



# Viscount™

307654T

## Hydraulic Reciprocator

1000 psi (6.9 MPa, 69 bar) Maximum Hydraulic Input Pressure

### Part No. 217222, Series J

Patent No. 4,383,475  
Foreign Patents Pending  
Patent 1984 Canada  
Brevete 1984

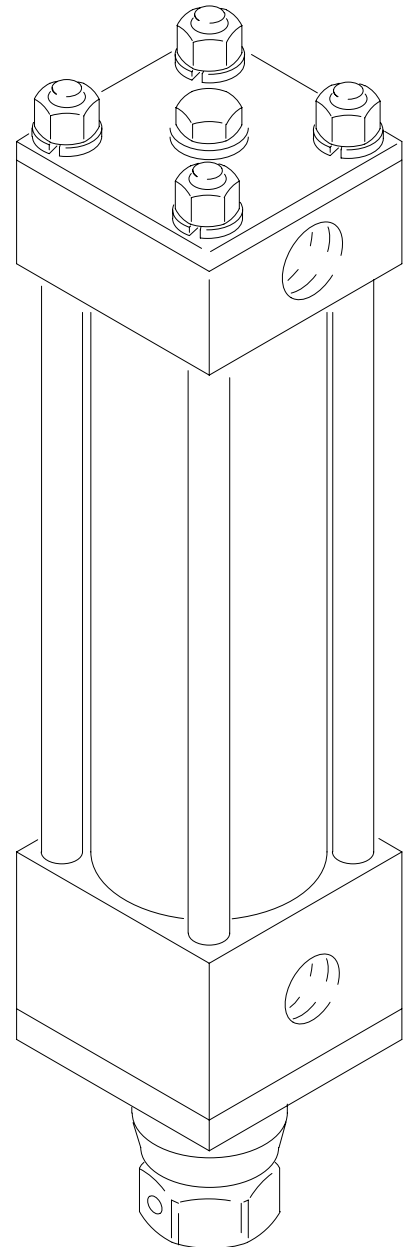
**NOTE:** Reciprocator does not include base.  
Refer to complete pump instructions for ordering.



#### Important Safety Instructions

Read all warnings and instructions in this manual.  
Save these instructions.

See page 14 for maximum working pressures.



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# Symbols

## Warning Symbol



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

## Caution Symbol



This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the corresponding 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 you operate 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 component in your system. This equipment has a **1000 psi (6.9 MPa, 69 bar) maximum hydraulic input pressure.**
- Use fluids and solvents that 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 kink or overbend hoses or 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).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# WARNING



## SKIN INJECTION HAZARD

Spray from the dispensing valve, leaks or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not point the dispensing valve at anyone or at any part of the body.
- Do not put your hand or fingers over the end of the dispensing valve.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Use only extensions and no-drip tips that are designed for use with your dispensing valve.
- Do not use a low pressure flexible nozzle with this equipment.
- Follow the **Pressure Relief Procedure** on page 6 if the grease fitting coupler clogs and before cleaning, checking, or servicing the equipment.
- Tighten all fluid connections before you operate the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Fluid hoses must have spring guards on both ends, to help protect them from rupture caused by kinks or bends near the couplings.



## TOXIC FLUID HAZARD

Hazardous fluids 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.

# 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.
- Before operating this equipment, electrically disconnect all equipment in the spray area.
- Before operating this equipment, 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 spraying or while there are any fumes in the air.
- Do not operate a gasoline engine in the spray area.
- Keep a fire extinguisher in the work area.



## MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers.

- Keep clear of all moving parts when you start or operate the pump.
- Before you service the equipment, follow the **Pressure Relief Procedure** on page 6 to prevent the equipment from starting unexpectedly.

# Installation

## ⚠ CAUTION

### Keep the Hydraulic System Clean

To reduce the risk of damaging the reciprocator hydraulic power supply, blow out all hydraulic lines with air, flush thoroughly with solvent, and blow out with air again before connecting the lines to the reciprocator.

Always plug the hydraulic inlets, outlets, and lines when disconnecting them for any reason to avoid introducing dirt and other contaminants into the system.

Carefully follow the manufacturer's recommendations on reservoir and filter cleaning, and periodic changes of hydraulic fluid.

## ⚠ CAUTION

### Recommended Hydraulic Oil

Use Graco-approved Hydraulic Oil or the equivalent. The equivalent is a premium, ISO grade 46 petroleum-based hydraulic oil containing rust and oxidation inhibitors and anti-wear agents.

