

Instructions



Grease or Oil Reciprocating Pump

3A5266E

EN

For pumping non-corrosive and non-abrasive lubricants only. For professional use only.

Models: Page 2

4000 psi (27.58 MPa, 275.8 bar) Maximum Working Pressure

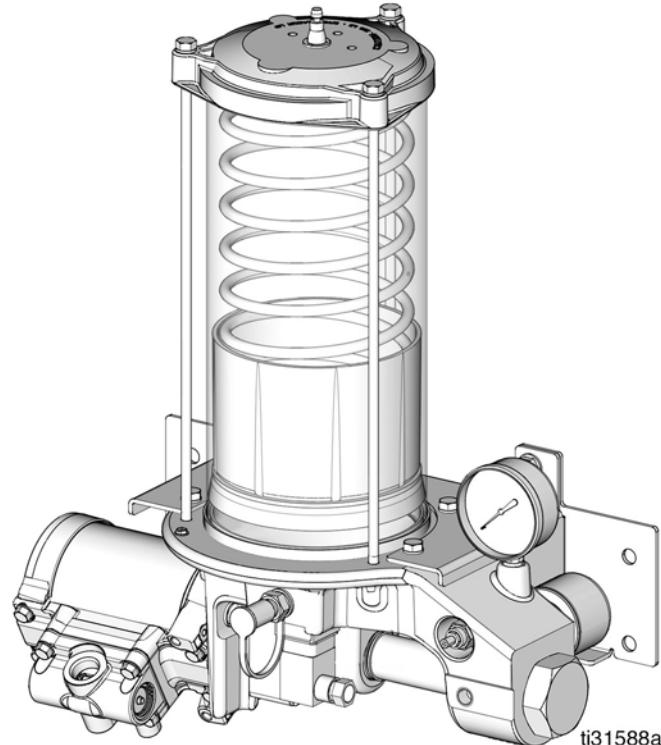
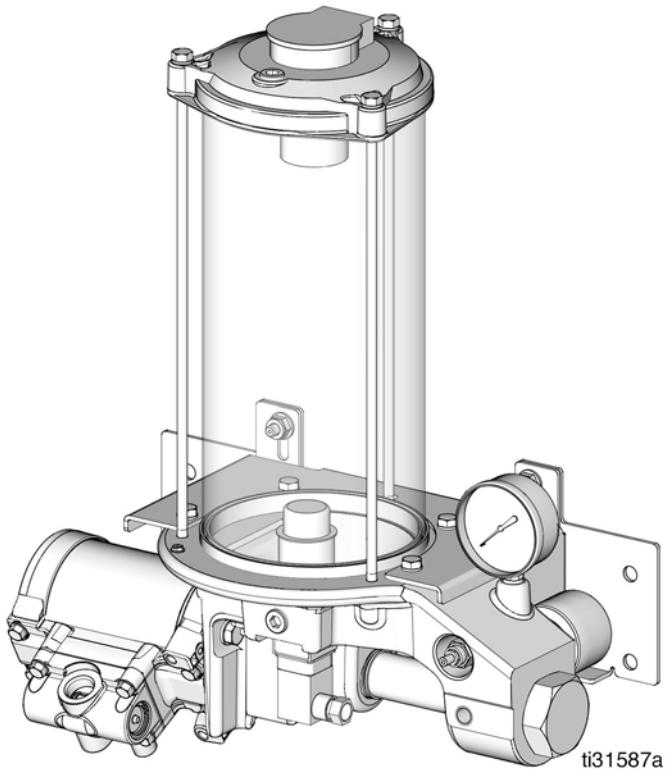


Important Safety Instructions

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

Related Manuals

406900 - Air Motor Repair Kit



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Models

Pneumatic Vent Valve	Series Progressive	Electric Vent Valve	Fluid	With Low Level	Reservoir Size (lb)	Ratio	Pressure	
							PSI	MPa/bar
17P750	17T176	17T193	Grease		12	40:1	4000	27.58 / 275.8
17P751	17T177	17T194	Grease	✓				
17P752	17T178	17T195	Oil					
17P753	17T179	17T196	Oil	✓				
17U217			Grease	✓	20			

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 or on warning labels, 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	
    	SKIN INJECTION HAZARD <p>High-pressure fluid from dispensing device, 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 dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing 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.
	PRESSURIZED EQUIPMENT HAZARD <p>Over-pressurization can result in equipment rupture and serious injury.</p> <ul style="list-style-type: none"> • Do not exceed the maximum air input pressure. • Fill slowly to avoid over pressurizing reservoir. • Use tubing, hoses and other components with pressure ratings equal to or higher than the pump rating.
 	PLASTIC PARTS CLEANING SOLVENT HAZARD <p>Many cleaning solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage.</p> <ul style="list-style-type: none"> • Use only compatible solvents to clean plastic structural or pressure-containing parts. • See Technical Specifications in all equipment manuals for materials of construction. Consult the solvent manufacturer for information and recommendations about compatibility.

 WARNING	
 	<p>ELECTRIC SHOCK HAZARD</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. Connect only to grounded power source. All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
 	<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 Specifications in all equipment manuals. Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) from distributor or retailer. Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. Make sure all equipment is rated and approved for the environment in which you are using it. 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>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective 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.
	<p>CALIFORNIA PROPOSITION 65</p> <p>This product contains a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.</p>

Installation



Typical Installation: Injector System

(grease model pump shown)

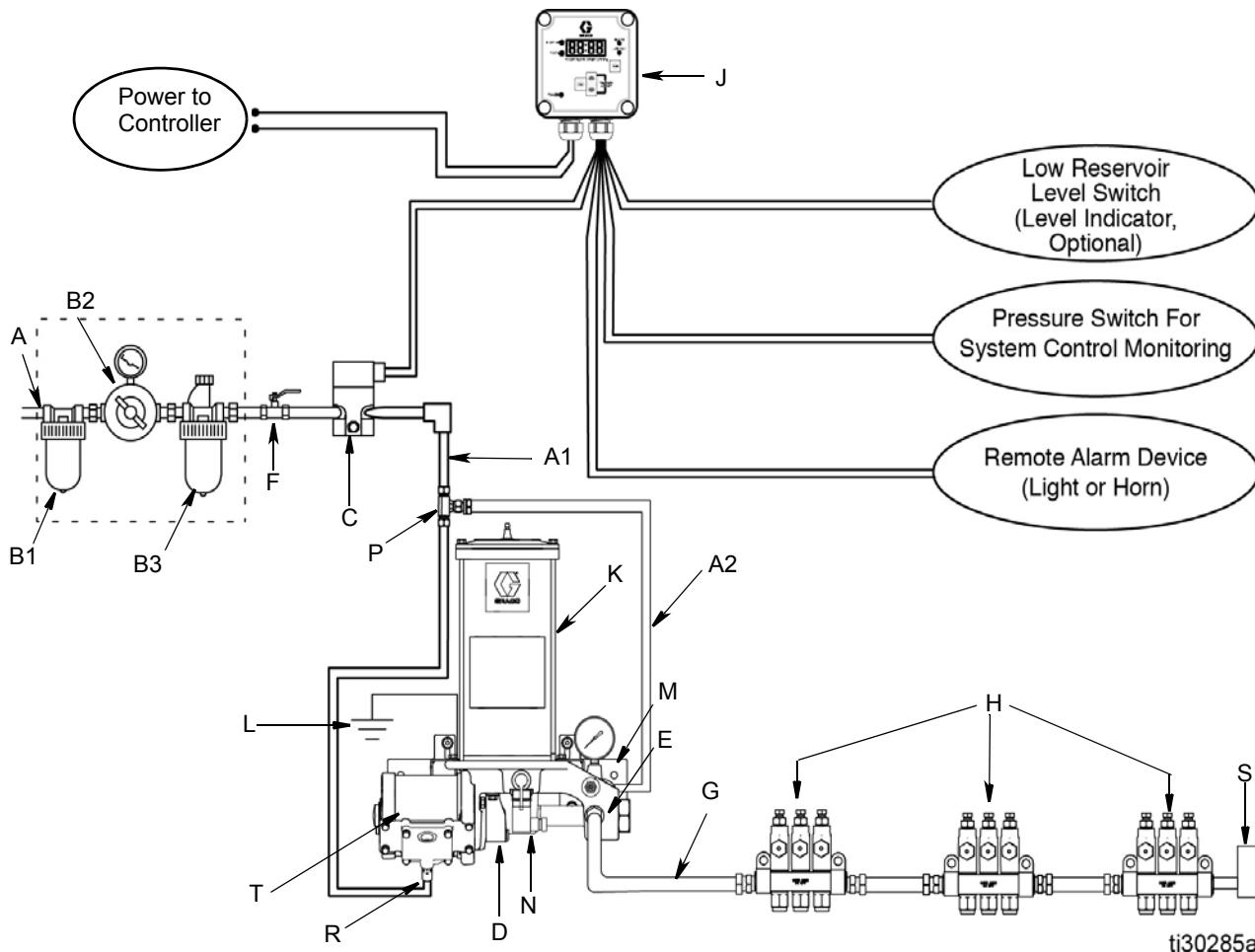


FIG. 1: Typical Installation

Key:

A Main Air Supply	G High Pressure Lubricant Supply Lines
A1 Switched Air Supply	H Injector
A2 Vent Valve Air Supply	J Lubricator Controller
B Filter/Regulator/Lubricator Assembly	K Pump Reservoir
B1 - Air Filter	L Ground
B2 - Air Regulator	M Vent Valve
B3 - Air Lubricator	N Low Level Switch (not installed on all pump models)
C Air solenoid valve (3-way)	P Tee-fitting to Vent Valve
D Pump Module	R Pump Air Inlet
E Pump Outlet	S Pressure Switch
F Bleed-type Master Air Valve (required)	T Air Motor

Typical Installation: Divider Valve System

(oil model pump shown)

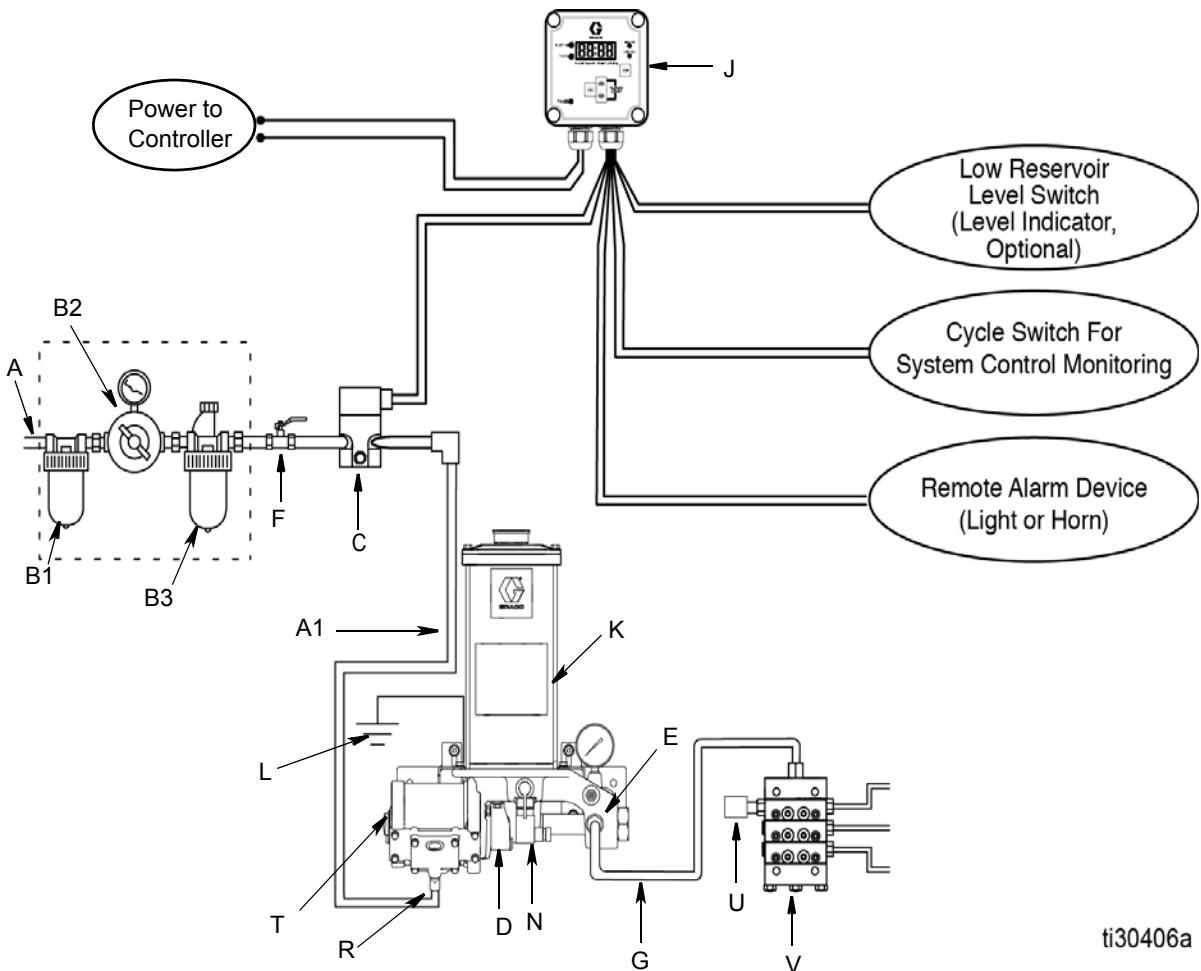


FIG. 2: Typical Installation

Key:

- A Main Air Supply
- A1 Switch Air Supply Line
- B Filter/Regulator/Lubricator Assembly
- B1 - Air Filter
- B2 - Air Regulator
- B3 - Air Lubricator
- C Air Solenoid Valve (3-way)
- D Pump Module
- E Pump Outlet
- F Bleed-type Master Air Valve (required)
- G High Pressure Lubricant Supply Lines
- J Lubricator Controller
- K Pump Reservoir
- L Ground
- R Pump Air Inlet
- T Air Motor
- U Cycle Switch
- V Divider Valve

Grounding



Grounding is required if a low level switch and/or an air valve using voltages above 30 VAC or 42 VDC are attached to the pump. Improper grounding can cause electric shock. Grounding reduces the risk of electric shock by providing an escape wire for the electric current in the event of malfunction or breakdown.

