

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

Rev. E
Supersedes D

HIGH EFFICIENCY LOW PRESSURE SYSTEM 2500

AIR-ASSISTED AIRLESS 10:1 RATIO MONARK™ SPRAYER

950 psi (66 bar) **MAXIMUM WORKING FLUID PRESSURE**
95 psi (6.5 bar) **MAXIMUM WORKING AIR PRESSURE***
10 psi (0.7 bar) **MAXIMUM OPERATING AIR PRESSURE****

Model 222-617

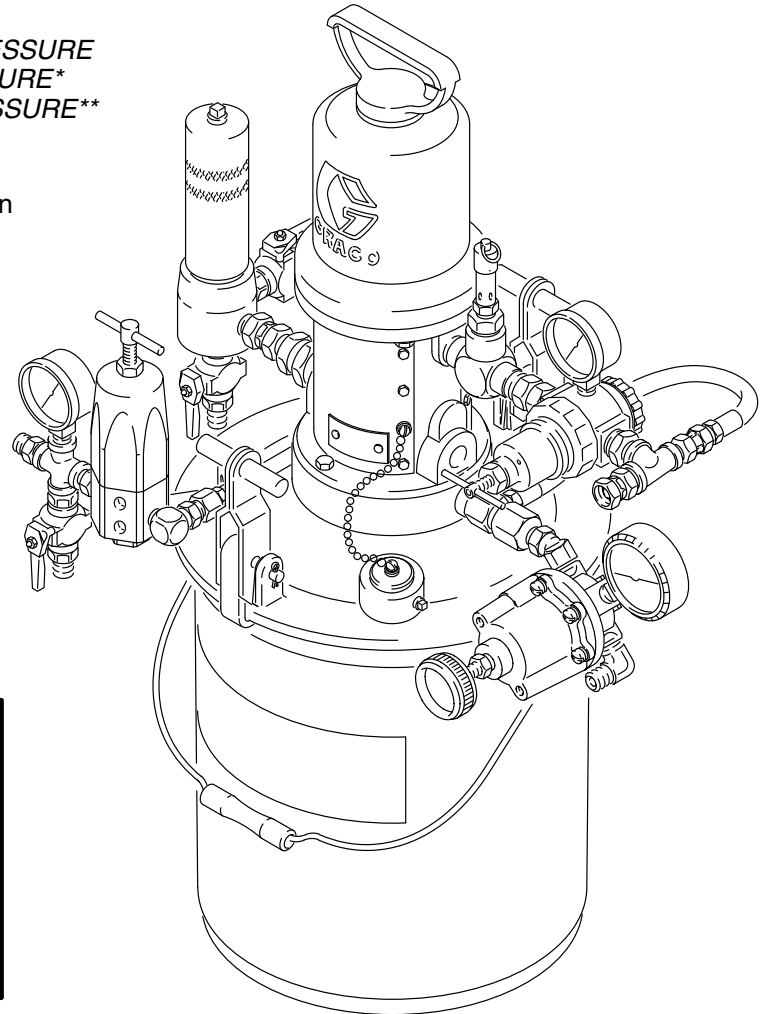
5 Gallon Pail-Mounted Sprayer with Fluid Regulation

Model 223-825

Wall-Mount Sprayer with Fluid Regulation

Model 231-165

Cart-Mounted Sprayer with Fluid Regulation



WARNING

Hazard of Using Fluids Containing Halogenated Hydrocarbons

Never use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in this equipment. Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious bodily injury and/or substantial property damage.

Consult your fluid suppliers to ensure that the fluids being used are compatible with aluminum parts.

MODEL 222-617 SHOWN
(without gun & gun hoses)

01101

*The **MAXIMUM WORKING AIR PRESSURE** indicates the maximum air pressure the gun was designed to operate safely under.

The **MAXIMUM OPERATING AIR PRESSURE indicates the maximum air pressure the air cap supplied with this gun was designed to operate at or below to comply with *California Wood Rule 1136*. To guarantee compliance to rule 1136, the gun must be used with *Air Regulator Part No. 110-776*. This regulator limits the operating pressure to 10 psi (0.7 bar), using an air supply pressure of 100 psi (7 bar).

SAFETY WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY. FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS

Read and understand all instruction manuals before operating equipment.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the gun, leaks or ruptured components can inject fluid through your skin and into your body and cause extremely serious bodily injury, including the need for amputation. Also, fluid injected or splashed into the eyes or on the skin can cause serious damage.

NEVER point spray gun at anyone or at any part of the body.

NEVER put hand or fingers over the spray tip.

NEVER try to “blow back” paint; this is NOT an air spray gun.

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

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

CHECK operation of all equipment safety devices before each use.

Medical Alert – Airless Spray Wounds

If any fluid appears to penetrate your skin, get **EMERGENCY MEDICAL CARE AT ONCE. DO NOT TREAT AS A SIMPLE CUT.** Tell the doctor exactly what fluid was injected.

Note to Physician: *Injection into the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.*

Spray Gun Safety Devices

Be sure all gun safety devices are operating properly before each use. Do not remove or modify any part of the gun; this can cause a malfunction and result in serious bodily injury.

Safety Latch

Whenever you stop spraying, even for a moment, always set the gun safety latch in the closed or “safe” position, making the gun inoperative. Failure to set the safety latch can result in accidental triggering of the gun.

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in serious bodily injury, including fluid injection and splashing fluid in the eyes or on the skin, or in fire, explosion or property damage.

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

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

Read and follow the fluid and solvent manufacturer’s literature regarding the use of protective eyewear, gloves, clothing, respirator and other equipment.

Diffuser

The gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check diffuser operation regularly. Follow the **Pressure Relief Procedure**, below, then remove the spray tip. Aim the gun into a *grounded* metal pail, holding the gun firmly to the pail. Using the lowest possible pressure, trigger the gun. If the fluid emitted is *not* diffused into an irregular stream, replace the diffuser immediately.

Spray Tip Safety

Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the **Pressure Relief Procedure**, below, and then remove the spray tip to clean it.

NEVER wipe off build-up around the spray tip or air cap until pressure is fully relieved and the gun safety latch is engaged.

Pressure Relief Procedure

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

1. Engage the spray gun safety latch.
2. Shut off the power to the pump.
3. Close the bleed-type master air valve (required in system).
4. Disengage the gun safety latch.
5. Hold a metal part of the gun firmly to the side of a *grounded* metal waste container and trigger the gun to relieve fluid pressure.
6. Engage the gun safety latch again.
7. Open the drain valve connected to the fluid pressure gauge to help relieve fluid pressure in the pump, hose and gun. Triggering the gun to relieve pressure may not be sufficient. Have 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 hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose obstruction.

System Pressure

The 10:1 Ratio Monark pump develops 950 psi (66 bar) **MAXIMUM FLUID WORKING PRESSURE** at 95 psi (6.5 bar) **MAXIMUM WORKING AIR PRESSURE**. The AA2000 Spray Gun has a 950 psi (66 bar) **MAXIMUM FLUID WORKING PRESSURE**. NEVER exceed 95 psi (6.5) air pressure to the pump or spray gun. To guarantee compliance to *California Wood Rule 1136*, the supply air to the gun must be regulated down to 10 psi (0.7 bar) **MAXIMUM OPERATING PRESSURE**, using Air Regulator Part No. 110–776. Be sure that all spray equipment and accessories added to the sprayer are properly rated to withstand the maximum working pressure of the sprayer. DO NOT exceed the maximum working pressure of any component or accessory used with the sprayer.