Before using any other type of oil in this Graco reciprocator, contact your Graco distributor, or order by Part No. from the following list:

**169236**            5 gallon (20 liter)

**207428**            1 gallon (3.8 liter)

Unauthorized use of lesser grade oil or substitutes may void the warranty.

Mount the pump to suit the type of installation planned.

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

### Hydraulic Shut-Off Valves

To order hydraulic shut-off valves, order by Part No. from the list below:

**102644**            3/4 npt(f); for supply line

**102645**            1" npt(f); for return line

### If the Pump Leaks at the Fluid Fittings

Tighten the fittings (B or K). See Fig. 1. These fittings are self sealing and have replaceable o-rings. If leaking persists, change the o-rings. Refer to the manual covering the pump and reciprocator assembly for o-ring part numbers.

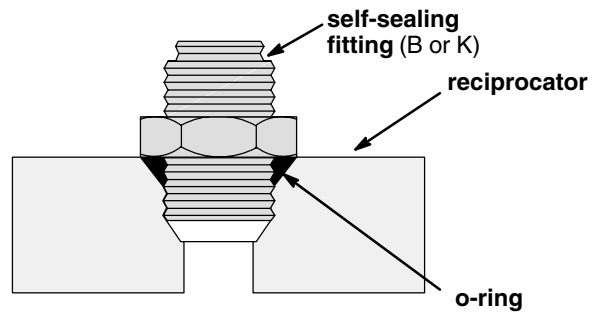


Fig. 1

## Grounding

To reduce the risk of static sparking, ground the pump. Check your local electrical code for detailed grounding instructions for your area and type of equipment.

1. *Pump:* Use ground wire and clamp as shown to the right.
2. *Hydraulic Hoses and Fluid Outlet Hoses:* Use only electrically conductive hoses.
3. *Hydraulic Power Supply and Air Compressor:* Follow manufacturer's recommendations.
4. *Any pails used when flushing:* Use only metal, grounded pails when flushing. Make firm metal-to-metal contact between the a metal part of the dispense valve and the pail. Use the lowest possible pressure.

**To ground the pump,** loosen the grounding lug locknut (W) and washer (X). Insert one end of a 12-ga (1.5 mm<sup>2</sup>) minimum ground wire (Y) into the slot in the lug (Z), and tighten the locknut securely. Connect the other end of the wire to a true earth ground. See Fig. 2. *To order a ground wire and clamp, order Part No. 222011.*

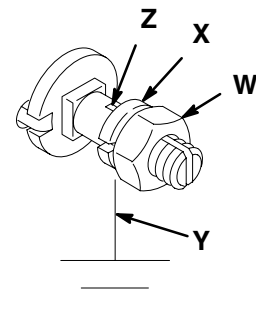


Fig. 2

# Operation

Before you start the pump, check the hydraulic fluid level, and add fluid as necessary to fill the lines, before each use.

## CAUTION

### Hydraulic Oil Working Temperature

The recommended hydraulic oil operating temperature is 80 to 115° F (27 to 45° C). The reciprocator seals will wear faster and leakage may occur if the pump is operated at higher oil temperatures.

If the hydraulic oil temperature approaches 130° F (54° C), check the hydraulic fluid supply cooling system, filters, etc. and clean or repair as needed.

## Shutdown and Care

Relieve the pressure.

## WARNING

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

ALWAYS shut off the supply line shutoff valve *first*, and then the return line shutoff valve. This is to prevent overpressurizing the reciprocator or its seals. When starting the hydraulic system, open the return line shutoff valve first.

## Pressure Relief Procedure

## WARNING



### SKIN INJECTION HAZARD

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- Are instructed to relieve the pressure
- Stop spraying
- Check or service any of the system equipment
- Install or clean the nozzle

1. Close the supply line shut-off valve and the return line shut-off valve. Shut off the hydraulic power supply. See **Hydraulic Shut-Off Valves** on page 5.
2. Open the dispensing valve to relieve pressure.
3. Open the pump outlet drain valve, and have a container ready to catch the fluid.
4. Leave the drain valve open until you are ready to spray again.

*If you suspect that the 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 to relieve pressure. Now clear the obstruction.*

# Service

## Disconnecting the Reciprocator and Displacement Pump. See Fig 3.

1. Flush the pump if possible and stop it with the displacement rod in the lowest position.
2. **Relieve the pressure.**

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 6.

3. Disconnect the outlet hose from the displacement pump.
4. Slowly loosen the hydraulic supply and return hose connections (A & B) to relieve any pressure, and then remove the hoses. Install plugs on the tube fittings and in the hose ends.

