



This manual contains important warnings and information.  
**READ AND KEEP FOR REFERENCE.**

INSTRUCTIONS

## STUBBY SIZE

# Viscount® I 250 Pump

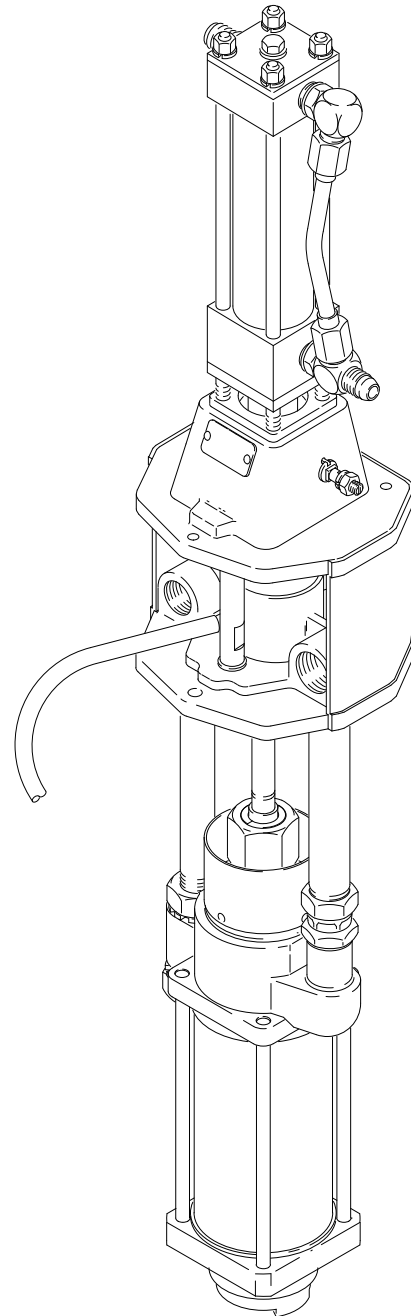
*250 psi (17 bar) Maximum Fluid Working Pressure*  
*1000 psi (70 bar) Maximum Hydraulic Input Pressure*

### Part No. 224-758, Series C

Carbon Steel, Leather Packed Pump  
For Use in Lubrication Systems

## Table of Contents

Warnings .....	2
Installation .....	5
Operation .....	8
Troubleshooting .....	11
Service .....	12
Parts .....	14
Dimensions .....	15
Mounting Hole Layout .....	16
Technical Data .....	17
Graco Warranty .....	20
Toll-Free Graco Phone Number .....	20



06117

# Symbols

## Warning Symbol



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

## Caution Symbol



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

## WARNING



INSTRUCTIONS

### EQUIPMENT MISUSE HAZARD

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

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. Refer to the **Technical Data** on page 17 for the maximum working pressure of this equipment.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not use hoses to pull equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).
- Wear hearing protection when operating this equipment.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# WARNING



## FIRE AND EXPLOSION HAZARD

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

- Ground the equipment and the object being sprayed. Refer to **Grounding** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately**. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the spray area.
- Extinguish all open flames or pilot lights in the spray area.
- Do not smoke in the spray area.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray area.



## TOXIC FLUID HAZARD

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

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



## MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers.

- Keep clear of all moving parts when starting or operating the pump.
- Before servicing the equipment, follow the **Pressure Relief Procedure** on page 8 to prevent the equipment from starting unexpectedly.



# Installation

## General Information

**NOTE:** Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.


**NOTE:** Always use Genuine Graco Parts and Accessories, available from your Graco distributor. If you supply your own accessories, be sure they are adequately sized and pressure rated for your system.

Fig. 2 is only a guide for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

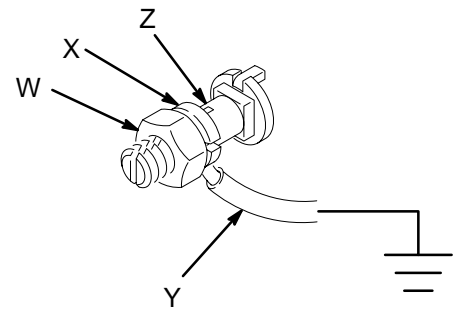
## Prepare the Operator

All persons who operate the equipment must be trained in the safe, efficient operation of all system components as well as the proper handling of all fluids. All operators must thoroughly read all instruction manuals, tags, and labels before operating the equipment.

## Grounding

<b>⚠ WARNING</b>	
	<b>FIRE AND EXPLOSION HAZARD</b> Before operating the pump, ground the system as explained below. Also read the section <b>FIRE AND EXPLOSION HAZARD</b> on page 3.

1. *Pump:* order Part No. 237–569 Ground Wire and Clamp. See Fig. 1. Loosen the grounding lug locknut (W) and washer (X). Insert one end of the ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. Connect the other end of the wire to a true earth ground.



**Fig. 1**

0864

2. *Hydraulic and fluid hoses:* use only electrically conductive hoses.
3. *Air compressor:* follow manufacturer's recommendations.
4. *Dispensing valve:* ground through connection to a properly grounded fluid hose and pump.
5. *Fluid supply container:* follow your local code.
6. *Object being lubricated:* follow your local code.
7. *Solvent pails used when flushing:* follow your 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.
8. *To maintain grounding continuity when flushing or relieving pressure,* hold a metal part of the dispensing valve firmly to the side of a grounded metal pail, then trigger the valve.

## Mounting the Pump

Mount the pump to suit the type of installation planned. The pump dimensions and mounting hole layout are shown on page 15.

<b>⚠ CAUTION</b>
To avoid leaking hydraulic fluid into the fluid supply, never mount the pump directly over the supply container. Always use siphon feed.

