

# INSTRUCTIONS-PARTS LIST



307-917

Rev A

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

SEVERE-DUTY, STAINLESS STEEL

## 10:1 RATIO STANDARD PUMP

PAIL AND WALL MOUNT SYSTEMS

950 psi (66 bar) MAXIMUM WORKING PRESSURE

**Model 222-252, Series A**  
**Basic Pump**

**Model 222-390**  
**Pail Mount System**

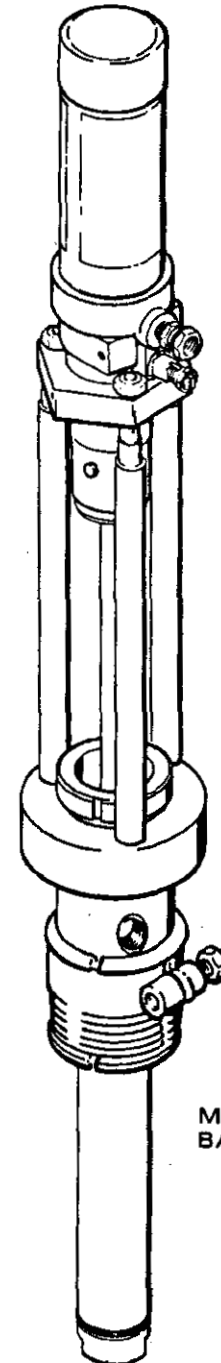
Includes pump, pail kit, air/fluid regulator kit,  
hose kit, air-assisted airless spray gun, and 415 tip

**Model 222-393**  
**Wall Mount System**

Includes pump, wall mount kit, air/fluid regulator kit,  
hose kit, air-assisted airless spray gun, and 415 tip

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MODEL 222-252  
BASIC PUMP

# SAFETY WARNINGS

HIGH PRESSURE FLUID 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 very high fluid pressure. Spray from the spray gun, 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 spray gun at anyone or at any part of the body. NEVER put hand or fingers over the spray tip. NEVER try to "blow back" paint; this is NOT an air spray system.

ALWAYS follow the Pressure Relief Procedure, right, before cleaning or removing the spray tip 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--Airless Spray 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 some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.*

### Spray Gun Safety Devices

Be sure all spray gun safety devices are operating properly before each use. Do not remove or modify any part of the spray gun; this can cause a malfunction and result in serious bodily injury.

### Safety Latch

Whenever you stop spraying, even for a moment, always set the spray gun safety latch in the closed or "safe" position, making the spray gun inoperative. Failure to set the safety latch can result in accidental triggering of the spray gun.

## EQUIPMENT MISUSE HAZARD

### General Safety

Any misuse of the spray 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, splashing in the eyes or on the skin, or other serious bodily injury, or fire, explosion or property damage.

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

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

Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

### Diffuser

The spray gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check the diffuser operation regularly. Follow the Pressure Relief Procedure, below, then remove the spray tip. Aim the spray gun into a grounded metal pail, holding the spray gun firmly to the pail. Using the lowest possible pressure, trigger the spray gun. If the fluid emitted is not diffused into an irregular stream, replace the diffuser immediately.

### Spray Tip Safety

Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the spray gun safety latch immediately. ALWAYS follow the Pressure Relief Procedure and then remove the spray tip to clean it.

NEVER wipe off build-up around the spray tip until pressure is fully relieved and the spray gun safety latch is engaged.

### Pressure Relief Procedure

To reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow this procedure whenever you shut off the pump, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Disengage the spray gun safety latch.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve (required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the air cap or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

### System Pressure

The 10:1 ratio pump can develop 950 psi (66 bar) MAXIMUM WORKING PRESSURE at 95 psi (6.5 bar) MAXIMUM INCOMING AIR PRESSURE. NEVER exceed 95 psi (6.5 bar) air pressure to the pump.

Be sure that all spray equipment and accessories are rated to withstand the maximum working pressure of the pump. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

### Fluid Compatibility

BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the TECHNICAL DATA on the back page. Always read the manufacturer's literature before using fluid or solvent in this pump.

## 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.

**ALL FLUID HOSES MUST HAVE SPRING GUARDS ON BOTH ENDS!** The spring guards help protect the hose from kinks or bends at or close to the coupling which can result in hose rupture.

**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 the 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 safely contain the high pressure fluid.

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

## FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the spray equipment 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 and the fluid being sprayed, dust particles and other flammable substances, whether you are spraying indoors or outdoors, and can cause a fire or explosion and serious bodily injury and property damage. Do not plug in or unplug any power supply cords in the spray area when there is any chance of igniting fumes still in the air.

If you experience any static sparking or even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY.** Check the entire system 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, object being sprayed, and all other spray equipment used or located in the spray area. **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 in Fig 1.
2. *Air hoses:* use only grounded air hoses.
3. *Fluid hoses:* use only grounded fluid hoses.
4. *Air compressor:* follow manufacturer's recommendations.
5. *Spray gun:* grounding is obtained through connection to a properly grounded fluid hose and pump.
6. *Fluid supply container:* according to your local code.
7. *Object being sprayed:* according to your local code.
8. *All solvent pails used when flushing,* according to local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.
9. *To maintain grounding continuity when flushing or relieving pressure,* always hold a metal part of the spray gun firmly to the side of a grounded metal pail, then trigger the spray gun.

## Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray system. Check the electrical resistance of your air and fluid hoses at least once a week. If your hose does not have a tag on it which specifies the maximum electrical resistance, contact the hose supplier or manufacturer for the maximum resistance limits. Use a resistance meter in the appropriate range for your hose to check the resistance. If the resistance exceeds the recommended limits, replace it immediately. An ungrounded or poorly grounded hose can make your system hazardous. Also, read **FIRE OR EXPLOSION HAZARD**, below.

## MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers or other body parts. **KEEP CLEAR** of moving parts when starting or operating the pump. Before checking or servicing the pump or any system component, follow the **Pressure Relief Procedure** on page 2, to prevent the pump from starting accidentally.

### To ground the pump:

To ground the pump, loosen the grounding lug locknut (W) and washer (X). Insert one end of a 1.5 mm<sup>2</sup> (12 ga) minimum ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. See Fig 1. Connect the other end of the wire to a true earth ground.

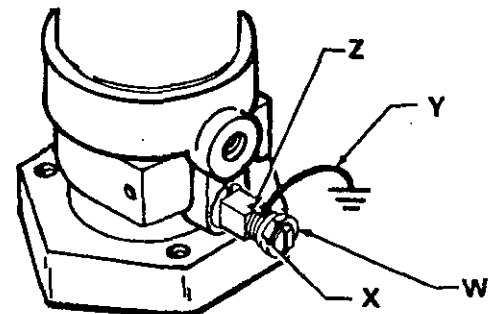


Fig 1

## Flushing Safety

Before flushing, be sure the entire system and flushing pails are properly grounded. Refer to **Grounding**, at the left. Follow the **Pressure Relief Procedure** on page 2, and remove the spray tip from the spray gun. Always use the lowest possible fluid pressure, and maintain firm metal-to-metal contact between the spray gun and the pail during flushing to reduce the risk of fluid injection injury, static sparking and splashing.

## Ventilate the Spray Booth

To prevent hazardous concentration of toxic and/or flammable vapors, spray only in a properly ventilated spray booth.

**NEVER** operate the spray gun unless the ventilating fans are operating.

## IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards - particularly the General Standards, Part 1910, and the Construction Standards, Part 1926 - should be consulted.

# INSTALLATION

**NOTE:** Be sure that all operators read and understand this entire manual and any separate manuals supplied with components and accessories before using this equipment.

Numbers and letters in parentheses refer to the parts lists and the callouts in Figs. 1-5.

The Typical Installations shown in Figs. 2 and 3 are only examples. For assistance in designing a system to meet your particular needs, contact your Graco representative. Accessories mentioned in the text are shown on page 17.

## PAIL MOUNT SYSTEM INSTALLATION (Refer to Fig. 2)

Place the pail cover (206) on the pail (204), and secure with the three thumbscrews (207). Install the bung adapter plate (205) on the pail cover, using the two hex screws (203).

Screw the pipe nipple (208) into the pump's intake valve. Lower the pump (A) through the adapter plate and cover into the pail, so the inlet is 1/2 in. (13 mm) off the bottom of the pail. Screw the pump's bung adapter (18) into the bung adapter plate tightly.

Refer to "Installation Procedure - All Models" to complete the installation.

