

INSTRUCTIONS—PARTS LIST



307-646

Rev E
Supersedes D

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

AIR-ASSISTED AIRLESS, 13:1 RATIO SENATOR® PUMP **POWER-FLO® SPRAYERS**

Senator Pump

66 bar (950 psi) *MAXIMUM FLUID WORKING PRESSURE*
5.2 bar (75 psi) *MAXIMUM AIR WORKING PRESSURE*

Air-Assisted Airless Spray Gun

66 bar (950 psi) *MAXIMUM FLUID WORKING PRESSURE*
7 bar (100 psi) *MAXIMUM AIR WORKING PRESSURE*

Model 224-631, Series A

Includes pump and portable cart

Model 231-155

Includes pump, portable cart, hose, gun and tip

Fluid Regulation Kit 222-564

Includes fluid regulator and attaching hardware

Second Gun Installation Kit 218-910

Includes air regulator, air manifold, hoses, and attaching hardware to connect a second spray gun to the sprayer

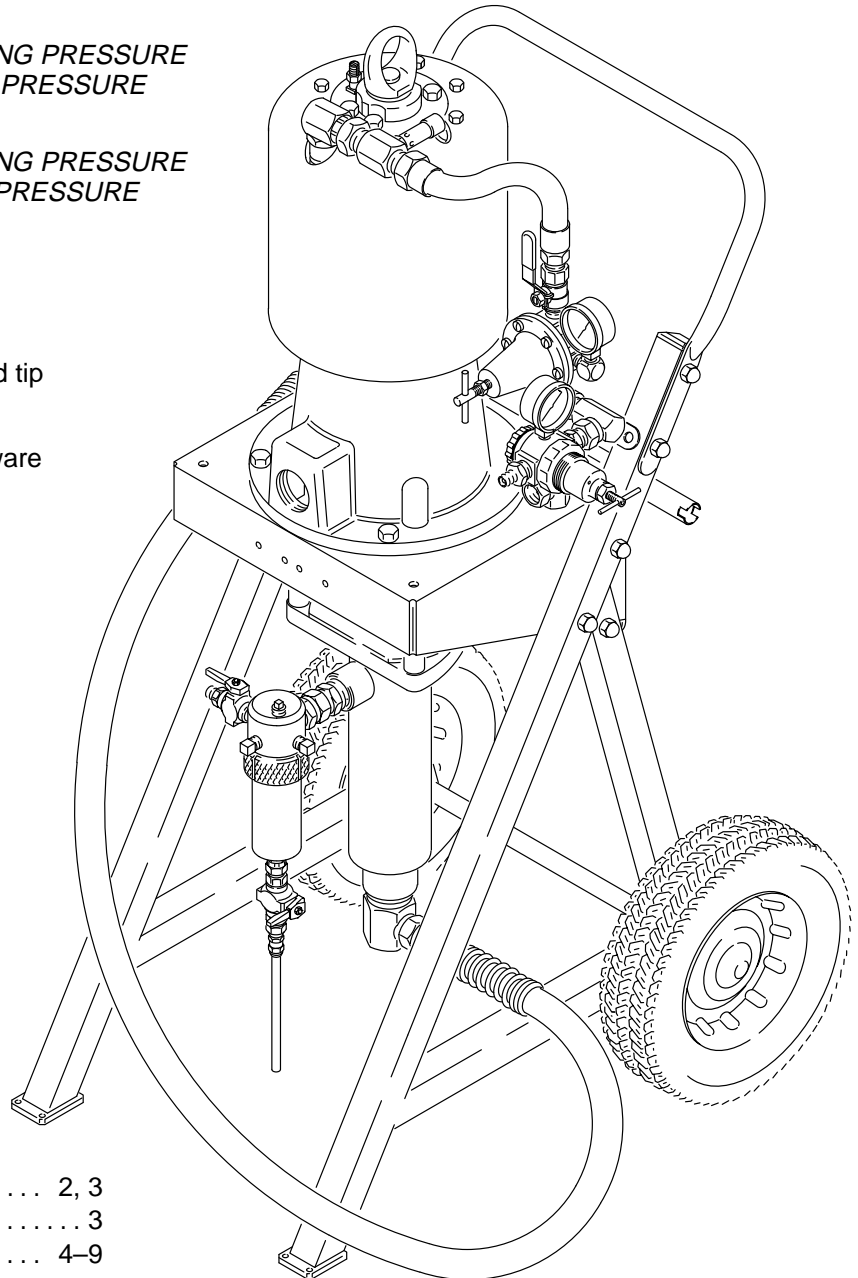


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MODEL 224-631 SHOWN



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SAFETY WARNINGS

HIGH PRESSURE FLUID CAN CAUSE SERIOUS INJURY. FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS. NEVER EXCEED 950 PSI (66 BAR) MAXIMUM FLUID PRESSURE IN THIS AIR ASSISTED AIRLESS PUMP.

Read And Understand All Instruction Manuals Before Operating Equipment.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the spray 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 the 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 system.

ALWAYS follow the **Pressure Relief Procedure**, 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.

Be sure equipment safety devices are operating properly 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 in 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 spray gun safety devices are operating properly before each use. Do not remove or modify any part of the spray 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 spray gun safety latch in the closed or “safe” position, making the spray gun inoperative. Failure to set the safety latch can result in accidental triggering of the spray gun.

Diffuser

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

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray 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 fluid injection, splashing in the eyes or on the skin, or other serious bodily injury, or fire, explosion or property damage.

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.

Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

Spray Tip Safety

Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the spray 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 until pressure is fully relieved and the spray 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 the skin, or injury from moving parts, always follow this procedure whenever you shut off the pump, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (supplied in your system).
4. Disengage the spray gun safety latch.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve connected to the fluid filter outlet, and all other drain valves used in the system (such as in systems using fluid regulation), to help relieve fluid pressure in the displacement 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(s) 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 air cap or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

System Pressure

The 13:1 ratio Senator pump can develop 66 bar (950 psi) MAXIMUM WORKING PRESSURE at 5.2 bar (75 psi) MAXIMUM INCOMING AIR PRESSURE. NEVER exceed 5.2 bar (75 psi) air pressure to the pump or 7 bar (100 psi) air pressure to the spray gun.

Be sure that all spray equipment and accessories are rated to withstand the maximum working pressure of the pump. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Fluid Compatibility

BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the **TECHNICAL DATA** in the separate component manuals. Always read the manufacturer’s literature before using fluid or solvent in this pump.

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 HOSES MUST HAVE SPRING GUARDS 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 safely contain the high pressure fluid.

HANDLE AND ROUTE HOSES CAREFULLY. Do not pull on hoses to move equipment. Do not use fluids which are not compatible with the inner tube and cover of the hose. **DO NOT** expose Graco hoses to temperatures above 82° C (180° F) or below -40° C (-40° F).

FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the spray equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparking 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 spraying indoors or outdoors, and can cause a fire or explosion and 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 even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY.** Check the entire system for proper grounding. Do not use the system again until the problem has been identified and corrected.

Grounding

To reduce the risk of static sparking, ground the sprayer, object being sprayed, and all other spray equipment used or located in the spray area. **CHECK** your local electrical code for detailed grounding instructions for your area and type of equipment. **BE SURE** to ground all of this spray equipment:

1. *Pump:* use a ground wire and clamp as shown in Fig 1.
2. *Air compressor:* follow manufacturer's recommendations.
3. *Air and fluid hoses:* use only grounded hoses with a maximum of 150 m (500 feet) combined hose length to ensure grounding continuity. Refer also to **HOSE SAFETY**.
4. *Spray gun:* grounding is obtained through connection to a properly grounded fluid hose and pump.
5. *Object being sprayed:* according to your local code.
6. *Fluid supply container:* according to your local code.
7. *All solvent pails used when flushing,* according to local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.

Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray system. Check the electrical resistance of your air and 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 hose can make your system hazardous. Also, read **FIRE OR EXPLOSION HAZARD**, below.

MOVING PARTS HAZARD

The piston in the air motor, located behind the air motor shield, moves when air is supplied to the motor. Moving parts can pinch or amputate your fingers or other body parts. Therefore, **NEVER** operate the pump with the air motor shield removed. **KEEP CLEAR** of moving parts when starting or operating the pump. Before checking or servicing the pump or any system component, follow the **Pressure Relief Procedure** on page 2, to prevent the pump from starting accidentally.

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

To ground the pump:

To ground the pump, loosen the grounding lug locknut (W) and washer (X). Insert one end of a 1.5 mm² (12 ga) minimum ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. See Fig 1. Connect the other end of the wire to a true earth ground. See the **ACCESSORIES** section for a ground wire and clamp.

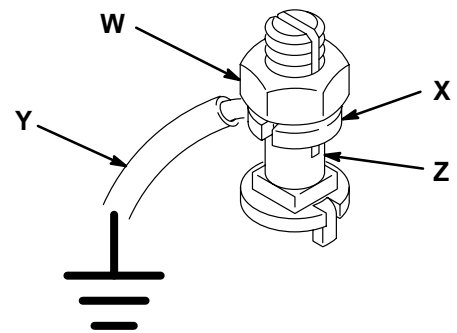


Fig 1

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Flushing Safety

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

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

WARNING Alerts user to avoid or correct conditions that could cause bodily harm.

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

NOTE Identifies essential procedures or helpful information.