Secure ground wire to grounding screw (66) as shown in FIG. 3.

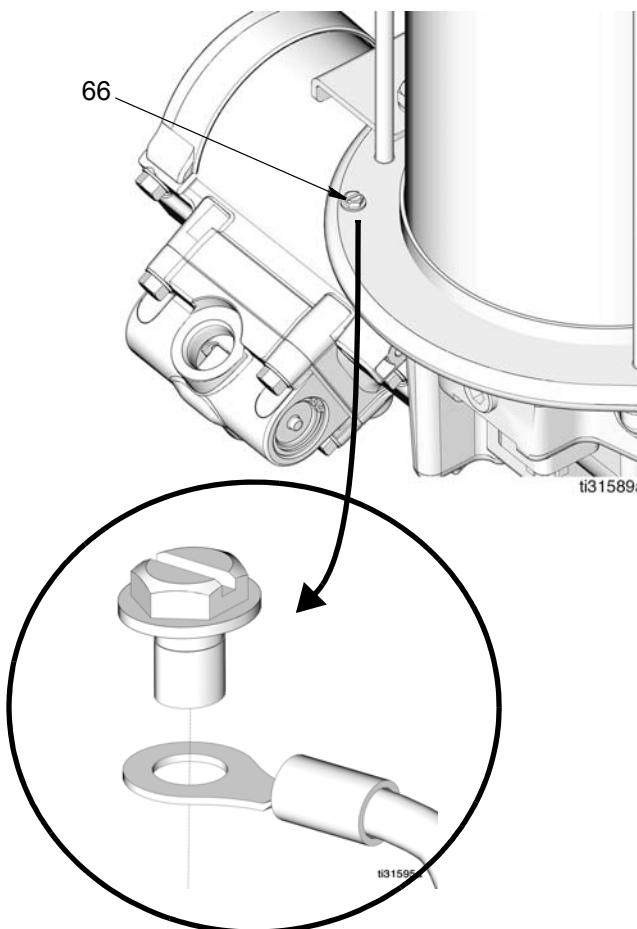


FIG. 3

Mounting



Mount the pump securely so that it cannot move around during operation. Failure to do so could result in injury or equipment damage.

Install the pump in a location that will adequately support the weight of the pump when filled with lubricant and also provides easy operator access to the pump air controls. See Technical Data, page 35 for pump weight information and the Dimensions and Mounting layout, page 28.

1. Secure wall bracket (39) to mounting location. (User must provide mounting hardware.)
2. Install pump bracket (38) to wall bracket (39). Secure pump bracket to wall bracket using washers (60) and nuts (44).

Low Level

For models equipped with a low level switch, connection is made to pins 1 and 2 for normally closed operation or pins 1 and 3 for normally open operation. See FIG. 4.

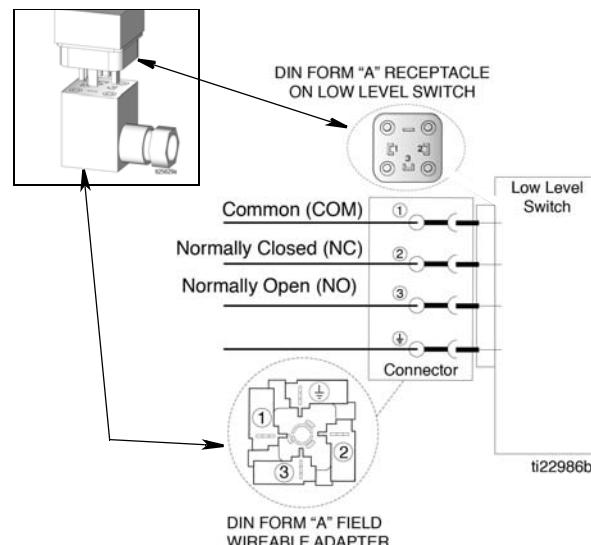
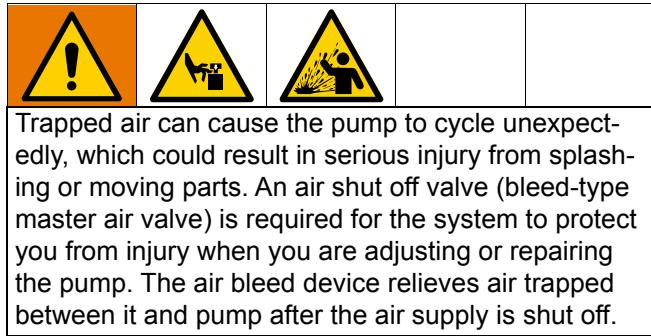


FIG. 4

Air and Fluid Line Accessories

Refer to FIG. 1 and FIG. 2, pages 5 and 6, for the following instructions.

Install the air line accessories in the order shown in FIG. 1 and FIG. 2, pages 5 and 6.



1. Install an air line filter (B1) to remove harmful dirt and contaminants from the compressed air supply
2. Install the air regulator (B2) to control pressure.
3. Install an air line lubricator (B3) to lubricate the air cylinder.
4. Install a bleed-type master air valve (F) to relieve air trapped between it and the pump. Install the valve in a location that is easily accessible and located downstream of the air regulator.
5. Install the(3-way) air solenoid valve (C) for control of the pump strokes.
6. Connect the vent valve (M).
 - **Pneumatic Vent Valve**
Connect the air powered vent valve to the pump supply air (A1).
 - a. Install a t-fitting (P) at the pump inlet.
 - b. Install a hose between the t-fitting and vent valve.
 - **Electric Vent Valve**
Connect to pump air control valve power.
 - a. Install a DIN connector into the vent valve.
 - b. Connect the leads to the controller output that signals the pump to turn on.



The maximum working pressure of each component in the system may not be the same. To reduce the risk of over-pressurizing any part of the system, know the maximum working pressure rating of each component and its connected components. Never exceed the maximum working pressure of the lowest rated components connected to a particular pump.

7. To use the air regulator reading to determine the fluid output pressure, multiply the ratio of the pump (40:1) by the air pressure shown on the regulator gauge; i.e., 40 psi x 40 = 1600 psi (2.75 bar x 40 = 110 bar; 0.27 MPa, x 40 = 10.8 MPa).
8. Limit the air pressure to the pump so that no air line or fluid line component or accessory is over pressurized.

Electric Vent Valve Kit 129713

Grease Models 17T193 and 17T194; Oil Models 17T195 and 17T196



1. Stop pump. Relieve pressure. See **Pressure Relief Procedure**, page 11.
2. Disconnect air line from pump.
3. Remove plug (57) from pump base (2) (FIG. 5).

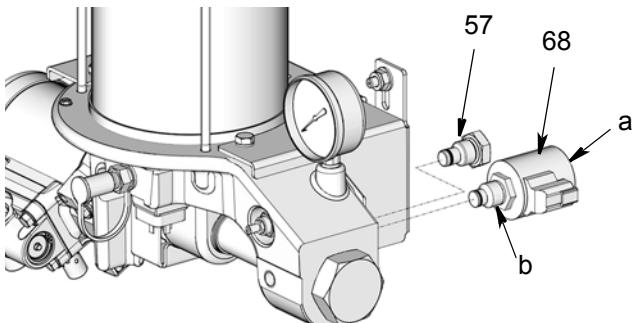


FIG. 5

4. Install valve cartridge (68) in pump base (FIG. 5). Torque coil nut (a) to 4 to 5 ft-lbs (5.42 to 6.78 N·m). Torque cartridge nut (b) to 16 to 20 ft-lbs (21.69 to 27.12 N·m).

Fill Reservoir

Oil Models

1. Open oil fill cap (32) on the top of the reservoir.

NOTE: A filter (33) is installed at the oil fill cap (32) to prevent lubricant contamination (FIG. 6).

- a. Inspect filter (33) before filling reservoir.
- b. When needed, remove filter (33) and clean it thoroughly.
- c. If removed in Step b, install filter (33) prior to adding lubricant.

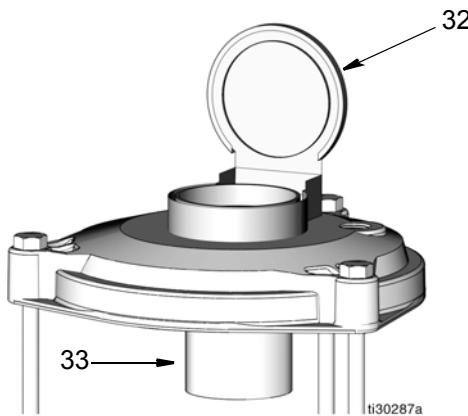


FIG. 6

2. Slowly add oil (ol) until reservoir is filled to capacity (FIG. 7). Take care to not fill reservoir too quickly and overflow the reservoir capacity.

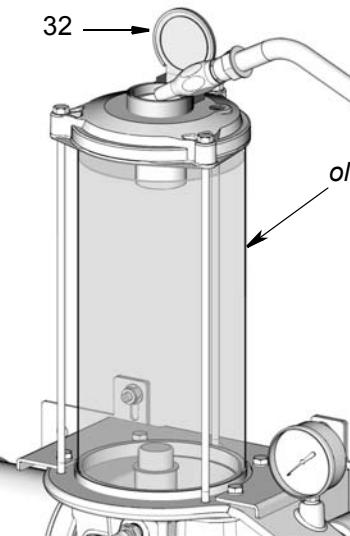


FIG. 7

3. Close oil fill cap (32) to prevent contamination and spillage (FIG. 7).

Grease Models

1. Remove dust cap (42) (FIG. 8) from fill stud (26).
2. Connect the quick connect fitting on the fill pump to the fill stud (26) on the reservoir.

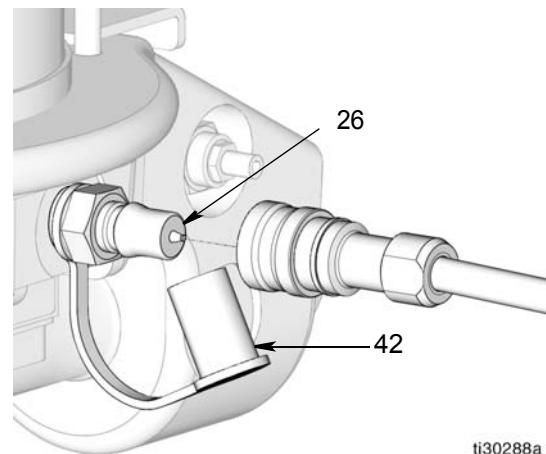
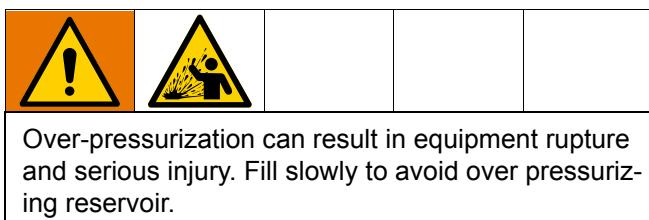


FIG. 8



- Slowly dispense grease from the fill pump into the reservoir until the grease in the reservoir lifts the follower plate (45) above the reservoir vent hole (vh) and air is expended from under the follower plate (FIG. 9). A small amount of grease may come out of the vent hole at this time.

Care must be taken not to overfill the reservoir. An over filled reservoir will vent the excess grease out of the vent hole (vh) until enough grease is expelled for the follower plate (45) to block the vent hole. Overfilling the reservoir could also cause the reservoir to rupture due to over-pressurization.

NOTE: The vent hole (vh) is located toward the back right side of the reservoir and cannot be seen in FIG. 9. The approximate location of the vent hole is identified as vh in the illustration.

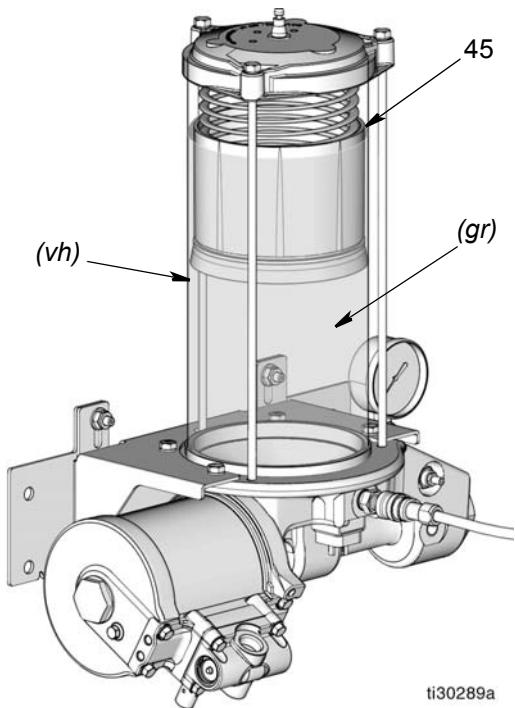


FIG. 9

- Disconnect the fill pump from the fill stud (26, FIG. 8).
- Secure dust cap (42) over fill stud (26) (FIG. 8).

