Parts

INSTRUCTIONS-PARTS LIST

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

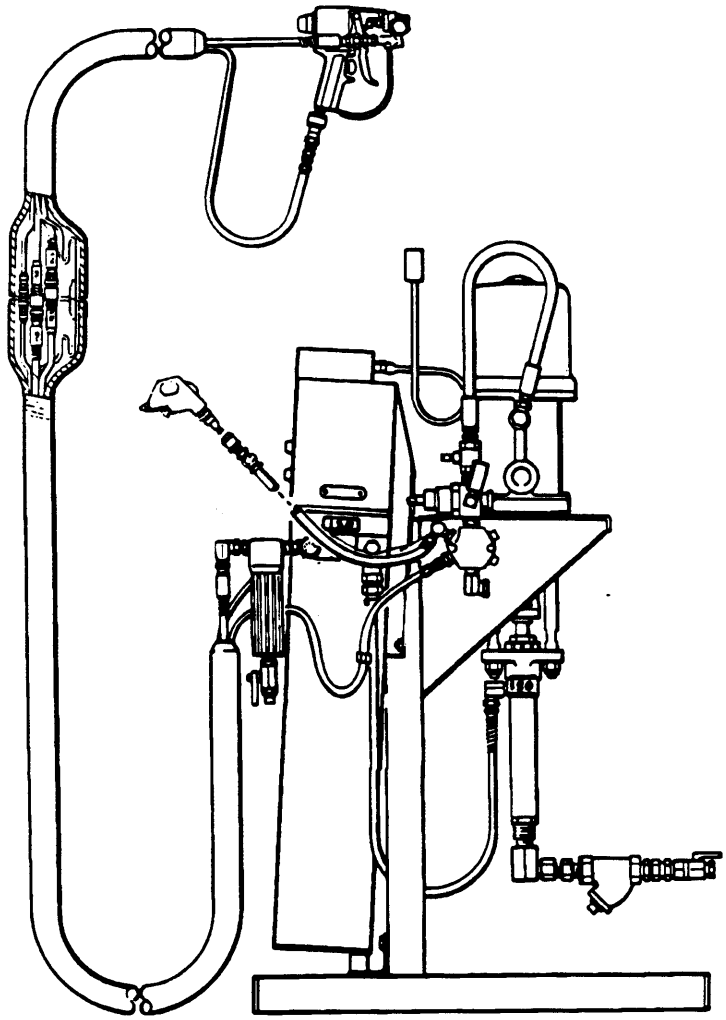
GRACO

307-542

Rev F
Supersedes E

Air Powered
FOAM-CAT® 200 SPRAYER

1500 psi (105 bar) MAXIMUM WORKING PRESSURE
240 Volt, 1 or 3 Phase, 50/60 Hertz



Delivery
15 lb/min at 48°F temperature rise
(6.75 Kg/min at 27°C temperature rise)

Power Requirements
Electrical: 240 Volt Maximum
208 Volt Minimum
Single phase:
37 Amps with 315 ft (91.4 m) hose
Three phase:
27 Amps with 315 ft (91.4 m) hose

Compressed Air: 80-120 psi (5.6-8.3 bar)
30 CFM (0.84 m^3/min)

Model 226-991 Includes:
- Foam-Cat Heater and Heated Hose Controls
- President Plural Component Pump
- Pump Stand
- 50 ft (15 m) 3/8 in. I.D. Heated Hose
- 15 ft (4.6 m) 1/4 in. I.D. Heated Whip Hose
- Spray Gun with 0.083 in. (2.11 mm) dia. Nozzle Kit

Model 230-965
- Same as 226-991, except does not include the 50 ft or 15 ft heated hose

WARNING

Reactive Chemical Hazard
Graco Inc. does not manufacture or supply any of the reactive chemical materials that may be used in this equipment and is not responsible for their effects. Because of the vast number of chemicals that could be used and their varying chemical reactions, before using this equipment, the buyer and the user should determine all facts relating to the materials used, including any of the potential hazards involved. Particular inquiry and investigation should be made into potential dangers relating to toxic fumes, fires, explosions, reaction times, and exposure of human beings to the individual components or their resultant mixtures. Graco assumes no responsibility for loss, damage, expense or claims for bodily injury or property damage, direct or consequential, arising from the use of such chemical components.

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

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INTRODUCTION

For your personal safety and optimum equipment performance, all users of this equipment must thoroughly read and understand all warnings and instructions in each component manual before using this manual, 307-542, as a guide for installing and operating a complete Foam-Cat™ 200 Sprayer. Each component manual contains "fine tuning" information and pertinent safety information which is essential for optimum equipment performance.

This manual also contains instructions for installing and using several recommended accessories. If any recommended accessory is not used, just move on to the next section of the manual. If you are using other similar accessories, refer to the instructions received with that equipment. Graco accessories are listed on the back cover.

Terms

RES and /SO refer to the foam chemicals Resin and Isocyanate, respectively.

Ambient Temperature is the surrounding air temperature.

ATC **is the Automatic Temperature Compensator** feature of the Foam-Cat Heater. See manual 307-543 for further information.

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

CAUTION: Alerts user to avoid or correct conditions that could damage or destroy equipment.

NOTE: Identifies helpful procedures and information.

WARNING

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 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 nozzle.

ALWAYS follow the Pressure Relief Procedure, below, *before* cleaning or removing the nozzle 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 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 Larch

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.

Trigger Guard

Never operate the gun with the trigger guard removed. This guard helps prevent the gun from triggering accidentally if it is dropped or bumped.

Nozzle Safety

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

NEVER wipe off build-up around the nozzle until pressure is fully relieved and the gun safety latch is engaged.

Pressure Relief Procedure

Always relieve the fluid pressure in the sprayer and hoses before checking or adjusting any part of the system or any component, to reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts or electric shock.

1. Engage the spray gun trigger safety latch.
2. Shut off the air to the feed pumps.
3. Turn off the air to the proportioning pump.
4. Close the gun manifold needle valves.
5. Disengage the trigger safety latch, trigger the gun, to relieve pressure, and engage the trigger safety again.
6. Open both fluid filter drain valves, having a container ready to catch the draining fluid.
7. If you are working on any part of the heater, shut off the main electrical power to the heater.

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 or other serious bodily injury, 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 read and follow the fluid and solvent manufacturer's recommendations regarding the use of protective clothing and equipment.

System Pressure

This system has a *1500 psi (105 bar) MAXIMUM WORKING PRESSURE.* Be sure that all spray equipment and accessories are rated to withstand the maximum working pressure of this heater. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Be sure that all accessories you add to the spray system are properly rated to withstand the maximum air and fluid working pressures of this system.

NEVER install any fluid shut off device at the fluid outlet of either heater or filter. Shutting off the fluid at the outlet causes high back pressure which can cause component rupture and result in serious bodily injury.

Fluid Compatibility

BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the Technical Data on the back cover. Always read the fluid and solvent manufacturer's literature before using them in this system.

HOSE SAFETY

The operating and safety features of the heater used in this system are designed to be used only with Graco Foam-Cat™ Heated Hoses. Models 218-813 and 218-614. NEVER attempt to connect other hoses to this heater.

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.

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 the hose until the couplings are properly insulated and the hose abrasion cover is in place.

Never operate the hose when it is coiled. Doing so causes excessive heat buildup which can result in hose rupture and cause serious bodily injury; including injection, and property damage.

NEVER use a damaged hose. Before each use, check 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.

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

FIRE OR EXPLOSION HAZARD

Static electricity is created by the high velocity 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 positive 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 pump 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 your** separate pump manual.
2. *Air hoses:* use only grounded air hoses.
3. *Flud* hoses: use only Graco heated hose, which are electrically grounded.
4. Heater: by wiring to a positively grounded power supply. In a mobile installation, be sure the truck or trailer is grounded to a true earth ground.

   The Ground Fault Interruptor on the hose control panel of the heater will not function unless the heater is positively grounded, and therefore would not sense a fault in the heat tape, which could result in static sparking.
5. *Air compressor or hydraulicpower supply:* follow manufacturer's recommendations.
6. *Spray* gun: grounding is obtained through connection to a properly grounded fluid hose and pump.
7. *Object being sprayed:* according to your local code.
8. *All solvent pails used when flushing,* according to local code. Use *ony metalpails,* which are conductive, placed on a grounded surface. Do not place the pail on a nonconductive surface, such a paper or cardboard, which interrupts the grounding continuity.
9. *To maintain grounding continuity when flushing or relieving pressure,* **always hold a metal part of the gun/valve** firmly to the side of a grounded *metal* pail, then trigger the gun/valve.

Electrical Wiring

All electrical wiring should be performed only by trained and qualified personnel, in compliance with all local codes and regulations.

Flushing Safety

Reduce the risk of fluid injection injury, static sparking, or splashing by following the specific flushing procedure given **on page 8 of this manual. Follow the Pressure Relief Pro**cedure on page 2, and *remove the spray tip before flushing.* Hold a metal part of the gun firmly to the side of a *metal* pail and use the lowest possible fluid pressure during flushing.

