

INSTRUCTIONS—PARTS LIST



307-638

Rev. AE
Supersedes AD

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

Model PRO4000®

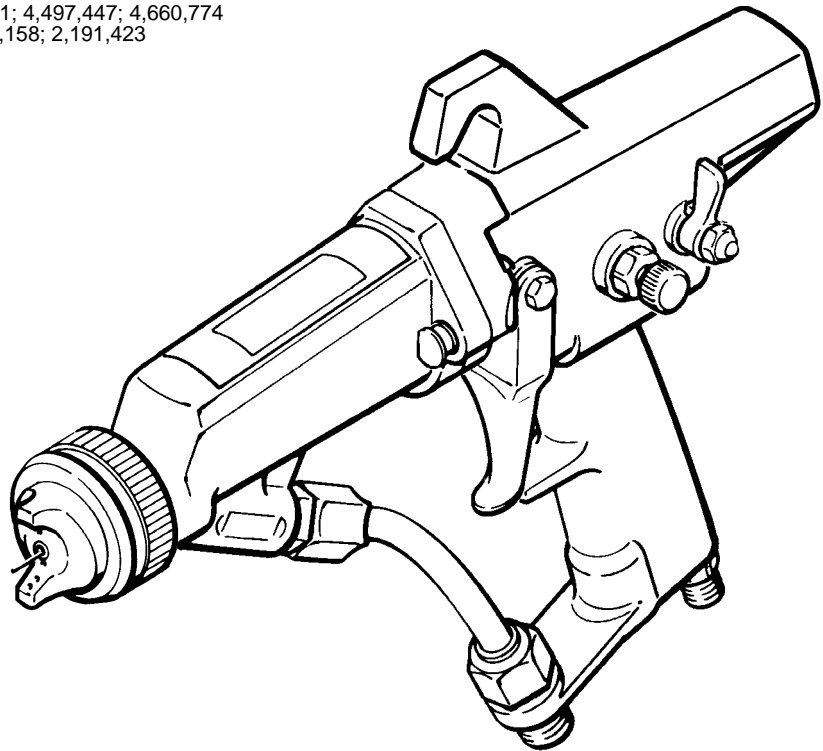
MANUAL MID-RANGE ELECTROSTATIC AIR SPRAY GUN

7 bar (100 psi) MAXIMUM WORKING AIR and FLUID PRESSURE

Part Number 218-026, Series E

With 1.2 mm (0.047 in.) fluid nozzle, part no. 218-996

U.S. Patent No. 4,290,091; 4,219,865; 4,462,061; 4,497,447; 4,660,774
U.K. Patent No. 2,140,327B; 2,142,559B; 2,147,158; 2,191,423
Patented 1986, 1987 Canada
Brevete 1986, 1987
French Patent No. 84 07942; 84 10234
Japanese Patent No. 86 07416



Approved



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

© COPYRIGHT 1984, GRACO INC.

TABLE OF CONTENTS

Terms	3	Electrical Tests	
Safety Warnings	4, 5	Test Gun Resistance	16
How The Electrostatic Air Spray Gun Works	5	Test Power Supply Resistance	16
		Test Resistor Stud Resistance	17
Installation		Service	
Typical Installation	6	Gun Disassembly	18
Warning Signs	6	Electrode Replacement	18
Ventilate the Spray Booth	7	Resistor Stud Replacement	19
Connect the Air Line	7	Barrel Removal	20
Connect the Fluid Line	7	Fluid Needle Packing Replacement	20
Check the Electrical Grounding	8	Power Cartridge Replacement	22
Operation		Turbine Alternator Removal	23
Filter the Fluid	9	Fan Air Valve Replacement	24
Operating Checklist	9	Air Valve Replacement	24
Spraying Operation	9	ES On–Off Valve Removal and Repair	25
Install the Fluid Nozzle and Air Cap	10	Fluid Adjusting Screw Replacement	25
Adjust the Spray Pattern	10	Muffler and Check Valve Replacement	25
Maintenance		Parts Drawing	26
Daily Care and Cleaning	11	Parts List	27
Clean the Air Cap and Fluid Nozzle	11	Repair Kits	28
Flush the Spray Gun	12	Technical Data	29
Spray Pattern Troubleshooting Chart	13	How To Order Replacement Parts	29
Gun Operation Troubleshooting Chart	14	Accessories	30, 31
Electrical Troubleshooting Chart	15	Warranty	Back Cover

TERMS

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

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

NOTE: Identifies essential procedures or helpful information.

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

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

ES ON-OFF VALVE: An on/off switch located near the rear of the gun, above the gun handle, that turns the electrostatic power on or off.

SAFETY WARNINGS

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, QUALIFIED 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 fluid nozzle.

ALWAYS follow the **Pressure Relief Procedure**, at right, before cleaning or removing the fluid nozzle 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.

System Pressure

This gun has a maximum working air and fluid 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.

Fluid Compatibility

BE SURE all fluids and solvents used are chemically compatible with the "Wetted Parts" shown in the **TECHNICAL DATA**. Always read the fluid and solvent manufacturer's literature before using the fluid or solvent in this gun.

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin, 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 nozzles, and whenever you stop spraying.

1. Turn the **ES On–Off valve lever to OFF**.
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 waste container ready to catch the drainage.
5. Leave the pump drain valve open until you are ready to spray again.

HAZARDOUS FLUID HAZARD

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

Be sure you know what fluid you are pumping and its specific hazards. Observe all precautions when handling known or potentially hazardous fluids, including, but not limited to, the following.

1. Store hazardous fluids in approved containers.
2. Dispose of any waste fluid according to all Local, State and Federal regulations pertaining to the disposal of hazardous wastes.

3. Read and follow the fluid and solvent manufacturer's literature regarding the use of protective clothing and equipment such as eye protection, respiratory protection, and gloves.
4. Provide for the safe piping and disposal of all exhaust air.
5. Provide proper ventilation in accordance with accepted industry standards and governmental regulations. Refer to **Ventilate the Spray Booth**, on page 7.

HOSE SAFETY

TIGHTEN all fluid connections securely before each use.

NEVER use a damaged hose. Before each use, check the entire hose for cuts, leaks, abrasion, bulging cover, or damage or movement of the hose couplings. If any of these conditions exist, replace the hose immediately.

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

FIRE OR EXPLOSION HAZARD

To reduce the risk of fire, explosion, or electric shock, which may result from electrical discharge, it is essential that:

- All parts of the electrostatic system are properly grounded.
- All personnel in or close to the spray area are properly grounded.
- All electrically conductive objects or devices in the spray area, including paint containers, wash cans and tools, are properly grounded.

When operating the electrostatic device, any ungrounded objects in the spray area (such as people, containers, tools, etc.) can become electrically charged. Arcing may occur if these objects then come in contact or close to ground. Arcing of sufficient energy levels can ignite the fluid being sprayed, fumes from solvents, dust particles, and other flammable substances. This can cause a fire or explosion and result in serious bodily injury and property damage.

Static electricity can also be generated by the flow of fluid through the pump, hose, gun, and nozzle, but it is dissipated through proper grounding as described in **Grounding** below.

If you experience any arcing 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.

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 and hydraulic power supplies*: ground according to the manufacturer's recommendations.
3. *Electrostatic Spray Gun*: obtain grounding through connection to a properly grounded air supply hose. Use only the Graco Electrically Conductive Air Supply Hose; see **ACCESSORIES** section to order. Connect the air hose ground wire to a true earth ground.
4. *Object being sprayed*: keep the work piece hangers clean and grounded at all times. Contact points must be sharp points or knife edges.
5. *All electrically conductive objects or devices* in the spray area, including paint containers and wash cans, must be properly grounded.

6. *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. The operator must not wear gloves which insulate the hand from spray gun. The gloves must be conductive or modified as shown on page 9.
7. *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.
8. *Flammable liquids* in the spray area must be kept in approved, grounded containers. Do not store more than the quantity needed for one shift.
9. *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.
10. *All air and fluid lines and electric cables* must be properly grounded.

Flushing and Cleaning Safety

To reduce the risk of static sparking or splashing, always follow the **Pressure Relief Procedure** on page 4.

Be sure the ES valve lever is OFF before flushing or cleaning any part of the spray system.

Use the lowest possible pressure to flush. Trigger the gun into a grounded metal waste container.

To flush or purge equipment, ALWAYS use solvents with a flash point equal to or greater than that of the fluid being sprayed.

To clean the exterior of the equipment, ALWAYS use solvents with a flash point of higher than 38° C (100° F).

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.

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

Check and follow all 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).

IMPORTANT

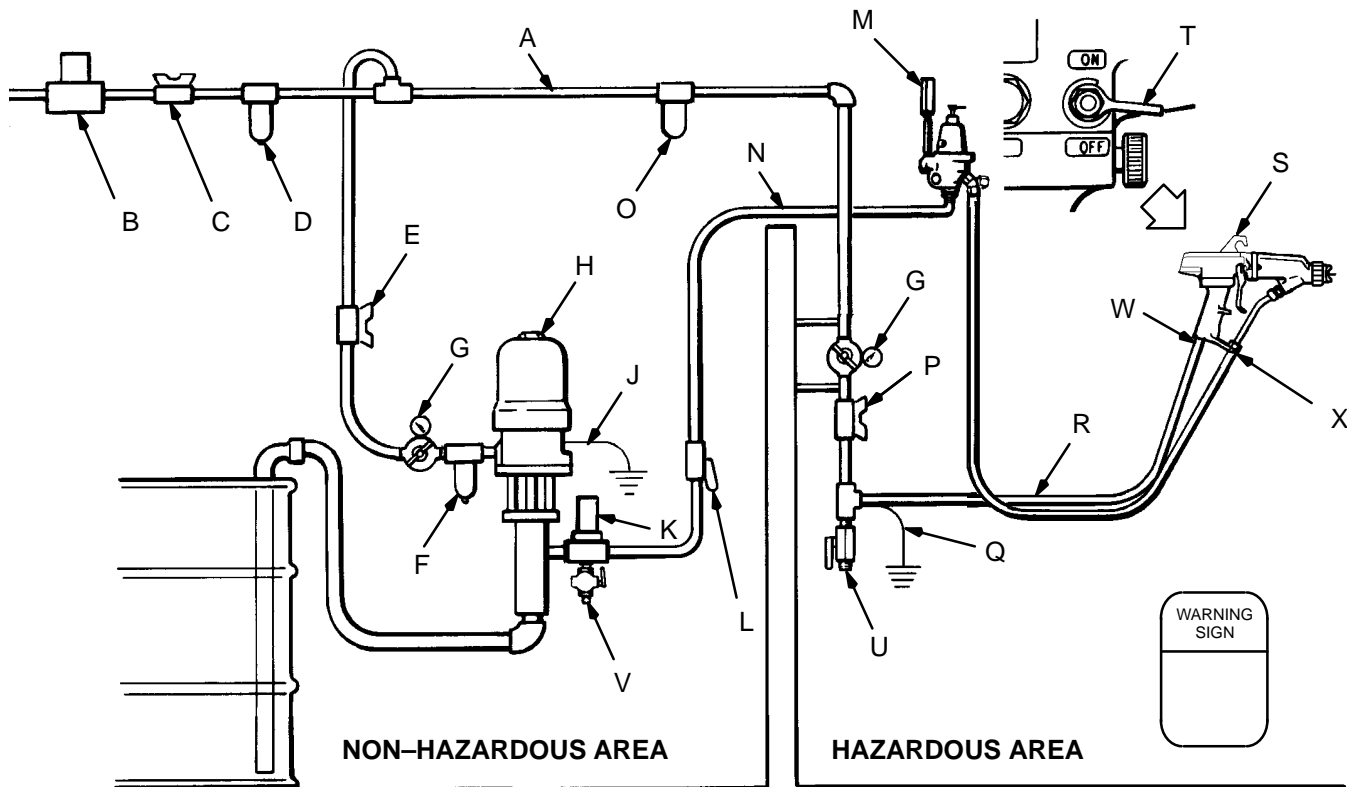
United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards—particularly the General Standards, Part 1910.107 and any other appropriate regulations—should be consulted in connection with the installation, operation, and maintenance of electrostatic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

HOW THE ELECTROSTATIC AIR SPRAY GUN WORKS

The air hose supplies air to the spray gun. Part of the air operates the turbine and the rest of the air atomizes the fluid being sprayed. The turbine generates power, which is converted by the power cartridge, to supply high voltage current to the gun's ionizing electrode.

