

ToughTek[®] F800e High Output Electric Fireproofing Pump

3A5653F

EN

Electric sprayer for water-based cementitious fireproofing material. For professional use only. Not approved for use in explosive atmospheres or hazardous locations.

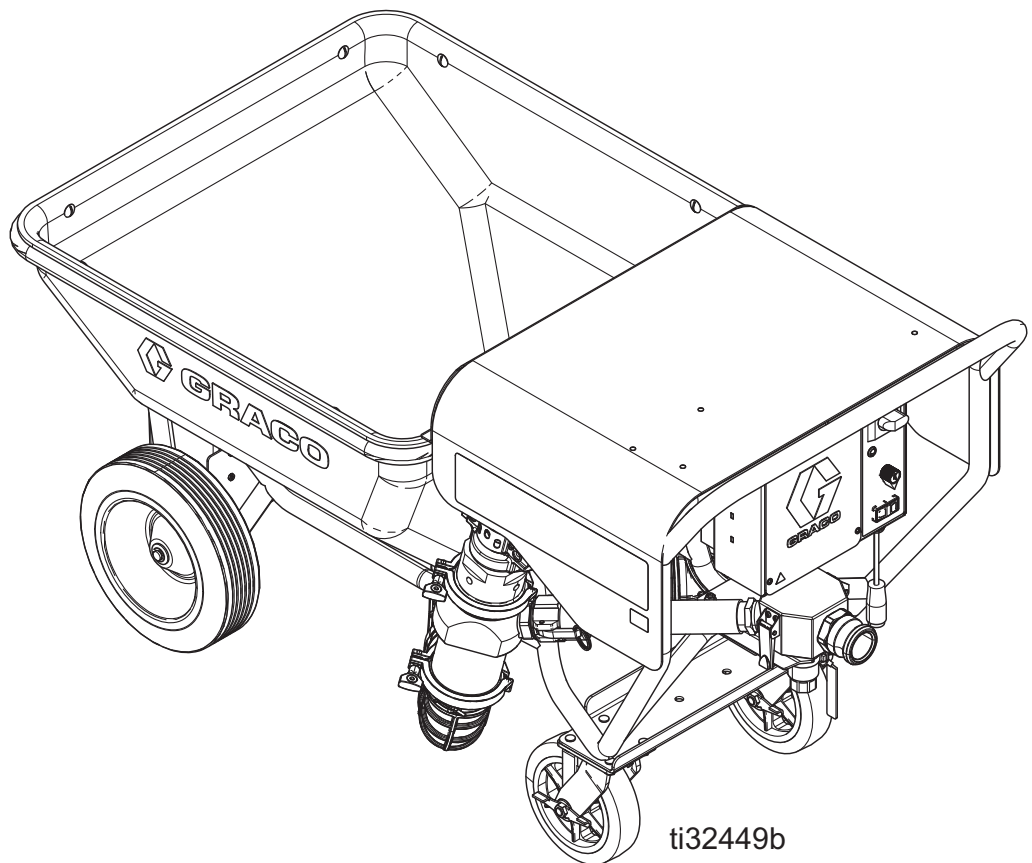
Model 25M800

600 psi (4.13 MPa, 41.3 bar) Maximum Working Pressure



Important Safety Instructions

Read all warnings and instructions in this manual before using this equipment. Save these instructions.



ti32449b

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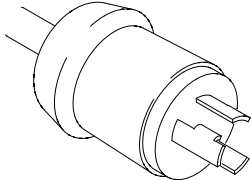


Related Manuals

Manuals are available at www.graco.com

Manual in English	Description
3A3244	Pole Spray Applicator
3A4554	ToughTek Mortar Hose

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.

 <h2 style="margin: 0;">WARNING</h2>	
	<p>GROUNDING</p> <p>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.</p> <ul style="list-style-type: none"> • Improper installation of the grounding plug is able to result in a risk of electric shock. • 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 230V circuit and has a grounding plug similar to the plugs illustrated in the figure below. <p style="text-align: center;">230V US</p>  <ul style="list-style-type: none"> • Only connect the product to an outlet having the same configuration as the plug. • Do not use a 3-to-2 adapter with this product. <p>Extension Cords:</p> <ul style="list-style-type: none"> • 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 10 AWG (4.0 mm²) 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.
 	<p>ELECTRIC SHOCK HAZARD</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"> • Turn off and disconnect power cord before servicing equipment. • Connect only to grounded electrical outlets. • Use only 3-wire extension cords. • Ensure ground prongs are intact on power and extension cords. • Do not expose to rain. Store indoors.

WARNING



FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion:



- Use equipment only in well-ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking).
- Ground all equipment in the work area. See **Grounding** instructions.
- Never spray or flush solvent at high pressure.
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive.
- **Stop operation immediately** if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.



MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.



- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.



SUCTION HAZARD

Powerful suction could cause serious injury.

- Never place hands near the pump fluid inlet when pump is operating or pressurized.



EQUIPMENT MISUSE HAZARD






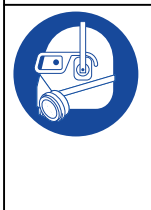
Misuse can cause death or serious injury.



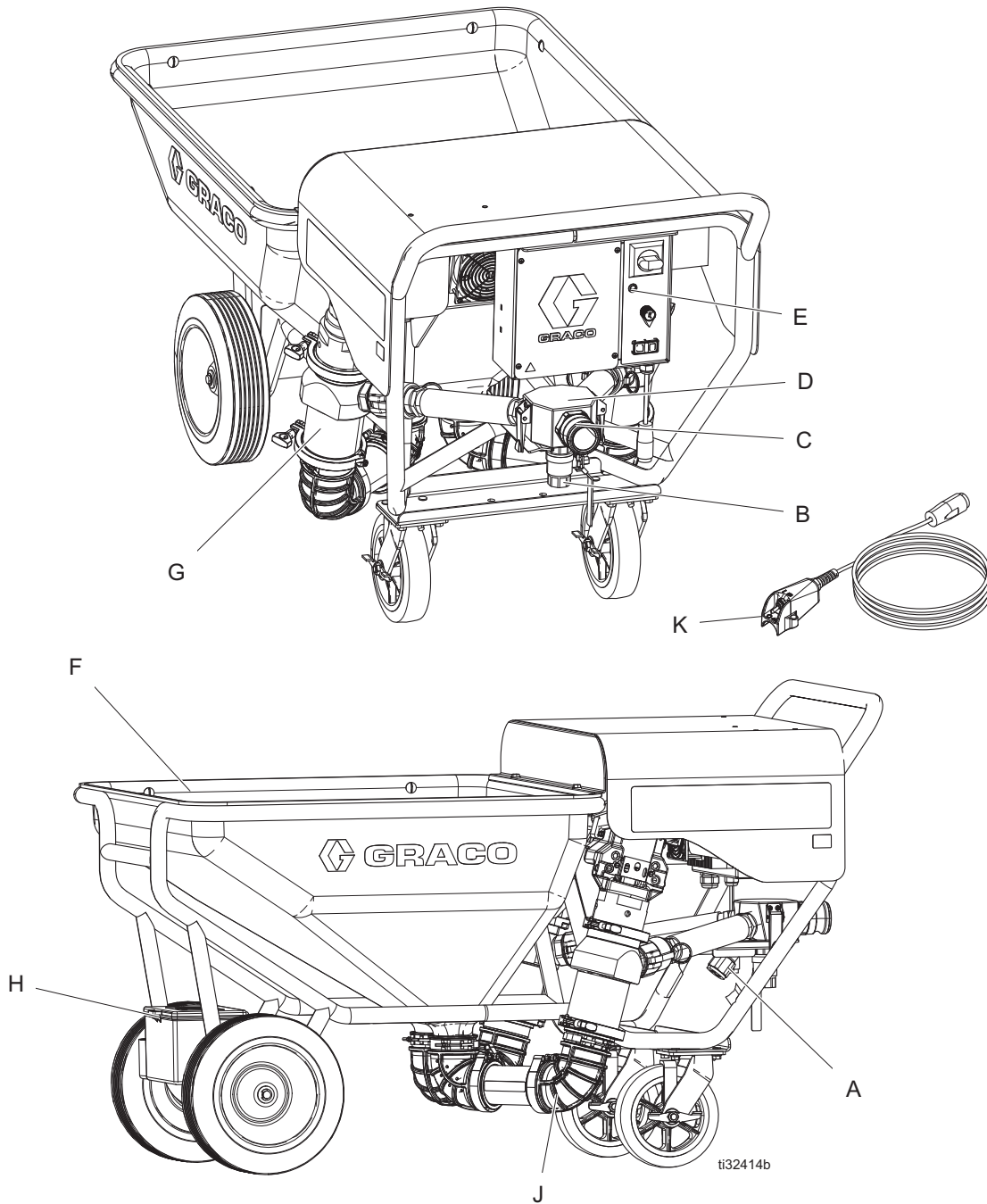
- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Specifications** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Specifications** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheets (SDSs) 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>PRESSURIZED ALUMINUM PARTS HAZARD</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"> • Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents. • Do not use chlorine bleach. • Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.
  	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow the Pressure Relief Procedure when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.
	<p>TOXIC FLUID OR FUMES HAZARD</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"> • Read Safety Data Sheets (SDSs) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>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. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

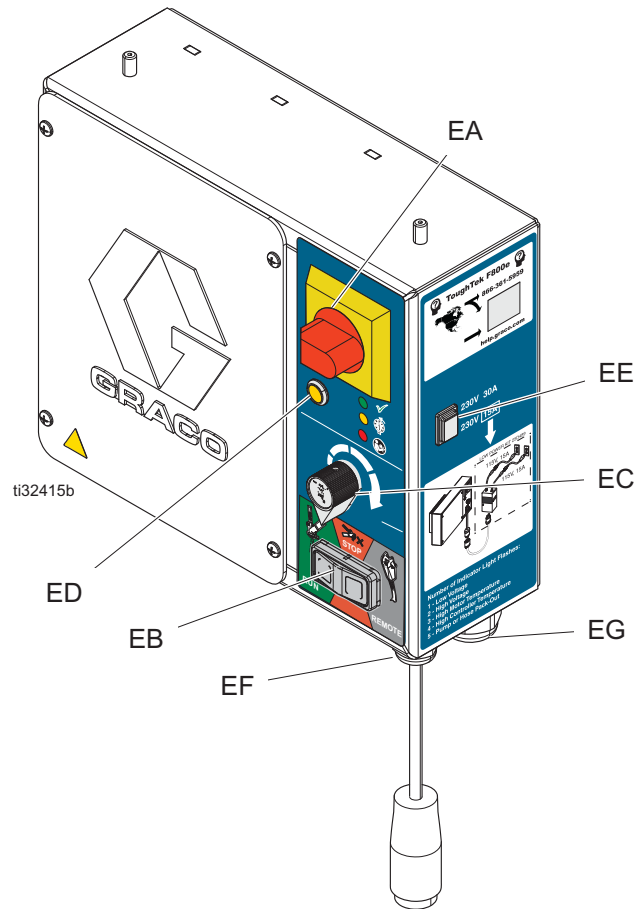
Component Identification



Ref.	Description
A	Over-Pressure Relief Valve
B	Drain/Purge Valve
C	2 in. Male Camlock
D	Manifold Assembly
E	Electrical Enclosure (see following page)

Ref.	Description
F	Hopper
G	Pump Lower
H	Tool Box
J	Inlet Tube Assemblies
K	Remote Switch

