

# Proportioning Pumps

312068 rev. A

*For proportioning pumps used on Hydraulic Proportioners.*

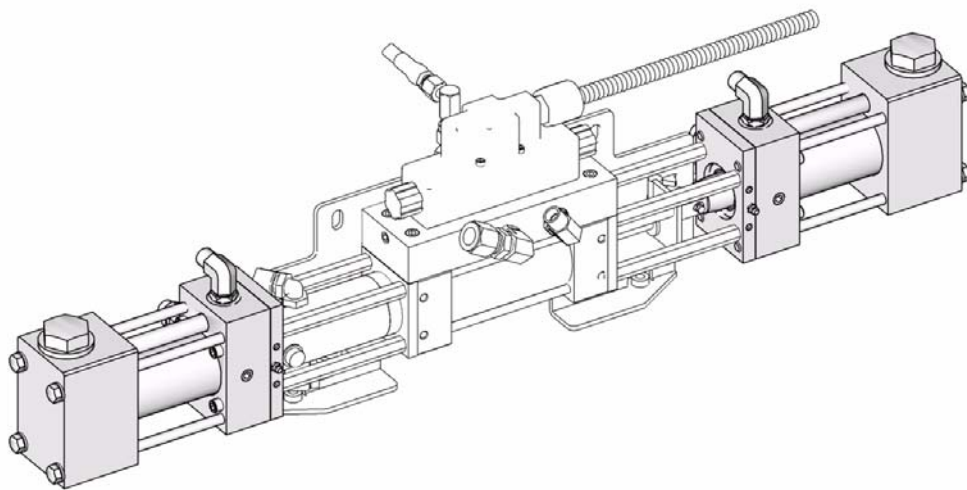


## **Important Safety Instructions**

Read all warnings and instructions in this manual and in manuals 312062 and 312063. Save both sets of instructions.

*3500 psi (24.0 MPa, 240 bar) Maximum Working Pressure*

See page 2 for model information.



T19778a

PROVEN QUALITY. LEADING TECHNOLOGY.

# Contents




<b>Models</b> .....	<b>2</b>
<b>Repair</b> .....	<b>2</b>
Flushing .....	2
Pressure Relief Procedure .....	2
Preventive Maintenance .....	3
Pump Base Disassembly .....	3
Pump Base Reassembly .....	3
Piston and Cylinder Seals .....	4
<b>Parts</b> .....	<b>6</b>
<b>Technical Data</b> .....	<b>9</b>
<b>Graco Standard Warranty</b> .....	<b>10</b>
<b>Graco Information</b> .....	<b>10</b>

# Models

Part, Series	Cylinder Size
<b>247371, A</b>	#30
<b>247372, A</b>	#40
<b>247373, A</b>	#48
<b>247374, A</b>	#60
<b>247375, A</b>	#80
<b>247376, A</b>	#96
<b>247377, A</b>	#120





## Repair

### Flushing

						
Flush equipment only in a well-ventilated area. Do not spray flammable fluids. Do not turn on heaters while flushing with flammable solvents.						

- Flush out old fluid with new fluid, or flush out old fluid with a compatible solvent before introducing new fluid.
- Use lowest possible pressure when flushing.
- To flush entire system, circulate through gun fluid manifold (with manifold removed from gun).
- Always leave some type of fluid in system. Do not use water.

### Pressure Relief Procedure

						
Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.						

1. Select **Park** on Pump Control Switch.
2. Turn off feed pumps.
3. Trigger gun to relieve pressure.
4. Close gun inlet valves.
5. Close fluid supply inlet valves.
6. Service spray gun. See corresponding spray gun manual.

## Preventive Maintenance

When pumps are functioning properly, it is not unusual for a trace amount of resin to seep past the pump packing onto the resin pump shaft. Routinely inspect shaft and wipe away any residue when the proportioner is turned off. Disassemble and clean the proportioning pumps annually. Inspect the pistons and cylinder for marks or scratches, which may cause leakage and damage to packings. Replace all packings, o-rings, expanders, and packing springs annually.

