

5 GAL. (20 LITER) STAINLESS STEEL (ASME) PRESSURE POT Optimiser HVLP Package

See the Data Sheet, 305-662, for application information

15 psi (1.05 bar) Maximum Fluid Working Pressure

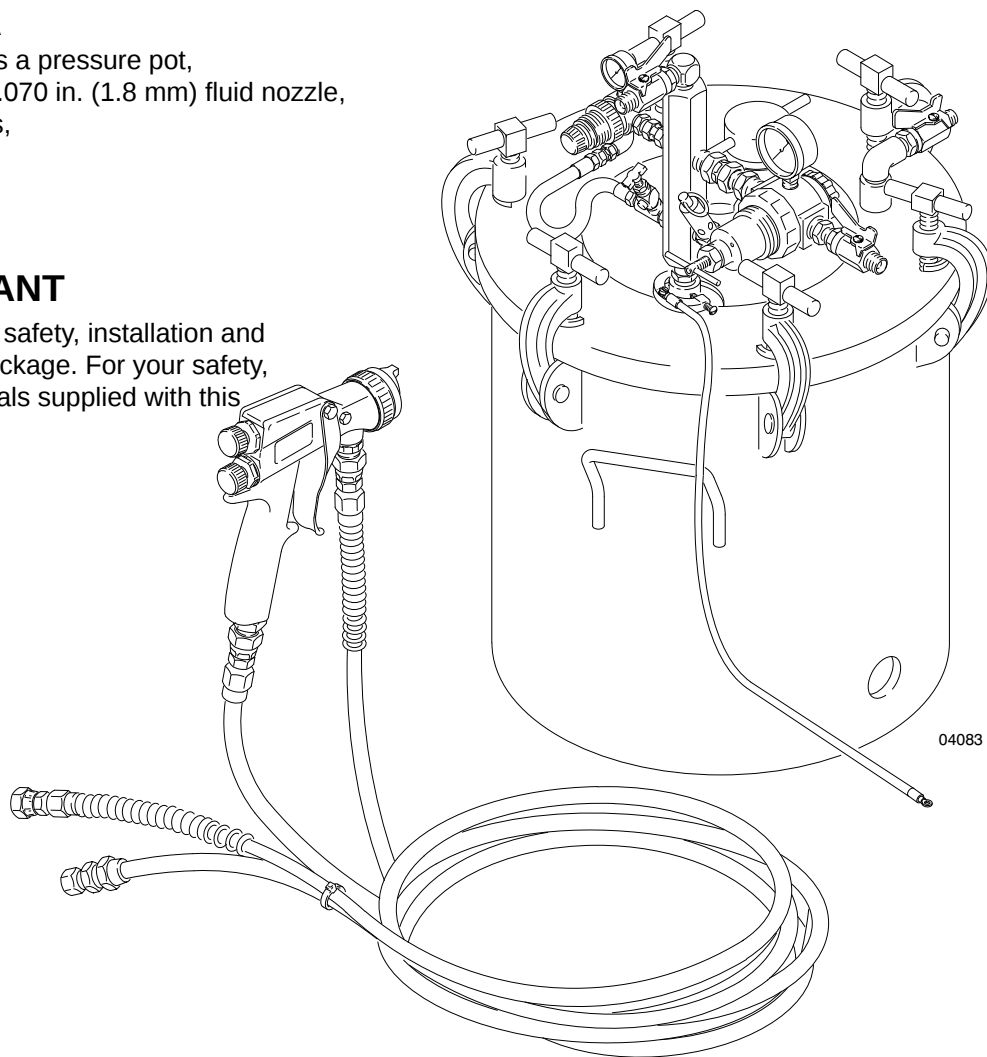
100 psi (6.9 bar) Maximum Air Input Pressure

Model 237-413, Series A

This complete package includes a pressure pot, an HVLP air spray gun with a 0.070 in. (1.8 mm) fluid nozzle, 25 ft. (7.6 m) air and fluid hoses, and air and fluid controls.

IMPORTANT

This manual provides the basic safety, installation and operation information for the package. For your safety, also read the component manuals supplied with this package before operating it.



Parts Change Notice

Some parts in Rev. C of manual 308-456 have changed but have not yet been changed in the instruction manual. Please note the changes below and mark them in your manual or keep this sheet with your manual.

Assembly No.	Series Letter Change	Part That Changed	Ref No.	Part Description	Description of Change
Model 237-413	—	236-015	42	Optimiser HVLP Spray Gun	Replaced by Part No. 239-561 Delta HVLP Spray Gun, .070" orifice. See manual 308-741.



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.