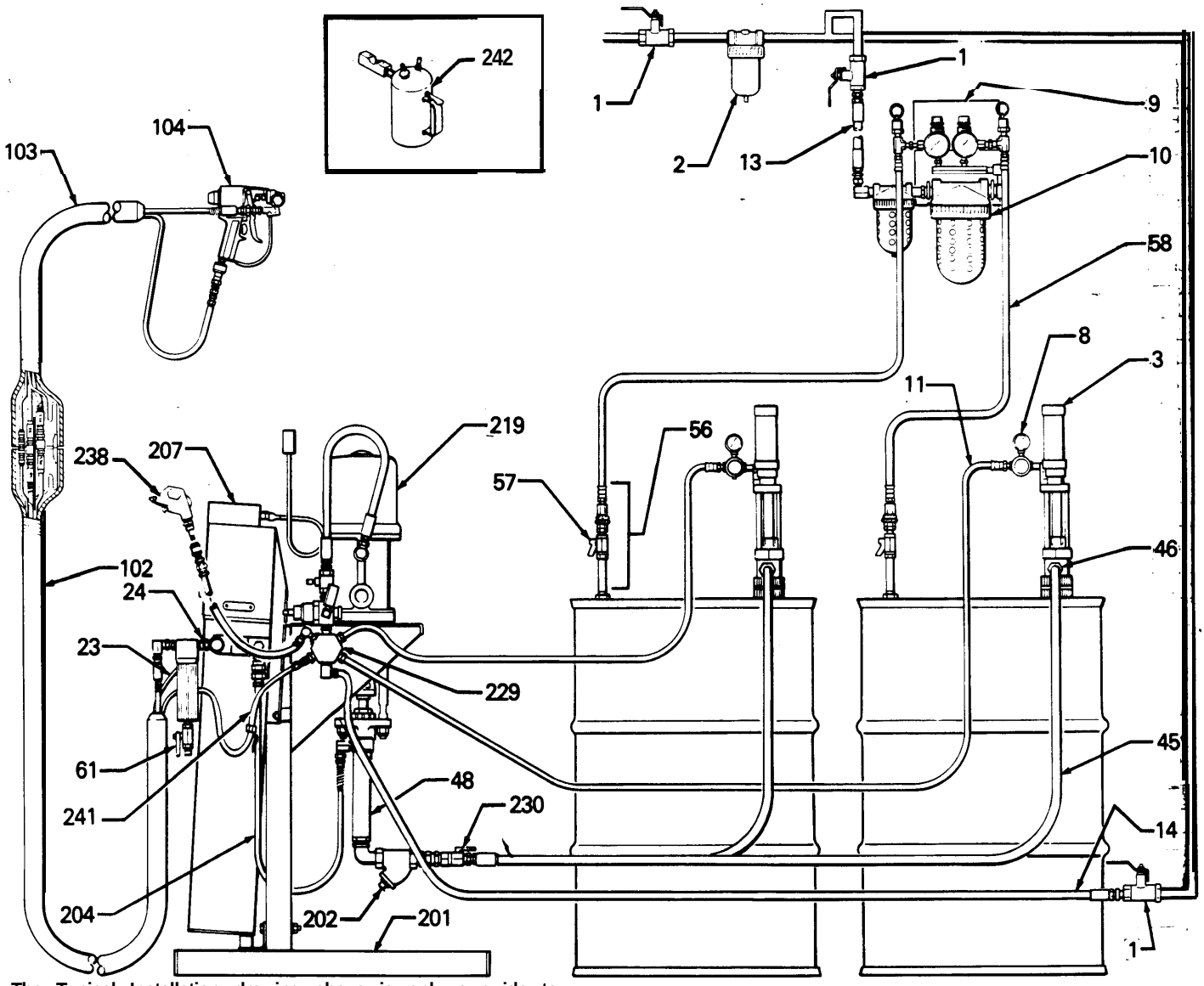
MOVING PARTS *HAZARD*

Moving parts can pinch or amputate your fingers or other body parts. KEEP CLEAR of moving parts when starting or operating the sprayer. Unplug the sprayer and relieve pressure before checking or servicing the sprayer to prevent it 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.

TYPICAL INSTALLATION DRAWING



The Typical Installation drawing above is only a guide to show all the components and recommended accessories for Foam-Cat™ ZOO Sprayer Model 226-991, and the correct routing of all air and fluid hoses. For assistance in setting up a system to suit your needs, contact your Graco representative.

Foam-Cat™ 200 Sprayer Component Manuals & Recommended Accessory Manuals.

Manual No.	Description
306-861	Check Valve*†
306-989	Plural Component Pump*†
307-204	Regulator* t
307-273	Fluid Filter*†
307543	Foam-Cat™ Gun*t
307-544	Foam-Cat™ Heated Hose+
307546	Foam-Cat™ Heater+ t
307548	Air Dryer**
307-551	Pump Stand*†
307-552	1 :1 Ratio Feed Pumps++
307-692	Solvent Flush Kit""

*Component in Model 226-991.
**Accessory component, order separately.
†Component in Model 230-265.

KEY
1 Master Air Valve
2 Air Line Filter
3 Feed Pump
6 Air Regulator or Air Valve
9 Air Dryer
10 Air Dryer Ring
11 Air Hose, Feed Pump Kit
13 Main Air Supply to Dryer
23 Control Box Cable, Heater
24 Fluid Outlet, Heater
46 Feed Hose, Feed Pump to Disp. Pump
46 Fluid Outlet, Proportioning Pump, (one of two)
46 Displacement Pump
66 Drum Fittings, Air Dryer
67 Shutoff Valve, Drum Fittings
66 Dry Air Hose, Air Dryer
61 Drain Valve, Heater
102 Heated Hose
193 Heated Whip Hose
104 Foam-Cat Gun
201 Pump Stand
202 Y-Line Strainer
294 Fluid Hose, Disp. Pump to Heater
207 Heater
219 Proportioning Pump
229 Air Manifold
236 Intake Valve, Disp. Pump
236 Air Blow Gun
241 Main Air Supply to Hose
242 Solvent Flush Kit

REFERENCE NUMBERS

Reference numbers in parentheses in the text refer to the parts shown in the Typical Installation drawing, Figures 1 thru 27, and/or the Parts Drawings.

Parts information for reference numbers 1 thru 61 can be found in separate manuals accompanying the sprayer or accessories.

Parts information for reference numbers 101 thru 243 can be found on pages 16 and 17.

1. Secure the sprayer stand (201) to the floor in a suitable location. Refer to the mounting hole. diagram in manual 307-551.

2. Install a bleed-type master air shutoff valve (1) on the main air supply line to provide a remote shutoff point for all air-powered components, and a main line air filter (2) to remove harmful dirt and moisture from the compressed air supply. See the Typical Installation on page 4 and the Accessories on the back cover.

NOTE: The air to the spray gun must be very clean and dry to avoid contaminating the foam.

CAUTION

To avoid mixing the polyurethane foam chemicals and permanently damaging the hoses, all critical air and fluid connections are clearly labeled ISO or RES. Make only ISO to ISO and RES to RES connections.

3. Install the 1:1 ratio feed pumps (3) in 55 gallon drums of ISO and RES.

   a. Screw the bung adapter (4) and pump tightly into the drum cover. Then tighten the nut (5) firmly to complete the airtight seal. See Fig 1.

   b. Separate the two halves of the ISO/RES identification label (6) along the perforation. Clean the surface of the air motor with solvent and apply the appropriate label (RES or ISO) to identify the chemical being pumped. See Fig 1.

   c. We recommend installing an air regulator near the feed pump air inlet to control pump speed. To install, remove the air valve (8) and use suitable adapters and thread sealer on male threads to install the regulator and pin fitting.

4. Mount the Air Dryer (9) in a suitable location near the ISO and RES drums. See the Typical Installation on page 4. Refer to the mounting hole diagram in manual 307-548.

WARNING

Never pressurize a drum or container that will not withstand 7 psi (0.49 bar) working pressure to reduce the risk of container rupture and serious bodily injury.

Never use a damaged drum of ISO or RES with the Air Dryer to reduce the risk of container rupture and serious bodily injury.

   a. Fill the bowl of the desiccant dryer. Unscrew the ring (10) to remove the dryer bowl. Refer to the Typical Installation. Remove the filter from the top of the bowl and fill the bowl with the desiccant crystals provided with the kit. Reinstall the filter and bowl.

5. Connect an air supply hose (11) from the 1/4 npt quick disconnect coupler of each feed pump to the air manifold (229). See the Typical Installation.

6. Connect an air supply hose (13) between the air inlet of the Air Dryer and the main air supply line. See the Typical Installation.

7. Connect a grounded 1/2 in. minimum ID main air supply line (14) to the air manifold (229). See the Typical Installation.

8. Be sure all air hose connections are tight.

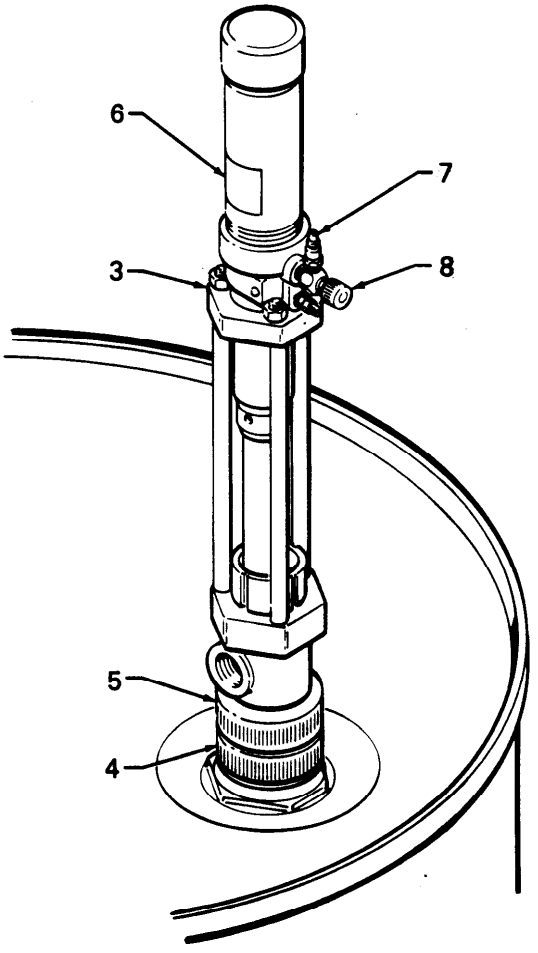


Fig 1

9. **Assemble the main heated hoses (102).**

a. Connect the corresponding fluid hoses of each 50 foot (15.2 m) assembly. See Fig 2.

b. A few inches back from the heat tape connectors, bend the heat tape ON BOTH SIDES OF CONNECTORS to take up slack. See Fig 2. Then couple the heat tapes.

