INSTRUCTIONS-PARTS LIST

308936

Rev. B
Supersedes Rev. A

This manual contains important warnings and information.
READ AND KEEP FOR REFERENCE.

INSTRUCTIONS

First choice when quality counts.™

85 KV ELECTROSTATIC

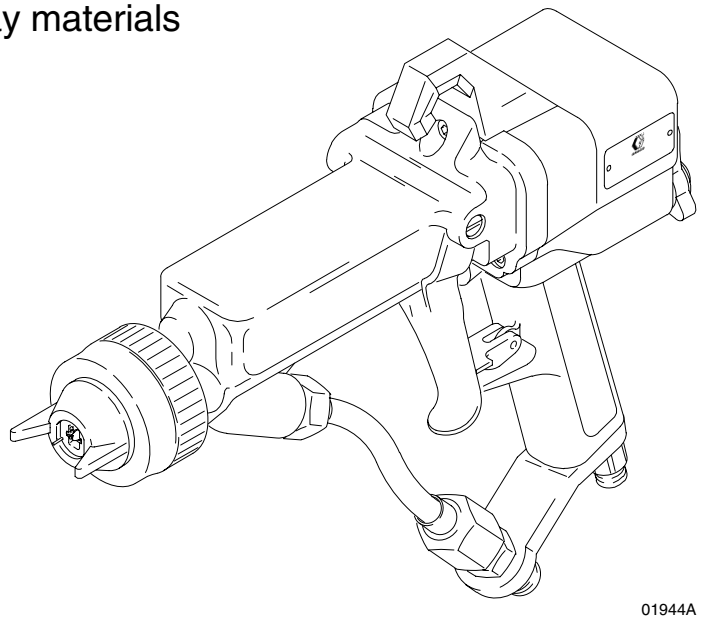
Model PRO AA4500 ™ /UNICARB® Air-Assisted Spray Gun

100 psi (7 bar, 0.7 MPa) Maximum Working Air Pressure
3000 psi (207 bar, 20.7 MPa) Maximum Working Fluid Pressure

For use with Class I, Group D paint spray materials

Part No. 965722, Series B
Spray Gun with basic power supply,
2-finger trigger

FM APPROVED



01944A

NOTE: Any modification of genuine Graco parts or replacement of parts with non-Graco parts will void agency approvals.

U.S. Patent No. 4,290,091; 4,219,865; 4,497,447; 4,462,061; 4,660,774; 5,063,350; 5,080,289; 5,289,977
Patented 1986, 1987 Canada
Brevete 1986, 1987
U.K. Patent No. 2,147,158; 2,142,559B; 2,140,327–B
Other U.S. and Foreign Patents Pending

UNICARB IS A REGISTERED TRADEMARK OF UNION CARBIDE, DANBURY CT.

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

Graco Inc. is registered to I.S. EN ISO 9001

HO03

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Improper grounding, poor air ventilation, open flames, or sparks can cause a hazardous condition and result in a fire, explosion, or electric shock.

- Electrostatic equipment must be used only by trained, qualified personnel who understand the requirements stated in this instruction manual.
- Ground the equipment, personnel in or close to the spray area, the object being sprayed, and all other electrically conductive objects in the spray area. See **Ground the System** on page 8.
- Check the spray gun resistance daily. See **Test Gun Resistance**, page 25.
- If there is any static sparking while using the equipment, **stop spraying immediately**. Identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable or toxic vapors. Interlock the gun turbine air supply to prevent operation of the power supply unless the ventilating fans are on. See **Ventilate the Spray Booth** on page 6.
- When cleaning, flushing, or purging electrostatic equipment, use solvents that comply with your local regulations. *For countries following the U.S. National Fire Protection Association (NFPA) 33 requirements,* use solvents with a flash point higher than 100° F (38° C) or a solvent normally used in spray operations. *For European Countries complying with EN 50053,* use solvents with a flash point as high as possible and higher than the ambient temperatures.
- Use only non-sparking tools to clean residue from the booth and hangers.
- Do not flush the system with the gun electrostatics turned on.
- Do not turn on the gun electrostatics until all solvent is removed from the system.
- Extinguish all open flames or pilot lights in the spray area.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Do not store any flammable fluids in the spray area.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not smoke in the spray area.
- Do not operate a gasoline engine in the spray area.

TOXIC FLUID HAZARD

Hazardous fluids or toxic fumes can cause a serious injury or death if splashed in the eyes or on the skin, swallowed, or inhaled.

- Know the specific hazards of the fluid you are using. Read the fluid manufacturer's warnings.
- Store hazardous fluid in an approved container. Dispose of the hazardous fluid according to all local, state, and national guidelines.
- Wear appropriate protective clothing, gloves, eyewear, and respirator.

⚠ WARNING

INJECTION HAZARD

Spray from the gun, hose leaks, or ruptured components can inject fluid into your body and cause an extremely serious injury, including the need for amputation. Splashing fluid in the eyes or on the skin can also cause a serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not point the spray gun at anyone or any part of the body.
- Do not put hand or fingers over the spray tip.
- Do not stop or deflect fluid leaks with your hand, body, glove, or rag.
- Do not “blow back” fluid; this is not an air spray system.
- Always have the tip guard on the spray gun when spraying.
- Check the gun diffuser operation weekly.
- Be sure the gun trigger safety operates before spraying.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 10 whenever you: are instructed to relieve pressure; stop spraying; clean, check, or service the equipment; and install or clean the spray tip.
- Tighten all the fluid connections before operating the equipment.
- Check the hoses, tubes and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in a serious injury.

- This equipment is for professional use only.
- Read all the instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are uncertain about usage, call your Graco distributor.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check the equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. This equipment has a **100 psi (7 bar, 0.7 MPa) maximum working air pressure and 3000 psi (207 bar, 20.7 MPa) maximum working fluid pressure**.
- Use fluids that are compatible with the equipment wetted parts. See the **Technical Data** section of all the equipment manuals. Read the fluid manufacturer’s warnings.
- Route the hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below –40°F (–40°C).
- Do not use the hoses to pull equipment.
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

Table of Contents

Symbols

Warning Symbol

⚠ WARNING

This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

Caution Symbol

⚠ CAUTION

This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the corresponding instructions.

Introduction

How the PRO AA4500/UNICARB Electrostatic Air-Assisted Spray Gun Operates

⚠ WARNING

Remember, this is not an air spray gun; for your safety be sure to read and follow the Warnings on pages 2 to 3 and throughout the text of this instruction manual.

The spray tip shapes the fluid into a fan pattern.

As the gun is triggered, the regulated air is directed to the power cartridge turbine.

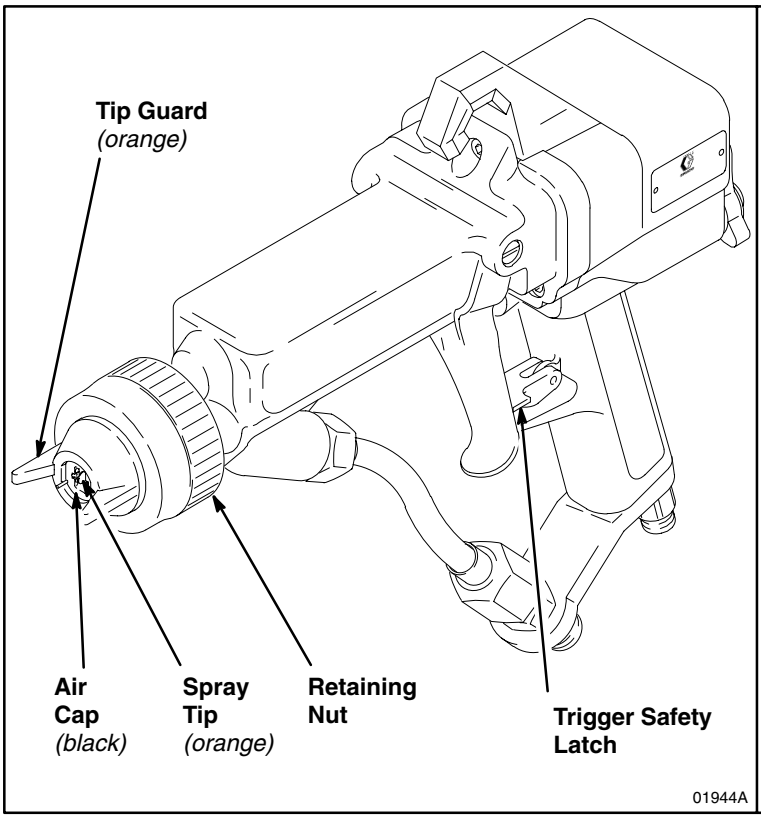
The air control valve does not control pattern width. To change pattern width, a new tip size must be used.

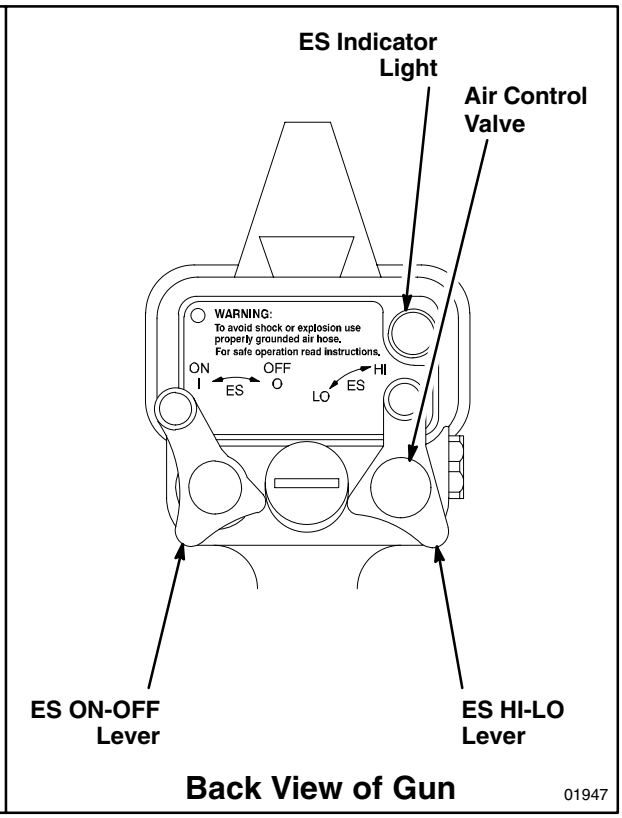
The ability of the PRO AA4500/UNICARB Electrostatic Spray Gun to spray at higher fluid pressures, combined with the addition of CO^2 from the UNICARB process, provides the additional power needed to atomize higher solids materials.

The gun's internal power cartridge provides high voltage current. The fluid is electrostatically charged as it passes the gun's electrode. The charged fluid is attracted to the grounded object, wrapping around and evenly coating all surfaces.

NOTE: The gun's air control valve must be completely turned off to have *airless* atomization. Closing the air control valve does not effect the operation of the turbine.

Power Supply's Adjustable Lower Voltage Setting
The gun's lower voltage setting (LO) is adjustable. The LO setting can be adjusted from 45 to 80 kV; it is preset by the factory at 60 kV. See page 35 to change the setting. NOTE: The gun's full (HI) voltage setting is 85 kV.





Installation

Installing the System

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD
Installing and servicing this equipment requires access to parts which may cause electric shock or other serious 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 I, Group D Hazardous Location.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

Fig. 1 shows a typical electrostatic UNICARB spray system. 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 distributor.

Warning Signs

Mount warning signs in the spray area where they can easily be seen and read by all operators. An English Warning Sign is provided with the gun. Additional English, French, German, and Spanish signs are available at no charge. See **Accessories** to order them.

Ventilate the Spray Booth

⚠ WARNING

FLAMMABLE OR TOXIC VAPOR HAZARD
Provide fresh air ventilation to avoid the buildup of flammable or toxic vapors. Do not operate the gun unless ventilation fans are operating.

Electrically interlock the gun air supply with the ventilators to prevent gun operation without ventilating fans operating. Check and follow all National, State, and Local codes regarding air exhaust velocity requirements.

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

Air Line Accessories (Refer to Fig. 1)

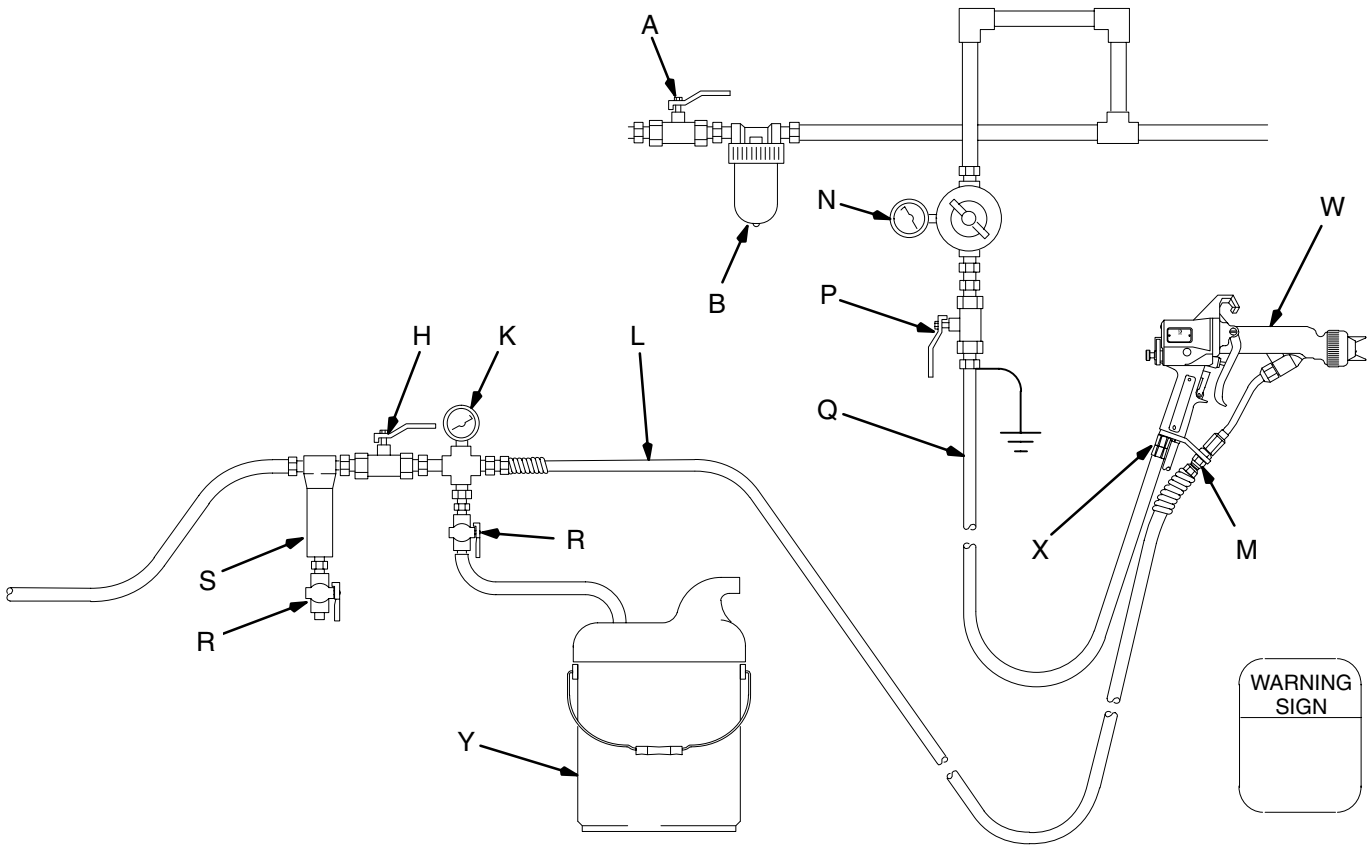
1. Install an air shut-off valve (P) on each gun air supply line (Q) to shut off air to the gun(s).
2. Install an air regulator (N) on the gun air supply line to control air pressure to the gun.
3. Install an air line filter (B) on the air supply line to ensure a dry, clean air supply to the gun. Dirt and moisture can cause the gun to malfunction.

