

INSTRUCTIONS-PARTS LIST



307-896

Rev. A

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

AUTOMATIC HIGH-RANGE ELECTROSTATIC AIR SPRAY GUN

7 bar (100 psi) MAXIMUM WORKING PRESSURE

Part Number 907-292

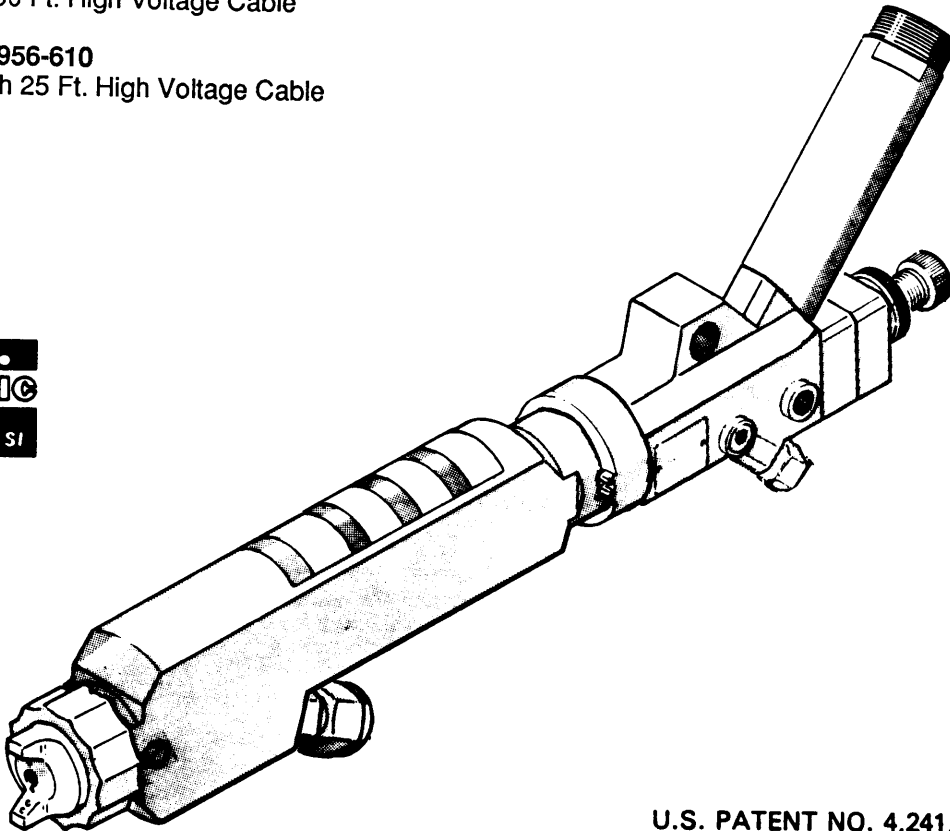
Spray Gun & 75 ft. High Voltage Cable

Part Number 956-112

Spray Gun & 50 Ft. High Voltage Cable

Part Number 956-610

Spray Gun with 25 Ft. High Voltage Cable



U.S. PATENT NO. 4,241,880; 4,335,851;
and 4,501,394



H003

GRACO INC. P.O. Box 1441 MINNEAPOLIS, MN 55440-1444

©COPYRIGHT 1988 GRACO INC.

TABLE OF CONTENTS

<p>WARNINGS 2</p> <p>HOW THE ELECTROSTATIC AIR SPRAY GUN WORKS 4</p> <p>INSTALLATION</p> <p style="padding-left: 20px;">Typical Installation 4</p> <p style="padding-left: 20px;">Ventilate the Spray Booth 4</p> <p style="padding-left: 20px;">Connect the High Voltage Power Supply 4</p> <p style="padding-left: 20px;">Connect the High Voltage Cable 5</p> <p style="padding-left: 20px;">Check the Electrical Grounding 5</p> <p style="padding-left: 20px;">Mount the Spray Gun 5</p> <p style="padding-left: 20px;">Connect the Air Lines 5</p> <p style="padding-left: 20px;">Connect the High Voltage Control 6</p> <p style="padding-left: 20px;">Connect the Fluid Line 6</p> <p>OPERATION</p> <p style="padding-left: 20px;">Operating Checklist 6</p> <p style="padding-left: 20px;">Filter the Fluid 6</p> <p style="padding-left: 20px;">Adjust the Spray Pattern 6</p> <p style="padding-left: 20px;">Cleaning 7</p> <p style="padding-left: 20px;">Clean the Air Cap and Fluid Tip 7</p> <p style="padding-left: 20px;">Flushing 7</p> <p>SERVICE</p> <p style="padding-left: 20px;">Spray Pattern Troubleshooting Chart 8</p> <p style="padding-left: 20px;">Gun Operation Troubleshooting Chart 9</p> <p style="padding-left: 20px;">Electrical Troubleshooting Chart 10</p> <p style="padding-left: 20px;">Gun Disassembly 11</p> <p style="padding-left: 20px;">Electrode Resistor Replacement 11</p> <p style="padding-left: 20px;">Fluid Needle Removal 12</p>	<p style="padding-left: 20px;">Fluid Needle Replacement 12</p> <p style="padding-left: 20px;">Barrel Removal 12</p> <p style="padding-left: 20px;">Fluid Packing Replacement 12</p> <p style="padding-left: 20px;">Barrel Reassembly 13</p> <p style="padding-left: 20px;">Resistor Tube/Resistor Replacement 13</p> <p style="padding-left: 20px;">Resistor Tube Regreasing 13</p> <p style="padding-left: 20px;">Servicing the Actuator 14</p> <p style="padding-left: 20px;">Fan Air Valve Replacement 14</p> <p>AIR CAP CONSUMPTION and FLUID TIP FLOW RATE CHART 15</p> <p style="padding-left: 20px;">Air Caps 15</p> <p style="padding-left: 20px;">Air Cap Assemblies 15</p> <p>PARTS DRAWING 16</p> <p>PARTS LIST 17</p> <p>HOW TO ORDER REPLACEMENT PARTS 17</p> <p>ACCESSORIES 18</p> <p>TECHNICAL DATA Back Cover</p> <p>The words Warning, Caution, and Note are used to classify information within this manual.</p> <p>WARNING: Alerts user to avoid or correct conditions that could cause personal injury.</p> <p>CAUTION: Alerts user to avoid or correct conditions that could cause damage to or destruction of equipment.</p> <p>NOTE: Identifies essential procedures or extra information.</p>
--	--



WARNING

SERIOUS BODILY INJURY, EXPLOSION, FIRE, OR ELECTRIC SHOCK CAN OCCUR IF THE PRECAUTIONS BELOW ARE NOT FOLLOWED.

READ AND UNDERSTAND ALL INSTRUCTION MANUALS, TAGS, AND WARNING LABELS BEFORE OPERATING EQUIPMENT.

ELECTROSTATIC EQUIPMENT SHALL ONLY BE USED BY TRAINED PERSONNEL WHO SHALL BE FULLY CONVERSANT WITH THE REQUIREMENTS STATED WITHIN THIS INSTRUCTION MANUAL.

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 serious bodily injury, fire, explosion or property damage.

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

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

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

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

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

This gun has a maximum working pressure of 7 bar (100 psi). Never exceed the maximum working pressure of the gun or any other component or accessory used in the system.

Pressure Relief Procedure

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

1. Turn off the high voltage power supply.
2. Turn off the air and fluid supply to the gun.
3. Trigger the gun into a grounded metal waste container to relieve fluid pressure.
4. Open the pump drain valve, having a grounded metal waste container ready to catch the drainage.
5. Leave the pump drain valve open until you are ready to spray again.

Bleed-Type Air Shutoff Valve and Fluid Drain Valve Required

These two accessories are required in your system to help reduce the risk of serious bodily injury, including splashing in the eyes and injury from moving parts if you are adjusting or repairing the pump.

The *bleed-type air shutoff valve* relieves air trapped between this valve and the pump after the air regulator is shut off. Trap-

ped air can cause the pump to cycle unexpectedly. Locate the valve within easy reach of the pump.

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.

FIRE OR EXPLOSION HAZARD

All parts of the electrostatic spray system must be properly grounded to reduce the risk of static electricity discharge. Static electricity is created by the high velocity flow of fluid through the pump and hose and the spray gun's power supply. Ungrounded objects can become electrically charged and sparking may occur. Sparks can ignite fumes from solvents, fluid being sprayed, dust particles and other flammable substances, which can cause a fire or explosion and result in serious bodily injury and property damage.

If you experience any sparking or feel even a slight shock, **STOP SPRAYING IMMEDIATELY**. Check for proper grounding of the entire system. Be sure you have corrected the problem before starting to spray again.

The *minimum spraying distance* from the gun tip to the workpiece is 100 mm (4 in.). Holding the gun any closer to the workpiece will cause sparking.

Grounding

The following are *minimum* requirements for grounding a basic electrostatic system. Your system may include other equipment or objects which must also be grounded. Always check your local electrical code for detailed grounding instructions. Be sure your system is connected to a true earth ground.

1. *Pump*: ground by using a ground wire and clamp as described in your separate pump instruction manual.
2. *Air compressors*: ground according to the manufacturer's recommendations.
3. *High voltage power supplies*: must be properly grounded and located outside the spray area. Ground according to the manufacturer's recommendations.
4. *High voltage cable*: obtain grounding through connection of an *undamaged* cable to a properly grounded power supply.
5. *All electric cables* going to the power supply must be properly grounded.
6. *Spray gun*: obtain grounding through connection to properly grounded high voltage cable.
7. *Object being sprayed*: keep the workpiece hangers clean and grounded at all times. Contact points must be sharp points or knife edges.
8. *All electrically conductive objects or devices, in the spray area*, including paint containers and wash cans, must be properly grounded.
9. *All persons entering the spray area*: shoes must have conductive soles, such as leather, or personal grounding straps must be worn. Rubber or plastic soles are not conductive.
10. *The floor of the spray area* must be electrically conductive and grounded. Do not cover the floor with cardboard or any non-conductive material which would interrupt grounding continuity.
11. *Flammable liquids in the spray area* must be kept in approved, grounded containers. Do not store more than the quantity needed for one shift.
12. *All solvent pails*: use only grounded metal pails, which are conductive. Do not place the pail on any non-conductive surface, such as cardboard or paper, which would interrupt grounding continuity.

