INSTRUCTIONS–PARTS LIST

306–517
Rev. N
Supersedes M

This manual contains IMPORTANT WARNINGS AND INSTRUCTIONS
READ AND RETAIN FOR REFERENCE

50:1 RATIO FIRE–BALL® PUMPS

8000 psi (560 bar) Maximum Working Pressure

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 bodily injury, including fluid injection.

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 3 for available models.

TABLE OF CONTENTS

TERMS

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

WARNING: Alerts user to avoid or correct conditions which could cause bodily injury.

CAUTION: Alerts user to avoid or correct conditions which could cause damage to or destruction of equipment.

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 V ALVE: Any fluid dispensing device which can be triggered on and off.

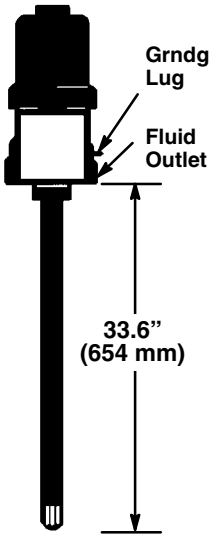
FLEXIBLE NOZZLE: A flexible rubber hose which extends from the dispense valve to a non–drip tip. Normally used for dispensing automatic transmission fluid.

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.

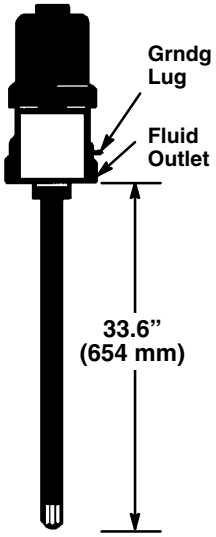
DIMENSIONAL DRAWING

MODEL 203–868, Series H
400 lb drum size



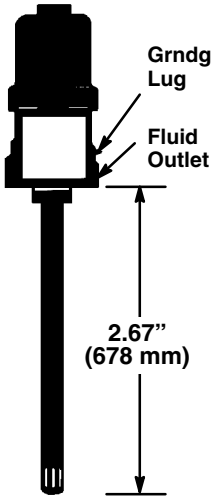
Overall length: 45.4" (1153.9 mm)

MODEL 221–034, Series A
400 lb drum size



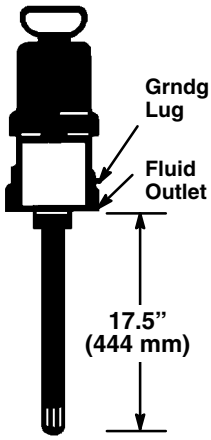
Overall length: 45.4" (1153.9 mm)

MODEL 203–869, Series H
120 lb drum size



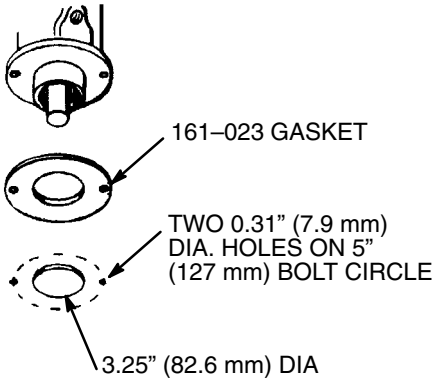
Overall length: 38.4" (115.9 mm)

MODEL 207–609, Series D
50 lb pail size



Overall length: 31" (787 mm)

MOUNTING HOLE LAYOUT



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	3 cfm per gallon pumped (1.35 m3/liter) at 100 psi (7 bar) up to 8 cfm with pump operated within recommended ranged
Pump cycles per gallon	310
Pump cycles per liter	84
Maximum recommended pump speed	76 cycles/min 1/4 gpm (1 liter/min)
Wetted parts	Steel, Brass, Aluminum, Nylon, Nitrile rubber
Approximate weight	22 lb (10 Kg)

SAFETY WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY.
FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS
Read and understand all instruction manuals before operating equipment.

FLUID INJECTION HAZARD

General Safety
This equipment generates fluid pressure high enough to cause an injection injury. Spray from the dispense valve or fluid emitted under high pressure from leaks or ruptured components can inject fluid through your skin and into your body and cause extremely serious bodily injury, including the need for amputation. Also, fluid injected or splashed into the eyes or on the skin can cause serious damage.

NEVER point the dispensing valve at anyone or at any part of the body. NEVER put hand or fingers over the end of the dispensing valve.

ALWAYS follow the **Pressure Relief Procedure**, right, before cleaning or removing the nozzle or servicing any system equipment.

NEVER try to stop or deflect leaks with your hand or body.

Be sure equipment safety devices are operating properly before each use.