⚠ WARNING

COMPONENT RUPTURE HAZARD
To reduce the risk of serious injury due to component rupture, supply pressure **must** be limited.

The fluid supply system must be prevented from producing a fluid pressure greater than the 3000 psi (207 bar, 20.7 MPa) *Maximum Working Pressure* of the spray gun.

Installation



KEY

A* Bleed-type Air Shutoff Valve
B Air Line Filter
H Fluid Shutoff Valve
K Pressure Gauge
L* Grounded Braid Type Fluid Hose with spring guards
M Gun Fluid Inlet (1/4 npsm)
N Gun Air Regulator
P Gun Air Shut-off Valve
Q* Graco Electrically Conductive Air Supply Hose (1/4 npsm x 1/4 npsm LH)
R* Fluid Drain Valve
S Fluid Filter
W PRO AA4500/UNICARB Spray Gun
X Gun Air Inlet (1/4 npsm LH)
Y Shrouded/Vented Waste Container

* *Equipment required for safe operation of system. Must be purchased separately. See* ACCESSORIES.

Fig. 1

Fluid Line Accessories (Refer to Fig. 1)

1. Install a fluid filter (S) and drain valve (R) at the pump outlet. Filtering the fluid will help remove coarse particles and sediment that could clog the spray tip.

⚠ WARNING

INJECTION HAZARD
The fluid drain valve (R) is required in your system to assist in relieving fluid pressure in the supply system, 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 serious injury, including fluid injection and splashing in the eyes or on the skin.

2. Install a fluid regulator (J) on the fluid line to control fluid pressure to the gun.

Installation

Ground the System

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD
When operating the electrostatic device, any ungrounded objects in the spray area (such as people, containers, tools, etc.) can become electrically charged. Improper grounding can result in static sparking, which can cause a fire, explosion, or electric shock. Follow the grounding instructions below.

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

1. *Pump:* ground the pump by connecting a ground wire and clamp as described in your separate pump instruction manual.

2. *Air compressors and hydraulic power supplies:* ground the equipment according to the manufacturer's recommendations.

3. *Electrostatic Spray Gun:* ground the gun by connecting the Graco Electrically Conductive Air Hose and connecting the air hose ground wire to a true earth ground. Check the electrical grounding of the gun as instructed on page 12.

4. *All air and fluid lines* must be properly grounded. Use only grounded hoses with a maximum of 500 feet (150 m) combined hose length to ensure grounding continuity.

5. *All electric cables* must be properly grounded.

6. *All persons entering the spray area:* their 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 that insulate the hand from the spray gun. The gloves must be conductive or modified as shown in Fig. 2, page 9.

7. *Object being sprayed:* keep the workpiece hangers clean and grounded at all times. Contact points must be sharp points or like knife edges.

8. *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.

9. *Flammable liquids in the spray area:* must be kept in approved, grounded containers. Do not store more than the quantity needed for one shift.

10. *All electrically conductive objects or devices in the spray area:* including fluid containers and wash cans, must be properly grounded.

Operation

Operating Checklist

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

____ 1. All the operators are properly trained to safely operate an electrostatic air-assisted airless spray system as instructed in this manual.

____ 2. All the operators are trained how to properly relieve pressure, using the **Pressure Relief Procedure** on page 10.

____ 3. The system is thoroughly grounded and the operator and all persons entering the spray area are properly grounded. See **Ground the System**, page 8.

____ 4. The warning sign provided with the gun is mounted in the spray area where it can be easily seen and read by all operators.

____ 5. The operator and all persons entering the spray area are properly grounded by wearing shoes with conductive soles or personal grounding straps.

____ 6. The operator is not wearing gloves which insulate the hand from the spray gun. If worn, gloves must be conductive or modified as shown in Fig. 2 so as not to interfere with the operator grounding through the gun.

____ 7. The condition of the electrical components of the spray gun has been checked as instructed in **Electrical Tests**, page 25.

____ 8. The ventilation fans are operating properly.

____ 9. The workpiece hangers are clean and grounded. Contact points must be sharp points or like knife edges.

____ 10. All the debris, including flammable liquids and rags, is removed from the spray area.

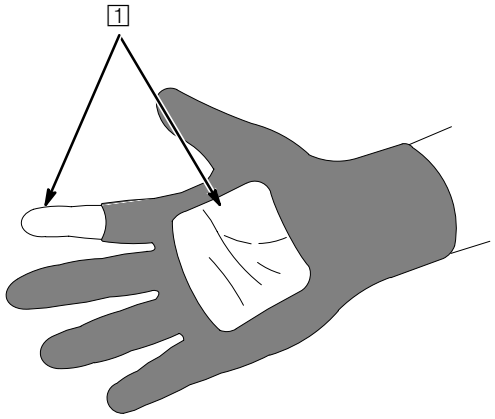
____ 11. All flammable liquids in the spray booth are in approved, grounded containers.

____ 12. All conductive objects in the spray area are electrically grounded and the floor of the spray area is electrically conductive and grounded.

⚠ WARNING

INJECTION HAZARD

Be sure the wallet sized warning card 179960, provided with the gun, is available and easily accessible, at all times, for anyone operating or servicing this equipment. The card contains important information on what to do if an injection injury occurs. Additional cards are available at no charge from Graco.



1 3 in. (76 mm) square cut out and finger of glove cut off

NOTE: If gloves are worn, they must be conductive or modified as shown so they do not interfere with operator grounding through the gun.

06445

Fig. 2

Operation

Pressure Relief Procedure

⚠ WARNING

INJECTION HAZARD
The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid or electric shock, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- or install or clean the spray tip.

1. Lock the spray gun trigger safety latch. See Fig. 3.
2. Turn the ES ON-OFF lever to OFF.
3. Turn off the fluid supply to the gun.
4. Close the bleed-type master air valve (required in system).
5. Close the air valve for the gun air supply line.
6. Unlock the gun trigger safety latch.
7. Trigger the gun into a grounded, shrouded and vented metal waste container to relieve fluid and air pressure. This may take several minutes.
8. Lock the gun trigger safety latch again.
9. Open the fluid drain valve (required in system) to help relieve fluid pressure. In addition, open the drain valve connected to the fluid pressure gauge (in a system with fluid regulation) to help relieve fluid pressure in the hose and gun. Triggering the gun to relieve pressure may not be sufficient. Have a container ready to catch the drainage.
10. Leave the drain valve(s) open until you are ready to spray again.
11. If you suspect that the spray tip or hose is completely clogged or that pressure has not been fully relieved after following the steps above, very slowly loosen the hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose obstruction.

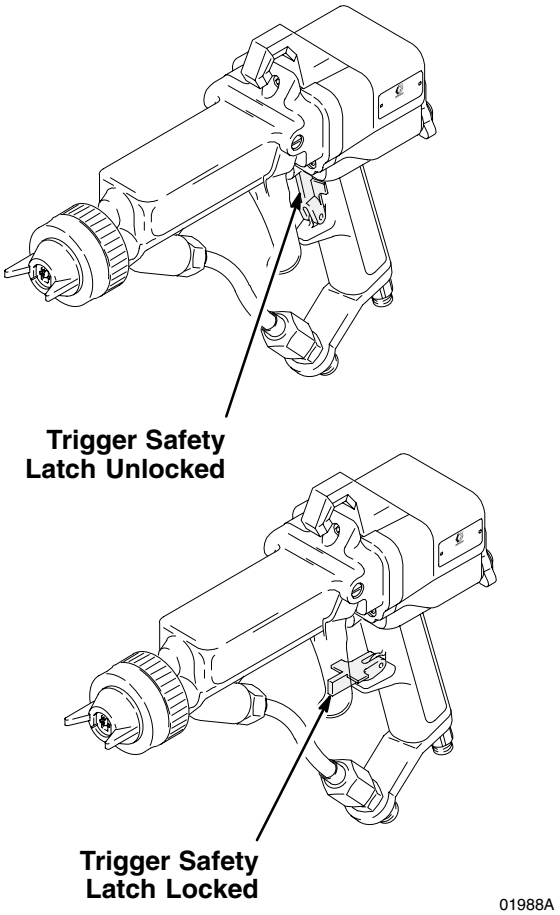


Fig. 3

Gun Setup

1. **Complete the Operating Checklist and follow the Warnings on pages 9 and 10.**

2. **Connect the Graco air hose.**

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock or other serious injury, the air supply hose must be electrically connected to a true earth ground. **Use Only Graco Electrically Conductive Air Supply Hose.**

NOTE: The Graco air hose and the gun have special left-hand threads to prevent connecting another type of air supply hose to the gun air inlet and is available in lengths ranging from 6 to 100 feet (1.83 to 30.5 m). See **Accessories** to order the hose.

A. Connect the 1/4 npsm(f) left-hand end of the Graco conductive air supply hose (A) to the gun air fitting (17).

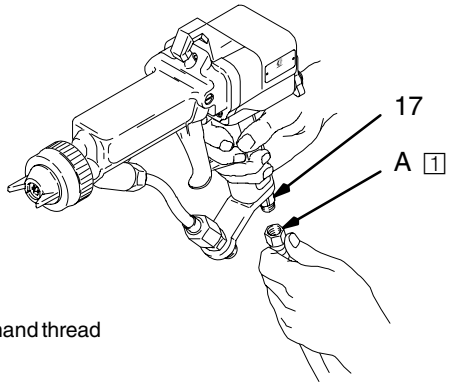


Fig. 2A 01989A

B. Connect the other end of the air supply hose (A) to a filtered and regulated air supply line (B).

C. Connect the air supply hose ground wire (C) to a true earth ground.

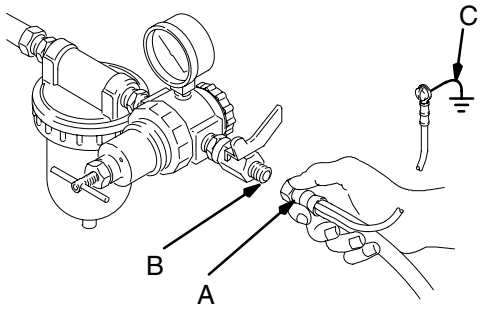


Fig. 2B-C 01990

NOTE: To connect two or more air hoses, use air adapter nipple 185493. See **Accessories**.

Continued on the next page.

Gun Setup

3. Check the gun's electrical grounding.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Megohmmeter P/N 218979 (E) is not approved for use in a hazardous area. To reduce the risk of sparking, do not use the megohmmeter to check electrical grounding unless:

- The gun has been removed from the hazardous area;
- Or all spraying devices in the hazardous area are turned off, ventilation fans in the hazardous area are operating, and there are no flammable vapors in the area (such as open solvent containers or fumes from spraying).

Failure to follow this warning could cause fire, explosion, electric shock and result in serious injury and property damage.

A. Have a qualified electrician check the electrical grounding continuity of the spray gun and air hose.

B. Turn the ES ON-OFF Lever to OFF.

C. Turn off the air and fluid supply to the gun. The fluid hose must not have any fluid in it.

D. Make sure the air hose (A) is connected and the hose ground wire is connected to a true earth ground.

E. Measure the resistance between the gun handle (7) and a true earth ground (D).

a. *If using a black or grey air hose,* use a megohmmeter E) to measure the resistance. Use an applied voltage of 500 minimum to 1000 volts maximum. The resistance should not exceed 2 megohms.

b. *If using a red turbine air hose,* use an ohmmeter to measure the resistance. Resistance should not exceed 100 ohms.

F. If the resistance is greater than the maximum reading specified above for your hose, check the tightness of the ground connections and be sure the air hose ground wire is connected to a true earth ground. If the resistance is still too high, replace the air hose.

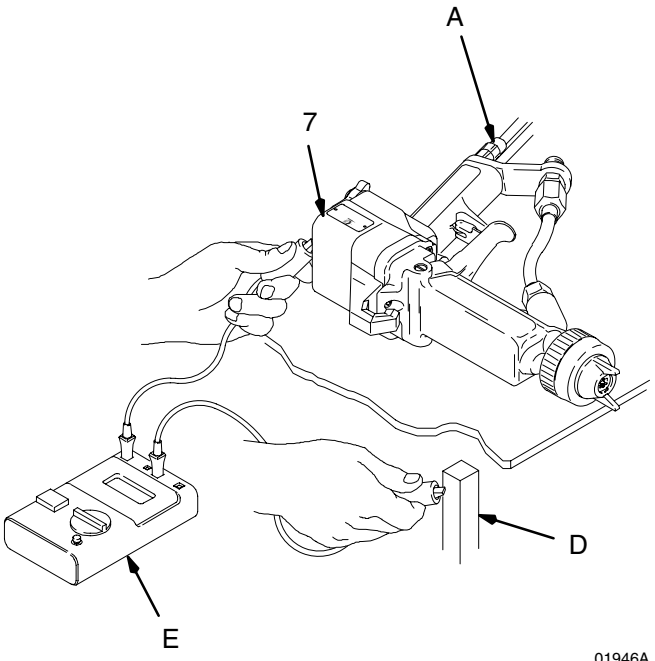


Fig. 3D–E

4. Connect the gun exhaust tube.

Press the exhaust tube (56) onto the barbed adapter on the bottom of the gun handle. Secure the tube with the clamp (57) provided.

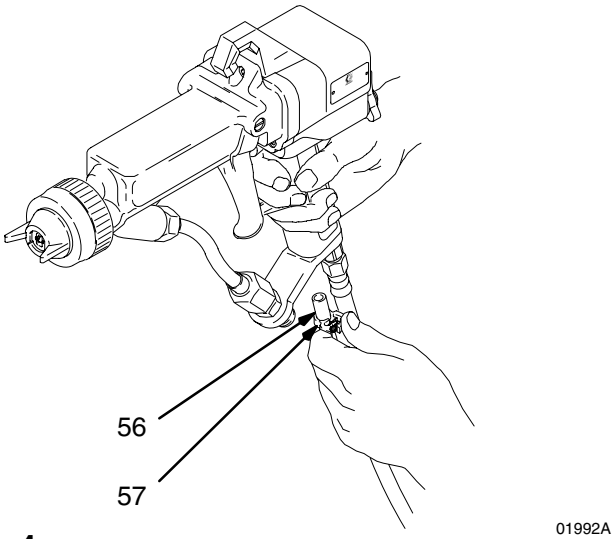


Fig. 4

Gun Setup

5. Connect the fluid hose.

A. Before connecting the fluid line, blow it out with air and flush it with solvent. Use solvent which is compatible with the fluid to be sprayed.

B. Connect the static-free fluid hose (F) to the 1/4–18 npsm gun fluid fitting (10).

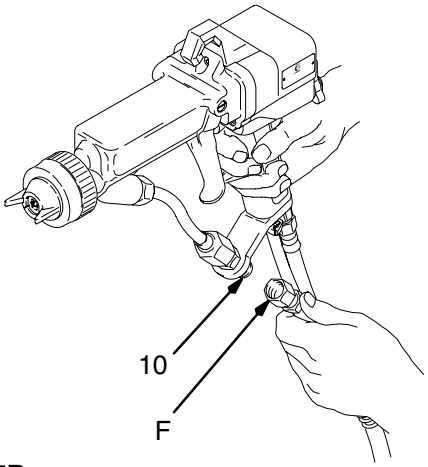


Fig. 5B

NOTE: The PRO AA4500 spray gun has a 100 mesh in-line fluid inlet filter. A 60 mesh filter is also available. See **Accessories**.