Fluid Compatibility

BE SURE all fluids and solvents used are chemically compatible with the “Wetted Parts” shown in the **TECHNICAL DATA** on page 17. Always read the fluid and solvent manufacturer’s literature before using them in this sprayer.

FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparks may also occur when plugging in or unplugging a power supply cord. Sparks can ignite fumes from solvents and the fluid being sprayed, dust particles and other flammable substances, whether you are pumping indoors or outdoors, and cause a fire or explosion, serious bodily injury, and property damage. Do not plug in or unplug any power supply cords in the spray area when there is any chance of igniting fumes still in the air.

If you experience any static sparking or feel even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY**. Check for proper grounding of the entire system. Do not use the system again until the cause of the problem is identified and corrected.

Grounding

To reduce the risk of static sparking, ground the pump 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 and be sure to *ground all of the following equipment*:

1. *Pump*: use a ground wire and clamp as shown in Fig 1.
2. *Fluid hoses connected to the pump*: use only grounded hoses with a maximum of 500 feet (150 m) combined hose length to ensure grounding continuity. Refer also to **Hose Grounding Continuity**, below.
3. *Air compressors*: ground according to the manufacturer's recommendations.
4. *Spray gun*: obtain grounding through connection to a properly grounded fluid hose and pump.
5. *Fluid supply container*: according to local code.
6. *Object being sprayed*: according to local code.
7. *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.

HOSE SAFETY

High pressure fluid in the hoses can be very dangerous. If the hose develops a leak, split or rupture due to any kind of wear, damage or misuse, the high pressure spray emitted from it can cause a fluid injection injury or other serious bodily injury or property damage.

ALL FLUID SPRAY HOSES MUST HAVE A SPRING GUARD ON BOTH ENDS! The spring guards help protect the hose from kinks or bends at or close to the coupling which can result in hose rupture.

TIGHTEN all fluid connections securely before each use. High pressure fluid can dislodge a loose coupling or allow high pressure spray to be emitted from the coupling.

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. **DO NOT** try to recouple high pressure hose or mend it with tape or any other device. A repaired hose cannot contain the high pressure fluid.

MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers or other body parts. **KEEP CLEAR** of moving parts when starting or operating the pump. **NEVER** operate the pump with any part removed to reduce the risk of pinching or amputating your fingers on moving parts. Before checking or

8. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun firmly to the side of a *grounded* metal pail, then trigger the gun.

To ground the pump, loosen the grounding lug locknut (A) and washer (B). Insert one end of a 12 ga (1.5 mm) minimum, ground wire (D) into the slot in lug (C) and tighten the locknut securely. See Fig 1. Refer to page 16 for ordering a ground wire and clamp. Connect the clamp end of the ground wire to a true earth ground.

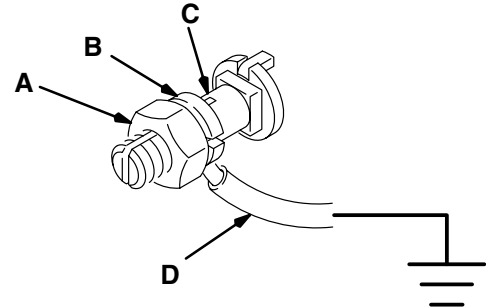


Fig 1

Flushing Safety

Before flushing, be sure the entire system and flushing pails are properly grounded. Refer to **Grounding**, above. Follow the **Pressure Relief Procedure** on page 2, and remove the spray tip from the gun. Always use the lowest possible fluid pressure, and maintain firm metal-to-metal contact between the gun and the *grounded* metal pail during flushing to reduce the risk of fluid injection injury, static sparking and splashing.

Ventilate the Spray Area

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a properly ventilated spray area.

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. **DO NOT** expose Graco hose to temperatures above 180° F (82° C) or below -40° F (-40° C).

Fluid Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray system. Check the electrical resistance of your fluid hoses at least once a week. If your hose does not have a tag on it which specifies the maximum electrical resistance, contact the hose supplier or manufacturer for the maximum resistance limits. Use a resistance meter in the appropriate range for your hose to check the resistance. If the resistance exceeds the recommended limits, replace it immediately. An ungrounded or poorly grounded fluid hose can make your system hazardous. Also read **FIRE OR EXPLOSION HAZARD**, above.

servicing the gun, pump, or any other system component follow the **Pressure Relief Procedure** on page 2, to prevent the pump from starting accidentally.

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.

TERMS

Be sure you read and understand each of these terms before reading the rest of the manual.

WARNING Alerts user to avoid or correct conditions which could cause bodily injury.

CAUTION Alerts user to avoid or correct conditions which could cause damage to or destruction of equipment.

PRESSURE RELIEF PROCEDURE A safety procedure for relieving air and fluid pressure in the system.

FOR YOUR SAFETY Alerts user to read the additional safety warnings on the page indicated.

FLUID INJECTION INJURY A serious injury, which may appear to be a simple cut, caused by high pressure injection of fluid directly into the body.

INSTALLATION

NOTES:

1. The numbers and letters in parentheses in the text refer to callouts in the drawings.
2. The circled letters in the drawings, such as **Ⓧ**, show hose connections.
3. Accessories are shown on page 16.
4. The following manuals are supplied with your sprayer.

MANUAL COMPONENT

307-595	10:1 Ratio Monark Pump 217-523
307-946	High Efficiency Low Pressure System 2500 10:1 Ratio Monark Air-Assisted Airless Spray System 222-617
307-947	High Efficiency Low Pressure System 2500 AA2000 Air-Assisted Airless Spray Gun 222-615
308-024	Gun Air Regulator 110-776
308-167	Pump Air Regulator 104-267
307-273	Fluid Filter 218-029
306-861	Ball Valve 210-657
307-886	Fluid Pressure Regulator 222-121

WARNING

For your safety in installing, operating and servicing this system, thoroughly read and follow all warnings and instructions given in this manual and in any other manuals supplied with this system or any accessories you add to the system. If a manual is missing or you need additional copies, they are available from Graco at no charge.

WARNING

The wallet sized warning card 179-960, provided with the gun, should be available and easily accessible at all times for anyone operating or servicing this equipment. The card contains important information on what to do if a fluid injection injury occurs. Additional cards are available at no charge from Graco.

Assembling the Sprayer

Locate your sprayer model on page 5, 6, or 7 and assemble the sprayer as instructed there. Then continue on with **Setting Up the System**. Keep the following points in mind as you assemble your sprayer.

1. DO NOT install a spray tip in the gun yet.
2. Instructions for installing the air line filter and for connecting the air hose grounding clamp are included in **Setting Up the System**.

