

## LineLazer™ ES 1000 Airless Line Striper

3A4603B  
EN

**For the application of line striping materials.**

**For professional use only.**

**Not approved for use in explosive atmospheres or hazardous locations.**

Maximum Operating Pressure: 3300 psi (22.8 MPa, 228 bar)

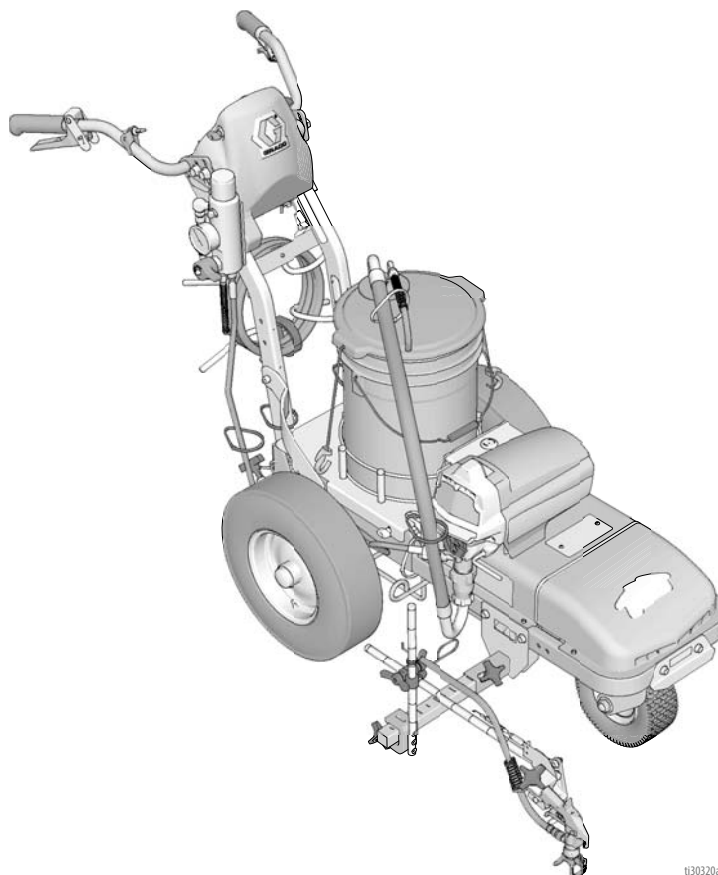


### Important Safety Instructions

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

Related Manuals:	
311254	Gun
334599	Pump

LineLazer ES 1000			
Model	No Battery Included	1 Battery Included	2 Batteries Included
25M225	✓ 120V		
25M226		✓ 120V	
25M315			✓ 120V
25M227 CE	✓ 230V		
25M228 CE		✓ 230V	
25M316 CE			✓ 230V



t130320a

*Use only genuine Graco replacement parts.  
The use of non-Graco replacement parts may void warranty.*

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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

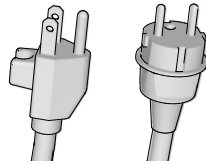


### GROUNDING

This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

- Improper installation of the grounding plug is able to result in a risk of electric shock.
- When repair or replacement of the cord or plug is required, do not connect the grounding wire to either flat blade terminal.
- The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.
- Check with a qualified electrician or serviceman when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded.
- Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.
- This product is for use on a nominal 120V or 230V circuit and has a grounding plug similar to the plugs illustrated below.

120V US      230V



- Only connect the product to an outlet having the same configuration as the plug.
- Do not use an adapter with this product.

### Extension Cords:

- Use only a 3-wire extension cord that has a grounding plug and a grounding receptacle that accepts the plug on the product.
- Make sure your extension cord is not damaged. If an extension cord is necessary use 12 AWG (2.5mm<sup>2</sup>) minimum to carry the current that the product draws.
- An undersized cord results in a drop in line voltage and loss of power and overheating.

# WARNING



## FIRE AND EXPLOSION HAZARD

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



- Do not spray flammable or combustible materials near an open flame or sources of ignition such as cigarettes, motors, and electrical equipment.
- Paint or solvent flowing through the equipment is able to result in static electricity. Static electricity creates a risk of fire or explosion in the presence of paint or solvent fumes. All parts of the spray system, including the pump, hose assembly, spray gun, and objects in and around the spray area shall be properly grounded to protect against static discharge and sparks. Use Graco conductive or grounded high-pressure airless paint sprayer hoses.
- Verify that all containers and collection systems are grounded to prevent static discharge. Do not use pail liners unless they are antistatic or conductive.
- Connect to a grounded outlet and use grounded extensions cords. Do not use a 3-to-2 adapter.
- Do not spray flammable or combustible liquids in a confined area.
- Sprayer generates sparks. Keep spray area well-ventilated. Keep a good supply of fresh air moving through the area.
- Keep pump assembly in a well ventilated area when spraying, flushing, cleaning, or servicing. Do not spray pump assembly.
- Do not smoke in the spray area or spray where sparks or flame is present.
- Do not operate light switches, engines, or similar spark producing products in the spray area.
- Keep area clean and free of paint or solvent containers, rags, and other flammable materials.
- Know the contents of the paints and solvents being sprayed. Read all Material Safety Data Sheets (MSDS) and container labels provided with the paints and solvents. Follow the paint and solvents manufacturer's safety instructions.
- Fire extinguisher equipment shall be present and working.











## 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 3300 psi. Use Graco replacement parts or accessories that are rated a minimum of 3300 psi.
- Always engage the trigger lock when not spraying. Verify the trigger lock is functioning properly.
- 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.

# ! WARNING

 	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• 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 Safety Data Sheet (SDS) from distributor or retailer.</li> <li>• Do not leave the work area while equipment is energized or under pressure.</li> <li>• Turn off all equipment and follow the <b>Pressure Relief Procedure</b> when equipment is not in use.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.</li> <li>• Make sure all equipment is rated and approved for the environment in which you are using it.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>
 	<p><b>ELECTRIC SHOCK HAZARD</b></p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> <li>• Turn off, disconnect power cord, and disconnect battery before servicing equipment.</li> <li>• Connect only to grounded electrical outlets.</li> <li>• Use only 3-wire extension cords.</li> <li>• Ensure ground prongs are intact on power and extension cords.</li> <li>• Do not expose to rain. Store indoors.</li> <li>• Wait thirty minutes after disconnecting power cord before servicing.</li> </ul>
 	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch, cut or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> and disconnect all power sources.</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 Safety Data Sheet (SDS) 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>
	<p><b>BURN HAZARD</b></p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> <li>• Do not touch hot fluid or equipment.</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.



## BATTERY HAZARD

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.



- Only use the battery type specified for use with the equipment. See **Technical Data**.
- Connecting cables to the battery creates sparks. Replace battery only in well-ventilated area and away from flammable or combustible materials, including paints and solvents.



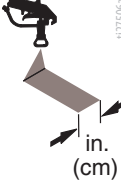


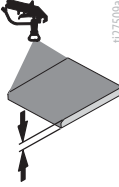
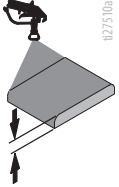
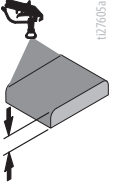


- Remove watches, rings or other metal objects before servicing.
- Only use tools with insulated handles. Do not lay tools or metal parts on top of battery.
- Do not dispose of battery in fire or heat above 50°C (122°F). The battery is capable of exploding.
- Do not throw into fire.
- Do not expose battery to water or rain.
- Do not disassemble, crush, or penetrate the battery.
- Do not use or charge a battery that is cracked or damaged.
- Follow local ordinances and/or regulations for disposal.

## CALIFORNIA PROPOSITION 65

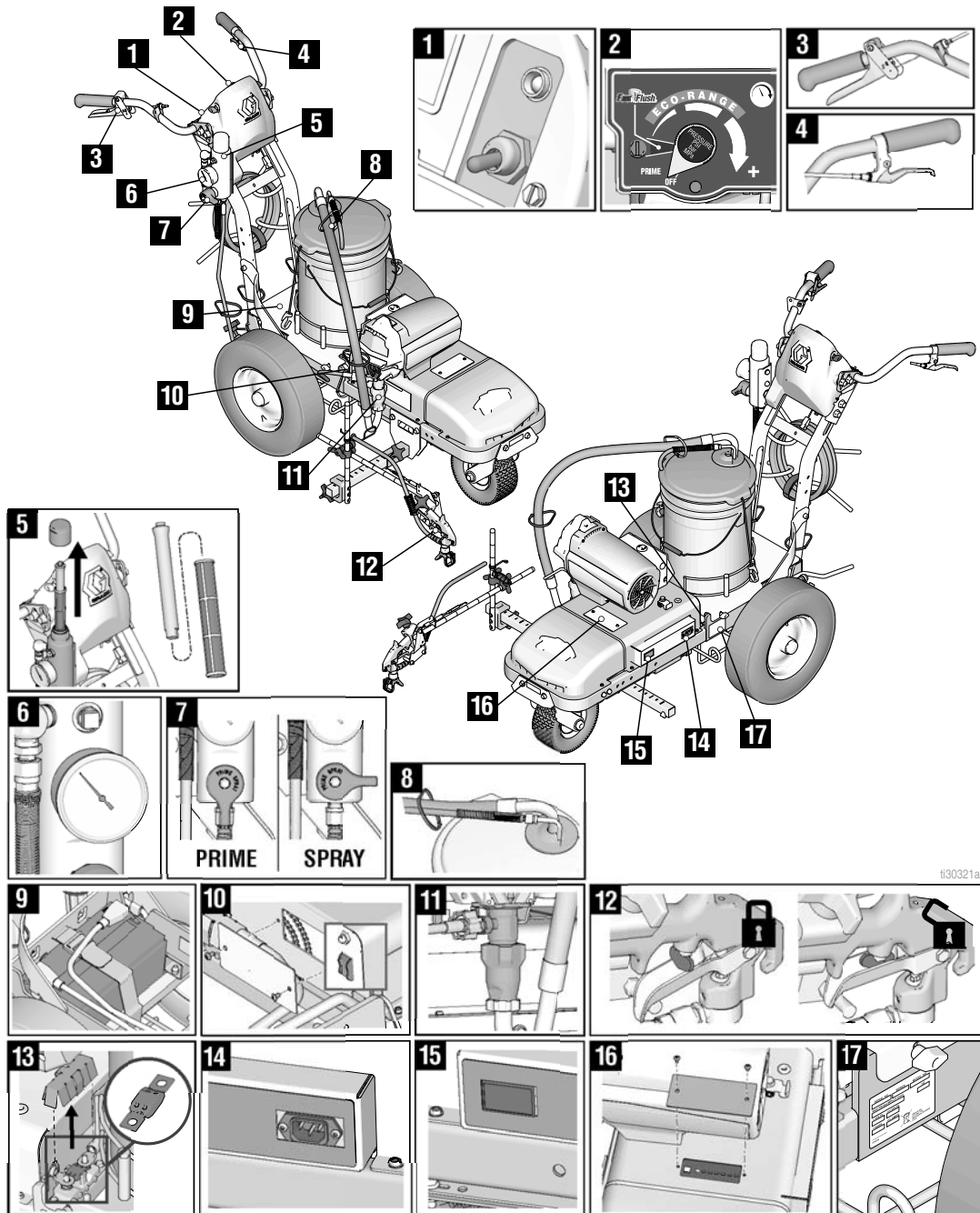
This product contains a chemical known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

# Tip Selection

							
	in. (cm)	in. (cm)	in. (cm)	in. (cm)			
LL5213*	2 (5)				✓		
LL5215*	2 (5)					✓	
LL5217		4 (10)				✓	
LL5219		4 (10)					✓
LL5315		4 (10)			✓		
LL5317		4 (10)			✓		
LL5319		4 (10)				✓	
LL5321		4 (10)				✓	
LL5323		4 (10)				✓	
LL5325		4 (10)					✓
LL5327		4 (10)					✓
LL5329		4 (10)					✓
LL5331		4 (10)					✓
LL5333		4 (10)					✓
LL5335		4 (10)					✓
LL5355		4 (10)					✓
LL5417			6 (15)		✓		
LL5419			6 (15)		✓		
LL5421			6 (15)		✓		
LL5423			6 (15)			✓	
LL5425			6 (15)			✓	
LL5427			6 (15)			✓	
LL5429			6 (15)			✓	
LL5431			6 (15)				✓
LL5435			6 (15)				✓
LL5621				12 (30)	✓		
LL5623				12 (30)	✓		
LL5625				12 (30)	✓		
LL5627				12 (30)	✓		
LL5629				12 (30)	✓		
LL5631				12 (30)		✓	
LL5635				12 (30)		✓	
LL5639				12 (30)			✓

\*Use 100 mesh filter to reduce tip clogs.

# Component Identification (ES 1000)



1	ON/OFF switch
2	Pressure control
3	Spray gun trigger
4	Turn control
5	Filter
6	Gauge
7	Prime/Pressure valves
8	Drain and siphon hoses
9	Battery compartment

10	Inverter circuit breakers
11	Pump
12	Trigger safety
13	Fuse
14	Charging port
15	Voltage meter
16	LED status center
17	Serial ID

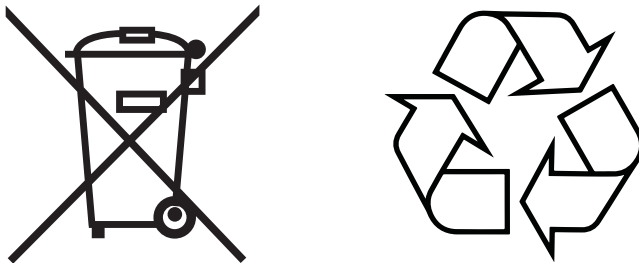


# Battery and Charger

- The LineLazer ES 1000 is designed to work with one or two 12V 100 Ahr **DEEP CYCLE** Absorbent Glass Mat (AGM) batteries. Maximum battery size is 13" x 9" x 7" (33cm x 23cm x 18cm).
- **Battery Protection Features:** Unit is designed to protect the battery by shutting down at 10.5V and not allowing charging to occur above 15.5V.
- **Battery Operating Temperature:** -4-140°F (-20-60°C)
- **Battery Charging Temperature:** 14-140°F (-10-60°C)
- **Battery Storage Temperature:** -4-140°F (-20-60°C)
- **Self Discharge:** Lead acid batteries can self-discharge in as little as 3 months depending on storage temperatures. The hotter the storage temperature, the faster the self-discharge occurs. To prevent damage to the battery, it is important to keep the battery in a charged state.
- **Battery Life:** Battery recharge cycles depend on the depth of discharge per cycle. A battery that is discharged to 50% depth will get over twice as many cycles in its life compared to it being discharged to 100% depth each cycle.

## Battery Disposal

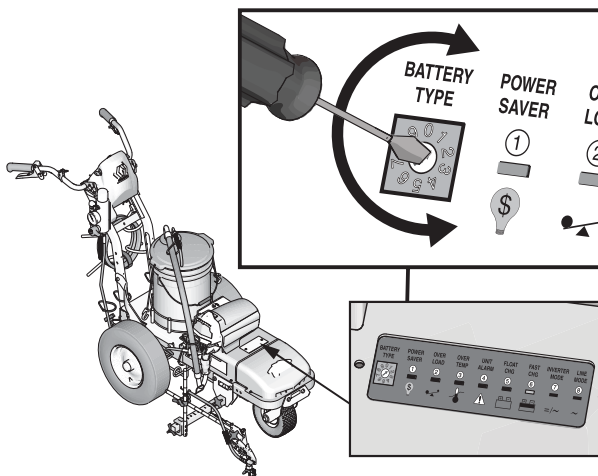
Do not place batteries in the trash. Recycle batteries according to local regulations.



## Battery Type and Charging Profiles

Graco recommends using a 12V 100 Ahr Absorbent Glass Mat (AGM) **DEEP CYCLE** battery. The charger is set for this charging profile from the factory. If a different battery is used, the charging profile can be set at the LED Status Center. The initial charge rate is 30 amps. Only use batteries that allow an initial charge rate of 30 amps or higher.

Use a small flat head screw driver to turn the arrow to point at the number that correlates with the chosen battery.

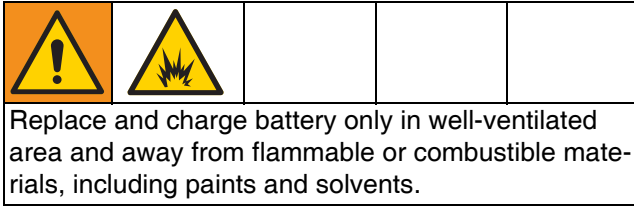


**BATTERY TYPE SELECTOR SETTINGS**

Switch Position	Description	Boost/Vdc	Float/Vdc
0	Charger Off		
1	Gel USA	14.0	13.7
2	AGM 1	14.1	13.4
3	AGM 2	14.6	13.7
4	Sealed Lead Acid	14.4	13.6
5	Gel Euro	14.4	13.8
6	Open Lead Acid	14.8	13.3
7	Calcium	15.1	13.6
8	De-sulphation	15.5 (4 hours then Off)	
9	Not used		

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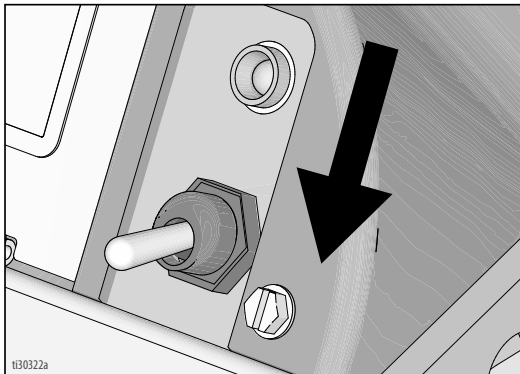
## Charging the Battery



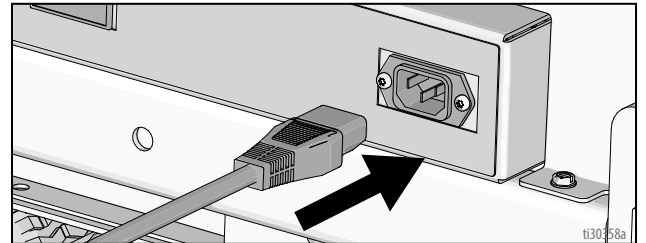
Use an extension cord with an undamaged ground contact. If an extension cord is necessary, use a 3-wire, 12 AWG (2.5 mm<sup>2</sup>) minimum.

Batteries are fully charged when leaving the factory. Due to self-discharging of the battery, charge battery before first use. It takes ~3 hours to charge a dead battery to 80%. It takes ~5 hours to charge a fully depleted battery (double these times for 2 battery unit).

1. Place unit in dry, well-ventilated area and away from flammable or combustible materials, including paints and solvents.
2. Ensure power switch is in **OFF** position.



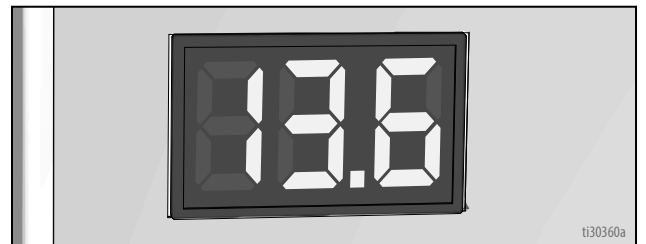
3. Plug charging cord into charging port on the unit. Connect an extension cord, minimum 12AWG (2.5mm<sup>2</sup>), to the charging cord and plug it into wall power.



4. When power is connected the voltmeter will turn on and the charger will immediately begin charging. User should be able to see voltmeter start to climb to indicate charging is occurring.



5. Battery will charge to 14.6-14.8 volts and then it will come back down to ~13.6 volts when fully charged.



# Grounding Procedure (AC Wall Power)



This equipment must be grounded to reduce the risk of static sparking and electric shock. An electric shock or static spark can cause fumes to ignite or explode. An improper ground can cause electric shock. A good ground provides an escape wire for the electric current.

Position the striper so the wheels are on a true grounded surface. Not on pavement.

The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.

## Power Requirements

- 100-120V units require 100-120 VAC, 50/60 Hz, 12 or 15A, 1 phase.
- 230V units require 230 VAC, 50/60 Hz, 7 or 9A, 1 phase.

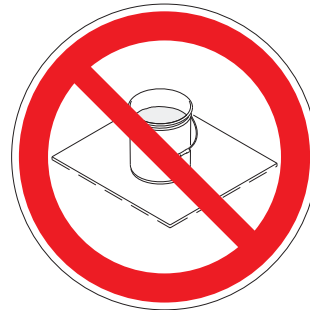
## Extension Cords

Use an extension cord with an undamaged ground contact. If an extension cord is necessary, use a 3-wire, 12 AWG (2.5 mm<sup>2</sup>) minimum.

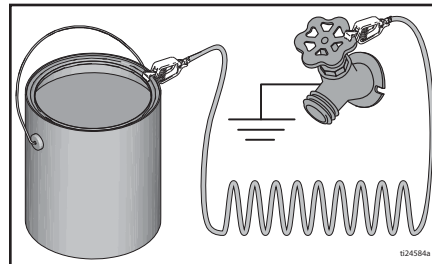
## Pails

**Solvent and oil-based fluids:** follow local code. Use only conductive metal pails, placed on a grounded surface such as concrete.