If the pump is mounted on the wall or on a stand, connect a suction line to the pump's 1–1/2" npt(f) fluid inlet and place the other end of the line in the fluid container.

# Installation

## KEY

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>A Pump</li> <li>B Wall Bracket</li> <li>C Hydraulic Supply Line</li> <li>D Hydraulic Return Line</li> <li>E Drain Line (from pressure reducing valve)</li> <li>F Pressure Gauge</li> <li>G Flow Control Valve</li> <li>H Pressure Reducing Valve</li> <li>J Accumulator</li> </ul> | <ul style="list-style-type: none"> <li>K Drain Line (from motor drip pan)</li> <li>L Fluid Drain Valve (required)</li> <li>M Electrically Conductive Fluid Supply Hose</li> <li>N Drum Suction Kit</li> <li>P Hydraulic Supply Line Shutoff Valve</li> <li>R Hydraulic Return Line Shutoff Valve</li> <li>S Hydraulic Return Line Filter</li> <li>Y Ground Wire (required; see page 5 for installation instructions)</li> </ul> |
|---|---|

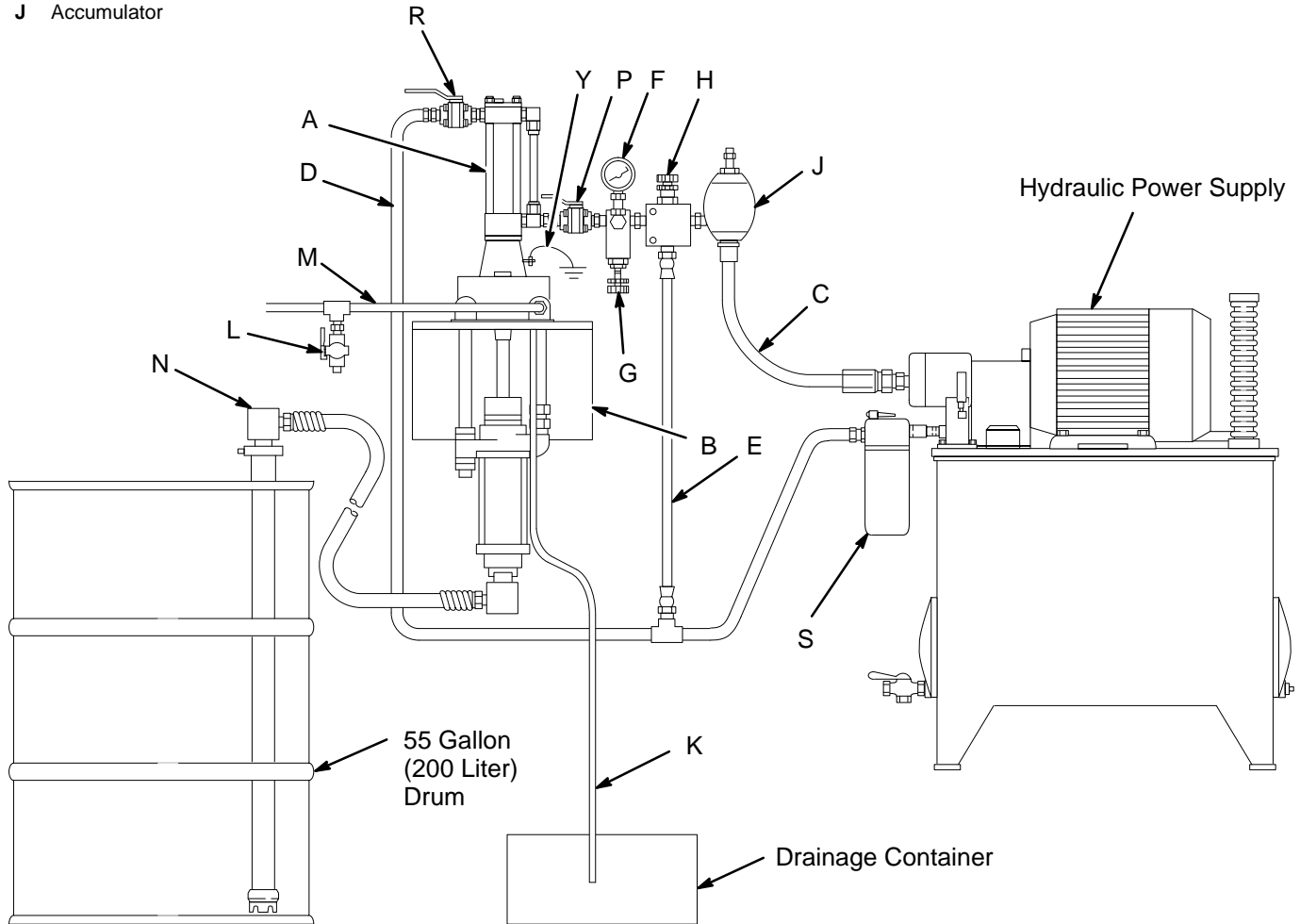


Fig. 2

06121

# Installation

## Available Accessories (must be purchased separately)

### Filters

Be sure your hydraulic power supply is equipped with a suction filter to the hydraulic pump and a system return line filter (S) of 10 micron size.

Carefully follow the manufacturer's recommendations on reservoir and filter cleaning, and periodic changes of hydraulic fluid. Use only Graco approved hydraulic oil. Order Part No. 169-236, 5 gallon (19 liter) or 207-428, 1 gallon (3.8 liter).