### Typical Installation: Pail Mount Systems

#### KEY

A	Pump
B	Pump Air Regulator
C	Gun Air Regulator
D	Air Line Filter
E	Main Air Line
F	Bleed-Type Master Air Valve
G	Drain Valve
H	Spray Gun
18	Bung Adapter
204	Pail
205	Bung Adapter Plate
206	Pail Cover
207	Thumbscrews
401	Fluid Hose
402	Fluid Filter
403	Gun Air Hose
503	Air Line Coupler
506	Safety Valve

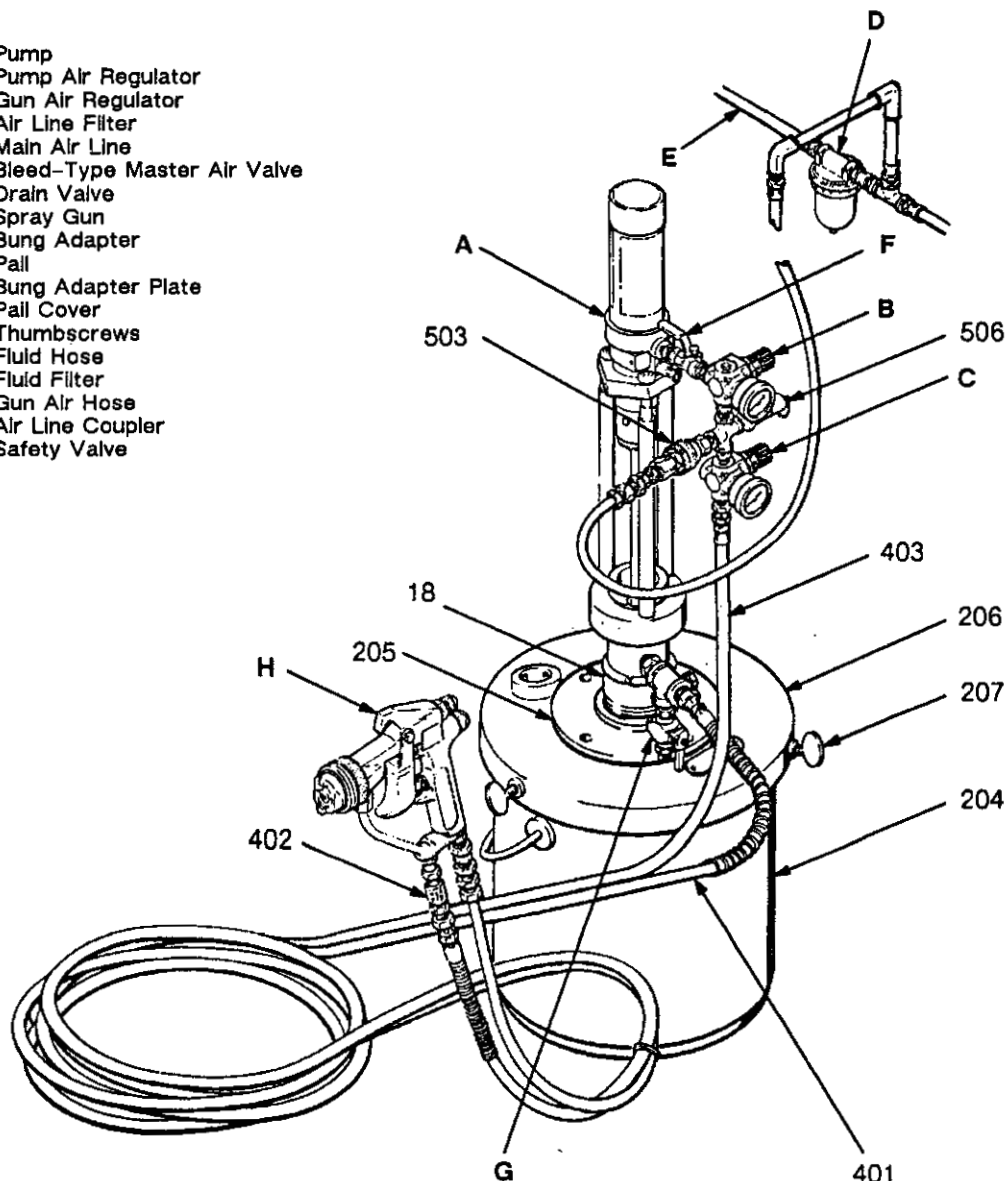


Fig. 2

## WALL MOUNT SYSTEM INSTALLATION (Refer to Fig. 3)

Install the bung adapter plate (306) on the wall bracket, using the two hex screws (303) and nuts (304).

Mount the wall bracket (305) 5 ft (1.5 m) above the floor. Refer to wall bracket manual 306-783 for instructions. Be sure the wall is strong enough to support the weight of the equipment, fluid, and hoses, and stress caused during pump operation.

Lower the pump (A) through the adapter plate and bracket. Screw the pump's bung adapter (18) into the bung adapter plate (306) tightly.

Screw the suction tube assembly (307) into the pump's fluid intake valve.

Refer to "Installation Procedure - All Models" to complete the installation.

### Typical Installation: Wall Mount Systems

#### KEY

A	Pump
B	Pump Air Regulator
C	Gun Air Regulator
D	Air Line Filter
E	Main Air Line
F	Bleed-Type Master Air Valve
G	Drain Valve
H	Spray Gun
18	Bung Adapter
305	Wall Bracket
306	Bung Adapter Plate
307	Suction Tube
401	Fluid Hose
402	Fluid Filter
403	Gun Air Hose
503	Air Line Coupler
506	Safety Valve

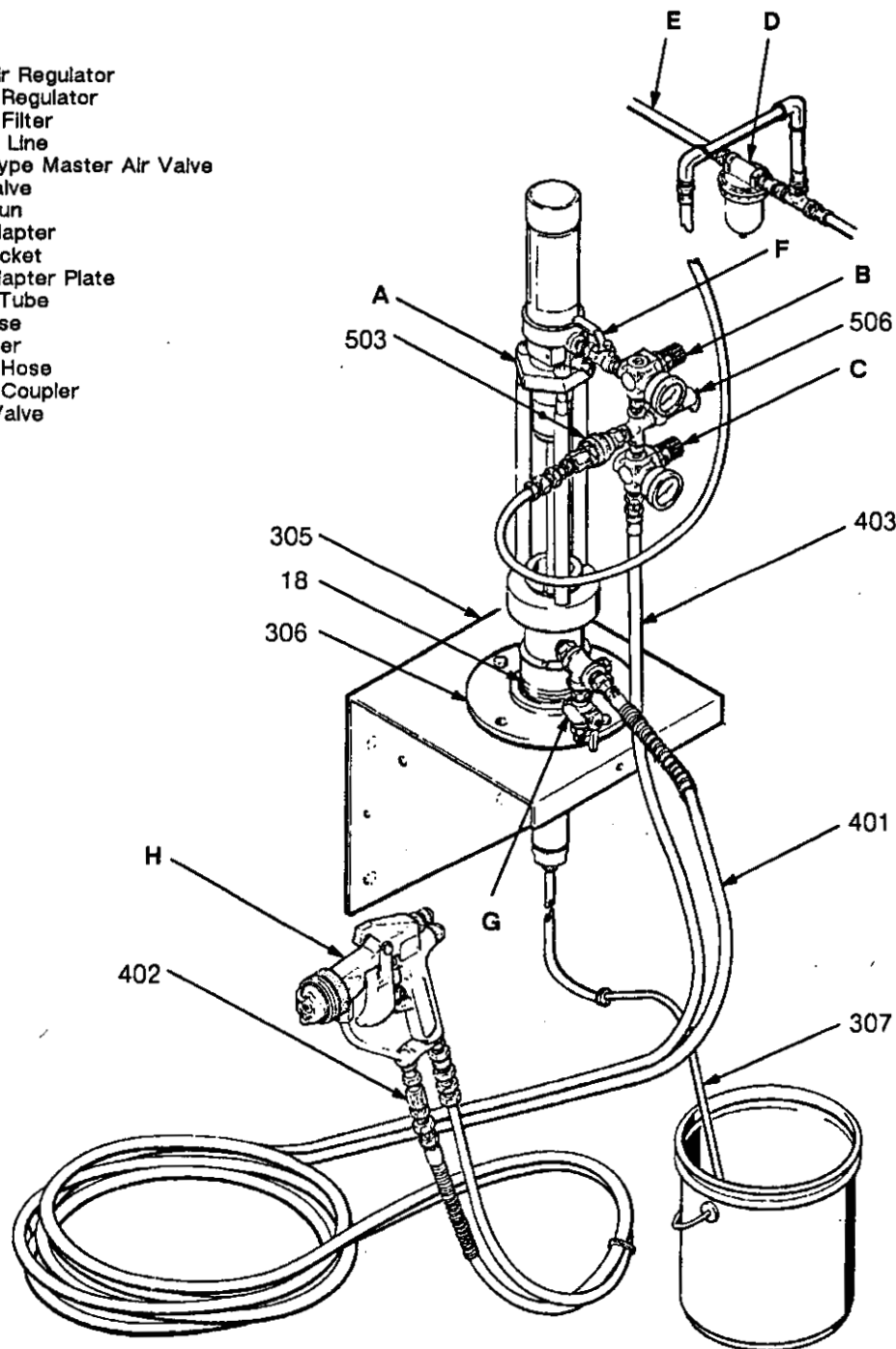


Fig. 3

**INSTALLATION PROCEDURE - ALL MODELS**  
(Refer to Figs. 2 and 3)

**WARNING**

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a properly ventilated spray booth. NEVER OPERATE THE SPRAY GUN UNLESS VENTILATION FANS ARE OPERATING.

Check and follow all of the National, State and Local codes regarding air exhaust velocity requirements.

**Air/Fluid Regulator Kit**

The Air/Fluid Regulator Kit is an assembled unit. It consists of the following parts:

- a pre-set safety valve (506), which prevents over-pressurization of the spray gun by opening automatically if the incoming air pressure to the pump exceeds 95 psi (6.6 bar)
- one air regulator (B) to control the air pressure to the pump (A), and a second regulator (C) to control the air pressure to the spray gun (H)
- an air line fitting (502) and coupler (503), to connect the main air line to the air/fluid regulator kit
- connectors and fittings.