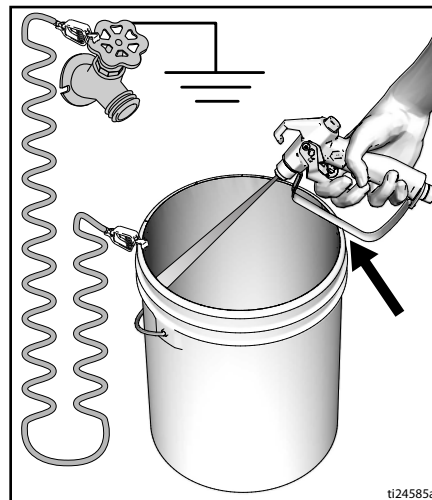
Do not place pail on a non-conductive surface such as paper or cardboard which interrupts grounding continuity.






**Always ground a metal pail:** connect a ground wire to the pail. Clamp one end to the pail and the other end to a true earth ground such as a water pipe.



**To maintain ground continuity when sprayer is flushed or pressure is relieved:** hold metal part of spray gun firmly to the side of a grounded metal pail then trigger gun.

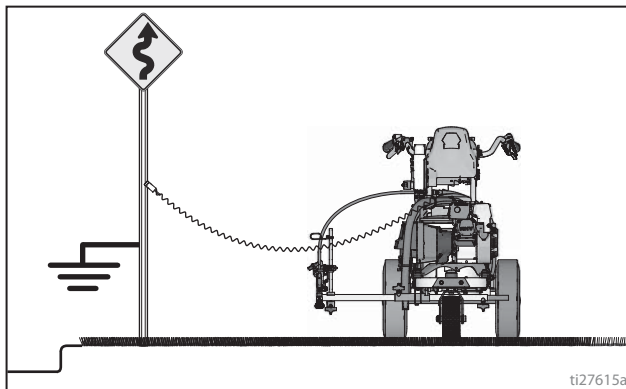


# Grounding Procedure (Battery Power)

				
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This equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.

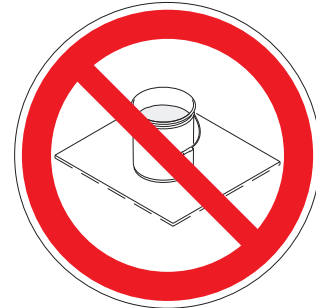
1. Position striper so that the tires are not on pavement.
2. Striper is shipped with a grounding clamp. Grounding clamp must attach to grounded object (e.g., metal sign post).



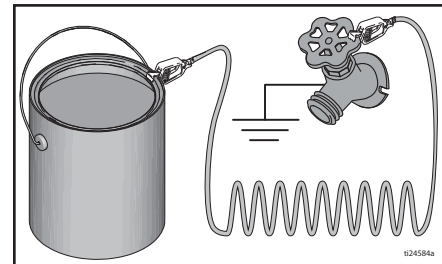
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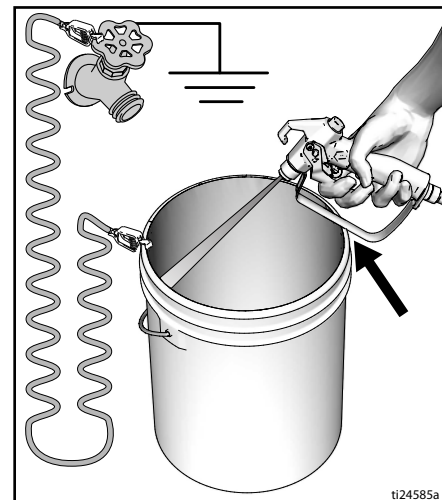
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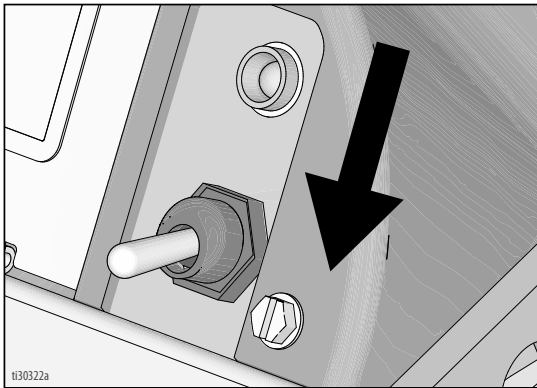


# Pressure Relief Procedure

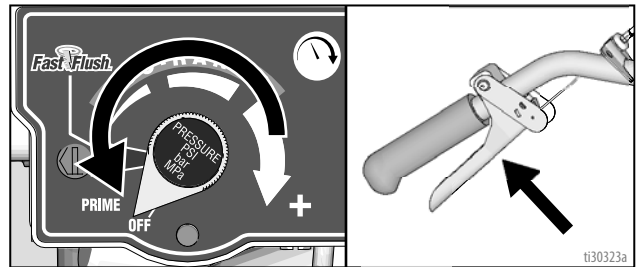


This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing the equipment.

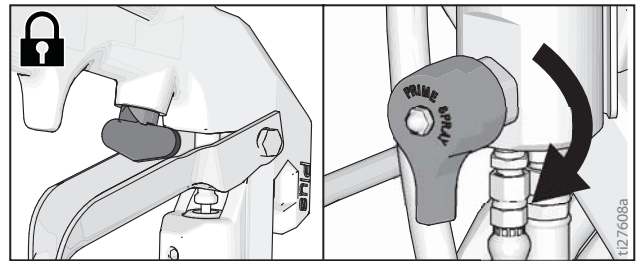
1. Perform **Grounding Procedure** if using flammable materials.
2. Turn ON/OFF Switch to **OFF**.



3. Turn pressure control to lowest setting. Trigger all guns to relieve pressure.



4. Engage all gun trigger locks. Turn prime valve down.

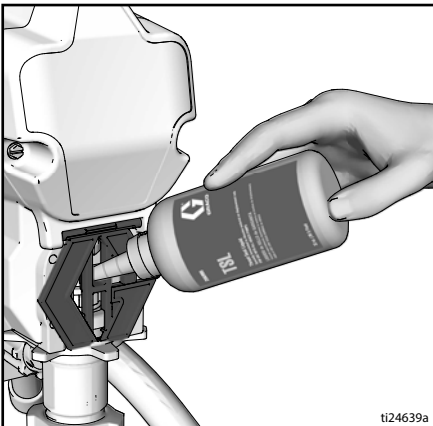


5. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved:
  - a. **VERY SLOWLY** loosen the tip guard retaining nut or the hose end coupling to relieve pressure gradually.
  - b. Loosen the nut or coupling completely.
  - c. Clear the obstruction in the hose or tip.

# Setup/Startup

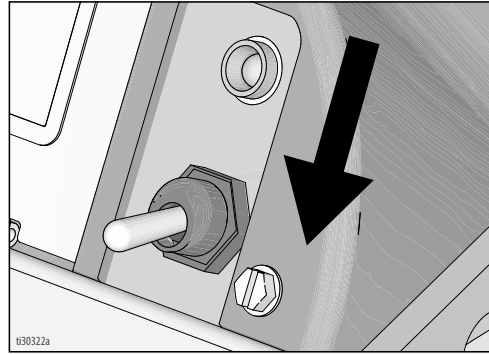


1. Perform **Pressure Relief Procedure**, page 13.
2. **Charge Battery**, page 10.
3. Perform **Grounding Procedure (AC Wall Power)**, page 11, **or Grounding Procedure (Battery Power)**, page 12, if using flammable materials.
4. Fill throat packing nut with TSL to prevent premature packing wear. Do this daily or each time you spray.
  - a. Place the TSL bottle nozzle into the top center opening in the grill at the front of the sprayer.
  - b. Squeeze bottle to dispense enough TSL to fill the space between the pump rod and packing nut seal.

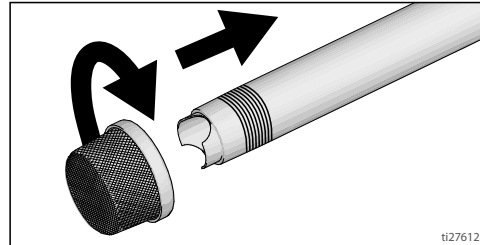


**NOTE:** If running off wall power, plug cord into charging port. If using an extension cord, use a 3-wire, 12 AWG (2.5mm<sup>2</sup>) minimum with an undamaged ground contact.

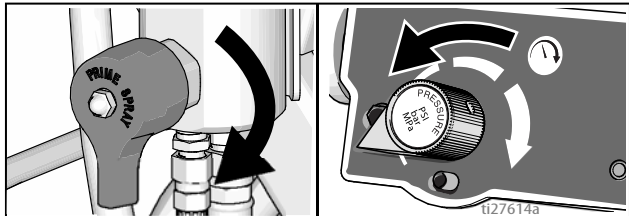
5. Turn On/OFF Switch to **OFF**.



6. If removed, install strainer.

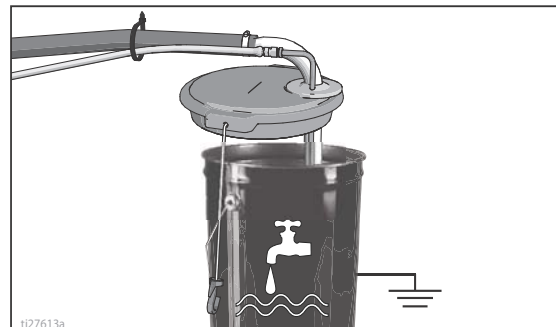


7. Turn prime valve down. Turn pressure control counterclockwise to lowest pressure.

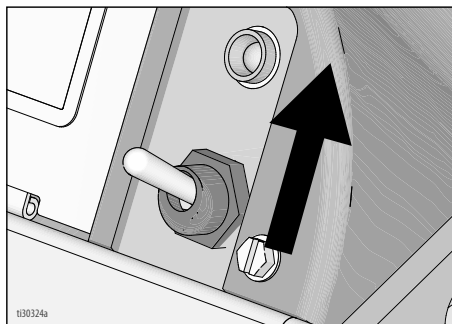


**NOTE:** Minimum hose size for proper sprayer operation is 1/4 in. x 50 ft for LL ES 1000.

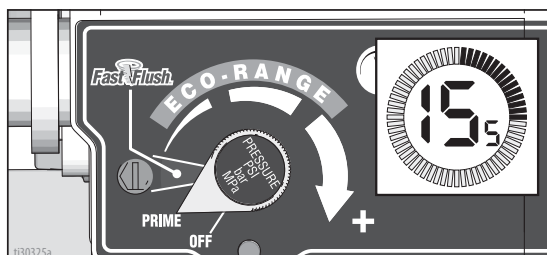
8. Place siphon tube set in grounded metal pail partially filled with flushing fluid. Attach ground wire to true earth ground. Use water to flush water-based paint and mineral spirits to flush oil-based paint and storage oil.



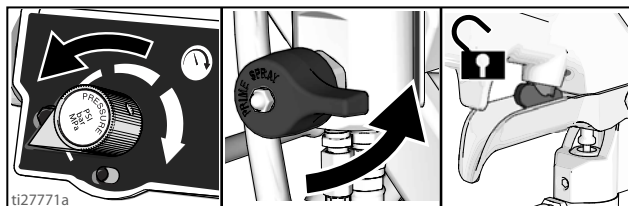
- Turn ON/OFF Switch to ON:



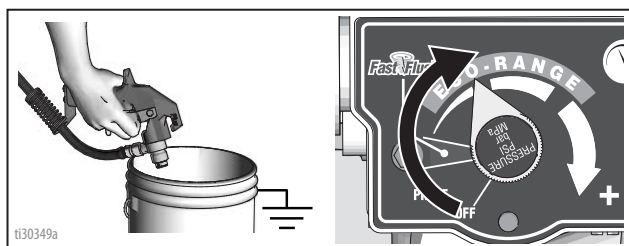
- Turn pressure control to prime. Allow fluid to circulate for 15 seconds.



- Turn pressure down, turn prime valve horizontal. Disengage gun trigger lock.



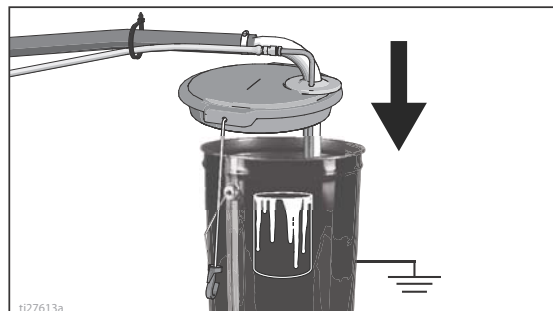
- Hold all guns against a grounded metal flushing pail. Trigger guns and increase fluid pressure slowly until pump runs smoothly. Turn up as needed to prime/spray.



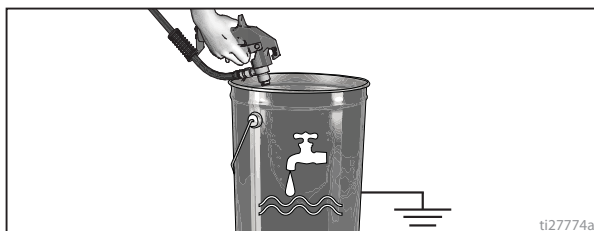
High-pressure spray is able to inject toxins into the body and cause serious bodily injury. Do not stop leaks with hand or rag.

- Inspect fittings for leaks. If leaks occur, turn sprayer OFF immediately. Perform **Pressure Relief Procedure**, page 13. Tighten leaky fittings. Repeat **Setup/Startup**, steps 1 - 17. If no leaks, continue to trigger gun until system is thoroughly flushed. Proceed to step 18.

- Place siphon tube in paint pails.



- Trigger all guns again into a flushing fluid pail until paint appears. Assemble tips and guards.

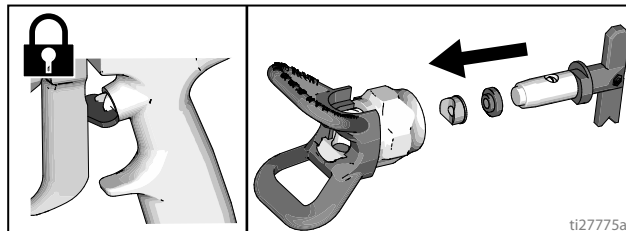


## SwitchTip and Guard Assembly

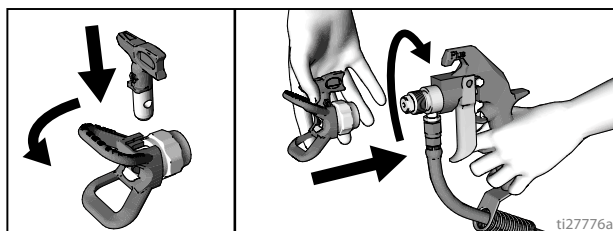


To avoid serious injury from skin injection do not put your hand in front of the spray tip when installing or removing the spray tip and tip guard.

- Engage trigger lock. Use end of SwitchTip to press OneSeal into tip guard, with curve matching tip bore.



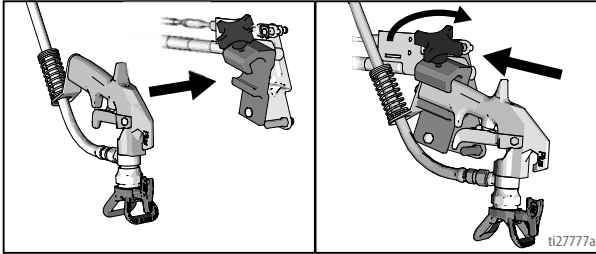
- Insert SwitchTip in tip bore and firmly thread assembly onto gun.



# Gun Placement

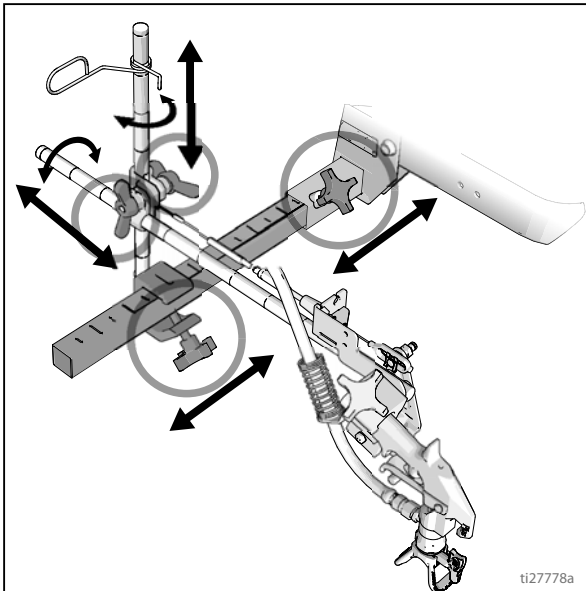
## Install Gun

1. Insert guns into gun holder. Tighten clamps.

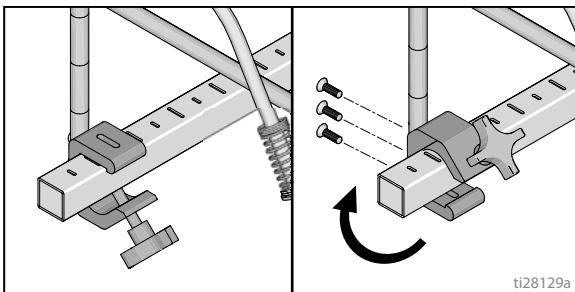


## Position Gun

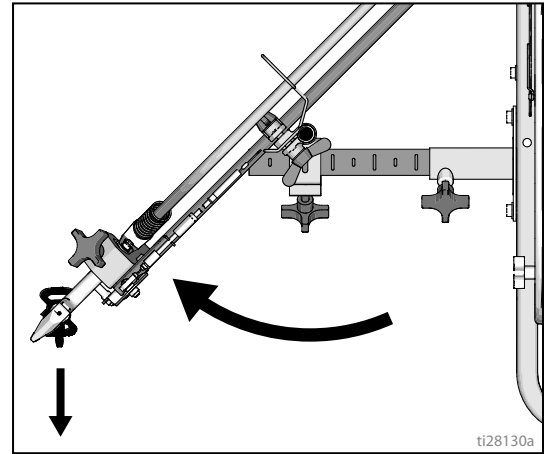
2. Position gun: up/down, forward/reverse, left/right. See **Gun Positions Chart**, page 17 for examples.



NOTE: When striping above a curb, the mounting clamp can be rotated for clearance.

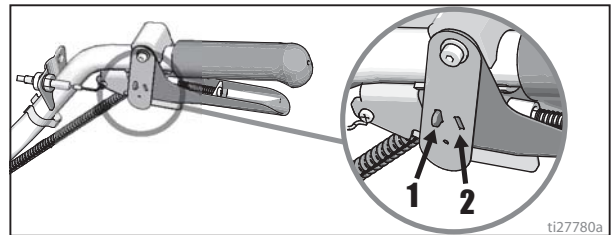


Another option can be to swing the gun out at an angle and rotate the tip guard. This results in better visibility for the user.



## Select Guns

3. Connect gun cables to left or right gun selector plates.



- a. One gun: Disconnect one gun selector plate from trigger.



- b. Both guns simultaneously: Adjust both gun selector plates to the same position.