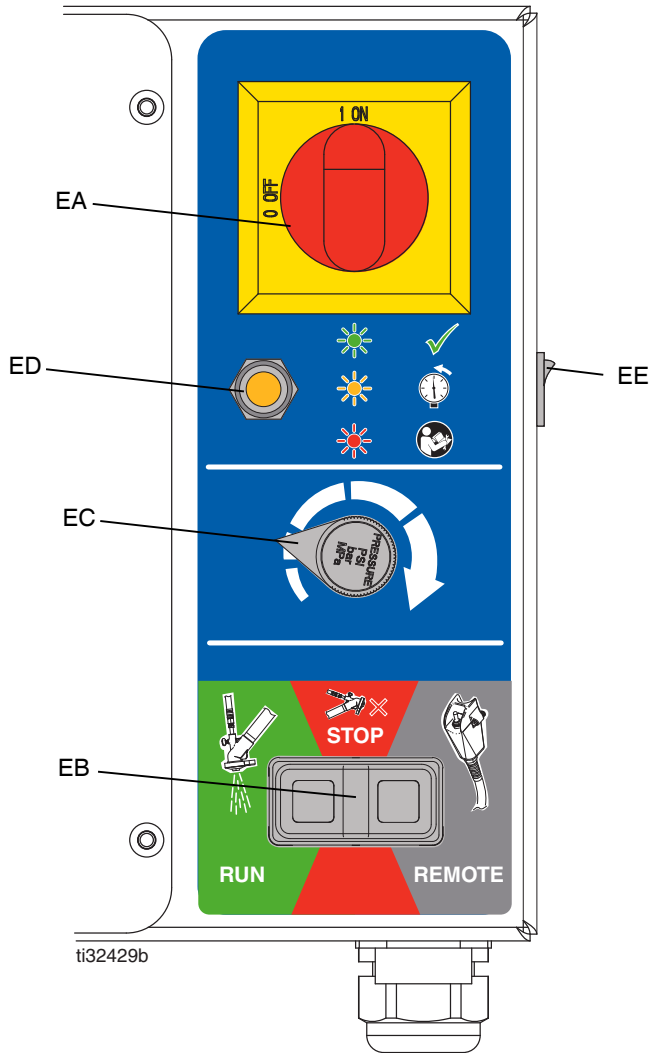
Electrical Enclosure (E)









Ref.	Description
EA	Power Disconnect Switch
EB	3-Way Switch (Run/Stop/Remote)
EC	Speed Control Knob
ED	Status Indicator Light
EE	Power Mode Switch
EF	Remote Switch Connection
EG	Power Cable Inlet

Pump Control Settings

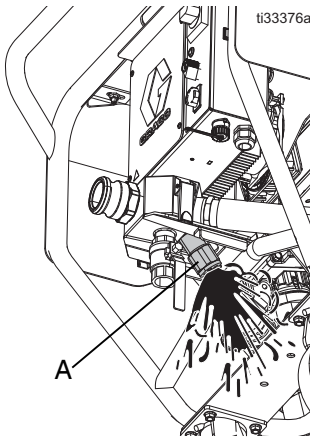
The power disconnect switch (EA) must be in the ON position for the sprayer to pump material.



POWER DISCONNECT SWITCH (EA)	
OFF	Power is disconnected. The motor will not run.
ON	If the 3-way switch (EB) is in either the RUN or in the REMOTE position with the remote control switch set to RUN, the motor will run continuously at a speed determined by the speed control knob (EC).

3-WAY SWITCH (EB)	
	The motor will run continuously at the speed determined by the speed control knob (EC).
	The motor will not run. There is still power to the unit.
	The "Remote Control" setting allows the user to control RUN/STOP functionality of the pump through the remote toggle switch. When the remote toggle switch is installed and the pump control settings are set to "Remote Control", the toggle switch can be used to start and stop the pump.
STATUS INDICATOR LIGHT (ED)	
	FULL POWER Full power operation. System is operating with no errors.
	CUTBACK MODE To enable, turn the Power Mode Switch (EE) to the 230V 15 A position. This allows the sprayer to operate on a 15A circuit.
	ALARM If flashing, a motor control error has occurred. See Troubleshooting , page 19.
POWER MODE SWITCH (EE)	
230V 30A	Full power operation. With the Power Mode Switch (EE) in the 230V 30 A position, the unit will operate in full power mode and the Status Indicator Light (ED) will be lit solid green. The controller requires a 30 amp supply in order to operate continuously at full power.
230V 15A	Reduced power operation. With the Power mode Switch (EE) in the 230V 15 A position, the unit will operate in reduced power mode and the Status Indicator Light (ED) will be lit solid amber. The controller will limit the performance of the unit to allow for continuous operation on a 15 amp circuit breaker.

Over-Pressure Relief Valve (A)



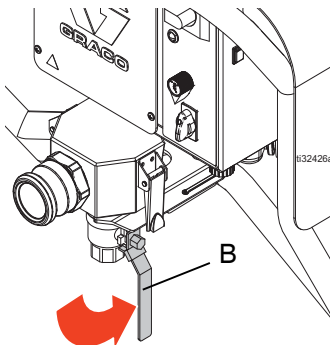
If the pump is over-pressurized, this valve may expel material to relieve the pressure. If this happens, the valve assembly must be removed from the manifold, disassembled, and thoroughly cleaned. See **Over-Pressure Relief Valve Components (17W643)**, page 27, for instructions.

NOTICE

To prevent material hardening in the over-pressure relief valve, remove and clean after every use.

Fluid Drain/Purge Valve (B)

The drain/purge valve (B) relieves pressure. This is used when a pump or hose pack-out occurs, or to relieve pressure inside the hose. Close the valve when spraying.

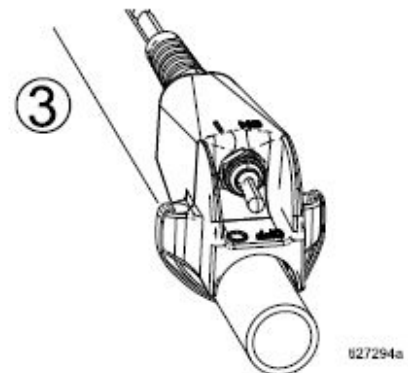
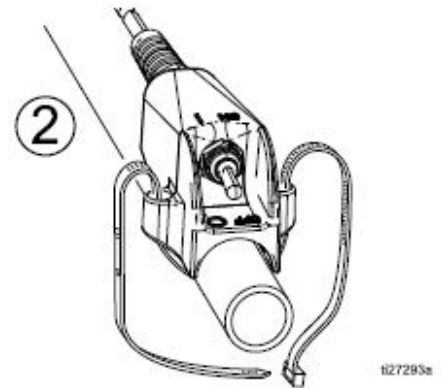
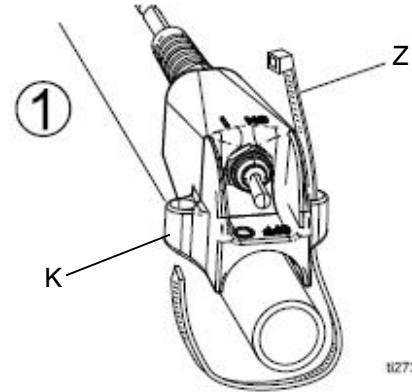


NOTICE





To prevent material hardening in fluid drain/purge valve, flush the valve after every use. See **Flush**, page 12.

Remote Switch (K)

Use a zip-tie (Z) to install the remote switch (K) to the hose or pole spray applicator. The remote switch will fit on hoses/applicators sized 0.75 in. up to 1.25 in.



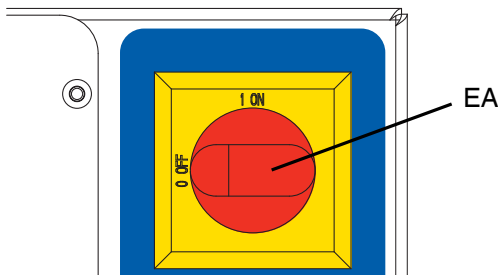
Grounding

				
<p>The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.</p>				

The pump is grounded through the power cord.

Setup

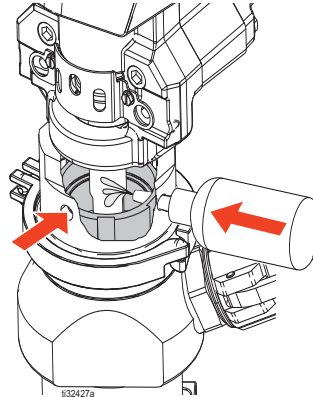
1. Turn the power disconnect switch (EA) to the OFF position.



2. To ground the pump, connect the power cord to a 230V 30 Amp power source.

NOTE: When in 15 A mode, it is possible to run the sprayer with a 15 A power source (see the **Low Power Kit (25D489)** section, page 36) for more detail.

3. Check the Throat Seal Liquid (TSL) level in the packing nut. Fill half full with TSL.





4. Check the inlet tube assemblies (J) to ensure they are clean. If there is sediment or material, remove the inlet tube assemblies and clean until no material remains, then reattach the inlet tubes.



NOTICE
<p>Allowing material to build up in the inlet tube assemblies can reduce performance of the pump and cause it to lose prime, which can damage the pump.</p>

5. Connect the air supply to the applicator.
6. Attach the hose to the applicator inlet and pump outlet (C), then secure Velcro straps around the camlock fitting.
7. Flush the system with water before using (see **Flush**, page 12).

Installation

				
Improper wiring may cause electric shock. All electric wiring must be done by a qualified electrician and comply with all local codes and regulations.				

Power Supply

				
To avoid tipping over, ensure cart is on a flat and level surface. Failure to do so could result in injury or equipment damage.				

See the table below for power supply requirements. The system requires a dedicated circuit protected with a circuit breaker.

Voltage	Phase	Hz	Current
200-240 VAC	1	60	30 A

Select the minimum extension cord wire gauge based on length according to the table below.

Voltage	Amperage	Extension Length	Minimum Wire Gauge
250 VAC	30	25-100 ft.	10 AWG

Flush



NOTICE

Failure to flush prior to material curing in the system will result in damage to system and may require replacement of all system parts in contact with the material.

NOTE: If the fluid/drain purge valve (B) has been used to relieve pressure, the valve must be flushed to prevent material hardening. If that is not sufficient, remove and clean the valve, then reinstall.

NOTE: When flushing material, the system may enter “flush mode” if the motor drops below a minimum speed (due to high pressures) for a period of time. This typically occurs when fireproofing material is flushed from long lengths of hose. When the system enters flush mode, there will be a noticeable change in sound as the motor reverses directions in a back and forth motion and operates at a reduced motor current level. The system will automatically enter flush mode on its own when flushing the hose. The system will shift back to regular operation once enough material has been pushed out of the hose and pressure has dropped.

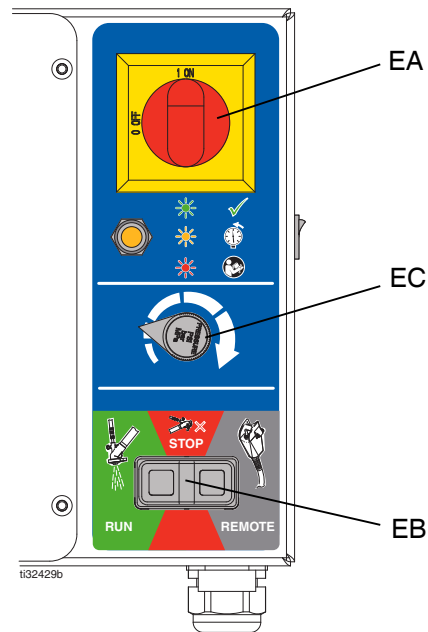
Things to keep in mind when flushing:

- Flush if the materials in the system are about to reach their cure time.
 - Flush any time the flow rate starts to decrease as this is a sign that material is starting to thicken and cure.
 - Always flush the system at least twice, draining all water between flushes then replacing with clean water.
 - Flush using water only.
1. Perform **Pressure Relief Procedure**, page 16.
 2. Remove applicator tip and retainer.

3. Place applicator outlet in a waste container. The waste container must be large enough to hold all dispensed material.