Medical Alert—Injection Wounds
If any fluid appears to penetrate your skin, get **EMERGENCY MEDICAL CARE AT ONCE. DO NOT TREAT AS A SIMPLE CUT.** Tell the doctor exactly what fluid was injected.

Note to Physician: Injection in the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with most lubricants injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.

Pressure Relief Procedure
To reduce the risk of serious bodily injury, including fluid injection or splashing in the eyes or on the skin, always follow this procedure whenever you shut of f the pump, when checking or servicing any part of the system, when installing or changing dispensing devices, and whenever you stop dispensing.

1. Close the pump air regulator.
2. Hold a metal part of the valve firmly to a grounded metal waste container and trigger the valve to relieve the fluid pressure.

Dispensing Valve Safety (if applicable)
Do not modify any part of the dispensing valve. Only use extensions and no–drip tips which are designed for use with your dispensing valve. Modifying parts can cause a malfunction and result in serious bodily injury, including fluid injection and splashing in the eyes or on the skin.

Flexible Nozzle Safety
Be sure you know the maximum working pressure of the flexible nozzle you are using. Never exceed that pressure, even if your dispensing valve and/or pump is rated for higher working pressures.

Never use a low pressure flexible nozzle, designed for low pressure dispensing valves or hand–powered lubricating equipment, on a high pressure dispensing valve.

Grease Fitting Coupler Safety
Use extreme caution when cleaning or changing grease fitting couplers. If the coupler clogs while dispensing, **STOP DISPENSING IMMEDIA TELY.** Follow the **Pressure Relief Procedure**, above. Then remove the coupler to clean it. Never wipe off buildup around the coupler until pressure is fully relieved.

HOSE SAFETY

High pressure fluid in the hoses can be very dangerous. If the hose develops a leak, split or rupture due to any kind of wear, damage or misuse, the high pressure spray emitted from it can cause a fluid injection injury or other serious bodily injury or property damage.

TIGHTEN all fluid connections securely before each use. High pressure fluid can dislodge a loose coupling or allow high pressure spray to be emitted from the coupling.

NEVER use a damaged hose. Before each use, check entire hose for cuts, leaks, abrasion, bulging cover , or damage or movement of the hose couplings. If any of these conditions exist, replace the hose immediately. DO NOT try to recouple high pressure hose or mend it with tape or any other device. A repaired hose cannot contain the high pressure fluid.

HANDLE AND ROUTE HOSES CAREFULL Y. Do not pull on hoses to move equipment. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose. DO NOT expose Graco hose to temperatures above 180° F (82° C) or below –40° F (–40° C).

EQUIPMENT MISUSE HAZARD

General Safety
Any misuse of the dispensing equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in fluid injection or other serious bodily injury, fire, explosion or property damage.

NEVER alter or modify any part of this equipment; doing so could cause it to malfunction.

CHECK all dispense equipment regularly and repair or replace worn or damaged parts immediately.

ALWAYS read and follow the lubricant or fluid manufacturer's recommendations regarding the use of protective clothing and equipment.

Fluid Compatibility
BE SURE that all lubricants or fluids used are chemically compatible with the wetted parts shown in the Technical Data. Always read the fluid and solvent manufacturer 's literature before using them in this system.

System Pressure
To reduce the risk of overpressurizing any part of your system, be sure you know the maximum working pressure rating of each pump and its connected components.

The **MAXIMUM WORKING PRESSURE** of the **50:1 Ratio Fire–Ball Pumps** is 8000 psi (560 bar). at a maximum air operating pressure of 160 psi (11 bar). Reduce the air pressure to reduce the fluid pressure. See the **Maximum Working Pressure Warning** on page 7. Never exceed the maximum working pressure of the *lowest rated component* in each system.

MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers or other body parts. The piston in the air motor, located behind the air motor plates, moves when air is supplied to the motor. Therefore, NEVER operate the pump with the air motor plates removed.

KEEP CLEAR of moving parts when starting or operating the pump. Before checking or servicing the pump, follow the **Pressure Relief Procedure** on page 4 to prevent the pump from starting accidentally.

FIRE OR EXPLOSION HAZARD

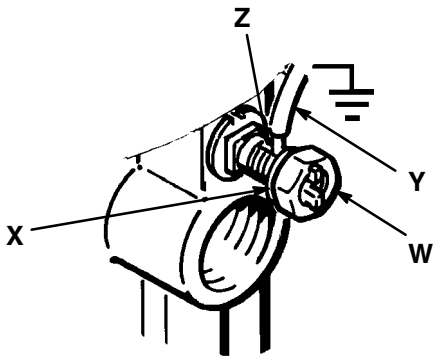
Static electricity is created by the flow of fluid through the pump and hose. If the pump is not properly grounded, sparking may occur, and the system may become hazardous. Sparking may also occur when plugging in or unplugging a power supply cord. Sparks can ignite fumes from solvents, dust particles and other flammable substances, whether you are operating indoors or outdoors, and can cause a fire or explosion and serious bodily injury and property damage.