Connect the pump air regulator (B) to the pump's air inlet. Use this regulator to control pump speed and fluid pressure.

The regulator kit's air inlet consists of a quick-disconnect coupler (503) and a pin fitting (502). Disconnect the coupler from the pin fitting and screw it onto the end of your air supply hose, but do not reconnect the coupler to the pin fitting yet.

**System Accessories**

Install an air line filter (D) in the main air line (E), to remove harmful dirt and moisture from the compressed air supplied to the pump and gun. Downstream from the pump air regulator (B), install a bleed-type master air valve (F), using necessary adapters.

Near the pump's fluid outlet, install a tee and drain valve (G).

**WARNING**

Two accessories are required in your system: a bleed-type master air valve (F) and a fluid drain valve (G). These accessories help reduce the risk of serious bodily injury including fluid injection, splashing in the eyes or on the skin, or injury from moving parts if you are adjusting or repairing the pump.

The *bleed-type master air valve* relieves air trapped between this valve and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. Locate the valve close to the pump.

The *fluid drain valve* assists in relieving fluid pressure in the displacement pump, hose, and gun; triggering the gun to relieve pressure may not be sufficient.

**Hose and Gun Connections**

The Hose Kit consists of the spray gun's air and fluid supply hoses. The fluid hose (401) has spring guards on both ends, and includes an in-line fluid filter (402) at the gun end. The hoses are tied together for ease of movement.

Connect the male end of the air hose (403) to the 1/4 npsm(f) swivel outlet of the gun air regulator (C), and connect the female end to the air inlet in the spray gun (H) handle.

Connect the male end of the fluid hose (401) to the pump's fluid outlet, and connect the female end to the gun's fluid inlet. DO NOT install the spray tip in the gun yet.

**GROUNDING**

**WARNING**

Before operating the pump, ground the system as explained under **FIRE OR EXPLOSION HAZARD** and **Grounding** on page 3.

## WARNING

### Pressure Relief Procedure

To reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow this procedure whenever you shut off the pump, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Disengage the spray gun safety latch.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve (required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, **VERY SLOWLY** loosen the air cap or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

## WARNING

For your safety, before operating the equipment be sure all operators have read and fully understand all the warnings, cautions and instructions in this manual and all manuals supplied with each component or accessory.

### Flush the Pump Before Using

Pumps are tested with lightweight oil which is left in to protect the pump parts. To prevent contamination of the fluid, flush the pump with a compatible solvent before using it.

## WARNING

*Before flushing*, be sure the entire system and flushing pails are properly grounded. Refer to **Grounding** on page 3. Follow the **Pressure Relief Procedure Warning** above, and *remove the spray tip from the gun*. Always use the lowest possible fluid pressure, and maintain firm metal-to-metal contact between the gun and the pail during flushing to reduce the risk of fluid injection, static sparking, and splashing in the eyes or on the skin.

### Starting and Adjusting the Pump

Be sure the two air regulators (507) and the bleed-type master air valve (D) are closed. **DO NOT INSTALL THE SPRAY TIP YET!**

Connect the air line coupler (503) to the pin fitting (502).

Open the bleed-type master air valve (D) and the gun air regulator. Hold a metal part of the spray gun firmly to the side of a grounded metal pail and trigger the gun. Slowly open the pump air regulator until the pump starts. **Allow the pump to cycle slowly until all the air is pushed out of the fluid lines.** Release the gun trigger and engage the safety latch; the pump will stall against the pressure.

With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun is triggered and released.

Follow the **Pressure Relief Procedure Warning** at left, then install the spray tip in the gun.

Use the pump air regulator to control the pump speed and fluid pressure. Always use the lowest pressure necessary to achieve the desired results. Higher pressures waste fluid and cause premature wear of the pump packings and spray tip.

Keep the packing nut/wet-cup (114) filled with Graco Throat Seal Liquid (TSL) to help prolong the packing life. Check the tightness of the packing nut weekly. The packing nut should be just tight enough to prevent leakage - no tighter. Always follow the **Pressure Relief Procedure Warning** at left before adjusting the packing nut.

Never allow the pump to run dry of the fluid 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 fluid supply. If the supply container is empty and air has been pumped into the lines, refill the supply container and prime the pump and lines with fluid, being sure to eliminate all air from the fluid system, or flush the pump as described in "Shutdown and Care," below.

### Shutdown and Care

Always follow the **Pressure Relief Procedure Warning** at left, whenever you shut off the pump. Stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod and damaging the throat packings.

Always flush the pump with a compatible solvent before the fluid can dry on the displacement rod, and at the end of each day. If you are pumping water-based fluid, flush first with water and then with mineral spirits to protect the pump parts. If you are pumping oil-based fluids, flush with mineral spirits only.

Relieve pressure and leave the mineral spirits in the pump to prevent corrosion.

**NOTE:** Due to the vented seat (102), this pump stalls only on the upstroke.

## TROUBLESHOOTING CHART

### WARNING

#### Pressure Relief Procedure

To reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow this procedure whenever you shut off the pump, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Disengage the spray gun safety latch.

5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve (required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the air cap or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

**NOTE:** Check all other possible remedies before disassembling pump.

PROBLEM	CAUSE	SOLUTION
Pump fails to operate.	Packing nut too tight.  Dirty or worn air motor.  Inadequate air supply or restricted line.  Clogged fluid hose, gun or tip.  Dried fluid seizure of displacement rod.	Tighten just enough to prevent leakage - no tighter.  Clean, service; see 307-456.  Increase or clean.  Clear.  Disassemble and clean.
Pump operates but output low on both strokes.	Clogged fluid hose, gun or tip.  Inadequate air supply or restricted line.  Exhausted fluid supply.  Worn or damaged piston packing.	Clear.  Increase or clean.  Refill.  Service.
Pump operates but output low on downstroke.	Worn or damaged piston packing.  Held open or worn fluid intake valve.	Service.  Clear, service.
Pump operates but output low on upstroke.	Worn or damaged piston packing.  Held open or worn fluid piston valve.	Service.  Clear, service.
Erratic or accelerated operation.	Exhausted fluid supply.  Broken air motor compression spring.  Worn or damaged piston packing.  Held open or worn fluid intake valve.  Held open or worn fluid piston valve.	Refill.  Service; see 307-456.  Service.  Clear, service.  Clear, service.



## REPAIR NOTES

1. To service the air motor, disconnect it from the displacement pump as explained below, and refer to the air motor manual 307-456.
2. Packing Repair Kit 222-344 is available. Parts included in the kit are designated with an asterisk, for example, (103\*). For best results, use all of the parts in the kit, even if the old parts look good. Lubricate the packings before installing.

## DISPLACEMENT PUMP SERVICE (See Figs. 4 & 5)

1. Flush the pump and stop it at the bottom of its stroke.
2. Before repairing the pump, follow the **Pressure Relief Procedure Warning** on page 8.
3. Disconnect the air and fluid hoses. Unscrew the bung adapter (18) and pump from the mounting. Loosen the screw (16) and remove the bung adapter from the pump.
4. Remove the three locknuts (4) and unscrew the tie rods (3). See Fig. 4.
5. Remove the spring clip (6) and pin (5) holding the coupling (115) in the air motor (1). Unscrew the coupling from the air motor. Pull the air motor (1) off the displacement pump (2).

6. Hold the pump upside down and unscrew the intake valve (102) from the pump cylinder (101). See Fig. 5. Remove the ball guide (105), ball (104), and ball stop pin (106) from the cylinder, being careful that they do not fall out. Remove the gasket (103). Clean all parts and inspect for wear or damage. Check the ball and seat for nicks.
7. Loosen, but do not remove the packing nut (114). Unscrew the coupling (115) from the displacement rod (107) and push the rod down until it clears the bottom of the cylinder (101). Pull the displacement rod out the bottom of the cylinder.
8. Unscrew the piston stud (108) from the displacement rod (107). Remove the piston nut (111) and piston packing (121). Drive the pin (109) out of the piston and remove the ball (110). Clean and inspect all parts for wear or damage.
9. Unscrew the cylinder (101) from the outlet housing (113). Inspect the inner surface of the cylinder and the outer surface of the displacement rod (107) for scoring which can damage the throat packings. Remove and inspect the o-ring (112).
10. Unscrew the packing nut (114) and remove the throat packings from the outlet housing (113). Clean and inspect all parts for wear or damage.