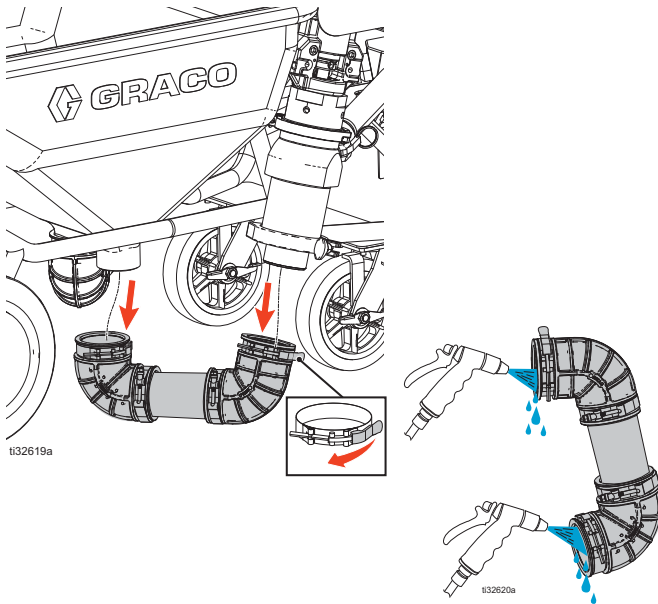
4. Turn the power disconnect switch (EA) to ON and push the 3-way switch (EB) to RUN.



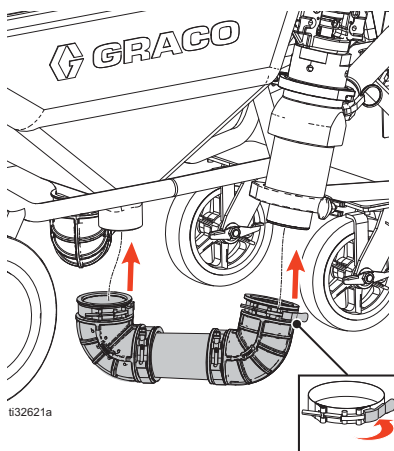
5. Turn speed control knob (EC) clockwise slowly to increase flow, until a steady stream flows from the applicator.
6. When the material level in the hopper is within a few inches of the material inlet at the bottom:
 - a. Scrape the material down the sides of the hopper.
 - b. Fill the hopper with water as the material runs out and continue dispensing.
7. Keep the hopper filled with water while dispensing.

NOTE: Be prepared to decrease the speed control knob (EC) when the material exiting the hose changes to water.

8. When water begins to exit the applicator outlet, stop filling the hopper with water. Keep dispensing water until the hopper is empty, then push the 3-way switch (EB) to STOP to stop dispensing.
9. Clean the hopper (F) and inlet tube assemblies (J):
 - a. Remove the inlet tube assemblies (J) and thoroughly clean both assemblies to remove all leftover material or sediment.



- b. Clean the hopper walls and outlet so no material remains in the hopper.
- c. Once the hopper and inlet tube assemblies are clean, reattach the inlet tubes.



10. Flush the fluid drain/purge valve (B).
 - a. Fill the hopper with clean water.
 - b. Turn the 3-way switch (EB) to RUN to begin circulating water.

- c. While pumping, open the fluid drain/purge valve (B). Allow the water to flush out any material to prevent material hardening in the valve. Once the water appears clean, close the fluid drain/purge valve.
- d. Push the 3-way switch (EB) to STOP.

11. Remove the remaining material with a hose clean-out ball.
 - a. Remove the applicator from the end of the hose and place the hose outlet back in the waste container.
 - b. Remove the hose inlet from the pump outlet and place a hose clean-out ball within the hose inlet. The ball must be wetted down before inserting.
 - c. Reattach the hose to the pump outlet and push the 3-way switch (EB) to RUN to resume flushing the hose.
 - d. The hose clean-out ball will be pushed out of the hose after several minutes. Once the ball is pushed through the hose, push the 3-way switch (EB) to STOP and repeat the entire process listed in this step one time to ensure the system is thoroughly flushed.
12. Turn compressed air on to blow out any material that may have back-flowed into the air lines while flushing (this will prevent air line pack out).
13. Drain the remaining water from the system:
 - a. Place a drain pan beneath the pump lowers (G).
 - b. Remove the inlet tube assemblies (J).
 - c. Use a screwdriver to lift the pump lower inlet ball. This will drain the remaining water from the pump lower. When the pump stops draining, release the pump lower inlet ball.
 - d. Reattach the inlet tube assemblies (J) to the pumps and hopper outlets.
 - e. Starting at the pump, raise the hose bundle above your head and slowly move towards the applicator. As you move towards the applicator, the remaining water in the hose will drain from the applicator into the bucket.
14. Dispose of all waste material in accordance with local rules and regulations. See manufacturer's SDS for additional information.

Mix the Material

Always follow the material manufacturer's instructions for the material being sprayed. Material must be thoroughly mixed to a smooth consistency before loading it in the hopper.

Managing Material After Mixing:

- Pay close attention to the work life of the material being used.
- Only mix the material kits as needed. Do not let mixed material sit longer than necessary.
- Scrape material down the sides of the hopper as the hopper material level lowers. Do not let older material cure on the walls.
- To ensure that all material in the hopper is used while fresh, occasionally wait until the hopper is almost empty before refilling.

Prime with Material



NOTICE

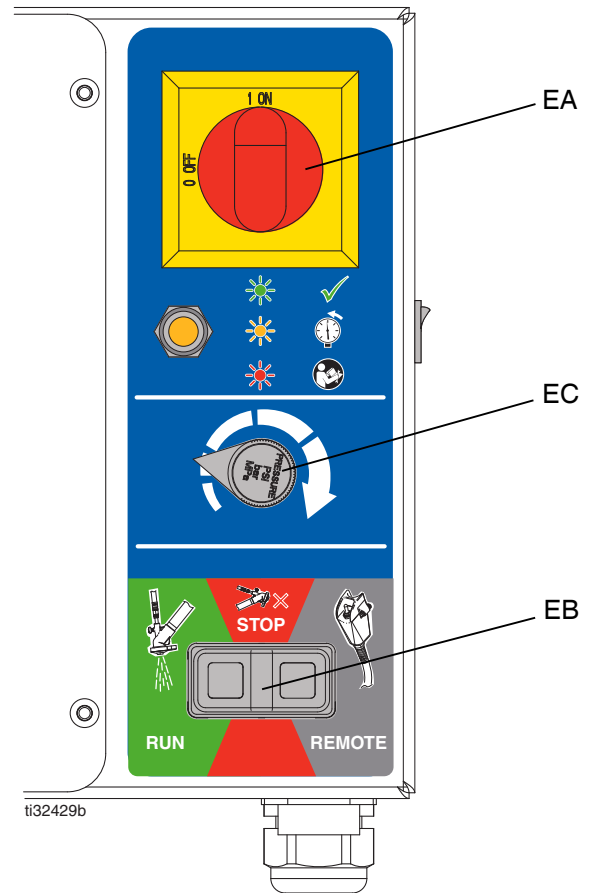
To prevent material curing in system, never load material into a dry system. Loading material into a dry system will cause the material to stick to internal components and cure, causing damage and requiring replacement of those parts.

1. Fill the clean hopper with material to be sprayed.
2. Place the hose applicator in a 5 gallon waste container.

NOTICE

To prevent damage to pump seals caused by cavitation, run the pump slowly until the system is primed.

3. Turn the power disconnect switch (EA) to ON and push the 3-way switch (EB) to RUN.



4. Turn the speed control knob (EC) clockwise slowly to increase pressure, until water is purged out and a steady stream of material flows from the applicator.
5. To stop dispensing, turn the speed control knob (EC) counterclockwise until it stops.
6. Install a tip onto the applicator (see the applicator manual). The system is now primed and ready to spray.

Spray

Prevent Pack-Out

To avoid “packing out” the pump or hose:

- Use the lowest pressure and largest nozzle size that provides an acceptable spray pattern. This will also result in seals and wear parts lasting much longer.
- Do not use any more fluid hose than is necessary.
- Use an applicator with a rubber tip retainer that will blow off if it plugs.

Before Starting or Stopping Material Flow

Always have the atomizing air turned on at the applicator before and after spraying fluid (see your applicator manual).

Spraying



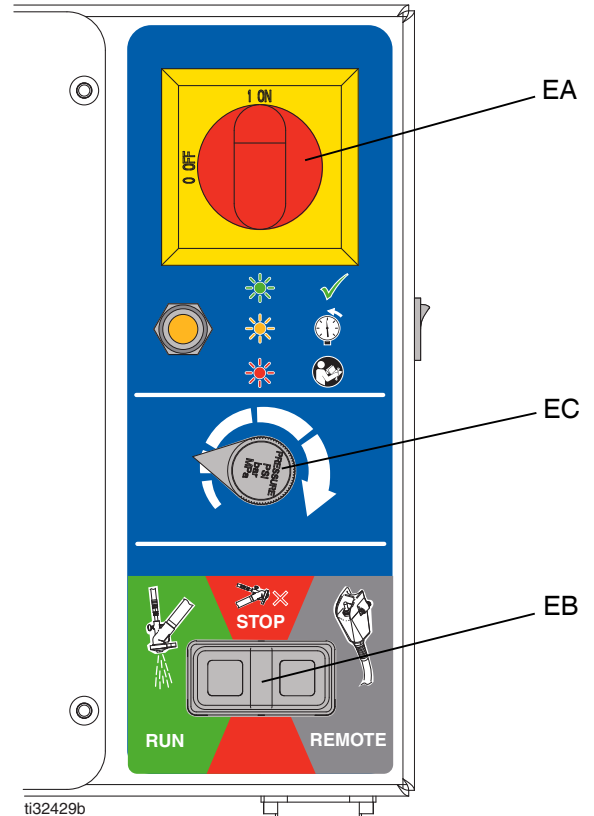
1. **Mix the Material**, page 14.

2. **Prime with Material**, page 14.

NOTICE
Do not allow pump to run without material in the hopper. It can cause damage to the pump seals.
Failure to flush prior to material curing in the system will result in damage to system and may require replacement of all system parts in contact with the material.

3. Turn on atomizing air and adjust the air needle valve on the applicator (see your applicator manual).

4. Turn the power disconnect switch (EA) to ON and push the 3-way switch (EB) to RUN.



5. Turn speed control knob (EC) until desired flow is reached. Turn clockwise to increase flow, counterclockwise to decrease flow.

6. If the system is approaching its cure time or the system will be idle for enough time for material to begin curing in the system, flush the system. See **Flush**, page 12.

NOTICE
Failure to flush prior to material curing in the system will result in damage to system and may require replacement of all system parts in contact with the material.

Pressure Relief Procedure

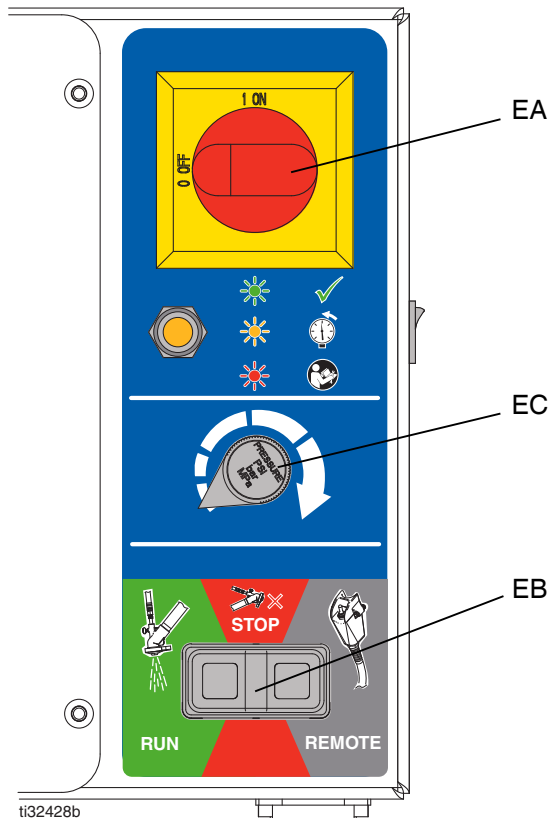


Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from splashing fluid, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Turn the speed control knob (EC) counterclockwise until it stops.
2. Push the 3-way switch (EB) to STOP and turn the power disconnect switch (EA) to OFF.



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3. Remove the applicator tip and tip retainer, and hold the applicator against a pail until material has stopped flowing out.