TYPICAL INSTALLATION

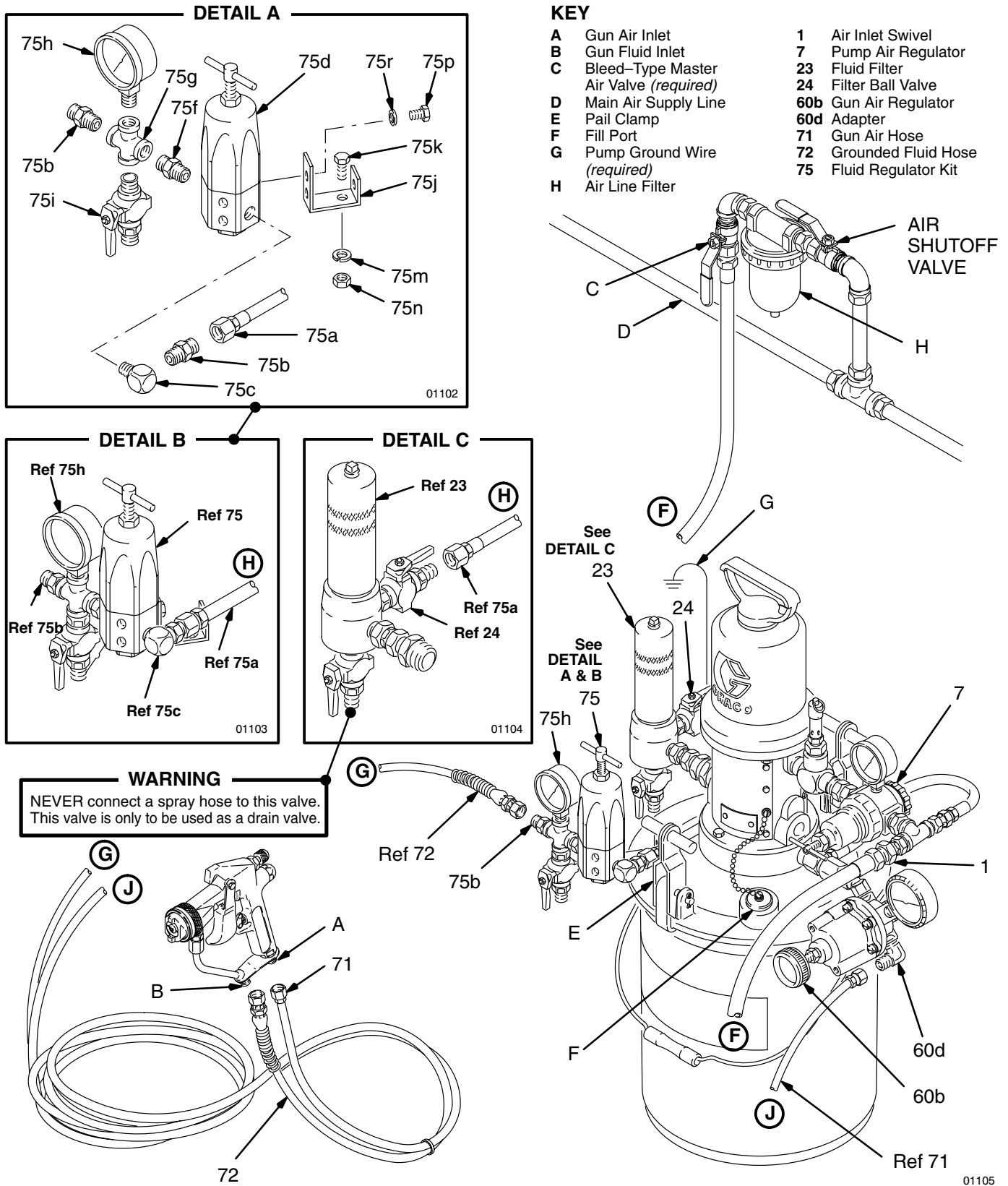


Fig 2

Model 222-617

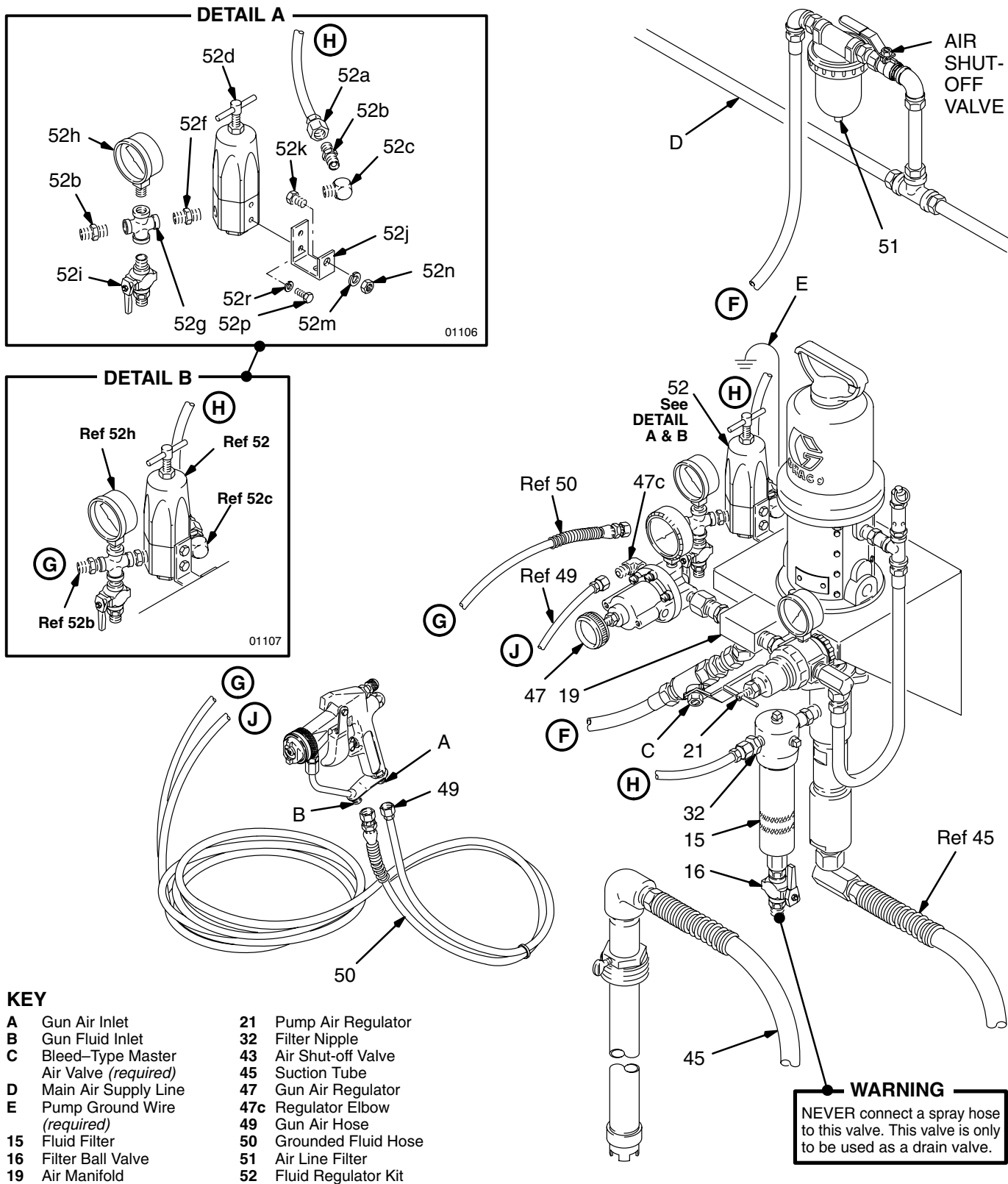
Connect the gun air supply hose (71) between the air inlet (A) of the gun and the air regulator adapter (60d).

Assemble the fluid regulator kit (75) as shown in Detail A and Detail B. Connect the fluid regulator (75d) to the top of the pail cover using the lockwasher (75m) and nut

(75n) provided. Connect the hose (75a) to filter ball valve (24).

Connect the grounded fluid hose (72) between the gun fluid inlet (B) and the nipple (75b) near the fluid regulator gauge (75h).

