

50:1 Ratio Fire-Ball® Pumps

FOR LUBRICATING PRODUCTS ONLY

8000 psi (560 bar) Maximum Fluid Working Pressure

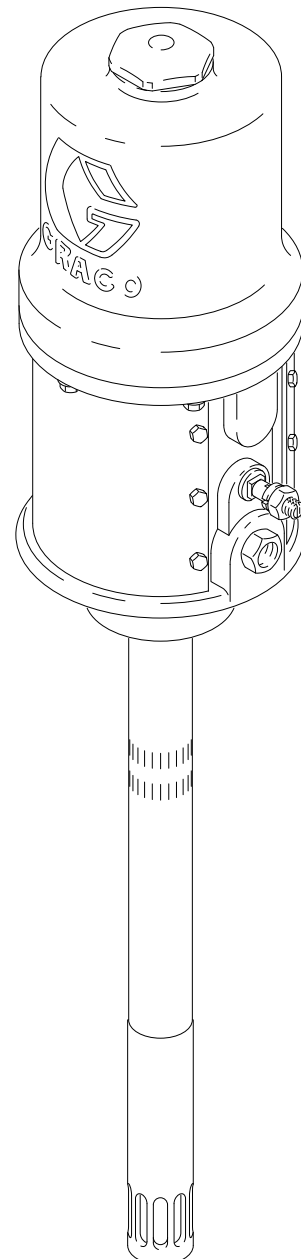
160 psi (11 bar) Maximum Air Working Pressure

CHASSIS LUBE PUMPS

With Lifetime Guarantee*

1. This guarantee is offered to the original purchaser for his entire lifetime. It covers all Fire-Ball and President Series lubrication pumps manufactured by Graco Inc., USA, when used in pumping non-corrosive and non-abrasive lubricants and greases.
2. Graco will repair or replace such pumps free of charge when inspection by Graco reveals defective materials or workmanship. Normal wear of packings and seals is not considered to be defective workmanship.
3. Graco will repair or replace such pumps at a reasonable charge if inspection by Graco reveals that damage was the result, in whole or in part, of causes other than defective materials or workmanship.
4. Pumps for which guarantee claims are made must be returned prepaid to the factory, factory branch or service agency accompanied by proof of purchase, establishing the owner as the original purchaser.
5. The foregoing is in lieu of all other warranties, expressed or implied, and the manufacturer neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with said equipment.

*30 years to corporations and purchasers other than natural persons. See page 6 for available models.



⚠ WARNING

These systems are designed to be used only in pumping non-corrosive and non-abrasive lubricants and greases. Any other use of the system can cause unsafe operating conditions and result in component rupture, fire, or explosion, which can cause serious injury, including fluid injection.

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Terms

Be sure you read and understand each of these terms before reading the rest of the manual.

NOTE: Gives additional information or helpful hints.

DISPENSE: To release fluid through the dispensing valve, which allows the fluid to flow out in a steady or metered stream.

DISPENSING VALVE: Any fluid dispensing device which can be triggered on and off.

FLEXIBLE NOZZLE: A flexible rubber hose which extends from the dispense valve to a non-drip tip. Normally used for dispensing automatic transmission fluid.

RIGID NOZZLE: A rigid tube which extends from the dispense valve to a non-drip tip. Normally used for dispensing motor oil, gear oil, etc.

NON-DRIP TIP: A manually operated twist-type valve tip used to stop flow from the dispense nozzle when dispensing is completed.

Symbols

Warning Symbol



This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol



This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

! WARNING



INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call Graco Technical Assistance at 1-800-543-0339.
- Do not alter or modify this equipment.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. This equipment has a **8000 psi (560 bar) maximum working pressure at 160 psi (11 bar) maximum incoming air pressure.**
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Handle hoses carefully. Do not pull on hoses to move equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

WARNING



INJECTION HAZARD

Spray from the dispensing valve, leaks or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not point the dispensing valve at anyone or at any part of the body.
- Do not put your hand or fingers over the end of the dispensing valve.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Use only extensions and no-drip tips which are designed for use with your dispensing valve.
- Do not use a low pressure flexible nozzle with this equipment.
- Follow the **Pressure Relief Procedure** on page 9 if the grease fitting coupler clogs and before cleaning, checking or servicing the equipment.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Fluid hoses must have spring guards on both ends, to help protect them from rupture caused by kinks or bends near the couplings.



TOXIC FLUID HAZARD

Hazardous fluids or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

WARNING



FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

- Ground the equipment and the object being sprayed. Refer to **Grounding** on page 8.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately**. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Before operating this equipment, electrically disconnect all equipment in the spray area.
- Before operating this equipment, extinguish all open flames or pilot lights in the spray area.
- Do not smoke in the spray area.
- Do not turn on or off any light switch in the spray area while spraying or while there are any fumes in the air.
- Do not operate a gasoline engine in the spray area.

