INSTRUCTIONS-PARTS LIST



Rev. S

308294



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



85 KV ELECTROSTATIC Model PRO AA4500[™] **Air-Assisted Airless 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. 236030, Series B Spray Gun with basic power supply, 2-finger trigger



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

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Table of Contents

Symbols 2	2
Warnings	3
Introduction	5
Installation 6 Installing the System 6 Warning Signs 6 Ventilate the Spray Booth 6 Air Line Accessories 7 Fluid Line Accessories 7 Ground the System 8	555573
Operation)))
Gun Setup 11	I
Daily Gun Care, Flushing, and Cleaning 17	7
Spray Pattern Troubleshooting 22	2
Gun Operation Troubleshooting 23	3
Electrical Troubleshooting	1
Electrical Tests 26 Test Gun Resistance 26 Test Power Supply Resistance 27 Test Barrel Resistance 28	5 57 3
Service 29 Prepare the Gun for Service 29 Tools Needed 29 Tip Guard, Air Cap, Spray Tip, or Seat 29 Housing Replacement 30 Electrode Replacement 31 Fluid Tube Removal & Replacement 32)))))
Fluid Filter Removal 32	2

Barrel Removal	33
Fluid Packing Adjustment	34
Fluid Needle Assembly Removal	35
Power Supply Removal and Replacement	36
Power Supply Adjustment	36
Turbine Alternator Removal and Replacement .	37
Barrel Installation	37
ES ON-OFF Valve Repair	38
Air Control Valve Repair	39
Air Valve Repair	40
Technical Data	41
Parts	42
Accessories	44
Spray Tip Selection Chart	47
Graco Standard Warranty	48
Graco Phone Number	48

Symbols

Warning Symbol

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

Caution Symbol

A CAUTION

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





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 medi**cal 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.



INSTRUCTIONS

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.

Introduction

How the PRO AA4500 Electrostatic Air-Assisted Airless 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 3 to 4 and throughout the text of this instruction manual.

The air-assisted airless spray gun combines airless and air spraying concepts. The spray tip shapes the fluid into a fan pattern, as does a conventional airless spray tip. Air from the air cap further atomizes the fluid and completes the atomization of the paint tails into the pattern to produce a more uniform pattern.

As the gun is triggered, the regulated air is directed to the air cap for the air-assist function and air is also directed to the power cartridge turbine.

The regulated air that is directed to the air cap can be further controlled using the gun's air control valve. This valve can be used to restrict air flow to the air cap while maintaining sufficient air flow to the 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 Electrostatic Spray Gun to spray at higher fluid pressures 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 can be completely turned off to have *airless* atomization if desired. 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 36 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 air-assisted airless 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. A Warning Sign is provided with the gun. Additional signs are available at no charge. See Accessories to order.

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

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 ruin the appearance of your finished work-piece and can cause the gun to malfunction.
- 4. Install a bleed-type air regulator (C) on the pump air supply line to control air pressure to the pump.

COMPONENT RUPTURE HAZARD

ШH

To reduce the risk of serious injury due to component rupture, pump pressure

must be limited by the pump air regulator. Do not rely on the gun fluid regulator to limit the fluid pressure to the gun.

The fluid supply pump 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. For example, the air supply pressure to a 30:1 pump must not exceed 100 psi (7 bar, 0.7 MPa).

5. Install a bleed-type air shutoff valve (A) on the main air line and the pump air line to shut off air to the pump. 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



INJECTION HAZARD

The bleed-type air shutoff valve (A) 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 injury, including fluid injection, and splashing in the eyes or on the skin.

6. Install an air line lubricator (D) as close to the pump (F) as possible.

Installation



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 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 serious injury, including fluid injection and splashing in the eyes or on the skin.

Install a fluid regulator (J) on the fluid line to con-2. trol 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

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.

grounding instructions below.

- 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.
- 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 26.
- 8. The ventilation fans are operating properly.
- 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.

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. Shut off the power to the pump.
- 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 metal waste container to relieve fluid and air pressure.
- 8. Lock the gun trigger safety latch again.
- 9. Open the pump drain valve (required in system) to help relieve fluid pressure in the displacement pump. 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.



- 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).



- **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.



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

Continued on the next page.

3. Check the gun's electrical grounding.

WARNING



FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Megohmmeter P/N 241079 (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.



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.



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).



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).



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.



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, 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.

9. Install the spray tip.

A. With the pressure relieved, trigger safety latch locked, and ES ON-OFF lever OFF, 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.