C. Connect the other end of the fluid hose (F) to a grounded, filtered, and regulated fluid line (G).

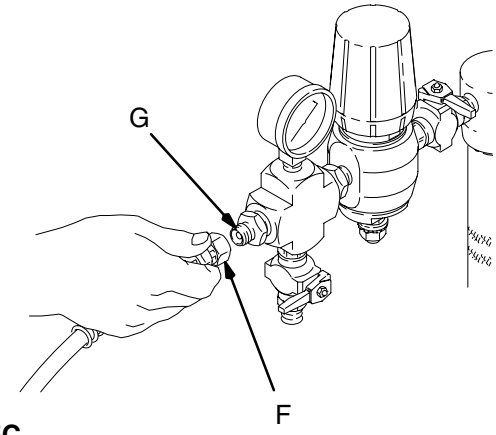


Fig. 5C

6. Flush the spray gun.

Before running any paint through the spray gun, make sure the trigger safety latch is in the locked position, and the ES ON-OFF lever is turned to OFF, then remove the spray tip. Flush the gun out with a solvent that is compatible with the fluid to be sprayed, using the lowest possible pressure.

7. Follow the Pressure Relief Procedure.

⚠ WARNING

INJECTION HAZARD
To reduce the risk of a fluid injection injury, always follow the **Pressure Relief Procedure** on page 10 *before* removing or installing the spray tip, pre-orifice air cap or tip guard.

8. Select a spray tip.

The fluid output and pattern width depend on the size of the spray tip, the fluid viscosity, and the fluid pressure. Use the Spray Tip Selection Chart on page 47, as a guide for selecting an appropriate spray tip for your application or consult your authorized Graco distributor. The orifice size of the spray tip is typically one or two sizes larger than the pre-orifice size selected below.

9. Select a pre-orifice

The fluid flow rate in UNICARB systems is controlled by the pre-orifice size, in conjuction with the fluid pressure. Use the pre-orifice selection chart on page 47 as a guide for selection.

Gun Setup

10. Install the pre-orifice

⚠ WARNING

To reduce the risk of a serious injury, including fluid injection, follow the **Pressure Relief Procedure** on page 10 when you stop spraying and whenever you are instructed to relieve the pressure.

A. Place the spray tip seal (9a) on a flat surface.

B. Note that the hole through the pre-orifice (9b) is larger on one side than the other.

C. Place the pre-orifice (9b), with its larger hole facing up, on top of the tip seal (9a) hole.

D. Use a large, flat object to press the pre-orifice (9b) into the tip seal (9a).

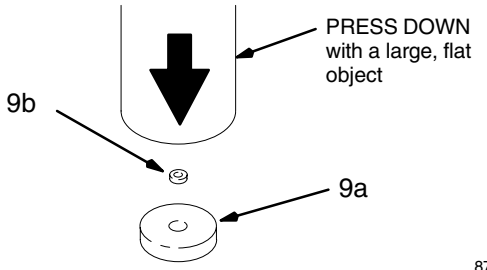


Fig. 10A–D

E. Turn over the tip seal and pre-orifice (9a, 9b) and insert them into the spray tip (9), wih the pre-orifice side facing down into the spray tip.

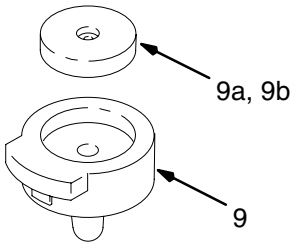


Fig. 10E

11. Install the spray tip

⚠ WARNING

To reduce the risk of a serious injury, including fluid injection, follow the **Pressure Relief Procedure** on page 10 when you stop spraying and whenever you are instructed to relieve the pressure.

A. Make sure there is no pressure in the system before removing or installing a spray tip. Relieve the system pressure.

B. Place the spray tip (9) in the air cap (1), aligning the tab of the tip with the groove in the air cap. Be careful not to bend the electrode wire (1a).

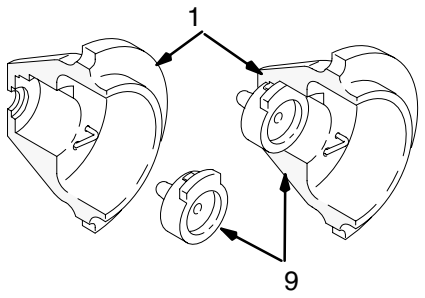


Fig. 11B

C. Install the spray tip (9) and air cap (1), tip guard (2), and retaining nut (8) onto the gun; tighten the retaining nut firmly.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

To reduce the risk of fire, explosion, and electric shock, never operate the spray gun with a bent, damaged or missing electrode (1a).

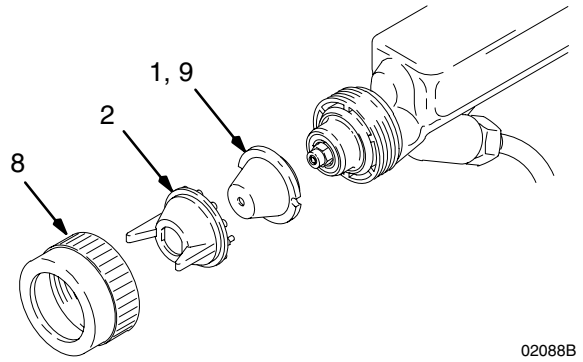


Fig. 11C

Gun Setup

12. Set the air pressure.

A. Atomizing air is not used in the UNICARB process. Close the air control valve (43) by turning it fully clockwise.

B. Turn the ES ON-OFF lever (26) to ON.

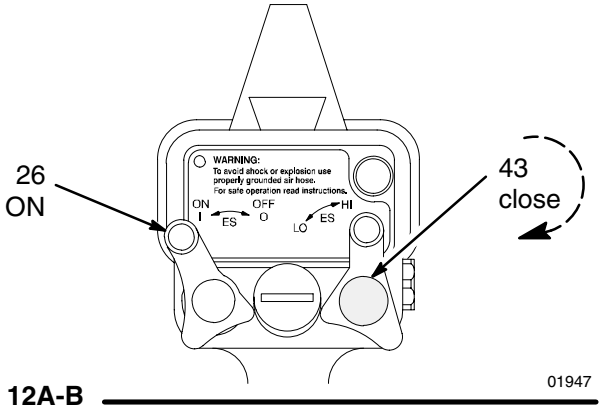


Fig. 12A-B

C. Make sure the fluid supply is shut off.

D. Trigger the gun and adjust the air pressure with the gun air regulator (H); use the **Recommended Air Hose Inlet Pressure** chart, below, as a guide.

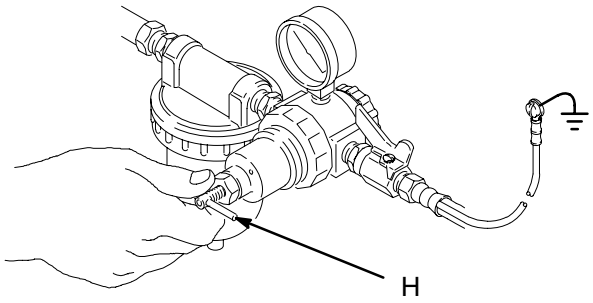


Fig. 12D

Recommended Air Hose Inlet Pressure

Air Hose Length	Recommended Air Hose Inlet Pressure
6 ft ((1.8 m)	40 psi (2.8 bar)
15 ft (5 m)	43 psi (3.0 bar)
25 ft (8 m)	45 psi (3.1 bar)
36 ft (11 m)	47 psi (3.2 bar)
50 ft (15 m)	50 psi (3.5 bar)
75 ft (23 m)	55 psi (3.8 bar)
100 ft (30.5 m)	60 psi (4.1 bar)

NOTE: Using higher than recommended air pressures can reduce the life of the turbine/alternator. Lower pressures can be used but may reduce electrostatic wrap.

E. Check the voltage output of the gun using a high voltage probe and meter.

NOTE: The gun's normal high voltage reading is 60 to 70 KV. If a ball end high voltage probe is used, the gun voltage will rise to about 85 KV. This will happen with all resistive electrostatic guns.

Gun Setup

13. Setting the Atomization Fluid Pressure

Atomization fluid pressure will vary based on the type of fluid used, the flow rate desired, the fluid temperature, and the percentage of CO^2 used. Follow the recommendations of your material and equipment supplier.

14. Using the Electrostatics

Turn the ES ON-OFF lever (26) to ON. This will activate the electrostatics.

Some objects with deep crevices or internal features may be painted more efficiently with the electrostatics turned off or in the LO setting (see 15 below). Be sure to turn off the electrostatics any time you are flushing the gun (see page 18).

NOTE: When spraying, the ES indicator light (K) will glow, indicating the electrostatic charge.

15. Use the ES HI-LO lever (43g) to change to either full voltage (HI) or a lower voltage level (LO).

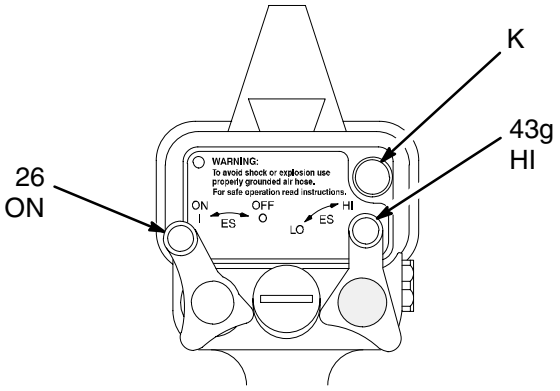


Fig. 14-15 01947

The LO setting is factory set to 60 kV. This setting can be adjusted between 45 and 80 kV. See page 35 to adjust.

Daily Gun Care, Flushing, and Cleaning

⚠ WARNING

INJECTION HAZARD
To reduce the risk of serious injury, including fluid injection, splashing in the eyes or on the skin or electric shock, always follow the **Pressure Relief Procedure Warning** on page 10 when shutting off the system, when you stop spraying and before checking, servicing, installing, cleaning or changing any part in the system.

⚠ CAUTION

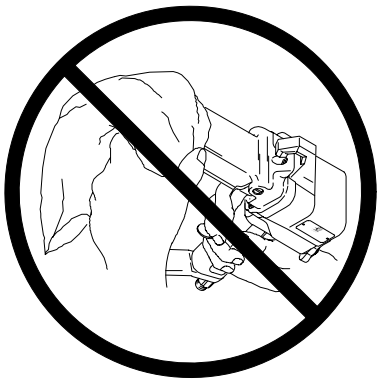
Clean all parts with a non-conductive solvent, compatible with the fluid being sprayed. Conductive solvents can cause the gun to malfunction.

Methylene chloride is not recommended as a flushing or cleaning solvent with this gun as it will damage nylon components.

⚠ CAUTION

Solvent left in gun passages could result in a poor quality paint finish and may draw current and reduce the electrostatic effect. Solvent in the power supply cavity can reduce the alternator life. Do not use any cleaning method which may allow solvent into the gun air passages.

Do not point the gun up while cleaning it.



02028

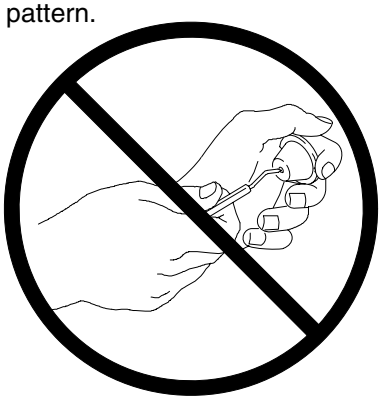
Do not wipe the gun with a cloth soaked in solvent; ring out the excess.

02027

Do not immerse the gun in solvent.

02000

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.



02001A

Daily Gun Care, Flushing, and Cleaning

General System Maintenance

1. Clean the fluid and air line filters daily.
2. Check all of the work hangers for material build-up; clean them if necessary.
3. Check for any fluid leakage from the gun and fluid hoses. Tighten fittings or replace equipment as needed.
4. Flush the gun before changing colors and whenever you are done operating the gun.

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of fire, explosion, or electric shock, be sure the ES ON-OFF lever is turned to OFF before flushing the gun.

1. Follow the Pressure Relief Procedure Warning on page 10.

2. Make sure the ES ON-OFF lever is turned to OFF and the trigger safety latch is locked before proceeding.

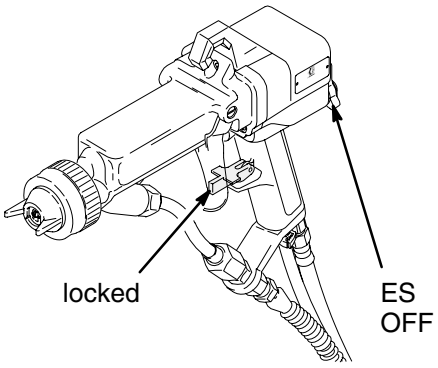


Fig. 2 02002A

3. Pointing the gun down, unscrew and remove the retaining nut (8), tip guard (2), air cap (1) and fluid tip (9).

You may have to turn the air cap with the tip guard to remove the air cap from the gun. Set these parts aside.

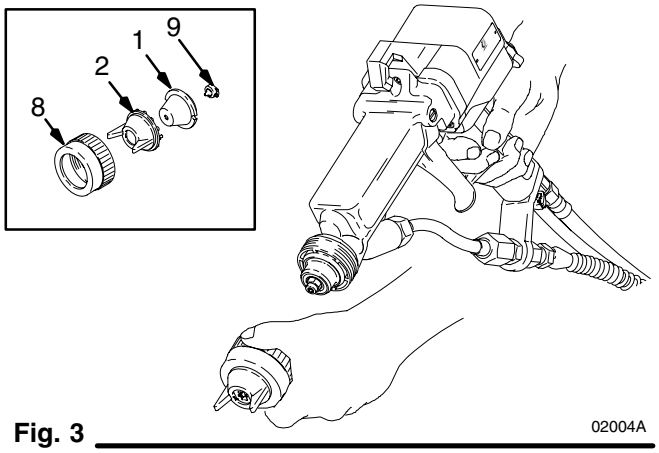


Fig. 3 02004A

4. Make sure the air and coating supply is turned off. Turn on the solvent supply.

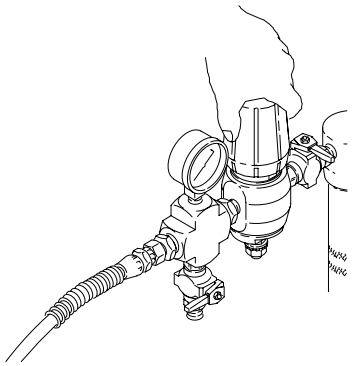


Fig. 4 01999A

5. Flush the Spray Gun.

Unlock the trigger safety latch, point the gun down into a grounded metal container, and flush the gun with solvent until it is clean. Use the lowest possible fluid pressure when flushing.