Priming

Refer to FIG. 1 and FIG. 2, pages 5 and 6, for the following instructions.

NOTE:

- Prime the pump before connecting the outlet to supply line (G).
- Before priming the pump, the reservoir must be filled with lubricant (see Fill Reservoir instructions, page 8).

Run the pump until lubricant, free of air, comes out of the pump outlet (E). It may take up to 20 pump strokes to expel the air from the pump and deliver a continuous flow of lubricant. This will depend on the viscosity of the lubricant and temperature.

Supply Lines

- Run the pump until the oil (ol), free of air, comes out of the pump outlet (E). Connect the supply line (G) to the pump outlet (E).
- If there are multiple pumps on the air line, close the air regulators and bleed-type master air valves to all but one of the pumps. If there is only one pump, open its air regulator and bleed-type master air valve.
- Open the master air valve from the compressor.
- Set the air pressure to each pump at the lowest pressure needed to get the desired results.

Feeder Lines

Fill each feeder line with lubricant prior to connecting feeder lines to the injector outlet or divider valve.

Injectors

- Check each injector for proper operation. The injector stem should move when lubricant is discharged.
- Adjust the injector output if needed to ensure that the output volume discharged is sufficient.

Divider Valves

1. Check for valve operation by
 - using a performance indicator (shows that the valve has cycled),
 - or, checking for lubricant dispensing at each lube point.
2. Adjust the injector output if needed to ensure that the output volume discharged is sufficient.

Pressure Relief Valve Adjustment

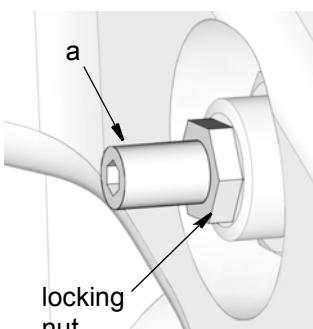


The pressure relief valve is factory set to 4000 psi (275.8 bar, 27.6 MPa) for grease models and 1000 psi (68.95 bar, 6.89 MPa) for oil models.

The relief point may require adjustment in systems that have components that are rated higher or lower than the factory presets. ***Do not exceed 4000 psi (275.8 bar, 27.6 MPa) in either grease or oil systems.***

To adjust the pressure relief valve, turn the pressure adjustment screw (a) clockwise to increase the pressure relief point or counter-clockwise to decrease the pressure relief point.

Whenever the valve is set/adjusted (after the set point is found) it is important to ensure that the valve is not bottomed out and there is at least 1/2 turn of adjustment remaining. This is determined by turning the screw (a) 1/2 turn and then back turning it out again.



Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing the equipment.

1. Close the bleed-type master air valve (F, page 5) (required in the system).
2. To relieve pressure in the system use a wrench to ***slowly loosen*** the lubrication line fitting (G) until no lubricant or air is leaking out of the fitting (FIG. 10).

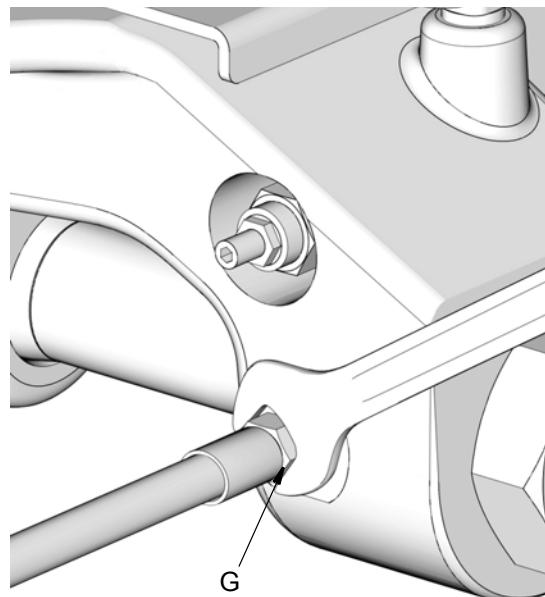


FIG. 10

Operation

Refer to FIG. 1 and FIG. 2, pages 5 and 6, for the following instructions.

Pump

Start Up



1. Verify reservoir is filled with lubricant and system has been Primed (see Prime System, page 10).
2. Turn on the lubrication controller (J) power switch.
3. Program the lubrication controller to actuate the air solenoid valve (C).

NOTE: See the lubrication controller instruction manual included with the system for these instructions.

4. Open air regulators and master air valves.

NOTE: Never allow the pump to run dry of the material being pumped.

NOTICE

Running the pump dry will cause an air lock. To prevent an air lock, do not run the pump without lubricant. Always refill the pump reservoir before it is empty.

At the start of a the pump cycle:

- a. The pump is supplied with air through the air solenoid valve (C) and then to the pump air inlet (R).
- b. Fluid is pumped to the lube metering device until the air solenoid valve (C) is turned off.
- c. After the air solenoid valve (C) shuts off, the pneumatic vent valve relieves the pressure in the lubricant lines (A1 and A2).
- d. In systems using a vent valve, fluid pressure is vented to the pump reservoir.

In systems using an electric vent valve, an electrical signal to the vent valve is required to build pressure. The same signal can be used to cycle the air valve and close the vent valve.

Low Level Switch

(Models 17P751 (grease) and 17P753 (oil) only)

Oil Model 17P753

When the oil reservoir is full, the low level float (37) sits in the high, raised position as shown in FIG. 11.

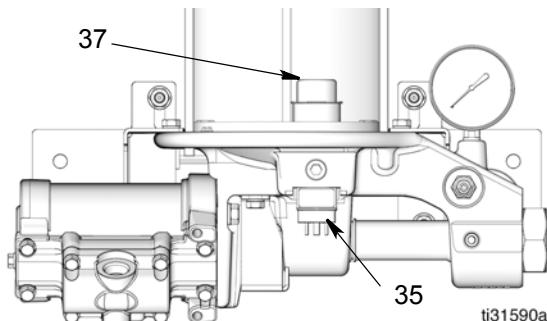


FIG. 11: Low level float in raised position

As oil is dispensed, the low level float (37) begins to travel downward. When the oil in the reservoir reaches a low level, the magnet in the bottom of the float activates the low level switch (35), changing its state to either open or closed.

Grease Model 17P751

As the grease is dispensed, the follower plate (45) travels down the reservoir. When it gets close to the low level switch (35), the magnet on the bottom of the follower plate assembly activates the switch, changing its state to either open or closed.

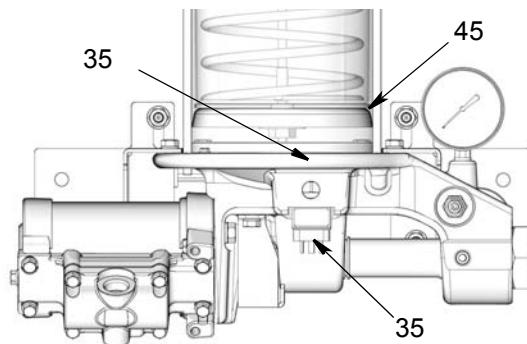


FIG. 12

Shut Down



To shut down the system, close the bleed-type master air valve (F, page 5 and 6) and turn off the electric power to the controller.

Troubleshooting



Problem	Cause	Solution
Pump is not operating. No lubricant flow.	No air	<ol style="list-style-type: none"> 1. Adjust air pressure/supply. 2. Open bleed-type master air valve (F) (page 5 and 6).
Pump is operating. No lubricant flow.	No lubricant in reservoir	Fill the reservoir.
	Losing prime	<ol style="list-style-type: none"> 1. Remove trapped air (see Priming, page 10). 2. Prime pump.
Injectors not cycling or only some of the injectors are operating	No lubricant flow	See Pump is not operating. No lubricant flow in Troubleshooting table.
	Low pressure or no pressure	<ol style="list-style-type: none"> 1. Check piping for leaks. If a leak is detected, repair or replace piping. 2. Check injectors for leaks. If a leak is detected, repair or replace injector. 3. If the pressure relief valve is set below the injector firing pressure, the injector will not operate. See page 11 for pressure relief setup instructions. 4. Check vent and relief valve o-rings. Damaged/worn o-rings will not allow pump to reach full pressure.
	Pump seals are bad	Replace seals. See Parts, page 18 and 20.
Divider valve not cycling	No lubricant flow	See Troubleshooting, Pump is not operating.
	Low lube point pressure or no pressure	See Troubleshooting, Pump is not operating.
		Check valve block for leaks.
		Check valve block for stuck pistons.
	Pump seals are damaged	Replace seals.

Repair

Remove Air Motor

See *Oil and Grease Parts*, pages 18 and 20.



1. Shut down pump, page 12. Relieve pressure. See **Pressure Relief Procedure**, page 11.
2. Disconnect air line from pump.
3. Remove screws, (40), washers (41) and finger guard (58) from pump base (2) (FIG. 13).

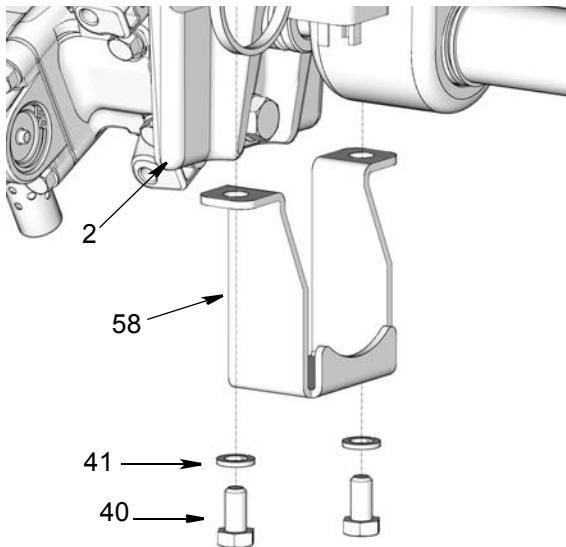


FIG. 13

4. Slide the retaining spring (22) off of the pin (21) and remove pin (FIG. 14).

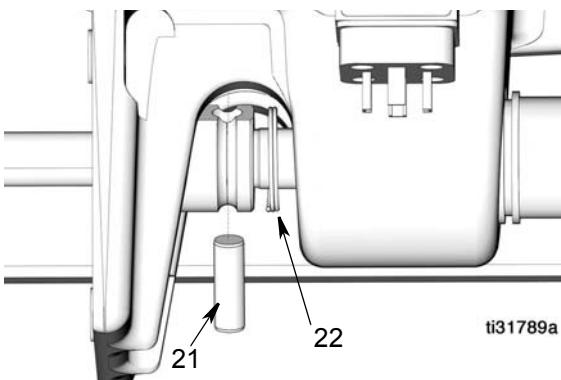


FIG. 14

5. Remove the three screws (16) and washers (59) holding air motor (1) to pump base (2). Remove air motor from pump base (FIG. 15).

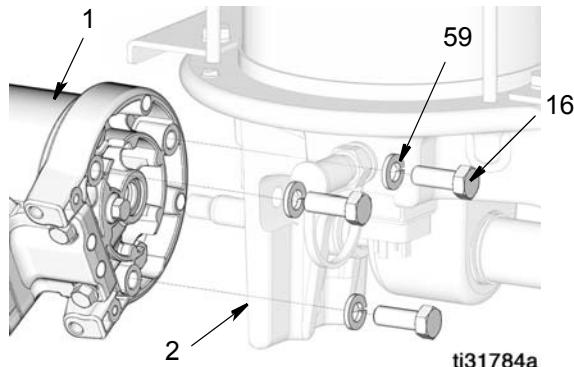


FIG. 15

Pump Lower Disassembly

1. Follow the Remove Air Motor instructions to remove the air motor (1) from the pump base (2) (if required).

OR

Shut down pump, page 12. Relieve pressure. See **Pressure Relief Procedure**, page 11.

NOTE: It is not necessary to remove the air motor (1) from the pump base (2) to disassemble the pump lower. However, it is easier to access all of seals with the air motor removed.

2. Remove the pump end nut (15) and o-ring (8) from pump base (2) (FIG. 16).

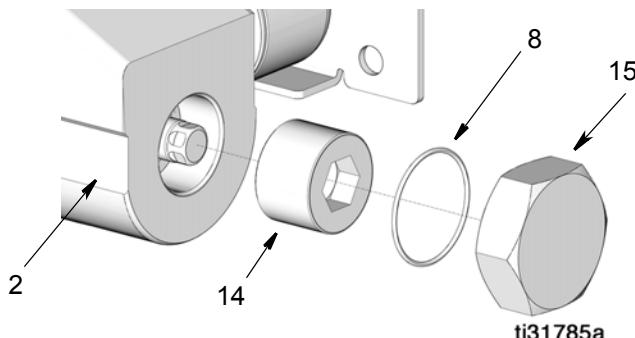


FIG. 16

3. Remove take up nut (14) from the pump base (2).

4. Pry the pump cylinder (11) out of the pump base (2) (FIG. 17).

NOTE: Be careful not to scratch or damage the outside surface of the pump cylinder and/or inside cavity of the pump base (2) when removing the pump cylinder

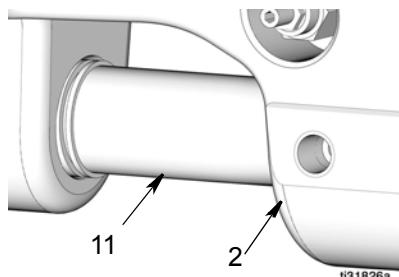


FIG. 17

5. Remove o-ring (6) from shovel seal retainer (10).

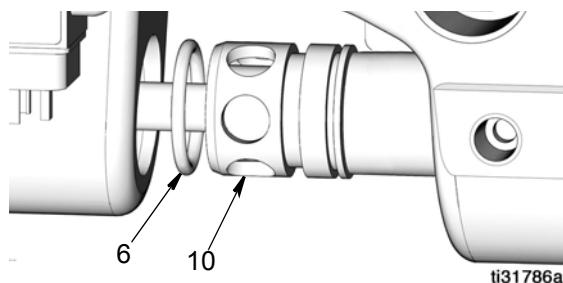


FIG. 18

6. Remove pump cylinder (11) and piston rod assembly from pump base (2) casting.

7. Inspect H-wiper seal (3) for damage and wear. If it is damaged and/or worn, remove it from pump base (2) (FIG. 19).

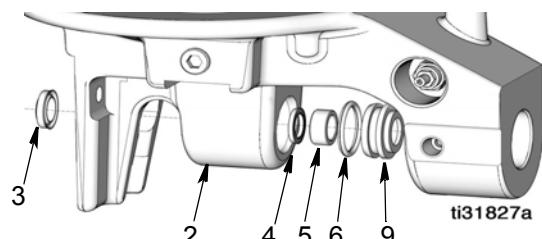


FIG. 19

8. Remove seal retainer (9) from pump base (2). Remove u-cup seal (4), o-ring (6) and bearing (5) from seal retainer (FIG. 19).

