

INSTRUCTIONS–PARTS LIST

This manual contains IMPORTANT
WARNINGS AND INSTRUCTIONS
READ AND RETAIN FOR REFERENCE

 **308–188**
Rev A

Model H.E.L.P. 1600B

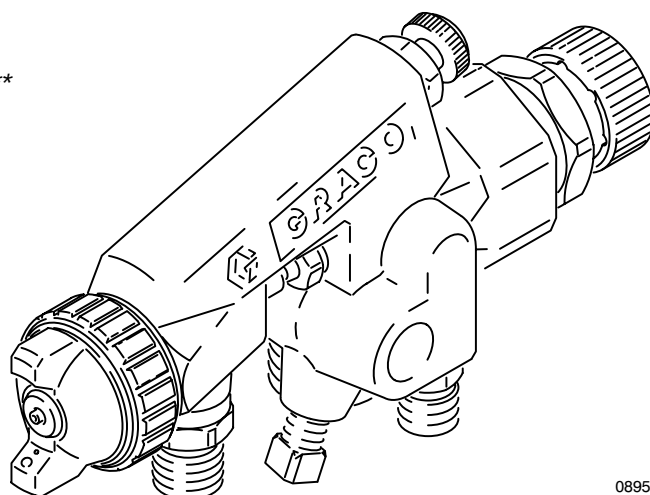
HIGH EFFICIENCY LOW PRESSURE[™] AUTOMATIC BLEEDER AIR SPRAY GUN

STAINLESS STEEL FLUID PASSAGES

300 psi (21 bar) MAXIMUM WORKING FLUID PRESSURE
100 psi (7 bar) MAXIMUM WORKING AIR PRESSURE*
15 psi (1.05 bar) MAXIMUM OPERATING AIR PRESSURE**

*The *Maximum Working Air Pressure* is the maximum air pressure the gun was designed to operate safely under.

**The *Maximum Operating Air Pressure* is the maximum inlet air pressure allowable to guarantee HVLP compliance. If input pressures are maintained at or below 15 psi (1.05 bar), the natural pressure drop through the gun will produce 10 psi (0.7 bar) maximum air cap pressure.



0895

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Part No. 224–891

Includes 0.032 in. (0.8 mm) fluid nozzle

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441

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WARNINGS

FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.

**Read and understand all instruction manuals, tags,
and warning labels before operating equipment.**

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray equipment or accessories, such as over pressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in serious bodily injury, fire, explosion or property damage.

NEVER point the spray gun at anyone or at any part of the body. NEVER put hand or fingers over the spray nozzle.

ALWAYS follow the **Pressure Relief Procedure**, at right, before cleaning or removing the fluid nozzle or servicing any system equipment.

NEVER try to stop or deflect leaks with your hand or body.

NEVER alter or modify any part of this equipment; doing so could cause it to malfunction.

CHECK all spray equipment regularly and repair or replace worn or damaged parts immediately.

System Pressure

This gun has a *MAXIMUM WORKING FLUID PRESSURE* of 300 psi (21 bar), a *MAXIMUM WORKING AIR PRESSURE* of 100 psi (7 bar) and a *MAXIMUM OPERATING AIR PRESSURE* of 15 psi (1.05 bar). NEVER exceed the maximum working pressure of the gun or any other component or accessory used in the system.

Fluid Compatibility

BE SURE all fluids and solvents used are chemically compatible with the “Wetted Parts” shown in the **TECHNICAL DATA** on the back cover. Always read the fluid and solvent manufacturer’s literature before using the fluid or solvent in this gun.

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin or injury from moving parts, always follow this procedure when shutting off the system, when checking or servicing any part of the spray system, when installing, cleaning or changing fluid nozzles, and whenever you stop spraying.

1. Turn off the air and fluid supply to the gun.
2. Trigger the gun into a grounded metal waste container to relieve air and fluid pressure.

HOSE SAFETY

TIGHTEN all fluid connections securely before each use.

