air valve (40) can be mounted with the muffler (17) on either side of the air valve.

To change the installation location:

- Remove the 4 screws (43).
- Remove the air valve (40) from its current mounted position on the air cylinder (21) and rotate the air valve 180 degrees, which will reposition the muffler to face the other side of the pump.

NOTE: When installing the pin (8) in Steps 14 - 20, it is helpful to place a support, such as a piece of wood, below the rods.

- Screw the connecting rod (32) and the displacement rod (25) together, aligning the pin hole in both pieces to allow the pin to be pushed through (Fig. 18).

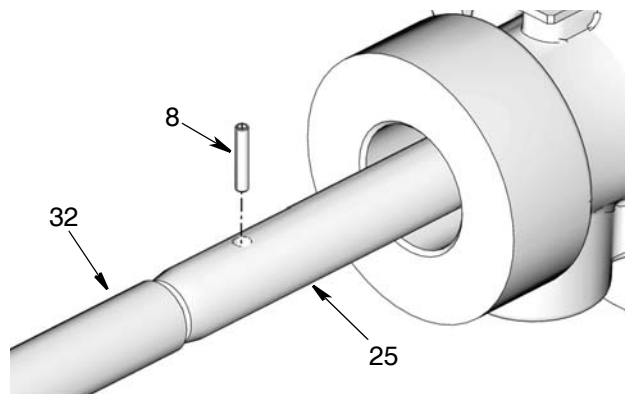


Fig. 18

- Replace the pin (8). Use a rubber hammer to tap the pin into place, being careful to make sure the sides of the pin are flush with the outside surface of the connecting rod (Fig. 18).
- Install piston seal (24) over the end of the piston rod (23). Note the correct orientation of the piston seal on the piston rod as shown in Fig. 19.

- Screw the piston rod (23) and the connecting rod (32) together aligning the pin hole in both pieces to allow the pin to be pushed through (Fig. 19).

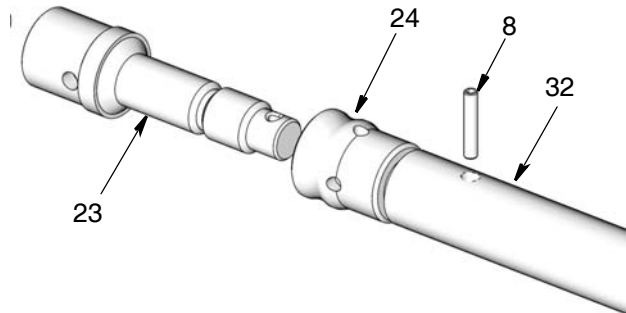


Fig. 19

- Replace the pin (8). Use a rubber hammer to tap the pin into place, being careful to make sure the sides of the pin are flush with the outside surface of the connecting rod (Fig. 19).
- Screw the piston rod (23) and priming rod (34) together aligning the pin hole in both pieces to allow the pin to be pushed through (Fig. 20).

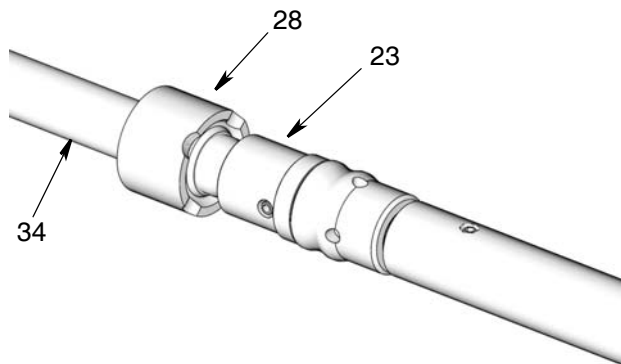


Fig. 20

- Replace the pin (8). Use a rubber hammer to tap the pin into place, being careful to make sure the sides of the pin are flush with the outside surface of the piston rod (Fig. 20)
- Check to make sure there is end play at all pinned connections.