9. Separate the piston rod assembly from pump cylinder (11).

10. Remove the spring pin (20) securing the piston rod (19) to the shovel rod (12). Unscrew the piston rod to separate it from the shovel rod (FIG. 20).

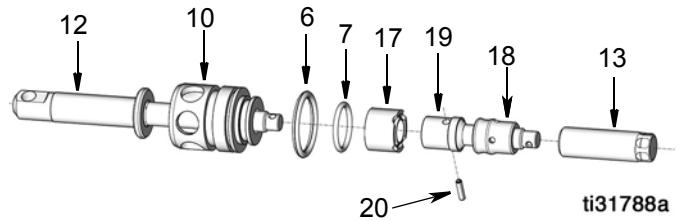


FIG. 20

11. Remove intake seal (17) from shovel rod (12).

12. Remove o-ring (7) from shovel seal retainer (10).

13. Unscrew alignment rod (13) to separate it from the piston rod (19).

NOTE:

- It may be easier to separate the two parts by clamping the piston rod in a vise. Take care when clamping the rod in a vise to not over-tighten the vise around the rod which could damage the rod or scratch the outside surface. Clamp only on recessed surface of piston rod (19).
- If using a vise, to prevent the rod from rotating while separating the two parts, insert a pin that is longer than the spring pin (20) through the pin holes.

NOTICE

Be careful when tightening piston rod in vise to not crush, scratch or damage the outside surface of the piston rod and/or alignment rod. A scratched or damaged surface can create a leak path for fluid.

14. Remove the piston seal (18) from piston rod (19).

15. Remove shovel seal retainer (10) from the shovel rod (12).

16. Remove u-cup seal (4), bearing (5) and two o-rings (6) from the pump cylinder (11).

17. Clean and inspect all parts for scratches and/or scoring. If damage is found or a loss of performance was noted during pump operation, replace parts.

18. Inspect pump base (2) casting for scratches and/or scoring. If excessive damage is found, replace pump.

Pump Lower Reassembly

See Oil and Grease Parts, pages 18 and 20.

NOTE:

Pump Lower Soft Seal Kit 17T654 is available (see page 30). Parts marked with \ddagger .

Hard Parts and Seal Kit 17T655 is available (see page 30). Parts marked with \diamond .

For best results, use all of the parts in the kit.

1. Press bearing (5 \diamond) into the pump cylinder (11 \diamond).
2. Install two o-rings (6 \ddagger \diamond) around pump cylinder (11 \diamond).
3. Install shovel seal retainer (10 \diamond) on piston shovel rod (12 \diamond).
4. Lubricate o-ring (7 \ddagger \diamond) and install on the end of the shovel seal retainer (10 \diamond).

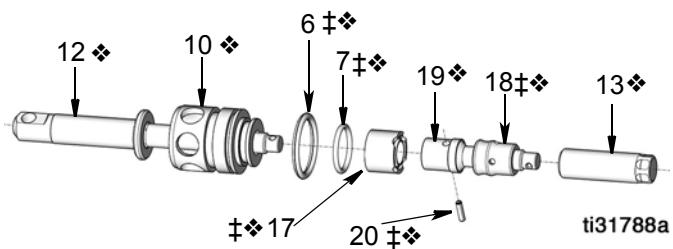


FIG. 21

5. Install intake seal (17 \ddagger \diamond) on the shovel rod (12 \diamond) (FIG. 21).

NOTE: When installed correctly the flat end of the intake seal (17 \ddagger \diamond) meets the flat surface of the shovel rod retainer (10 \diamond). The jagged end of the intake seal will be facing the piston rod (19).

6. Install piston seal (18 \ddagger \diamond) to piston rod (19 \diamond).
7. Clean threads of piston rod (19 \diamond) and alignment rod (13 \diamond) with solvent to prepare it for thread locking compound (FIG. 21).

8. Apply oil resistant, thread locking compound (user supplied) to threads of piston rod (19 \diamond) and alignment rod (13 \diamond). Screw the two rods together. Torque to 25-35 ft-lbs (34 to 47.5 N·m).

NOTE:

- It may be easier to assemble the two parts by clamping the piston rod in a vise. Take care when clamping the rod in vise to not over-tighten the vise around the rod which could damage the rod or scratch the outside surface. Clamp only on recessed surface of piston rod (19).
- If using a vise, to prevent the rod from rotating while torquing the two parts. insert a pin that is longer than the spring pin (20) through the pin holes.

9. Screw shovel rod (12 \diamond) into piston rod (19 \diamond). Tighten until pin holes in each rod (FIG. 21) align.
10. Install spring pin (20 \ddagger \diamond) through holes aligned in Step 6 (FIG. 21).
11. Install piston rod (19 \diamond) and shovel rod (12 \diamond) assembly inside pump cylinder (11 \diamond).
12. Install bearing (5 \diamond) in seal retainer (9 \diamond).
13. Lubricate wiper seal (4 \ddagger \diamond) and install in the seal retainer (9 \diamond).

NOTE: The lips of the wiper seal (4 \ddagger \diamond) should be facing out; toward the piston shovel rod (12 \diamond).

14. Lubricate o-ring (6 \ddagger \diamond) and install o-ring around the seal retainer (9 \diamond).
15. If the H-wiper seal (3 \ddagger \diamond) was removed in Pump Lower Disassembly, Step 7, page 15, lubricate new seal from kit and install it in pump base (2).

NOTE: The lips of the H-wiper seal (3 \ddagger \diamond) should be facing in; toward the pump cylinder (11 \diamond).

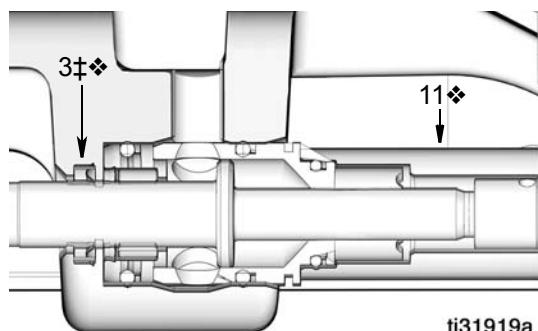


FIG. 22

16. Push seal retainer (9❖) into pump base (2).
17. Partially install pump cylinder (11❖) in pump base (2).
18. Lubricate o-ring (6❖) and install it around the shovel seal retainer (10❖) (FIG. 23).

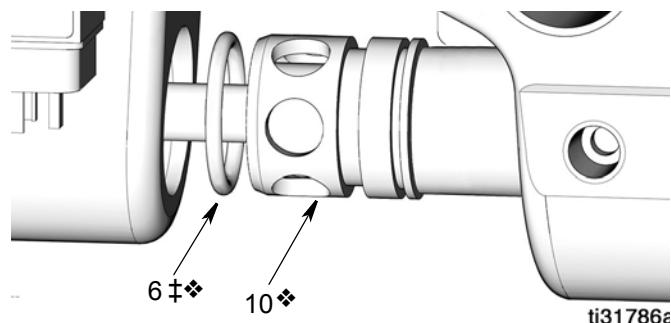


FIG. 23

19. Press pump cylinder assembly into pump base (2).
20. Lubricate u-cup (4❖) and install it in the pump cylinder (11).

NOTE: The lips of the u-cup seal (4❖) should be facing in; toward the piston rod (19❖).

21. Install nut (14) in pump base (2). Torque to 100 to 105 ft.-lbs (135.6 to 142.4 N•m) (FIG. 24).
22. Lubricate o-ring (8❖). Install o-ring and pump end nut (15) in pump base (FIG. 24). Torque end nut to 45 to 50 ft.-lbs (61.01 to 67.79 N•m).

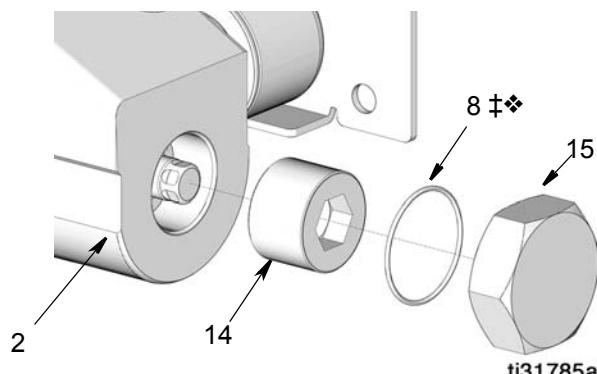


FIG. 24

23. If the air motor does not require maintenance or repair, install air motor. See Air Motor Installation instructions, page 27.

Parts: Grease Models

Ref	Part No.	Description	Qty
1	25D081	MOTOR, air	1
2		BASE, pump	1
3	‡❖	SEAL, H-wiper, 0.625 ID	1
4	‡❖	SEAL, u-cup, quad ring, 0.625 ID	2
5	❖	BEARING, 0.625 x 0.875 x 0.375LNG	2
6	‡❖	PACKING, o-ring	4
7	‡❖	O-RING	1
8	‡❖	O-RING, 030 Buna	1
9	❖	RETAINER, seal	1
10	❖	RETAINER, seal, shovel	1
11	❖	CYLINDER, pump	1
12	❖	ROD, shovel, piston	1
13	❖	ROD, alignment	1
14		NUT, take up	1
15		NUT, pump end	1
16		SCREW, cap, hex head	3
17	‡❖	SEAL, intake	1
18	‡❖	SEAL, piston	1
19	❖	ROD, piston, 50:1	1
20	‡❖	PIN, spring	1
21	❖	PIN, straight	1
22	❖	SPRING, retaining	1
23	102814	GAUGE, pressure, fluid	1
24	24Z687	VALVE, cartridge, air	1
25	125495	VALVE, pressure relief cartridge	1
26		STUD, fill	1
27		ROD, tie 5/12# reservoir	3
28		GASKET, reservoir	1
29		CAP, reservoir	1
30		RESERVOIR, plastic	1
31	❖	PACKING, o-ring	1
34		SPACER, aluminum, 0.343l inch. 5 hex, 0.25	3

Ref	Part No.	Description	Qty
35	17C665	PLUG, low level switch, model 17P750, 17T176, 17T193	1
	❖	SWITCH, low level, NO and NC, model 17P751, 17T177, 17T194	1
36		NUT, low level float mount	1
38		BRACKET, pump, top	1
39		BRACKET, pump, wall	1
40		SCREW, cap, hex head	6
41		WASHER, lock	9
42		CAP, dust	1
43	597151	FITTING, elbow, 1/4 OD x 1/8 NPT, 17P750, 17P751	1
44		NUT, nylock st 5/16-18	4
45		PLATE, follower	1
55▲	16W503	LABEL, ground (not shown)	1
56▲	130175	LABEL, warning, pressurized equipment	1
57	17T189	PLUG, SAE-08, models 17T176, 17T177, 17T193, 17T194	1
58		GUARD, finger	1
59		WASHER, lock, 3/8 inch	3
60		WASHER, plain	4
66		SCREW, ground 1/4-20, green	1
67▲	15H108	LABEL, warning, pinch	1
68	129713	VALVE, HF, cartridge, 24VDC, DIN, 17T193, 17T194	1
69	125520	CONNECTOR, DIN, form A, 4-pin	1

