



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

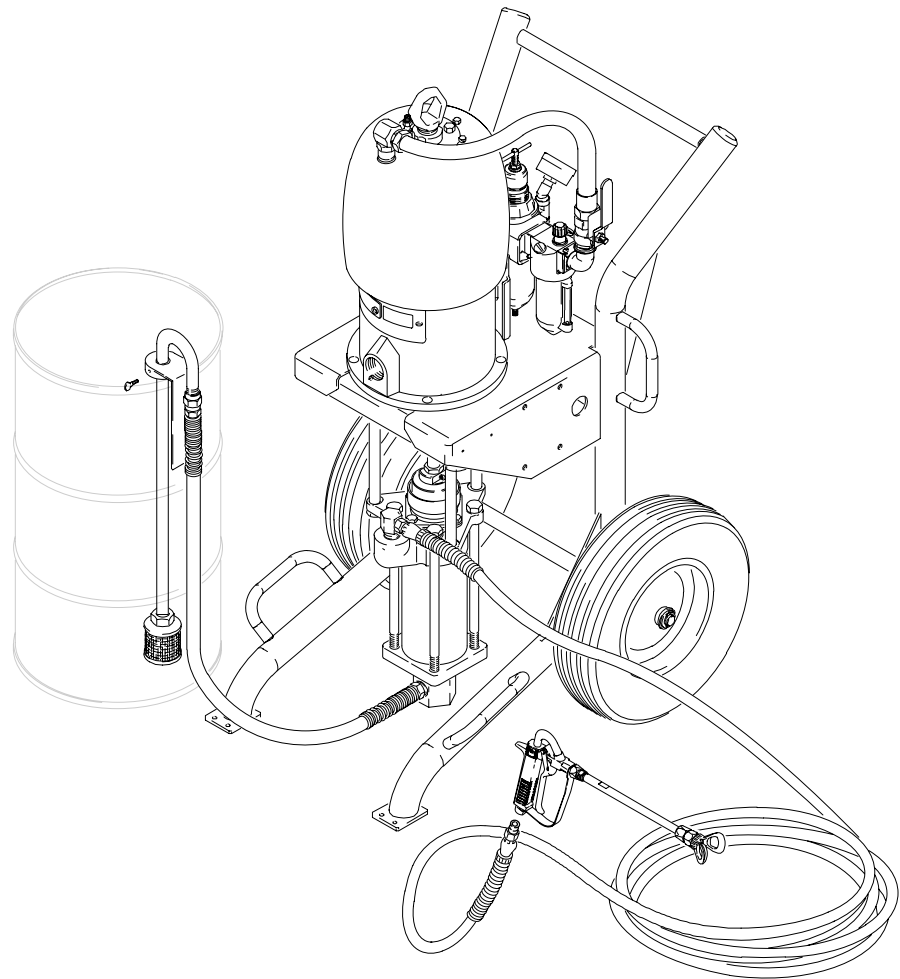
INSTRUCTIONS

*First choice when quality counts.™*

## 10:1 RATIO BULLDOG, PORTABLE, STAINLESS STEEL RUBBER PACKED **Hydra-Clean<sup>®</sup> Pressure Washer**

*1000 psi (6.9 MPa, 69 bar) Maximum Working Pressure*

**Model 226314, Series G**



06648B

### **⚠ CAUTION**

The Graco warranty will not apply if cleaning solutions other than those recommended by Graco are used in these units. Only use solutions that are not harmful to the wetted parts. See the **Technical Data** on page 9.