June 10, 1998

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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



PRESSURIZED FLUID HAZARD

Spray from the gun, hose leaks or ruptured components can splash fluid in the eyes or on the skin and cause serious injury.

- Do not stop or deflect fluid leaks with your hand, body, glove or rag.
- Follow the **Pressure relief procedure** on page 7 before cleaning, checking or servicing the equipment.
- Tighten all fluid connections before each use.
- Check the hoses, tubes and couplings daily. Replace parts immediately if worn, damaged or loose. Permanently coupled hoses cannot be repaired.
- Handle and route hoses and tubes carefully. Keep the hoses and tubes away from moving parts and hot surfaces. Do not use the hoses to pull equipment. Do not expose Graco hoses to temperatures above 180°F (82°C) or below -40°F (-40°C).



FIRE AND EXPLOSION HAZARD

Improper grounding, poor air 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. See **Ground the system** on 5.
- If there is any static sparking while using the equipment, **stop spraying immediately**. Identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable vapors from the solvent or the fluid being sprayed.
- Do not smoke in the spray area.
- Extinguish all open flames or pilot lights in the spray area.
- Do not turn on or off any light switch in the spray area.
- Electrically disconnect all equipment in the spray area.
- Keep the spray area free of debris, including solvent, rags and gasoline.
- Do not operate a gasoline engine in the spray area.



WARNING



EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction or start unexpectedly and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are in doubt about this, call Graco Technical Assistance at 1-800-543-0339.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the **15 psi (1.05 bar) maximum working pressure at 100 psi (6.9 bar) maximum incoming air pressure** of the package, or the maximum working pressure of any accessory used with it.
- Do not move or lift pressurized equipment.
- Use fluids or solvents which are compatible with equipment wetted parts. See the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Fluid hoses must have spring guards on both ends to protect it from rupture caused by kinks or bends at or close to the couplings.
- Comply with all applicable local, state and national fire, electrical and other safety regulations.



TOXIC FLUID HAZARD

Improper handling of hazardous fluids or inhaling toxic fumes can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose hazardous fluid according to all local, state and national guidelines.
- Wear appropriate clothing, gloves, eyewear and respirator.

Setup

⚠ CAUTION

This equipment is compatible with most water based materials. See the wetted parts in the **Technical Data** section and your fluid and solvent manufacturer's compatibility information.

I. Prepare the operator.

All persons who operate the system should be trained in the safe, efficient operation of all system components as well as the proper handling of the chemical coating. At a minimum, all operators should thoroughly read the safety, installation and operation sections of this manual and the component manuals.

II. Prepare the site.

1. Use a minimum 5 HP (3.7 kW) air compressor for efficient operation.

2. Clear obstacles and debris that could cause an unsafe operating environment.
3. Bring an air line from your compressed air supply to the pressure pot location. Be sure the air is dry and filtered. Install a bleed-type master air valve upstream from the pressure pot. When it is closed and the pressure pot air regulator (33) is opened, the bleed-type master air valve relieves all air pressure to the equipment components.
4. 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.

KEY

Components you must supply:

- A Bleed-Type master air valve
Required for pump; order part no. 110-223, 1/4" npt(f)
- B Air filter.
Order part no. 110-146, 1/4 npt(f)
- C Air supply line
- D Air line moisture trap

Components supplied with package:

- 1 Pressure Pot
- 4 Pressure relief valve
- 7 Air relief valve
- 13 Ground wire
- 17a Gun air shutoff valve
- 17b Pressure pot air shutoff valve
- 18 fluid shutoff valve
- 33 Pressure pot air regulator
- 36 Gun air regulator
- 40 Gun fluid hose
- 43 Gun air hose
- 42 Optimiser HVLPgun

