

# INSTRUCTIONS-PARTS LIST



306-970

Rev. F  
SUPERSEDES E

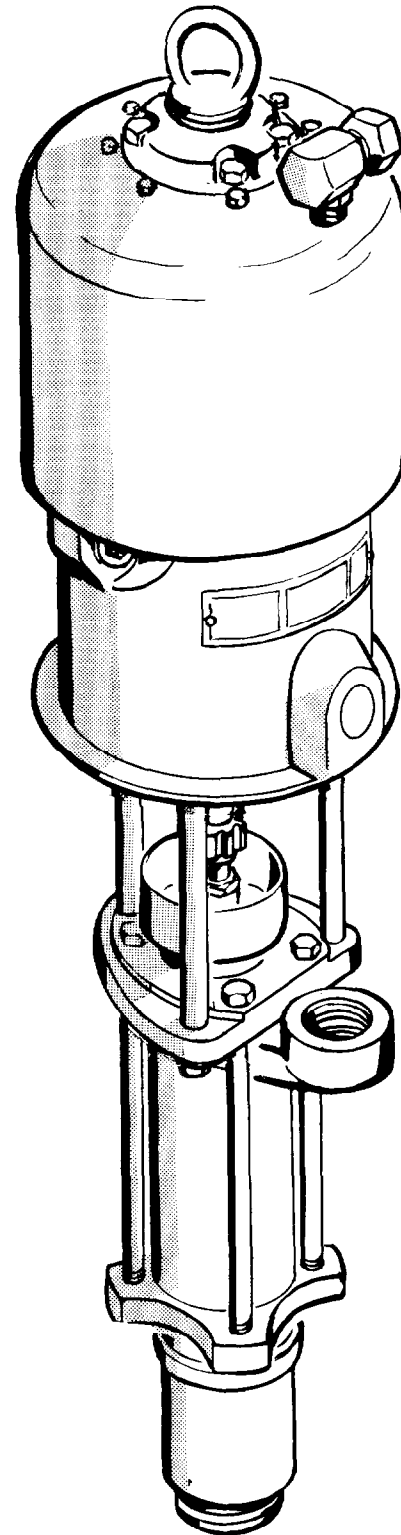
This manual contains **IMPORTANT WARNINGS** and **INSTRUCTIONS**  
READ AND RETAIN FOR REFERENCE

## 55:1 RATIO KING™ PUMP

WITH PRIMING PISTON

4950 psi (341 bar) MAXIMUM WORKING PRESSURE

Model 207-568, Series D



### INDEX

WARNINGS.....	2, 3
INSTALLATION.....	4
OPERATION.....	5
MAINTENANCE.....	5
ACCESSORIES.....	6
SERVICE.....	7-9
Troubleshooting Chart.....	7
Displacement Pump Service.....	8
PARTS DRAWING.....	10
PARTS LIST.....	11
HOW TO ORDER REPLACEMENT PARTS.....	11
TECHNICAL DATA.....	Back Page
DIMENSIONAL DRAWING.....	Back Page
PUMP MOUNTING HOLE LAYOUT.....	Back Page
WARRANTY.....	Back Page

# WARNING

## 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 very high fluid pressure. Spray from the gun or dispensing valve, 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 onto the skin can cause serious damage.

NEVER point the spray gun or dispensing valve at anyone or at any part of the body. NEVER put hand or fingers over the spray tip or nozzle.

ALWAYS have the tip guard in place on the spray gun when spraying.

ALWAYS follow the **Pressure Relief Procedure**, below, before cleaning or removing the spray tip or 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—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 or Dispensing Valve Safety Devices

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

#### Safety Latch

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

#### Diffuser (on spray guns only)

The gun diffuser breaks up spray and reduces the risk of injection when the tip is not installed. Check diffuser operation regularly. Follow the **Pressure Relief Procedure**, below, then

remove the spray tip. Aim the gun into a metal pail, holding the gun firmly to the pail. Using the lowest possible pressure, trigger the gun. If the fluid emitted *is not* diffused into an irregular stream, replace the diffuser immediately.

#### Tip Guard (on spray guns only)

ALWAYS have the tip guard in place on the spray gun while spraying. The tip guard alerts you to the fluid injection hazard and helps reduce, but does not prevent, accidentally placing your fingers or any part of your body close to the spray tip.

#### Trigger Guard

NEVER operate the gun or dispensing valve with the trigger guard removed. The guard reduces the risk of accidentally triggering the gun or valve if it is dropped or bumped.

#### Spray Tip or Nozzle Safety

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

NEVER wipe off build-up around the spray tip or nozzle until pressure is fully relieved and the gun or valve 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 or nozzles, and whenever you stop spraying or dispensing. (1) Engage the gun safety latch. (2) Turn off the air to the pump. (3) Close the bleed-type master air valve (required in system). (4) Disengage the gun safety latch. (5) Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun into the pail to relieve pressure. (6) Engage the gun safety latch. (7) Open the pump drain valve (required), having a container ready to catch the drainage, and leave open until you are ready to spray again.

*If you suspect that the spray tip, nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, wrap a rag around the tip guard retaining nut or hose end coupling and VERY SLOWLY loosen the part to relieve pressure gradually, then loosen completely. Now clear the tip, nozzle or hose.*

### EQUIPMENT MISUSE HAZARD

#### General Safety

Any misuse of the spray or 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 equipment regularly and repair or replace worn or damaged parts immediately.

ALWAYS read and follow the fluid and solvent manufacturer's recommendations regarding the use of protective eyewear, respirator, clothing and equipment.

#### System Pressure

The 55:1 King pump develops 4950 psi (341 bar) **MAXIMUM WORKING PRESSURE** at 90 psi (6 bar) **MAXIMUM INCOMING AIR PRESSURE**. NEVER exceed 90 psi (6 bar) air supply to the pump. Be sure that all spray equipment and accessories are rated to withstand the maximum working pressure of this 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 cover. Always read the fluid and solvent manufacturer's literature before using them in this pump.