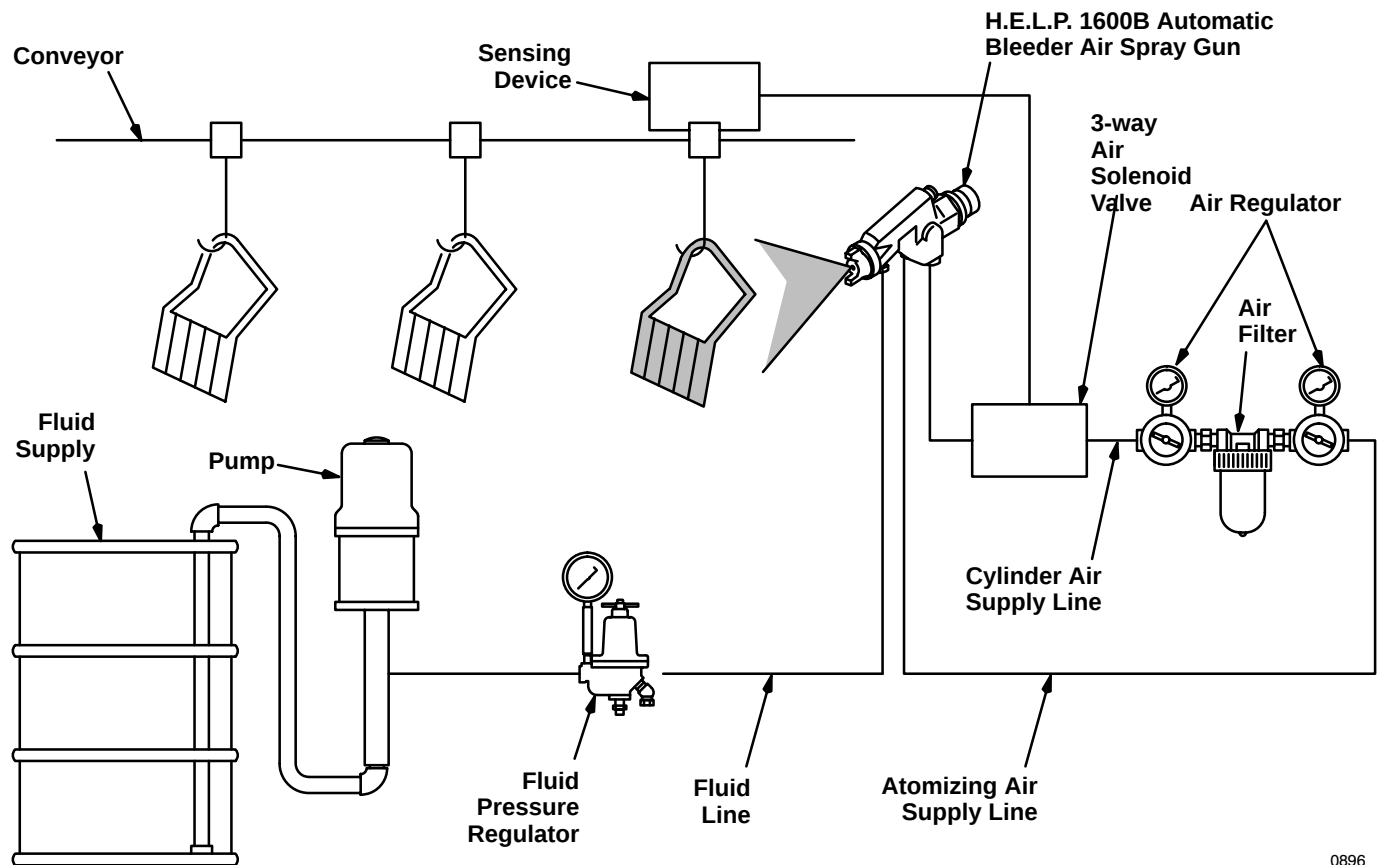
NEVER use a damaged hose. Before each use, check the entire hose for cuts, leaks, abrasion, bulging cover, or damage or movement of the hose couplings. If any of these conditions exist, replace the hose immediately.

HANDLE AND ROUTE HOSES CAREFULLY. Do not pull on hoses to move equipment. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose.

IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards—particularly the General Standards, Part 1910 and the Construction Standards, Part 1926—should be consulted.

TYPICAL INSTALLATION



0896

The Model H.E.L.P. 1600B High Efficiency Low Pressure Bleeder Spray Gun was designed to produce the highest quality finish with today's fluids as well as the the Low V.O.C. (*volatile organic compound*) fluids of tomorrow.

This spray gun can spray most coatings or finishes currently being used for automotive refinish, industrial, aerospace, marine, wood, plastic and architectural applications, while easily operating from any paint delivery system, including pressure pots of any size, or remote pumps for production line operation.

If input air pressures are maintained at or below 15 psi (1.05 bar), maximum air cap pressure will be 10 psi (0.7 bar), which is required to meet all new regulations.

The Typical Installation shown above is only a guide for selecting and installing the equipment needed for an automatic spray system. It is not an actual system design. For assistance in designing a system, contact your Graco representative.

INSTALLATION

Ventilate the Spray Booth

WARNING

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a properly ventilated spray booth. **Never operate the spray gun unless ventilation fans are operating.**

Check and follow all of the National, State and Local codes regarding air exhaust velocity requirements.

Check and follow all local safety and fire codes.

Mount the Gun

Mount the gun on a 0.50 in. (12 mm) diameter rod mounting fixture that allows adjustment of the spray pattern direction and the distance from the workpiece.

Connect the Fluid Line

1. Before connecting the fluid line, blow it out with air and flush it with solvent. Use solvent which is compatible with the fluid to be sprayed.
2. Install a fluid regulator on the fluid line to control fluid pressure to the gun.
3. Connect the fluid line to the 3/8–18 npsm (R 3/8–19) gun fluid inlet.

INSTALLATION

Connect the Air Lines

1. Install an air filter to provide a clean, dry air supply to the gun. Dirt and moisture in the air line can affect the appearance of your finished workpiece.
2. Install a normally closed, 3-way air solenoid valve in the cylinder air supply line. Connect an air hose from the solenoid valve to the 1/4–18 npsm (R 1/4–19) gun air inlet marked CYL.
3. Connect an atomizing air supply line to the 3/4–11.5 NH (standard garden hose fitting) gun air inlet marked ATOM.
4. Install separate air regulators to control atomizing air and cylinder air.

Recommended Hose Sizes *(general purpose)*

FLUID HOSE		CYLINDER AIR HOSE		ATOMIZING AIR HOSE	
Length Needed	ID (in.)	Length Needed	ID (in.)	Length Needed	ID (in.)
0–35 ft (0–11 m)	3/8	0–100 ft (0–30 m)	5/16 in.	0–25 ft (0–7.63 m)	3/4 in.
35–100 ft (11–30 m)	1/2 in.	100–200 ft (30–60 m)	3/8 in.		
100–200 ft (30–60 m)	3/4 in.				

OPERATION

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin or injury from moving parts, always follow this procedure when shutting off the system, when checking or servicing any part of the spray system, when installing, cleaning or changing fluid nozzles, and whenever you stop spraying.

1. Turn off the air and fluid supply to the gun.
2. Trigger the gun into a grounded metal waste container to relieve fluid pressure.

Filter the Fluid and Check Viscosity

Filter the fluid to remove coarse particles and sediment which could clog the spray nozzle, then check the viscosity of your fluid. This gun is best suited for light to medium fluids.

Light Fluid: 19 to 24 seconds (No. 2 Zahn cup). Auto, Furniture, Appliances, Fine Finish Metalics, Top Coats, Lacquer, Enamel Primer.