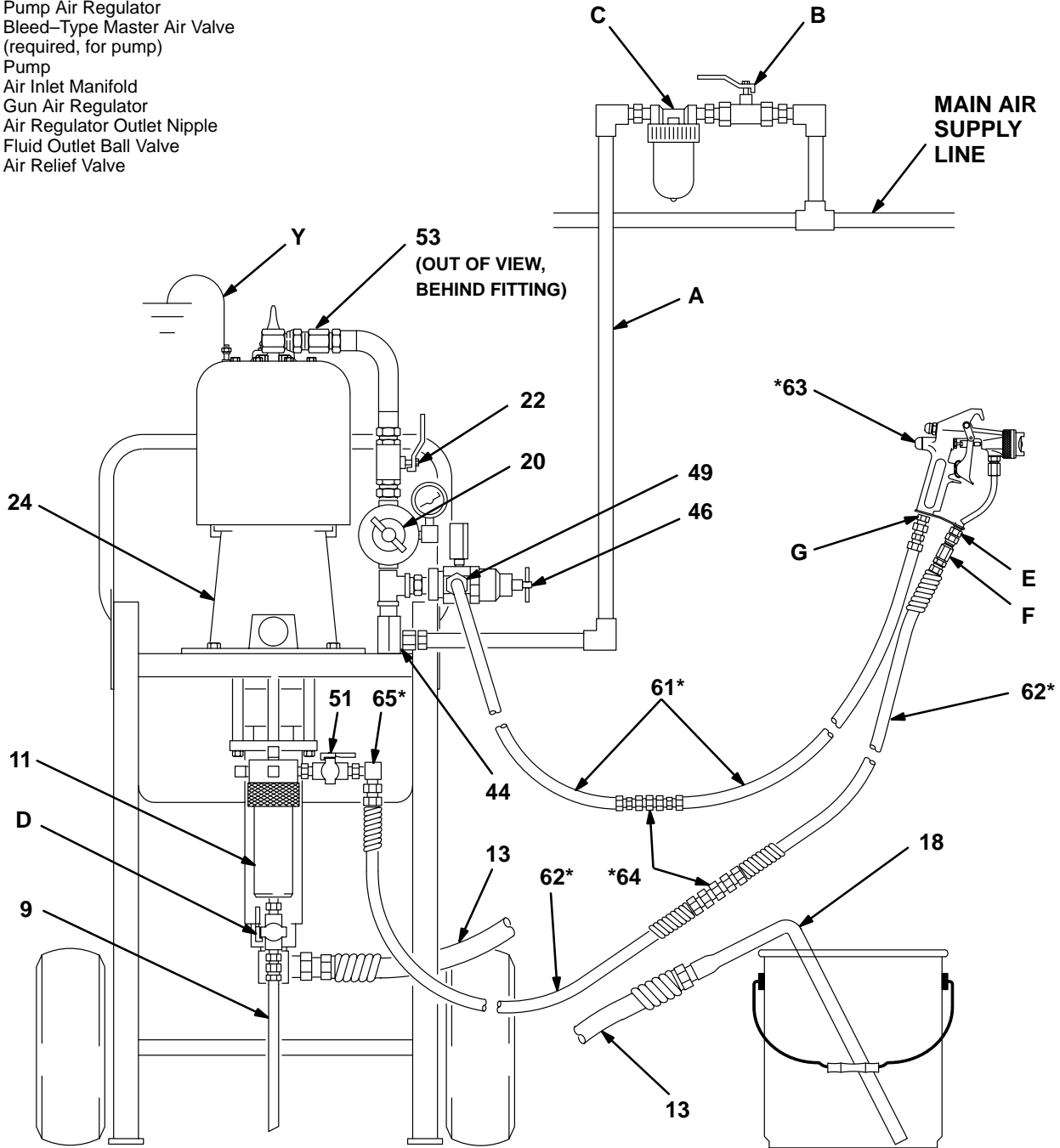
TYPICAL INSTALLATION

KEY

- A Grounded Air Supply Hose
- B Bleed-Type Master Air Valve (for accessories)
- C Air Line Filter
- D Fluid Drain Valve (required)
- E Gun Fluid Inlet
- F In-Line Fluid Filter
- G Gun Air Inlet
- Y Ground Wire (required)
- 9 Fluid Drain Tube
- 11 Fluid Filter
- 13 Suction Hose
- 18 Suction Tube
- 20 Pump Air Regulator
- 22 Bleed-Type Master Air Valve (required, for pump)
- 24 Pump
- 44 Air Inlet Manifold
- 46 Gun Air Regulator
- 49 Air Regulator Outlet Nipple
- 51 Fluid Outlet Ball Valve
- 53 Air Relief Valve

NOTE: Items marked with an asterisk (*) are included in Model 231-155 only.

- 61* Gun Air Hose
- 62* Fluid Hose
- 63* Air-Assisted Airless Spray Gun
- 64* Hose Nipples
- 65* Elbow



INSTALLATION

NOTES:

1. The reference numbers and letters in parentheses in the text refer to the callouts in the drawings.
2. The accessories mentioned are shown on page 14.
3. The Typical Installation shown on page 4 is only a guide for selecting and installing system components and accessories. Contact your Graco representative or Graco Technical Assistance (see back page) for assistance in designing a system to suit your particular needs.
4. The following manuals are supplied:

Manual	Component
307-649	13:1 Ratio Senator Pump
307-646	Air-Assisted Airless Spray System
307-586	AA2000 Air-Assisted Airless Spray Gun
308-167, 308-168	Air Regulators
308-136	Universal Cart
307-296	Fluid Filter

WARNING

For your safety in installing, operating and servicing this system, thoroughly read and follow all warnings and instructions given in this manual or 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, copies are available from Graco at no charge.

Air Line Accessories

Refer to the Typical Installation on page 4. Install an air line filter (C) in the main air line, to remove harmful dirt and moisture from the compressed air supply. A bleed-type master air valve (22) is supplied with your sprayer, mounted downstream from the pump air regulator (20). Install a second bleed valve (B) upstream from all other air accessories, to isolate the accessories for servicing.

WARNING

The bleed-type master air valve (22), air relief valve (53), and fluid drain valve (D) are **supplied** in your system, to help reduce the risk of serious bodily injury including fluid injection, splashing in the eyes or on the skin, overpressurization, or injury from moving parts if you are adjusting or repairing the pump.

The *bleed-type master air valve* relieves air trapped between this valve and the pump. Trapped air can cause the pump to cycle unexpectedly.

The *air relief valve* opens automatically to relieve air pressure to the pump if the pressure exceeds a preset level. This valve prevents overpressurization of the spray gun.

The *fluid drain valve* assists in relieving fluid pressure in the displacement pump, hose, and gun; triggering the gun to relieve pressure may not be sufficient.

CAUTION

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

Assembling Sprayer Model 231-155

Refer to the Typical Installation on page 4. Connect the two air hoses (61), using a nipple (64). Connect the two fluid hoses (62) with a nipple (64).

Connect the gun air supply hose (61) between the air inlet (G) of the gun and the nipple (49) connected to the outlet of the gun air regulator (46).

Install the elbow (65) onto the ball valve (51) at the fluid filter (11) outlet. Connect the fluid hose (62) between the gun fluid inlet (E) and the elbow (65).

All Models

Refer to the Typical Installation on page 4. DO NOT install the spray tip in the gun (63) yet.

If additional fluid filtration is desired, install an in-line fluid filter (F) between the gun fluid inlet (E) and the fluid hose (62).

WARNING

To reduce the risk of serious bodily injury, **never** connect a spray hose to the drain valve (D) of the fluid filter (11). The tube (9) connected to the drain valve is only a drain tube. This valve is required for relieving fluid pressure in the system during shut-down.

Connect a grounded air supply hose (A) from the main air line to the air inlet manifold (44). Place the suction tube (18) in the fluid container.

GROUNDING

WARNING

Before operating the pump, ground the system as explained under **FIRE OR EXPLOSION HAZARD** and **Grounding** on page 3.