NOTE: When there is *end play* at the pinned connection, you should be able to slightly move from side-to-side, the displacement rod (25) pinned to the connecting rod (32) and the connecting rod (32) pinned to the piston rod (23) and piston rod (23) pinned to the priming rod (34).

- If these connections seem too rigid remove the pin and adjust hole alignment by 1/2 turn in the direction that aligns the through holes as close as possible, axis-to-axis (Fig. 21).

NOTICE

Improper alignment will take the self-aligning feature out of the design which could result in damage to the pump.

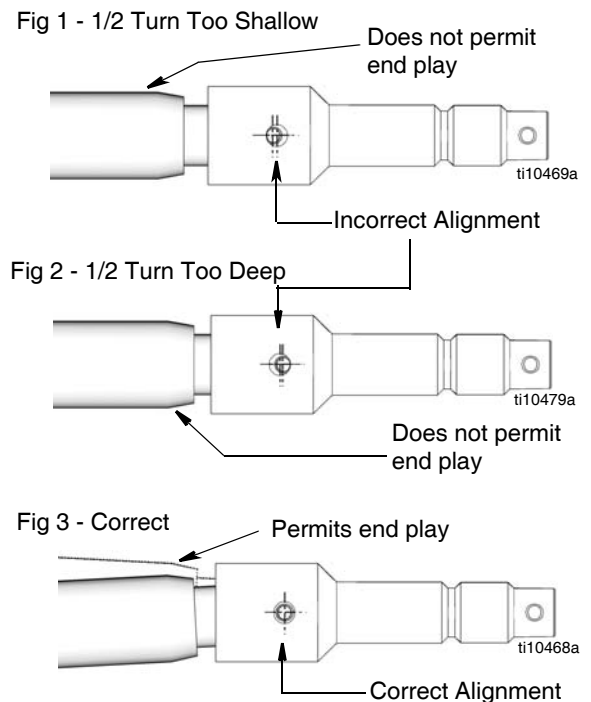


Fig. 21

- Install spacer cylinder (36) over rod assembly. Use a strap wrench to tighten spacer cylinder securely.
- Install cylinder (26) and seal (30). Torque to 45 - 55 ft. lbs (61 - 75 N.m).
- Install the intake seal (28) over the end of the priming rod (34). Note the correct orientation of the

intake seal on the priming rod as shown in Fig. 20.

26. Install seal retainer (29) over priming rod (34) (Fig. 22).
27. Use an adjustable wrench to tighten seal retainer securely, then torque to 45 - 55 ft lbs (61 - 75 N.m).

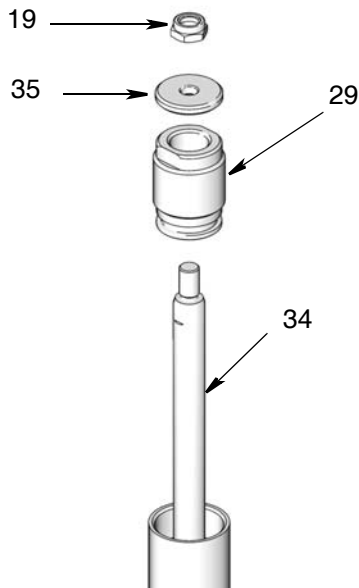


Fig. 22

28. Install the priming piston (35 and nut (19) (Fig. 3, Fig. 4) on priming rod (34) Use an adjustable wrench to hold the priming rod (34) securely. Use a second adjustable wrench to tighten nut. Then torque nut to 70 - 80 in. lbs (7.9 - 9.0 N.m) (Fig. 22 and Fig. 23).