> **CAUTION**
>
> Strain on the heat tape connectors when the hose is in service, causes wires to pull loose, and the heat tape will not function. To prevent strain on the wires, you must bend the heat tape to take up the slack on both sides of the connectors.
>
> Never wrap heat tapes around the hoses as this also causes strain on the connectors.

c. Cut the uncoupled air hose (17) to a length that will be easy to couple to the next air hose.

d. Attach a coupling to the air hose (17). See Fig 3.

(1) Slide the male end of the sleeve (18) over the hose.

(2) Grease the barbed end of the stud (19) and push it into the hose until it seats properly.

(3) Tighten the sleeve until it bottoms on the fitting.

e. Connect the air hoses.

f. Check the continuity of the heat tapes.

(1) Use an ohmmeter to check the electrical resistance of the two outer prongs of the connector (20) which attaches to the heated hose control cable (23). Refer to Fig 4. The resistance for the various lengths of coupled hose assemblies is given in the chart below.

Coupled Hose Length	Resistance Range-
315 feet (91.4 m)	11-15 ohms
215 feet (60.9 m)	20-25 ohms
115 feet (30.5 m)	37-46 ohms
65 feet (20.0 m)	65-80 ohms
50 feet (15.2 m)	84-124 ohms

(2) Between the middle and outer prong of&e-connector, the resistance should be more than 1 megohm. If it is less, there is a fault in one of the connectors (20) or the heat tapes. A fault will cause the Ground Fault Interruptor in the Foam-Cat Heated Hose Control to shut off the electric power to the hose. If there is a fault, check each 50 foot (15.2 m) hose section individually and replace the faulty section.

(3) Check the continuity of the middle wire of the connector (20) from one end of the coupled hoses to the other. The resistance should be less than 10 ohms.

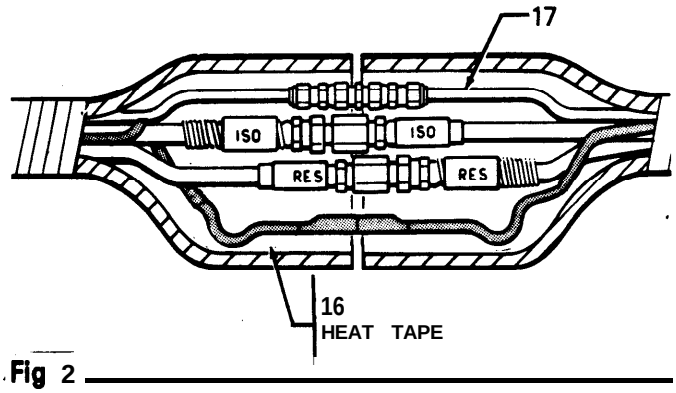
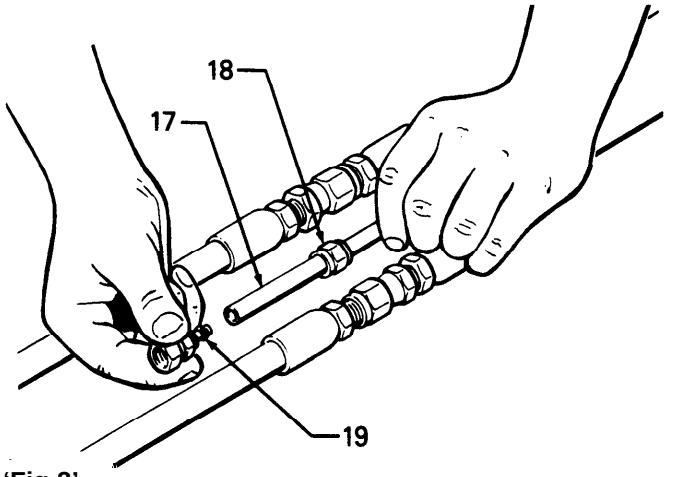


Fig 2



'Fig 3'

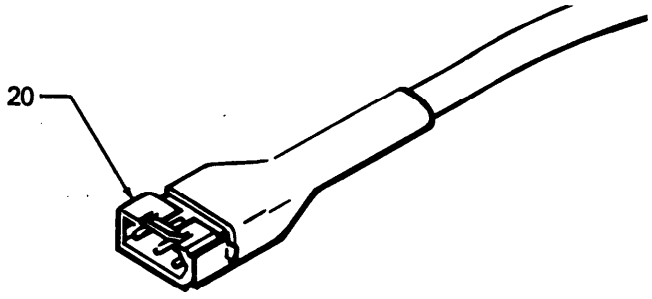


Fig 4

(4) Check the continuity of the whip hose between the two outer prongs and then between the outer and the middle prongs of the exposed connector as instructed in steps el and e2, above. The resistance between the outer prongs should be 300400 ohms.

g. Connect the whip hose (103) to the main hose assembly.

(1) Connect the corresponding fluid hoses.

(2) Connect the hose electrical connector to the control box cable. See Fig 5, page 7.

(3) Connect the air hoses. No alteration is needed. Do not connect the hoses to the gun yet.

h. Check to be sure that all hose connections are securely tightened. Do not tape the insulation tubing yet!

10. Connect the heated hose **assembly (102 & 103)** to the heater8 and heated **hose** control **(207).** See Fig 5.

a. Connect the fluid hoses to the corresponding 3/8 npt outlet union of the fluid filters (22).

b. Connect the heat tape (16) of the whip hose to the hose control box cable (23).

c. Connect the air hose (17) to the air manifold (229). See the Typical Installation on page 4.

WARNING

To reduce the risk of overpressurizing the heater anti pump, which can result in serious bodily injury and equipment damage, follow these precautions.

Do not install any fluid shutoff device at the fluid outlet of either heater or filter! (See Ref 24, Fig 5).

Use at least 56 ft (15.2 m) of fluid hose between the fluid outlet and any fluid control device such as a shutoff valve, regulator or spray gun.

11. **Install** the needle/nozzle kit on the gun. The needle/nozzle kit includes the parts shown in Fig 6, except the pin vise (36) which holds the cleaning pin (37), and the nozzle retainer (30) which is part of the gun assembly.

NOTE: The wrenches mentioned in the following instructions are provided with the gun.

To install the nozzle kit:

a. Use the 3/16" wrench (25) to remove the one capscrew (26) from the fluid manifold (27) and to remove the two capscrews (26) from the nozzle housing (28). See Fig 7.

b. Trigger the gun, then pull the nozzle housing (28) straight off the gun body (29).

c. Use the 1/2" end of the wrench (35) to remove the nozzle retainer (30) from the back of the housing (28). Refer to Fig 8a.

d. Insert the nozzle (31), tapered end first, into the back of the housing. See Fig 8a.

e. Slide the packing nut (32), nozzle retainer (30), and packing (33) onto the needle (34). Screw the packing nut (32) into the nozzle retainer (30) until the top thread of the packing nut is flush with the back of the retainer. See Fig 8b.

f. Slide the needle assembly through the nozzle and into the nozzle housing assembly. See Fig 8a.

g. Adjust the needle so it protrudes 1-3/4 in. (44 mm) from the rear of the housing. See Fig 9.

h. Screw the nozzle retainer (30) snugly into the back of the housing. Torque to 25-35 in-lb (2.8-3.9 N·m) using the open end wrench (35).

CAUTION

Do not overtighten the nozzle retainer (30). This can compact the nozzle (31) and damage it or cause it to seat improperly, resulting in spray pattern distortion.