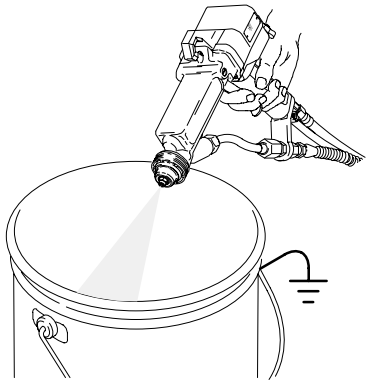


Fig. 5 02005A

Daily Gun Care, Flushing, and Cleaning

6. **Lock the trigger safety latch and turn off the solvent supply.**

7. **Follow the Pressure Relief Procedure Warning on page 10.**

8. **Make sure the trigger safety latch is locked, then disconnect the solvent (F) and air (A) supply hoses from the gun.**

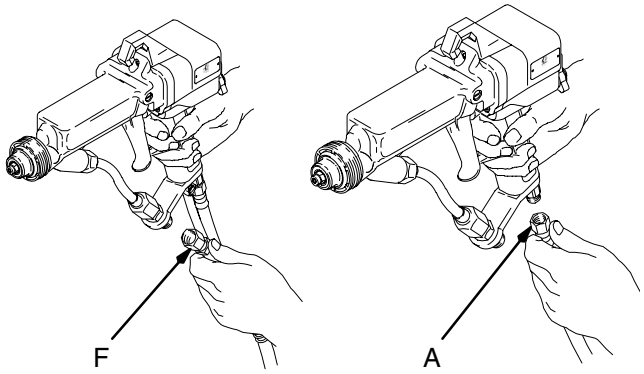


Fig. 8

9. **Unlock the trigger safety latch and trigger the gun into a grounded metal container (L) to drain the fluid tube.**

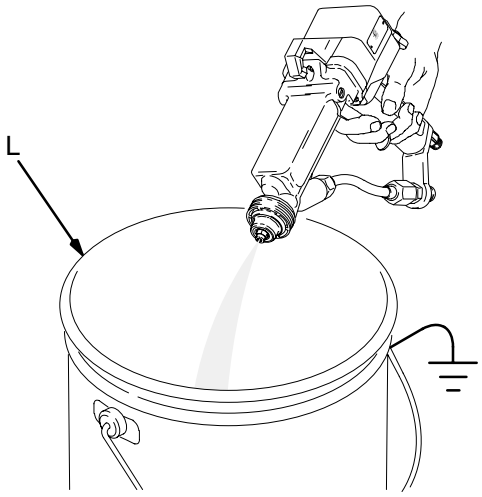


Fig. 9

10. **Lock the trigger safety latch.**

11. **Dip the end of a soft-bristle brush into a compatible solvent. Then point the gun down and clean the front with the brush and solvent.**

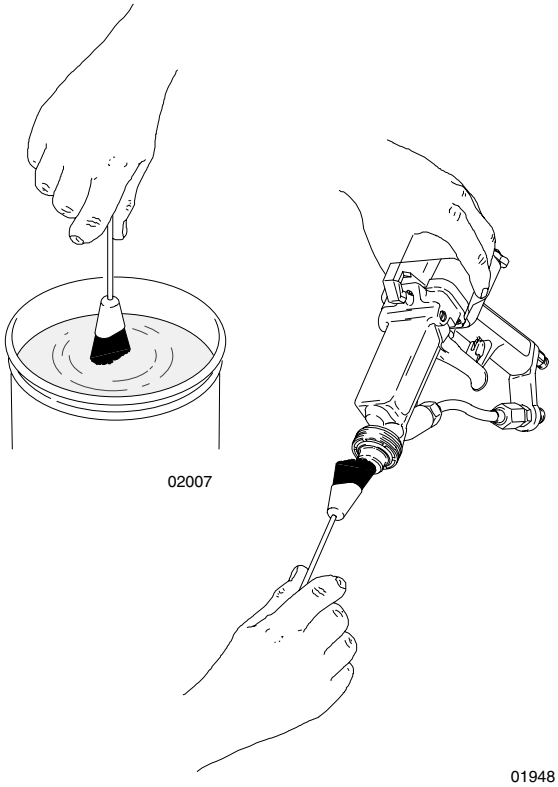


Fig. 11

12. **Dampen a soft cloth with solvent and wring-out the excess. Point the gun down and wipe off the outside.**

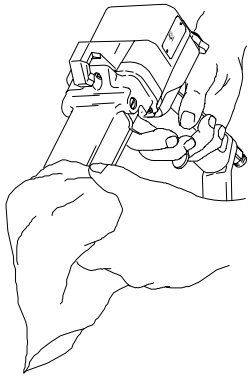
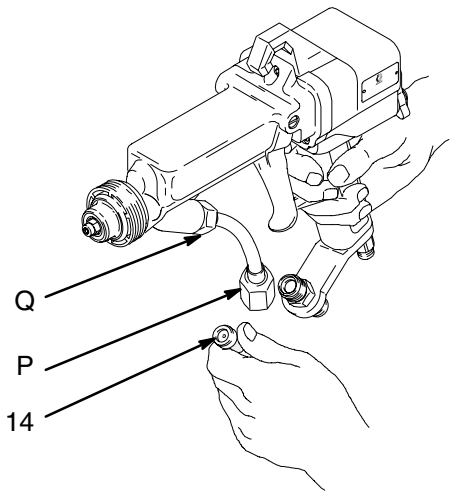


Fig. 12

Daily Gun Care, Flushing, and Cleaning

13. Remove the bottom fluid tube fitting (P) and filter (14). Clean the filter in a compatible solvent.

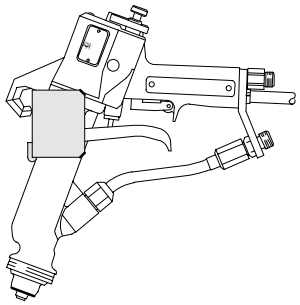
14. Reinstall the filter and fitting. Do not over-tighten and make sure the top fluid tube fitting (Q) remains tightened.



02009

Fig. 13–14

15. Hang up the gun.

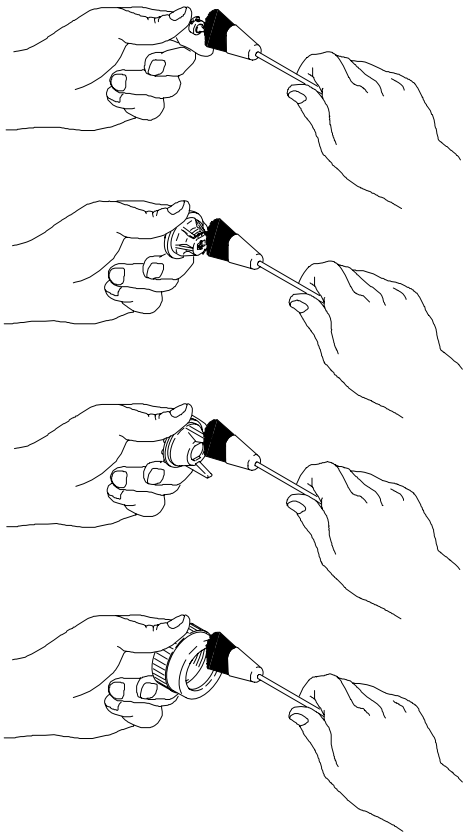


02010A

Fig. 15

16. Clean the retaining nut, tip guard, air cap and fluid tip with a soft brush daily, minimum.

Clean the parts with a soft brush and replace them if they are damaged. Be careful not to bend, damage, or disengage the electrode wire.



02011

Fig. 16

17. Wipe off the parts with a dry cloth. Be careful not to bend the electrode wire.

18. Check the electrode wire. Replace it if it is bent or damaged. See page 30.

⚠ CAUTION

Always hang the gun with its nozzle pointing down to avoid having solvent run into the gun air passages. Solvent in the gun air passages can cause poor atomization and excessive current demands and can damage the gun.

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock or explosion, never operate the spray gun with a bent, damaged or missing electrode.

Daily Gun Care, Flushing, and Cleaning

19. Place the spray tip (9) in the air cap (1).

Align the tab of the tip with the groove in the air cap. Be careful not to bend the electrode wire.

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of electric shock or explosion, never operate the spray gun with a bent, damaged or missing electrode.

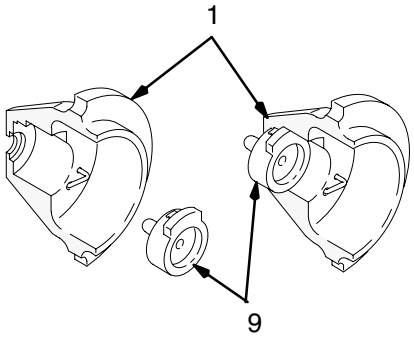


Fig. 19

20. Install the spray tip (9) and air cap (1), tip guard (2), and retaining nut (8). Tighten the retaining nut firmly.

⚠ CAUTION

To avoid damaging the tip guard (2), orientate the air cap (1) before tightening the retaining nut (8). Do not turn the air cap when the retaining nut is tight.

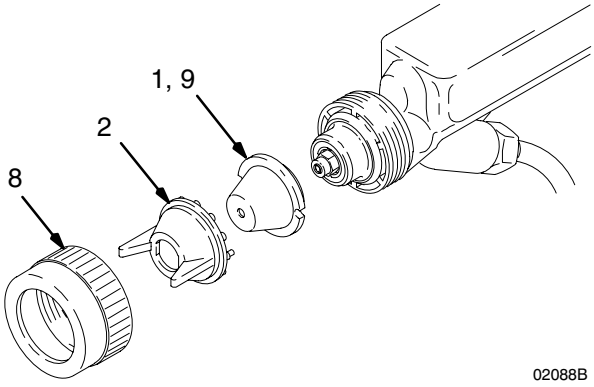


Fig. 20

21. Hang up the gun until it is used again.

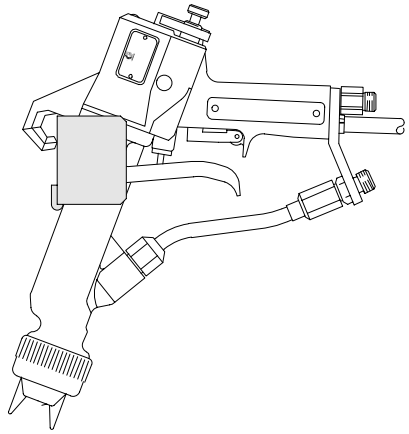


Fig. 21

⚠ CAUTION

Always hang the gun with its nozzle pointing down to avoid having solvent run into the gun air passages. Solvent in the gun air passages can cause poor atomization and excessive current demands and can damage the gun.

Spray Pattern Troubleshooting

⚠ WARNING

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious 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 injury, including fluid injection, splashing fluid or solvent in the eyes or on the skin, or electric shock, always follow the **Pressure Relief Procedure** on page 10 before checking, adjusting, cleaning or repairing the gun or any part of the system.

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

NOTE: Some spray pattern problems are caused by the improper balance between air and fluid.

PROBLEM: IMPROPER SPRAY PATTERN	CAUSE	SOLUTION
Fluttering or spitting spray	The fluid pressure or fluid supply is insufficient. There is air in the fluid supply line. The CO^2 percentage is fluctuating or is too high. The fluid temperature is fluctuating.	Adjust the flluid/CO^2 supply system. Check; tighten the siphon hose connections; bleed the air from the fluid line. Check fluid/CO^2 supply system. Check temperature control system
Irregular pattern	There is fluid buildup on the spray tip or the spray tip or pre-orifice is partially plugged. The spray tip or pre-orifice is damaged or worn.	Clean the spray tip and pre-orifice; see page 20. Replace the damaged or worn part; see page 29.
Tails in pattern	The CO^2 percentage is too low. The fluid pressure is too low. The temperature is too low	Increase the CO^2 percentage. Increase the fluid pressure with the gun fluid regulator.* Increase fluid temperature.
Excessive paint buildup on the air cap and tip guard	The fluid pressure is too low.	Increase the fluid pressure with the gun fluid regulator.*

** Use the least fluid pressure needed for good results.*

Gun Operation Troubleshooting

PROBLEM	CAUSE	SOLUTION
Leakage from fluid needle area	Fluid needle packings loose	Tighten packing nut; See page 33
	Fluid needle packing damaged	Replace fluid needle; See page 34
Air leakage from front of gun	Air valve not turned off	Turn off air (43). See page 15
	Piston air valve not seating properly	Clean, Service; See page 39
Fluid leakage from front of gun	Fluid needle worn	Replace fluid needle; See page 34
	Fluid seat loose or worn	Tighten or replace fluid seat
	Spray tip loose	Tighten retaining nut
	Tip seal damaged	Replace tip seal; See page 29
"Orange Peel" finish	CO^2 percentage is too low	Increase CO^2 percentage
	Fluid pressure too low	Increase fluid pressure with gun fluid regulator*
	Spray tip or pre-orifice too large	Use a smaller size spray tip or pre-orifice; See page 47
	Fluid poorly mixed or filtered	Remix or refilter fluid
	Improper thinner being used	Use proper thinner
Excessive spray fog	Fluid thinned too much	Properly thin fluid
No fluid sprays from gun	Fluid supply low	Check; Add fluid if necessary
	Spray tip or pre-orifice is dirty or clogged	Clean spray tip and pre-orifice; See page 20
	Spray tip damaged	Check; Replace spray tip; See page 29
	Fluid needle damaged	Replace fluid needle; See page 34
Equipment covered with fluid	Booth exhaust air flow too low or not directed properly	Check for proper CFM; Check baffles and direction of air flow
	Improper distance between gun and workpiece	Adjust spraying distance to 8 to 12 inches (203 to 305 mm)
Paint build-up on air cap	CO^2 percentage too high	Reduce CO^2 percentage
	Air cap dirty	Clean air cap; See page 20
Fluid doesn't shut off properly	Seat housing over-tightened	Replace seat housing; See page 29
	Fluid leakage buildup on fluid needle	Replace fluid needle; See page 34
	Fluid packings too tight	Adjust fluid packings; See page 34

** Use the least fluid pressure needed for good results.*

Electrical Troubleshooting

NOTE: Additional gun troubleshooting can be done on Gun Part No. 236031 using the Remote Spraying Voltage Read-out (*SVR™*). See **Accessories** to order the SVR.

PROBLEM	CAUSE	SOLUTION
Reduced fluid efficiency	Improper distance between gun and work-piece	Adjust spraying distance to 8 to 12 inches (203 to 305 mm)
	Parts poorly grounded	Clean hangers; Check for proper ground on conveyer or track
	High booth exhaust velocity	Reduce exhaust velocity within code limits
	Fluid pressure too high	Reduce fluid pressure at fluid supply
	Improper fluid viscosity	Check supplier for proper fluid for electro-static spray
	Fluid resistivity too low	Check fluid resistivity with paint meter and probe
	No or low voltage output	Check possible causes listed below
	Turbine alternator not operating	Check air supply to turbine inlet; See page 15
	Faulty gun resistance	Check gun resistance; See page 25
	Fluid leaks from needle packing and causes short	Clean needle cavity; Replace fluid needle; See page 34
	Faulty turbine alternator	Be sure plug is in place on back of turbine alternator housing; Remove and test turbine alternator; See page 36
	kV switch stuck on low	Check switch actuation; replace if needed
Operator gets shock	Operator not properly grounded or is near an ungrounded object	Be sure floor is properly grounded; Wear shoes with conductive soles or 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
	Gun not properly grounded	See **Check the Electrical Grounding**, page 12
Operator gets shock when touching workpiece	Workpiece not properly grounded.	Clean workpiece hangers; Check for proper ground on conveyor or track
No or low voltage output reading on gun display module	Damaged fiber optic cable or connection	Check cables and connections; replace if damaged
		See other causes under **Problem** – **Reduced fluid efficiency**, above

NOTE: If using an ES Display Module, see its instruction manual, No. 308265, for further troubleshooting.

Electrical Tests

The performance and safety of the spray gun are 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 (18) and the barrel resistor cartridge as well as the continuity of the electrical path between the components.

⚠ CAUTION

The barrel resistor cartridge is part of the barrel and is not replaceable. To avoid destroying the gun barrel, do not attempt to remove the barrel resistor cartridge.

Use megohmmeter P/N 218979 (A) and an applied voltage of 500 volts to complete these electrical tests. Connect the leads as shown.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Megohmmeter P/N 218979 (A-see Fig. 4) is not approved for use in a hazardous area. To reduce the risk of sparking, do not use the megohmmeter to do the electrical tests unless:

- The gun has been removed from the hazardous area;
- Or all spraying devices in the hazardous area are turned off, ventilation fans in the hazardous area are operating, and there are no flammable vapors in the area (such as open solvent containers or fumes from spraying).

