

# Sports Field Marker

332119J  
EN

*For field marking applications only*



### IMPORTANT SAFETY INSTRUCTIONS

Read all warnings and instructions in this manual and on the unit. Be familiar with the controls and the proper usage of the equipment. Save these instructions.

### All Models:

*Maximum Working Pressure 1200 psi (8.3 MPa, 83 bar)*

Model	Charger Voltage	Series
24N950	120V	B
24R023	240V	B
24R370	240V	B
24R371	120V/240V	B



t1246823

## ! WARNING



### FIRE AND EXPLOSION HAZARD

Solvent and paint fumes can ignite or explode.

- **Use only water-based materials.** Do not use materials which state "FLAMMABLE" on the packaging. For more information about your material, request SDS from distributor or retailer.
- Do not spray or flush with flammable materials.



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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 or on warning labels, 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



### SKIN INJECTION HAZARD

High-pressure spray is able to inject toxins into the body and cause serious bodily injury. In the event that injection occurs, **get immediate surgical treatment.**

- Do not aim the gun at, or spray any person or animal.
- Keep hands and other body parts away from the discharge. For example, do not try to stop leaks with any part of the body.
- Always use the nozzle tip guard. Do not spray without nozzle tip guard in place.
- Use Graco nozzle tips.
- Use caution when cleaning and changing nozzle tips. In the case where the nozzle tip clogs while spraying, follow the **Pressure Relief Procedure** for turning off the unit and relieving the pressure before removing the nozzle tip to clean.
- Equipment maintains pressure after power is shut off. Do not leave the equipment energized or under pressure while unattended. Follow the **Pressure Relief Procedure** when the equipment is unattended or not in use, and before servicing, cleaning, or removing parts.
- Check hoses and parts for signs of damage. Replace any damaged hoses or parts.
- This system is capable of producing 1200 psi (8.3 MPa, 83 bar). Use Graco replacement parts or accessories that are rated a minimum of 1200 psi (8.3 MPa, 83 bar).
- Verify that all connections are secure before operating the unit.
- Know how to stop the unit and bleed pressure quickly. Be thoroughly familiar with the controls.



### 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.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request SDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure.
- Turn off all equipment and follow the **Pressure Relief Procedure** 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. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- 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.

# ! WARNING

	<p><b>BATTERY HAZARD</b></p> <p>The battery may leak, explode, cause burns, or cause an explosion if mishandled. Contents of an open battery can cause severe irritation and/or chemical burns. If on skin, wash with soap and water. If in eyes, flush with water for at least 15 minutes and get immediate medical attention.</p> <ul style="list-style-type: none"> <li>• Only use the battery type specified for use with the equipment. See <b>Technical Data</b>.</li> <li>• Replace battery only in a well-ventilated area and away from flammable or combustible materials, including paints and solvents.</li> <li>• When battery is not in use, keep it away from metal objects like keys, nails, screws or other metal objects that can short circuit the battery terminals.</li> <li>• Do not dispose of battery in fire or heat above 50 °C (122 °F). The battery is capable of exploding.</li> <li>• Do not throw into fire.</li> <li>• Charge only with Graco approved charger as listed in this manual.</li> <li>• Do not expose battery to water or rain.</li> <li>• Do not disassemble, crush, or penetrate the battery.</li> <li>• Do not use or charge a battery that is cracked or damaged.</li> <li>• Follow local ordinances and/or regulations for disposal.</li> </ul>
  	<p><b>CHARGER ELECTRIC SHOCK, FIRE AND EXPLOSION HAZARD</b></p> <p>Improper setup or usage can cause electric shock, fire, and explosion.</p> <ul style="list-style-type: none"> <li>• Charge only in a well-ventilated area and away from flammable or combustible materials, including paints and solvents.</li> <li>• Do not charge on a combustible or flammable surface.</li> <li>• Do not leave battery unattended while charging.</li> <li>• Immediately unplug charger and remove battery when charging is complete.</li> <li>• Charge only Graco approved batteries listed in this manual; other batteries may burst.</li> <li>• Use only in dry locations. Do not expose to water or rain.</li> <li>• Do not use a charger that is cracked or damaged.</li> <li>• If the supply cord is damaged, replace the charger or cord, depending on model.</li> <li>• Never force the battery into the charger.</li> <li>• When operating a charger outdoors, always provide a dry location and use an extension cord suitable for outdoor use.</li> <li>• Disconnect the charger from the outlet before cleaning.</li> <li>• Ensure that the outside surface of the battery is clean and dry before plugging into the charger.</li> <li>• Do not attempt to charge non-rechargeable batteries.</li> <li>• Do not disassemble the charger. Take charger to authorized service center when service or repair is required.</li> </ul>
	<p><b>PRESSURIZED ALUMINUM PARTS HAZARD</b></p> <p>Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.</p> <ul style="list-style-type: none"> <li>• Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.</li> <li>• Do not use chlorine bleach.</li> <li>• Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.</li> </ul>
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Read SDSs to know the specific hazards of the fluids you are using.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> </ul>

 **WARNING****PERSONAL PROTECTIVE EQUIPMENT**

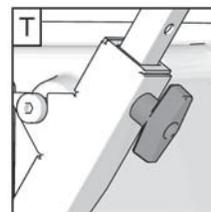
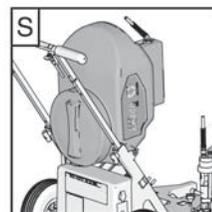
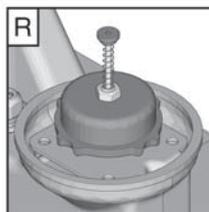
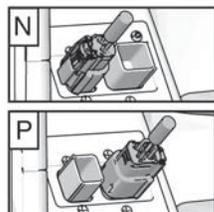
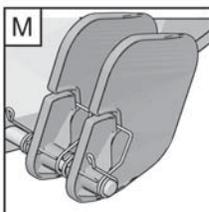
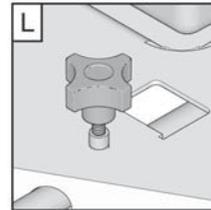
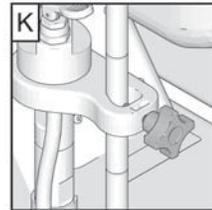
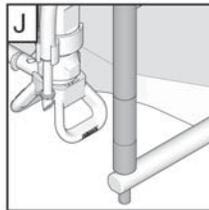
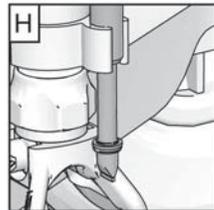
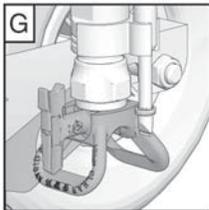
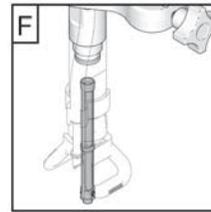
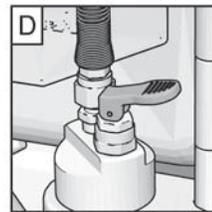
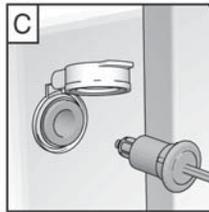
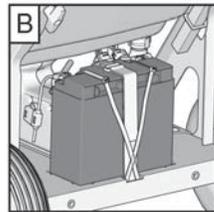
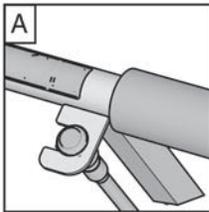
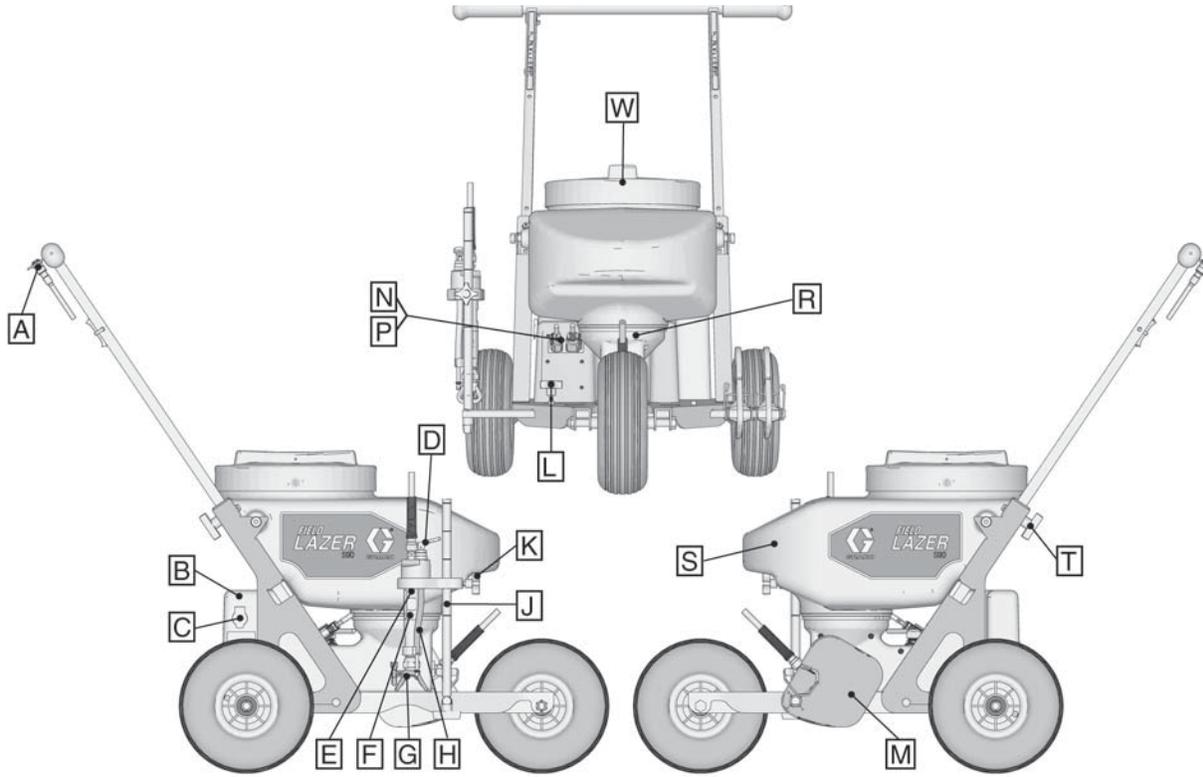
Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

**CALIFORNIA PROPOSITION 65**

This product contains a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

# Component Identification



1124683

## Component Identification List

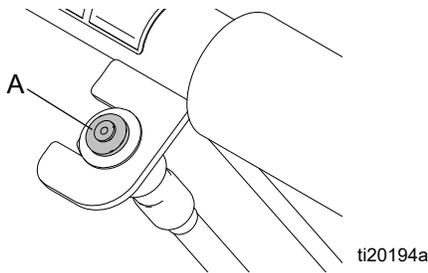
A	Spray Button
B	Battery Shroud (battery inside)
C	Battery Charger Connection Port
D	Prime/Spray Valve
E	Material Dispenser
F	Filter
G	Spray Tip/Guard Assembly
H	Prime Hose
J	Height Adjustment Mount

K	Material Dispenser Height Adjustment Knob
L	Material Dispenser Arm Adjustment Knob
M	Spray Shields
N	Motor Plug
P	Spray Button Plug
R	Paint Hopper Screen/Ball Knocker
S	Tilt-N-Pour Paint Hopper
T	Adjustable Handlebar Knob
W	Paint Hopper Lid

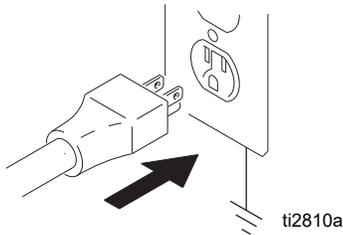
# Charging the Battery (Series A)

						
<p>Battery charger is for indoor use only. Do not expose charger to rain or snow. Charge battery with Graco-approved charger.</p> <p><b>NOTE:</b> Fully charge battery prior to first use.</p>						

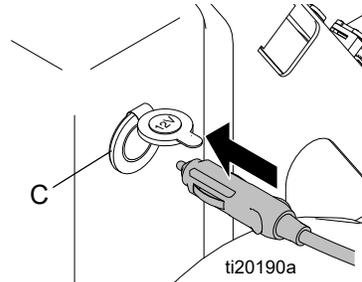
1. Place field marker in a dry, well-ventilated area away from flammable or combustible materials, including paints and solvents.
2. Before charging, make sure spray button (A) is out (OFF position).