The pump supplies fluid to the hose and gun, where the fluid is electrostatically charged as it passes the electrode. The charged fluid is attracted to the grounded workpiece, wrapping around and evenly coating all surfaces.

TYPICAL INSTALLATION



**Power Supply Must Be Interlocked
With Spray Booth Exhaust Fan.**

KEY

A Main Air Supply Line	J Pump Ground Wire	Q Spray Gun Ground Wire
B Ventilation Fan Interlock Solenoid Valve	K Fluid Filter	R Grounded Air Supply Hose
C Main Air Supply Shutoff Valve (bleed-type)	L Fluid Supply Line Shutoff Valve	S Electrostatic Spray Gun
D Air & Water Separator	M Fluid Pressure Regulator	T ES On-Off Valve Lever
E Pump Air Supply Shutoff Valve (bleed-type)	N Fluid Supply Line	U Air Line Drain Valve
F Air Line Lubricator	O Air Filter (5 micron)	V Fluid Drain Valve
G Air Pressure Regulator	P Air Supply Line	W Gun Air Inlet
H Pump	Shutoff Valve (bleed-type)	X Gun Fluid Inlet

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 Signs

Mount warning signs in the spray area where they can easily be seen and read by all operators. See the **ACCESSORIES** section to order.

WARNING

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious bodily injury if work is not performed properly. **Do not install or service this equipment unless you are trained and 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.

Ventilate the Spray Booth

WARNING

To prevent hazardous concentrations of toxic and/or flammable vapors, spray only in a properly ventilated spray booth. **Never operate the spray gun unless ventilation fans are operating.**

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

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 100-150 ft/min (31-46 linear meters/minute) should be sufficient.

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

WARNING

To reduce the risk of electric shock or other serious bodily injury, the air supply hose must be electrically connected to a true earth ground. **Use Only Graco Electrically Conductive Air Supply Hose.** This hose, and the gun, have special threads which prevent using any other type of hose with the gun. See the **ACCESSORIES** section to order the hose.

1. Connect the air supply hose (R) between the air supply line and the gun's air inlet (W). *The gun air inlet fitting has a left hand thread.* Connect the air supply hose ground wire (Q) to a true earth ground.
2. Install an air line filter (O) and an air and water separator (D) on the air line to ensure a dry, clean air supply to the gun. Dirt and moisture can ruin the appearance of your finished workpiece and can cause the gun to malfunction.
3. Install a bleed-type air regulator (G) on the pump and gun air supply lines to control air pressure to the pump and gun.

4. Install a bleed-type air shutoff valve (C, E, P) on the main air line, the pump 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.

WARNING

The *bleed-type air shutoff valve* is required in your system to relieve air trapped between this valve and the pump after the air regulator is closed. Trapped air can cause the pump to cycle unexpectedly, which could result in serious bodily injury, including splashing in the eyes or on the skin and injury from moving parts.

5. Install an air line lubricator (F) as close to the pump (H) as possible.

Connect the Fluid Line (Refer to the Typical Installation Drawing)

1. Before connecting the fluid line (N), blow it out with air and flush it with solvent. Use solvent which is compatible with the fluid to be sprayed.
2. Install a fluid regulator (M) on the fluid line to control fluid pressure to the gun.
3. Install a fluid filter (K) and drain valve (V) at the pump outlet.

WARNING

The *fluid drain valve* (V) is required in your system to assist in relieving fluid pressure in the displacement pump, hose and gun; triggering the gun to relieve pressure may not be sufficient. Install a drain valve close to the pump's fluid outlet. The drain valve reduces the risk of property damage or serious bodily injury, including splashing in the eyes or on the skin and contamination from hazardous fluids.

4. Connect the fluid line to the 3/8-18.6(m) gun fluid inlet (X).

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 5. Ground the system as explained there. Then check your system as explained below.

1. Turn the ES On-Off valve to OFF. See Fig 2 for the location of the valve lever.
2. Turn off the air and fluid supply to the gun.
3. Have a qualified electrician check the electrical grounding continuity of the spray gun and air hose.
 - a. With the electrically conductive air hose (BB) connected (see **Connect the Air Line**, page 7) and properly grounded, use a megohmmeter (AA) (shown in **ACCESSORIES** section) to measure the resistance between the gun handle (Y) and a true earth ground (Z). Use an applied voltage of 500 minimum to 1000 volts maximum. See Fig 1.
 - b. If the resistance is greater than 2 megohms, check the tightness of the ground connections, and be sure the air supply hose ground wire is connected to a true earth ground. If the resistance is still greater than 2 megohms, replace the air supply hose.

KEY

- Y Gun Handle
- Z True Earth Ground
- AA Ohmmeter
- BB Grounded Air Hose

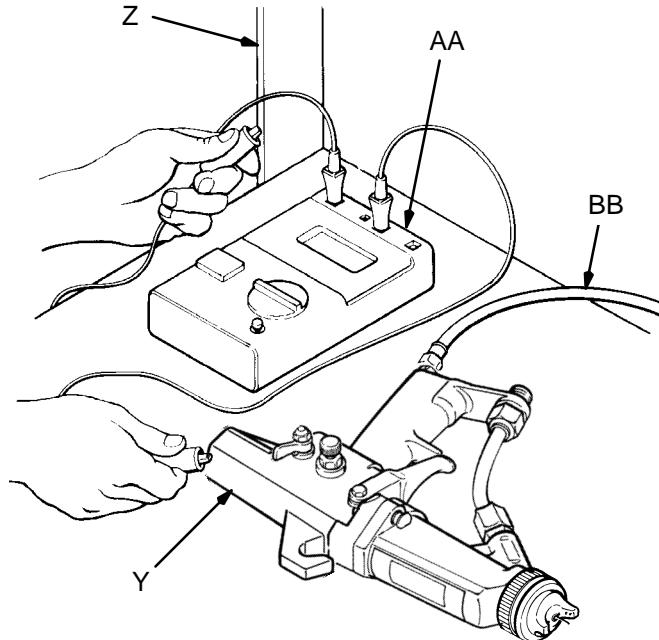


Fig 1

KEY

- Y ES Valve Lever
- Z Fluid Adjusting Knob
- AA Fan Adjusting Knob
- BB ES Indicator Lights

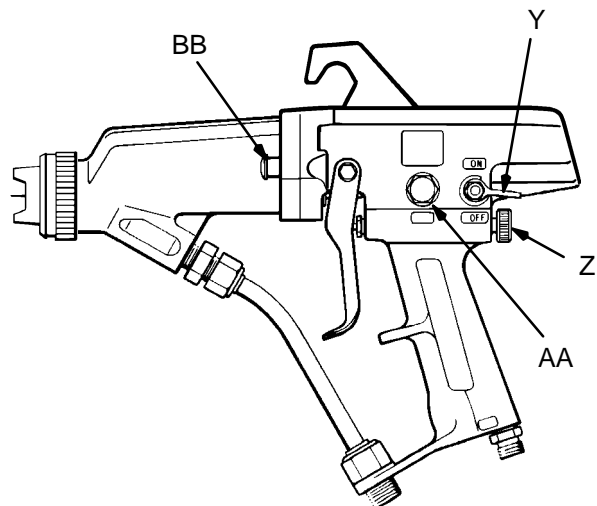


Fig 2

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin, 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 nozzles, and whenever you stop spraying.

1. Turn the ES ON-OFF Valve lever to OFF.
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 waste container ready to catch the drainage.
5. Leave the pump drain valve open until you are ready to spray again.

Filter the Fluid

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

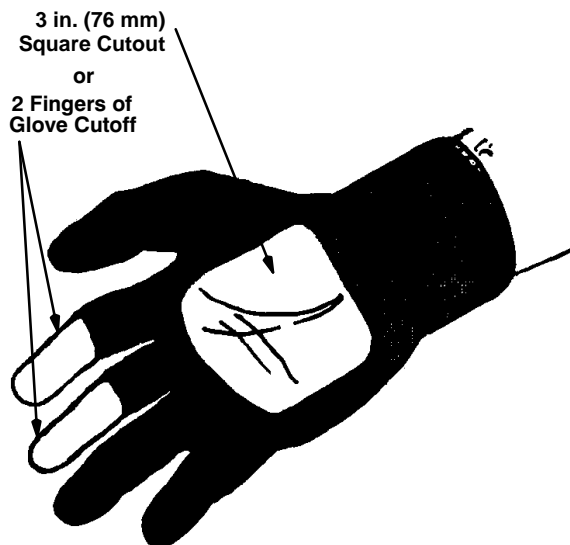


Fig 3

Operating Checklist

Check the following list daily, before starting to operate the system, to help ensure 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 5, and **Check the Electrical Grounding** on page 8.
4. Be sure the operator and all persons entering the spray area are properly grounded by wearing shoes with conductive soles or personal grounding straps.
5. Operator must not wear gloves which insulate the hand from the spray gun. If worn, gloves must be conductive or modified as shown in Fig 3.
6. Be sure ventilation fans are operating properly.
7. Be sure the workpiece hangers are clean and grounded. Contact points must be sharp points or knife edges.
8. Be sure all refuse is removed from the spray booth.
9. Be sure all flammable liquids in spray booth are in approved, grounded containers.
10. Be sure all conductive objects within 20 ft (6 m) of the gun are electrically grounded and the floor of the spray area is electrically conductive and grounded.

Spraying Operation

This gun has a built-in lead and lag operation. The gun begins emitting air before the fluid is discharged. When you release the trigger, the fluid stops before the air flow stops. This helps prevent fluid buildup on the air cap.

When spraying, the ES indicator lights (BB) should glow, indicating the electrostatic charge. See Fig 2.

Install the Fluid Nozzle and Air Cap

WARNING

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin or electric shock, always follow the **Pressure Relief Procedure** on page 9 before installing, or removing the fluid nozzle/air cap assembly.

1. See Instruction Manual 307–803 for air cap consumption and fluid nozzle flow rate information. The fluid output and pattern shape depends on the fluid nozzle size, fluid viscosity, and fluid pressure.
2. Remove the old air cap and fluid nozzle as instructed in **Clean the Air Cap and Fluid Nozzle**, steps 1 through 4.
3. Push the pin housing (83) into the slot (A) on the front of the gun until it bottoms out. See Fig 4.
4. Push the locking pin (84) into the housing (83).
5. Turn the locking pin (84) to the unlocked position, and screw the new fluid nozzle (13) onto the gun. See Fig 5.
6. Turn the locking pin (84) to the locked position to lock the fluid nozzle (13) in place.
7. Carefully install air cap assembly. Avoid bending electrode (12). Tighten the retaining nut so it is snug, allowing the air cap to turn with resistance. If too tight, the spray pattern will be distorted.

Adjust the Spray Pattern

Follow these steps to establish the correct fluid flow and air flow. **DO NOT** turn the ES ON–OFF lever to ON yet:

1. Adjust the fluid flow for the appropriate flow rate by using the fluid pressure regulator installed in the fluid line. Check the fluid nozzle chart in manual 307–803 for the appropriate flow rate for the air cap. Start with the lowest rate shown and increase it until you get the desired flow rate.
2. For fine adjustment, use the adjusting knob (Z) located at the rear of the gun. See Fig 2. Turn the knob clockwise to reduce the amount of fluid being sprayed and counterclockwise to increase the amount of fluid being sprayed.
3. Choose the correct size air cap for the type of fluid being sprayed and the pattern desired.
4. Be sure the fan adjusting knob (AA) is closed (turned fully clockwise).
5. Use an air pressure regulator to adjust the degree of atomization. Always use the lowest air pressure possible for the most efficiency.

NOTE: A minimum of 2.8 bar (40 psi) air supply at the gun is required to ensure full voltage from the power supply. The gun may be operated at a lower air pressure/voltage if required, but may lose some electrostatic wrap.

6. First, complete all the checks under the **Operating Checklist** on page 9. Then turn the ES ON–OFF lever to ON. When spraying, the *ES indicator light* should glow, indicating the electrostatic charge.
7. Use the *fan adjusting knob* to change the shape of the spray pattern. Turn the knob counterclockwise for a wide pattern and clockwise for a solid, round pattern. When increasing to a wide, flat pattern, it may be necessary to increase the supply of fluid to the gun to maintain the same amount of coverage over a large area.

NOTE: See the **Spray Pattern Troubleshooting Chart** on page 13 to correct spray pattern problems.