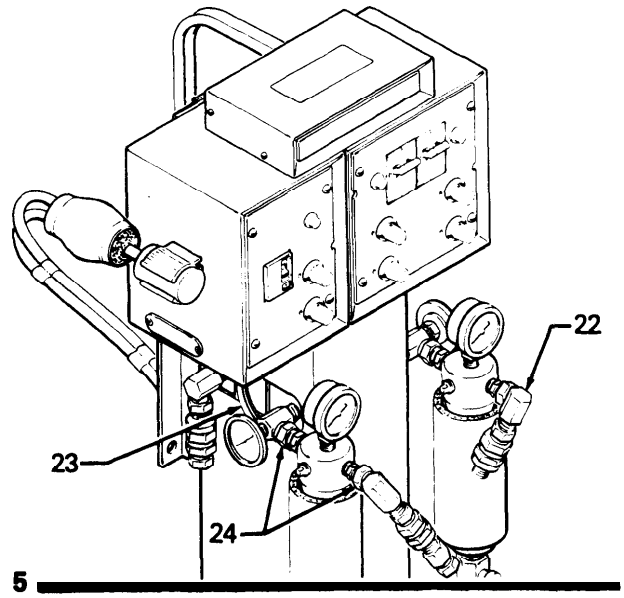


Fig 5

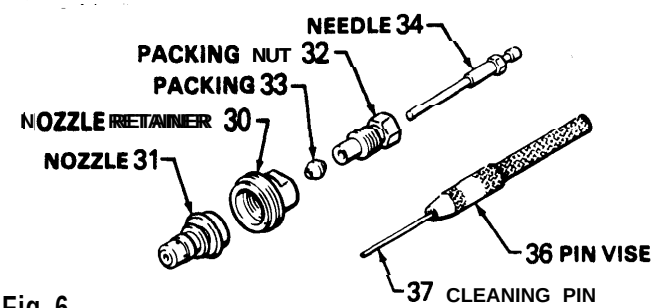


Fig 6

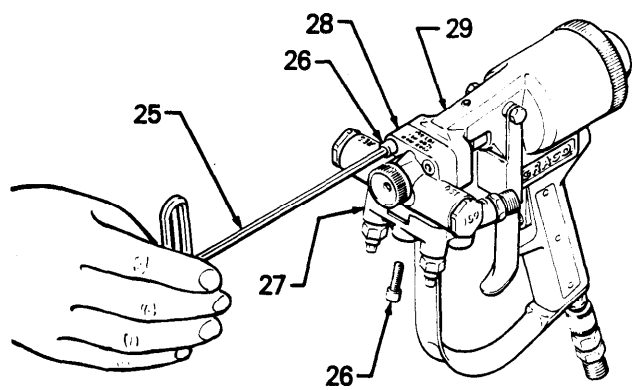


Fig 7

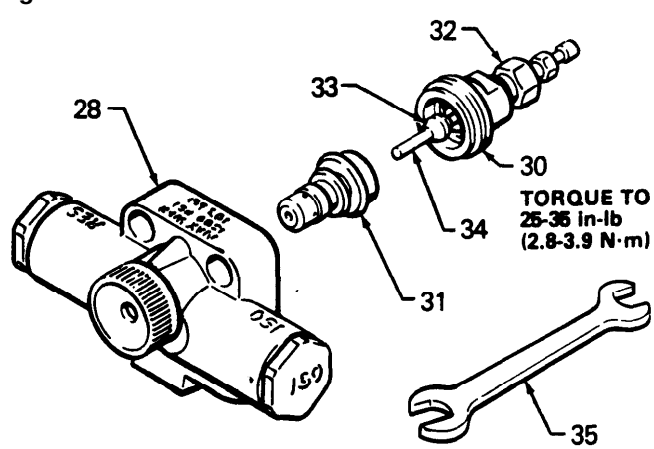


Fig 8a

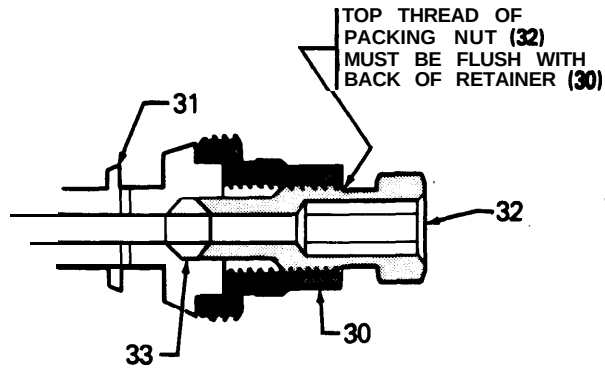


Fig 8

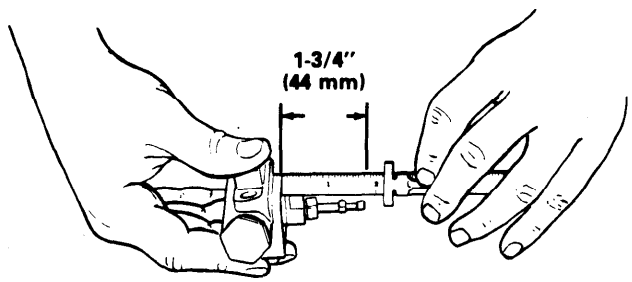


Fig 9

i. Guide the needle of the nozzle assembly into the front opening (38) of the gun body (29). The socket of the piston rod (39) must face down. Tilt the nozzle assembly up, and swing the ball of the needle (34) into the piston rod socket. See Fig 10.

j. Push the nozzle assembly further into the front opening (38) until the back of the assembly meets the gun body. Refer to Fig 10.

k. Use the 3/16" wrench (25) to install the two capscrews (26) firmly into the nozzle housing *(torque: 40 in-lb 4.5 N·m).* Refer to Fig 12.

WARNING

Be sure the trigger safety latch (40) is engaged (ON SAFE) before proceeding to reduce the risk of serious bodily injury from injection. Refer to Fig 11.

l. Screw on the air cap (41). Connect the air hose of the heated hose assembly to the inlet bushing (42) of the gun. See Fig 12.

m. Use the 7/16" end of wrench (35) to adjust the packing nut (32) until it is *just snug.* Don't overtighten it! See Fig 11.

n. Install the plastic shield (43) around the exposed part of the needle assembly to keep foam overspray from collecting on the needle. See Fig 12.

12. Connect the fluid hoses to the spray gun manifold. See Fig 12.

a. The manifold (27) has four inlet ports, two of which are plugged with steel plugs (44). Change the position of the plugs to route the hoses straight down from the manifold, if desired.

b. Connect the fluid hoses to the corresponding inlets of the gun manifold.

c. Do not connect the manifold to the gun yet.

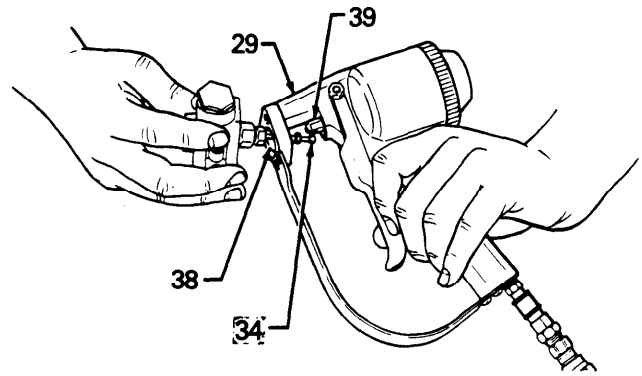
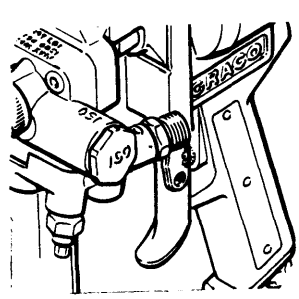
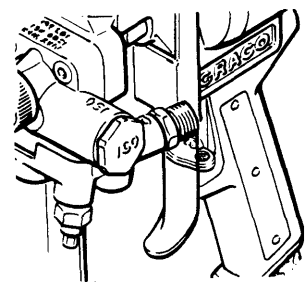


Fig 10



TRIGGER (40) SHOWN IN "OFF- SAFE" POSITION



TRIGGER (40) SHOWN IN "ON - SAFE" POSITION

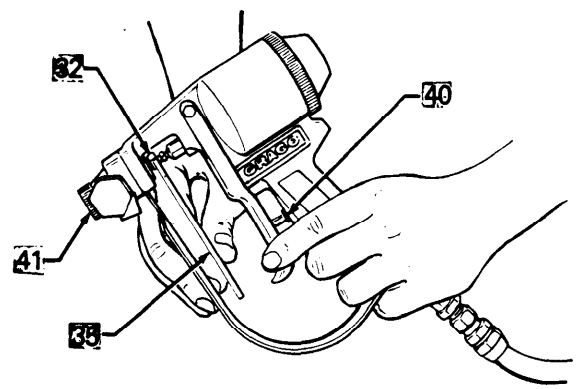


Fig 11

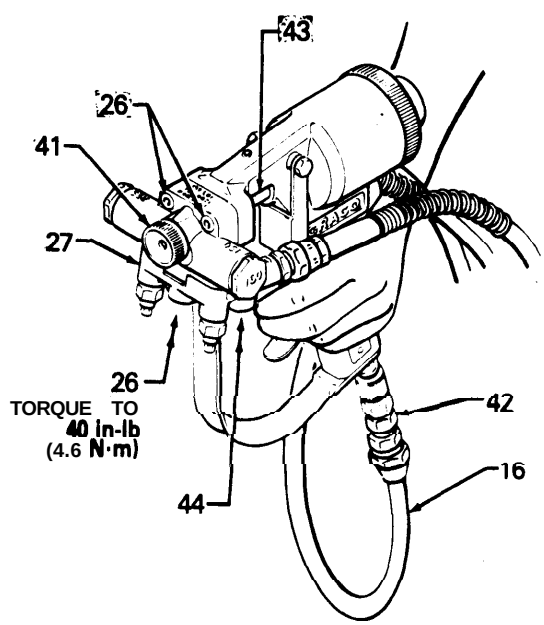


Fig 12

13. Connect the feed hose to the displacement pumps. Slide an identification band (ISO or RES) over the end of each feed hose (45). Connect a feed hose between the feed pump fluid outlet (46) and the 3/4 npt(f) fluid intake valve (202) of each displacement pump (48). Refer to the Typical Installation on page 4.

14. Remove the ATC Sensor (49) from the clamp (50) and locate it *outside* in air that is typical of the surface to be sprayed. The sensor has a 15 ft (4.6 m) cable. See Fig 5, page 7.

WARNING

electrical wiring should be done only by train- and qualified personnel to reduce the risk of rious bodily injury and electric shock.

bserve all local codes and regulations regarding ectrical wiring.