TYPICAL INSTALLATION



KEY

- | | |
|--|------------------------|
| A Gun Air Inlet | 21 Pump Air Regulator |
| B Gun Fluid Inlet | 32 Filter Nipple |
| C Bleed-Type Master Air Valve (required) | 43 Air Shut-off Valve |
| D Main Air Supply Line | 45 Suction Tube |
| E Pump Ground Wire (required) | 47 Gun Air Regulator |
| 15 Fluid Filter | 47c Regulator Elbow |
| 16 Filter Ball Valve | 49 Gun Air Hose |
| 19 Air Manifold | 50 Grounded Fluid Hose |
| | 51 Air Line Filter |
| | 52 Fluid Regulator Kit |

Fig 3

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Model 223-825

Connect the gun air supply hose (49) between the air inlet (A) of the gun and the air regulator elbow (47c).

Assemble the fluid regulator kit (52) as shown in Detail A and Detail B. Connect the fluid regulator (52d) to the side of the wall bracket using the bracket (52j), screw (52k),

lockwasher (52m), and nut (52n). Connect the hose (52a) to the filter nipple (32).

Connect the grounded fluid hose (50) between the gun fluid inlet (B) and the nipple (52b) near the fluid regulator gauge (52h).

TYPICAL INSTALLATION

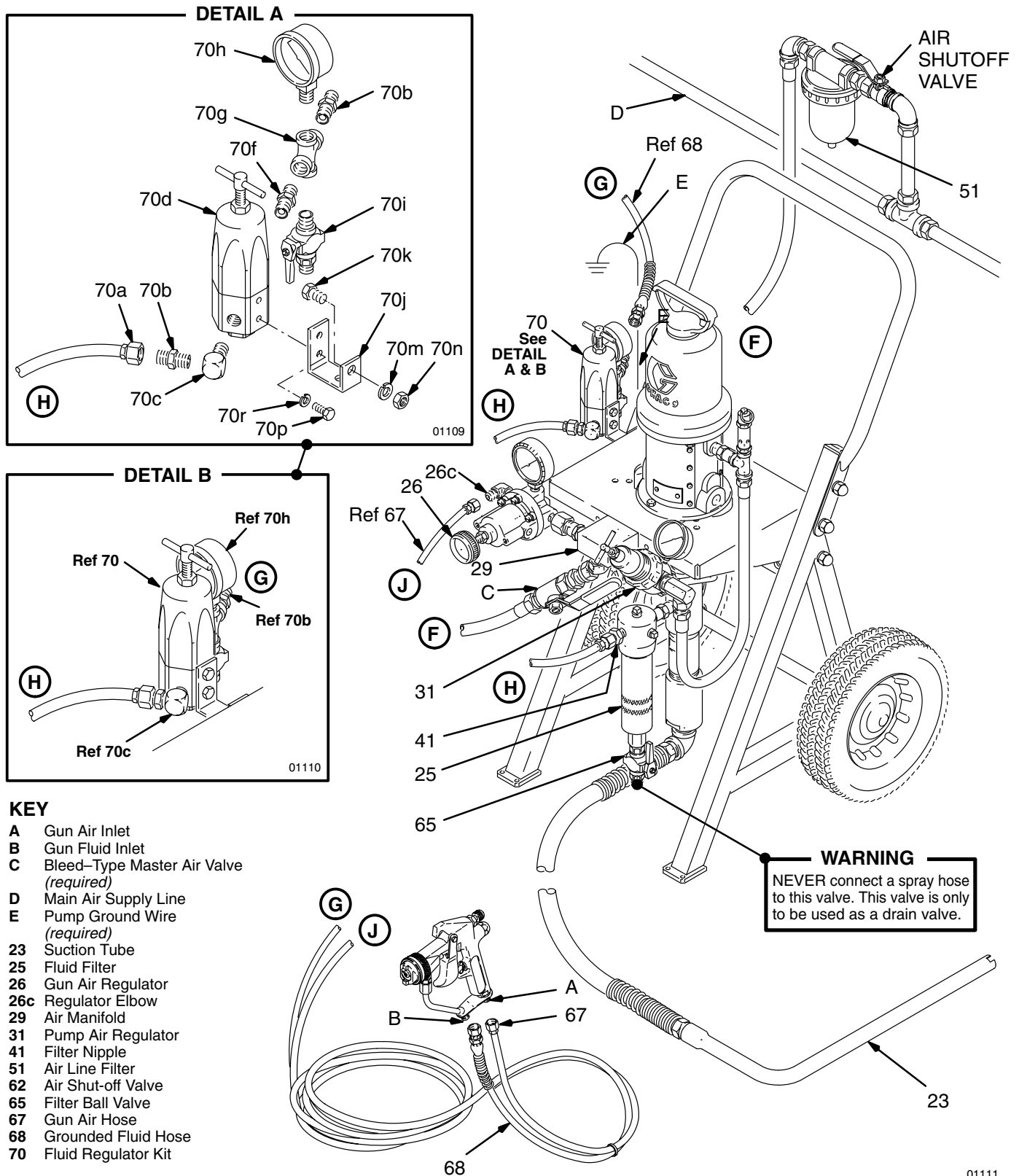


Fig 4

Model 231-165

Connect the gun air supply hose (67) between the air inlet (A) of the gun and the air regulator adapter (26c).

Assemble the fluid regulator kit (70) as shown in Detail A and Detail B. Connect the fluid regulator (70d) to the side of the cart using the bracket (70j), screw (70k), lock-

washer (70m), and nut (70n). Connect the hose (70a) to filter nipple (41).

Connect the grounded fluid hose (68) between the gun fluid inlet (B) and the nipple (70b) near the fluid regulator gauge (70h).

TYPICAL INSTALLATION

Setting Up the System

Grounding

Read the warning section FIRE OR EXPLOSION HAZARD on page 3 of this manual and ground the pump, and system as instructed there.

Flushing

Read the warning section *Flushing and Cleaning Safety*, under FIRE OR EXPLOSION HAZARD on page 3 of this manual. Then flush the pump as instructed in manual 307–595, supplied, to remove the oil left in the pump after factory testing.

Air Line

Always use an air line filter (H or 51) to remove harmful dirt and contaminants from your compressed air supply.

Within easy reach of the pump, install a bleed-type master air valve (C).

WARNING

The bleed-type master air valve (C) is required in your system to shut off and relieve air pressure that may be trapped in the air motor. This air could cause the pump to cycle unexpectedly, which could result in serious bodily injury, including amputation of a limb, or splashing in the eyes.

CAUTION

To avoid contaminating the air supply to the gun, do not use an automatic air line oiler; lubricate the motor manually, instead. See the OPERATION section.

Fluid Supply (Refer to the drawing for your sprayer)

For pail-mounted sprayers, fill the 5-gallon pail with fluid. Be sure you engage the pail clamps (E) securely. The pail has an inspection/fill port (F) for replenishing the fluid supply.

For cart-mounted and wall-mounted sprayers, place the suction tube (23 or 45) in the fluid container.

Hoses

Secure the air and fluid hoses together with plastic ties spaced about 18 to 24 in. (0.5 to 0.6 m) apart.

WARNING

Pressure Relief Procedure

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

1. Engage the spray gun safety latch.
2. Shut off the power to the pump.
3. Close the bleed-type master air valve (required in system).
4. Disengage the gun safety latch.
5. Hold a metal part of the gun firmly to the side of a *grounded* metal waste container and trigger the gun to relieve fluid pressure.
6. Engage the gun safety latch again.
7. Open the drain valve connected to the fluid pressure gauge to help relieve fluid pressure in the pump, hose and gun. Triggering the gun to relieve pressure may not be sufficient. Have 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 hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose obstruction.

NOTE: Contact your Graco distributor for information on training aids which are available from Graco.

To Operate the Pump

Open the bleed-type master air valve. Adjust the pump air regulator until the pump is running smoothly.

