Instructions

Manual Electrostatic

PRO™ Xs Waterborne Air Spray Gun

312900F

EN

For use with conductive spray materials (waterborne and other materials less than 1 megohm-cm). For professional use ONLY.

For use in Class I, Div. I hazardous locations using Group D spray materials.

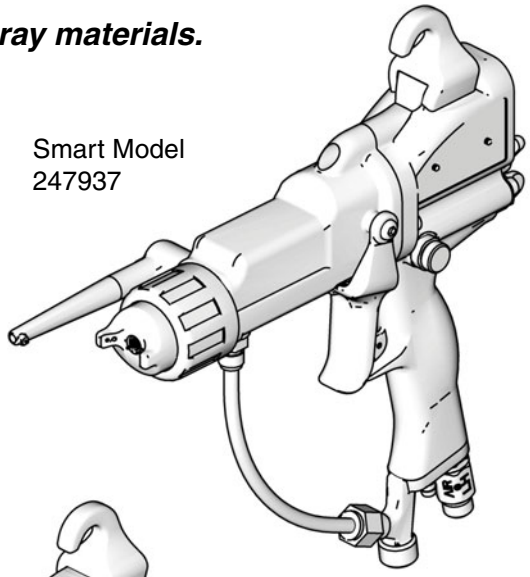
FM C US APPROVED

For use in Group II, Zone 1 areas using Group IIA spray materials.

CE Ex **II 2 G EEx 0.24 mJ**

247936 Standard Model
247937 Smart Model

100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure
100 psi (0.7 MPa, 7 bar) Maximum Working Fluid Pressure

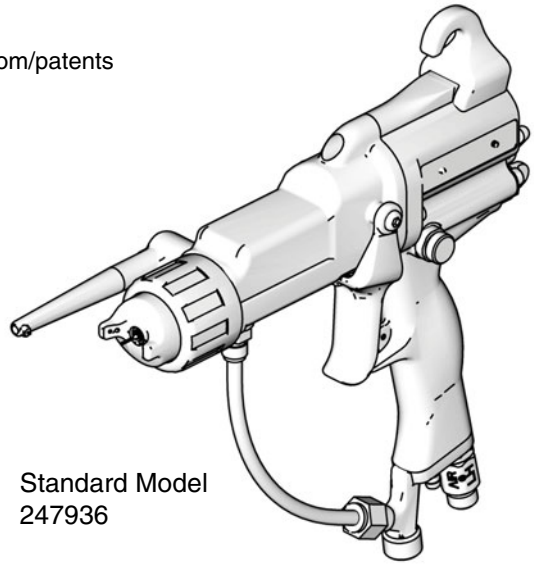


Smart Model
247937

Important Safety Instructions:
Read all warnings and instructions in this manual.
Save these instructions.

See page 2 for **Table of Contents.**

For patent information, see www.graco.com/patents



Standard Model
247936

HO03

PROVEN QUALITY. LEADING TECHNOLOGY.

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Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠WARNING

FIRE, EXPLOSION, AND ELECTRIC SHOCK HAZARD

Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:

- Electrostatic equipment must be used only by trained, qualified personnel who understand the requirements of this manual.
- Ground equipment, personnel, object being sprayed, and conductive objects in work area. See **Grounding** instructions.
- Only use grounded Graco conductive air supply hoses.
- Check gun and hose resistance and electrical grounding daily.
- Use and clean equipment only in well ventilated area.
- Interlock the gun air supply to prevent operation unless ventilating fans are on.
- Use cleaning solvents with highest possible flash point when flushing or cleaning equipment. To comply with EN50050 requirements, cleaning solvents must have a flash point at least 5°C above ambient temperature.
- Always turn the electrostatics off when flushing, cleaning or servicing equipment.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Keep work area free of debris, including solvent, rags and gasoline.
- Keep a working fire extinguisher in the work area.

ELECTRIC SHOCK HAZARD

This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off air supply before servicing equipment.
- All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
- Do not touch gun electrode when electrostatics are on.
- Do not expose to rain. Store indoors.

PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

⚠WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the **Pressure Relief Procedure** in this manual when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

TOXIC FLUID OR FUMES HAZARD

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

- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.
- If this equipment is used with isocyanate material, see additional information on isocyanates in Isocyanate Conditions Section of this manual.

Overview

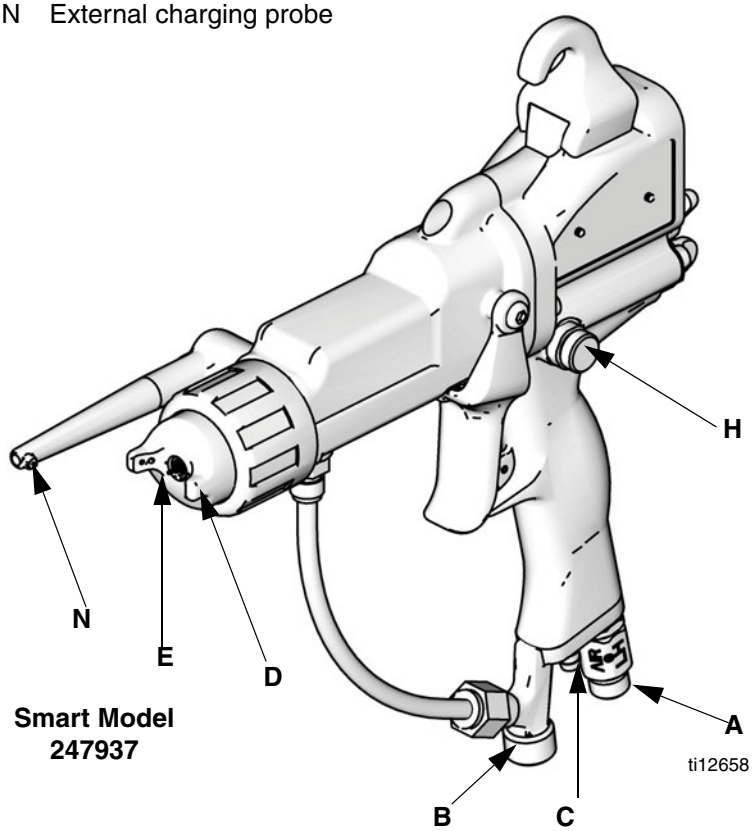
How the Electrostatic Air Spray Gun Works

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

The pump supplies fluid to the hose and gun, where the fluid is atomized by the air cap and the atomized particles are electrostatically charged as they pass the external charging probe. The charged fluid is attracted to the grounded workpiece, wrapping around and evenly coating all surfaces. The external charging allows the fluid supply to remain grounded at all times and therefore eliminate the need for an isolation system.

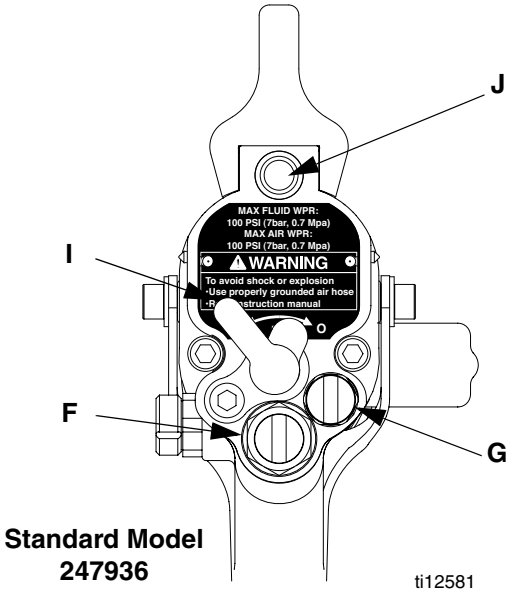
KEY

A Air swivel inlet page 6
B Fluid inlet page 6
C Turbine air exhaust page 6
D Air cap and nozzle page 6
E Fluid needle page 6
F Fluid adjustment page 7
G Fan air adjustment valve page 7
H Atomizing air restrictor valve page 7
I ES ON/OFF switch page 7
J ES indicator (247936 only) page 8
K Voltage/current display (247937 only) page 8
L ES HI/LO switch (247937 only) page 8
M LO voltage adjustment (247937 only) page 8
N External charging probe



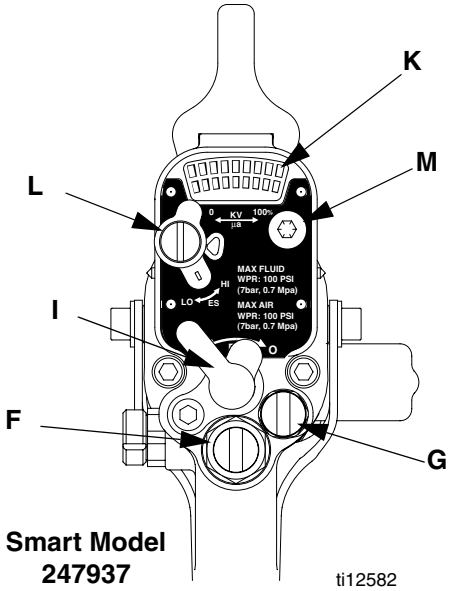
Smart Model 247937

ti12658



Standard Model 247936

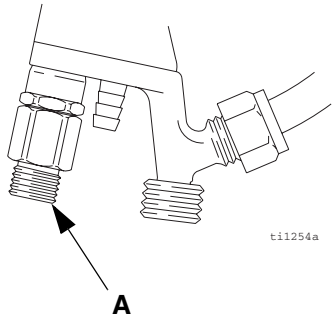
ti12581



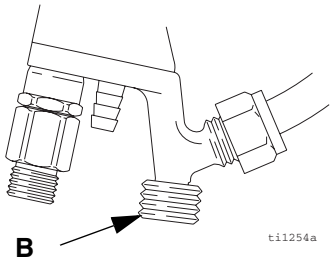
Smart Model 247937

ti12582

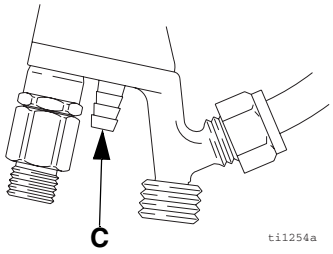
A. ***Air swivel inlet.*** Left-hand thread.



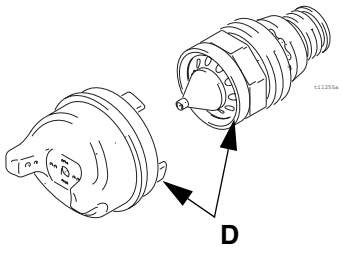
B. **Fluid inlet.**



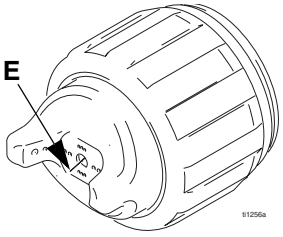
C. ***Turbine air exhaust.***



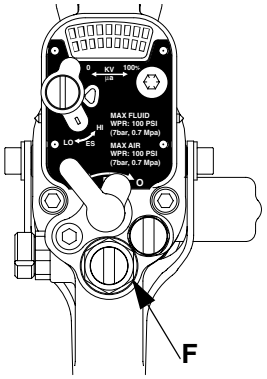
D. ***Air cap and nozzle.*** See page 13 for sizes.



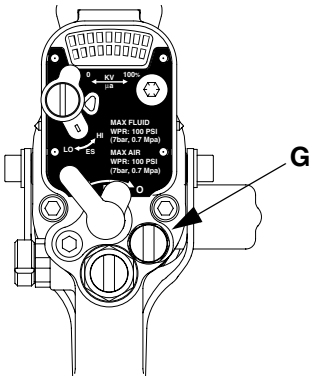
E. ***Fluid needle.*** Shuts off fluid flow and provides a ground point.



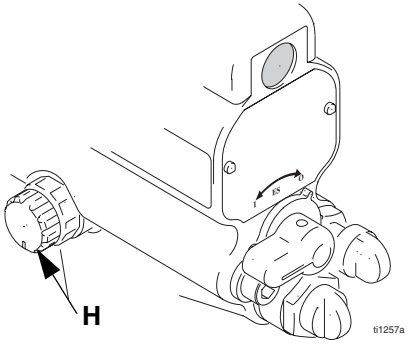
F. ***Fluid adjustment valve.*** Adjusts fluid needle travel. Use only in low flow conditions, to reduce needle wear.



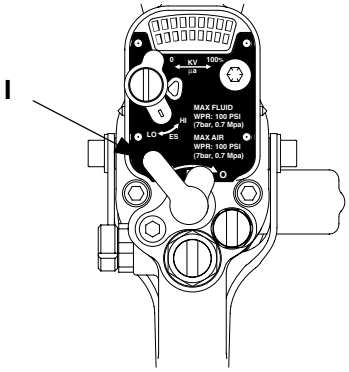
G. ***Fan air adjustment valve.*** Adjusts fan size and shape.



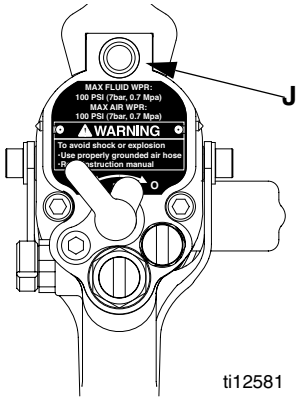
H. ***Atomizing air restrictor valve.*** Restricts atomizing air flow. Replace with plug (included) if desired.



I. ***ES ON/OFF switch.*** Turns electrostatics ON (I) or OFF (0).

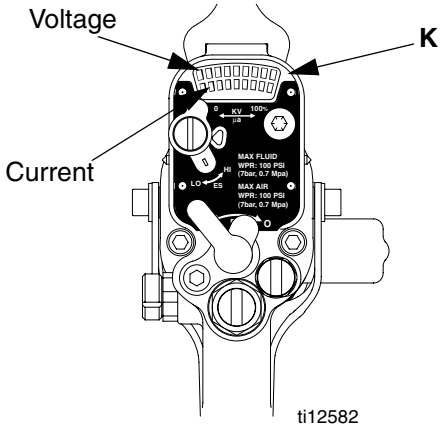


J. ***ES indicator (247936 only).*** Green when ES is ON (I).

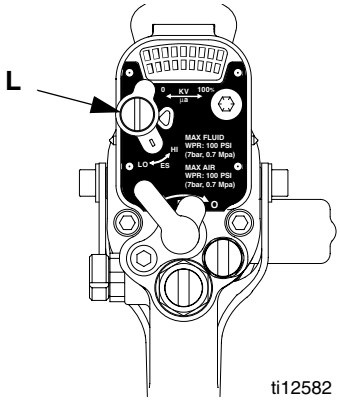


K. ***Voltage (247937 only).*** Shows voltage and current.
Green/yellow=spray,
red=see **Electrical Troubleshooting**, page 22.