## FIRE OR EXPLOSION HAZARD

Static electricity is created by the high velocity flow of fluid through the pump and hose. If every part of the spray/dispensing system 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/dispensed, 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 a 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 positive 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 and all other equipment used or located in the spray/dispensing area. **CHECK** your local electrical code for detailed grounding instructions for your area and type of equipment. **BE SURE** to ground all of these components:

1. *Pump:* to ground the pump, loosen the grounding lug locknut (A) and washer (B). Insert one end of a 12 ga (1.5 mm<sup>2</sup>) minimum ground wire (D) into the slot in lug (C) and tighten locknut securely. See Fig 1. Connect the other end of the wire to a true earth ground. Check your local code. See **ACCESSORIES**, page 6, to order ground wire and clamp.

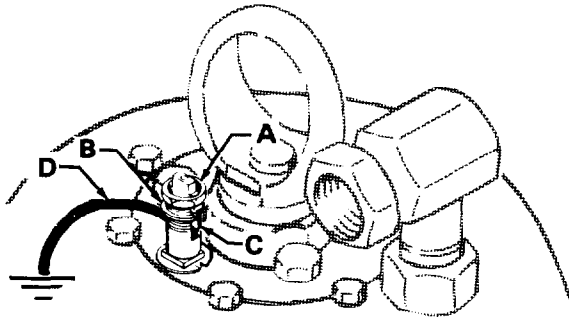


Fig 1

## 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 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.

2. *Air and fluid hoses:* use only grounded hoses with a maximum of 500 feet (150 m) combined hose length to ensure grounding continuity. Refer to **Hose Grounding Continuity**.
3. *Air compressor:* follow manufacturer's recommendations.
4. *Spray gun or dispensing valve:* obtain grounding through connection to a properly grounded fluid hose and pump.
5. *Object being sprayed:* according to local code.
6. *All solvent pails* used when flushing, according to local code. *Use only metal pails*, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.
7. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun/valve firmly to the side of a *metal* pail, then trigger the gun/valve.

### Flushing Safety

Reduce the risk of fluid injection injury, static sparking, or splashing by following the flushing procedure given on page 5 of this manual. Follow the **Pressure Relief Procedure** on page 2, and, for a spray gun, *remove the spray tip before flushing*. Hold a metal part of the gun/valve firmly to the side of a *grounded metal* pail and use the lowest possible fluid pressure during flushing.

## 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 shield, moves when air is supplied to the motor. **NEVER** operate the pump with the air motor shield removed. Keep fingers clear of the priming piston and intake valve while the pump is operating, to reduce the risk of amputation or injury to your hand or fingers. Before checking or servicing the pump, always disconnect the power source and relieve pressure, following the **Pressure Relief Procedure** on page 2, to prevent the pump from starting accidentally.

**HANDLE AND ROUTE HOSES CAREFULLY.** 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).

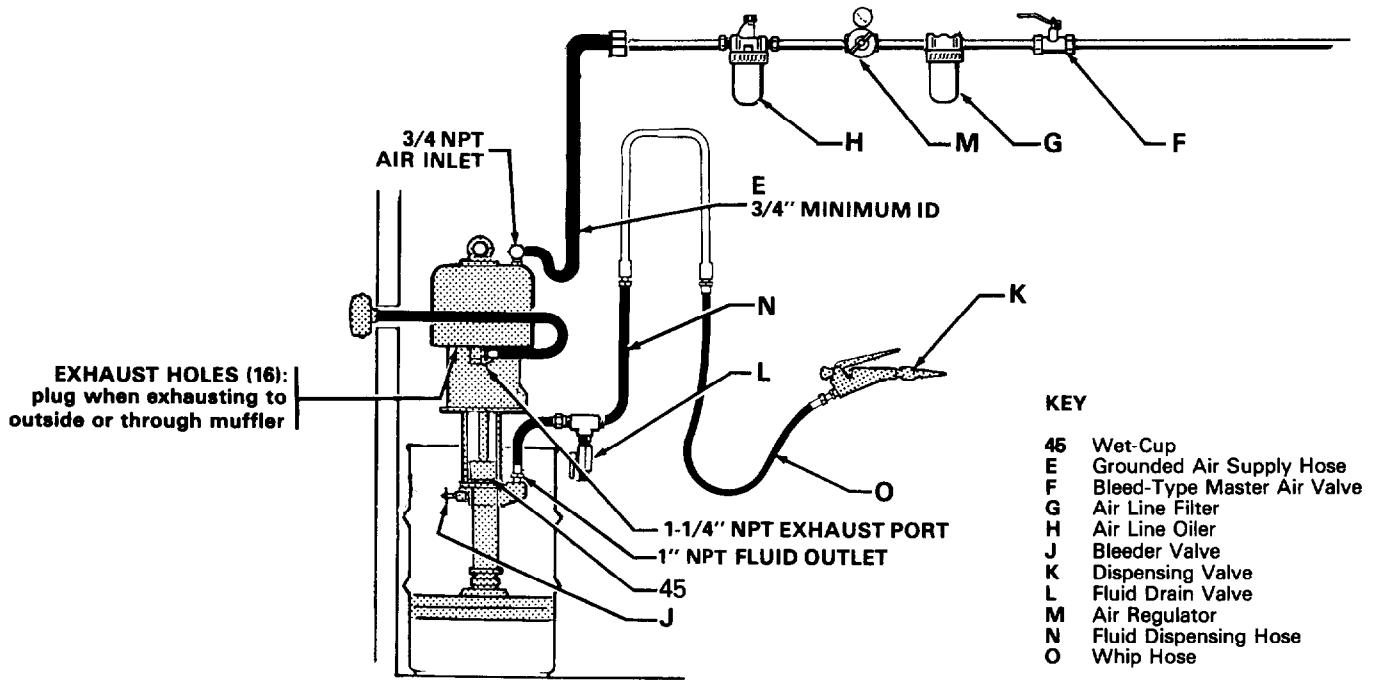
### Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray/dispensing 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** above.