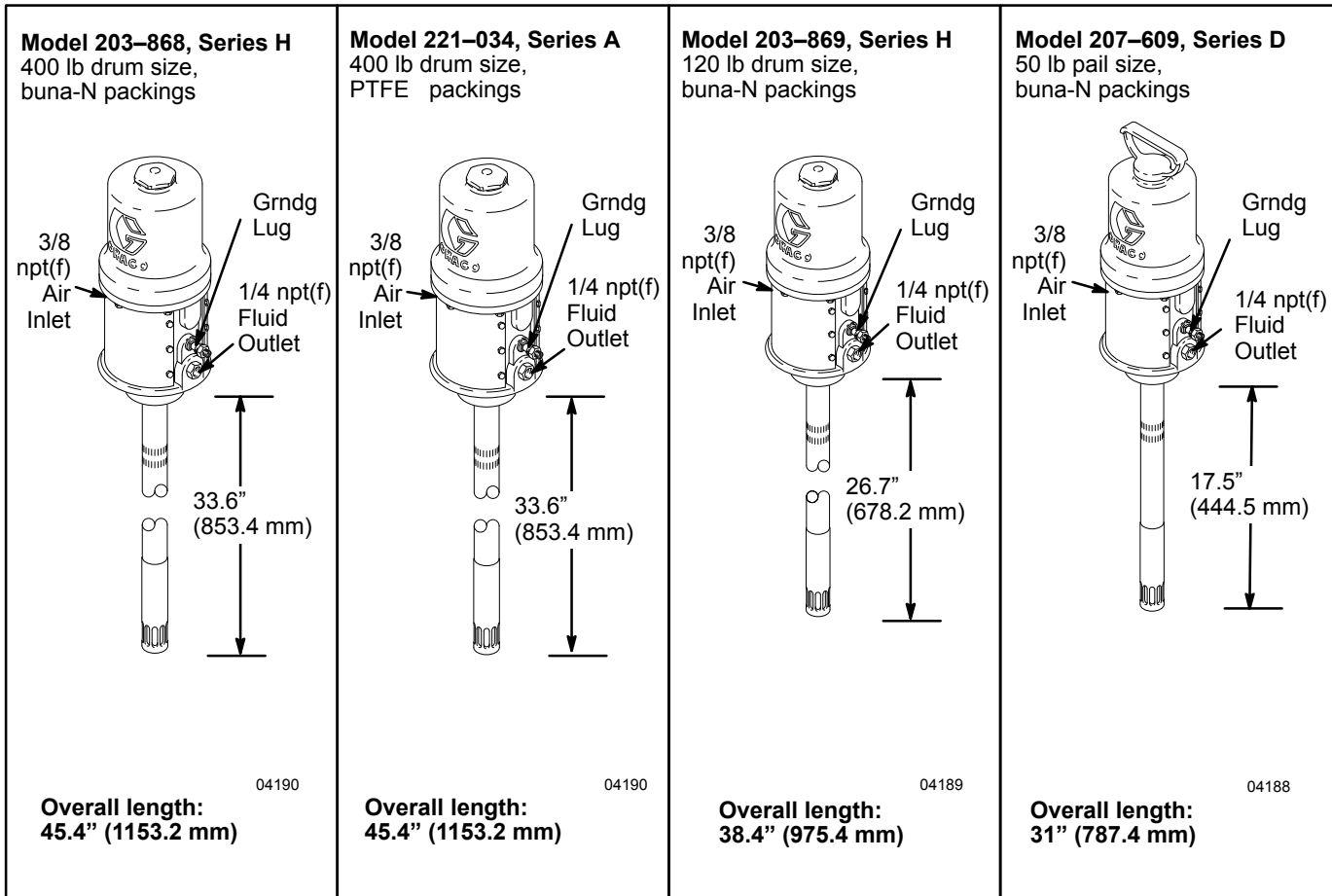


MOVING PARTS HAZARD

Moving parts, such as the air motor piston, can pinch or amputate your fingers.

- Do not operate the pump with the air motor plates removed.
- Keep clear of all moving parts when starting or operating the pump.
- Before servicing the equipment, follow the **Pressure Relief Procedure** on page 9 to prevent the equipment from starting unexpectedly.

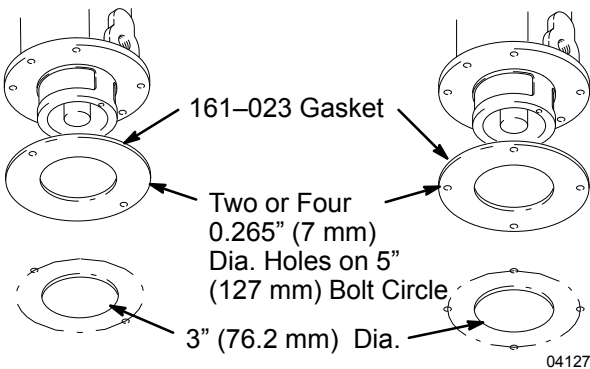
Dimensional Drawings



Mounting Hole Layout

2 Hole Mounting Pattern

4 Hole Mounting Pattern



Technical Data

Maximum Working Pressure	8000 psi (560 bar)
Fluid pressure ratio	50:1
Air operating range	40 to 160 psi (3 to 11 bar)
Air consumption	19 cfm (0.532 m ³ /min) at 0.25 gpm (0.95 liter/min) at 100 psi (7 bar)
Pump cycles per gallon	304
Pump cycles per liter	80
Maximum recommended pump speed	76 cycles/min 0.25 gpm (0.95 liter/min)
Wetted parts	Steel, Brass, Aluminum, Nylon, Nitrile rubber
Approximate weight	22 lb (10 Kg)

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Loctite[®] is a registered trademark of the Loctite Corp.

Installation

For Stationary Mountings

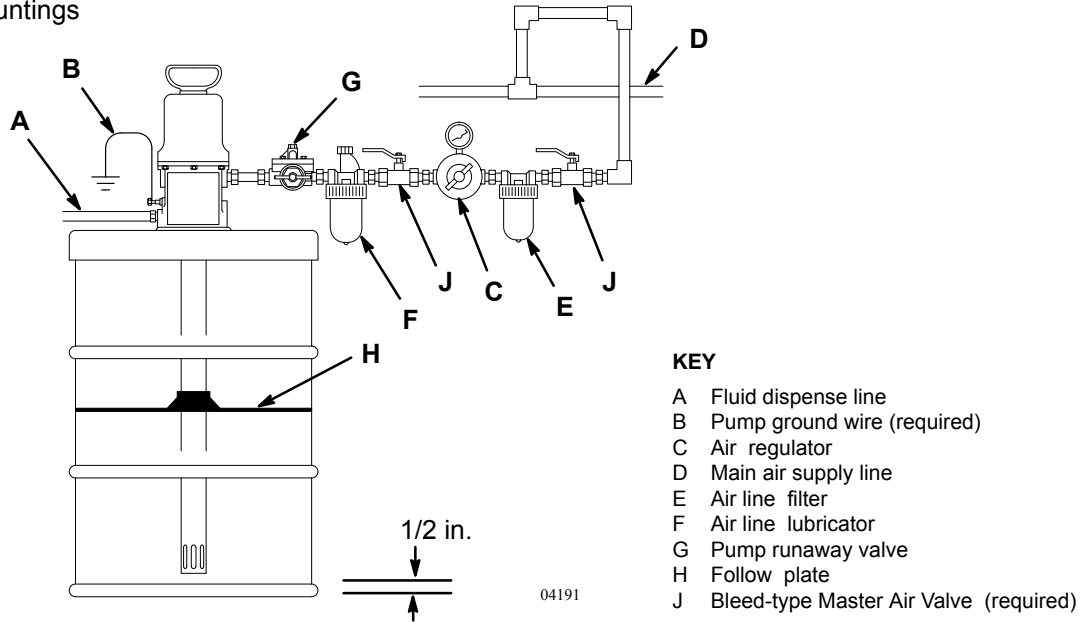


Fig. 1

Mounting

1. Plan the mounting layout for easy operator access to the pump air controls, sufficient room to change drums and a secure mounting platform.
2. If using a follow plate (H), remove the drum cover. Scoop the material to the center of the drum to make the surface concave. Place the plate on the material. Guide the pump foot valve through the plate.
3. Mount the pump to the drum cover or other suitable mounting device.
4. For ease in changing drums, install a pump elevator.