Flushing and Cleaning Safety

To reduce the risk of static sparking or splashing, always follow the **Pressure Relief Procedure** on page 2, and remove the fluid tip before flushing. Use the lowest possible pressure and use a grounded metal waste container.

Be sure the high voltage power supply is OFF during flushing.

NEVER use solvents having a flash point of less than 21°C (70°F) to clean the gun. **NEVER** use solvents having a flash point of less than 38°C (100°F) to clean the spray system. **ALWAYS** remove all solvent from the system before reactivating the spray gun.

Use only non-sparking tools to clean residue from the booth and hangers.

Ventilate the Spray Booth

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

The High Voltage Power Supply must be electrically interlocked with the ventilators to prevent operation of the Power Supply unless ventilating fans are operating.

NEVER operate the spray gun unless the ventilating fans are operating.

IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards—particularly the General Standards, Part 1910.107 and any other appropriate regulations—should be consulted in connection with the installation, operation and maintenance of electrostatic spray painting equipment.

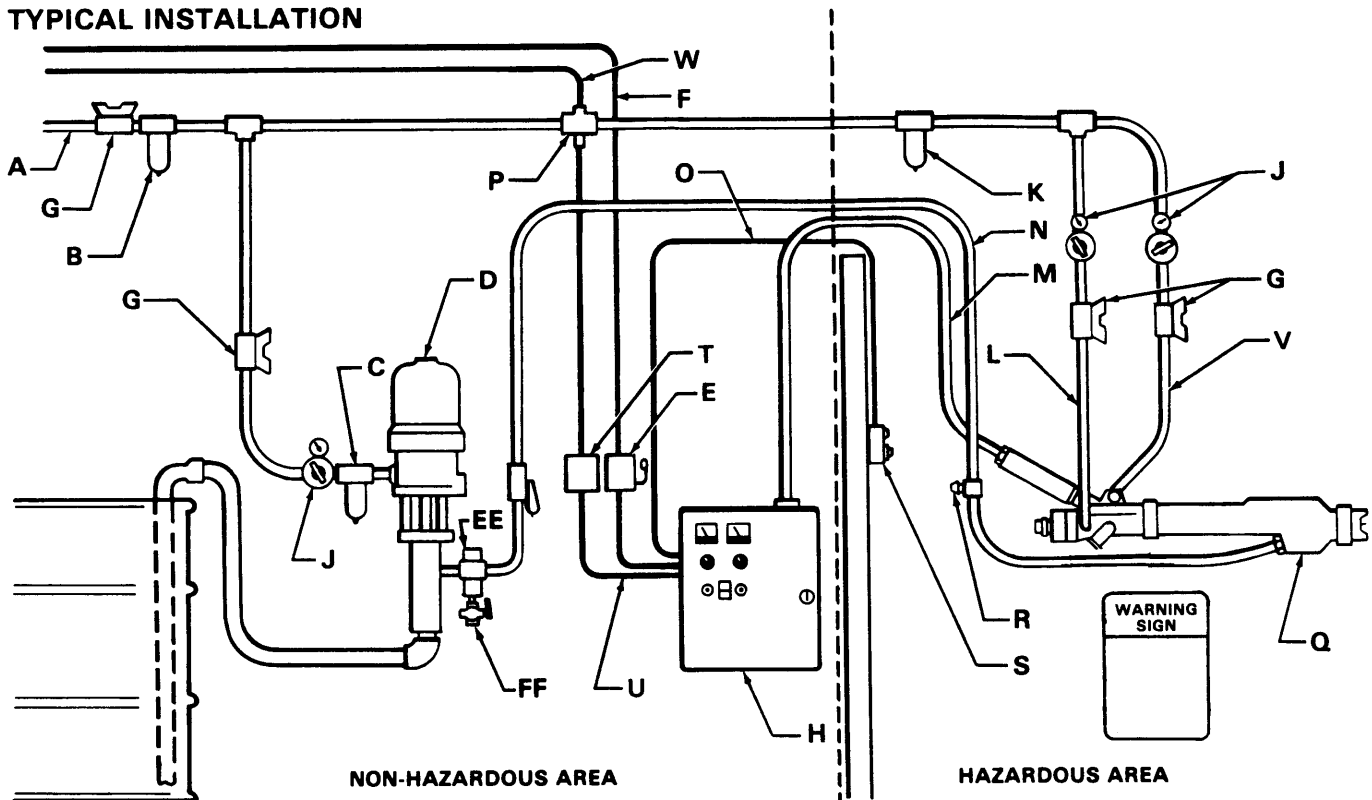
How the Electrostatic Air Spray Gun Works

A transformer supplies high voltage current through the cable to the gun's ionizing electrode, where the electrostatic field is developed. The pump supplies fluid through the hose and gun, where it is electrostatically

charged as it passes the ionizing electrode. The charged fluid is attracted to the grounded workpiece, wrapping around it and coating all surfaces.

INSTALLATION

TYPICAL INSTALLATION



KEY

- | | | | | | |
|---|---------------------------------------|----|---|----|---|
| A | Air Supply Line | J | Air Regulator | Q | Electrostatic Automatic Gun |
| B | Air Line Filter | K | Air Filter (40 micron) | R | Fluid Regulator |
| C | Air Line Lubricator | L | Atomizing Air Line | S | Remote Switch & Lights |
| D | Pump | M | High Voltage Cable | T | Relay for Electrical Signal |
| E | ON-OFF (D.P.-D.T.) Switch | N | Fluid Line | U | Connection Between Relay & Power Supply |
| F | Electric Power Line | O | Remote Switch & Lights Wiring | V | Cylinder (CYL) Air Line |
| G | Air Supply Shutoff Valve (Bleed-type) | P | Normally Closed, 3-way Air Solenoid Valve or 3-way Manual Valve | W | Electrical Signal Required to Actuate Air |
| H | High Voltage Power Supply | EE | Fluid Filter | FF | Drain Valve |

The Typical Installation shown above is only a guide for selecting and installing electrostatic air spray systems. It is not an actual system design. The particular type and size system for your operation must be custom designed for your needs. For assistance in designing a system, contact your Graco representative.

WARNING

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious bodily injury. Do not install or service this equipment unless you are qualified.

Be sure your installation complies with national, state and local codes for the installation of electrical apparatus in a Class 1, Group D; Divisions 1 and 2 Hazardous Location.

Warning Signs

Mount warning signs in the spray area where they can easily be seen and read by all operators. See the Accessories section on page 18.

Ventilate the Spray Booth

WARNING

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a properly ventilated spray booth. The High Voltage Power Supply must be electrically interlocked with the ventilators to prevent operation of the power supply unless the ventilation fans are operating. NEVER OPERATE THE SPRAY GUN UNLESS VENTILATION FANS ARE OPERATING.

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

Check and follow all local safety and fire codes and OSHA standard 1910-107(b)(5)(i).

NOTE: High velocity air exhaust will decrease the operating efficiency of the electrostatic system. Air exhaust velocity of 31-46 linear meters/minute (100-150 ft/min) should be sufficient.

Connect the High Voltage Power Supply

The electrical connections to the Power Supply (H) must be performed by a qualified electrician, in accordance with all applicable local, state and national codes.

Connect the High Voltage Cable

Grease the resistor tube as described in **Resistor Tube Regreasing** on page 13.

Route the High Voltage Cable (M) from the gun to the Power Supply. Lubricate o-rings with petroleum jelly.

Connect the High Voltage Cable to the Power Supply.

To avoid permanent indentations of the cable and cable failures due to unnecessary stress to the cable, follow these steps:

1. Support the cable overhead to keep people from walking on it and vehicles driving over it.
2. DO NOT clamp the cable too tightly at supports.
3. Avoid sharp kinks and bends in the cable.

Check the Electrical Grounding (See Fig 1)

WARNING

Proper electrical grounding of every part of your system is essential. For your safety, read the warning section, **FIRE OR EXPLOSION HAZARD**, on page 3. Ground the system as explained there. Then check your system as explained below.

1. Make sure the *High Voltage Power Supply* is properly grounded and located outside the spray area. The **Power Supply case and spray gun actuator can become charged if the case is not well grounded.** The **ground wire** is part of the high voltage circuit and **must, without fail, be connected to a true earth ground.** As an added precaution, attach a separate ground wire to the case of the High Voltage Power Supply.
2. Shut off the Power Supply and the air and fluid lines to the gun.
3. Have a qualified electrician check the electrical grounding continuity of the spray gun. Use an ohmmeter (X) to measure resistance between the actuator of the gun (Y) and a true earth ground (Z). The resistance should be less than 20 ohms.

WARNING

If the resistance is over 20 ohms, the gun is not properly grounded, and the *system may be hazardous.* Check again that you have properly grounded your system components; see **FIRE OR EXPLOSION HAZARD**, on page 3. Since the gun is grounded through connection to an undamaged, properly grounded, high voltage cable (which is grounded through connection to a properly grounded power supply), check for a grounding problem with the cable and power supply first. **BE SURE** you have corrected the problem before using the system.

Mount the Spray Gun

Mount the gun (Q) on a stationary support or on a reciprocating arm. The mounting rod must be *properly grounded.*

Mount the gun head 254 to 300 mm (10 to 12 in.) from the workpiece.

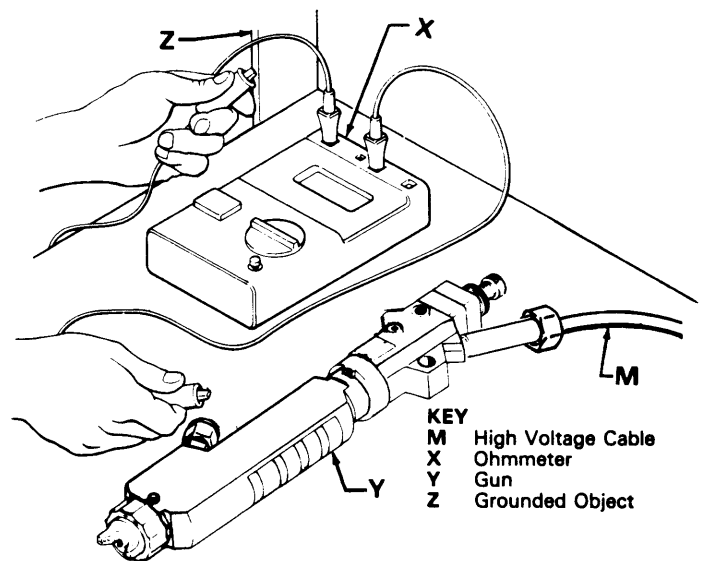


Fig 1

Connect the Air Lines (Refer to the Typical Installation Drawing)

1. Install an air line filter (B) to ensure a clean, dry air supply to the gun. Dirt and moisture in the line can ruin the appearance of your finished piece, and cause malfunction of the Power Supply.
2. Install an air line lubricator (C) as close to the pump (D) as possible.
3. Install a normally closed, 3-way air solenoid (P), or hand valve in the air supply line (A).
4. Install an air regulator (E) on the pump and gun air supply lines to control air pressure to pump and gun.
5. Install a bleed-type air shutoff valve (G) on the main air line and each gun air supply line to shut off air to the pump and/or gun(s). Install an additional bleed-type valve on each pump air supply line to relieve air trapped between this valve and the pump after the air regulator is shut off. See **Bleed-Type Air Shutoff Valve and Fluid Drain Valve Required**, warnings section, page 3.
6. Connect the atomizing air line (L) from the air line to the gun's 1/4 npt(f) atomizing air inlet. Refer to the Typical Installation drawing.
7. Connect the cylinder air line (V) from the solenoid valve to the gun's 1/4 npt(f) cylinder air inlet.