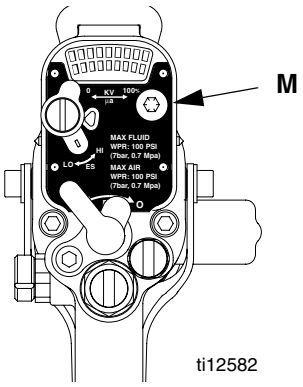
NOTE: Normal current draw for this model is higher and the yellow current bar will be lit.



L. ***ES HI/LO switch (247937 only).*** Sets voltage to HI or LO (factory settings).



M. ***LO voltage adjustment (247937 only).*** Remove plug to adjust to 4 settings.



Installation

Install the System

Installing and servicing this equipment requires access to parts which may cause electric shock or other serious injury if work is not performed properly.

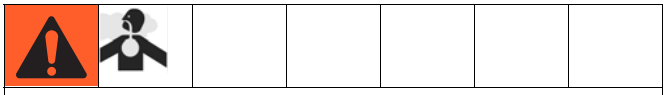
- Do not install or service this equipment unless you are trained and qualified.
- Be sure your installation complies with National, State and Local codes for the installation of electrical apparatus in a Class I, Div. I, Group D or a Group II, Category 2G Hazardous Location.
- Comply with all applicable local, state, and national fire, electrical, and other safety regulations.

FIG. 1. shows a typical electrostatic air spray system. It is not an actual system design. For assistance in designing a system to suit your particular needs, contact your Graco distributor.

Warning Sign

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.

Ventilate the Spray Booth



Provide fresh air ventilation to avoid the buildup of flammable or toxic vapors when spraying, flushing, or cleaning the gun. 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.

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.

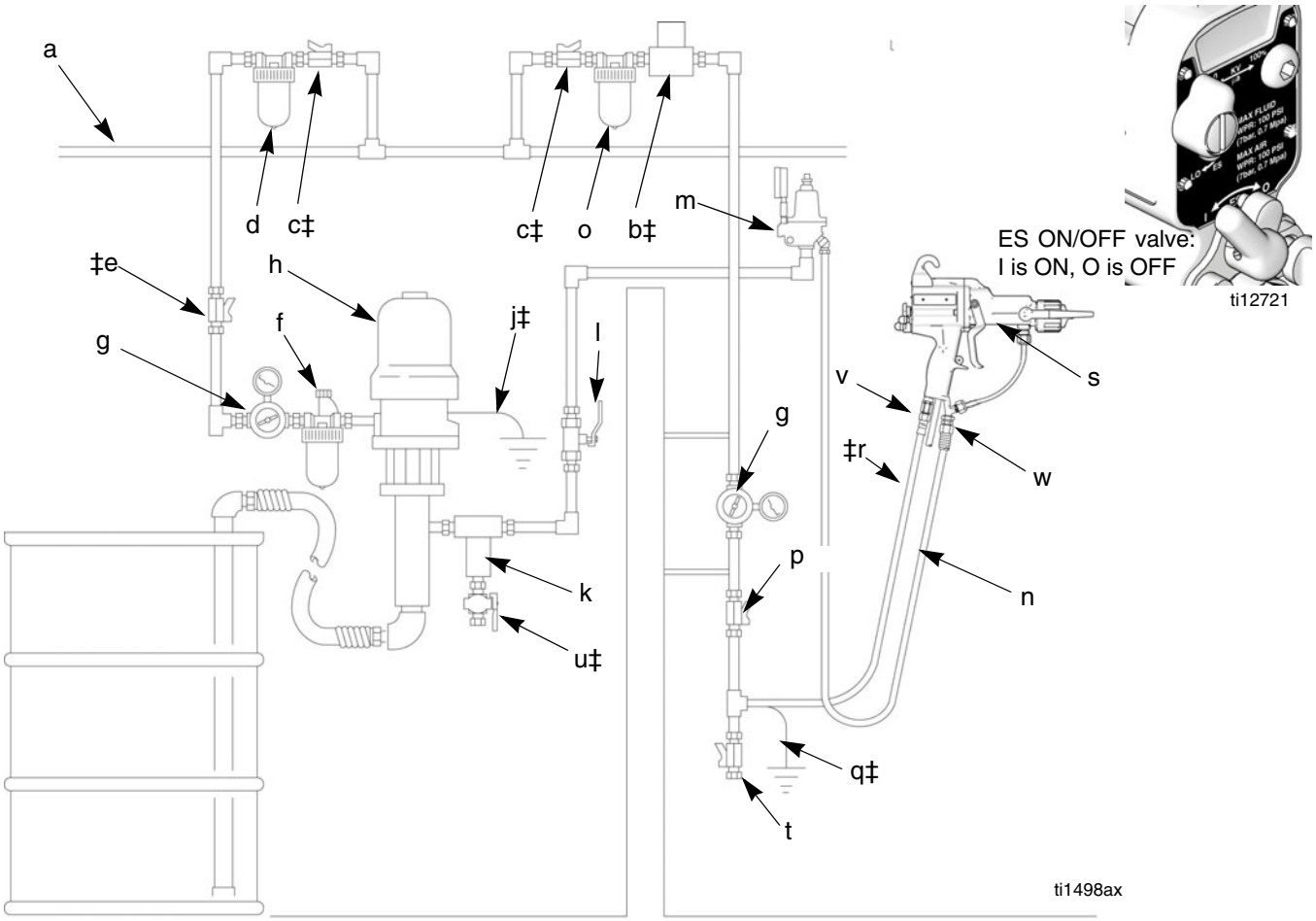


Fig. 1. Typical Installation

Key

- a Main Air Supply Line
- b‡ Ventilation Fan Interlock Solenoid Valve
- c‡ Main Air Supply Shutoff Valve (bleed-type)
- d Pump Air Line Filter/Water Separator
- e‡ Pump Air Supply Shutoff Valve (bleed-type)
- f Air Line Lubricator
- g Air Pressure Regulator
- h Pump
- j‡ Pump Ground Wire
- k Fluid Filter
- l Fluid Supply Line Shutoff Valve
- m Fluid Pressure Regulator
- n Fluid Supply Line
- o Gun Air Line Filter/Water Separator
- p Gun Air Supply Line Shutoff Valve (bleed-type)
- q‡ Air Hose Ground Wire
- r‡ Graco Grounded Air Hose
- s Electrostatic Air Spray Gun
- t Air Line Drain Valve
- u‡ Fluid Drain Valve
- v Gun Air Inlet
- w Gun Fluid Inlet
- ‡ These items are required for proper operation and must be purchased separately.
  NOTE: Solenoid valve (b) is not offered as a Graco accessory.

Connect the Air Line

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 Grounded Air Supply Hose.**

1. Connect the Graco Grounded Air Supply Hose (R) between the air supply line and the gun's air inlet (V) (FIG. 2). The gun air inlet fitting has a left-hand thread. Connect the air supply hose ground wire (Q) to a true earth ground.

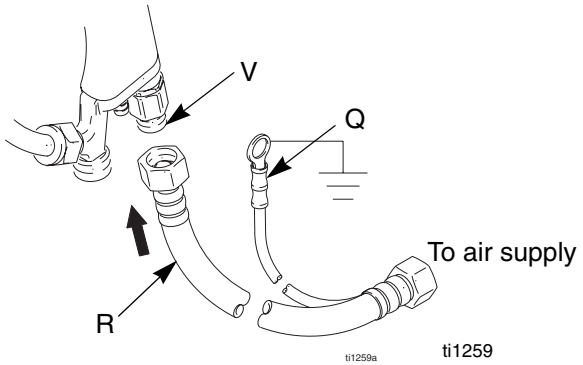


FIG. 2

2. Install an air line filter/water separator (O) on the gun air line to ensure a dry, clean air supply to the gun. Dirt and moisture can ruin the appearance of your finished workpiece and can cause the gun to malfunction.

3. Install a bleed-type air regulator (G) on the pump and gun air supply lines to control air pressure to the pump and gun.

4. Install a bleed-type air valve (E) on the pump air line to shut off air to the pump. Install an additional bleed-type air valve (C) on the main air line (A) to isolate the accessories for servicing.

The bleed-type air valve (E) is required in your system to relieve air trapped between the valve and the pump after the air regulator is shut off. Trapped air can cause the pump to cycle unexpectedly, which can result in serious injury, including splashing fluid in the eyes or on the skin.

5. Install an air shutoff valve (P) on each gun air supply line to shut off air to the gun(s).

Connect the Charging Probe

1. Apply dielectric grease to probe socket.

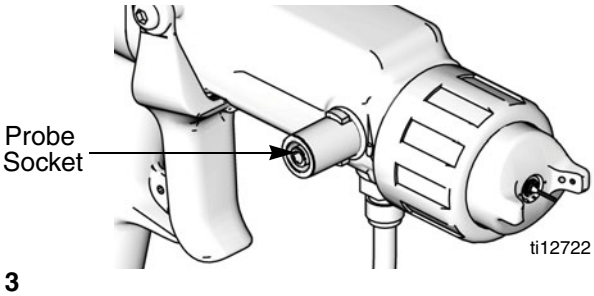


FIG. 3

2. Press electrode on in Connect/Disconnect position shown in FIG. 4.

3. Rotate electrode to spray position.

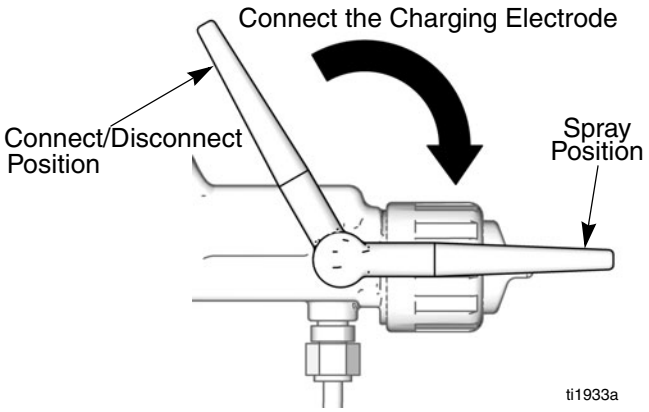


FIG. 4

NOTICE

The external charging probe rotates easily. Do not press too hard when rotating it or it could be damaged.

NOTICE

For proper performance, do not operate electrostatics if the charging probe is not in spray position.

Connect the Exhaust Tube

Press the exhaust tube (38) onto the barbed adapter on the bottom of the gun handle. Secure the tube with the clamp (39) (FIG. 5).

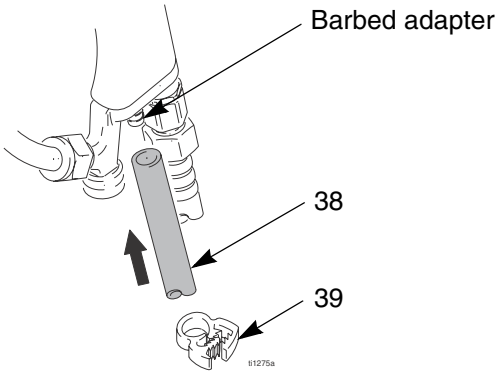


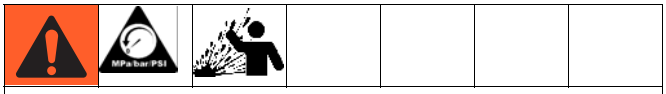
FIG. 5

Connect the Fluid Line

1. Before connecting the fluid line (N), blow it out with air and flush it with solvent. Use solvent compatible with the fluid to be sprayed.

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

3. Install a fluid filter (K) and drain valve (U) at the pump outlet.



The fluid drain valve (U) 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 splashing in the eyes or on the skin.

4. Connect the fluid line to the 3/8 npsm gun fluid inlet (W) (FIG. 6).

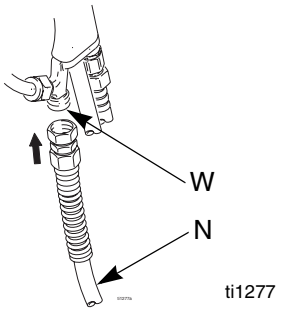


FIG. 6

5. Before running any paint through the spray gun, flush it with a compatible solvent.

Filter the Fluid

Install a fluid filter (K) to remove particles and sediment that could clog the spray nozzle.

Select a Fluid Nozzle and Air Cap

The gun is supplied with Part No. 197266 Nozzle and 24A276 Air Cap. If you require a different size, refer to Table 1 and Table 2 , and instruction manual 309419, or consult with your Graco distributor. See **Replace Air Cap/Nozzle** on page 28.

A wide pattern kit (P/N 24A431) is included with the gun and if installed, will provide more fan air for wider spray patterns. (If pattern becomes split, use the fan air valve to reduce the amount of fan air.)

To reduce the risk of an injury, follow the **Pressure Relief** procedure on page 19 before removing or installing a fluid nozzle and/or air cap.

NOTE: Due to the larger needle diameter, use a nozzle one size larger than you would use with a standard Pro Xs gun (i.e., 1.5 mm = 1.2 mm flow area).

Table 1: Fluid Nozzles

Part No.	Orifice Size
197265	1.2 mm (.047 in.)
197266	1.5 mm (.055 in.)
197267	1.8 mm (.070 in.)
249922*	1.2 mm (.047 in.)
249923*	1.5 mm (.055 in.)
249924*	1.8 mm (.070 in.)

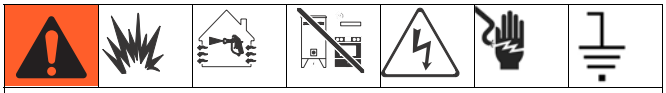
* Glass-reinforced acetal construction.