Fluid Regulation Kit 222–564

WARNING

Before installing the fluid regulation kit on the sprayer, follow the **Pressure Relief Procedure** on page 2. Disconnect all hoses from the pump.

Order one Fluid Regulation Kit 222–564 (see page 14 for the kit parts list) and one 0.9 m (3 ft) Fluid Hose 214–912 (H).

1. Refer to Fig 2. Attach the fluid regulator mounting bracket (110) to the regulator (104) with the two screws (114) and lockwashers (115). The large hole in the mounting bracket should face down.
2. Assemble the remaining parts of the fluid regulation kit as shown in Fig 2. Do not connect the hoses (H and 62) yet.
3. Install the fluid regulator bracket (110) in the hole in the corner of the cart's pump bracket, using the screw (111), lockwasher (112) and nut (113). See Fig 2.
4. Discard the 559 mm (22 in.) hose (101, not shown) supplied with the kit, and replace it with the 0.9 m (3 ft) Hose 214–912 (H). Connect the hose (H) between the fluid regulator inlet nipple (102a) and the elbow (65) at the outlet of the fluid filter (11).
5. Connect the gun air supply hose (61) between the air inlet (G) of the gun (63) and the outlet nipple (49) of the gun air regulator (46).
6. Connect the fluid hose (62) between the fluid inlet (E) of the gun (63) and the outlet nipple (102b) of the fluid regulator (104).

Ref Nos. 102–115 are part of Fluid Regulation Kit
222–564. See page 14.