Air and Fluid Line and Accessories

Refer to Figure 1 above.

WARNING

The bleed-type master air valve (J) is required in your system to help reduce the risk of serious injury from moving parts if you are adjusting or repairing the pump. Locate the valve close to the pump, and downstream from the air regulator. The bleed valve relieves air trapped between it and the air motor after the air supply is shut off. Trapped air can cause the air motor to cycle unexpectedly, causing serious injury.

CAUTION

Do not hang the air accessories directly on the air inlet. The fittings are not strong enough to support the accessories and may cause one or more to break. Provide a bracket on which to mount the accessories.

NOTE: Install the air line accessories in the order shown in Figure 1.

1. Install a pump runaway valve (G) to shut off the air to the pump if the pump accelerates beyond the pre-adjusted setting. A pump which runs too fast can be seriously damaged.
2. Install an air line lubricator (F) for automatic air motor lubrication.
3. Install a bleed-type master air valve (J) to relieve air trapped between the valve and the motor (see **WARNING** at left). Order Part No. 107-142.
4. Install the air regulator (C) to control pump speed and pressure.
5. Install an air line filter (E) to remove harmful dirt and contaminants from your compressed air supply.
6. Install a second bleed-type master air valve (J) upstream from all other accessories, to isolate the accessories for servicing.

Installation

Grounding

Proper grounding is an essential part of maintaining a safe system.

To reduce the risk of static sparking, ground the pump. Check your local electrical code for detailed grounding instructions for your area and type of equipment. Be sure to ground all of this equipment:

1. *Pump:* use a ground wire and clamp as shown in Fig. 2.
2. *Air and fluid hoses:* use only electrically conductive hoses.
3. *Air compressor:* follow manufacturer's recommendations.
4. *Fluid supply container:* according to local code.
5. *To maintain grounding continuity when flushing or relieving pressure,* always hold a metal part of the valve firmly to the side of a grounded metal pail, then trigger the valve.

To ground the pump:

To ground the pump, loosen the grounding lug locknut (W) and washer (X). Insert one end of a 12 ga (1.5 mm²) minimum ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. Connect the other end of the wire to a true earth ground. Order Part No. 222-011, Ground Wire and Clamp.

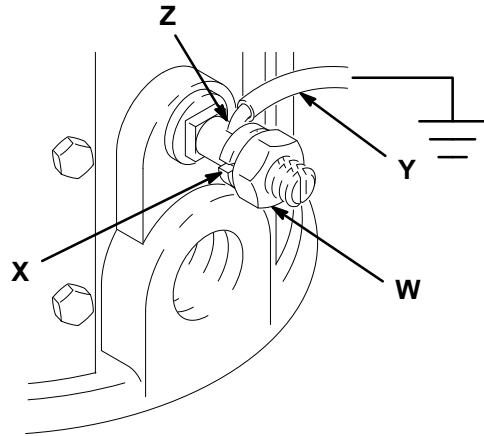




Fig. 2

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Operation

Pressure Relief Procedure

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



1. Close the pump air regulator and the bleed-type master air valve (required in your system).
2. Hold a metal part of the dispensing valve firmly to a grounded metal waste container and trigger the valve to relieve the fluid pressure.

Startup

1. If there are multiple pumps on the air line, close the air regulators and bleed-type master air valves to all but one pump. If there is only one pump, close its air regulator and bleed-type master air valve.
2. Open the master air valve from the compressor.
3. For the pump which is supplied with air, open the dispensing valve into a grounded metal waste container, making firm metal-to-metal contact between the container and valve. Open the bleed-type master air valve and open the pump air regulator slowly, just until the pump is running. When the pump is primed and all air has been pushed out of the lines, close the dispense valve.
4. If you have more than one pump, repeat this procedure for each pump.

NOTE: When the pump is primed, and with sufficient air supplied, the pump starts when the dispensing valve is opened and shuts off when it is closed.

5. Set the air pressure to each pump at the lowest pressure needed to get the desired results.

 WARNING	
	COMPONENT RUPTURE HAZARD The maximum working pressure of each component in the system may not be the same. To reduce the risk of overpressurizing any component in the system, be sure you know the maximum working pressure of each component. Never exceed the maximum working pressure of the lowest rated component in the system. Overpressurizing any component can result in rupture, fire, explosion, property damage, and serious injury.
To determine the fluid output pressure using the air regulator reading, multiply the ratio of the pump by the air pressure shown on the regulator gauge. For example:	
$50 \text{ (:1) ratio} \times 100 \text{ psi air} = 5000 \text{ psi fluid output}$	
$[50 \text{ (:1) ratio} \times 7 \text{ bar air} = 350 \text{ bar fluid output}]$	
Limit the air to the pump so that no air line or fluid line component or accessory is overpressurized.	

6. Never allow the pump to run dry of the material being pumped. A dry pump will quickly accelerate to a high speed, possibly damaging itself. If your pump accelerates quickly, or is running too fast, stop it immediately and check the material supply. If the supply container is empty and air has been pumped into the lines, prime the pump and lines with material, or flush it and leave it filled with a compatible solvent. Be sure to eliminate all air from the material lines.

NOTE: A pump runaway valve (G) can be installed on the air line to automatically shut off the pump if it starts to run too fast.

7. Read and follow the instructions supplied with each component in your system.
8. To shut off the system, always follow the **Pressure Relief Procedure Warning**, at the left.

Troubleshooting

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 9.

⚠ WARNING



MOVING PARTS HAZARD

Never operate the pump with the warning plate or the identification plate removed. These plates protect your fingers from pinching or amputation by moving parts in the air motor.

Relieve pressure before you check or service any system equipment.

NOTE: Check all other possible problems and solutions before disassembling the pump.