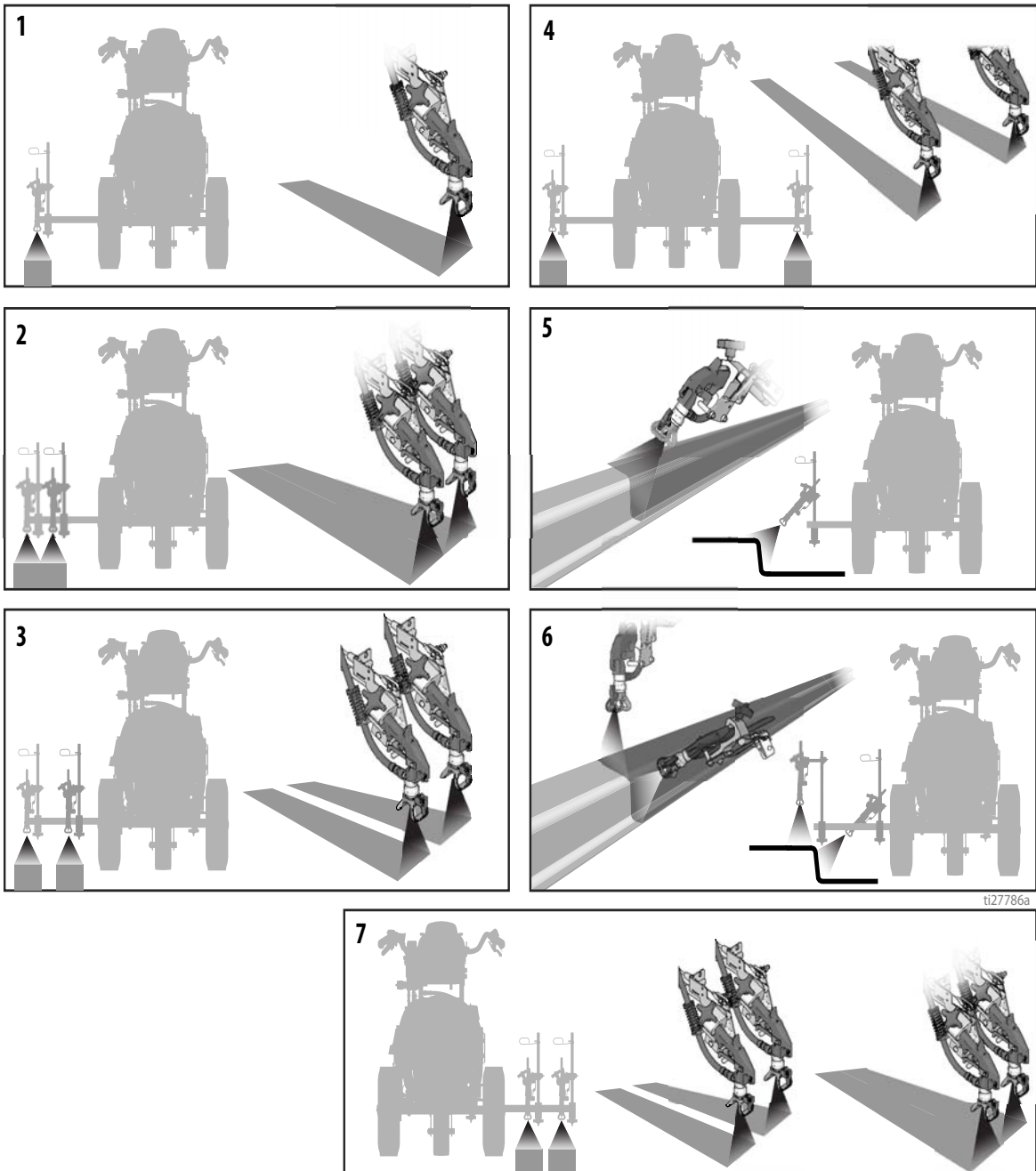


- c. Solid-skip and skip-solid: Adjust solid-line gun to position 1 and skip-line to position 2.





# Gun Positions Chart

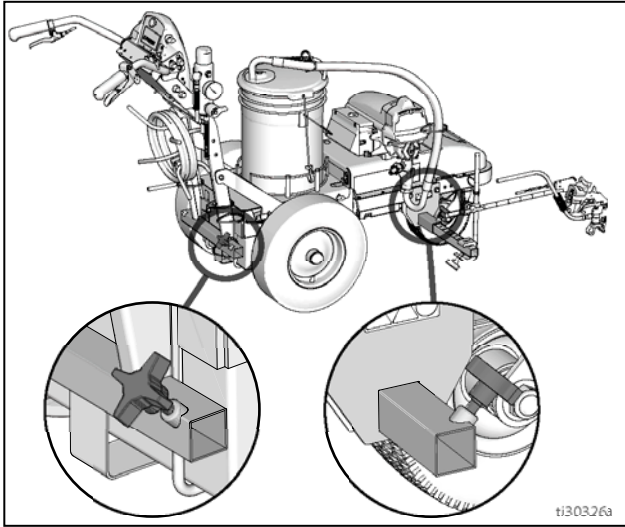


ti27786a

1	One line
2	One line up to 24 in. (61cm) wide
3	Two lines
4	One line or two lines to spray around obstacles
5	One gun curb
6	Two gun curb
7	Two lines or one line up to 24 in. (61 cm) wide

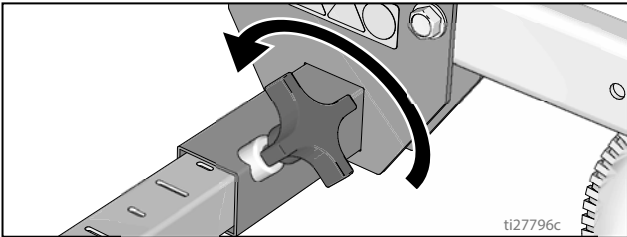
## Gun Arm Mounts

This unit is equipped with front and rear gun arm mounts.

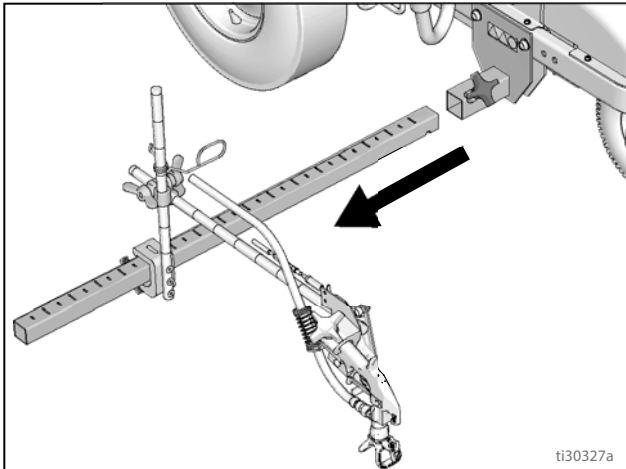


## Change Gun Position (Front and Back)

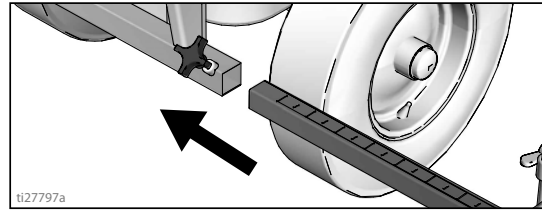
1. Loosen gun arm knob and remove from gun arm mounting slot.



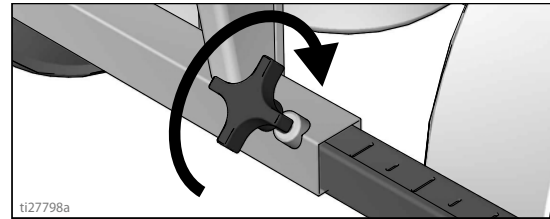
2. Slide gun arm assembly (including gun and hoses) out from gun arm mounting slot.



3. Slide gun arm assembly into desired gun arm mounting slot.



4. Tighten gun arm knob into gun arm mounting slot.



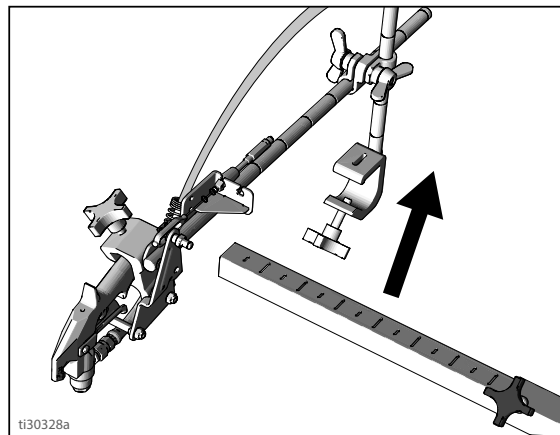
### NOTICE

Make sure all hoses, cables, and wires are properly routed through brackets and do NOT rub on tire. Contact with tire will result in damaged hoses, cables, and wires.

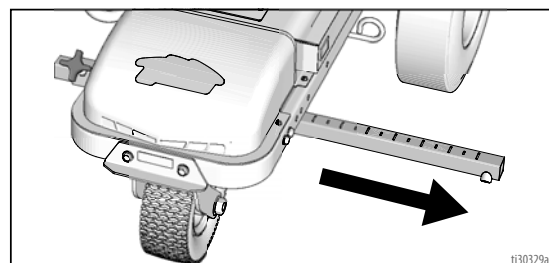
## Change Gun Position (Left and Right)

### Removal

1. Loosen vertical gun arm knob on gun arm mounting bar and remove.

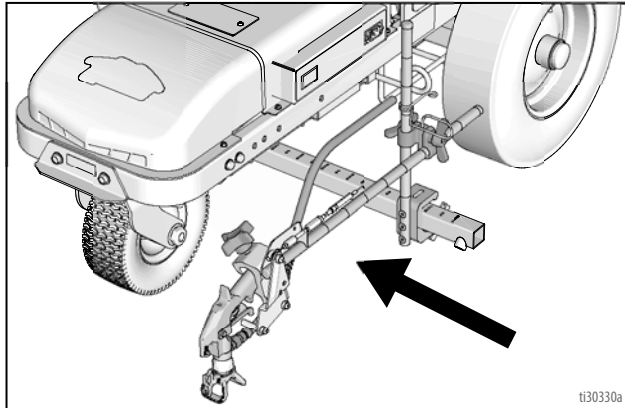


2. Extend mounting bar on opposite side of the machine.



## Installation

1. Install vertical gun mount onto gun bar.

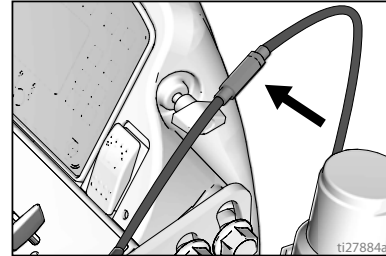


**NOTE:** Make sure all hoses, cables, and wires are properly routed through brackets.

## Gun Cable Adjustment

Adjusting the gun cable will increase or decrease the gap between the trigger plate and the gun trigger. To adjust trigger gap, perform the steps below.

1. Use wrench to loosen locking nut on cable adjuster.

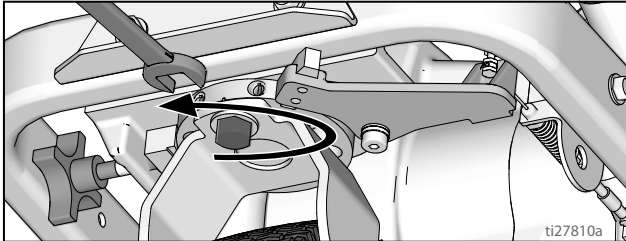


2. Loosen or tighten adjuster until desired result is achieved. **NOTE:** More thread exposed means less gap between gun trigger and trigger plate.
3. Use wrench to tighten locking nut on the adjuster.

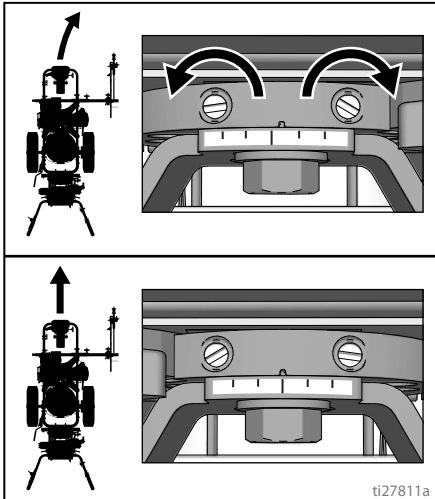
## Straight Line Adjustment

The front wheel is set to center the unit and allow the operator to form straight lines. Over time, the wheel may become misaligned and will need to be readjusted. To re-center the front wheel, perform the following steps:

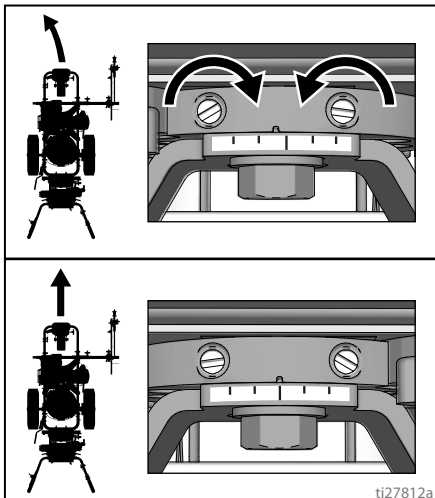
1. Loosen bolt on the front wheel bracket.



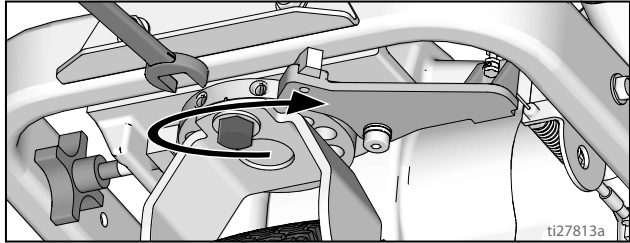
2. If striper arcs to the right, loosen left set screw and tighten right set screw for fine tune adjustment.



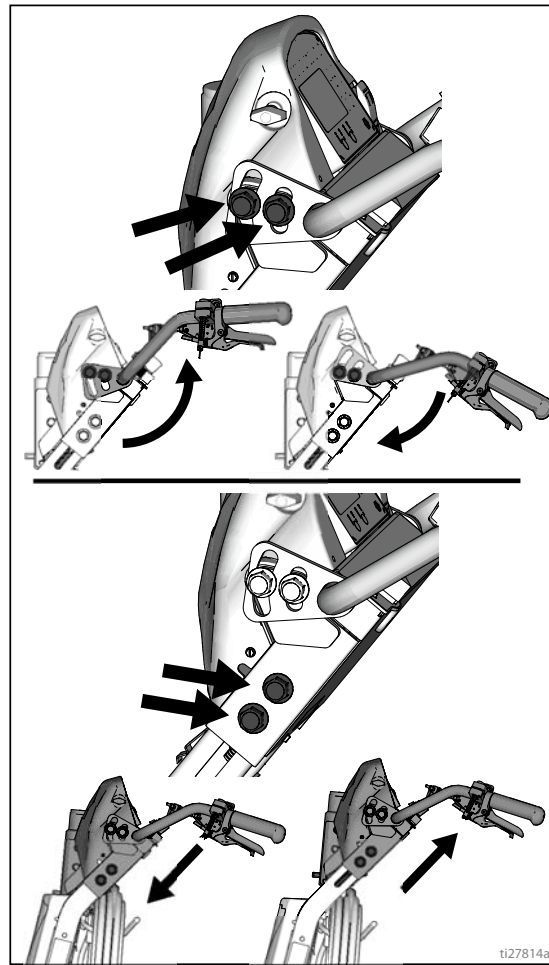
3. If striper arcs to the left, loosen right set screw and tighten left set screw.



4. Roll the striper. Repeat steps 2 and 3 until striper rolls straight. Tighten bolt on wheel alignment plate to lock the new wheel setting.

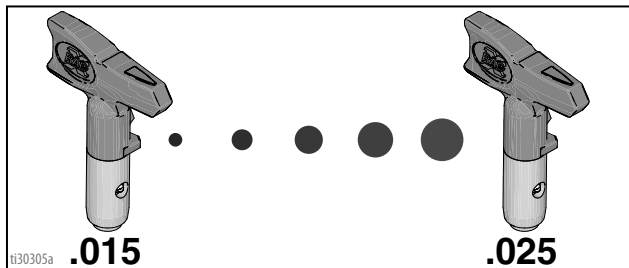
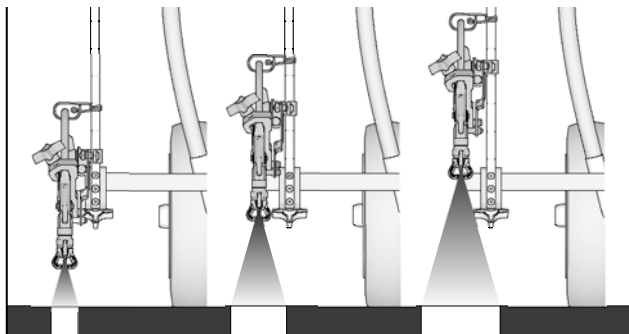


## Handle Bar Adjustment

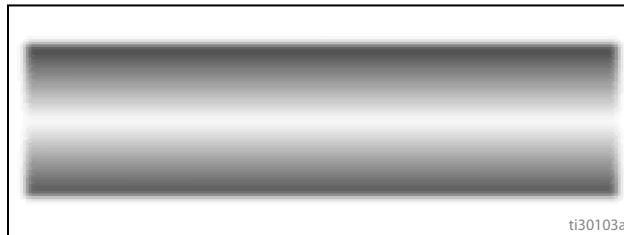


# Paint Stripe Width

1. Adjust gun up or down to change paint stripe width.



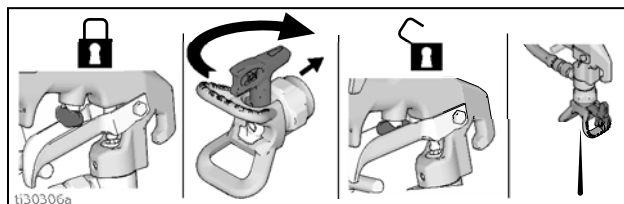
2. Trigger gun and spray test pattern. Slowly adjust pressure to eliminate heavy edges. Use smaller tip size if pressure adjustment can not eliminate heavy edges.



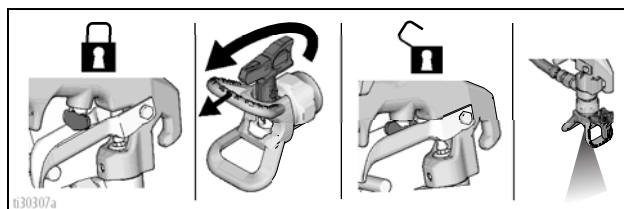
## Clearing Tip Clogs



1. Release trigger. Engage gun trigger lock. Rotate Uni-Tip. Disengage gun trigger lock and trigger gun to clear the clog.

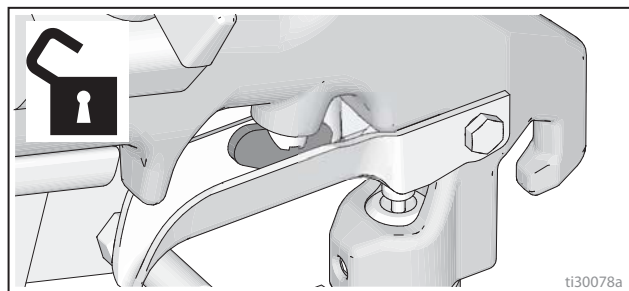


2. Engage gun trigger lock, return Uni-Tip to original position, disengage gun trigger lock and continue spraying.



## Spray Test Stripe

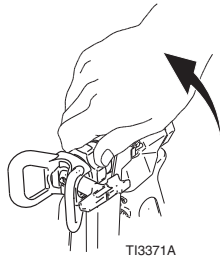
1. Disengage trigger lock.



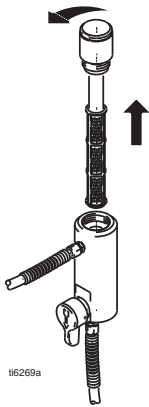
# Cleanup



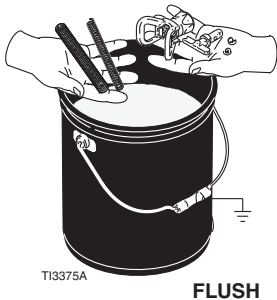
1. Perform **Pressure Relief Procedure**, page 13.
2. Remove guard and SwitchTip from all guns.



3. Unscrew cap, remove filter. Assemble without filter.



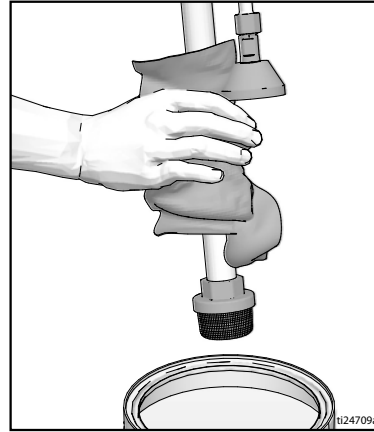
4. Clean filter, guard and SwitchTip in flushing fluid.



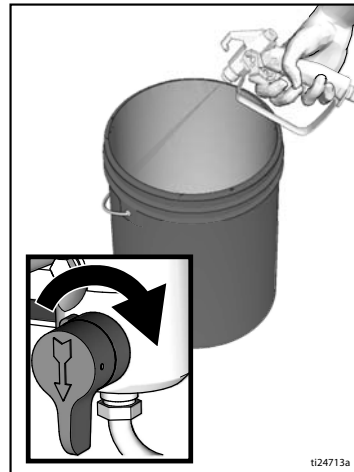
5. Attach ground wire to true earth ground or plug unit into grounded outlet.

## Fast Flush Drain Tube

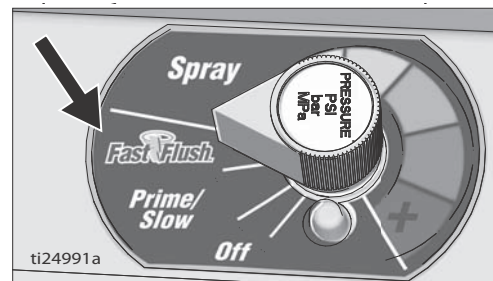
6. Remove fluid intake and drain tube from paint, wipe excess paint off outside.



7. Place siphon tube set in grounded metal pail partially filled with flushing fluid. Use water for water base paint and mineral spirits for oil-based paint.
8. To flush drain tube and pump turn prime valve down.