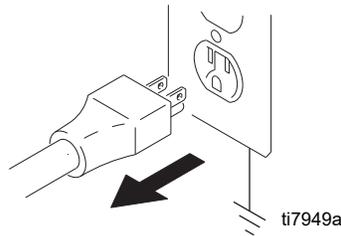
3. Plug charger into an electrical outlet.



4. Plug 12V charger jack into battery connection port (C) on field marker.



5. When charging is complete, disconnect charger from electrical outlet. Then disconnect charger from battery connection port on field marker.



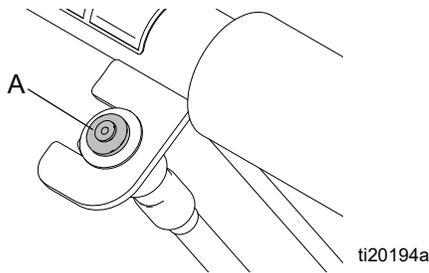
## Charger Indicator Lights

Appearance	Description
RED	Battery is being charged.
GREEN	Charging is complete.
<p><b>NOTE:</b> Disconnect charger from field marker after battery is fully charged. Charge times will vary from 0 - 14 hours depending on level of discharge.</p> <p><b>NOTE:</b> Green light on charger will be ON if:</p> <ul style="list-style-type: none"> <li>• Charging is complete.</li> <li>• Charger is NOT plugged into electrical outlet but is plugged into battery charger connection port on field marker.</li> <li>• Charger is plugged into electrical outlet but is NOT plugged into battery charger connection port on field marker.</li> </ul>	

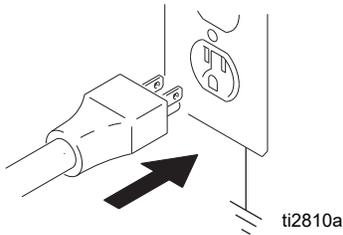
# Charging the Battery (Series B)

						
<p>Battery charger is for indoor use only. Do not expose charger to rain or snow. Charge battery with Graco-approved charger.</p> <p><b>NOTE:</b> Fully charge battery prior to first use.</p>						

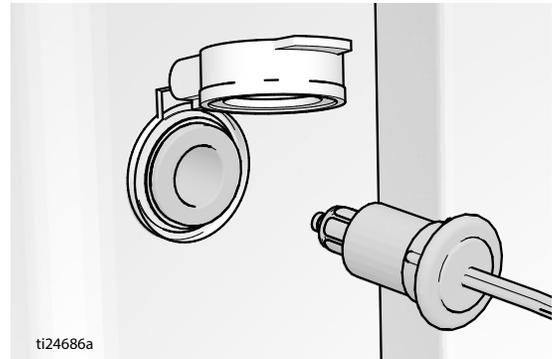
1. Place field marker in a dry, well-ventilated area away from flammable or combustible materials, including paints and solvents.
2. Before charging, make sure spray button (A) is out (OFF position).



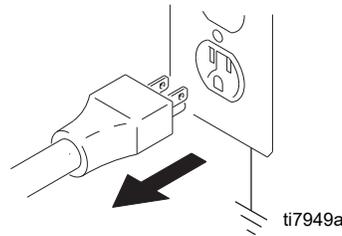
3. Plug charger into an electrical outlet.



4. Plug 12V charger jack into battery connection port on field marker.



5. When charging is complete, disconnect charger from electrical outlet. Then disconnect charger from battery connection port on field marker.

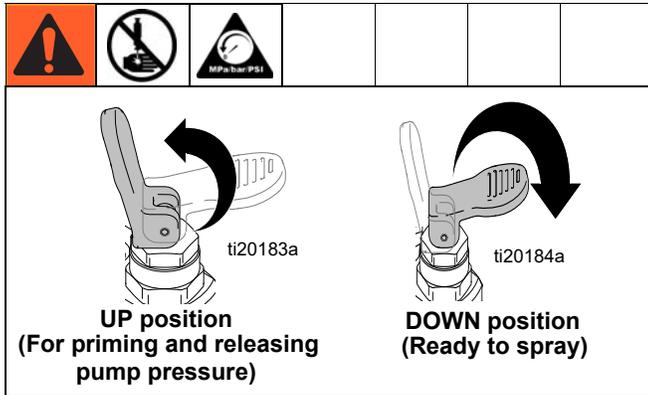


## Charger Indicator Lights

Description	Appearance
Power on with no battery connected	Power LED is red
Desulfating	First charging light is green and stays on until the bulk charge cycle starts.
Charging	Charging lights lite to indicate show the state of charge.
Charged/Float charging	All four charging lights are on solid.
Reverse polarity	All four charging lights flash.
Sleep mode. If the battery is fully charged or the charged is connected to a fully charged battery the charger may go into the sleep mode.	All four charging lights dim and flash.
<p><b>NOTE:</b> Disconnect charger from field marker after battery is fully charged. Charge times will vary from 0 - 14 hours depending on level of discharge.</p>	

# Common Procedures

## Prime/Spray Valve



 Follow the **Pressure Relief Procedure** whenever you see this symbol.

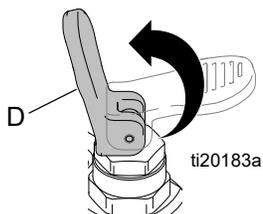
## Pressure Relief Procedure

						
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Do not operate or spray near children. Do not aim the field marker at, or spray any person or animal. Keep hands and other body parts away from the discharge. For example, do not try to stop the paint flow with any part of the body.

This field marker builds up an internal pressure of 1200 psi (8.3 MPa, 83 bar) during use. Follow this **Pressure Relief Procedure** whenever you stop spraying and before cleaning, checking, servicing, or transporting equipment to prevent serious injury.

1. Put prime/spray valve (D) UP to release pressure.

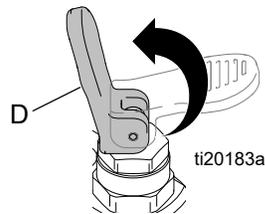


## Install Spray Tip/Guard Assembly (if not installed)

						
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Perform the **Pressure Relief Procedure** before installing spray tip/guard assembly.

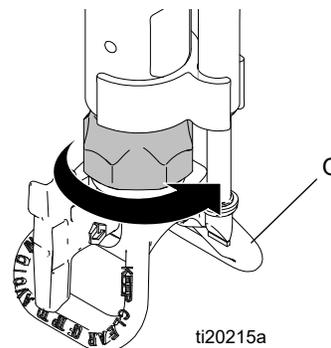
1. Put prime/spray valve (D) UP to release pressure.



						
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Do NOT place hands in front of tip.

2. Screw spray/tip guard assembly (G) onto field marker. Tighten retaining nut until completely engaged with field marker. Do not overtighten nut.

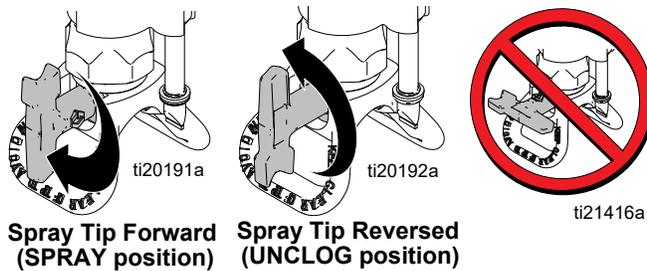


## Reversible Spray Tip

Always perform <b>Pressure Relief Procedure</b> before adjusting spray tip position.						

In the event that particles or debris clog the spray tip, this field marker is designed with a reversible spray tip that can be used to quickly and easily clear the particles and resume spraying as quickly as possible.

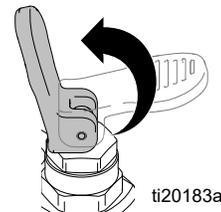
- Always point the reversible spray tip down when spraying.
- When particles or debris get caught in the tip, it can be reversed to quickly clean the tip.
- Only operate field marker with spray tip in forward or reversed position.



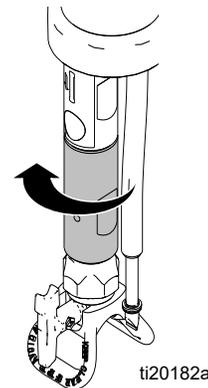
## Filter Removal / Cleaning

Always perform <b>Pressure Relief Procedure</b> before removing filter.						

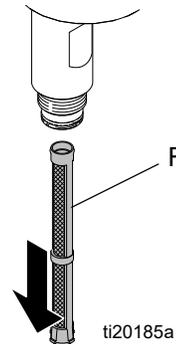
1. Perform **Pressure Relief Procedure**, page 10.



2. Unscrew to remove filter.



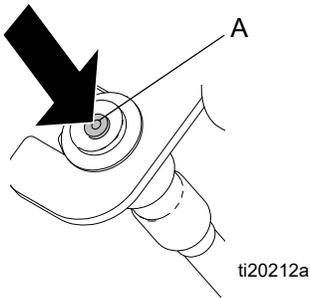
3. Pull out filter (F).



4. Clean filter with water. Replace filter if damaged or unable to clean.
5. Reinstall filter.
6. Install and tighten filter housing.

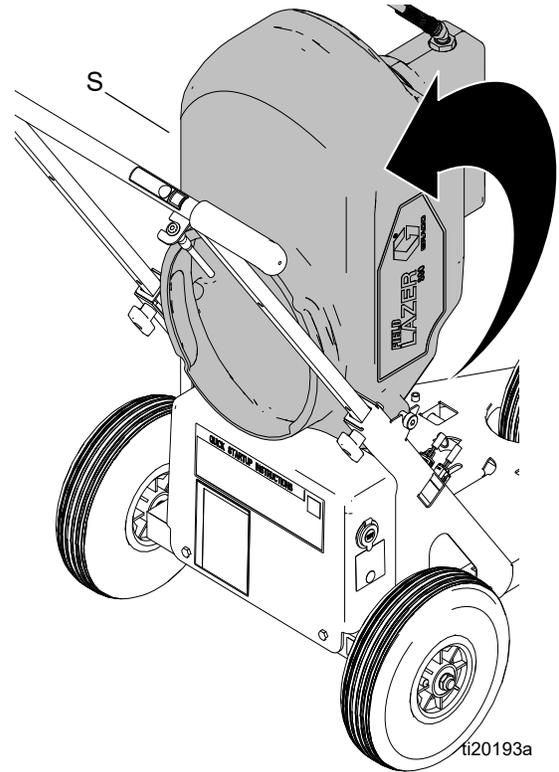
## Spraying

Press spray button (A) to spray. Spray will continue until spray button is pressed again to stop.



## Emptying the Paint Hopper

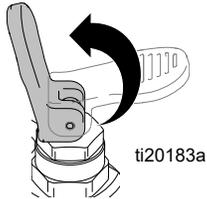
1. Place striping machine near the material container.
2. Remove paint hopper lid.
3. Grab front of paint hopper (S) and slowly lift. Material will pour back into the material container.