15. Wire the electrical service to the heater junction box. The electrical requirements for the heater are shown on the inside cover to the heater junction box.

The heater is grounded through the electrical wiring to a grounding screw on the inside bottom of the junction box. The proportioning pump must also be grounded to provide adequate system electrical grounding. Refer to Step 16.

16. Ground the spray system.

WARNING

To reduce the risk of static sparking, which can cause a fire or explosion and result in serious bodily injury, including electric shock, and property damage, be sure your entire spray system is properly grounded. Read and follow the warnings in FIRE OR EXPLOSION HAZARD, page 2, and steps 16a-16d, below.

To ground the pumps and sprayer:

a. Loosen the grounding lug locknut (55) and washer (52) located on the proportioning pump motor (48). Insert one end of a 12 ga (1.5 mm^2) minimum ground wire (53) into the slot in the lug (54) and tighten the locknut securely. See Fig 13.

b. Connect the other end of the wire to a good ground such as a steel building column (check your local code).

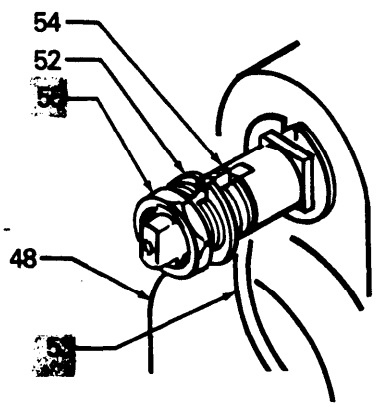


Fig 13

To ground the heater and heated hoses:

c. Wire the heater to a positively grounded power supply In a mobile installation, be sure the truck or trailer is connected to a true earthen ground.

d. Connect the heated hose to a properly grounded heater. The Ground Fault Interruptor on the hose control panel of the Foam-Cat Heater senses electrical continuity in the heated hoses; it cannot function unless the heater is positively grounded. In Europe, hose continuity must comply with VDE 0100.

17. Install the Air Dryer drum fittings (56) in the 3/4 in. vent port of the corresponding drum of fluid. Close the shutoff valve (57) and connect the corresponding dry air hoses (58). Use only the special pin fitting (59) and coupler (60) to connect the dry air hoses to the drum fittings. Do not use additional lengths of dry air hose. See Fig 14.

WARNING

The special air line pin fitting (59) and coupler (60) are designed to prevent accidentally coupling an unregulated air supply hose to the drum. Unregulated air can overpressurite the drum and cause it to rupture and cause serious bodily injury.

Never substitute a different type of coupler and fitting! Use original Graco parts.

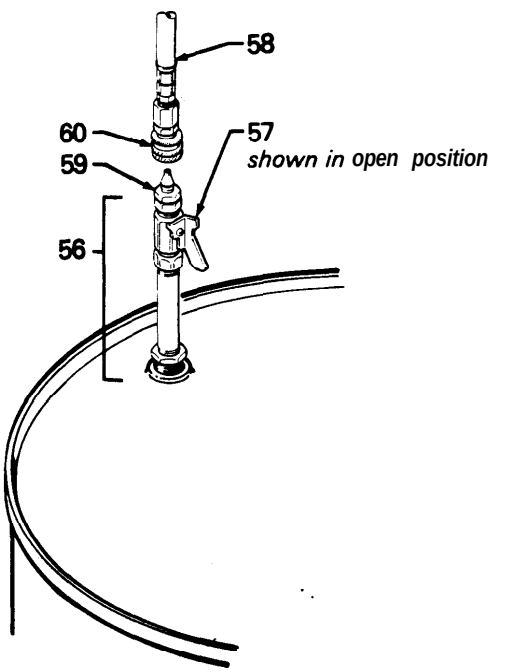


Fig 14

WARNING

Be sure the heater and heated hose circuit breakers (63) are shut off to reduce the risk of electric shock. See Fig 21, page 12.

First Time Start-Up

1. Prime the sprayer and check for leaks at all fluid connections.

   a. Close the feed pump air inlet valves or regulators (8). See the Typical Installation on page 3.

   b. Close the heater drain valve (61). See the Typical Installation.

   c. Close the air valve (214) to the proportioning pump air motor. Refer to the Typical Installation on page 3.

   d. Close the needle valves (64) of the spray gun manifold. *Do not overtighten as this will crack the seals!* See Fig 15.

   e. Fill the displacement pump wet-cup 2/3 full with IPO (ISO Pump Oil, supplied).

   f. Open the proportioning pump fluid intake valves (230). Refer to the Typical Installation.

   g. Open the main air line shutoff valve (1). Refer to the Typical Installation.

   h. Adjust the Air Dryer (9). See Fig 16.

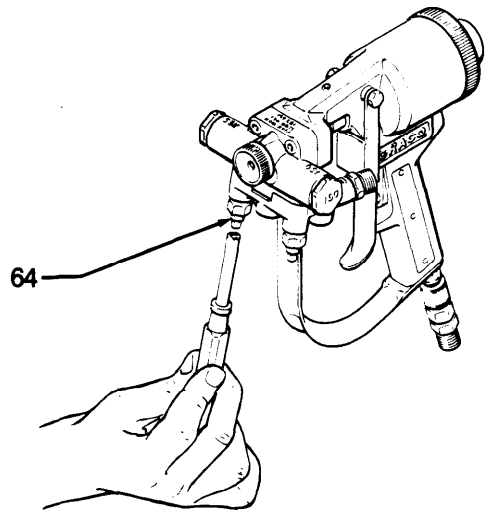


Fig 15

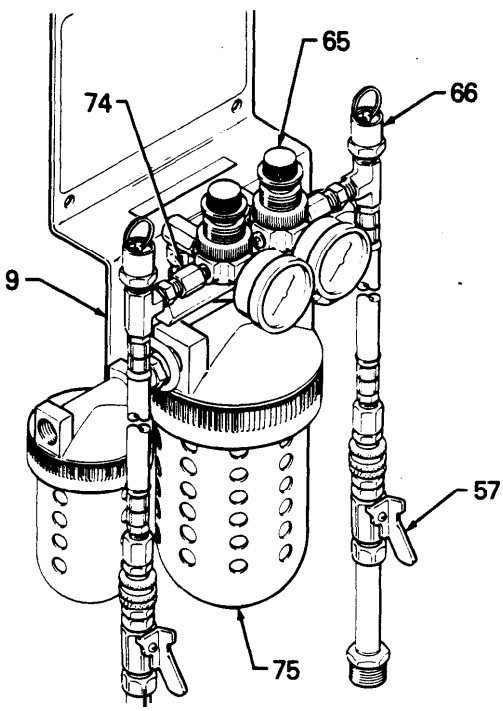


Fig 16

WARNING

To reduce the risk of overpressurizing the supply drum or container, which could rupture the drum and cause serious bodily injury and property damage, DO NOT operate the Air Dryer with any part removed.

Do not operate with the restrictor nipple (74) removed. These nipples limit the volume of air to the Air Dryer.

Do not operate with either pressure relief valve (66) removed. These valves relieve air pressure to the drums if it exceeds 5.5 psi (0.38 bar).

Do not operate with the metal bowl guard (75) removed from the oil filter or desiccant dryer.

(1) Set both air regulators (65) to the lowest pressure needed to provide adequate dry air to the supply drums. A setting of 2 psi (0.14 bar) normally provides enough dry air to the drums.

(2) Open the drum shutoff valves (57). Refer to the Typical Installation.

(3) To lower the pressure on the gauge, turn the regulator knob counterclockwise and pull up on the pressure relief valve ring (66) until the pressure on the gauge is just below the desired setpoint. Release the ring then turn the knob to the desired pressure. See Fig 16.

WARNING

If either pressure relief valve (66) is not operating properly, or if the drum pressure ever exceeds 5.5 psi (0.38 bar), replace the valve immediately. A malfunctioning relief valve can allow the drum to overpressurize and rupture resulting in bodily injury and property damage. Therefore, *never* attempt to repair the valve.

(4) Check the pressure relief valves daily.

To check the relief valves; close the drum shutoff valves (57) and uncouple the air hoses (58) from the pin fitting.

Increase the air pressure slowly. If pressure is not relieved by 5.5 psi (0.38 bar), replace the valve.

NOTE: A minimum pressure of 1 psi (0.07 bar) is needed to open the check valves (67).

i. Open the feed pump air valves (8). Refer to the Typical Installation.

j. Prime the hoses.

(1) With the gun disconnected from the manifold, hold the manifold (27) so each outlet port is directly over a separate waste container as shown in Fig 17.

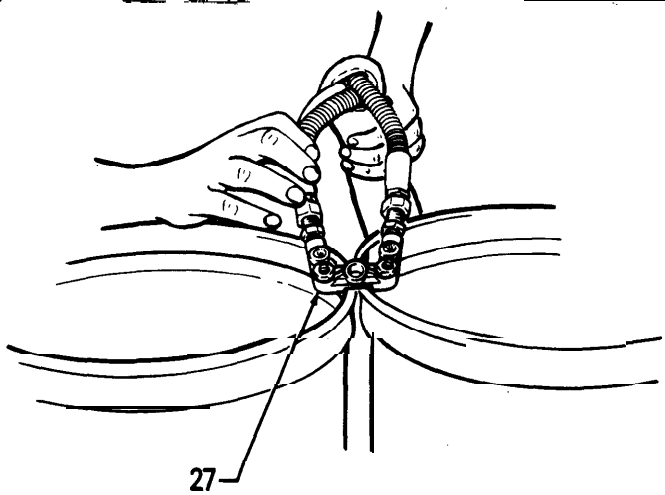


Fig 17

(2) Open the manifold needle valves (64). See Fig 15, page 9. Allow the material to flow out until all air is purged from the sprayer and the spitting stops.