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To avoid injury from splashing fluid, never open a camlock hose or applicator fitting while there is pressure in the fluid line.

4. Slowly open the fluid drain/purge valve (B) at the pump outlet and drain material into a waste pail.
5. If there is still pressure trapped down the hose line, start at the last hose and carefully decouple the hose. Repeat this with all other hoses working all the way back to the sprayer.

NOTICE

To prevent material hardening in fluid drain/purge valve, flush the valve after each use.

Shutdown



NOTICE

To prevent rust, never leave water or water-based fluid in pump overnight.

1. To shutdown, flush the system. See **Flush**, page 12.
2. Turn the power disconnect switch (EA) to OFF.

Maintenance

Daily Maintenance



1. Flush the system (see **Flush**, page 12).
2. Clean hopper with a scrub pad. It is recommended that you clean the outside of the sprayer using a cloth with water.
3. Check hoses, tubes, and couplings for wear or damage. Tighten all fluid connections before each use.
4. Check and replace camlock gaskets as needed.

Water Exposure

NOTICE

Exposing the motor and/or control box to water can cause damage and possible motor failure. Do not store the pump outside. Do not spray water directly into the motor fans.

Preventative Maintenance

The operating conditions of your particular system determine how often maintenance is required. Establish a preventative maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

DAILY: Check hose for wear and damage, and inspect fluid lines for leaks.

DAILY: Check fluid drain/purge valve for proper operation.

DAILY: Check level of Throat Seal Liquid (TSL) in displacement pump packing nut/wet cup. Fill nut 1/2 full with TSL. Maintain TSL level to help prevent material buildup on piston rod and premature wear of packings and pump corrosion.

DAILY: Remove and clean the inlet tube assemblies (J) daily to prevent material buildup. Failure to do so can reduce pump performance and cause it to lose prime while pumping.

Corrosion Protection

NOTICE

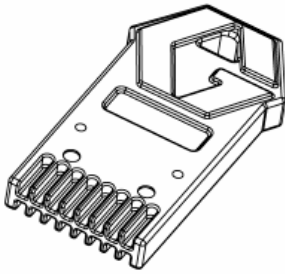
To prevent rust, never leave water or water-based fluid in pump overnight.

Always flush the pump before the fluid dries on the displacement rod. First flush with water, then with oil. Relieve the pressure, but leave the oil in the pump to protect the parts from corrosion.

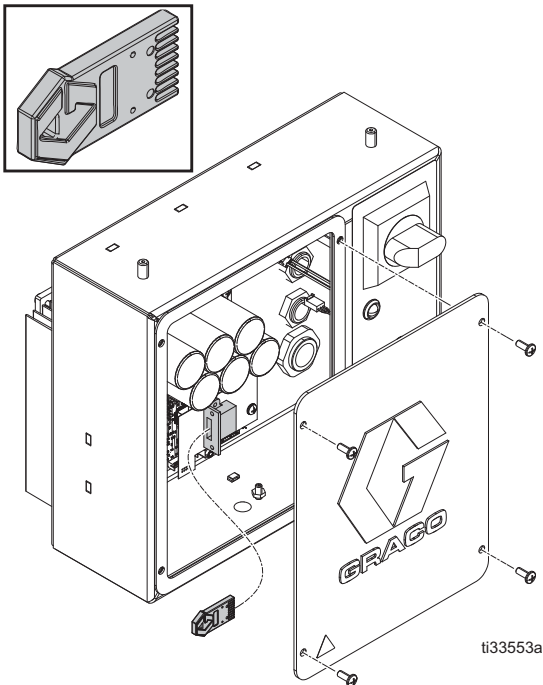
Software Upgrades



Perform the following steps to update the F800e software with a token:



1. Turn OFF the power disconnect switch.
2. Remove the cover of the enclosure.
3. Insert and press the token firmly into the token connector slot, make sure it snaps into place when inserted.



NOTE: The token requires no specific orientation.

4. Turn the power disconnect switch ON.

NOTE: LEDs on the control board will flash at a fast steady rate. When software loading is complete, the LED indicator (ED) will flash the software version in the format of x.yy.zzz. Green flashes indicate “x”, yellow flashes indicate “yy”, and the red flashes indicate “zzz”. For example: “green flash [pause] yellow flash [pause] yellow flash [pause] red flash [pause]” would indicate that version 1.02.001 as been loaded.

5. Turn the power disconnect switch OFF.
6. Remove the programming token from the system.
7. Reinstall the cover to the enclosure.
8. Turn the power disconnect switch ON when ready to spray.

NOTE: The latest software version for each system can be found on the Graco website (www.graco.com) under the “Support”, “Technical Support”, “Search Frequently Asked Questions and Answers”.

Troubleshooting



1. Perform the **Pressure Relief Procedure**, page 16.
2. Check all possible problems, causes, and solutions listed below before disassembling pump.

NOTE: For troubleshooting and repair questions, please contact your distributor.

Mechanical/Fluid Flow

Problem	Cause	Solution
Displacement pumps operate, but output is low.	The piston ball check not seating properly.	Service the piston ball check.
	Seals worn or damaged.	Tighten packing nut or replace seals.
	Outlet check valve not seating properly.	Clean check valve.
	Inlet ball check not seating properly.	Service the inlet ball check.
	Rubber elbow air leak.	Tighten clamps.
	Fluid hose on the applicator is obstructed.	Clean the fluid hose on the applicator.
	Material has built up in the inlet tube assemblies (J).	Remove and clean out the inlet tube assemblies.
	Applicator tip/gun is dirty or clogged.	Clean or replace.
	Large pressure drop in fluid hose.	Reduce length or increase hose diameter.
Material leaks and runs over the side of the wet cup.	Loose wet cup.	Tighten wet cup enough to stop leakage.
	Throat packings worn or damaged.	Replace packings.
Electric motor does not operate.	Power switch is not ON.	Turn power switch ON.
	Tripped circuit breaker.	Check circuit breaker at power source. Reset motor switch.
	Warning light.	See Electrical Troubleshooting , page 21.
Sprayer does not operate.	Fluid hose or applicator obstructed.	Clean hose or applicator.
Erratic accelerated speed.	Material supply exhausted, clogged suction.	Refill hopper and prime pump.
	Open or worn piston valve or packings.	Clear piston valve; replace packings.
	Open or worn intake valve.	Clear or service intake valve.
	Material has built up in the inlet tube assemblies (J).	Remove and clean out the inlet tube assemblies.
Cycles or fails to hold pressure at stall.	Worn check balls, seats, or piston packing.	Service pump lower.

Problem	Cause	Solution
Poor finish or irregular spray pattern.	Inadequate atomizing air pressure.	Adjust air needle valve on applicator (see your applicator manual).
	Dirty, worn, or damaged spray applicator.	Service spray applicator (see your applicator manual).
Motor powered but nothing comes out of hose.	Pump is packed out with dry or cured material.	Disassemble and Clean the pump.
	Hose is packed out with dry or cured material.	Reverse hose and try to push out bad material.
		Some materials may need only 1 in. inner diameter fluid line all the way to the applicator.
Material has built up in the inlet tube assemblies (J).	Remove and clean out the inlet tube assemblies.	
Material is too thick to push through the hose without packing out.	Hose is too restrictive.	Thin and mix material thoroughly to a lower viscosity.
		Use a pump system priming fluid (slime). Wet out the system.
		Use a larger diameter hose and/or a shorter hose.

Electrical Troubleshooting

Problem	Cause	Solution
Low voltage: Amber light flashes one time (sprayer continues to run).	Low voltage (< 190 VAC)	<ol style="list-style-type: none"> 1. Remove other equipment that uses the circuit. 2. Locate a better power source. <p>NOTE: The light will stop flashing on its own if voltage rises.</p>
Low voltage: Red light flashes one time (sprayer turns off).	Low voltage (< 150 VAC)	<ol style="list-style-type: none"> 1. Set the sprayer to OFF and disconnect power to sprayer. 2. Remove other equipment that uses the same circuit. 3. Locate a better power source.
High voltage: Red light flashes two times (sprayer turns off).	High line voltage (> 280 VAC)	<ol style="list-style-type: none"> 1. Set sprayer to OFF and disconnect power to sprayer. 2. Connect sprayer to proper voltage supply.
High motor temperature: Amber light flashes three times (sprayer continues to spray with reduced output).	Motor temperature is high: <ul style="list-style-type: none"> • High ambient temperature • Clogged fan intake • Disconnected fan power wire 	<ol style="list-style-type: none"> 1. Check fans and clean off with compressed air if necessary. 2. Check fan wiring. 3. Check fan fuses.
High motor temperature: Red light flashes three times (sprayer turns off).	Motor overheated: <ul style="list-style-type: none"> • High ambient temperature • Clogged fan intake • Disconnected fan power wire 	<ol style="list-style-type: none"> 1. Allow sprayer to cool. 2. Check fans and clean off with compressed air if necessary. 3. Check fan wiring. 4. Check fan fuses.
High control board temperature: Amber light flashes four times (sprayer continues to spray with reduced output).	Control board is getting hot: <ul style="list-style-type: none"> • High ambient temperature • Clogged fan intake • Disconnected fan power wire 	<ol style="list-style-type: none"> 1. Check fans and clean off with compressed air if necessary. 2. Check fan wiring. 3. Check fan fuses.
High control board temperature: Red light flashes four times (sprayer turns off).	Control is too hot: <ul style="list-style-type: none"> • High ambient temperature • Clogged fan intake • Disconnected fan power wire 	<ol style="list-style-type: none"> 1. Allow sprayer to cool. 2. Check fans and clean off with compressed air if necessary. 3. Check fan wiring. 4. Check fan fuses.
Pump or hose pack-out: Red light flashes five times (sprayer turns off).	Control is commanding the motor to run but the motor shaft does not rotate fully.	<ol style="list-style-type: none"> 1. Turn power off. 2. Perform the Pressure Relief Procedure (page 16) and separate the hose from the system. 3. Verify the motor and pumps function properly. 4. Replace the plugged hose section, rebuild the pump, or call Graco Technical Support.
Locked rotor (not current): Red light flashes six times (sprayer turns off).	Control is commanding the motor to run, but the motor shaft does not rotate. The motor may vibrate.	<ol style="list-style-type: none"> 1. Turn power off. 2. Check motor wiring. 3. Call Graco Technical Support.

Problem	Cause	Solution
Motor over current: Red light flashes seven times (sprayer turns off).	Excessive motor current.	<ol style="list-style-type: none"> 1. Turn power off. 2. Check motor wiring. 3. Call Graco Technical Support.
Disconnected motor temperature sensor: Amber light flashes eight times (sprayer continues to spray with reduced output).	Motor temperature sensor is disconnected.	<ol style="list-style-type: none"> 1. Check motor temperature sensor wires. 2. Call Graco Technical Support.
Communication error: Red light flashes nine times (sprayer turns off).	Internal board communication error.	<ol style="list-style-type: none"> 1. Cycle power. 2. Replace motor controller module.
Software mismatch: Red light flashes ten times (sprayer turns off).	Internal boards have incompatible software loaded.	<ol style="list-style-type: none"> 1. Cycle power. 2. Update software.
Debris detected in pump: Red light flashes 11 times (sprayer turns off).	Debris inside the pump lower.	Remove the pump inlet assembly and clean out debris.
	Piston rod assembly components have become unthreaded.	Remove the piston rod assembly, apply thread sealant, re-install the assembly, and re-torque.

Check Motor Procedure

1. Turn OFF the power disconnect switch.
2. Disconnect motor wires from the motor terminal block (#414). Measure resistance between each set of motor wires (1 to 2, 1 to 3, and 2 to 3). Resistance must all be approximately the same and within the range of 0.4 - 2.0 ohms.
3. Measure resistance between each motor wire (1,2,and 3) and the ground. Resistance values must all be greater than 1 megaohm.
4. If any readings are outside of the acceptable ranges, the motor may need to be replaced.