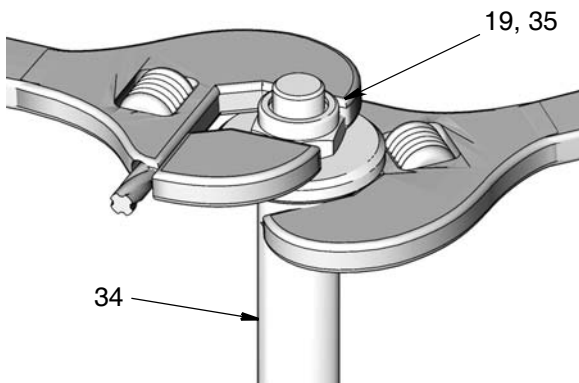


Fig. 23

29. Install shovel cylinder (27) over priming rod (34) (Fig. 24). Use a strap wrench to tighten shovel cylin-

der securely then torque to 45 - 55 ft. lbs (61 - 75 N.m).

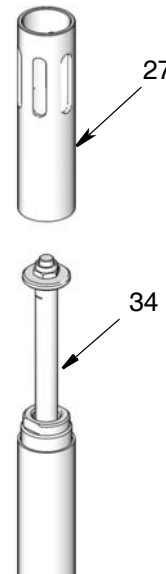
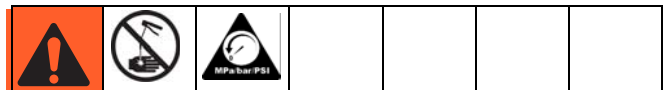


Fig. 24

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 instruction section of this manual.

Throat and Piston Seal Replacement Kit - 24H854 (Fig. 25)

Replacement parts for o-ring (5) installed on air piston (15), o-rings (6 and 12) installed in bottom cover (14), o-ring (7), u-cup seal (11) and gasket (30) installed on flange (22), pin (8) used to reassemble rod sections, and gasket (18) used later in reassembly of the air valve (40). A replacement part for the retainer nut (37) is also included in this kit.

Ref.	Description	Qty
5	O-RING, air piston	1
6	O-RING	1
7	O-RING	1
8	PIN, slotted, straight	3
11	SEAL, u-cup	1
12	O-RING	3
18	GASKET, cover, small	2
30	GASKET	1
37	NUT, retainer	1

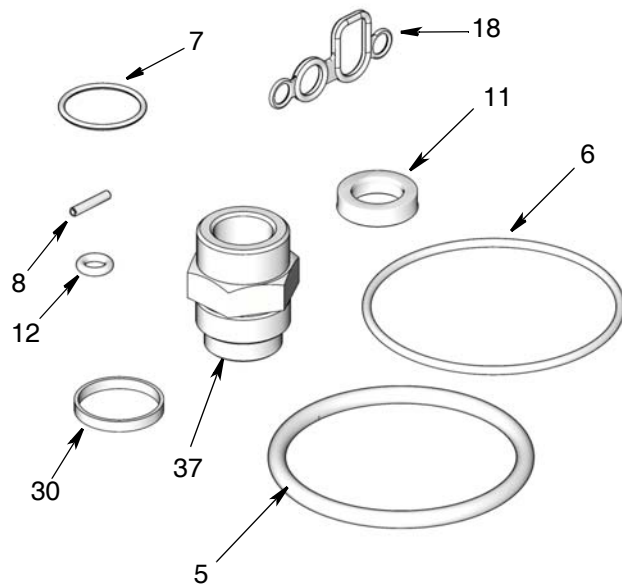


Fig. 25

1. Disassemble the pump following Disassembly Steps 1-3 (page 3), Steps 9-12 (page 5) and 15-21 (pages 5-6).

2. Use a pick to remove the o-ring (5) installed around the circumference of the air piston (15) (Fig. 26). Grease the new o-ring included in the kit and install it around the air piston.

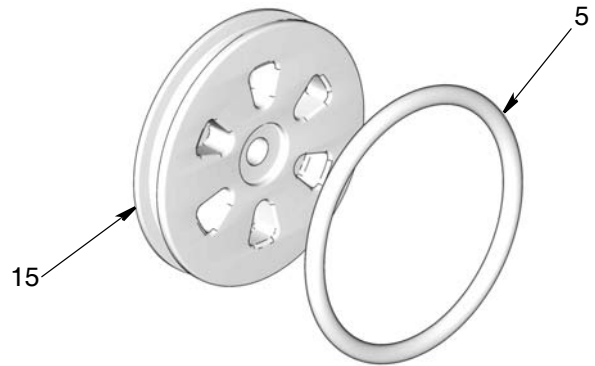


Fig. 26

3. Use a pick to remove o-ring (7) and gasket (30) from inside flange (22) (Fig. 27). Grease the o-ring and replace the o-ring and gasket in flange.