Adjust the Air Bleed Valve (See Fig 2)

If the gun is mounted **above** the workpiece, remove the plug (11), adjust the air bleed valve (43) to allow slightly more atomizing air through the front of the gun, then replace the plug (11). This helps prevent fluid from dripping from the front of the gun onto the workpiece.

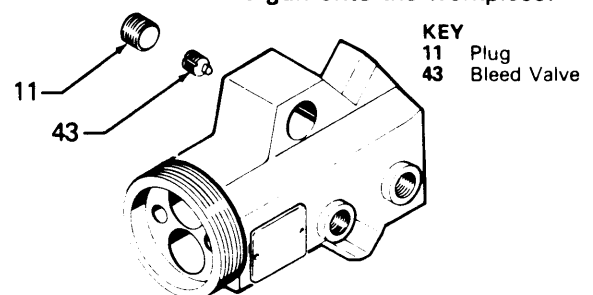


Fig 2

Connect the High Voltage Control

An electrical signal is required to actuate the normally closed, 3-way air solenoid valve (P). The air solenoid valve opens the cylinder air to the actuator, which opens the fluid needle, allowing the fluid to spray. The same signal (W) that actuates the air solenoid valve actuates a relay (T). A set of contacts from this relay is connected to the 120 KV Power Supply. This allows the High Voltage to be turned on and off automatically.

Connect the Fluid Line

Before connecting the fluid line (N), blow it out with air, and flush it with solvent. Be sure the solvent you use is compatible with the fluid to be sprayed.

Connect the fluid line (Teflon) from the outlet of the pump to the 1/8 Tube Fitting inlet of the gun. Install a fluid filter (EE) and drain valve (FF) at the pump outlet. The drain valve assists in relieving fluid pressure in the displacement pump, hose and gun. See **Bleed-Type Air Shutoff Valve and Fluid Drain Valve Required**, Warnings Section. Install a fluid regulator (R) between pump and gun to control fluid pressure to the gun.

Color Change/Circulating System Option

Remove the plug (13) and o-ring (66) from one side of the gun barrel, and install a 1/4 npt(f) elbow (see Accessories Section) in the gun barrel inlet.

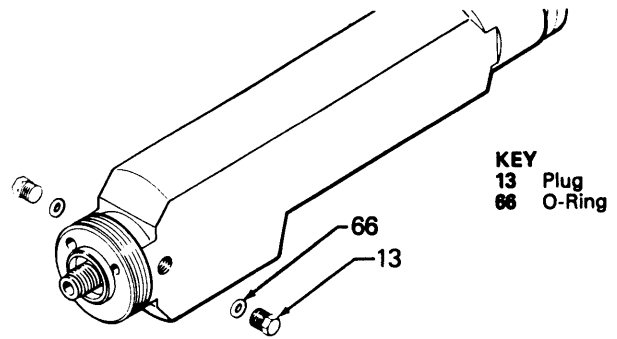


Fig 3

WARNING

Do not use metal fittings at the gun head. Metal fittings can cause sparking and result in fire or explosion and cause serious bodily injury.

For color change, connect a fluid line to the elbow. Remove the fluid tube assembly and install a flushing valve (see Accessories Section) in the gun barrel fluid inlet. Connect the fluid flushing line to the flushing valve. Connect an air line to actuate the flushing valve.

For a circulating system, connect the fluid return line to the elbow.

OPERATION

WARNING

For Your Safety, always follow the **Pressure Relief Procedure** on page 2 when shutting off the system, when you stop spraying, and before checking, servicing, installing, cleaning or changing any part in the system.

Operating Checklist

Check the following list daily, before starting to operate the system, to help assure you of safe, efficient operation.

1. Be sure all operators are properly trained to safely operate an electrostatic air spray system.
2. Be sure all operators are trained how to properly and completely relieve system pressure.
3. Be sure the system is thoroughly grounded. See **FIRE OR EXPLOSION HAZARD** on page 3, and **Check the Electrical Grounding** on page 5.
4. Be sure the operator and all persons entering the spray area are properly grounded.
5. Be sure ventilation fans are operating properly.
6. Be sure the workpiece hangers are clean and grounded. Contact points must be sharp points or knife edges.
7. Be sure all refuse is removed from spray booth.
8. Be sure all flammable liquids in the spray booth are in approved, grounded containers.
9. Be sure all conductive objects within 6 m (20 ft) of the gun are electrically grounded and the floor of the spray area is electrically conductive and grounded.

Filter the Fluid

Filter the fluid to remove coarse particles and sediment which could clog the spray tip.

Adjust the Spray Pattern

This gun can atomize many fluids with different viscosities and at various flow rates. Follow these steps to establish the correct fluid flow and air flow:

1. Set the atomizing air pressure at 2 bar (30 psi) and fluid pressure at 0.25 bar (3 to 4 psi).
2. Choose the correct fluid tip and air cap combination for your application. (See the Air Cap Consumption and Fluid Tip Flow Rate Chart), page 15. Both flow rate and viscosity must be considered. A 1.2 mm (0.047 in.) fluid tip is furnished with the gun.
3. Turn on the High Voltage Power Supply.
4. Adjust the fluid flow by using the fluid pressure regulator installed in the fluid line. (See Accessories Section).
5. For fine adjustment, use the fluid adjusting screw (39) located at the rear of the gun. See Fig 4. Turn the knob *clockwise* to reduce the amount of fluid being sprayed, and *counterclockwise* to increase the amount being sprayed.
6. Use an air pressure regulator to adjust the pressure for the desired degree of atomization. Always use the lowest air pressure possible for most efficiency.
7. Use the fan valve (57) to change the shape of the spray pattern. See Fig 4. Turn fan valve knob *counterclockwise* for a wide pattern and *clockwise* for a solid, round pattern.

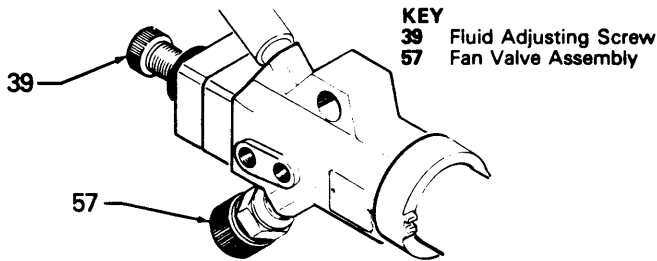


Fig 4

NOTE: When increasing to a wide, flat pattern, you may have to increase the supply of fluid to the gun to maintain the same amount of coverage over a large area.

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

See the **Spray Pattern Troubleshooting Chart** in the Service section for additional information.

When all adjustments of atomizing air, fluid pressure, and fan pattern are made, the high voltage can be turned on and operation can begin.

Cleaning

WARNING

For Your Safety, always follow the **Pressure Relief Procedure** on page 2 when shutting off the system, when you stop spraying and before checking, servicing, installing, cleaning or changing any part in the system.

1. Clean the fluid and air line filters daily.
2. Clean the outside of the gun daily with a soft cloth dampened in a compatible solvent.
3. Clean the air cap and fluid tip daily, minimum. Some applications require more frequent cleaning. Replace the fluid tip and air cap if they are damaged. See **Clean the Air Cap and Fluid Tip** below.
4. Check the electrode resistor (55). Straighten it if it is bent, and replace it if it is broken or damaged. See page 11 for replacing the electrode resistor.
5. Check all of the work hangers for build-up of material; clean them, if necessary.

CAUTION

Do not use metal tools to clean the air cap holes as this may scratch them, and make sure the electrode wire is not damaged. Scratches in the air cap holes or a damaged electrode wire can distort the spray pattern.

Do not use any cleaning method which may allow solvent into the gun air passages. Clogged air passages cause poor atomization and excessive current demands. Point the gun down while cleaning to prevent dirty solvent from running back into the air passages. **NEVER IMMERSER THE GUN IN SOLVENT.**

Clean all parts with a non-conductive solvent, compatible with the fluid being sprayed. Conductive solvents can cause the gun to malfunction.

Clean the Air Cap and Fluid Tip

Equipment needed:

- Soft bristle brush (supplied).
- Fluid tip wrench (supplied).
- Solvent compatible with fluid being sprayed.

Procedure:

1. Turn off the Power Supply.
2. Shut off the fluid and air supply lines to the gun.
3. Actuate the gun to release the air and fluid pressure trapped in the lines.
4. Note the position of the fluid adjusting screw (39). See Fig 4. Turn the fluid adjusting screw to relieve spring tension on needle assembly.
5. Remove the air cap retaining nut (27) and air cap (32). See Fig 5. With the wrench (83b) supplied, remove the fluid tip (30).
6. Use the soft bristle brush (83a) supplied and solvent to clean air cap, fluid tip, and front part of the gun.
7. Screw the fluid tip back into the gun. Tighten the tip securely with the wrench (83b). Torque the fluid tip to 1.1 to 1.4 N-m (10 to 12 in-lb). See Fig 5.