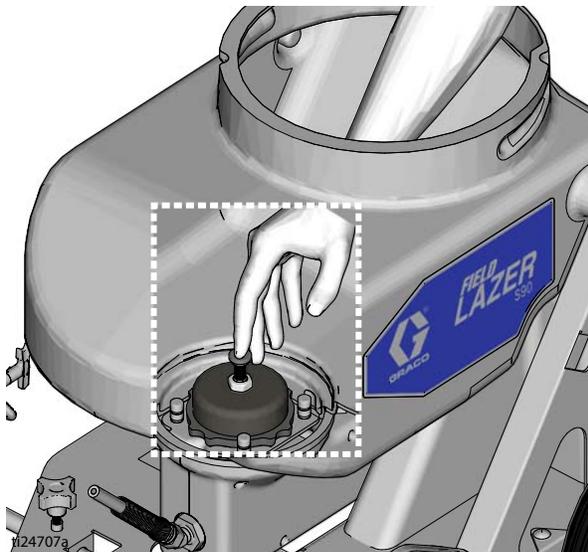
# Starting a New Job



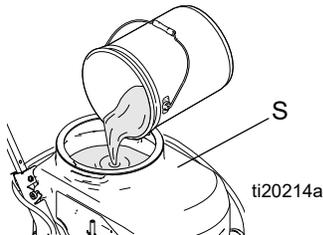
1. Perform **Pressure Relief Procedure**, page 10.



**NOTICE**  
If material fails to flow through prime hose, the inlet ball check valve may be stuck due to improper cleaning and storage. Reach into hopper. Press button to break the inlet ball check free.

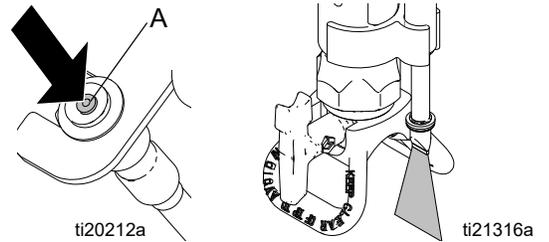


2. Pour material into paint hopper (S).



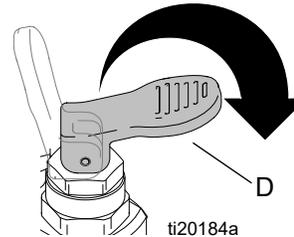
3. **Prime the Pump:**

a. To fill field marker with fluid, press spray button (A) and allow field marker to run until material flows through prime hose.



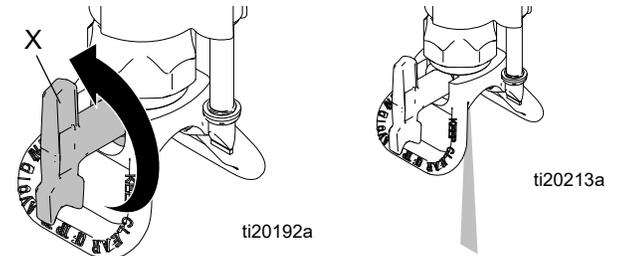
b. Stop field marker by pressing spray button.

4. Put prime/spray valve (D) in DOWN position.

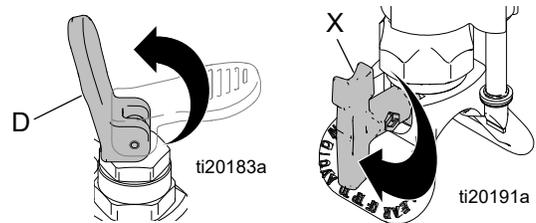


5. Reverse spray tip (X) to UNCLOG position, spray for two seconds and then stop.

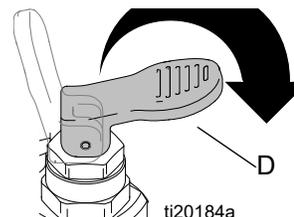
**NOTE:** Failure to perform this operation could result in poor spray pattern.



6. Put prime/spray valve (D) UP to release pressure. Then rotate spray tip (X) back to spray position.



7. Put prime/spray valve (D) down and you are ready to spray.

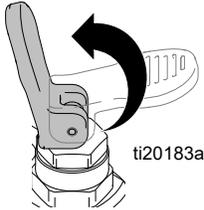


## Adjusting Line Width

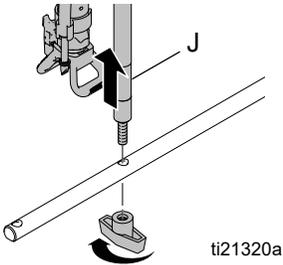


### With Shields

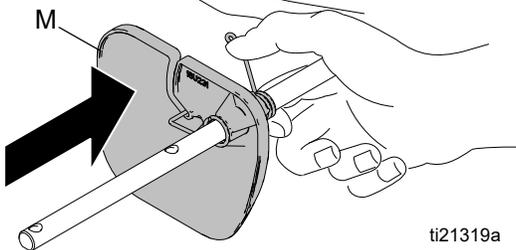
1. Perform **Pressure Relief Procedure**, page 10.



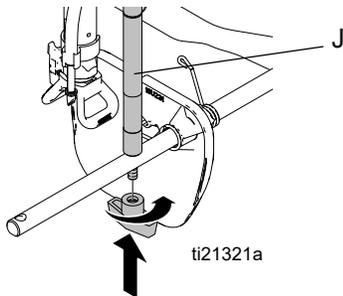
2. Remove height adjustment mount (J) and material dispenser arm assembly.



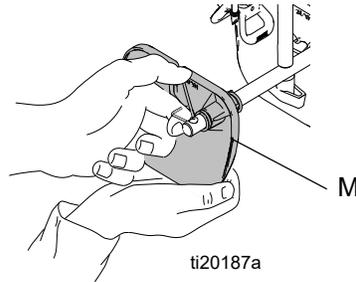
3. Install inner spray shield assembly (M) by collapsing spring and sliding shield onto horizontal D-bar.



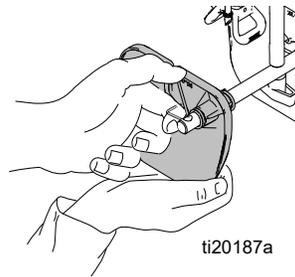
4. Install height adjustment mount (J) and material dispenser arm assembly



5. Install outer spray shield assembly (M) by collapsing spring and sliding shield onto horizontal D-bar.



6. Adjust shields to the desired line width. Spray tip should be centered between shields. Spray pattern should touch shields just above the bottom of the shields.



### Without Shields

1. Perform **Pressure Relief Procedure**, page 10.
2. Move vertical material dispenser bar holder to outside position.



3. Adjust height of tip to adjust line width (raising tip height will create wider lines).

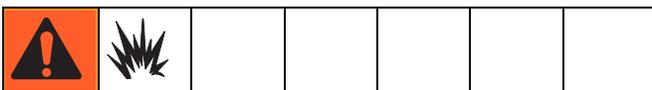
**NOTE:** Different tip sizes are available for lines greater than 6 in. (15 cm) wide. Use Graco part number LL5417 for wider lines.

# Shutdown and Cleaning

**NOTICE**

Failure to properly clean field marker after each use will result in hardened materials, damage to the field marker, and the warranty will no longer be valid. Do not store solvents in field marker. Always flush with Graco Pump Armor prior to storage.

## Flushing Field Marker



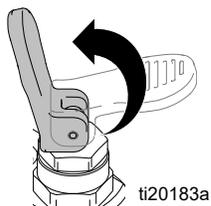
**Use only water-based materials.** Do not use materials which state "FLAMMABLE" on the packaging. For more information about your material, request SDS from distributor or retailer.



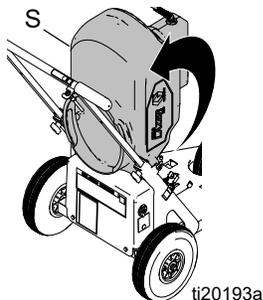
Do not operate or spray near children. Do not aim the field marker at, or spray any person or animal. Keep hands and other body parts away from the discharge. For example, do not try to stop the paint flow with any part of the body.

This field marker builds up an internal pressure of 1200 psi (8.3 MPa, 83 bar) during use. Follow this **Pressure Relief Procedure** whenever you stop spraying and before cleaning, checking, servicing, or transporting equipment to prevent serious injury.

1. Perform **Pressure Relief Procedure**, page 10.

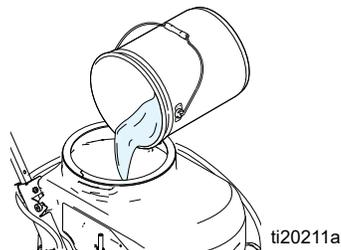


2. Empty the paint hopper (S), see page 12.

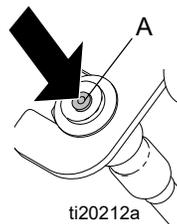


3. Remove paint hopper screen and clean

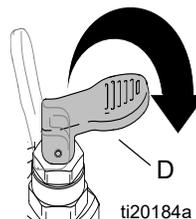
4. Clean inside of paint hopper with water. **Optional:** Tilt paint hopper back and spray inside with water.
5. Fill paint hopper with 1/2 gallon (2 liters) water.



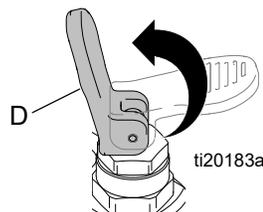
6. Put prime/spray valve (D) UP to clean prime hose.
7. Push spray button (A) to pump water through prime hose. Pump until water is clear.



8. Push spray button to stop pumping water through prime hose.
9. Put prime/spray valve (D) DOWN to spray position.



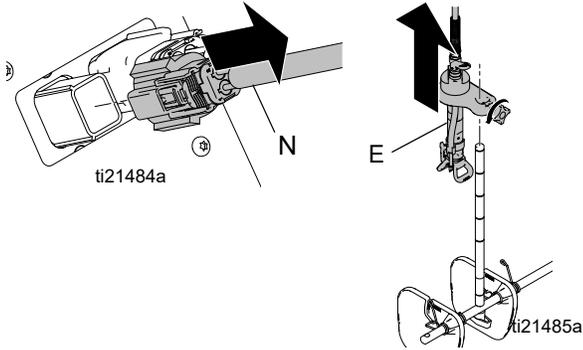
10. Push spray button to spray water through tip. Spray until water is clear.
11. Push spray button to stop spraying water through tip.
12. Empty the paint hopper, see page 12.
13. Repeat steps 5-10 until water runs clear.
14. Put prime/spray valve (D) UP to release pressure.



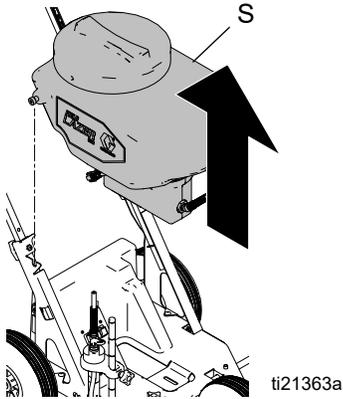
15. Remove and clean filter, page 11.

## Optional Cleanup:

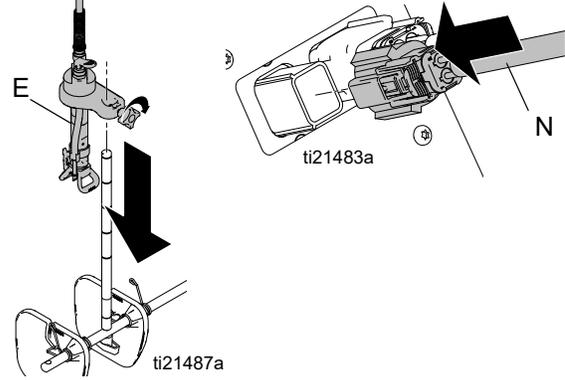
- Perform **Pressure Relief Procedure**, page 10.
- Empty the paint hopper, see page 12.
- Disconnect motor plug (N) and remove material dispenser (E) from height adjustment mount.



- Remove paint hopper (S) from field marker.



- Clean out paint hopper at a sink.
- Install paint hopper onto field marker.
- Install material dispenser (E) and connect motor plug (N).