## Pump Base Disassembly



Disassemble and clean pump base annually.


1. Relieve pressure, page 2.
2. Turn OFF the main disconnect and lock out power at the source.
3. Remove pump cap (19) from pump base (23), and remove o-ring (6):
  - a. Remove outlet ball (4) and o-ring (9).
  - b. Remove inlet ball cage (14), spring (22) and inlet ball (10).
  - c. Remove inlet ball seat (11) and o-ring (9) from bottom of cavity.
- d. Thoroughly clean all metal parts in a compatible solvent and inspect for wear or damage. Inspect each ball and seat for nicks or scratches; replace as required.
- e. Replace all o-rings. Kit 261859 contains all o-rings for pump base rebuild.

## Pump Base Reassembly

1. Install inlet valve in pump base by inserting o-ring (9), inlet ball seat (11), ball (10), spring (22), and inlet ball cage (14) into pump base cavity. See **Parts** on page 6.
2. Install outlet valve in pump base:
  - a. Install o-ring (9) and valve ball (4) into the cavity.
  - b. Install the o-ring (6) on pump cap (19). Install and tighten cap to pump base. Torque to 75 ft-lb (101.3 N•m).

## Piston and Cylinder Seals



 Piston Seal and Cylinder Seal Repair Kits are available. See Table 1 on page 7 to order the correct kits for your pump. Also see kit manual 312071.

### Disassembly

1. Relieve pressure, page 2.
2. Turn OFF the main disconnect and lock out power at the source.
3. Disconnect the pump inlet and outlet lines; see your proportioner repair manual. Remove the four screws (30) holding the pump outlet flange (26) to the hydraulic cylinder. Disconnect pump from drive and take pump assembly to a workbench.
4. Remove the four bolts (8) and washers (5). See **Parts** on page 6.
5. Remove the flange retainer (27), gasket (17), bushing (13), and adapter ring (29).
6. Use a soft-faced mallet to help separate pump base (23) and outlet flange (26) from cylinder (12). Remove crossover tube (24).
7. Remove piston from cylinder bore. Remove piston cap bolt (25), then slide bushing (18) and u-cup seal (15) from rod.
8. Thoroughly clean all parts in a compatible solvent and inspect for wear or damage. Replace as required.

### Reassembly

#### CAUTION

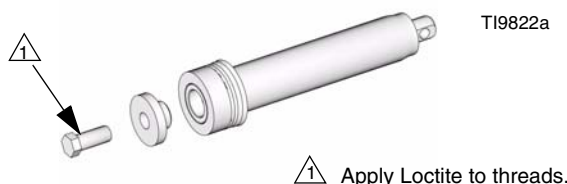
To prevent cross-contamination of the equipment's wetted parts, **never** interchange component A (isocyanate) and component B (resin) parts.

1. Install piston rod seal; ensure u-cup faces piston rod as shown in FIG. 1.



**FIG. 1: U-Cup Orientation**

2. Assemble piston head to piston rod. Tighten piston head; see Torque Specification table for torque according to pump size.



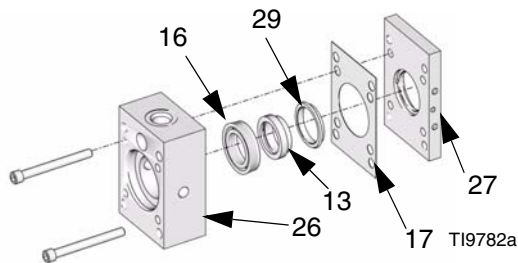
**FIG. 2: Piston Head and Rod**

#### Torque Specification

Pump Size	Torque
30	130 in-lb (14.7 N•m)
40, 48, 60	22 ft-lb (29.7 N•m)
80, 96, 120	45 ft-lb (60.8 N•m)

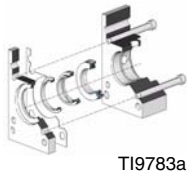
3. Assemble the piston parts on the piston shaft, using the new parts in the piston seal kit. Apply supplied thread locker to piston bolt and torque to spec on **Parts** drawing, page 6.