### **CAUTION**

ALWAYS keep the hydraulic oil system clean and free of contaminants to reduce the risk of damaging the hydraulic reciprocator. Install a plug in each tube fitting and on each hose end whenever fluid lines are disconnected.

5. Remove the three nuts (H) from inside the pump base (J).
6. Remove the connecting rod pin (E).
7. Pull the motor off the pump base (J).
8. Remove the four nuts (C) and lockwashers from inside the reciprocator base (D).
9. Loosen the fluid tube nuts (F).
10. Loosen the jam nuts (K) on the tube fittings (A & G). Then use a wrench to rotate the tube fittings to the side, and remove the tube. Install plugs in the fittings.

## Reciprocator Repair

Motor repair kit 218210 is available. See the Parts List on page 12. For the best results, use all the parts in the kit.

Inspect all other parts for wear or damage and replace as needed.

**NOTE:** In addition to typical repair equipment, the following are also needed:

- Assembly tool 189305
- Fresh Loctite® 242 and 609 thread sealants, Loctite® Primer T or Perma-Loc® 115 thread sealant, and Perma-Bond® Surface Conditioner I  
**Note:** Use Loctite® 609 on yoke (9) and rod (12) on page 8, step 13 only. Use Loctite® 242 and 115 on other threaded surfaces as required.
- Chlorinated solvent
- No. 10–24 UNC-2B tap

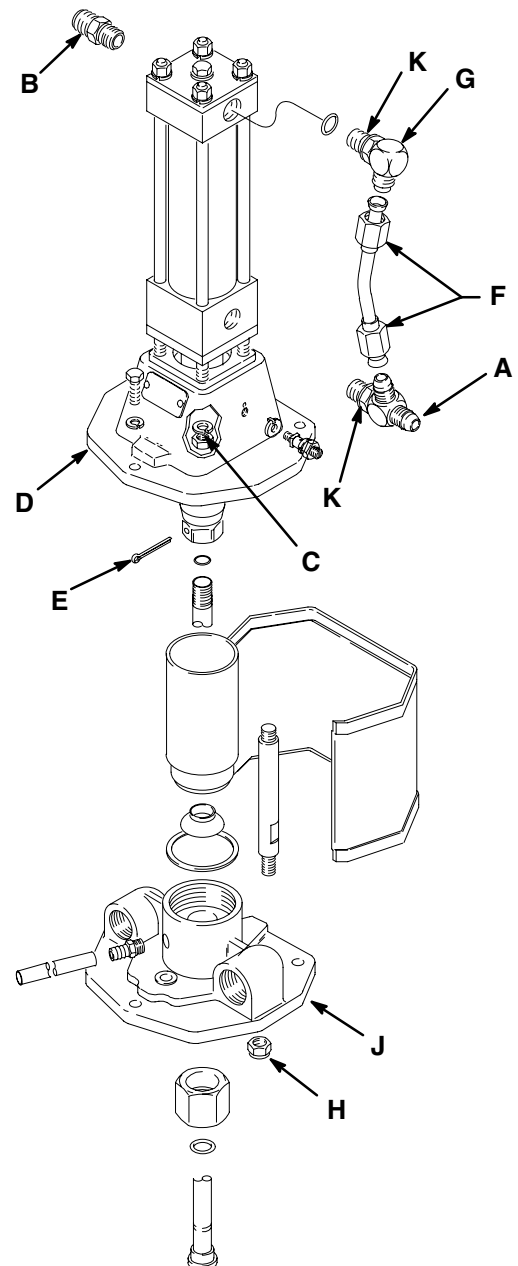


Fig. 3

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# Service

Refer to Fig. 4 when you are doing steps 1 to 16.

1. Remove the nuts (36) and lockwashers (37) on top of the reciprocator.
2. Slide the upper cylinder cap (1) and cylinder (25) together off the lower cylinder cap (32). Tap upward on the bottom of the displacement rod (34) with a plastic mallet to loosen the cylinder.
3. Grasp the displacement rod (34) and pull the cylinder off the upper cap (1).
4. Place a clean rag around the yoke (9) to prevent the detent balls from popping out. Then slide yoke sideways off the valve sleeve (29) while holding the balls (7) and spring (6) in place.
5. Hold the hex end of the displacement rod (34) in a vise and use a spanner wrench in the pin holes of the piston (22) to screw it off the rod.

## CAUTION

Be careful not to scratch the outside of the displacement rod.