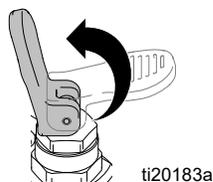


- Perform **Flushing Field Marker** procedure steps 5 - 15, page 15.

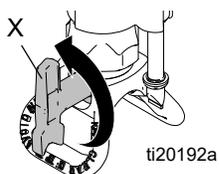
## Unclogging Spray Tip/Guard Assembly

						
Always perform <b>Pressure Relief Procedure</b> before unclogging spray tip/guard assembly.						

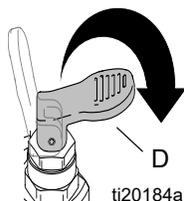
1. Perform **Pressure Relief Procedure**, page 10.



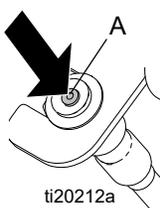
2. Reverse spray tip (X) to UNCLOG position.



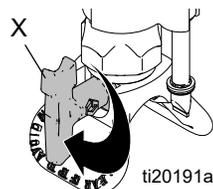
3. Put prime/spray valve (D) DOWN to spray position.



4. Push spray button (A) to start field marker and clear clog.



5. Push spray button again to stop field marker.
6. Perform **Pressure Relief Procedure**, page 10.
7. Rotate spray tip (X) back to SPRAY position.



8. Put prime/spray valve DOWN to spray position.
9. Push prime/spray button to start sprayer and resume spraying.
10. If spray tip is still clogged, you may have to repeat steps 1 - 9 several times.
11. If material still fails to be sprayed, perform **Pressure Relief Procedure**, page 10.
12. Perform **Tip Removal Cleaning**, page 19.
13. Perform **Filter Removal/Cleaning**, page 11.
14. If applicable, perform **CleanShot Cleaning**, page 19.

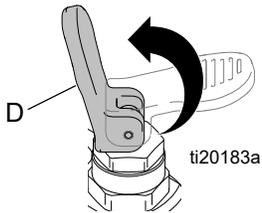
# Storage



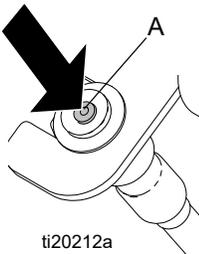
## NOTICE

Failure to store field marker with Pump Armor will result in operational problems the next time you spray. Always circulate Pump Armor through the field marker after cleaning. **Water left in the field marker will damage the pump due to freezing.**

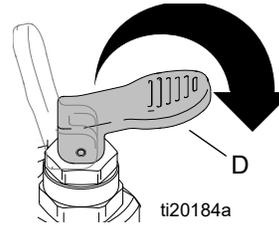
1. Clean field marker. See **Shutdown and Cleaning**, page 15.
2. Lift prime/spray valve (D) UP to the prime position.



3. Pour a small amount of Pump Armor into bottom of paint hopper.
4. Push spray button (A) to pump the material.



5. Press spray button to stop when Pump Armor flows through prime hose.
6. Move prime/spray valve (D) DOWN to the spray position.



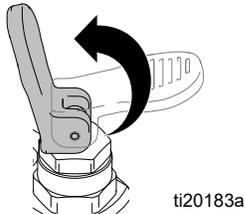
7. Press spray button to spray material.
8. Press spray button to stop pump when Pump Armor sprays through tip.
9. Plug charger into field marker. See **Charging the Battery**, page 8. Charge to full charge and disconnect.
10. Store field marker indoors in a cool, dry place. Always store field marker with some Pump Armor in the paint pump/hopper. Never store field marker dry or with paint in the pump/hopper.

# Repair

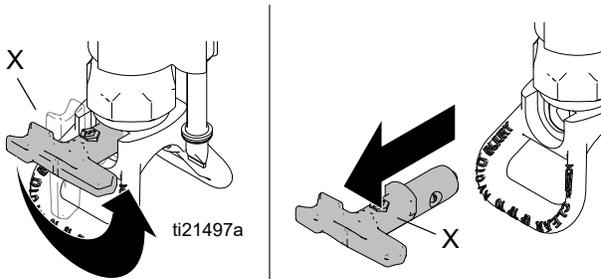
## Tip Removal/Cleaning



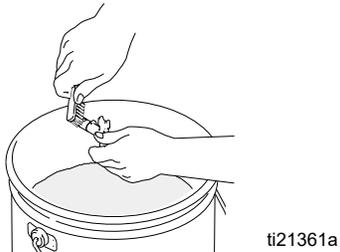
1. Perform **Pressure Relief Procedure**, page 10.



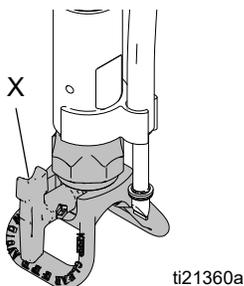
2. Rotate spray tip (X) 1/4 turn and remove.



3. Wash tip in sink under running water. Use a brush or pick to remove excess or dried material.



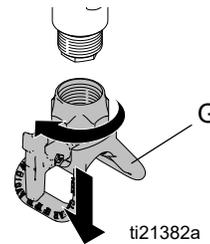
4. Use a pressurized air hose to blow out any remaining material from tip. **NOTE:** You should be able to clearly see through the tip hole when cleaned.
5. Install spray tip (X) and position to spray as shown below.



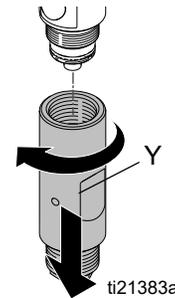
## CleanShot™ Cleaning (If applicable)



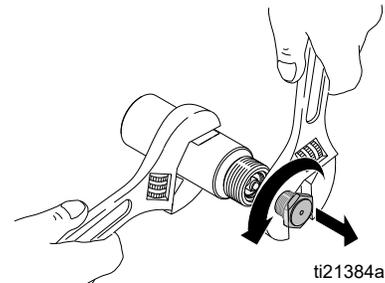
1. Perform **Pressure Relief Procedure**, page 10.
2. Remove spray tip/guard assembly (G).



3. Remove CleanShot assembly (Y).

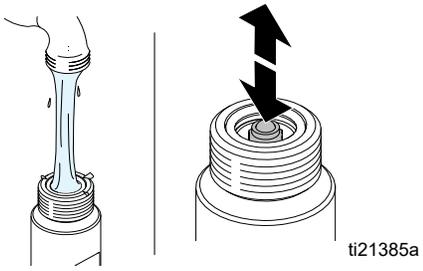


4. Use two wrenches to remove needle seat.

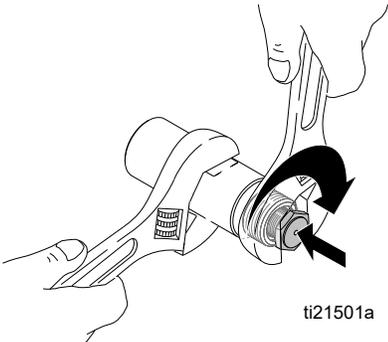


Repair

5. Hold CleanShot over running water and clean. Work needle in and out to free CleanShot from excess or hardened material.

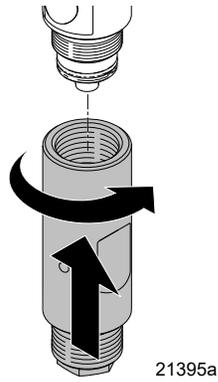


6. Use two wrenches to install needle seat.

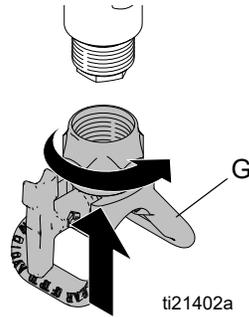


7. Clean filter. See **Filter Removal/Cleaning**, page 11.

8. Install CleanShot assembly.



9. Install spray tip/guard assembly (G).

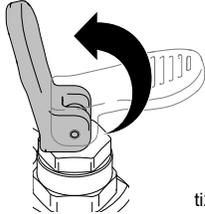


# Fuse Replacement



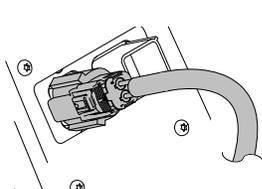
## Removal

1. Perform **Pressure Relief Procedure**, page 10.

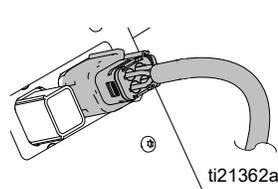


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2. Disconnect motor plug and spray button plug.



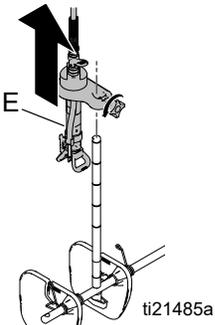
**Motor Plug**



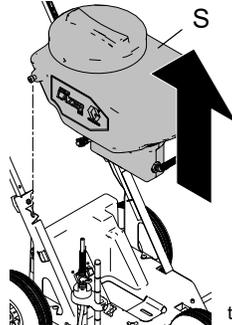
ti21362a

**Spray Button Plug**

3. Remove material dispenser (E) and paint hopper (S).

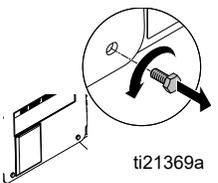


ti21485a

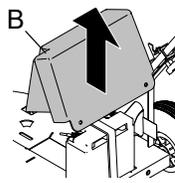
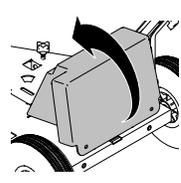


ti21363a

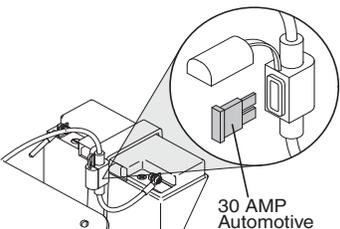
4. Use wrench to remove two bolts and remove battery shroud (B).



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5. Open fuse case and remove old fuse.

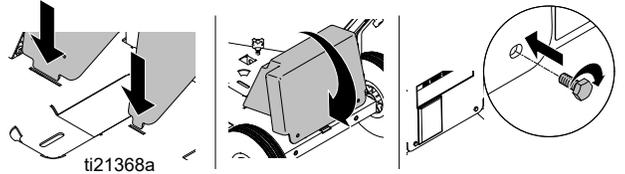


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30 AMP  
Automotive  
Regulator ATO

## Installation

1. Insert a new standard 30 A automotive fuse (Regular ATO) fuse into fuse case.
2. Place front tabs of battery shroud into slots, then pivot back of shroud down. Use wrench to tighten two bolts and secure shroud into place.

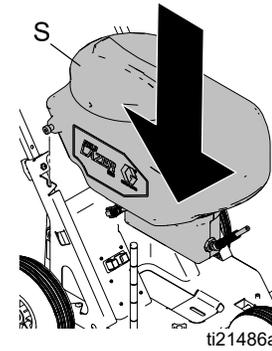


ti21368a

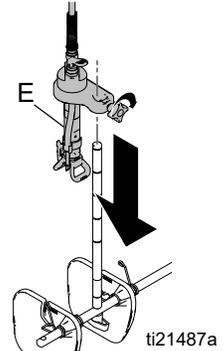
**NOTICE**

When installing the battery shroud, wires can get pinched between the shroud and frame and become damaged. To avoid damage, make sure all wires are kept in front of the battery when installing the shroud.

3. Install paint hopper (S) and material dispenser (E).

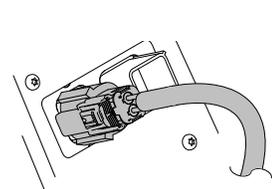


ti21486a

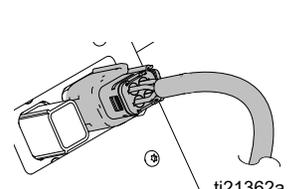


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4. Connect spray button plug and motor plug.



