Repair

Mark VII Max, Mark X Premium and Mark X Max Electric Airless Sprayers

3A2244A
EN

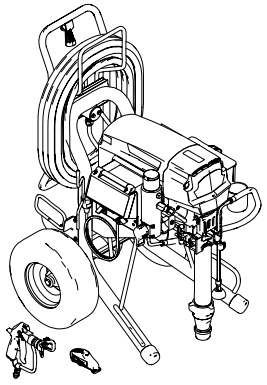
For Portable Airless Spraying of Architectural Coatings and Paints.
For professional use only. Not approved for use in European explosive atmosphere locations.

3300 psi (227 bar, 22.7 MPa) Maximum Working Pressure

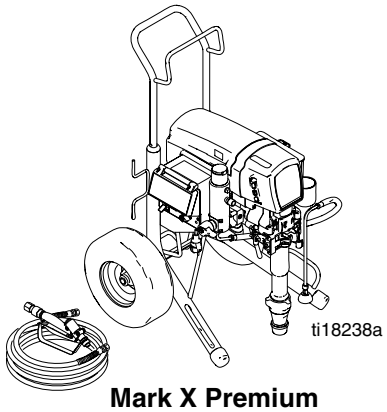
IMPORTANT SAFETY INSTRUCTIONS
Read all warnings and instructions in this manual and all related manuals. Save these instructions.

Related Manuals:

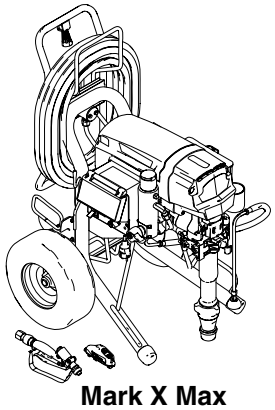
3A2243
309495
308491
309277
310894
3A2245
3A2528



Mark VII Max



Mark X Premium



Mark X Max

CE

PROVEN QUALITY. LEADING TECHNOLOGY.

Models:

Model	QuikReel	E-Control	Blue Texture Gun	HD Inline Texture Gun	1/2in. x 50ft + 3/8in. x 12ft whip (12.7mm x 15m + 9.5mm x 3.7m whip)	1/2in. x 100ft + 3/8in. x 12ft whip (12.7mm x 30m + 9.5mm x 3.7m whip)
24L996 Mark VII MAX - Europe	✓	✓	✓			✓
24L997 Mark VII MAX - MultiCord	✓	✓	✓			✓
24M734 Mark VII Max - Special Edition	✓	✓	✓			✓
24L998 Mark X MAX - Europe	✓	✓		✓		✓
24L999 Mark X MAX - MultiCord	✓	✓		✓		✓
24M005 Mark X Premium - Europe				✓	✓	
24M006 Mark X Premium - MultiCord				✓	✓	

Table of Contents

Warnings

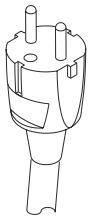
The following warnings are for the setup, use, grounding, maintenance and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings.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

⚠ WARNING

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 230V (or 110V for UK models) circuit and has a grounding plug similar to the plug illustrated in the figure below.

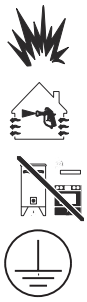


- Only connect the product to an outlet having the same configuration as the plug.
- Do not use an adapter with this product.

Extension Cords:

- Use only a 3-wire extension cord that has a grounding plug and a 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 (2.5 mm^2) 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.
- Connect to a grounded outlet and use grounded extensions cords. Do not use a 3-to-2 adapter.
- Do not use a paint or a solvent containing halogenated hydrocarbons.
- Keep spray area well-ventilated. Keep a good supply of fresh air moving through the area. Keep pump assembly in a well ventilated area. Do not spray pump assembly.
- Do not smoke in the spray area.
- 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.
- Sprayer generates sparks. When flammable liquid is used in or near the sprayer or for flushing or cleaning, keep sprayer at least 20 feet (6 m) away from explosive vapors.

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.
- Do not leave the unit energized or under pressure while unattended. When the unit is not in use, turn off the unit and follow the **Pressure Relief Procedure** for turning off the unit.
- 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**.
- Check hoses and parts for signs of damage. Replace any damaged hoses or parts.
- This system is capable of producing 3300 psi (227 bar, 22.7 MPa). Use Graco replacement parts or accessories that are rated a minimum of 3300 psi (227 bar, 22.7 MPa).
- 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

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS 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.

ELECTRIC SHOCK HAZARD

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

- 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
- Wait five minutes after disconnecting power cord before servicing large capacitor units.

PRESSURIZED ALUMINUM PARTS HAZARD

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.

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.

MOVING PARTS HAZARD

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

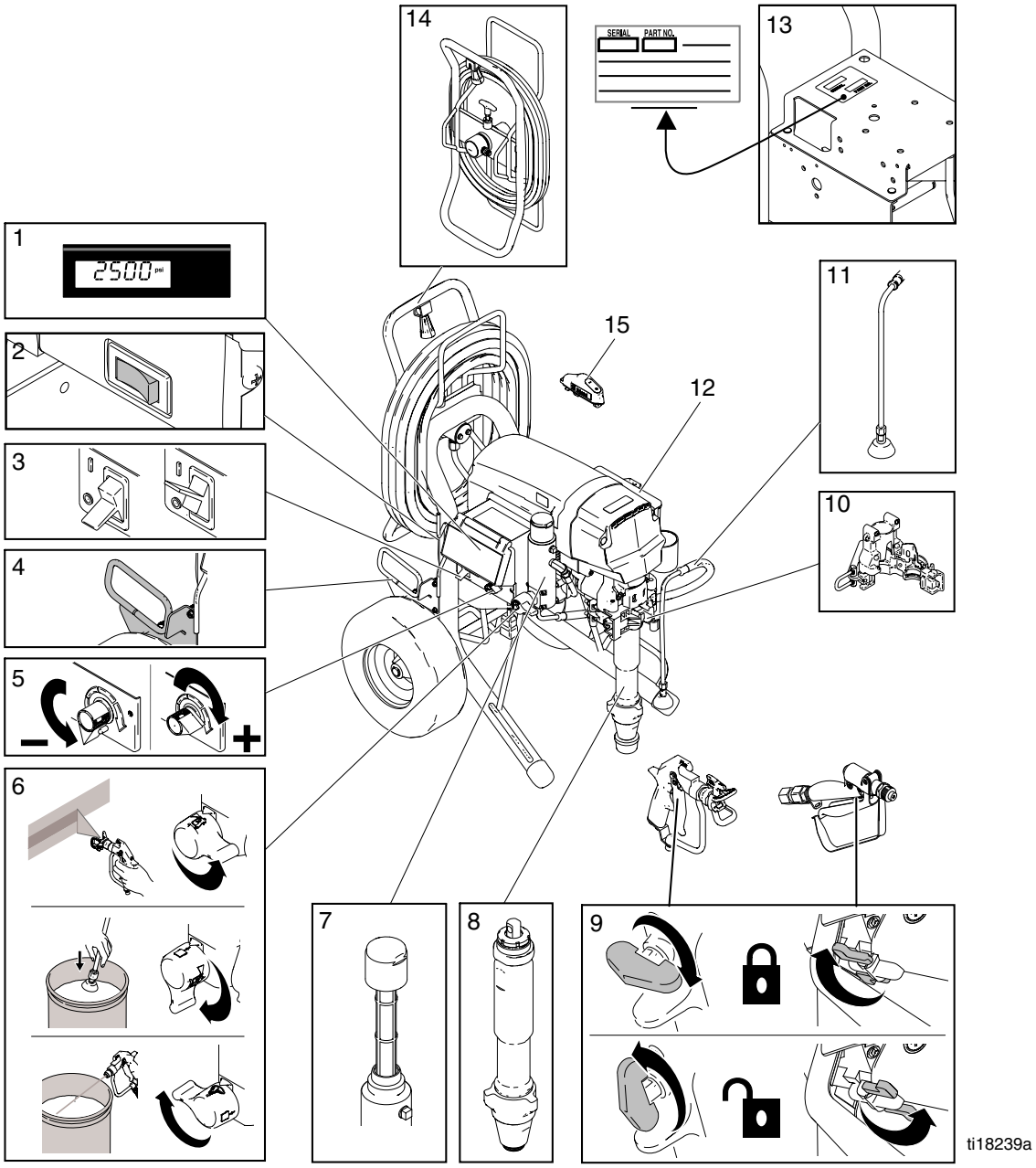
- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This 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.