Failure to follow this warning could cause fire, explosion, electric shock and result in serious injury and property damage.

Test Gun Resistance (See Fig. 4)

NOTE: The fluid passage must be flushed and dried to get an accurate reading.

Measure the resistance between the end of the electrode (1a) and the air fitting (17). The resistance should be between 329 to 401 megohms. If the resistance is outside the specified range, go to the next test. If the resistance is correct, refer to **Electrical Troubleshooting** on page 24 for other possible causes of poor performance.

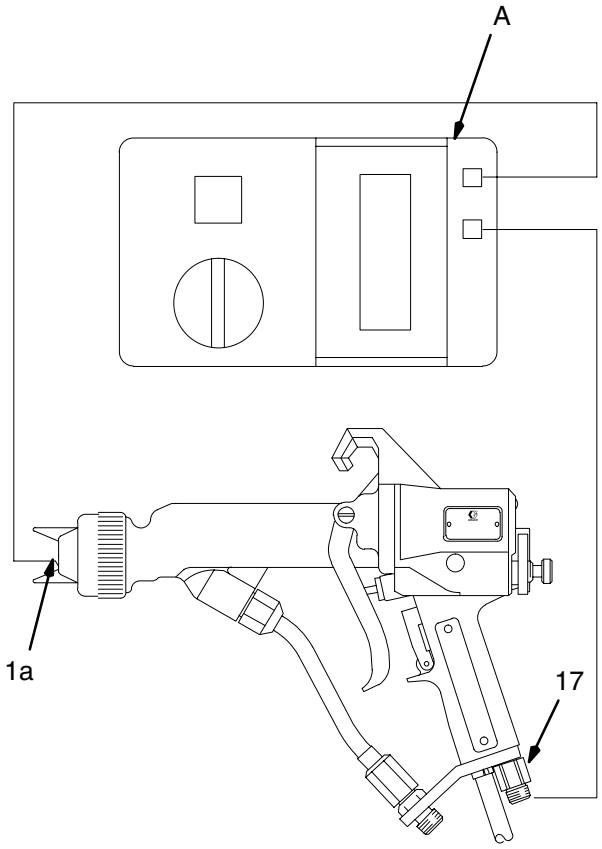


Fig. 4

Electrical Tests

Test Power Supply Resistance (See Fig. 5)

Remove the power supply (18) from the gun. See page 35.

Measure the resistance from the power supply's ground contact point (EE) to the contact inside of the power supply seal (18e) *[the conductive rubber contact may be slightly recessed into the seal]*. See Fig. 5.

The resistance should be 297 to 363 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 **Electrical Troubleshooting** for other possible causes of poor performance, or contact the nearest authorized service agency.

NOTE: Be sure the seal (18e) is in place on the end of the power supply before installing the power supply back into the gun.

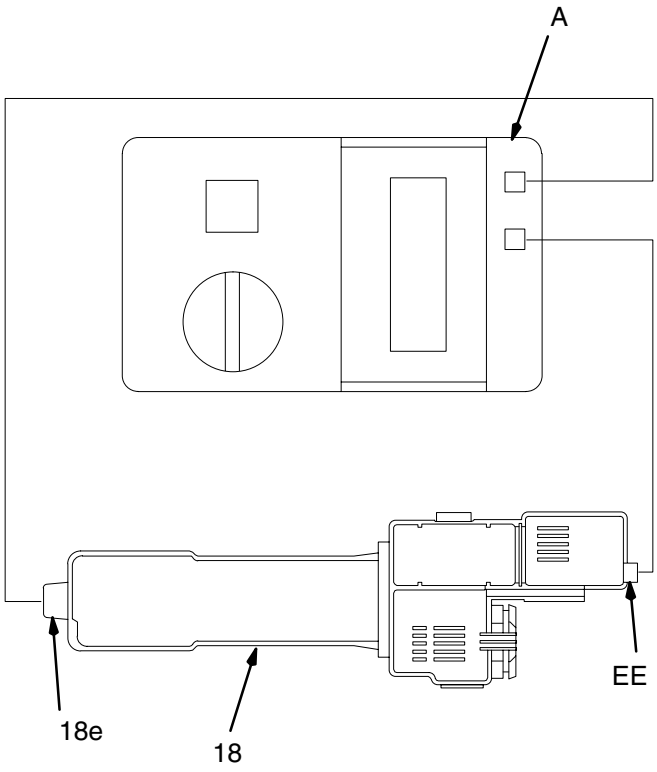


Fig. 5

Electrical Tests

Test Barrel Resistance (See Fig. 6)

Measure the resistance between the barrel contact ring (3a) and the metal contact pin (E), using a metal rod (D) and megohmmeter as shown in Fig. 6. Be careful not to damage or scratch the inner surfaces of the barrel with the metal rod.

The resistance should be 19 to 29 megohms. If the resistance is incorrect, make sure the metal contact pin (E) and the barrel contact ring (3a) are clean.

If the resistance is still outside the specified range:

1. Remove the barrel contact ring (3a) with a small pick. There is a wire lead in the groove that the contact ring was removed from.

2. With the metal rod (D) still inside the barrel as shown in Fig. 6, measure the resistance between the wire lead and the metal rod.

3. If the resistance is still outside the specified range, the gun barrel needs to be replaced.

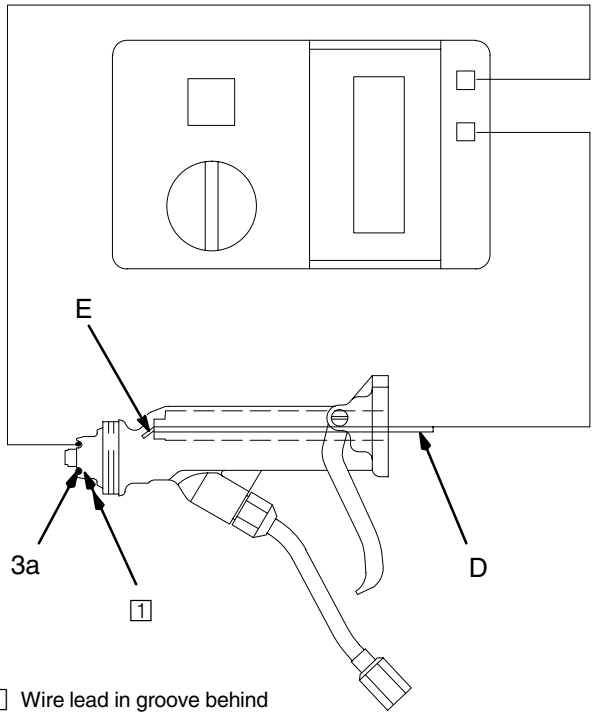
   If the resistance is correct, install a new contact ring (3a) and press it firmly into the groove on the front of the barrel.

   Be sure the contact ring is in place before operating the gun.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

The barrel contact ring (3a) is a conductive contact ring, **not** a sealing o-ring. To reduce the risk of sparking or electric shock, **do not** remove the barrel contact ring from the barrel except to replace it and never operate the gun without the contact ring in place. Do not replace the contact ring with anything but a genuine Graco part.



[1] Wire lead in groove behind contact ring

01957

Fig. 6

Service

Prepare the Gun for Service

⚠ WARNING

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

⚠ WARNING

INJECTION HAZARD
To reduce the risk of serious injury, including fluid injection, splashing in the eyes or on the skin or electric shock, always follow the **Pressure Relief Procedure Warning** on page 10 before checking or servicing any part in the system and whenever you are instructed to relieve the pressure.

NOTE:

- Check all possible remedies in **Troubleshooting** before disassembling the gun.
- If the plastic parts of the gun must be held securely, always clamp them in padded vice jaws to prevent damage to the parts.
- Lightly lubricate o-rings and seals with petroleum jelly. Do not over-lubricate.
- Only use genuine Graco parts. Do not mix or use parts from other PRO Gun models. Note that the air cap, spray tip, and tip guard for this gun are orange.

⚠ WARNING

Some PRO AA4500 Gun replacement parts look similar to other PRO Gun parts but are not interchangeable! **When servicing, do not mix or use other PRO Gun parts that may look similar, but have different part numbers!** Use of parts other than those specified in the PRO AA4500 Gun parts list on page 43 could alter the grounding continuity of the gun, cause parts to leak or rupture, or cause the gun to malfunction and result in serious injury, fire, explosion or property damage.

1. Flush the gun as instructed on page 18.
2. Relieve the pressure.
3. Disconnect the air and fluid lines from the gun.
4. Remove the spray gun from the worksite for service or repair. Service or repair area must be clean.

Tools Needed

- 2 mm Driver *(included with gun)*
- 4 mm Driver *(included with gun)*
- 9 mm Driver *(included with gun)*
- Adjustable Wrench
- Medium Screw Driver
- Snap Ring Pliers
- Needle Nose Pliers

Service

Pre-Orifice, Tip Guard, Air Cap, Spray Tip, or Seat Housing Replacement

1. Prepare the gun for service as instructed on page 28.

2. Remove the retaining nut (8), tip guard, (2), air cap (1), and spray tip (9). See Fig. 7. You may have to turn the air cap with the tip guard to remove the air cap from the gun.

3. Replace the tip gasket (9a) if damaged.

4. Trigger the gun and remove the seat housing (21) with the 9 mm driver (64), supplied. See Fig. 8.

⚠ CAUTION

The barrel resistor cartridge (B) is part of the barrel and is not replaceable. To avoid destroying the gun barrel, do not attempt to remove the barrel resistor cartridge.

⚠ WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

The barrel contact ring (3a) is a conductive contact ring, **not** a sealing o-ring. To reduce the risk of sparking or electric shock, **do not** remove the barrel contact ring from the barrel except to replace it and never operate the gun without the contact ring in place. Do not replace the contact ring with anything but a genuine Graco part.

5. Trigger the gun and install the seat housing (21) with the 9 mm driver (64). Tighten the seat housing until it's snug and then tighten it 1/4 turn more.

⚠ CAUTION

To avoid damaging the seat housing and gun barrel, never over-tighten the seat housing. Over-tightening may result in improper fluid shut-off.

6. Assemble the spray tip (9), air cap (1), and tip guard (2). Then install them on the gun, securing them with the retaining nut (8). Tighten the retaining nut firmly.

⚠ CAUTION

To avoid damaging the tip guard (2), orientate the air cap (1) before tightening the retaining nut (8). Do not turn the air cap when the retaining nut is tight.

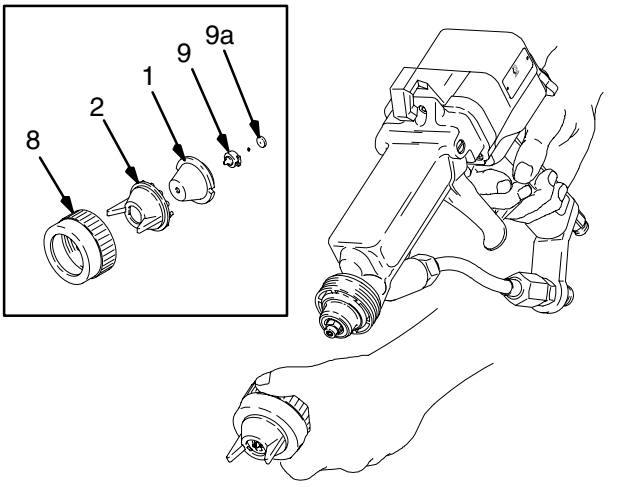
7. Make sure the electrode is not bent, damaged or missing from the air cap.

⚠ WARNING

ELECTRIC SHOCK HAZARD

To reduce the risk of electric shock or explosion, never operate the spray gun with a bent, damaged or missing electrode.

8. Test the gun resistance as instructed on page 25.



02004A

Fig. 7

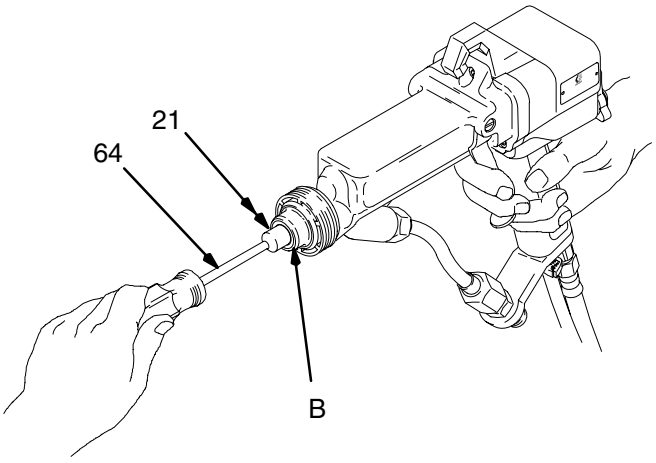


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Fig. 8

Service

Electrode Replacement

⚠ WARNING

ELECTRIC SHOCK HAZARD
To reduce the risk of fire, explosion, or electric shock, do not operate the spray gun without the electrode installed in the air cap.

1. Prepare the gun for service as instructed on page 28.

2. Remove the retaining nut (8), tip guard, (2), air cap (1) and spray tip (9). See Fig. 7. You may have to turn the air cap with the tip guard to remove the air cap from the gun.

3. Pull the electrode (1a) out of the backside of the air cap with a needle nose pliers.

4. Push the new electrode through the air cap hole. Place firm finger pressure on the electrode wire (1a) on the backside of the air cap, and make sure the short end (BB) of the electrode engages into the hole (CC) as shown in Fig. 9.

5. Assemble the spray tip, air cap, and tip guard. Then install them on the gun, securing them with the retaining nut. Tighten the retaining nut firmly.

6. Test the gun resistance as instructed on page 25.

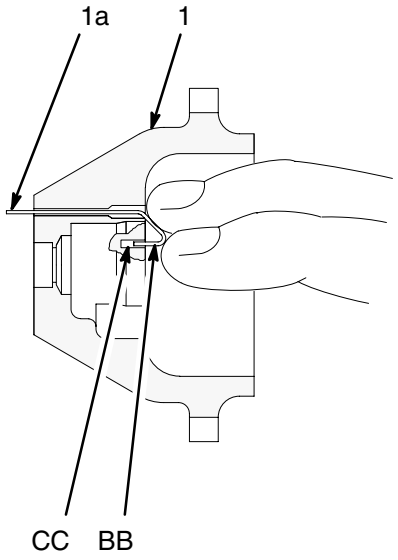

Fig. 9

Service

Fluid Tube Removal & Replacement

To remove the fluid tube assembly (12) for cleaning or replacement:

1. Prepare the gun for service as instructed on page 28.

2. Disconnect the bottom fluid tube nut (C). See Fig. 10.

3. Carefully unscrew the top fluid tube nut (D).

⚠ CAUTION

Be careful not to damage the fluid tube assembly (12) when cleaning or installing it, especially the sealing surface (E). See Fig. 11. If the sealing surface is damaged, the entire fluid tube assembly must be replaced.

4. Apply grease, part no. 217115, to the entire length of the plastic extension on the end of the fluid tube (12). See **Accessories** to order the grease.

5. Apply a low strength thread sealer (such as purple Loctite®) to the fluid tube nut (D) threads.

6. Install the fluid tube into the gun barrel by tightening the top fluid tube nut (D) hand-tight, then turn it 1/4 to 1/2 turn with a wrench. There will be a gap between the nut and barrel. Do not over-tighten it.

7. Make sure the fluid filter (14) is in place in the fluid fitting (10). Then tighten the bottom fluid tube nut (C) onto the fluid fitting; make sure the top fluid tube nut (D) remains tightened.