Medium Fluid: 22 to 41 seconds (No. 2 Zahn cup). Contact Adhesive, Latex, Maintenance Paints, Textures, Primers, Epoxies, Vinyls, High Flow High Viscosity.

Heavy Fluid: 2.8 Volatile Organic Compounds, High-solid Polyurethanes, Heavy Waterborne Enamels

Position the Air Cap

The direction of the spray pattern is controlled by the position of the air cap. See Fig 1. Loosen and turn the air cap to the desired position, then hand tighten the air cap securely.

Adjust the Spray Pattern

Follow these steps to establish the correct fluid flow and air flow:

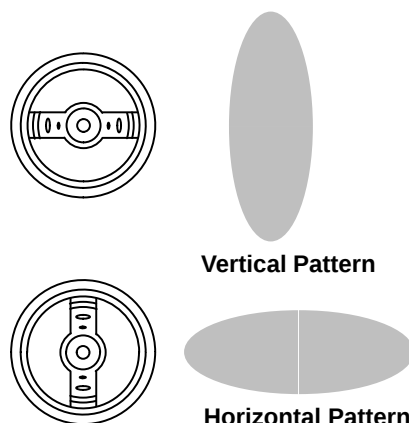


Fig 1

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1. Adjust the pattern size by turning the pattern adjusting valve *OUT (counterclockwise)* for a wider pattern or *IN (clockwise)* for a narrower pattern. Refer to Fig 2.

NOTE: The pattern width at the widest adjustment is 10 to 11 in. (254 to 279 mm) at 350 grams/min. fluid flow and 10 in. (254 mm) target distance with 15 psi (1.05 bar) inlet air pressure. (Measurements taken using a 23 sec. Zahn #2 viscosity fluid.) The pattern length will vary with the fluid flow, air pressure, fluid viscosity, and other factors.

2. To adjust the volume of fluid output:
 - a. Turn the fluid adjusting valve all the way out *(counterclockwise)*. Refer to Fig 2.
 - b. Adjust the fluid regulator for the desired pressure.
 - c. For final adjustment, turn the fluid adjusting valve in *(clockwise)* to reduce the volume of fluid output and obtain the desired results.

NOTE: If the fluid adjusting valve is turned in all the way the gun will only emit air.

OPERATION

3. *For continuous spraying*, leave the pattern adjusting valve and fluid adjusting valve in the full open position. This provides maximum fluid flow and prevents premature wear on the fluid nozzle.
4. Test the spray pattern and atomization while holding the gun about 6 to 8 inches (150 to 200 mm) from the test piece. Adjust the air pressure to the gun until proper atomization is achieved. Always use the lowest possible atomizing air pressure to obtain the desired results.

To Operate the Gun

Adjust the system's sensing device so the gun starts spraying just before meeting the workpiece and stops as the workpiece has passed.

Air and Fluid Pressure

- The gun requires 71 psi (4.9 bar) air pressure to the cylinder.
- The atomizing air pressure must be set at or below 15 psi (1.05 bar) for compliant operation.
- The fluid pressure normally does not exceed 15 psi (1.0 bar).