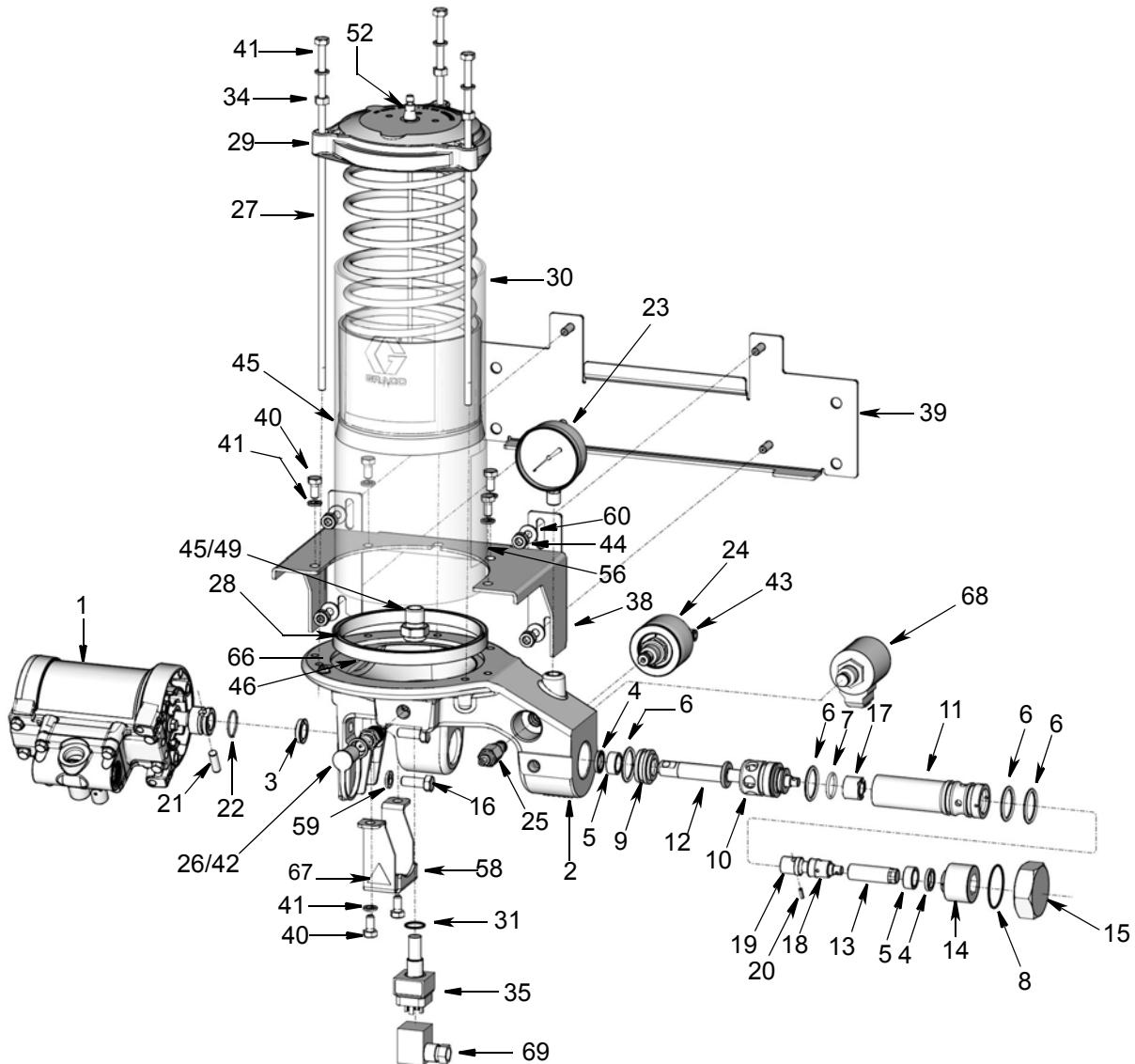
▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

‡ Included Soft Seal Kit 17T654. See page

❖ Included in Hard Part and Seal Kit 17T655. See page

❖ Included in Low Level Grease Kit 17T657. Kit also includes 125520 - DIN Connector and 17C623 - Magnet.

Parts: Grease Models



Parts: Oil Models

Ref	Part No.	Description	Qty
1	25D081	MOTOR, air	1
2		BASE, pump	1
3	‡❖	SEAL, H-wiper, 0.625 ID	1
4	‡❖	SEAL, u-cup, quad ring, 0.625 ID	2
5	❖	BEARING, 0.625 x 0.875 x 0.375LNG	2
6	‡❖	PACKING, o-ring	4
7	‡❖	O-RING	1
8	‡❖	O-RING, 030 Buna	1
9	❖	RETAINER, seal	1
10	❖	RETAINER, seal, shovel	1
11	❖	CYLINDER, pump	1
12	❖	ROD, shovel, piston	1
13	❖	ROD, alignment	1
14		NUT, take up	1
15		NUT, pump end	1
16		SCREW, cap, hex head	3
17	‡❖	SEAL, intake	1
18	‡❖	SEAL, piston	1
19	❖	ROD, piston, 50:1	1
20	‡❖	PIN, spring	1
21	❖	PIN, straight	1
22	❖	SPRING, retaining	1
23	102814	GAUGE, pressure, fluid	1
24	24Z687	VALVE, cartridge, air, models 17P752 and 17P753	1
25	125495	VALVE, pressure relief cartridge	1
27		ROD, tie 5/12# reservoir	3
28		GASKET, reservoir	1
29		CAP, reservoir	1
30		RESERVOIR, plastic, 12 L	1
31	✖	PACKING, o-ring	1
32	557797	CAP, fill, reservoir	1
33	557799	SCREEN, filter	1

Ref	Part No.	Description	Qty
34		SPACER, aluminum, 0.3431 inch. 5 hex, 0.25	3
35	17C665	PLUG, low level switch, model 17P752, 17T178, 17T195	1
	✖	SWITCH, low level, NO and NC, model 17P753, 17T179, 17T196	1
36		NUT, low level float mount	1
37	✖	FLOAT, low level, oil, model 17P753	1
38		BRACKET, pump, top	1
39		BRACKET, pump, wall	1
40		SCREW, cap, hex head	6
41		WASHER, lock	9
43		FITTING, elbow, 1/4 OD x 1/8 NPT	1
44		NUT, nylock st 5/16-18	4
45		PLUG, SAE-08, models 17T178, 17T179, 17T195, 17T196	1
55▲	16W503	LABEL, ground (not shown)	1
56▲	130175	LABEL, warning, pressurized equipment	1
58		GUARD, finger	1
59		WASHER, lock, 3/8 inch	3
60		WASHER, plain	4
62		PLUG, dry seal, 1/4 NPTF	1
63		PLUG, pipe, 3/8 NPTF	1
66		SCREW, ground 1/4-20, green	1
67▲	15H108	LABEL, warning, pinch	1
68	129713	VALVE, HF, cartridge, 24VDC, DIN, 17T195, 17T196	1
69	125520	CONNECTOR, DIN, form A, 4-pin	1

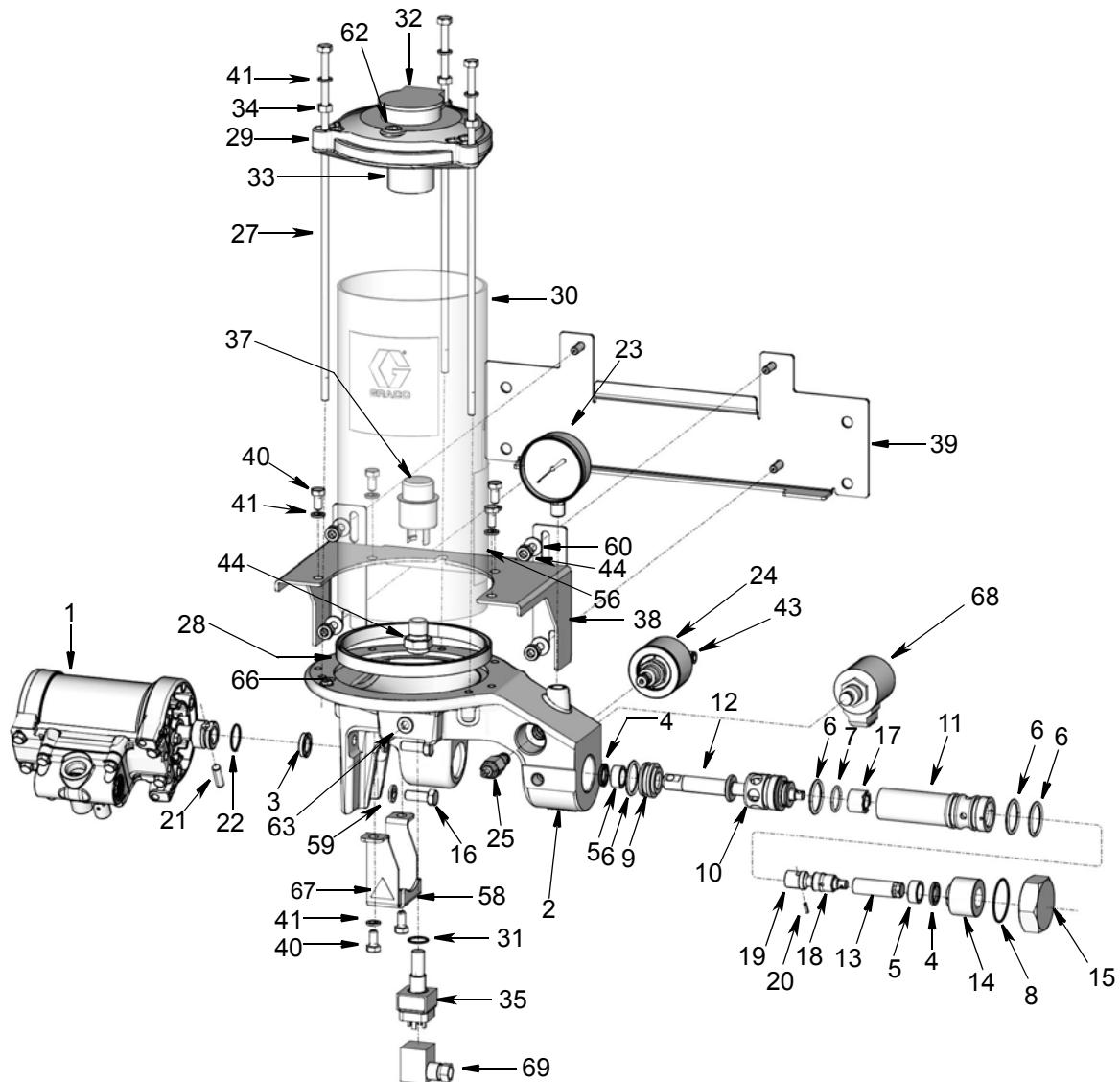
▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

‡ Included Soft Seal Kit 17T654. See page 28.

❖ Included in Hard Part and Seal Kit 17T655. See page 28.

✖ Included in Low Level Oil Kit 17T656. Kit also includes 125520 - DIN Connector.

Parts: Oil Models



Repair Air Valve



Replace Complete Air Valve

1. Stop pump. Relieve pressure. See **Pressure Relief Procedure**, page 11.
2. Disconnect the air line to the motor.
3. Remove four screws (211), then remove the air valve (214) and gasket (209*♦). See **Repair Air Motor**, page 24.
4. Repair the Air Valve. To install a replacement air valve, continue with Step 5.
5. Align the new air valve gasket (209*♦) on the manifold, then attach the air valve (214). Torque screws (211) to 95-105 in-lb (11-12 N·m).
6. Reconnect the air line to the motor.

Replace Seals or Rebuild Air Valve

NOTE:

Air Valve Seal Kits are available (see page 30). Parts marked with †.

Air Valve Repair Kits are available (see page 30). Parts marked with ♦.

Air Valve End Cap Kits are available (see page 30). Parts marked with ♦.

Disassemble the Air Valve (FIG. 25 and FIG. 26)

1. Stop pump. Relieve pressure. See **Pressure Relief Procedure**, page 11.
2. Perform steps 2-3 under **Replace Complete Air Valve** procedure.
3. Use a 2 mm or 5/64 hex key to remove two screws (305♦). Remove the valve plate (309♦), cup (312♦), and spring (311♦).

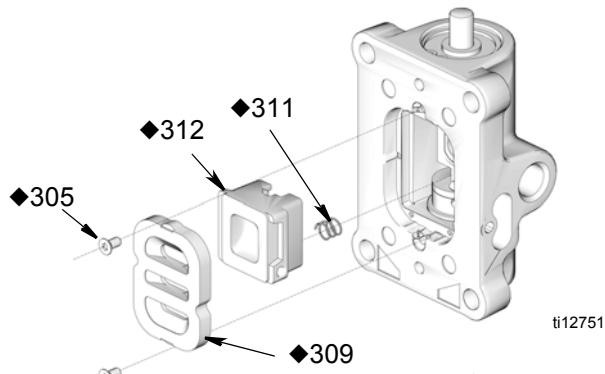


FIG. 25

4. Remove the snap ring (310*) from each end. Use the piston to push the end caps (307*) out of the ends. Remove the end cap o-rings (306†*♦).

5. Remove the piston (302◆). Remove the u-cup seals (308†◆) from each end and the detent assembly (303◆) and detent cam (304◆) from the center.

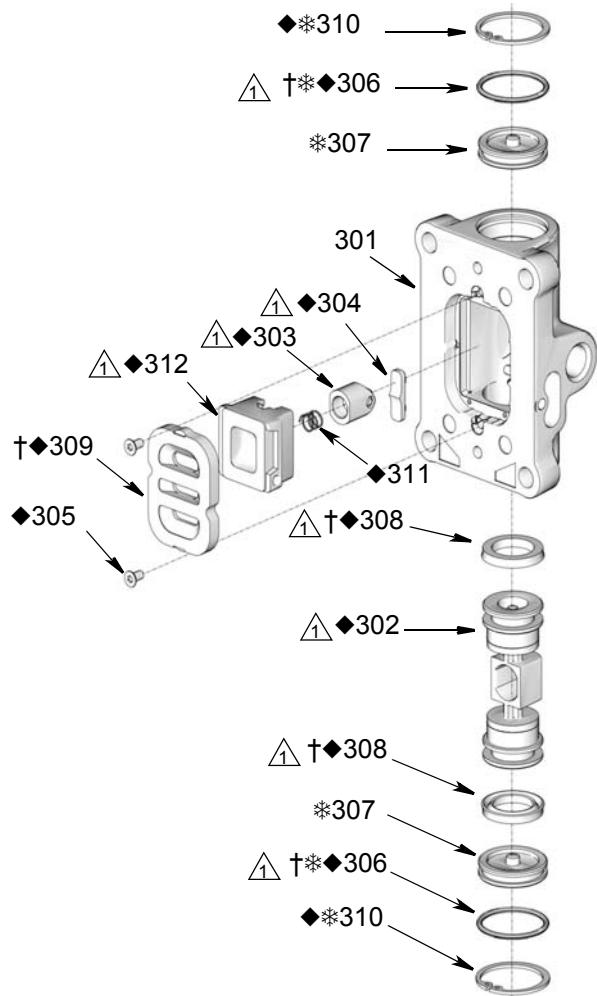


FIG. 26

Reassemble the Air Valve (FIG. 27 and FIG. 28)

1. Lubricate the detent cam (304◆) and install into the housing.
2. Lubricate the u-cups (308†◆) and install on the piston (302◆) with the lips facing toward the center of the piston.