ELECTRIC SHOCK HAZARD

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



Continued on the next page. 308294 13

9. Install the spray tip (continued)

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

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. 9B

10. Set the air pressure.

- A. Close the air control valve (43) by turning it fully clockwise.
- B. Turn the ES ON-OFF lever (26) to ON.



- **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.

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.

11. Set the atomization fluid pressure.

NOTE: Atomization fluid pressure will vary based on the viscosity of the fluid, the flow rate desired, and other characteristics of your system.

Atomization Chart

Fluid Viscosity	Starting Fluid Pressure	Fluid Pressure Increments
40 or more seconds in #2 Zahn cup*	1500 psi (105 bar)	200 psi (14 bar)
25–40 seconds in #2 Zahn cup**	1000 psi (70 bar)	100 psi (7 bar)
25 or less seconds in #2 Zahn cup***	500 psi (35 bar)	100 psi (7 bar)

- Includes fluids with 60% volume solids or greater.
 Examples: high-build high-solids protective urethanes and epoxies
- ** Includes fluids with 40 to 60% (medium) volume solids. Examples: alkyd enamels, some protective urethanes and epoxies
- *** Includes fluids with 40% volume solids or less.Examples: stains, lacquers, and decorative urethanes
- **A.** Close the air control valve (43) by turning it fully clockwise and turn the ES ON-OFF lever (26) to OFF.

B. Set the fluid pressure with the fluid regulator (J), based on the *Starting Fluid Pressure* in the **Atomization Chart** at left for the type of fluid you are spraying.

C. With the ES ON-OFF lever OFF and the air control valve closed, spray a test pattern across a piece of paper, holding the gun 12 inches (305 mm) from the surface.

Without being concerned about the presence of "tails", note the particle size.

- **D.** Increase the fluid pressure by the *Fluid Pressure Increment* shown in the **Atomization Chart** for the type of fluid you are spraying.
- E. Spray another test pattern across a piece of paper.
- **F.** Without being concerned about the presence of "tails", compare the particle size of the two test patterns.

A decrease in particle size indicates improved atomization.

11 Set the atomization fluid pressure. (continued)

G. Continue to increase the fluid pressure by the increments shown in the chart until the particle size no longer reduces in size; do not exceed the gun's *Maximum Fluid Pressure* of 3000 psi (207 bar, 20.7 MPa).

When the particle size no longer reduces in size, the pattern is atomized at the lowest possible fluid pressure, but will still have tails.

H. To eliminate the tails, gradually open the air control valve, by turning it counterclockwise, until there are no tails in the pattern.

- 12. Turn the ES ON-OFF lever (26) to ON.
- 13. Use the ES HI-LO lever (43g) to change to either full voltage (HI) or a lower voltage level (LO).

The LO setting is factory set to 60 kV. This setting can be adjusted between 45 and 80 kV. See page 36 to adjust.

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

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.

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.

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 wipe the gun with a cloth soaked in solvent; ring out the excess.

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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

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.
- Flush the gun before changing colors and when-4. ever you are done operating the gun.

WARNING

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.

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.

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

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.

- 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.

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

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.

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

- 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.

15. Hang up the gun.

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. 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.

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 31.

WARNING

02010A

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. 15

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.

ELECTRIC SHOCK HAZARD

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

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

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.

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

Fig. 21

02012B

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

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.

PROBLEM: IMPROPER SPRAY PATTERN	CAUSE	SOLUTION
Fluttering or spitting spray	Insufficient fluid supply	Adjust fluid regulator or fill fluid tank
	Loose or cracked coupler at fluid inlet	Tighten or repair
	Air in fluid supply line	Check; Tighten siphon hose connec- tions; Bleed air from fluid line
Irregular pattern Fluid build-up or spray tip partially plugged		Clean spray tip
	Damaged or worn fluid tip or air cap holes	Replace damaged or worn part; See page 30
Pattern pushed to one side; air cap gets dirty	Air cap holes partially or totally plugged	Clean air cap holes with solvent and soft brush
Tails in pattern	Insufficient air flow	Increase air pressure with gun air con- trol valve or with gun air regulator
	Fluid pressure too low	Increase fluid pressure
Excessive paint build-up on air cap and tip guard	Too much air flow	Reduce air pressure with gun air control valve or with gun air regulator
	Fluid pressure too low	Increase fluid pressure