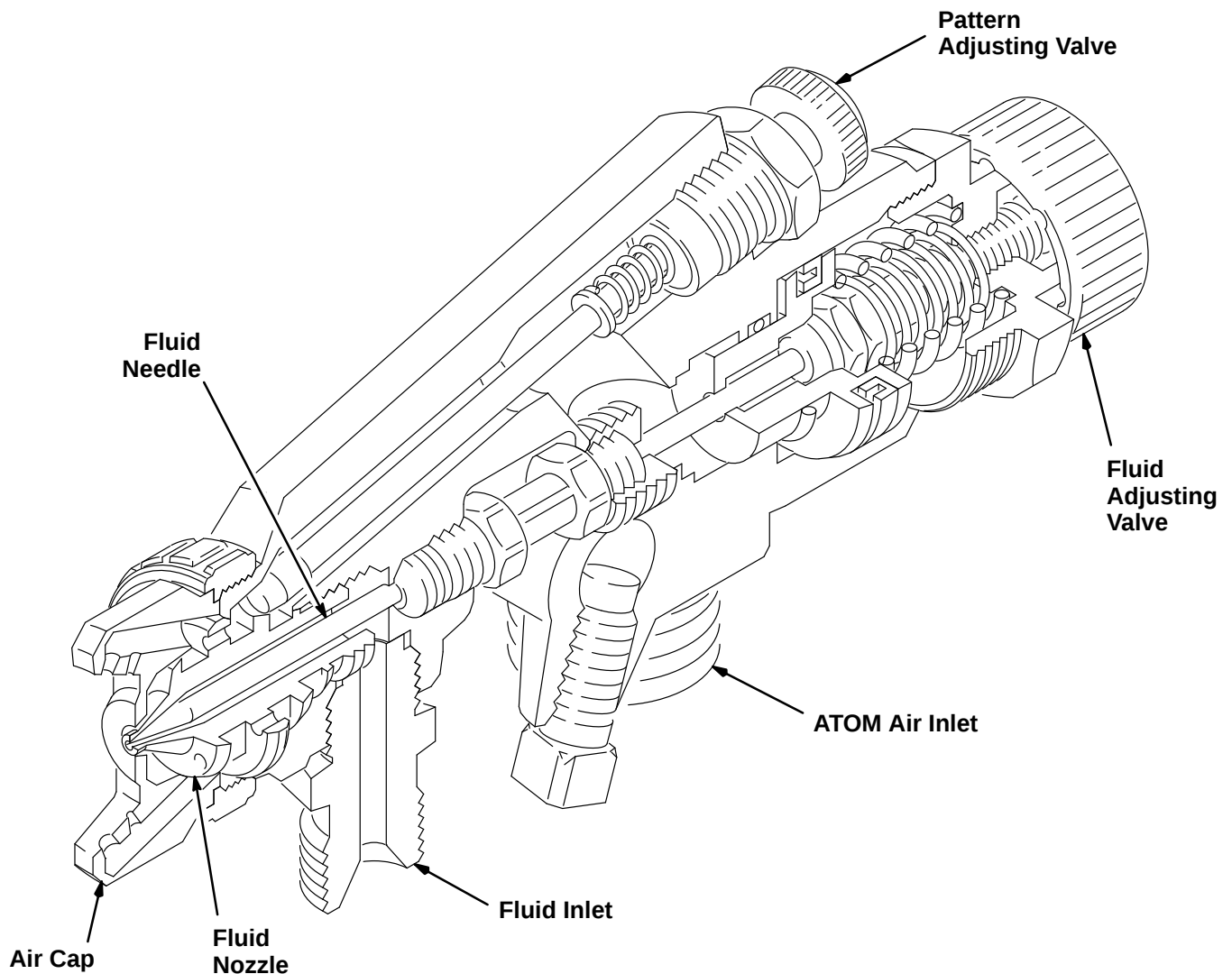


Fig 2

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Daily Care and Cleaning

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin or injury from moving parts, always follow this procedure when shutting off the system, when checking or servicing any part of the spray system, when installing, cleaning or changing fluid nozzles, and whenever you stop spraying.

1. Turn off the air and fluid supply to the gun.
2. Trigger the gun into a grounded metal waste container to relieve fluid pressure.

CAUTION

Clean all parts with a solvent compatible with the fluid being sprayed and compatible with gun wetted parts. See **TECHNICAL DATA** on the back page.

To avoid getting solvent in the gun air passages, **NEVER immerse the gun in solvent.**

To avoid scratches that can distort the spray pattern, NEVER use metal instruments to clean holes in the air cap or fluid nozzle .

1. After operation, flush the gun with a compatible solvent until all traces of paint are removed from the gun passages. Follow the **Pressure Relief Procedure Warning**, at left, before proceeding.
2. Wipe the outside of the gun clean with a solvent dampened cloth.
3. Remove the air cap and fluid nozzle from the gun. Soak them in solvent and scrub them with a fine, bristled brush (provided with the gun).
4. To clean out air cap holes, use a soft implement, such as a toothpick, to avoid damaging critical surfaces. Clean the air cap and fluid nozzle daily, minimum. (Some applications require more frequent cleaning.)
5. Lubricate the exposed portion of the fluid needle (1) daily with Graco TSL or light oil. Periodically lubricate the needle spring (7) and cylinder with light-weight grease or petroleum jelly. See Fig 3, page 9.

NOTE: The shield (24) helps to minimize over-spray buildup on the fluid needle (1). Refer to the **PARTS DRAWING**.

GUN OPERATION TROUBLESHOOTING CHART

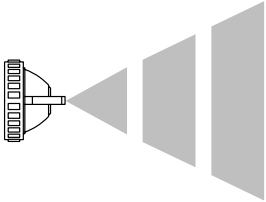
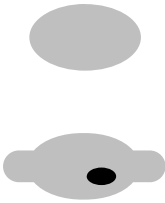
WARNING

To reduce the risk of serious bodily injury, including splashing fluid or solvent in the eyes or on the skin, always follow the **Pressure Relief Procedure Warning**, above, before checking, adjusting, cleaning or repairing the gun or any part of the system. Disconnect the fluid hose from the gun.

NOTE: Check all possible remedies in the Troubleshooting Charts before disassembling the gun.

PROBLEM	CAUSE	SOLUTION
Leakage from fluid packing nut.	Loose needle packing nut(s) (9). Worn needle packings (10, 16).	Tighten packing nut(s). Replace packing assemblies. See page 8.
Fluid leakage from front of gun.	Fluid needle (1) worn or damaged. Worn fluid needle and fluid nozzle seat Fluid packing nuts (9) too tight.	Replace fluid needle. See page 8. Replace fluid nozzle (2) and needle (1). See page 8. Lubricate packings (10, 16) and adjust packing nuts (9). See page 8.

SPRAY PATTERN TROUBLESHOOTING CHART

PROBLEM: IMPROPER SPRAY PATTERN	CAUSE	SOLUTION
Fluttering or spitting spray 	Insufficient fluid supply. Loose fluid nozzle or damaged fluid nozzle taper seat. Dirt between fluid nozzle, taper seat and body. Loose or cracked fluid inlet fitting (4a). Loose fluid tube in pressure tank. Dry or worn fluid needle packings (10, 16) or loose packing nuts (9) permit air to get into fluid passage.	Adjust fluid regulator or fill fluid tank. Tighten or replace fluid nozzle (2) and needle (1). Clean. Tighten or replace fitting. Tighten fluid tube. Lubricate or replace packings; tighten packing nuts.
	Fluid build-up on air cap; partially clogged horn holes. Full air pressure from clean horn hole forces fan pattern toward clogged end. Damaged fluid nozzle or air cap holes.	Clean with soft implement or submerge in suitable solvent and wipe clean. Replace damaged part.
	Fluid build-up on the perimeter of fluid nozzle orifice, or partially clogged fluid nozzle orifice.	Remove obstruction. Never use wire or hard instruments.
	Too high atomization air pressure. Fluid too thin. Not enough fluid pressure.	Reduce air pressure or adjust air adjusting valve (5). Regulate fluid viscosity. Increase fluid pressure.
	Low atomization air pressure. Fluid too thick. Too much fluid.	Increase air pressure or adjust air adjusting valve (5). Regulate fluid viscosity. Reduce fluid pressure. Adjust fluid adjusting valve (6) until proper pattern is obtained.
Streaks  0899	Last coat of fluid applied too wet. Too much air pressure. Insufficient air pressure. Non-uniform spray pattern.	Apply drier finish with multiple strokes. Use least air pressure necessary. Increase air pressure. Clean or replace air cap.