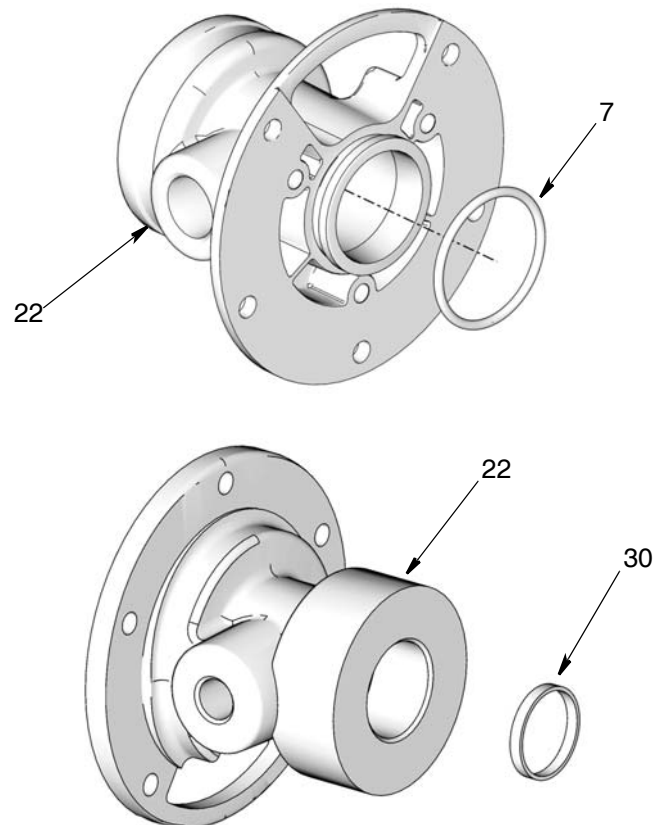


Fig. 27

- Remove nut retainer (37) from flange (22) (Fig. 28).

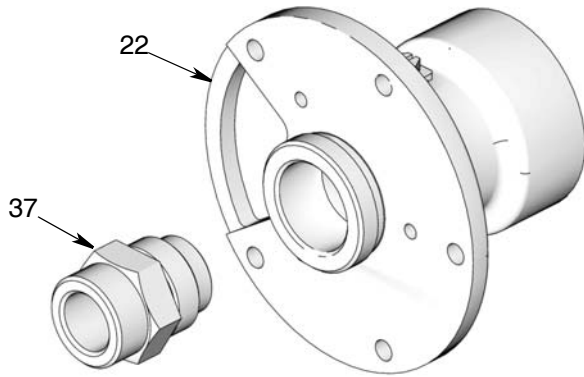


Fig. 28

- Remove u-cup seal (11) from flange (22) (Fig. 29). Grease and replace the u-cup seal with the new part included in the kit and install them in the order shown in Fig. 29.

NOTE:

- The bearing (31) 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 (31) is a transition fit and in some installations it may not be removed.
- Be sure u-cup seal (11) is installed with the lips facing down as shown in Fig. 29.

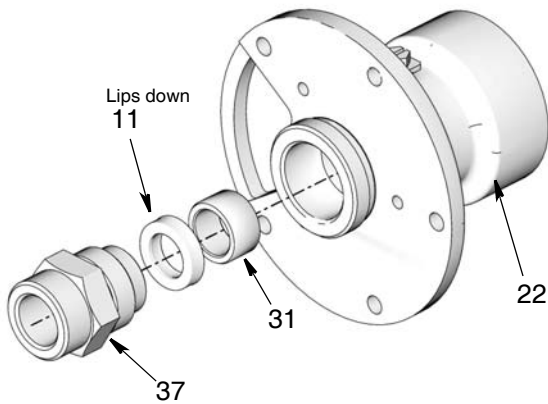


Fig. 29

- Install displacement rod (25) through flange assembly (22) (Fig. 30).
- Remove and discard the 3 small o-rings (12) and o-ring (6) in the bottom cover (14) (Fig. 30). Grease

the new o-rings (12) and o-ring (6) included in the kit and install them in the bottom cover housing.