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

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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 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

 <b>INSTRUCTIONS</b>	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury. Use this pump only for pumping water and water–diluted cleaning solutions in a pressure washing system. Never use the pump for paint or any other coatings. Any misapplication of the pump may cause dangerous operating conditions which can result in serious injury and substantial property damage.</p> <ul style="list-style-type: none"> <li>● This equipment is for professional use only.</li> <li>● Read all instruction manuals, tags, and labels before operating the equipment.</li> <li>● Use the equipment only for its intended purpose. If you are unsure about usage, call your Graco distributor.</li> <li>● Do not alter or modify this equipment. Use only Graco parts and accessories.</li> <li>● Check equipment daily. Repair or replace worn or damaged parts immediately.</li> <li>● Do not exceed the maximum working pressure stated for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.</li> <li>● Do not lift pressurized equipment.</li> <li>● Handle hoses carefully. Do not pull on hoses to move equipment.</li> <li>● Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 66°C (150°F) or below –40°C (–40°F).</li> <li>● Wear hearing protection when operating this equipment.</li> <li>● Comply with all applicable local, state, and national fire, electrical, and safety regulations.</li> </ul>
	<p><b>TOXIC FLUID HAZARD</b></p> <p>Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>● Know the specific hazards of the fluid you are using.</li> <li>● Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.</li> <li>● Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.</li> </ul>

# ⚠ WARNING



## INJECTION HAZARD

Spray from the gun, 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 is a serious injury. The injury may look like just a cut, but it is a serious injury. Get immediate medical attention.
- Do not point the gun at anyone or at any part of the body.
- Do not put your hand or fingers over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Be sure the gun trigger safety operates before spraying.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 6 if the spray tip clogs and before cleaning, checking or servicing the equipment.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately.



## 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 4.
- 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 operating if fumes are present.
- Do not operate a gasoline engine in the spray area.



## MOVING PARTS HAZARD

Moving parts, such as the air motor piston, can pinch or amputate your fingers.

- Keep clear of all moving parts when starting or operating the pump.
- Never operate the pump with the air motor plates removed.
- Before checking or servicing the equipment, follow the **Pressure Relief Procedure** on page 6 to prevent the equipment from starting unexpectedly.

# Installation

## Grounding

**⚠ WARNING**

**FIRE AND EXPLOSION HAZARD**  
Before operating the pump, ground the system as explained below. Also read the section **FIRE AND EXPLOSION HAZARD** on page 3.

Although water generally provides a natural electrical ground, the following equipment must be grounded if the cleaning chemicals are volatile.

1. *When cleaning in enclosed areas*, such as storage tanks, locate the pump and air compressor outside the area and well away from it. Provide adequate ventilation. If the area you are cleaning has stored flammable materials, take appropriate precautions to avoid static sparking. Consult your local codes.
2. *Pump*: use a ground wire and clamp. See Fig. 1. Remove the ground screw (Z) and insert through the eye of the ring terminal at end of ground wire (Y). Fasten the ground screw back onto the pump and tighten securely. Connect the other end of the wire to a true earth ground. Order Part No. 222011 Ground Wire and Clamp.

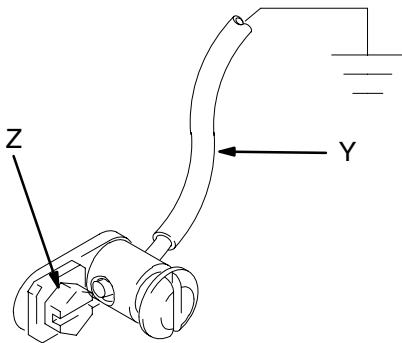


Fig. 1

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

## General Information

The typical setup shown in Figure 2 is only a guide to selecting and installing required and optional components. For assistance in designing a system to suit your needs, contact your Graco representative. Refer to Figure 2 for callouts in parentheses.