Component Identification

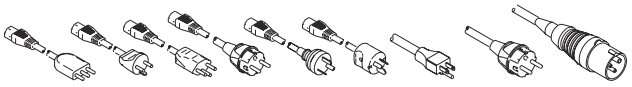


1	Digital Display	9	Trigger Lock
2	10 / 16 Amp Switch	10	Bearing Housing / ProConnect™
3	ON/OFF Switch	11	Drain Tube
4	Hose Reel Guide	12	Tool Box
5	Pressure Control	13	Unit / Serial Tag
6	Spray / Prime / Fast Flush	14	Hose Reel
7	Filter	15	E-Control
8	Pump		

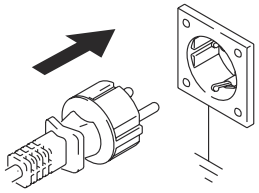
Grounding

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.

The sprayer cord includes a grounding wire with an appropriate grounding contact.



This sprayer requires 220-240 VAC, 50/60 Hz circuit with a grounding receptacle. Never use an outlet that is not grounded.



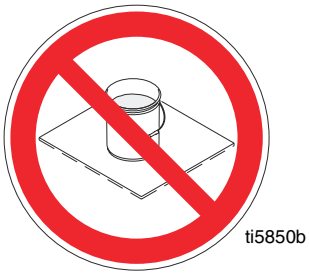
Do not modify plug! Tampering with the plug will result in a voided warranty. Do not use sprayer if electrical cord has damaged ground prong.

If plug will not fit in outlet, have grounded outlet installed by a qualified electrician. Do not use an adapter. **NOTE:** Smaller gauge or longer extension cords may reduce sprayer performance.

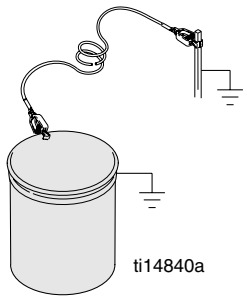
Pails

To reduce the risk of static sparking, explosion and electric shock when using solvent and oil/based fluids, use only conductive metal pails, placed on a grounded surface such as concrete.

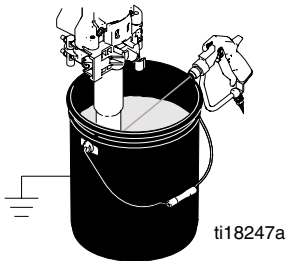
Do not place pail on a nonconductive surface such as paper or cardboard which interrupts grounding continuity.



Grounding a metal pail: connect a ground wire to the pail by clamping one end to pail and other end to a true earth ground.



To maintain grounding continuity when flushing or relieving pressure: hold metal part of spray gun firmly to side of a grounded metal pail. Then trigger gun.



Thermal Overload

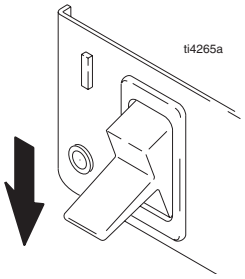
Motor has a thermal overload switch to shut itself down if overheated. If unit overheats, allow approximately 45 minutes for unit to cool. Once cool, switch will close and unit will restart.

To reduce risk of injury from motor starting unexpectedly when it cools, always turn power switch OFF if motor shuts down.

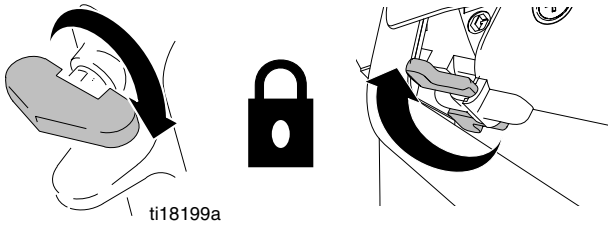
Pressure Relief Procedure

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 spraying and before cleaning, checking, or servicing the equipment.

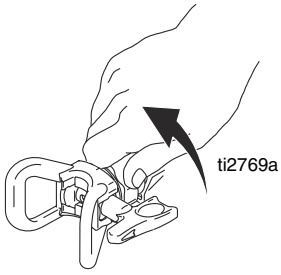
1. Turn power **OFF.** Wait 5 minutes for power to dissipate.



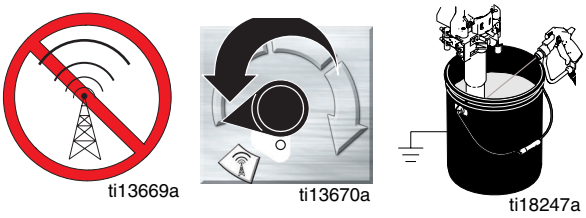
2. Lock gun trigger safety.



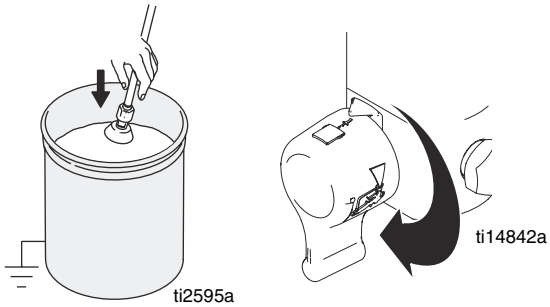
3. Remove guard and SwitchTip.



4. Turn pressure to lowest setting. Make sure you are not in **E-Control Mode** (see Operation manual). Trigger gun to relieve pressure.



5. Put drain tube in pail. Turn prime valve down to DRAIN position.



Troubleshooting

Mechanical/Fluid Flow

Perform **Pressure Relief Procedure**; page 9.

TYPE OF PROBLEM	WHAT TO CHECK If check is OK, go to next check	WHAT TO DO When check is not OK, refer to this column
CODE XX is displayed	Fault condition exists	Determine fault correction from table, page 13.
Pump output is low	Spray tip worn	Follow **Pressure Relief Procedure** on page 9, then replace tip. See your separate gun or tip manual.
	Spray tip clogged	Relieve pressure. 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, tip filter, or tip is clogged or dirty.	Clean filter; see operation manual.
	Prime valve leaking	Relieve pressure. 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.

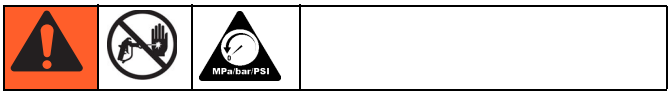
TYPE OF PROBLEM	WHAT TO CHECK If check is OK, go to next check	WHAT TO DO When check is not OK, refer to this column
Pump output is low	Pump rod damage	Repair pump. See pump manual.
	Low stall pressure	Turn pressure knob fully clockwise. Make sure pressure control knob is properly installed to allow 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.
	Pressure setting is too low	Increase pressure; see pump manual.
	Large pressure drop in hose with heavy materials	Use larger diameter hose and/or reduce overall length of hose.
	Check to see if 10/16 Amp switch is on 10A setting. Make sure circuit is able to provide 16A.	Switch to 16A setting. Change to circuit that provides 16A. Change to less loaded circuit.
Motor runs but pump does not stroke	Displacement pump pin damaged or missing; see pump manual.	Replace pump pin if missing. Be sure retainer spring is fully in groove all around connecting rod; see pump manual.
	Connecting rod assembly damaged; see pump manual.	Replace connecting rod assembly; see pump manual.
	Gears or drive housing damaged, page 26.	Inspect drive housing assembly and gears for damage and replace if necessary; see pump manual.
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.
	Tip is partially clogged	Clear tip; see Operation manual.
	Fluid supply is low or empty	Refill fluid supply. Prime pump; see pump manual. Check fluid supply often to prevent running pump dry.