Table 2: Air Caps

Part No.	Pattern Shape and Length in. (mm)	Recommended Fluids and Production Rates
24A438	Round end; 15-17 (381-432)	Light to medium viscosity. Up to 15 oz/min (450 cc/min)
24A279	Round end; 14-16 (356-406)	Medium to high viscosity and high solids. Up to 15 oz/min (450 cc/min)
24A276*	Tapered end; 17-19 (432-483)	Light to medium viscosity. Up to 15 oz/min (450 cc/min)
24A274	Tapered end; 12-14 (305-356)	Light to medium viscosity. Up to 15 oz/min (450 cc/min)
24A439	Round end; 11-13 (279-330)	Medium to high viscosity and high solids. Up to 15 oz/min (450 cc/min) For use with 2.0 mm nozzle.
24A275	Tapered end; 14-16 (356-406)	Light to medium viscosity and high solids. Aerospace coatings. Up to 25 oz/min (750 cc/min).

* Also available in the following colors:
24A376 - gray
24A277 - red
24A278 - green

Grounding

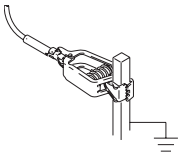


Fire, Explosion, and Electric Shock Hazard

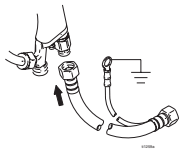
When operating the electrostatic gun, any ungrounded objects in the spray area (people, containers, tools, etc.) can become electrically charged. Improper grounding can result in static sparking, which can cause a fire, explosion, or electric shock. Follow the grounding instructions below.

The following are minimum grounding requirements for 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.

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

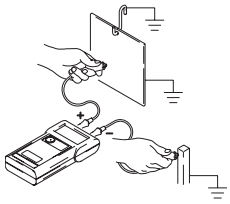


- *Electrostatic Air Spray Gun:* ground the gun by connecting the Graco Grounded Air Hose and connecting the air hose ground wire to a true earth ground. See **Check Electrical Grounding,** page 15.

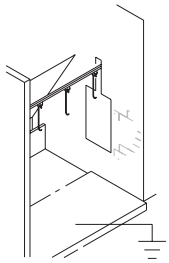


- *Air compressors:* ground the equipment according to the manufacturer's recommendations.
- *All air and fluid lines* must be properly grounded. Use only grounded hoses with a maximum of 100 feet (30.5 m) combined hose length to ensure grounding continuity.
- *All persons entering the spray area:* shoes must have conductive soles, such as leather, or personal grounding straps must be worn. Do not wear shoes with non-conductive soles such as rubber or plastic. If gloves are necessary, wear the conductive gloves that are supplied with the gun. If non-Graco gloves are worn, cut off fingers or palm area of gloves to ensure your hand contacts the grounded gun handle.

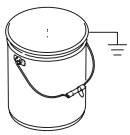
- *Object being sprayed:* keep the workpiece hangers clean and grounded at all times. Resistance must not exceed 1 megohm.



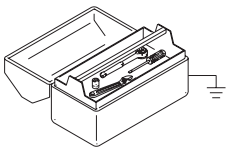
- *The floor of the spray area:* must be electrically conductive and grounded. Do not cover the floor with cardboard or any non-conductive material which would interrupt grounding continuity.



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



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



Check Electrical Grounding

Fire, Explosion, and Electric Shock Hazard

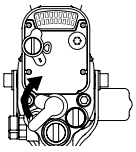
Megohmmeter Part No. 241079 (AA-see FIG. 7.) is not approved for use in a hazardous area. To reduce the risk of sparking, do not use the megohmmeter to check electrical grounding unless:

- 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, and electric shock and result in serious injury and property damage.

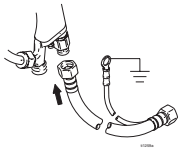
1. Have a qualified electrician check the electrical grounding continuity of the spray gun and air hose.

2. Turn the ES ON/OFF valve OFF.



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

4. Make sure the grounded air hose (R) is connected and the hose ground wire is connected to a true earth ground.



5. Measure the resistance between the gun handle (BB) and a true earth ground (CC). Use an applied voltage of 500 minimum to 1000 volts maximum. The resistance should not exceed 1 megohm. See FIG. 7.

6. If the resistance is greater than 1 megohm, 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.

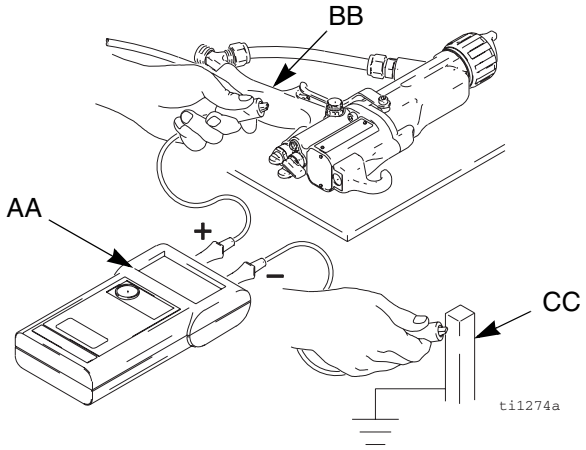


Fig. 7. Check Gun Grounding

Check Fluid Resistivity

Fire, Explosion, and Electric Shock Hazard

Check the fluid resistivity in a non-hazardous area only. Resistance Meter 722886 and Probe 722860 are not approved for use in a hazardous area.
Failure to follow this warning could cause fire, explosion, or electric shock and result in serious injury and property damage.

Graco Part No. 722886 Resistance Meter and 722860 Probe are available as accessories to check that the resistivity of the fluid being sprayed meets the requirements of an electrostatic air spray system.

Follow the instructions included with the meter and probe. If the material is above 1 megohm-cm, then a Pro Xs3 HC gun may be a better option. The Pro Xs WB gun is intended to spray very conductive waterborne materials and other materials less than 1 megohm-cm.

Check Fluid Viscosity

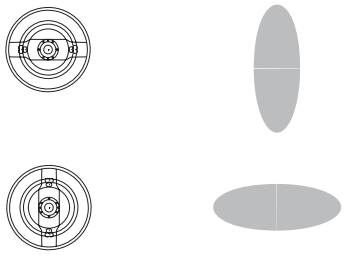
To check fluid viscosity you will need:

- a viscosity cup
- a stopwatch.

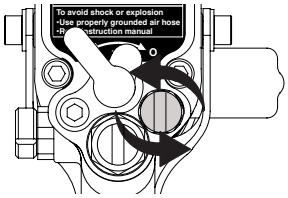
1. Completely submerge the viscosity cup in the fluid. Lift the cup out quickly, starting the stopwatch as soon as the cup is completely removed.
2. Watch the stream of fluid coming from the bottom of the cup. As soon as there is a break in the stream, shut off the stopwatch.
3. Record the fluid type, elapsed time, and size of the viscosity cup.
4. If the viscosity is too high or too low, contact the material supplier. Adjust as necessary.

Prepare to Paint

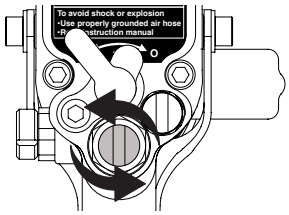
1. Position air cap.



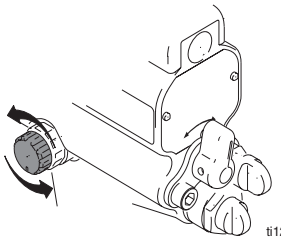
2. Fully open fan air adjustment valve.



3. Fully open fluid adjustment valve.

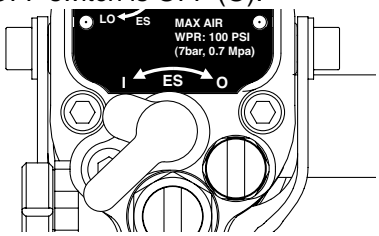


4. Fully open atomizing air restrictor valve.

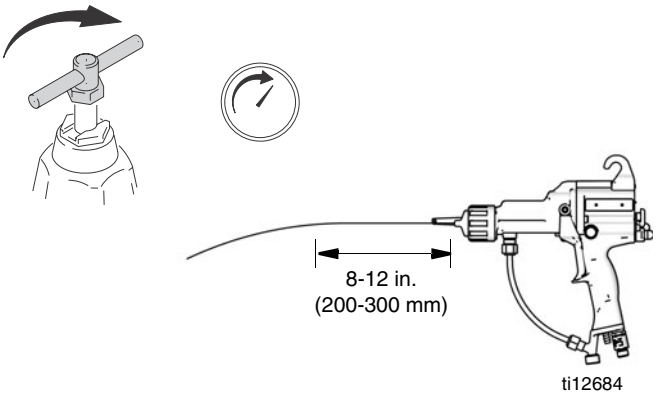


5. Check that ES ON/OFF switch is OFF (O).

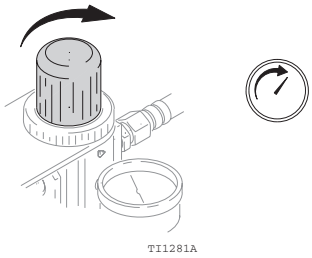
NOTE: This illustration shows the switch in the ON (I) position to view I and O indicators.



6. Start pump. Adjust fluid regulator until stream from gun travels 8-12 in. (200-300 mm) before falling off. Typically, if fluid pressure is below 5 psi (.04 MPa, 0.4 bar) or above 20 psi (0.14 MPa, 1.4 bar), a change of nozzle size is recommended.



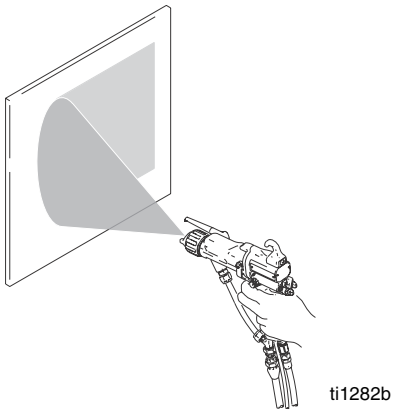
7. Set gun air regulator to deliver minimum 40 psi (0.28 MPa, 2.8 bar) at gun when triggered, for maximum transfer efficiency. See table at right.



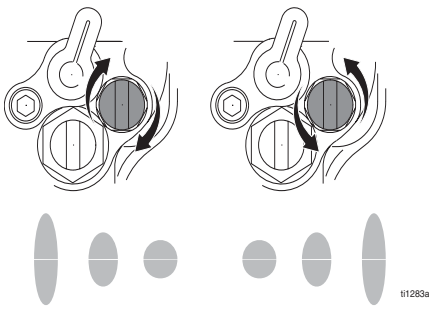
Air Hose* Length ft (m)	Regulator Setting** psi (MPa, bar)
15 (4.6)	50 (0.35, 3.5)
25 (7.6)	60 (0.42, 4.2)
50 (15.3)	75 (0.52, 5.2)

* 5/16 in. (8 mm) diameter/8 mm (5/16 in.)
**Gun triggered

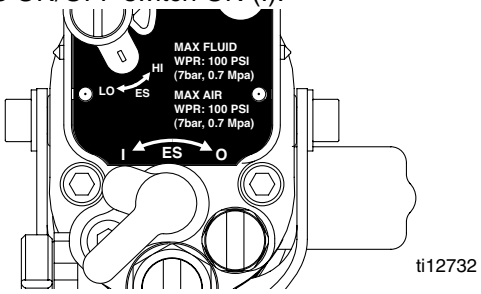
8. Spray test pattern. Check atomization. If over-atomization occurs at minimum pressure, adjust restrictor valve. If atomization is inadequate, increase air pressure.



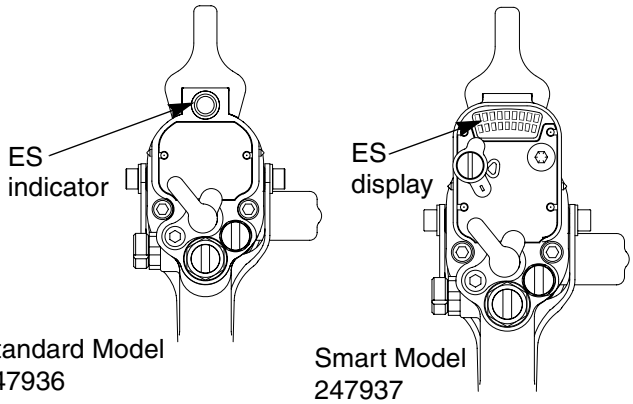
9. Adjust fan air adjustment valve: clockwise for a shorter pattern, counterclockwise for wider pattern.



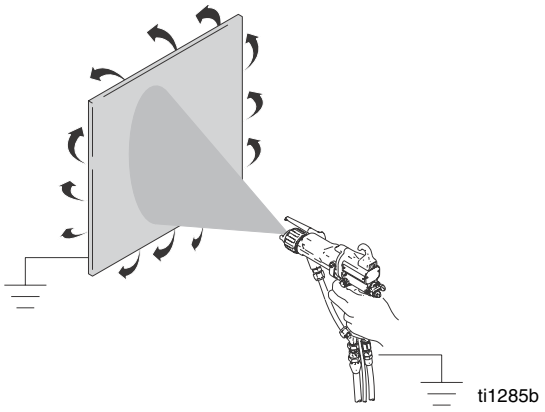
10. Turn ES ON/OFF switch ON (I).



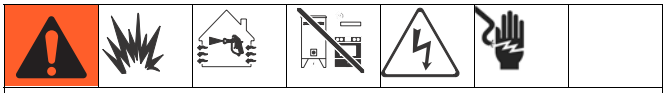
11. Check that ES indicator or display is lit. If not, see **Electrical Troubleshooting**, page 22.



12. Spray test piece. Examine edges for coverage. If wrap is poor, see **Spray Pattern Troubleshooting**, page 25.



Flush



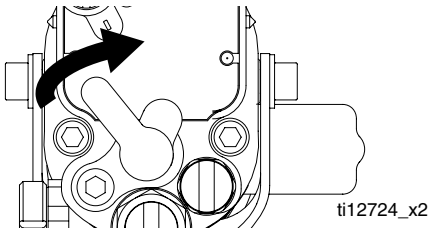
Fire, Explosion, and Electric Shock Hazard

Read **Fire and Explosion, and Electric Shock Hazards,** page 3. Follow steps 1-6 below to flush the gun when using gun first time, changing colors, before fluid dries, at end of day, and before storing gun.

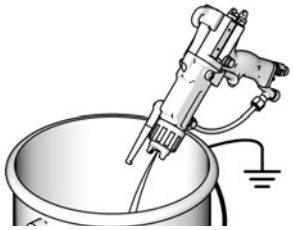
NOTICE

This gun has nylon components which will be damaged if you use methylene chloride as a flushing or cleaning solvent.