Check Motor Temperature Sensor Procedure

1. Turn OFF the power disconnect switch.
2. Disconnect the motor thermistor wires (J2, P2).
3. Measure resistance between the two pins in the connector attached to the motor. Readings vary depending on temperature, but at room temperature (72 °F / 22 °C) the resistance should be approximately 1500 - 2500 ohms. An open or short circuit reading indicates a possible wire issue and the motor may need to be replaced.
4. Check resistance between each thermistor wire and one of the motor power wires. There should not be any continuity. If continuity is detected, the motor may be to be replaced.
5. Check resistance between each thermistor wire and one of the motor power wires. there should not be any continuity. If continuity is detected, the motor may need to be replaced.

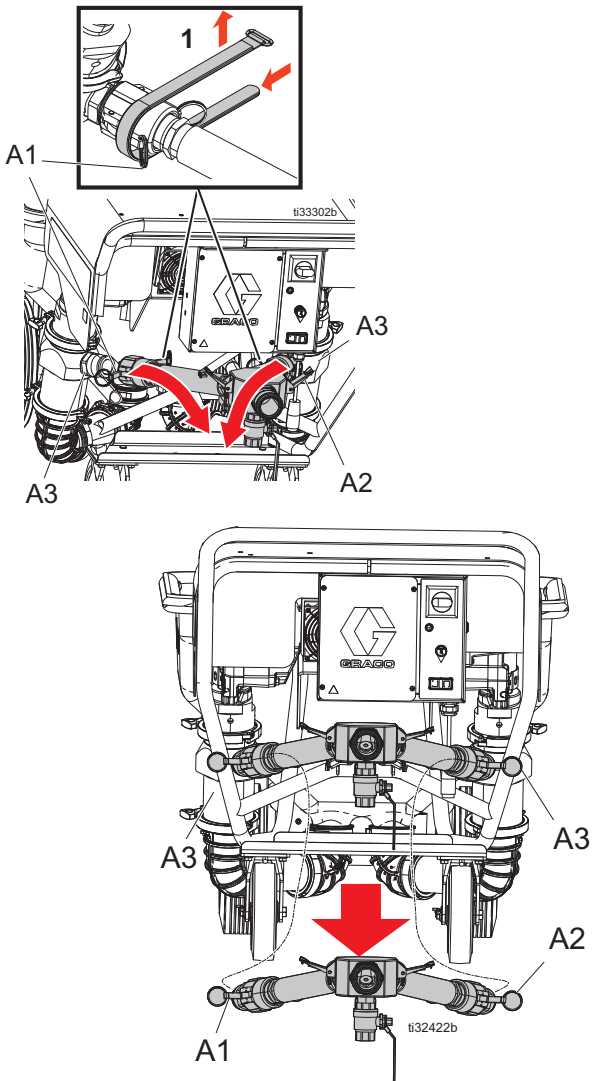
Repair



The sprayer must be turned off and disconnected from power during repair. Relieve all pressure before working on the system.

Manifold Assembly Removal

1. Perform **Pressure Relief Procedure** on page 16.
2. Remove the Velcro retaining straps from camlocks (A1) and open the camlock arms.
3. Unfasten the manifold latches from the bracket (A2).
4. Pull the manifold assembly out and at an angle to disconnect it from the pump lowers (A3).



Pump Lower Removal

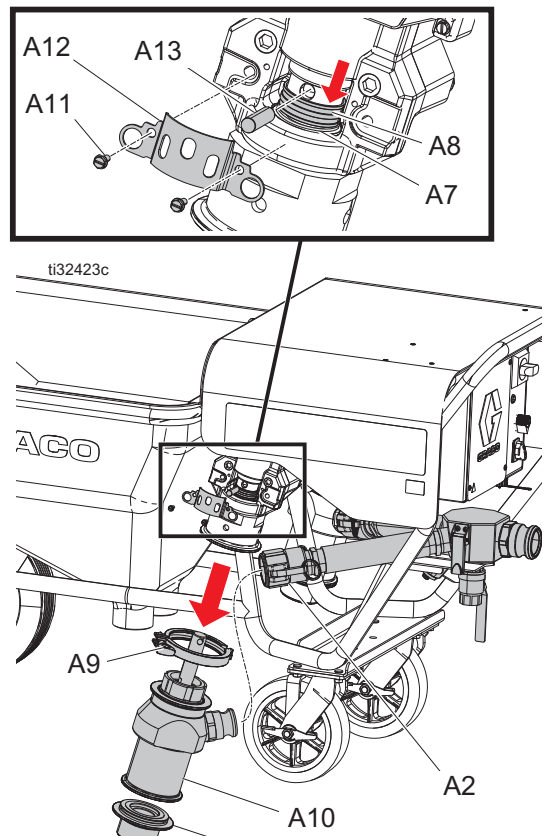
If maintenance is required on the pump lower that requires detaching it from the sprayer, or parts need to be replaced, perform the procedure below.

1. Perform the **Pressure Relief Procedure**, page 16.
2. Disconnect and remove the manifold assembly (A3). See **Manifold Assembly Removal**, page 23.
3. Remove the inlet tube assemblies (J).
4. Remove the lower pump clamp (A5) and pump inlet housing (A6).
5. Remove screws (A11) and finger guard (A12).
6. Slide down retaining ring (A7) and slide down link collar (A8). Remove pin (A13).
7. Remove the upper pump clamp (A9) while supporting the pump cylinder housing (A10).

NOTICE

Support the pump lower during removal. Damage may occur if the pump falls to the floor.

8. Move the pump lower assembly to a workbench/workspace to perform any maintenance or replace and repair parts.



Fuse Replacement

Replacement fuses can be purchased using part number (116682).

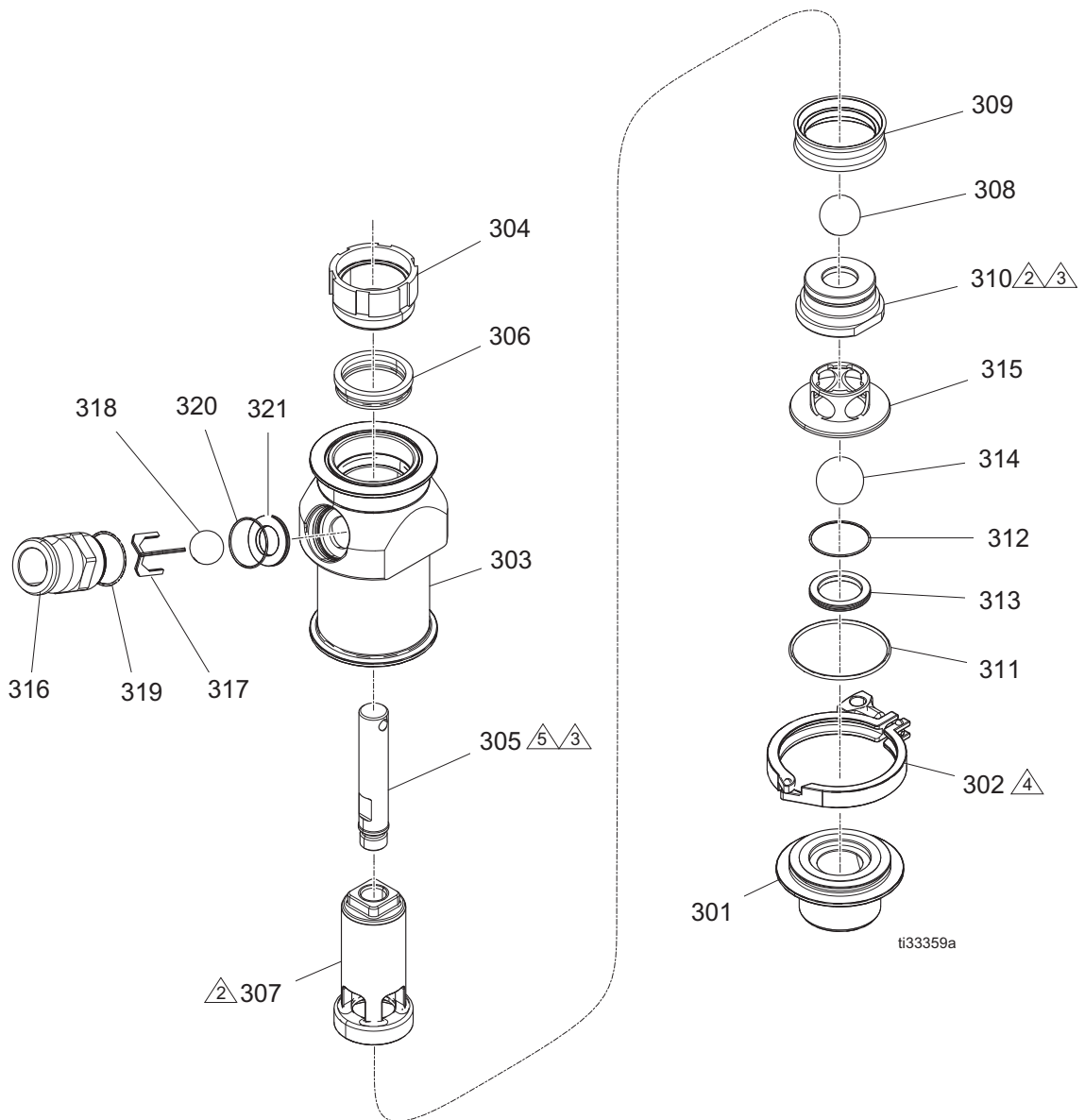
To replace the fuse, perform the following steps.

1. Turn OFF the power disconnect switch.
2. Disconnect the power cord from the power source.
3. Remove four screws to remove the enclosure door.
4. Cut the cable tie that holds the fuse holders to the enclosure.
5. Replace the bad fuse with a 0.5 amp, 250 VAC, 5 x 20 mm time-lag type fuse.
6. Secure the fuse holder to the enclosure with a cable tie.
7. Secure the door to the enclosure with the four screws.

Pump Components

F800 Pump Lower (17W613)

Remove the pump lower before replacing any pump components. For a list of available pump lower kits, see the following page.



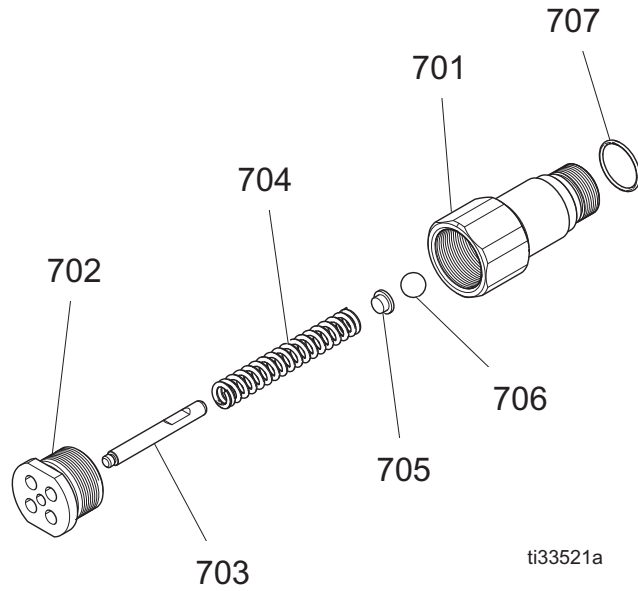
- △₂ Apply medium strength (blue) thread sealant to threads.
- △₃ Torque to 100 +/- 10 ft-lb. Do not torque parts 305, 307, and 310 together. Torque each thread individually.
- △₄ Tighten knob on clamp 302 one full turn after hand-tight.
- △₅ Apply high strength (red) thread sealant to threads.