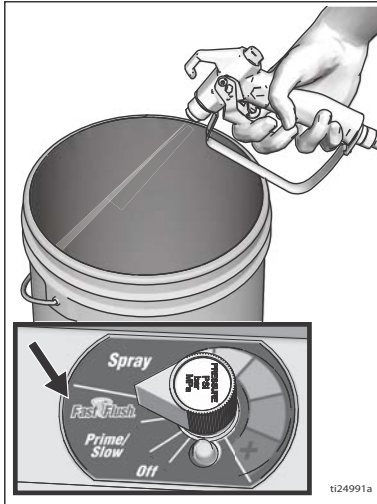


9. Turn pressure control to Fast Flush operate until the pump runs steady and flushing fluid appears in the waste pail.



## Fast Flush Hose and Gun

10. To flush airless hose and spray gun, turn prime valve horizontal.
11. Hold gun against waste pail. Disengage trigger lock. Trigger gun and turn pressure control to Fast Flush operate until the pump runs steady and flushing fluid appears.
12. Stop triggering gun.
13. Fill pump with Pump Armor and reassemble filter, guard and SwitchTip.
14. Each time you spray and store, fill throat packing nut with TSL to decrease packing wear.



# Maintenance

Routine maintenance is important to ensure proper operation of your sprayer. Maintenance includes performing routine actions which keep your sprayer in operation and prevents trouble in the future.



Activity	Interval
Inspect/clean sprayer filter, fluid inlet strainer, and gun filter.	Daily or each time you spray
Inspect motor shield vents for blockage.	Daily or each time you spray
Fill TSL by adding through TSL fill point.	Daily or each time you spray
<p>Check sprayer stall.</p> <p>With sprayer gun NOT triggered, sprayer motor should stall and not restart until gun is triggered again.</p> <p>If sprayer starts again with gun NOT triggered, inspect pump for internal/external leaks and check prime valve for leaks.</p>	Every 1000 gallons (3785 liters)
<p>Throat packing adjustment</p> <p>When pump packing begins to leak after extended use, tighten packing nut down until leakage stops or lessens. This allows approximately 100 gallons of additional operation before a repacking is required. Packing nut can be tightened without O-ring removal.</p>	As necessary based on usage



# Troubleshooting

## Mechanical/Fluid Flow



1. Follow **Pressure Relief Procedure**, page 13, before checking or repairing.
2. Check all possible problems and causes before disassembling the unit.

Problem	What to Check If check is OK, go to next check	What to Do When check is not OK, refer to this column
Control board status light is blinking or the light is off and there is power to the sprayer.	Fault condition exists.	Determine fault correction from page 27. Follow <b>Pressure Relief Procedure</b> , page 13.
Pump output is low	Spray tip worn.	Follow <b>Pressure Relief Procedure</b> , page 13, then replace tip. See separate gun or tip manual.
	Spray tip clogged.	Follow <b>Pressure Relief Procedure</b> , page 13. Check and clean spray tip.
	Paint supply.	Refill and reprime pump.
	Intake strainer clogged.	Remove and clean, then reinstall.
	Intake valve ball and piston ball are not seating properly.	Remove intake valve and clean. Check balls and seats for nicks; replace if necessary. See pump manual. Strain paint before using to remove particles that could clog pump.
	Fluid filter or tip filter is clogged or dirty.	Clean filter.
	Prime valve leaking.	Follow <b>Pressure Relief Procedure</b> , page 13, then repair prime valve.
	Verify pump does not continue to stroke when gun trigger is released. (Prime valve not leaking.)	Service pump. See pump manual.
	Leaking around throat packing nut which may indicate worn or damaged packings.	Replace packings. See pump manual. Also check piston valve seat for hardened paint or nicks and replace if necessary. Tighten packing nut/wet-cup.
	Pump rod damage.	Repair pump. See pump manual.
	Low stall pressure.	Turn pressure knob fully clockwise. Make sure pressure control knob is properly installed to allow full clockwise position. If problem persists, replace pressure transducer.
	Piston packings are worn or damaged.	Replace packings. See pump manual.
	O-ring in pump is worn or damaged.	Replace o-ring. See pump manual.
Intake valve ball is packed with material.	Clean intake valve. See pump manual.	
Large pressure drop in hose with heavy materials.	Reduce overall length of hose.	
Check extension cord for correct size.	See <b>Extension Cords</b> , page 11.	

Troubleshooting

<b>Problem</b>	<b>What to Check If check is OK, go to next check</b>	<b>What to Do When check is not OK, refer to this column</b>
Motor runs but pump does not stroke	Connecting rod assembly damaged.	Replace connecting rod assembly. See pump manual.
	Gears or drive housing damaged.	Inspect drive housing assembly and gears for damage and replace if necessary.
Excessive paint leakage into throat packing nut	Throat packing nut is loose.	Remove throat packing nut spacer. Tighten throat packing nut just enough to stop leakage.
	Throat packings are worn or damaged.	Replace packings. See pump manual.
	Displacement rod is worn or damaged.	Replace rod. See pump manual.
Fluid is spitting from gun	Air in pump or hose.	Check and tighten all fluid connections. Cycle pump as slowly as possible during priming.
	Spray tip is partially clogged.	Clear tip.
	Fluid supply is low or empty.	Refill fluid supply. Prime pump. See pump manual. Check fluid supply often to prevent running pump dry.
Pump is difficult to prime	Air in pump or hose.	Check and tighten all fluid connections. Cycle pump as slowly as possible during priming.
	Intake valve is leaking.	Clean intake valve. Be sure ball seat is not nicked or worn and that ball seats well. Reassemble valve.
	Pump packings are worn.	Replace pump packings. See pump manual.
	Paint is too thick.	Thin the paint according to supplier recommendations.
Sprayer operates for 5 to 10 minutes then stops	Pump packing nut too tight. When pump packing nut is too tight the packings on the pump rod restrict pump action and overloads the motor.	Loosen pump packing nut. Check for leaks around throat. If necessary, replace pump packings. See Pump manual.

## Electrical

Symptom: Sprayer does not run, stops running, or will not shut off.



Keep clear of electrical and moving parts during troubleshooting procedures. To avoid electrical shock hazards when covers are removed for troubleshooting, wait 7 seconds after disconnecting power cord for stored electricity to dissipate.				

Perform **Pressure Relief Procedure**, page 13.

1. Turn the ON/OFF switch **OFF** wait 30 seconds and then turn power back **ON** again (this ensures sprayer is in normal run mode).
2. Turn pressure control knob clockwise 1/2 turn.


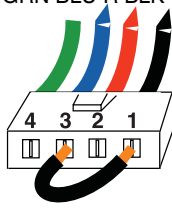
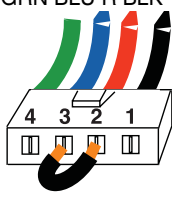
3. Remove control box cover to view control board status light. To determine which code (or any other code besides voltage supply) refer to the control board status light. Turn the ON/OFF switch **OFF**, remove the control cover then turn power back **ON**. Observe the status light. Blinking LED total count equals the error code (for example: two blinks equals CODE 02).

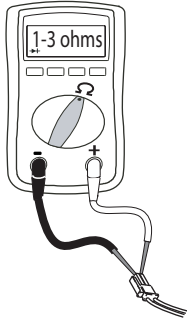
## Error Code Messages

CODE	MESSAGE	ACTION
02	HIGH PRESSURE DETECTED - RELIEVE PRESSURE	Check for clogs. Use only Graco spray hoses, use a minimum of 50ft/15m.
03	PRESSURE TRANSDUCER NOT DETECTED	Check transducer connection.
05	MOTOR NOT SPINNING	Check for mechanical failure and check motor connections. Material may be too thick, thin material.
06	MOTOR OVERHEATED	Turn sprayer OFF. Check motor connections. Check shroud vents for blockage. Sprayer may take up to an hour to cool.

Problem	What to Check	How to check
Sprayer does not run at all AND Control board status light never lights	See flow chart, page 32.	
Sprayer does not shut off AND Control board status light blinks 2 times repeatedly	Control board.	Replace control board.

Problem	What to Check	How to check
<p>Sprayer does not run at all  AND  Control board status light blinks 2 times repeatedly</p>	<p>Check transducer or transducer connections</p>	<p>Make sure there is no pressure in the system (see <b>Pressure Relief Procedure</b>, page 13). Check fluid path for clogs, such as clogged filter.</p> <p>Use airless paint spray hose with no metal braid. A small hose or metal braid hose may result in high-pressure spikes.</p> <p>Turn ON/OFF switch <b>OFF</b> and disconnect power to sprayer by unplugging power cord and disconnecting battery.</p> <p>Check transducer and connections to control board.</p> <p>Disconnect transducer from control board socket. Check that transducer and control board contacts are clean and secure.</p> <p>Reconnect transducer to control board socket. Connect power, turn ON/OFF switch <b>ON</b> and control knob 1/2 turn clockwise. If sprayer does not run properly, turn ON/OFF switch <b>OFF</b> and go to next step.</p> <p>Install new transducer. Connect power, turn ON/OFF switch <b>ON</b> and control knob 1/2 turn clockwise. Replace control board if sprayer does not run properly.</p>
<p>Sprayer does not run at all  AND  Control board status light blinks 3 times repeatedly</p>	<p>Check transducer or transducer connections (control board is not detecting a pressure signal).</p>	<p>Turn ON/OFF switch <b>OFF</b> and disconnect power to sprayer by unplugging power cord and disconnecting battery.</p> <p>Check transducer and connections to control board.</p> <p>Disconnect transducer from control board socket. Check to see if transducer and control board contacts are clean and secure.</p> <p>Reconnect transducer to control board socket. Connect power, turn ON/OFF switch <b>ON</b> and control knob to 1/2 turn clockwise. If sprayer does not run, turn ON/OFF switch <b>OFF</b> and go to next step.</p> <p>Connect a confirmed working transducer to control board socket.</p> <p>Turn ON/OFF switch <b>ON</b> and control knob to 1/2 turn clockwise. If sprayer runs, install new transducer. Replace control board if sprayer does not run.</p> <p>Check transducer resistance with an ohmmeter (less than 9k ohm between red and black wires and 3-6k ohm between green and yellow wires).</p>

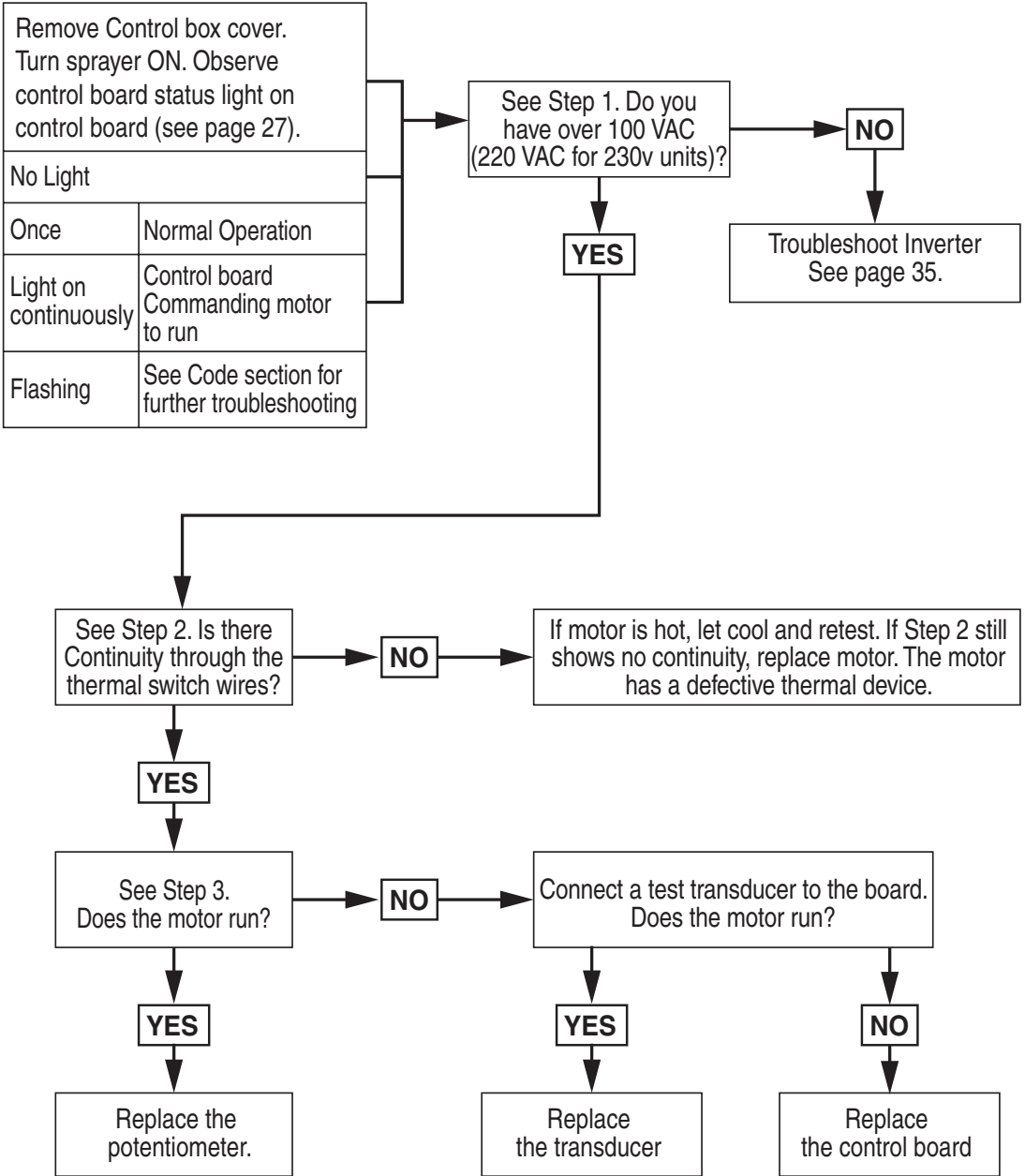
Problem	What to Check	How to check
<p>Sprayer does not run at all                      AND                      Control board status light blinks 5 times repeatedly</p>	<p>Control is commanding motor to run but motor shaft does not rotate. Possibly locked rotor condition, an open connection exists between motor and control, there is a problem with motor or control board, or motor amp draw is excessive.</p>	<ol style="list-style-type: none"> <li>1. Remove pump and try to run sprayer. If motor runs, check for locked or frozen pump or drive train. If sprayer does not run, continue to step 2.</li> <li>2. Turn ON/OFF switch <b>OFF</b> and disconnect power to sprayer by unplugging power cord and disconnecting battery.</li> <li>3. Disconnect motor connector(s) from control board socket(s). Check that motor connector and control board contacts are clean and secure. If contacts are clean and secure, continue to step 4.</li> <li>4. Set sprayer to OFF and spin motor fan 1/2 turn. Restart sprayer. If sprayer runs replace control board. If sprayer does not run, continue to step 5.</li> <li>5. Perform Spin Test: Test at large 4-pin motor field connector. Disconnect fluid pump from sprayer. Test motor by placing a jumper across pins 1 &amp; 2. Rotate motor fan at about 2 revolutions per second. A cogging resistance to motion should be felt at the fan. The motor should be replaced if no resistance is felt. Repeat for pin combinations 1 &amp; 3 and 2 &amp; 3. Pin 4 (the green wire) is not used in this test. If all spin test is positive, continue to step 6.</li> </ol> <div style="text-align: center;"> <p><b>STEP 1:</b></p>  <p><b>STEP 2:</b></p>  <p><b>STEP 3:</b></p>  </div>

Problem	What to Check	How to check
		<p>6. Perform Field Short Test: Test at large 4-pin motor field connector. There should not be continuity from pin 4, the ground wire, and any of the remaining 3 pins. If motor field connector tests fail, replace motor.</p> <p>7. Check Motor Thermal Switch: Unplug thermal wires. Set meter to ohms. Meter should read 100k ohms.</p>  <p>8. Reconnect motor connector(s) to control board socket(s). Connect power, turn ON/OFF switch <b>ON</b> and control knob to 1/2 turn clockwise. If motor does not run, replace control board.</p>
<p>Sprayer does not run at all  <b>AND</b>                      Control board status light blinks 6 times repeatedly</p>	<p>Motor is hot or there is a fault in the motor thermal device.</p>	<p>Allow sprayer to cool. If sprayer runs when cool, correct cause of overheating. Keep sprayer in cooler location with good ventilation. Make sure motor air intake is not blocked. If sprayer still does not run, replace motor.</p> <p><b>NOTE:</b> Motor must be cooled down for the test.</p> <ol style="list-style-type: none"> <li>1. Check thermal device connector (yellow wires) at control board.</li> <li>2. Disconnect thermal device connector from control board socket. Make sure contacts are clean and secure. Measure resistance of the thermal device. If reading is not correct, replace motor.</li> </ol> <p><b>Check Motor Thermal Switch:</b> Unplug thermal wires. Set meter to ohms. Meter should read 100k ohms.</p> <ol style="list-style-type: none"> <li>3. Reconnect thermal device connector to control board socket. Connect power, turn sprayer ON and control knob 1/2 turn clockwise. If sprayer does not run, replace control board.</li> </ol>
<p>Basic electrical problems</p>	<p>Motor leads are securely fastened and properly mated</p>	<p>Replace loose terminals; crimp to leads. Be sure terminal are firmly connected.</p> <p>Clean circuit board terminals. Securely reconnect leads.</p>
	<p>Motor armature commutator for burn spots, gouges or extreme roughness.</p>	<p>Remove motor and have motor shop resurface commutator if possible.</p>
<p>Inverter will not turn on during initial power up.</p>	<p>Batteries are not connected, loose battery-side connections</p>	<p>Check the batteries and cable connections. Check DC fuse and breaker.</p>
	<p>Low battery voltage below 10V</p>	<p>Charge the battery with external charger (not charger on board the unit).</p>

Problem	What to Check	How to check
No AC output voltage and indicator lights ON.	Output circuit breaker tripped	Check circuit breaker and reset if necessary, page 35.
AC output voltage is low and the inverter turns loads OFF in a short time.	Low battery	Check the condition of the batteries and recharge if possible.
Charger is inoperative and unit will not accept AC.	AC voltage has dropped out-of-tolerance	Check the AC voltage for proper voltage and frequency.
Charger is supplying a lower charger rate.	Charger controls are improperly set.	Refer to the section on adjusting the "Charger Rate"
	Low AC input voltage.	Source qualified AC power.
	Loose battery or AC input connections.	Check all DC / AC connections.

# Sprayer Will Not Run

(See following page for steps)

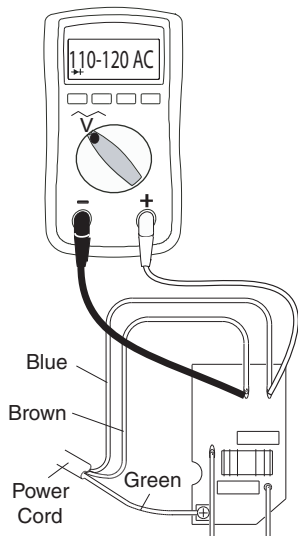


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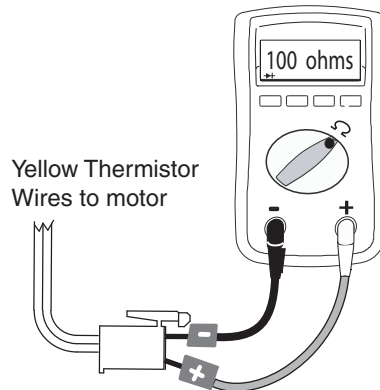
**Step 1:**

Plug Power cord in and turn switch ON. Connect probes to control board. Turn meter to AC Volts.



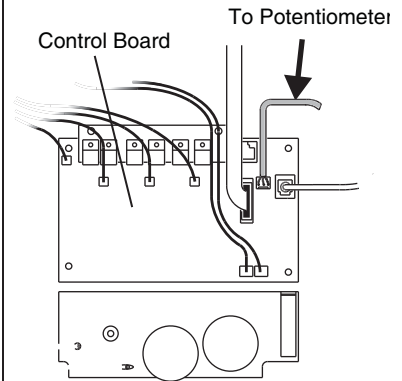
**Step 2:**

Check motor thermal switch. Unplug yellow wires. Meter should read 100 ohms. NOTE: Motor should be cool during reading.



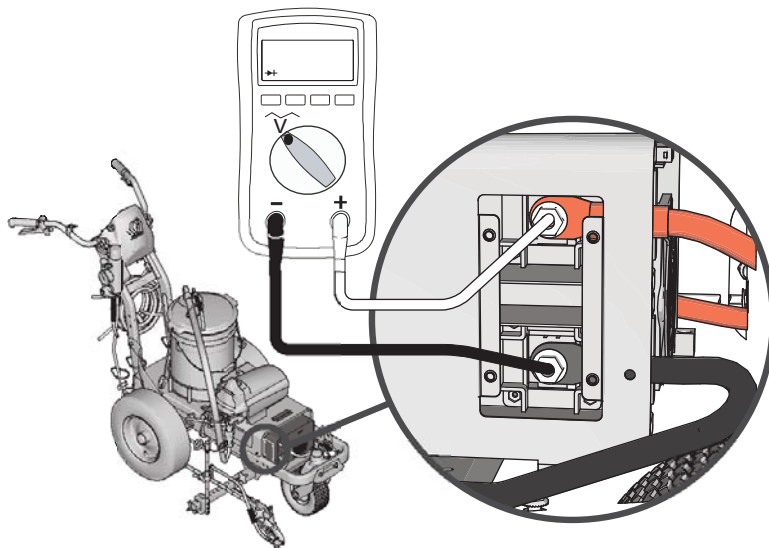
**Step 3:**

Disconnect potentiometer. Plug power cord in and turn switch ON.