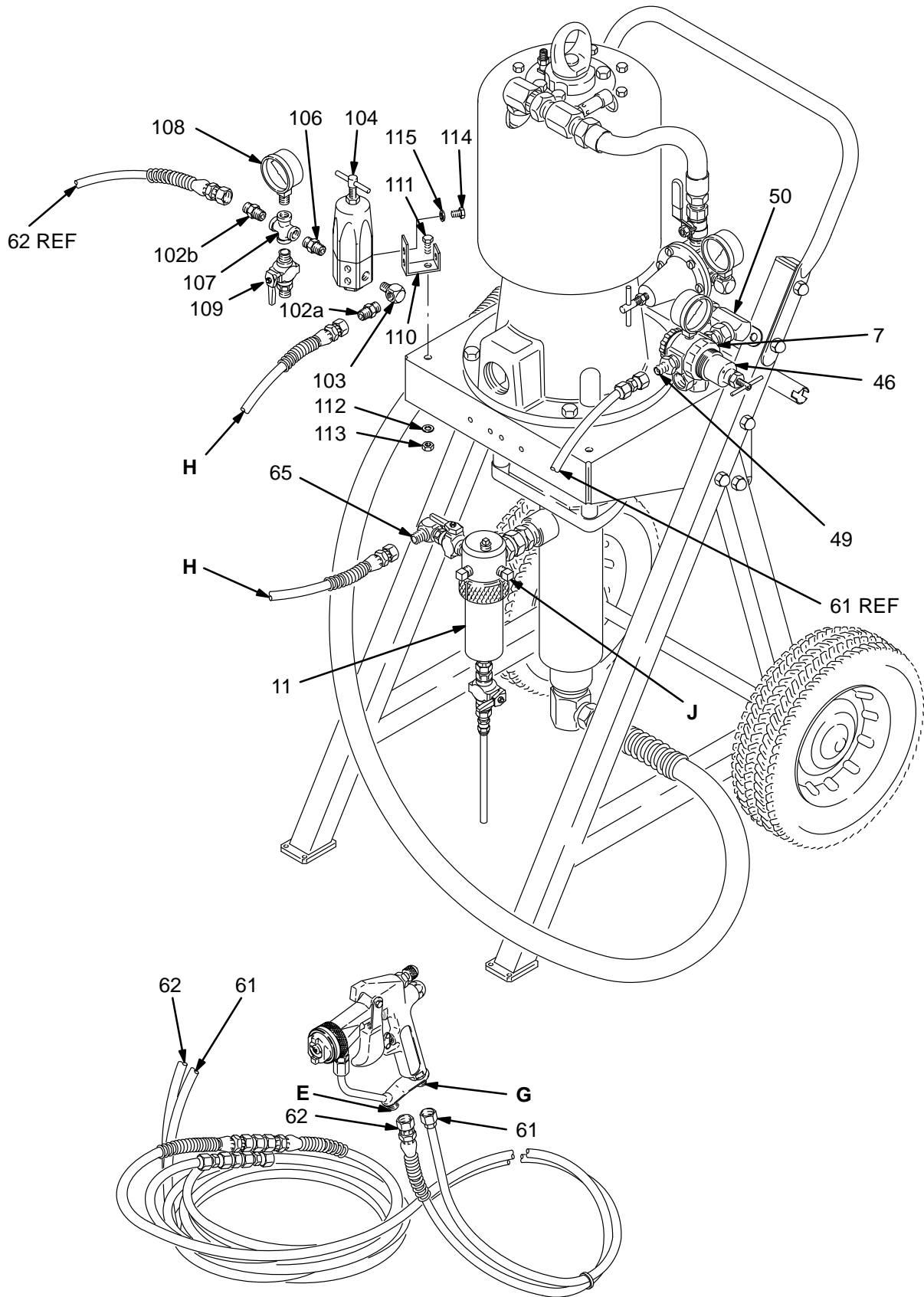


Fig. 2

Second Gun Installation Kit 218–910

WARNING

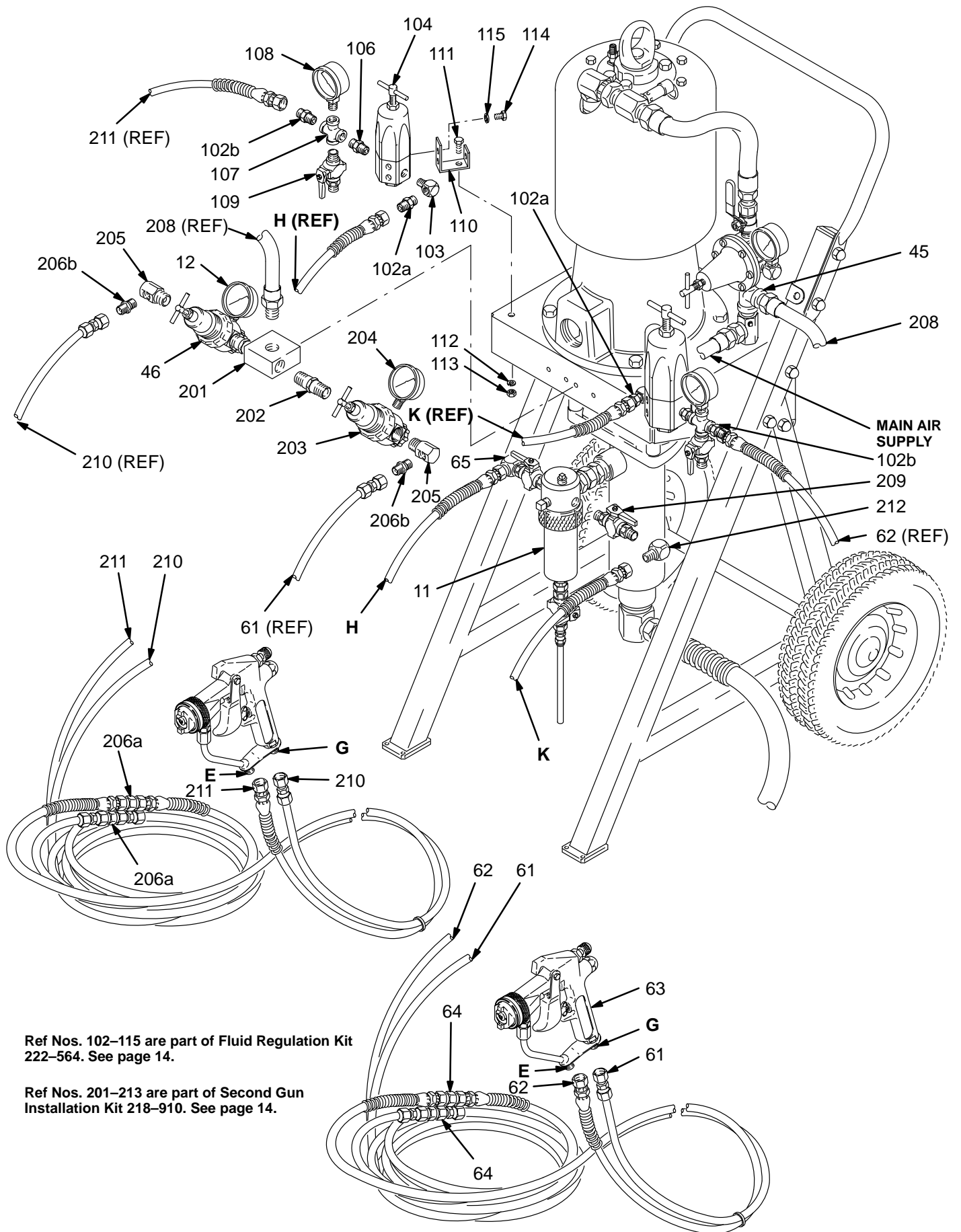
Before installing the second gun kit on the sprayer, follow the **Pressure Relief Procedure** on page 2. Disconnect all hoses from the pump.

Order an additional AA2000 Gun and the second gun installation kit 218–910 separately. If fluid regulation is desired, order a fluid regulation kit 222–564 and hose 214–912 for each gun. See page 14.

1. Refer to Fig 2. Disconnect the existing gun air regulator (46) and gauge from the swivel adapter (50). Remove the nipples (49 and 7) from the regulator. Remove the side plug (J) from the filter (11).
2. Remove and discard the swivel adapter (50). Screw the air hose (208) from the kit into the open branch of the tee (45). Screw the air manifold (201) onto the other end of the hose. See Fig 3.
3. Using parts from the kit, connect the air regulator (203) inlet to the air manifold (201), using a 1/2 npt nipple (202). Install an elbow (205) and 1/4 npt nipple (206b) at the air regulator outlet. Install the pressure gauge (204) on the air regulator. Use the plug (213, not shown) to close the other gauge port of the regulator. See Fig 3.
4. Install the air regulator (46) and gauge (12) removed in step 1 on the other side of the manifold (201), using attaching hardware from the kit as in step 3.

5. Using the screws (207) provided in the kit, install the manifold assembly on the front of the cart (25). Mounting holes are provided.
6. Install the ball valve (209) in the open outlet of the fluid filter (11). Install the elbow (212) onto the ball valve.
7. Connect the two lengths of air hose (210), using a nipple (206a). Connect the two lengths of fluid hose (211) with a nipple (206a).
8. *If you ARE NOT using fluid regulation*, connect the new air hose (210) between the new gun's air inlet (G) and the air regulator outlet nipple (206b). Connect the old air hose (61) and gun (63) in the same manner. Similarly, connect the new and old fluid hoses (211 and 62) between the fluid inlets (E) of the two guns and the two outlet elbows (212 and 65) of the fluid filter (11).

If you ARE using fluid regulation, assemble the fluid regulation kits as explained in steps 1 and 2 of **Fluid Regulation Kit 222–564** on page 6. Mount the kits on the cart, as shown in Fig 3. Then connect the new air hose (210) between the new gun's air inlet (G) and the air regulator outlet nipple (206b). Connect the old air hose (61) and gun (63) in the same manner. Connect the two fluid hoses 214–912 (H and K) between the fluid filter outlet elbows (212 and 65) and the fluid regulator inlet nipples (102a). Then connect the new and old fluid hoses (211 and 62) between the gun fluid inlets (E) and the fluid regulator outlet nipples (102b).