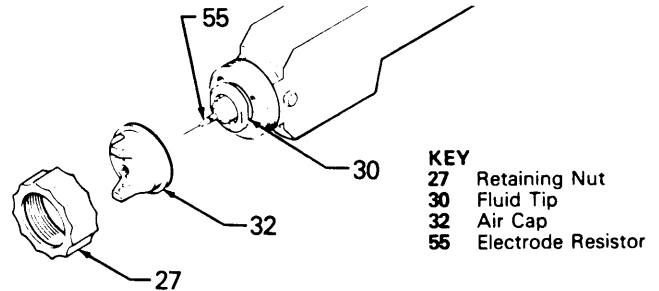


Fig 5

8. Replace the retaining nut and air cap carefully to avoid bending the electrode wire. Tighten the retaining nut so it is snug, allowing the air cap to turn with resistance. If it is too tight, the spray pattern will be distorted.
9. Reset the fluid adjusting screw (39) to its original position. Measure the travel of the resistor electrode. Full travel should be 2.5 mm (0.10 in.). The gun is now ready for spraying.

Flushing

WARNING

For Your Safety, always follow the **Pressure Relief Procedure** on page 2 when shutting off the system, when you stop spraying and before checking, servicing, installing, cleaning or changing any part in the system.

1. Turn off the high voltage power supply.
2. Disconnect and plug the fluid supply line.
3. Connect the solvent supply to the gun.
4. Run solvent through the gun.
5. Disconnect the solvent supply.
6. Reconnect the fluid supply line.
7. Trigger the gun until it is clean of solvent.

SERVICE

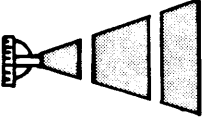


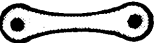



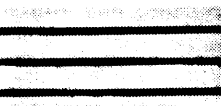
WARNING

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious bodily injury. Do not install or service this equipment unless you are qualified.

Before servicing the tip or gun, and before disassembling the gun, **ALWAYS** follow the **Pressure Relief Procedure** on page 2. Disconnect the fluid hose from the gun.

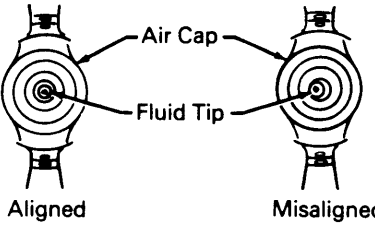
NOTE: Check all of the possible remedies in the Troubleshooting Charts before disassembling the gun.

SPRAY PATTERN TROUBLESHOOTING CHART

PROBLEM: IMPROPER SPRAY PATTERN	CAUSE	SOLUTION
<p>Fluttering or Spitting spray</p> 	<p>Insufficient fluid supply</p> <p>Leak in the fluid line</p> <p>Dry or worn fluid needle packing or loose packing nut permits air to get into fluid passage.</p> <p>Loose fluid tip or damage fluid tip taper seat.</p> <p>Dirt between fluid tip, taper seat and body.</p>	<p>Adjust fluid regulator or fill tank.</p> <p>Tighten or repair</p> <p>Lubricate or replace packing, tighten packing nut.</p> <p>Tighten or replace fluid tip.</p> <p>Clean.</p>
	<p>Fluid build up on air cap; partially clogged horn holes. Full air pressure from clean horn hole forces fan pattern toward clogged end</p> <p>Damaged fluid tip or air cap holes</p>	<p>Clean with soft brush or submerge in suitable solvent and wipe clean.</p> <p>Replace damaged part.</p>
	<p>Fluid build up on the perimeter of fluid tip orifice, or partially clogged fluid tip orifice</p>	<p>Remove obstruction. <i>Never</i> use a wire or hard instruments.</p>
	<p>Too high atomization air pressure</p>	<p>Reduce air pressure or adjust air adjusting valve.</p>
	<p>Fluid too thin</p> <p>Not enough fluid pressure</p>	<p>Regulate fluid viscosity.</p> <p>Increase fluid pressure.</p>
 	<p>Low atomization air pressure</p> <p>Fluid too thick</p> <p>Too much fluid</p>	<p>Raise air pressure.</p> <p>Regulate fluid viscosity.</p> <p>Reduce fluid flow, reduce fluid pressure on pressure feed guns and/or adjust fluid adjusting screw until proper pattern is obtained.</p>
<p>Streaks</p> 	<p>Last coat of fluid applied too wet</p> <p>Too much air pressure</p> <p>Insufficient air pressure</p> <p>Non-uniform spray pattern</p>	<p>Apply drier finish with multiple strokes.</p> <p>Use least air pressure necessary.</p> <p>Increase air pressure.</p> <p>Clean or replace air cap.</p>

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

GUN OPERATION TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
Leakage from fluid packing nut.	Loose packing nut (23). Worn needle packing (4).	Tighten. Replace.
Air leakage from front of gun.	Air valve not seating properly. Air bleed valve is open.	Clean, service. Check, adjust or close as required. See Fig 2.
Fluid leakage from front of gun.	Resistor electrode worn or damaged. Worn fluid seat. Fluid packing (4) too tight. Loose fluid tip (30). Adjusting screw (39) not set correctly. Cylinder air going into gun not completely shut off.	Replace. Replace fluid tip and/or resistor electrode. Lubricate and adjust. Tighten. Adjust. Turn off cylinder air.
Fluid leaks from rear needle packing nut or drain hole.	Worn needle packing (4). Worn needle shaft (61).	Replace packing. Replace worn needle shaft.
"Orange Peel" finish.	Insufficient air pressure. Paint viscosity too high. Fluid poorly mixed or filtered. Improper thinner being used.	Increase, use least air pressure needed for good results. Thin paint or use larger fluid nozzle. Remix or refilter fluid. Use proper thinner.
Excessive spray fog.	Too much air pressure. Fluid thinned too much.	Reduce, use least air pressure needed for good results. Properly thin fluid.
No fluid sprays from gun.	Fluid low. Damaged air cap. Dirty or clogged fluid tip. Damaged fluid tip. Air valve not actuating. Damaged fluid needle.	Check, add if necessary. Replace air cap. Clean fluid tip. Check, replace fluid tip. Check cylinder air, fluid needle packing (4), and needle. Replace parts as necessary. Replace.
Equipment covered with fluid.	Exhaust air flow insufficient or not directed properly. Equipment closer to ionizing tip than object being sprayed.	Check for proper CFM, check baffles and direction of air flow. Mount gun closer to target.
Dirty air cap.	Misalignment between air cap and fluid tip. 	Remove and clean air cap and fluid tip as described in the Operation Section under To Clean or Change the Air Cap and Fluid Tip (page 7). Reinstall fluid tip finger tight. Using the wrench supplied, tighten fluid tip 1/4 turn (torque to 1.1-1.4 N-m (10-12 in-lb)). Set locking pin to locked position. Reinstall air cap being sure to tighten retaining nut until snug only; allowing air cap to turn with resistance.

ELECTRICAL TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
Poor wrap-around.	<p>Parts poorly grounded.</p> <p>High exhaust velocity.</p> <p>High fluid pressure.</p> <p>Fluid viscosity.</p> <p>Low or no electrostatic voltage.</p> <p>Faulty gun resistance.</p> <p>Improper distance between gun and workpiece.</p> <p>Too high atomizing air pressure.</p> <p>Too low fluid resistivity.</p> <p>Faulty power supply resistance.</p> <p>Faulty needle electrode assembly.</p>	<p>Clean hangers, check for proper ground on conveyer or track.</p> <p>Reduce within code limits.</p> <p>Reduce pressure.</p> <p>Check supplier for proper fluid for electrostatic spray.</p> <p>See below.</p> <p>Check; resistance should be 450 megohms \pm 20 from the end of the resistor electrode of gun to the end of the High Voltage Cable, where it connects to the Power Supply. If resistance is lower check resistance of resistor (62).</p> <p>Adjust spraying distance to 203-305 mm (8-12 in.).</p> <p>Reduce air pressure.</p> <p>Check fluid resistivity with paint meter and probe (refer to instruction manual 307-263).</p> <p>Check power supply resistance. See page 12.</p> <p>Replace needle electrode assembly.</p>
Low or no electrostatic wrap.	<p>Power Supply is off.</p> <p>Fuse on inside of High Voltage Power Supply is blown.</p> <p>Power line voltage is incorrect.</p>	<p>Line Power Switch is OFF, should be turned ON.</p> <p>Replace fuse.</p> <p>Adjust for correct voltage.</p>
Low or no electrostatic wrap. (Spraying voltage light does not come on).	Faulty High Voltage Power Supply.	See instruction manual included with High Voltage Power Supply.
Low or no electrostatic wrap. (Spraying voltage light comes on then goes off).	<p>Gun held too close to part being painted.</p> <p>Fluid is too conductive.</p> <p>Electrical short in the High Voltage Cable.</p> <p>Electrical short in gun.</p> <p>Faulty High Voltage Power Supply.</p>	<p>Increase distance between part and gun.</p> <p>Lower conductivity of fluid.</p> <p>Replace the High Voltage Cable.</p> <p>Take gun apart and visually check the resistor holder, the resistor well and the needle well in the gun barrel for dirt and/or damage. Clean and replace parts as required.</p> <p>See instruction manual included with High Voltage Power Supply.</p>
Low or no electrostatic wrap. (Spraying voltage light is on all of the time). Continued on page 11.	<p>Faulty resistor in the resistor electrode assembly.</p> <p>Resistor of gun not making a good connection with contact inside of gun body.</p> <p>High Voltage Cable not making good contact with resistor of gun. Cable insulation punctured.</p>	<p>Replace the resistor electrode assembly.</p> <p>See Resistor Assembly Replacement in this manual.</p> <p>Replace conductive spring as required.</p> <p>Replace cable.</p>

ELECTRICAL TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
Low or no electrostatic wrap. (Spraying voltage light is on all of the time). Continued from page 10.	Spring at transformer end of cable not making good contact. Electrical short in gun. Faulty High Voltage Power Supply.	Stretch spring. Take gun apart and visually check the resistor holder, the resistor well and needle well for dirt and/or damage. Clean and replace parts required. See instruction manual included with High Voltage Power Supply.
Spraying voltage stays on when gun is not actuated.	Gun actuating device is faulty.	Check actuating device, replace if faulty.
Operator gets mild shock.	Operator not properly grounded or is in contact with ungrounded object. Gun not properly grounded.	Be sure floor is properly grounded. Wear shoes with non-insulating soles. Be sure operator is not in contact with or carrying (in clothing) any metallic items which could build-up electric charge. Be sure Graco air supply hose is being used and is properly grounded.
Operator gets mild shock when touching workpiece.	Workpiece not properly grounded.	Clean workpiece hangers. Check for proper ground on conveyor or track.