With no spray tip installed, hold a metal part of the gun firmly to the side of a *grounded* metal pail. Disengage the gun's safety latch and trigger the gun into a pail to prime the pump. See Fig 5. Be sure to remove all air from the fluid line. Release the trigger and engage the gun safety latch.

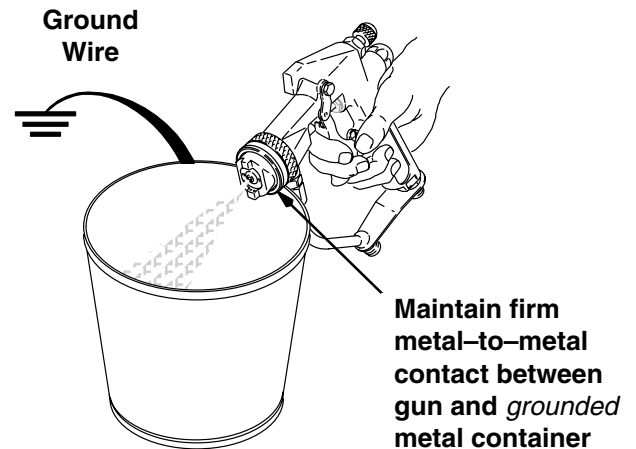


Fig 5

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AA2000 Spray Gun Operation

Refer to the OPERATION section of manual 307-947, supplied, for installing the spray tip, adjusting the spray pattern and using the spray gun.

Control air to the gun with the gun air regulator.

Control the fluid to the gun with the fluid pressure regulator.

Manual Air Motor Lubrication

To lubricate the air motor manually, first follow the **Pressure Relief Procedure Warning**, at left. Then remove the air inlet fitting from the motor. Place 10-15 drops of oil in the inlet, reinstall the air inlet fitting and apply air to the motor. Do this daily for the best corrosion protection.