Problem	Cause	Solution
Pump fails to operate	Inadequate air supply pressure or restricted air lines	Increase air supply; clear
	Closed or clogged valves	Open; clean
	Clogged fluid lines, hoses, valves, etc.	Clear*
	Damaged air motor	Service air motor
	Exhausted fluid supply	Refill and reprime or flush
Continuous air exhaust	Worn or damaged air motor gasket, packing, seal, etc.	Service air motor
Erratic pump operation	Exhausted fluid supply	Refill and reprime or flush
	Held open or worn intake valve or piston packings	Clear; service
Pump operates, but output low on up stroke	Held open or worn piston packings	Clear; service
Pump operates, but output low on down stroke	Held open or worn intake valve	Clear; service
Pump operates, but output low on both strokes	Inadequate air supply pressure or restricted air lines	Increase air supply; clear
	Closed or clogged valves	Open; clean
	Exhausted fluid supply	Refill and reprime or flush
	Clogged fluid lines, hoses, valves, etc.	Clear*
	Packing nut too tight	Loosen
	Loose packing nut or worn packings	Tighten; replace

*Follow the **Pressure Relief Procedure Warning** on page 9 and disconnect the fluid line. If the pump starts when the air is turned on again, the line, etc., is clogged.

Displacement Pump Service

Before you start:

1. Be sure you have all necessary parts on hand. If using a repair kit, use all the parts in the kit for the best results.
2. **Displacement Pump Repair Kit 204–164** is available for Pumps 203–868, 203–869 and 207–609. **Displacement Pump Repair Kit 221–036** is available for Pump 221–034. Parts included in the kits are marked with an asterisk or a dagger, for example, (10*), in the text and drawings. See page 18 to order these kits.
3. A special **Tune-up Kit 221–037** is also available for Pump 221–034. See page 18 for parts included in this kit.
4. A 0.25 in. (6.4 mm) diameter rod (K) is required for disassembling the pump.

Disassembly

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 9.

1. Flush the pump.
2. Relieve the pressure before proceeding.
3. Disconnect the hoses, remove the pump from its mounting, and clamp the air motor base (35) in a vise.
4. Screw the priming tube (46) off of the displacement cylinder (61).
5. Hold the displacement tube (55) with the rod (K) and screw the priming piston (45) off the displacement tube. See Fig. 3.
6. See Fig. 4. Use a pipe wrench at the knurled part of the displacement cylinder (61) to screw it out of the base. Screw the packing retainer (60) out of the cylinder. Remove the seal (59), guides (56,58) and packing (57). See Fig. 4, Detail A.
7. Use the rod (K) to screw the displacement tube (55) out of the check valve packing retainer (54). Remove the gasket (49), seat (48) and ball (40). Then screw the packing retainer out of the coupling (47). Remove the upper gasket, seat and ball, and the guide (50), packing (51), and washer (52). Do not remove the press-fit brass guide (53) unless it is damaged. See Fig. 4, Detail B.
8. If the pressed-on brass guide (53) needs replacing, clamp it in a vise and drive the packing retainer (54) out with a plastic hammer. The new guide must be started onto the retainer squarely.
9. Clean all the parts in a compatible solvent and inspect them for wear or damage. Use all the parts in the repair kit, and replace other parts as necessary. The checkball seats (48) can be turned over to provide new seats.
10. Lubricate all the parts with light waterproof grease and reassemble the pump. Apply medium-strength Loctite® to the threads of the intake packing retainer (60).
11. If the ground wire was disconnected before servicing, be sure to reconnect it before regular operation of the pump.