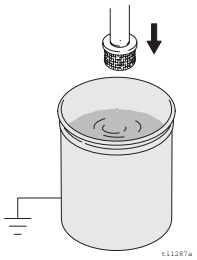
1. Turn ES ON/OFF switch OFF (O).



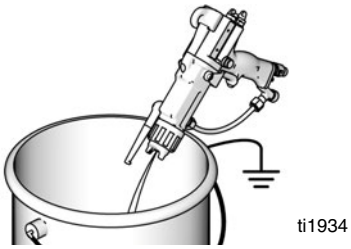
2. Relieve pressure, page 19.



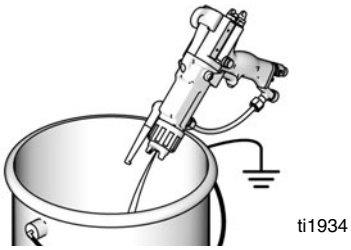
3. Change fluid source to solvent, **or** disconnect fluid line and connect solvent supply line to gun.



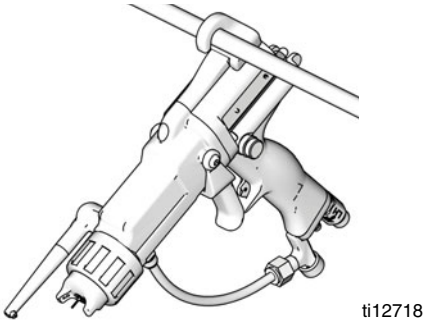
4. Point gun into grounded metal pail. Flush until clean solvent flows from gun.



5. Relieve pressure, page 19.



6. Hang gun from hook. Nozzle must point down.



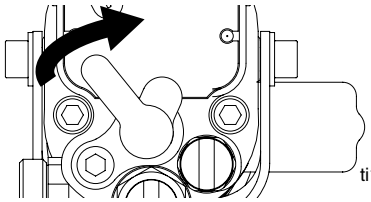
Pressure Relief

Pressurized Equipment Hazard

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. To reduce the risk of an injury from electric shock, accidental spray from the gun, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

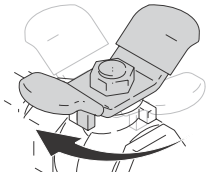
- are instructed to relieve the pressure
- stop spraying
- check or service any of the system equipment

1. Turn the ES ON/OFF valve OFF.



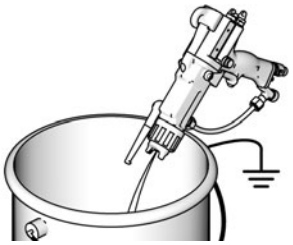
ti12724_x2

2. Turn off the air bleed valves to the fluid source and to the gun.



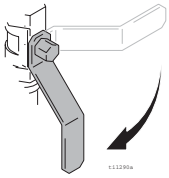
ti1289

3. Trigger the gun into a grounded metal waste container to relieve the fluid pressure.

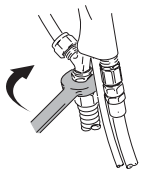


ti1934

4. Open the pump drain valve, having a waste container ready to catch the drainage. Leave the pump drain valve open until you are ready to spray again.



5. If the nozzle or hose is completely clogged or pressure is not fully relieved, slowly loosen the hose end coupling. Now clear the nozzle or hose.

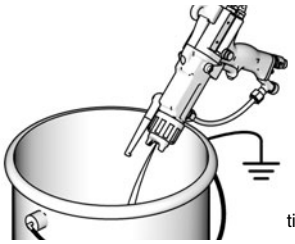


ti1298

Shutdown

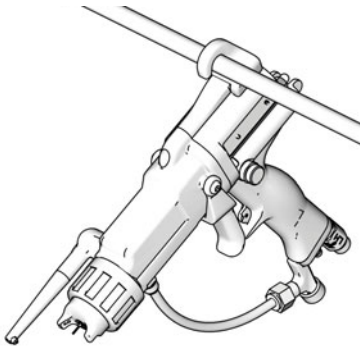
Follow these steps at end of workshift and before cleaning, checking, or repairing equipment

1. Flush, page 18.



ti1934

2. Hang gun from hook. Nozzle must point down.



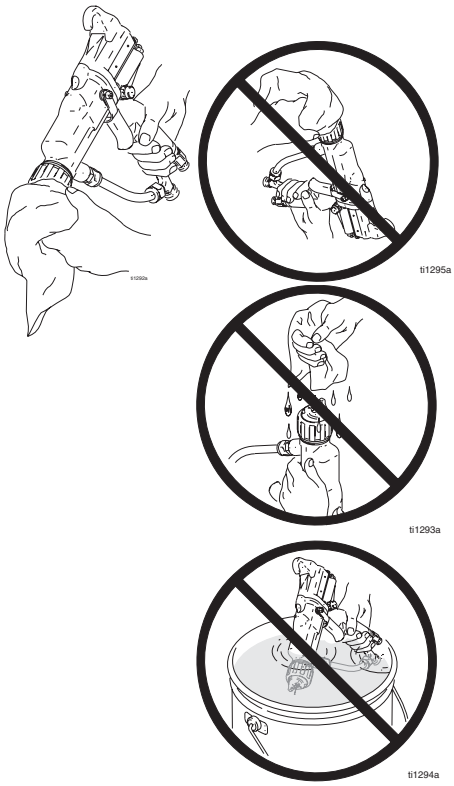
ti12718

Maintenance

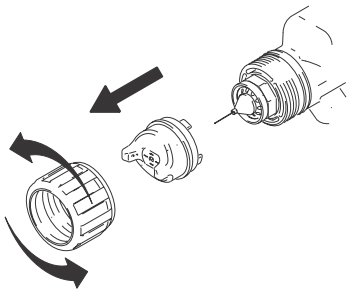
Clean Gun Daily

1. Flush, page 18.

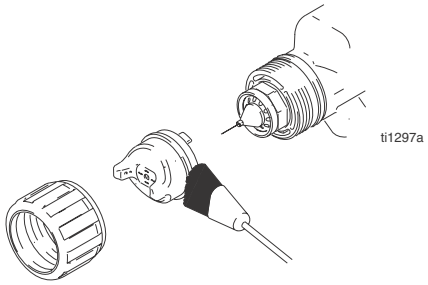
2.
   a. Clean outside of gun with non-conductive, compatible solvent. Point gun down.
   b. Use soft, damp cloth.
   c. Do not immerse gun.



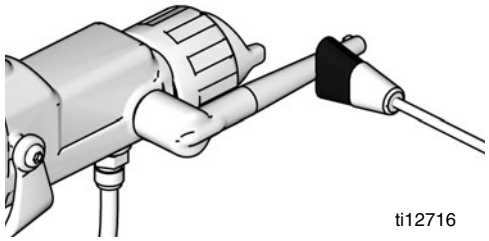
3. Remove air cap.



4. Clean air cap, retaining ring, and nozzle with soft brush and non-conductive, compatible solvent.

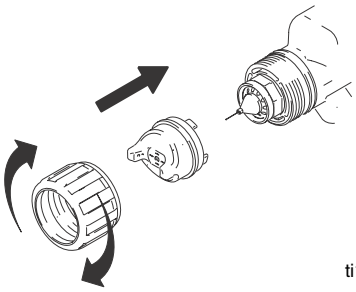


5. Clean probe with soft brush and compatible solvent.



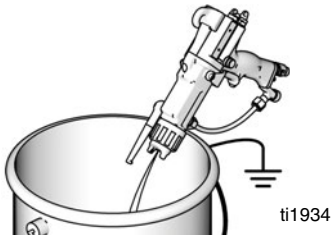
6. Use toothpick or other soft tool to clean air cap holes. Do not use metal tools.

7. Reinstall air cap. Tighten securely.

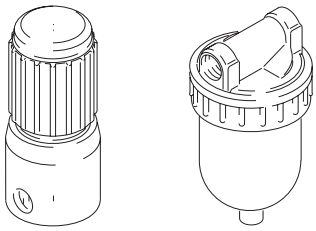


Daily System Care

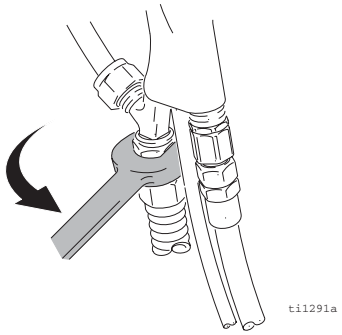
1. Relieve pressure, page 19.



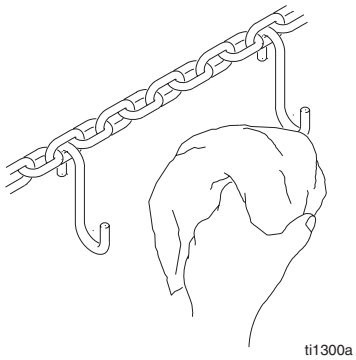
2. Clean fluid and air filters.



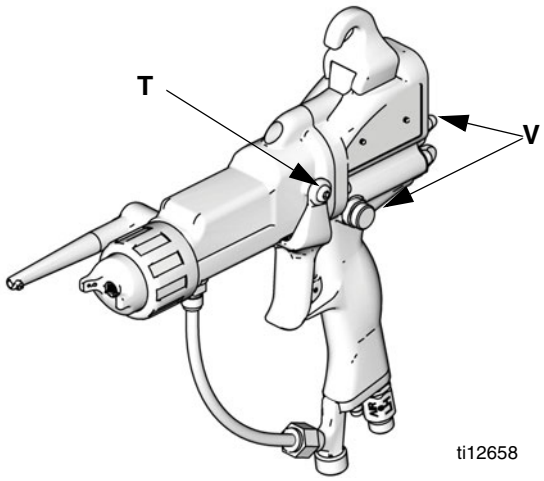
3. Check for fluid leaks. Tighten all fittings.



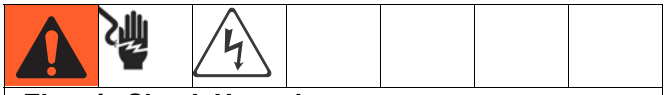
4. Clean workpiece hangers. Use non-sparking tools.



5. Check movement of trigger (T) and valves (V). Lubricate if necessary.



Electrical Troubleshooting



Electric Shock Hazard

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

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

Problem	Cause	Solution
Poor wrap. (In general, a Pro Xs Waterborne gun will have less wrap than a Pro Xs solventborne gun.)	ES ON/OFF valve OFF (0).*	Turn ON (I).
	Gun air pressure too low.	Check air pressure to gun; minimum 40 psi (0.28 MPa, 2.8 bar) needed at gun for full voltage.
	Atomizing air pressure too high.	Decrease.
	Fluid pressure too high.	Decrease.
	Incorrect distance from gun to part.	Should be 8-12 in. (200-300 mm).
	Poorly grounded parts.	Resistance must be 1 megohm or less. Clean workpiece hangers.
	Faulty gun resistance.	See **Test Total Gun Resistance** on page 23.
	Faulty turbine alternator.	Be sure the plug is in place on the back of the power supply housing. Remove and test the turbine alternator. See page 33.
	The KV HI-LO lever is on LO.	Check the lever actuation; replace if needed.
ES indicator or voltage/current display is not lit.	ES ON/OFF valve OFF (0).*	Turn ON (I).
	No power.	Replace power supply. See page 32.
Voltage/current display stays red (smart guns only).	Gun too close to part.	Should be 8-12 in. (200-300 mm).
	Dirty gun.	Clean. See **Maintenance** on page 20.
Operator gets mild shock.	Operator not grounded or is near ungrounded object.	See **Grounding** on page 14.
	Gun not grounded.	See **Check Electrical Grounding** on page 15 and **Test Total Gun Resistance** on page 23.
Operator gets shock from workpiece.	Workpiece not grounded.	Resistance must be 1 megohm or less. Clean workpiece hangers.

* ES indicator light is off when the gun is triggered.

Electrical Tests

Electrical components inside the gun affect performance and safety. The following procedures test the condition of the power supply (18), barrel (16) and charging probe (31), and electrical continuity between components.

Use megohmmeter Part No. 241079 (AA) and an applied voltage of 500 V. Connect the leads as shown.

Fire, Explosion, and Electric Shock Hazard

Megohmmeter Part No. 241079 (AA-see FIG. 8. through FIG. 12.) is not approved for use in a hazardous areas. 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, and electric shock and result in serious injury and property damage.

Test Total Gun Resistance

Measure resistance between the charging probe tip (BB) and the air swivel (35) (see FIG. 8.); it should be 90-130 megohms. If outside this range, go to the next test. If in range, refer to **Gun Repair** on page 27 for other possible causes of poor performance.

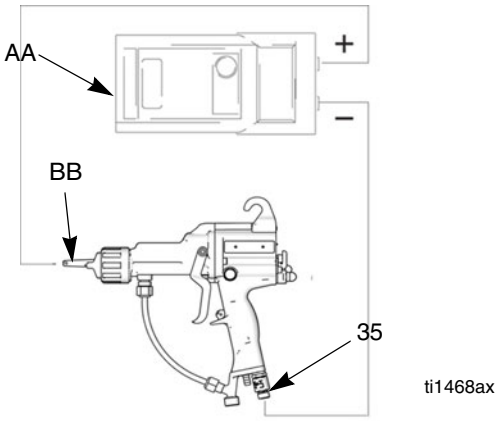


Fig. 8. Test Total Gun Resistance

Test Gun Resistance

Measure resistance between the air swivel (35) and the charging probe socket (CC) (see FIG. 9); it should be 70-95 megohms. If outside this range, check the power supply and barrel resistance. If in range, test the charging probe resistance.

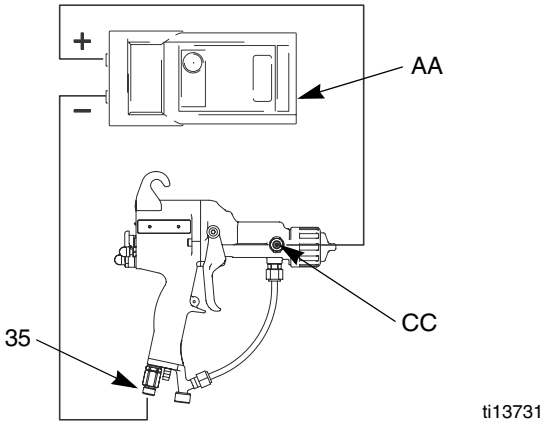


FIG. 9. Test Gun Resistance

Test Charging Probe Resistance

Measure resistance between the metal spring in the charging probe (DD) and the charging probe tip (BB) (see FIG. 9); it should be 15-30 megohms. If outside this range, replace the charging probe. If in range, inspect the spring and barrel socket for possible causes of poor continuity. Reassemble the charging probe and retest the gun resistance.