TYPE OF PROBLEM	WHAT TO CHECK If check is OK, go to next check	WHAT TO DO When check is not OK, refer to this column
Pump is difficult to prime	1. Air in pump or hose	1. Check and tighten all fluid connections. Cycle pump as slowly as possible during priming.
	2. Intake valve is leaking	2. Clean intake valve. Be sure ball seat is not nicked or worn and that ball seats well. Reassemble valve.
	3. Pump packings are worn	3. Replace pump packings; see pump manual.
	4. Paint is too thick	4. Thin the paint according to supplier recommendations.
No display, sprayer operates	1. Display is damaged or has bad connection	1. Check connections. Replace display.

Electrical

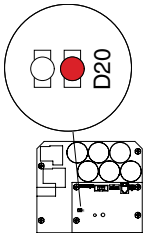
Symptom: Sprayer does not run, stops running, or will not shut off.

Perform **Pressure Relief Procedure**; page 9.



1. Plug sprayer into correct voltage, grounded outlet
2. Set power switch OFF for 30 seconds and then ON again (this ensures sprayer is in normal run mode)
3. Turn pressure control knob clockwise 1/2 turn
4. View digital display

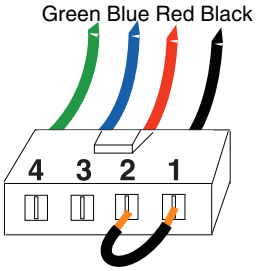
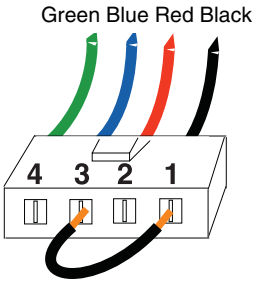
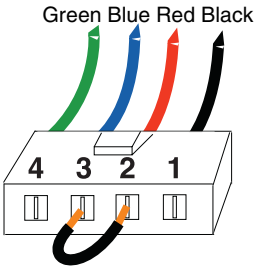
Keep clear of electrical and moving parts during troubleshooting procedures. To avoid electrical shock hazards when covers are removed for troubleshooting, wait 5 minutes after unplugging power cord for stored electricity to dissipate.



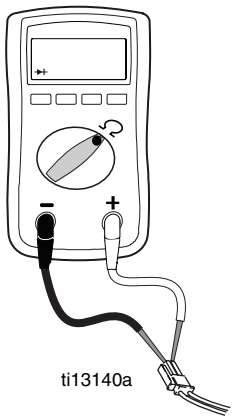
If no digital display is available, use control board status light to troubleshoot problems: Turn ON/OFF switch OFF, remove control cover and then turn power back ON. Observe status light. Blinking LED total count equals digital code i.e., two blinks equals CODE=02.

TYPE OF PROBLEM	WHAT TO CHECK	HOW TO CHECK
Sprayer does not run at all Digital display is blank Control board status light never lights	See flow chart, page 18.	
Sprayer does not run at all Digital display shows CODE 2  Control board status light blinks 2 times repeatedly	Check transducer or transducer connections	1. Make sure there is no pressure in the system (see **Pressure Relief Procedure**, page 9). Check fluid path for clogs, such as clogged filter. 2. Use airless paint spray hose with no metal braid 1/4 in. x 50 ft minimum. Smaller hose or metal braid hose may result in high-pressure spikes. 3. Set sprayer to OFF and disconnect power to sprayer. 4. Check transducer and connections to control board. 5. Disconnect transducer from control board socket. Check that transducer and control board contacts are clean and secure. 6. Reconnect transducer to control board socket. Connect power, set sprayer ON and control knob 1/2 turn clockwise. If sprayer does not run properly, set sprayer to OFF and go to next step. 7. Install new transducer. Connect power, set sprayer ON and control knob 1/2 turn clockwise. Replace control board if sprayer does not run properly.

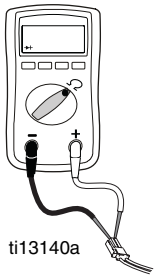
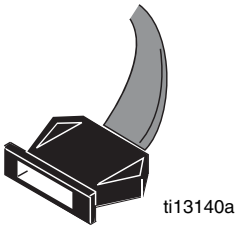
TYPE OF PROBLEM	WHAT TO CHECK	HOW TO CHECK
Sprayer does not run at all Digital display shows CODE 3  Control board status light blinks 3 times repeatedly	Check transducer or transducer connections (control board is not detecting a pressure signal).	1. Set sprayer to OFF and disconnect power to sprayer. 2. Check transducer and connections to control board. 3. Disconnect transducer from control board socket. Check to see if transducer and control board contacts are clean and secure. 4. Reconnect transducer to control board socket. Connect power, set sprayer ON and control knob to 1/2 turn clockwise. If sprayer does not run, set sprayer to OFF and go to next step. 5. Connect a confirmed working transducer to control board socket. 6. Set sprayer ON and control knob to 1/2 turn clockwise. If sprayer runs, install new transducer. Replace control board if sprayer does not run. 7. Check transducer resistance with ohmmeter (less than 9k ohm between red and black wires and 3-6k ohm between green and yellow wires).

TYPE OF PROBLEM	WHAT TO CHECK	HOW TO CHECK
Sprayer does not run at all Digital display shows CODE 5  Control board status light blinks 5 times repeatedly	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.	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. 2. Set sprayer to OFF and disconnect power to sprayer. 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. 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. 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 & 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 & 3 and 2 & 3. Pin 4 (the green wire) is not used in this test. If all spin test is positive, continue to step 6. **STEP 1:**  **STEP 2:**  **STEP 3:** 

<table>
<tr><th>TYPE OF PROBLEM</th><th>WHAT TO CHECK</th><th>HOW TO CHECK</th></tr>
<tr><td>Sprayer does not run at all
Digital display shows CODE 5
 
Control board status light blinks 5 times repeatedly</td><td rowspan="2">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.</td><td>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.

7. Check Motor Thermal Switch: Unplug thermal wires. Set meter to ohms. Meter should read the proper resistance for each unit (see table below).</td></tr>
<tr><td> 
ti13140a