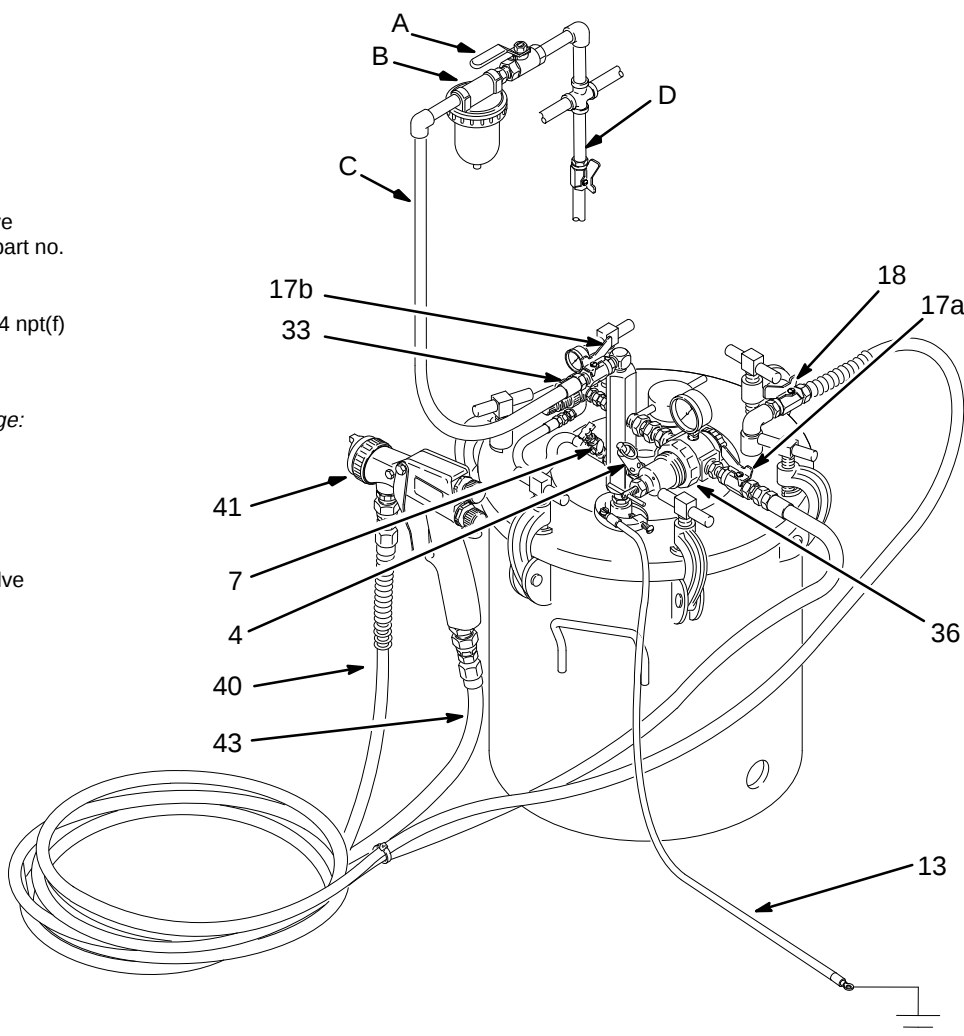


Fig. 1

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Setup

III. Unpack the system.

1. In addition to the assembled unit, these components are packed loosely or separately: hose set, gun, instruction manuals. These are the manuals you should receive:

308–369 Pressure pot
308–293 Optimiser HVLP spray gun
308–167 Air regulator

IV. Connect the hose set and gun to the system. See Fig. 1.

1. Connect the air hose (43) between the pressure pot air shutoff valve (17b) and the air inlet of the spray gun. These are 1/4–18 npsm swivel fittings.
2. Connect the fluid hose (40) between the fluid shutoff valve (18) and the fluid inlet of the spray gun. These are 3/8–18 npsm swivel fittings.
3. Verify that all fittings throughout the system are tightened securely.

V. Ground the system.

WARNING

To reduce the risk of static sparking, ground the pressure pot and all other equipment used or located in the spray area. Check your local electrical code for detailed grounding instructions for your area and type of equipment. *Ground all of this equipment.* Also read **FIRE OR EXPLOSION HAZARD** on page 2.

1. *Pressure pot:* One end of the ground wire (13) is already connected to the pressure pot. Connect the other end of the ground wire to a true earth ground.
2. *Air compressor:* according to manufacturer's recommendations.
3. *Object being sprayed:* according to local code.
4. *Fluid supply container:* according to local code.
5. *All solvent pails used when flushing,* according to local code. Use only metal pails, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.

System Component Information

I. How to use the Optimiser HVLP gun.

See Fig. 2.

1. Make all fluid and air adjustments at the pressure pot for maximum efficiency.
2. If you make adjustments at the gun, take note of what you do. Then, if the results are not satisfactory, you can easily return the gun to its previous adjustment. Steps 3 and 4 explain the gun adjustments.
3. Fan pattern adjusting valve (E).
 - a. For a round spray pattern, turn the pattern adjusting valve fully IN (clockwise).
 - b. For a an oval (flat) spray pattern, turn the pattern adjusting valve fully OUT (counterclockwise).
4. Fluid adjusting valve (F). This valve is used in systems that do not have a fluid regulator. For this system, use the pressure pot regulator to adjust fluid flow. Turn the valve (F) out until full trigger travel is obtained.
5. The gun has a built-in lead and lag operation. When triggered, the gun emits air before the fluid is discharged. When the trigger is released, the fluid stops before the air flow stops. This helps assure the spray is atomized and prevents fluid build-up on the air cap.
6. Loosen the air cap retaining ring (G) and rotate the horns of the air cap to obtain the desired spray position. Tighten the retaining ring snugly, but do not overtighten. See Fig. 3 for how to obtain a vertical or horizontal spray pattern.
7. Clean and lubricate the gun as instructed in the separate gun manual, 308–293.