KEY

- A Slot
- 83 Pin Housing

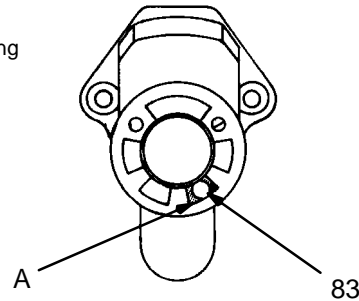


Fig 4

KEY

- 13 Fluid Nozzle
- 14 Air Cap Assembly
- 84 Locking Pin

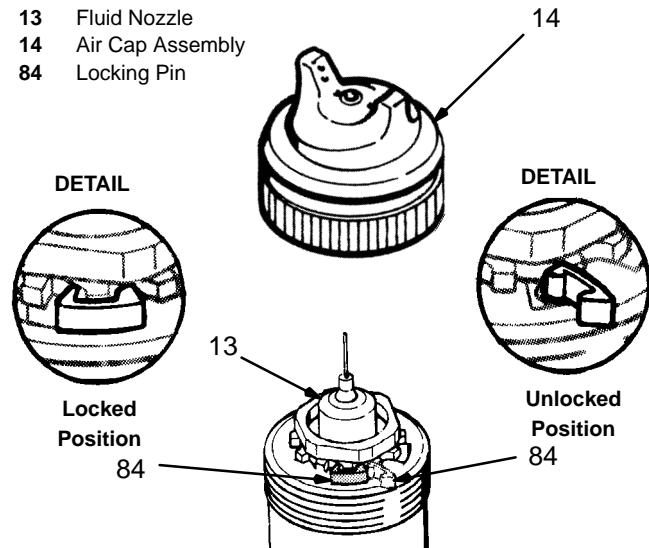


Fig 5

Daily Care and Cleaning

WARNING

To reduce the risk of serious bodily injury, including splashing in the eyes or on the skin or electric shock, always follow the **Pressure Relief Procedure Warning** on page 9 when shutting off the system, when you stop spraying and before checking, servicing, installing, cleaning or changing any part in the system.

CAUTION

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

Do not use any cleaning method which may allow solvent into the gun air passages. Solvent left in the gun passages could result in a poor quality paint finish and may draw current and reduce the electrostatic effect. Point the gun down while cleaning to prevent dirty solvent from running back into the air passages. **NEVER IMMERSER THE GUN IN SOLVENT.**

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 nozzle daily, minimum. Some applications require more frequent cleaning. Replace the fluid nozzle and air cap if they are damaged. See **Clean the Air Cap and Fluid Nozzle**.
4. Check the electrode wire. Straighten if bent, and replace if broken or damaged. See **Electrode Needle Replacement**.
5. Check all of the work hangers for build-up of material; clean them, if necessary.

Clean the Air Cap and Fluid Nozzle

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.

Equipment needed:

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

Procedure:

1. Follow the **Pressure Relief Procedure Warning** on page 9.
2. Remove the air cap assembly (14). See Fig 6.
3. Turn the locking pin (84) to the unlocked position.
4. Squeeze the gun trigger and remove the fluid nozzle with the fluid nozzle wrench (59g) supplied. Make sure the front of the gun is held down. See Fig 6.
5. Use the soft bristle brush (59a) supplied and solvent to clean the air cap, fluid nozzle, and front part of the gun.
6. Squeeze the gun trigger and screw the fluid nozzle back into gun. Tighten the nozzle securely with the wrench (59g) supplied. Torque the fluid nozzle to 1.1–1.4 N•m (10–12 in–lb). See Fig 6. Turn the locking pin to the locked position.
7. Carefully reinstall the air cap assembly. Avoid bending the electrode (12). Tighten the retaining nut so it is snug, allowing the air cap to turn with resistance. If too tight, the spray pattern will be distorted.

KEY

- 12 Electrode
- 13 Fluid Nozzle
- 14 Air Cap Assembly
- 59g Wrench

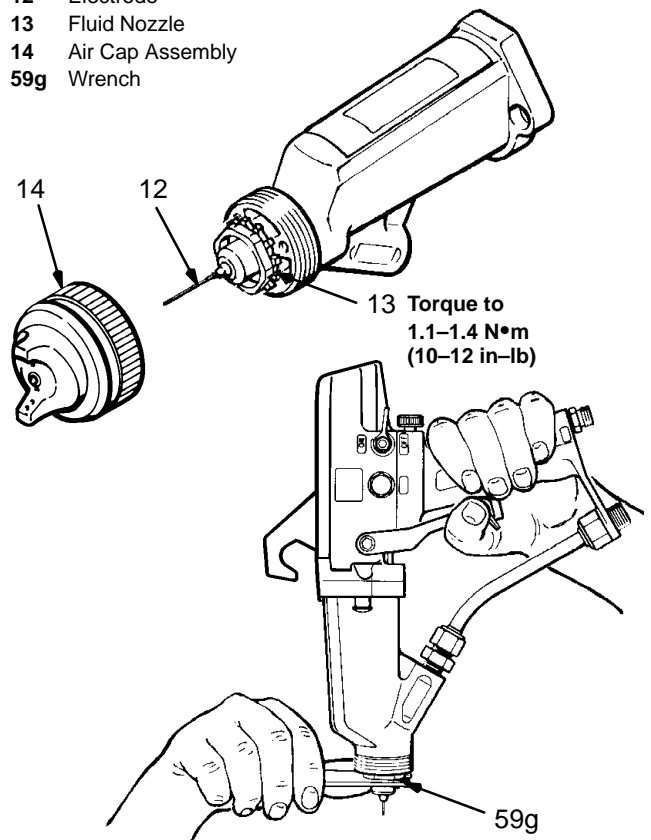


Fig 6

Flush the Spray Gun

WARNING

To reduce the risk of fire or explosion and serious bodily injury, the ES ON-OFF lever must be OFF before flushing.

1. Follow the **Pressure Relief Procedure Warning** on page 9.
2. Disconnect and plug the fluid line.
3. Connect the solvent supply to the gun.
4. Flush the gun with solvent until it is clean.
5. Follow the **Pressure Relief Procedure Warning**, then disconnect the solvent supply.
6. Reconnect the fluid supply line.
7. Turn on the fluid and air supplies.
8. Trigger the gun until it is clear of solvent.

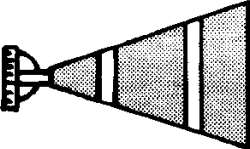
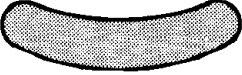


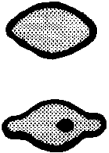
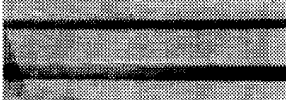
SPRAY PATTERN TROUBLESHOOTING CHART

WARNING

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

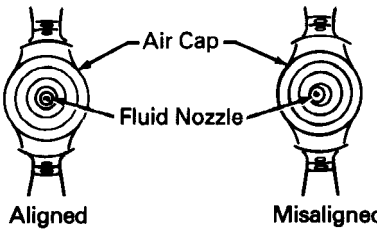
To reduce the risk of serious bodily injury, including splashing fluid or solvent in the eyes or on the skin, always follow the **Pressure Relief Procedure Warning** on page 9 before checking, adjusting, cleaning or repairing the gun or any part of the system. Disconnect the fluid hose from the gun.

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

PROBLEM: IMPROPER SPRAY PATTERN	CAUSE	SOLUTION
<p>Fluttering or spitting spray</p> 	<p>Insufficient fluid supply.</p> <p>Loose fluid nozzle or damaged fluid nozzle taper seat.</p> <p>Dirt between fluid nozzle, taper seat and body.</p> <p>Loose or cracked coupler at fluid inlet.</p> <p>Loose fluid tube in cup or tank.</p>	<p>Adjust fluid regulator or fill fluid tank.</p> <p>Tighten or replace fluid nozzle See page 10.</p> <p>Clean. See page 11.</p> <p>Tighten or repair.</p> <p>Tighten.</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 nozzle or air cap holes.</p>	<p>Clean with soft implement or submerge in suitable solvent and wipe clean. See page 11.</p> <p>Replace damaged part. See page 10.</p>
	<p>Fluid build-up on the perimeter of fluid nozzle orifice, or partially clogged fluid nozzle orifice.</p>	<p>Remove obstruction. Never use wire or hard instruments. See page 11.</p>
	<p>Too high atomization air pressure.</p> <p>Fluid too thin.</p> <p>Not enough fluid pressure.</p>	<p>Reduce air pressure or adjust air adjusting valve.</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>Increase 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. See page 11.</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.	Worn needle packing.	Replace packing assembly. See page 21.
Air leakage from front of gun.	Air valve not seating properly. Air stem packing too tight.	Clean, service. See page 24. Loosen packing. See page 24.
Fluid leakage from front of gun.	Electrode worn or damaged. Worn fluid seat. Fluid packing too tight. Loose fluid nozzle. Fluid adjusting screw not set correctly.	Replace electrode. See page 18. Replace fluid nozzle and/or electrode. See page 18. Adjust packing screw. See page 20. Tighten fluid nozzle. See page 10. Adjust screw.
"Orange Peel" finish.	Insufficient air pressure. Fluid poorly mixed or filtered. Improper thinner being used.	Increase, use least air pressure needed for good results. 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 nozzle. Damaged fluid nozzle.	Check, add if necessary. Replace air cap. See page 10. Clean fluid nozzle. See page 11. Check, replace fluid nozzle. See page 10.
Equipment covered with fluid.	Exhaust air flow insufficient or not directed properly. Improper distance between gun and work piece.	Check for proper CFM, check baffles and direction of air flow. Adjust distance to 203–305 mm (8–12 in.).
Dirty air cap.	Misalignment between air cap and fluid nozzle. <div style="text-align: center;">  </div>	Remove and clean air cap and fluid nozzle as described in Maintenance Section under Clean the Air Cap and Fluid Nozzle , then reinstall them.

ELECTRICAL TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
<p>Poor wrap-around.</p>	<p>*ES ON-OFF lever in OFF position.</p> <p>Improper distance between gun and workpiece.</p> <p>Parts poorly grounded.</p> <p>High booth exhaust velocity.</p> <p>Atomizing air pressure too high.</p> <p>Fluid pressure too high.</p> <p>Fluid viscosity.</p> <p>Fluid resistivity too low.</p> <p>*Turbine alternator not operating (no audible whine).</p> <p>Faulty gun resistance.</p> <p>Faulty resistor stud resistance.</p> <p>Faulty power supply resistance.</p> <p>Faulty needle electrode assembly.</p> <p>*Faulty turbine alternator.</p>	<p>Turn lever to ON.</p> <p>Adjust spraying distance to 203–305 mm (8–12 in.).</p> <p>Clean hangers, check for proper ground on conveyer or track.</p> <p>Reduce within code limits.</p> <p>Reduce air pressure.</p> <p>Reduce fluid pressure.</p> <p>Check supplier for proper fluid for electrostatic spray.</p> <p>Check fluid resistivity with paint meter and probe.</p> <p>Check if ES ON-OFF lever is ON. Check air supply to gun. Check for dirt or moisture in turbine. See page 23.</p> <p>Check gun resistance. See page 16.</p> <p>Check resistor stud resistance. See page 17.</p> <p>Check power supply resistance. See page 16.</p> <p>Replace needle electrode assembly. See page 18.</p> <p>Be sure plug is in place on back of turbine alternator housing. Remove and test turbine alternator. See page 23.</p>
<p>Operator gets mild shock.</p>	<p>Operator not properly grounded or is in contact with ungrounded object.</p> <p>Gun not properly grounded.</p>	<p>Be sure floor is properly grounded. Wear shoes with conductive soles and wear personal grounding straps. Be sure operator is not in contact with or carrying any metallic items which could build up electrical charge. If worn, a glove must be conductive or modified as shown on page 9.</p> <p>See Check the Electrical Grounding, page 8. Be sure Graco air supply hose is being used and is properly grounded.</p>
<p>Operator gets mild shock when touching work piece.</p>	<p>Work piece not properly grounded.</p>	<p>Clean work piece hangers. Check for proper ground on conveyer or track.</p>

**ES indicator light not on when gun is triggered.*

ELECTRICAL TESTS

The performance of the spray gun is directly affected by the condition of the electrical components contained inside the gun. The electrical tests below can be used to determine the condition of the power supply (5) and the resistor stud (16) as well as the continuity of the electrical path between the components.

Use megohmmeter 218–979 (see **ACCESSORIES**) and an applied voltage of 500 volts to complete these electrical tests. Connect the leads as shown.