6. Slide the displacement rod off.
7. Unscrew the nut (18) and remove the spring (21) from the stop rod (12). Install a new spring (21\*) and screw on the nut (18), adjusting the nut as shown in Detail A in Fig. 4.
8. Replace the piston bearing (24\*), piston seal (23\*), o-ring (41\*), and o-ring (17\*).
9. Tap the housing retainer (33) with a plastic mallet to loosen it, and then pull it away from the lower cylinder cap (32).
10. Remove the block packing (15\*) and o-ring (13\*). Install the new parts in reverse order.
11. Reassemble the housing retainer and lower cylinder cap.

12. Remove the o-ring (13\*) from the top of the lower cylinder cap and install a new o-ring.

**NOTE:** If any of these parts are being reused, use a surface cleaner such as chlorinated solvent on the threads and blow with compressed air. If needed, use a #10–24 UNC–2B tap to remove adhesive from the internal threads of the yoke (9).

See the **NOTE** in the **Reciprocator Repair** section on page 7 for the thread sealant and primer required for step 13.

**NOTE:** Loctite® 609 is used only on step 13 below.

13. Apply three drops of fresh thread sealant to the first two or three internal threads of the yoke (9). Apply primer to the external thread of the rod (12). Let dry for three or four minutes. Assemble, and torque the rod to 96–100 in-lb (10.8–11.2 N•m). Remove excess sealant. Allow 24 hours to cure before operating the motor.

**NOTE:** If you disassemble the valve stop (26) and valve sleeve (29) from the upper cylinder cap assembly, use the same cleaning process, primer and adhesive as in step 13. Use Loctite® 242 and primer or Perma-Loc® 115.

14. Remove the capscrew (3), sealing washer (2) and o-ring (39\*) from the cap plate (30). Lift off the cap and remove the o-ring (4\*). Reassemble these parts, using new parts (39\* & 4\*) from the repair kit.
15. Remove the o-ring (13\*) from the bottom of the upper cylinder cap, and replace it with a new o-ring.
16. Hold the piston (22) with a spanner wrench and screw on the displacement rod (34). Torque to 30 to 40 ft-lb (41 to 54 N•m).
17. Lay Assembly A and Assembly B (as labeled in Fig. 5) on the workbench.
18. Slide Assembly B into the the center of the tool. Align the upper detent holes of the yoke (9) with the center line of the tool. See Fig. 5.