II. How to adjust the air regulators.

See Fig. 4.

1. Always open air regulators slowly to prevent surging during startup.
2. As you look at the system, the regulator (36) on the right controls air to the gun and the regulator (33) on the left controls air to the pressure pot.
3. To use the gun air regulator (36), turn the T-handle IN (clockwise) to open and turn the T-handle fully OUT (counterclockwise) to close. Be sure the jam nut (H) under the T-handle does not interfere with your adjustments. Tighten the jam nut to lock in the setting, if desired.

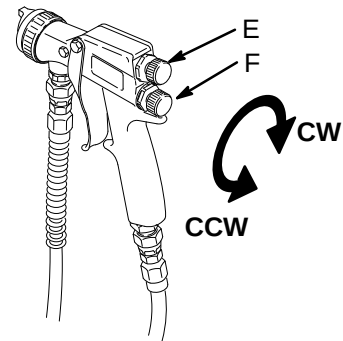


Fig. 2

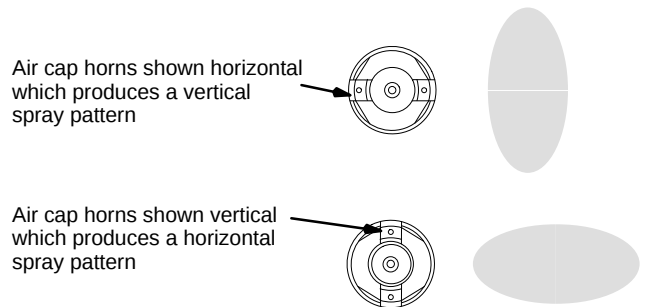


Fig. 3

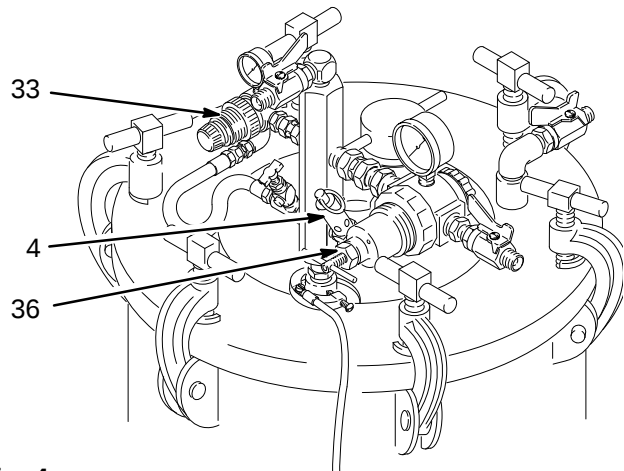


Fig. 4

4. To use the pressure pot air regulator (33), pull out the adjustment knob. Turn the knob IN (clockwise) to open and turn the knob fully OUT (counterclockwise) to close. Push the adjusting knob in to lock the setting, if desired.

III. Safety relief valve

See Fig. 4.

The safety relief valve (4) automatically relieves the pressure pot pressure when the air pressure exceeds approximately 100 psi (6.9 bar). It resets automatically when the pressure is relieved.

Operation

I. Pressure relief procedure.

WARNING

The system remains pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, accidental spray from the gun or splashing of any fluid, follow this procedure whenever you:

- instructed to relieve pressure,
- stop spraying,
- check or service any system equipment,
- install, clean or change spray nozzles,
- before loosening or removing the pressure pot cover or fill port.

1. Close the gun air shutoff valve (17b). See Fig. 5.
2. Open the air relief valve (7) by turning it counter-clockwise. (Leave it open until you reinstall the pressure pot cover or fill port.)
3. Wait until there is no air escaping through the drain cock fitting before removing the pressure pot cover or opening the fill port.

II. Flush the pressure pot before the first use.

Flush with a solvent compatible to your fluid. Consult the fluid manufacturer's literature for recommendations. See **Flushing** on page 9.

KEY

- A Bleed-Type master air valve
Required for pump; order part no.
110-223, 1/4" npt(f)
- 7 Air relief valve
- 17a Gun air shutoff valve
- 17b Pressure pot air shutoff valve
- 18 Fluid shutoff valve
- 27 C-clamps
- 33 Pressure pot air regulator
- 36 Gun air regulator

III. Prime the system.

1. Remove the pressure pot cover.
2. Place a 5 gal. (20 liter) metal pail of fluid in the pressure pot, or, install the pressure pot liner (supplied) and fill it with up to 5 gal. (20 liter) of fluid.