NOTE: Some improper patterns are caused by the improper balance between air and fluid.

Air and Fluid Fitting Replacement

When replacing the fluid fitting (4a), **BE SURE** to reinstall the gasket and washer included with the fitting (gasket and washer are not sold separately). Apply Loctite® 242 sealant or equivalent on the fluid fitting threads and torque the fitting to 20 ft-lb (27 N•m).

When replacing the cylinder (CYL) air fitting (4b), apply Loctite® PST pipe sealant or equivalent on the threads before installing the new fitting. **DO NOT** remove the atomizing air fitting as it is press fit.

Piston Service

1. Follow the **Pressure Relief Procedure Warning** on page 6 to relieve fluid pressure.
2. Unscrew and remove the fluid needle guide (8).
3. Carefully pull the fluid needle (1) out of the piston (12).
4. Clean and inspect the fluid needle (1), spring (7), piston (12), and piston packings (13, 15) for damage or wear. Replace if needed.
5. Apply a few drops of light-weight machine oil to the fluid needle and reassemble the parts.

Fluid Packing Replacement

If fluid leakage cannot be stopped by tightening the packing nuts (9), replace the fluid packings (10, 16). Service as instructed below; refer to Fig 3.

1. Follow the **Pressure Relief Procedure Warning** on page 6 to relieve fluid pressure.
2. Unscrew and remove the fluid needle guide (8).
3. Carefully pull the fluid needle (1) out of the piston (12).

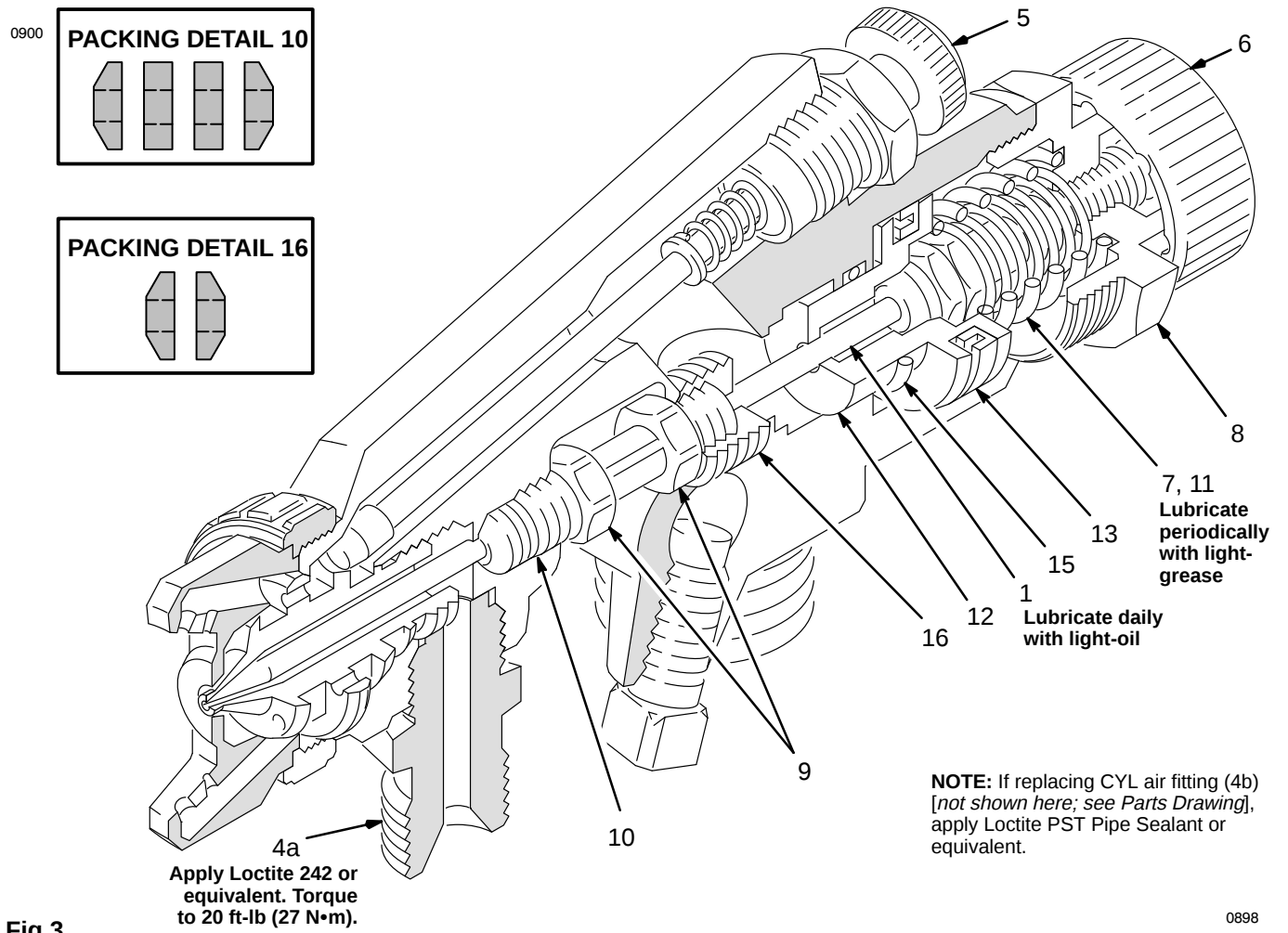
4. Unscrew the packing nuts (9) and remove the packings (10, 16); use a pick if needed.
5. Clean and inspect the fluid needle (1); replace the needle if damaged or worn.
6. Reinstall the fluid needle (1) through the piston (12) and the rear packing cavity.
7. Slide the rear packings (16) onto the fluid needle; orientate them as shown in **Packing Detail 16**.
8. Slide the packing nuts (9), threads facing oppositely, onto the fluid needle.
9. Slide the remaining four packings (10) onto the fluid needle in the order shown in **Packing Detail 10**.
10. Slide the fluid needle (1) into the front fluid packing cavity.
11. Push the fluid needle (1) and piston (12) fully forward.
12. Screw in both packing nuts (9) until the packings (10, 16) are fully compressed, then back off the nuts until the fluid needle moves freely.