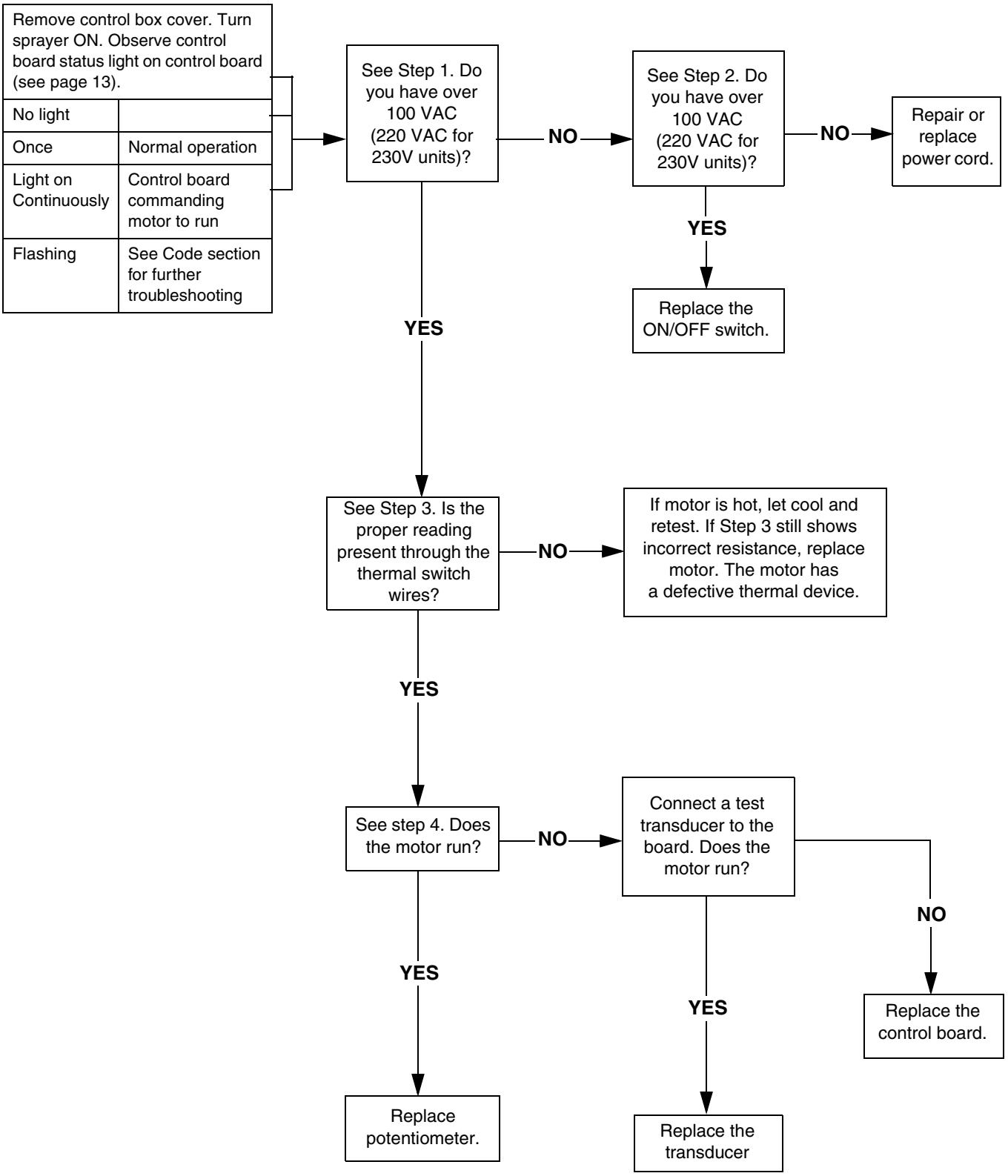
<table><tr><th colspan="2">Resistance Table:</th></tr><tr><td>MARK VII</td><td>6.2k ohms</td></tr><tr><td>MARK X</td><td>10.0k ohms</td></tr></table></td></tr>
</table>

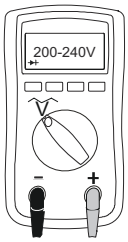
TYPE OF PROBLEM	WHAT TO CHECK	HOW TO CHECK
Sprayer does not run at all Digital display shows CODE 6  Control board status light blinks 6 times repeatedly	Allow sprayer to cool. If sprayer runs when cool, correct cause of overheating. Keep sprayer in cooler location with good ventilation. Make sure motor air intake is not blocked. If sprayer still does not run, follow Step 1.	**NOTE:** Motor must be cooled down for the test. 1. Check thermal device connector (yellow wires) at control board. 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. **Check Motor Thermal Switch:** Unplug thermal wires. Set meter to ohms. Meter should read the proper resistance for each unit (see table below).  ti13140a **Resistance Table:** MARK VII: 6.2k ohms MARK X: 10.0k ohms 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.
Sprayer does not run at all Digital display shows CODE 9  Control board status light blinks 9 times repeatedly	Check the connections. Control is not receiving a motor position sensor signal	1. Turn power OFF. 2. Disconnect motor position sensor and inspect for damage at connectors.  ti13140a 3. Reconnect sensor. 4. Turn power ON. If code continues, replace motor.
Sprayer does not run at all Digital display shows CODE 10  Control board status light blinks 10 times repeatedly	Check to see if control board is over heating.	1. Make sure motor air intake is not blocked. 2. Make sure fan has not failed. 3. Make sure control board is properly connected to back plate and that conductive thermal paste is used on power components. 4. Replace control board. 5. Replace motor.

Sprayer Will Not Run

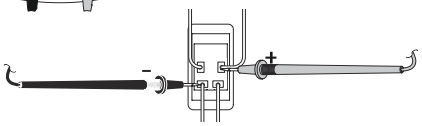
(See following page for steps)

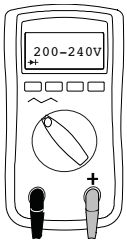
Remove control box cover. Turn sprayer ON. Observe control board status light on control board (see page 13).	
No light	
Once	Normal operation
Light on Continuously	Control board commanding motor to run
Flashing	See Code section for further troubleshooting



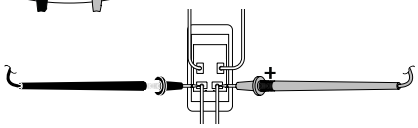


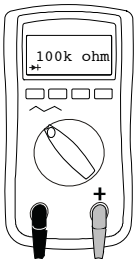
STEP 1:
Plug power cord in and turn switch ON. Connect probes to on/off switch. Turn meter to AC Volts.



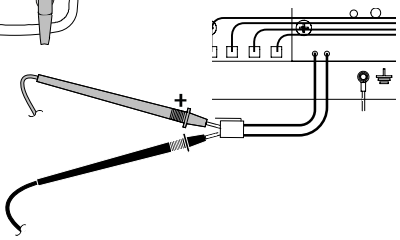


STEP 2:
Plug power cord in and turn switch ON. Connect probes to on/off switch. Turn meter to AC Volts.

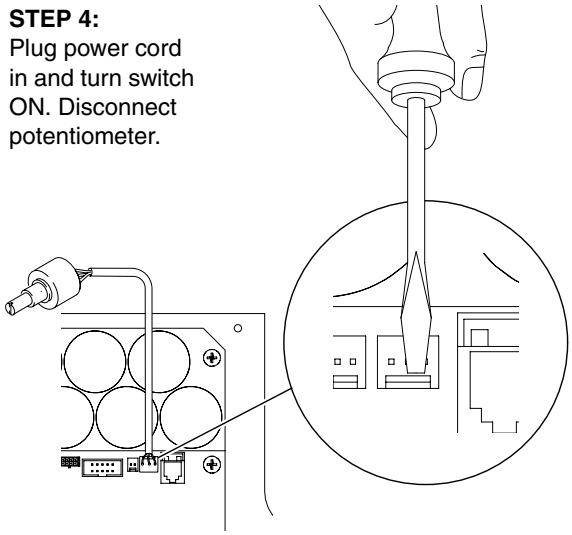




STEP 3:
Check motor thermal switch. Unplug yellow wires. Meter should read according to Resistance Table on page 17.
NOTE: Motor should be cool during reading.