PARTS LIST

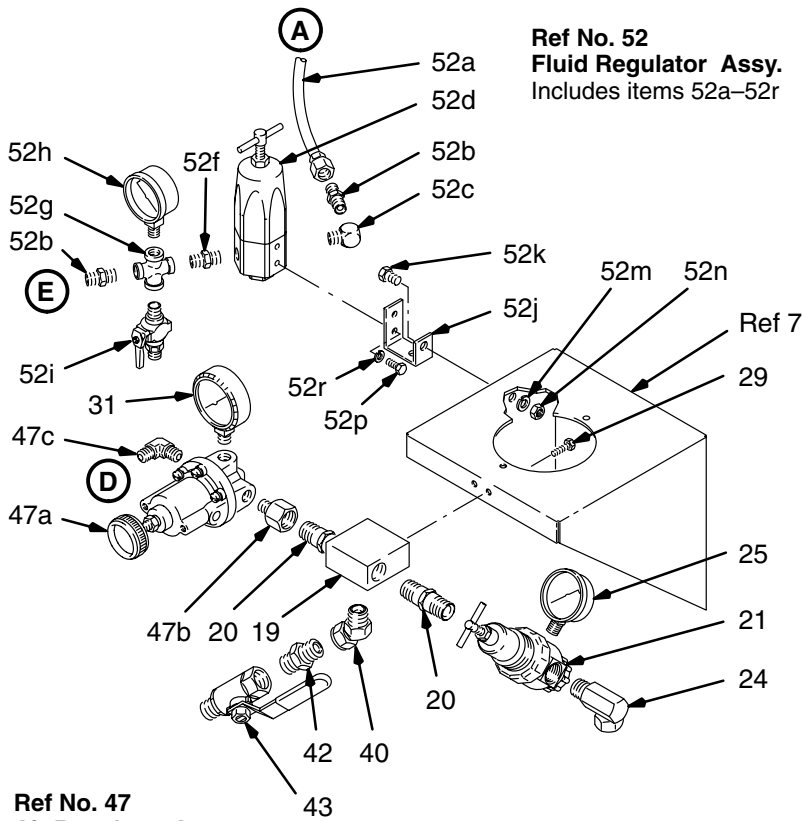
Part No. 222-617

H.E.L.P. 2500 10:1 Ratio Monark Pail-Mounted Sprayer

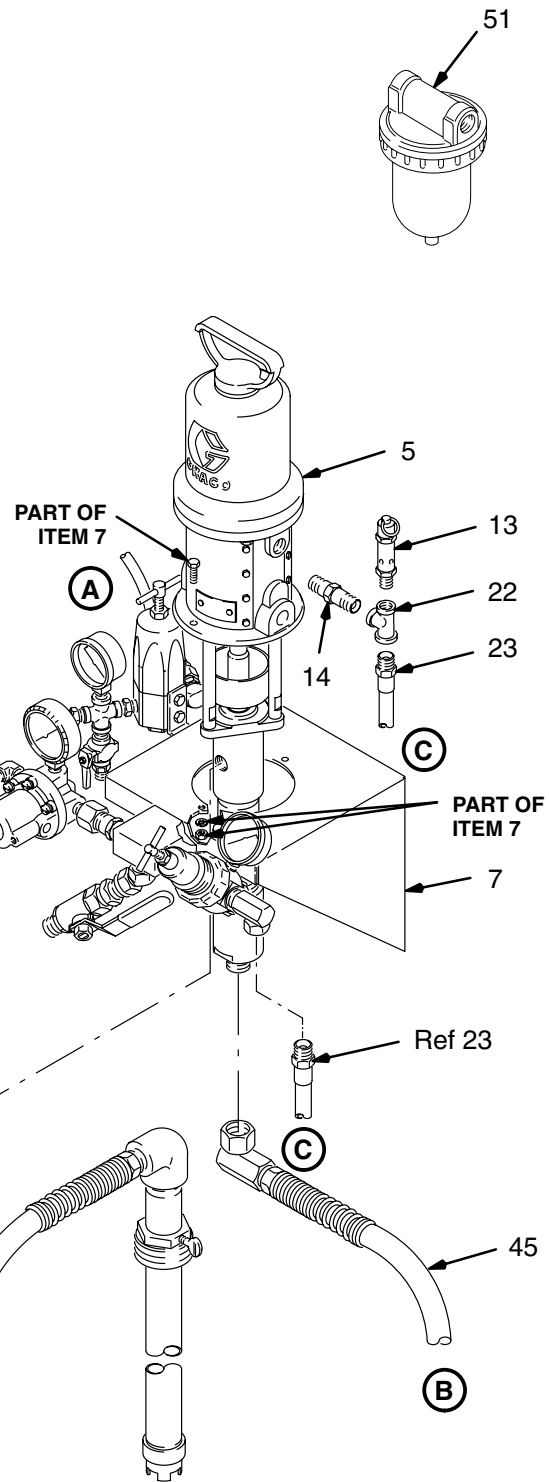
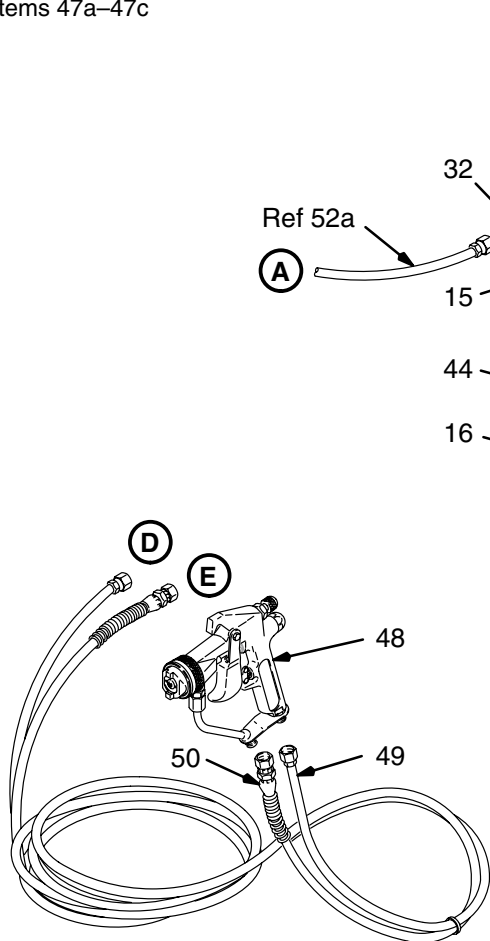
REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY						
1	162-505	UNION, swivel; 3/8 npt(m) x 1/2 npsm(f) swivel	1	56*	101-380	BUTTON, plug	1						
3	171-987	TEE; 3/8 npt(f) x 1/4 npt(f) run; 3/8 npt(f) branch	1	57*	160-516	O-RING, nitrile rubber	1						
4	156-823	UNION, swivel; 1/4 npsm(f) swivel x 1/4 npt(m)	1	58*	165-096	PLUG, inspection hole	1						
5	202-812	HOSE, air, neoprene; 1/4" ID; cpld 1/4 npt(mbe); 1.2' (0.36 m) long	1	60	223-594	AIR REGULATOR ASSEMBLY Includes items 60a-60d	1						
6	101-180	GAUGE, air pressure; 0-200 psi (0-44 bar) range	1	60a	110-232	•UNION, adapter, 45° swivel; 1/4-18 npt (m x f)	1						
7	104-267	AIR REGULATOR See 308-167 for parts	1	60b	110-776	•REGULATOR, air pressure See 308-024 for parts	1						
8	158-256	UNION, straight swivel; 1/2 npt(m) x 3/8 npsm(f) swivel	1	60c	159-842	•ADAPTER; 1/4 npt(m) x 1/2 npt(f)	1						
9	103-347	AIR PRESSURE RELIEF VALVE	1	60d	110-249	•ELBOW, 90° street; 1/4-18 npt(m)	1						
10	100-176	BUSHING, hex; 1/4 npt(f) to 3/8 npt(m)	1	61	185-350	GAUGE, air pressure	1						
11	108-066	TEE, pipe; two 3/8 npt(m); one 3/8 npt(f)	1	70	222-615	High Efficiency Low Pressure System 2500 AA2000 AIR-ASSISTED AIRLESS SPRAY GUN; See 307-947 for parts	1						
12	104-765	PLUG, pipe, hdls; 1/8-27 npt(f)	1	71	185-353	HOSE, air, buna; 3/8" ID; cpld 1/4 npsm(fbe) swivel; 25' (7.6 m) long	1						
14	217-523	10:1 RATIO MONARK PUMP; See 307-595 for parts	1	72	214-698	HOSE, fluid, grounded, nylon; 3/16" ID; cpld 1/4 npsm(f) swivel x 1/4 npt(m); 25' (7.6 m) lg; spring guards both ends	1						
15	104-429	CAPSCREW, hex hd; 1/4-20 x 2.25" long	2	73*	182-513	SPRAY TIP	1						
16	165-198	NIPPLE, rdcg; 3/8 x 1/4 npt	1	75	222-564	FLUID REGULATOR ASSEMBLY Includes items 75a-75r	1						
17	206-966	HOSE, fluid, PTFE®; 1/4" ID; cpld 1/4 npsm(fbe); 12.5" (317.50 mm) long	1	75a	110-192	.HOSE, coupled	1						
18	162-453	NIPPLE; 1/4 npt x 1/4 npsm	1	75b	162-453	.NIPPLE, 1/4 npt x 1/4 npsm (only qty. of 2 used with this sprayer)	3						
19	164-259	ELBOW, str; 3/8 npt(m) x 1/4 npt(f)	1	75c	100-840	.ELBOW, street; 1/4 npt (m x f) (only qty. of 1 used with this sprayer)	2						
20	166-031	ELBOW, outlet; 3/4 npt x 3/8 npt	1	75d	222-121	.REGULATOR, fluid pressure See Manual 307-886 for parts.	1						
21	161-800	ADAPTER; 3/8 npsm x 3/4 npt	1	75e*	110-220	.UNION, adapter, swivel (not used with this sprayer)	1						
22	155-665	UNION, adapter; 3/8 npt(m) x 3/8 npsm(f)	1	75f	156-971	.NIPPLE, short; 1/4 npt x 1-3/8" long	1						
23	218-029	FILTER, fluid See 307-273 for parts	1	75g	102-959	.CROSS, pipe; 1/4 npt	1						
24	210-657	BALL VALVE; 1/4 npt(mbe) See 306-861 for parts	2	75h	802-072	.GAUGE, pressure, fluid; 0-1000 psi (0-69 bar) range	1						
28	104-813	PLUG, pipe, sq hd; 3/8 npt	1	75i	210-657	.VALVE, ball	1						
30	218-693	BASE, mounting, pump	1	75j	185-251	.BRACKET, regulator	1						
31	100-933	SCREW, type "F" self-tapping; No. 8-32 x 3/16"	2	75k	100-469	.SCREW, cap, hex hd;	1						
32	206-755	CORD, wire; 5.5" (140 mm) long	2	75m	100-133	.WASHER, lock	1						
33	164-726	PLUG, inspection hole	1	75n	100-307	.NUT, full, hex	1						
34	156-593	O-RING, nitrile rubber	1	75p	100-270	.SCREW, cap, hex hd	2						
35	101-962	SCREW, cup pt soc hd set; 1/4-20 x 3/8"	2	75r	100-016	.WASHER, lock	2						
36	179-917	COVER, pail	1	<i>306, 307, & 308 Numbers in the description refer to separate instruction manuals.</i>									
39	161-395	PIN, pivot; 0.25" (6.4 mm) dia; 2.0" (51 mm) long	2										
40	204-535	HANDLE, latch, cover	2	<i>*These items are not shown in the Parts Drawing.</i>									
41	204-534	HOOK, latch, cover	2										
42	158-223	WASHER, steel	2	<div style="text-align: center;">HOW TO ORDER REPLACEMENT PARTS</div> <ol style="list-style-type: none"> 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. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">6 digit Part Number</th> <th style="text-align: center;">Qty</th> <th style="text-align: center;">Part Description</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> <td> </td> </tr> </tbody> </table>				6 digit Part Number	Qty	Part Description			
6 digit Part Number	Qty	Part Description											
43	100-063	PIN, cotter; 0.06" (1.6 mm) dia; 0.5" (12.7 mm) long	2										
44	100-016	LOCKWASHER, spring; 1/4"	2										
45	100-015	NUT, hex; 1/4-20	2										
46	185-347	PAIL, 5 gallon (U.S.)	1										
47	185-348	LABEL	1										
49	159-239	NIPPLE, pipe, reducing; 1/2 to 3/8 npt	1										
50	100-721	PLUG, slotted hd pipe; 1/4 npt	1										
55*	206-994	THROAT SEAL LIQUID, 8 oz.	1										