If you experience any static sparking or even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY**. Check for proper grounding. Do not use the system again until the problem has been identified and corrected.

Grounding
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 spray equipment:

1. *Pump:* use a ground wire and clamp as shown to the right.
2. *Air and Fluid hoses:* use only grounded 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, 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 locknut securely. Connect the other end of the wire to a true earth ground. Refer to page 15 to order a ground wire and clamp.

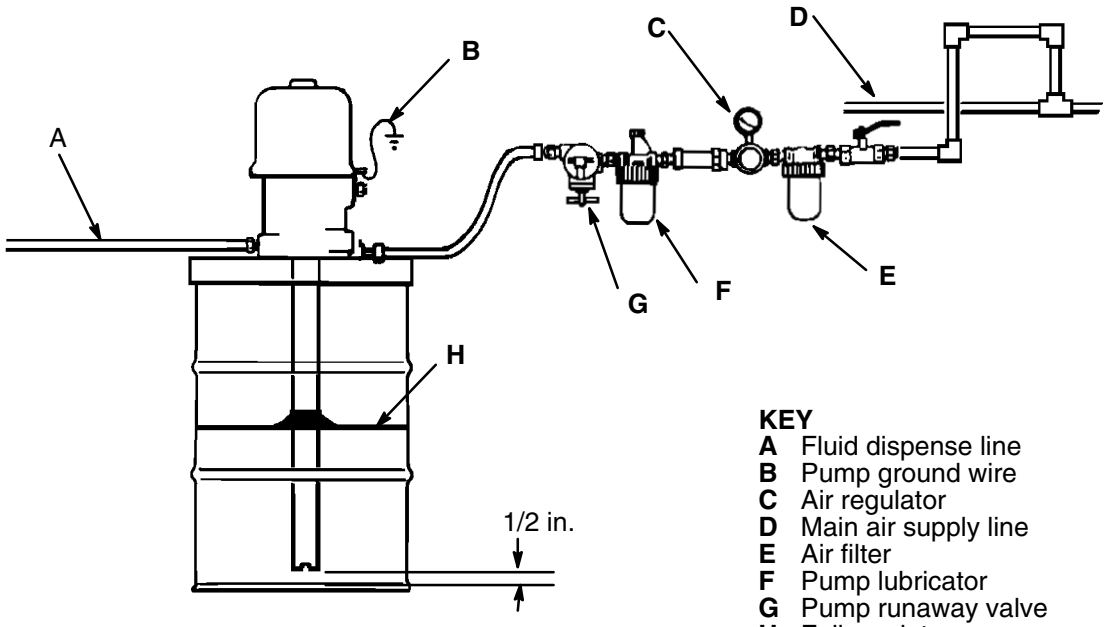


IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards—particularly the General Standards, Part 1910—should be consulted.

TYPICAL INSTALLATION

For Stationary Mountings



KEY
A Fluid dispense line
B Pump ground wire
C Air regulator
D Main air supply line
E Air filter
F Pump lubricator
G Pump runaway valve
H Follow plate

INSTALLATION

1. **Mounting**

   a. Plan the mounting layout for easy operator access to the pump air controls, sufficient room to change drums and a secure mounting platform.

   b. 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.

   c. Mount the pump to the drum cover or other suitable mounting device.

   d. For ease in changing drums, install a pump elevator.

2. **Air and Fluid Line and Accessories**
   Refer to The Typical Installation above.

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 the **TYPICAL INSTALLATION**.

a. 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.

b. Install an air line lubricator (F) for automatic air motor lubrication.

c. Install the air regulator (C) to control pump speed and pressure.

d. On the main air supply line from the compressor, install an air line filter (E) to remove harmful dirt and contaminants from your compressed air supply.

GROUNDING

Proper grounding is an essential part of maintaining a safe system. Read and follow the grounding instructions in **FIRE OR EXPLOSION HAZARD** on page 5.

WARNING

Pressure Relief Procedure
To reduce the risk of serious bodily injury, including fluid injection or splashing in the eyes or on the skin, always follow this procedure whenever you shut off the pump, when checking or servicing any part of the system, when installing or changing grease fitting couplers, and whenever you stop dispensing.

1. Close the pump air regulator.
2. Hold a metal part of the dispense valve firmly to a grounded metal waste container and trigger 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

Maximum Working Pressure
The maximum working pressure of each component in your system may not be the same. T o reduce the risk of overpressurizing any part of your system, be sure you know the maximum working pressure rating of each component. Never exceed the maximum working pressure of the lowest rated component connected to a pump.