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

Gun Operation Troubleshooting

PROBLEM	CAUSE	SOLUTION
Leakage from fluid needle	Fluid needle packings loose	Tighten packing nut; See page 34
area	Fluid needle packing damaged	Replace fluid needle; See page 35
Air leakage from front of gun	Air valve not seating properly	Clean, Service; See page 40
	Air valve o-ring sticking	Lubricate o-ring; See page 40
Fluid leakage from front of	Worn fluid needle	Replace fluid needle; See page 35
gun	Loose or worn fluid seat	Tighten or replace fluid seat
	Loose spray tip	Tighten retaining nut
	Damaged tip seal	Replace tip seal; See page 30
"Orange Peel" finish	Insufficient air pressure	Increase air pressure with gun air con- trol valve or with gun air regulator; Use least air pressure needed for good results
	Using too large of a spray tip	Use a smaller size spray tip
	Fluid poorly mixed or filtered	Remix or refilter fluid
	Improper thinner being used	Use proper thinner
Excessive spray fog	Too much air pressure	Reduce air pressure with gun air control valve or with gun air regulator; Use least air pressure needed for good results
	Fluid thinned too much	Properly thin fluid
No fluid sprays from gun	Fluid low	Check; Add fluid if necessary
	Dirty or clogged spray tip	Clean spray tip
	Damaged spray tip	Check, Replace spray tip; See page 30
	Broken fluid needle	Replace fluid needle; See page 35
Equipment covered with fluid	Booth exhaust air flow insufficient 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	Too much air pressure	Reduce air pressure with gun air control valve or with gun air regulator
Fluid doesn't shut off	Seat housing over-tightened	Replace seat housing; See page 30
ргорепу	Fluid leakage buildup on fluid needle	Replace fluid needle; See page 35
	Fluid packings too tight	Remove fluid needle, then re-install, turning fluid needle 1/4 turn past snug; See page 35

Electrical Troubleshooting

PROBLEM	CAUSE	SOLUTION
Poor wrap-around	KV HI-LO lever on low	Check lever position
	*ES ON-OFF lever in OFF position	Turn lever to ON
	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 lim- its
	Atomizing air pressure too high	Reduce atomizing air pressure
	Fluid pressure too high	Reduce fluid pressure
	Improper fluid viscosity	Check supplier for proper fluid for elec- trostatic 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 if ES ON-OFF lever is ON; Check air supply to gun; Check for dirt or moisture in turbine; See page 37
	Faulty gun resistance	Check gun resistance; See page 26
	Fluid leaks from needle packing and causes short	Clean needle cavity; Replace fluid needle; See page 35
	*Faulty turbine alternator	Be sure plug is in place on back of tur- bine alternator housing; Remove and test turbine alternator; See page 37

*ES indicator light not on when gun is triggered.

Electrical Troubleshooting

PROBLEM	CAUSE	SOLUTION
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 op- erator 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 , on page 12
Operator gets shock when touching workpiece	Workpiece not properly grounded.	Clean workpiece hangers; Check for proper ground on conveyor or track
Lower than normal voltage	Faulty gun resistance	Check gun resistance; See page 26
σαιραί	Insufficient air to the turbine alternator	Increase air pressure to the gun
	Faulty turbine alternator	Replace turbine alternator; See page 37
	Improper distance between gun and workpiece	Adjust spraying distance to 8 to 12 inches (203–305 mm)
	Fluid resistivity too low	Check fluid resistivity with paint meter and probe
	Dirty gun	Clean gun
	Faulty gun resistance	Check gun resistance; See page 26
Higher than normal voltage	Faulty gun resistance	Check gun resistance; See page 26
	Fluid resistivity higher than normal	Check fluid resistivity with paint meter and probe

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.

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 241079 (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 241079 (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.

Electrical Tests

Test Power Supply Resistance (See Fig. 5)

Remove the power supply (18) from the gun. See page 36.

Measure the resistance from the power supply's ground contact point (EE) to the contact inside of the power supply seal (B) [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 (B) is in place on the end of the power supply before installing the power supply back into the gun.

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.

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.

WARNING

INJECTION HAZARD

To reduce the risk of serious injury, including fluid injection, splashing in the eves 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.

- Flush the gun as instructed on page 18. 1.
- 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**

Tip Guard, Air Cap, Spray Tip, or Seat Housing Replacement

- 1. Prepare the gun for service as instructed on page 29.
- 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.

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.

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.

A 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 26.

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 29.
- 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.
- 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 26.