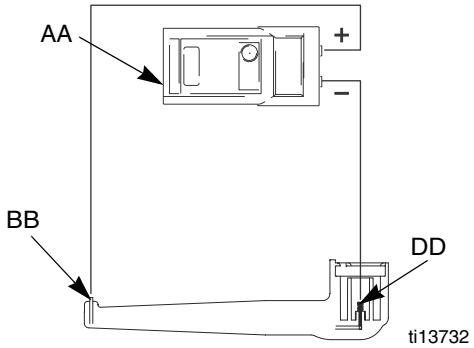


FIG. 10. Test Charging Probe Resistance

Test Power Supply Resistance

1. Remove the power supply (18), page 31.
2. Remove the turbine alternator (19) from the power supply, page 32.
3. Measure resistance from the power supply's ground strips (EE) to the conductive contact in the center of the power supply seal (FF). See FIG. 11.
4. The resistance should be 55-70 megohms. If outside this range, replace the power supply. If in range, proceed to the next test.

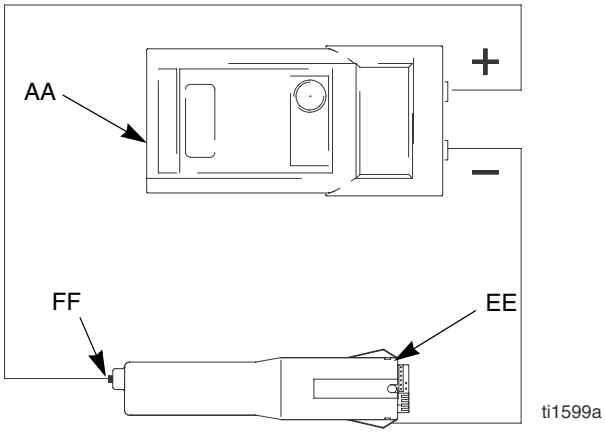


Fig. 11. Test Power Supply Resistance

Test Barrel Resistance

1. Insert a conductive rod (GG) into the gun barrel (removed for the power supply test) and against the metal contact (HH) in the front of the barrel.
2. Measure the resistance between the conductive rod (GG) and the charging probe socket (CC). See FIG. 12. The resistance should be 15-30 megohms.
3. If the resistance is outside the range, replace barrel.
4. If resistance is in range, reassemble the gun and test the gun resistance.
5. If you still have problems, refer to **Gun Repair** on page 27 for other possible causes of poor performance, or contact your Graco distributor.

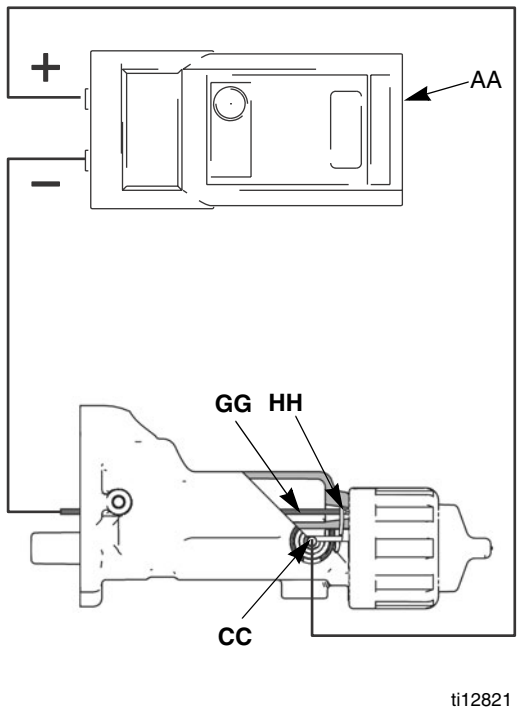


Fig. 12. Test Barrel Resistance

Spray Pattern Troubleshooting

Electric Shock Hazard

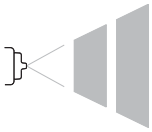
Installing and servicing this equipment requires access to parts which may cause an electric shock or other serious injury if the work is not performed properly. Do not install or repair this equipment unless you are trained and qualified.

Pressurized Equipment Hazard

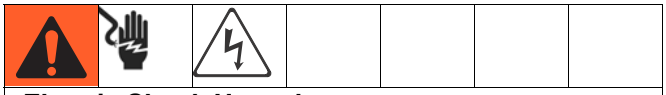
To reduce the risk of an injury, follow the **Pressure Relief** procedure on page 19 whenever you are instructed to relieve the pressure.

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

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

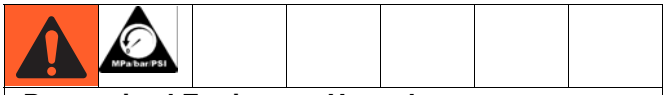
Problem	Cause	Solution
Fluttering or spitting spray. 	No fluid.	Refill supply.
	Loose, dirty, damaged nozzle/seat.	Clean or replace nozzle, page 28.
	Air in fluid supply.	Check fluid source. Refill.
Improper spray pattern. 	Damaged nozzle or air cap.	Replace, page 28.
	Fluid buildup on air cap or nozzle.	See **Maintenance** on page 20.
	Fan air pressure too high.	Decrease.
	Fluid too thin.	Increase viscosity.
	Fluid pressure too low.	Increase.
	Fan air pressure too low.	Increase.
	Fluid too thick.	Reduce viscosity.
	Too much fluid.	Decrease flow.
Streaks.	Did not apply 50% overlap.	Overlap strokes 50%.
	Dirty or damaged air cap.	Clean or replace, page 28.

Gun Operation Troubleshooting



Electric Shock Hazard

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



Pressurized Equipment Hazard

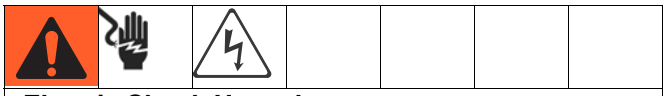
To reduce the risk of an injury, follow the **Pressure Relief** procedure on page 19 whenever you are instructed to relieve the pressure.

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

Problem	Cause	Solution
Excessive spray fog.	Atomizing air pressure too high.	Close restrictor valve some, or decrease air pressure as low as possible; minimum 40 psi (0.28 MPa, 2.8 bar) needed at gun for full voltage.
	Fluid too thin.	Increase viscosity.
“Orange Peel” finish.	Atomizing air pressure too low.	Open atomizing air valve more or increase gun air inlet pressure; use lowest air pressure necessary.
	Poorly mixed or filtered fluid.	Remix or refilter fluid.
	Fluid too thick.	Reduce viscosity.
Fluid leaks from the fluid packing area	Worn packings or rod.	Replace packings or rod; see page 30.
Air leaks from the front of the gun	Air valve (21) is not seating properly.	Clean and service air valve; see page 34.
Fluid leakage from the front of the gun	Worn or damaged packing rod (26).	Replace; see page 30
	Worn fluid seat.	Replace fluid nozzle and/or needle; see page 28.
	Loose fluid nozzle (7).	Tighten; see page 28.
	Damaged nozzle o-ring (7b).	Replace; see page 28.
Gun does not spray	Low fluid supply.	Add fluid if necessary.
	Damaged air cap (9).	Replace; see page 28.
	Dirty or clogged fluid nozzle (7).	Clean; see page 28.
	Damaged fluid nozzle (7).	Replace; see page 28.
	Damaged fluid adjustment valve (25).	Replace; see page 34.
Dirty air cap	Misaligned air cap (9) and fluid nozzle (7).	Clean fluid buildup off air cap and fluid nozzle seat; see page 28.

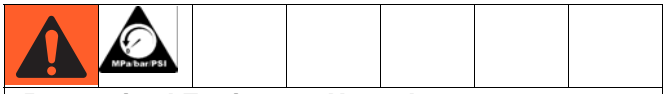
Gun Repair

Prepare the Gun for Repair



Electric Shock Hazard

Installing and repairing 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.



Pressurized Equipment Hazard

- To reduce the risk of injury, follow the **Pressure Relief** procedure on page 19 before checking or servicing any part of the system and whenever you are instructed to relieve the pressure.

- Check all possible remedies in **Gun Operation Troubleshooting** before disassembling the gun.
- Use a vise with padded jaws to prevent damage to plastic parts.
- Lubricate the power supply seal (18a), some packing rod parts (26), and certain fluid fittings with dielectric grease (40), as specified in the text.
- Lightly lubricate o-rings and seals with non-silicone grease. Order Part No. 111265 Lubricant. Do not over-lubricate.
- Only use genuine Graco parts. Do not mix or use parts from other PRO Gun models.
- Air Seal Repair Kit 244781 is available. The kit must be purchased separately. Kit parts are marked with an asterisk, for example (6*).
- Fluid Seal Repair Kit 244911 is available. The kit must be purchased separately. Kit parts are marked with a double asterisk, for example (5†).

1. Flush the gun, page 18.
2. Relieve the pressure, page 19.
3. Disconnect the gun air and fluid lines.
4. Remove the gun from the worksite. Repair area must be clean.

Replace Air Cap/Nozzle

NOTICE

Hold the front end of the gun up and trigger the gun while removing the nozzle to help drain the gun and prevent any paint or solvent left in the gun from entering the air passages.

1. Prepare gun for repair page 27.
2. Remove probe.
3. Remove the retaining ring (27) and air cap (9). See FIG. 13.
4. Point gun up and squeeze trigger while removing the fluid nozzle (7) assembly with the multi-tool (37).

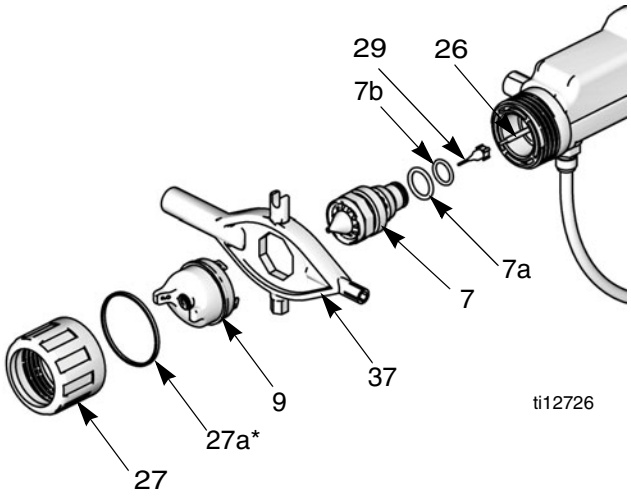


Fig. 13. Replace Air Cap/Nozzle

Fire, Explosion, and Electric Shock Hazard

The nozzle contact ring (7a) is a conductive contact ring, not a sealing o-ring. To reduce the risk of sparking or electric shock, do not remove the nozzle contact ring (7a) 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.

Use non-silicone grease, Part No. 111265, on the small o-ring (7b). Do not over-lubricate. Do not lubricate the contact ring (7a).

5. Lightly lubricate the o-ring (7b). Install it and the contact ring (7a) on the nozzle (7).

   Make sure the fluid needle (29) is finger- tight (page 28).

6. Trigger gun while installing the fluid nozzle (7) with the multi-tool (37). Tighten until the fluid nozzle seats in the gun barrel (1/8 to 1/4 turn past hand-tight).
7. Install the air cap (9) and retaining ring (27). Make sure the u-cup (27a*) is in place with the lips facing forward.

Replace Fluid Needle

1. Prepare the gun for repair page 27.
2. Remove the air cap and nozzle, page 28.
3. Unscrew the fluid needle (29). Hold the packing rod end (26) to prevent it from turning, FIG. 13.
4. Apply low-strength (purple) Loctite® or equivalent thread sealant to the fluid needle and packing rod threads. Install the fluid needle finger-tight. Do not overtighten.
5. Install the fluid nozzle and air cap, page 28.

Remove Fluid Packing

1. Prepare the gun for repair, page 27.
2. Remove the air cap and fluid nozzle, page 28.
3. Remove the fluid needle, page 28.
4. Loosen the trigger screws (8) and trigger (30). See FIG. 14.
5. Remove the packing rod (26), using the multi-tool (37).

NOTICE

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.

6. Check all parts for wear or damage and replace if necessary.

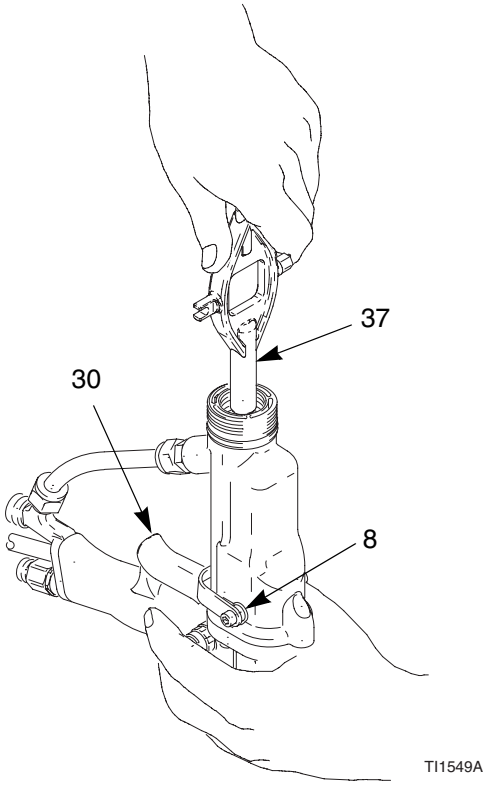


Fig. 14. Remove Fluid Packing

Repair Packing Rod

You may replace the packing rod as individual parts or as an assembly. The assembly is pre-adjusted at the factory for proper air lead and lag. The gun begins emitting air before the fluid is discharged and the fluid stops before the air flow stops.

To adjust the lead/lag air flow:

1. Remove the spring (4) from the nut (E).
2. Use a hex wrench to hold the end of the packing rod. Turn the nut (E) out to increase the lead/lag time for the air flow. The recommended adjustment is one half turn and not more than one full turn.
3. Apply thread-locking adhesive to fix the nut in the new position.