### Hydraulic Line Accessories

#### CAUTION

It is very important to keep the hydraulic supply system clean at all times. Be sure that all hydraulic fluid lines are absolutely clean. Blow out the lines with air and flush thoroughly with solvent before connecting to the hydraulic motor, to avoid introducing harmful contaminants into the motor.

Do not exceed 3 gpm (11.4 liter/min) hydraulic oil volume to the motor, to avoid pump stalling.

For optimum pump performance, keep the temperature of the hydraulic oil below 130°F (54°C).

The hydraulic motor has a 3/4-16(m) 37° flared hydraulic oil supply fitting, and a 7/8-14(m) 37° flared hydraulic oil return fitting. Use a minimum 1/2 in. (13 mm) ID hydraulic supply line, and a minimum 5/8 in. (16 mm) return line.

On the hydraulic supply line (C), install the following accessories in the order shown in Fig. 2, using adapters as necessary.

- **A shutoff valve (P)** to isolate the pump for servicing.
- **A fluid pressure gauge (F)** to monitor hydraulic oil pressure to the motor and to avoid overpressurizing the motor or displacement pump, and **a pressure and temperature-compensated flow control valve (G)** to prevent the motor from running too fast and possibly damaging itself.

- **A pressure reducing valve (H) with a drain line (E)** running directly into the hydraulic return line (D).
- **An accumulator (J)** to reduce the hammering effect caused by the motor reversing direction.

On the hydraulic return line (D), install the following accessories in the order shown in Fig. 2, using adapters as necessary.

- **A shutoff valve (R)** to isolate the pump for servicing.
- **A filter (S)** of 10 micron size.

### Hydraulic Motor Drip Pan

Connect the drain line (K) to the barbed hose fitting on the motor base. Without twisting or kinking the tube, direct it downward into a waste container. Trim the tube as necessary so it always stays above the level of oil collected in the container. Empty the container as necessary.

### Fluid Line Accessories

Install the following accessories in the order shown in Fig. 2, using adapters as necessary.

#### WARNING

A fluid drain valve (L) is required in your system to help reduce the risk of serious injury, including splashing of fluid in the eyes or on the skin.

The fluid drain valve assists in relieving fluid pressure in the displacement pump, hose, and dispense valve. Triggering the valve to relieve pressure may not be sufficient.

- **The fluid drain valve (L)** is required in your system to relieve fluid pressure in the hose and dispense valve (see the **WARNING** above).
- Connect a **suction tube kit (N)** to the pump's 1-1/2" npt(f) fluid inlet.

### Fluid Supply Hose

Be sure the fluid supply hose (M) is properly sized and pressure-rated for your system. Use only electrically conductive hoses.

# Operation

## Pressure Relief Procedure

### **⚠ WARNING**

#### **PRESSURIZED EQUIPMENT HAZARD**

The system pressure must be manually relieved to prevent the system from starting or dispensing accidentally. To reduce the risk of an injury from accidental spray from the dispense valve, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure,
- stop dispensing,
- check or service any of the system equipment,
- or install or clean the dispense valve nozzle.

1. Lock the dispense valve trigger safety.
2. Shut off the hydraulic power supply.
3. Close the supply line shutoff valve (P), then the return line shutoff valve (R).
4. Unlock the dispense valve trigger safety.
5. Hold a metal part of the dispense valve firmly to the side of a grounded metal pail, and trigger the valve to relieve pressure.
6. Lock the dispense valve trigger safety.
7. Open the drain valve (L, required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to dispense again.

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

## Packing Nut

### **⚠ WARNING**

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

Check the tightness of the packing nut/wet-cup (U) periodically. The nut should be tight enough to prevent leakage. Torque the nut to 20–24 ft-lb (27–33 N.m); do not overtighten or you may damage the packings. **Relieve pressure** before adjusting the nut. See Fig. 3.

Fill the packing nut/wet-cup 1/2 full with a compatible solvent. Keep the cup filled at all times to help prevent the fluid you are pumping from drying on the exposed displacement rod and damaging the throat packings.

## Flush the Pump Before First Use

The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent. See **Flushing** on page 10.

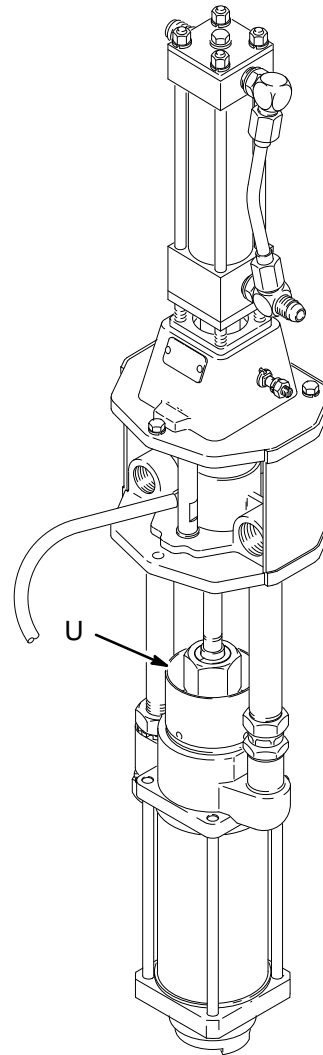


Fig. 3

06117



# Operation

## Prime the Pump

1. See Fig. 2. Connect the suction kit (N) to the pump's fluid inlet, and place the tube into the fluid supply.
2. Check the hydraulic fluid level before each use, and add fluid as necessary.
3. Close the supply line shutoff valve (P) and the return line shutoff valve (R).
4. Start the hydraulic power supply.
5. Hold a metal part of the dispense valve (if used) firmly to the side of a grounded metal pail and hold the trigger open.
6. Open the return line shutoff valve (R) first, then slowly open the supply line shutoff valve (P).
7. Run the pump slowly until all air is pushed out and the system is fully primed. Always use the lowest pressure necessary to get the desired results. Higher pressures cause premature pump wear.
8. Release the dispense valve trigger and lock the trigger safety. With adequate hydraulic volume supplied to the motor, the pump will start and stop as you open and close the dispense valve.

### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 8.

9. **Relieve the pressure.** Install the nozzle in the dispense valve, as explained in the dispense valve manual.

### WARNING

#### COMPONENT RUPTURE HAZARD



To reduce the risk of overpressurizing your system, which could cause component rupture and serious injury, **never** exceed *1000 psi (70 bar) maximum hydraulic input pressure or 3 gpm (11.4 liter/min) hydraulic input to the pump, or 250 psi (17 bar) maximum fluid working pressure* (see **Technical Data** on page ).

To prevent overpressurizing the hydraulic motor or its seals, **always** shut off the supply line valve (P) *first*, then shut off the return line valve (R).

### CAUTION

Do not allow the hydraulic oil temperature to exceed 130°F (54°C). The pump seals will wear faster and leakage may occur if the pump is operated at higher oil temperatures.

10. Use the fluid pressure gauge (F) and pressure-reducing valve (H) to control pump outlet pressure and pump speed. Always use the lowest hydraulic flow and pressure necessary to get the desired results. Higher pressure causes premature pump wear.

### CAUTION

Do not allow the pump to run dry. It will quickly accelerate to a high speed, causing damage. If your pump is running too fast, stop it immediately and check the fluid supply. If the container is empty and air has been pumped into the lines, refill the container and prime the pump and the lines, or flush and leave it filled with a compatible solvent. Eliminate all air from the fluid system.

# Maintenance

## Shutdown and Care of the Pump

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 8.

For overnight shutdown, stop the pump at the bottom of its stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings. **Relieve the pressure.**

Always flush the pump before the fluid dries on the displacement rod. See **Flushing** below.

## Flushing

### **WARNING**



#### **FIRE AND EXPLOSION HAZARD**

Before flushing, read the section **FIRE AND EXPLOSION HAZARD** on page 3. Be sure the entire system and flushing pails are properly grounded. Refer to **Grounding** on page 5.

Flush the pump:

- Before the first use
- When changing fluids
- Before storing the pump.

Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts in your system. Check with your fluid manufacturer or supplier for recommended flushing fluids and flushing frequency.

### **CAUTION**

Never leave water or water-base fluid in the pump overnight. If you are pumping water-base fluid, flush with water first, then with a rust inhibitor such as mineral spirits. Relieve the pressure, but leave the rust inhibitor in the pump to protect the parts from corrosion.

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 8.

1. **Relieve the pressure.**
2. Hold a metal part of the dispense valve firmly to the side of a grounded *metal* pail.
3. Start the pump. Always use the lowest possible fluid pressure when flushing.
4. Trigger the dispense valve.
5. Flush the system until clear solvent flows from the dispense valve.
6. **Relieve the pressure.**

## Corrosion Protection for Carbon Steel Pumps

### **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. Follow the instructions under **Flushing**, at left.

## Fluid Piston and Intake Valve Adjustment

The fluid piston and intake valves are factory set for pumping medium viscosity fluids. See the separate displacement pump manual, 307–983, for adjustment procedures to pump lighter or heavier viscosity fluids.

# Troubleshooting

## WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 8.

1. **Relieve the pressure.**
2. Check all possible problems and solutions before disassembling pump.

Problem	Cause	Solution
Pump fails to operate.	Restricted line or inadequate hydraulic supply.	Clear; increase hydraulic supply.
	Dirty or damaged hydraulic motor.	Service motor (see 307–654).
	Clogged fluid hose, valve, or nozzle.	Clear.*
Pump operates but output is low on both strokes.	Restricted line or inadequate hydraulic supply.	Clear; increase hydraulic supply.
	Exhausted fluid supply.	Refill; reprime or flush.
	Clogged fluid hose, valve, or nozzle.	Clear.*
	Loose packing nut or worn throat packings.	Tighten packing nut (see page 8); replace throat packings.
	Piston and intake valves need adjustment.	Adjust; see manual 307–983.
Pump operates but output is low on downstroke.	Held open or worn intake valve.	Clear; service. See manual 307–983.
Pump operates but output is low on upstroke.	Held open or worn fluid piston valve or packings.	Clear; service. See manual 307–983.
Erratic or accelerated operation.	Exhausted fluid supply.	Refill; reprime or flush.
	Piston and intake valves need adjustment.	Adjust; see manual 307–983.
	Held open or worn intake valve.	Clear; service. See manual 307–983.
	Held open or worn fluid piston valve or packings.	Clear; service. See manual 307–983.

\* To determine if the fluid hose or gun is obstructed, follow the **Pressure Relief Procedure** on page 8. Disconnect the fluid hose and place a container at the pump fluid outlet to catch any fluid. Turn on the hydraulic power just enough to start the pump. If the pump starts when the hydraulic power is turned on, the obstruction is in the fluid hose or gun.

# Service

## Disconnecting the Displacement Pump

**NOTE:** For displacement pump repair instructions, refer to the separate displacement pump manual 307–983, supplied.

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 8.

1. Flush the pump if possible. Stop the pump at the bottom of its stroke. **Relieve the pressure.**
2. Disconnect all hoses and remove the pump from its mounting.
3. Plug all hydraulic connections to avoid contamination.
4. Unscrew the coupling nut (32) from the displacement rod (R). Remove the coupling collars (33). See Fig. 4.
5. Unscrew the lower locknut (23a) and lockwasher (7) from the return mounting tube (25).
6. Unscrew the swivel union (S) from the supply mounting tube (21).