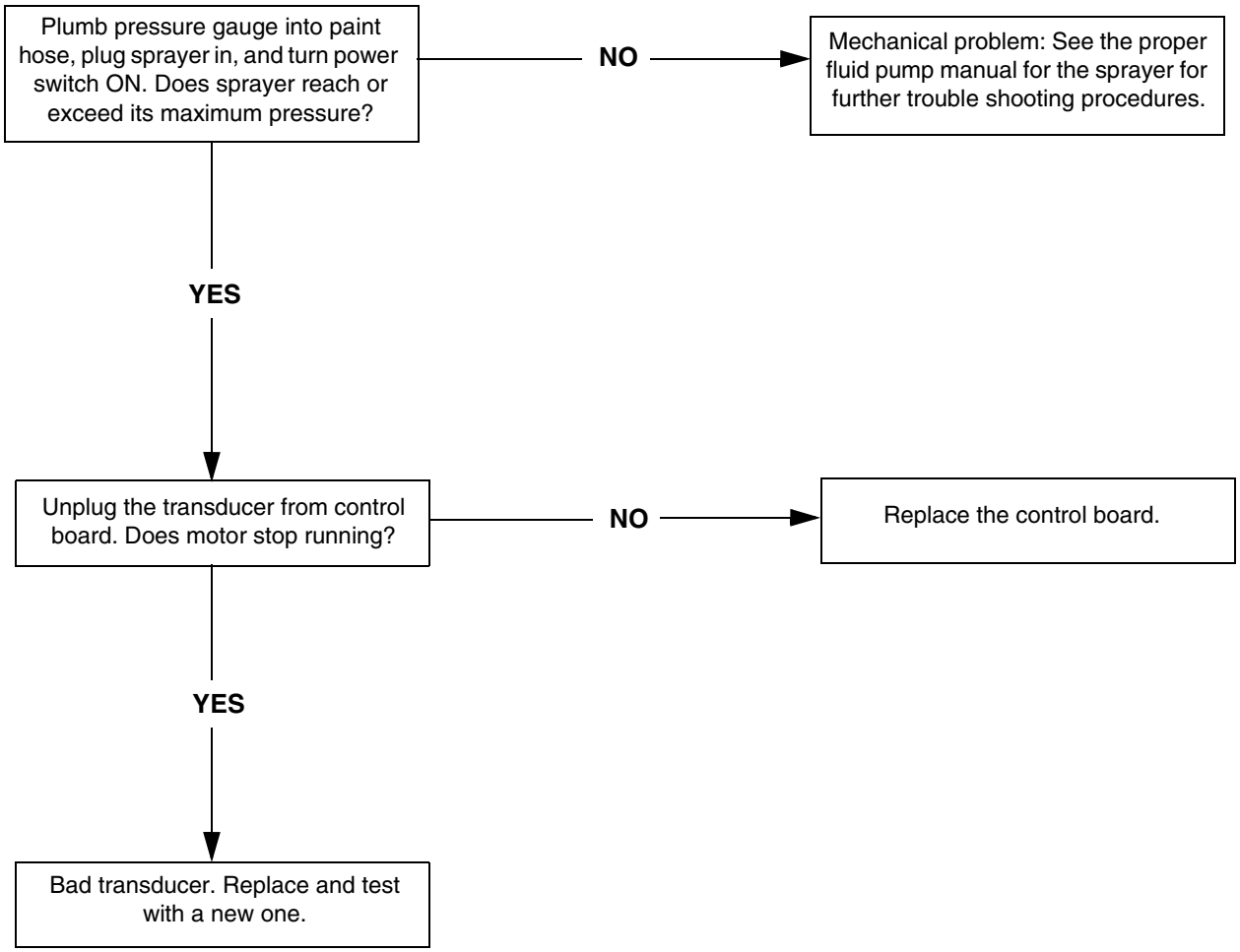
STEP 4:
Plug power cord in and turn switch ON. Disconnect potentiometer.



Sprayer Will Not Shut Off

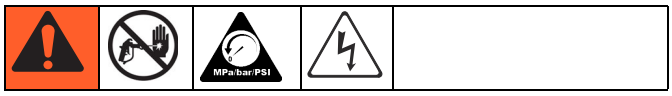
1. Perform **Pressure Relief Procedure**; page 9. Leave prime valve open and power switch OFF.
2. Remove control box cover so the control board status light can be viewed if available.

Troubleshooting Procedure

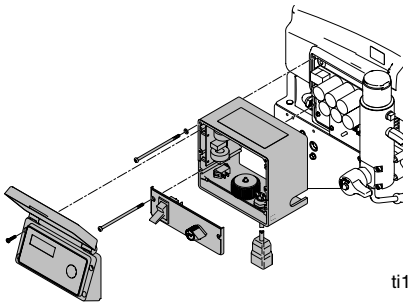


Motor Control Board

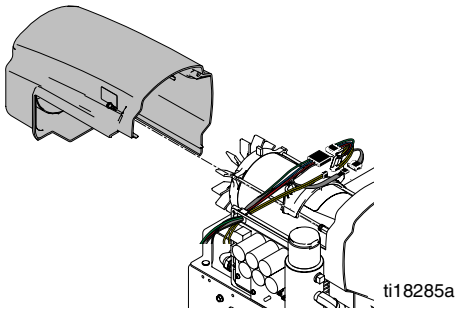
Removal



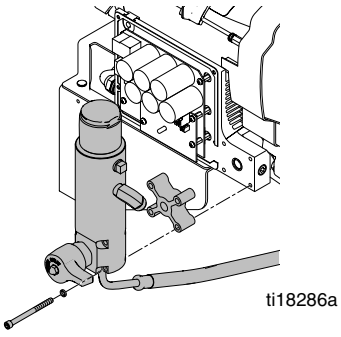
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove display, control panel, and control box.



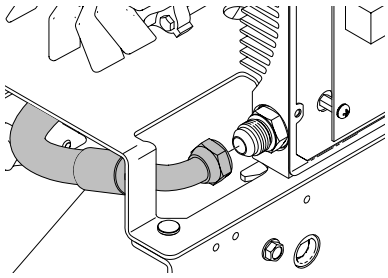
3. Disconnect display, 10/16 Amp switch, potentiometer, pressure transducer, and fast flush connection (if supplied). See **Wiring Diagrams**, page 34.
4. Remove motor shroud. Disconnect wires on top of motor.



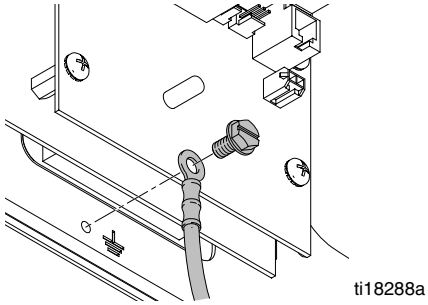
5. Remove four screws from front of filter bowl, then remove filter bowl assembly and spacer.



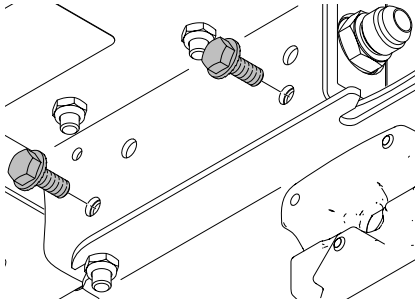
6. Remove hose from power bar.



7. Remove ground wire from control board assembly.



8. Remove two screws from underneath sprayer platform to remove control board assembly.



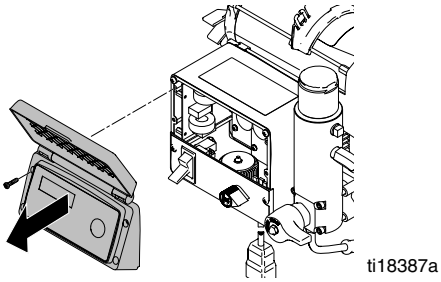
Installation

1. Attach control board assembly to the frame. Torque to 25 - 30 ft-lb (34 - 41 N•m).
2. Attach ground wire to assembly. Torque to 22 - 28 in-lb (2.5 - 3.2 N•m).
3. Attach hose to power bar.
4. Attach filter bowl to powerbar and torque four screws to 65 - 80 in-lb (7.3 - 9.0 N•m).
5. Reconnect wiring to motor. Reinstall motor shroud.
6. Reconnect fast flush connection, pressure transducer, potentiometer, 10/16 Amp switch, and display. See **Wiring Diagrams**, pages 34.
7. Install control box, control panel, display.