Fluid Filter Removal

1. Prepare the gun for service as instructed on page 28.

2. Disconnect the bottom fluid tube nut (C). See Fig. 10.

3. Remove the fluid filter (14) from the fluid fitting (10). Clean or replace the filter, as needed.

4. Install the fluid filter back into the fluid fitting (10) and tighten the bottom fluid tube nut (C) onto the fluid fitting; make sure the top fluid tube nut (D) remains tightened.

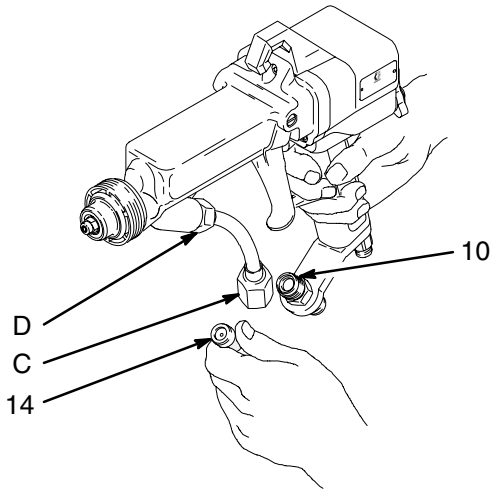

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Fig. 10

[1] Apply grease 217115
[2] Apply low strength thread sealer

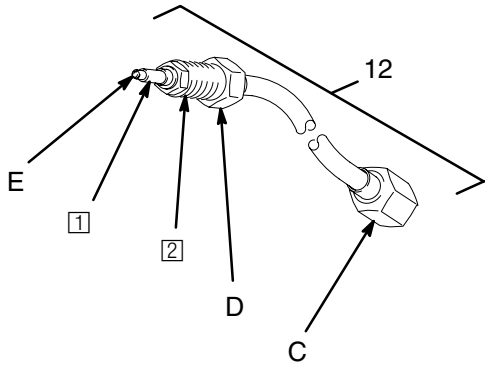

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Fig. 11

Service

Barrel Removal

1. Prepare the gun for service as instructed on page 28.
2. Disconnect the bottom fluid tube nut (C). See Fig. 12.

NOTE: *2-finger trigger guns only*
It should not be necessary to remove the fluid fitting (10) from the bracket. If you must remove it, remove the two setscrews in the bracket that hold it in place. Apply a low strength (purple) Loctite® to setscrews before re-installing them.

3. Loosen the three cap screws (5), using the 4 mm driver (55), supplied.
4. Hold the gun handle (7) with one hand and pull the barrel (3) straight away from the handle to remove it. See Fig. 13.

⚠ CAUTION

To avoid damaging the power supply (18), 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.

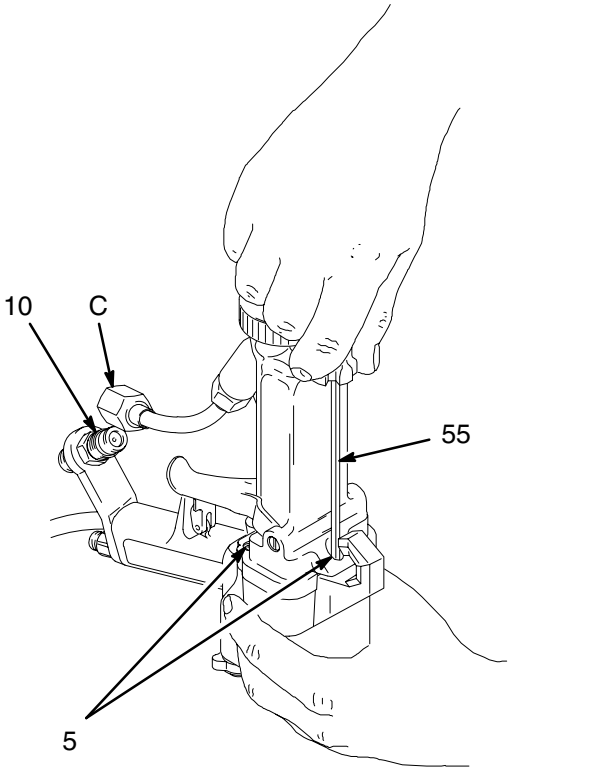


Fig. 12

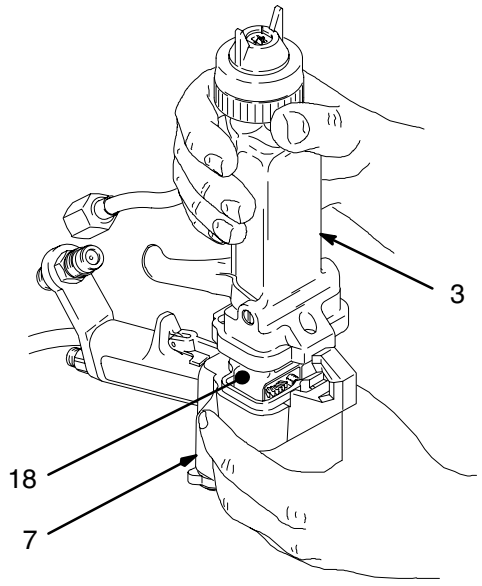


Fig. 13

Fluid Packing Adjustment

If fluid leaks from the fluid needle area, the fluid packings may be loose. Tighten the packings, following the procedure below.

1. Prepare the gun for service as instructed on page 28.
2. Remove the retaining nut (8), tip guard, (2), air cap (1), and spray tip (9). See Fig. 7, page 29. You may have to turn the air cap with the tip guard to remove the air cap from the gun.
3. Trigger the gun and remove the seat housing (21) with the 9 mm driver (64), supplied. See Fig. 8, page 29.

NOTE: The seat housing (21) must be removed before adjusting the fluid packings.

4. Remove the barrel as instructed on page 32.
5. Place the 2 mm driver (58), supplied, in the back of the fluid needle assembly. Push the tool in and turn it clockwise, slightly, to tighten the packings. See Fig. 14.
6. Assemble the barrel as instructed on page 36.
7. Trigger the gun and install the seat housing (21) with the 9 mm driver (64). Tighten the seat housing until it's snug and then tighten it 1/8 turn more.

⚠ CAUTION

To avoid damaging the seat housing and gun barrel, never over-tighten the seat housing. Over-tightening may result in improper fluid shut-off.

8. Assemble the spray tip, air cap, and tip guard. Then install them on the gun, securing them with the retaining nut. Tighten the retaining nut firmly.
9. Test the gun resistance as instructed on page 25.

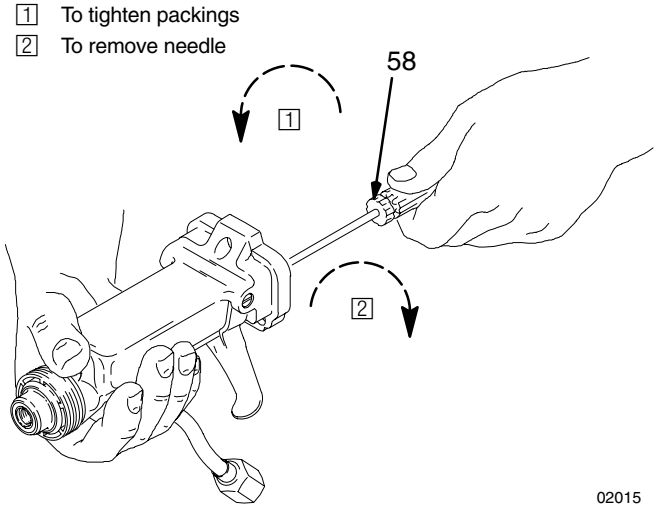


Fig. 14

Fluid Needle Assembly Removal

1. Prepare the gun for service as instructed on page 28.
2. Remove the retaining nut (8), tip guard, (2), air cap (1) and spray tip (9). See Fig. 7, page 29. You may have to turn the air cap with the tip guard to remove the air cap from the gun.
3. Trigger the gun and remove the seat housing (21) with the 9 mm driver (64). See Fig. 8, page 29.
4. Remove the barrel as instructed on page 32.
5. Remove the trigger screws (4) and trigger (13).
6. Place the 2 mm driver (58) in the back of the fluid needle assembly (28). See Fig. 14. Push the tool in and turn it counterclockwise about 12 full turns to unthread the needle.
7. Insert the 2 mm driver (58) into the front of the gun and push the fluid needle assembly (28) out the back of the gun body.

⚠ CAUTION

To avoid damaging the needle assembly, be sure the needle is completely unthreaded before pushing it out of the barrel.

8. Install the fluid needle assembly (28) into the gun barrel. See Fig. 15. Push in on the needle with the 2 mm driver (58) and tighten the assembly clockwise until just snug, then 1/4 to 1/2 turn tighter.
9. Install the trigger (13) and tighten the trigger screws (4).
10. Assemble the barrel as instructed on page 36.
11. Trigger the gun and install the seat housing (21) with the 9 mm driver (64). Tighten the seat housing until it's snug and then tighten it 1/8 turn more.

⚠ CAUTION

To avoid damaging the seat housing and gun barrel, never over-tighten the seat housing. Over-tightening may result in improper fluid shut-off.

12. Assemble the spray tip, air cap, and tip guard. Then install them on the gun, securing them with the retaining nut. Tighten the retaining nut firmly.
13. Test the gun resistance as instructed on page 25.

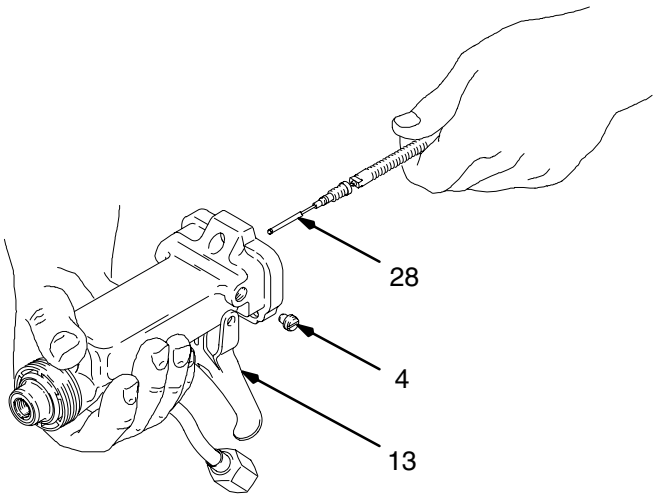


Fig. 15

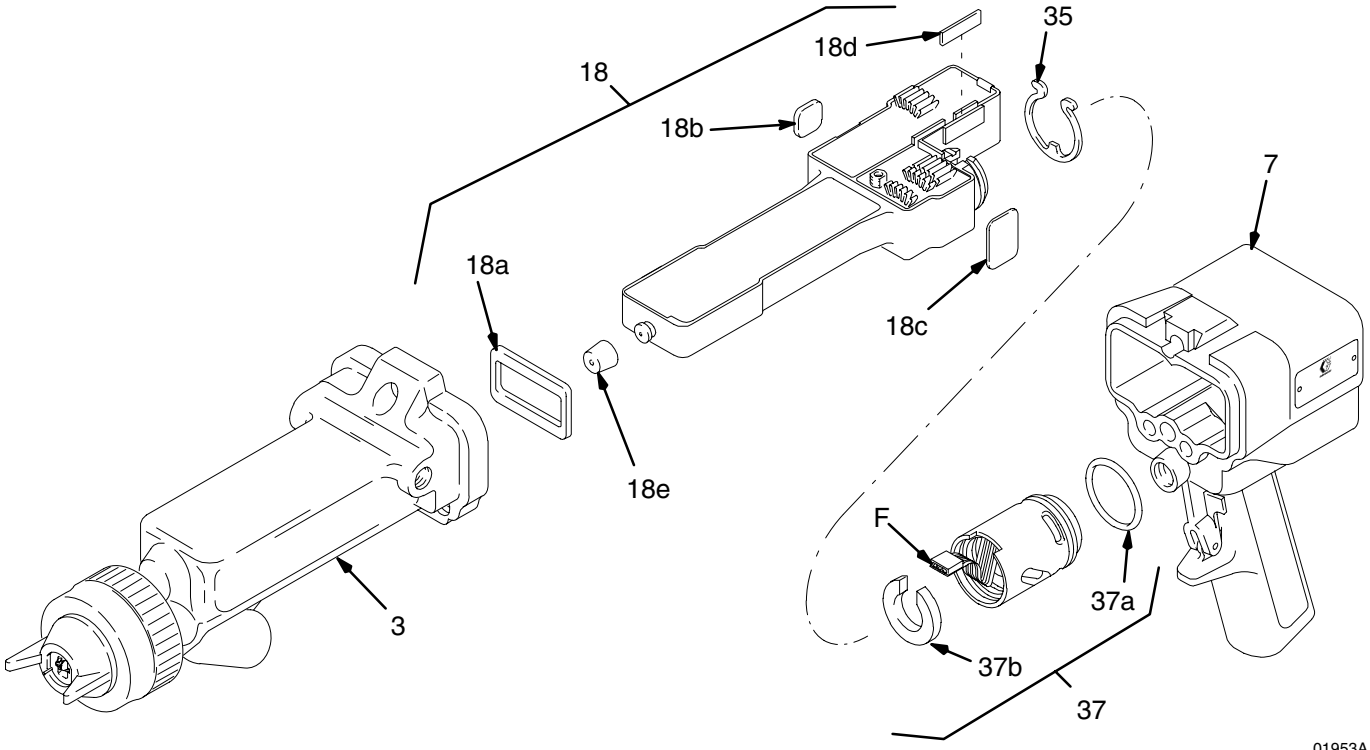


Fig. 16

Power Supply Removal and Replacement

NOTES:

a. To avoid a loss in electrostatic performance, inspect the gun handle's power supply cavity for dirt or moisture. Clean the cavity with a clean, dry rag.

b. Do not expose the seal (18e) or o-ring (37a) to solvents as it will damage them.

c. Be careful when handling the power supply to avoid damaging it.

1. Prepare the gun for service as instructed on page 28.

2. Remove the barrel as instructed on page 32.

3. Grasp the power supply (18) with your hand. With a gentle side to side motion, pull the power supply free from the gun handle (7), then pull it straight out.

4. Inspect the power supply for any physical damage. Check the electrical resistance as instructed on page 26. If needed, replace the power supply.

   Before installing the power supply, inspect the seal (18e) for any damage or swelling; replace if necessary. Also, make sure the gaskets/pads (18a–18d) are in place. See Fig. 16.

5. Lubricate the o-ring (37a) and insert the power supply in the gun handle.

6. Install the barrel on the handle as instructed on page 36.

7. Test the gun resistance as instructed on page 25.

Power Supply Adjustment

The KV HI/LO switch, on the back of the gun manifold, enables you to switch between full voltage and a lower voltage output. The lower voltage is factory set at 60 kV, but can be adjusted. Place the pin in either the 45 kV or 60 kV position.

Turbine Alternator Removal and Replacement

NOTE: Replace turbine bearings after 2000 hours of operation. See your authorized Graco representative.

1. Prepare the gun for service as instructed on page 28.
2. Remove the power supply from the gun handle as instructed on page 35.
3. Squeeze the two ends of the retaining ring (35) together and carefully pull the alternator (37) away from the power supply (18) until the 3-wire connector (F) disengages. See Fig. 16.
4. Use an ohmmeter to test the turbine alternator coil. Measure the resistance between the two outer terminals of the 3-wire connector (F). Resistance should be 3 to 5 ohms. If the reading varies from this value, replace the alternator.
5. Measure the resistance between each outer terminal of the 3-wire connector and the turbine alternator housing. The resistance should be infinite. If the resistance is not infinite, replace the alternator.
6. Connect the 3-wire connector to the 3 prongs in the power supply. Push the alternator (37) onto the power supply (18) until the retaining ring (35) engages with the alternator.
7. Install the power supply in the gun handle as instructed on page 35.