Gun Disassembly

WARNING

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious bodily injury. Do not install or service this equipment unless you are qualified.

Turn off the High Voltage Power Supply and relieve all of the pressures trapped in the gun and the lines before servicing any part of the system.

Follow the **Pressure Relief Procedure** on page 2.

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

CAUTION

If the plastic parts of the gun must be held securely, ALWAYS clamp them in padded vise jaws to prevent damage to the parts.

ALWAYS lubricate the o-rings and seals with petroleum jelly.

ALWAYS remove the gun from worksite for service or repair. Service or repair area must be clean.

To disconnect the gun from the High Voltage Power Supply and the fluid supply:

1. Turn off the high voltage at the Power Supply.
2. Turn off the line voltage input to the Power Supply.
3. Shut off the fluid pump and actuate the gun to relieve the pressure.
4. Disconnect the fluid hose and air lines from the gun.
5. Flush the gun with a compatible solvent.

6. Disconnect High Voltage Cable from Power Supply.
7. Take the gun and cable assembly to the workbench for repair.

NOTE: Because of the high operating voltage, the High Voltage Cable resistor tube is filled with dielectric grease. The High Voltage Cable should not be removed from the gun, unless replacement or regreasing is necessary.

Electrode Resistor Replacement (See Fig 6)

Remove the air cap and fluid tip as described in the Operation Section under **Clean the Air Cap and Fluid Tip**. Remove the electrode resistor (55) with the wrench (83d) supplied. Install new electrode resistor with the wrench. Do not overtighten.

CAUTION

To avoid damaging the plastic threads, be very careful when installing the electrode.

Install the air cap and fluid tip as described in the Operation Section under **Clean the Air Cap and Fluid Tip**.

KEY
83d Wrench

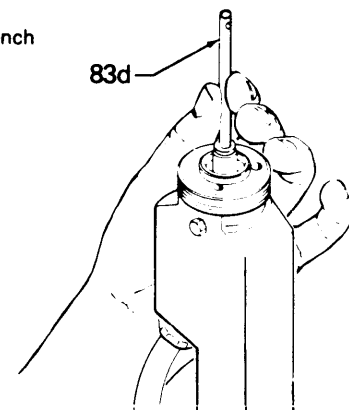


Fig 6

Fluid Needle Removal (See Figs 7 and 8)

Remove the air cap and fluid tip as described in the Operation Section under **Clean the Air Cap and Fluid Tip**. Turn the cylinder air off. Remove the electrode resistor (55). Note the position of the adjusting screw (39), and remove adjusting screw, retaining nut (35), spring (63) and washer (68). Remove plate (37), by removing the four screws (12). Loosen the needle packing nut (23) half a turn, using the wrench (83c) supplied. With a long nose pliers pull out the needle assembly (64) from the back of the actuator.

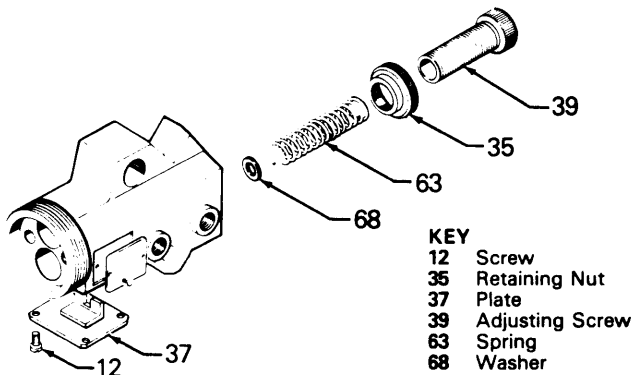


Fig 7

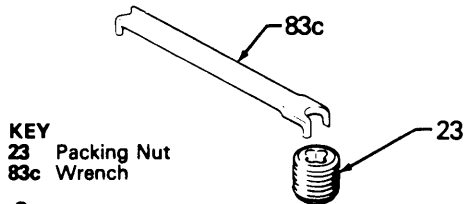


Fig 8

Fluid Needle Replacement

The fluid needle assembly (64) is sent from the factory with retaining nuts (34) set for the correct length. If these nuts are moved, reset them to the proper dimension shown in Fig 9.

Before replacing the needle assembly, thoroughly lubricate with petroleum jelly. Twist the needle when installing into gun.

KEY
34 Retaining Nuts
64 Fluid Needle Assy.

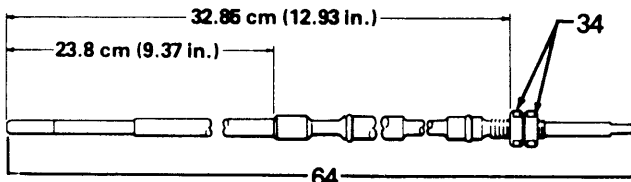


Fig 9

Install the plate (37) with the four screws (12). Install the adjusting screw (39), retaining nut (35), spring (63) and washer (68). Set adjusting screw (39) to its original position. See Fig 7.

Install the electrode resistor (55) with the wrench (83d) supplied. See Fig 6. Install the air cap and fluid tip as described in the Operation Section under **Clean the Air Cap and Fluid Tip**.

Apply air to cylinder air port of the gun. Adjust the packing nut (23) with the wrench (83c) supplied (See Fig 8) until there is light packing resistance on the needle.

If the fluid needle packing (4) or resistor tube (48) have to be replaced, the resistor tube must be refilled with dielectric grease as described in **Resistor Tube Regreasing, Regreasing with Barrel/Resistor Tube Disassembled**.

Barrel Removal

Remove the fluid needle as described in **Fluid Needle Removal**.

Loosen the barrel nut (28) using wrench (83b) supplied. Pull the gun barrel forward off resistor tube. Be careful not to lose the gasket (24). See Fig 12.

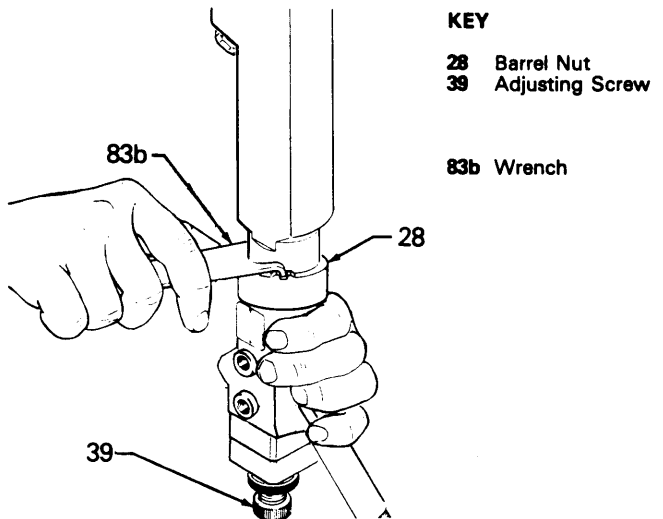


Fig 10

Fluid Packing Replacement

Remove the gun barrel (60) as described in **Barrel Removal**.

Remove the packing nut (23) from the rear of the barrel using the wrench (83c) supplied. See Figs 8 and 11. Remove the insulator (44) from the gun barrel.

Place the barrel on the bench in a vertical position with the back of the barrel touching the bench. Insert the rod (83e) supplied in the front of the barrel and gently tap out the needle packing (4) and supports (20, 29).

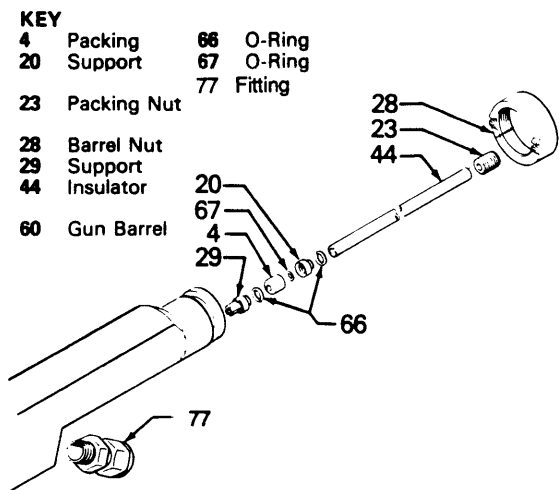


Fig 11

Check all of the parts for wear or damage and replace them if necessary.

CAUTION

Use extreme care when handling the packing (4) because it is very brittle. You may want to keep extra packings on hand.

Clean all parts in non-conductive solvent compatible to the fluid being used, such as Xylol or mineral spirits. Use of conductive solvents can cause the gun to malfunction.

Place packing nut (23), insulator tube (44), support (20), packing (4) and support (29) over needle shaft.

Barrel Reassembly

Make sure the three o-rings (66, 67) are in place in packing supports (20, 29). See Fig 11.

Insert the needle shaft assembly into the barrel and tighten packing nut (23) with wrench (83c) supplied. See Figs 8 and 11. Pull the needle back out of the barrel.

Assemble the barrel to the actuator, tightening the barrel nut (28) with the wrench (83b) supplied. See Fig 10.

Install the needle into the gun as described in **Fluid Needle Replacement**.

Resistor Tube/Resistor Replacement (See Fig 12)

Remove the barrel from the gun body as described in **Barrel Removal**. Place a wrench on the flats of retainer (52) and remove retainer from gun body. Remove retainer, packing (8), and insert (53). Inspect for damage, replace as necessary. If insert (53) has burn marks, replace it.

CAUTION

Clean all parts in non-conductive solvent compatible with the fluid being used, such as Xylol or mineral spirits. Use of conductive solvents can cause the gun to malfunction.

Remove spring (58) and o-rings (6). Inspect for damage and replace if necessary. Check resistance of resistor (62) using a megohmmeter. The resistor electrode (55) should have 25 ± 5 megohms resistance.

To remove the resistor tube (48), lift up on it with one hand, pushing it from the back of the gun body (56), while pulling it from the front of the gun body with your other hand.

Push the new resistor tube (48) back in from the front of the gun body. The resistor tube should protrude 190 mm (7.5 in.) from the front of the gun body (56).

Screw the retainer (52) back into the gun body. Torque the retainer to 20 to 27 N·m (15 to 20 ft·lb).

Place the o-ring (8) into insert (53). Install the larger bored end of the insert into the retainer (52) and over the resistor tube (48). Slide the o-rings (6) in place over the resistor tube.