NOTE: For the best packing life, lubricate the fluid needle daily as explained in **MAINTENANCE**, step 5.

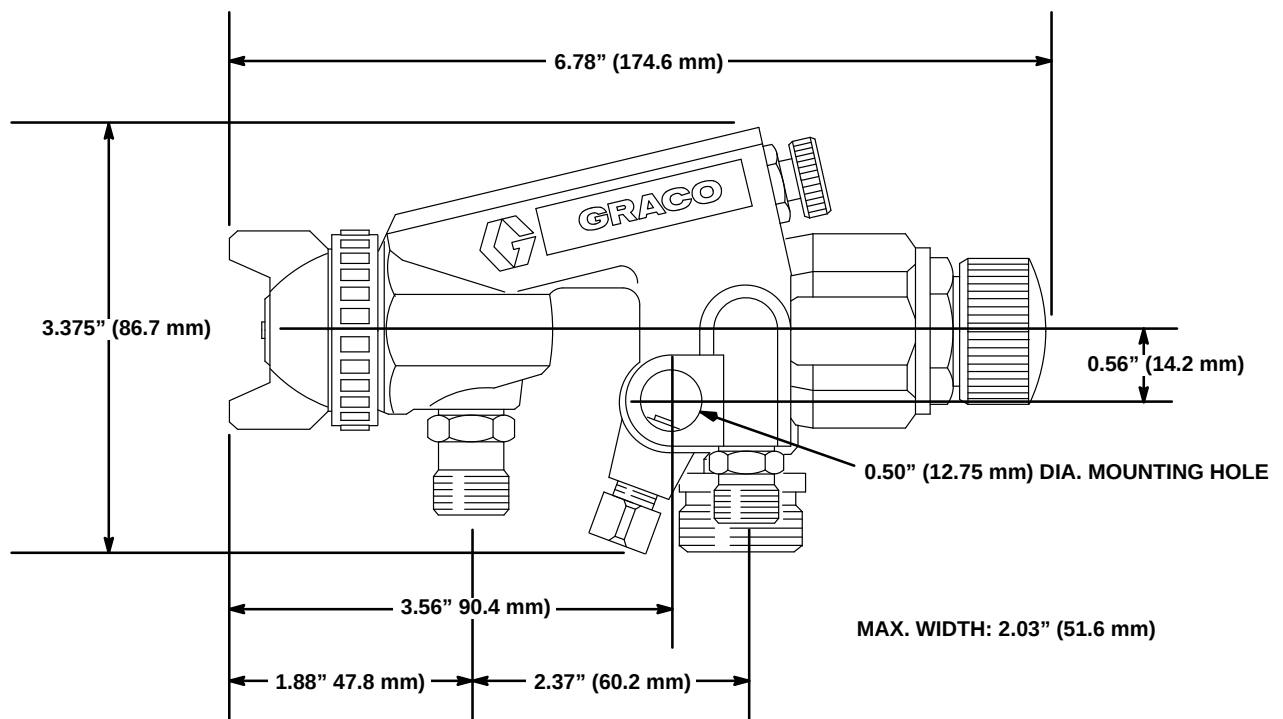
IMPORTANT PHONE NUMBERS

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-328-0211 Toll Free**

FOR TECHNICAL ASSISTANCE, service repair information or assistance regarding the application of Graco equipment: **1-800-543-0339 Toll Free**