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 (:1) ratio x 100 psi air =
5000 psi fluid output

[50:(1) ratio x 7 bar air = 350 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 GUIDE

WARNING

Pressure Relief Procedure
To reduce the risk of serious bodily injury , including injection, always follow this procedure whenever you shut off the pump, and before inspecting, removing, cleaning or repairing any part of the pump or system.

(1) Close the bleed–type master air valve (required in the system).

(2) Open the dispensing valve until pressure is fully relieved.

If you suspect that the nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VER Y SLOWL Y loosen the nozzle or hose end coupling and relieve pressure gradually , then loosen completely . Now clear the nozzle or hose.

WARNING

NEVER operate the pump with the air motor warning plate or the identification plate removed as these plates enclose the piston and help protect your fingers from serious injury, including amputation.

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 material lines, hoses, valves, etc.	Clear*
	Damaged air motor	Service air motor
	Exhausted material 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 material 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 material supply	Refill and reprime or flush
	Clogged material lines, hoses, valves, etc.	Clear*
	Packing nut too tight	Loosen
	Loose packing nut or worn packings	Tighten; replace

*Follow the **Pressure Relief Procedure Warning**, above, and disconnect the material line. If the pump start when the air is turned on again, the line, etc., is clogged.

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.

   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 kit are marked with two asterisks, for example, (22**), in the text and drawings. See page 14 for ordering these kits.

   A **special Tune–up Kit 221–037** is also available for Pump 221–034. See page 14 for parts included in that kit.

2. A **0.25 in. (6.4 mm) diameter rod** (K) is required for disassembling the pump.

Disassembly

1. Flush the pump. Follow the **Pressure Relief Procedure Warning,** page 8, before proceeding.
2. Disconnect the hoses, remove the pump from its mounting, and clamp the air motor base in a vise.
3. Clamp the pump base (35) in a vise. Screw the priming tube (46) off of the displacement cylinder (61).
4. Hold the displacement tube (55) with the rod (K) and screw the priming plunger (45) off the displacement tube.
5. 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 tube. Remove the seal (59), guides (56,58) and packing (57). See Fig 9–1.

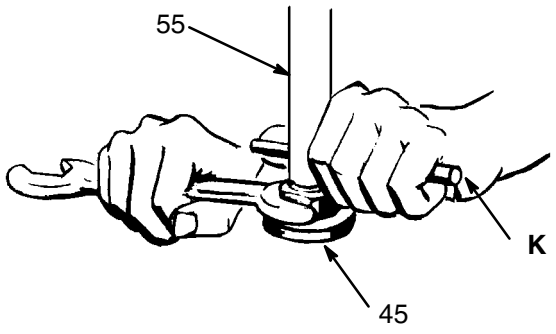


Fig 9–1

6. 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).
7. 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.
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. Lubricate all the parts with light waterproof grease and reassemble the pump. Apply medium–strength Loctite to the threads of the packing retainer (60).
10. If the ground wire was disconnected before servicing, be sure to reconnect it before regular operation of the pump.