Regrease the gun as described in **Resistor Tube Regreasing, Regreasing with Barrel/Resistor Tube Disassembled**.

KEY

- | | |
|----|----------------|
| 6 | O-Ring |
| 8 | O-Ring |
| 22 | Retaining Ring |
| 24 | Gasket |
| 28 | Barrel Nut |
| 48 | Resistor Tube |
| 52 | Retainer |
| 53 | Insert |
| 56 | Gun Body |
| 58 | Spring |
| 60 | Gun Barrel |
| 62 | Resistor |

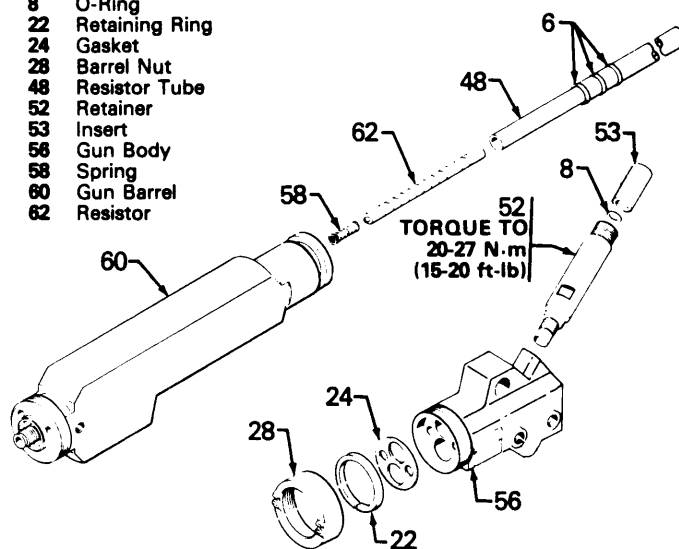


Fig 12

Resistor Tube Regreasing (See Fig 12)

NOTE: Service Kit 217-114 (supplied with the gun) contains all items needed to regrease the resistor tube.

Regreasing With Barrel/Resistor Tube Disassembled

Remove the resistor (62) from the resistor tube (48). Screw the grease fitting (82c) into the resistor end of the resistor tube (48). Using the grease gun (82a) and dielectric grease (82b), fill the resistor tube until the grease comes out of the end of the retainer (52). Remove the grease fitting.

To install the resistor, first, cover the open end of the retainer (52) with your thumb to prevent too much grease from being pushed out of the resistor tube (48) and retainer. The, face the plug end of the resistor toward the front of the gun barrel (60), and push the resistor into the resistor tube.

Thoroughly wipe off any excess grease. Grease may contaminate the fluid to be sprayed if allowed to seep into fluid passages of the gun. (Continued on page 14).

Replace the barrel as described in **Barrel Reassembly**. Reassemble the electrode resistor (55), fluid tip (30), and air cap (32) as described in **Clean the Air Cap and Fluid Tip** in the Operation Section.

NOTE: If the gun is to be stored, cover the retainer (52) opening to prevent contamination.

Reassemble the High Voltage Cable to the gun. Grease should come out from the threads and bleed hole in the cable swivel if the resistor tube is properly filled. Wipe off the excess grease.

When the cable is assembled with the gun, the total system resistance through the gun and cable should be 450 ± 25 megohms.

Regreasing With Only the High Voltage Cable Removed

If only the High Voltage Cable is removed from the gun, the gun can be greased by back filling through the retainer (52).

Attach the grease gun (82a) to the lubricant fitting of the grease tube (82e). Insert the grease tube into the open end of the insert (53) and retainer (52), through the resistor tube cavity, until contact is made with the back of the resistor (62).

Slowly fill the tube with dielectric grease (82b). As grease fills the cavity, the grease tube will back out of the insert (53). Continue filling until the grease tube comes all the way out and the entire cavity is full. Carefully wipe off any excess grease. Grease may contaminate the fluid to be sprayed if allowed to seep into the fluid passages of the gun.

NOTE: If the gun is to be stored, cover the retainer (52) opening to prevent contamination.

Reassemble the High Voltage Cable to the gun. Grease should come out from the threads and bleed hole in the cable swivel if the resistor tube is properly filled. Wipe off the excess grease.

When the cable is assembled with the gun, the total system resistance through the gun and cable should be 450 ± 25 megohms.

Servicing the Actuator (See Fig 13)

Remove the needle as described in **Fluid Needle Replacement**. Remove the four screws (9) and lockwashers (71).

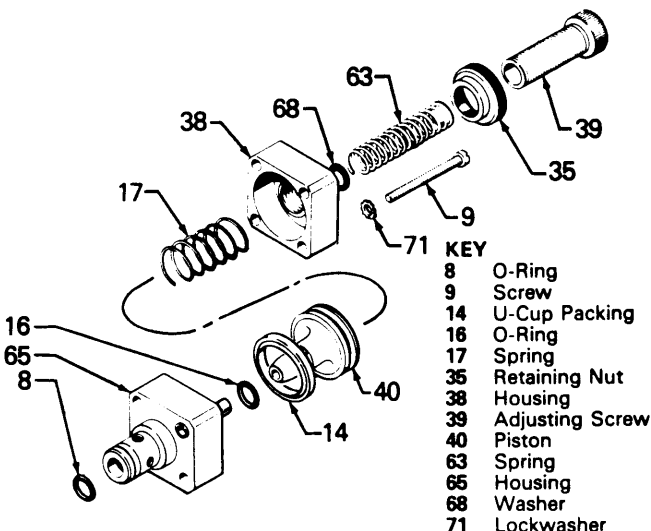


Fig 13
14 307-896

Remove the housing (38), and spring (17) from the housing (65). Remove housing (65). Piston parts from the gun body (56) will come out with the housing. Clean all parts with compatible solvent and replace if worn.

NOTE: To inspect the o-ring (16), the piston (40) must be tapped lightly through the center hole of the housing (65) with a small punch.

When reassembling the actuator, lightly coat all the parts with petroleum jelly. Slide the u-cup (14) onto the piston. Install the piston into the rear housing (38). Place the o-ring (16) onto the piston. Put the front and rear housing together, and push the piston into the front housing (65) using a dowel rod through the hole in the front housing. Remove the rear housing to install the spring (17). Then install the rear housing back onto the front housing. Reassemble the remaining parts as shown in Fig 13.

Assemble the remainder of the gun as described in **Fluid Needle Replacement**.

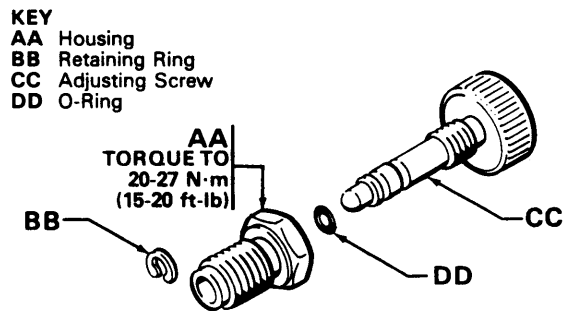


Fig 14

Fan Air Valve Replacement

Place a wrench on the flats of fan valve assembly (57) housing (AA) and remove it from the handle. Remove the retaining ring (BB). Rotate the adjusting screw (CC) *counterclockwise* removing it from valve housing (AA). Clean all parts, inspect for wear or damage, and replace if necessary. See Fig 14.

When reassembling the fan air valve assembly (57), use petroleum jelly to lubricate o-ring (DD) and the threads of the adjusting screw (CC).

After the retaining ring (BB) is reinstalled on the adjusting screw (CC), back the adjusting screw out of the housing (AA) until it bottoms out against the retaining ring (BB).

Apply Loctite® pipe sealant to the threads of the housing (AA). Torque the housing (AA) to 20 to 27 N·m (14 to 20 ft·lb) when replacing into the gun body (56).

AIR CAP CONSUMPTION AND FLUID TIP FLOW RATE CHART

NOTE: This is only a guide for selecting an air cap and fluid tip combination for your application. ALL TIPS AND CAPS ARE INTERCHANGEABLE. Contact your Graco representative for further information.

TYPE OF FLUID AND VISCOSITY	RECOMMENDED AIR CAP AND FLUID TIP COMBINATIONS					
	Air Cap Part Number	Air Consumption m ³ /min at 2.1 bar (CFM at 30 psi)	Pattern Shape and Length at 254 mm (10 in.)	Fluid Tip Part Number	ID mm (in.)	Flow Rate ml/min (oz/min)
<i>Low Production</i> Stains Primers Sealers Lacquers 15 to 22 seconds (No. 2 Zahn cup)	177-037	0.20 (7.0)	Round end 279 to 330 mm (11 to 13 in.)	181-298	1.0 (0.040)	177 to 532 (6 to 18)
				181-299	1.2 (0.047)	355 to 710 (12 to 24)
	177-846	0.34 (12.1)	Round end 356 to 406 mm (14 to 16 in.)	181-298	1.0 (0.040)	177 to 532 (6 to 18)
<i>Medium Production</i> Primers Lacquers Enamels Sealers 19 to 30 seconds (No. 2 Zahn cup)	177-034	0.24 (8.5)	Round end 330 to 381 mm (13 to 15 in.)	181-298	1.0 (0.040)	177 to 532 (6 to 18)
				181-299	1.2 (0.047)	355 to 710 (12 to 24)
	177-846	0.34 (12.1)	Round end 356 to 406 mm (14 to 16 in.)	181-300	1.5 (0.060)	591 to 1182 (20 to 40)
				181-298	1.0 (0.040)	177 to 532 (6 to 18)
<i>High Production</i> Metallics Lacquers Enamels 19 to 30 seconds (No. 2 Zahn cup)	180-739*	0.27 (9.2)	Round end 381 to 432 mm (15 to 17 in.)	181-298	1.0 (0.040)	177 to 532 (6 to 18)
				181-299*	1.2 (0.047)	355 to 710 (12 to 24)
	180-740	0.27 (9.2)	Round end 457 to 508 mm (18 to 20 in.)	181-300	1.5 (0.060)	591 to 1182 (20 to 40)
				181-298	1.0 (0.040)	177 to 532 (6 to 18)
<i>Low Volume-High Solid</i> Lacquers Enamels Epoxies Urethanes Over 28 seconds (No. 2 Zahn cup)	177-846	0.34 (12.1)	Round end 356 to 406 mm (14 to 16 in.)	181-299	1.2 (0.047)	89 to 207 (3 to 7)
				181-300	1.5 (0.060)	177 to 355 (6 to 12)
<i>Heavy and High Solid</i> Lacquers Enamels Epoxies Urethanes Over 28 seconds (No. 4 Zahn cup)	177-036	0.28 (10.0)	Tapered end 381 to 432 mm (15 to 17 in.)	181-299	1.2 (0.047)	355 to 710 (12 to 24)
				181-300	1.5 (0.060)	591 to 1182 (20 to 40)
	177-039	0.29 (10.2)	Tapered end 356 to 406 mm (14 to 16 in.)	181-301	1.8 (0.070)	1035 to 1479 (35 to 50)
				181-300	1.5 (0.060)	591 to 1182 (20 to 40)
				181-301	1.8 (0.070)	1035 to 1479 (35 to 50)

*Air cap and fluid tip combination supplied with gun.