Before installing the fluid packing rod into the gun barrel, make sure the internal surfaces of the barrel are clean. Remove any residue with a soft brush or cloth. Check the inside of the barrel for marks from high voltage arcing. If marks are present, replace the barrel.

To assemble the individual parts:

1. Place the packing nut (26g) and seal (26f†) on the fluid rod (26a). Flats on the packing nut must face the back of the fluid rod. The seal o-ring must face away from the packing nut. See FIG. 15.
2. Fill the inner cavity of the spacer (26e†) with dielectric grease (40). Place the spacer on the fluid rod (26a) in the direction shown. Generously apply dielectric grease to the outside of the spacer.
3. Place the rod packing (26d†), packing spreader (26c†), and housing (26b) on the packing rod (26h).
4. Lightly tighten the packing nut (26g). The packing nut is properly tightened when there is 3 lb (13.3 N) of drag force when sliding the packing housing (26b) assembly along the rod. Tighten or loosen the packing nut as needed.
5. Install the o-ring (26h†) on the outside of housing (26f). Lubricate the o-ring with non-silicone grease, Part No. 111265. Do not over-lubricate.
6. Install the spring (4) against the nut (E) as shown.
7. Install the packing rod assembly (26) into the gun barrel. Using the multi-tool (37), tighten the assembly until just snug.
8. Install the trigger (30) and screws (8).
9. Install the fluid needle page 28.
10. Install the nozzle and air cap, page 28.
11. Install the probe.

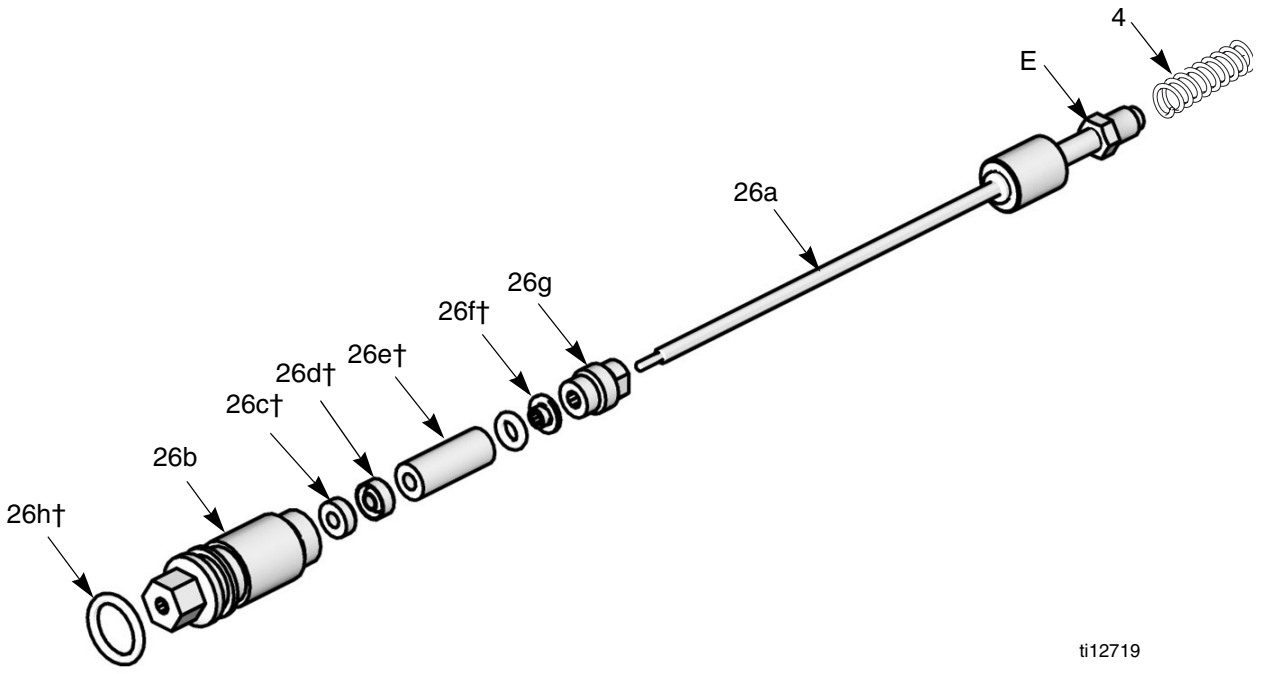


Fig. 15. Packing Rod

Remove Barrel

1. Prepare the gun for repair, page 27.

2. Carefully loosen the nut (54) from the bracket fluid fitting (13). Pull the tube (14 or 50a) out of the fitting. Make sure both ferrules and the nut stay with the tube.

3. Loosen the three screws (11).

NOTICE

To avoid damaging the power supply (18), pull the gun barrel straight away from the gun handle. If necessary, gently move the gun barrel from side to side to free it from the gun handle.

4. Hold the gun handle (17) with one hand and pull the barrel (16) straight off the handle. See FIG. 16.

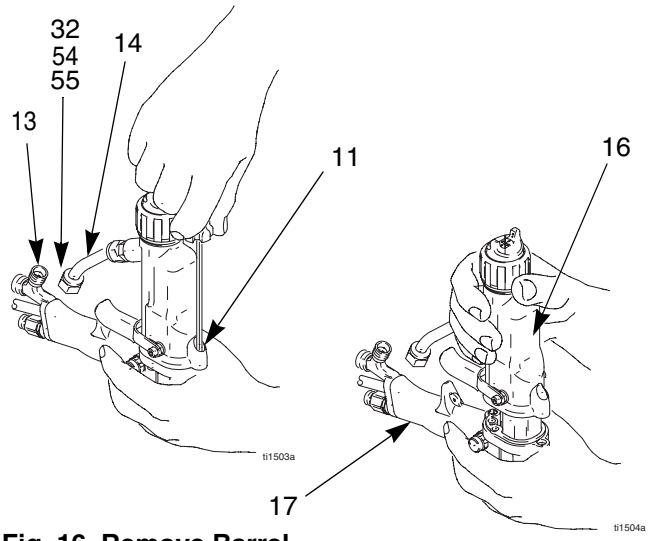


Fig. 16. Remove Barrel

Install Barrel

1. Be sure the gasket (10*) and grounding spring (53) are in place. Make sure the air holes are aligned properly. Replace if damaged. See FIG. 17.

2. Place the barrel (16) over the power supply (18) and onto the gun handle (17).

3. Tighten the three screws (11) oppositely and evenly (about a half turn past snug).

NOTICE

Do not over-tighten the screws (11).

4. Assemble the fluid tube (14) into the bracket fitting (13). Ensure that the ferrules are in place. Tighten the nut (54).

5. Test gun resistance, page 23.

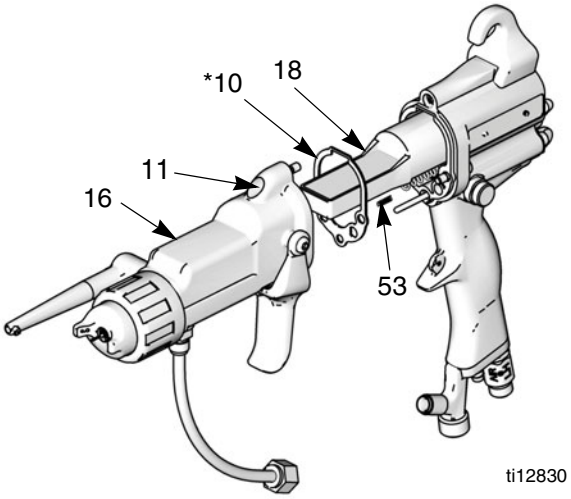


Fig. 17. Install Barrel

Remove and Replace Power Supply

- Inspect the gun handle power supply cavity for dirt or moisture. Clean with a clean, dry rag.
- Do not expose gasket (10) to solvents.

1. Prepare gun for service, page 27.
2. Remove the barrel (16), page 31.

NOTICE

Be careful when handling the power supply (18) to avoid damaging it.

3. Grasp the power supply (18) with your hand. With a gentle side to side motion, free the power supply/alternator assembly from the gun handle (17), then carefully pull it straight out. *On Smart Model only,* disconnect the flexible circuit (59) from the socket at the top of the handle (17). See FIG. 18.
4. Disconnect the 3-wire connector (GG) from the power supply. Slide the alternator up and off the power supply. Inspect the power supply and alternator for damage. *On Smart Model only,* disconnect the 6-pin flexible circuit (59) from the power supply.
5. Check the power supply resistance, page 24. Replace if necessary.
6. *On Smart Model only,* connect the 6-pin flexible circuit (59) to the power supply.
7. Connect the 3-wire connector (GG). Slide the alternator (19) down onto the power supply (18).
8. Lubricate the alternator o-ring (19a*) with non-silicone grease, Part No. 111265. Do not over-lubricate. Ensure the alternator pads (19e) are in place.
9. Lubricate the power supply seal (18a) with dielectric grease (40).
10. Insert the power supply/alternator assembly in the gun handle (17). Make sure the ground strips make contact with the handle. *On Smart Model only,* connect the flexible circuit (59) to the socket at the top of the handle. Push the 6-pin connector into the socket to ensure it is properly connected.
11. Install the barrel (16), page 31. Ensure the ground spring (53) is in place.
12. Test gun resistance, page 23.

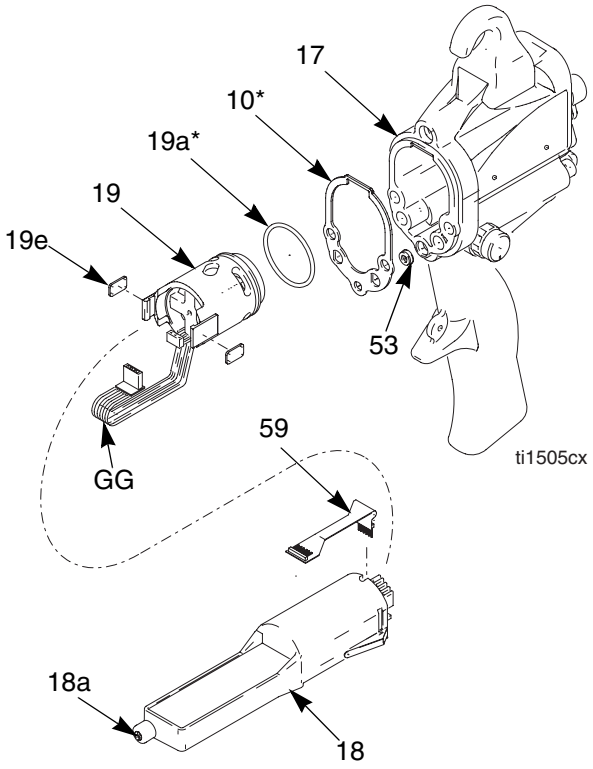


FIG. 18. Power Supply

Remove and Replace Turbine Alternator

Replace turbine alternator bearings after 2000 hours of operation. Order Part No. 223688 Bearing Kit.

1. Prepare gun for repair, page 27.
2. Remove the power supply/alternator assembly, page 32.
3. Disconnect the alternator from the power supply, page 32.
4. Measure resistance between the two outer terminals of the 3-wire connector (GG); it should be 2.5-3.5 ohms. If outside this range, replace the alternator coil.
5. Follow the bearing replacement procedure in the bearing kit manual 308034.
6. Install the alternator on the power supply, page 32.
7. Install the power supply/alternator assembly, page 32.

Repair Fan Air Adjustment Valve

1. Prepare the gun for service, page 27.
2. Place a wrench on the flats of the valve assembly (20) and unscrew it from the handle (17).

   You may replace the valve as an assembly (go to step 9) or as individual parts (steps 3-9).
3. Remove the retaining ring (20a). See FIG. 19.
4. Turn the valve stem (20d) counterclockwise until it comes free from the valve housing (20c).
5. Remove the o-ring (20b).
6. Clean all parts and inspect for wear or damage.

   Use non-silicone grease, Part No. 111265. Do not over-lubricate.
7. When reassembling the fan air valve (20), lightly lubricate the valve threads and screw the stem (20d) fully into the housing (20c) until bottomed. Install the o-ring (20b*), lubricate, and unscrew the valve stem until the o-ring enters the housing.
8. Reassemble the retaining ring (20a). Unscrew the valve stem from the housing until it is stopped by the retaining ring.
9. Screw the valve assembly (20) into the gun handle, using a wrench on the flats of the housing. Torque to 15-25 in-lb (1.7-2.8 N•m).

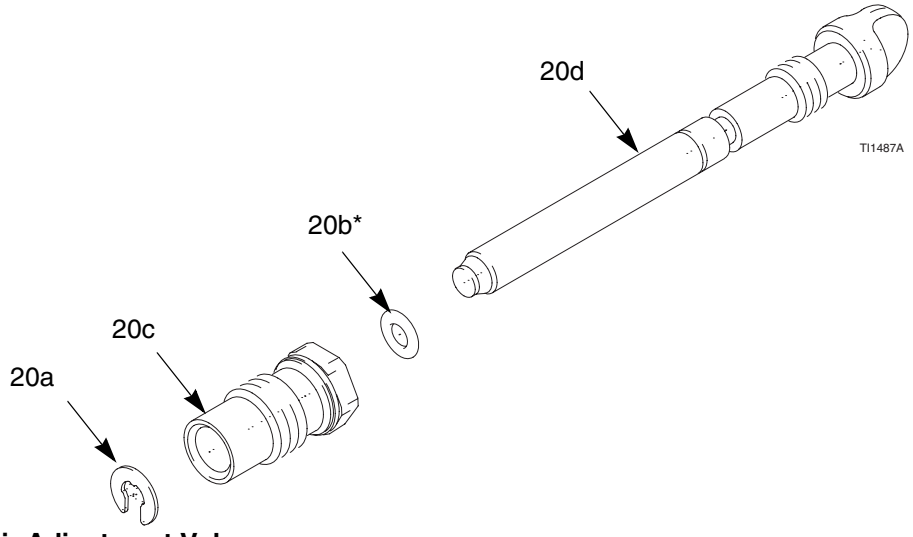


Fig. 19. Fan Air Adjustment Valve

Repair Fluid Adjustment Valve

1. Prepare the gun for repair, page 27.
2. Remove the fluid adjustment valve (25). It can only be replaced as a complete assembly. See FIG. 20..
3. Screw the valve (25) into the gun handle. Torque to 15-25 in-lb (1.7-2.8 N•m).