WARNING

To reduce the risk of sparking, which could cause fire or explosion and result in serious bodily injury, **DO NOT** use the megohmmeter in the hazardous area. Remove the gun from the hazardous area before testing it.

Test Gun Resistance

NOTE: Check the resistance with the gun triggered and untriggered.

Measure the resistance between the end of the electrode (12) and the gun air fitting (2a). See Fig 7. The resistance should be between 115–152 megohms. If the resistance is outside the specified range, go to the next test. If the resistance is correct, refer to the **Electrical Troubleshooting Chart** on page 15 for other possible causes of poor performance.

Test Power Supply Resistance

Remove the power cartridge (3) from the gun handle (2). See **Power Cartridge Replacement**.

Remove the turbine alternator (3a) from the power supply (5). See **Turbine Alternator Removal**.

Measure the resistance from the center prong (EE) in the power supply to the contact spring (5c) on the other end of the power supply. See Fig 8.

The resistance should be 95–122 megohms. If the resistance is outside the specified range, the power supply is defective and must be replaced. If the resistance of the power supply is correct, proceed to the next test.

If you still have problems, refer to the **Electrical Troubleshooting Chart** for other possible causes of poor performance, or contact the nearest authorized service agency.

KEY

- A Megohmmeter
- 2 Gun Handle
- 2a Air Fitting
- 12 Electrode

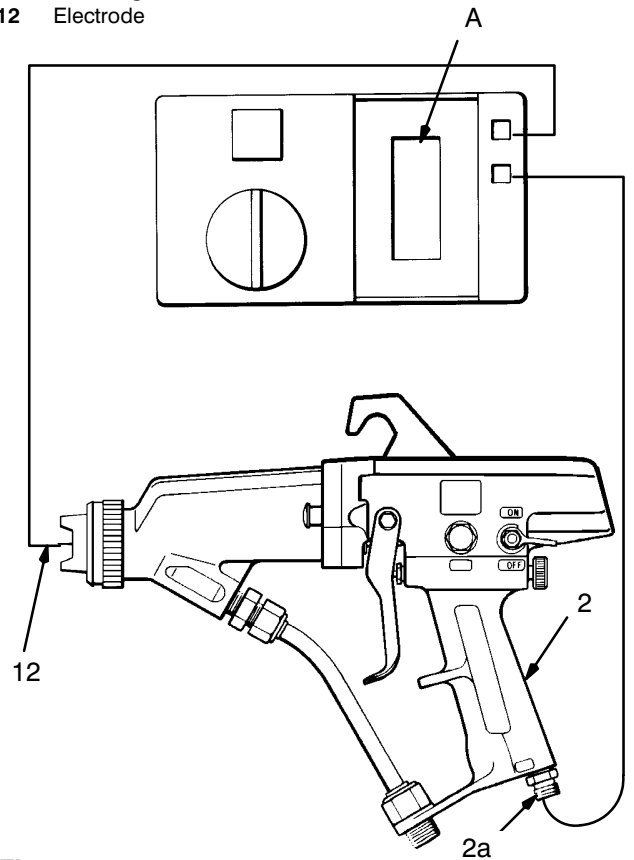


Fig 7

KEY

- A Megohmmeter
- EE Connector Center Prong
- 5 Power Supply
- 5c Contact Spring

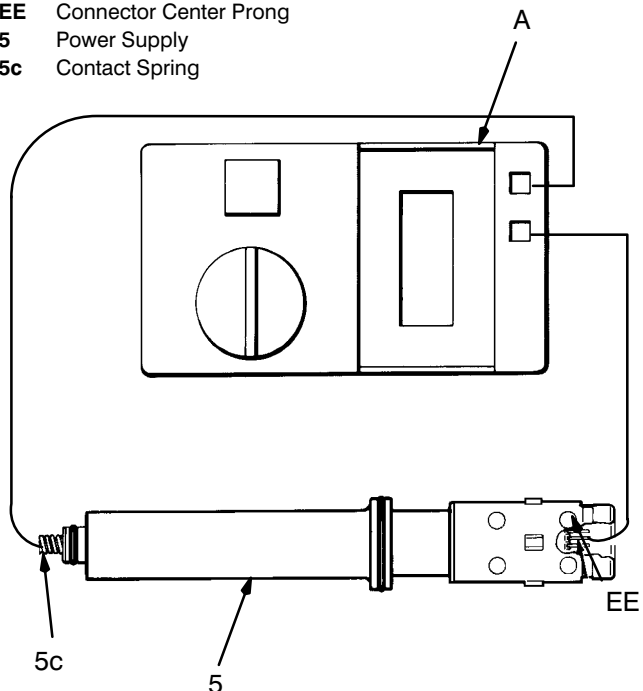


Fig 8

ELECTRICAL TESTS

Test Resistor Stud Resistance

Insert a conductive rod (FF) into the gun barrel (removed for the power supply test) and against the metal contact (GG) in the front of the barrel. See Fig 9.

Measure the resistance between the conductive rod (FF) and the gun electrode (12). The resistance should be 20–30 megohms. If the resistance is correct, refer to the **Electrical Troubleshooting Chart** for other possible causes of poor performance, or contact the nearest authorized service agency.

If the resistance is outside the specified range, remove the electrode (12). See **Electrode Replacement**. Measure the resistance between the conductive rod (FF) and the resistor in the inside diameter of resistor stud (16).

The resistance should be 20–30 megohms. If the resistance is correct, the electrode wire is defective and must be replaced. See **Electrode Replacement**. If the resistance is outside the specified range, the resistor is defective and the resistor stud (16) must be replaced. See **Resistor Stud Replacement**.

If you still have problems, refer to the **Electrical Troubleshooting Chart** for other possible causes of poor performance, or contact the nearest authorized service agency.

KEY

- A Megohmmeter
- FF Conductive Rod
- GG Metal Contact
- 12 Electrode
- 18 Gun Barrel

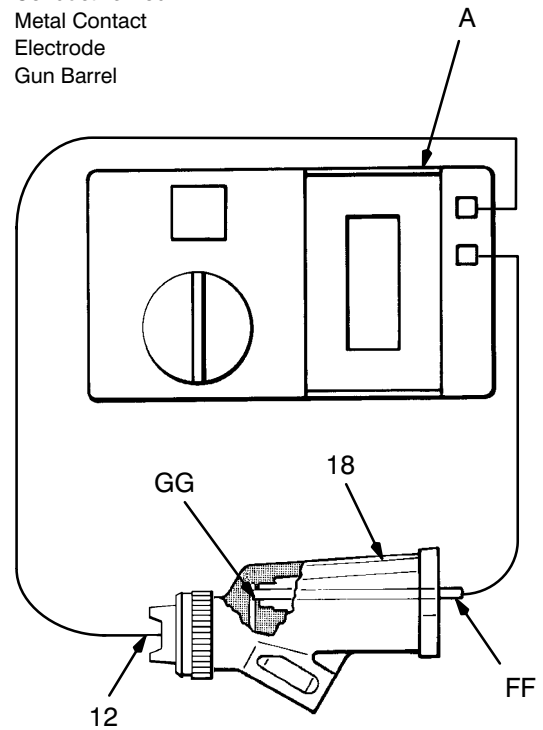


Fig 9

Gun Disassembly

WARNING

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

Follow the **Pressure Relief Procedure Warning**, page 9, before servicing the gun or any part of the system. Disconnect the fluid hose from the gun.

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

CAUTION

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

ALWAYS lubricate o-rings and seals with petroleum jelly.

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

Flush the gun as described under **Flush the Spray Gun**. Follow the **Pressure Relief Procedure Warning** on page 9. Disconnect the air and fluid line from the gun.

Electrode Replacement

1. Remove the air cap assembly and fluid nozzle as described in **Clean the Air Cap and Fluid Nozzle**.
2. Unscrew and remove the electrode (12) with the wrench (59c) supplied. See Fig 10. If the needle shaft assembly (45) turns while trying to loosen the electrode, hold the needle shaft assembly nut with a small wrench.

3. Install the new electrode (12) with the wrench (59c) supplied. Do not overtighten.

CAUTION

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

4. Reinstall fluid nozzle and air cap assembly as described in **Clean the Air Cap and Fluid Nozzle**.

KEY

- 45 Fluid Needle Shaft Assembly
59c Wrench

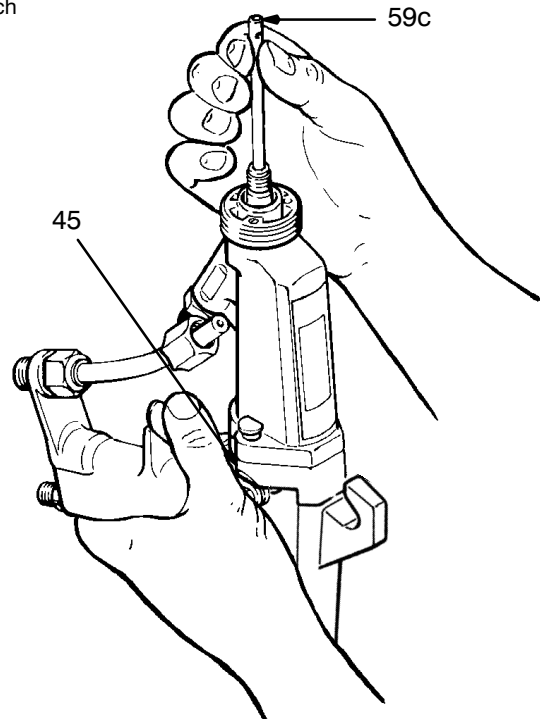


Fig 10

Resistor Stud Replacement

WARNING

Old/New Style Resistor Stud and Electrode

To reduce the risk of sparking, which could cause fire or explosion, BE SURE the electrode and stud you install are black. The old style electrode and stud in the Series A–D Guns were white. DO NOT mix old style parts with new style parts.

1. Remove the air cap assembly and fluid nozzle as described in **Clean the Air Cap and Fluid Nozzle**.
2. Remove the electrode as described in **Electrode Replacement**.
3. Using the wrench (59h) supplied, unscrew and remove the resistor stud (16) with the o–ring (17) and washer (75). See Fig 11.

To install the resistor stud:

1. Lubricate the o–ring (17) with petroleum jelly and install it on the resistor stud (16).
2. Install the washer (75) in the gun barrel.

3. Using the wrench supplied, install the resistor stud in the front of the gun barrel. Tighten until snug.
4. Install the electrode as described in **Electrode Replacement**.
5. Install the fluid nozzle and air cap assembly as described in **Clean the Air Cap and Fluid Nozzle**.

KEY

- 16 Resistor Stud
- 17 O–Ring
- 75 Washer

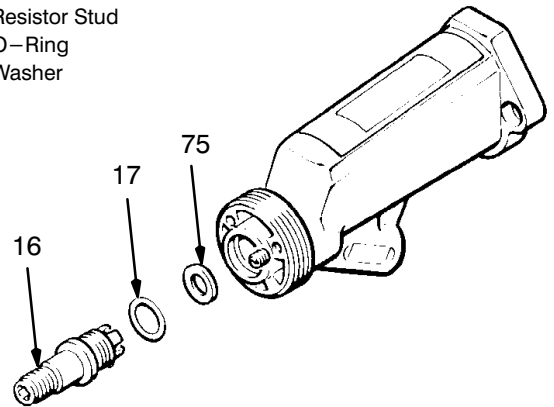


Fig 11

Barrel Removal

1. Unscrew the nut (19) at the barrel fluid inlet. See Fig 12.
2. Pull the fluid tube (20) out of the fluid inlet.
3. Remove the trigger by removing the screws and spacers from the gun.
4. Remove the ES indicator lights from the socket head capscrews (30).
5. Using the wrench (59f) supplied, loosen and remove the two socket head capscrews (30) from the gun.
6. Hold the gun handle (2) with one hand and pull straight up to remove the gun barrel (18). See Fig 13.

CAUTION

To avoid damaging the power cartridge, always pull the gun barrel straight away. If necessary, gently move the gun barrel from side to side to free it from the gun handle.

NOTE: The gasket (46) should be left in the gun handle (2) if the gasket is not to be replaced.

To install the barrel (18), follow the procedure below:

1. Be sure the gasket (46) is in place. Replace if damaged. Place the barrel over the power cartridge (3) and onto the gun handle (2). See Fig 13.
2. Install the two socket head capscrews (30) and tighten with the wrench (59f) supplied. See Fig 12.
3. Snap the ES indicator lights in place over the socket head capscrews (30).
4. Insert the fluid tube (20) into the fluid inlet of the gun barrel and tighten the nut (19).
5. Install the trigger with the screws and spacers. Test the gun resistance as instructed on page 16.