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 29.
- 2. Disconnect the bottom fluid tube nut (C). See Fig. 10.
- 3. Carefully unscrew the top fluid tube nut (D).

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.
- 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.
- 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

- Prepare the gun for service as instructed on page 29.
- 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.

- 1 Apply grease 217115
- 2 Apply low strength thread sealer

Barrel Removal

- Prepare the gun for service as instructed on page 29.
- 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.

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.

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 29.
- Remove the retaining nut (8), tip guard, (2), air cap (1), and spray tip (9). See Fig. 7, page 30. 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 30.

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

- 4. Remove the barrel as instructed on page 33.
- 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 37.
- 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.

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 26.
- 1 To tighten packings

Fluid Needle Assembly Removal

- 1. Prepare the gun for service as instructed on page 29.
- Remove the retaining nut (8), tip guard, (2), air cap (1) and spray tip (9). See Fig. 7, page 30. 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 30.
- 4. Remove the barrel as instructed on page 33.
- 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.

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

- 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 37.
- 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.

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 26.

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 (B) or o-ring (37a) to solvents as it will damage them.
- c. Be careful when handling the power supply to avoid damaging it.
- Prepare the gun for service as instructed on page 29.
- 2. Remove the barrel as instructed on page 33.
- 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 27. If needed, replace the power supply.

Before installing the power supply, inspect the seal (B) for any damage or swelling; replace if necessary. Also, make sure the gaskets/pads (18a–18d) are in place. See Fig. 16. **308294**

- 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 37.
- 7. Test the gun resistance as instructed on page 26.

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.

The power supply may be equipped with either a potentiometer or a two position jumper pin. If you have the jumper pin style, place the pin in either the 45 kV or 60 kV position. If you have the potentiometer style, follow the directions below.

To adjust the low voltage setting, use a small blade end screw driver to turn the potentiometer (G), clockwise to increase the voltage or counterclockwise to decrease it; fully clockwise is 80 kV, fully counterclockwise is 45 kV. Refer to Fig. 16.

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 29.
- 2. Remove the power supply from the gun handle as instructed on page 36.
- 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.
- 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.
- 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 36.

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.

 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.

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 26.

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

ES ON-OFF Valve Repair

- Prepare the gun for service as instructed on page 1. 29.
- Loosen the set screw (24) with the 2 mm hex key 2. (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.

- Use internal snap ring pliers to remove the retain-3. ing ring (47) from the handle. Align the holes in the retaining ring with the flat on the spacer (32) to ease assembly and disassembly.
- Remove the valve body (38) from the handle; be 4. careful not to drop the regulator disk (46) and spacer (32).
- Clean and inspect the parts for damage. Replace if 5. necessary. Lubricate the o-ring (36) with petroleum jelly.

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.

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

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.
- Install the retaining ring (47) into the groove in the 8. 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.

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- Bevelled side of disk (46) faces toward valve (38) 1
- 2 Lubricate o-rings with petroleum jelly
- 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 29.
- 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).
- 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.
- 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).
- 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 $1.4 \text{ N} \cdot \text{m}$).

9. Install the retaining ring (43h) back into the groove in the valve housing (43d).

Air Valve Repair

- Prepare the gun for service as instructed on page 29.
- 2. Using a screw driver, remove the air valve cap (45). See Fig. 20.
- 3. Remove the o-ring (23) and spring (44).

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).

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.
- 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
- Do not remove u-cup (42) unless damaged. Install with lips facing into handle.

Fig. 20 _________

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

Teflon[®], Viton[®], are registered trademarks 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.

Parts

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Parts

Def

A 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. 236030 Spray Gun Includes items 1–64, 67