4. Using supplied bolts in the cylinder seal kits, press seal (16) into outlet flange (26). Ensure seal faces cylinder. Assemble bushing (13) throat seal (29) and flange adapter (29) into flange retainer (27) and fasten to outlet flange.



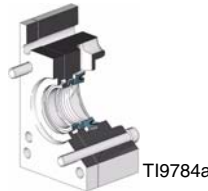
5. Ensure plate is parallel with block. Carefully tighten screws until plate is flush with block. Be sure to press seal straight into bore.

Seal Alignment



TI9783a

Pressed Seal



TI9784a

6. Insert piston rod (28) through throat seal (29) on front of block.



TI9787a

7. Place assembly on a spacer, such as a 2 in. (51 mm) wide roll of tape, and tap piston rod (28) through throat seal (29) and bearing.



TI9788a

8. Assemble o-rings (1) to cylinder (12), and lubricate with grease.
9. Tap cylinder (12) onto piston rod (28) as shown in the following figure. Be careful to not score piston seal. Continue tapping cylinder until it seats in bore of outlet flange (26).

Use grease to aid in insertion of piston rod into cylinder.



TI9819a

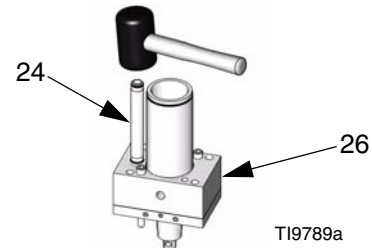
Cylinder Assembly



TI9820a

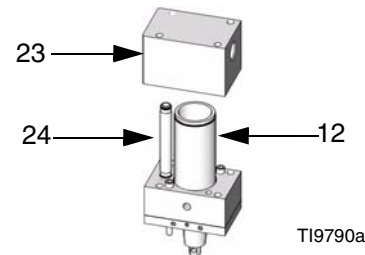
Seat Cylinder in Bore

10. Assemble o-rings (2) to crossover tube (24) and lubricate with grease. Insert crossover tube into outlet flange (26). Softly tap crossover tube into bore until it seats.



TI9789a

11. Carefully align cylinder (12) and crossover tube (24) to bores in pump base (23). Tap pump base until the cylinder is fully seated in bore.