## 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.

## TYPICAL INSTALLATION



### KEY

45	Wet-Cup
E	Grounded Air Supply Hose
F	Bleed-Type Master Air Valve
G	Air Line Filter
H	Air Line Oiler
J	Bleeder Valve
K	Dispensing Valve
L	Fluid Drain Valve
M	Air Regulator
N	Fluid Dispensing Hose
O	Whip Hose

## INSTALLATION

Mount the pump to suit the type of installation planned.

The dimensional drawing on the back page gives measurements needed for installing the pump on a custom designed mounting. See ACCESSORIES (page 9) for mounting accessories. Use the 3/8 in. bolts, lockwashers and nuts to attach pump firmly to mounting.

**NOTE:** Reference numbers and letters in the text refer to the Typical Installation, Fig 1 and 2 and the Parts Drawing.

### Ground the Pump and Other System Components

#### WARNING

Ground the pump, all other components in the system, and the object being sprayed to reduce the risk of shock, fire or explosion which can result in serious bodily injury and property damage. Static electricity which may be created by the passage of high pressure fluid through the pump and hose can cause static sparking which in turn can ignite fumes from solvents and the fluid being sprayed, dust particles, etc., whether you are spraying indoors or outdoors. See page 3 and your local electrical code for more information on grounding.

### System Accessories

The Typical Installation drawing above is only an example. Contact your Graco representative for assistance in setting up a system to meet your needs. The accessories mentioned are shown on page 9.

**NOTE:** To ensure maximum pump performance, be sure that any accessory used is properly sized to meet your system requirements.

#### WARNING

Two accessories, the bleed-type master air valve (F), and the fluid drain valve (L) are **required** for your system to reduce the risk of serious bodily injury from moving parts or injection when shutting off the pump.

The bleed-type air valve relieves air trapped between the valve and the pump, after the pump is shut off. Trapped air can cause the pump to cycle unexpectedly and result in serious bodily injury if you are adjusting or repairing the pump.

The fluid drain valve helps relieve fluid pressure in the displacement pump, hose and gun when shutting off the pump. Triggering the gun to relieve pressure may not be sufficient, especially if there is a clog in the hose, gun/dispensing valve, or tip/nozzle.

Your system should also include an air line filter (G) to remove harmful dirt and moisture from your compressed air supply. On the air line (E), each pump should have a bleed-type master air valve (F), an air regulator (M), and an air line oiler (H) which must be installed *downstream* from the air regulator. See Typical Installation, above.

Adjust the oiler to deliver about one drop of oil per minute through the sight glass.

### Connect the Hoses

Connect a grounded air supply hose (E) to the 3/4 npt(f) air inlet or the air regulator. Connect a grounded fluid dispensing hose (N) to the 1 in. npt fluid outlet, using a suitable adapter. For more flexible gun movement, use a shorter whip hose (grounded) (O) between the main fluid hose and the gun/valve.

To route the air motor exhaust outside, remove the exhaust port plug and connect the exhaust hose to the 1-1/4 in. npt air exhaust port. Plug the 16 exhaust holes in the air motor base with 1/4 x 1/2 in. self-tapping screws.

## OPERATION

### 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 or nozzles, and whenever you stop spraying or dispensing.

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

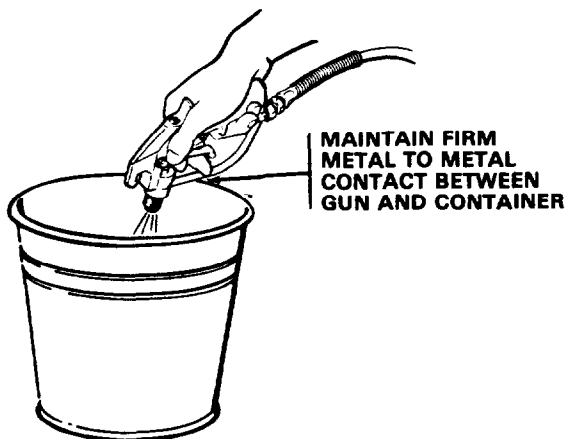
*If you suspect that the spray tip, nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, wrap a rag around the tip guard retaining nut or hose end coupling and VERY SLOWLY loosen the part to relieve pressure gradually, then loosen completely. Now clear the tip, nozzle or hose.*

#### Flush Pump Before Using

Pumps are tested with lightweight oil which is left in to protect the pump parts. To prevent contamination of fluids, flush the pump with a compatible solvent before using. If the pump is being used to supply a circulating system, allow solvent to circulate until the system is thoroughly flushed.

### WARNING

To reduce the risk of static sparking, which can cause fire or explosion and serious bodily injury and property damage, be sure your entire system is properly grounded before flushing. Refer to **FIRE OR EXPLOSION HAZARD** on page 3. Remove the tip from the gun (relieve pressure first), then hold a metal part of the gun firmly to the side of a grounded metal pail, and use the lowest possible pressure to flush.



#### Starting and Adjusting Pump

Fill the wet-cup (45) one-half full with Graco Throat Seal Liquid (TSL). With the drain valve and bleeder valve closed, and the gun/valve safety disengaged, trigger the gun/valve and slowly open the air supply valve until the pump starts. If fluid does not flow from the triggered gun/valve, open the bleeder valve (40) slightly. See Fig 2. If fluid does not flow from the open bleeder valve, use a hand or finger over the bleeder hole as a priming valve. When fluid appears, close bleeder valve.

### WARNING

Keep your hand and fingers away from the priming piston and fluid intake valve to reduce the risk of serious bodily injury, including amputation.

With pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun/valve is triggered and released. In a circulating system, it will run continuously and speed up or slow down as supply demands until air supply is shut off.

Use an adequately sized air regulator (M) to control pump speed and fluid pressure. See Typical Installation on page 4 and ACCESSORIES. Always use the lowest air pressure necessary to give you the results you want.