# Installation

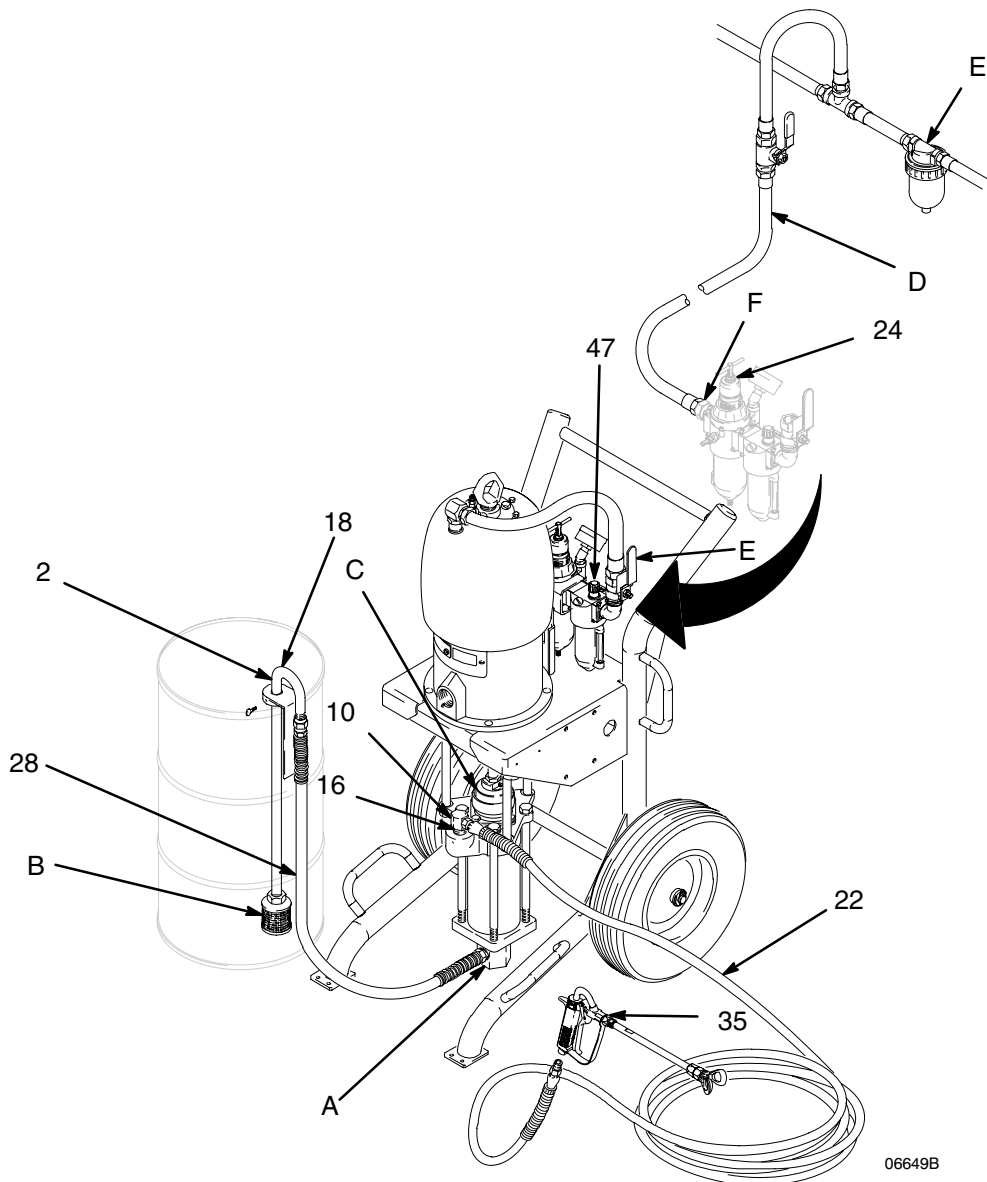


Fig. 2

## Pump Setup

See Fig. 2. Connect the suction hose (28) between the pump inlet (A) and the suction tube (18), using thread sealant on the male threads. Screw on the suction tube filter (B). Place the suction tube in the supply drum, and adjust it so it is 1 in. (25 mm) off the bottom of the drum. Tighten the thumbscrew (2) of the pipe hanger onto the drum.

Connect the spray hose (22) to the pump outlet manifold (16). For two gun spraying, remove the plug (10) in the manifold and connect another spray hose. Connect the spray gun (35) to the hose (22). Use thread sealant on the male threads.

Fill the displacement pump wet-cup (C) 1/2 full with Throat Seal Liquid, or a compatible solvent.