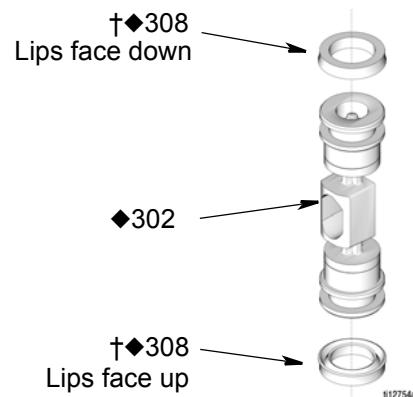


FIG. 27

3. Lubricate both ends of the piston (302◆) and install it in the housing.
4. Lubricate and install the detent assembly (303◆) into the piston.
5. Lubricate new o-rings (306†◆*) and install on the end caps (307*). Install the end caps into the housing.
6. Install a snap ring (310◆*) on each end to hold end caps in place.
7. Install the spring (311◆). Lubricate and install the air valve cup (312◆). Align the small round magnet with the air inlet.
8. Install the valve plate (305◆). Tighten the screws (309†◆) to hold it in place.

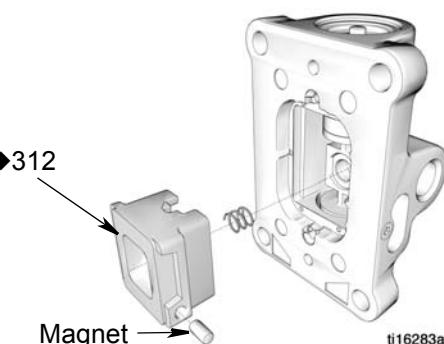


FIG. 28

Replace Pilot Valves



1. Stop pump. Relieve pressure. See **Pressure Relief Procedure**, page 11.
2. Disconnect the air line to the motor.
3. Use a 10 mm wrench to remove the old pilot valves (213) from the top and bottom covers (see **Repair Air Motor**, page 24).
4. Lubricate and install the new pilot valves (213). Torque to 95-105 in-lb (11-12 N·m).

Repair Air Motor

NOTE:

Complete Air Motor Replacement Kit is available. Order 25D081 (2.5 in. motor).

Air Motor Seal Kits are available. See page 28 for the correct kit for your motor. Parts included in the kit are marked with an asterisk (*). For best results, use all of the parts in the kit.

Disassemble the Air Motor (FIG. 29)

1. Remove air motor (1) from pump base (2). See Remove Air Motor instructions, page 14.
2. Use a 10 mm socket wrench to remove four screws (211). Remove the air valve (214) and gasket (209*♦†).
3. Remove four screws (211) and remove the manifold (220) and two gaskets (208*).
4. Use a 10 mm socket wrench to remove the pilot valves (213) from the top and bottom cover.
5. Use a 13 mm socket wrench to remove the tie bolts (212).
6. Remove the top cover (210). Remove the o-ring (202*).
7. Remove the shield (206) and cylinder (205).
8. Remove the o-ring (204*) from the piston.
9. Secure the piston (219) in a vise with soft jaws. Use a wrench on the flats of the rod (218) to remove the rod and bottom cover assembly (201) from the piston.
10. Remove the rod from the bottom cover assembly.
11. Remove retaining ring (217), u-cup seals (207*), and o-ring (202*) from the bottom cover.

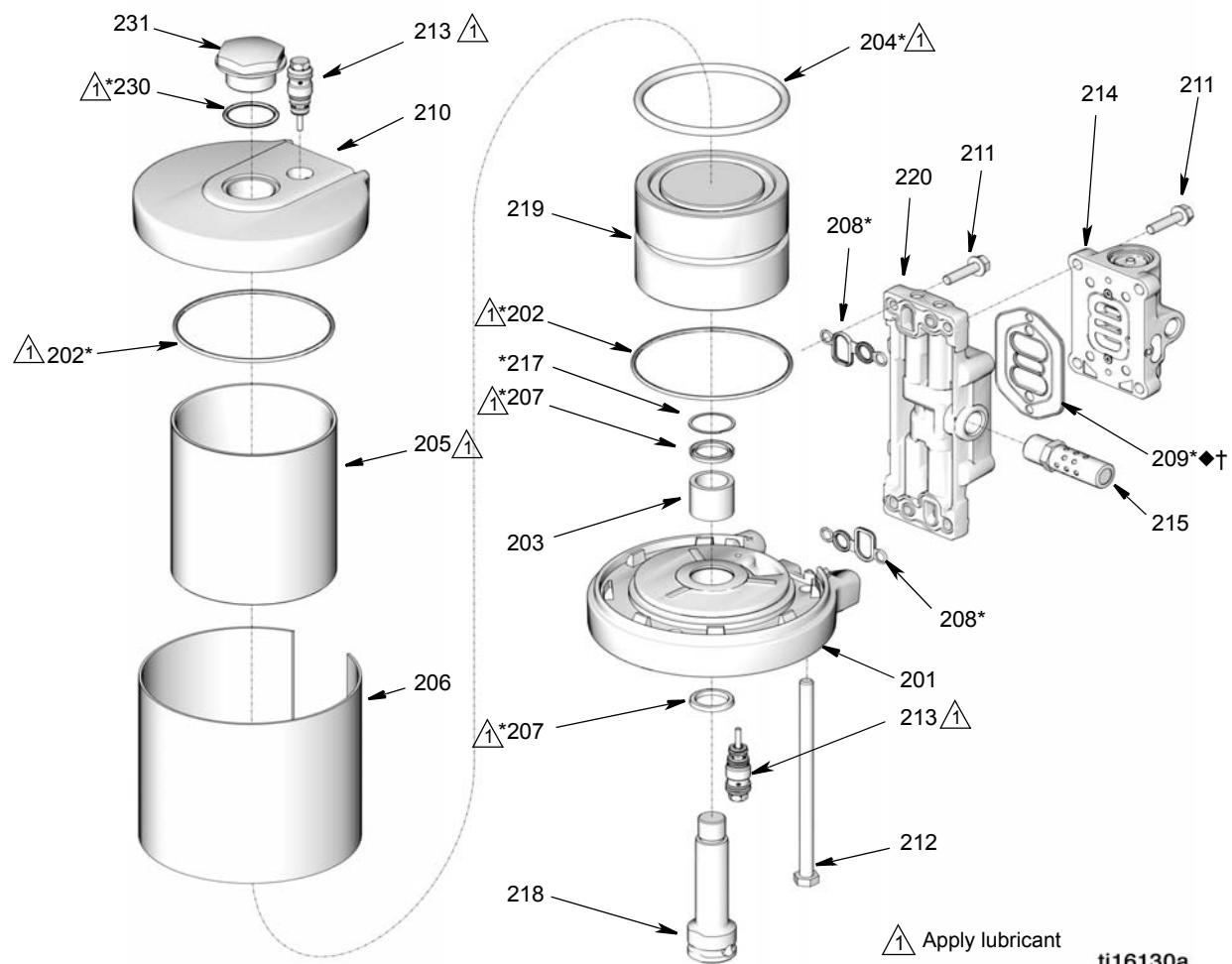


FIG. 29

Reassemble the Air Motor (FIG. 30 and FIG. 31)

NOTE: For easier reassembly, start with the top cover (210) turned over on the workbench and assemble the air motor upside-down.

1. Lubricate and install the o-ring (202*) on the top cover (210).
2. Lubricate the inside of the cylinder (205). Lower the cylinder onto the top cover (210).
3. Install the shield (206) around the cylinder (205) and in the groove on the top cover (210).
4. Lubricate and install a new u-cup seal (207*) in the bottom of the bearing in the bottom cover (201). The lips must face down. Lubricate and install a new u-cup seal (207*) in the top of the bearing. Lips must face up to install the retaining ring (217).

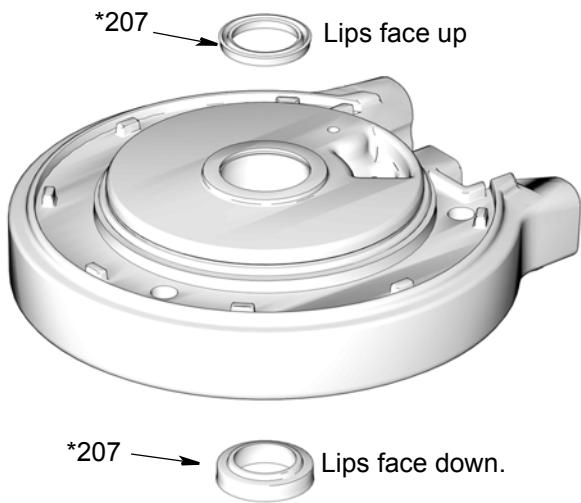


FIG. 30

5. Lubricate and install the o-ring (202*) on the bottom cover (201).
6. Carefully push the threaded end of the rod (218) up through the bottom cover (201).
7. Apply 16G561 adhesive to the threads of the rod (218). Screw the piston (219) onto the rod. Place the piston in a vise with soft jaws and torque to 35-40 ft-lb (47-54 N·m).
8. Lubricate and install the o-ring (204*) on the piston (219).
9. Carefully place the bottom cover/piston assembly on the cylinder (205), sliding the piston (219) into

the cylinder. The manifold surfaces of the top and bottom covers must align. Be sure the shield (206) is in the groove on both the top and bottom covers.

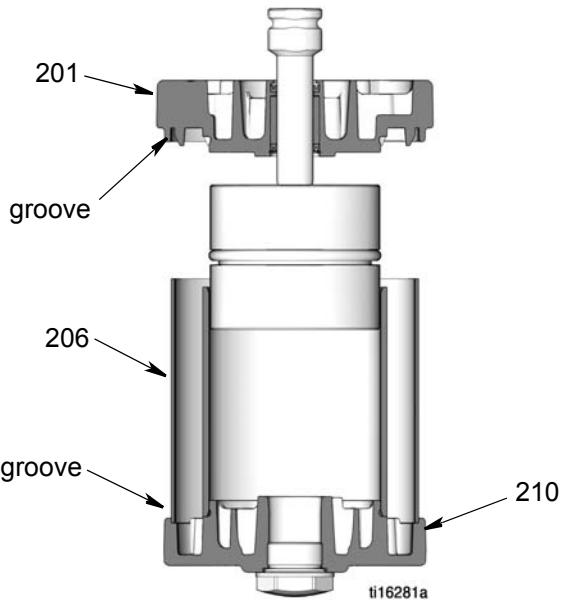


FIG. 31

10. Install the tie bolts (212) hand tight.
11. Install two gaskets (208*) on the manifold (220). Install the manifold (220). Torque screws (211) to 95-105 in-lb (10.7-11.9 N·m).

NOTE: The manifold is reversible for ease of placement of muffler or remote exhaust.

12. Align the air valve gasket (209*♦†) on the manifold, then attach the air valve (214). Torque screws (211) to 95-105 in-lb (11-12 N·m).
13. Tighten the tie bolts (212) halfway. Work in a criss-cross pattern. Check that the shield (206) remains in the grooves on both covers. Continue tightening the bolts in pattern to 11-13 ft-lb (15-18 N·m).
14. Lubricate and install pilot valves (213) in top and bottom cover. Torque to 95-105 in-lb (11-12 N·m).
15. See **Air Motor Installation** on page 27.

Air Motor Installation

1. Align air motor (1) in pump base (2). Align pin hole in air motor with pin hole in shovel rod (12).
2. Install three washers (59) and screws (16). Torque to 5 to 10 ft.-lbs (6.77 to 13.56 N·m) (FIG. 32).