PARTS DRAWING

**Ref No. 52
Fluid Regulator Assy.**
Includes items 52a-52r



**Ref No. 47
Air Regulator Assy.**
Includes items 47a-47c



PARTS LIST

Part No. 223-825

H.E.L.P. 2500 10:1 Ratio Monark Wall-Mounted Sprayer

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
5	217-523	10:1 RATIO MONARK PUMP; See 307-595 for parts	1	47	223-938	AIR REGULATOR ASSEMBLY; Includes items 47a to 47c	1
7	207-365	BRACKET, self-mounting; Includes mounting hardware; See 306-783 for parts	1	47a	110-776	• REGULATOR, air pressure; See 308-024 for regulator instructions	1
8*	206-994	THROAT SEAL LIQUID, 8 oz.	1	47b	159-842	• ADAPTER; 1/4 npt(m) x 1/2 npt(f)	1
13	103-347	AIR PRESSURE RELIEF VALVE	1	47c	110-249	• ELBOW, 90°; 1/4-18 npt(m)	1
14	156-850	NIPPLE, adapter; 3/8 npt; 2.5" long	2	48	222-615	High Efficiency Low Pressure System 2500 AA2000 AIR-ASSISTED AIRLESS SPRAY GUN; See 307-947 for parts	1
15	218-029	FILTER, fluid; See 307-273 for parts	1	49	185-353	HOSE, air, buna; 3/8" ID; cpld 1/4 npsm(fbe) swivel; 25' (7.6 m) long	1
16	210-658	BALL VALVE	1	50	214-698	HOSE, fluid, grounded, nylon; 3/16" ID; cpld 1/4 npsm(f) swivel x 1/4 npt(m); 25' (7.6 m) lg; spring guards both ends	1
17	100-509	PLUG, pipe; 1/4 "	3	51	106-148	AIR FILTER; 3/8 npt(f)	1
19	179-749	MANIFOLD, air; two 1/2 npt(f)	1	52	222-564	FLUID REGULATOR ASSEMBLY Includes items 52a-52r	1
20	156-877	NIPPLE; 1/2 npt	2	52a	110-192	.HOSE, coupled	1
21	104-267	AIR REGULATOR; See 308-167 for parts	1	52b	162-453	.NIPPLE, 1/4 npsm x 1/4 npt (only qty. of 2 used with this sprayer)	3
22	171-987	TEE; 3/8 npt(f) x 1/4 npt(f) run; 3/8 npt(f) branch	1	52c	100-840	.ELBOW, street; 1/4 npt (m x f) (only qty. of 1 used with this sprayer)	2
23	204-560	HOSE, air buna-N; 3/8" ID, cpld 3/8 npt(m), 1.5' (460 mm) long	1	52d	222-121	.REGULATOR, fluid pressure See Manual 307-886 for parts.	1
24	161-037	ADAPTER, union; 1/2 npt(m) x 3/8 npsm(f) swivel	1	52e*	110-220	.UNION, adapter, swivel (not used with this sprayer)	1
25	101-180	GAUGE, air pressure; 0-200 psi (0-44 bar) range	1	52f	156-971	.NIPPLE, short; 1/4 npt x 1-3/8" long	1
29	102-254	SCREW, sems hex head; 1/4-20 x 7/8"	2	52g	102-959	.CROSS, pipe; 1/4 npt	1
31	185-350	GAUGE, air pressure	1	52h	802-072	.GAUGE, pressure, fluid; 0-1000 psi (0-69 bar) range	1
32	162-453	NIPPLE; 1/4 npsm x 1/4 npt	1	52i	210-657	.VALVE, ball	1
40	222-297	UNION, swivel adapter; 1/2-14 npsm x 1/2-14 nptf	1	52j	185-251	.BRACKET, regulator	1
42	100-122	NIPPLE, close; 1/2-14 npt	1	52k	100-469	.SCREW, cap, hex hd;	1
43	107-142	VALVE, shut-off; 1/2-14 npt	1	52m	100-133	.WASHER, lock	1
44	150-286	ADAPTER; 3/8" (m x f) std. pipe thd.	1	52n	100-307	.NUT, full, hex	1
45	208-259	SUCTION KIT	1	52p	100-270	.SCREW, cap, hex hd	2
46*	110-110	SEALANT, stainless steel pipe	1	52r	100-016	.WASHER, lock	2

306, 307, & 308 Numbers in the description refer to separate instruction manuals.

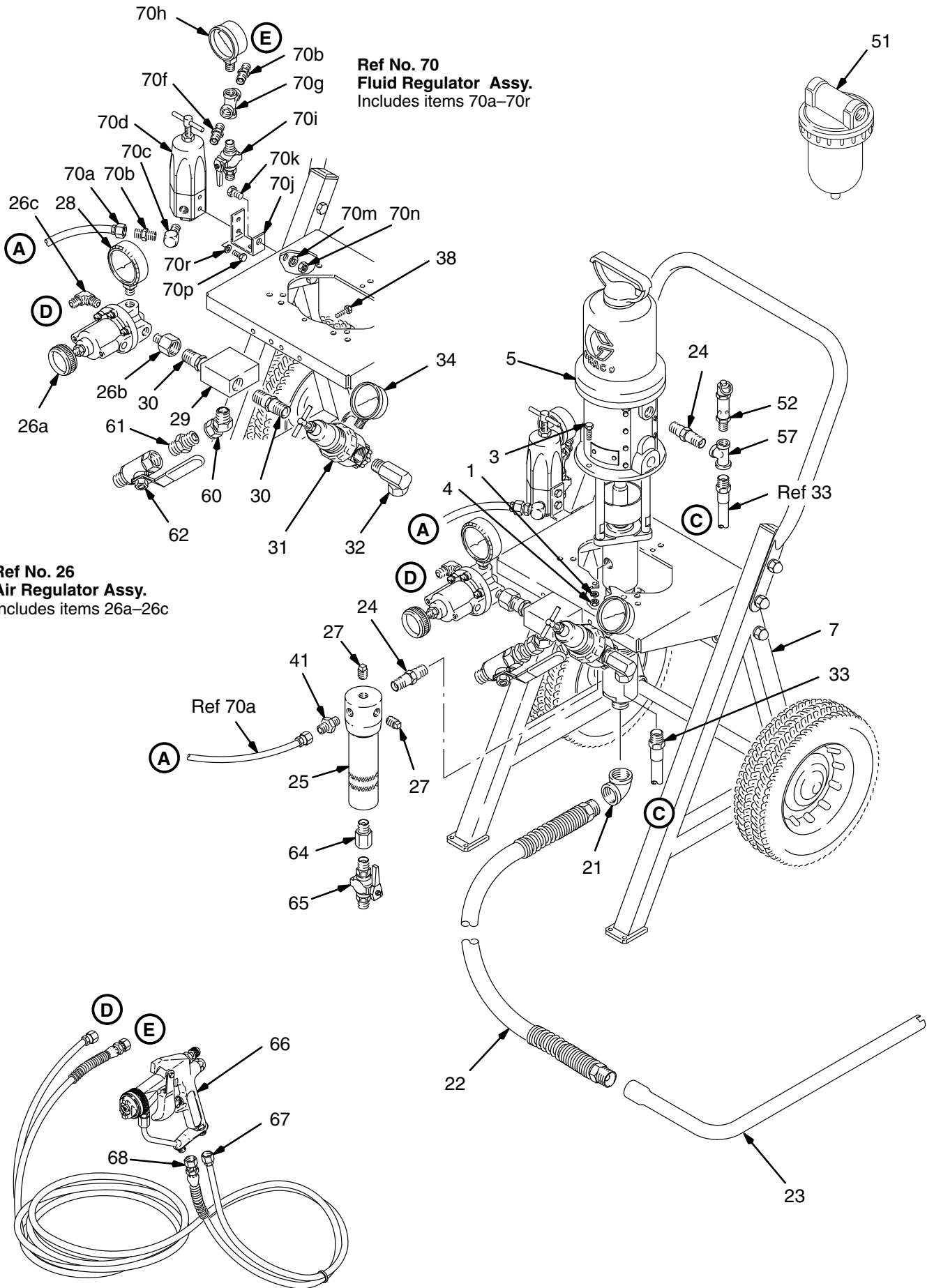
*These items are not shown in the Parts Drawing.