NOTE: Order part no. 111-330 for a package of 20 liners.

3. Tighten the c-clamp handles (27) securely.
4. Close the pressure pot and gun air regulators (33,36).
5. Be sure the air relief valve (7) is closed (clockwise).
6. Be sure the pressure pot air shutoff valve (17b) is closed (valve handle at a right angle to the valve body), and then connect the air line (C) to the valve.
7. Open the master air valve (A).
8. Open the pressure pot air shutoff valve (17b).
9. Adjust the pressure pot air regulator (33) to 10 psi (0.7 bar).
10. Open the fluid shutoff valve (18).
11. Hold the gun against and aimed into a grounded metal waste pail. Trigger the gun slowly. The gun will emit air until the fluid arrives. When fluid flows freely, release the gun trigger.

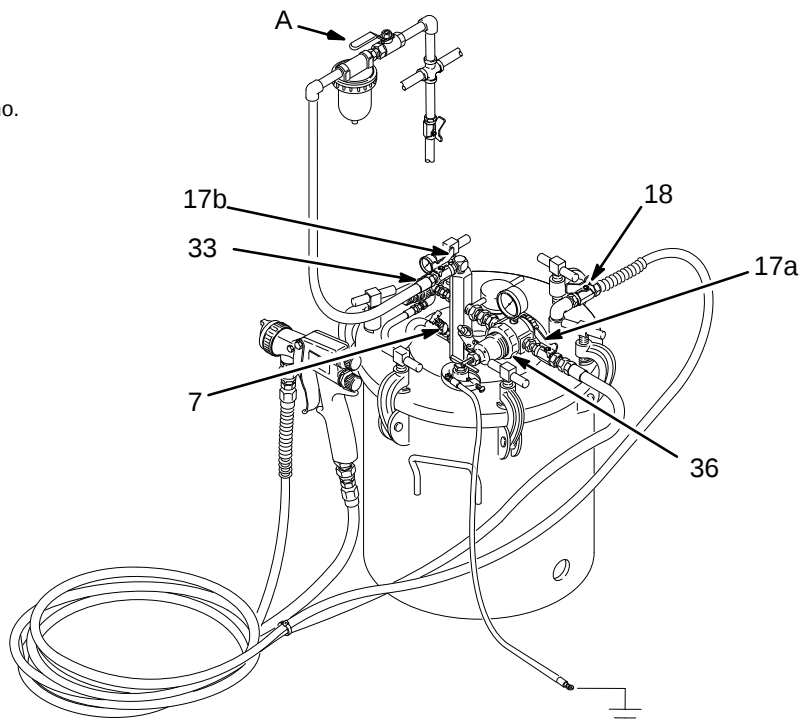


Fig. 5

Operation

IV. Set the fluid and air pressure.

1. With the system primed and the gun air regulator closed (36), trigger the gun and adjust the pressure pot air regulator (33). If available, use the pressure setting provided by your fluid supplier. Otherwise, use the following instructions to determine the fluid pressure.

To determine the fluid pressure setting, hold the gun parallel to the floor. (Be sure to catch the fluid in a container.) With the gun air pressure turned OFF, trigger the gun. Adjust the pressure pot regulator (33) until the straight fluid stream is within the range indicated for the viscosity of your fluid before it drops off, but do not exceed 15 psi (1.05 bar) to maintain HVLP compliance. That is your optimal pressure pot air pressure. See Fig. 6.

Fluid Viscosity

Measured with #2 Zahn cup

Light (18–25 seconds)	4–6" (100–150 mm)
Medium (25–40 seconds)	2–4" (50–100 mm)
Heavy (40–60 seconds)	1–2" (25–50 mm)

Fluid Droop



1 Fluid droop; straight stream before fluid drops off

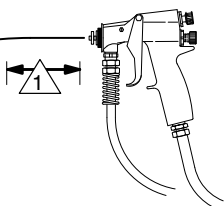


Fig. 6 02106

2. Release the gun trigger. Install the air cap.
3. Open the gun air shutoff valve (17a). Partially trigger the gun so only air is emitted. Set the gun air regulator (36) pressure to 70 psi (4.9 bar).

4. Open the fan pattern control valve (E) by turning it fully counterclockwise, then turn it in 1–1/2 to 2 turns. See Fig. 7.