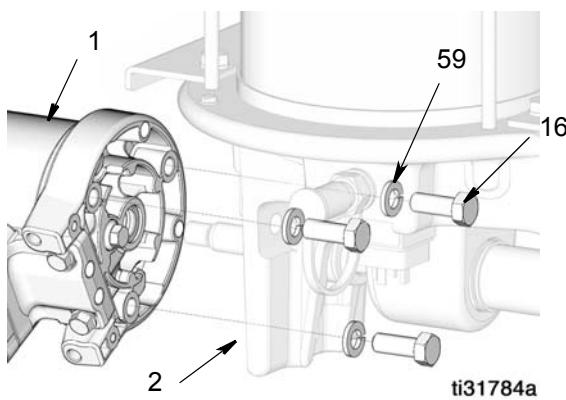


FIG. 32

3. Install pin (21) through alignment hole. Push retaining spring (22) over pin (FIG. 33).

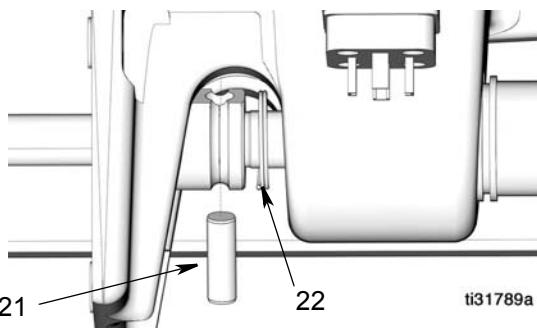


FIG. 33

4. Install finger guard (58) to pump base (2). Install washers (41) and screws (40). Tighten securely (FIG. 34).

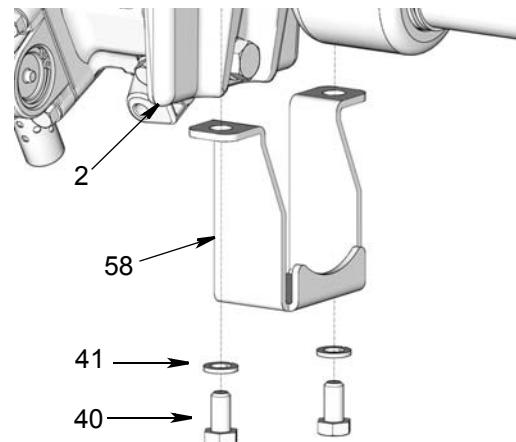


FIG. 34

Air Motor Parts

Ref.	Description		Qty.
201	KIT, cover, bottom; includes 202 (qty 1), 203, 207, 213 (qty 1), and 217	24G695	1
202*	O-RING, cover	Not sold separately. See Air Motor Seal Kit (below), Bottom Cover Kit (201, this table), or Top Cover Kit (210, this table)	2
203	BEARING	Not sold separately. See Bottom Cover Kit (201, this table)	1
204*	O-RING, piston	Not sold separately. See Air Motor Seal Kit (below) or Piston Kit (219, this table)	1
205	CYLINDER, motor	15M289	1
206▲	COVER, cylinder (includes English warning label)	15M302	1
207*	SEAL, u-cup	Not sold separately. See Air Motor Seal Kit (below) or Bottom Cover Kit (201, this table)	2
208*	GASKET, manifold	Not sold separately. See Air Motor Seal Kit (below) or Manifold Assembly (220, this table)	2
209*◆†	GASKET, air valve	Not sold separately. See Air Motor Seal Kit, Valve Repair Kit 24A537, Valve Seal Kit 24A535 (below), or Manifold Assembly (220, this table)	1
210	KIT, cover, top; includes 202 and 213 (qty 1 of each). 15X353 also includes 230 and 231.	24H004	1
211	SCREW, M6 x 25	Not sold separately. See Manifold Assembly (220, this table) or Air Valve Replacement Kit (page 30)	8
212	BOLT, tie, hex head	15M314	2
213	VALVE, pilot (pack of 2)	24A366	1
214	VALVE, air; includes items 209 and 211 (qty 4)	24A351	1
215	MUFFLER	15M213	1
217*	RING, retaining	Not sold separately. See Air Motor Seal Kit (below) or Bottom Cover Kit (201, this table)	1
218	ROD, air motor	Not sold separately. See Motor Piston Kit (219, this table)	1
219	KIT, piston, motor; includes 204 and 218, and 16G561 adhesive.	24G697	1
220	MANIFOLD, assembly, includes 208, 209, and 211 (qty. 4)	24A579	1
229▲	LABEL, warning (French and Spanish)	15W719	1

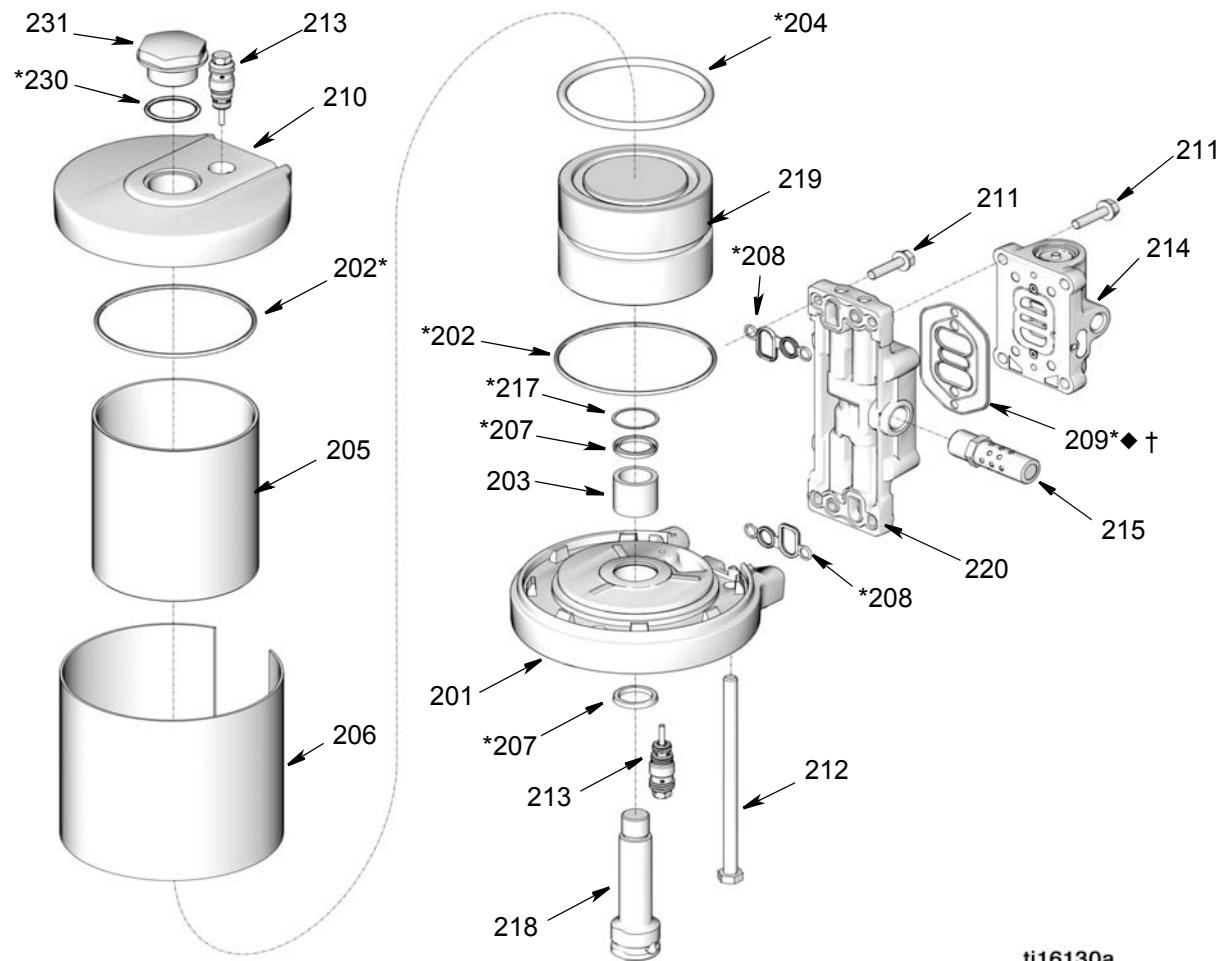
▲Replacement Danger and Warning labels, tags, and cards are available at no cost.

† Included in Air Valve Seal Kit 24A535. See page 30.

◆ Included in Air Valve Repair Kit 24A537. See page 30.

* Included in Air Motor Seal Kit 24G699 (2.5 in. motor).

Air Motor Parts



Complete Air Valve Replacement Kit 24A351

To replace the complete air valve, order Air Valve Replacement Kit 24A351.

The kit includes items 301-312 below, and items 209 and 211 on page 30. Air Valve Repair Kits

Air valve parts are not sold individually.

The table below shows possible kit options for each part.

Ref.	Description	Qty.	Air Valve Repair Kit 24A537	Air Valve Seal Kit 24A535	Air Valve End Cap Kit 24A360
301	HOUSING	1			
302◆	AIR VALVE PISTON	1	✓		
303◆	DETENT PISTON ASSEMBLY	1	✓		
304◆	DETENT CAM	1	✓		
305◆	PLATE, air valve	1	✓		
306†‡◆	O-RING	2	✓	✓	✓
307‡	CAP	2			✓
308†◆	U-CUP	2	✓	✓	
309†◆	SCREW	2	✓	✓	
310‡	SNAP RING	2	✓		✓
311◆	DETENT SPRING	1	✓		
312◆	CUP	1	✓		

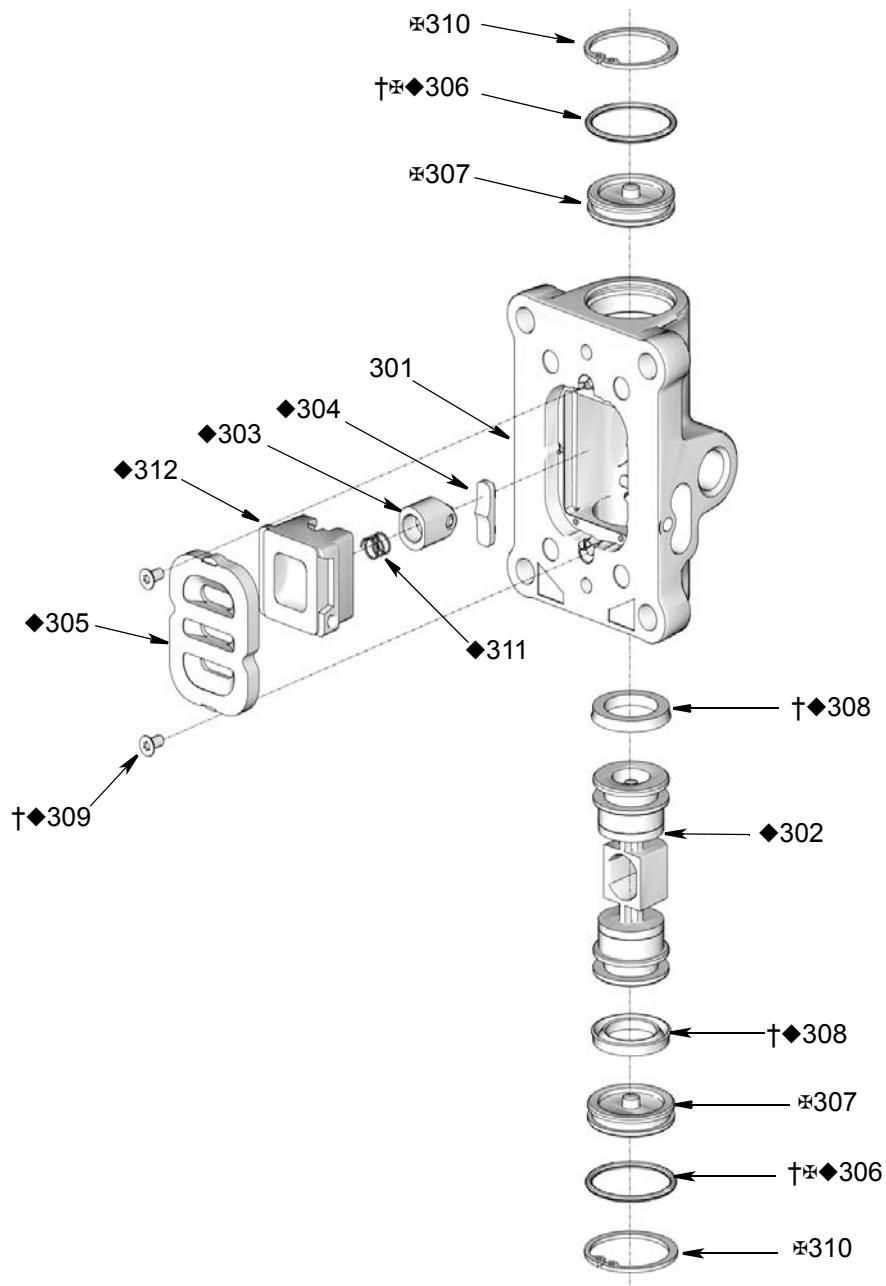
† Included in Air Valve Seal Kit 24A535.

◆ Included in Air Valve Repair Kit 24A537.

‡ Included in Air Valve End Cap Kit 24A360.

Replacement screws (309) are available in a pack of 10. Order Kit 24A359.

Air Valve Parts



Pump Kits Parts

To replace the soft seals in the pump, order Soft Seal Kit 17T654. The kit includes items 3, 4, 6, 7, 8, 17, 18, and 20.

To replace the hard parts and seals in the pump, order Hard Parts and Seal Kit 17T655. The kit includes items 3 - 13 and 17- 21.

Kit parts are not sold individually. The table below shows the parts included in each kit.

Ref.	Description	Qty.	Soft Seal Kit 17T654	Hard Parts and Seal Kit 17T655
3‡◊	SEAL, H-wiper, 0.625 ID	1	✓	✓
4‡◊	SEAL, u-cup, quad ring, 0.625 ID	2	✓	✓
5◊	BEARING, 0.625 x 0.875 x 0.375LNG	2		✓
6‡◊	PACKING, o-ring	4	✓	✓
7‡◊	O-RING	1	✓	✓
8‡◊	O-RING, 030 Buna	1	✓	✓
9◊	RETAINER, seal	1		✓
10◊	RETAINER, seal, shovel	1		✓
11◊	CYLINDER, pump	1		✓
12◊	ROD, shovel, piston	1		✓
13◊	ROD, alignment	1		✓
17‡◊	SEAL, intake	1	✓	✓
18‡◊	SEAL, piston	1	✓	✓
19◊	ROD, piston, 50:1	1		✓
20‡◊	PIN, spring	1	✓	✓
21◊	PIN, straight	1		✓
22◊	SPRING, retaining	1		✓

‡ Included Soft Seal Kit 17T654.