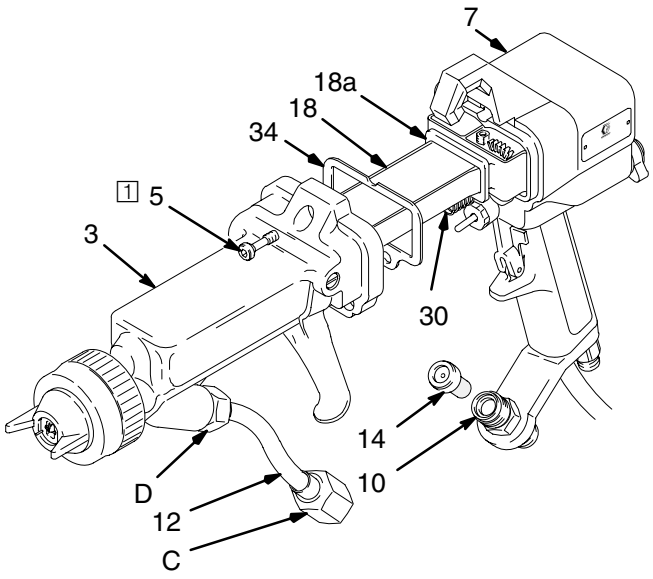
Barrel Installation

1. Be sure the gaskets (34 & 18a) and spring (30) are in place. See Fig. 17. Replace if damaged.
2. Place the barrel (3) over the power supply (18) and onto the gun handle (7). Make sure the fluid needle spring (30) is seated properly.
3. Pressing the barrel and handle together, tighten the three cap screws (5) oppositely and evenly with the 4 mm driver (55). Tighten the cap screws to 18 in-lbs (2 N•m) maximum (about a half turn past snug). Do not over-tighten.

⚠ CAUTION

To avoid damaging the gun, do not over-tighten the cap screws (5).

4. Make sure the fluid filter (14) is in place in the fluid fitting (10).
5. Tighten the bottom fluid tube nut (C) onto the fluid fitting (10); make sure the top fluid tube nut (D) remains tightened.
6. Test the gun resistance as instructed on page 25.



1 Tighten to 18 in-lbs (2 N•m) **maximum** (about half turn past snug), using wrench provided.

01952A

Fig. 17

ES ON-OFF Valve Repair

1. Prepare the gun for service as instructed on page 28.

2. Loosen the set screw (24) with the 2 mm hex key (63), supplied. Remove the lever (26) from the valve. See Fig. 18.

⚠ WARNING

MOVING PARTS HAZARD
To reduce the risk of eye injury, be sure to wear safety glasses when removing or installing the retaining ring (47) as the retaining ring could slip off the tool when compressed.

3. Use internal snap ring pliers to remove the retaining ring (47) from the handle. Align the holes in the retaining ring with the flat on the spacer (32) to ease assembly and disassembly.

4. Remove the valve body (38) from the handle; be careful not to drop the regulator disk (46) and spacer (32).

5. Clean and inspect the parts for damage. Replace if necessary. Lubricate the o-ring (36) with petroleum jelly.

⚠ CAUTION

Do not over-lubricate parts. Excessive lubricant on the o-ring (36) can be pushed into the gun air passage and blemish the finish on the workpiece.

6. Install the regulator disk (46) in the valve (38) with its bevelled side facing in toward the valve.

⚠ CAUTION

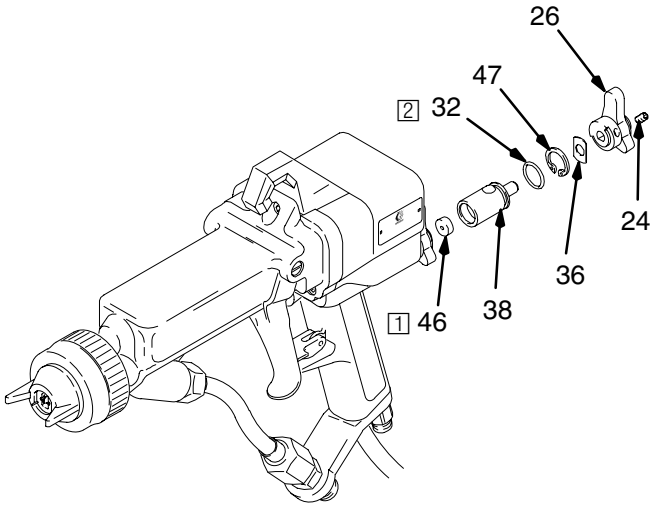
Be sure the regulator disk (46) is installed correctly. A missing or incorrectly installed regulator disc can cause severe damage to the turbine alternator.

7. Install the valve (38), with the regulator disc (46) and o-ring (36), into the gun handle as shown in Fig. 18. Install the spacer (32) on the valve.

8. Install the retaining ring (47) into the groove in the handle. Install the lever (26) and tighten the set screw (24).

⚠ WARNING

MOVING PARTS HAZARD
Make sure that the retaining ring (47) is engaged in the groove in the gun handle when installing the ES ON-OFF Valve. If the retaining ring is missing or improperly installed, the valve assembly can be propelled out of the gun when air pressure is applied and cause serious injury.



1 Bevelled side of disk (46) faces toward valve (38)
2 Lubricate o-rings with petroleum jelly

01955B

Fig. 18

Air Control Valve Repair

NOTE: The air control valve (43) can be replaced as an assembly or as individual parts.

To disassemble the air control valve,

1. Prepare the gun for service as instructed on page 28.
2. Remove the retaining ring (43h). See Fig. 19.
3. Slide the KV HI-LO lever (43g) up, place a wrench on the flats of the valve housing and remove the air control valve assembly (43).
4. Remove the retaining ring (43b).
5. Rotate the adjustment knob (43c) counterclockwise until it is disengaged from the valve housing threads (43d). Pull the adjustment knob out of the valve housing. The KV HI-LO lever (43g) and the wave spring (43f) can be removed if necessary.
6. Clean all the parts and inspect them for wear or damage.
7. Reassemble the air control valve (43). Lubricate the o-rings (43e) and the adjustment knob threads (43c) with petroleum jelly. Install the retaining ring (43h).
8. Apply low strength *(purple)* Loctite or equivalent thread sealant to the threads of the valve housing (43d) and install the air control valve assembly (43) into the gun handle.

   To start the valve housing (43d) threads into the handle, turn the adjustment knob (43c). Once the threads are started, turn the adjustment knob (43c) fully counterclockwise.

   Torque the valve housing into the gun handle to 10 to 12 in-lb (1.1 to 1.4 N•m).
9. Install the retaining ring (43h) back into the groove in the valve housing (43d).

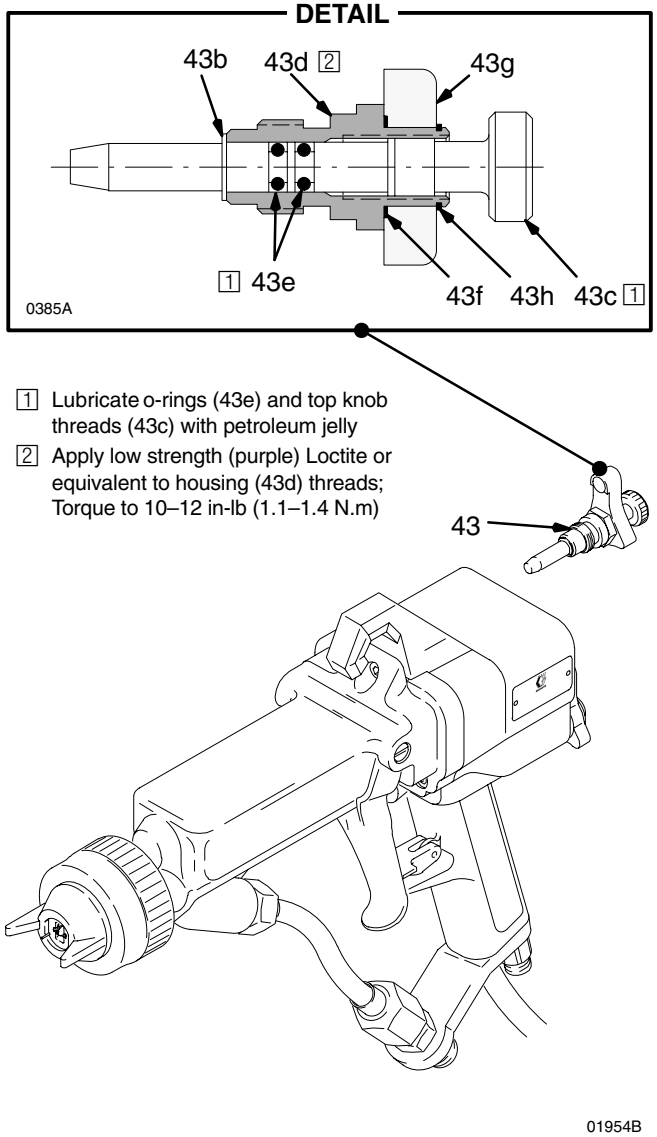


Fig. 19

Air Valve Repair

1. Prepare the gun for service as instructed on page 28.

2. Using a screw driver, remove the air valve cap (45). See Fig. 20.

3. Remove the o-ring (23) and spring (44).

⚠ 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.

4. Loosen the air valve packing nut (40) one full turn, then remove the air valve shaft (39).

⚠ CAUTION

When removing the air valve shaft (39) be careful not to damage the seat area.

5. Check the o-rings (41, 23) for damage and replace if necessary. Apply petroleum jelly to the o-rings.

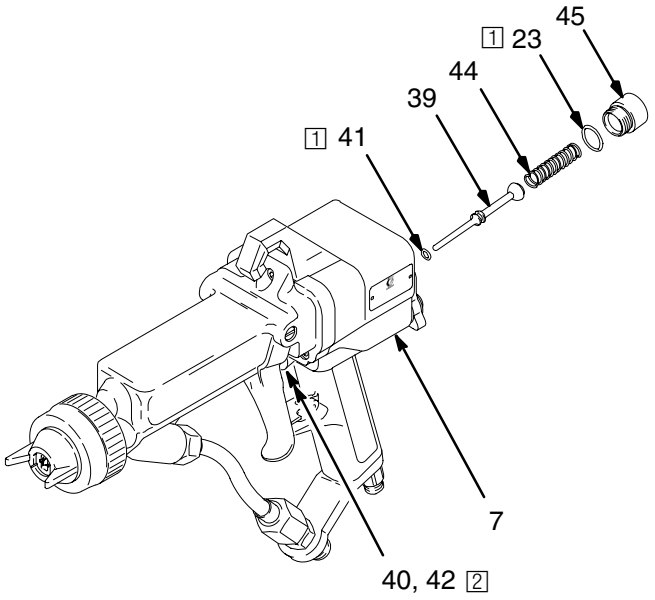
6. Unscrew the packing nut (40) to check the u-cup (42). Do not remove the u-cup unless it is damaged. *If the u-cup (42) is removed,* be sure to install the air valve shaft (39) into the handle before installing the packing nut and u-cup.

7. Install the air valve shaft, with the o-ring (41) into the back of the gun handle (7).

8. If removed, install the u-cup with its lips facing into the gun handle.

9. Tighten the air valve packing nut (40) until it bottoms.

10. Install the spring (44), o-ring (23) and air valve cap (45). Tighten the air valve packing nut (40).



1 Lubricate o-rings with petroleum jelly
2 Do not remove u-cup (42) unless damaged. Install with lips facing into handle.

Fig. 20 02014A

Notes

Technical Data

Category	Data
Gun Weight	35 oz (1 kg)
Gun Length	11.4 in (290 mm)
Maximum Air Working Pressure	100 psi (7 bar, 0.7 MPa)
Maximum Fluid Working Pressure	3000 psi (207 bar, 20.7 MPa)
Typical Noise Level at 40 psi (2.8 bar, 0.28 MPa)*	Sound Pressure † 86 Db(A) Sound Power ‡ 88.9 Db(A)
Maximum Noise Level at 100 psi (7 bar, 0.7 MPa)**	Sound Pressure † 95 Db(A) Sound Power ‡ 99.7 Db(A)
Voltage Output	0–85 kV
Short Circuit Current Output	120 mA
Paint Resistivity Range	3 megohm-cm to infinity
Air Inlet	1/4 npsm(m) left-hand
Fluid Inlet	1/4 npsm(m)
Wetted Parts	Stainless Steel, Nylon, PEEK, Ultra High Molecular Weight Polyethylene, Tungsten Carbide, Glass Filled Nylon

Viton® is a registered trademark of the DuPont Co.
Loctite® is a registered trademark of the Loctite Corporation.

* Noise levels measured with a 40 psi (2.8 bar) air supply at the gun air inlet and typical gun air flow settings.

** Noise levels measured with a 100 psi (7 bar) air supply at the gun air inlet and maximum gun air flow settings.

† Sound pressure was measured per Cagi Pneurop, 1969.

‡ Sound power was measured per ISO–3744, 1981.

Radio Frequency Transmitter Approval for Gun Part No. 236031 and 236033

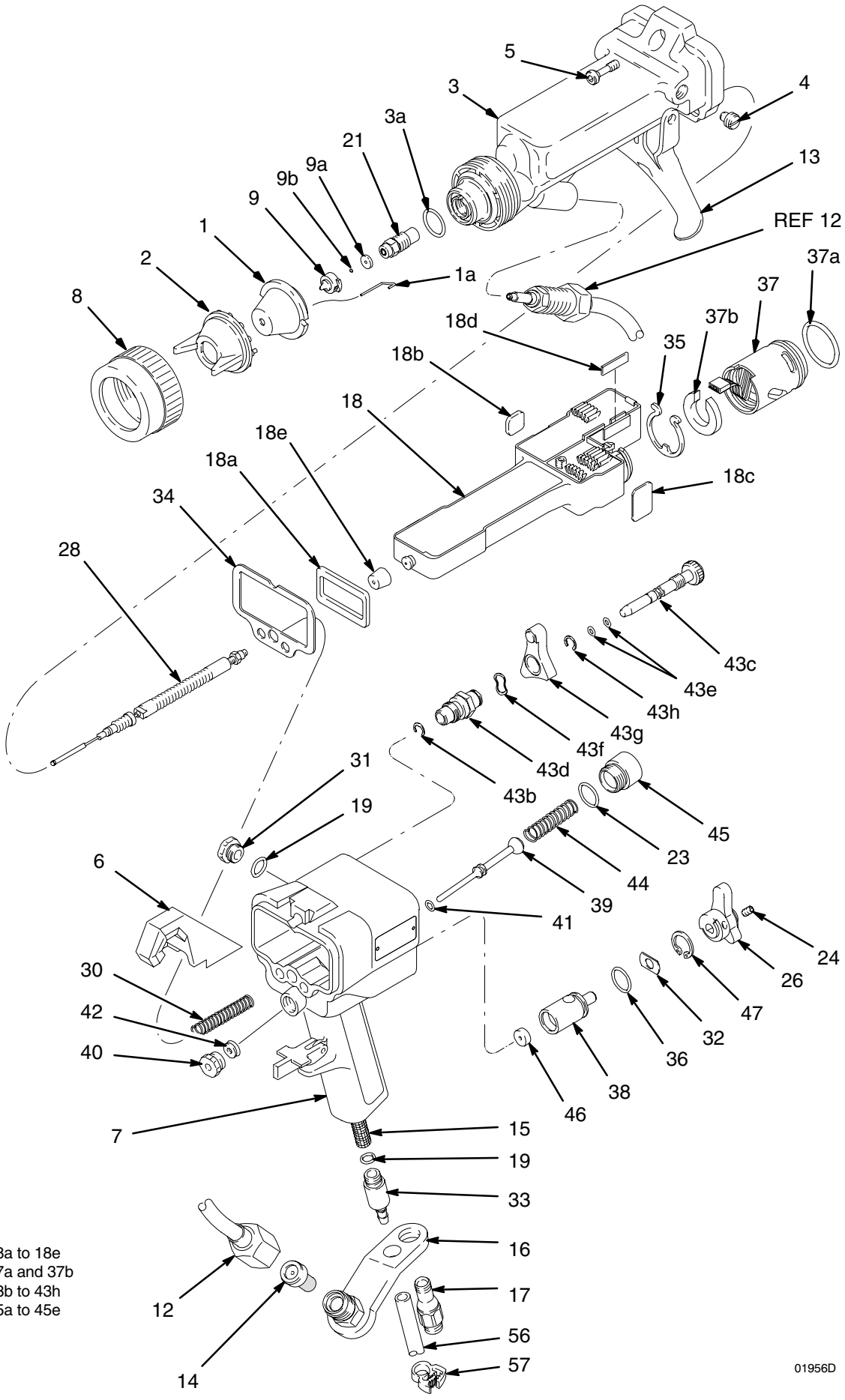
FCC ID: JHI1

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1.) This device may not cause harmful interference, and
2.) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modification to this equipment, not expressly approved by the party responsible for compliance, could void the user's authority to operate this equipment.