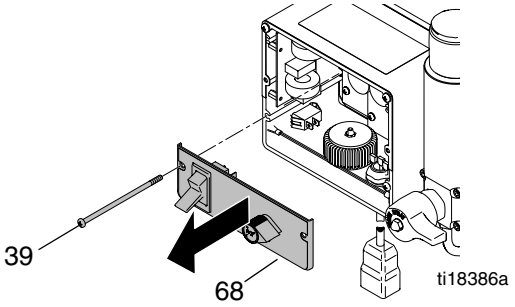
Filter Board

Removal

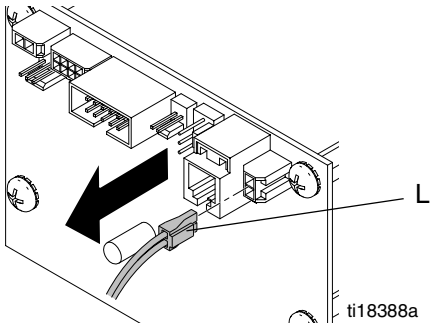
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove four screws and display cover.



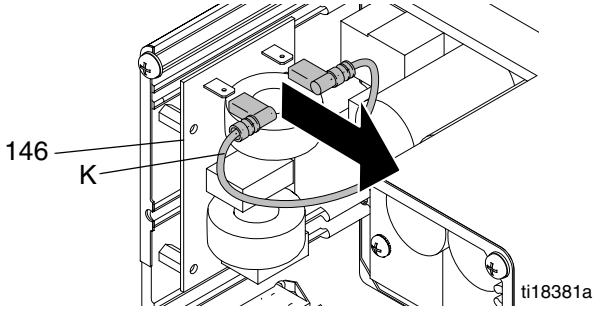
3. Disconnect display connector from motor control board.
4. Remove bottom two screws (39). Disconnect potentiometer connector from motor control board.



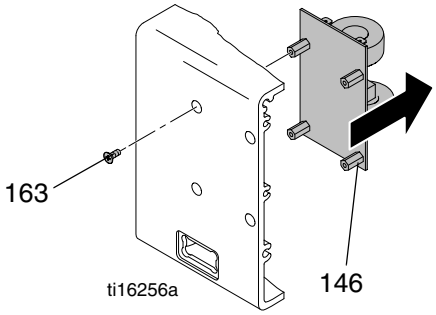
5. Disconnect power cord connectors and filter board connectors from ON/OFF switch and remove control panel.
6. **Mark VII Units:** Disconnect Fast Flush switch connector (L) from motor control board.



7. Disconnect motor control board power connectors (K) from filter board (146).



8. Remove four screws (163) from filter board (146).



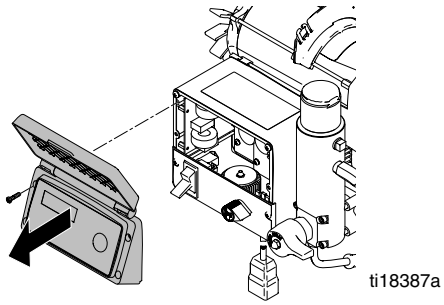
Installation

1. Install filter board (146) with four screws (163).
2. Connect motor control board power connectors (K) to filter board (146).
3. Connect filter board power connectors to top two terminals of ON/OFF switch and power cord connectors to bottom two terminals of ON/OFF switch. Connect potentiometer connector to motor control board.
4. **Mark VII Units:** Connect Fast Flush switch connector (L) to motor control board.
5. Install control panel (68) with two screws (39).
6. Connect display connector to motor control board.
7. Install cover with four screws.

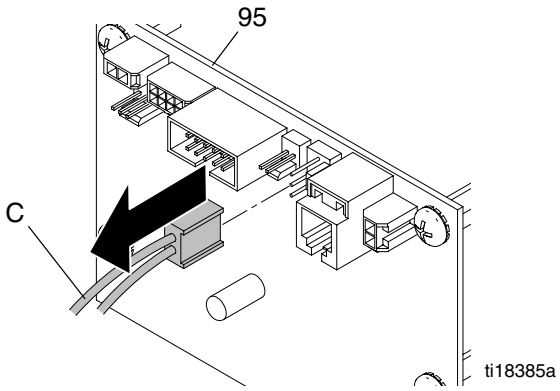
Pressure Adjust Potentiometer

Removal

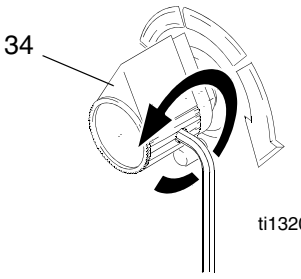
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove display.



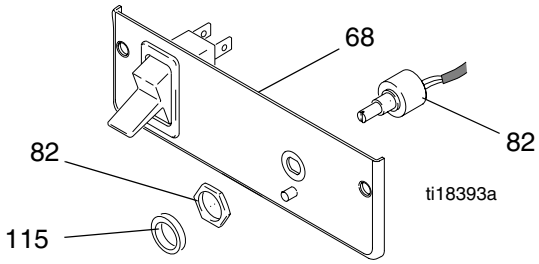
3. Remove control panel.
4. Disconnect potentiometer connector (C) from motor control board (95).



5. Use allen wrench to loosen two screws on knob (34).



6. Remove gasket (115), nut and potentiometer (82) from control panel (68).

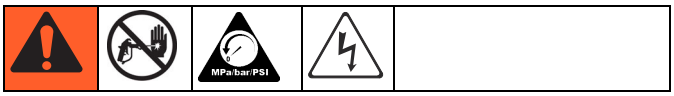


Installation

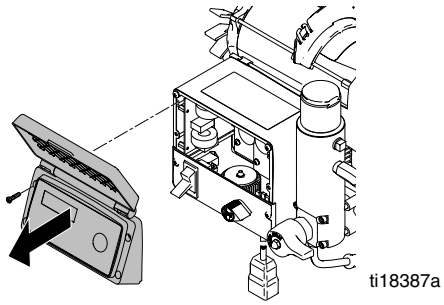
1. Install gasket (115), nut and potentiometer (82) on control panel (68). Torque nut to 30-35 in-lb (3.25 - 4.0 N•m).
2. Rotate new potentiometer shaft to highest pressure setting (fully clockwise) and install knob (34). Use allen wrench to tighten two screws on knob.
3. Connect potentiometer connector (C) to motor control board.
4. Install control panel and tighten two screws.
5. Install cover with four screws.

Pressure Control Transducer

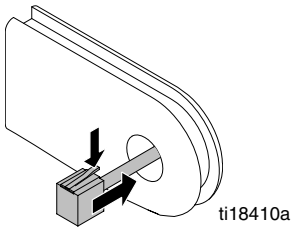
Removal



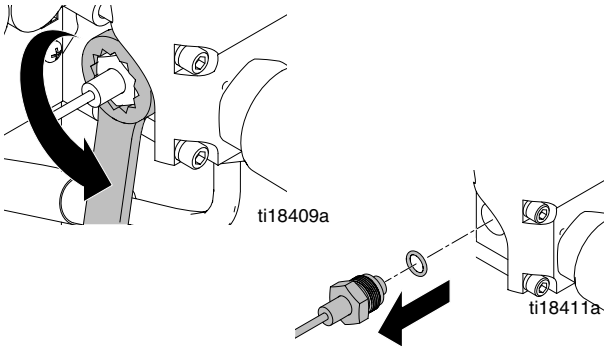
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove display.



3. Remove control panel.
4. Disconnect transducer from motor control board.
5. Remove two screws and allow control panel to hang down.
6. Press tab on transducer connector and pull transducer wire through grommet.



7. Route transducer wire through 3/4 in. box. end wrench and remove transducer and o-ring from valve block.



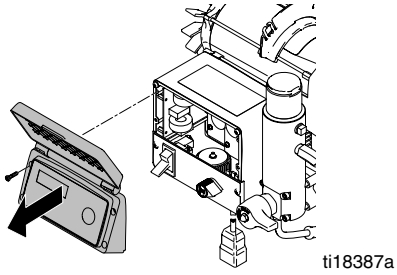
Installation

1. Install transducer and o-ring in valve block. Torque to 47 - 61 N•m (35 - 45 ft-lb).
2. Press tab on transducer connector and push transducer wire through grommet.
3. Install control box. Torque screws to 3.4 - 3.9 N•m (30 - 35 in-lb).
4. Connect transducer connector to motor control board.
5. Connect display connector to motor control board.
6. Install cover with four screws.