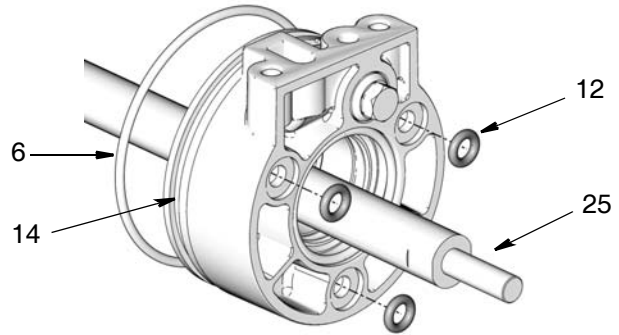


Fig. 30

- Reassemble the pump as described in the Reassembly instructions, page 7.

O-Ring and Seal Replacement Kit - 24H856 (Fig. 31)

Replacement parts for gasket (30) installed in the flange and around the circumference of the cylinder (26), o-ring (10) installed around the seal retainer (29), pin (8) used to reassemble rod sections, and replacement seals (24 and 28) installed on the displacement rod assembly.

Ref.	Description	Qty
8	PIN, slotted, straight	3
10	O-RING	1
24	SEAL, piston	1
28	SEAL, intake	1
30	GASKET	2

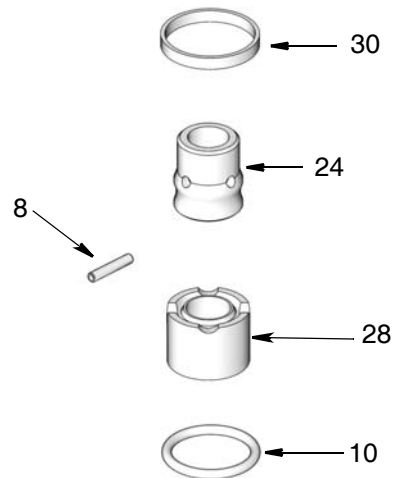


Fig. 31

1. Disassemble the pump following Disassembly Steps 1-14 (pages 3-5) only.
2. Use a pick to remove the gasket (30) installed between the flange (22) and tube (36) (Fig. 32). Grease the new gasket included in the kit and install it inside the flange.

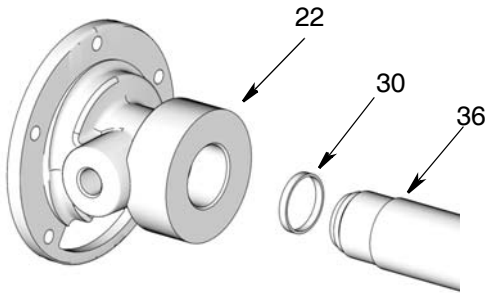


Fig. 32

3. Use a pick to remove the other gasket (30) installed between the cylinder (26) and tube (36) (Fig. 33). Grease the new gasket included in the kit and install it around the cylinder.

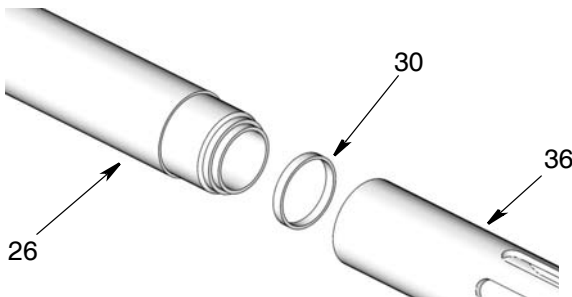


Fig. 33

4. Use a pick to remove the o-ring (10) installed around the top of the seal retainer (29) (Fig. 34). Grease the new o-ring included in the kit and install it over the seal retainer.