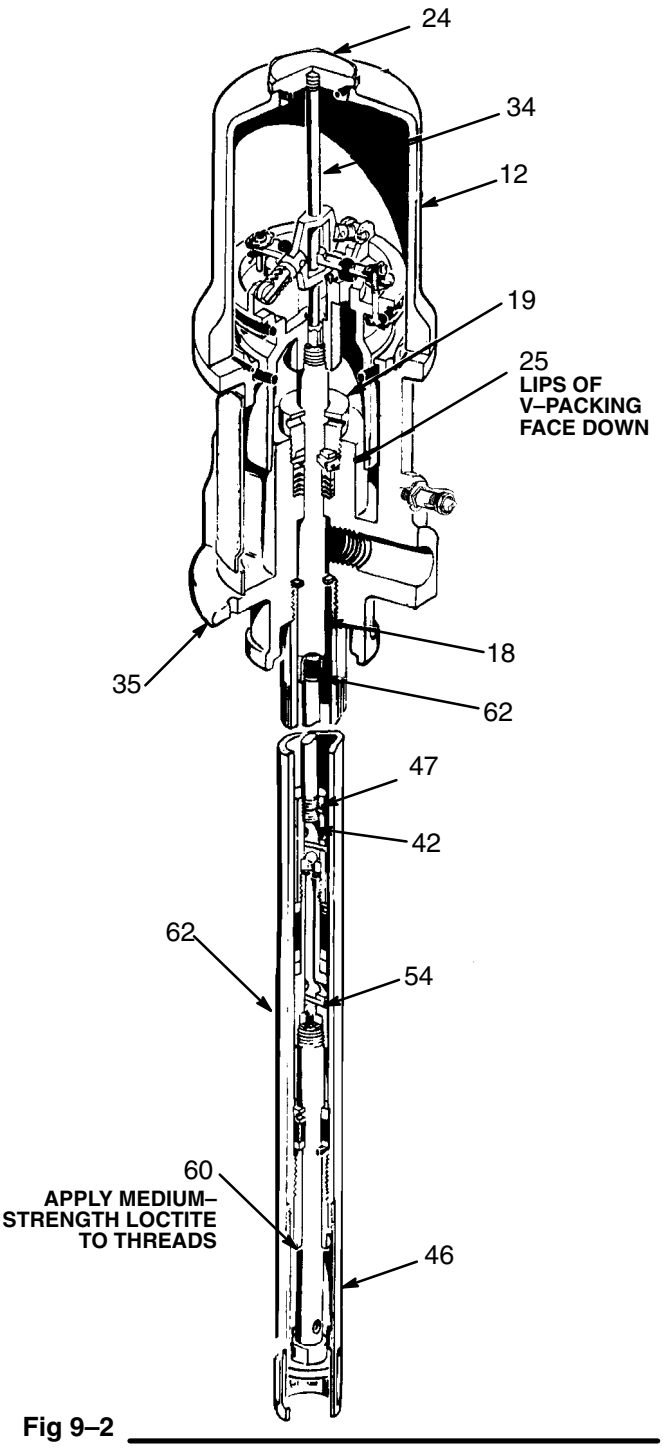


Fig 9–2

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 used. **Padded pliers, 207–579.** is used to grip the trip rod without damaging its surface. **Gauge, 171–818**, is used to assure the proper clearance between the poppets and seat of the transfer valve. See **ACCESSORIES** for ordering.

Disassembly

1. Flush the pump. Follow the **Pressure Relief Procedure Warning,** page 8, before proceeding.

2. Disconnect the hoses, remove the pump from its mounting, and clamp the air motor base in a vise.

3. Use a pipe wrench on the knurled part of the cylinder (61) to screw it out of the base (35).

4. Pull the connecting rod (62) down as far as it will go.

5. 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.

6. 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.

7. 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.

WARNING

To reduce the risk of pinching or amputating your fingers, ALWAYS keep fingers clear of the toggle assemblies (J).

8. Use a screwdriver to push down on the trip rod yoke (7) and snap the toggles down. See Fig 10–1. 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.

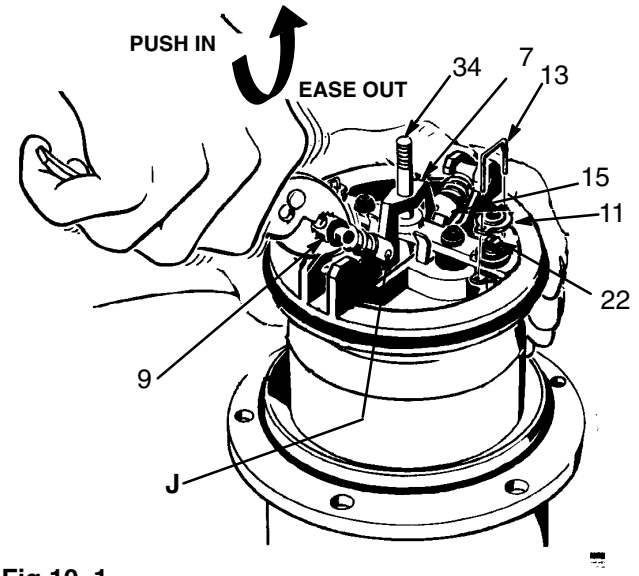


Fig 10–1

9. Grip the toggle rockers (9) with a pliers. Compress the springs up, away from the piston lugs, and remove the parts. Check to see that the valve actuator (33) is supported by the spring clips (38), but slides easily into them.

10. Remove the trip rod yoke, actuator and trip rod (4). Check the exhaust valve poppets (31) for cracks.

11. Remove one of the air motor plates (32 or 64). Pull the piston up out of the base. Remove the throat packing nut (10), packings (25), gland (27), backup washer (20), flat packing (21) and bearing (28).

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

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, piston rod and cylinder wall for scratches or wear. A scored rod will cause premature packing wear and leaking.

3. Lubricate all parts with a light, waterproof grease.

4. Install the v–packings (25), bearing and washer one at a time, with the lips of the v–packings facing down. Screw the packing nut(10) into the base loosely.

5. Slide the piston rod (18) down through the packings and lower the piston into the base. Be sure the o–rings are in place.