Fluid Needle Packing Replacement

1. Remove the air cap and fluid nozzle as described in **Clean the Air Cap and Fluid Nozzle**.
2. Remove the electrode as described under **Electrode Replacement**.
3. Remove the gun barrel as described under **Barrel Removal**.
4. Unscrew the packing nut (45e) using the wrench (59b) supplied. See Fig 14.

KEY

- 19 Nut
- 20 Fluid Tube
- 30 Capscrew
- 59f Wrench

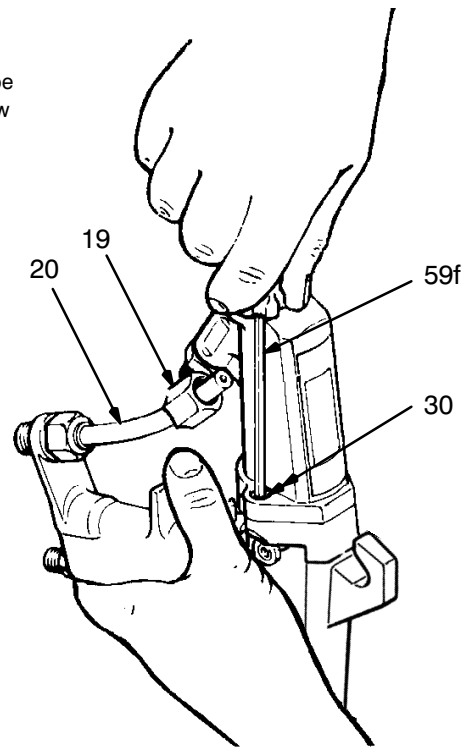


Fig 12

KEY

- 2 Gun Handle
- 3 Power Cartridge
- 18 Gun Barrel
- 46 Gasket

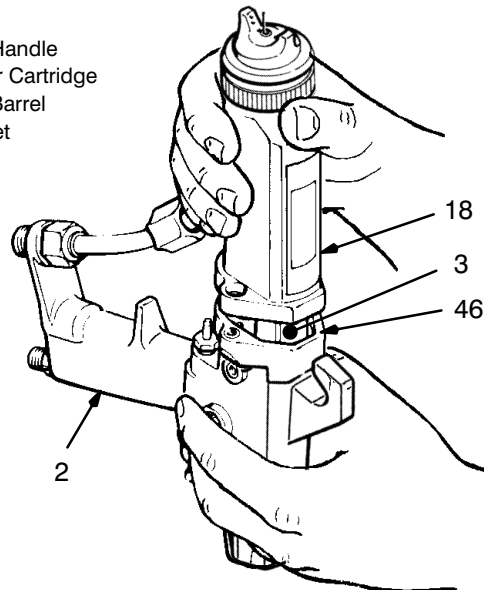


Fig 13

KEY

- 45e Packing Nut
- 59b Wrench

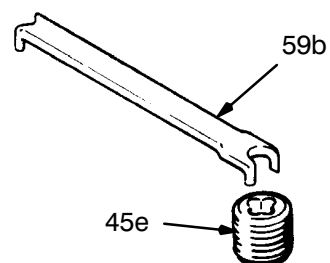


Fig 14

SERVICE

- Carefully remove the fluid needle assembly (45) from the rear part of the gun barrel (18). See Fig 15. If the packing assembly (45a) or insulator (45g) are still in the barrel, insert the packing removal rod (59d) into the front of the barrel to gently push them out. Refer to Fig 16.

NOTE: If the insulator (45g) is removed, be sure to install it so the insulator end with holes is facing the packing assembly (45a).

- Wipe the internal surfaces of the barrel clean with a soft brush or cloth.

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 the packing assembly (45a) from the needle (45b).

NOTE: If the position of the adjusting nut (45c) is changed, install the adjusting nut to the approximate dimension shown in Fig 15. (Final adjustment will be made in step 15.) If the spring (45f) was removed, reinstall it over the nut (45d).

- Install the new packing assembly (45a).

CAUTION

Carefully screw needle (45b) into new packing assembly (45a) to avoid damaging the seals.

- Test the drag on the fluid needle. It should be approximately 2.5–3 lbs (use a small spring scale to measure). If the adjustment is out of tolerance, tighten or loosen the adjusting screw on the packing assembly (45a) slightly and retest. Continue to adjust until the tolerance is correct.
- Install the entire fluid needle assembly (45) into the gun barrel, from the back of the barrel.
- Firmly tighten the packing nut (45e) down until it bottoms.

CAUTION

When checking the fluid needle movement, DO NOT move the needle out of the gun barrel more than 6.35 mm (1/4 in.) to avoid pulling the needle out of the packing area and damaging the packings.

- Install the barrel as described under **Barrel Removal**.
- Install the electrode as described under **Electrode Replacement**.

- Install the air cap assembly and fluid nozzle as described in **Clean the Air Cap and Fluid Nozzle**.

- Trigger the gun to check the needle adjustment. The air should come fully on before the fluid comes on. Adjust the needle adjusting nut (45c) until the proper lead and lag is achieved.

If the fluid comes on too soon, remove the trigger and back the needle adjusting nut (45c) out (away from the barrel) slightly.

If the fluid comes on too late, tighten the needle adjusting nut (45c) slightly (turn towards barrel).

After adjustment is complete, tighten the locking nut (45d) against the adjusting nut (45c).

KEY

- 18 Gun Barrel
- 45 Fluid Needle Assembly
- 45c Needle Adjusting Nut

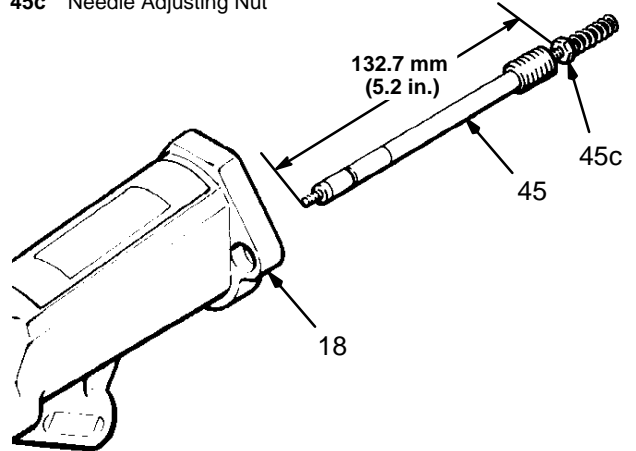


Fig 15

KEY

- 45 Fluid Needle Assembly
- 45a Needle Packing Assembly
- 45b Fluid Needle
- 45c Adjusting Nut
- 45d Locking Nut
- 45e Packing Nut
- 45f Spring
- 45g Insulator

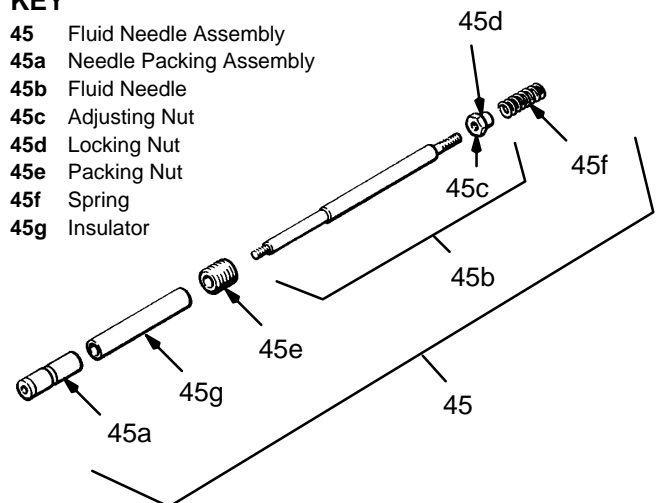


Fig 16

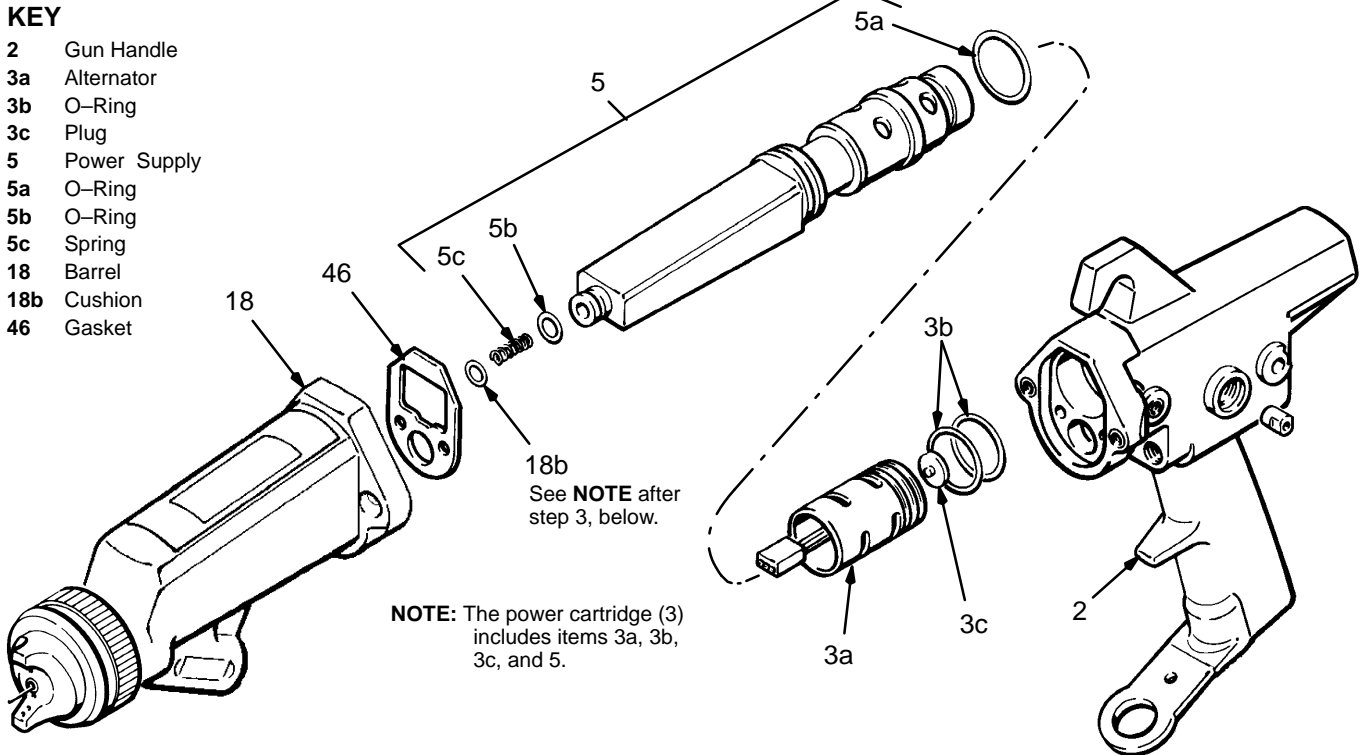


Fig 17

Power Cartridge Replacement

1. Remove the barrel as described under **Barrel Removal**.
2. Remove the gasket (46) from the gun. See Fig 17.

CAUTION

The power cartridge is fragile. Be careful when handling it to avoid damage.

3. Grasp the power cartridge with your hand. With a gentle side to side motion, pull it free from the gun handle (2). Then pull the power cartridge straight out of the handle.

CAUTION

DO NOT use solvents to clean the power cartridge cavity in the gun handle (2). Solvent will damage electrical components contained in the power cartridge.

Inspect the power cartridge cavity in the handle for dirt or moisture. Clean out the cavity with a clean, dry rag if necessary.

Lightly lubricate the o-rings (3b, 5a, 5b) on the new power cartridge with petroleum jelly. All the o-rings and the compression spring (5c) must be in place or the gun will malfunction.

NOTE: The cushion (18b) is part of the gun barrel and should never be removed. If it ever is removed, push the cushion, adhesive side in toward the barrel, with a rod until it is securely adhered in the barrel. **DO NOT** use the power supply (5) to press the cushion into the barrel as it will not adhere properly.

4. Insert the new power cartridge in the gun handle.

NOTE: See Fig 18 for proper alignment of the power cartridge (3) in the gun handle (2).

5. Install the gasket (46) in the gun handle (2).
6. Install the barrel on the handle as described under **Barrel Removal**.