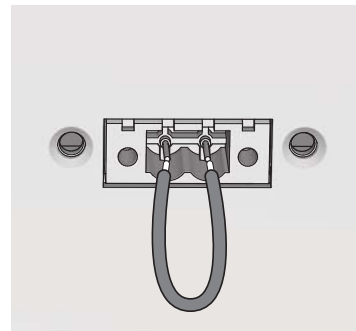
**Step 4:**

Connect probes to positive and negative posts on inverter.



**Step 5:**

Connect jumper across pins 1 and 2

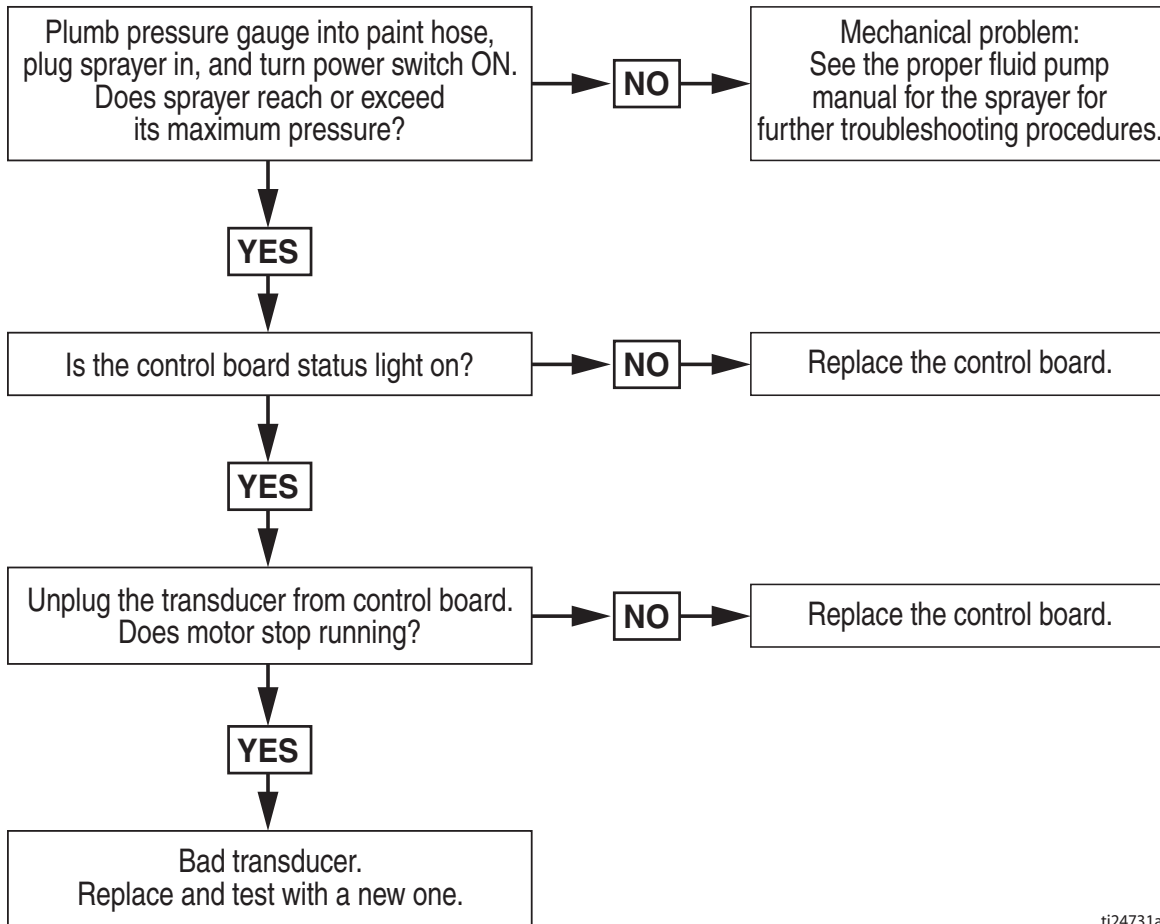


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## Sprayer Will Not Shut Off

1. Perform **Pressure Relief Procedure**, page 13. Leave prime valve open (down) and turn ON/OFF switch **OFF**.
2. Remove control box cover so the control board status light can be viewed if available.

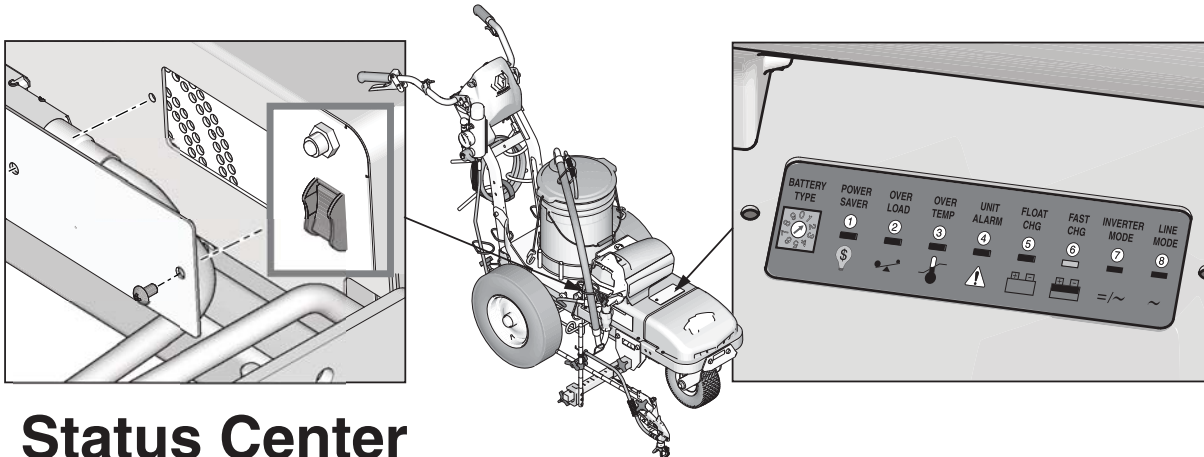
### Troubleshooting Procedure



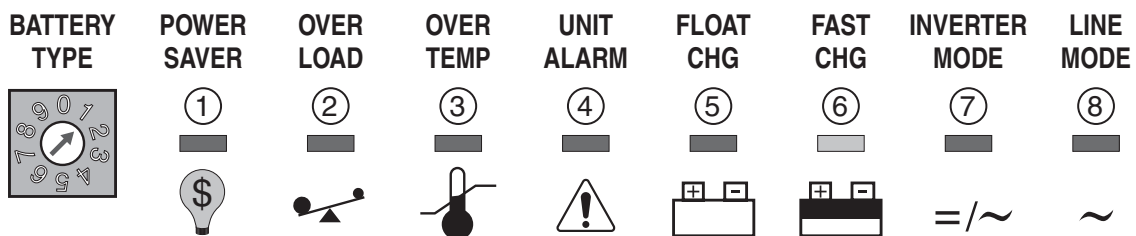
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# Inverter

The inverter has 2 circuit breakers, and an LED Status Center that communicates inverter operation status. See chart below for different functions, alarms, and fault modes.



## Status Center



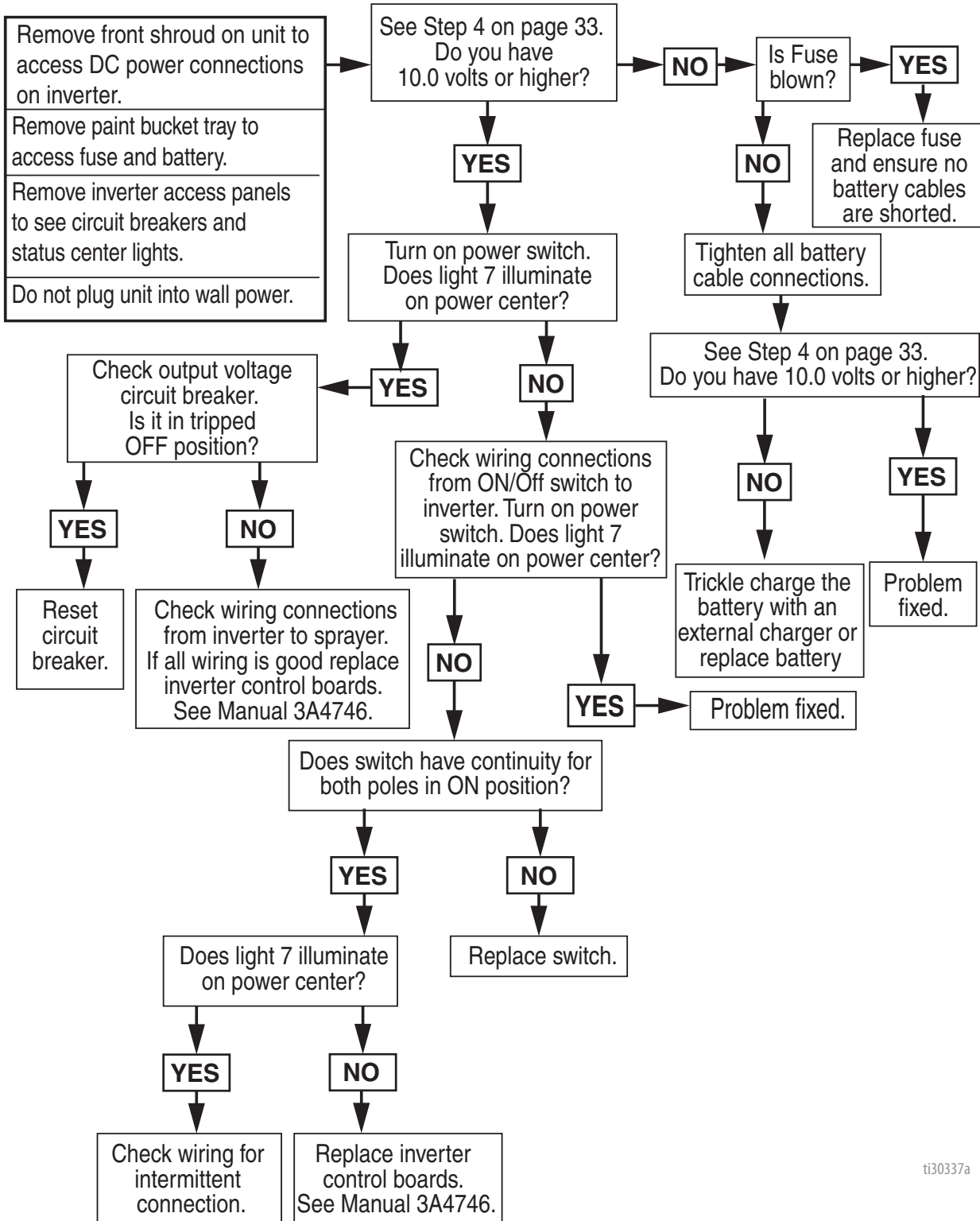
## Indication & Fault finding chart

Status	L.E.D.s Function	Alarm								
		①	②	③	④	⑤	⑥	⑦	⑧	
Charge function	Constant current charge						on Flash		on	
	Constant voltage charge								on	
	Float					on			on	
	Standby								on	
Inverter mode	Inverter on							on		
Alarms	Battery low voltage				on			on	beep 0.5s every 5 s	
	Battery high voltage				on			on	beep 0.5s every 5 s	
	Over load (inverter mode)		on		on			on	beep 0.5s every 5 s	
	Over temp (inverter mode)			on	on			on	beep 0.5s every 5 s	
	Over temp (line mode)			on	on	on			on	beep 0.5s every 5 s
	Over charge				on	on			on	beep 0.5s every 5 s
Fault mode	Fan lock								beep continuous	
	Battery high voltage							on	beep continuous	
	Inverter mode overload		on						beep continuous	
	Over temperature			on					beep continuous	

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# Sprayer does not have 100 VAC (220 VAC for 230V units)

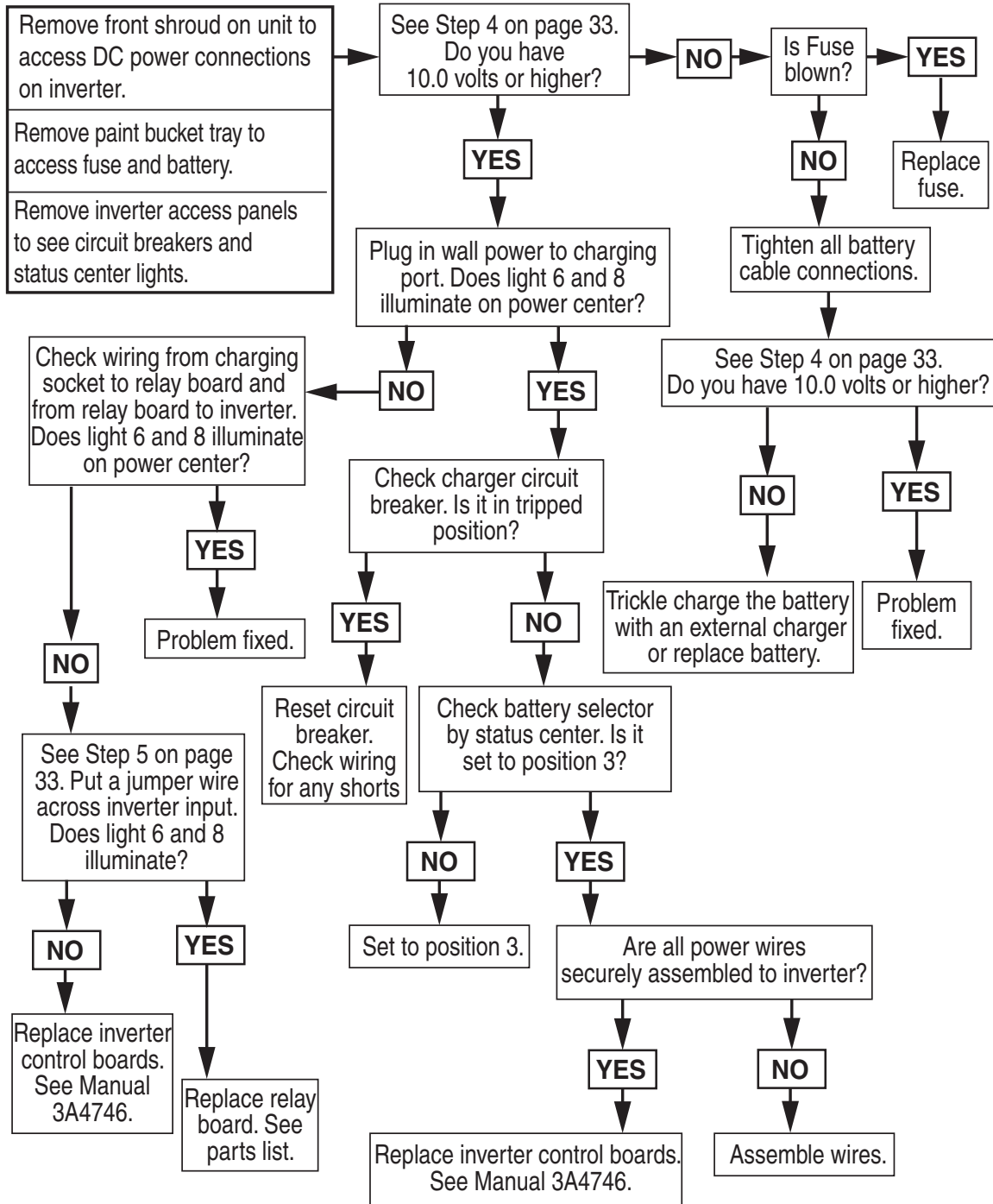
## Troubleshooting Procedure:



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# Battery Will Not Charge

## Troubleshooting Procedure:



ti30338a

# Parts Drawing - LineLazer ES 1000

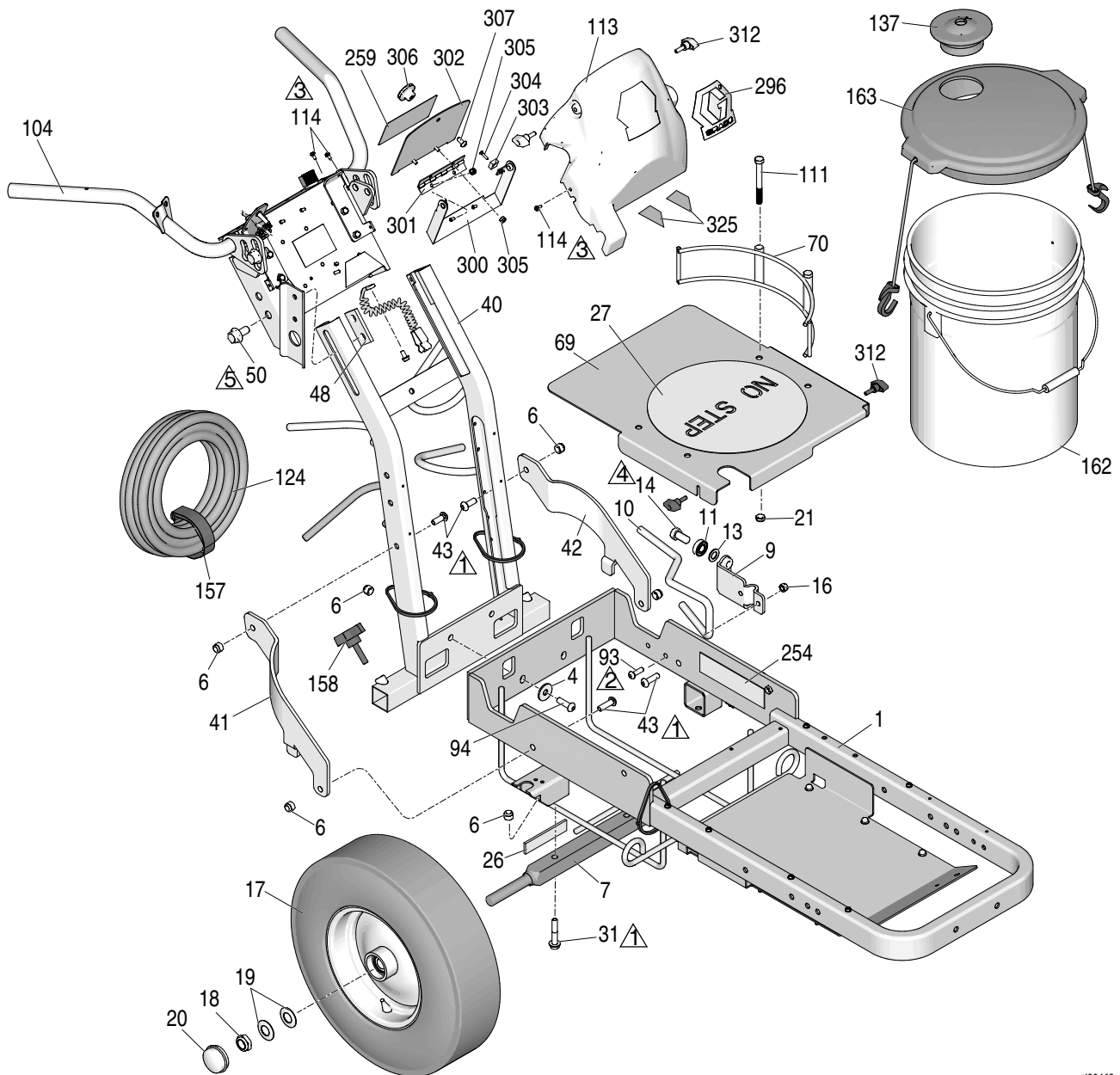
⚠ Torque to 17-23 ft-lbs  
(23.0-31.1 N·m)

⚠ Torque to 190-210 in-lbs  
(21.4-23.7 N·m)

⚠ Torque to 18-22 in-lbs  
(2.0-2.4 N·m)

⚠ Torque to 23-27 ft-lbs  
(31.1-36.6 N·m)