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

PARTS DRAWING



PARTS LIST

Part No. 231-165

H.E.L.P. 2500 10:1 Ratio Monark Cart-Mounted Sprayer

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
1	100-016	LOCKWASHER, spring; 1/4"	2	61	158-491	NIPPLE; 1/2 npt	1
3	100-022	CAP SCREW; 1/4-20 x 3/4"	2	62	107-142	VALVE, shut-off; 1/2-14 npt	1
4	100-015	NUT, hex; 1/4-20	2	64	150-286	ADAPTER; 3/8" (m x f) std. pipe thd.	1
5	217-523	10:1 RATIO MONARK PUMP; See 307-595 for parts	1	65	210-658	BALL VALVE	1
7	224-044	UNIVERSAL CART; See 308-136 for parts	1	66	222-615	High Efficiency Low Pressure System 2500 AA2000 AIR-ASSISTED AIRLESS SPRAY GUN; See 307-947 for parts	1
21	100-349	ELBOW, 90°; 3/4 npt	1	67	185-353	HOSE, air, buna; 3/8" ID; cpld 1/4 npsm(fbe) swivel; 25' (7.6 m) long	1
22	214-960	HOSE, suction; 3/4" ID; 3-1/2" (1 m) lg; cpld 3/4 npt(mbe); with spring guard	1	68	214-698	HOSE, fluid, grounded, nylon; 3/16" ID; cpld 1/4 npsm(f) swivel x 1/4 npt(m); 25' (7.6 m) lg; spring guards both ends	1
23	165-767	TUBE, suction	1	70	222-564	FLUID REGULATOR ASSEMBLY Includes items 70a-70r	1
24	156-850	NIPPLE, adapter; 3/8 npt; 2.5" long	2	70a	110-192	.HOSE, coupled	1
25	218-029	FILTER, fluid; See 307-273 for parts	1	70b	162-453	.NIPPLE, 1/4 npsm x 1/4 npt (only qty. of 2 used with this sprayer)	3
26	223-938	AIR REGULATOR ASSEMBLY; Includes items 26a to 26c	1	70c	100-840	.ELBOW, street; 1/4 npt (m x f) (only qty. of 1 used with this sprayer)	2
26a	110-776	• REGULATOR, air pressure; See 308-024 for regulator instructions	1	70d	222-121	.REGULATOR, fluid pressure See Manual 307-886 for parts.	1
26b	159-842	• ADAPTER; 1/4 npt(m) x 1/2 npt(f)	1	70e*	110-220	.UNION, adapter, swivel (not used with this sprayer)	1
26c	110-249	• ELBOW, 90°; 1/4-18 npt(m)	1	70f	156-971	.NIPPLE, short; 1/4 npt x 1-3/8" long	1
27	100-509	PLUG, pipe; 1/4"	3	70g	102-959	.CROSS, pipe; 1/4 npt	1
28	185-350	GAUGE, air pressure	1	70h	802-072	.GAUGE, pressure, fluid; 0-1000 psi (0-69 bar) range	1
29	179-749	MANIFOLD, air; two 1/2 npt(f)	1	70i	210-657	.VALVE, ball	1
30	156-877	NIPPLE; 1/2 npt	2	70j	185-251	.BRACKET, regulator	1
31	104-267	AIR REGULATOR; See 308-167 for parts	1	70k	100-469	.SCREW, cap, hex hd;	1
32	161-037	ADAPTER, union; 1/2 npt(m) x 3/8 npsm(f) swivel	1	70m	100-133	.WASHER, lock	1
33	204-560	HOSE, air buna-N; 3/8" ID, cpld 3/8 npt(m), 1.5' (460 mm) long	1	70n	100-307	.NUT, full, hex	1
34	101-180	GAUGE, air pressure; 0-200 psi	1	70p	100-270	.SCREW, cap, hex hd	2
38	102-254	SCREW, sems hex head; 1/4-20 x 7/8"	2	70r	100-016	.WASHER, lock	2
41	162-453	NIPPLE; 1/4 npsm x 1/4 npt	1				
42*	206-994	THROAT SEAL LIQUID, 8 oz.	1				
51	106-148	AIR FILTER; 3/8 npt(f)	1				
52	103-347	AIR PRESSURE RELIEF VALVE	1				
57	171-987	TEE; 3/8 npt(f) x 1/4 npt(f) run; 3/8 npt(f) branch	1				
60	222-297	UNION, swivel adapter; 1/2-14 npsm x 1/2-14 nptf	1				

306, 307, & 308 Numbers in the description refer to separate instruction manuals.

*These items are not shown in the 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

ACCESSORIES

Accessories must be purchased separately.
Use only **GENUINE GRACO PARTS AND ACCESSORIES**.

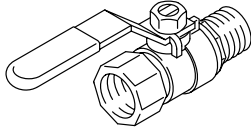
BLEED-TYPE MASTER AIR VALVE

300 psi (21 bar) MAXIMUM WORKING PRESSURE

Relieves air trapped in the air line between the pump air inlet and this valve when closed.

107-141 3/4 npt(m x f) inlet & outlet

107-142 1/2 npt(m x f) inlet & outlet



AIR SUPPLY HOSE

175 psi (12 bar) MAXIMUM WORKING PRESSURE

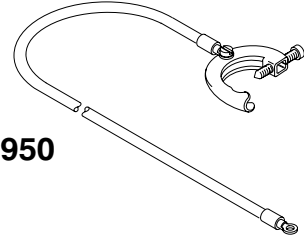
205-418 6 ft (1830 mm)

205-216 15 ft (4.6 m)

205-273 25 ft (7.6 m)

208-594 50 ft (15.2 m)

GROUNDING CLAMP 103-538

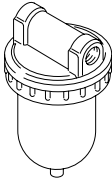


AIR LINE FILTER

250 psi (17.5 bar) MAXIMUM WORKING PRESSURE

106-148 3/8 npt(f)

106-149 1/2 npt(f)



GROUND WIRE 208-950

25 ft (7.6 m) lg, 12 ga.

THROAT SEAL LIQUID

Non-evaporating solvent for wet-cup

206-995 1 quart (0.9 liter)

206-996 1 gallon (3.8 liter)

TECHNICAL DATA

Recommended Air
Operating Range 20–95 psi (1.5–6.3 bar)

Maximum Pump Fluid
Working Pressure 950 psi (66 bar)

Maximum Recommended Pump Speed
for Continuous Operation 60 cycles/min:
 1 gpm (3.8 liter/min) delivery

Air Consumption Approximately 15 SCFM per
 gallon at 95 psi (6.3 bar)

Air Inlet Size 1/2 npt(f); use 1/2 in. ID air hose

Fluid Filter 60 mesh (250 micron) screen

Wetted Parts See component instruction manuals

SPRAYER DIMENSIONS

Sprayer Model	Overall Height	Overall Width	Overall Depth	Ap- prox. Net Weight
222–617	30 in. (762 mm)	15.5 in. (394 mm)	14.75 in. (375 mm)	52 lb (24 Kg)
223–825	30.37 in. (771 mm)	20.75 in. (526 mm)	15.25 in. (387 mm)	49 lb (22 Kg)
231–165	42.25 in. (1149 mm)	27.75 in. (705 mm)	27.50 in. (699 mm)	140 lb (60 Kg)

SERVICE INFORMATION

This manual was revised to add Sprayer Model 231–165, which uses the universal cart.

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.

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**

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

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

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