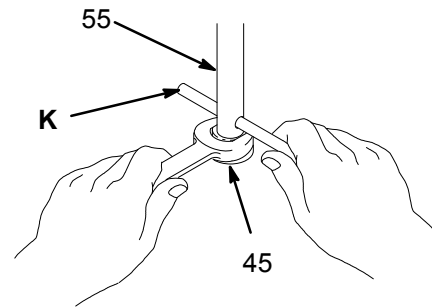


Fig. 3

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Displacement Pump Service

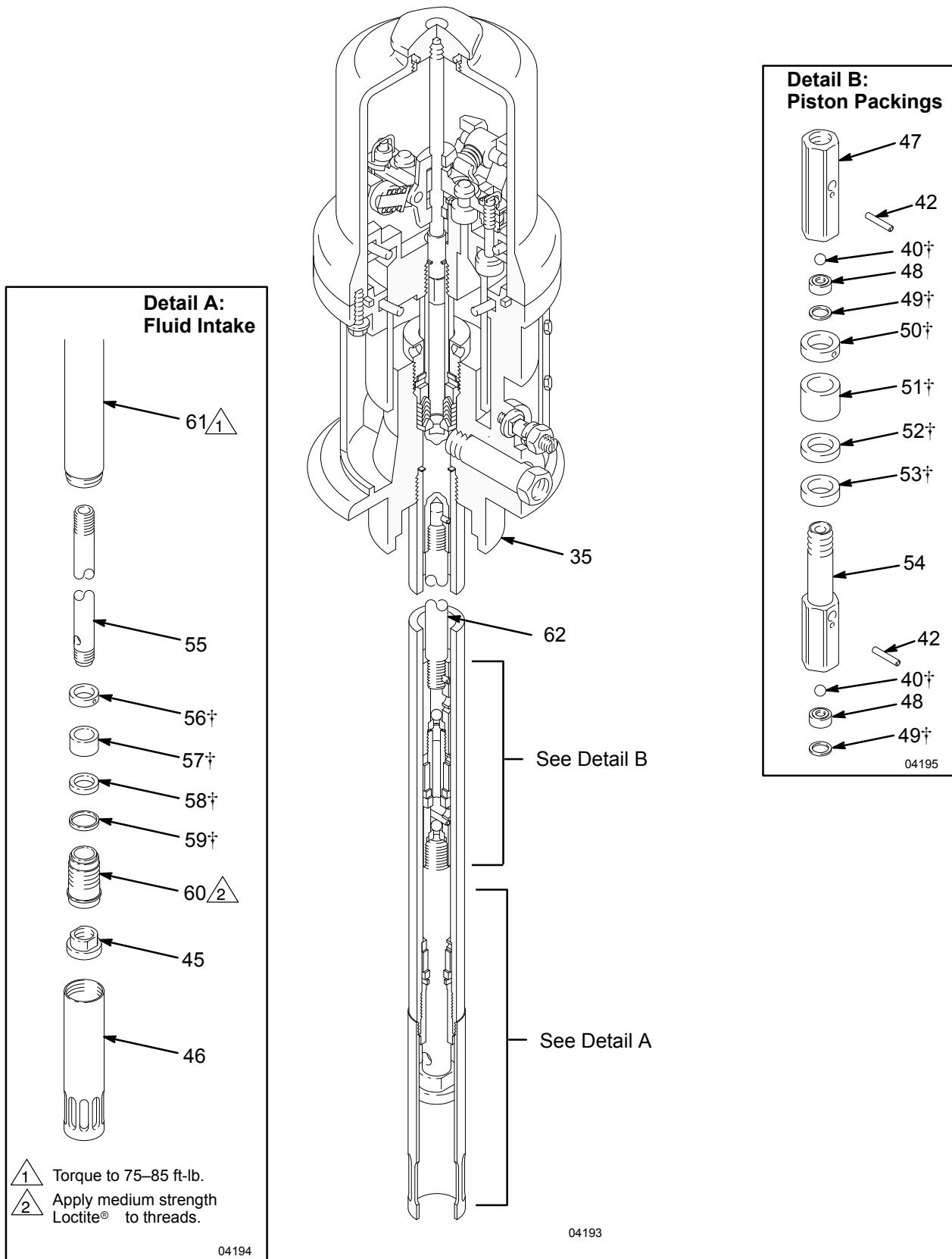


Fig. 4

Air Motor and Throat Service

Before you start:

1. Be sure you have all necessary parts on hand. **Repair Kit 206–728** is available for the motor and throat. Use all the parts in the kit for the best results. Parts included in the kit are marked with one asterisk, for example, (10*), in the text and drawings.
2. Two accessory tools should be ordered. Use **Padded Pliers, 207–579**, to grip the trip rod without damaging its surface. Use **Gauge, 171–818**, to ensure the proper clearance between the poppets and seat of the transfer valve.

Disassembly

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 9.

1. Flush the pump.
2. Relieve the pressure before proceeding.
3. Disconnect the hoses, remove the pump from its mounting, and clamp the air motor base (35) in a vise.
4. Use a pipe wrench on the knurled part of the cylinder (61) to screw it out of the base (35). See Fig. 5.

5. Pull the connecting rod (62) down as far as it will go.
6. Use a hammer and punch to remove the roll pin (42) from the piston rod (18), and then screw the connecting rod (62) out of the piston rod.

CAUTION

Do not damage the plated surface of the trip rod. Damaging the surface of the trip rod can result in erratic air motor operation. Use the special padded pliers, 207–579, to grasp the rod.

7. Manually push on the piston rod (18) to move the piston (39) up as far as it will go. Unscrew the cylinder cap nut (24). Pull the nut up. Grip the trip rod (34) with padded pliers and screw the nut off the rod. See Fig. 5.
8. Remove the six screws (3) holding the cylinder (12) to the base. Carefully pull the cylinder straight up off the piston (39).

CAUTION

To avoid damaging the cylinder wall, lift the cylinder straight up off of the piston. Never tilt the cylinder as it is being removed.

Air Motor and Throat Service

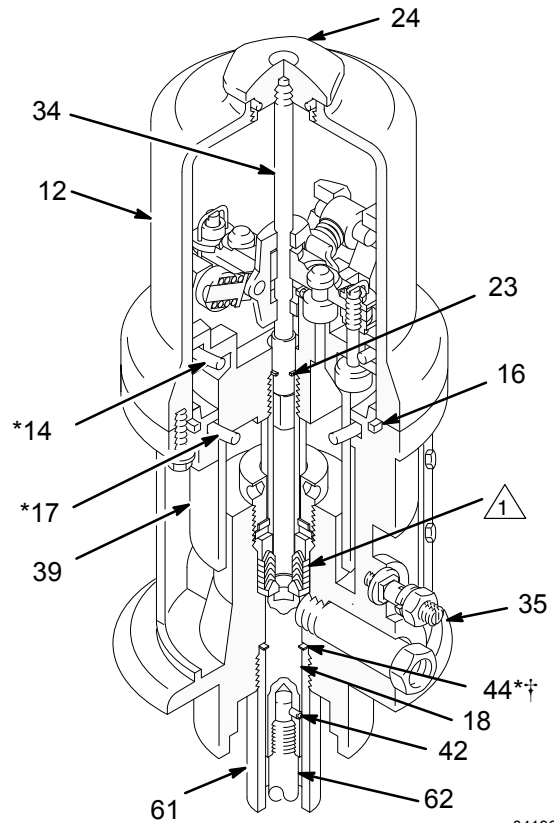
⚠ WARNING

To reduce the risk of pinching or amputating your fingers, **always** keep fingers clear of the toggle assemblies (L). See Fig. 6.

9. Use a screwdriver to push down on the trip rod yoke (7) and snap the toggles down. See Fig. 6. Remove the lockwires (13) from the adjusting nuts (11) of the transfer valves. Screw the top nuts off. Screw the stems (22) out of the grommets (10) and bottom nuts. Take the valve poppets (30) off the stems and squeeze them firmly to check for cracks.
10. Grip the toggle rockers (9) with a pliers. Compress the springs (26) and swing the toggle assembly (L) up and away from the piston lugs (M), and remove the parts. Check to see that the valve actuator (33) is supported by the spring clips (29), but slides easily into them. See Fig. 6.
11. Remove the trip rod yoke (7), actuator (33), and trip rod (34). Check the exhaust valve poppets (31) for cracks.

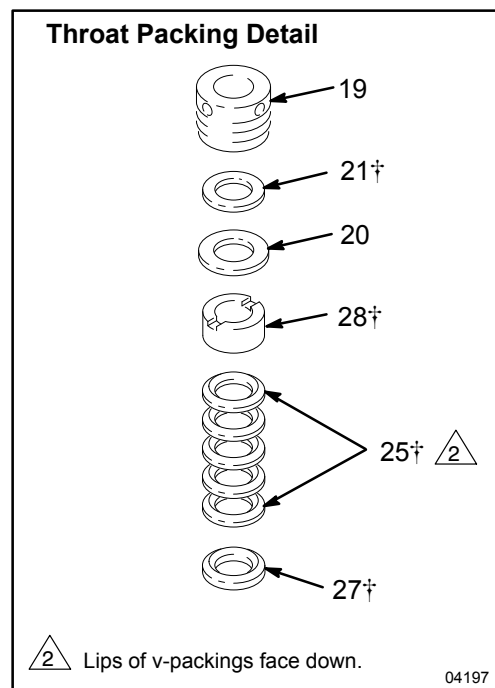
NOTE: To remove the exhaust valve poppets (31), stretch them out and cut them with a sharp knife.

