

# Displacement Pump

312745A

*For pressure washing applications.*



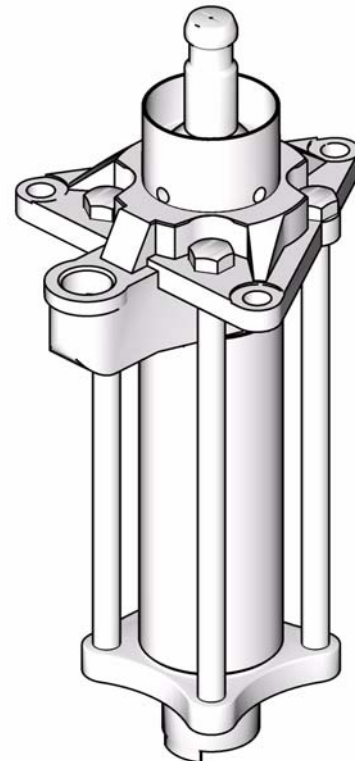
**Important Safety Instructions**

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

**Part No. 247599, Series A**

with PTFE and carbon-filled PTFE packings

*1250 psi (8.7 MPa, 87 bar) Maximum Fluid Working Pressure*




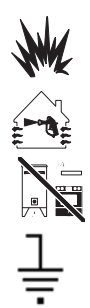

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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.






 <b>WARNING</b>	
	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer’s warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer’s replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>

 <b>WARNING</b>	
	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not point gun at anyone or at any part of the body.</li> <li>• Do not put your hand over the spray tip.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Do not spray without tip guard and trigger guard installed.</li> <li>• Engage trigger lock when not spraying.</li> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> </ul>
	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> in this manual. Disconnect power or air supply.</li> </ul>
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read MSDS's to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> <li>• Always wear impervious gloves when spraying or cleaning equipment.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• Protective eyewear</li> <li>• Clothing and respirator as recommended by the fluid and solvent manufacturer</li> <li>• Gloves</li> <li>• Hearing protection</li> </ul>

# Repair

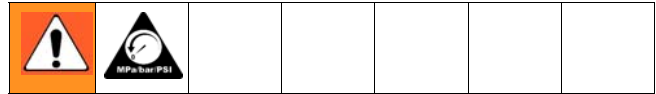
- Packing repair kit 247881 is available. Use all of the parts in the kit for the best results. Kit parts are indicated with an asterisk, for example, (3\*)
- Have all necessary repair parts on hand. Recommended spare parts are indicated in the parts list with a checkmark, for example (2✓).
- The throat and piston packing stacks (11\* and 12\*) are preassembled. Do not disassemble the stacks when you install them.
- Use light, waterproof grease wherever lubrication is indicated.

## Pressure Relief Procedure

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

1. Engage the trigger lock.
2. Close the bleed-type master air valve to shutoff the pump.
3. Disengage the trigger lock.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.
5. Engage the trigger lock.
6. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave the drain valve(s) open until you are ready to spray again.
7. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear the hose or tip obstruction.

## Disassembly



1. Flush the pump, if possible. Stop the pump at the bottom of its stroke. Relieve the pressure, page 4.
2. Disconnect the displacement pump from the air motor as described in Hydra-Clean package manual 312585.
3. See the **Parts** drawing on page 6. Unscrew the four tie bolts (7) and remove the intake valve housing (6).
4. Disassemble the intake valve, taking note of the position of the ball stop pin (5). Inspect the ball (4) and seat for nicks and scratches.
5. Pull the cylinder (2) straight off the outlet housing (1), being careful not to scratch or damage the polished inner wall. Remove the o-rings (3).
6. Loosen the packing nut/wet-cup (15). Pull the displacement rod (8) out the bottom of the outlet housing (1).
7. Inspect the polished inner surface of the cylinder (2) and the outer surface of the displacement rod (8) for scoring or scratches which can damage the packings.
8. Unscrew the piston body (13) from the displacement rod (8). Disassemble the piston. Inspect the ball (4) and seat for nicks or scratches. If you remove the ball stop pin (9), take note of which set of holes it was installed in.
9. Unscrew the packing nut/wet-cup (15). Remove the bearing (14) from the packing nut. Remove the throat packings (12) from the outlet housing (1).
10. Use a compatible solvent to clean parts. Inspect parts for wear or damage and replace parts as needed.