⚠ Torque to 45-55 ft-lbs  
(61.0-74.5 N·m)



ti30462a

# Parts List

Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
1	17N763	FRAME, linestriper	1	94	129601	SCREW, cap, btn hd, 3/8 x 1.25	4
4	108851	WASHER, plain	4	104	17N451	CONTROL, assembly, LL ES	1
6	101566	NUT, lock	12	111	867517	SCREW, hex head, 3/8-16 x 3.5"	4
7	193405	AXLE	1	113	17J135	COVER, control	1
9	198891	BRACKET	1	137	278723	GASKET, pail	1
10	198930	ROD, brake	1	124	249080	HOSE, cpld, 1/4" x 50'	1
11	198931	BEARING	1	157	114271	STRAP, retaining	1
13	195134	SPACER, ball, guide	1	158	108471	KNOB, pronged	1
14	113961	SCREW, cap, hex hd	1	162	115077	PAIL, plastic	1
16	111040	NUT, lock, insert, nylock, 5/16	4	163	24U241	KIT, pail cover	1
17	111020	WHEEL, pneumatic	2	254▲	17K396	LABEL, safety	1
18	112405	NUT, lock	3	259	17N740	LABEL, tool box	1
19	112825	WASHER, belleville	6	296	17K379	LABEL, console	1
20	114648	CAP, dust	2	300	17K235	BRACKET, access door	1
21	125205	NUT, lock, nylon, 3/8-16	5	301	17K236	HINGE, access door	1
26	17P800	BUMPER	2	302	17K291	DOOR, access, painted	1
27	17P831	PAD, non-slip, no step	1	303	17K309	MAGNET, square	2
31	114982	SCREW, cap, flng hd	6	304	107070	SCREW, mach, flh	2
40	24Y665	FRAME, handle upright	1	305	109466	NUT, lock, hex	4
41	15F576	BRACE, right	1	306	17K320	KNOB, ribbed	1
42	15F577	BRACE, left	1	307	112925	SCREW, cap	1
43	128977	SCREW, cap, btn hd, 3/8 x 1	2	312	16W408	KNOB, t-handle, 1/4-20 thd stud	4
48	17J125	BRACKET, slide	2	325	17K584	LABEL, wire cutout	2
50	17J136	SCREW, hex, flange head	4				
69	17P305	PLATE, bucket holder	1				
70	17N536	HOLDER, bucket	2				
93	125112	SCREW, cap, btn hd, 5/16 x 1	2				

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

# Parts Drawing - LineLazer ES 1000

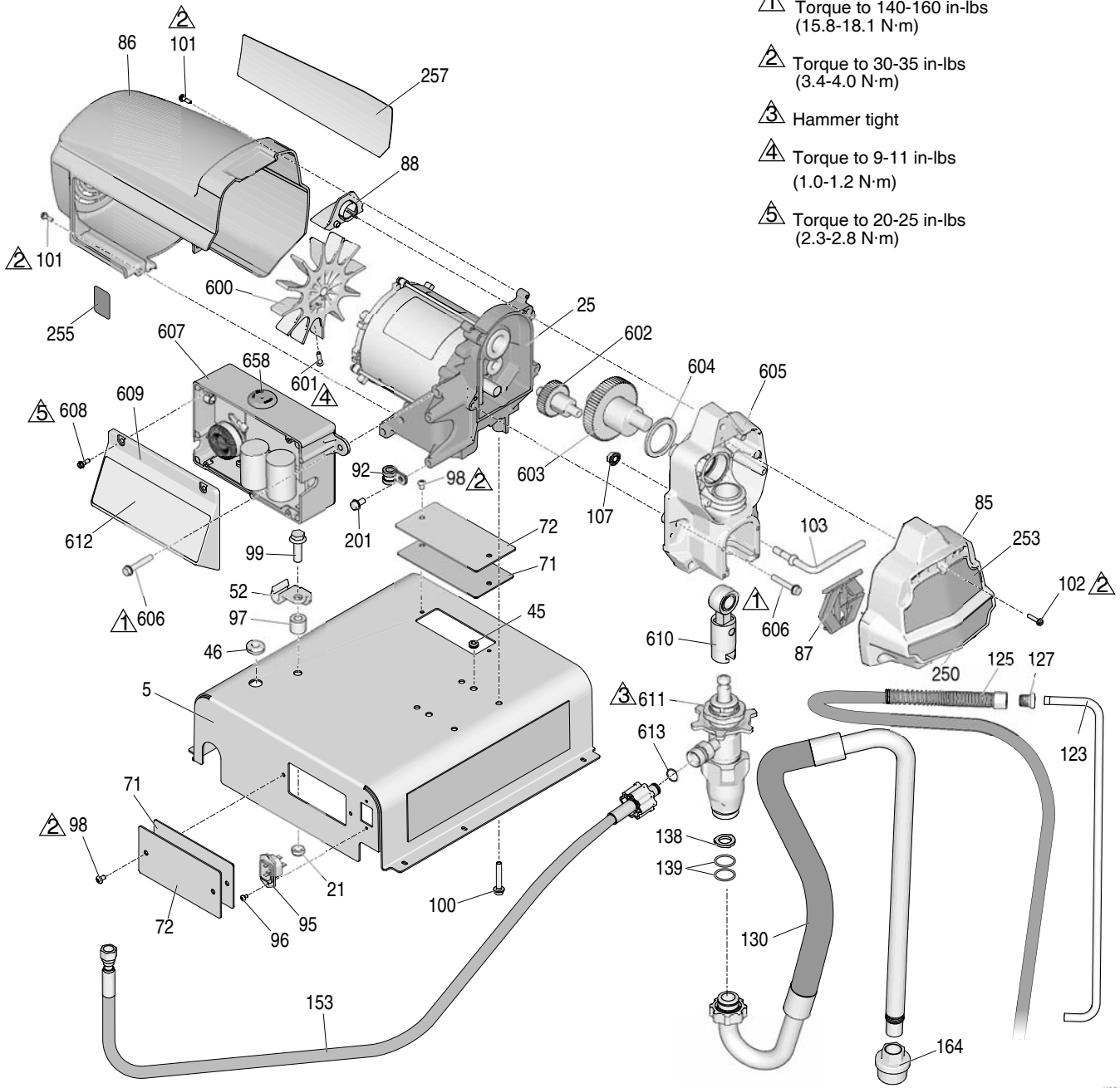
Torque to 140-160 in-lbs  
(15.8-18.1 N·m)

Torque to 30-35 in-lbs  
(3.4-4.0 N·m)

Hammer tight

Torque to 9-11 in-lbs  
(1.0-1.2 N·m)

Torque to 20-25 in-lbs  
(2.3-2.8 N·m)



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


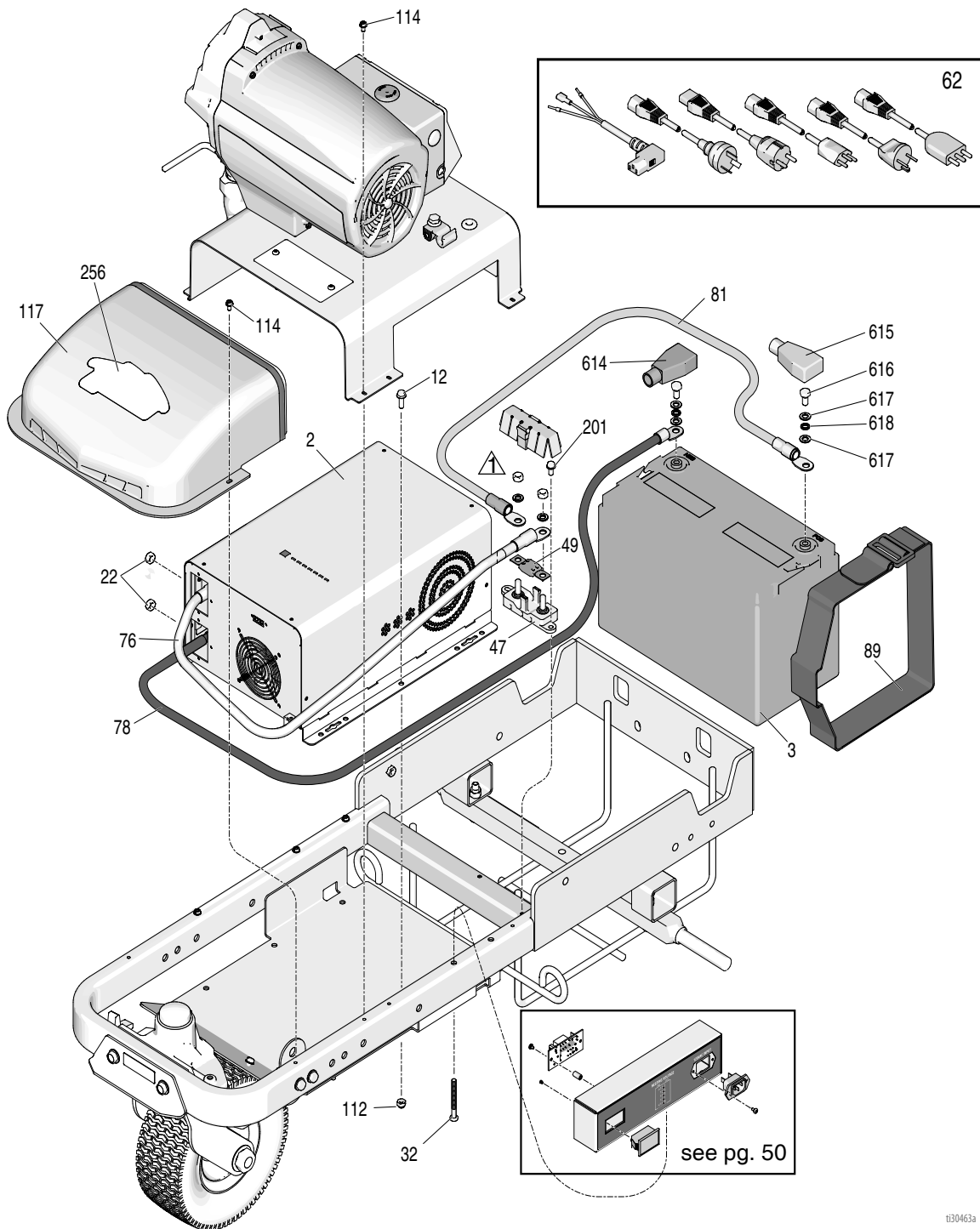
# Parts List

Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
5	17P496	COVER, inverter	1	137	278723	GASKET, pail	1
21	125205	NUT, lock, nylon, 3/8-16	1	138	115099	WASHER, garden	1
25	24R702	MOTOR, electric	1	139	117559	O-RING	2
45	129604	GROMMET, rubber	2	153	17N217	HOSE, coupled	1
46	17N444	GROMMET	1	164	187651	STRAINER, 3/4-16 unf	1
52	278204	CLIP, drain line	1	201	107254	SCREW, thd forming	5
71	17P506	GASKET, access port	2	250	17N730	LABEL, front, bottom	1
72	17P497	COVER, access port	2	253	17N729	LABEL, front, brand	1
85	17C541	COVER, front	1	255▲	195793	LABEL, warning	1
86	15G449	SHIELD, motor	1	257	17N731	LABEL, side	1
87	17C483	COVER, PC pro pump rod	1	600	15D088	FAN, motor	1
88	15G447	PLUG, shield	1	601	115477	SCREW, mach	1
91	17N989	WIRE, jumper, 18 awg, white	1	602	249194	GEAR, reducer	1
92	125220	CLAMP, cushion, support	1	603	24X020	GEAR, crankshaft	1
95	114064	PLUG, inlet	1	604	180131	BEARING, thrust	1
96	15W998	SCREW, mach	2	605	24W817	HOUSING, drive	1
97	129627	SPACER, nylon	1	606	117493	SCREW, mach	7
98	108795	SCREW, mach	4	607a	25M490	BOX, control, 120V	1
99	111193	SCREW, cap	1	607b	25M491	BOX, control, 230V	1
100	117493	SCREW, mach, hex washer hd	4	608	117501	SCREW, mach	4
101	117501	SCREW, mach, slot hex wash hd	4	609	277229	COVER, control	1
102	127914	SCREW, mach, slot hex wash hd	3	610	24W640	ROD, connecting	1
103	17P888	GUIDE, hose	1	611	24Z731	PUMP, displacement	1
107	110996	NUT, hex, flange head	1	612	17C964	LABEL, smart control	1
123	16X071	TUBE, drain line	1	613	16H137	O-RING	1
125	248008	HOSE, cpld, 1/4" x 44"	1				
126	15F624	NUT, cable, gun	2				
127	196180	BUSHING	1				
130	17M875	HOSE, suction	1				

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

# Parts Drawing - LineLazer ES 1000

 Torque to 8-10 ft-lbs  
(10.8-13.6 N·m)

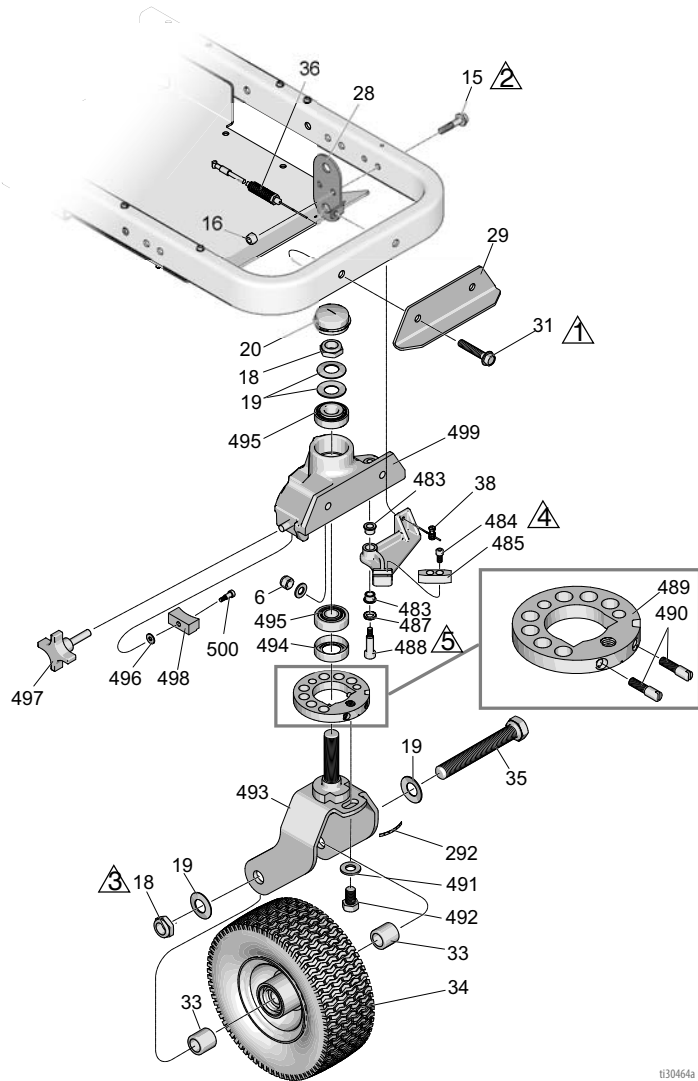


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# Parts List

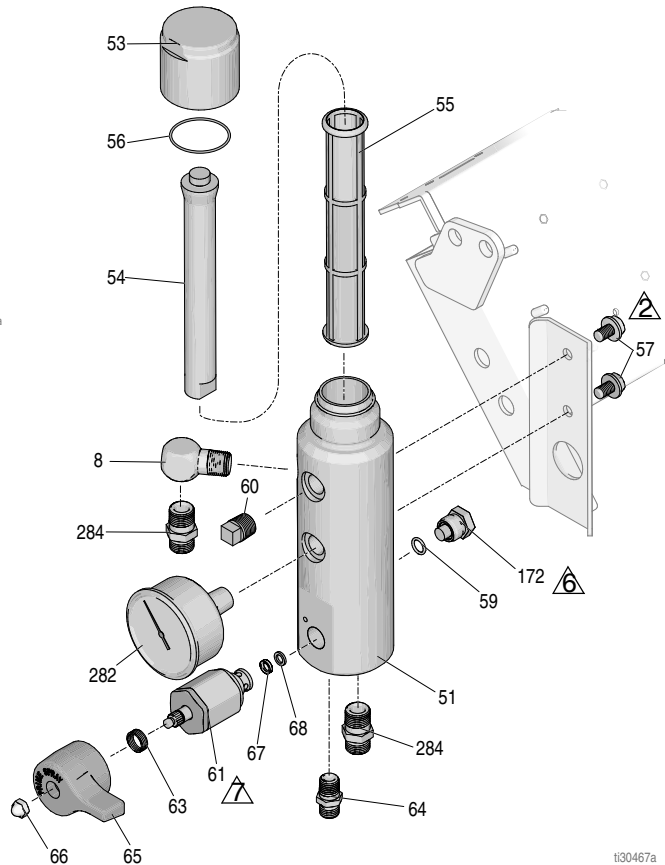
Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
2a	17N508	INVERTER, power supply, 120V	1	76	17M321	CABLE, red, dia .625 x 3 ft	1
2b	17N509	INVERTER, power supply, 230V	1			(includes 615)	
3	17N448	BATTERY	1	78	17M323	CABLE, black, dia .625 x 3.5 ft	1
12	113796	SCREW, flanged, hex hd	6			w/ cover (includes 614)	
22	16A390	NUT, hex, flanged	2	81	17M322	CABLE, red, dia .625 x 2 ft w/ cover	1
32	113469	SCREW, cap, hex hd	2	89	129629	STRAP, retaining	1
44	17N921	BOX, voltage meter, 120V	1	112	102040	NUT, lock, hex	6
47	17N816	HOLDER, fuse	1	114	128978	SCREW, mach, slot hex wash hd	8
49	17N815	FUSE, 200, amp	1	117	17P562	COVER, front, LL ES	1
62		CORD, power	1	201	107257	SCREW, hhd forming	2
	17N760	US		256	17P202	LABEL, logo	1
	17R033	AUSTRALIA		614	129545	COVER, black	1
	17R034	CEE 7/7		615	129546	COVER, red	1
	17R035	SWITZERLAND		616	108768	SCREW	2
	17R036	DENMARK		617	104572	WASHER, lock	2
	17R037	ITALY		618	108788	WASHER, flat	4

# Parts Drawing - LineLazer ES 1000



t130464a

- 1 Torque to 17-23 ft-lbs (23.0-31.1 N-m)
- 2 Torque to 190-210 in-lbs (21.4-23.7 N-m)
- 3 Torque to 23-27 ft-lbs (31.1-36.6 N-m)
- 4 Torque to 60-80 in-lbs (6.7-9.0 N-m)
- 5 Torque to 17-23 ft-lbs (23.0-31.1 N-m)
- 6 Torque to 35-45 ft-lbs (47.4-61.0 N-m)
- 7 Torque to 365-385 in-lbs (41.2-43.4 N-m)



t130467a

# Parts List

## Swivel Wheel Assembly

Ref.	Part	Description	Qty
6*	101566	NUT, lock	2
8	196179	FITTING, elbow, street	1
15	112960	SCREW, cap, flng hd	2
16	111040	NUT, lock, insert, nylock, 5/16	2
18*‡	112405	NUT, lock	2
19*‡	112825	WASHER, belleville	4
20*‡	114648	CAP, dust	1
28‡	15F910	BRACKET, cable	1
29	240991	BRACKET, caster, front	1
31	114982	SCREW, cap, flng hd	2
33*‡	193658	SPACER, seal	2
34*	114549	WHEEL, pneumatic	1
35*	113471	SCREW, cap, hex hd	1
36	241105	CABLE	1
38‡	114802	STOP, wire	1
292*‡	17H489	LABEL, disk adjustment	1
483*‡	114548	BEARING, bronze	2
484*‡	110754	SCREW, cap, sch	2
485*‡	193662	STOP, wedge	1
487*‡	15J603	SPACER, round	1
488*‡	120476	BOLT, shoulder	1
489*‡	17H486	DISK, adjuster, assembly	1
490*‡	17G762	SCREW, disk adjuster	2
491*‡	113962	WASHER	1
492*‡	114681	SCREW, cap, hex hd	1
493*‡	17H485	FORK	1
494*‡	113484	SEAL, grease	1
495*‡	113485	BEARING, cup/cone	2
496*‡	112776	WASHER, plain	1
497*‡	181818	KNOB, pronged	1
498*‡	193661	JAW	1
499*‡	15G952	CASTER	1
500*‡	108483	SCREW, shoulder	1

\* Included in Swivel Wheel Repair Kit 240719

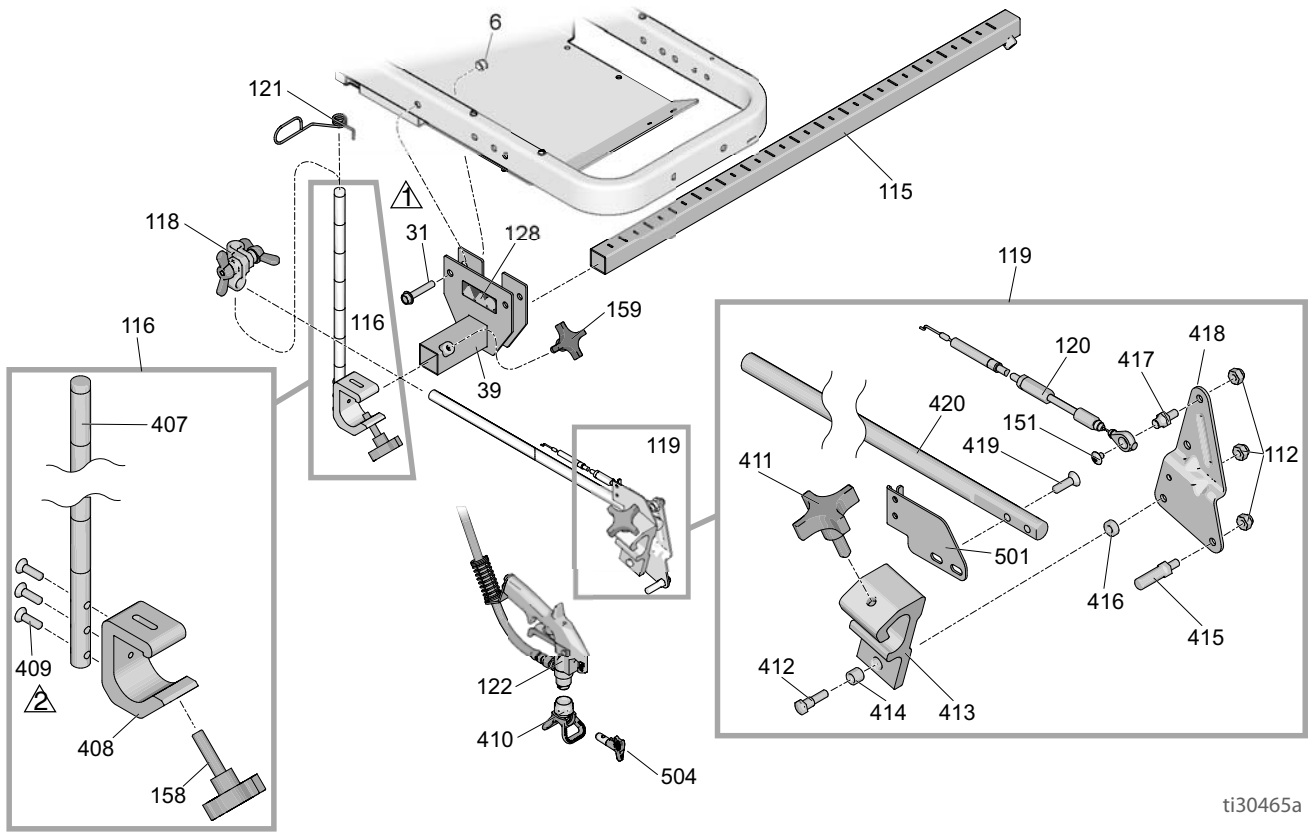
‡ Included in Swivel Wheel Repair Kit 241105