# Service

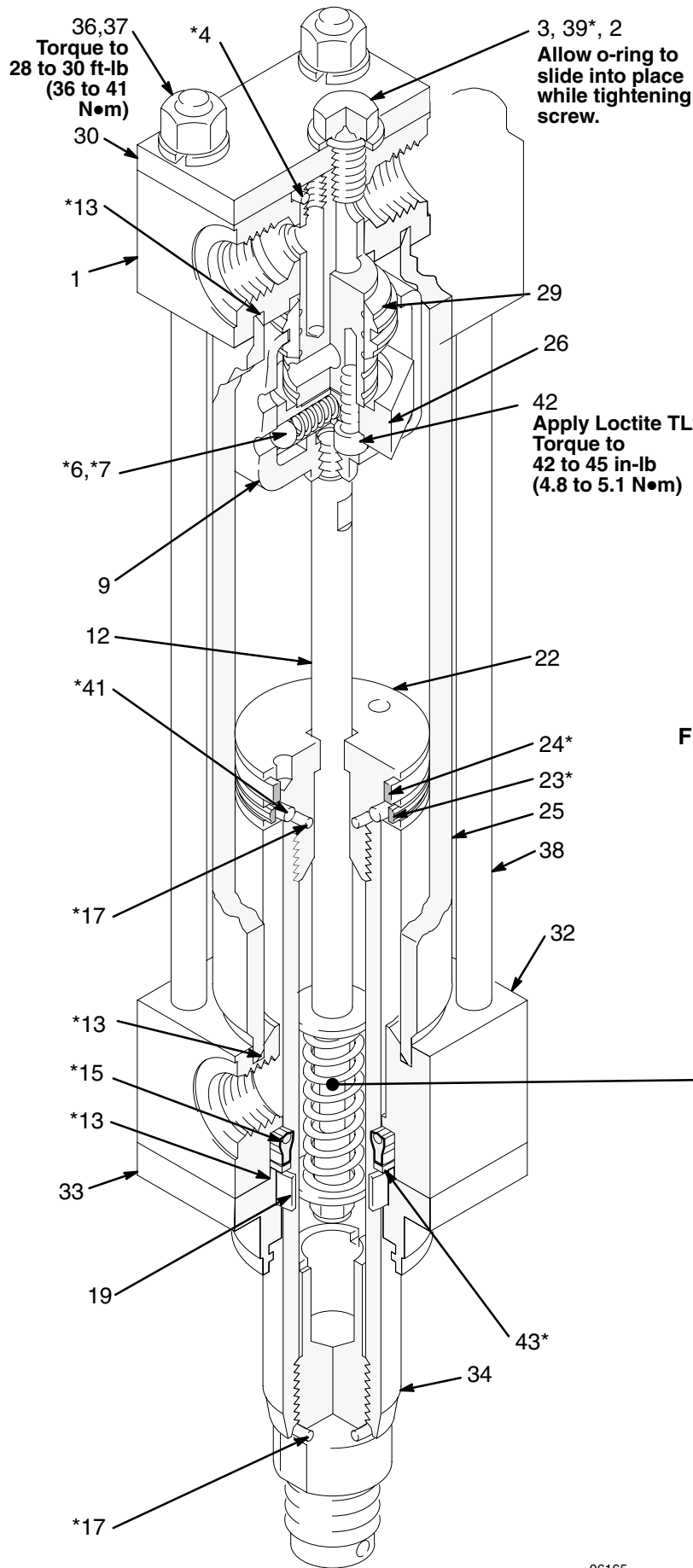


Fig. 4

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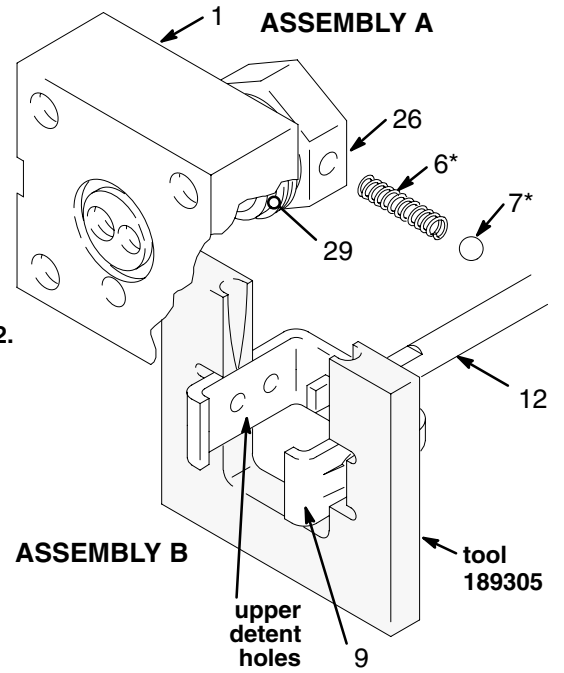
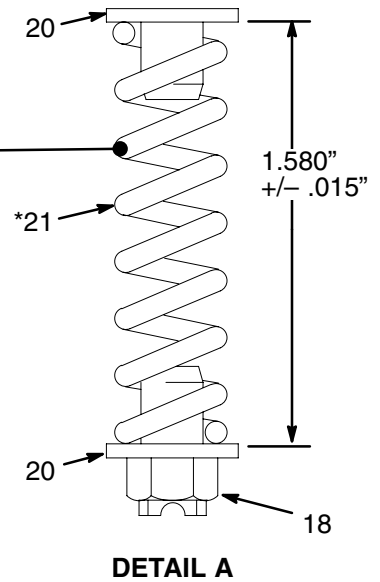


Fig. 5

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# Service

19. Insert the spring (6\*) and one ball (7\*) into the valve stop (26) of Assembly A. Tilt the valve stop and start guiding it into the tool, making sure the ball is sliding into the rounded slot in the tool. Place the other ball at the other end of the spring and push it in with your thumb while rotating the valve stop (26) until the spring is horizontal and the balls are in place. Continue holding this assembly together. See Fig. 5.
20. Place your thumbs on the valve stop (26) and, grasp the bottom of the tool with your other fingers and press the assemblies together. Make sure the balls (7\*) snap into the upper set of holes in the yoke (9), and the curved ends of the guide clamp have engaged the valve sleeve (29) groove. Slide the tool back over the rod (12) to remove it. See Fig. 5.
21. Slide the lower cylinder cap (32) onto the displacement rod. See Fig. 4.

**NOTE:** When you reinstall the cylinder (25) (step 22), be sure the “P” port in the upper cylinder cap (1) and the port in the lower cylinder cap (32) are in line with each other. Be sure the o-rings (13\*) are in place in the cylinder caps.