*Never* exceed 90 psi (6 bar) air pressure to the pump.

## MAINTENANCE

Keep the wet-cup (45) filled with Graco Throat Seal Liquid (TSL). Check tightness of packing nut (34) weekly. The packing nut should be tight enough to prevent leakage—no tighter. Always shut off and relieve the air pressure to the pump and relieve the fluid pressure before adjusting the packing nut.

Never allow the pump to run dry of 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 lines, prime pump and lines with fluid, or flush and leave filled with compatible solvent. Be sure to eliminate all the air from fluid system.

#### Shutdown and Care of Pump

For overnight shutdown, relieve the air and fluid pressure according to the **Pressure Relief Procedure**, at left. Always stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod.

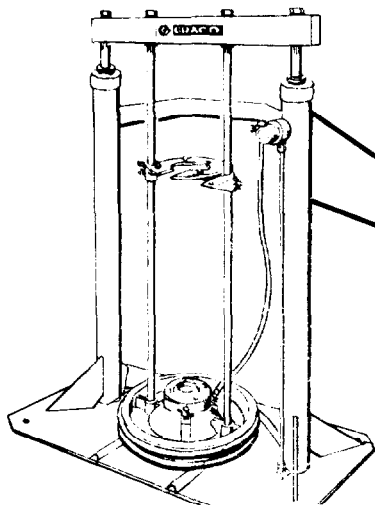
Always flush the pump before the fluid dries on the rod. If the pump is to be stored for any period of time, and you are pumping water based fluids, first flush with water, then with mineral spirits to protect the pump parts.

#### Corrosion Protection

### CAUTION

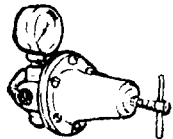
Water, or even moist air, can cause your pump to corrode. To help prevent corrosion, NEVER leave the pump filled with water or air. After normal flushing, flush the pump again with mineral spirits or oil-based solvent, relieve pressure, and leave the mineral spirits in the pump. Be sure to follow all steps of the **Pressure Relief Procedure**, at left.

**ACCESSORIES** (Must be purchased separately)

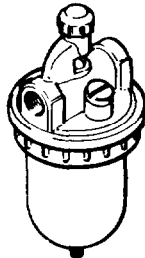


**55 GALLON (200 liter) RAM 207-279**  
For extruding heavy fluids from open 55 gal. (200 liter) drums.

**HIGH VOLUME AIR REGULATOR 206-199**  
0-9 bar (0-125 psi) Regulated Pressure  
14 bar (200 psi) Steel Pressure Gauge.  
1/2 npt inlet and outlet. See instruction manual 306-972.



**AIR LINE OILER**  
250 psi (17.5 bar) MAXIMUM WORKING PRESSURE  
214-848 1/2 npt inlet & outlet  
214-849 3/4 npt inlet & outlet



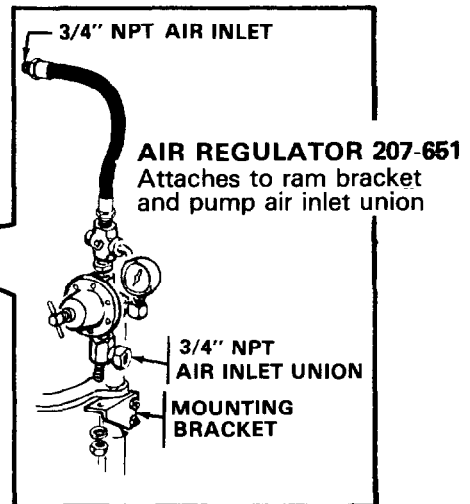
**THROAT SEAL LIQUID (TSL)**  
Non-evaporation solvent for wet-cup.  
206-995 1 qt (0.95 liter)  
206-996 1 gal (3.8 liter)

**GROUNDING BUNA-N AIR SUPPLY HOSE**  
175 psi (12 bar) MAXIMUM WORKING PRESSURE

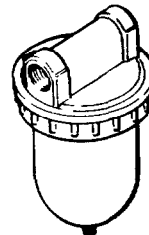
Part No.	ID	Length	Thd. Size
208-610	3/4" (19 mm)	6 ft (1.8 m)	3/4 npt(m)
205-548	3/4" (19 mm)	15 ft (4.5 m)	3/4 npt(m)
208-611	3/4" (19 mm)	25 ft (7.6 m)	3/4 npt(m)
208-612	3/4" (19 mm)	50 ft (15 m)	3/4 npt(m)

**GROUNDING BUNA-N FLUID HOSE**  
5000 psi (345 bar) MAXIMUM WORKING PRESSURE

Part No.	ID	Length	Thd. Size
215-445	1/2" (12.7 mm)	5 ft (1.5 m)	1/2 npt(mbe)
215-441	1/2" (12.7 mm)	10 ft (3.1 m)	1/2 npt(mbe)
215-443	1/2" (12.7 mm)	25 ft (7.6 m)	1/2 npt(mbe)
215-444	1/2" (12.7 mm)	50 ft (15.2 m)	1/2 npt(mbe)

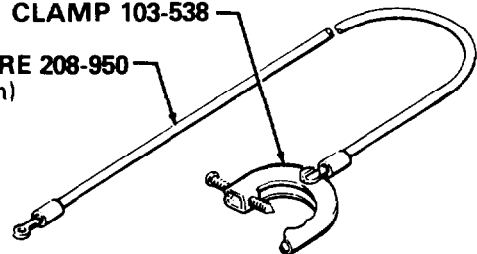


**AIR LINE FILTER**  
250 psi (17.5 bar) MAXIMUM WORKING PRESSURE  
106-149 1/2 npt inlet & outlet  
106-150 3/4 npt inlet & outlet