### **CAUTION**

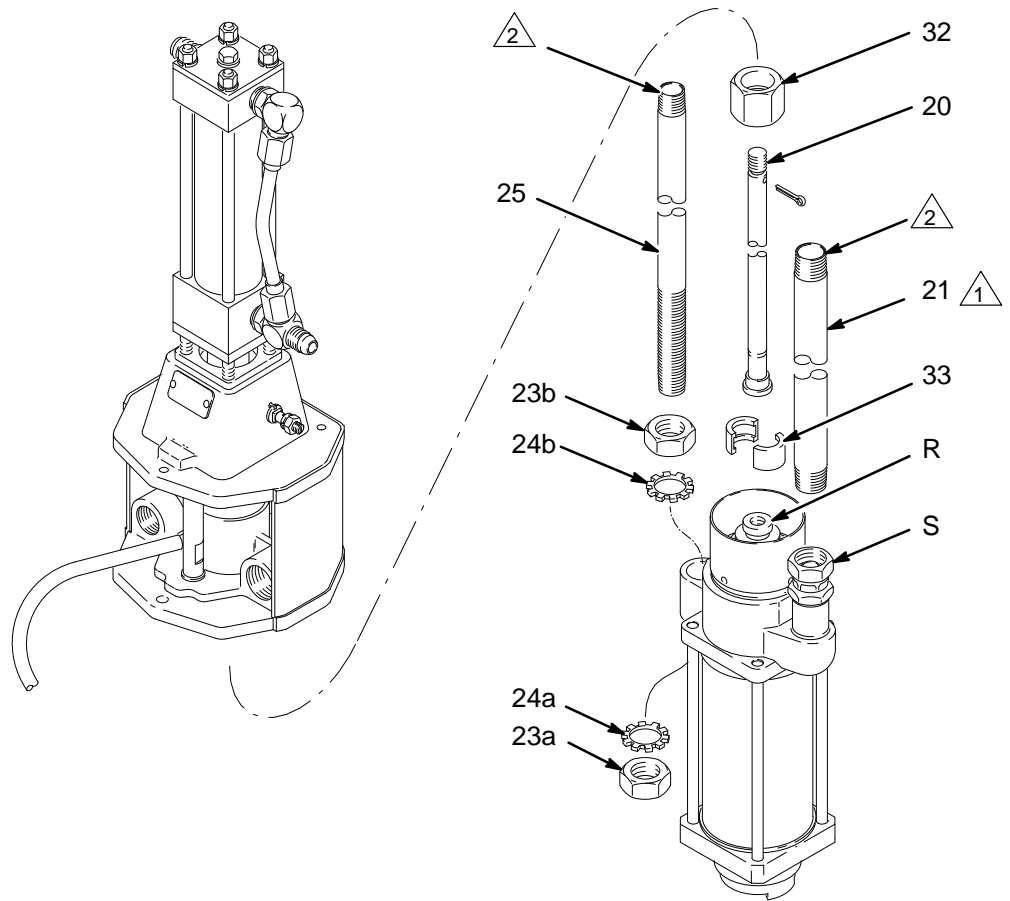
If you are removing the mounting tubes, wrench the tubes close to the motor base to prevent thread damage in the base. Use thread sealant on the male threads when reinstalling.

## Reconnecting the Displacement Pump

1. Position the displacement pump on the mounting tubes (21, 25). Thread the upper locknut (23b) onto the return mounting tube (25) a couple of turns. Tighten the swivel union (S) securely onto the supply mounting tube (21). See Fig. 4.
2. Butt the connecting rod (20) and displacement rod (R) together; if necessary, adjust the locknuts (23) on the return mounting tube (25) to align the rods.
3. Position the coupling collars (33) so they engage with the connecting rod (20) and displacement rod (R). Lower the coupling nut (32) over the coupling collars and screw it securely onto the displacement rod.
4. Tighten the locknuts (23) securely.
5. Remount the pump and connect all hoses.
6. Turn on the hydraulic power to the motor and run the pump slowly. Adjust the locknuts (23) on the return mounting tube (25) as necessary until the pump operates smoothly at minimum hydraulic pressure to the motor, and a No. 60 (0.040 in. diameter) drill bit passes freely between the bearing (31) and the connecting rod (20), all around the rod. Tighten the locknuts securely. See the Detail in Fig. 4.
7. Reconnect the ground wire if it was disconnected during repair.
8. Fill the packing nut/wet-cup 1/2 full of compatible solvent.

# Service

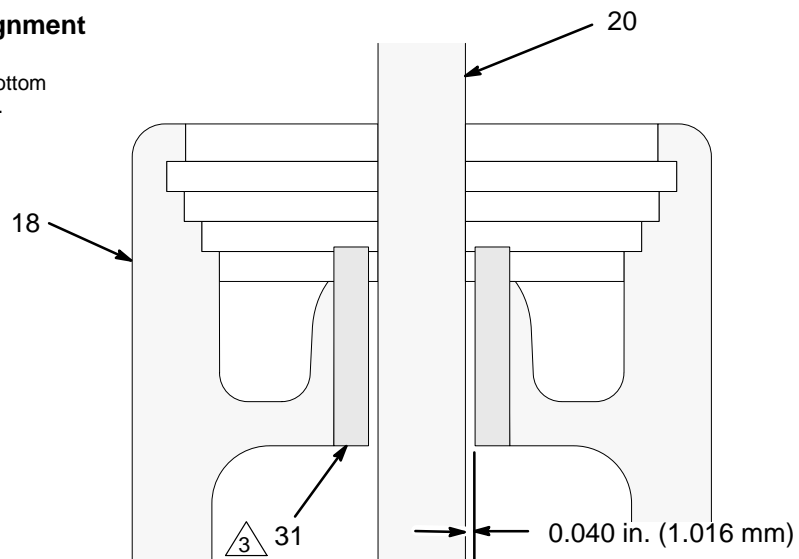
- 1 Torque to 65–75 ft-lb (88–102 N.m).
- 2 Use thread sealant when reinstalling.