Fig. 34

5. Reassemble the pump as described in the Reassembly instructions, page 7.

Air Piston Replacement Kit - 24U984 (Fig. 35)

Ref.	Description	Qty
5	O-RING	1
8	PIN, straight, slotted, 2.5 x 16	1
13	GASKET, 32 OD	1
15	PISTON, air, plastic	1
18	GASKET, cover small	2
19	NUT, hex	1
21	CYLINDER, air, machined	1
25	ROD, displacement, 50:1	1
30	GASKET	1
38	WASHER, 32 OD	1
101	LABEL, identification	1
102	LABEL, overlay, clear	1

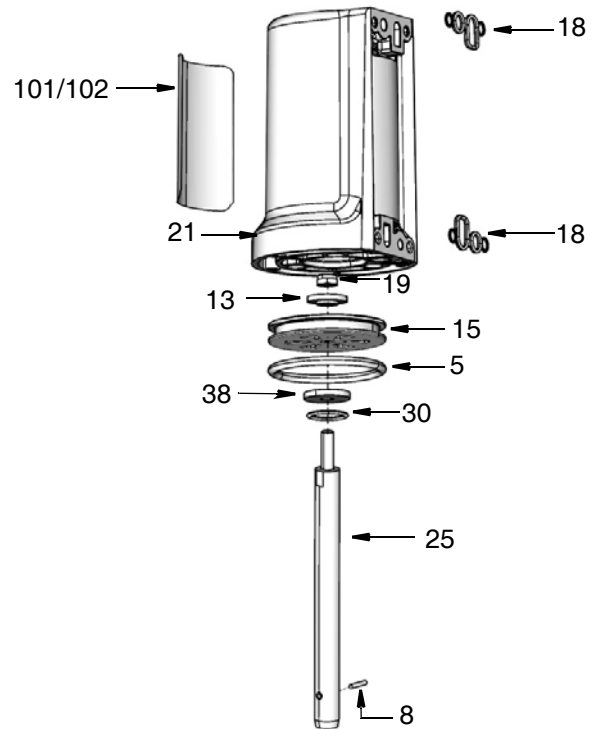


Fig. 35

Pump Disassembly,

1. Follow Pump Disassembly instructions Steps 1-3 beginning on page 3.
2. Secure a strap wrench around the spacer cylinder (36) and use it to turn the cylinder counter clockwise to loosen and remove it from the flange (22) (Fig. 36).

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

3. Pull spacer cylinder (36) away from pump to access pin (8) (Fig. 36).

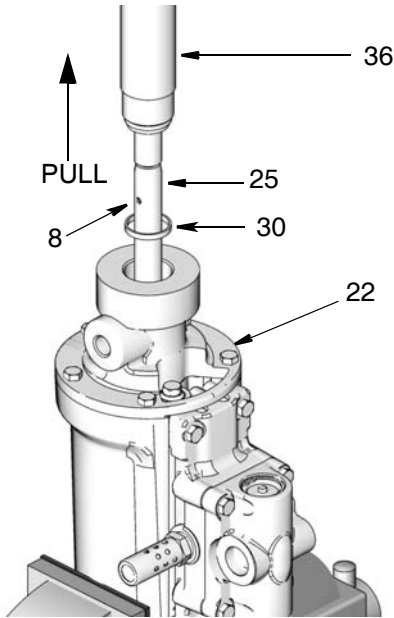


Fig. 36

4. Use a rubber hammer and small punch to drive the pin (8) out.
5. Unscrew the pump lower from displacement rod (25). Set aside pump lower for reassembly.
6. Use a pick to remove gasket (30) from inside the flange (22).
7. Continue pump disassembly instructions Steps 15 - 19, beginning on page 5.
8. Discard pin (8), air piston (15) and displacement rod (25) according to all applicable safety regulations for disposal of these parts.