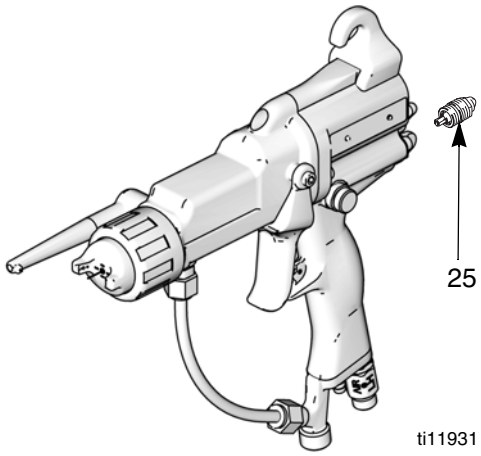


Fig. 20. Fluid Adjustment Valve

Repair Air Valve

1. Prepare the gun for service, page 27.
2. Remove the barrel, page 31.
3. Remove the fluid adjustment valve (25) from the handle (17). Remove the spring (15). See FIG. 21.

NOTICE

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. Remove the air valve (21) with a pliers. Inspect the rubber sealing surface and replace the air valve if damaged.

NOTICE

When removing the air valve (21) be careful not to damage the seat area.The rubber seal is not removable.

5. Inspect the u-cup (6*). Do not remove the u-cup unless damaged. If removed, install the new one with its lips facing into the gun handle (17).
6. Install the air valve (21) and spring (15) into the gun handle (17).
7. Install the fluid adjustment valve (25). Torque to 15-25 in-lb (1.7-2.8 N•m).
8. Install the barrel, page 31.

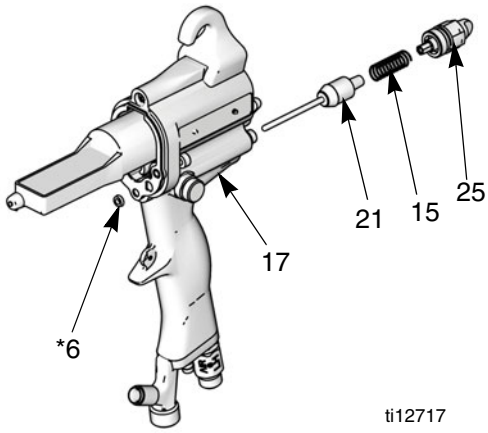


Fig. 21. Air Valve

Remove and Replace Atomizing Air Restrictor Valve

1. Prepare the gun for repair, page 27.

2. Remove the atomizing air restrictor valve (23). Inspect the o-ring (23c*). Replace if necessary. See FIG. 22.

3. Install a new atomizing air restrictor valve (23), or disassemble and replace parts individually. The valve protrusion must be oriented to clear the air valve (21) shaft.

   If the atomizing air restrictor valve is not desired, install the supplied plug (2).

4. Torque the valve housing (23a) to 15-20 in-lb (1.7-2.3 N•m).

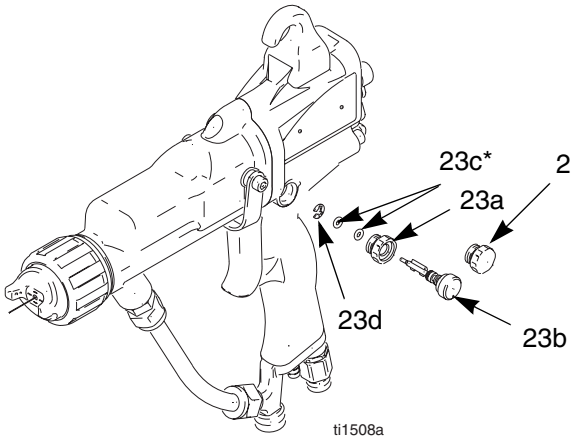


Fig. 22. Atomizing Air Restrictor Valve

Repair ES ON/OFF Valve

1. Prepare the gun for repair, page 27.

2. Loosen the screw (48). Remove the valve.

3. Lubricate the o-rings (22a* and 22b*) with non-silicone grease, Part No. 111265. Do not over-lubricate.

NOTICE

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

4. Clean and inspect parts for damage. Replace if necessary.

   The protrusion on the retainer plate (22d) must point upward.

5. Reinstall the valve. Torque the screw (48) to 15-25 in-lb (1.7-2.8 N•m).

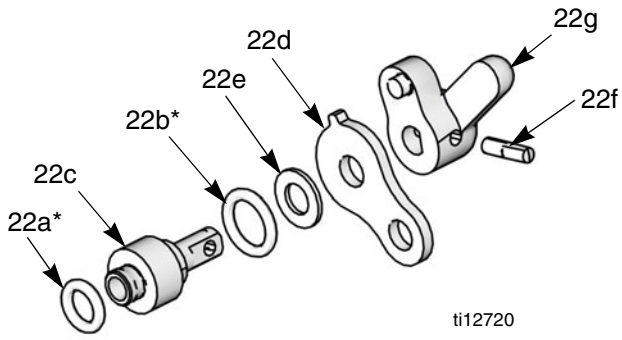
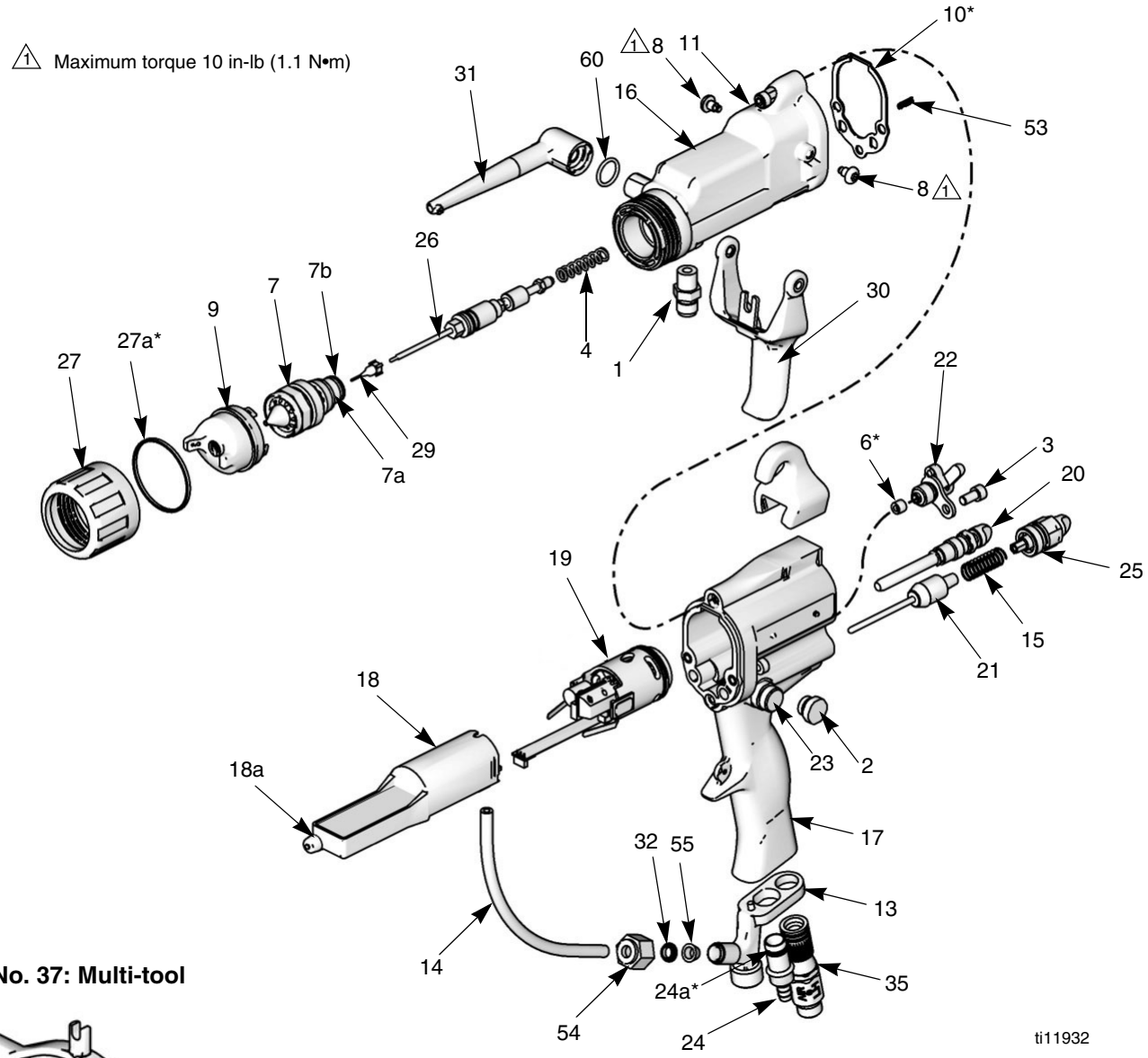


Fig. 23. ES ON/OFF Valve

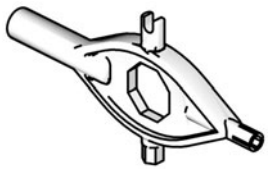
Parts

Part No. 247936 60 kV Electrostatic Gun, Series A (Standard model)

See page 38 for detail views of the alternator (19), fan adjustment valve (20), ES ON/OFF valve (22), and packing rod (26).

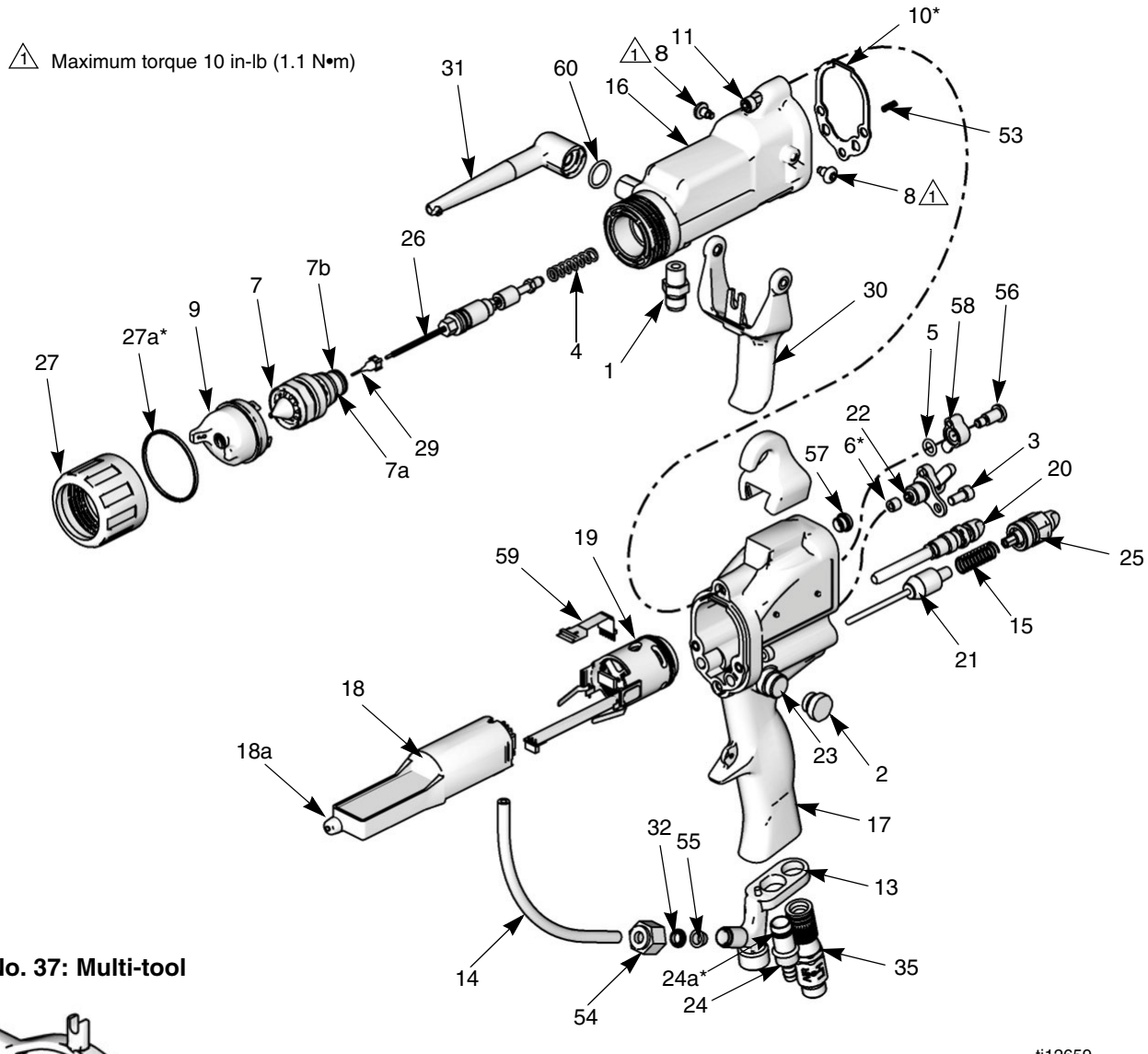


Ref. No. 37: Multi-tool

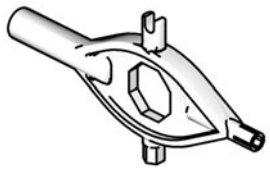


Part No. 247937 60 kV Electrostatic Gun, Series A (Smart model)

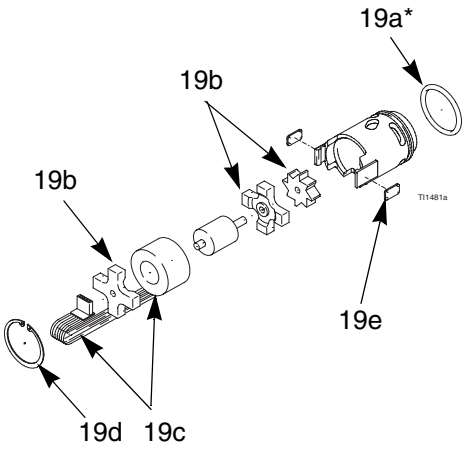
See page 38 for detail views of the alternator (19), fan adjustment valve (20), ES ON/OFF valve (22), and packing rod (26).