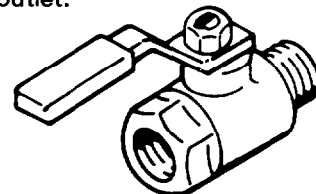


**GROUNDING CLAMP 103-538**

**GROUND WIRE 208-950**  
25 ft lg (7.6 m)



**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(mxf) inlet and outlet.



**GROUNDING NEOPRENE FLUID HOSE**  
5000 psi (345 bar) MAXIMUM WORKING PRESSURE

Part No.	ID	Length	Thd. Size
215-241	3/4" (19.1 mm)	6 ft (1.8 m)	3/4 npt(mbe)
215-238	3/4" (19.1 mm)	10 ft (3.1 m)	3/4 npt(mbe)
215-239	3/4" (19.1 mm)	15 ft (4.5 m)	3/4 npt(mbe)
215-240	3/4" (19.1 mm)	25 ft (7.6 m)	3/4 npt(mbe)

## SERVICE

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

*If you suspect that the spray tip, nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, wrap a rag around the tip guard retaining nut or hose end coupling and VERY SLOWLY loosen the part to relieve pressure gradually, then loosen completely. Now clear the tip, nozzle or hose.*

### WARNING

Never operate the pump with the air motor shield removed, to reduce the risk of serious bodily injury, including amputation, from moving parts inside the air motor housing.

## TROUBLESHOOTING CHART

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

PROBLEM	CAUSE	SOLUTION
Pump fails to operate	Exhausted fluid supply Restricted line or inadequate air supply  Insufficient air pressure; closed or clogged air valves, etc. Obstructed fluid hose or gun Dried fluid built up on displacement rod Dirty or worn air motor parts	Refill Clear; see TECHNICAL DATA on back page Open; clean Clear Clean; see pages 8 and 9 Clean; service (see 306-968)
Pump operates, but output low on both strokes	Exhausted fluid supply Restricted line or inadequate air supply  Insufficient air pressure; closed or clogged air valves, etc. Obstructed fluid hose or gun Open or worn bleeder valve Air leaking into fluid pressure chamber of ram Fluid too heavy for pump to prime Worn throat packings in displacement pump	Refill Clear; see TECHNICAL DATA on back page Open; clean Clear* Close; replace Check ram plate seal, etc. Use bleeder valve; see OPERATION; use ram units Clear; service
Pump operates, but output low on downstroke	Fluid too heavy for pump to prime Held open or worn intake valve	Use bleeder valve; see OPERATION; use ram units Clear; service
Pump operates, but output low on upstroke	Held open or worn piston valve or packings	Clear; service
Erratic or accelerated pump operation	Exhausted fluid supply Fluid too heavy for pump to prime  Held open or worn piston valve or packings Held open or worn intake valve Worn throat packings in displacement pump	Refill Use bleeder valve; see OPERATION; use ram units Clear; service Clear; service Clear; service

\*Follow the **Pressure Relief Procedure** above; disconnect the fluid hose. If the pump starts when the air is turned on, the hose, spray gun or dispensing valve is clogged.

## DISPLACEMENT PUMP SERVICE

### Before you Start:

- A. To reduce downtime, be sure you have all necessary repair parts available. Recommended "tool box" spare parts are listed in the parts list with an asterisk (\*).
- B. Packing repair kit 210-539 is available (see page 10). If you have a repair kit, use all the new parts for the best results. Parts included in the kit are marked with a double asterisk, for example (28\*\*).
- C. When cleaning parts, use a compatible solvent. Inspect parts for wear or damage and replace as necessary. Scoring or irregular surfaces on the displacement rod (46) or smooth inner surface of the displacement cylinder (27) causes premature packing wear and leaking. Check these parts by rubbing a finger on the surface or holding them up to the light at a slight angle.
- D. Use light, water-proof grease whenever grease is mentioned.

### Repair Procedure

- Solvent flush the fluid from the pump if possible. Follow the **Pressure Relief Procedure** on page 6. Stop the pump at the bottom of its stroke.
- Disconnect the hoses from the displacement pump. Remove the pump from its mounting, and clamp it in a vise.
- Detach the displacement pump from the air motor by unscrewing the coupling nut (6) and the tie rod locknuts (3). Remove the cotter pin (1) from the top of the displacement rod (46). Loosen the jam nut (4) and unscrew the connecting rod (9) from the displacement rod. See Fig 2.
- Unscrew the tie bolts (19). Secure the displacement pump in a vise so the outlet housing (26) is against one vise jaw.
- Remove the packing nut (34).
- Push the displacement rod down until the piston assembly on the priming rod (30) clears the intake housing (31).
- Remove the jam nut (15), piston plate (37), valve plate (36) and valve plate guide (38).
- Pull the intake housing down off the displacement cylinder.
- Pull the priming rod (30), intake valve, piston (47) and displacement rod (46) from the bottom of the cylinder (27).
- Secure the flats of the displacement rod in a vise.
- Disassemble the intake valve.
- Remove the cotter pin (14) from the piston. Unscrew the priming rod (30) from the piston. Unscrew the piston from the displacement rod (46). Be careful not to drop or damage the steel ball (16\*\*).
- Disassemble the piston assembly, removing the washers (39, 28\*\*), packings (18\*\*) and spacer (35).
- Remove the throat packings (28\*\*, 18\*\*, 21) from the housing (32) and remove the housing.