12. Remove one of the air motor plates (32 or 64). Pull the piston (39) up out of the base (35). Remove the throat packing nut (19), v-packings (25), male gland (27), backup washer (20), flat packing (21) and bearing (28). See the Detail in Fig. 5.



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⚠ See Detail below.



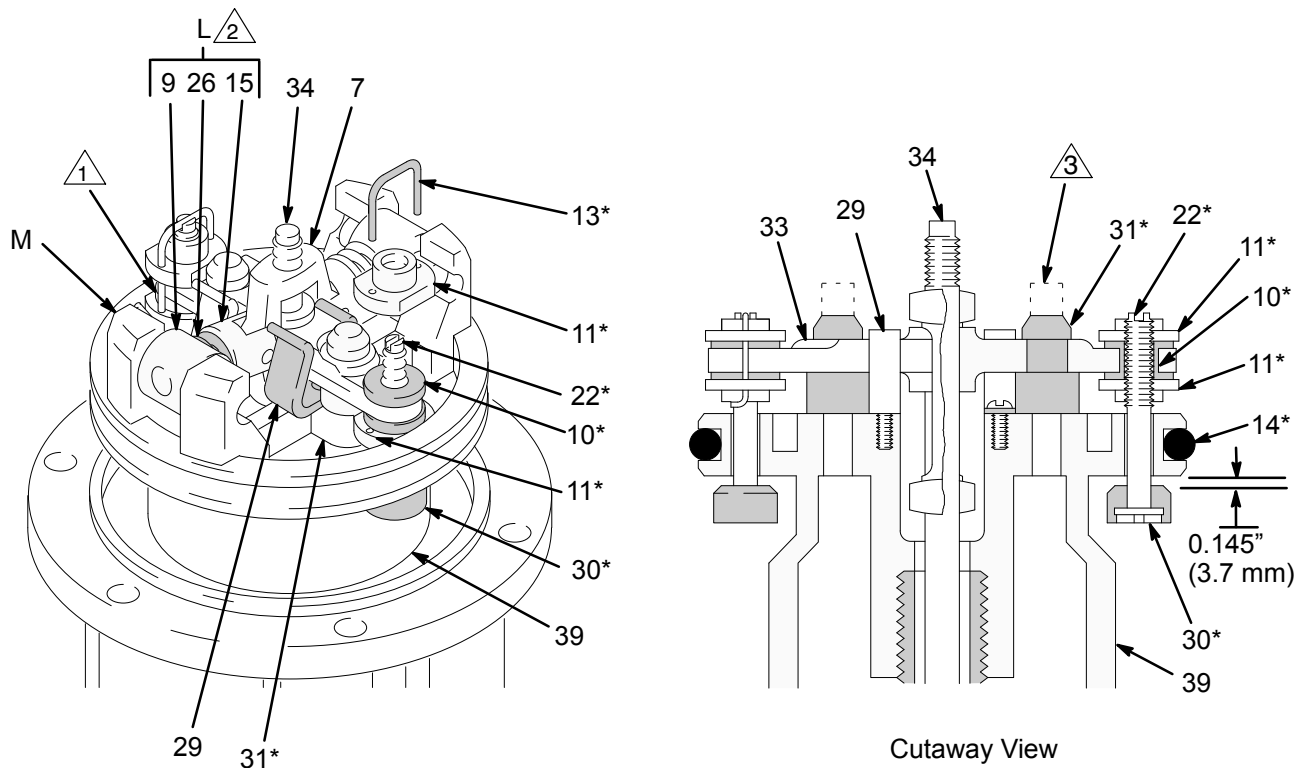
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Fig. 5

Air Motor and Throat Service

Reassembly

1. 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.
2. Check the polished surfaces of the piston (39), piston rod (18), and cylinder wall (12) for scratches or wear. A scored rod will cause premature packing wear and leaking.
3. Lubricate all parts with a light, waterproof grease.
4. One at a time, install the male gland (27†), five v-packings (25†), bearing (28†), backup washer (20), and flat packing (21†), with the lips of the v-packings facing down. Screw the packing nut (19) into the base (35) loosely. See the Detail in Fig. 5.
5. Slide the piston rod (18) down through the packings and lower the piston (39) into the base (35). Be sure the o-rings (14*, 16, 17*) are in place. See Fig. 5.
6. Pull the exhaust valve poppets (31*) into the valve actuator (33) and clip off the top part shown with dotted lines. See Fig. 6.
7. Install the transfer valve grommets (10*), then reassemble the valve mechanism. Before installing the lockwires (13*) in the adjusting nuts (11*), use the special gauge, 171–818, to adjust the transfer valve so there is 0.145 in. (3.7 mm) clearance between the poppets (30*) and the seat when it is open. See Fig. 6. Snap the toggles (15) to the up position.
8. Reassemble the air motor and assemble to the displacement pump. Before installing the air motor plate, tighten the throat packing nut (19) just snug — don't overtighten.
9. Before remounting the pump, connect an air hose and run the pump slowly [at about 40 psi (3 bar)] to see that it operates smoothly.
10. Reconnect the ground wire before regular operation of the pump.



- 1 Turn wires up. 04118
2 Push toggles (L) in and then up.
3 Cut off tops of poppets as indicated by dotted lines.