TI9790a

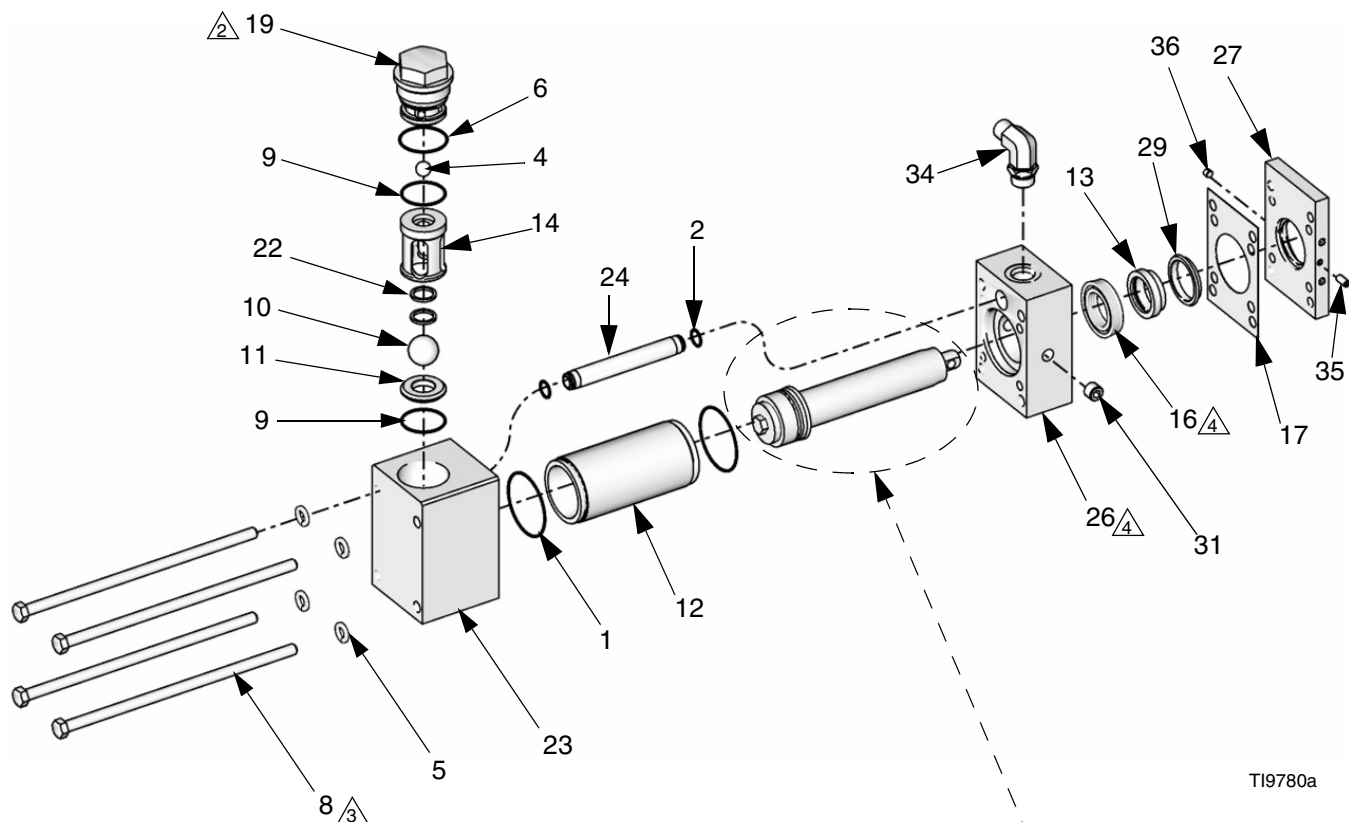
12. Install four bolts (8) and washers (5). Torque to 45 ft-lb (60.8 N•m).

<b>CAUTION</b>
----------------


Keep rod straight to prevent damage to throat seal.
---






# Parts

## A Side Shown

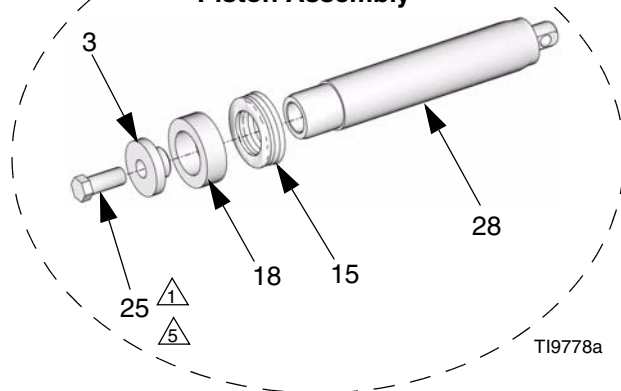


TI9780a

 B side of pump is same as A side except items 31, 34, 35, and 36 are reversed.