06119

## Detail A: Checking Pump Alignment

- 3 Press fit flush with bottom surface of base (18).

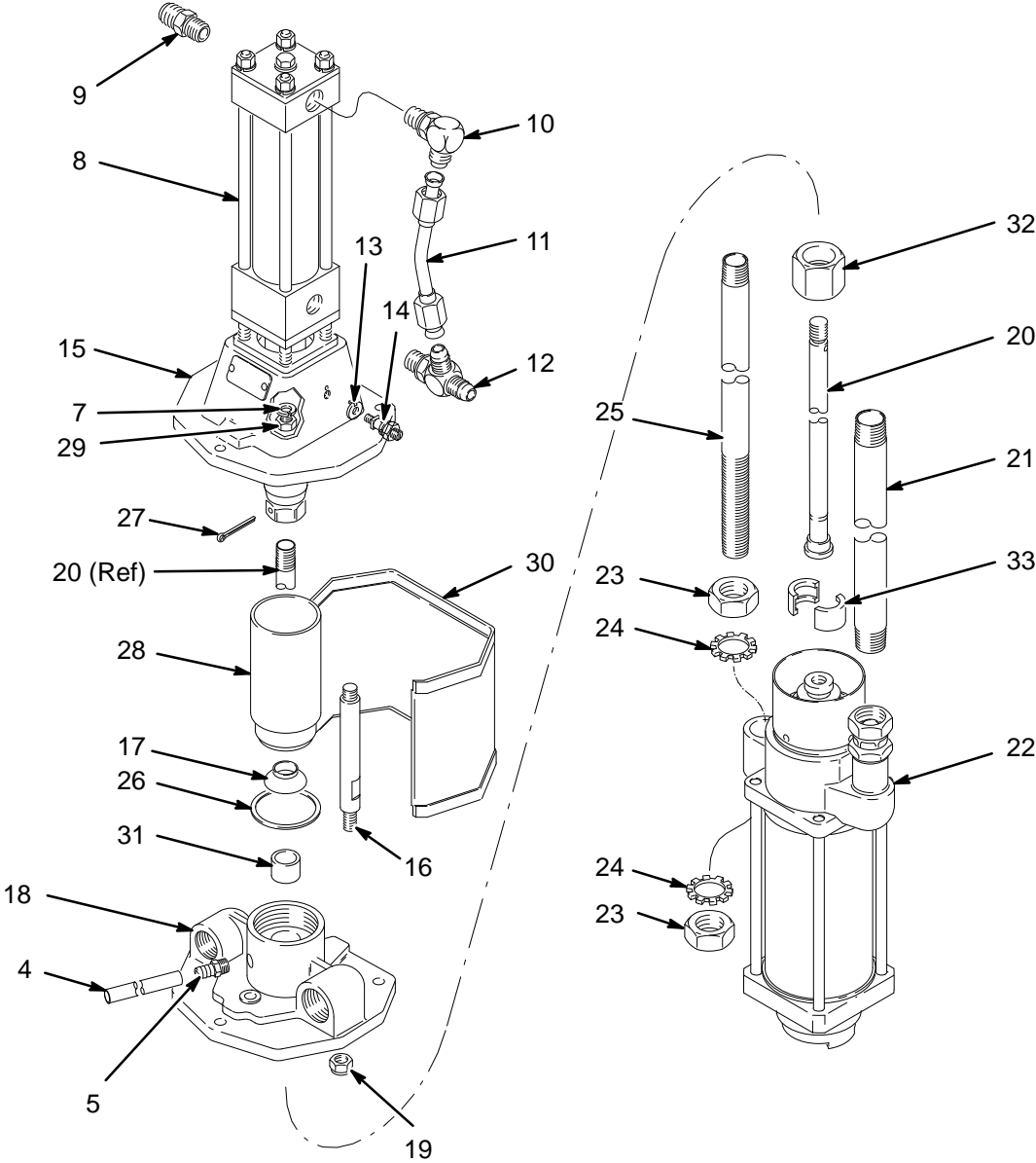


06122

Fig. 4

# Parts

Model 224-758, Series C  
Viscount I 250 Pump, Stubby Size



06118

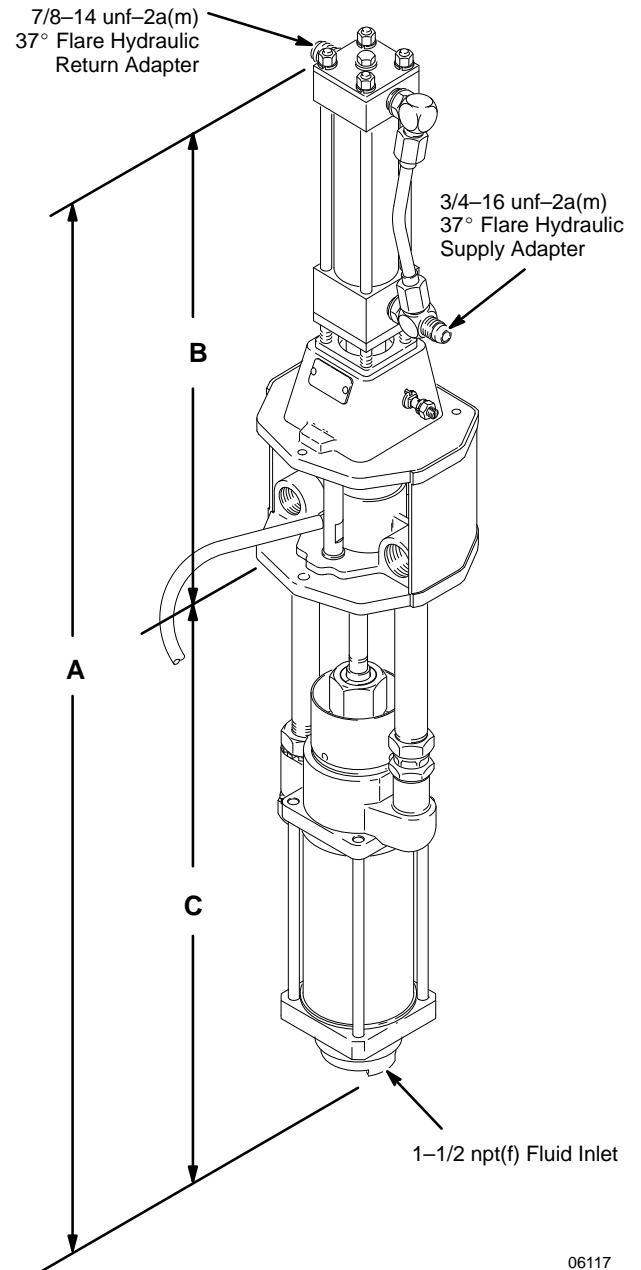
# Parts

## Model 224-758, Series C Viscount I 250 Pump, Stubby Size

Ref No.	Part No.	Description	Qty
4	054-104	TUBE	6 ft
5	103-875	ADAPTER, hose, barbed; 1/8 npt	1
7	100-133	LOCKWASHER; 3/8" size	4
8	217-222	VISCOUNT RECIPROCATOR See manual 307-654 for parts	1
9	107-195	ADAPTER, str. thd.; 7/8-14 unf-2a; 37° flare x 3/4-16 unf-2a	1
10	106-470	ELBOW, 90°; str. thd. for 1/2" (13 mm) diameter tube	1
11	217-221	TUBE, fluid; cpld 3/4-16 unf-2a; 37° flare	1
12	107-197	TEE, run, str.; 3/4-16 unf-2a; 37° flare x 3/4-16 unf-2a	1
13	104-582	WASHER, tab	1
14	104-029	CLAMP, grounding	1
15	179-882	BASE, motor, hydraulic	1