(3) Close the needle valves. Do not connect the manifold and gun.

NOTE: Do not reuse the purged material in both waste containers to avoid contaminating your supply drums with test fluid left in the components after factory testing.

k. Adjust the air pressure regulator (212) to the proportioning pump to 50 psi (3 bar). See the Typical Installation on page 4.

l. Slowly open the air valve (114). This pressurizes the fluid in the sprayer. See the Typical Installation on page 4.

m. Check each fluid connection for leaks. If there are any leaks, relieve the fluid pressure as instructed below and tighten the connection.

WARNING

Pressure Relief Procedure

Always relieve the fluid pressure in the sprayer and hoses before checking or adjusting any part of the system or any component, to reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts or electric shock.

1. Engage the spray gun trigger safety latch.
2. Shut off the air to the feed pumps.
3. Turn off the air to the proportioning pump.
4. Close the gun manifold needle valves.
5. Disengage the trigger safety latch, trigger the gun, to relieve pressure, and engage the trigger safety again.
6. Open both fluid filter drain valves, having a container ready to catch the draining fluid.
7. If you are working on any part of the heater, shut off the main electrical power to the heater.

2. Insulate the hose connections.

a. Be sure the fluid pressure is relieved and the electric power is shut off as instructed in the Pressure Relief Procedure warning, the left.

b. Wrap electrical tape securely around the fluid and air hose connectors (only) so the sharp metal edges of the connectors cannot damage the plastic connectors of the heat tapes. See Fig 18a.

c. Tape the heat tape connectors to the taped air and fluid hoses connectors, making sure the heat tape is still bent to take up slack *on both* sides of the connectors. Do not tape the heat tape wires as they must be able to move slightly to prevent strain on the connector wires. See Fig 18b.

WARNING

Do not use the heated hose for spraying until the insulation tubing (see step 2) and the abrasion cover (see step 3) is in place.

The insulation helps protect against bodily fluid injection if a leak occurs and minimizes heat loss and damage to the hose connections.

The abrasion cover protects the insulation from surface damage.

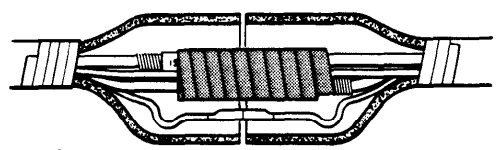


Fig 18a

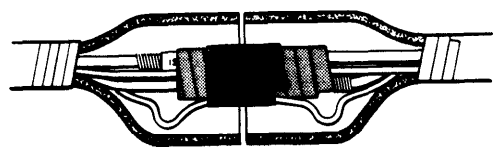


Fig 18b

d. Wrap the insulation tubing (68) around the hose connections, overlapping it at the seam. Wrap tape (69) continuously around the tubing, beginning and ending about 2 inches (51 mm) past the slit in the insulation. This insulation minimizes heat loss at the connections and protects the couplings and heat tape from damage. See Fig 18c.

NOTE: Use standard black electrical tape if additional tape is needed to secure the tubing.

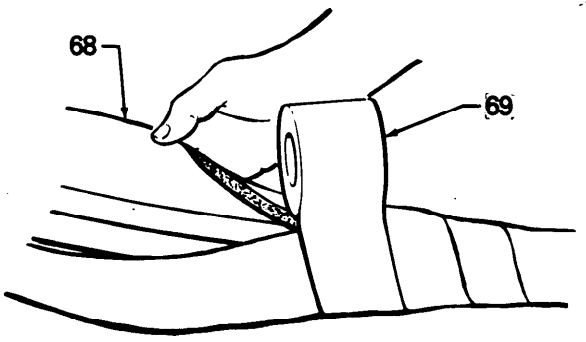


Fig 18c

3. Install the hose abrasion cover.

See Accessories on the back cover. To install the cover:

a. Be sure the gun manifold needle valves (64) are tightly closed. Refer to Fig 15.

b. Lay the hose assembly and abrasion cover (76) end to end. Refer to Fig 19.

c. With the gun disconnected from the manifold and starting at the gun manifold (27), pull a couple of inches of the cover over the hose and tape it in place.

d. Push the cover onto the hose. See Fig 19. The cover will double over itself and be turned inside out as it slides over the hose.

e. Cut off any extra abrasion cover.

f. Secure the end with tape.

g. Connect the gun and manifold.

h. Connect the air hose (17) to the gun. Loop the extra hose down between the gun and whip hose.

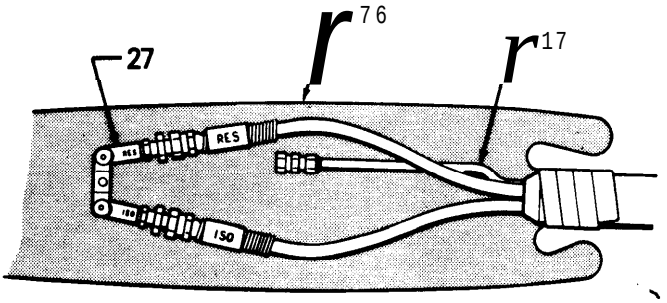


Fig 19

WARNING

Never operate the hose when it is coiled. Doing so causes excessive heat buildup which can result in hose rupture and cause serious bodily injury, including injection, and property damage. The high heat can also cause poor foam development.

Routine Sprayer Operation

CAUTION

The heater and sprayer must be primed before turning on the heater to reduce the risk of equipment damage.

Refer to 'First Time Startup' on pages 10,through 12 for priming procedure.

NOTE: The first time you operate the sprayer, follow these instructions carefully. Then, as you become familiar with this equipment, you will learn how to quickly adjust the fluid pressure and fluid temperature to obtain the best results for your spray application.

1. Open the main air supply valve (1).

2. Open the main air supply valve and the air valves (8) to the feed pumps (3). See the Typical Installation on page 3.

3. Adjust the air regulator (212) to the proportioning pump motor to 50 psi (3 bar).

4. Slowly open the air valve (214) to the proportioning pump.

5. Start the heaters. See Fig 20.

WARNING

Never operate the heater with the ATC sensor cord unplugged from the heater junction box. If unplugged, the heater will overheat which can cause overpressurization and rupture and result in serious bodily injury.

a. Turn all three ATC temperature range selectors (72, 77) to OFF.

b. Set all three Temp Set dials (73) to 115°F (46°C).

c. Turn the circuit breakers (63) to "I" for ON.

d. Let the material to heat for 15 minutes.

e. Set the heated hose ATC (77) to MED.

NOTE: Graco recommends always using the hose ATC even if the heater ATC is not used.

f. The first time you use the heater, operate it without using the *heater* ATC (72). Check the temperature gauges regularly during the day and adjust the fluid temperature as needed. This will help you determine the right ATC range for the type of foam chemicals you are using.

g. The second day of operation, set both heater ATCs to MED. This range normally provides enough ambient temperature compensation.

NOTE: You will quickly learn what ATC range is the best for your foam chemicals. The chart in Fig 21 can help you determine how wide a range in temperature you need to maintain the proper fluid temperature and viscosity for good foam development.

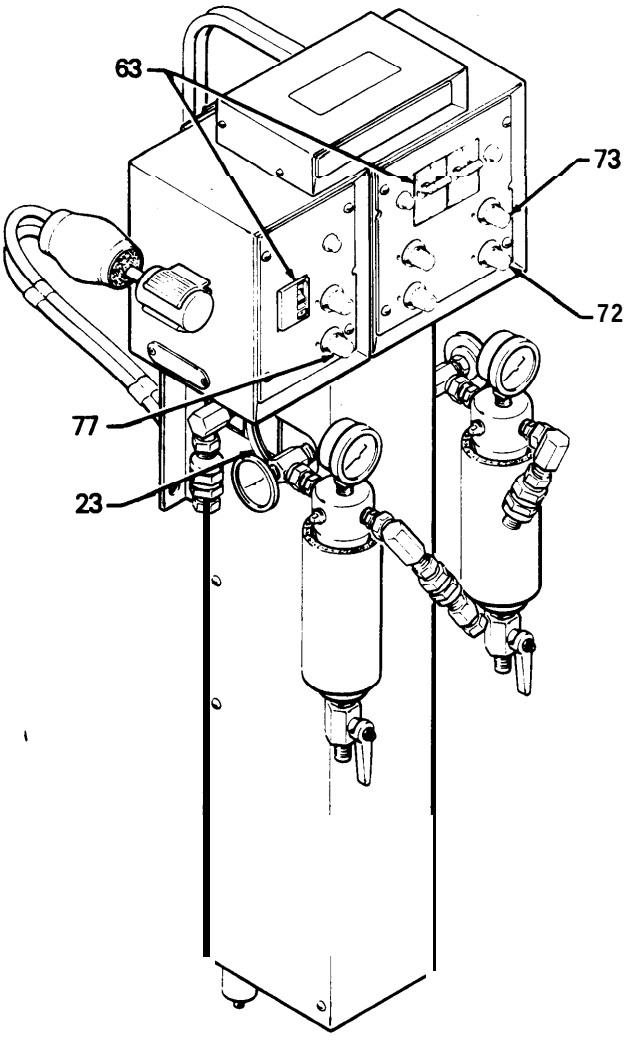


Fig 20

AMBIENT TEMP	*ATC SETTING			
	OFF	MIN	MED	MAX
60°F (15°C)	115°F (46°C)	120°F (49°C)	125°F (52°C)	135°F (57°C)
80°F (27°C)	115°F (46°C)	115°F (46°C)	115°F (46°C)	115°F (46°C)
100°F (38°C)	115°F (46°C)	112°F (44°C)	108°F (42°C)	95°F (35°C)

*With Temp Set at 115°F (46°C).