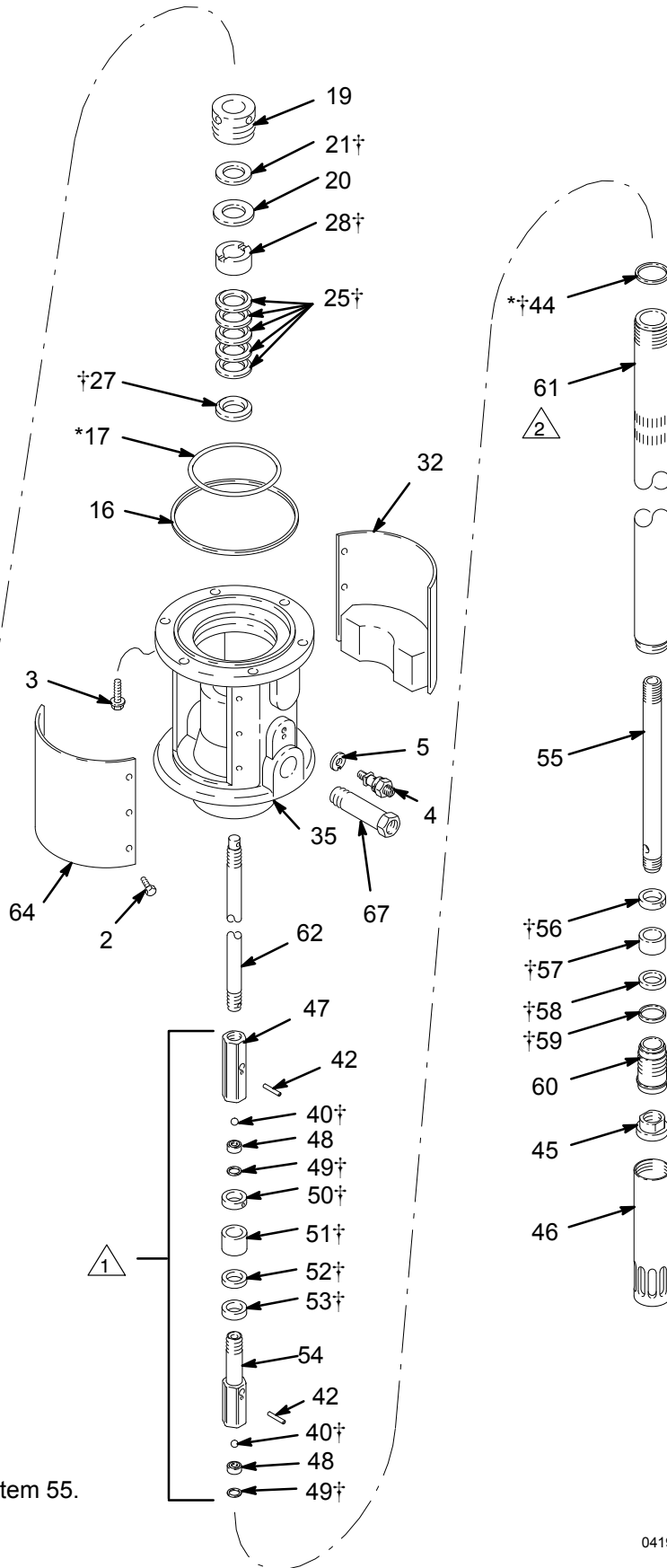
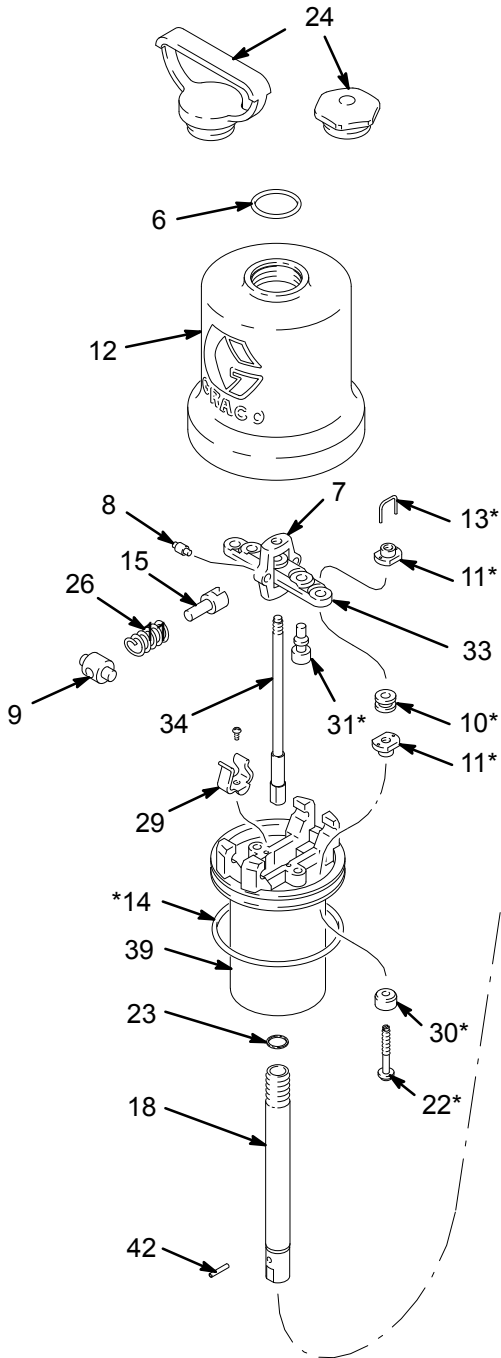
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Fig. 6

Parts

See Repair Kit information on page 18.