## Reassembly

1. See the **Parts** drawing on page 6. Install the throat gland/packing stack (12\*) into the outlet housing (1), with the lips of the v-packings facing down. The stack is preassembled. Do not disassemble the stack.
2. Install the bearing (14\*) in the packing nut/wet-cup (15) and install the packing nut in the outlet housing (1). Tighten the packing nut/wet-cup just enough to prevent leaking, but no tighter. Overtightening compresses the packings and causes leaking.
3. Install the ball stop pin (9) in the desired holes in the displacement rod (8).
4. Lubricate and install the o-ring (16\*) on the piston body (13).
5. Lubricate and install the gland/packing stack (11\*) on the piston (13) with the lips of the v-packings facing up. The stack is preassembled to the required dimension and includes up to three shims (S). Do not disassemble the stack.
6. Place the ball (4) on the piston (13) and screw the piston into the displacement rod (8). Torque to 150-175 ft-lb (203-237 N•m).
7. Lubricate the outer surface of the displacement rod (8) and slide it up into the outlet housing (1).
8. Install an o-ring (3\*) on the groove at the bottom of the outlet housing (1). Carefully slide the cylinder (2) straight up into the outlet housing, being careful not to scratch or mar the polished inner surface of the cylinder.
9. Place an o-ring (3\*) in the groove of the intake valve housing (6). Install the intake ball (4). Insert the ball stop pin (5) in the desired holes.
10. Install the four tie bolts (7) through the outlet housing (1) and into the intake valve housing (6). Tighten evenly and torque to 57-63 ft-lb (77-85 N•m).
11. Reconnect the displacement pump to the air motor as described in Hydra-Clean package manual 312585.

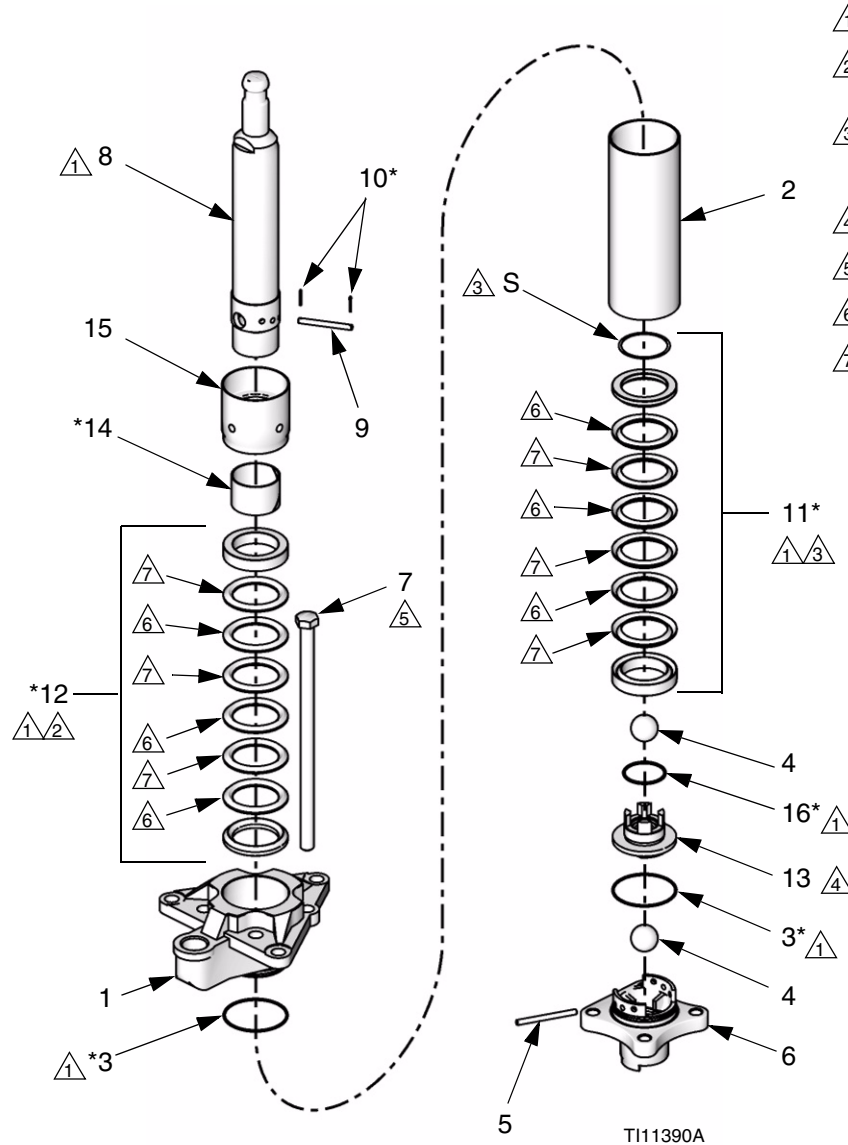
## Check Valve Adjustment

The piston and intake check valves are factory-set for light viscosity fluids. This setting minimizes surging at pump stroke changeover. To adjust the valves for heavier viscosity fluids:

1. Relieve the pressure, page 4.
2. Unscrew the four tie bolts (7) and remove the intake valve (6) and cylinder (2).
3. Remove the ball stop pins (9 and 5) and move them to a higher set of holes to increase the ball travel.
4. Reassemble.

# Parts

## 247599 Displacement Pump, Series A

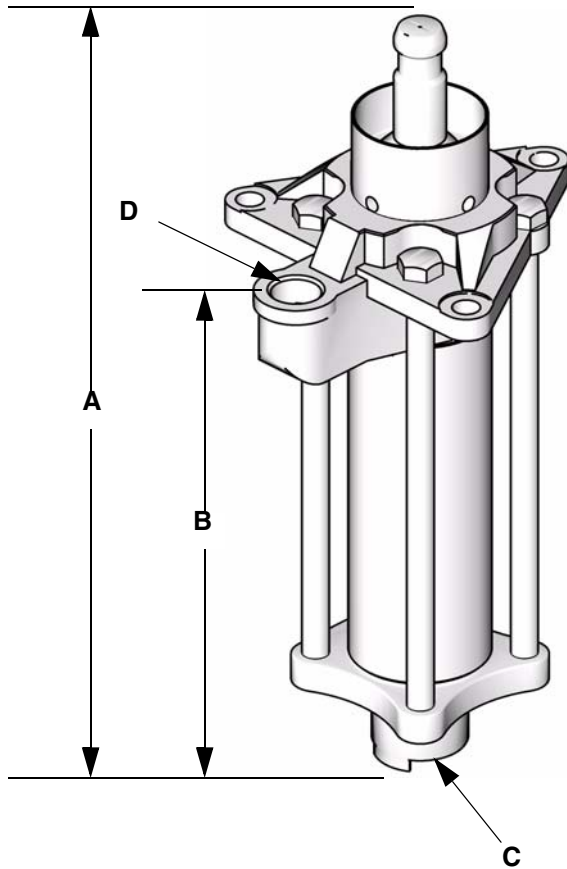


- △1 Lubricate.
- △2 Do not disassemble throat packing stack (12). Lips of throat packings must face down.
- △3 Do not disassemble piston packing stack (11). Piston packing stack includes up to three shims (S). Lips of piston packings must face up.
- △4 Torque to 150-175 ft-lb (203-237 N•m).
- △5 Torque to 57-63 ft-lb (77-85 N•m).
- △6 Carbon-filled PTFE.
- △7 PTFE.

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Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	166384	HOUSING, outlet	1	12*	n/a	PACKING STACK, throat	1
2✓	166368	CYLINDER	1	13✓	206616	PISTON BODY	1
3*	166624	O-RING; PTFE	2	14*	168283	BEARING, throat	1
4✓	101968	BALL; 1-1/4 in. (32 mm) dia.	2	15	168282	NUT, packing, with wet-cup	1
5✓	166376	PIN, ball stop, intake	1	16*	166623	O-RING; PTFE	1
6✓	206617	HOUSING, intake valve	1	* Parts included in Repair Kit 247881 (purchase separately).			
7	102215	SCREW, cap, hex hd; 5/8-11 x 12 in. (305 mm)	4	✓ Recommended spare parts. Keep on hand to avoid downtime.			
8✓	15R588	ROD, displacement	1	Parts labeled n/a are not available separately.			
9✓	166371	PIN, ball stop, piston	1				
10*	100063	PIN, cotter	2				
11*	n/a	PACKING STACK, piston	1				

# Dimensions



A in. (mm)	B in. (mm)	C	D	Weight lb (kg)
19.0 (483)	13.75 (350)	1-1/2 in. npt(f)	1 in. npt(f)	35 (15.8)

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# Technical Data

Maximum fluid working pressure ..... 1250 psi (8.7 MPa, 87 bar)  
 Wetted parts ..... 303 and 304 grades of stainless steel, PTFE, carbon-filled PTFE

# 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.

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# 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.*

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