16	168-221	ROD, tie; 5-3/4" (146 mm)	3
17	107-226	CUP, suction	1
18	179-883	BASE, adapter, hydraulic motor	1
19	102-021	LOCKNUT; 3/8" size	3
20	191-738	ROD, connecting; 10.94" (228 mm) long	1
21	190-178	TUBE, supply; 6.75" (171.5 mm) long	1
22	224-756	PUMP, displacement See 307-983 for parts	1
23	160-026	NUT, special lock; 3/4 garden hose thread	2
24	162-648	LOCKWASHER, ext shakeproof	2
25	181-120	TUBE, return; 12.812" (325.4 mm) long	1
26	107-196	O-RING; buna-N	1
27	100-103	PIN, cotter	1
28	179-881	TUBE	1
29	106-292	NUT, hex; 3/8" size	4
30	180-095	SHIELD	1
31	100-039	BEARING, sleeve	1
32	190-065	NUT, coupling	1
33	190-066	COLLAR, coupling	2

Ref No.	Part No.	Description	Qty
---------	----------	-------------	-----

## Dimensions

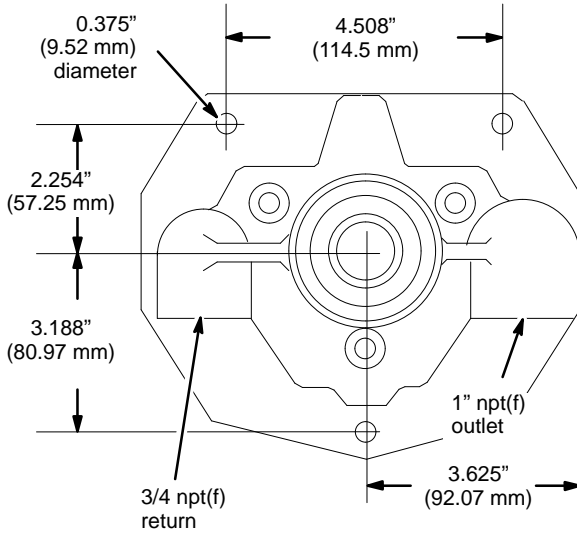


06117

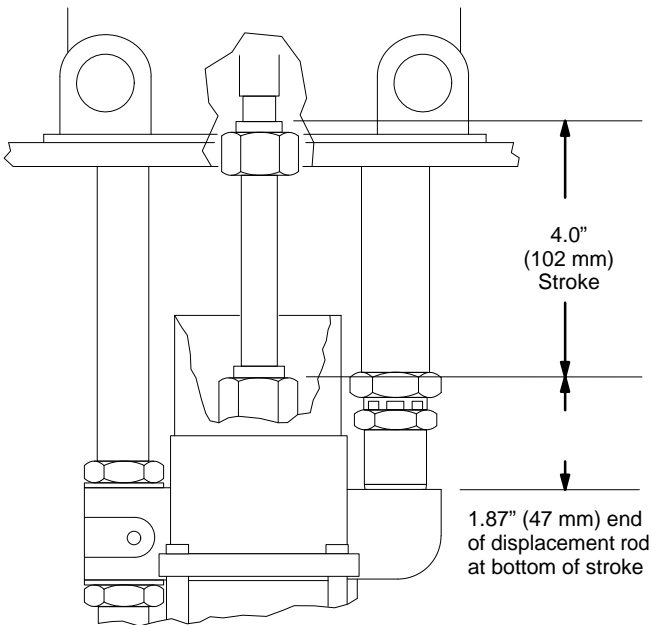
Model No.	A	B	C
224-758	40 in. (1016 mm)	20 in. (508 mm)	20 in. (508 mm)