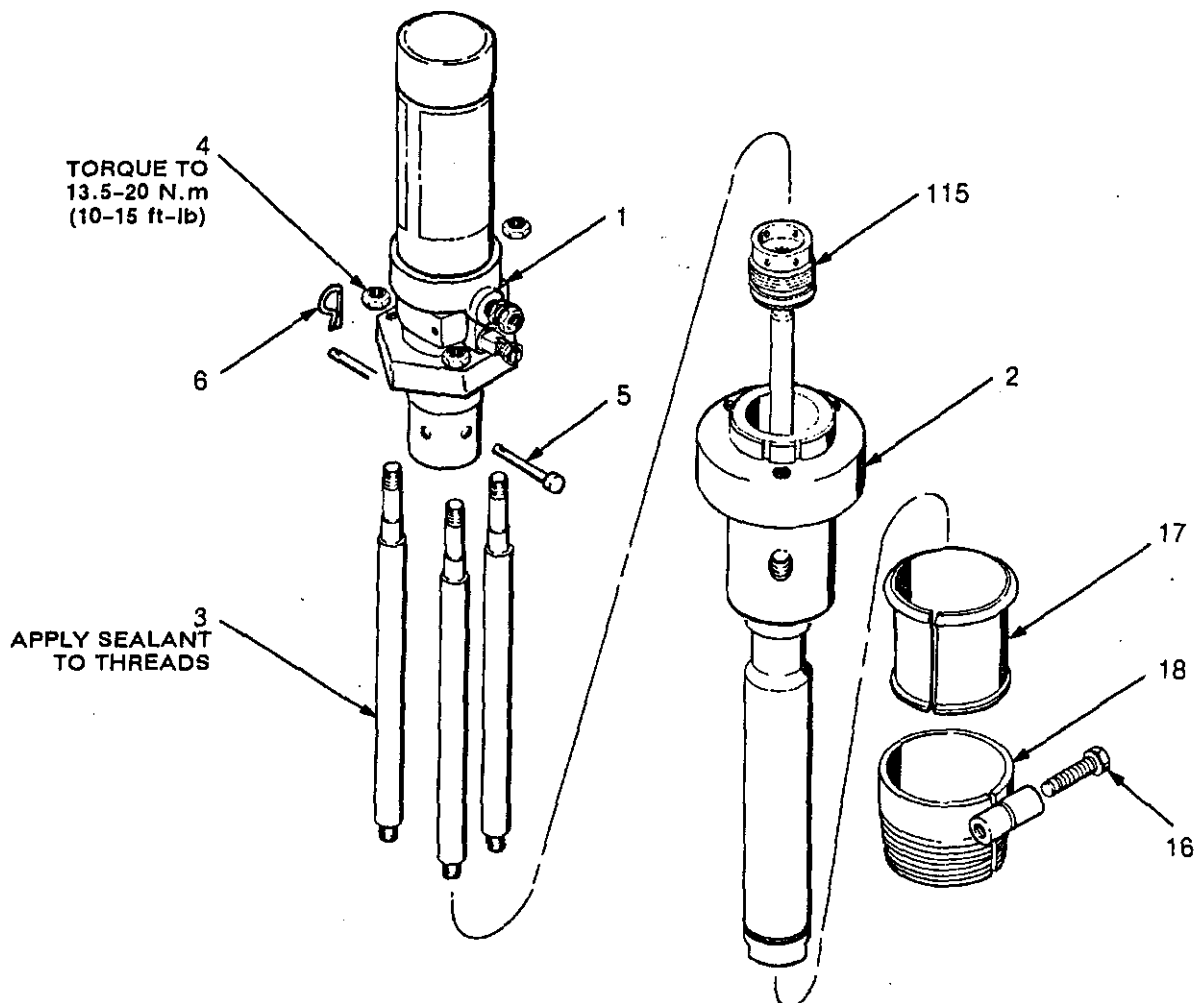


Fig. 4

11. Install the throat packings in the outlet housing (113) one at a time as follows, with the lips of the v-packings facing down: male gland (118\*), one UHMWPE v-packing (120\*), the PTFE v-packing (119\*), the other UHMWPE v-packing (120\*), and the female gland (117\*). Lubricate the threads of the packing nut (114) and loosely install in the outlet housing. See Fig. 5.
12. Install the ball (110) in the piston stud (108). Press fit the ball stop pin (109) in the hole of the piston stud so it is flush with or below the stud's surface. Apply thread sealant to the displacement rod (107) threads and screw the piston stud (108) onto the rod. Torque to 20.3-27 N.m (15-20 ft-lb).
13. Install the piston packing (121\*) on the piston stud (108). Apply sealant to the threads of the piston stud (108) and screw the piston nut (111) onto the stud. Torque to 20.3-27 N.m (15-20 ft-lb).
14. Lubricate the o-ring (112) and install it in the outlet housing (113). Lubricate the threads of the cylinder (101) and screw it into the outlet housing. Torque to 34-40 N.m (25-30 ft-lb). Push the displacement rod (107) up into the pump cylinder from the bottom until it clears the packing nut (114).
15. Apply sealant to the threads of the displacement rod (107) and screw the coupling (115) onto the rod. Torque to 20.3-27 N.m (15-20 ft-lb).
16. Torque the packing nut (114) to 34-40 N.m (25-30 ft-lb).
17. Install the pin (106) in the ball guide (105). Insert the ball guide into the pump cylinder (101) so the pin (106) is toward the top of the pump.
18. Install the gasket (103\*) on the intake valve (102). Place the ball (104) on the seat of the intake valve, and screw the valve into the cylinder. Torque to 34-40 N.m (25-30 ft-lb).
19. Screw the coupling (115) into the air motor (1). Line up the holes and secure with the pin (5) and spring clip (6). See Fig. 4.
20. Apply sealant to the threads of the tie rods (3) and screw the rods into the outlet housing (113). Mount the air motor (1) on the tie rods (3). Screw the locknuts (4) onto the tie rods loosely.
21. Reinstall the bung adapter (18) on the pump. Lower the pump through its mounting and screw the pump and bung adapter into the mounting.
22. Reconnect the air and fluid hoses to the pump. Reconnect the grounding wire if it was disconnected during service.
23. Run the pump slowly to check for binding of the tie rods. Adjust as necessary and torque the locknuts (4) to 13.5-20 N.m (10-15 ft-lb).

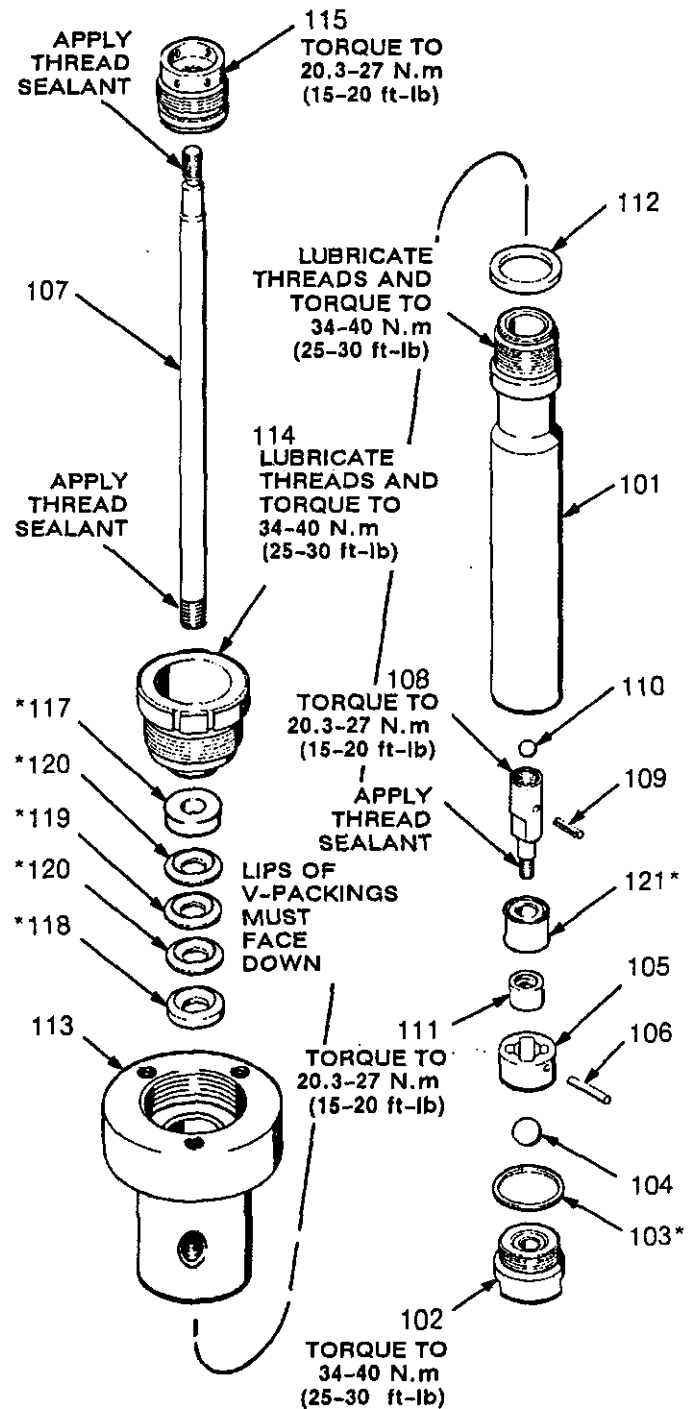
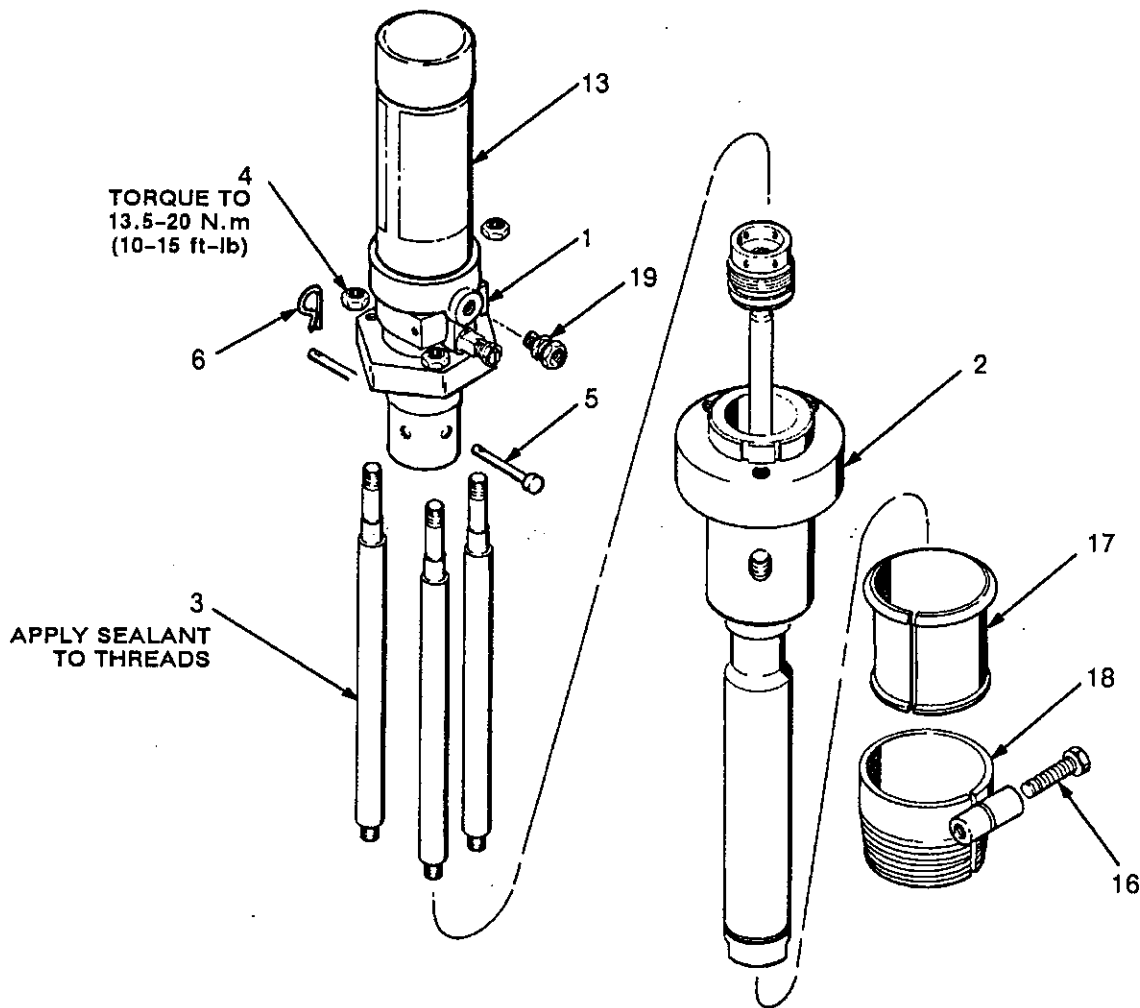