6. Pull the exhaust valve poppets (31) into the valve actuator (33) and clip off the top part shown with dotted lines. See Fig 11–1.

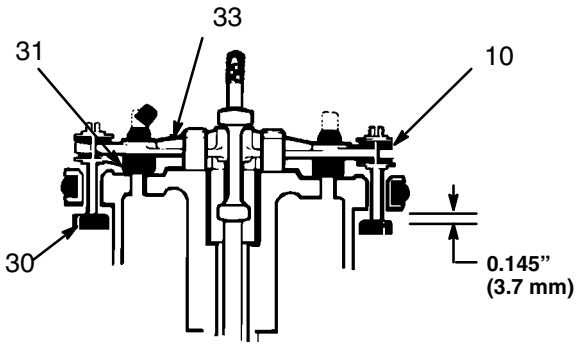
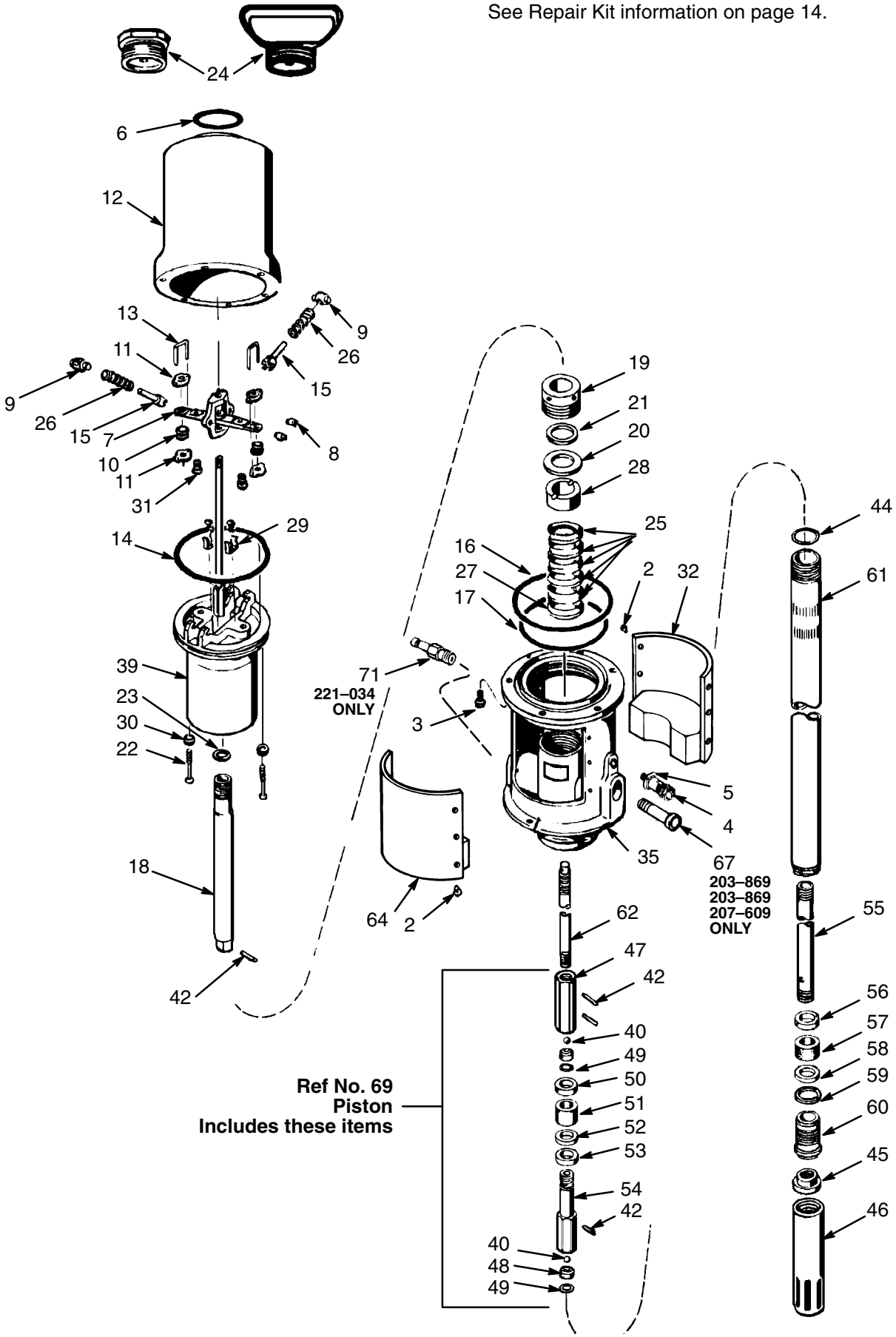


Fig 11–1

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 11–1. 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 over tighten.
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.