Pump Parts List

Ref.	Part	Description	Qty.
301	17W614	HOUSING, inlet	1
302	510490	CLAMP, 4 in. tri-clamp 13 MHHM	1
303	17W615	HOUSING, cylinder, outlet	1
304	17W616	NUT, packing, F800	1
305‡	17W617	ROD, connecting	1
306†	16W492	BEARING, seal	1
307‡	17W618	ROD, displacement, piston	1
308†	253030	BALL, metallic, 1.50 in. dia. (3 pack)	1
309†	16W491	PACKING, cup	1
310	17W619	PISTON, retainer	1
311†	289189	O-RING, buna, 3.48 in. dia.	1
312†	17V181	O-RING, buna, 2.11 in. dia.	1
313†	17W620	SEAT, inlet, lapped	1
314†	16W494	BALL, sst, 1.75 in. dia. (3 pack)	1
315	17W621	STOP, cage, inlet	1
316	17W622	HOUSING, outlet, camlock	1
317	17J712	RETAINER, ball, assy, welded	1
318†	16W493	BALL, metallic, 1.25 in. dia. (3 pack)	1
319†	105756	PACKING, o-ring	1
320†	17V179	SEAT, outlet, F800	1
321†	16V410	PACKING, o-ring	1

Symbol	Kit	Description	Included in Kit: Ref. (Qty.)
†	17W623	F800 Pump Lower Repair Kit	306 (1), 308 (1), 309 (1), 311 (1), 312 (1), 313 (1), 314 (1), 318 (1), 319 (1), 320 (1), 321 (1)
‡	25P014	F800 Pump Rod Kit	305 (1), 307 (1)

Over-Pressure Relief Valve Components (17W643)

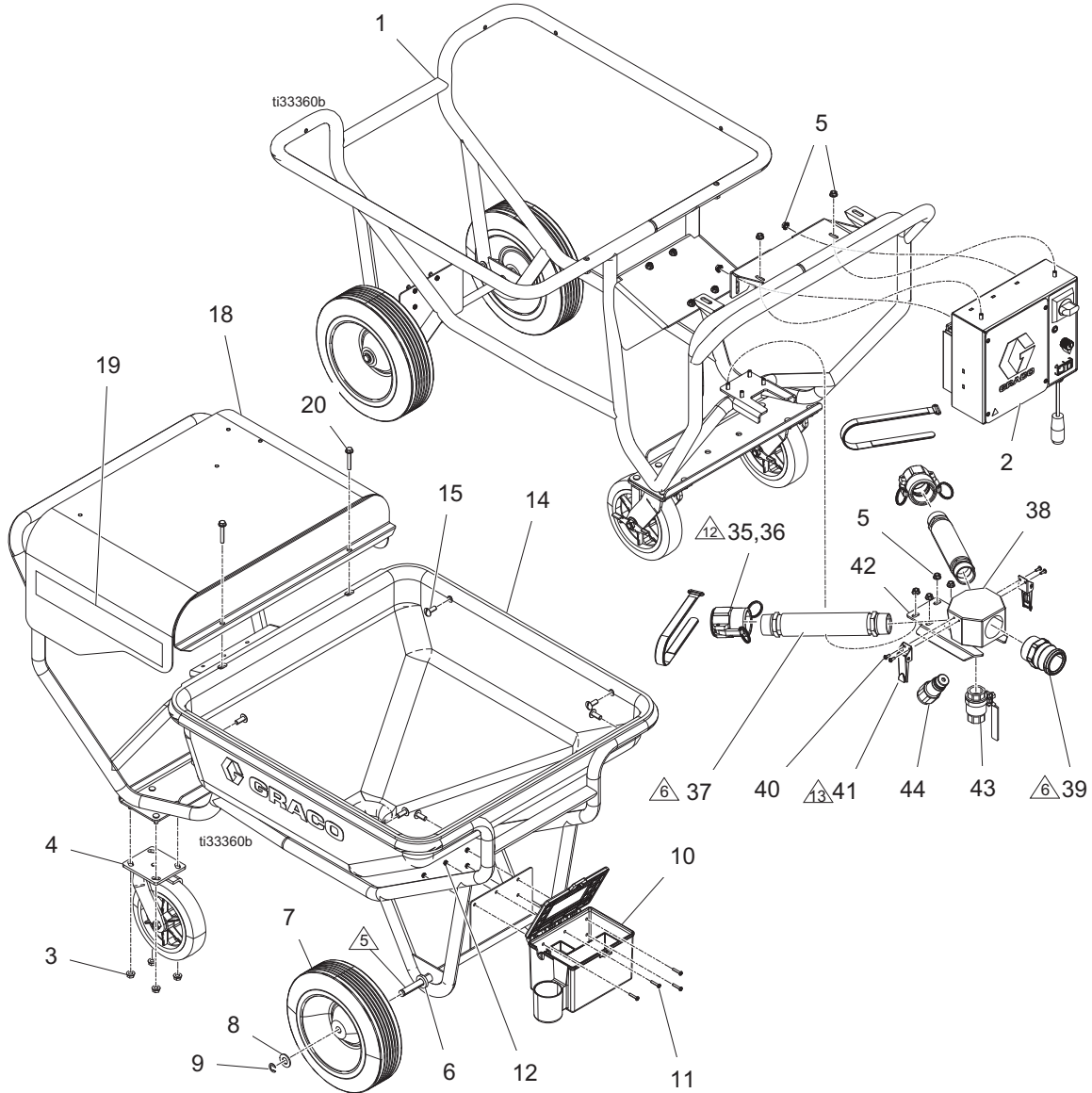


Pump Parts List

Ref.	Part	Description	Qty.
701	-----	HOUSING, pressure relief	1
702	-----	RETAINER, pressure relief	1
703	-----	ROD, threaded	1
704	131422	SPRING, relief, over pressure	1
705	17W603	CAP, pressure relief	1
706	105445	BALL, 0.5000	1
707	103255	PACKING, o-ring	1

Parts

F800e System Parts



- ⚠ Apply grease lubricant to axle of the cart before assembling wheel components (6, 7, 8, 9).
- ⚠ Apply thread sealant and thread sealant tape to threads.
- ⚠ Use strap (36) to bond ears of camlock (35) after assembly.
- ⚠ Adjust latch (41) 3.5 threads past engagement or approximately .08 in.

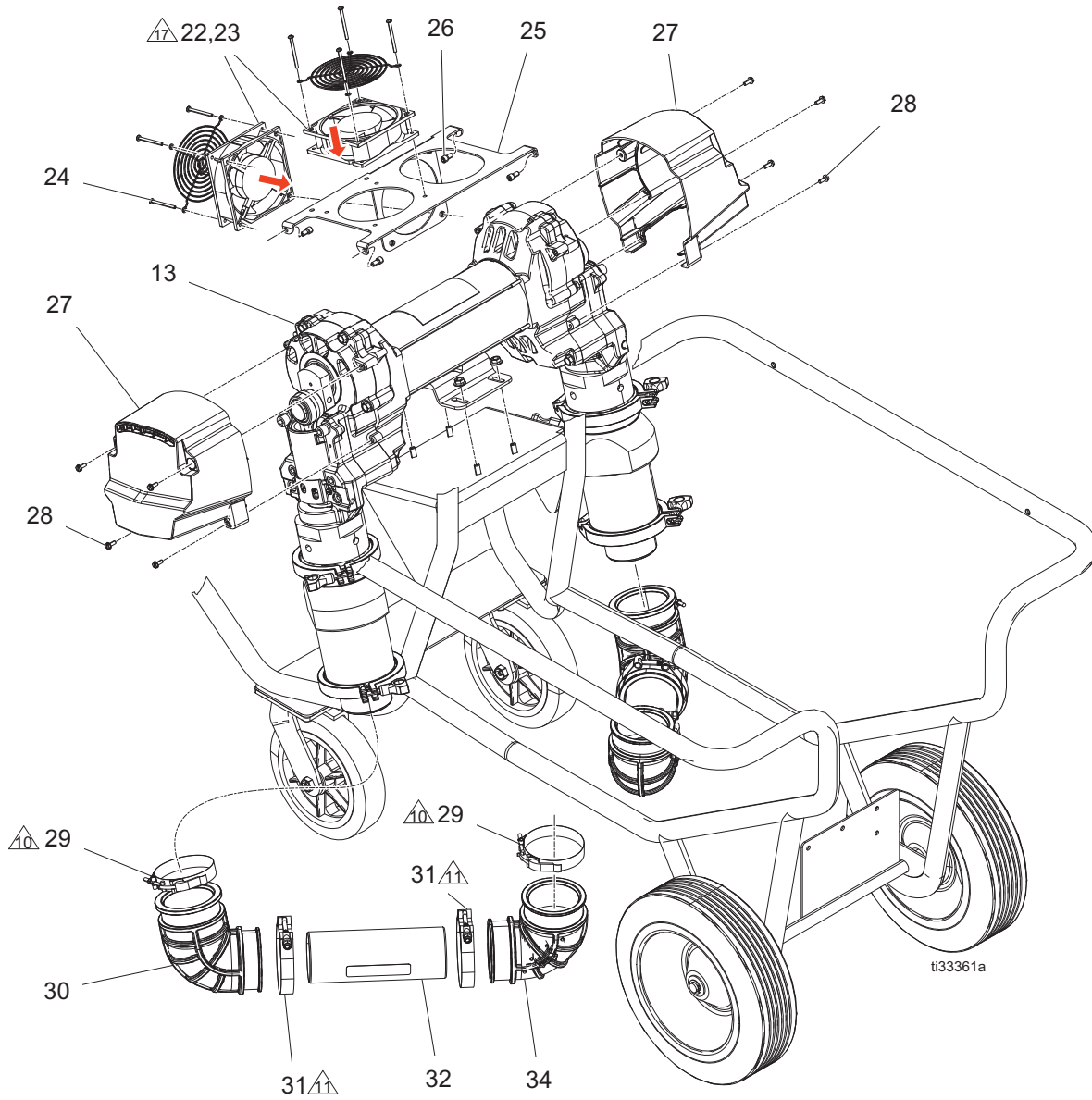
F800e System Parts List




Ref.	Part.	Description	Qty.	Ref.	Part.	Description	Qty.
1*	25B389	CART, assy, painted, F800	1	20	-----	SCREW, cap, flange head, 5/16-18 x 2.0 in.	2
2	17W605	CONTROL BOX, F800E	1	35	128475	FITTING, 1.5 cmlk f x 1.5 npt f	2
3	-----	NUT, hex, flanged, 3/8-16	8	36	114271	STRAP, retaining	2
4	17W628	CASTER, forged, 8 in. dia	2	37	17W638	HOSE SET, manifold	1
5	-----	NUT, hex, flange head, 5/16-18	14	38	17W639	MANIFOLD, F800E	1
6†	-----	WASHER, space	2	39	25D602	FITTING, male 2 in. camlock x male 2 in. npt	1
7†	-----	WHEEL, semi-pneumatic	2	40	-----	SCREW, pan hd, #10-24 x 0.50 in.	4
8†	-----	WASHER, plain 5/8	2	41	17W640	LATCH, adjustable draw	2
9†	-----	RING, retaining, ext	2	42	17W648	BRACKET, mount, manifold, painted	1
10◆	-----	TOOL BOX	1	43	17W642	VALVE, ball, 1000 psi, 1 in.	1
11◆	-----	SCREW, #10-24 x 1.0 in.	4	44	17W643	VALVE, relief, over pressure, F800	1
12◆	-----	NUT, keps, hex hd, #10-24	4				
14	17W630	HOPPER, F800E (includes screws)	1				
15	17G248	SCREW, truss, slotted, 3/8-16 x 1	6				
18	17W631	COVER, F800, top (includes hardware)	1				

* Cart comes with two wheels and two casters assembled on the frame.