Fig 21

6. Spray the gun for several seconds, in cold weather, to warm the fluid nozzle.

CAUTION

Open the RES side needle valve first to prevent damage to the nozzle.

7. Test the spray pattern. Aim the gun at a piece of scrap cardboard and trigger for 1 second to check the spray pattern. A good pattern should be round and well atomized, and it should harden with a fairly smooth surface. Refer to the chart in Fig 22 for the proper size of pattern and spray distance for the nozzle being used.

NOTE: **Release the gun trigger at least once a minute, while spraying, if you use a no-release triggering method. This is to actuate the mechanical purger and avoid material buildup on the nozzle tip and air cap.**

NOZZLE PERFORMANCE CHART

Nozzle Kit No.	Needle Diameter in. (mm)	DELIVERY: Outlet Pressure psi (bar)	DELIVERY: [1]Flow Rate lb/min (kg/min)	DELIVERY: [2]Pattern Diameter in. (mm)
217-424	0.073 (1.85)	1000 (70) 750 (53)	10.5 (4.7) 8.5 (3.8)	12 (305)
217-425	0.083 (2.11)	100 (70 750 (53)	15 (6.6) 12 (5.5)	17 (432)

NOTE:

[1] Flow rate test conditions: 2.7 lb (1.22 Kg) foam; ISO viscosity of 200 cps (200 mPa·s) at 77°F (25°C); RES viscosity of 650 cps (650 mPa·s) at 68°F (20°C); heater and hose temperature of 115°F (43°C); pump outlet pressure as indicated in chart.

[2] At the recommended 30 in. (762 mm) spraying distance.

Fig 22

8. **Adjust the gun's cleanoff air.**

WARNING

To reduce the risk of an injection injury:
Before adjusting the cleanoff air, engage the trigger safety (40), close the needle valves (64), disengage the trigger safety and trigger the gun to relieve the fluid pressure. Engage the trigger safety again. See Fig 23.

a. Screw in the cleanout hole setscrew (72) using the Allen wrench (71) until no air or almost no air is escaping. See Fig 23.

b. Regulate the air to the gun to 100 psi (7 bar).

c. Back off the setscrew two turns as a test setting.

d. If the air appears to affect the spray pattern, screw in the setscrew another turn. If build up behind the air cap occurs, back off the setscrew about 1/2 turn at a time.

Shutdown

At the end of each work day, stop the pump with the displacement rod in the *down* position. Shut off the heater and main circuit breakers and relieve the fluid pressure as instructed in the Warning. below. Then disconnect the gun from the fluid manifold, flush the gun as instructed in 307-546, and store it.

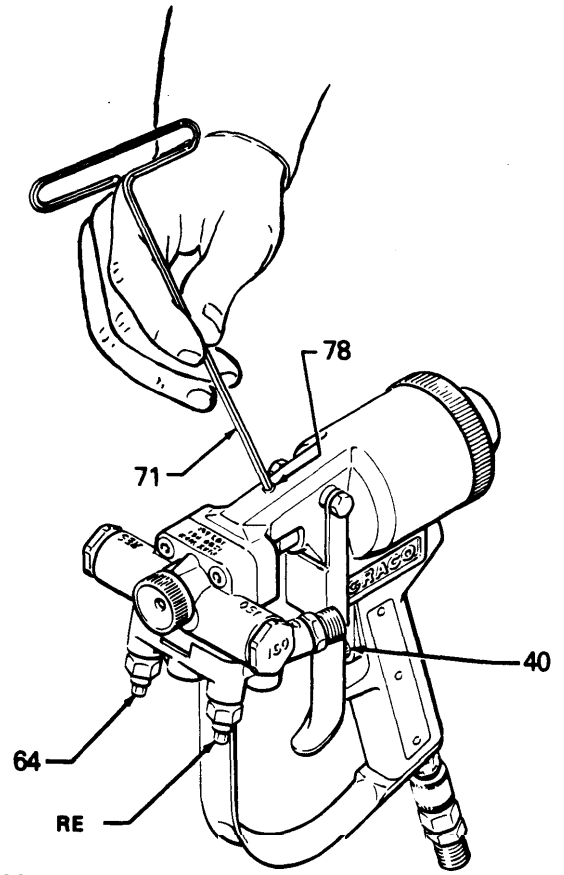


Fig 23

WARNING

Pressure Relief Procedure

Always relieve the fluid pressure in the sprayer and hoses before checking or adjusting any part of the system or any component, to reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts or electric shock.

1. Engage the spray gun trigger safety latch.
2. Shut off the air to the feed pumps.
3. Turn off the air to the proportioning pump.
4. Close the gun manifold needle valves.
5. Disengage the trigger safety latch, trigger the gun, to relieve pressure, and engage the trigger safety again.
6. Open both fluid filter drain valves, having a container ready to catch the 'draining fluid.
7. If you are working on any part of the heater, shut off the main electrical power to the heater.

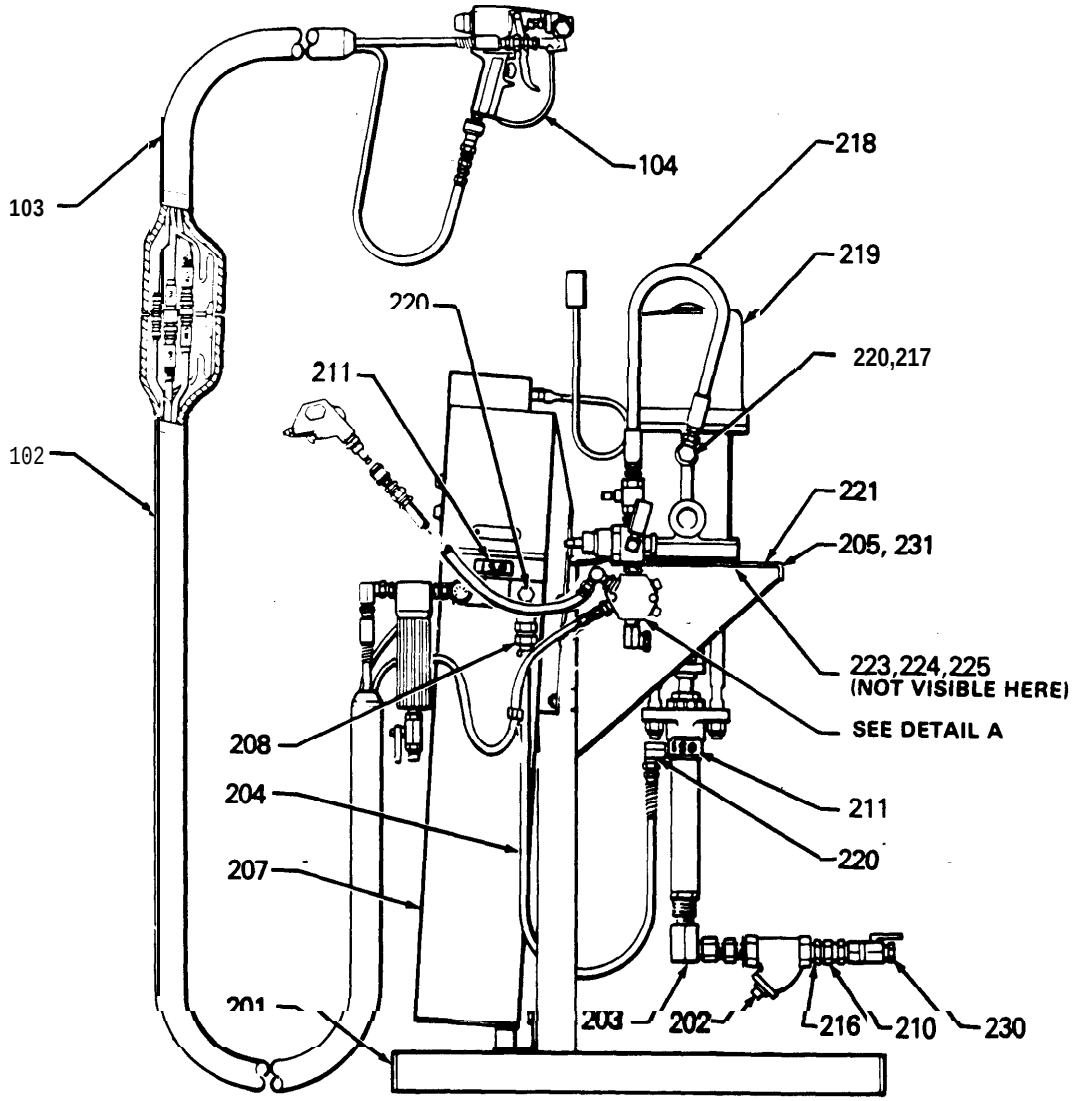
-Maintenance

Keep the displacement pump wet-cup 2/3 full of IPO at all times to help protect the pump packings.

Refer to the separate instruction manual for each system component for routine maintenance and repair procedures.