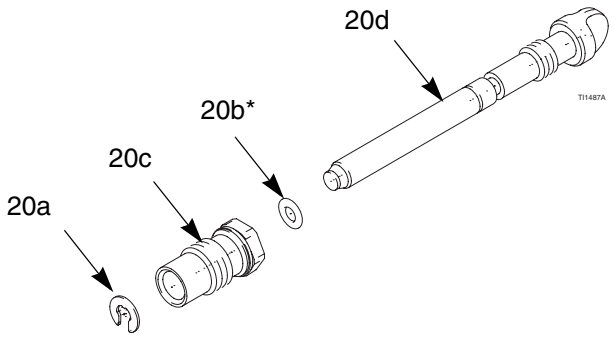
Ref. No. 37: Multi-tool



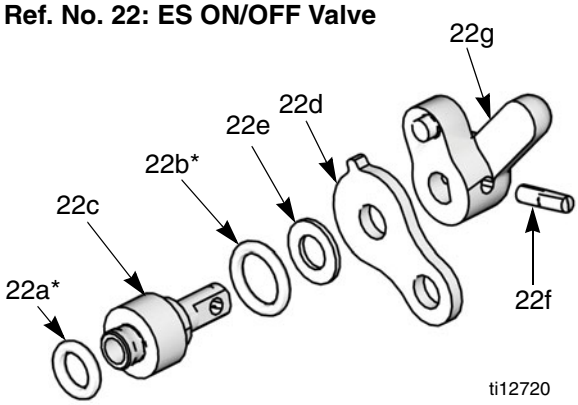
Ref. No. 19: Alternator



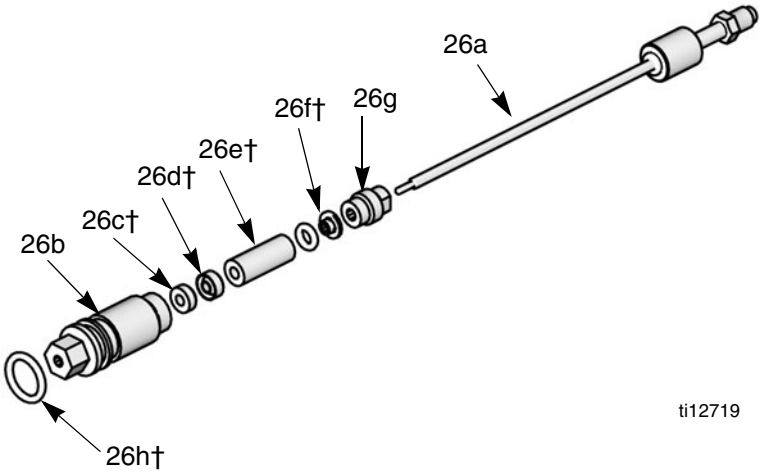
Ref. No. 20: Fan Adjustment Valve



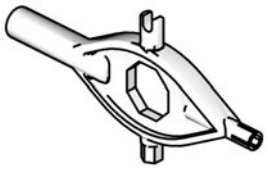
Ref. No. 22: ES ON/OFF Valve



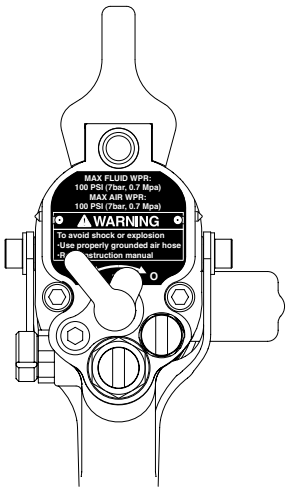
Ref. No. 26: Packing Rod



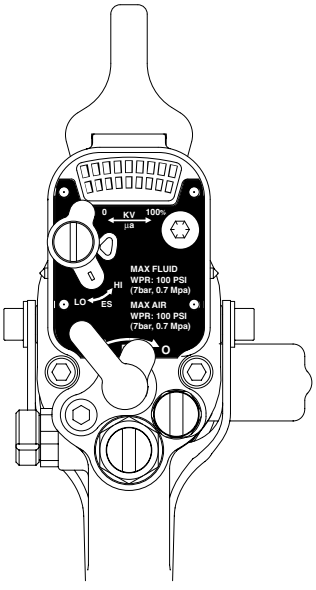
Ref. No. 37: Multi-tool



247936 (Standard Model) controls



247937 (Smart Model) controls



Part No. 247936 60 kV Electrostatic Gun, Series A (Standard model)

Part No. 247937 60 kV Electrostatic Gun, Series A (Smart model)

Ref. No.	Part No.	Description	Qty
1	111157	FITTING, tube, fluid	1
2	197967	PLUG, handle	1
3	198058	SCREW, cap, socket head	1
4	185111	SPRING, compression	1
5	111450	PACKING, o-ring (247937 only)	1
6*	188749	PACKING, u-cup, air valve; UHMWPE	1
7	197266	NOZZLE; 1.5 mm orifice; includes 7a and 7b	1
7a	111261	. O-RING, conductive	1
7b	111507	. O-RING; fluoroelastomer	1
8	24A445	SCREW, trigger	2
9	24A276	AIR CAP	1
10*	197517	GASKET, barrel	1
11	197518	SCREW; socket-hd; 10-24 x 3/4 in. (19 mm)	3
13	24A336	BRACKET, inlet, fluid	1
14	24A334	TUBE, fluid	1
15	185116	SPRING, compression	1
16	24A329	BODY, gun; ES; includes 16a-16e	1
17	24A596	HANDLE, smart (247937)	1
	24A595	HANDLE, standard (247936)	1
18	24A332	POWER SUPPLY, 60 kV	1
18a	256267	. SEAL	1
19	244555	TURBINE, alternator; includes 19a-19e	1
19a*	110073	. O-RING; fluoroelastomer	1
19b	223688	. BEARING KIT; includes front and rear bearings and fan	1
19c	244577	. COIL	1
19d	111745	. RING, retaining	1
19e	198821	. PAD, pressure	2
20	244556	VALVE, adjustment, fan; includes 20a-20d	1
20a	101021	. RING, retaining	1
20b*	106560	. O-RING; fluorocarbon	1
20c	197566	. HOUSING, fan valve	1
20d	197567	. STEM, fan valve	1
21❖	244557	VALVE, air;	1
22	244558	VALVE, electrostatics, ON/OFF; includes 22a-22g	1
22a*	111516	. O-RING; CV75	1
22b*	113137	. O-RING; fluoroelastomer	1
22c	198403	. SHAFT, valve	1
22d	198404	. PLATE, retaining	1
22e	198453	. WASHER	1
22f	198464	. PIN	1
22g	249185	. KNOB	1
23	244559	VALVE, air restrictor; includes 23a-23d	1
23a	197594	. HOUSING, valve	1
23b	197591	. SHAFT	1
23c*	111504	. O-RING; fluoroelastomer	2
23d	101021	. RING, retaining	1
24	249323	VALVE, exhaust; includes 24a	1
24a*	112085	. O-RING; fluorocarbon	1
25	244593	VALVE, adjustment, fluid	1

Ref. No.	Part No.	Description	Qty
26	24A331	NEEDLE; includes 26a-26h	1
26a	24A330	. NEEDLE, assembly	1
26b	185495	. HOUSING, packing	1
26c†	178763	. PACKING, needle	1
26d†	178409	. PACKING, fluid	1
26e†	186069	. SPACER, packing	1
26f†	116905	. SEAL	1
26g	197641	. NUT, packing	1
26h†	111316	. PACKING, o-ring	1
27	244927	RING, retaining; includes 27a	1
27a*	198307	. PACKING, u-cup	1
29	24A338	NEEDLE, electrode	1
30	24A335	TRIGGER	1
31	24A328	PROBE, external charging	2
32	111285	FERRULE, back	1
35	244834	SWIVEL, air; 1/4 npsm(m) ; left-hand threads	1
36	107460	WRENCH, ball end; 4 mm	1
37	276741	MULTI-TOOL	1
38	185103	TUBE, exhaust (not shown)	1
39	110231	CLAMP (not shown)	1
40	116553	GREASE, dielectric, tube (not shown)	1
41	244915	COVER, gun; box of 10 (not shown)	1
42▲	179791	TAG, warning (not shown); replacement available at no cost	1
43▲	180060	SIGN, warning (not shown); replacement available at no cost	1
53	197624	SPRING, compression	1
54	112644	NUT, swagelock	1
55	111286	FERRULE, front	1
56	197910	SCREW, pivot, ES HI/LO (247937 only)	1
57	276734	PLUG, KV adjust (247937 only)	1
58	244627	SWITCH, ES HI/LO (247937 only)	1
59	245265	CIRCUIT, flexible (247937 only)	1
60	248130	O-RING (pack of 6)	1
61	24A431	KIT, wide pattern (not shown)	1

* Included in Air Seal Repair Kit 244781.

† Included in Fluid Seal Repair Kit 244911.

❖ Rubber seal is not removable.

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

Accessories

Air Line Accessories

AirFlex™ Flexible Grounded Air Hose

100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

0.315 in. (8 mm) ID; 1/4 npsm(f) x 1/4 npsm(f) left-hand thread

244963 6 ft (1.8 m)
244964 15 ft (4.6 m)
244965 25 ft (7.6 m)
244966 36 ft (11 m)
244967 50 ft (15 m)
244968 75 ft (23 m)
244969 100 ft (30.5 m)

Standard Grounded Air Hose

100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

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 (4.6 m)
223070 25 ft (7.6 m)
223071 36 ft (11 m)
223072 50 ft (15 m)
223073 75 ft (23 m)
223074 100 ft (30.5 m)

High Flow Grounded Air Hose

100 psi (7 bar, 0.7 MPa) Maximum Working Pressure

0.375 in. (10 mm) ID; 3/8 npsm(f) x 1/4 npsm(f) left-hand thread

24A225 50 ft (15.2 m)
24A226 75 ft (22.9 m)

Bleed-Type Master Air Valve

300 psi (21 bar, 2.1 MPa) Maximum Working Pressure

Relieves air trapped in the air line between this valve and the pump air motor when closed.

107141 3/4 npt

Air Line Shutoff Valve

150 psi (10 bar, 1.0 MPa) Maximum Working Pressure

For turning air to gun on or off.

224754 1/4 npsm(m) x 1/4 npsm(f) left-hand thread.

Air Line Quick Disconnect

112534 Swiveling quick disconnect replaces standard air inlet swivel.

Air Hose Adapter Nipple

185493 Use to connect multiple air hoses. 1/4 npt x 1/4 npsm left-hand thread.

Non-Swivel Air Inlet Fitting

185105 Replaces standard swivel. Left-hand thread.

Extended Air Inlet Fitting

189191 Replaces standard swivel to provide extended handle grip area. Left-hand thread.

Fluid Line Accessories

Fluid Hose

225 psi (14 bar, 1.4 MPa) Maximum Working Pressure

FM Approved; nylon; 3/8 npsm(fbe)

215637 1/4 in. (6 mm) ID x 25 ft (7.6 m)
215638 1/4 in. (6 mm) ID x 50 ft (15.2 m)

Fluid Shutoff/Drain Valve

500 psi (35 bar, 3.5 MPa) Maximum Working Pressure

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

208630 1/2 npt(m) x 3/8 npt(f); carbon steel and PTFE; for non-corrosive fluids

Fluid Swivel

5800 psi (405 bar, 40 MPa) Maximum Working Pressure

115898 1/4 npsm(m) x 1/4 npsm(f)

Gun Accessories

Gun Repair Kits

244781 Air Seal Repair Kit
244911 Fluid Seal Repair Kit

Push/Pull Fan Air Valve

244912 For quick change of fan size.

ES Always On Kit

244913 Replaces inlet fitting with ball valve to shut off air during flushing. Converts ES ON/OFF valve to always ON condition.

Handle Grips

245263 Medium Grip
245264 Large Grip

Gun Washer Kit

245270 Use to convert Graco gun washers so they can clean PRO Xs3 and PRO Xs4 air spray guns.

Pressure Cups

Includes air regulators for gun atomization air and supply air to pressure cup.

244731 1 Quart (0.95 Liter)
244732 2 Quart (1.90 Liter)

Gun Valve Lubricant

111265 4 oz (113 g) tube of sanitary (non-silicone) lubricant for fluid seals and wear areas.

Alternator Bearing Kit

223688 To repair the turbine alternator.

Cleaning Brush

105749 For cleaning air cap and fluid nozzle.

Miscellaneous Accessories

Ground Wire and Clamp

222011 For grounding pump and other components and equipment in the spray area.
12 gauge, 25 ft (7.6 m).

Megohmmeter

241079 500 Volt output; 0.01-2000 megohms.
Not for use in hazardous areas.

Paint Resistance Meter

722886 Use with 722860 Paint Probe to measure resistance of paint.
Not for use in hazardous areas.

Paint Probe

722860 Use with 722886 Paint Resistance Meter to measure resistance of paint.
Not for use in hazardous areas.

Safety Warning Signs

180060 English Warning Sign. FM Approved. Available at no charge from Graco.

Electrostatic Conductive Gloves (box of 12)

117823 Small
117824 Medium
117825 Large

Technical Data

Category	Data
Maximum Working Fluid Pressure	100 psi (0.7 MPa, 7 bar)
Maximum Working Air Pressure	100 psi (0.7 MPa, 7 bar)
Maximum Fluid Operating Temperature	120°F (49°C)
Maximum voltage output	60kV
Sound Pressure (measured per ISO Standard 9216)	at 40 psi (0.28 MPa, 2.8 bar); 90.4 dB(A) at 100 psi (0.7 MPa 7 bar): 105.4 dB(A)
Sound Pressure (measured 1 m from gun)	at 40 psi (0.28 MPa, 2.8 bar); 87 dB(A) at 100 psi (0.7 MPa 7 bar): 199 dB(A)
Air inlet fitting, left-hand thread	1/4 npsm
Fluid inlet fitting	3/8-18 npsm (R 3/8-19) compound thread
Gun Weight	247936: 22.4 oz (634 g) 247937: 25.1 oz (712 g)
Gun Length (with probe)	10.6 in. (24.6 cm)
Paint Resistivity	<1 megohm-cm
Wetted Parts	Polyethylene, Stainless Steel; Nylon, Acetal, PTFE, UHMWPE, Fluoroelastomer, PEEK, Nickel Plate

Graco Warranty

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 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 or two thousand hours of operation from the date of sale, repair or replace any part of the equipment determined by Graco to be 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 the date of sale. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, 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.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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Graco Information

For the latest information about Graco products, visit www.graco.com.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.
Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 312900

Graco Headquarters: Minneapolis
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www.graco.com
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