KEY

- 2 Gun Handle
- 3 Power Cartridge

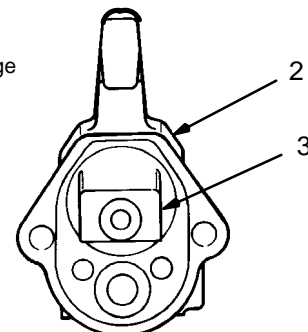


Fig 18

Turbine Alternator Removal

1. Remove power cartridge from the gun handle as described under **Power Cartridge Replacement**.
2. Carefully twist the turbine alternator (3a) counter-clockwise and pull it off the power supply (5) until just disengaged from the coupling. Then continue to slowly pull the turbine alternator away from the power supply, disconnecting the 3-wire connector (HH). See Fig 19.
3. Using an ohmmeter, test the coil in the turbine alternator (3a). Measure the resistance between the two outer terminals of the 3-wire connector (HH). The resistance should be 3–5 ohms. If the reading varies from this value, replace the alternator.
4. Measure the resistance between each outer terminal of the 3-wire connector (HH) and the turbine alternator housing. The resistance should be infinite. If the resistance is not infinite, replace the alternator.
5. Partially connect the 3-wire connector (HH) onto the prongs inside the power supply (5). See Fig 19. Using a small screwdriver, push the connector onto the prongs until seated.
6. Slide the turbine alternator (3a) onto the power supply, being sure to align the coupling between the power supply and the turbine alternator housing. Then twist the turbine alternator clockwise to lock the coupling.

7. Install the power cartridge in the gun handle as described under **Power Cartridge Replacement**.

KEY

- HH 3-wire Connector
 3a Alternator
 5 Power Supply

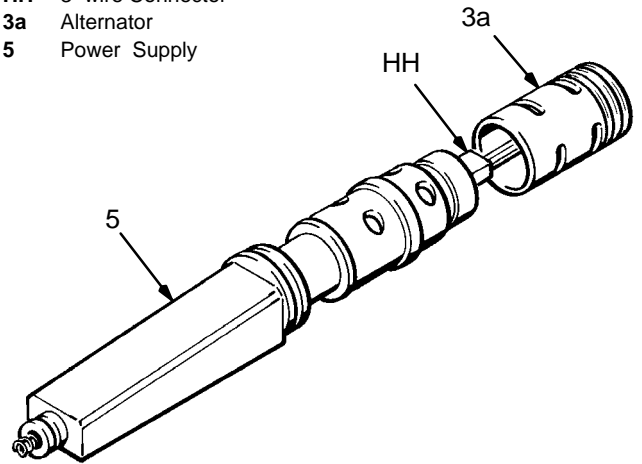


Fig 19

Fan Air Valve Replacement

1. Place a wrench on the flats of the valve housing (33) and remove it from the handle (2). See Fig 20.
2. Remove the retaining ring (31).
3. Rotate the air adjusting screw (34) *counterclockwise* until it is disengaged from the valve housing threads. Pull the adjusting screw (34) out of the valve housing (33).
4. Clean all the parts and inspect them for wear or damage. If replacing the seal (40), unscrew it *clockwise* and remove it from the adjusting screw.
5. Apply medium grade thread sealant to the small threads on the end of the adjusting screw (34) and install a new seal (left hand thread).
6. When reassembling the fan air valve, lubricate the o-ring (32) and the adjusting screw threads with petroleum jelly.
7. After the retaining ring (31) is installed on the adjusting screw (34), back the adjusting screw out of the valve housing (33) until it bottoms out against the retaining ring (31).
8. Apply PTFE paste to the threads of the valve housing (33) and install it in the handle (2). Torque the housing (33) to 1.1–1.4 N•m (10–12 in-lb).

KEY

- 2 Gun Handle
- 31 Retaining Ring
- 32 O-Ring
- 33 Valve Housing
- 34 Adjusting Screw
- 40 Valve Seal

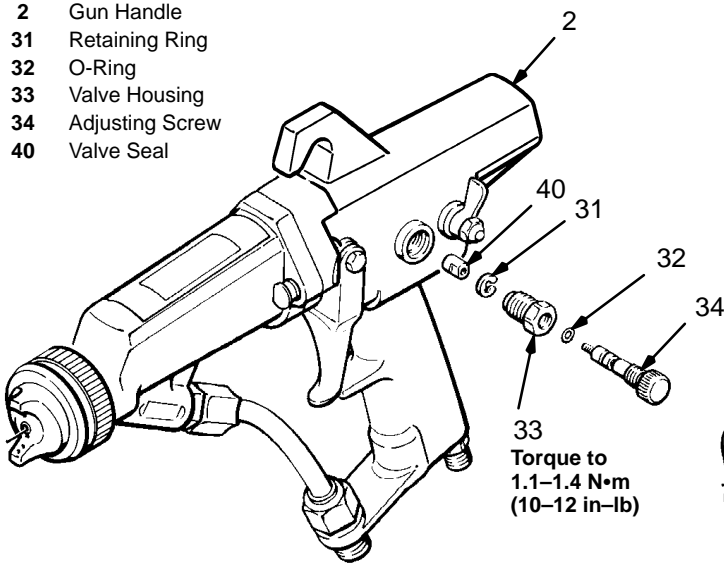


Fig 20

Air Valve Replacement

1. Using a screwdriver, remove the retainer (27), spring (26), and air valve (25). See Fig 21.

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.

2. Remove the trigger by removing the screws and the spacers from the gun.
3. Unscrew and remove the guide (24) and packing (47) from the front of the gun handle (2).
4. Apply PTFE tape to the threads of the guide (24). Install the new packing (47) and guide (24) in the front of the gun handle (2). Tighten the guide (24) finger tight only.
5. Install the new air valve (25) and spring (26) into the back of the gun handle (2).
6. Apply PTFE tape to the threads of the retainer (27). Install the retainer (27) in the back of the gun handle (2) and tighten with a screwdriver.
7. Reinstall the trigger with the screws and spacers.
8. Squeeze the trigger and tighten the guide (24) just until the valve (25) will not return when the trigger is released. Then loosen the guide just enough so the valve stem returns freely when the gun is triggered and released.

KEY

- 2 Gun Handle
- 24 Guide
- 25 Air Valve Assembly
- 26 Spring
- 27 Retainer
- 47 Packing

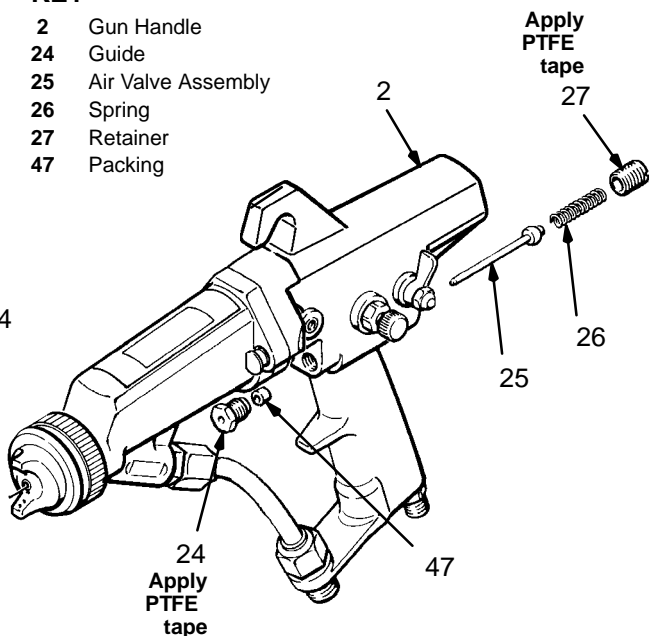


Fig 21

ES ON-OFF Valve Removal & Replacement

1. Loosen and remove the nut (35). Remove the lever (37) and washer (36). See Fig 22. Insert the hex head wrench into the hex end of the valve (39), and turn it to loosen and remove the valve.
2. Clean and inspect parts for wear or damage. Replace if necessary. Lubricate the o-rings (38) and valve (39) with petroleum jelly.
3. Install the regulator disc (4) so that the beveled face of the disc faces into the valve (39).
4. Install the valve (39) with the regulator disc (4) and o-rings (38) into the gun handle (2) so that the larger opening of the valve cylinder faces toward the front of the gun handle (2).
5. Install the wave washer (36), lever (37), and nut (35) on the valve stem. Tighten the nut (35) and torque it to 0.225 N•m (2 in-lb).

Fluid Adjusting Screw Replacement

Remove the retaining ring (23) from the fluid adjusting screw (28). Refer to the Parts Drawing. Unscrew and remove the fluid adjusting screw from the back of the gun handle. Install the new assembly.

KEY

2	Key	37	Valve Lever
4	Regulator Disk	38	O-Ring
35	Nut	39	Air Valve
36	Wave Washer		

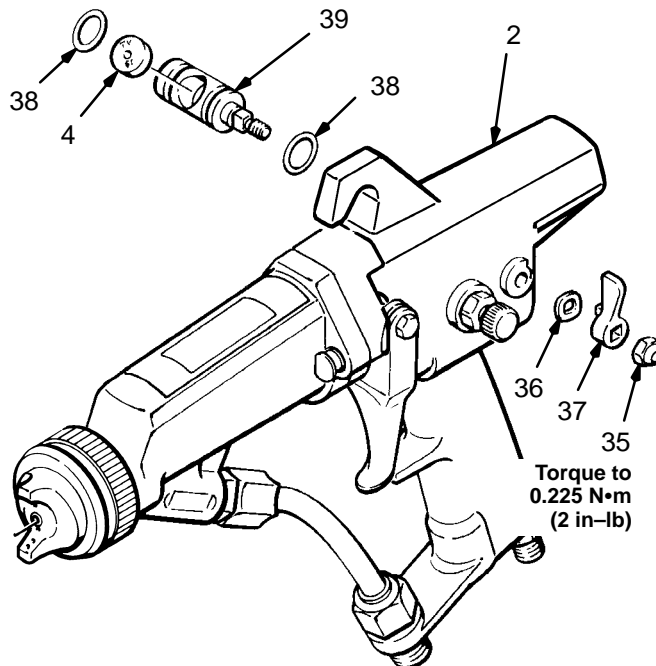
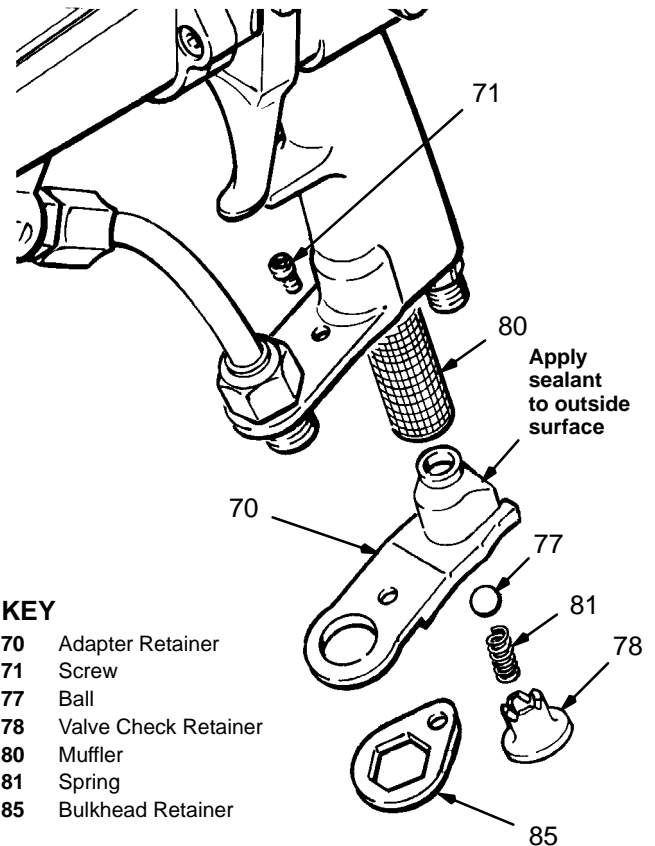


Fig 22

Muffler and Check Valve Replacement

1. Remove the screw (71), adapter retainer (70) and bulkhead retainer (85) from the gun handle. See Fig 23.
2. Pull the muffler (80) from the gun handle and replace with a new muffler.
3. Insert a 3.18 mm (0.125 in.) rod into one of the holes in the valve check retainer (78) and pry it out of the adapter retainer (70). Be ready to catch the ball (77) and spring (81).
4. Install a new ball (77) and spring (81) in the adapter retainer (70) and snap the valve check retainer (78) back into place on the adapter retainer.
5. Install the adapter retainer (70) and bulkhead retainer (85) on the gun handle using the screw (71).