Fig. 5

**PARTS DRAWINGS  
and  
PARTS LISTS**

# PARTS DRAWING AND LIST

**Model 222-252, Series A**  
**Basic Pump**  
 Includes items 1-19



REF NO.	PART NO.	DESCRIPTION	QTY
1	222-389	AIR MOTOR KIT Includes item 13 See 307-456 for parts	1
2	222-253	DISPLACEMENT PUMP See page 13 for parts	1
3	185-031	ROD, tie	3
4	104-541	NUT, lock; w/nylon insert; M8 x 1.25	3
5	178-923	PIN, clevis	1
6	180-166	CLIP, spring	1
9	172-477	TAG (not shown)	1
13	185-150	LABEL, warning	1
16	104-587	CAPSCREW, hex hd; M8 x 1.25; 35 mm long	1
17	172-405	BUSHING, bung adapter	1
18	210-877	ADAPTER, bung	1
19	156-823	ADAPTER; 1/4 npt(m) x 1/4 npsm(f) swivel	1

## PUMP CONVERSION KITS

To convert pump 222-252 to a pail mount system, order:

- 222-250** Pail Mount Kit (Refer to item 202 on page 14 for a parts breakdown. Kit includes instructions.)
- 222-391** Air/Fluid Regulator Kit (Refer to page 16)
- 222-392** Hose Kit (Refer to page 16)
- 217-292** Air-Assisted Airless Spray Gun

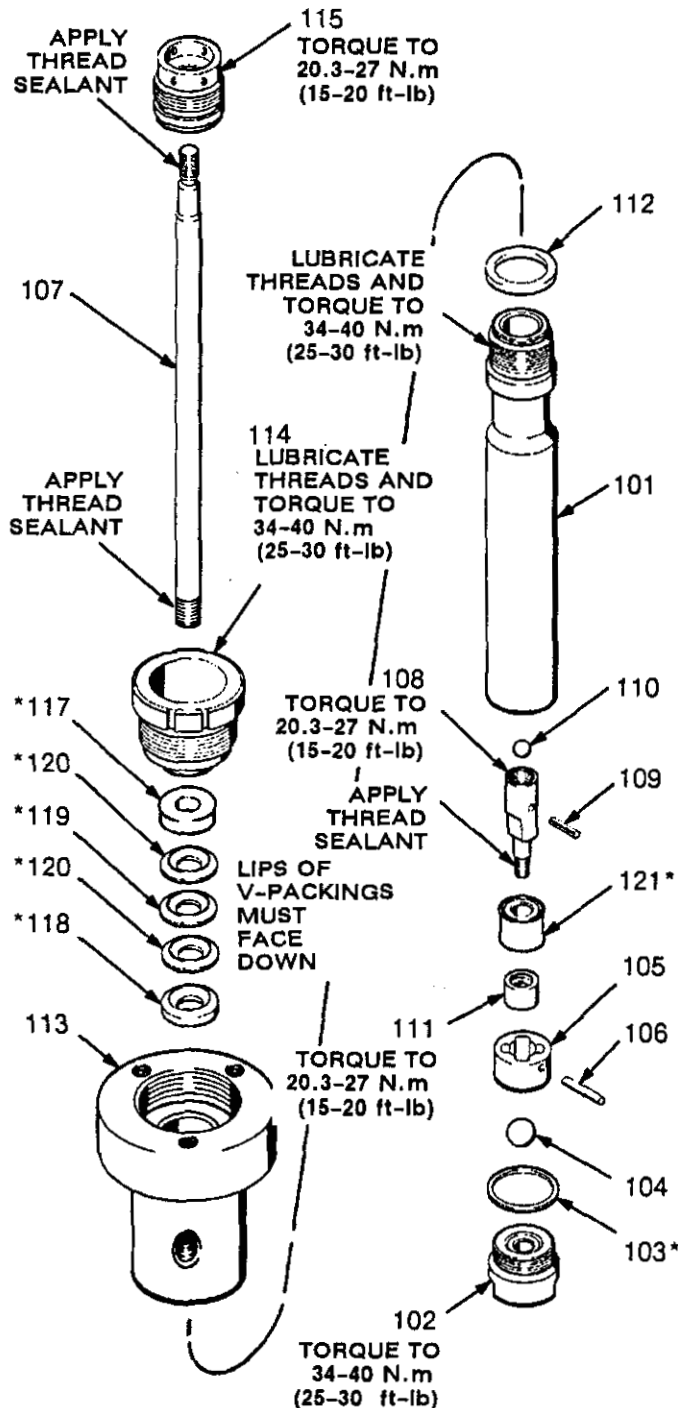
To convert pump 222-252 to a wall mount system, order:

- 222-251** Wall Mount Kit (Refer to item 302 on page 15 for a parts breakdown. Kit includes instructions.)
- 222-391** Air/Fluid Regulator Kit (Refer to page 16)
- 222-392** Hose Kit (Refer to page 16)
- 217-292** Air-Assisted Airless Spray Gun

Refer to "How to Order Parts" on page 13.

# PARTS DRAWING AND LIST

**Model 222-253, Series A  
Displacement Pump**  
Includes items 101-121



REF NO.	PART NO.	DESCRIPTION	QTY
101	185-005	CYLINDER, pump	1
102	185-004	VALVE, intake	1
103	110-049*	GASKET; acetal	1
104	105-445**	BALL; 13 mm (1/2") dia.; sst	1
105	176-760	GUIDE, ball	1
106	176-759	PIN, stop, ball	1
107	185-011	ROD, displacement	1
108	185-007	STUD, piston	1
109	110-038	PIN, spring, straight	1
110	101-823**	BALL; 8 mm (5/16") dia.; sst	1
111	185-006	NUT, piston	1
112	160-516**	O-RING; buna-N	1
113	222-257	HOUSING, outlet	1
114	185-009	NUT, packing	1
115	185-010	COUPLING, rod	1
117	185-014*	GLAND, female	1
118	185-015*	GLAND, male	1
119	110-040*	V-PACKING PTFE <sup>in</sup>	1
120	110-042*	V-PACKING; UHMWPE	2
121	110-257*	PACKING, piston; UHMWPE	1

\* Included in repair kit 222-344.

\*\* Recommended spare parts. Keep on hand to reduce downtime.