◊ Included in Hard Part and Seal Kit 17T655.

Additional Pump Kits

Kit No.	Description
129713✓	Electric Vent Valve Kit - 24V
25D081	Air Motor Replacement Kit
128338	1/4 NPT to 1/4 BSPT Adapter (existing)
25D118	Grease Reservoir Assembly, 12 lb.
25D310	Grease Reservoir Assembly, 20 lb.
25D119	Oil Reservoir Assembly

✓ See installation instructions, page 28.

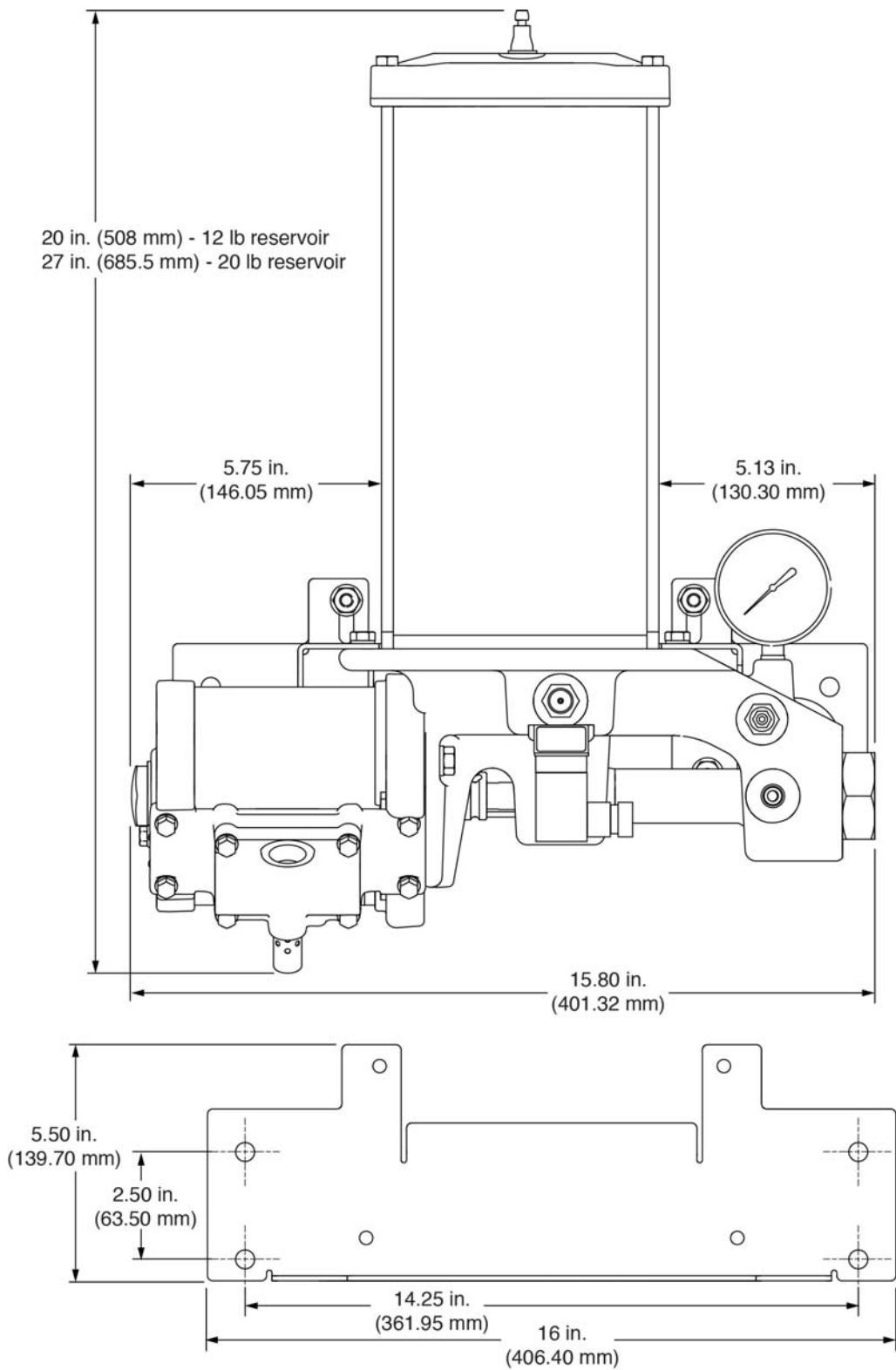
Technical Data

Reciprocating Pump, Oil or Grease		
	US	Metric
Maximum fluid working pressure	4000 psi	27.58 MPa, 275.8 bar
Pressure ratio		40:1
Pump output	See Performance Curve, page 36	
Reservoir capacity	6 Qt. oil; 4.2 Qt. grease	5.7 L oil; 4 L grease
Maximum air inlet pressure	100 psi	6.89 bar, 0.68 MPa
Air inlet size		1/4 in. NPT
Fluid outlet size		1/4 in. NPT
Filling		
Oil models		Top cover with strainer
Grease models		Quick coupler
Wetted Parts		Reservoir: polycarbonate Seals: Urethane
Approximate weight	45 lbs	40.4 kg
Operating temperature	14°F to 149°F	-10°C to 65°C
Sound Data 25D081 Air Motor		
Sound Power*	83.2 dBA	
Sound Pressure**	76.5 dBA	
Vent Valve		
Electric Vent Valve		
Voltage	24VDC	
Maximum Current	0.8 Amps	
Power	18.2 Watts	
Ratings	IP69K	
Pneumatic Vent Valve		
Air inlet size		1/8 NPT or 5/16 inch tube
Maximum air inlet pressure	125 psi	0.86 MPa, 8.6 bar
Low Level Switch		
Voltage	120 Max AC or DC	
Maximum Switching Amps	0.25 Amps	
Contact Power Rating	5 Watts	

*Sound power at 70 psi (0.48 MPa, 4.8 bar), 80 cpm. Sound power measured per ISO-9614-2.

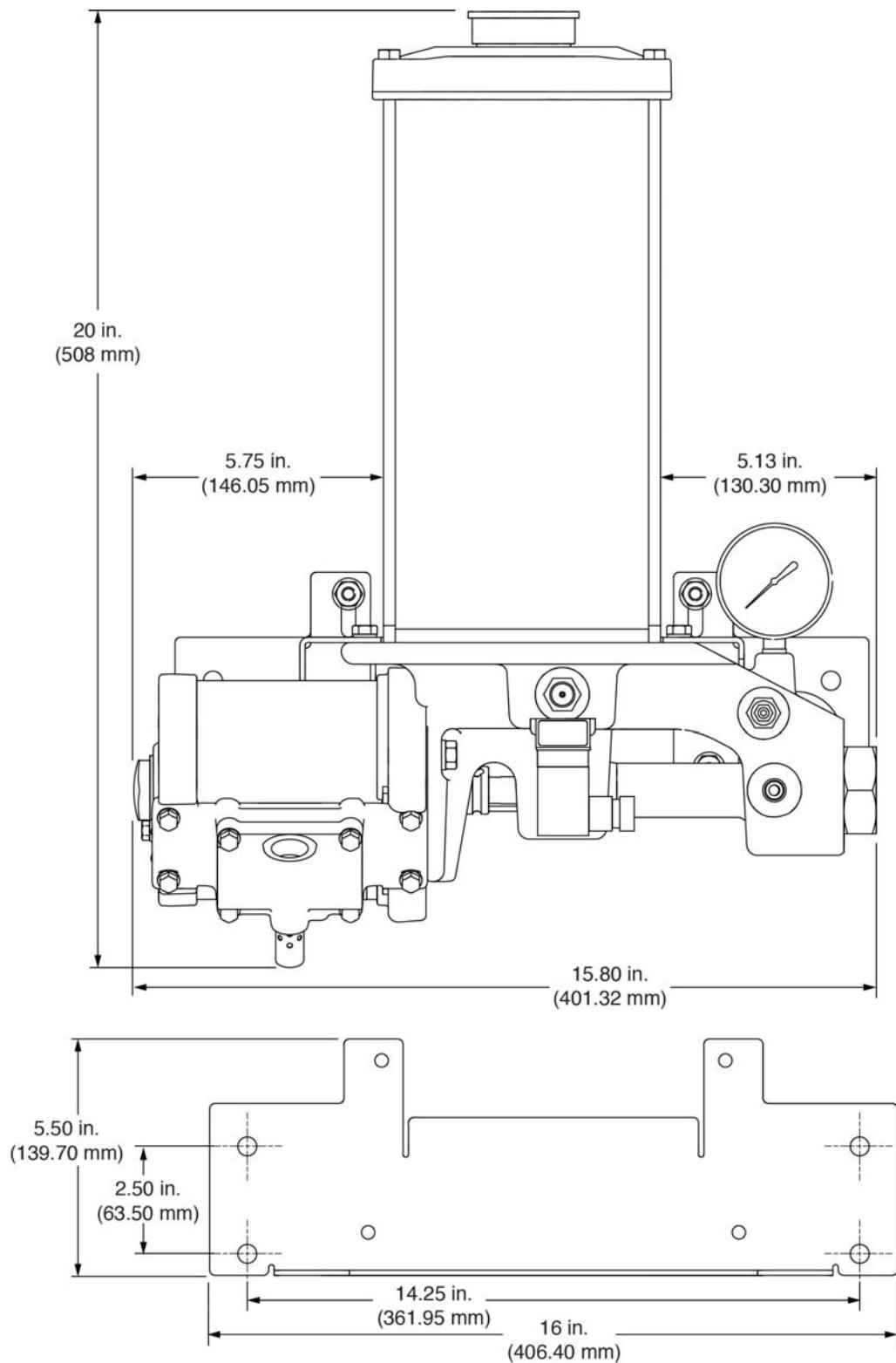
** Sound pressure was tested 3.28 feet (1 m) from equipment.

Grease Pump Dimensions and Mounting



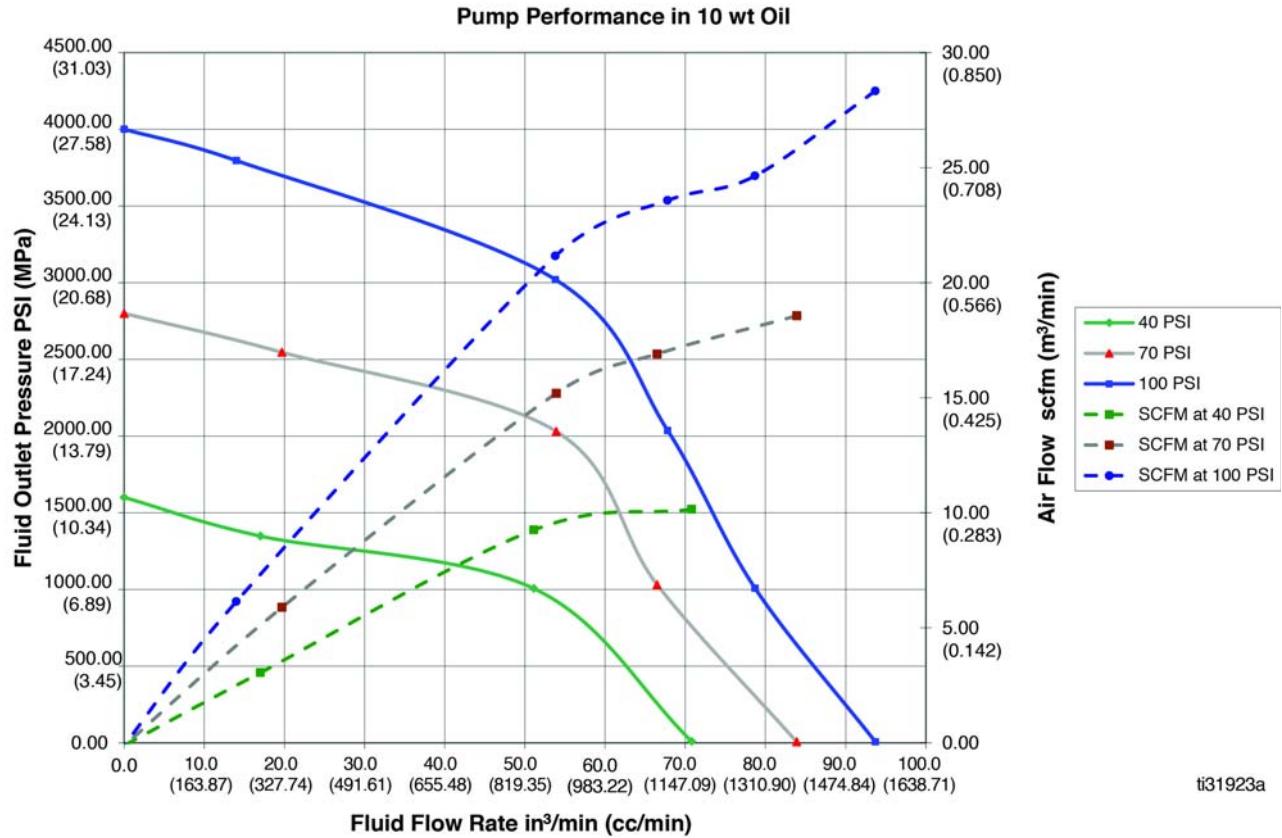
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Oil Pump Dimensions and Mounting



ti30291a

Performance Curve



Notes

Graco Standard Warranty

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

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Original instructions. This manual contains English. MM3A5266

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