PARTS DRAWING

See Repair Kit information on page 14.



Model 203–868, Series H
400 lb drum size
Includes items 1 – 65, 67–70

Model 203–869, Series H
120 lb drum size
Includes items 1 – 65, 67–70

REF NO	PART NO.	DESCRIPTION	QTY
1	**203–964**	**AIR MOTOR ASSY,**	
	SERIES P	*(MODEL 203–868, 203–869 ONLY)*	
		INCLUDES ITEMS 2–39, 64, 68	1
	206–404	**AIR MOTOR ASSY,**	
	SERIES K	*(MODEL 207–609 ONLY)*	
		INCLUDES ITEMS 2–39, 64, 67, 68	1
	221–060	**AIR MOTOR ASSY.,**	
	SERIES B	*(MODEL 221–034 ONLY*	
		INCLUDES ITEMS 2–39, 64, 68	
2	100–078	.SCREW , HEX HEAD, NO. 8–32 X 0.38 IN. LG.	12
3	101–578	.SCREW , HEX HEAD , NO. 8–32 X 0.38 IN. LG.	6
4	104–029	.LUG, GROUNDING	1
5	104–582	.WASHER, TAB	1
6	156–698	.O–RING, BUNA–N	1
7	158–360	.YOKE, ROD, TRIP	1
8	158–362	.PIN, TOGGLE	2
9	158–364	.ROCKER, TOGGLE	2
10	158–367*	.GROMMET, RUBBER, AIR INTAKE	2
11	160–261*	.NUT, ADJUSTING	4
12	160–613	.CYLINDER AIR MOTOR	1
13	160–618*	.LOCKWIRE, TRANSFER VALVE	2
14	160–621*	.O–RING, NITRILE RUBBER	1
15	160–623	.ARM, TOGGLE	2
16	160–624	.O–RING, BUNA–N	1
17	160–625 *	.O–RING, BUNA–N	1
18	160–639	.ROD, PISTON	1
19	160–640	.NUT, PACKING	1
20	160–641	.WASHER, BACK–UP	1
21	160–644**	.PACKING; FLAT LEATHER	1
22	160–896*	.STEM, VALVE	2
23	160–932	.GASKET, COPPER	1
24	161–435	.NUT, CYLINDER, CAP *(MODEL 203–868, 203–869 ONLY)*	1
	164–704	.NUT, CYLINDER CAP *(MODEL 207–609 ONLY)*	1
25	162–391**	.V–PACKING; LEATHER *(MODELS 203–868, 203–869, 207–609 ONLY)*	5
	164–555**	.V–PACKING;PTFE ® *(MODEL 221–034 ONLY)*	5
26	167–585	.SPRING, HELICAL COMPRESSION	2
27	168–851 **	.GLAND, MALE	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”	2
39	160–614	.PISTON, AIR MOTOR	
40	100–069**	.BALL, STEEL; 1/4” DIA.	2
42	101–579	.PIN, ROLL 0.12” (3.2 MM) DIA 0.75” (19 MM) LG	2
44	150–694	GASKET: COPPER	1

Model 207–609, Series D
50 lb pail size
Includes items 1–65, 67–70

Model 221–034, Series A
400 lb drum size
Includes items 1 – 65, 68–71

REF NO	PART NO.	DESCRIPTION	QTY
45	160–667	PISTON, PRIMING	1
46	160–668	CYLINDER, INTAKE	1
47	160–669	COUPLING, HEX	1
48	160–670	SEAT, VALVE; REVERSIBLE	2
49	160–671**	GASKET, COPPER	2
50	160–672**	GUIDE, UPPER, BRASS	1
51	160–673**	PACKING, UPPER PISTON BLOCK, BUNA–N	1
	680–239	PACKING, UPPER PISTON BLOCK, BUNA–N	1
52	160–674**	WASHER, BACKUP, NYLON	1
53	160–675**	GUIDE, LOWER	1
54	160–676	RETAINER, PACKING	1
55	160–677	TUBE, DISPLACEMENT	1
56	160–678**	GUIDE, DISPL. TUBE, BRASS	1
57	160–679**	PACKING, SHOVEL TUBE BLOCK, BUNA–N *(MODELS 203–868, 203–869 AND 207–609 ONLY)*	1
	680–277	PACKING, SHOVEL TUBE BLOCK, BUNA–N *(MODEL 221–034 ONLY)*	1
58	160–680**	GUIDE, DISPL. TUBE, NYLON	1
59	160–681**	SEAL, PACKING RETAINER; NYLON	1
60	160–682	RETAINER, PACKING	1
61	160–683	CYLINDER *(MODEL 203–869 ONLY)*	1
	160–685	CYLINDER *(MODEL 207–609 ONLY)*	1
	160–687	CYLINDER *(MODEL 203–868 ONLY)*	1
62	160–684	ROD, CONNECTING; 12” (304.8 MM) LONG *(MODEL 203–869 ONLY)*	1
	160–686	ROD, CONNECTING; 12” (304.8 MM) LONG *(MODEL 207–609 ONLY)*	1
	160–688	ROD, CONNECTING; 12” (304.8 MM) LONG *(MODEL 203–868 ONLY)*	1
64	222–501	PLATE, WARNING *WITH MUFFLER*	1
67	162–718	ADAPTER,3/8 NPT(M) X 1/4 NPT(F) *MODELS 203–868, 203–869, 207–609*	1
68	180–233	LABEL, WARNING	2
69	207–069	**PISTON ASSEMBLY** *(MODELS 203–868, 203–869, 207–609 ONLY)* INCLUDES ITEMS 40, 42 (QTY 2), & 47 TO 55	1
	221–035	**PISTON ASSEMBLY** *(MODELS 221–034 ONLY)* INCLUDES ITEMS 40, 42 (QTY 2), & 47 TO 55	1
70	172–479	TAG, WARNING	1
71	169–971	FITTING, AIR LINE *MODEL 221–034 ONLY*	1