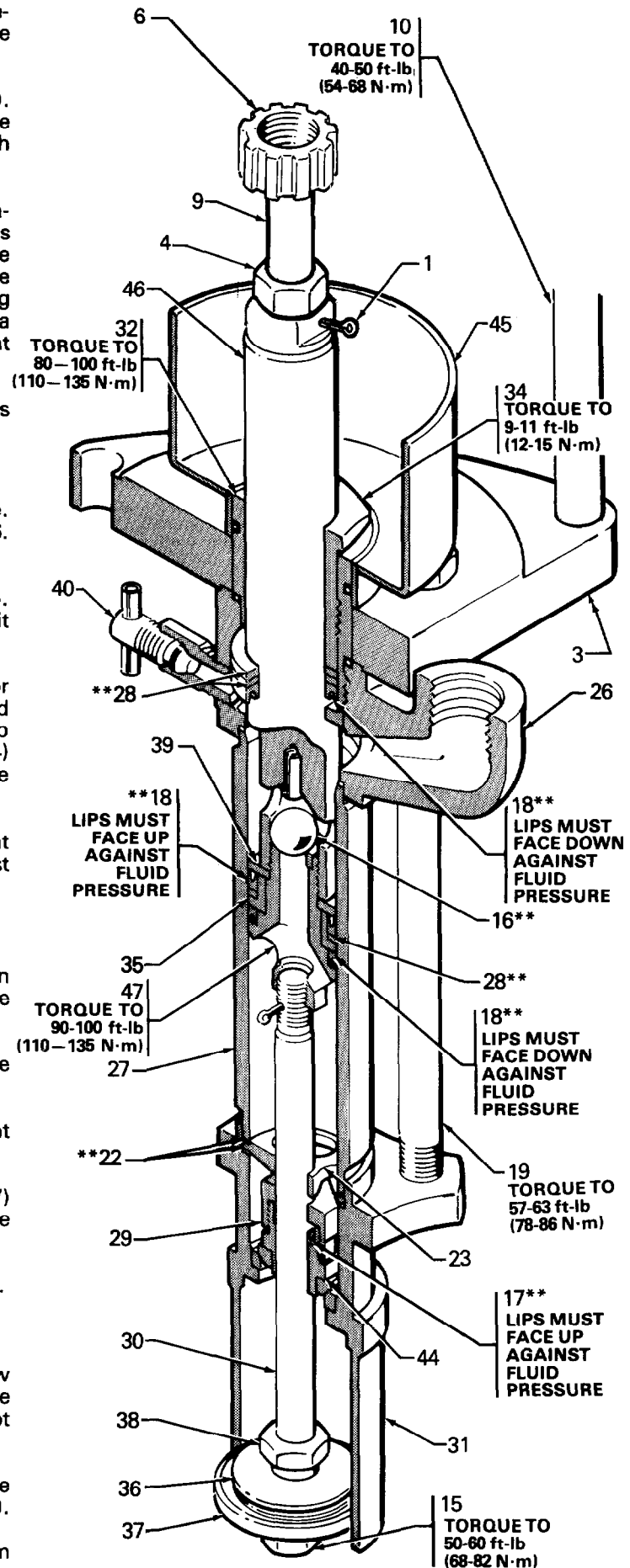


Fig 2



### Clean and Inspect Parts

1. Clean all the parts in a compatible solvent. Inspect them for wear and damage, replacing parts as needed. Lubricate the parts before assembling.
2. Check the outer surface of the displacement rod (46) and the inner surface of the cylinder (27) for nicks, scratches and wear. A scored rod or cylinder will cause premature packing wear and leaking.

### Reassembly

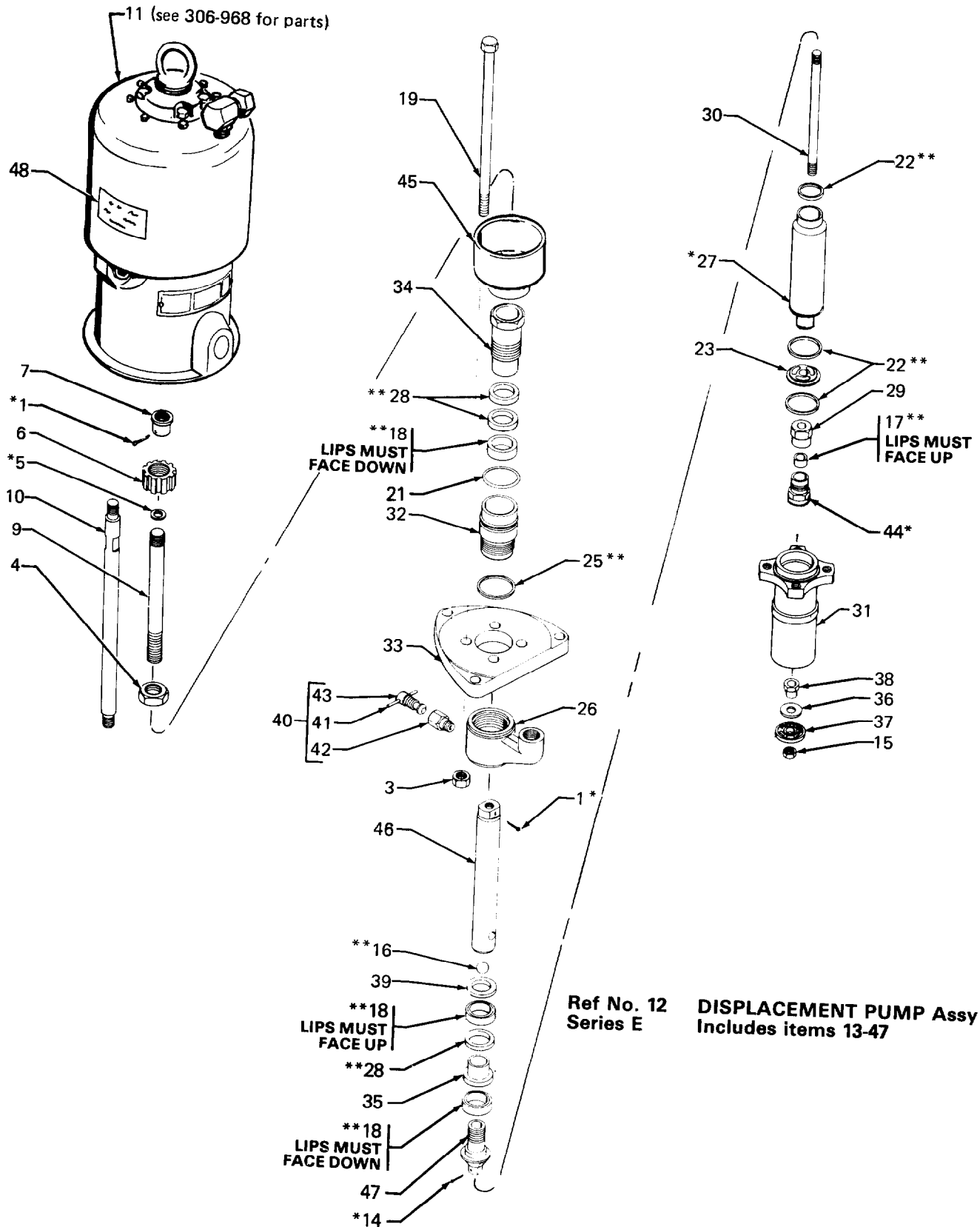
1. One at a time, install the o-ring (21), packing (18\*\*) and washers (28\*\*) in the packing housing (32). Be sure the lips of the packing face down. Always replace the washers when you replace the packing. Screw the housing (32) into the housing outlet (26), and torque to 80-100 ft-lb (110-135 N·m).
2. Loosely screw the packing nut (34) into the packing housing (32).
3. One at a time, install the packing (18\*\*) with the lips facing down, the spacer (35), the back-up washer (28\*\*), the other packing (18\*\*) with the lips facing up, and the washer (39) onto the piston (47). Place the steel ball (16\*\*) onto the piston.
4. Screw the piston into the displacement rod (46), torquing it to 80-100 ft-lb (100–135 N·m).
5. Screw the priming rod (30) into the piston, aligning the holes. Reinstall the cotter pin (14).
6. Secure the outlet housing (26) in a vise. Install a new gasket (22\*\*) on the pump cylinder (27). Position the cylinder in the outlet housing.
7. Lubricate the cylinder (27) and displacement rod (46). Carefully slide the displacement rod assembly through the cylinder.