Ref Nos. 102–115 are part of Fluid Regulation Kit 222–564. See page 14.

Ref Nos. 201–213 are part of Second Gun Installation Kit 218–910. See page 14.

Fig. 3

WARNING**Pressure Relief Procedure**

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

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (supplied in your system).
4. Disengage the spray gun safety latch.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve connected to the fluid filter outlet, and all other drain valves used in the system (such as in systems using fluid regulation), to help relieve fluid pressure in the displacement 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 air cap or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

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

To Operate the Pump

Be sure the air regulators and bleed-type master air valve are closed. **DO NOT INSTALL THE SPRAY TIP YET!**

Place the suction tube (18) in the fluid pail. Open the bleed-type master air valve in the main air line, then open the gun air regulator (46). Hold a metal part of the spray gun (63) firmly to the side of a grounded metal pail and trigger the gun. Open the pump's bleed-type master air valve (22). Slowly open the pump air regulator (20) until the pump starts. Allow the pump to cycle slowly until all the air is pushed out of the fluid lines. Release the gun trigger and engage the safety latch; the pump will stall against the pressure.

With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun is triggered and released.

Follow the **Pressure Relief Procedure Warning** at left, then install the spray tip in the gun (see manual 307–586, supplied).

Use the pump air regulator (20) to control the pump speed and fluid pressure. Always use the lowest pressure necessary to achieve the desired results. Higher pressures waste fluid and cause premature wear of the pump packings and spray tip.

Keep the wet-cup filled with Graco Throat Seal Liquid (TSL) or other compatible solvent, to help prolong the packing life.

Never allow the pump to run dry of the fluid being pumped. A dry pump will quickly accelerate to a high speed, possibly damaging itself. If your pump accelerates quickly, or is running too fast, stop it immediately and check the fluid supply. If the supply container is empty and air has been pumped into the lines, refill the supply container and prime the pump and lines with fluid, being sure to eliminate all air from the fluid system, or flush the pump as described in "Shutdown and Care".

AA2000 Spray Gun Operation

Refer to the OPERATION section of manual 307–586, supplied, for installing the spray tip, adjusting the spray pattern and using the AA2000 gun.

Control the air pressure to the gun with the gun air regulator (46 and/or 203).

Control the fluid pressure to the gun with the fluid regulator, if used. Otherwise, adjust the air pressure to the pump motor to control fluid pressure.

Shutdown and Care

Always follow the **Pressure Relief Procedure Warning** at left, whenever you shut off the pump. Stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod and damaging throat packings.

Always flush the pump with a compatible solvent before the fluid can dry on the displacement rod, and at the end of each day. If you are pumping water-based fluid, flush first with water and then with mineral spirits to protect the pump parts. If you are pumping oil-based fluids, flush with mineral spirits only.

Relieve pressure and leave the mineral spirits in the pump to prevent corrosion.