Symbol	Kit	Description	Included in Kit: Ref. (Qty.)
†	17W629	Wheel Kit	6 (1), 7 (1), 8 (1), 9 (1)
◆	17J705	Tool Box	10 (1), 11 (4), 12 (4)

F800e System Parts (continued)



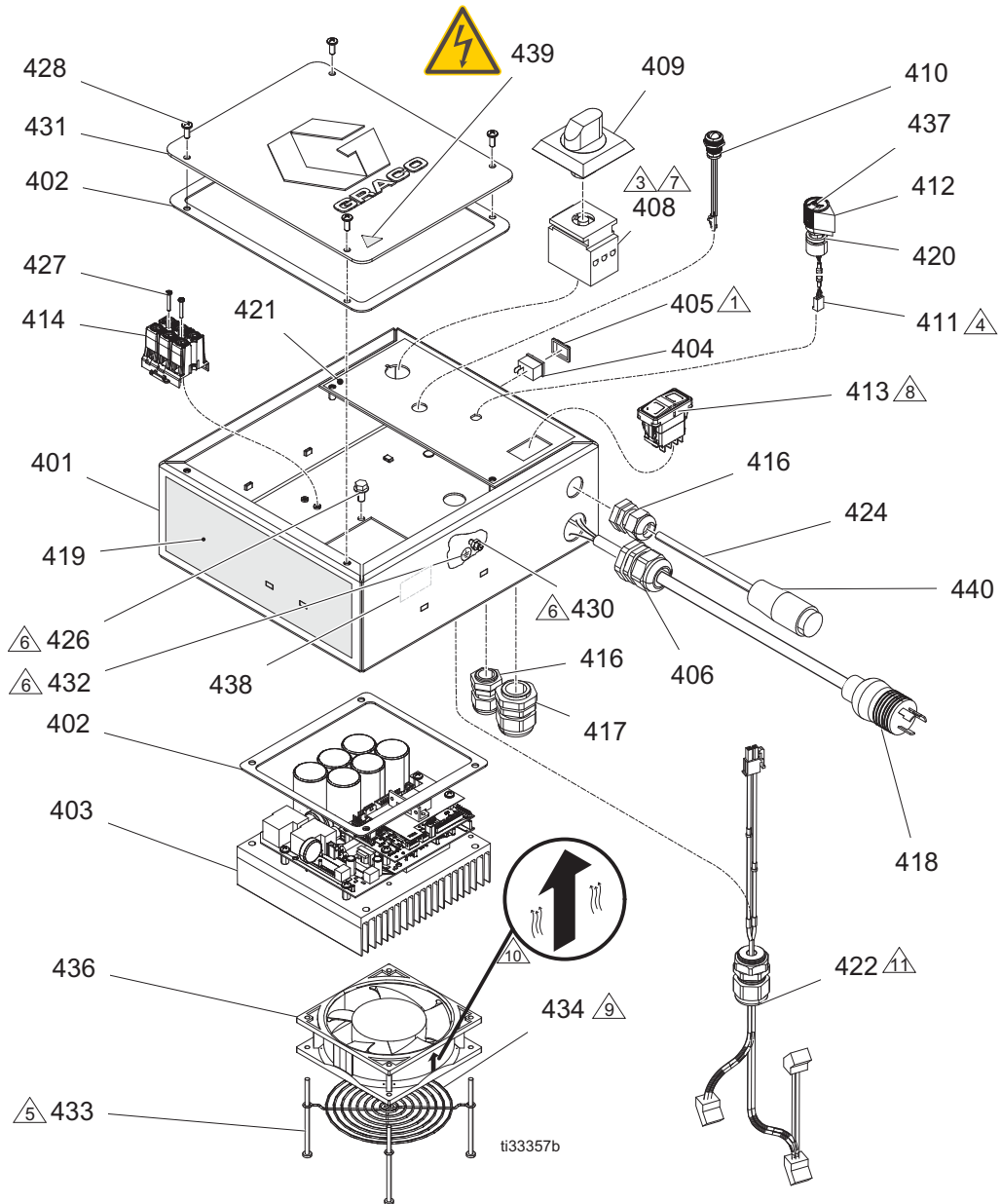
-  Orient clamps as shown. Tighten nut on clamp (29) to a depth of 0.42 in.
-  Orient clamps as shown. Tighten nut on clamp (31) to a depth of 0.50 in.
-  Orient fans (22) for flow and connector location as shown.

F800 System Parts List (continued)

Ref.	Part.	Description	Qty.	Ref.	Part.	Description	Qty.
13	-----	PUMP, double-ended, F800E	1	27	24V024	COVER, front, plastic, painted (hardware included)	2
22	127433	FAN, cooling, 230V, IP55	2	28	118444	SCREW, mach, slot hex wash hd #10-24 TAPTITE x 0.470/0.500	8
23	115836	GUARD, finger	2	29†	17W633	CLAMP, over-center, 3 in. dia.	4
24	120094	SCREW, pan hd, #8-32 x 2.0 in.	8	30†	17H193	BOOT, elbow, rubber, 3 in. ID	2
25	17W632	BRACKET, fan, motor (hardware included)	1	31†	17W634	CLAMP, simple, 3 in. dia.	4
26	C19800	SCREW, cap, socket hd 1/4-20 x 0.5 in.	4	32†	17W635	TUBE, inlet, F800	2
				34†	17W636	BOOT, inlet, F800	2

Symbol	Kit	Description	Included in Kit: Ref. (Qty.)
†	17W637	Inlet Tube Assembly Kit	29 (2), 30 (1), 31 (2), 32 (1), 34 (1)

Control Box Parts (17W605)



- ⚠ (4) Orient (4) to have "O" upward.
- ⚠ (8) Orient (8) with "ON" in the upward position.
- ⚠ (11) Orient (11) to have wires towards the bottom of the enclosure.
- ⚠ Apply thread locker to threads.
- ⚠ Torque to 30 in-lb.
- ⚠ Torque to 7 in-lb.
- ⚠ Orient as shown.
- ⚠ Make sure fan guard is assembled with convex away from fan as shown.

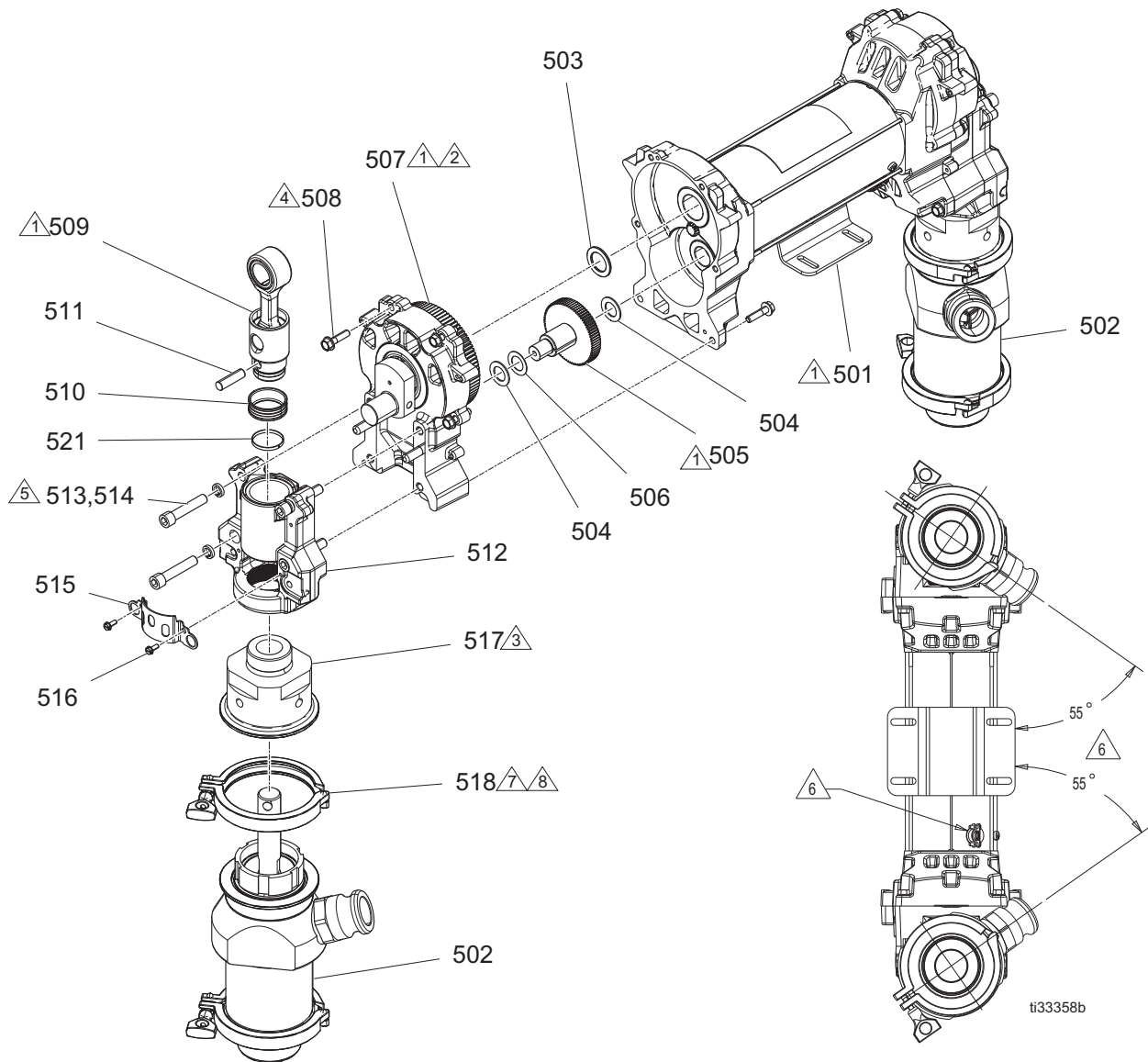
Control Box Parts List

Ref.	Part	Description	Qty.
401	-----	ENCLOSURE, control box, painted	1
402	17W607	GASKET, set	1
403	17W608	MODULE, GCA, F800E (includes gaskets)	1
404	16W611	SWITCH, rocker (includes cap)	1
405	-----	CAP, rocker switch	1
406	116171	BUSHING, strain relief	1
408†	123970	SWITCH, disconnect, 40A	1
409†	123971	KNOB, disconnect, operator	1
410	17U555	HARNESS, 3 color led	1
411	256219	POTENTIOMETR, assembly	1
412	116167	KNOB, potentiometer	1
413	17F719	SWITCH, rotary	1
414	17W610	BLOCK, terminal, 3 pole	1
416	114421	BUSHING, strain relief	1
417	16W761	BUSHING, strain relief	1
418	17U928	CORD, power, L6-30P	1
419	17U307	LABEL, instructions, lp, clean out	1
420	15C973	GASKET	1
421	17E480	LABEL	1
422	17W612	HARNESS, fan power, cord grip	1
423	26C112	HARNESS, rocker switch	1
424	18B821	HARNESS, remote	1
426	113161	SCREW, flange, hex hd, 1/4-20 x 0.50 in.	4
427	-----	SCREW, machine, pnh, #4-40 x 0.75 in.	2
428	116610	SCREW, mach, phil, pan, #10-32 x 0.50 in.	4
429	125871	TIE, Cable, 7.50 In.	11
430	C19293	NUT, hex, machine	2
431	17W606	COVER, control box (hardware included)	1
432▲	186620	LABEL, symbol, ground	1
433	-----	SCREW, #8-32 x 3.25 in.	4
434	115836	GUARD, finger	1
436	127433	FAN, cooling, 230V, IP55	1
437	17J017	LABEL, speed control, F800e	1
438	25D611	LABEL, identification	1
439▲	189930	LABEL, caution	1
440	18B225	CONNECTOR, circular, 4 pin, plug	1

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

Symbol	Kit	Description	Included in Kit: Ref. (Qty.)
†	258921	Disconnect Knob and Switch Kit	408 (1), 409 (1)

Double-Ended Pump Parts



- ① Apply grease lubricant to all gear teeth proportionally (5), motor housings (1), drive housing (7), and to rectangular cavity of connecting rod assembly.
- ② Rotate crankshaft in housing (7) 180° out of phase with one another.
- ③ Apply thread sealant locker to threads.
- ④ Torque to 190-210 in-lb.
- ⑤ Torque to 25-30 ft-lb.
- ⑥ Orient lowers as shown towards the back side of the motor with its wires.
- ⑦ Orient clamps (18) with the joint to be aligned with the outlet of the pump. Knobs should face outwards from the pump line.
- ⑧ Tighten the knob on clamps (18) one full turn after hand tight.