Part No. 236032 Spray Gun

Includes items 1-9, 11-67

Ref No.	Part No.	Description 0	Qty	37a†
1	235947	AIR CAP & ELECTRODE ASSY.:		37D 20
		Includes item 1a	1	20
1a	188676	ELECTRODE; See pg. 45		39 40
		to order kit of 5 electrodes	1	40 /1+
2	188479	TIP GUARD	1	41 12+
3	235827	BARREL, gun; Includes item 3a	1	42 /3
3a	111261	 CONTACT RING, barrel 	1	-10
4	186654	SCREW, trigger	2	43h
5	185096	SCREW, cap, relieved; M5 x 0.8	3	43c
6	185097	HOOK	1	43d
7	235911	HANDLE; 236030 only	1	43et
	189026	HANDLE; 236032 only	1	43f
8	188480	RETAINING NUT, air cap	1	43a
9	GG3XXX	SPRAY TIP, customer choice; Include	s	43h
		item 9a; See pg. 47 to order	1	44
9a	183459	 SEAL, spray tip 	1	45
11▲‡	179791	WARNING TAG	1	46
12	235843	FLUID TUBE ASSY.; 236030 only	1	47
	236162	FLUID TUBE ASSY.; 236032 only	1	54▲
13	186791	TRIGGER; 236030 only	1	55‡
	189034	TRIGGER; 236032 only	1	56
14	205264	FLUID FILTER	1	57
15	185122	MUFFLER (flame arrestor)	1	58‡
16	238160	BRACKET; 236030 only	1	59▲‡
	236161	BRACKET; 236032 only	1	
17	185105	AIR FITTING	1	60‡
18	236039	POWER SUPPLY ASSY.; 85 KV		
		Includes items 18a–18f	1	62▲‡
18a†	186840	• GASKET	1	64‡
18b	185099	• PAD	1	65
18c	185145	• PAD	2	66
18d	185141	• CUSHION	1	67‡
18f	192361	• PAD	1	

No.	Part No.	Description	Qty
19†	106555	O-RING, plug & adapter; Viton®	2
21	235797	SEAT HOUSING	1
23†	109450	O-RING, air valve cap; Teflon®	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; 236030 only	1
	188878	FITTING, barb; 236032 only	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		1
41†	111508	O-RING, air valve; fluoroelastomer	1
42T	105452	U-CUP, air vaive; letion	1
43	223978	AIR CONTROL VALVE ASSY.	
406	405004		1
430	105681	• RETAINING RING	1
43C 42d	191806		1
430 420+	169519	O PING Viton	ו 2
436 42f	111221	• O-RING, VION	4
430	22/106		1
43y ∕13h	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
65	189023	TAB, finger; 236032 only	1
66	112324	SCREW; 4-40 x 0.25"; 236032 only	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
~	a / a		1	

210658 3/8 npt(m), Viton seals

- **210659** 3/8 x 1/4 npt(m), Viton seals
- 214037 1/4 npt(m), Teflon[®] seals

Nylon Static Free Fluid Hoses

3300 psi (228 bar, 22.8 MPa) Maximum Working Pressure

Part No.	ID	Length	Thread Size
214700	3/16 in (4.8 mm)	2 ft (610 mm)	1/4 npsm(f)
214701	3/16 in (4.8 mm)	3 ft (914 mm)	1/4 npt(mxf)
214699	3/16 in (4.8 mm)	6 ft (1.8 m)	1/4 npsm(f)
214698	3/16 in (4.8 mm)	25 ft (7.6 m)	1/4 npsm(f)
214697	3/16 in (4.8 mm)	50 ft (15.2 m)	1/4 npsm(f)

Nylon Static Free Fluid Hoses

3000 psi (207 bar, 20.7 MPa) Maximum Working Pressure

Part No.	ID	Length	Thread Size
223763	1/4 in (6.4 mm)	14 in (356 mm)	1/4 npt(m)
223760	1/4 in (6.4 mm)	28 in (711 mm)	1/4 npsm(f)
223761	1/4 in (6.4 mm)	3 ft (914 mm)	1/4 npsm(f) x 1/4 npt(m)
223756	1/4 in (6.4 mm)	15 ft (4.6 mm)	1/4 npsm(f)
223540	1/4 in (6.4 mm)	25 ft (7.6 m)	1/4 npsm(f)
223541	1/4 in (6.4 mm)	50 ft (15.2 m)	1/4 npsm(f)

Flexible Nylon Static-free Fluid Whip Hose 3000 psi (207 bar, 20.7 MPa) Maximum Working

Pressure

0.125 in. (3.2 mm) ID; 1/4 npsm(m) x 1/4 npsm(f)

236134 3 ft (0.9 m) **236135** 6 ft (1.8 m)

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

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

Use Only Genuine Graco Parts and Accessories

MISCELLANEOUS ACCESSORIES

Grounding Clamp and Wire 222011

12 ga, 25 ft (7.6 m) wire

Megohmmeter 241079 500 Volt output; 0.01–2000 megohms; Not for use in Hazardous areas

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

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)	
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)	

Manual Change Summary

This manual has been changed per ECOs V5645, V5638, V5457, and V389201.

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Graco warrants all equipment manufactured by Graco 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. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

www.graco.com

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