This equipment complies with (DOC) GRR II 6. (4)
En conformite avec (MDC) RGR II 6. (4).

Parts



Item 1 includes item 1a
Item 3 includes item 3a
Item 18 includes items 18a to 18e
Item 37 includes items 37a and 37b
Item 43 includes items 43b to 43h
Item 45 includes items 45a to 45e

Parts

⚠ WARNING

Some PRO 4500sc Gun replacement parts look similar to other PRO Gun parts but are not interchangeable! **When servicing, do not mix or use other PRO Gun parts!** Use of parts other than those specified in the parts list below could alter the grounding continuity of the gun, cause parts to leak or rupture, or cause the gun to malfunction and result in serious injury, fire, explosion or property damage.

Part No. 965722, Series B
Includes items 1–8, 10–67

Ref No.	Part No.	Description	Qty
1	241250	AIR CAP & ELECTRODE ASSY.; Includes item 1a	1
1a	188676	• ELECTRODE; See pg. 45 to order kit of 5 electrodes	1
2	188479	TIP GUARD	1
3	235827	BARREL, gun; Includes item 3a	1
3a	111261	• CONTACT RING, barrel	1
4	186654	SCREW, trigger	2
5	185096	SCREW, cap, relieved; M5 x 0.8	3
6	185097	HOOK	1
7	235911	HANDLE	1
8	188480	RETAINING NUT, air cap	1
9	GG3XXX	SPRAY TIP, customer choice See pg. 47 to order	1
9a	626588	SEAL, spray tip	1
9b	5519XX	PRE-ORIFICE, customer choice See pg. 47 to order	1
11▲‡	179791	WARNING TAG	1
12	235843	FLUID TUBE ASSY.	1
13	186791	TRIGGER	1
14	205264	FLUID FILTER	1
15	185122	MUFFLER (flame arrestor)	1
16	238160	BRACKET	1
17	185105	AIR FITTING	1
18	236039	POWER SUPPLY ASSY.; 85 KV Includes items 18a–18e	1
18a†	186840	• GASKET	1
18b	185099	• PAD	1
18c	185145	• PAD	1
18d	185141	• CUSHION	1
18e†	186637	• SEAL	1
19†	106555	O-RING, plug & adapter; Viton®	2
21	235797	SEAT HOUSING	1
23†	110099	O-RING, air valve cap; PTFE	1
24	110083	SET SCREW; M4 x 0.7	1
26	186839	ES ON-OFF LEVER	1
28	235798	FLUID NEEDLE ASSY.	1
30	112691	SPRING, compression	1
31	185079	PLUG	1
32	185119	SPACER, ES valve	1
33	185112	FITTING, barb	1
34†	185113	GASKET, manifold; polyethylene	1
35	185114	RETAINER RING, alternator	1
36	113746	O-RING, ES valve; CV75	1
37	222319	TURBINE ALTERNATOR; Includes items 37a & 37b	1
37a†	110073	• O-RING, Viton	1
37b	185124	• CUSHION	1
38	185118	ES VALVE	1
39	224194	AIR VALVE SHAFT ASSY.	1
40	185115	PACKING NUT	1
41†	111508	O-RING, air valve; fluoroelastomer	1
42†	105452	U-CUP, air valve; PTFE	1
43	223978	AIR CONTROL VALVE ASSY. Includes items 43b–43h	1
43b	105681	• RETAINING RING	1
43c	191806	• KNOB, adjustment	1
43d	186837	• HOUSING	1
43e†	168518	• O-RING, Viton	2
43f	111221	• SPRING. wave	1
43g	224196	• LEVER, ES HI-LO	1
43h	111510	• RETAINING RING, external	1
44	185116	SPRING, compression, air valve	1
45	188486	AIR VALVE CAP	1
46	107107	DISC REGULATOR	1
47	110082	RETAINING RING	1
54▲	188774	WARNING TAG	1
55‡	107460	DRIVER, socket head; 4 mm	1
56	185103	EXHAUST TUBE; polyurethane	1
57	110231	CLAMP, exhaust tube	1
58‡	112080	DRIVER, socket head, 2 mm	1
59▲‡	180060	WARNING SIGN, English See Accessories for additional signs	1
60‡	180209	GUN COVER; Order Part No. 218374 for package of 10	1
62▲‡	222385	WARNING CARD	1
64‡	110087	DRIVER, hex nut, 9 mm	1
67‡	235300	BRACKET, gun hanging	1

▲ *Replacement Danger and Warning labels, tags and cards are available at no cost.*

† *These parts are included in Air Seal Repair Kit 224633, which may be purchased separately.*

‡ *These parts are not shown in the parts drawing.*

Accessories

Use Only Genuine Graco Parts and Accessories

AIR LINE ACCESSORIES

Conductive Air Supply Hose; black
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

FM Approved; Color coded black; 0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread

220444	6 ft (1.8 m)
218100	15 ft (5 m)
218101	25 ft (8 m)
218102	36 ft (11 m)
218103	50 ft (15 m)
220119	75 ft (23 m)
220120	100 ft (30.5 m)

Conductive Air Supply Hose; gray
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

FM Approved; Color coded gray; More flexible than black hose; 0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread

223068	6 ft (1.8 m)
223069	15 ft (5 m)
223070	25 ft (8 m)
223071	36 ft (11 m)
223072	50 ft (15 m)
223073	75 ft (23 m)
223074	100 ft (30.5 m)

Conductive Air Supply Hose; red
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

Meets CENELEC EN 50 050 requirement for metallic ground path; Color coded red; Stainless steel braid ground path; 0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread

235068	6 ft (1.8 m)
235069	15 ft (5 m)
235070	25 ft (8 m)
235071	36 ft (11 m)
235072	50 ft (15 m)
235073	75 ft (23 m)
235074	100 ft (30.5 m)

Flexible Conductive Air Whip Hose
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

Must be used with a full size Graco Conductive Air Supply Hose; Metallic ground path; 0.187 in. (4.5 mm) ID; 1/4 npsm(m) left-hand x 1/4 npsm(f) left-hand

236130	3 ft (0.9 m)
236131	6 ft (1.8 m)

Air Swivel Fitting 236129
100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

Replaces gun air inlet fitting 185105; 1/4 npsm(m) left-hand

Air Adapter Nipple 185493
For connecting two or more conductive gun air supply hoses; 1/4 npt x 1/4 npsm left-hand

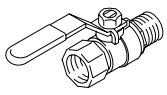
Quick Disconnect/Swivel Coupling Assy. 112534
Includes a quick disconnect coupling insert, which replaces air inlet fitting 185105, and a swivel shut-off coupling body with left-hand thread which connects to the conductive air hose.

Air Shutoff Valve 224754
150 psi (10 bar, 1.0 MPa) Maximum Working Pressure

For turning air to gun off or on. 1/4 npsm(m) x 1/4 npsm(f) left-hand thread

Bleed-type Master Air Valve 107141
300 psi (21 bar, 2.1 MPa) Maximum Working Pressure

Relieves air trapped in the air line between the paint pump air motor and this valve when closed. 3/4 npt



Accessories

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FLUID LINE ACCESSORIES

High Pressure Ball Valves
5000 psi (350 bar, 35 MPa) Maximum Working Pressure

For turning fluid off or on to the gun and for relieving fluid line pressure at the pump

210657	1/2 npt(m), Viton® seals
210658	3/8 npt(m), Viton seals
210659	3/8 x 1/4 npt(m), Viton seals
214037	1/4 npt(m), PTFE seals

Fluid Swivel Fitting 189018
5800 psi (400 bar, 40 MPa) Maximum Working Pressure

Connects to gun fluid inlet fitting 188691; 1/4 npsm(m) x 1/4 npsm(f)

GUN ACCESSORIES

Electrostatic Gun Cleaning Kit 236659
Required when using Graco Gun Washers 112634, 112635, and 112636 to clean this gun.

Extended Air Fitting 189191
Replaces the standard air fitting (item 17 in parts list) to provide an extended handle-grip area.

Inline Fluid Filter 205265; 60 mesh
To replace the 100 mesh Filter 205264 that is included with the gun

Electrode Replacement Kit 236001
Includes five electrodes

Snap Ring Pliers 110090
For removing the ES ON-OFF Valve Retaining Ring (item 47 in parts list)

Brush 105749
For cleaning the gun

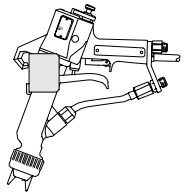
Grease 217115
To grease the plastic extension on the fluid tube end.

ES ON/OFF Valve Conversion Kit 223976
Converts the ES ON/OFF Valve to a constant on setting; a ball valve is included for complete air shut-off at the gun

Push-Pull Pattern Adjustment Valve 224720
Pattern adjustment valve that allows quick adjustment of the air cap air between two adjustable settings

Fluid Shut-off Spring 112876
For use with fluids that require higher shut-off force. Use in place of compression spring 112691 (item 30 in the parts list).

Gun Hanging Bracket 235300



Accessories

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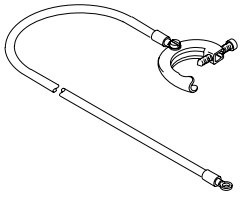
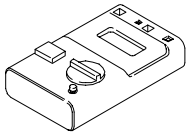
MISCELLANEOUS ACCESSORIES

Grounding Clamp and Wire 222011
12 ga, 25 ft (7.6 m) wire

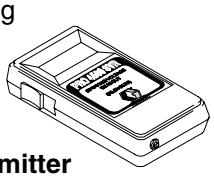


0189

Megohmmeter 218979
500 Volt output; 0.01–2000 megohms;
Not for use in Hazardous areas



Remote Spraying Voltage Readout *(SVR™)* 224388
(Requires Gun Power Supply change to 224100; see below)
For monitoring the gun voltage during operation. Battery operated, intrinsically safe (Class I, Group D), handheld unit. See Manual 308183.



Gun Power Supply with RF Transmitter 224100
Power supply with transmitter capability for spraying voltage readout (SVR).

Gun High Voltage Probe and Meter 236003
For direct measurement of gun output voltage

Paint Resistance Meter 722886
Used with 722860 Paint Probe to measure resistance of paint; **Not for use in Hazardous areas**

Paint Probe 722860
Used with 722886 Paint Resistance Meter to measure resistance of paint; **Not for use in Hazardous areas**

Safety Warning Signs
Available at no charge from Graco

180060	Warning Sign (English)
180061	Warning Sign (French)
180062	Warning Sign (German)
180063	Warning Sign (Spanish)

Setup Instruction Poster 189062
Basic PRO AA4500 Gun operator setup instructions to hang in the spray booth area; English on one side and Spanish on the other side

Daily Gun Care Instruction Poster 189063
Basic PRO AA4500 daily gun care instructions to hang in the spray booth area; English on one side and Spanish on the other side

Spray Tip Selection Chart

Part No.	Fan Width at 10 in. (260 mm) in. (mm)	Orifice Size in. (mm)
GG3107	2–4 (50–100)	0.007 (0.178)
GG3207	4–6 (100–150)	
GG3307	6–8 (150–200)	
GG3209	4–6 (100–150)	0.009 (0.229)
GG3309	6–8 (150–200)	
GG3409	8–10 (200–250)	
GG3609	12–14 (300–350)	
GG3211	4–6 (100–150)	0.011 (0.279)
GG3311	6–8 (150–200)	
GG3411	8–10 (200–250)	
GG3511	10–12 (250–300)	
GG3611	12–14 (300–350)	
GG3213	4–6 (100–150)	0.013 (0.330)
GG3313	6–8 (150–200)	
GG3413	8–10 (200–250)	
GG3513	10–12 (250–300)	
GG3613	12–14 (300–350)	
GG3215	4–6 (100–150)	0.015 (0.381)
GG3315	6–8 (150–200)	
GG3415	8–10 (200–250)	
GG3515	10–12 (250–300)	
GG3615	12–14 (300–350)	
GG3217	4–6 (100–150)	0.017 (0.432)
GG3317	6–8 (150–200)	
GG3417	8–10 (200–250)	
GG3517	10–12 (250–300)	
GG3617	12–14 (300–350)	

Part No.	Fan Width at 10 in. (260 mm) in. (mm)	Orifice Size in. (mm)
GG3319	6–8 (150–200)	0.019 (0.483)
GG3419	8–10 (200–250)	
GG3519	10–12 (250–300)	
GG3619	12–14 (300–350)	
GG3719	14–16 (350–400)	
GG3421	8–10 (200–250)	0.021 (0.533)
GG3521	10–12 (250–300)	
GG3621	12–14 (300–350)	
GG3721	14–16 (350–400)	
GG3821	16–18 (400–450)	
GG3423	8–10 (200–250)	0.023 (0.584)
GG3523	10–12 (250–300)	
GG3623	12–14 (300–350)	
GG3723	14–16 (350–400)	
GG3823	16–18 (400–450)	
GG3425	8–10 (200–250)	0.025 (0.635)
GG3525	10–12 (250–350)	
GG3625	12–14 (300–350)	
GG3725	14–16 (350–400)	
GG3825	16–18 (400–450)	

Pre-orifice Selection Chart

Part No.	Orifice Size in. (mm)
551932	0.007 (0.178)
551933	0.008 (0.203)
551935	0.010 (0.254)

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 or two thousand hours of operation from time of sale, repair or replace any part of the equipment proven defective. However, any deficiency in the barrel, handle, trigger, hook, internal power supply, and alternator (excluding turbine bearings) will be repaired or replaced for thirty six months or six thousand hours of operation from time 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 to an authorized Graco distributor for verification of the claim. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

DISCLAIMERS AND LIMITATIONS

The terms of this warranty constitute purchaser's sole and exclusive remedy and are in lieu of any other warranties (express or implied), **including warranty of merchantability or warranty of fitness for a particular purpose,** and of any non–contractual liabilities, including product liabilities, based on negligence or strict liability. Every form of liability for direct, special or consequential damages or loss is expressly excluded and denied. in no case shall Graco's liability exceed the amount of the purchase price. Any action for breach of warranty must be brought within two (2) years of the date of sale.

EQUIPMENT NOT COVERED BY GRACO WARRANTY

Graco makes no warranty, and disclaims all implied **warranties of merchantability and fitness for a particular purpose,** with respect to accessories, equipment, materials, or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

Graco Phone Number

TO PLACE AN ORDER, contact your Graco distributor, or call Graco: **1–800–367–4023 Toll Free**

Manual Change Summary

The manual was revised to remove 3 pre-orifice offerings, per ECO V6786.

Sales Offices: Minneapolis, Detroit
Foreign Offices: Belgium, Korea, Hong Kong, Japan

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