Refer to the separate instructions, supplied, for instructions on filling and adjusting the air line lubricator.

Close the air shutoff valve (E). Then, connect a 3/4 in. ID (minimum) air supply hose (D) to the 3/4 npt (m) air manifold (F) swivel.

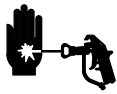
Ground the system as described on page 4.

An important step in installing this sprayer is to read and understand each of the instruction manuals supplied with sprayer. These manuals contain additional warnings, cautions, and detailed instructions about installing, operating, and servicing the various system components.

# Operation

## Pressure Relief Procedure

### WARNING



#### INJECTION HAZARD

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,
- or install or clean the spray tips.

1. Lock the gun trigger safety.
2. Close the air regulator.
3. Close the bleed-type master air valve (E).
4. Unlock the gun trigger safety.
5. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
6. Lock the gun trigger safety.
7. Open the drain valve (required in your system), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely 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 and relieve pressure gradually. Then, loosen completely. Clear the tip or hose obstruction.

## Pump Operation

Prepare the cleaning solution according to the manufacturer's instructions. For your own safety, be sure to observe all warnings. If you are using powdered cleaners, mix them thoroughly in a separate pail before adding them to a supply drum. Undissolved powders are extremely abrasive and may damage pump parts.

### WARNING

Wear appropriate protective clothing, such as waterproof outerwear and eye goggles, according to the cleaner manufacturer's recommendations. Cleaning chemicals may be toxic, and cause serious irritation to your eyes or skin.

See Fig. 2. To start the pump, close the bleed-type master air valve (E), close the air regulator (24) by turning the T-handle all the counterclockwise until the spring tension is relieved. Open the shutoff valve, hold a metal part of the gun firmly to the side of a grounded metal pail, trigger the gun, and slowly open the regulator until fluid comes from the gun. Release the trigger; the pump will stall against pressure.

When supplied with an adequate air pressure and volume, the pump will start and stop as the gun is opened and closed.

Use the air regulator (24) to control pump speed and fluid pressure. Always use the lowest pressure necessary to get the desired result. Higher pressures will waste the material and cause early spray tip and pump wear.

# Operation

## WARNING

To reduce the risk of overpressurizing the sprayer, NEVER exceed 1000 psi (6.9 MPa, 69 bar) Maximum Working Pressure. If you add any accessories to the fluid line, be sure they are rated for at least 1000 psi (6.9 MPa, 69 bar) working pressure.

Adjust the air line lubricator to about two drops per minute through the sight glass when the pump is running. Refer to the separate instruction manual, supplied, for adjustment instructions.

### Useful Hints

## WARNING

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

Protect surfaces that may be damaged by the cleaning solution. Rinse the solution off before it dries.

Hold the spray nozzle about 2 feet (2/3 meter) from the surface and completely mist-wet the object you are cleaning. Let the object soak briefly, then use the spray to “chisel” the dirt off. Keep the nozzle about 6 in. (153 mm) from and at an angle to the surface. If some dirt remains, wet the surface again, let it soak a little longer, then hold the nozzle close to the surface to blast the dirt off. A heated cleaning solution may work better; check with your cleaner manufacturer.

After all dirt is cleaned off, rinse all the solution off with clean, cold water. Relieve the pressure whenever you stop spraying.

Always stop the pump at the bottom of its stroke to prevent material from drying on the rod and damaging the packings.

## CAUTION

Never let the pump run dry. A pump that is running too fast can damage itself. Shut the pump off immediately, then check and refill the supply container to prevent air from being sucked into the system, keep liquid in the supply container at all times.

## WARNING

Check the bleed-type master air valve (E) weekly to be sure it relieves all air in the motor when in the closed position. If it is not completely relieved, the pump could cycle unexpectedly and cause serious injury. Replace the valve immediately if it is, or appears to be faulty.

### Shutdown and Care of the Sprayer

## WARNING

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

Check the air line lubricator to ensure that it contains enough oil.