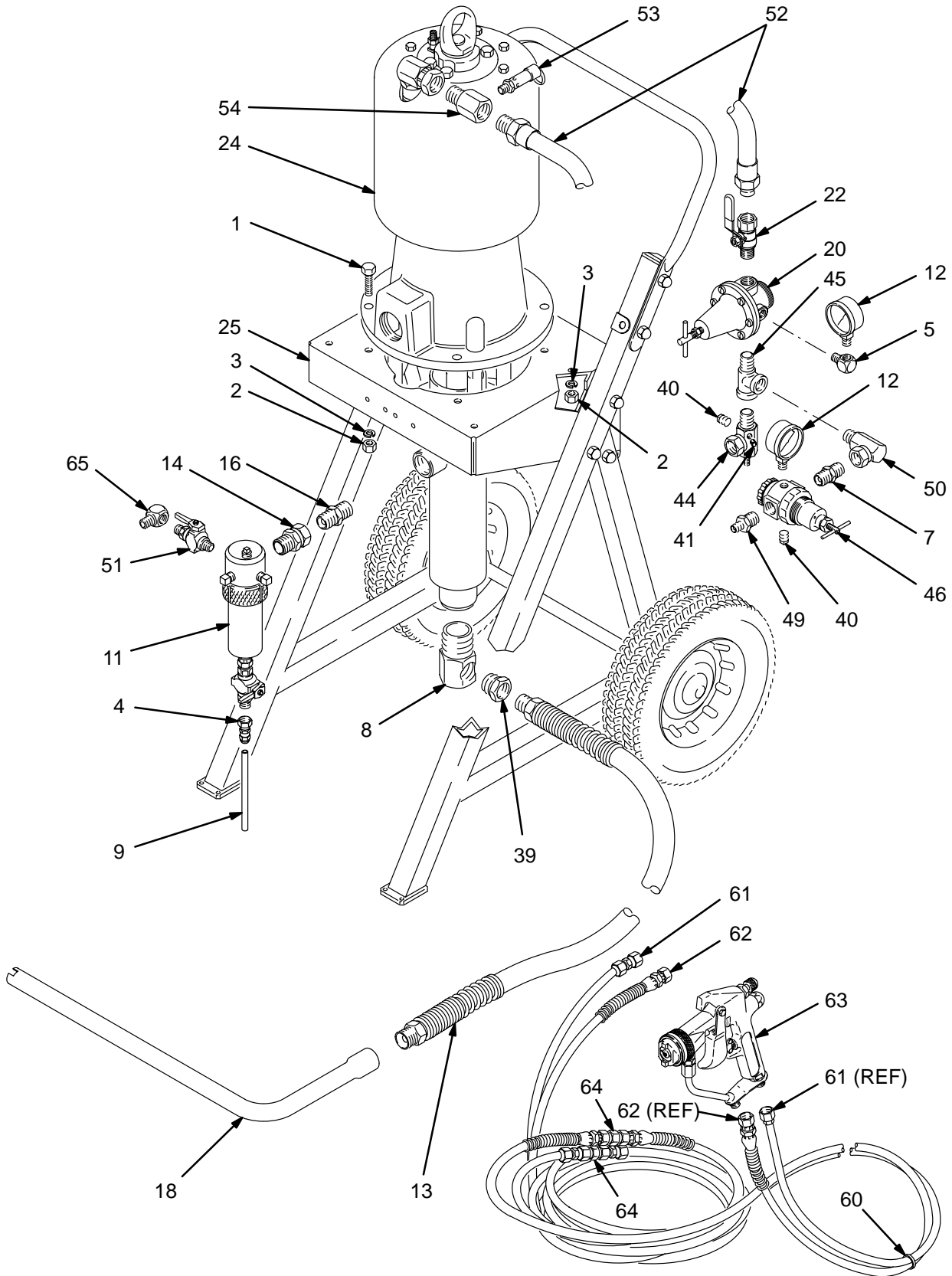
Manual Air Motor Lubrication

To lubricate the air motor manually, first follow the **Pressure Relief Procedure Warning** at left. Then remove the adapter manifold (54) from the motor air inlet. 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 DRAWING

Model 224-631, Series A
Includes items 1-54

Model 231-155
Includes items 1-65



PARTS LIST

Model 224–631, Series A

Includes items 1–54

Model 231–155

Includes items 1–65

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
1	100–004	CAPSCREW, hex hd; 3/8–16 unc–2a; 31 mm (1.25") lg	4	40	100–509	PLUG, pipe; 1/4 npt	2
2	100–131	NUT, full, hex; 3/8–16 unc–2b	5	41	100–403	PLUG, pipe; 1/8 npt	1
3	100–133	LOCKWASHER; 3/8"	5	44	206–205	MANIFOLD, air	1
4	205–448	COUPLING, hose, reusable; for 6.3 mm (1/4") ID hose; 3/8 npsm(f)	1	45	108–126	TEE, street; 1/2 npt(m) x 1/2 npt(f) x 1/2 npt(f)	1
5	100–840	ELBOW, street; 1/4 npt (m x f)	1	46	104–267	REGULATOR, air; see 308–167 for parts	1
7	158–491	NIPPLE; 1/2 npt	1	49	162–449	NIPPLE, reducing; 1/2 to 1/4 npt	1
8	180–180	ELBOW, street; 1–1/2" npt(m) x 1" npt(f)	1	50	155–470	UNION, adapter; 1/2 npt(m) x 1/2 npsm(f) swivel	1
9	186–447	TUBE, drain; nylon; 6.3 mm (1/4") ID; 229 mm (9") lg	1	51	210–658	BALL VALVE; 3/8 npt (mbe)	1
11	214–625	FILTER, fluid; see 307–296 for parts	1	52	214–952	HOSE, air; cpld 3/4 npt x 1/2 npt (mbe); 307 mm (1.25 ft) long	1
12	101–180	GAUGE, air	2	53	108–124	AIR PRESSURE RELIEF VALVE	1
13	214–961	HOSE, suction; cpld 3/4 npt (mbe); spring guards both ends; 1.9 m (6 ft) long	1	54	180–916	MANIFOLD, adapter; 3/4 npt(f) x 3/4 npsm(m) x 1/4 npt(f)	1
14	157–785	UNION, swivel; 3/4 npt(m) x 3/4 npsm(f) swivel	1	60	103–473	STRAP, tie	8
16	179–970	NIPPLE, reducing; 1" npt x 3/4 npsm	1	61	216–070	HOSE, air; nylon; 6.3 mm (1/4") ID; cpld 1/4 npsm (fbe) swivel; 15.2 m (50 ft) long	2
18	165–767	TUBE, suction	1	62	223–541	HOSE, fluid; nylon; 6.3 mm (1/4") ID; cpld 1/4 npsm (fbe) swivel; spring guards both ends; 15.2 m (50 ft) long	2
20	181–521	REGULATOR, air; 0–6 bar (0–75 psi) range see 308–168 for parts	1	63	217–292	AA2000 AIR–ASSISTED AIRLESS SPRAY GUN; see 307–586 for parts	1
21	206–994	THROAT SEAL LIQUID, 8 oz (not shown)	1	64	162–453	NIPPLE; 1/4 npsm x 1/4 npt	2
22	107–142	VALVE, air, bleed–type; 1/2 npt(m) inlet x 1/2 npt(f) outlet	1	65	167–000	ELBOW, 90°; 3/8 npt(f) x 1/4 npsm(m)	1
24	230–983	13:1 RATIO SENATOR PUMP see 307–649 for parts	1	<i>307 numbers in descriptions refer to separate instruction manuals.</i>			
25	224–043	CART, pump; see 308–136 for parts	1				
38	181–057*	LABEL, warning (not shown)	1				
39	158–586	BUSHING; 3/4 npt(f) x 1" npt(m)	1	<i>* Additional warning labels are available at no charge.</i>			

HOW TO ORDER 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

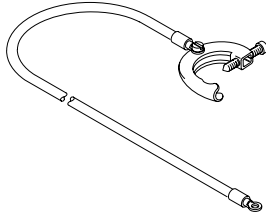
USE GENUINE GRACO PARTS AND ACCESSORIES

Must be purchased separately.