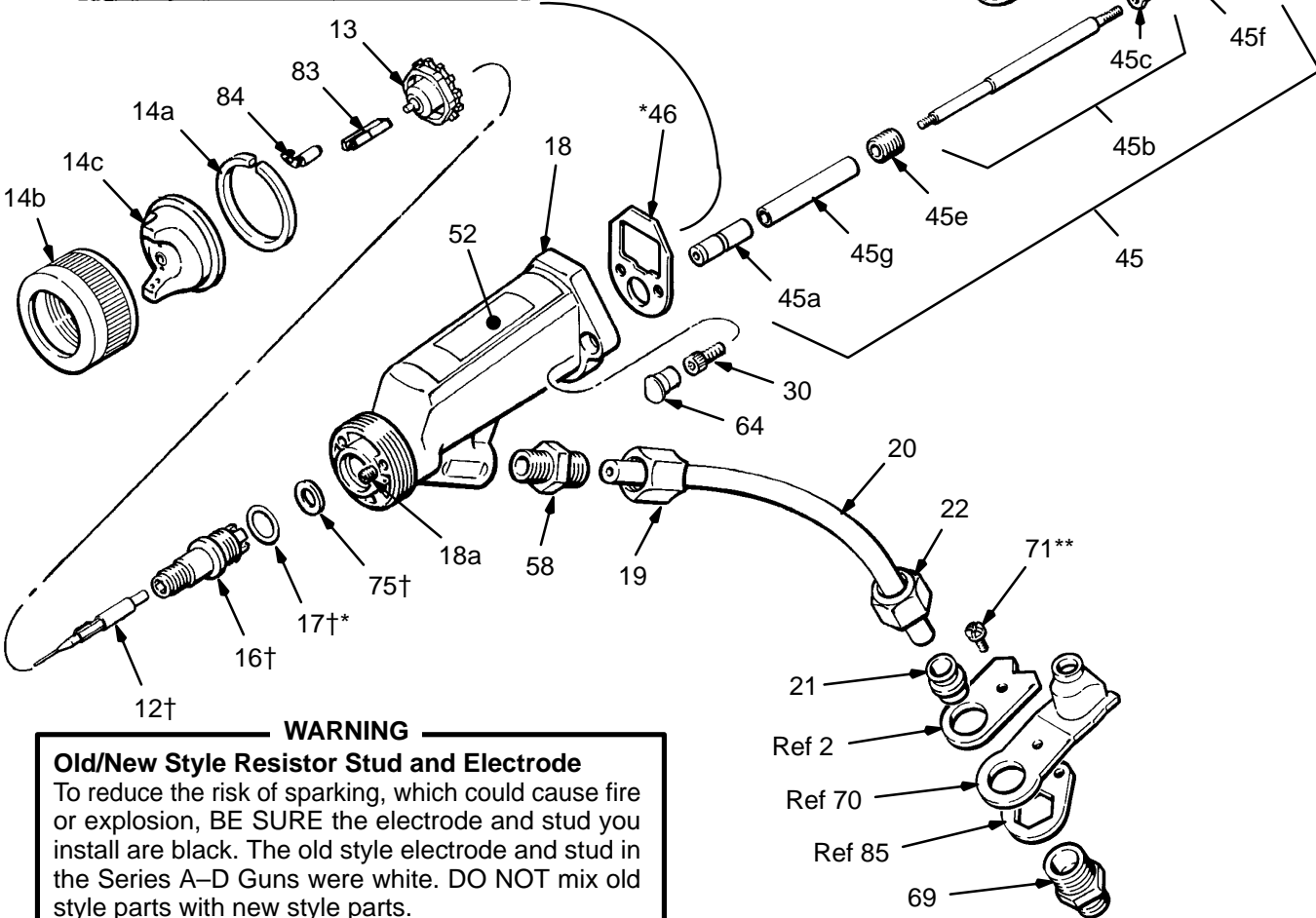
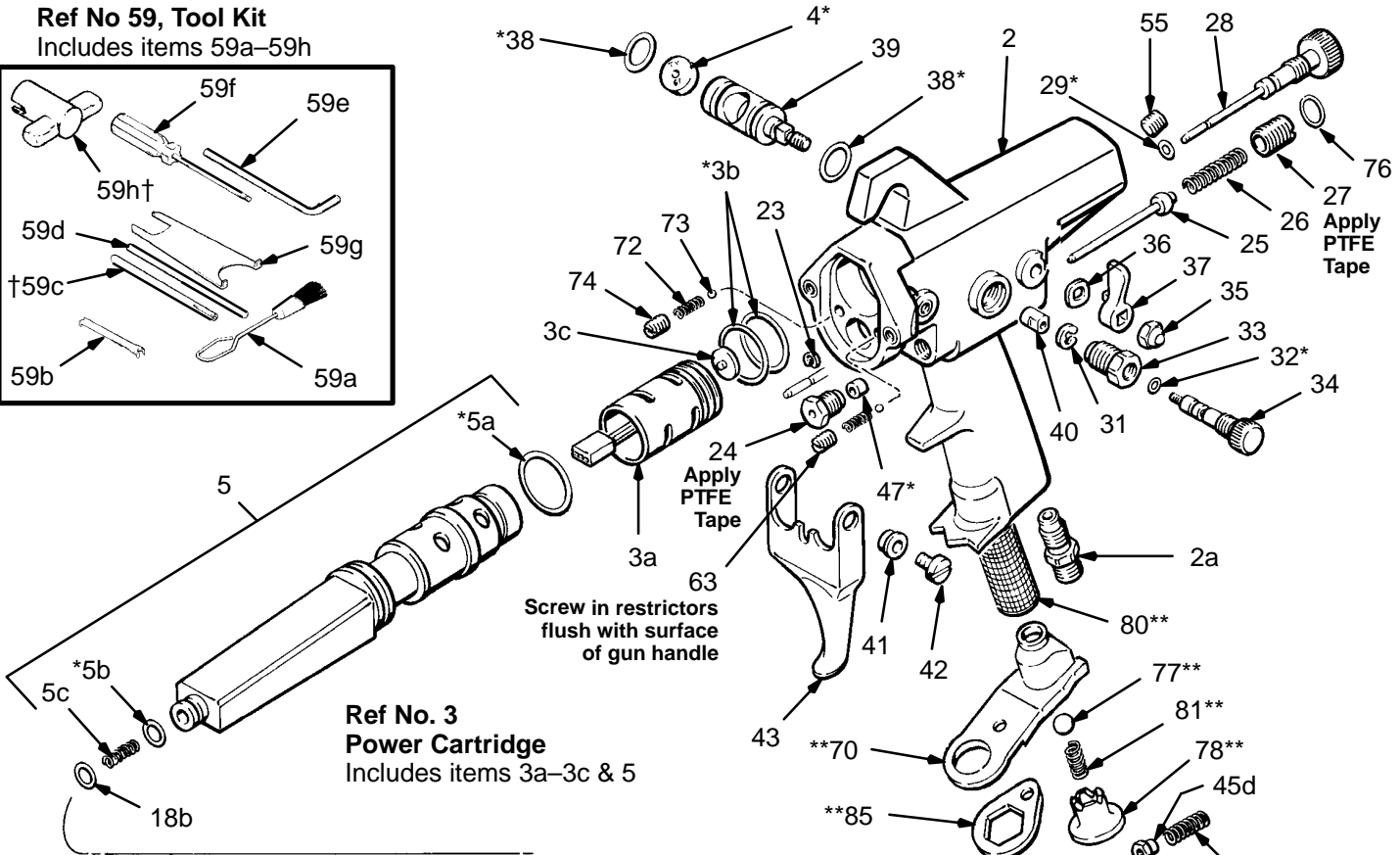
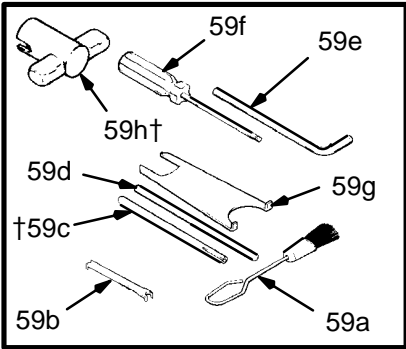
KEY

70	Adapter Retainer
71	Screw
77	Ball
78	Valve Check Retainer
80	Muffler
81	Spring
85	Bulkhead Retainer

Fig 23

PARTS DRAWING

Ref No 59, Tool Kit
Includes items 59a–59h



PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
2	218-014	HANDLE, gun; Includes item 2a	1	40	181-383	SEAL, valve	1
2a	179-400	.ADAPTER	1	41	177-128	SPACER	2
3	218-111	POWER CARTRIDGE; Includes items 3a and 5	1	42	107-400	SCREW, trigger	2
3a	217-591	ALTERNATOR, turbine; Includes items 3b & 3c	1	43	186-473	TRIGGER	1
3b*	107-106	.O-RING, buna-n	2	45	222-256	FLUID NEEDLE ASSY; Includes items 45a-45g	1
3c	180-070	.PLUG	1	45a	222-255	.PACKING ASSY, needle	1
4*	107-107	REGULATOR, disc	1	45b	222-013	.NEEDLE, fluid; Includes item 45c & 45d	1
5	218-041	POWER SUPPLY; Includes items 5a-5c	1	45c	183-749	..NUT, adjusting	1
5a*	177-156	.O-RING; Viton®	1	45d	183-750	..NUT, locking	1
5b*	106-555	.O-RING; Viton	1	45e	176-936	.NUT, packing	1
5c	178-504	.SPRING, compression	1	45f	105-673	.SPRING, compression	1
12†	181-824	ELECTRODE (color coded black)	1	45g	179-388	.INSULATOR, needle	1
13	181-299	NOZZLE, fluid; See manual 307-803 for available nozzles	1	46*	179-387	GASKET, housing	1
14	218-996	AIR CAP ASSEMBLY; See manual 307-803 for available air cap assys.; Includes items 14a-14c	1	47*	106-901	PACKING, needle, PTFE	1
14a	176-930	.RING, retaining	1	52	179-790	LABEL, warning	1
14b	176-968	.NUT, retaining	1	53	179-791	TAG, warning (not shown)	1
14c	180-739	.AIR CAP; See manual 307-803 for available air caps	1	55	104-765	PLUG, screw	1
16†	220-923	STUD, resistor (color code black)	1	58	107-207	FITTING, male	1
17†*	105-667	O-RING; Viton (standard; color coded green)	1	59	220-388	TOOL KIT; Includes item 59a-59h	1
	108-045	O-RING; polyethylene (optional; color coded white)	1	59a	105-749	.BRUSH, cleaning	1
18	179-412	BARREL, gun; Includes item 18a	1	59b	177-732	.WRENCH, nut, packing	1
18a	176-921	.PLUG, M3 x 0.5 x 6	1	59c†	177-007	.WRENCH, needle	1
18b	186-127	.CUSHION	1	59d	179-803	.ROD, packing removal	1
19	107-208	NUT, ferrule	1	59e	107-158	.WRENCH, stud, resistor	1
20	179-933	TUBE, fluid	1	59f	107-460	.WRENCH, barrel	1
21	178-131	COLLAR	1	59g	177-004	.WRENCH, nozzle, fluid	1
22	106-262	NUT, tube, flareless	1	59h†	183-107	.TOOL, resistor stud	1
23	105-661	RING, retaining	1	63	179-994	RESTRICTOR	1
24	176-941	GUIDE, valve, air	1	64	218-179	LIGHT, indicator, ES	2
25	215-890	VALVE, air	1	65	180-060	SIGN, warning, English (not shown)	1
26	107-029	SPRING, compression	1	69	181-384	ADAPTER, fluid	1
27	179-391	RETAINER, spring	1	70**	181-380	RETAINER, adapter	1
28	218-150	SCREW, adjusting, fluid	1	71**	180-624	SCREW, machine; pnh; M5 x 12	1
29*	168-110	O-RING; Viton	1	72	107-414	SPRING, compression	2
30	107-100	SCREW, cap, socket hd	2	73	100-172	BALL, steel; 3/16" dia.	2
31	105-681	RING, retaining	1	74	180-235	RESTRICTOR (color coded black)	1
32*	103-557	O-RING; Viton	1	75†	181-825	WASHER	1
33	181-382	HOUSING, valve	1	76	103-338	O-RING; Viton	1
34	181-381	SCREW, adjusting	1	77**	101-435	BALL, SST, 3/8 dia.	1
35	181-328	NUT, hex	1	78**	180-621	RETAINER, valve, check	1
36	102-268	WASHER, wave	1	80**	180-623	MUFFLER	1
37	181-327	LEVER, valve	1	81**	108-046	SPRING, compression	1
38*	103-648	O-RING; Viton	2	82	180-209	COVER, gun (not shown)	1
39	181-326	VALVE, air	1	83	181-302	HOUSING, pin	1
				84	181-303	PIN, locking	1
				85**	180-143	RETAINER, bulkhead	1

*Included in Repair Kit 218-051. See page 28.