8. Assemble the gasket (22\*\*), valve stop (23) and other gasket (22\*\*), and place them on the end of the cylinder.
9. Assemble the packing nut (29), packing (17\*\*) with the lips facing up, and the seal and seat (44). Then slide them onto the priming rod (30). Position the intake housing (31) on the cylinder (27).
10. Insert the tie bolts (19) through the pump tie plate (33) and screw the bolts into the intake housing (31). Torque the tie bolts to 57-63 ft-lb (77-86 N·m). Torque the packing nut (34) to 9-11 ft-lb (12-15 N·m).
11. Assemble the valve plate guide (38), valve plate (36), piston plate (37), and jam nut (15) onto the priming rod (30). Torque the jam nut to 50-60 ft-lb (61-75 N·m).
12. Secure the connecting rod (9) to the displacement rod (46) with the cotter pin (1). Screw the locknut (4) down.
13. Fill the wet cup (45) with TSL. Start the pump and operate it slowly, at about 40 psi (3 bar) air pressure, to check the tie rods for binding. Adjust the tie rod locknuts, if necessary, to eliminate binding.
14. Reinstall the pump in its mounting. If the ground wire was disconnected during servicing, be sure to reconnect it before operating the pump.

# PARTS DRAWING

Model 207-568, Series D  
55:1 Ratio KING PUMP

**NOTE:** See the service section for important torque requirements.



# PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY
1	*100-103	PIN, cotter; 0.125" (3.2 mm) dia; 1.5" (38.1 mm) long	2
3	101-712	NUT, lock; 5/8"-11	3
4	101-936	NUT, jam; 3/4"-10	1
5	*158-674	SEAL, o-ring; nitrile rubber	1
6	168-210	NUT, shouldered	1
7	168-211	COUPLING, connecting rod	1
9	168-253	ROD, connecting; 9-5/16" (236.5 mm) lg	1
10	168-254	ROD, tie; 13-9/16" (344.5 mm) shoulder-to-shoulder	3
11	207-647	AIR MOTOR, see 306-968 for parts	1
12	207-671	DISPLACEMENT PUMP Assy Series E includes items 13-47	1
14	*100-103	.PIN, cotter; 0.125" (3.2 mm) dia; 1.5" (38.1 mm) lg	1
15	100-338	.NUT, jam; 1/2"-13	1
16	**100-400	.BALL, steel; 0.75" (19 mm) dia	1
17	**102-413	.PACKING, u-cup; polyurethane	1
18	**102-416	.PACKING, u-cup; polyurethane	3
19	102-420	.BOLT, mach; 5/16"-11 x 12"	4
21	156-641	.SEAL, o-ring; nitrile rubber	1
22	**161-635	.GASKET, copper	3
23	161-636	.STOP, valve check	1
25	**161-673	.GASKET, copper	1
26	161-946	.HOUSING, outlet	1
27	*161-947	.CYLINDER, displacement	1
28	**161-950	.WASHER, acetal back-up	3
29	162-305	.NUT, packing; intake valve	1
30	162-317	.ROD, priming	1
31	167-258	.HOUSING, intake valve	1
32	168-245	.RETAINER, packing	1
33	168-246	.PLATE, tie	1
34	168-509	.NUT, packing	1
35	171-772	.SPACER	1
36	171-778	.PLATE, valve	1
37	171-779	.PLATE, piston	1
38	171-782	.GUIDE, valve plate	1
39	181-810	.WASHER	1
40	206-256	.PLUG 0 BLEEDER VALVE Includes items 41-43	1
41	102-039	..PIN, spring; 0.25" (6.4 mm) dia x 1.5" (38.1 mm) lg	1
42	165-702	..BODY	1
43	165-703	..PLUG	1
44	*207-078	.SEAL 0 SEAT; intake valve	1
45	207-672	.WET-CUP	1
46	*208-100	.ROD, displacement	1
47	210-752	.PISTON	1
48	†172-447	PLATE, warning	1

\*Recommended "tool box" spare parts. Keep on hand to reduce down time.

\*\*Included in repair kit 210-539.

†Extra warning plates available at no charge.