Pump Reassembly

Always use all new parts included in the kit for reassembly.

1. Apply a thin coat of grease around the threaded end of the new displacement rod (25).
2. Assemble washer (38), air piston (15), gasket (13), o-ring (5) and hex nut (19) to displacement rod (25) as shown in Fig. 37. Be sure the male boss on gasket (13) mates with the counter bore in air piston (15). Tighten and torque nut (19) to 155 - 165 in. pounds (17.5 - 18.6 N.m).

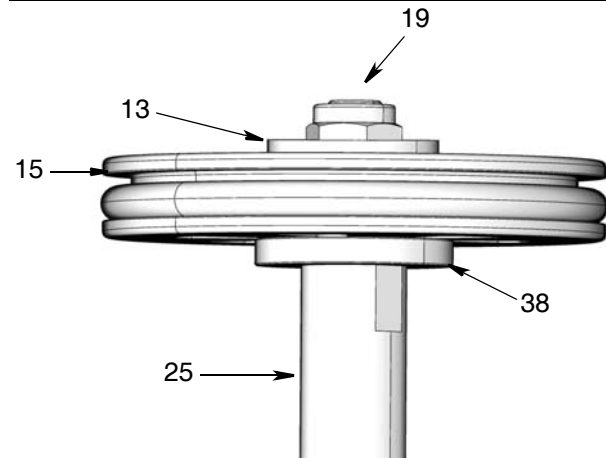
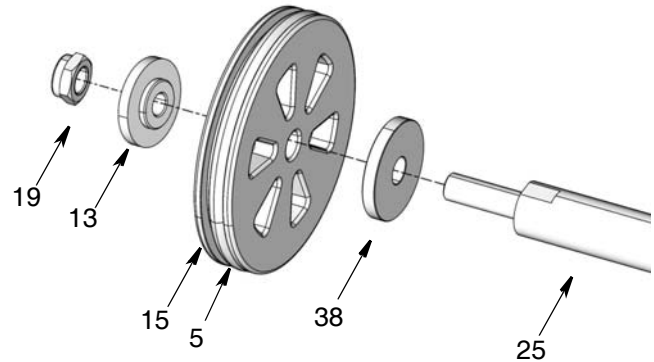


Fig. 37

3. Apply a thin coat of grease around the chamfered end of the displacement rod assembly (25). Push the displacement rod through the opening in the bottom cover and into the flange assembly as shown in

Fig. 38.

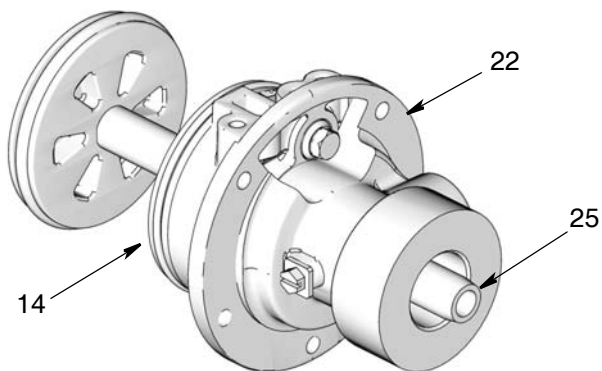


Fig. 38

4. Remove pilot valve (20) from the old air cylinder (21). Apply a light coat of grease to o-rings.
5. Install pilot valve (20) into new air cylinder included in the kit (Fig. 39). Torque to 95-105 in. lbs (10.7-11.9 N.m).

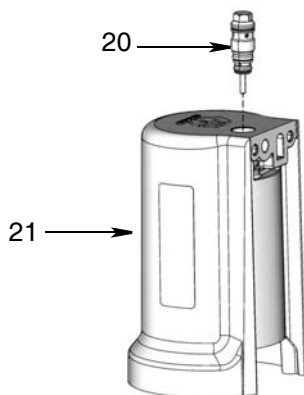


Fig. 39

6. Apply a thin coat of grease to o-rings (5) and o-ring on bottom cover (14). Install the air cylinder (21) over the bottom cover (14) / air piston (15) assembly. Place the top of the air cylinder down on a clean hard surface. Use the palms of your hands to press

the bottom cover firmly into the air cylinder (Fig. 40).