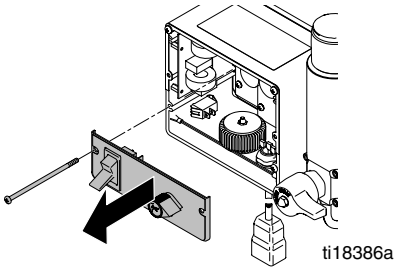
Fast Flush Switch Replacement (Mark VII Only)

Removal

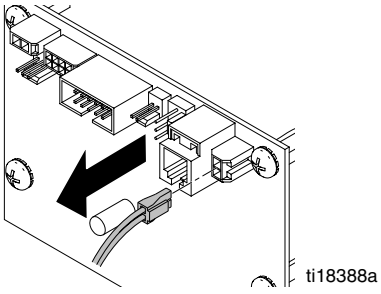
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove four screws and remove display cover.



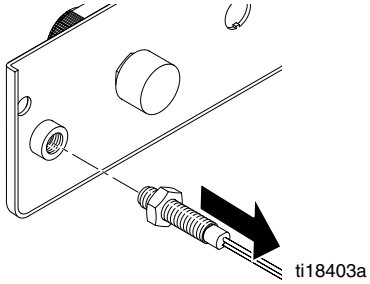
3. Remove two screws and remove control panel.



4. Unplug Fast Flush switch from control board.

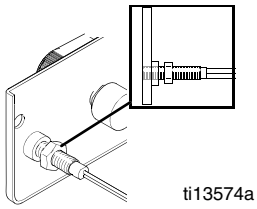


5. Unscrew Fast Flush switch from control panel.

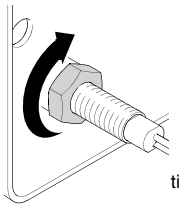


Installation

1. Apply thread sealant to end of Fast Flush switch. Hand tighten Fast Flush switch until it is tight against control panel.

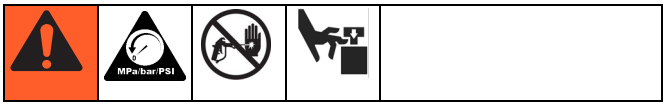


2. Add thread sealant and tighten jam nut against threaded bus.



3. Connect Fast Flush switch to control board.
4. Replace control panel and tighten two screws.
5. Replace display cover and tighten four screws.

Drive and Bearing Housing Replacement

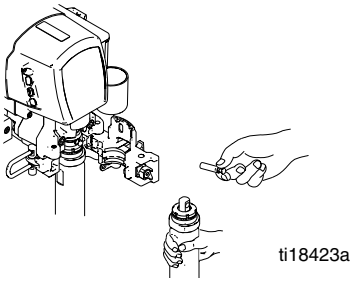


NOTICE

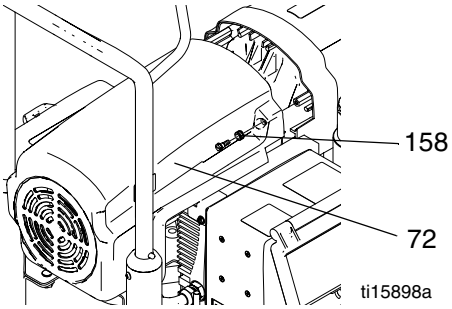
Do not drop gear cluster when removing drive housing or damage will occur. Gear cluster could stay engaged in motor front end bell or drive housing.

Removal

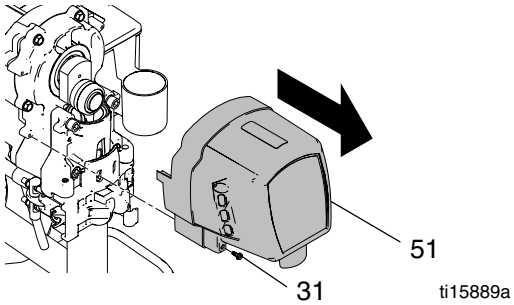
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove **Pump**, page 28.



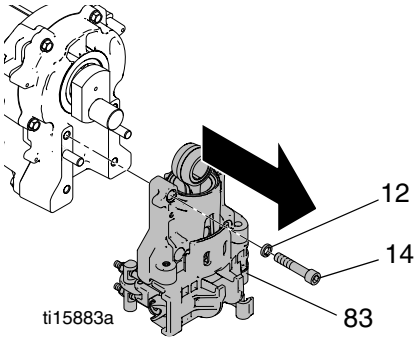
3. Remove two screws (158) and shroud (72).



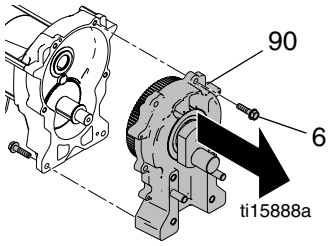
4. Remove four screws (31) and front cover (51).



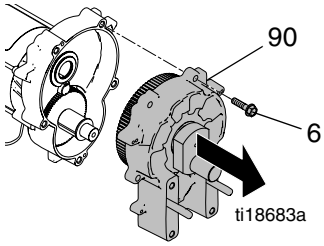
5. Remove four screws (14) and washers (12) and remove bearing housing (83) and connecting rod.



6. Remove screws (6) and pull drive housing (90) off motor.



Mark X Models



Mark VII Models

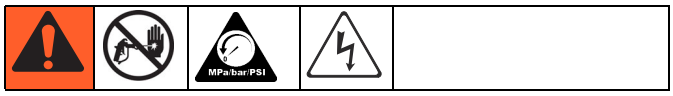
Installation

NOTE: Make sure gear and thrust washers are in place. Brush grease onto gear teeth. Fill motor housing with remaining grease.

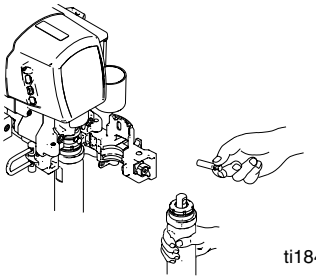
1. Push drive housing (90) onto motor and install with screws (6). Torque to 21 - 23 N•m (190 - 210 in-lb).
2. Install bearing housing (83) with four screws (14) and washers (12). Torque to 47 - 61 N•m (35 - 45 ft-lb) for Mark X units, and 34 - 40 N•m (25 - 30 ft-lb) for Mark VII units.
3. Install front cover (51) with four screws (31). Torque to 4.5 - 5.1 N•m (40 - 45 in-lb).
4. Install shroud (158) with two screws (72). Torque to 4.5 - 5.1 N•m (40 - 45 in-lb).
5. Replace **Pump**, page 28.

Motor Replacement

Removal



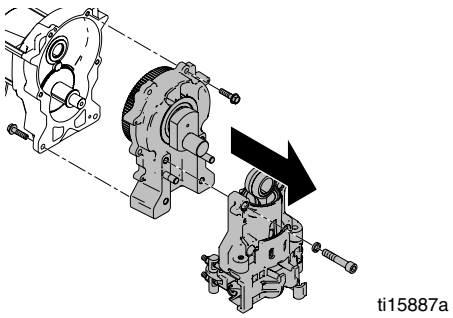
1. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Remove **Pump**, page 28.



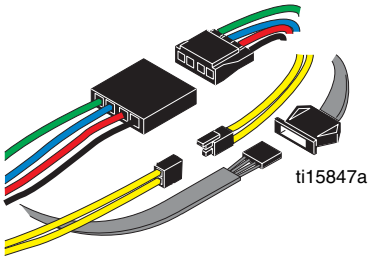
NOTICE

Do not drop gear cluster when removing drive housing or damage will occur. Gear cluster could stay engaged in motor front end bell or drive housing.