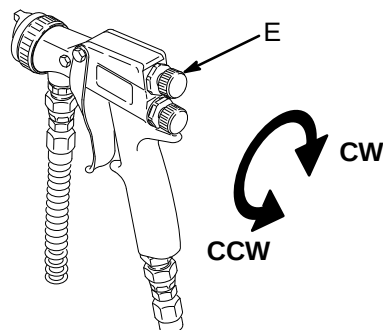


Fig. 7

5. Spray a stationary test pattern on scrap paper. Hold the gun 10 to 12 in. (250–300 mm) from the paper and spray for 2 or 3 seconds. If the spray pattern is poorly atomized, the air and/or fluid pressures may need adjustment.

If the spray pattern atomization is not fine enough, increase the gun air pressure. If the spray pattern atomization is too fine, decrease the gun air pressure. If the atomization is still not good enough, try lowering the fluid pressure in increments of 2 or 3 psi to achieve the desired finish quality.

NOTE: For the most efficient paint usage, use the lowest air pressure needed to obtain a good finish. Higher air pressures create more overspray and uses more fluid.

V. You are now ready for production spraying.

CAUTION

When using catalyzed materials, observe the fluid pot life as recommended by the fluid manufacturer. Always flush the system before the pot life has expired to prevent dried fluid which may be difficult to clean out and may damage the system.

VI. When to shut down the system.

Shut down the system at the end of the work shift and before checking, adjusting, cleaning or repairing the system. Always follow the **Pressure relief procedure**, on page 7.

Flushing

I. When to flush.

- Before the first time use
- When changing colors
- Before fluid can dry or settle out in a dormant system (observe the recommended fluid pot life on catalyzed fluids)
- Before storing the system

II. How to flush.

See Fig. 8.

1. Relieve pressure.
2. Remove the air cap before flushing. Clean it separately.
3. Remove the pressure pot cover. Remove the tank liner, if used. Pour in 1 gal. (4 liter) or place a 1 gal. (4 liter) metal pail of compatible solvent in the pressure pot. Install the cover and tighten the c-clamp handles (27) securely.
4. Make sure the pressure pot and gun air regulators (33,36) and the master air valve (A) is closed.
5. Be sure the air relief valve (7) is closed (clockwise).
6. Open the master air valve (A).
7. Open the pressure pot air shutoff valve (17b).
8. Set the pressure pot air regulator to 20 psi (1.6 bar).
9. Open the fluid shutoff valve (18).
10. Hold the gun against and aimed into a grounded metal waste pail. Trigger the gun slowly. When fluid flows freely, release the gun trigger.
11. For a first-time flush: trigger the gun and flush with solvent for 30 seconds.

For flushing after spraying fluid: trigger the gun and flush with solvent until the system is thoroughly cleaned. Repeat with clean solvent, if necessary.
12. Release the gun trigger, close the pressure pot air shutoff valve (17b).
13. Relieve pressure.
14. Open the tank and clean the inside of the tank and its suction tube.
15. You are now ready to prime the system with another fluid or to store the system. Relieve pressure if you are storing the system.

KEY

- A Bleed-Type master air valve
Required for pump; order part no.
110-223, 1/4" npt(f)
- 7 Air relief valve
- 17a Gun air shutoff valve
- 17b Pressure pot air shutoff valve
- 18 Fluid shutoff valve
- 27 C-clamps
- 33 Pressure pot air regulator
- 36 Gun air regulator