**Motor Plug**



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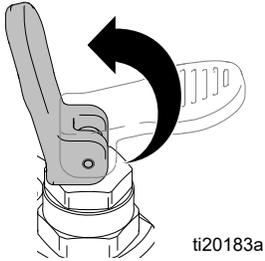
**Spray Button Plug**

# Battery Replacement

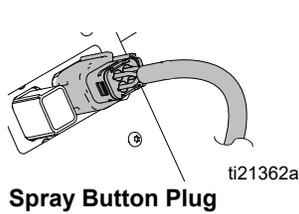
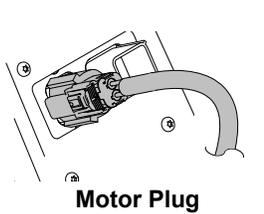


## Removal

1. Perform **Pressure Relief Procedure**, page 10.



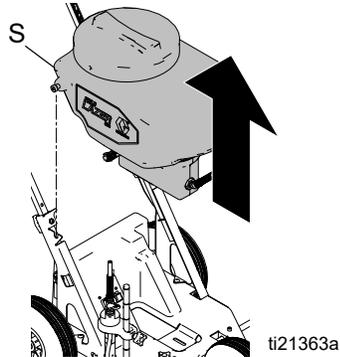
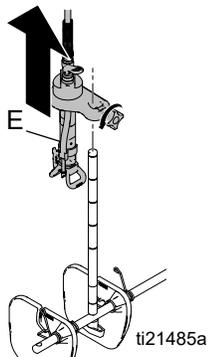
2. Disconnect motor plug and spray button plug.



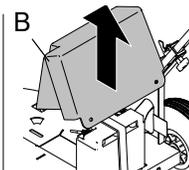
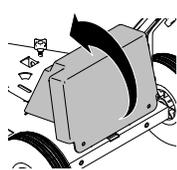
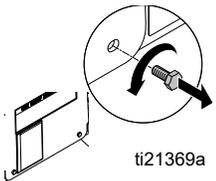
Motor Plug

Spray Button Plug

3. Remove material dispenser (E) and paint hopper (S).



4. Use wrench to remove two bolts and remove battery shroud (B).



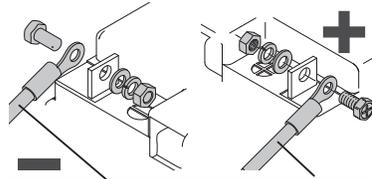
5. Attach battery cables to battery.

### For Battery with Thru Hole Post

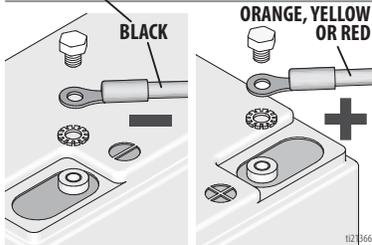
Use two wrenches to remove serrated nut on negative (black) battery post. Then use wrenches to remove serrated nut on positive (red) battery post.

### For Battery with Threaded Post

Use wrench to remove screw on negative battery post. Then use wrench to remove screw on positive battery post.

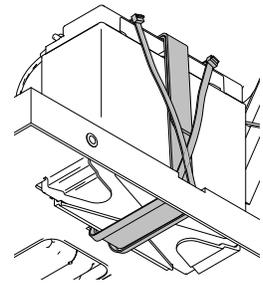
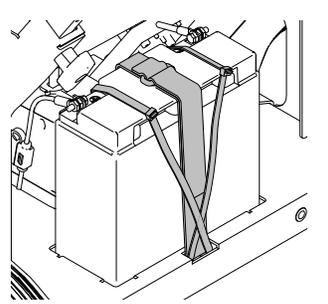


For Battery with Thru Hole Post



For Battery with Threaded Post

6. If installed, clip plastic tie straps used for shipping. Undo velcro strap from battery. Remove battery.

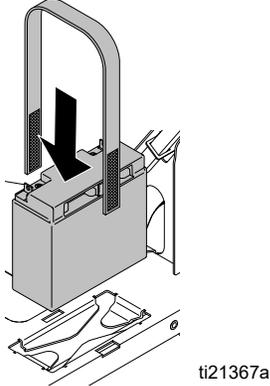


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7. Remove bolt and nut from each battery post.

## Installation

1. Install new battery. Install bolts and nuts onto battery posts with terminals facing front of field marker. Tighten velcro strap around battery to secure into place.



2. Attach battery cables to battery.

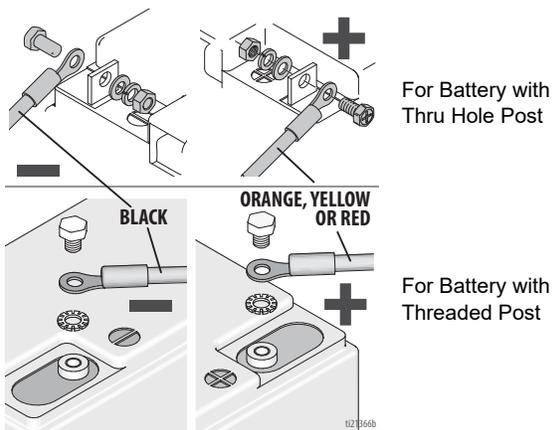
### For Battery with Thru Hole Post

Use two wrenches to attach battery cable to positive (red) battery post. Then use wrenches to attach to negative (black) battery post.

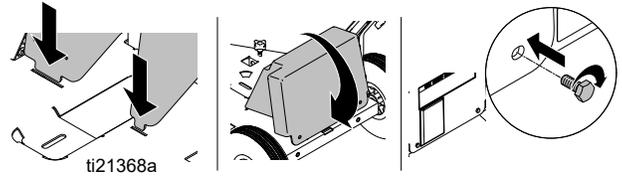
### For Battery with Threaded Post

Use wrench to attach battery cable to positive (red) battery post. Then use wrench to attach to negative (black) battery post.

**NOTE:** Star washer goes between battery post and cable.



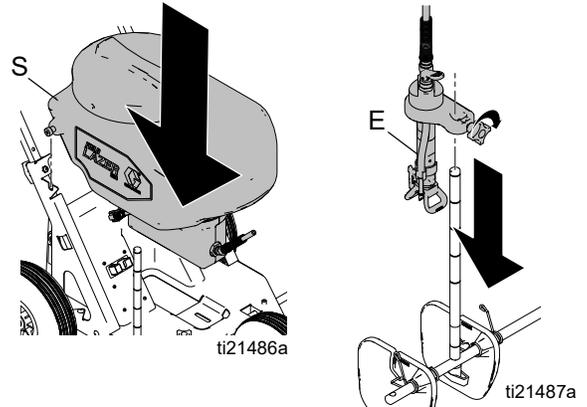
3. Place front tabs of battery shroud into slots, then pivot back of shroud down. Use wrench to tighten two bolts and secure shroud into place.



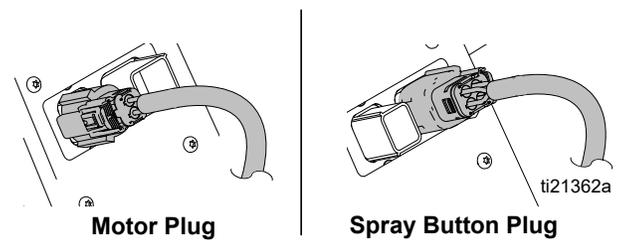
### NOTICE

When installing the battery shroud, wires can get pinched between the shroud and frame and become damaged. To avoid damage, make sure all wires are kept in front of the battery when installing the shroud.

4. Install paint hopper (S) and material dispenser (E).



5. Connect spray button plug and motor plug.

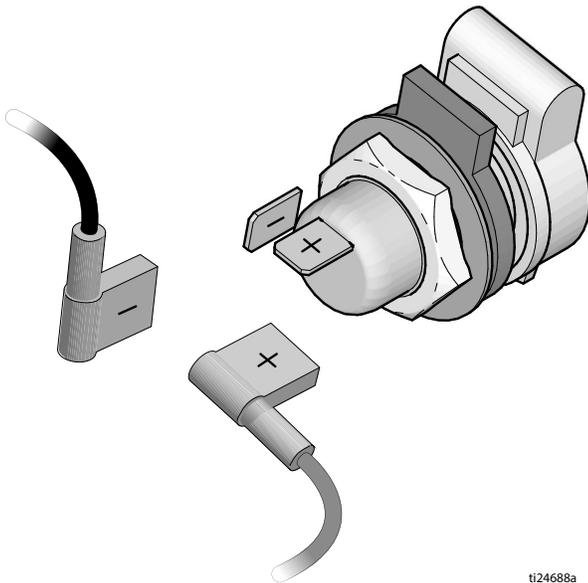


## Control Board Replacement



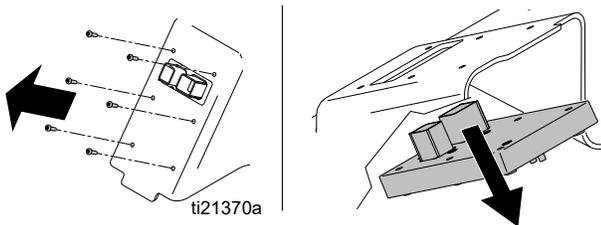
### Removal

1. Disconnect battery wires. See **Battery Removal** steps 1 - 5, page 22.
2. Disconnect two wires from battery charger connection port.



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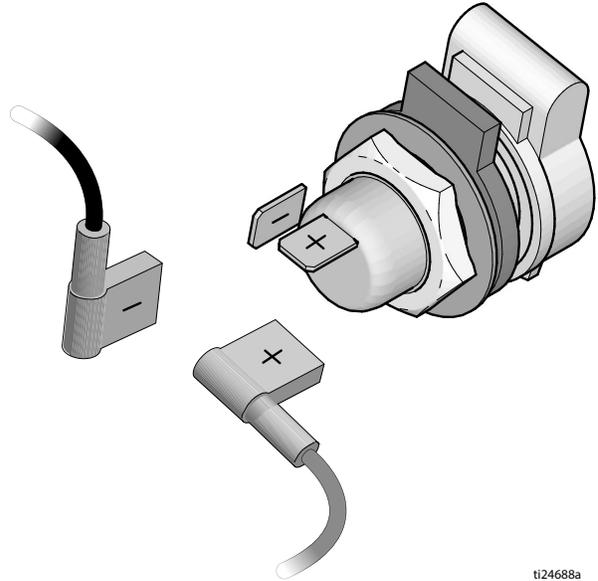
3. Remove six torx screws from board. Remove board from battery shroud.



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### Installation

1. Install new board into battery shroud. Tighten six torx screws into board.
2. Connect negative wire (black) to outer connector of charger jack. Connect positive wire (red) to inner connector of charger jack.



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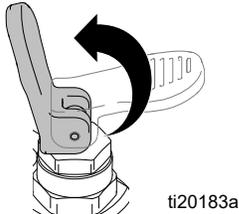
3. Connect battery wires. See **Battery Installation** steps 2 - 5, page 23.

# Pump/Motor Removal

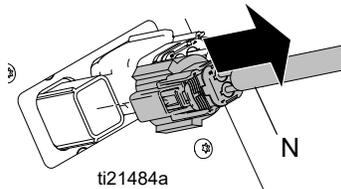


## Removal

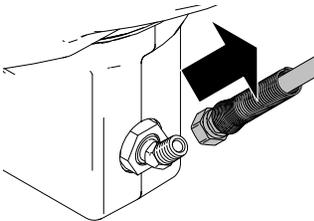
1. Perform **Pressure Relief Procedure**, page 10.



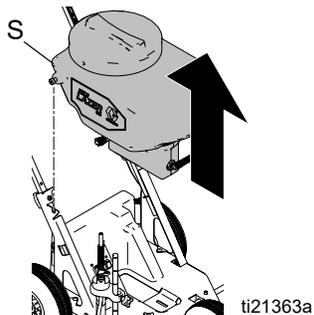
2. Disconnect motor plug (N).