# Manual Change Summary

## Mounting Hole Layout



Assembly Changed	Part Status	Ref. No.	Part No.	Name
Model 224-758, to Series C	Added	32	190-065	Coupling Nut
	Added	33	190-066	Collars
	Old	20	218-792	Conn. Rod
	New	20	191-738	Conn. Rod



06120

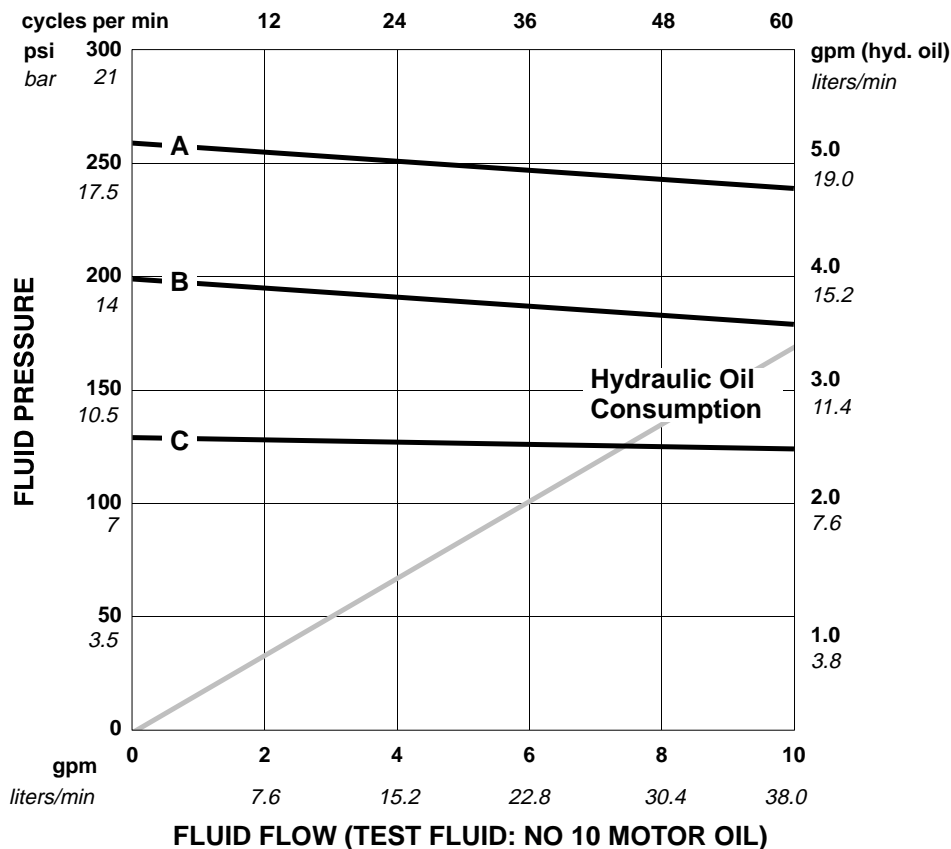


# Technical Data

Category	Data
Maximum fluid working pressure	250 psi (17.5 bar)
Maximum hydraulic input pressure	1000 psi (70 bar)
Pump cycles per 1 gallon (3.8 liters)	6
Fluid flow at 60 cycles per minute	10 gpm (38 liters/min)
Fluid inlet size	1-1/2 npt(f)
Fluid outlet size	1 in. npt(f)
Hydraulic oil inlet size	3/4 unf-2a
Weight	48 lb (22 kg)
Maximum pump operating temperature	180°F (82°C)
Wetted parts	<i>Supply and Return Tubes: Nickel-plated carbon steel Displacement Pump: Refer to manual 307-983</i>

**KEY:** Fluid Outlet Pressure – Black Curves  
Hydraulic Oil Consumption – Gray Curve

**A** 1000 psi (70 bar) hydraulic pressure  
**B** 750 psi (53 bar) hydraulic pressure  
**C** 500 psi (35 bar) hydraulic pressure



**To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating hydraulic 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 Hydraulic Oil Consumption (gpm or liters/min) at a specific fluid flow (lpm/gpm) and operating hydraulic pressure (bar/psi):**

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





# Graco Warranty and Limitation of Liability

## WARRANTY

Graco warrants all equipment listed in this manual which is manufactured by Graco 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. Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, 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.

### For Sales to Canadian Customers:

Except as expressly stated herein, Graco makes no representations, warranties or conditions, express, implied or collateral, concerning any goods or services sold, and **GRACO SHALL NOT BE LIABLE IN ANY MANNER FOR** any other representation, warranty or condition of any kind, whether arising by operation of law or otherwise, including but not limited to, **WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

## LIMITATION OF LIABILITY

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or for the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

# Graco Phone Number

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

**Sales Offices:** Atlanta, Chicago, Detroit, Los Angeles

**Foreign Offices:** Belgium, Canada, England, Korea, Switzerland, France, Germany, Hong Kong, Japan

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

PRINTED IN U.S.A. 308-160 January 1992 Revised April 1996