DIMENSIONAL DRAWING



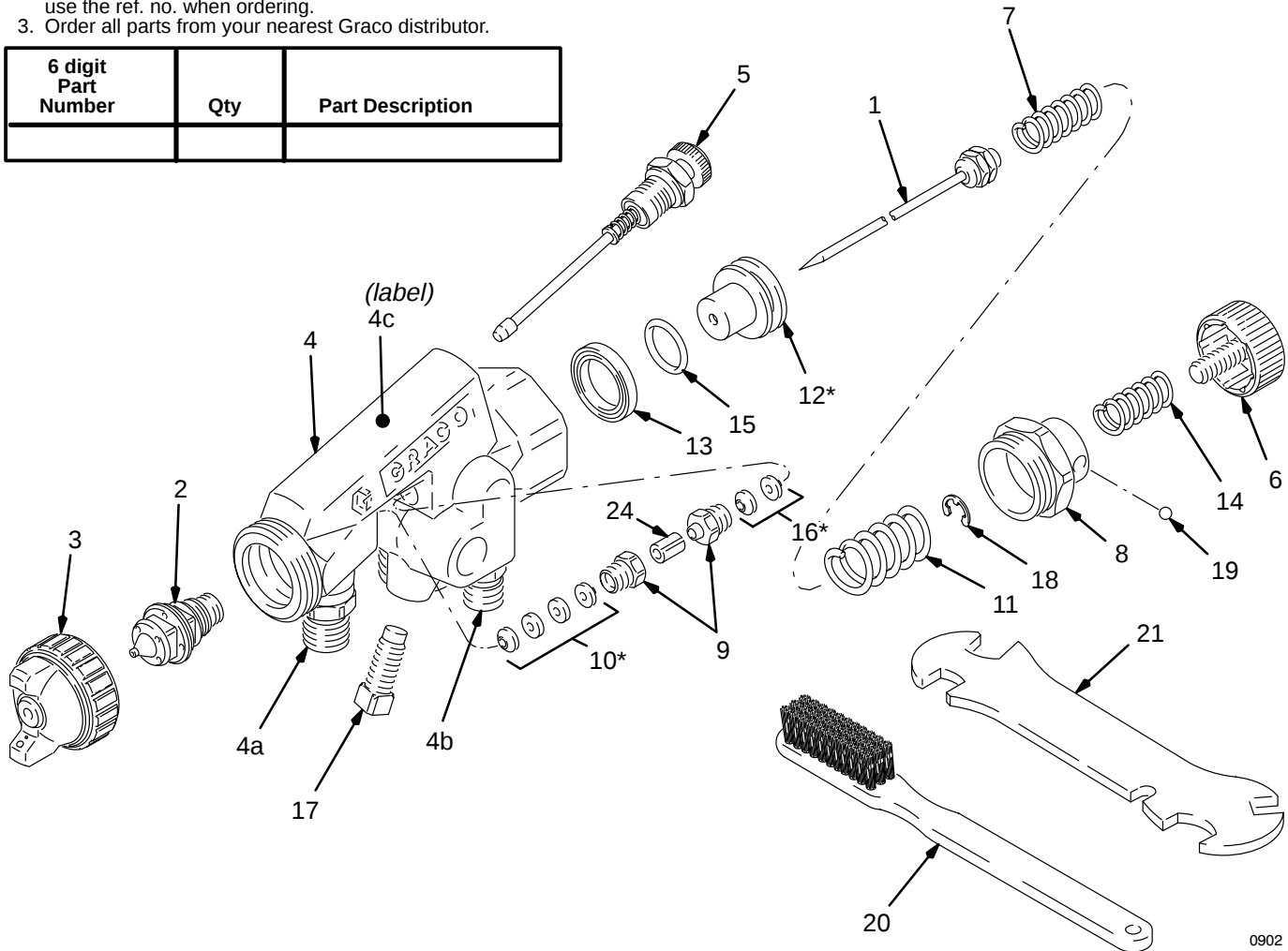
PARTS DRAWING

HOW TO ORDER REPLACEMENT PARTS

1. To be sure you receive the correct replacement parts, kits or accessories, always give all of the information requested in the chart below.
2. Check the parts list to identify the correct part number; do not use the ref. no. when ordering.
3. Order all parts from your nearest Graco distributor.

6 digit Part Number	Qty	Part Description

Model H.E.L.P. 1600B Automatic Bleeder Air Spray Gun



0902

PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
1	599-599	NEEDLE, fluid	1	10*	106-885	KIT, packing, fluid needle; (2) leather, (2) Teflon®	1
2	187-271	FLUID NOZZLE; 0.032" (0.8 mm); <i>See ACCESSORIES for other sizes</i>	1	11	107-821	SPRING, compression, air valve	1
3	110-864	AIR CAP	1	12*	187-550	PISTON	1
4	223-282	GUN BODY Includes items 4a & 4b	1	13	107-822	PACKING, u-cup; buna-n	1
4a	106-786	• FITTING, fluid; includes gasket & washer	1	14	107-819	SPRING, compression, fluid adj.	1
4b	106-690	• FITTING, air	1	15	107-828	O-RING; buna-n	1
4c	185-771	• LABEL, instruction	1	16*	107-829	KIT, packing, needle; leather	1
5	107-824	VALVE, fan adjusting	1	17	107-823	SCREW SET	1
6	107-818	KNOB, fluid adjusting valve	1	18	107-826	RING, retaining	1
7	107-817	SPRING, compression, needle	1	19	100-172	BALL	1
8	107-825	GUIDE, fluid needle	1	20		BRUSH	1
9	106-781	NUT, packing, needle	2	21	110-765	WRENCH	1
				24	106-780	SHIELD, tube	1

*Recommended "tool box" replacement parts.

ACCESSORIES

THROAT SEAL LIQUID (TSL) 206–995

1 quart (0.97 liter) non-evaporating lubricant for air and fluid packings.

WRENCH 179–764

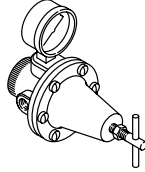
Open-end type wrench with openings for all required disassembly and adjustments of this gun.

AIR PRESSURE REGULATOR 207–755

10–125 psi (1–9 bar) Regulated Pressure
3/4 npt(f) inlet and outlet

AIR PRESSURE GAUGE

101–180
0–200 psi (0–14 bar) Pressure Range



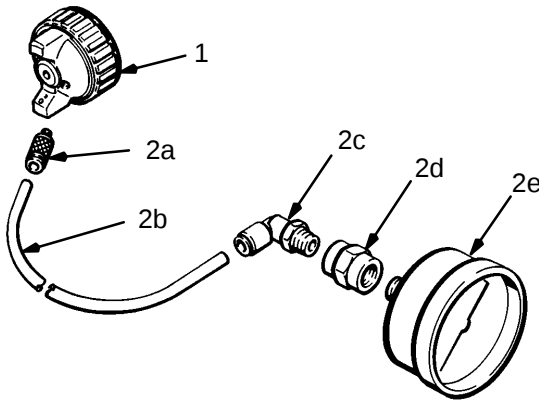
AIR PRESSURE VERIFICATION KIT 224–133

For use in checking air cap pressure at various gun inlet pressures. **Do not use the air cap for spraying.**

Assemble the kit as shown in the drawing below. Install the air cap on the gun. Turn on the air to the gun, then trigger the gun and read the resulting air cap pressure.

The air cap pressure reading will vary slightly, depending on the position (rotation) of the air cap on the gun, but with 15 psi (1.05 bar) inlet atomizing air pressure, the average air cap pressure will be 10 psi (0.7 bar). Gauge accuracy is +/- 2% over the middle half of the gauge scale, +/- 3% over the remainder of the gauge scale.

NOTE: To be "HVLV compliant", the atomizing inlet air pressure must not exceed 15 psi (1.05 bar).