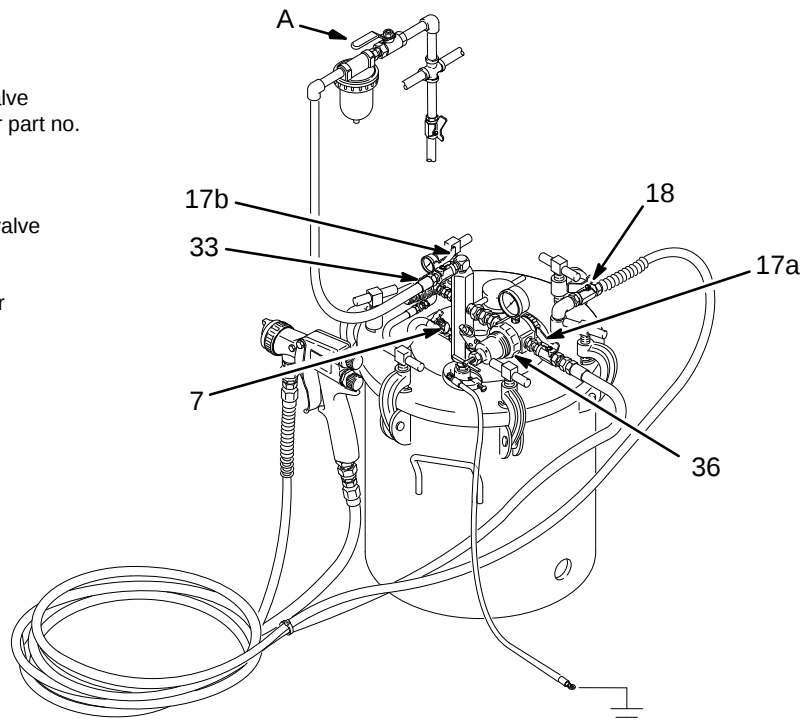


Fig. 8

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Parts

Model 237–413, Series A

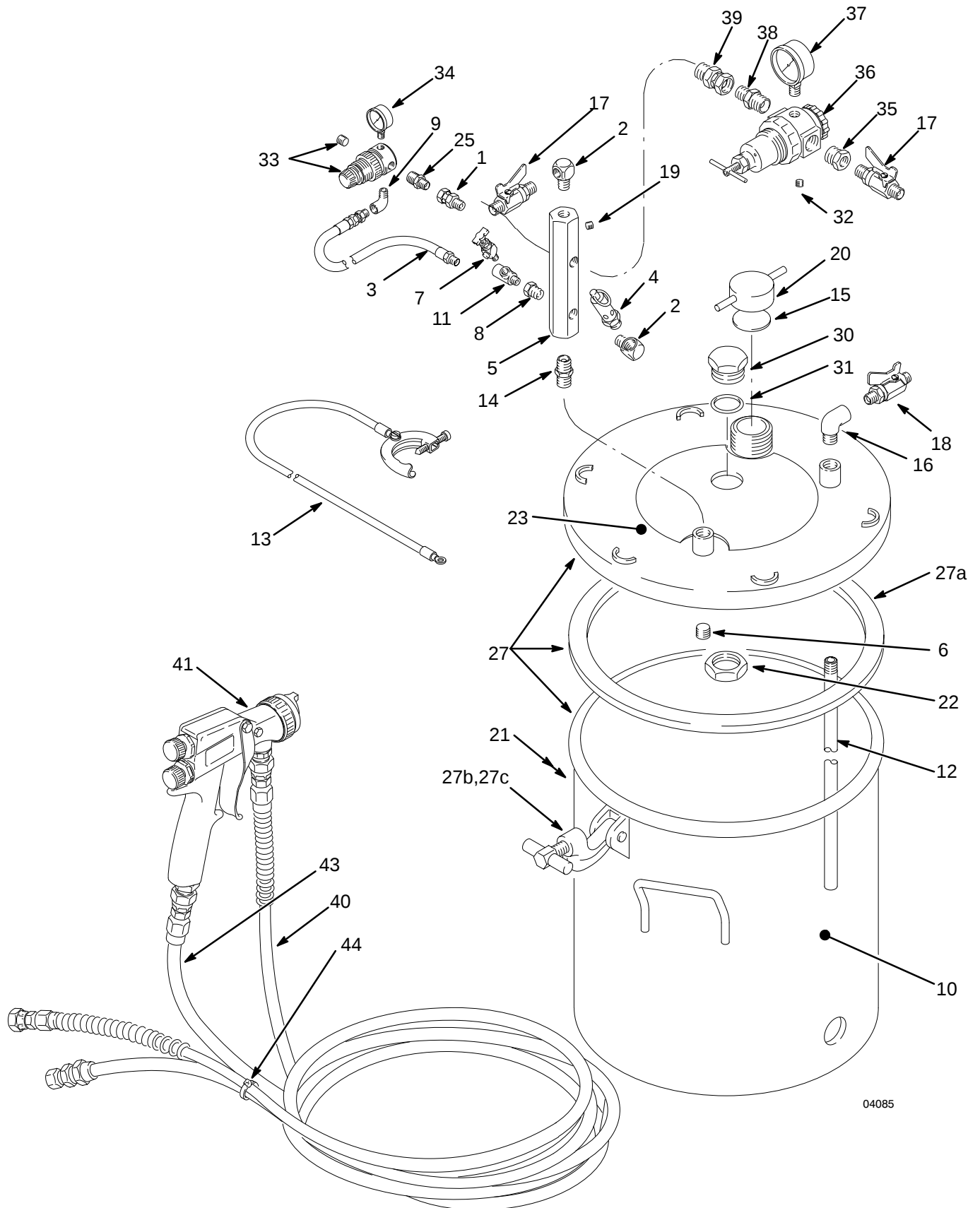
Includes items 1 to 44

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	110-476	ADAPTER, union, straight swivel, 3/8 npt(m) to 1/4 npsm(f)	1	27b	111-381	. C-CLAMP KIT <i>includes item 27c</i>	6
2	100-840	ELBOW, street, 1/4-18 npt(m x f)	2	27c✓	110-143	. T-HANDLE	6
3	164-724	HOSE, coupled 1/8-27 npt(m)	1	30	188-880	PLUG,	1
4	103-347	SAFETY VALVE, 100 psi (14 bar), 1/4-18 npt(m)	1	31✓	103-414	O-RING, packing, Viton®	1
5	189-016	AIR INLET MANIFOLD, 3/8-18 npt x 1/4-18 npt	1	32	100-721	PLUG, pipe, 3/8-18 npt	1
6	112-306	PLUG, pipe, 3/8-18 npt,	1	33✓	111-501	AIR REGULATOR, 0-15 psi (0-1.05 bar)	1
7	101-759	AIR RELIEF VALVE	1	34✓	110-444	AIR PRESSURE GAUGE 0-15 psi (0-1.05 bar)	1
8	100-030	BUSHING, 1/8-27 npt(f x m)	1	35	100-206	BUSHING	1
9	112-307	ELBOW, street, 90°, 1/8-27 npt(f x m)	1	36	104-267	AIR REGULATOR	1
10	176-347	IDENTIFICATION LABEL	1	37	160-430	AIR PRESSURE GAUGE	1
11	110-475	TEE, street, 1/8-27 npt(f x m)	1	38	159-239	NIPPLE	1
12	171-976	TUBE, 5 gal. (20 liter) size,	1	39	155-665	SWIVEL	1
13	222-011	GROUND WIRE & CLAMP	1	40	235-339	HOSE, fluid, nylon, cpld 3/8 npsm (fbe), 1/4" ID x 25' (6.3 mm ID x 7.6 m)	1
14	156-849	NIPPLE, pipe, 3/8-18 npt	1	42	236-015	OPTIMISER HVLP GUN See manual 308-293	1
15✓	171-988	GASKET, chlororene rubber and cork	1	43	210-867	AIR HOSE, cpld 1/4 npsm(fbe), 5/16" ID x 25' (7.9 mm ID x 7.6 m)	1
16	110-756	ELBOW, street, 90°, 3/8 npt (mx f)	1	44	103-473	WIRE TIE STRAP	13
17✓	208-390	BALL VALVE, 1/4-18 npt(m) See 307-068 for parts	2	Use only Genuine Graco Parts and Accessories. ✓ <i>Keep these spare parts on hand to reduce down time.</i> ▲ <i>Replacement Danger and Warning labels, tags and cards are available at no cost.</i>			