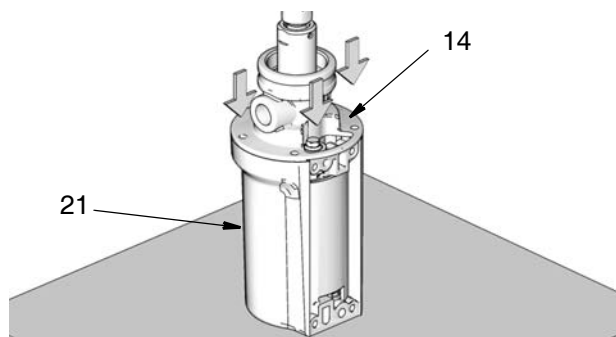


Fig. 40

7. Install the 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 - 11.8 N.m) to ensure full thread formation.

8. To ensure there is a proper seal between the air valve and manifold, loosen all 5 screws (4) approximately 1/8 to 1/4 turn (Fig. 41). These screws will be torqued **AFTER** the air valve (40) is installed.

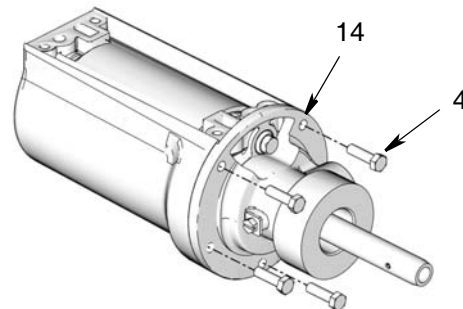


Fig. 41

9. Continue reassembly instructions Steps 8 - 13, beginning on page 8.
10. Install gasket (30) into bottom cover (14) (Fig. 42).
11. Screw the connecting rod (32) and the displacement rod (25) together, aligning the pin hole in both

pieces to allow the pin to be pushed through (Fig. 42).

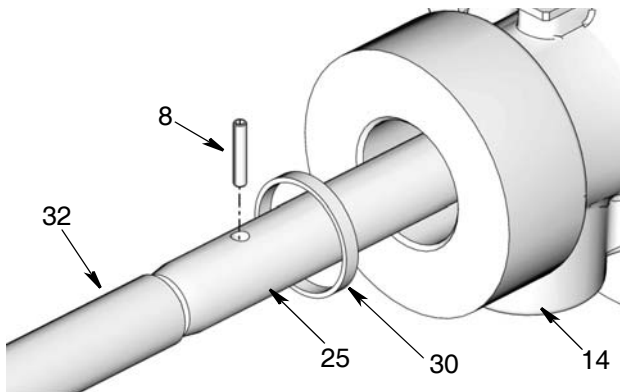


Fig. 42

12. Replace the pin (8). Use a rubber hammer to tap the pin into place, being careful to make sure the sides of the pin are flush with the outside surface of the connecting rod (Fig. 42).
13. Check to make sure there is end play at all pinned connections.

NOTE: When there is *end play* at the pinned connection, you should be able to slightly move from side-to-side, the displacement rod (25) pinned to the connecting rod (32) and the connecting rod (32) pinned to the piston rod (23) and piston rod (23) pinned to the priming rod (34).

14. If these connections seem too rigid remove the pin and adjust hole alignment by 1/2 turn in the direction that aligns the through holes as close as possible, axis-to-axis (Fig. 21).

NOTICE

Improper alignment will take the self-aligning feature out of the design which could result in damage to the pump.

15. Slide spacer cylinder (36) into bottom cover (14).
16. Using a strap wrench, tighten and torque spacer cylinder (36) to 45 - 55 ft. lbs (61.0 - 74.5 N.m).
17. 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.
18. 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.

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

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Original instructions. This manual contains English. MM3A1495

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