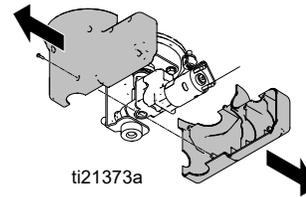
3. Use wrench to disconnect hose to material dispenser.



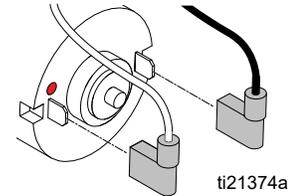
4. Remove paint hopper (S).



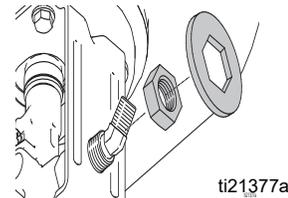
5. Remove six torx screws on motor shroud. Remove motor shroud.



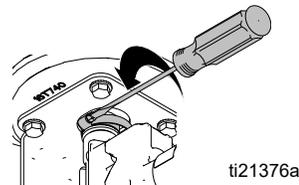
6. Disconnect motor wires and remove power cord.



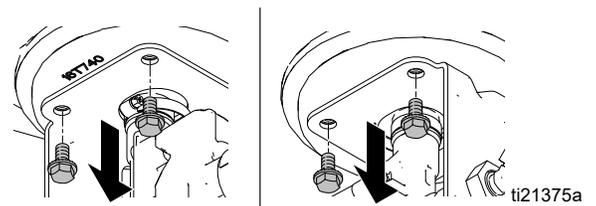
7. Remove foam gasket and use wrench to remove bulkhead nut.



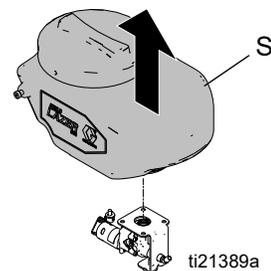
8. Loosen hose clamp below paint hopper.



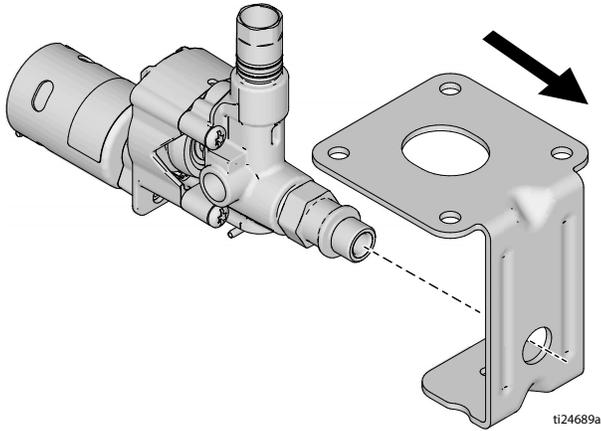
9. Remove four screws from paint hopper bracket.



10. Remove paint hopper (S) from pump/motor assembly.

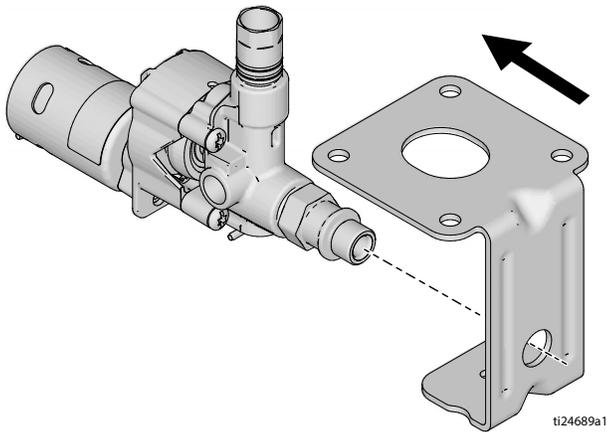


11. Remove pump/motor assembly from hopper bracket.

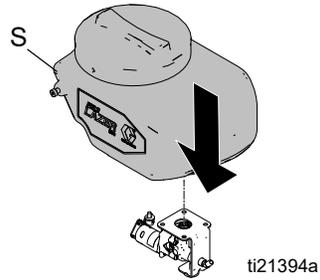


### Installation

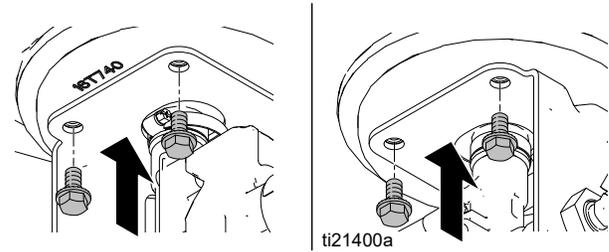
1. Loosely install hose clamp on pump before installing pump/motor assembly onto pump bracket. Install new Pump/Motor assembly into pump bracket.



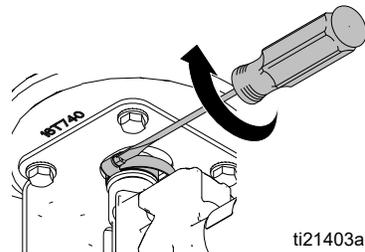
2. Install Pump/Motor assembly into paint hopper (S).



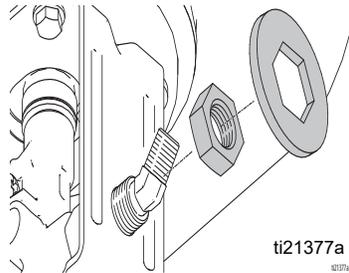
3. Install and tighten four screws.



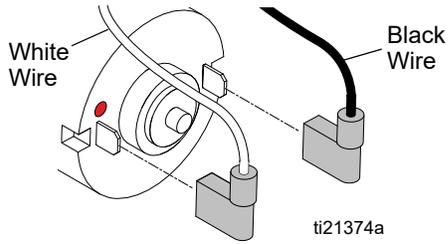
4. Install and tighten hose clamp to paint hopper.



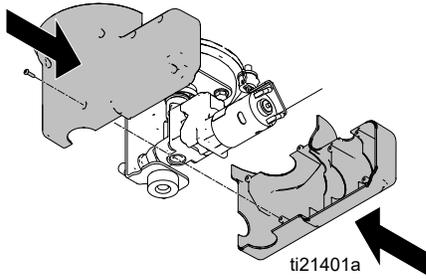
5. Install and tighten bulkhead nut.



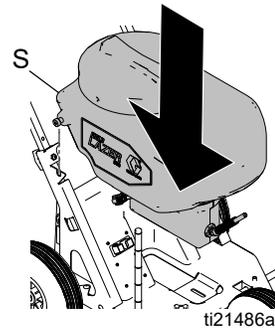
6. Install power cord and connect motor wires. Connect white wire to post with red indicator mark. Connect black wire to outside post.



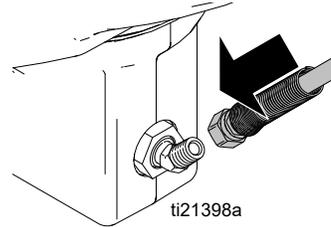
7. Install motor shroud, capture wire strain relief and tighten six torx screws.



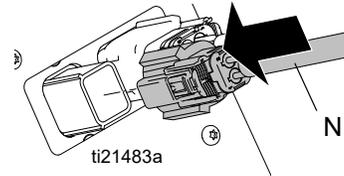
8. Install paint hopper (S).