## Filter



Ref.	Part	Description	Qty
51	17K166	MANIFOLD, filter	1
53	15C765	CAP, filter	1
54	15C766	TUBE, diffusion	1
55	243984	FILTER, fluid	1
56	117285	PACKING, o-ring	1
57	111801	SCREW, cap, hex hd	2
59	111457	PACKING, o-ring	1
60	15G331	PLUG, pipe	1
61†	287879	VALVE, drain, assy	1
63†	114708	SPRING, compression	1
64	196181	FITTING, nipple	1
65†	15G563	HANDLE, valve	1
66†	116424	NUT, cap	1
67†	193709	SEAT, valve	1
68†	193710	SEAL, seat valve	1
172	17R281	TRANSDUCER	1
282	868015	GAUGE, pressure, 0-5000 psi	1
284	196177	ADAPTER, nipple	2

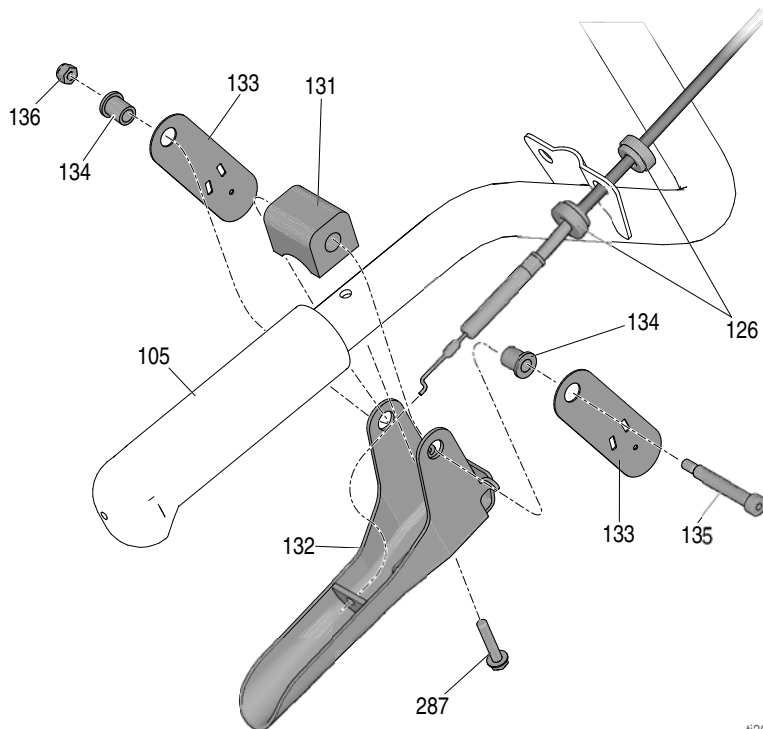
† Included in Prime Valve Repair Kit 245103

# Parts Drawing - LineLazer ES 1000



ti30465a

-  Torque to 17-23 ft-lbs  
(23.0-31.1 N·m)
-  Torque to 145-155 in-lbs  
(16.3-17.5 N·m)



ti30466a

# Parts List

## Gun Holder and Arm

Ref.	Part	Description	Qty
6	101566	NUT, lock	2
31	114982	SCREW, cap, flng hd	2
39	17N447	BRACKET, gun arm	1
112	102040	NUT, lock, hex	3
115	17J407	ARM, extension, bar, weldment	1
116	17J424	BAR, heigh adjustment, assy	1
118	24Y645	KIT, clamp	1
119	25A528	BAR, gun holder	1
120	287696	CABLE, gun	1
121	188135	GUIDE, cable	1
122	235457	GUN, flex, basic	1
128▲	16P136	LABEL, safety, warning, iso	1
151	119648	SCREW, mach, trshd	1
158	108471	KNOG, pronged	1
159	111145	KNOB, pronged	1
407	17J139	BAR, gun, height, adjustment	1
408	17J153	BRACKET, gun, holder	1
409	113428	SCREW, mach, hex hd	3
410	243161	GUARD	1
411‡	15F750	KNOB, holder, gun	1
412	17J575	FASTENER	1
413‡	15F216	HOLDER, gun	1
414‡	119664	BEARING, sleeve	1
415	15F209	STUD, pull, trigger	1
416	17J576	SPACER	1
417	15F211	STUD, cable	1
418	15F214	ACTUATOR, lever	1
419	119647	SCREW, cap, socket	2
420	17J145	ARM, holder, gun	1
501	15F213	BRACKET, cable	1
504	LL5317	STRIPING TIP	1
	LL5319	STRIPING TIP	1

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

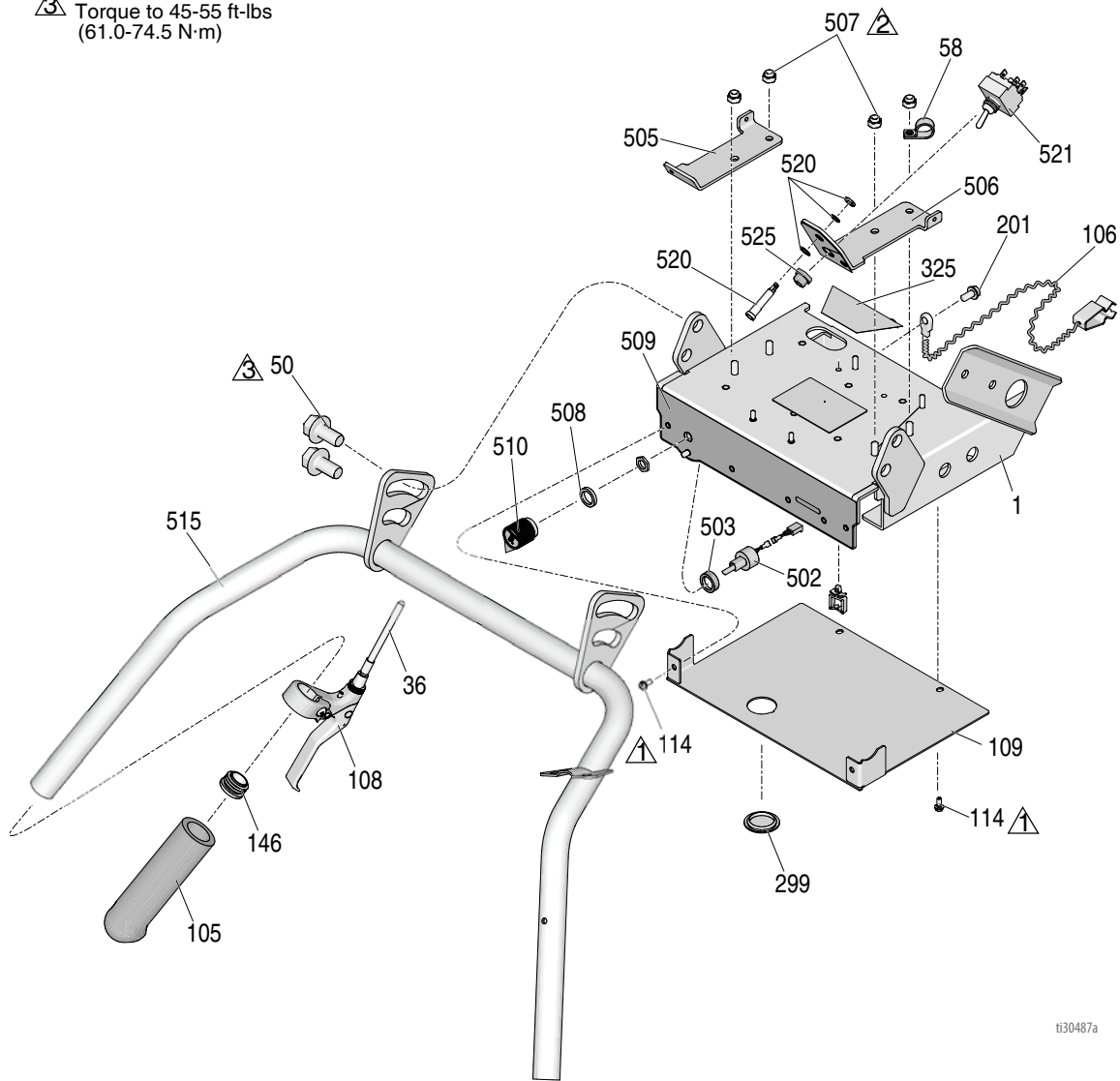
‡ Included in Gun Holder Repair Kit 287569

## Gun Trigger

Ref.	Part	Description	Qty
105	114659	GRIP, handle	2
126	15F624	NUT, cable, gun	2
131	198896	BLOCK, mounting	1
132	245676	HANDLE	1
133	198895	PLATE, lever, pivot	2
134	111017	BEARING, flange	2
135	116941	SCREW, shoulder	1
136	129476	NUT, lock w/ nylon insert	1
287	128803	SCREW, thd forming, hex washer	1

# Parts Drawing - LineLazer ES 1000

- ⚠ Torque to 18-22 in-lbs  
(2.0-2.4 N·m)
- ⚠ Torque to 28-32 in-lbs  
(3.1-3.6 N·m)
- ⚠ Torque to 45-55 ft-lbs  
(61.0-74.5 N·m)



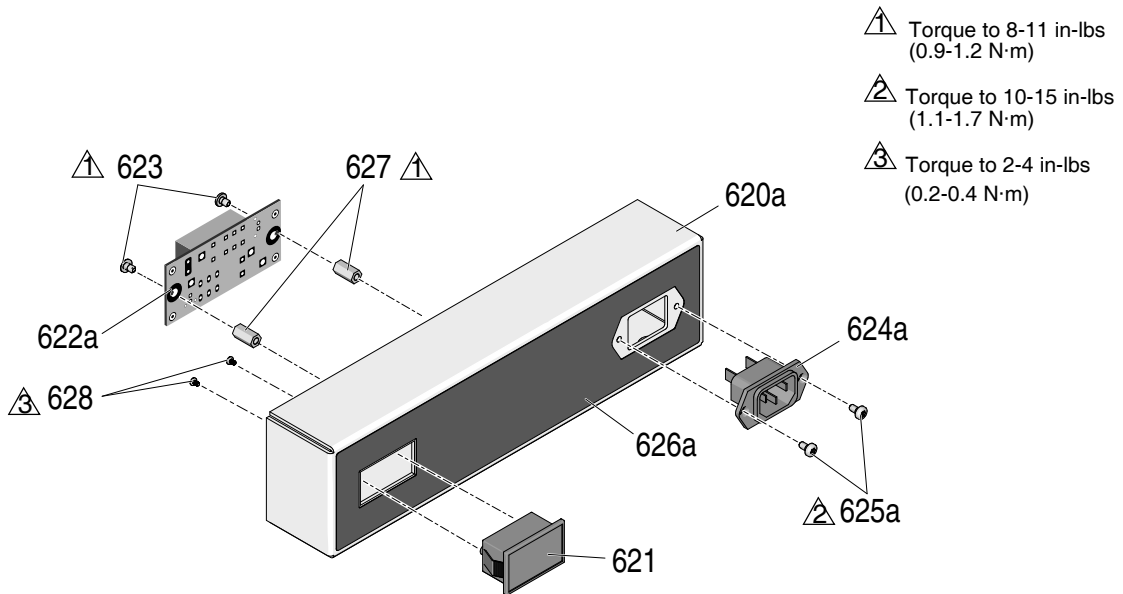
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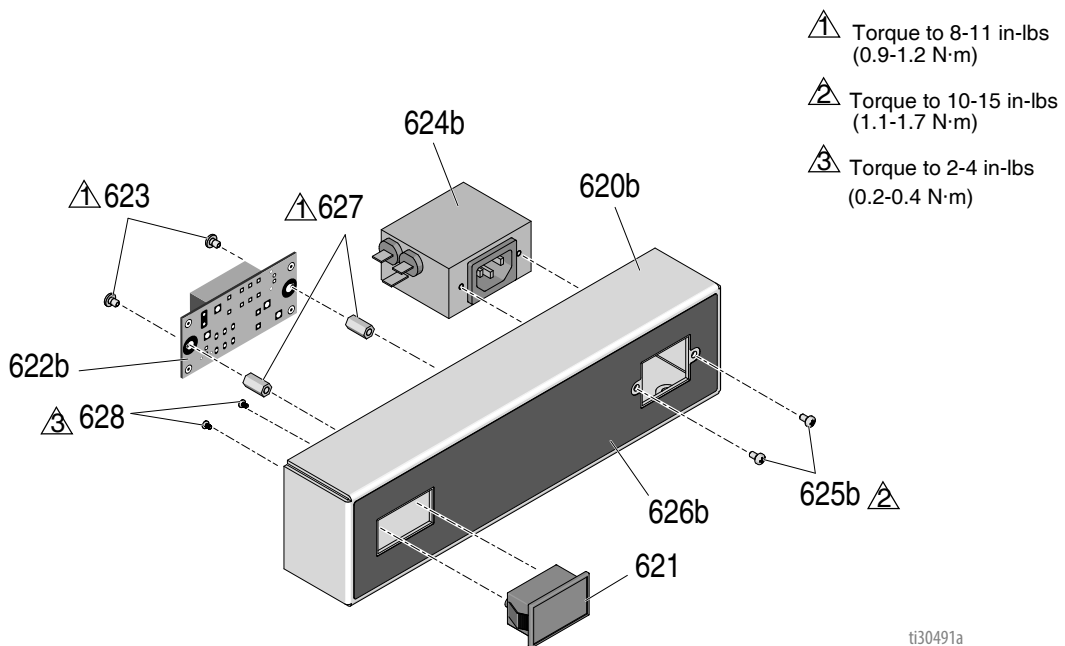
# Parts List

Ref.	Part	Description	Qty	Ref.	Part	Description	Qty
36	114632	CABLE	1	502	17N443	POTENTIOMETER	1
50	17J136	SCREW, hex, flange hd	4	503	198650	SPACER, shaft	1
58	113491	CLAMP, wire	1	505	17J126	BRACKET, shroud	1
105	114659	GRIP, handle	1	506	17N419	BRACKET, switch	1
106	237686	GROUNDING, clip	1	507	102040	NUT, lock, hex	4
108	194310	LEVEL, actuator	1	508	15C973	GASKET	1
109	17J123	PLATE, cover	1	509	17N416	LABEL, control	1
114	128978	SCREW, mach, slot hex wash hd	8	510	116167	KNOB, potentiometer	1
146	120151	PLUG, tube	2	515	24Y641	BAR, handle	1
299	17K310	PLUG, button	1	520	17N435	INDICATOR, LED, panel mount	1
325	17K584	LABEL, wire cutout	1	521	17N418	SWITCH, toggle	1
501	24Y642	PLATE, control, Weldment	1	525	195428	BOOT, toggle	1

# Voltage Meter Box, 120V



# Voltage Meter Box, 230V



# Parts List




## Voltage Meter Box, 120V

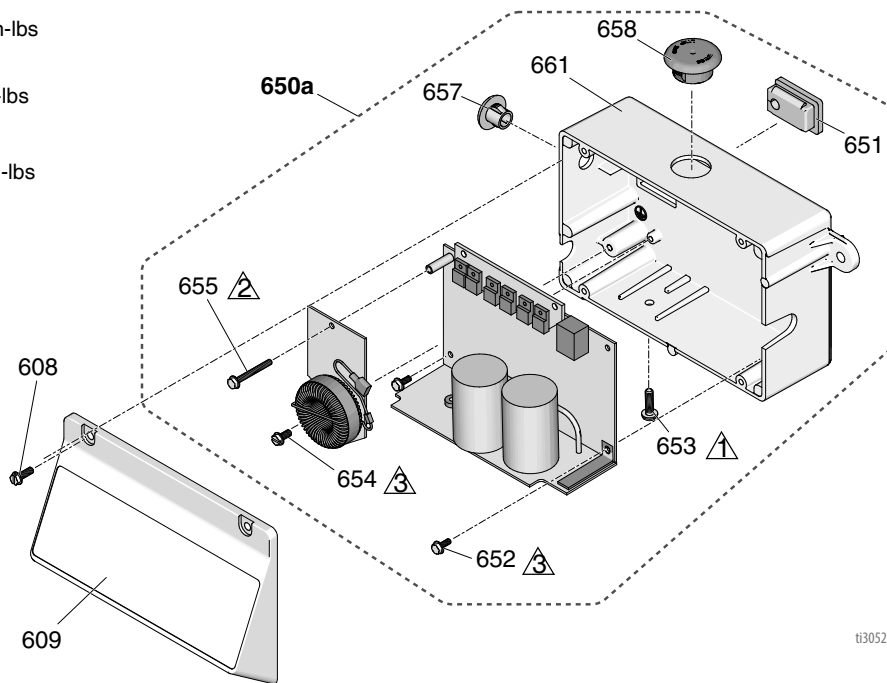
Ref.	Part	Description	Qty
620a	17R015	PANEL, box, meter, voltage, 120V	1
621	17N638	METER, volt, digital	1
622a	25M487	KIT, repair, bear, relay, 120V	1
623	104714	SCREW, mach, pnh	2
624a	114064	PLUG, inlet	1
625a	15W998	SCREW, mach, torix	2
626a	17N659	LABEL, battery, 120V AC	1
627	129510	FASTENER, threaded hex standoff	2
628	129696	SCREW, pan head, phillips	2

## Voltage Meter Box, 230V

Ref.	Part	Description	Qty
620b	17N929	PANEL, box, meter, voltage, 230V	1
621	17N638	METER, volt, digital	1
622b	25M489	KIT, repair, bear, relay, 230V	1
623	104714	SCREW, mach, pnh	2
624b	129649	FILTER, inlet	1
625b	119912	SCREW, mach, phillips	2
626b	17N753	LABEL, battery, 230V AC	1
627	129510	FASTENER, threaded hex standoff	2
628	129696	SCREW, pan head, phillips	2




# Control Box, 120V

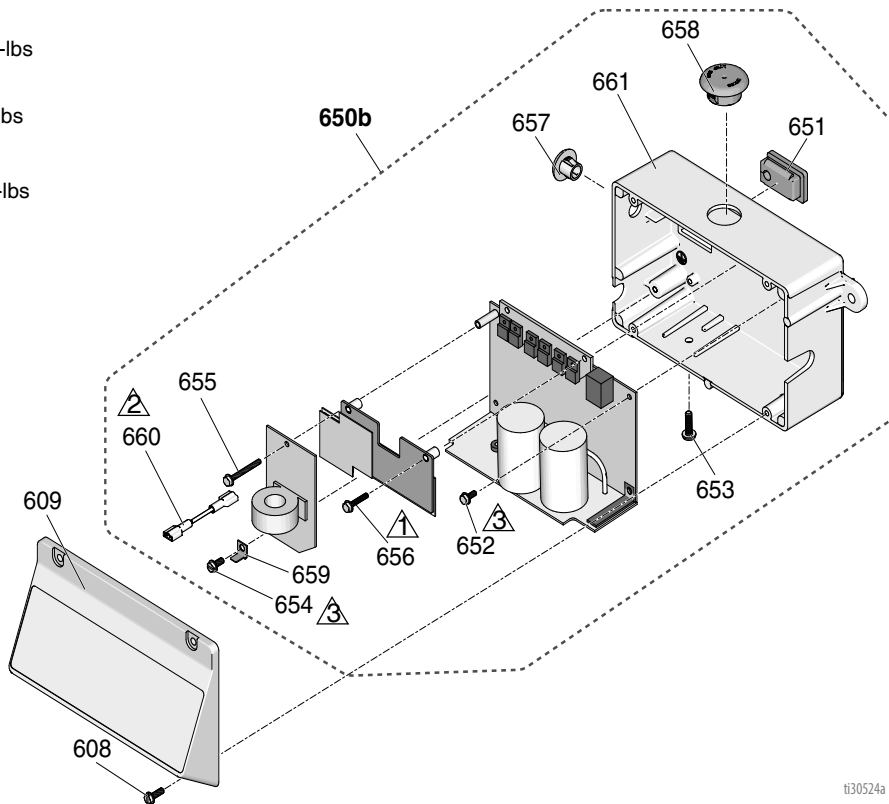
-  Torque to 20-25 in-lbs  
(2.3-2.8 N·m)
-  Torque to 12±2 in-lbs  
(1.4 ± 2 N·m)
-  Torque to 30-35 in-lbs  
(3.4-3.9 N·m)