-  Apply supplied sealant to threads
-  Torque to 75 ft-lb (101.3 N•m)
-  Torque to 45 ft-lb (60.8 N•m)
-  Seal must be pressed straight into housing
-  See Torque Specification table for torque according to pump size

### Piston Assembly



TI9778a

### Item 25 Torque Specification

Pump Size	Torque
30	130 in-lb (14.7 N•m)
40, 48, 60	22 ft-lb (29.7 N•m)
80, 96, 120	45 ft-lb (60.8 N•m)

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1✿		O-RING, PTFE	2	16✕		SEAL, throat, u-cup	1
2✿		O-RING, TPE	2	17✕		GASKET	1
3◆		CAP, piston	1	18✕		BUSHING, piston, acetal	1
4	105445	BALL, valve, outlet, SST; 1/2 in. (13 mm) diameter	1	19	261867	CAP, ball guide	1
5	261866	WASHER, flat, packing support (4 pack)	1	22	261897	SPRING, valve	1
6✿		O-RING, PTFE	1	23	261903	PUMP, base	1
8	261865	SCREW, hex hd cap; 3/8-24 x 9.0 in. (228 mm) (4 pack)	1	24	261898	TUBE, crossover	1
9✿		O-RING, PTFE	2	25✕		SCREW, hex hd cap	1
10	107167	BALL, valve, inlet, SST; 1 in. (25 mm) diameter	1	26◆		FLANGE, outlet	1
11	193395	SEAT, ball, inlet, carbide	1	27	261875	RETAINER, flange	1
12◆		CYLINDER	1	28◆		ROD, piston; includes cap (ref. 3)	1
13✕		BUSHING, throat, acetal	1	29◆		ADAPTER, throat	1
14	261899	GUIDE, inlet ball, with outlet ball seat	1	31	295225	PLUG, pipe, flush	1
15✕		SEAL, piston, u-cup	1	34	120401	ELBOW, 3/4-16 unf x 1/2 in. (13 mm) O.D. tube	1
				35	295229	FITTING, grease; 1/4-28	1
				36	M70430	SCREW, set; 1/4-28 x 3/16 in.	1

◆ Refer to Table 1 for part number.

✕ Refer to Table 1 for part number.

✖ Refer to Table 1 for part number.

✿ Parts included in Kit 261859 (purchase separately).

Table 1. Proportioning Pump Parts Matrix

	Pump Sizes and Part Numbers						
	#30	#40	#48	#60	#80	#96	#120
Part Ref.	247371	24372	247373	247374	247375	247376	247377
3	261889	261886	261886	261886	261883	261883	261883
12	261896	261895	261894	261893	261892	261891	261890
26	261902	261902	261902	261902	261901	261901	261901
28	261882	261881	261880	261879	261878	261877	261876
29	261874	261873	261872	261871	261870	261869	261868

Table 2. Cylinder Seal Kits; Includes Parts 13, 16, 17

Pump	Proportioning Pump Size	Kit
247371	30	261858
247372	40	261857
247373	48	261856
247374	60	261855
247375	80	261854
247376	96	261853
247377	120	261852

Table 3. Piston Seal Kits; Includes Parts 15, 18, 25

Pump	Proportioning Pump Size	Kit
247371	30	261851
247372	40	261850
247373	48	261849
247374	60	261848
247375	80	261847
247376	96	261846
247377	120	261845



A series of horizontal lines for writing, consisting of 20 lines. Each line is preceded by a small vertical margin line on the left side.



# Technical Data

Category	Data
Maximum working pressure	3500 psi (24.0 MPa, 240 bar)
Maximum fluid temperature	190°F (88°C)
Viscosity range	250-1500 centipoise
Maximum material inlet pressure	400 psi (2.7 MPa, 27 bar)
Wetted parts	Carbon Steel, Stainless Steel, Chrome, PTFE, Acetal, UHMWPE

Loctite® is a registered trademark of the Loctite Corp.

# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, 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.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or 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.

## **FOR GRACO CANADA CUSTOMERS**

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

# Graco Information

**TO PLACE AN ORDER,** contact your Graco distributor or call to identify the nearest distributor.

**Phone:** 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

*All written and visual data contained in this document reflects the latest product information available at the time of publication.  
Graco reserves the right to make changes at any time without notice.*

MM 312068

**Graco Headquarters:** Minneapolis  
**International Offices:** Belgium, China, Japan, Korea

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

www.graco.com  
312068A  
4/2007