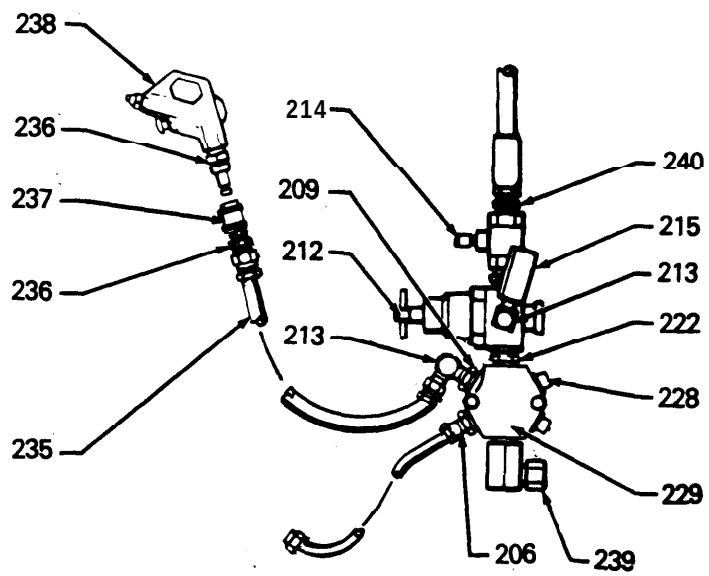
NOTES:

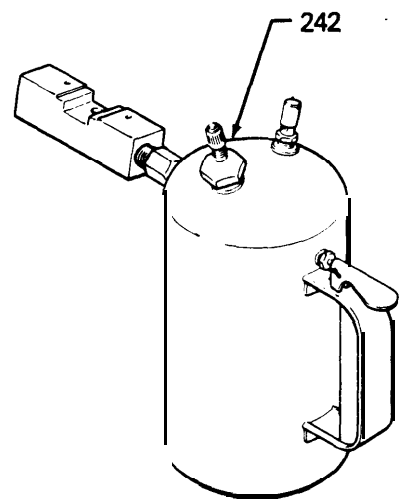
Model **230-965**
without heated hoses
Includes items 101, 104, 105 and 201 to 243



Detail A

Air Manifold Connections





Basic Sprayer Components

REF NO.	PART NO.	DESCRIPTION	QTY
201	217-296	STAND, pump (see 307-551 for parts)	1
202	101-078	STRAINER, "Y"; 20 mesh screen; 3/4 npt(fbe) Includes item 202a	2
202a	180-199	.ELEMENT, filter, 20 mesh screen	1
203	160-327	ADAPTER, union, 90°; 3/4 npt(m) x 3/4 npt(f) swivel	2
204	217-378	HOSE, cpld 3/8 npt(mbe); 3/8" ID; spring guard one end; 2.5 ft (780 mm) lg	2
205	180-236	PLATE, serial	1
206	155-571	BUSHING, pipe; 1/2 npt(m) x 1/4 npt(f)	1
207	217-399	HEATER, fluid, 15 lb/min (6.75 kg/min); See 307-543	1
208	206-831	CHECK VALVE, 3/8 npsm(f) swivel x 3/8 npt(m); See 306861 for parts	1
209	162-449	NIPPLE, reducing; 1/2 to 1/4 npt	1
210	157-785	UNION, swivel, straight; 3/4 npsm(f) swivel x 3/4 npt(m)	2
211	178600	LABEL, ISO/RES	2
212	104-267	REGULATOR, air; O-125 psi (O-10 bar) range; 1/2 npt(f) in/out; two 1/4 npt(f) gauge ports (see 307-204 for parts)	1
213	100840	ELBOW, 90° street; 1/4 npt(m x f)	1
214	107-142	VALVE, shutoff, vented	1
215	100-960	GAUGE, pressure, air; O-200 psi (O-14 bar) range, 1/4 npt(m)	1
216	160-032	NIPPLE, 3/4 npt x 1-7/8" long	2
217	100-081	BUSHING, pipe; 1/2 npt(f) to 3/8 npt(f)	1
218	214-652	HOSE, air; cpld 3/8 npt(mbe) x 1.5 ft (457 mm) long	1
219	208-851	PUMP, President Plural Component (see 306-989 for parts)	1
220	155-699	ELBOW, street 90°; 3/8 npt(m x f)	3
221	178-471	PLATE, mounting	1
222	158-491	NIPPLE, 1/2 npt x 1-5/8" long	2
223	100-101	CAPSCREW, hex hd; 3/8 npt x 1" long	7
224	loo-133	LOCKWASHER, spring; 3/8"	7
225	loo-131	NUT, hex, 3/8 npt	4
226	loo-333	CAPSCREW, hex head; 1/4 thd x 0.5" (13 mm)	2
227	100-016	LOCKWASHER, spring; 1/4"	2
228	loo-737	PLUG, pipe; 1/2 npt	3
229	177-I 17	MANIFOLD, air; six 1/2 npt(f) ports	1
230	102-735	VALVE, ball; 3/4 npt(fbe)	2
231	102-556	RIVET, blind	2
232	217-374	OIL, pump, ISO; 1 pint (0.46 liter)	1
235	212-005	HOSE, air; 1/4" ID; cpld 1/4 npsm(f) swivel; 3'9" (1.1 mm)	1
236	100-030	BUSHING, hex; 1/4 x 1/8 npt	2
237	106-552	COUPING, air line, quick disconnect	1
238	208-625	GUN, air blow	1
239	155-470	UNION, swivel, 90° 1/2 npt(m) x 1/2 npsm swivel	2
240	158-256	ADAPTER, union; 3/8 npsm(f) swivel x 1/2 npt(m)	1
241	200-I 18	HOSE, air, 2.6' (762 mm) cpld 1/4-18 npt	1
242	218669	SOLVENT FLUSH KIT (see 307-692)	1
243	100509	PLUG, pipe, 1/4-18 npt(f)	1

See 'How To Order Replacement Parts" on page 18.

Model 226-991, Foam-Cat ™ 200

Includes items 101 to 105

REF NO.	PART NO.	DESCRIPTION	QTY
101	226-990	SPRAYER, foam (see items 201 to 243)	1
102	218-613	HOSE, heated (see 307-544 forparts)	1
103	218-614	HOSE, heated, whip (see 307-544 for parts)	1
104	217-373	GUN, foam	1
105	217-425	KIT, nozzle, gun; 0.083" (2.11 mm) dia. needle	1

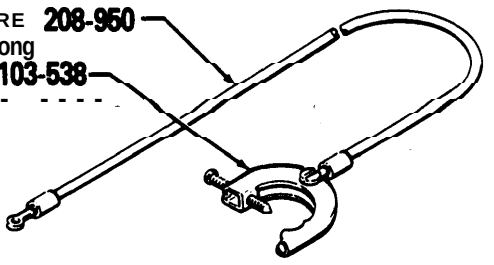
Model 230-965, Foam-Cat ™ 200

Includes items 101, 104 and 105

REF NO.	PART NO.	DESCRIPTION	QTY
101	226-990	SPRAYER, foam (see items 201 to 243)	1
104	217-373	GUN, foam	1
105	217-425	KIT, nozzle, gun: 0.063" (2.11 mm) dia. needle	1

See "How to Order Replacement Parts" on page 18.

ACCESSORIES (Must be purchased separately)



GROUND WIRE 208-950
25 ft (7.6 m) long
and CLAMP **103-538**

AIR FILTER 106-148
250 psi (17.5 bar) MAXIMUM WORKING PRESSURE
Separates harmful moisture and contaminants from the compressed air supply.
1/2 npt(fbe)

AIR SHUTOFF VALVE 103-344
500 psi 135 bar) MAXIMUM WORKING PRESSURE
Bleed type valve for shutting off main air supply to spray system. 3/4 in. size.

AIR DRYER KIT 217-341
150 psi (0.49 bar) MAXIMUM AIR INLET WORKING PRESSURE
Provides clean, dry air to two supply drums of polyurethane foam chemicals to prevent crystalization of Isocyanate and Freon loss in Resin. See manual 307-548.

1:1 RATIO FEED PUMPS 226-946
1:1 RATIO FEED PUMP KIT 217-381
180 psi (12 bar) MAXIMUM WORKING PRESSURE
These feed pumps, which have an airtight bung adapter, supply polyurethane foam chemicals from supply containers to proportioning pumps. The Feed Pump Kit includes an Air Dryer 217-394, two feed hoses, three air hoses and related fittings. See manual 307552.

ISO PUMP OIL
Helps protect displacement pump throat packings.
217-374 1 pint (0.47 liter)
218-656 1 gallon (3.8 liter)

HOSE ABRASION COVER 070411
Protects heated hose from damage caused by rough surfaces. Specify length needed times 1.125 when ordering.

AIR REGULATOR and GAUGE 206-199
300 psi (27 bar) MAXIMUM WORKING PRESSURE
10- 125 psi (1-9 bar) REGULATED PRESSURE RANGE
1/2 npt(f) inlet and outlet

HOW TO ORDER REPLACEMENT PARTS

1. To be sure you receive the correct replacement parts, kit 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

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-Grace 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 inspectron 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 AU **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 Graco, 7:00 a.m. to 6:00 p.m. Central Time:

1-800-423-8594 Toll Free
1-612-623-6921 in Minnesota

FOR ***TECHNICAL ASSISTANCE,*** service repair information or answers about the application of Graco equipment, call the following number, 7:00 a.m. to 6:00 p.m. Central Time:

1-800-543-0339 Toll Free
1-612-623-6922 in Minnesota

SERVICE INFORMATION

Assembly Changed	Status	Ret No.	Part No.	Name
226-991 &	OLD	105	217-423	Gun Kit
230-965 Sprayer	NEW	105	217-425	Gun Kit

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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