Air Caps

The following air caps can be ordered as accessories:

Part No.
177-034
177-036
177-037
177-039
180-739
180-740

Air Cap Assemblies

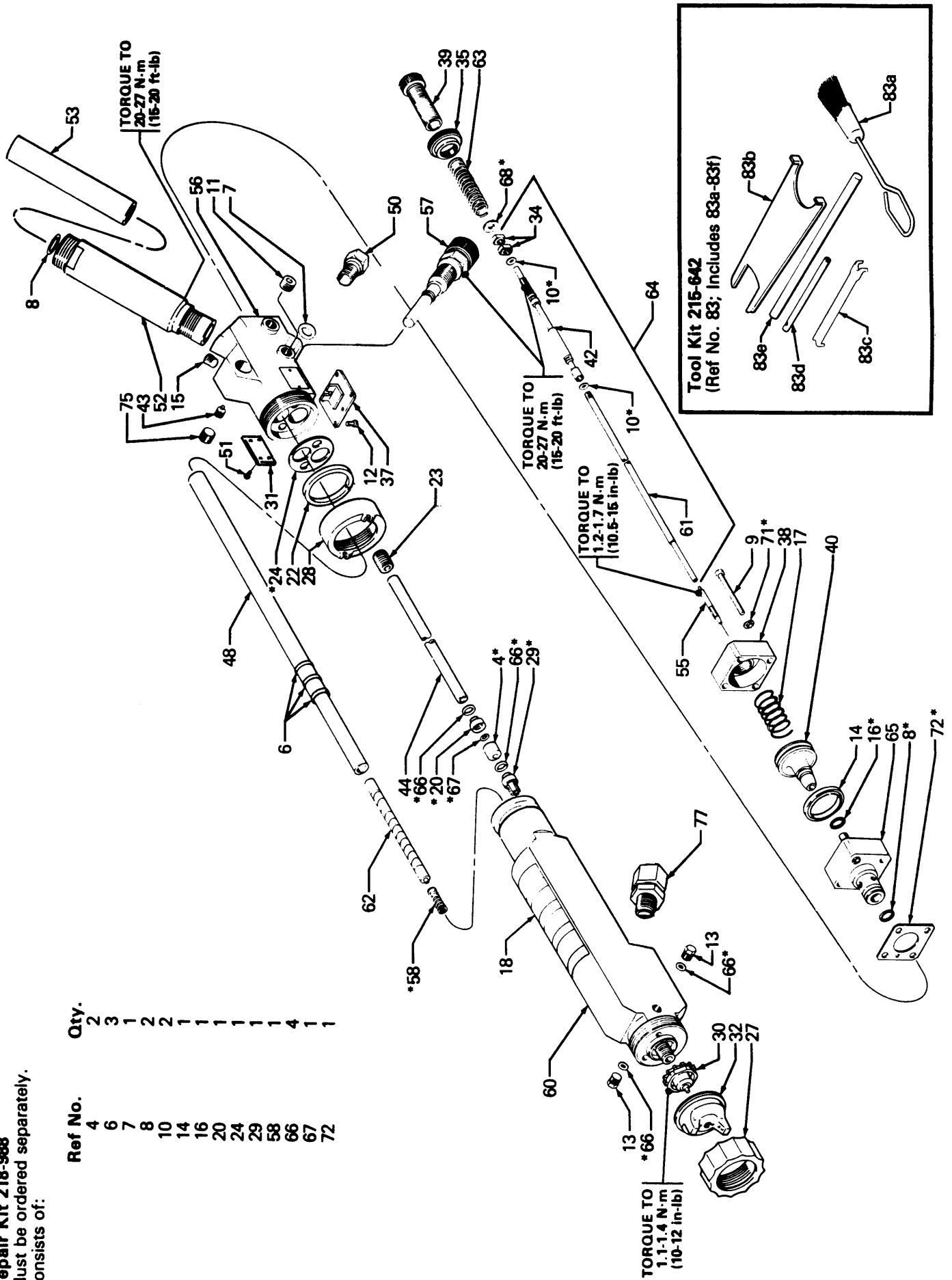
Air cap assemblies include a pre-assembled retaining ring (part no. 176-930), retaining nut (part no. 176-968), and air cap.

Part No.	Includes Air Cap:
217-454	177-034
217-455	177-036
217-456	177-037
217-457	177-039
218-996	180-739
220-386	180-740

PARTS DRAWING

Repair Kit 218-988
 Must be ordered separately.
 Consists of:

Ref No.	Qty.
4	2
6	3
7	1
8	2
10	2
14	1
16	1
20	1
24	1
29	1
58	1
66	4
67	1
72	1



PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
4	*105-662	PACKING, needle; Teflon	1	55	215-864	RESISTOR, electrode	1
6	*103-338	O-RING; Viton	3	56	215-951	BODY, gun	1
7	*105-668	O-RING; Viton	1	57	215-952	FAN VALVE ASSY.	1
8	*105-796	O-RING; Viton	2	58	*727-566	SPRING, compression	1
9	105-797	SCREW, pnh; M4 x 0.7 x 45	4	60	216-068	BARREL, gun; Includes items 13 & 66	1
10	*105-798	O-RING; Viton (Part of Ref No. 64)	2	61	220-214	NEEDLE ASSY (Part of Ref No. 64)	1
11	104-765	PLUG, pipe	1	62	216-112	RESISTOR, primary	1
12	105-800	SCREW, filh; M3 x 0.5 x 6	4	63	724-391	SPRING	1
13	105-801	PLUG, pipe (Part of Ref No. 60)	2	64	220-215	NEEDLE ASSEMBLY	1
14	*598-706	PACKING, u-cup; UHMWPE	1			Includes items 10, 34, 42 & 61	1
15	106-144	SETSCREW; M10 x 1.5 x 16	1	65	217-066	HOUSING, valve	1
16	*155-685	O-RING	1	66	*106-167	O-RING; Kalrez (Qty 2, part of Ref No. 60)	4
17	170-253	SPRING, compression	1	67	*106-174	O-RING; Kalrez	1
18	**172-045	LABEL, warning	1	68	102-360	WASHER, flat; 3/16	1
20	*177-918	SUPPORT, packing	1	70	177-839	SPACER	1
22	176-930	RING, retaining	1	71	157-021	LOCKWASHER; int. tooth 3/16	4
23	176-936	NUT, packing	1	72	*177-200	GASKET	1
24	*178-271	GASKET, housing	1	75	103-147	PLUG, pipe	1
27	176-968	NUT, retaining, air cap	1	77	597-427	FITTING	1
28	176-969	NUT, barrel	1	79	**176-898	TAG, warning (not shown)	1
29	*177-919	SUPPORT, packing	1	80	162-453	NIPPLE; 1/4 npsm(f) x 1/4 npt(m) (not shown)	2
30	181-299	FLUID TIP; 1.2 mm (0.47"); other fluid tips available, see page 15	1	81	722-615	FITTING, hose; 1/4 npsm(f) x 1/4 npt(m) (not shown)	2
31	177-785	PLATE, designation, MAX WPR	1				
32	180-739	AIR CAP, Other Air Caps Available See Page 15	1	82	217-114	KIT, service (not shown) Includes items 82a and 82e	1
34	177-197	NUT, retaining (Part of Ref No. 64)	2	82a	728-224	.GREASE GUN	1
35	177-198	NUT, retaining	1	82b	217-115	.LUBRICANT, can, 3.5 oz.	2
37	177-203	PLATE	1	82c	100-054	.FITTING, lubricant	1
38	177-204	HOUSING, retaining	1	82d	177-927	.TOOL, packing removal	1
39	177-205	ADJUSTING SCREW	1	82e	217-505	.GREASE TUBE	1
40	681-332	PISTON, valve	1	83	215-642	KIT, tool Includes items 83a to 83f	1
42	181-541	SHAFT, actuator (Part of Ref No. 64)	1	83a	105-749	.BRUSH, cleaning	1
43	177-209	VALVE, bleed	1	83b	177-004	.WRENCH, fluid tip	1
44	177-212	INSULATOR	1	83c	177-732	.WRENCH, packing nut	1
48	177-436	TUBE, resistor	1	83d	177-007	.WRENCH, needle	1
50	176-939	PLUG; M12 x 1.25	1	83e	179-803	.ROD, packing removal	1
51	101-343	SCREW, drive; 3/16" long	4	83f	107-158	.WRENCH, resistor stud	1
52	177-529	RETAINER, sleeve	1				
53	177-530	INSERT	1				

*Supplied in Repair Kit 218988

**Extra warning labels and tags are supplied at no charge.

WARNING

When servicing, use only original Graco replacement parts. Use of other parts could alter the grounding continuity of the gun.

HOW TO ORDER REPLACEMENT PARTS

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

6 digit PART NUMBER	QTY	PART DESCRIPTION

ACCESSORIES (Must be purchased separately)

WARNING

Never operate your equipment at a working pressure rating that is higher than the lowest rated component in your system. Lower rated components may not be able to withstand the pressure developed by the pump and may rupture, causing serious bodily injury or property damage.

HIGH VOLTAGE POWER SUPPLY 956-155

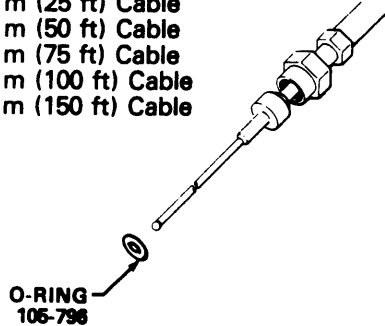
115 VAC, 50/60 Hz.