9. Reconnect hose to pump/motor outlet.



10. Connect motor plug (N).



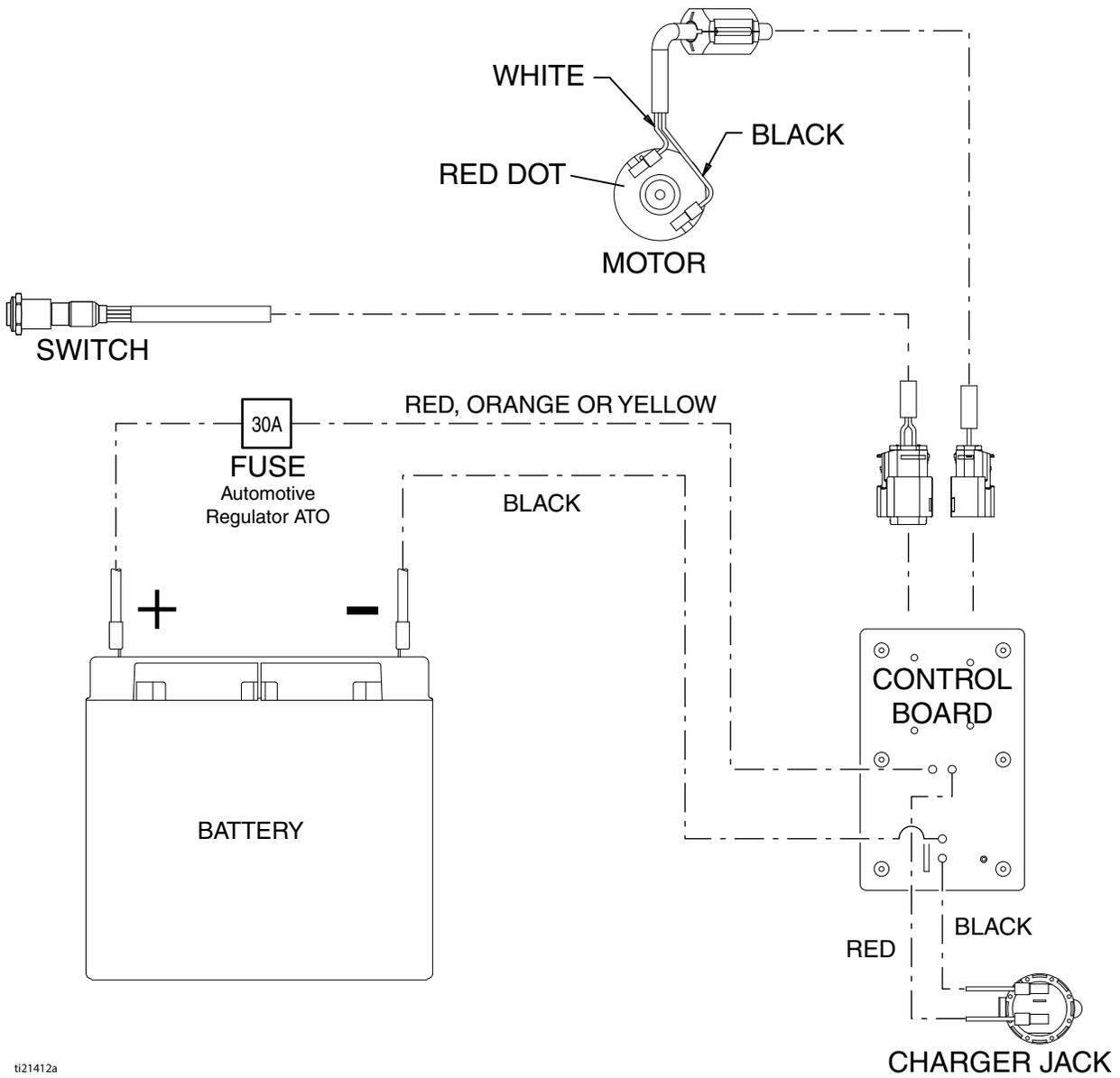
# Troubleshooting



Problem	Cause	Solution
Pump/motor runs but material is not being sprayed	Paint hopper is empty	Fill paint hopper with spray material.
	Field marker is not primed	Prime field marker. See <b>Starting a New Job</b> , page 13.
	Field marker inlet ball check valve has foreign material in passage way.  Field marker inlet ball check valve is stuck shut due to improper cleaning and storage.	Remove foreign material in the field marker inlet ball check valve by: <ol style="list-style-type: none"> <li>1. Empty the paint hopper.</li> <li>2. Remove paint hopper screen.</li> <li>3. Add 0.5 gallons (2 liters) of water to the paint hopper.</li> <li>4. Use a thin rod to move inlet ball check up and down.</li> </ol> <p><b>NOTE:</b> If paint particles seem to be settling in hopper screen, strain paint with a paint sock prior to filling hopper.</p>
Pump/motor runs but material comes out prime hose	Prime/spray valve is UP	Move valve handle DOWN to spray position.
	Material dispenser tip is plugged	Clean material dispenser tip by reverse spraying. See <b>Reversible Spray Tip</b> , page 11.
	Material dispenser tip and/or filter is plugged	Clean material dispenser tip by reverse spraying and clean filter. See <b>Unclogging Spray Tip/Guard Assembly</b> , page 17.  If tip does not clean by using Reversible Spray Tip procedure, remove tip and clean using a cleaning wire pick, water and pressurized air or water (compressed air or nozzle jetted city water). If tip cannot be cleaned, replace tip.  See <b>Tip Removal/Cleaning</b> , page 19.
	CleanShot has foreign particles in passageway	See <b>CleanShot Removal/Cleaning</b> , page 19.
Pump/motor does not run when spray button is in	Battery is discharged. Spray button is red when button is in.	Connect battery charger and recharge battery. See <b>Charging the Battery</b> , page 8.
	Motor plug is disconnected	Connect motor plug on battery shroud. See (N) <b>Component Identification</b> , page 6.
	Spray button plug is disconnected	Connect spray button on battery shroud. See (P) <b>Component Identification</b> , page 6.
	Battery fuse has faulted resulting in an open circuit (blown fuse)	Remove battery shroud and check for pinched or shorted wires before replacing fuse. See <b>Fuse Replacement</b> , page 21.
	Wires to battery have become loose, disconnected or damaged	Tighten wire connection or reconnect. See <b>Battery Replacement</b> , page 22.
	Field marker fluid path is plugged between pump and prime/spray valve	Perform <b>Pressure Relief Procedure</b> , page 10. If pressure cannot be relieved as evidenced by material flowing out of prime hose, STOP and contact Graco Technical Support or bring field marker to Graco distributor for repair.  <b>NOTE:</b> Red light on spray button will be flashing.
	Pump/motor is damaged	Remove pump/motor for repair. See <b>Pump/Motor Removal</b> , page 25. Contact Graco Technical Support or bring field marker to Graco distributor for repair.

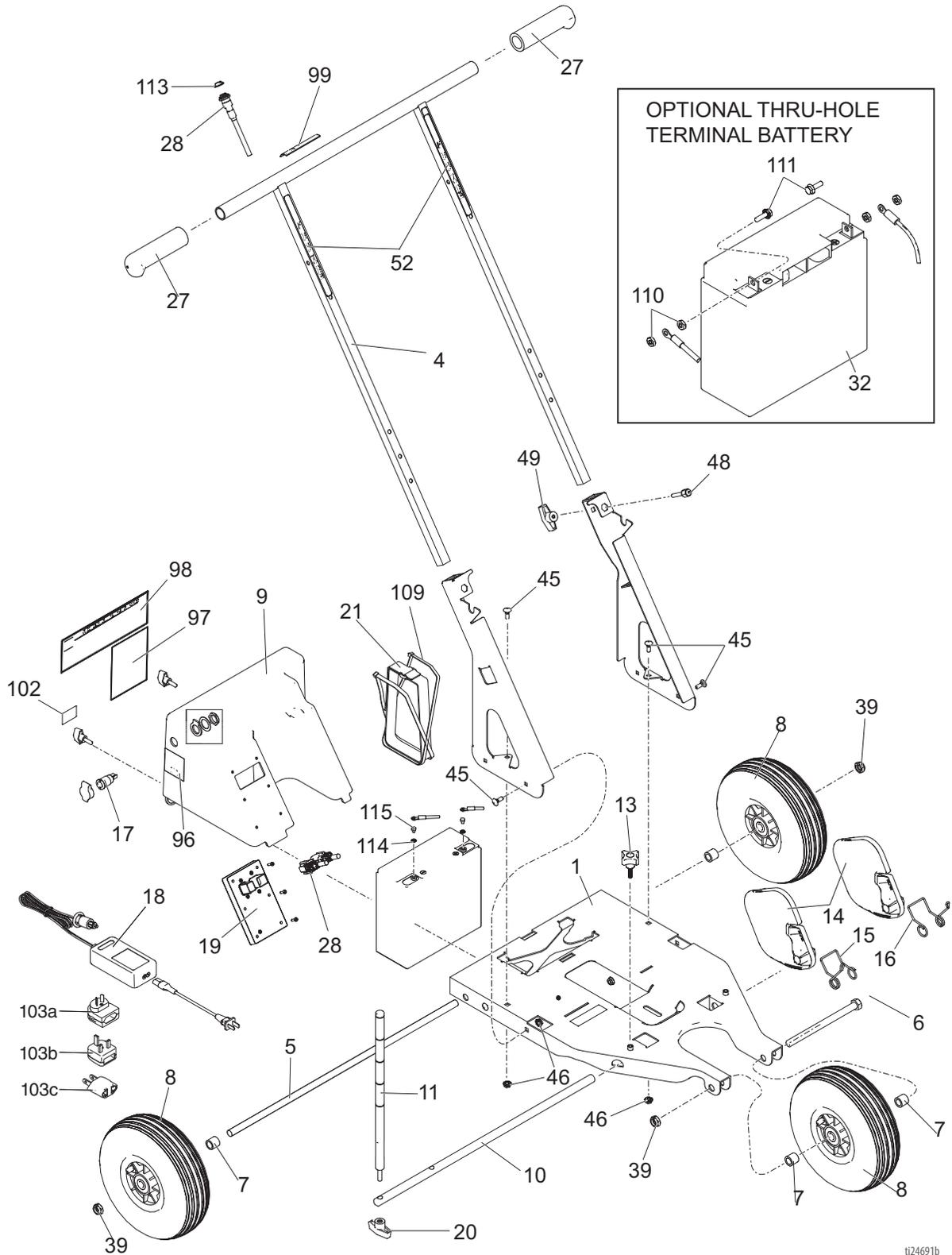
Problem	Cause	Solution
Pump/motor runs but red light on spray button is on	Battery has been discharged to the level that user is notified the battery is low.	Recharge battery. Connect battery charger and recharge battery. See <b>Charging the Battery</b> , page 8. <b>NOTE:</b> When red light first comes on, user has approximately 15 minutes of field marker run time left.
Spray pattern width is decreasing	Incorrect material dispenser holder height position.	Readjust material dispenser holder until desired width is achieved. See <b>Adjusting Line Width</b> , page 14.
	Material dispenser tip is wearing out.	Replace tip. See <b>Tip Removal/Cleaning</b> , page 19.
	Material is too dense and/or too viscous.	Readjust material dispenser holder until desired width is achieved. See <b>Adjusting Line Width</b> , page 14. Dilute material as required.
	Pump/motor is not operating at specified RPM.	Check spray pattern with water only. If spray pattern is good, dilute material as required. If spray pattern is not good with water, contact Graco Technical Support or bring field marker to Graco distributor for repair.
Pump/motor randomly stops; full spray pattern cannot be achieved	Material needs to be strained to remove solids.	Use a paint sock to filter material as it is being poured into paint hopper.
Material continues to flow out of tip after stopping spray	Foreign material in CleanShot.	Remove and clean CleanShot. See <b>CleanShot Cleaning</b> , page 19.
	CleanShot is damaged.	Contact Graco Technical Support or bring field marker to Graco distributor for repair.
Battery did not fully charge	Battery charger was disconnected too early (charging was interrupted before completing charge).	Disconnect charger from field marker. Disconnect charger from power outlet and allow charger to remain unpowered for 5 - 10 minutes. See <b>Charging the Battery</b> , page 8.
	Wire terminals are loose or disconnected on battery charger connection port (C).	Reconnect terminals or replace terminals at battery port (C). See <b>Control Board Replacement</b> , page 24.
	Battery is damaged or at the end of the recharge life cycle.	Replace battery. See <b>Battery Replacement</b> , page 22.
	Charger is damaged.	Replace charger. Contact Graco distributor for correct replacement.
Paint is leaking from pump/motor shroud	Seals on pump are worn out.	Replace pump/motor assembly.

# Wiring Diagram



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# Parts



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## Parts List

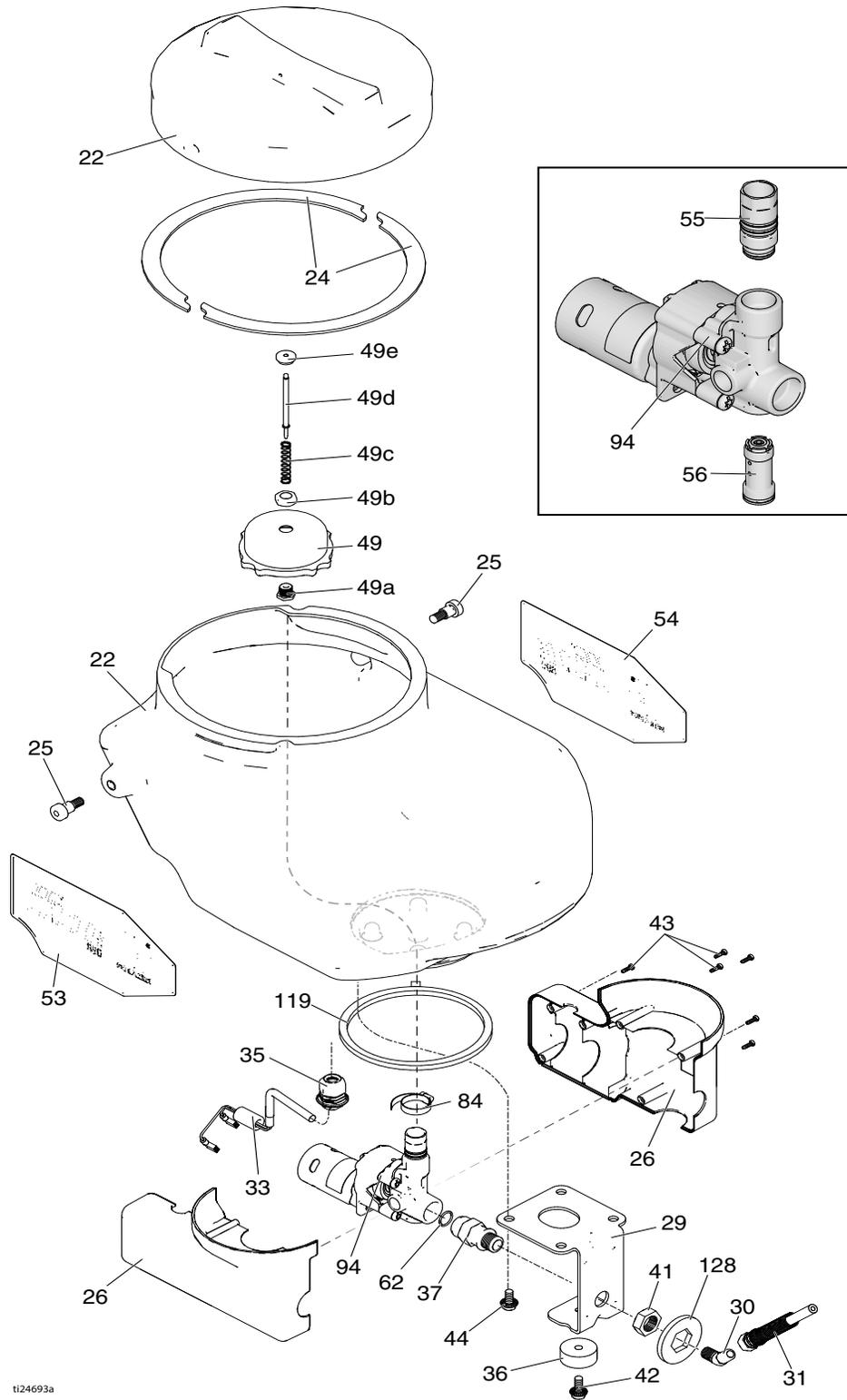
Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	16U476	FRAME, stamped, S90	1	32	24X370	KIT, battery, 18 ah, sealed	1
2	16U478	BRACKET, frame, right	1	33	16U707	HARNESS, motor wire	1
3	16U477	BRACKET, frame, left	1	39	119547	NUT, hex, lock, nylon, thin	3
4	24R069	BAR, handle, weldment	1	40	100270	SCREW, cap, hex hd	2
5	16U580	AXLE, rear, S90	1	43	119236	SCREW, mach, torx pan hd	6
6	126946	BOLT, cap, hex head	1	45	111570	BOLT, carriage	6
7	195367	SPACER	4	46	115942	NUT, hex, flange head	6
8	126947	TIRE, 10 inch, pneumatic	3	48	24R664	KIT, handle bar fasteners	1
9	24R882	KIT, shroud, battery, <i>includes 96, 97a, 97b, 98, 102</i>	1	49	115480	KNOB, to handle	2
10	16U229	BAR, support	1	52	16U680	LABEL, brand, S90, handle, upright	2
11	16U230	BAR, adjustment, height	1	96	16V158	LABEL, 12V battery charge	1
13	15D862	NUT, hand	1	▲97a	16V162	LABEL, warning, iso, multiple	1
14†	16U231	SHIELD, spray, guide, plastic	2	▲97b	16V507	LABEL, warning, iso, Europe	1
15	15F142	GUIDE, wire, right shield	1	98	16V161	LABEL, quick start instructions	1
16	15F143	GUIDE, wire, left shield	1	99	16V157	LABEL, indicator light	1
17		JACK, charger, 12 volt, 15 Amp	1	102	16D576	LABEL, Made in USA w/global comp	1
	126951	Series A		103a	124783	PLUG, converter, Asia/Aus	1
	127926	Series B		103b	124507	PLUG, converter, UK	1
18a		CHARGER, 120V ac, USA	1	103c	127155	PLUG, converter, Japan	1
	17C571	Series A, <i>includes 17</i>		109	108774	STRAP, tie, wires	2
	17C565	Series B		110	113505	BATTERY, terminal nut	4
18b		KIT, charger, S90, 240V, Euro	1	111	125857	BATTERY, terminal bolt	2
	17C572	Series A, <i>includes 17, 103a, 103c</i>		113	16V701	BOOT, replacement	1
	17C566	Series B		114	111307	WASHER	2
18d		KIT, charger, S90, 240V, Asia/Aus	1	115	128131	SCREW	2
	17C572	Series A, <i>includes 17, 103a, 103c</i>					
	17C568	Series B, <i>includes 103a, 103c</i>					
19*	24R792	KIT, board, control, S90, <i>includes 43</i>	1				
20	127052	KNOB, T-handle	1				
21	126949	STRAP, battery	1				
27	114659	GRIP, handle	2				
28	24P924	SWITCH, pushbutton	1				