**222-344 Packing Repair Kit**  
(Must be purchased separately)  
Consists of:

Ref. No.	Qty
103	1
117	1
118	1
119	1
120	2
121	1

### HOW TO ORDER PARTS

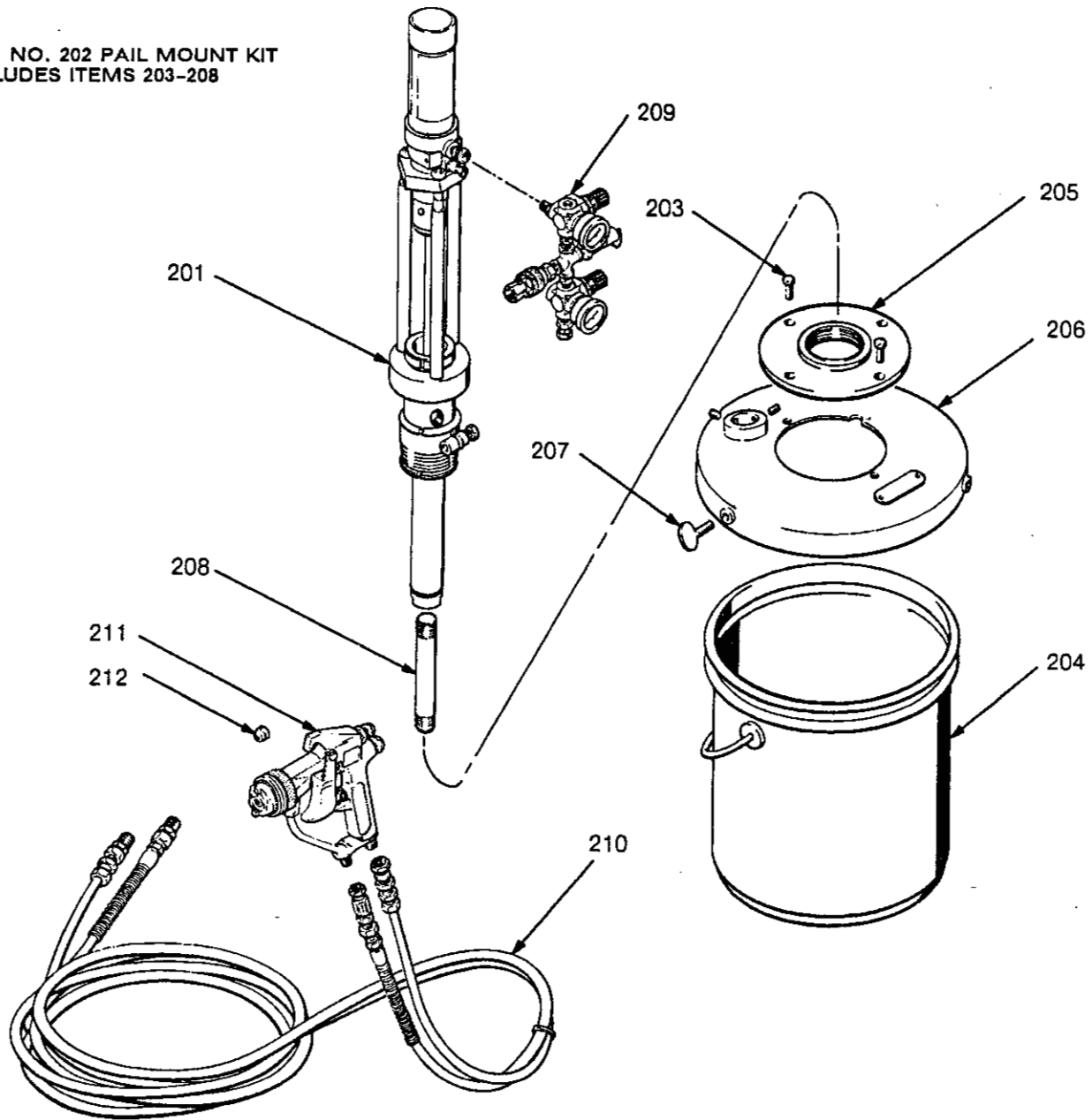
- To be sure you receive the correct replacement parts, kits or accessories, always give all of the information requested in the chart below.
- Check the parts list to identify the correct part number; do not use the ref. no. when ordering.
- Order all parts from your nearest Graco distributor.

6 digit Part Number	Qty	Part Description

# PARTS DRAWING AND LIST

**Model 222-390**  
**Pail Mount System**  
 Includes items 201-212

REF. NO. 202 PAIL MOUNT KIT  
 INCLUDES ITEMS 203-208

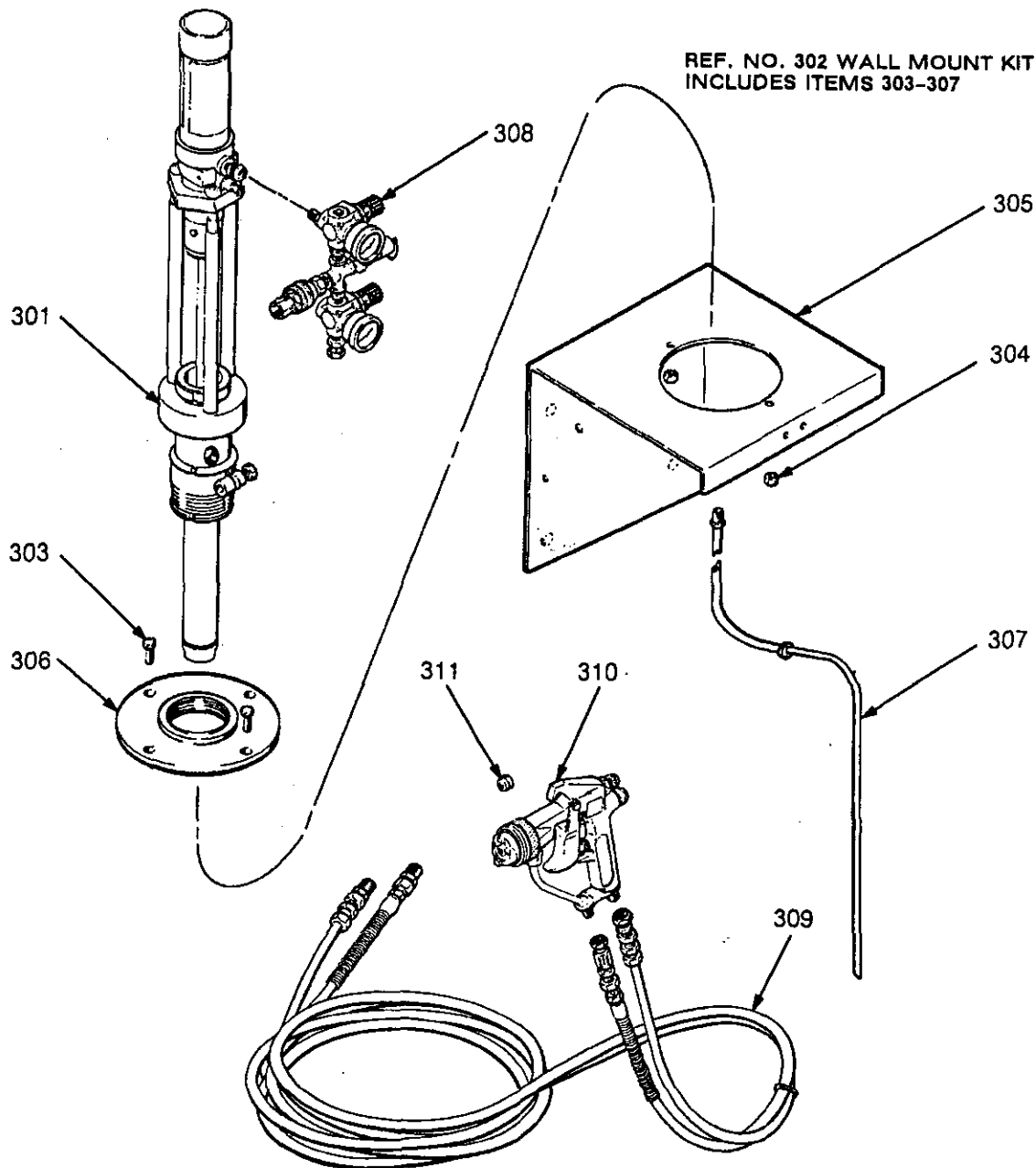


REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
201	222-252	PUMP See page 12 for parts	1	208	110-044	. NIPPLE, pipe; 3/8 npt; 127 mm (5") long	1
202	222-250	KIT, pail mount Includes items 203-208	1	209	222-391	KIT, air/fluid regulator See page 16 for parts.	1
203	100-270	. CAPSCREW, hex hd; 1/4-20 unc x 16 mm (5/8") long	2	210	222-392	KIT, hose See page 16 for parts	1
204	101-108	. PAIL; 19 liter (5 gal.)	1	211	217-292	SPRAY GUN See 307-586 for parts	1
205	160-754	. PLATE, adapter, bung	1	212	182-415	SPRAY TIP	1
206	205-786	. COVER, pail	1				
207	100-220	. THUMBSCREW; 5/16 unc x 25 mm (1") long	3				

Refer to "How to Order Parts" on page 13.