## CAUTION

When inserting the piston into the cylinder, carefully guide the piston seal (23\*) and bearing (24\*) to prevent damaging these parts.

22. Reinstall the tie rods (38) with the short threaded end at the upper cylinder cap. Install the nuts (36), and leave approximately one thread exposed. Torque the nuts to 28 to 30 ft-lb (36 to 41 N•m).

## CAUTION

Never install the fluid tube, which connects the upper and lower cylinder caps, before you torque the tie rods, as that could cause misalignment and damage the reciprocator when it is operated.

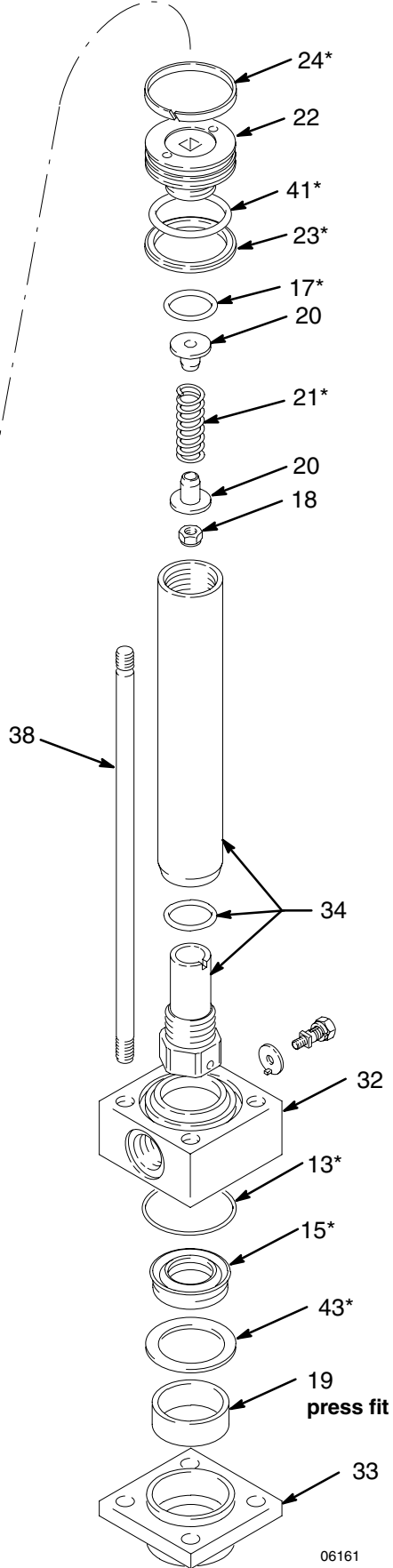
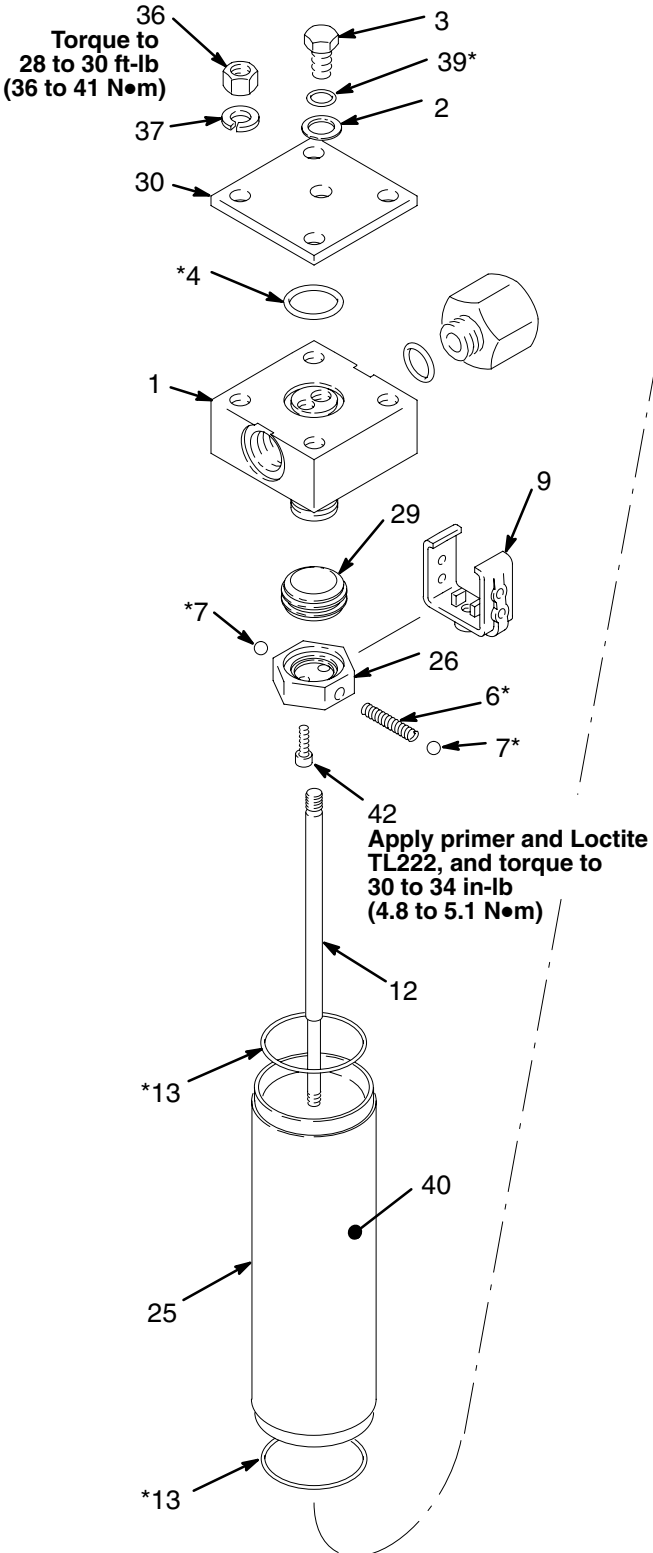
23. Inspect the o-rings on the fittings, and replace them if they are worn (See Fig. 1 on page 5). Refer to the complete pump manual for o-ring part numbers. Reinstall the fluid tube and fittings. Tighten the fittings enough to prevent leakage.
24. Pull the displacement rod (34) in and out to be sure it moves easily with only a little resistance from the rod seal.
25. Reconnect the reciprocator to the base.