Contact your Graco distributor for information.

HIGH VOLTAGE CABLES

FOR POWER SUPPLY 956-155

- 217-413 8 m (25 ft) Cable
- 217-414 15 m (50 ft) Cable
- 217-415 23 m (75 ft) Cable
- 217-416 30 m (100 ft) Cable
- 217-417 46 m (150 ft) Cable



SAFETY WARNING SIGN

- 172-049—English
- 172-771—Spanish
- 172-149—French
- 172-150—German

GROUNDED AIR HOSE ASSEMBLY, Buna-N

217-069

12 bar (175 psi) *MAXIMUM WORKING PRESSURE*
0.31 ID, with 1/4 npsm(fbe) 15 m (50 ft)

AIR HOSE ASSEMBLIES, Nylon

14 bar (225 psi) *MAXIMUM WORKING PRESSURE*

6.35 mm (0.25 in.) ID, 1/4 npsm(fbe)

215-630 8 m (25 ft) Air Hose Assembly

215-631 15 m (50 ft) Air Hose Assembly

FLUID HOSE ASSEMBLIES, Nylon

14 bar (225 psi) *MAXIMUM WORKING PRESSURE*

6.35 mm (0.25 in.) ID, 1/4 npsm(fbe)

215-637 8 m (25 ft) Fluid Hose Assembly

215-638 15 m (50 ft) Fluid Hose Assembly

The accessories on this section of the page have not been tested by Factory Mutual.

FLUSHING DUMP VALVE 907-517

HIGH VOLTAGE POWER SUPPLY

ANALOG CONTROL - 956111

110 VAC 50/60 Hz.

Contact your Graco distributor for information.

STATIONARY GUN MOUNTING STAND 722-562

STATIONARY GUN BRACKET 724-344

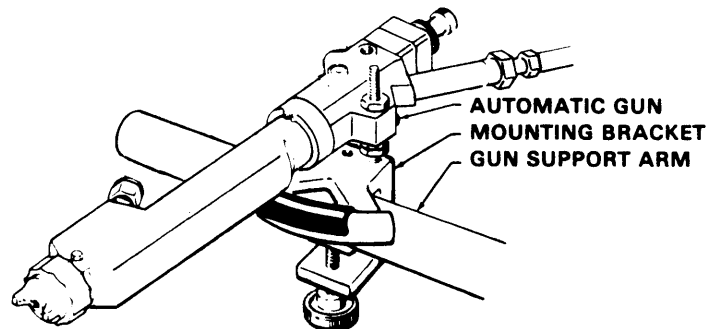
3-WAY AIR VALVE 722-502

ELBOW, Nylon 108-173

Male, 1/4-18 nptf, 5/8-20

UNIVERSAL GUN BRACKET 590-236

RECIPROCAL GUN BRACKET 725-973

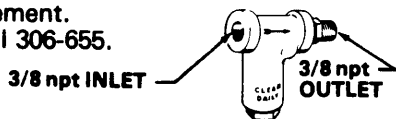


NOTE: All safety barriers and interlocks are to be supplied by the customer.

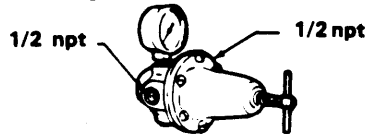
ACCESSORIES (Must be purchased separately)

The accessories on this page have not been tested by Factory Mutual.

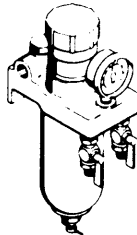
STRAINER (AIR or PAINT) 202-271
52 bar (750 psi) MAXIMUM WORKING PRESSURE
With 60 mesh filter element.
See instruction manual 306-655.



HIGH VOLUME AIR REGULATOR 206-199
0-9 bar (0-125 psi) Regulated Pressure
14 bar (200 psi) Steel Pressure Gauge



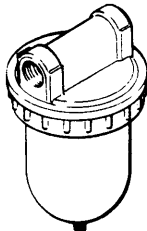
FILTER and MOISTURE SEPARATOR 202-660
12.6 bar (180 psi) MAXIMUM WORKING PRESSURE
With 1/2 npt(f) inlet, (2) 1/4 npt(m) outlets, and (2) 1/4 npt regulated outlets. With a porous bronze 50 micron filter and a 100 micron mesh inlet strainer. See instruction manual 306-273.



AIR LINE FILTERS

17.5 bar (250 psi) MAXIMUM WORKING PRESSURE
Reusable 40 micron filter with drain cock for cleaning and drying air in spray systems.

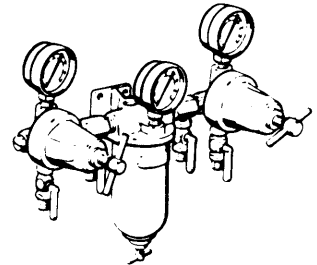
- 106-148 3/8 npt(f) inlet and outlet.
- 106-149 1/2 npt(f) inlet and outlet.



REMOTE SWITCH & SIGNAL LIGHT 728-386



FILTER-REGULATOR ASSEMBLY 217-076
14 bar (200 psi) MAXIMUM WORKING PRESSURE
With 1/2 npt(f) inlet, 1/4 npt(m) regulated outlets. With a porous bronze 40 micron filter and a 100 micron mesh inlet strainer. See instruction manual 307-476.



STAINLESS STEEL FLUID PRESSURE REGULATORS
17 bar (250 psi) MAXIMUM WORKING PRESSURE
0.3-6.8 bar (5-100 psi) REGULATED PRESSURE
1/4 npt air inlet (Model 214-980 only), 3/8 npsm fluid inlet, 3/8 npt fluid outlet and 1/4 npt gauge port.

SPRING OPERATED FLUID REGULATORS

- 214-896 Without pressure gauge and mounting tube.
- 214-706 With 6.8 bar (100 psi) pressure gauge and gauge mounting tube.
- 214-971 With 6.8 bar (100 psi) chrome plated gauge and stainless steel gauge mounting tube.

AIR OPERATED FLUID REGULATOR

- 214-980 1 bar (15 psi) MAXIMUM INBOUND AIR PRESSURE
- 906-800 0-60 psi FLUID REGULATOR
- 906-800 EXTENDED LIFE REGULATOR

AIR LINE LUBRICATORS

17.5 bar (250 psi) MAXIMUM WORKING PRESSURE
See instruction manual 307-316.

- 214-847 3/8 npt inlet and outlet.
- 214-848 1/2 npt inlet and outlet.
- 214-849 3/4 npt inlet and outlet.

PAINT RESISTANCE METER 722-886

Used with 722-860 to measure resistivity. See instruction manual 307-263.

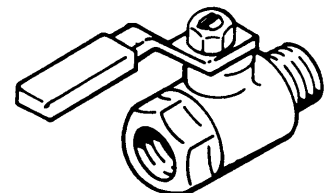
PAINT PROBE 722-860

Used with 722-886 resistivity meter. See instruction manual 307-263.

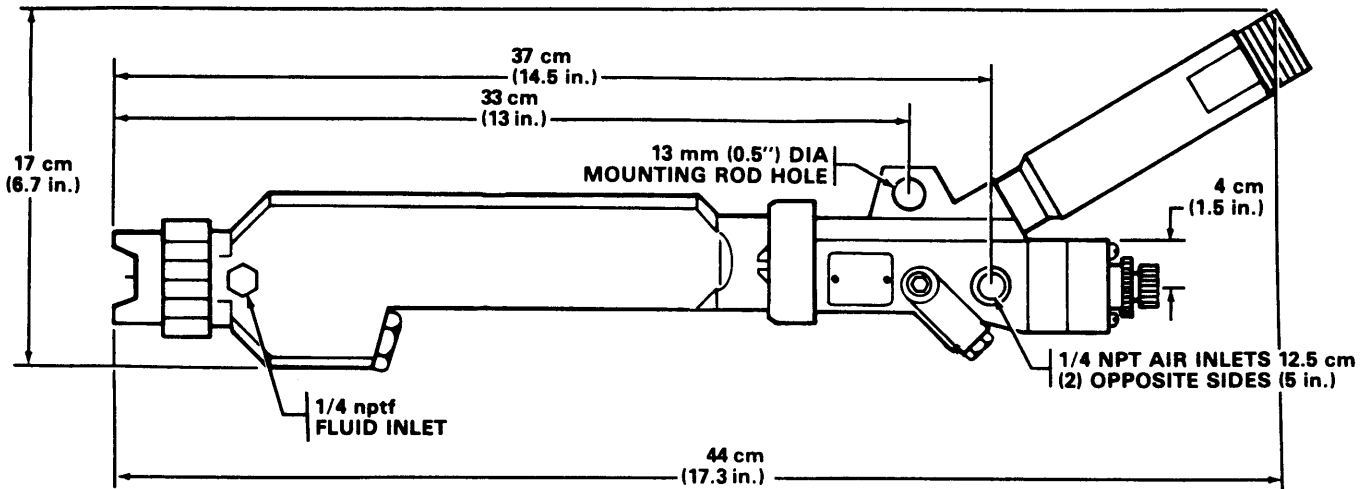
BLEED-TYPE MASTER AIR VALVE (REQUIRED)

21 bar (300 psi) MAXIMUM WORKING PRESSURE
Relieves air trapped in the air line between the pump air inlet and this valve when closed.

- 107-141 3/4 npt(m x f) inlet and outlet
- 107-142 1/2 npt(m x f) inlet and outlet



DIMENSIONAL DRAWING



TECHNICAL DATA

Operating voltage range :	0-120 KV
Maximum air working pressure :	10.4 bar (150 psi)
Maximum fluid working pressure :	7 bar (100 psi)
Minimum air cylinder operating pressure :	3.5 bar (50 psi)
Fluid inlet :	3/8 npsm(m)
Atomizing air inlet :	1/4 npt(f)
Cylinder air inlet :	1/4 npt(f)
Weight (with 50-foot cable) :	8 kg (17 lb 9 oz)
(gun only) :	1.3 kg (2.85 lb)
Paint resistivity range :	7 Megohm CM to infinity

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 for examination by Graco to verify the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the the costs of parts, labor and transportation.

DISCLAIMERS AND LIMITATIONS

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

EQUIPMENT NOT COVERED BY GRACO WARRANTY

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

Factory Branches: Atlanta, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)
Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan

GRACO INC. P. O. Box 1441 MINNEAPOLIS, MN 55440-1444

PRINTED IN U.S.A. 307-896 3/88