**Included in Repair Kit 218-682. See page 28.

† Included in Repair Kit 220-391. See page 28. Read and follow the Old/ New Style Resistor Stud and Electrode Warning on page 26.

REPAIR KITS

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

WARNING

When servicing use only genuine Graco replacement parts. Use of other parts or any alteration or modification of this equipment could result in serious injury, fire, explosion, or property damage.

NOTE: The Ref. Nos. shown in the kits below correspond to the reference numbers used in the parts list on page 27. For the best results, use all the parts in the kit, even if the old parts still look good.

Spray Gun Repair Kit 218-051

Includes:

Ref No.	Part No.	Description	Qty
3b	107-106	O-RING, buna-n	2
4	107-107	REGULATOR, disc	1
5a	177-156	O-RING, Viton	1
5b	106-555	O-RING, Viton	1
17	105-667	O-RING, Viton	1
29	168-110	O-RING, Viton	1
32	103-557	O-RING, Viton	1
38	103-648	O-RING, Viton	2
46	179-387	GASKET, housing	1
47	106-901	PACKING, needle, PTFE	1

Resistor Stud and Electrode Kit 220-391

Includes:

Ref No.	Part No.	Description	Qty
12	181-824	ELECTRODE (color coded black)	1
16	220-923	STUD, resistor (color coded black)	1
17	105-667	O-RING, Viton	1
59c	177-007	WRENCH, needle	1
59h	183-107	TOOL, resistor stud	1
75	181-825	WASHER	1

Muffler Kit 218-682

Includes:

Ref No.	Part No.	Description	Qty
70	181-380	RETAINER, adapter	1
71	180-624	SCREW, machine, pnh; M5 x 12	1
77	101-435	BALL, SST; 3/8 dia.	1
78	180-621	RETAINER, valve, check	1
80	180-623	MUFFLER	1
81	108-046	SPRING, compression	1
85	180-143	RETAINER, bulkhead	1

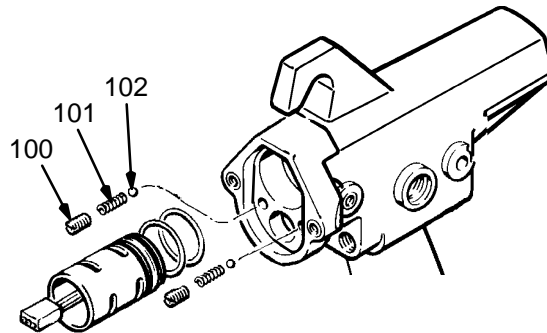
Low Air Flow Restrictor Kit 223-830*

For reducing atomizing air flow.

Includes:

Ref No.	Part No.	Description	Qty
100	179-994	RESTRICTOR	2
101	107-414	SPRING, compression	2
102	100-172	BALL; 3/16" diameter	2

*MUST also order **Air Cap 220-535**.



Optional Air Cap 220-535

MUST be used with **Low Air Flow Restrictor Kit 223-830**, above. Must order separately.

TECHNICAL DATA

Weight 0.87 Kg (1.90 lb)
 Gun Length 310 mm (12.25 in.)
 Maximum Working Pressure 7 bar (100 psi)
 Air Pressure Operating Range: 0–7 bar (0–100 psi)
 Fluid Pressure Operating Range: 0–7 bar (0–100 psi)
 Voltage Operating Range 0–75 KV
 Paint Resistivity Range 7 megohm cms to infinity
 Air Inlet 1/4 npsm(m) L.H.
 Fluid Inlet 3/8 npsm(m)
 Wetted Parts Stainless Steel, Polyethylene,
 Nylon, Acetal, Viton® PTFE,
 Delrin®

Viton® and Delrin® are registered trademarks of the DuPont Co.

Loctite® is a registered trademark of the Loctite Corporation.

HOW TO ORDER REPLACEMENT PARTS

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

6 digit Part Number	Qty	Part Description

SERVICE INFORMATION

Listed below by assembly changed are OLD and NEW parts.

Assembly Changed	Status	Ref No.	Part No.	Name
218–026	ADDED	18b	186–127	Cushion
Spray Gun	OLD	43	181–183	Trigger
	NEW	43	186–473	Trigger

INTERCHANGEABILITY NOTE: NEW parts replace OLD parts listed directly above them.

MISCELLANEOUS NOTES: Revised the manual to update the gun handle drawings.

ACCESSORIES

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

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.

The accessories in the box, below, are approved by Factory Mutual.

GROUNDING AIR SUPPLY HOSE

7 bar (100 psi) MAXIMUM WORKING PRESSURE

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

220-444	1.2 m (4 ft)
218-100	5 m (15 ft)
218-101	8 m (25 ft)
218-102	11 m (36 ft)
218-103	15 m (50 ft)
220-119	23 m (75 ft)
220-120	30.5 m (100 ft)

FLUID HOSE ASSEMBLIES (Nylon)

14 bar (225 psi) MAXIMUM WORKING PRESSURE

6.35 mm (0.25 in.) ID, 3/8 npsm(fbe)

215-637	8 m (25 ft)
215-638	15 m (50 ft)
215-639	75 ft (23 m)
215-640	100 ft 30.5 m)
215-641	150 ft (46 m)

FLUID HOSE ASSEMBLIES (Nylon)

35 bar (500 psi) MAXIMUM WORKING PRESSURE

6.35 mm (0.25 in.) ID, 3/8 npsm(fbe)

216-076	8 m (25 ft)
216-077	15 m (50 ft)
216-078	23 m (75 ft)
216-079	30 m (100 ft)
216-080	46 m (150 ft)

WARNING SIGNS

Available from Graco at no extra charge.

Must be ordered separately.

180-060	Warning Sign (English)
180-061	Warning Sign (French)
180-062	Warning Sign (German)
180-063	Warning Sign (Spanish)

ACCESSORIES

The accessories below and on page 31 have not been tested by Factory Mutual.

AIR LINE ACCESSORIES

GROUNDING AIR SUPPLY HOSE

7 bar (100 psi) MAXIMUM WORKING PRESSURE

8 mm (0.315 in.) ID; 1/4 npsm(fbe);

Color coded gray; More flexible than black hose

223-068	1.2 m (4 ft)
223-069	5 m (15 ft)
223-070	8 m (25 ft)
223-071	11 m (36 ft)
223-072	15 m (50 ft)
223-073	23 m (75 ft)
223-074	30.5 m (100 ft)

QUICK DISCONNECT COUPLING ASSY. 110-806

Includes a quick disconnect coupling insert, which replaces air inlet fitting 179-400, and a shut-off coupling body (left hand thread), which connects to the grounded air hose.

AIR HOSE ADAPTER 185-493

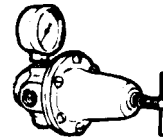
For connecting two or more air supply hoses together.
1/4 npt(m) x 1/4 npsm(m) left-hand thread.

HIGH VOLUME AIR REGULATOR 206-199

0-9 bar (0-125 psi) Regulated Pressure

14 bar (200 psi) Steel Pressure Gauge

1/2 npt(f) inlet and outlet



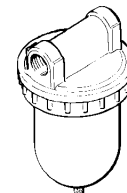
AIR FILTER & MOISTURE SEPARATOR 106-148

17.5 bar (250 psi) MAXIMUM WORKING PRESSURE

For cleaning and drying air in air spray system.

20 micron element, 5 oz. bowl capacity,

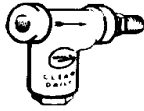
3/8 npt(f) inlet and outlet



ACCESSORIES

FILTER (AIR OR PAINT) 202-271

52 bar (750 psi) MAXIMUM WORKING PRESSURE
With 250 micron (60 mesh) element,
3/8 npt(f) inlet, 3/8 npt(m) outlet



SPRAY SYSTEM ACCESSORIES

218-118 ELECTROSTATIC SYSTEM

Includes items:

- 218-026 Manual Electrostatic Air Spray Gun
- 218-103 Grounded Air Supply Hose (See page 30 for specifications)
- 216-077 Fluid Hose (See page 30 for specifications)
- 106-148 Air Filter

218-123 ELECTROSTATIC SYSTEM

Includes items:

- 218-026 Manual Electrostatic Air Spray Gun
- 218-101 Grounded Air Supply Hose (See and page 30 for specifications)
- 216-076 Fluid Hose (See page 30 for specifications)
- 106-148 Air Filter

218-124 ELECTROSTATIC SYSTEM

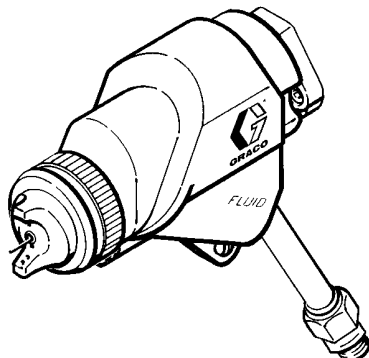
Includes items:

- 218-026 Manual Electrostatic Air Spray Gun
- 218-102 Grounded Air Supply Hose (See and page 30 for specifications)
- 216-077 Fluid Hose (See page 30 for specifications)
- 106-148 Air Filter

PRO4000H GUN ELECTROSTATIC HIGH CONDUCTIVITY KIT 222-029

For converting the PRO4000 Gun to spray conductive (metallic) paints. Since there are so many variations in paint formulations, Graco recommends your specific material be tested for useability with this gun.

NOTE: The installation of this kit will void the CSA and FM approval on the PRO4000 Gun.



ISOLATION STAND 728-650

Required for isolating the fluid supply from the ground when spraying conductive water-base fluid.

CONDUCTIVE (WATER BASE) HOSE KIT 221-008

For converting gun to handle conductive (water base) fluids. See instruction manual 307-639.

NOTE: The installation of this kit will void the CSA and FM approval on the PRO4000 Gun.

WATER BASE PACKING KIT 220-014

For converting packings to handle water base fluids.

NOTE: The installation of this kit will void the CSA and FM approval on the PRO4000 Gun.

WATER BASE CONTROL BOX 218-619

7 bar (100 psi) MAXIMUM WORKING PRESSURE

110-115 Volt output; 50-60 Hz

Pneumatically operated control box used in a water base electrostatic system to automatically bleed the electrostatic charge from the water base fluid supply when the gun is released or the safety fence is open.

Must also order the following:

- 221-008 Water Base Conductive Hose Kit
- 728-650 Isolation Stand

CONDUCTIVE (SOLVENT BASE) HOSE KIT 218-568

For converting gun to handle conductive (solvent base) fluids. See instruction manual 307-640.

NOTE: The installation of this kit will void the CSA and FM approval on the PRO4000 Gun.

MISCELLANEOUS ACCESSORIES

PAINT RESISTANCE METER 722-886

Used with 722-860 Paint Probe to measure resistance of paint. **Not for use in Hazardous areas.**

PAINT PROBE 722-860

Used with 722-886 Paint Resistance Meter to measure resistance of paint. **Not for use in Hazardous areas.**

MEGOHMMETER 218-979

500 Volt output; 0.01-2000 megohms

GUN COVER 180-209

Order Part No. 218-374 for package of 10.

THE GRACO PRO4000 WARRANTY AND DISCLAIMERS

WARRANTY

Graco warrants the PRO4000 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, with the exception of defects in the internal power supply and alternator, which will be repaired or replaced for thirty-six months from the date of sale. 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 costs of parts, labor and transportation.

DISCLAIMERS AND LIMITATIONS

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

EQUIPMENT NOT COVERED BY GRACO WARRANTY

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

IMPORTANT PHONE NUMBERS

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-328-0211 Toll Free**

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

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)

Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan

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

PRINTED IN U.S.A. 307-638 3-83 Revised 5-90

Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>