18✓	237-533	BALL VALVE, 3/8-18 npsm(m x f), See 307-068 for parts	1				
19	100-139	PLUG, pipe, headless, 1/8-27 npt	1				
20	210-575	CAP, filler	1				
21▲	290-044	LABEL, identification	1				
22	188-784	NUT, jam, hex, 1-1/2-12-unf-2b,	1				
23▲	175-078	LABEL, Warning	1				
25	151-519	NIPPLE, reducing, 1/4-1/8 npt	1				
26	111-329	PRESSURE POT LINER, 5 gal. (20 liter) size <i>not shown</i>	1				
	111-330	ACCESSORY LINERS, Package of 20, 5 gal. (20 liter) size <i>Purchase separately.</i>	1				
27	236-087	PRESSURE POT, 5 gal (20 liter), Includes replaceable items 27a to 27c	1	Manual Change Summary This manual has been updated to change the orientation of the gun air shutoff valve.			
27a✓	171-966	. GASKET, Thiokol®	1				

Parts

Model 237-413, Series A

Includes items 1 to 44



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Technical Data

Maximum Fluid Working Pressure	15 psi (1.05 bar)
Maximum Air Working Pressure	100 psi (6.9 bar)
Gun Air Consumption	20 scfm at 65 psi (0.56 m ³ /min at 4.5 bar)
Actual Pot Capacity	8.8 U.S. gal (33 liter)
Pressure pot	304/316 stainless steel ASME, Thiokol®, Zytel®, and Mylar®
Spray gun	303/420304/17–4 pH stainless steel
Fluid hoses	nylon
Fluid fittings	304/316 stainless steel

NOTE: All 304, 316 and 17-4 pH stainless steel are electropolished and/or passivated.
Zytel®, Mylar®, and are registered trademarks of the Du Pont Company.
Thioko® is a registered trademark of the Thiokol Chemical Corporation.

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 claim. 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.

Graco Phone Numbers

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-367-4023 Toll Free**

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

Sales Offices: Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)
Foreign Offices: Canada, England, Korea, Switzerland, France, Germany, Hong Kong, Japan

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