## HOW TO ORDER REPLACEMENT PARTS

- To be sure you receive the correct replacement parts, kit 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

## PACKING CONVERSION KITS

(Must be purchased separately)

### Standard Polyurethane Packing Kit 210-539

Consists of:

Ref No.	Qty.
16	1
17	1
18	3
22	3
25	1
28	3

### Ultra High Molecular Weight Polyethylene Kit 220-114 (See Ref No. for placement)

Includes:

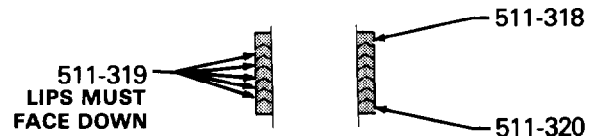
Use in place of Ref No.

Part No.	Name	Qty
16	100-400 Ball	1
17	108-310 Seal	1
18	108-311 Seal	3
22	161-635 Gasket	3
25	161-673 Gasket	1
28	161-950 Washer	3

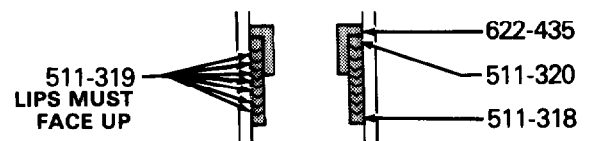
### PTFE n Kit 947-485 (See drawing below for placement)

Includes:

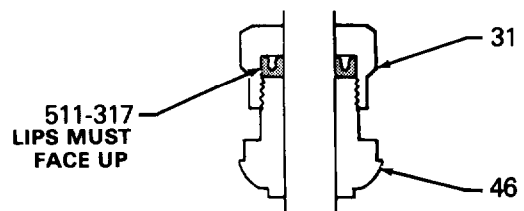
Part No.	Name	Qty
511-317	U-Cup Packing	1
511-318	Female Gland	2
511-219	PTFE V-Packing	12
622-435	Spacer	1
511-320	Male Gland	2



THROAT PACKINGS



PISTON PACKINGS



INTAKE VALVE PACKING

## SERVICE INFORMATION

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

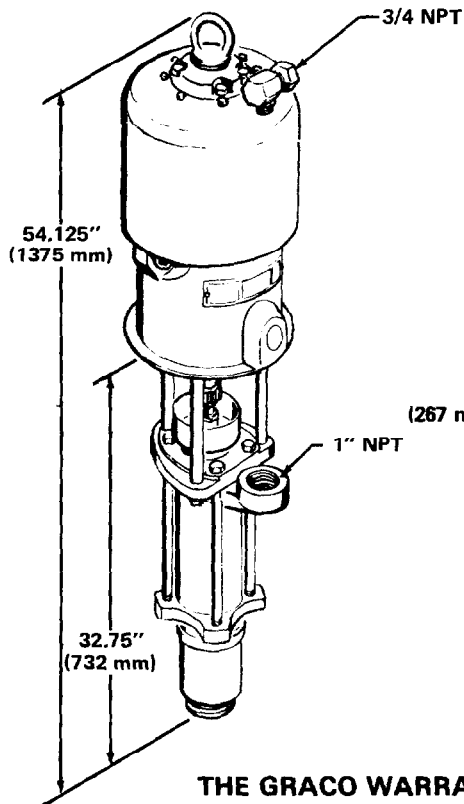
Assembly Changed	Part Status	Ref No.	Part No.	Name
207-671	OLD		171-783	Washer
Disp. Pump	NEW	39	181-810	Washer

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

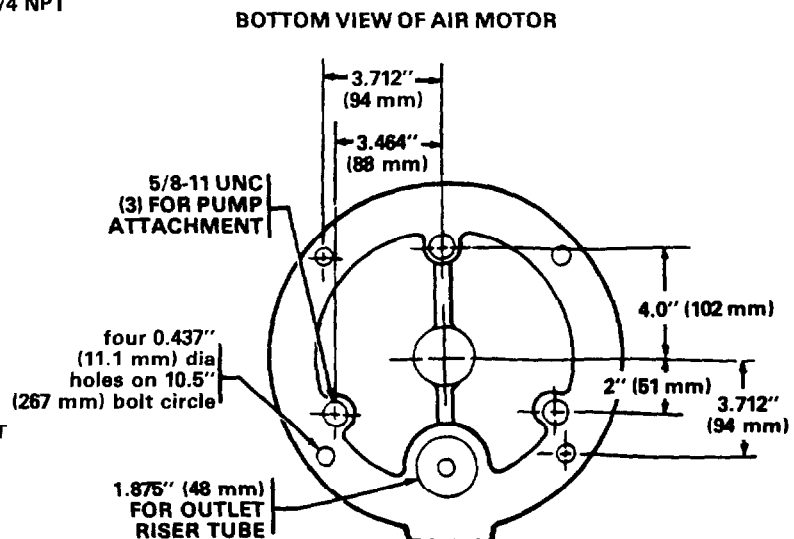
## TECHNICAL DATA

Maximum air inlet pressure:	90 psi (6 bar)
Air consumption:	74 cfm per gallon pumped (0.55 m <sup>3</sup> /min/l) at 100 psi (7 bar) air pressure: <i>up to 185 cfm (5.2 m<sup>3</sup>/min) with pump operated within recommended range</i>
Pump cycles per gallon (3.8 liter):	20
Maximum recommended pump speed:	50 cycles per minute: 2.5 gpm (9.5 liter/min)
Maximum pump discharge pressure:	4950 psi (331 bar)
Wetted parts:	Steel, Copper, Nitralloy, Polyurethane, Acetal
Weight:	117 lb (53 Kg)

## DIMENSIONAL DRAWING



## PUMP MOUNTING HOLE LAYOUT



## 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 for examination by Graco to verify the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

### 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.

**Factory Branches:** Atlanta, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)  
**Subsidiary and Affiliate Companies:** Canada; England; Switzerland; France; German; Hong Kong; Japan  
**GRACO INC. P.O. Box 1441 MINNEAPOLIS, MN 55440-1444**