## WARNING

If the grounding wire was disconnected while servicing the reciprocator or pump, be sure to reconnect it before you operate the pump.

# Parts Drawing

## Model 217222, Series J, Hydraulic Reciprocator



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# Parts List

## Model 217222, Series J, Hydraulic Reciprocator

| Ref. No. | Part No. | Description   | Qty. | Ref. No. | Part No. | Description                             | Qty. |
|----------|----------|---|------|----------|----------|---|------|
| 1        | 239874   | CYLINDER CAP ASSY, upper<br><i>includes item 42</i> | 1    | 24*      | 178207   | BEARING, piston;<br>bronze-filled PTFE  | 1    |
| 2        | 178179   | WASHER, sealing                                     | 1    | 25       | 178229   | CYLINDER, motor; cs                     | 1    |
| 3        | 106276   | CAPSCREW, hex hd; 3/8" thd x<br>0.625" long         | 1    | 26       | 192654   | STOP VALVE                              | 1    |
| 4*       | 104093   | O-RING; nitrile rubber                              | 1    | 29       | 189072   | SLEEVE, valve; steel                    | 1    |
| 6*       | 108437   | SPRING, compression; steel                          | 1    | 30       | 178181   | PLATE, cap                              | 1    |
| 7*       | 100069   | BALL; steel; 1/4" dia.                              | 2    | 32       | 178235   | CAP, cylinder, bottom                   | 1    |
| 9        | 189077   | YOKE, valve   | 1    | 33       | 178233   | RETAINER, housing                       | 1    |
| 12       | 192657   | ROD, trip   | 1    | 34       | 222301   | ROD, displacement; cs                   | 1    |
| 13*      | 106274   | O-RING; buna-N                                      | 3    | 36       | 106292   | NUT, hex; 3/8" thread                   | 4    |
| 15*      | 109194   | V-PACKING, block                                    | 1    | 37       | 100133   | WASHER, lock; 3/8"                      | 4    |
| 17*      | 105765   | O-RING; buna-N                                      | 2    | 38       | 178228   | ROD, tie; 12.28" (312 mm); cs           | 4    |
| 18       | 114231   | LOCKNUT, hex, 10-32 UNF-3B;<br>with nylon insert    | 1    | 39*      | 155685   | O-RING; buna-N                          | 1    |
| 19       | 178185   | BEARING, sleeve                                     | 1    | 40▲      | 179885   | LABEL, warning                          | 1    |
| 20       | 192655   | RETAINER, spring                                    | 2    | 41*      | 108014   | O-RING; buna-N                          | 1    |
| 21*      | 178189   | SPRING, compression; steel                          | 1    | 42       | 104092   | CAPSCREW, sch;<br>10-24 UNRC-3A X .625" | 2    |
| 22       | 192656   | PISTON  | 1    | 43*      | 183915   | WASHER                                  | 1    |
| 23*      | 178226   | SEAL, piston; glass-filled PTFE                     | 1    |          |          |   |      |

\* Included in repair kit 218210. The kit includes part no. 108094 which is not used on Series J and above.