GROUNDING CLAMP 103-538

GROUND WIRE 208-950

7.6 m (25 ft) long,
1.5 mm² (12 gauge)

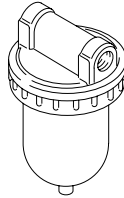


AIR LINE FILTER

17.5 bar (250 psi) MAXIMUM WORKING PRESSURE

106-149 1/2 npt inlet and outlet

106-150 3/4 npt inlet and outlet



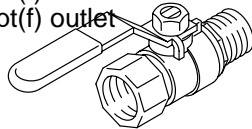
BLEED-TYPE MASTER AIR VALVE

21 bar (300 psi) MAXIMUM

WORKING PRESSURE

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

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



FOR FLUID REGULATION

Order the following items separately.

Installation instructions are provided on pages 6-7.

222-564 Fluid Regulation Kit
(see parts list below)

214-912 Nylon Fluid Hose; 0.9 m (3') long;
6.3 mm (1/4") ID; 1/4 npsm (fbe) swivel

FLUID REGULATION KIT 222-564

Includes items 101-115

REF PART

NO.	NO.	DESCRIPTION	QTY
101	110-192	HOSE, fluid; 559 mm (22") long (not used with this sprayer)	1
102	162-453	NIPPLE; 1/4 npt x 1/4 npsm (only 2 used with this sprayer)	3
103	100-840	ELBOW, street; 1/4 npt (m x f) (only 1 used with this sprayer)	2
104	222-121	REGULATOR, fluid pressure see 307-886 for parts	1
105	110-220	ADAPTER, swivel, 45°; 1/4 npt(m) x 1/4 npsm(f) (not used with this sprayer)	1
106	156-971	NIPPLE; 1/4 npt	1
107	102-959	CROSS, pipe; 1/4 npt(f)	1
108	802-072	GAUGE, fluid pressure	1
109	210-657	VALVE, ball; 1/4 npt (mbe)	1
110	185-251	BRACKET, mounting	1
111	100-469	SCREW, cap, hex hd; 3/8-16 x 19 mm (3/4") long	1
112	100-133	LOCKWASHER; 3/8"	1
113	100-307	NUT, hex; 3/8-16 unc	1
114	100-270	SCREW, cap, hex hd; 1/4-20 x 16 mm (5/8") long	2
115	100-016	LOCKWASHER; 1/4"	2
14	307646E		

GROUNDING BUNA-N AIR SUPPLY HOSE

12 bar (175 psi) MAXIMUM WORKING PRESSURE

Part No.	ID	Length	Thd. Size
205-418	13 mm (1/2")	1.8 m (6 ft)	1/2 npt(m)
205-216	13 mm (1/2")	4.5 m (15 ft)	1/2 npt(m)
205-273	13 mm (1/2")	7.6 m (25 ft)	1/2 npt(m)
208-594	13 mm (1/2")	15 m (50 ft)	1/2 npt(m)

FOR TWO GUN OPERATION

Order the following items separately.

Installation instructions are provided on pages 8-9.

217-292 AA2000 Air-Assisted Airless Spray Gun

218-910 Second Gun Installation Kit

(see parts list below)

222-564 Fluid Regulation Kit

(see parts list at left; order a kit for
each gun, if you are using fluid regulation)

214-912 Nylon Fluid Hose; 0.9 m (3') long;
6.3 mm (1/4") ID; 1/4 npsm (fbe) swivel
(order one for each fluid regulation kit)

SECOND GUN INSTALLATION KIT 218-910

Includes items 201-213

REF PART

NO.	NO.	DESCRIPTION	QTY
201	179-749	MANIFOLD, air; three 1/2 npt(f) ports and two 1/4-20 unc-2b ports	1
202	156-877	NIPPLE; 1/2 npt	2
203	104-267	REGULATOR, air; 0-9 bar (0-125 psi) range	1
204	101-180	GAUGE, pressure, air; 0-14 bar (0-200 psi) range	1
205	166-999	ELBOW, street, reducing; 1/2 npt(m) x 1/4 npt(f)	2
206	162-453	NIPPLE; 1/4 npt x 1/4 npsm	4
207	102-254	SCREW, sems hex hd; 1/4 x 22 mm (7/8") long	2
208	220-598	HOSE; nitrile; 1/2" ID; cpld 1/2 npt (mbe); 457 mm (1.5') long	1
209	210-658	VALVE, ball; 3/8 npt (mbe)	1
210	216-070	HOSE, air; nylon; 6.3 mm (1/4") ID; cpld 1/4 npsm (fbe) swivel; 15 m (50') long	2
211	223-541	HOSE, fluid; nylon; 6.3 mm (1/4") ID; cpld 1/4 npsm (fbe) swivel; 15 m (50') long	2
212	167-000	ELBOW, 90°; 3/8 npt(f) x 1/4 npsm(m)	1
213	100-509	PLUG, pipe; 1/4 npt	1

THROAT SEAL LIQUID (TSL)

Non-evaporating solvent for wet-cup

206-995 0.9 liter (1 quart)

206-996 3.8 liter (1 gallon)

SERVICE INFORMATION

Model 230-982 is obsolete and is replaced by Model 224-631, which uses the universal cart.

Model 231-012 is obsolete and is replaced by Model 231-155, which uses the universal cart.

The illustrations and text have been generally updated.

TECHNICAL DATA

Maximum pump fluid working pressure	66 bar (950 psi)
Recommended air operating range	1.5 to 5.2 bar (20 to 75 psi)
Pump ratio	13:1
Maximum recommended pump speed	
for continuous operation	60 cpm (3.8 liters/min [1.0 gpm])
Air consumption	approx. 0.43 m ³ /min (15 scfm) at 3.8 liter/min (1.0 gpm) flow rate at 6.6 bar (95 psi) air pressure
Air inlet size	1/2 npt(f)
Sprayer dimensions	<i>Height: 1230 mm (48.45"); Width: 737 mm (29"); Depth: 838 mm (33"); Weight (approx): 92 kg (203 lb)</i>
Fluid filter	250 micron (60 mesh) screen
Wetted parts	See separate component instruction manuals

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.

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

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