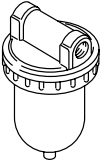


REF NO.	PART NO.	DESCRIPTION	QTY
1	186–789	AIR CAP, tapped	1
2	224–187	GAUGE ASSEMBLY; Includes items 2a–2e	1
2a	108–294	•CONNECTOR, tube	1
2b	054–177	•TUBE, bulk (order by length needed)	10 in.
2c	110–552	•CONNECTOR, elbow; 1/8 npt(m)	1
2d	104–192	•COUPLING, pipe, 1/8 npt(f)	1
2e	102–730	•GAUGE, 0 to 15 psi (0 to 1 bar) pressure range	1

AIR FILTER & MOISTURE SEPARATOR

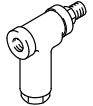
250 psi (17.5 bar) MAXIMUM WORKING PRESSURE
For cleaning and drying air in air spray system.
40 micron filtration

- 106–146** 1/2 npt(f), with gauge
5–125 psi (0.35–9 bar)
pressure range, 4 oz. bowl
- 106–148** 3/8 npt(f), without gauge,
5 oz. bowl



FILTER (AIR OR PAINT) 202–271

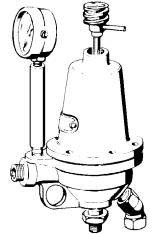
750 psi (52 bar) MAXIMUM WORKING PRESSURE
With 250 micron (60 mesh) element,
3/8 npt(f) inlet, 3/8 npt(m) outlet



FLUID REGULATOR

250 psi (18 bar) MAXIMUM WORKING PRESSURE
To reduce and regulate fluid pressure to one air spray gun. 3/8 npsm(m) and 3/8 npt(f) fluid outlets

- 203–831** 0–60 psi (0–4 bar)
pressure range
- 204–500** 0–15 psi (0–1 bar)
pressure range
- 205–425** 0–60 psi (0–4 bar)
pressure range
(for viscous fluid)



FLUID NOZZLE/NEEDLE COMBINATIONS

Type	Orifice Size	Order Part Number		
		Kit	Nozzle Only	Needle Only
0N/0N	0.032" (0.8 mm)	224–581	187–271	599–599
02N/02N	0.047" (1.2 mm)	224–582	187–272	107–801
03N/02N	0.055" (1.4 mm)	224–583	187–273	107–801
04N/04N	0.070" (1.8 mm)	224–584	187–274	107–802

Needles and fluid nozzles are manufactured in matched, lapped sets and should be ordered as a kit to ensure perfect seating of the needle in the fluid nozzle.

ATOMIZING AIR HOSE ASSEMBLY

15 psi (1 bar) MAXIMUM WORKING PRESSURE
0.75 in. (19 mm) ID, 3/4–11.5 NH (standard garden hose)
Male x female swivel fittings, natural-color polyurethane

- 223–263** 15 ft (4.575 m) long
- 223–265** 25 ft (7.625 m) long

H.E.L.P. 1500 SYSTEM 223–293

See Manual 308–057

TECHNICAL DATA

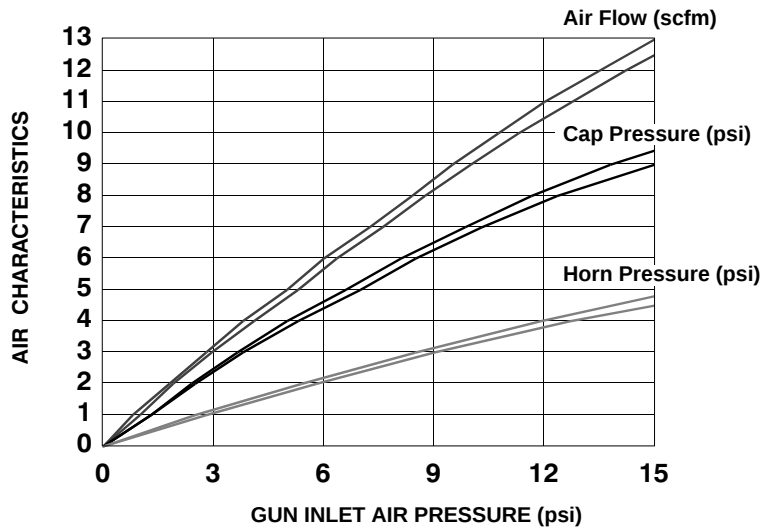
Weight 1.4 lb (0.64 kg)
Maximum Working Fluid Pressure ... 300 psi (21 bar)
Maximum Working Air Pressure 100 psi (7 bar)
Maximum Operating Air Pressure ... 15 psi (1.05 bar)
Typical Pattern Width 10–11 in. (254–279 mm)
Cylinder Air Inlet 1/4-18 npsm (R1/4-19)

Atomizing Air Inlet 3/4-11.5 NH (std. garden hose)
Fluid Inlet 3/8–18 npsm (R3/8–19)
Wetted Parts Stainless Steel, Teflon®, Leather

Teflon® is a registered trademark of Du Pont Company.

Loctite® is a registered trademark of Loctite Corporation.

AIR CHARACTERISTICS CHART



NOTE: The maximum and minimum air flow, cap pressure, and horn pressure ranges are shown.

THE GRACO WARRANTY AND DISCLAIMERS

WARRANTY

Graco warrants all equipment manufactured by it 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. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven 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, 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 with Graco equipment of 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.

DISCLAIMERS AND LIMITATIONS

THE TERMS OF THIS WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND ARE IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED), INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON-CONTRACTUAL LIABILITIES, INCLUDING PRODUCT LIABILITIES, BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED. IN NO CASE SHALL GRACO'S LIABILITY EXCEED THE AMOUNT OF THE PURCHASE PRICE. ANY ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS OF THE DATE OF SALE.

EQUIPMENT NOT COVERED BY GRACO WARRANTY

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

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)

Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan; Korea

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