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# Control Box, 230V

-  Torque to 20-25 in-lbs  
(2.3-2.8 N·m)
-  Torque to 12±2 in-lbs  
(1.4 ± 2 N·m)
-  Torque to 30-35 in-lbs  
(3.4-3.9 N·m)



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# Parts List

## Control Box, 120V

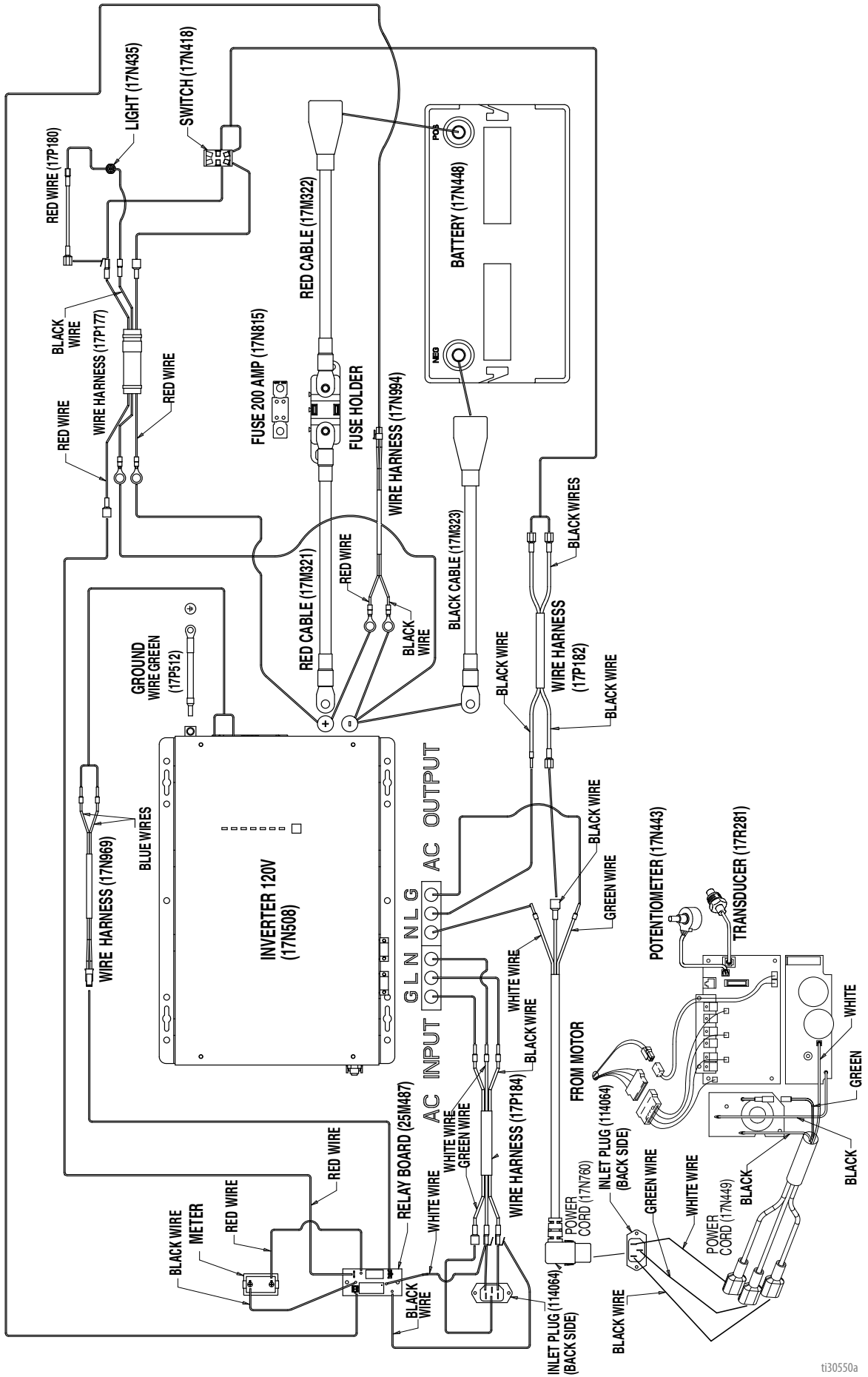
Ref.	Part	Description	Qty
608	117501	SCREW, mach, slot hex wash hd	4
609	277229	COVER, control	1
650a	25M490	BOX, control board, 120V, includes 651, 652, 653, 654, 655, 657, 658	1
651	15G562	BUSHING, control box	1
652	120405	SCREW, mach, hex washer hd	2
653	120165	SCREW, mach, phillips, pan hd	1
654	123850	SCREW, tapping, slot hex wash hd	1
655	120406	SCREW, mach, hex, wash hd	1
657	16Y457	PLUG, molded	1
658	17N560	PLUG	1
661	17N559	BOX, control	1

## Control Box, 230V

Ref.	Part	Description	Qty
608	117501	SCREW, mach, slot hex wash hd	4
609	277229	COVER, control	1
650b	25M491	BOX, control board, 230V, includes 651, 652, 653, 654, 655, 656, 657, 658, 659, 660	1
651	15G562	BUSHING, control box	1
652	120405	SCREW, mach, hex washer hd	2
653	120165	SCREW, mach, phillips, pan hd	1
654	123850	SCREW, tapping, slot hex wash hd	1
655	120406	SCREW, mach, hex, wash hd	1
656	128038	SCREW, mach, hex wash	2
657	16Y457	PLUG, molded	1
658	17N560	PLUG	1
660	17P859	WIRE, jumper	1
661	17N559	BOX, control	1

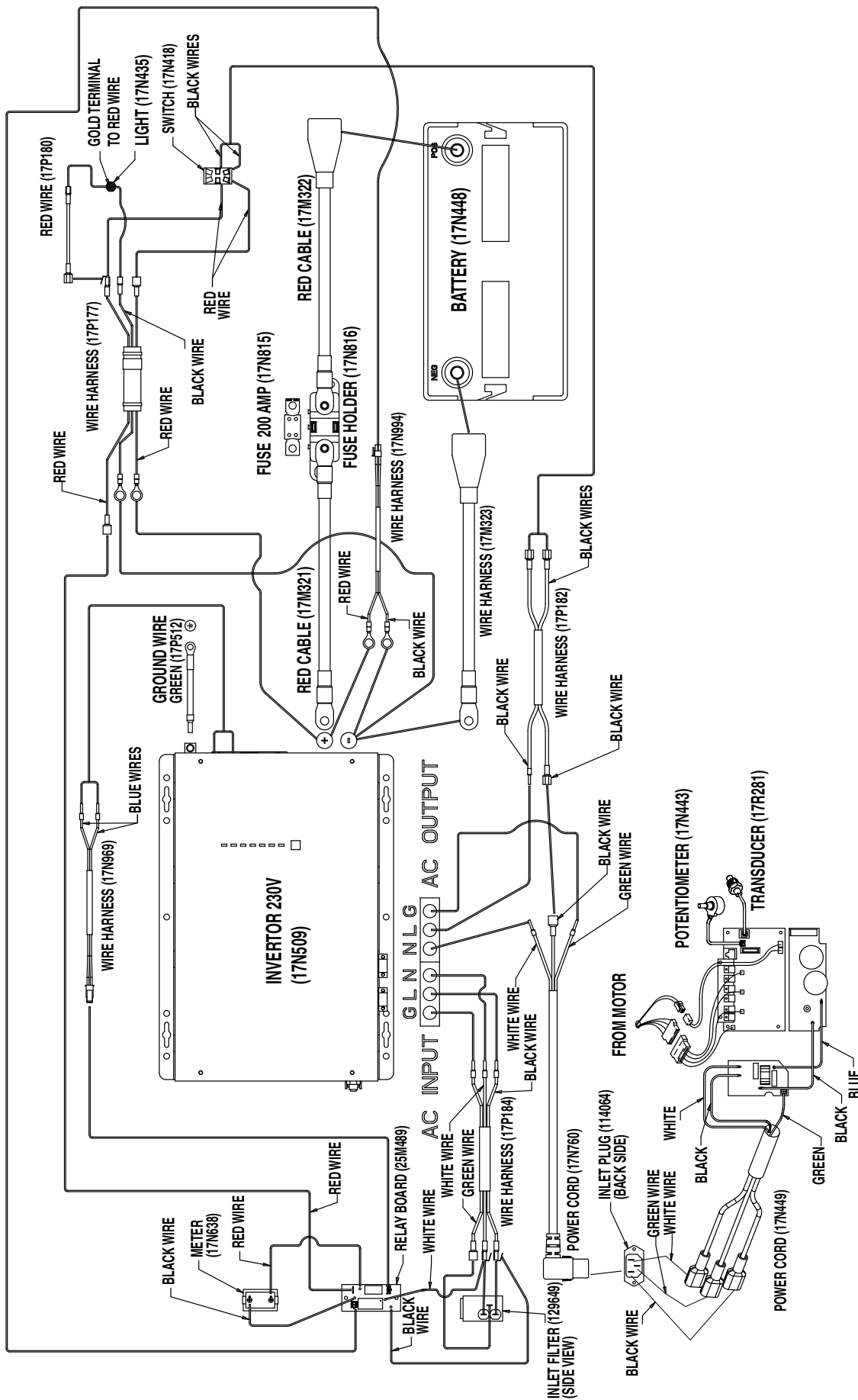
# Wiring Diagram

## 120V



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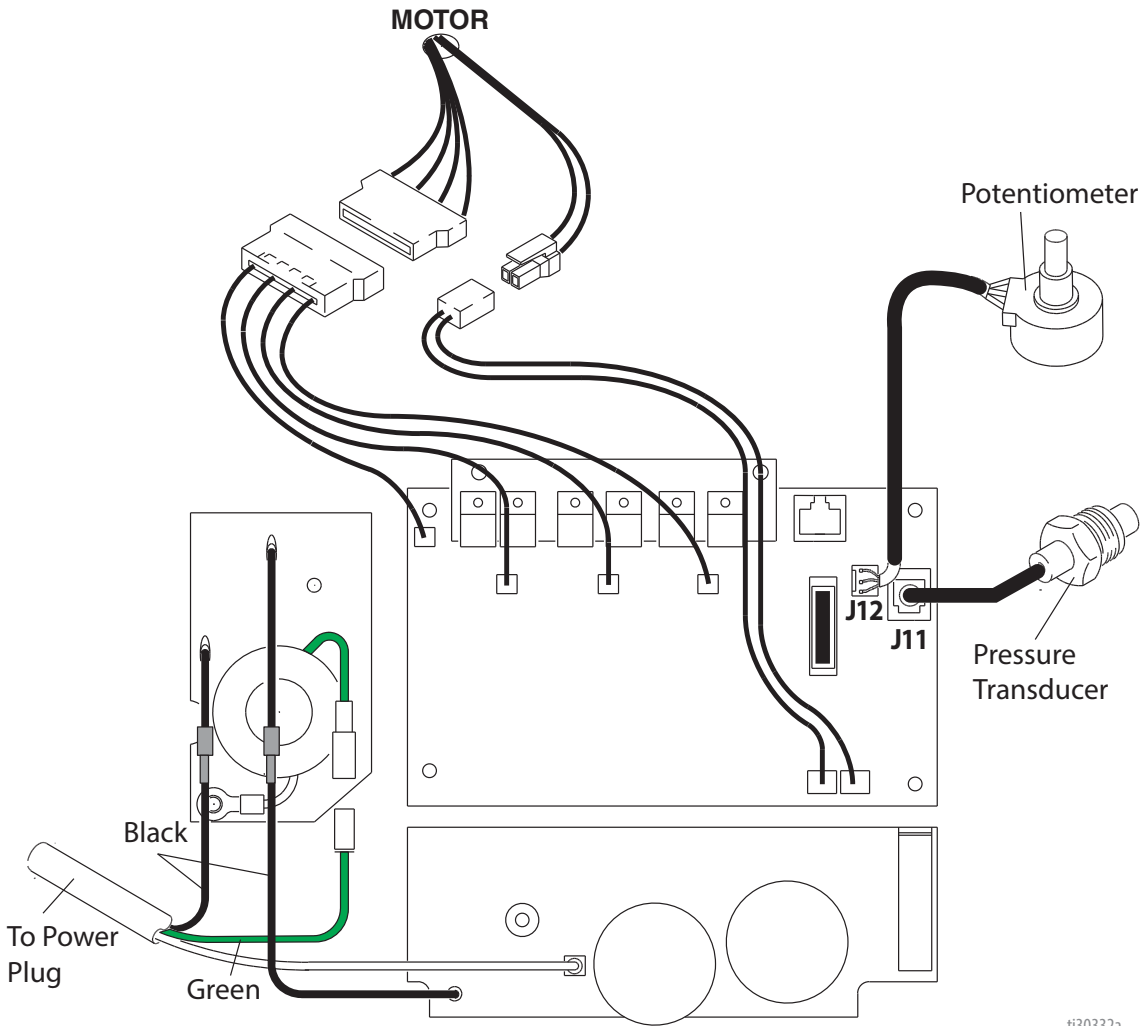
230V



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# Control Board Wiring Diagram

110/120V

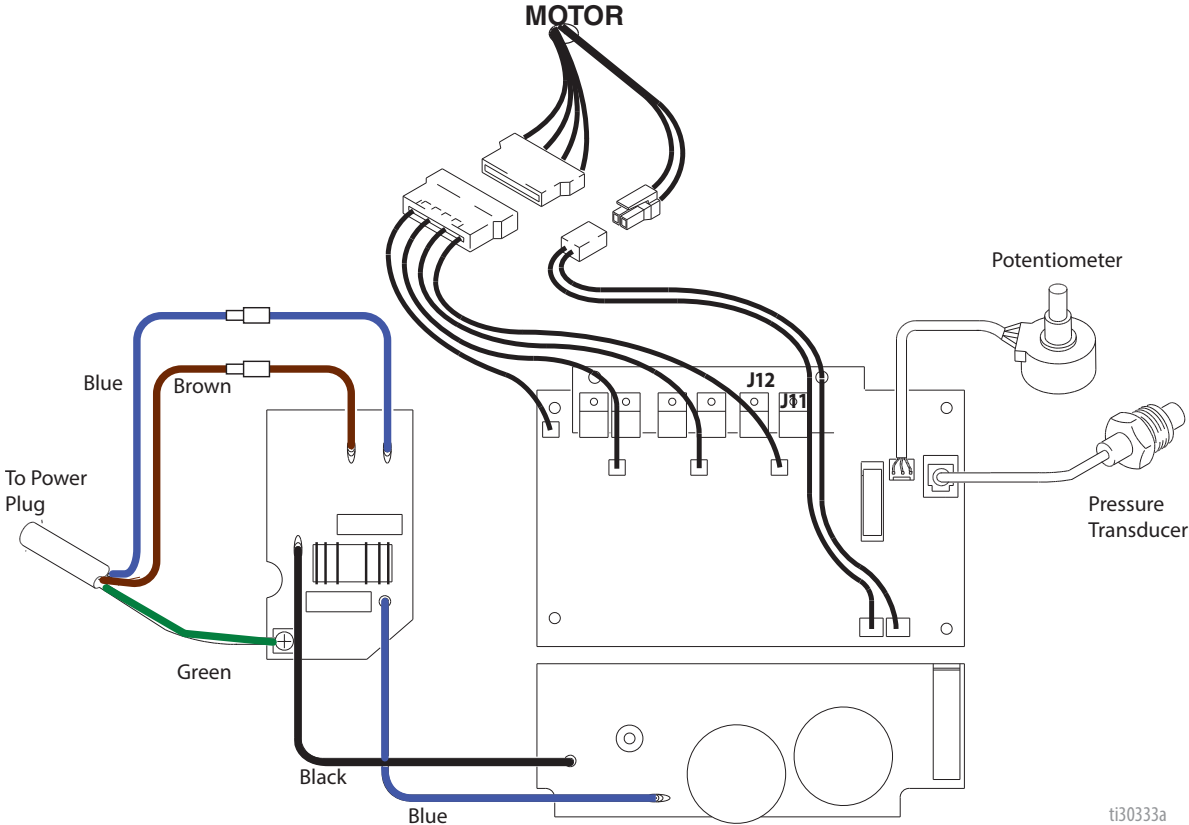




# 230V

**NOTICE**

Heat from inductor coil of filter board may destroy wire insulation that comes in contact with it. Exposed wires could cause shorts and component damage. Bundle and tie loose wires so none lay in contact with inductor coil on the filter board.



ti30333a

# Technical Specifications

LineLazer ES 1000 with 1 battery		
	U.S.	Metric
<b>Dimensions</b>		
Height (with handle bar down)	Unpackaged - 44.5 in. Packaged - 53.0 in.	Unpackaged - 113.03 cm Packaged - 134.62 cm
Width	Unpackaged - 34.25 in. Packaged - 39.0 in.	Unpackaged - 86.99 cm Packaged - 99.06 cm
Length (with platform down)	Unpackaged - 68.75 in. Packaged - 75.0 in.	Unpackaged - 174.63 cm Packaged - 190.5 cm
Weight (dry - no paint)	Unpackaged - 340 lbs Packaged - 437 lbs	Unpackaged - 154 kg Packaged - 198 kg
<b>Noise (dBA)</b>		
Sound Power per ISO 3741:	89.8 dBA	
Sound Pressure per ISO 3741:	85.3 dBA	
<b>Vibration (m/s<sup>2</sup>) (8 hours daily exposure)</b>		
Right-hand (per ISO 5349)	1.85	
Left-hand (per ISO 5349)	0.90	
Maximum Delivery	0.6 gpm	2.3 lpm
Maximum Tip Size 1 gun	.025	
Inlet paint strainer	16 mesh	1190 micron
Outlet paint strainer	60 mesh	297 micron
Pump inlet size	1 in. NSPM (m)	
Pump outlet size	1/4 NPT (f)	
Maximum working pressure	3300 psi	228 bar, 22.8 MPa
Battery	12V, 100Ah, AGM, Deep cycle	

Wetted Parts: PTFE, Nylon, polyurethane, V-Max, UHMWPE, fluoroelastomer, acetal, leather, tungsten carbide, stainless steel, chrome plating, nickel-plated carbon steel, ceramic

# Electrical Specifications

LineLazer ES 1000		
<b>DC Input</b>		
Nominal Input Voltage	12.0Vdc	
Minimum Start Voltage	10.0Vdc	
Low Battery Alarm	11.0Vdc	
Low Battery Trip	10.5Vdc	
High Voltage Alarm & Fault	16.0Vdc	
High DC Input Recovery	15.5Vdc	
Low Battery Voltage Recovery	13.0Vdc	
Idle Consumption-Search Mode	60W	
<b>Charge</b>		
Input Voltage Range	100~135VAC / 194~243 VAC;	
Input Frequency Range	50/60Hz	
Output Voltage	Depends on battery type (see chart below)	
Charger Breaker Rating (230Vac)	10A	
Charger Breaker Rating (120Vac)	20A	
Max Charger Rate	30 amps	
Over Charge Protection	15.7V for 12Vdc	
Battery Type	Fast Vdc	Float Vdc
Gel U.S.A.	14.0	13.7
A.G.M 1	14.1	13.4
A.G.M 2	14.6	13.7
Sealed Lead Acid	14.4	13.6
Gel Euro	14.4	13.8
Open Lead Acid	14.8	13.3
Calcium	15.1	13.6
De-sulphation	15.5 for 4 hrs	
<b>Bypass &amp; Protection</b>		
Nominal Voltage	120Vac	230Vac
Low Voltage Trip	90V±4%	184V±4%
Low Voltage re engage	100V±4%	194V±4%
High Voltage Trip	140V±4%	253V±4%
High Voltage re engage	135V±4%	243V±4%
Max Input AC Voltage	150VAC	270VAC
Nominal Input Frequency	50Hz or 60Hz (Auto detect)	
Low Freq Trip	Wide: 40±0.3Hz for 50Hz/60Hz	
Low Freq re engage	Wide: 45±0.3Hz for 50Hz/60Hz	
High Freq Trip	Wide: No up limit for 50Hz/60Hz	
High Freq re engage	Wide: No up limit for 50Hz/60Hz	
Output Short circuit protection	Circuit Breaker	
Bypass Breaker Rating (230Vac)	20A	
Bypass Breaker Rating (120Vac)	30A	

# 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.

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For patent information, see [www.graco.com/patents](http://www.graco.com/patents).

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Original instructions. This manual contains English. MM 3A4603

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

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