**Relieve the pressure**, and check the displacement pump packing nut adjustment often. The packing nut should be tight enough to stop leakage, but no tighter.

Keep the displacement pump wet-cup (C) 1/2 full at all times. The TSL helps protect the pump packings. See Fig. 2.

# Troubleshooting

**NOTE:** Refer to the separate instruction manuals which are supplied with this sprayer, and the manuals which are supplied with any accessories you added, for complete operation, troubleshooting and repair instructions.

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

## **WARNING**

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

**NOTE:** **Relieve the pressure** before checking or servicing the equipment.

Problem	Cause	Solution
Will not spray	Insufficient air supply	See performance chart on page 9.
	Closed or clogged air regulator, valve, supply line, etc.	Open, clear.
	Obstructed spray tip, valve, or hose	Clear, use larger tip.
	Worn or damaged pump parts	See manual 306818 or 306821.
Valve will not stop pump operation	Clogged fluid intake filter	Clean.
	Exhausted cleaning solution supply	Refill.
	Worn or damaged pump parts	See manual 306818 or 306821.
Valve will not stop fluid spray	Incorrect valve adjustment	Adjust; see manual 307010.
	Obstructed or worn valve stem or seat	Clear, replace; see manual 307010.
Fluid leaking from valve at needle	Closed or clogged air regulator, valve, supply line, etc.	Open, clear.
	Worn needle packings or loose packing nut	Tighten; see manual 307010
Fluid will not come from pump (hose removed)	Insufficient air supply	See performance chart on page 9.
	Closed or clogged air regulator, valve, supply line, etc.	Open, clear.
	Obstructed spray tip, valve, or hose	Clear, use larger tip.
	Clogged fluid intake filter	Clean.
	Exhausted cleaning solution supply	Refill.
	Worn or damaged pump parts	See manual 306818 or 306821
Pump operating, but output low	Obstructed spray tip, valve, or hose	Clear, use larger tip.
	Exhausted cleaning solution supply	Refill.
	Worn or damaged pump parts	See manual 306818 or 306821
Fluid leaking from valve handle	Spray valve swivel packings worn	Replace; see manual 307010

# Pump Performance Chart

7 cycles per gallon (3.8 liter)

Maximum recommended continuous speed: 60 cycles/min: 8 gpm (29 liter/min)

		40 psi (0.3 MPa, 3 bar) AIR SUPPLY TO PUMP		70 psi (0.5 MPa, 5 bar) AIR SUPPLY TO PUMP			100 psi (0.7 MPa, 7 bar) AIR SUPPLY TO PUMP		
SPRAY TIP ORIFICE SIZE	GPM (l/min)	CFM (m <sup>3</sup> /min)	WP	GPM (l/min)	CFM (m <sup>3</sup> /min)	WP	GPM (l/min)	CFM (m <sup>3</sup> /min)	WP
0.065 in. (1.65 mm)	1.7 (6.6)	10 (0.28)	340 psi (2.4 MPa, 24 bar)	2.3 (8.9)	24 (0.67)	590 psi (4.0 MPa, 40 bar)	2.7 (10.2)	38 (1.06)	825 psi (5.7 MPa, 57 bar)
0.078 in. (1.98 mm)	2.9 (11.2)	17 (0.48)	330 psi (2.3 MPa, 23 bar)	3.8 (14.6)	38 (1.06)	560 psi (3.8 MPa, 38 bar)	4.5 (17.0)	60 (2.08)	800 psi (5.5 MPa, 55 bar)
0.094 in. (2.39 mm)	4.2 (16.3)	25 (0.70)	320 psi (2.2 MPa, 22 bar)	5.4 (20/9)	54 (1.51)	540 psi (3.7 MPa, 37 bar)	6.5 (24.5)	83 (2.32)	760 psi (5.2 MPa, 52 bar)
0.109 in. (2.77 mm)	5.4 (20.9)	33 (0.92)	300 psi (2.1 MPa, 21 bar)	7.3 (28.3)	7.3 (28.3)	510 psi (3.5 MPa, 35 bar)	8.5 (32.2)	95 (2.66)	700 psi (4.8 MPa, 48 bar)