# PARTS DRAWING AND LIST

**Model 222-393**  
**Wall Mount System**  
 Includes items 301-311

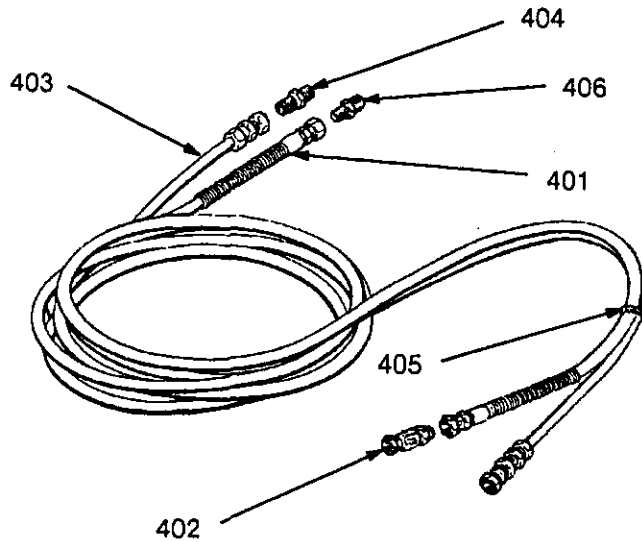


REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
301	222-252	PUMP See page 12 for parts	1	306	160-754	. PLATE, adapter, bung	1
302	222-251	KIT, wall mount Includes items 303-307	1	307	222-395	. TUBE, suction; 3/8 npt(m)	1
303	100-270	. CAPSCREW, hex hd; 1/4-20 unc x 16 mm (5/8") long	2	308	222-391	KIT, air/fluid regulator See page 16 for parts	1
304	102-025	. NUT, hex; 1/4-20	2	309	222-392	KIT, hose See page 16 for parts	1
305	207-365	. BRACKET, mounting See 306-783 for parts	1	310	217-292	SPRAY GUN See 307-586 for parts	1
				311	182-415	SPRAY TIP	1

Refer to "How to Order Parts" on page 13.

## PARTS DRAWING AND LIST

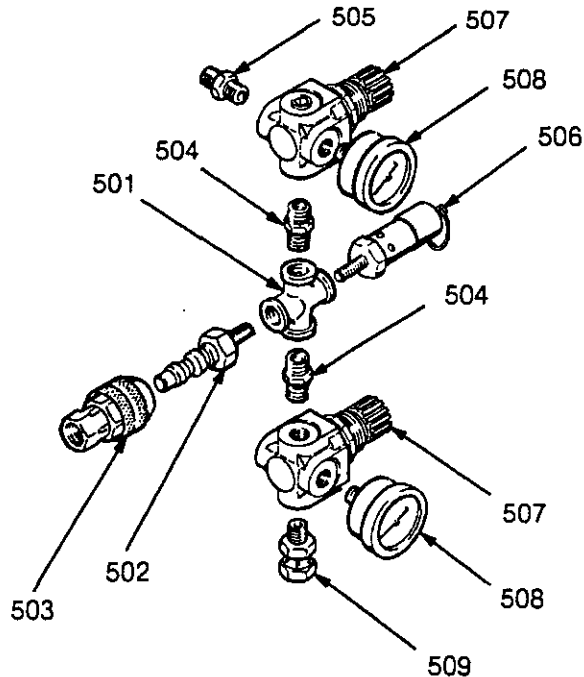
### 222-392 Hose Kit Includes items 401-406



REF NO.	PART NO.	DESCRIPTION	QTY
401	214-698	HOSE, fluid; 3/16" ID; nylon; coupled 1/4 npsm (f) swivel; 7.6 m (25') long	1
402	210-500	FILTER, fluid, in-line; 100 mesh; 1/4 npsm(m) x 1/4 npsm(f) swivel	1
403	205-406	HOSE, air; 1/4" ID; nylon; coupled 1/4 npsm (f) swivel; 7.6 m (25') long	1
404	162-453	NIPPLE; 1/4 npt x 1/4 npsm	1
405	103-473	STRAP, tie	8
406	164-672	ADAPTER; 3/8 npt x 1/4 npsm (mbe)	1

Refer to "How to Order Parts" on page 13.

### 222-391 Air/Fluid Regulator Kit Includes items 501-509



REF NO.	PART NO.	DESCRIPTION	QTY
501	102-959	CROSS, pipe; 1/4 npt(f)	1
502	169-970	FITTING, air; 1/4 npt(m)	1
503	208-536	COUPLER, quick disconnect	1
504	151-519	NIPPLE; 1/4 npt x 1/8 npt	2
505	169-797	ADAPTER	1
506	103-347	VALVE, safety	1
507	108-159	REGULATOR, air; 0-7 bar (0-100 psi) adjustment range; 1/8 npt(f) inlet and outlet	2
508	108-190	GAUGE, pressure; 0-7 bar (0-100 psi)	2
509	208-434	ADAPTER; 1/8 npt(m) x 1/4 npsm(f) swivel	1

Refer to "How to Order Parts" on page 13.

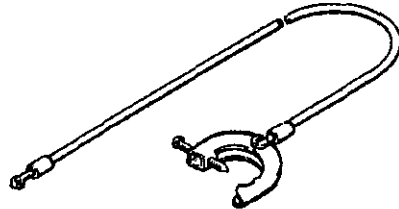


## ACCESSORIES

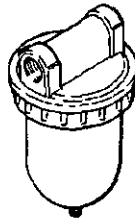
### USE GENUINE GRACO PARTS AND ACCESSORIES

*Must be purchased separately.*

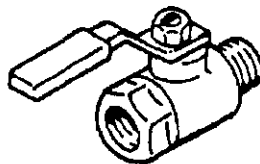
**GROUNDING CLAMP 103-538**  
**GROUND WIRE 208-950**  
 25 ft (7.6 m) long, 12 gauge (1.5 mm<sup>2</sup>)



**AIR LINE FILTER**  
 250 psi (17.5 bar) MAXIMUM WORKING PRESSURE  
 106-149 1/2 npt inlet and outlet  
 106-150 3/4 npt inlet and outlet

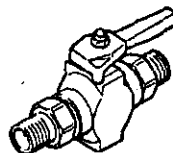


**BLEED-TYPE MASTER AIR VALVE 107-142**  
 300 psi (21 bar) MAXIMUM WORKING PRESSURE  
 Relieves air trapped in the air line between the pump air inlet and this valve when closed. 1/2 npt (m x f) inlet and outlet.



**PLUMBING FOR BLEED VALVE**  
 159-840 Adapter; 1/8 npt(m) x 1/4 npt(f)  
 159-842 Adapter; 1/4 npt(m) x 1/2 npt(f)  
 100-206 Bushing; 1/2 npt(m) x 1/4 npt(f)  
 162-453 Nipple; 1/4 npt x 1/4 npsm

**FLUID DRAIN VALVE 210-658**  
 5000 psi (350 bar) MAXIMUM WORKING PRESSURE  
 Relieves fluid pressure in hoses and gun when opened. 3/8 npt (mbe).



**PLUMBING FOR DRAIN VALVE**  
 100-195 Nipple; 3/8 npt; 4" (102 mm) long  
 100-483 Tee; 3/8 npt(f)

**GRACO THROAT SEAL LIQUID**  
 Non-evaporating liquid for wet cup

206-995 1 quart (0.95 liter)  
 206-996 1 gallon (3.8 liter)

**WARNING:** Not for use in rubber packed or food pumps, air line lubricators or air motors.

**PORTABLE BASE 205-054**  
 Caster base makes pail mount system portable.

**PAIL AGITATOR 204-536**  
 1/4 HP, air powered. Requires the following mounting parts (must be ordered separately):

160-023 Air Hose; buna-N; 1/4" ID; 1/8 npt (mbe); 18" (0.45 m) long  
 100-547 Tee; 1/4 npt(f)  
 100-030 Reducing Bushing; 1/4 npt(m) x 1/8 npt(f)  
 156-971 Nipple; 1/4 npt

**PUMP EXTENSION PIPE 185-190**  
 Screw into the pump intake to increase pump length for use with 55 gal. (200 liter) drums.