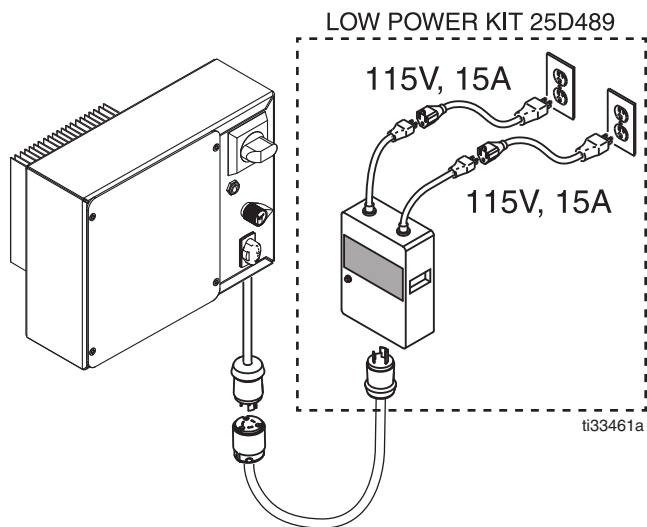
Double-Ended Pump Parts List

Ref.	Part	Description	Qty.
501	25D996	MOTOR, electric, high output fp	1
502	17W613	LOWER, F800	2
503	116192	WASHER, thrust, (1595)	2
504	114672	WASHER, thrust	4
505	288035	GEAR, combination (includes 504, 506)	2
506	114699	WASHER, thrust	2
507	287990	HOUSING, drive Mark X (includes 503, 508)	2
508	15C753	SCREW, mach, hex wash hd, 5/16-18 Taptite x 1.25 in.	12
509◆	25D492	ROD, connecting, assy	2
510◆	19Y279	COLLAR, link, connecting	2
511◆	17V727	PIN, pump	2
512†◆	-----	HOUSING, bearing, 7900, STD	2
513†	112599	SCREW, cap, socket head, 7/16-14 UNC-3A x 2.25 in.	8
514†	112600	WASHER, lock, spring, (hi-collar), 3/16	8
515†	16X770	SHIELD, pump rod	2
516†	118444	SCREW, mach, slot hex wash hd, #10-24 Taptite x 0.470/0.500	4
517	17W627	ADAPTER, lower, clamp	2
518	510490	CLAMP, 4 in. tri-clamp 13mhhm	2
521◆	19Y277	RING, retaining	2

Symbol	Kit	Description	Included in Kit: Ref. (Qty.)
†	17W626	F800 Bearing Housing Kit	512 (1), 513 (4), 514 (4), 515 (1), 516 (2)
◆	17W625	Connecting Rod Assembly Kit	509 (1), 510 (1), 511 (1), 512 (1), 521 (1)

Replacement Parts and Accessories

Low Power Kit (25D489)



When the pump is in the 230V 15A power mode, the Quick 220 low power accessory kit is used to convert two 120 VAC outlets into one 240 VAC power source. The Quick 220 requires that both 120 VAC sources be on different phases of the service panel. The light on the Quick 220 will be ON when the two 120 VAC sources are correct. See the manual included with the kit for more details.

Use the correct extension cord wire gauge for the distance from the outlet: 14 AWG for up to 50 ft, and 12 AWG for extensions exceeding 50 ft.

NOTE: If the amber light is flashing, that is an indication of an error. See **Troubleshooting** section (page 19) for solutions.

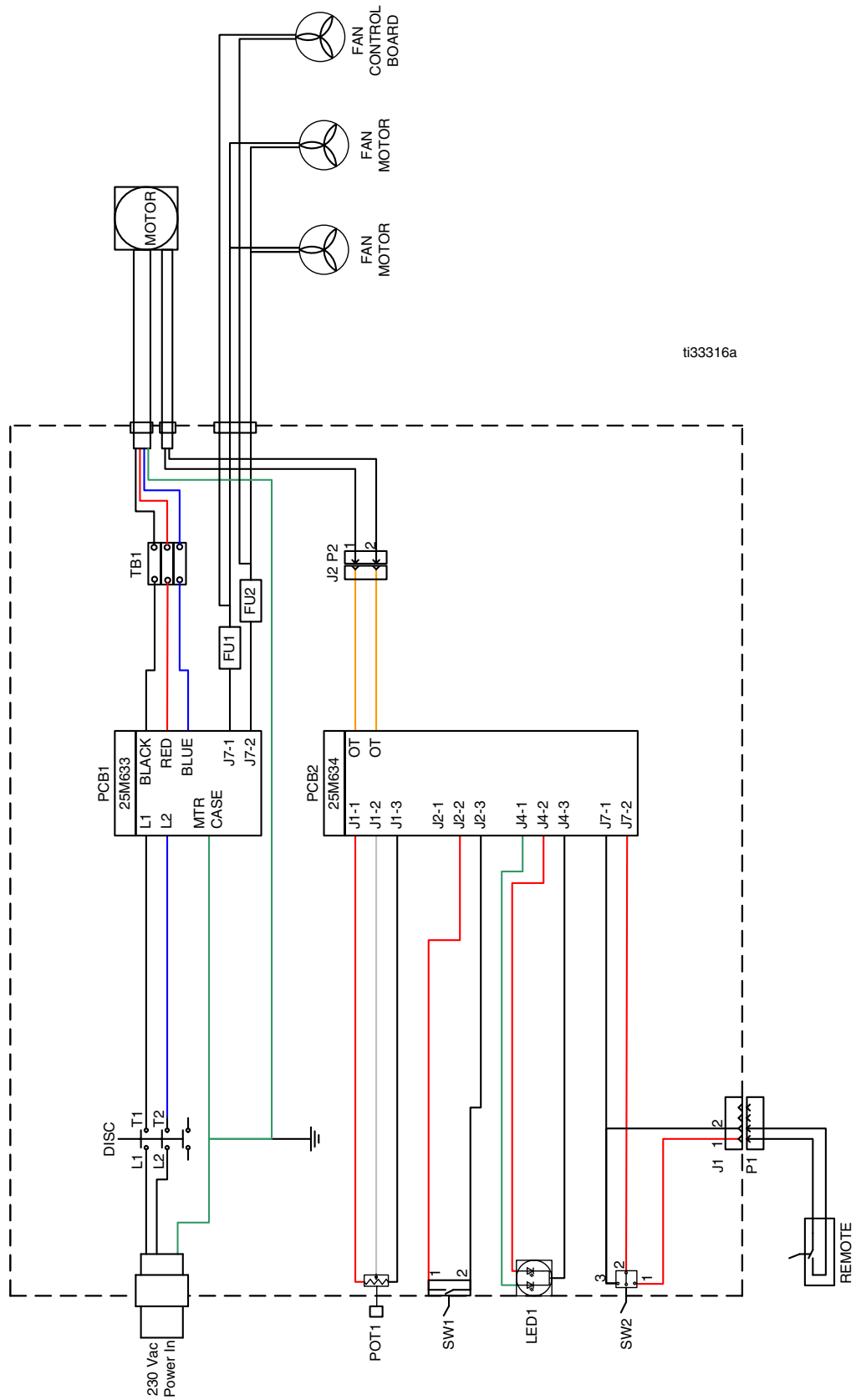
Accessories

Part	Description
17W604	Kit, remote switch, cable (switch and 100 ft cable)
17W829	Kit, remote switch, extension cord (110 ft)
123888	45 degree, m x f, 1 in. npt fitting (attach on applicator before fluid housing for added spray angles)
114271	Strap, retaining
240296	Kit, retaining straps, 4-pack
248515	Kit, clean out, sponge ball, 1.18 in. diameter (30 mm) 5-pack (for use on 1 in. hoses)
25A227	Kit, clean out, sponge ball, 1.57 in. diameter (40 mm) 5-pack (for use on 1.38 in. hoses)
17G930	Kit, clean out, sponge ball, 2.36 in., diameter (60 mm) 5-pack (for use on 2.0 in. hoses)
18B818	Kit, inlet, diameter 1.5

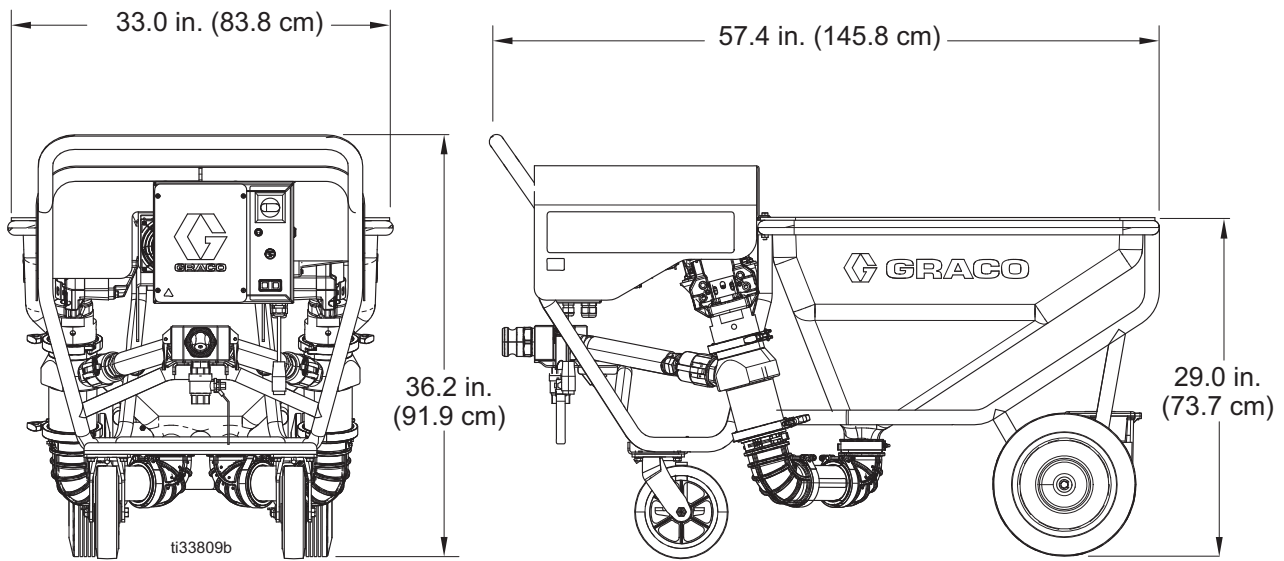
Repair Parts

Part	Description
17W623	Kit, repair, pump, rebuild
510490	Kit, lower, clamp (cylinder clamp)
16W492	Kit, repair, 3-pack, seal, throat, (throat seal)
17W613	Kit, pump, lower, F800e, (complete assembled F800e pump lower)
16W491	Kit, repair, 3-pack, seal piston, (piston packing pump)
25D996	Kit, motor, electric, F800e

Electrical Schematics



Dimensions



Technical Specifications

ToughTek F800e Sprayer		
	U.S.	Metric
Maximum Fluid Working Pressure	600 psi	4.1 MPa, 41 Bar
Stroke Length	2.38 in.	60.3 mm
Maximum Pump Speed	145 cycles per minute	
Weight (dry)	385 lb	175 kg
Wetted Parts	Stainless steel, plated steel, carbide, urethane, PTFE, UHMWPE, LLDPE, aluminum, solvent-resistant o-rings	
Inlet/Outlet Sizes		
Fluid Inlet Size	3 in.	
Fluid Outlet Size	2.0 in. npt(f) with 2.0 in. male camlock	
Hose Requirements		
Minimum Pressure	600 psi	4.1 MPa, 41 Bar
Minimum Hose Diameter	1.0 in.	2.5 cm
Minimum Hose Length	25 ft	7.6 m
Dimensions		
Length	57.4 in.	145.8 cm
Width	33.0 in.	83.8 cm
Height	36.2 in.	91.9 cm
Hopper Height	29.0 in.	73.7 cm
Electrical Ratings		
200–240 VAC Models	30 A, 1 phase, 60 Hz	
Noise Level		
Sound Pressure measured at 3.1 ft	83.0 dB(A)	
Operating Ambient Temperature Range		
Temperature	32 °F to 120 °F	0 °C to 49 °C

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Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211, **Fax:** 612-378-3505

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Original instructions. This manual contains English. MM 3A5653

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA
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