## KEY TO PERFORMANCE CHART

GPM: Gallons Per Minute

CFM: Cubic Feet Per Minute

PSI: Pounds Per Square Inch

WP: Working Pressure in psi

## Technical Data

Air Operating Range ..... 40–100 psi (0.3–0.7 MPa, 3–7 bar)

Pump cycles per gallon (3.8 liter) ..... 7

Maximum recommended pump speed ..... 60 cycles per minute: 8 gpm (29 liter/min)

Recommended speed for optimum pump life ..... 20 cycles per minute: 3 gpm (11 liter/min)

Air consumption ..... See chart above

Pump discharge pressure ..... See chart above

Fluid hose ..... 0.38 in. (9.7 mm) ID; 3 wire braid; 40' (12.2 m) lg;  
3/8 npt(m) stainless steel couplings; 2250 psi  
(15.6 MPa, 156 bar) maximum working pressure

Spray gun..... Pistol grip with PTFE packings and 10 in. (254 mm) extension tube  
1000 psi (6.9 MPa, 69 bar) maximum working pressure

Intake filter ..... 60 mesh wire screen; brass body

Wetted parts ..... Type 302, 303, 304 & 316 Stainless Steel; Brass; Nitrile Rubber



# Parts

## Model 226314, Series G

10:1 Bulldog Portable Hydra-Clean Unit

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	244530	CART ASSY, global Includes items 1a–1g	1	26	206797	10:1 BULLDOG PUMP; See manual 306821 for parts	1
1a	113362	. WHEEL	2	28	237522	HOSE, coupled; nylon; 1 in. (25 mm) ID; cpld 1–11 1/2 npt(m); 6' (1.8 m) long	1
1b	113436	. RING, retaining	2				
1c	113361	. CAP	2				
1d	191605	. BRACKET	1	29	207299	SPRAY VALVE EXTENSION ASSY; Includes item 30, 32, 33, 34	1
1e	100131	. NUT, hex; 3/8–16	4				
1f	100133	. WASHER, lock; 3/8	4	30	164017	. TUBE, extension; 1/4 npt(m); 10 in. (254 mm) long	1
1g	100004	. SCREW, cap, hex hd	4				
2	100085	SCREW, thumb; 0.25–20 x 0.5 in.	1	31	103977	SWIVEL	1
10	101748	PLUG, pipe; 3/8 npt	1	32*	103921	TIP, spray, 40° fan angle; .065 in. (1.65 mm) orifice	1
15*	165447	FILTER, fluid intake; 1 in. npt(f)	1				
16	166444	MANIFOLD, outlet; 1 in. npt(m) x 3/8 npt(f)	1	33	175019	BODY, nozzle	1
17	166629	COUPLING, hex pipe; 1 in. npt	1	34	220220	GUARD, tip	1
18	166630	TUBE, suction; 1 in. npt(mbe); max. adj. height 30 in. (0.76 m)	1	35	237485	SPRAY GUN See manual 307010 for parts	1
19	180180	ELBOW, street; reducing; 1–1/2 npt (m) x 1 in. npt (f)	1	41	244524	GROUND WIRE ASSY	1
21	238374	HOSE, coupled	1	42	235208	UNION, swivel	1
22*	205753	HOSE, fluid cpld 3/8 npt(m), 40 ft (12.2 m) lg. Buna-N; 3/8 in. ID	1	46	113498	VALVE, safety relief	1
23	205770	HANGER, pipe	1	47	C11034	LUBRICATOR, air	1
24	244720	AIR REGULATOR See manual 309341 for parts	1	48	116522	CONNECTOR, air control	1

\* Recommended Tool Box spare parts. Keep these spare parts on hand to reduce down time.

# 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 by an authorized Graco distributor 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 Phone Numbers

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

**1-800-367-4023 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.*

**Sales Offices:** Minneapolis, Detroit

**International Offices:** Belgium, Korea, Hong Kong, Japan

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