NOTE: See page 14 for ordering repair kits.
*****Included in Repair Kit 206–728.*
***Included in Repair Kit 204–164 or 221–036 as appropriate.*

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	1
22	2
30	2
31	2

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
49	2	58	1
50	1	59	1

221–036 Displacement Pump Repair Kit
FOR PUMP MODELS 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
49	2	58	1
50	1	59	1

221–037 Tune–Up Kit
FOR PUMP MODELS 221–034 ONLY
Must be purchased separately

Consists of:

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

SERVICE INFORMATION

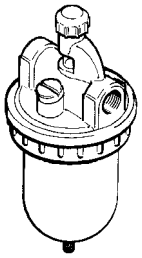
Listed below by the assembly changed are OLD and NEW parts.

Assembly Changed	Status	Ref No.	Part No.	Description
203–964 Air Motor to Series P, 206–404 Air Motor to Series K, 221–060 Air Motor to Series B	OLD		172–464	Plate
	NEW	32	222–499	Plate with muffler
	OLD		172–457	Plate
	NEW	64	222–501	Plate with muffler

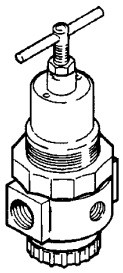
INTERCHANGEABILITY NOTE: NEW parts replace the OLD parts listed directly above them.

ACCESSORIES

Air Line Lubricator
250 psi (127.5 bar) Maximum Working Pressure
214–847 3/8” npt
214–848 1/2” npt

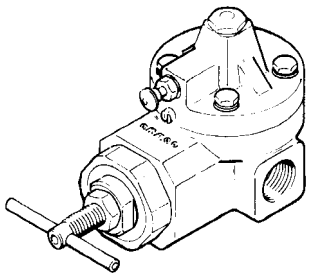


Air Regulator
300 psi Maximum Working Pressure
109–075 3/8” npt
104–266 1/2” npt



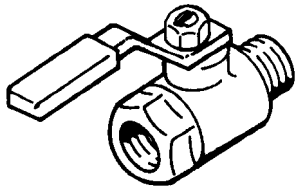
Pump Runaway Valve 215–362
180 psi (12 bar) Maximum Working Pressure

Shuts off air suppy to the pump if the pump accelerates beyond the pre–adjusted setting due to an empty supply container, interrupted fluid supply to the pump or excessive cavitation.
3/4” npt(f)

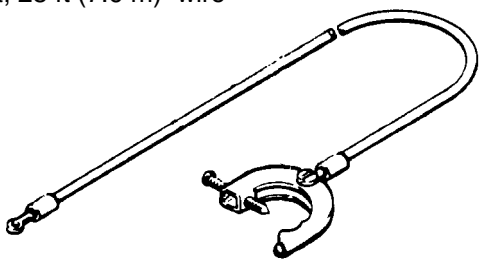


Bleed–type Master Air Valve 107–142
300 psi (21 bar) Maximum Working Pressure

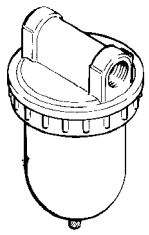
Relieves air trapped in the air line between the pump air inlet and this valve when closed.
1/2” npt



Grounding Clamp & Wire 222–011
12 ga, 25 ft (7.6 m) wire



Air Line Filter
250 psi (127.5 bar) Maximum Working Pressure
106–148 3/8” npt
106–149 1/2” npt



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 W ARRANTY 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.

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)
Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan

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