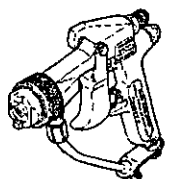
**DRUM BUNG UNIT**  
 To mount the pump in a bung hole of a 55 gal. (200 liter) drum, order the following parts:

222-252 10:1 Standard Pump  
 185-190 Extension Pipe  
 222-391 Air/Fluid Regulator Kit  
 222-392 Hose Kit  
 217-292 Air-Assisted Airless Spray Gun  
 182-415 Spray Tip

**DRUM COVER UNIT**  
 To mount the pump on a 55 gal. (200 liter) drum, order the following parts:

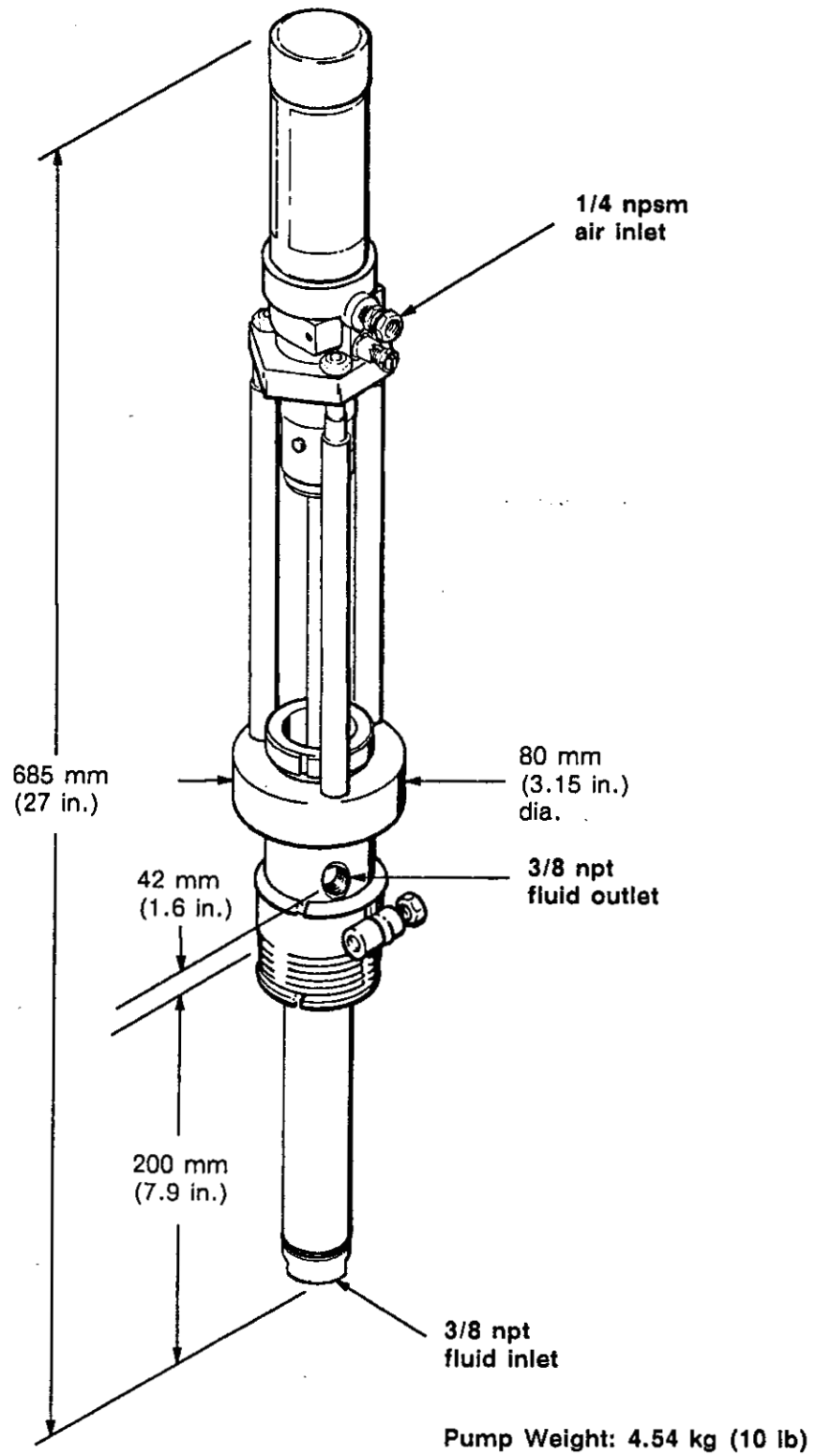
222-252 10:1 Standard Pump  
 200-326 Drum Cover  
 160-754 Flange Adapter  
 100-270 Capscrews (2)  
 185-190 Extension Pipe  
 222-391 Air/Fluid Regulator Kit  
 222-392 Hose Kit  
 217-292 Air-Assisted Airless Spray Gun  
 182-415 Spray Tip

**AA2000™ AIR-ASSISTED AIRLESS SPRAY GUN**  
 217-292  
 950 psi (66 bar) MAXIMUM WORKING PRESSURE



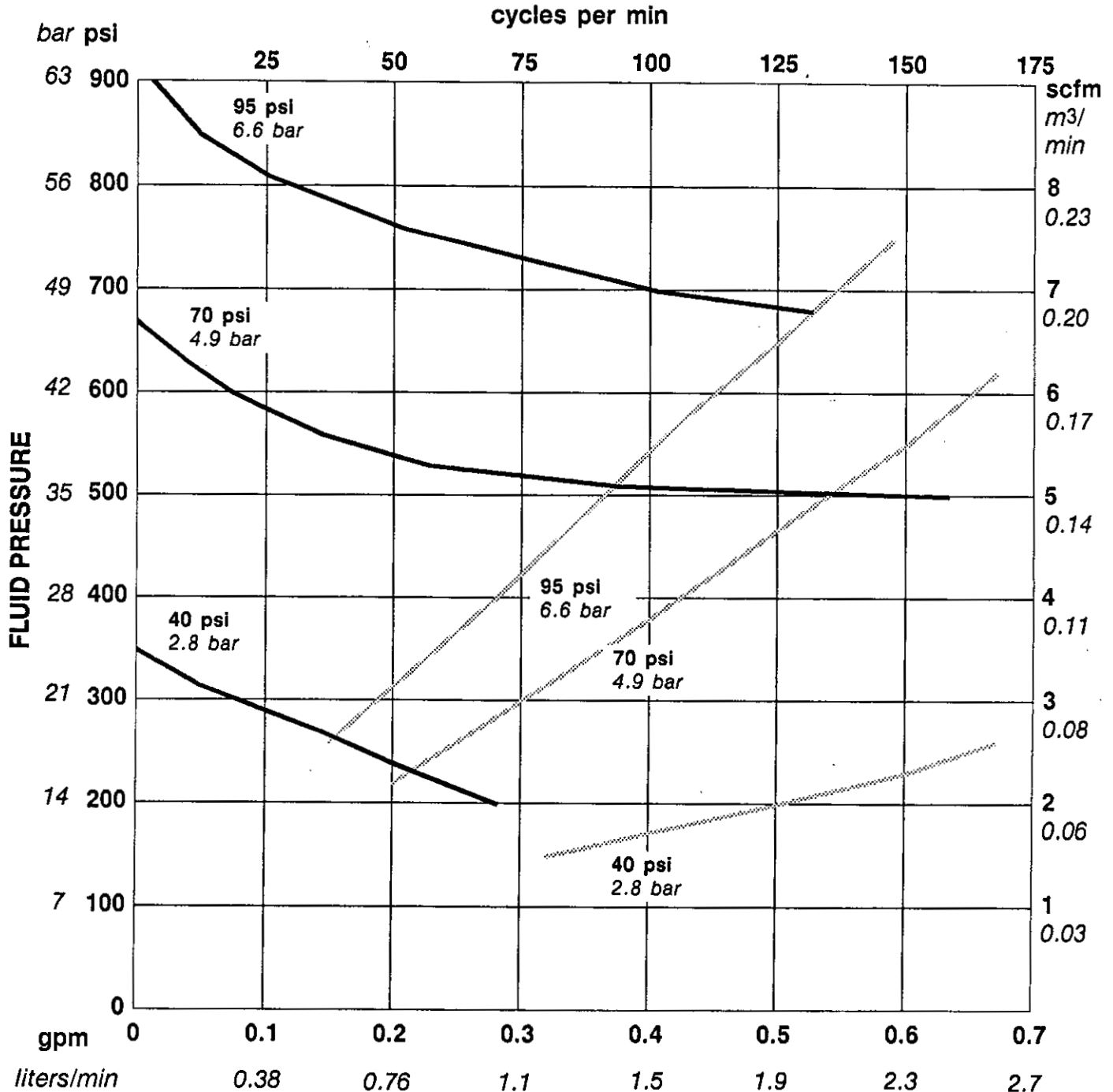
**SPRAY TIP**  
 182-415 supplied unless specified by customer.

# DIMENSIONAL DRAWING



# PERFORMANCE CHART

**KEY:**  
 FLUID OUTLET PRESSURE - BLACK CURVES  
 AIR CONSUMPTION - GRAY CURVES



## FLUID FLOW (TEST FLUID: NO. 10 MOTOR OIL)

**To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (bar/psi):**

1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale and read fluid outlet pressure.

**To find Pump Air Consumption (m<sup>3</sup>/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (bar/psi):**

1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.

## TECHNICAL DATA

Maximum working pressure	950 psi (66 bar)
Maximum incoming air pressure	95 psi (6.5 bar)
Minimum incoming air pressure	25 psi (1.7 bar)
Ratio	10:1
Maximum recommended pump speed	100 cpm (0.5 gpm [1.9 liters/min])
Air consumption	approx. 3.8 scfm (0.106 m <sup>3</sup> /min) at 0.3 gpm (1.1 liter/min) flow rate (60 cpm), 70 psi (4.8 bar) air pressure, 500 psi (35 bar) fluid pressure
Air inlet	1/4 npsm(f) swivel
Fluid inlet	3/8 npt(f)
Fluid outlet	3/8 npt(f)
Wetted parts	Stainless Steel, Chrome Plating, Acetal, PTFE Ultra-High Molecular Weight Polyethylene, Buna-N

PTFE is a registered trademark of the Co.

## 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.

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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, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)

**Subsidiary and Affiliate Companies:** Canada; England; Switzerland; France; Germany; Hong Kong; Japan

**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1444**

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