† 24P894 KIT, spray shield, S90, includes 14, 15, 16

\* Fuse is a 30 Amp automotive fuse, Regular ATO

▲ Replacement Warning and Safety labels are available at no cost.

# Parts

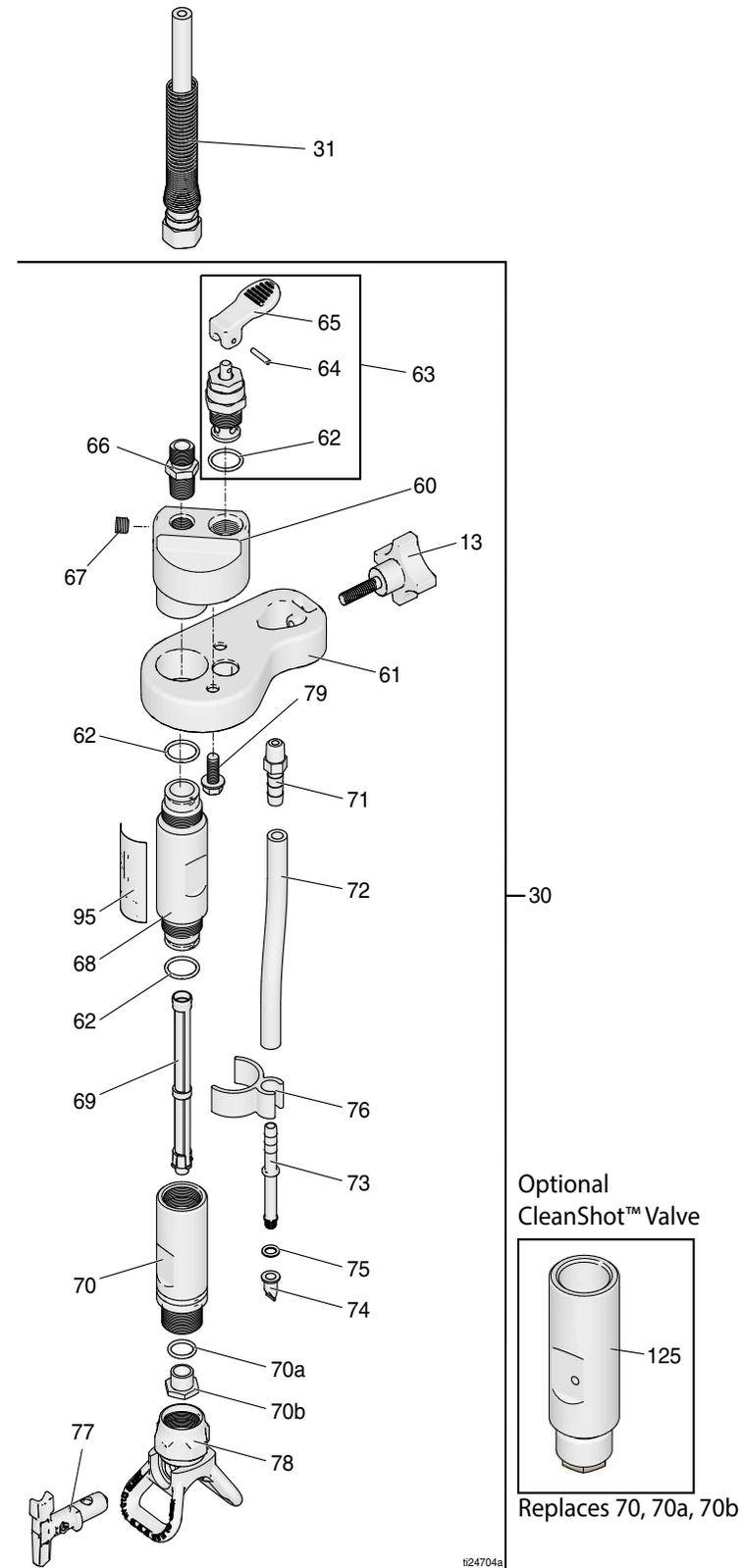


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## Parts List

Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
22‡	24R795	KIT, hopper, S90, <i>includes 24, 25, 53, 54, 119</i>	1	49b	192348	NUT, head	1
24	16U373	SEAL, lid, hopper	2	49c	127962	SPRING	1
25	126108	SCREW, shoulder, socket head	2	49d	17C934	STEM, ball knocker	1
26	24R883	KIT, cover, S90 pump, <i>includes 43</i>	1	49e	17C935	KNOB	1
29	16T186	BRACKET, pump	1	53	16U679	LABEL, brand, S90, hopper, lside	1
30	126954	FITTING, elbow, 45 deg, 1/4 npt	1	54	16U677	LABEL, brand, S90, hopper, rside	1
31	277183	HOSE, cpd, 3/16 in. x 6 ft, 3300 wp	1	55	16U602	HOUSING, inlet assembly	1
33	16U707	HARNES, motor wire, <i>includes 35</i>	1	56	16T184	VALVE, outlet, ball check	1
35	126955	BUSHING, strain relief	1	62	109576	PACKING, o-ring	1
36	113817	BUMPER	1	84	117464	CLAMP, hose, micro 1.75 max dia.	1
37	16T185	FITTING, pump adapter	1	94	24R172	KIT, complete pump and motor	1
41	100071	NUT, hex	1	114	865663	STRAINER, mesh, hopper, 5 gallon (12 pack) (item not shown)	1
42	117791	SCREW, cap, tri lobe	1	119	17C502	SEAL, hopper, base	1
43	119236	SCREW, mach, torx pan hd	6	128	17W933	GASKET, hopper, base	1
44	111800	SCREW, cap, hex hd	4	‡ Lid Kit 24R820 is available ( <i>includes 24</i> )			
49	16U370	FILTER, hopper <i>includes 49a – 49e</i>	1				
49a	17C933	BUSHING, ball knocker	1				

# Parts



## Parts List

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
13	15D862	NUT, hand	1	70	17C501	HOUSING, filter, turf	1
30	24P124	KIT, holder, tip, <i>includes 31-79</i>	1	70a	103610	O-RING, packing	1
31	277183	HOSE, cpld, 3/16 in. x 6 ft, 3300 wp	1	70b	17C500	HOUSING, restrictor	1
60	16T159	MANIFOLD, filter	1	71	103875	ADAPTER, hose, barb	1
61	16U255	HOLDER, tip	1	72	16U667	TUBE, drain	1
62	109576	PACKING, o-ring	3	73	16C645	TUBE, drain	1
63	24R790	KIT, valve, prime, S90, <i>includes 62-65</i>	1	74	196467	VALVE	1
64	119956	PIN, straight	1	75	104893	PACKING, o-ring	1
65		HANDLE, drain valve	1	76	195400	CLIP, spring	1
66	162453	FITTING, (1/4 npsm x 1/4 npt)	1	77	LL5315	TIP, spray, RAC 5, striping	1
67	103147	PLUG, pipe	1	78	243161	GUARD, RAC IV / 5	1
68	16T160	TUBE, filter	1	79	112774	SCREW, mach, sltd hex wash hd	2
69	287033	FILTER, 100 mesh	1	95	16V159	LABEL, gun, filter	1
				125	24P969	VALVE, CleanShot, turf, <i>optional</i>	

# Technical Data

	<b>U.S.</b>	<b>Metric</b>
Maximum working pressure	1200 psi	8.3 MPa, 83 bar
Recommended Tip Size	LL5315	LL5315
Maximum Tip Size	LL5417	LL5417
Weight	60 lb	27.2 kg
Dimensions:		
Length	40 in.	101.6 cm
Width	23 in.	58.4 cm
Height	36 in.	91.4 cm
Storage temperature range ◆?	33° to 120° F	1° to 48° C
Operating temperature range ?	33° to 120° F	1° to 48° C
Sound pressure level	79.2 dBa† sound pressure level 93.8 dBa† sound power level	79.2 dBa† sound pressure level 93.8 dBa† sound power level
Vibration level acceleration	Less than 5.5 feet/s <sup>2</sup> ††	Less than 1.7 m/s <sup>2</sup> ††
<b>Charger:</b>		
Charging time	6 hours to 80%, 6 to 14 to 100%	6 hours to 80%, 6 to 14 to 100%
Power source	120/240 VAC	120 /240VAC
<b>Battery (Sealed Lead Acid):</b>		
Voltage (DC)	12 V Maximum	12 V Maximum
Capacity	22 Ah, 264 Wh	22 Ah, 264 Wh
<b>Fuse</b>		
Current rating	30 Amp	30 Amp
Type	Automotive, Regular ATO	Automotive, Regular ATO

◆ Pump damage will occur if fluid freezes in pump.

⌘ Damage to plastic parts may result if impact occurs in low temperature conditions.

⌘ Changes in paint viscosity at very low or very high temperatures can affect field marker performance.

† per ISO 3744 measured at 3.3 feet (1m)

†† per ISO 5349, no load condition

# Graco Standard Warranty

Graco warrants all equipment referenced in this document which is 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 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.

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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