Ref. No. 1 Air Motor includes items 2–39, 64, 67, & 68



1 Ref No. 69 Piston includes these items & item 55.

2 Torque to 75–85 ft-lb.

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Parts

Model 203–868, Series H

400 lb drum size, buna-N packings

Model 203–869, Series H

120 lb drum size, buna-N packings

Model 207–609, Series D

50 lb pail size, buna-N packings

Model 221–034, Series A

400 lb drum size, PTFE packings

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	203–964 <i>SERIES P</i>	AIR MOTOR ASSY, (Pump Models 203–868 and 203–869 only) Includes items 2–39, 64, 67, 68	1	44*†	150–694	GASKET; copper	1
	206–404 <i>SERIES K</i>	AIR MOTOR ASSY, (Pump Model 207–609 only) Includes items 2–39, 64, 67, 68	1	45	160–667	PISTON, priming	1
	221–060 <i>SERIES B</i>	AIR MOTOR ASSY., (Pump Model 221–034 only) Includes items 2–39, 64, 67, 68	1	46	160–668	TUBE, priming	1
2	100–078	.SCREW, hex head; no. 8–32 x 0.38 in. (10 mm) long.	12	47	160–669	COUPLING, hex	1
3	101–578	.SCREW, hex head; no. 8–32 x 0.38 in. (10 mm) long	6	48	160–670	SEAT, valve; reversible	2
4	104–029	.LUG, grounding	1	49†	160–671	GASKET; copper	2
5	104–582	.WASHER, tab	1	50†	160–672	GUIDE, upper; brass	1
6	156–698	.O-RING; buna-N	1	51†	160–673	PACKING, block, upper piston; buna-N (Pump Models 203–868, 203–869 and 207–609 only)	1
7	158–360	.YOKE, rod, trip	1	680–239	PACKING, block, upper piston; PTFE (Pump Model 221–034 only)	1	
8	158–362	.PIN, toggle	2	52†	160–674	WASHER, backup; nylon	1
9	158–364	.ROCKER, toggle	2	53†	160–675	GUIDE, lower	1
10*	158–367	.GROMMET, rubber, air intake	2	54	160–676	RETAINER, packing	1
11*	160–261	.NUT, adjusting	4	55	160–677	TUBE, displacement	1
12	160–613	.CYLINDER, air motor	1	56†	160–678	GUIDE, displ. tube; brass	1
13*	160–618	.LOCKWIRE, transfer valve	2	57†	160–679	PACKING, block, shovel tube; buna-N (Pump Models 203–868, 203–869 and 207–609 only)	1
14*	160–621	.O-RING, nitrile rubber	1	680–277	PACKING, block, shovel tube; PTFE (Pump Model 221–034 only)	1	
15	160–623	.ARM, toggle	2	58†	160–680	GUIDE, displ. tube; nylon	1
16	160–624	.O-RING, buna-N	1	59†	160–681	SEAL, packing retainer; nylon	1
17*	160–625	.O-RING, buna-N	1	60	160–682	RETAINER, packing	1
18	160–639	.ROD, piston	1	61	160–683	CYLINDER; 22" (55.8 mm) long (Pump Model 203–869 only)	1
19	160–640	.NUT, packing	1	160–685	CYLINDER; 12.75" (323.9 mm) long (Pump Model 207–609 only)	1	
20	160–641	.WASHER, back-up	1	160–687	CYLINDER; 28.94" (735.1 mm) long (Pump Models 203–868 and 221–034 only)	1	
21†	160–644	.PACKING, flat; leather	1	62	160–684	ROD, connecting; 12" (304.8 mm) long (Pump Model 203–869 only)	1
22*	160–896	.STEM, valve	2	160–686	ROD, connecting; 2.75" (69.9 mm) long (Pump Model 207–609 only)	1	
23	160–932	.GASKET; copper	1	160–688	ROD, connecting; 18.94" (481.1 mm) long (Pump Models 203–868 and 221–034 only)	1	
24	161–435	.NUT, cylinder, cap (Pump Models 203–868, 203–869, and 221–034 only)	1	64	222–501	PLATE, warning with muffler	1
	164–704	.NUT, cylinder cap (Model 207–609 only)	1	67	162–718	ADAPTER; 3/8 npt(m) x 1/4 npt(f)	1
25†	162–391	.V-PACKING; leather (Pump Models 203–868, 203–869, and 207–609 only)	5	68	180–233	LABEL, warning	2
	164–555	.V-PACKING; PTFE (Pump Model 221–034 only)	5	69	207–069	PISTON ASSEMBLY (Pump Models 203–868, 203–869, and 207–609 only) Includes items 40, 42 (qty 2), and 47 to 55	1
26	167–585	.SPRING, helical compression	2	221–035	PISTON ASSEMBLY (Pump Model 221–034 only) Includes items 40, 42 (qty 2), and 47 to 55	1	
27†	168–851	.GLAND, male	1	70	172–479	TAG, warning (not shown)	1
28†	168–852	.BEARING, throat	1				
29	172–866	.CLIP, spring	2				
30*	170–708	.POPPET, valve; urethane	2				
31*	170–709	.POPPET, valve; urethane	2				
32	222–499	.PLATE, identification; with muffler	1				
33	172–867	.ACTUATOR, valve	1				
34	203–965	.ROD, trip	1				
35	204–896	.BASE, air motor	1				
37	102–975	.SCREW, rd hd mach; no. 6–32 x 0.25" (6.3 mm)	2				
39	160–614	.PISTON, air motor	1				
40†	100–069	BALL, steel; .0.25" (6.3 mm) dia.	2				
42	101–579	PIN, roll 0.12" (3.2 mm) dia. 0.75" (19 mm) long	4				

* The replacements for these parts are available in Repair Kit 206–728. Purchase the kit separately. See page 18.

† The replacements for these parts are available in Repair Kits 204–164 (buna-N) or 221–036 (PTFE), as appropriate. Purchase the kits separately. See page 18.

☞ Replace gasket every time the cylinder is removed for repair.

Repair Kits

206-728 Air Motor Repair Kit

Must be purchased separately

Consists of:

Ref No.	Qty
10	2
11	4
13	2
14	1
17	1
22	2
30	2
31	2
44	1

204-164 Displacement Pump Repair Kit

For Pump Models 203-868, 203-869 and 207-609 only

Must be purchased separately

Consists of:

Ref No.	Qty	Ref	Qty
21	1	51	1
25	5	52	1
27	1	53	1
28	1	56	1
40	2	57	1
44	1	58	1
49	2	59	1
50	1		

221-036 Displacement Pump Repair Kit

For Pump Model 221-034 only

Must be purchased separately

Consists of:

Ref No.	Qty	Ref	Qty
21	1	51	1
25	5	52	1
27	1	53	1
28	1	56	1
40	2	57	1
44	1	58	1
49	2	59	1
50	1		

221-037 Tune-Up Kit

For Pump Models 221-034 only

Must be purchased separately

Consists of:

Ref No.	Qty
44	1
50	1
51	1
52	1
53	1
56	1
57	1
58	1
59	1

Manual Change Summary

The manual was revised to add Part Number 150-694 , gasket (Ref. No. 44, Qty. 1), to Repair Kits 204-164, 206-728, 221-036 and 221-037.

Also, a torque requirement of 75-85 ft-lb. was added to the cylinder (Ref. No. 61) on pages 12 and 16.

The Graco Warranty and Disclaimers

WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven 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, 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 with Graco equipment of 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 claim. 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.

DISCLAIMERS AND LIMITATIONS

The terms of this warranty constitute purchaser's sole and exclusive remedy and are in lieu of any other warranties (express or implied), **including warranty of merchantability or warranty of fitness for a particular purpose**, and of any non-contractual liabilities, including product liabilities, based on negligence or strict liability. Every form of liability for direct, special or consequential damages or loss is expressly excluded and denied. In no case shall Graco's liability exceed the amount of the purchase price. Any action for breach of warranty must be brought within two (2) years of the date of sale.

EQUIPMENT NOT COVERED BY GRACO WARRANTY

Graco makes no warranty, and disclaims all implied **warranties of merchantability and fitness for a particular purpose**, with respect to accessories, equipment, materials, or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

Graco Phone Numbers

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-367-4023 Toll Free**

FOR TECHNICAL ASSISTANCE, service repair information or assistance regarding the application of Graco equipment: **1-800-543-0339 Toll Free**

Sales Offices: Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)
Foreign Offices: Canada; England; Korea; Switzerland; France; Germany; Hong Kong; Japan

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