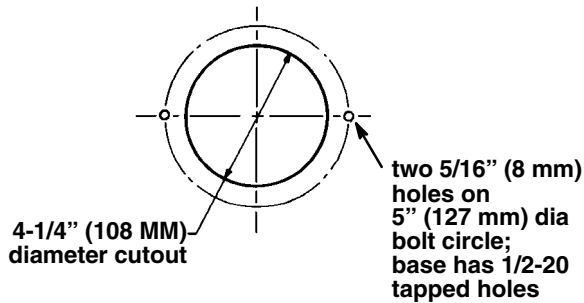
To convert older reciprocators to Series J, order Conversion Kit 239875.

▲ Replacement warning labels available at no charge.

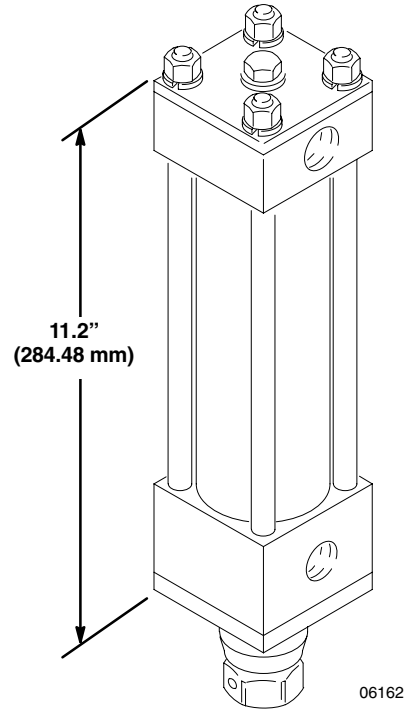
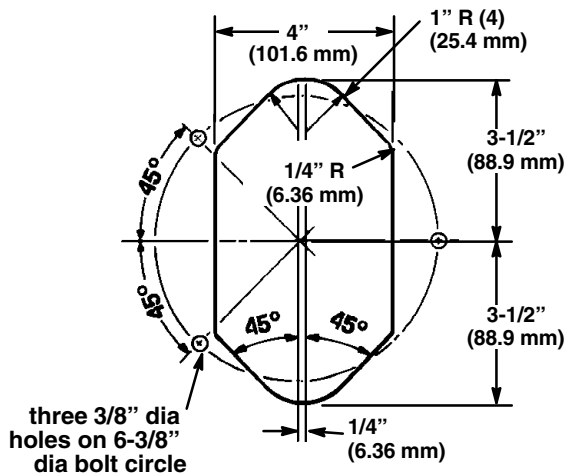
# Mounting Hole Layout

# Dimensional Drawing

## 3-TIE-ROD MOUNTING



## 2-TIE-ROD MOUNTING



# Technical Data

|  |   |
|--|---|
| Maximum hydraulic fluid input pressure | 1000 psi (6.9 MPa, 69 bar)  |
| Maximum hydraulic fluid input volume   | 3 gpm (11.3 liter/min)  |
| Fluid consumption rate                 | 6.5 ounces (0.195 liter) per cycle<br>or 1 gallon per 19.5 cycles |
| Maximum fluid temperature              | 130° F (55° C)  |
| Effective piston area                  | 1.48 sq. in. (9.55 cm <sup>2</sup> )                              |
| Piston rod diameter                    | 1 3/8 in. (34.9 mm)   |
| Stroke length                          | 4 in. (101.6 mm)  |
| Thrust at 1000 psi (70 bar)            | 1480 lb (673 Kg)  |
| Weight with base                       | 18.5 lb (83 Kg)   |

Loctite® is a registered trademark of Loctite Corporation.

Perma-Loc® and Perma-Bond® are registered trademarks of Perma-Loc Company.

# Graco Standard Warranty

Graco warrants all equipment 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**

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# Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

**1-800-367-0211 Toll Free**

**612-623-6921**

**612-378-3505 Fax**

*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.*

This manual contains English. MM 307654

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**International Offices:** Belgium, China, Japan, Korea

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