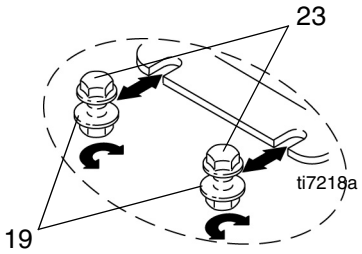
3. Remove drive housing and bearing housing, motor shroud, and front cover; **Drive and Bearing Housing Replacement**, page 26.



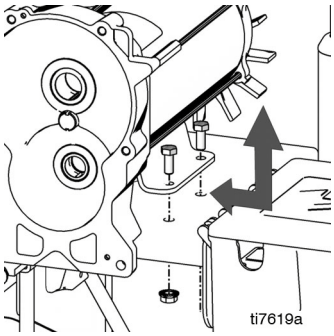
4. Disconnect motor leads, motor sensor leads, and thermal switch leads.



5. Remove motor wires from blade baffle and remove baffle.
6. Loosen two nuts (19) and screws (23) on side near control.



7. Remove two screws and nuts on side opposite control and remove motor from cart frame.

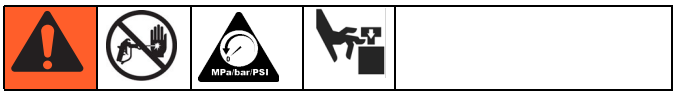


Installation

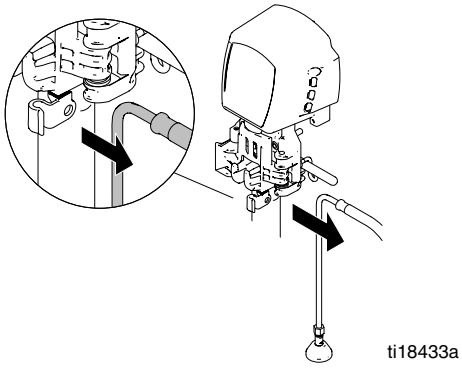
1. Slide new motor under two screws (23) and washers (19) in cart frame near control.
2. Install two screws and nuts on motor side opposite control. Tighten all four screws and nuts. Torque nuts to 25.59 - 28.98 N•m (200 - 230 in-lb).
3. Connect motor leads, motor sensor leads, and thermal switch leads.
4. Connect motor wires to blade baffle and install baffle.
5. Install drive housing and bearing housing, motor shroud, and front cover: **Drive and Bearing Housing Replacement**, page 26.
6. Install **Pump**, page 28.

Displacement Pump Replacement

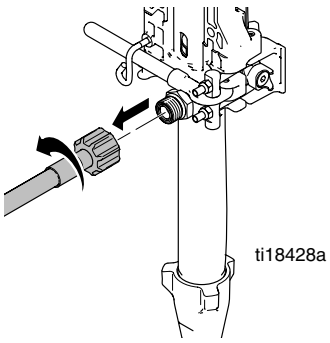
Removal



1. Flush pump.
2. Stop pump with piston rod in its lowest position.
3. Perform **Pressure Relief Procedure**, page 9.
4. Separate drain hose from sprayer.

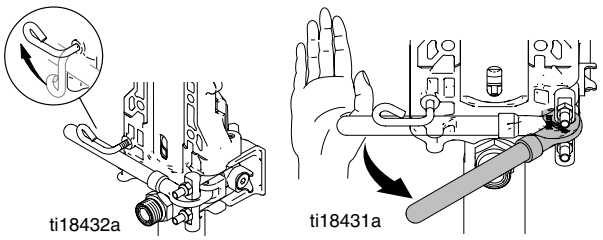


5. Disconnect hose from pump.

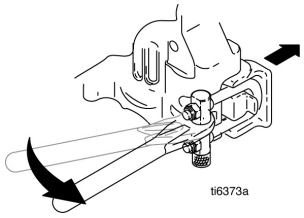


NOTE: It is recommended that the check valve be repaired at the same time as the pump. For check valve repair, see page 32 (Mark X units only).

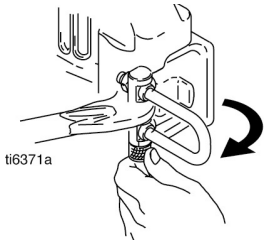
6. Raise latch lock. Push latch open.



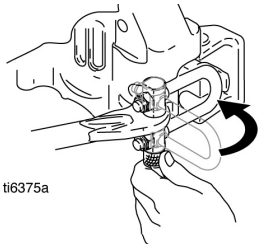
7. Ratchet pump door forward.



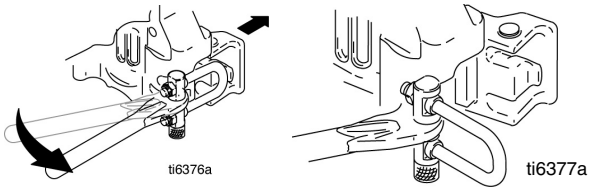
8. Twist latch u-bolt out of pump door recess.



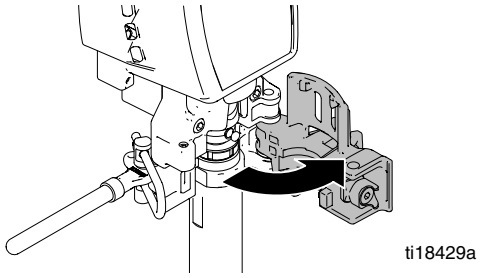
9. Place u-bolt on pump door protrusion.



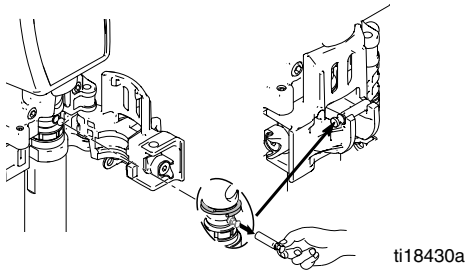
10. Ratchet pump door forward.



11. Open pump door.

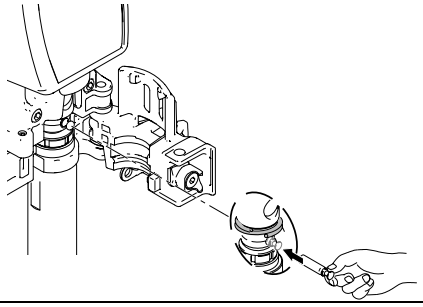


12. Pull out pump pin and place in pin holder.

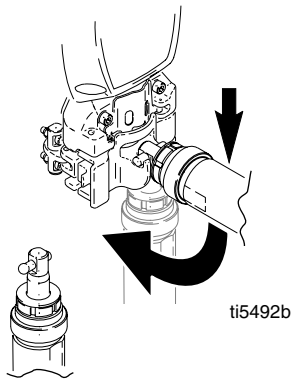


Installation

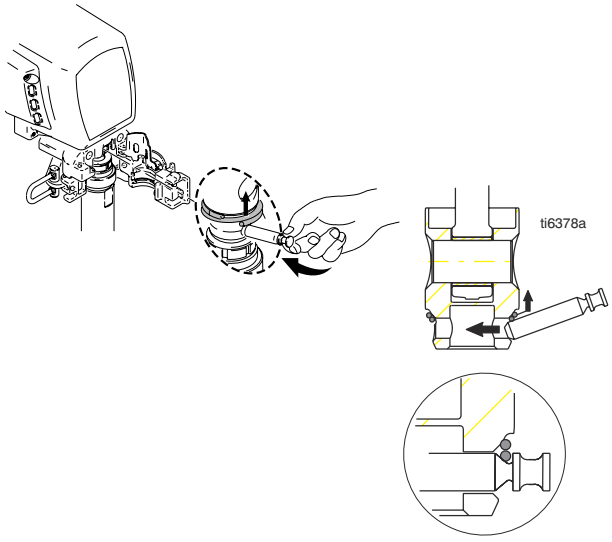
If pump pin is not inserted properly, it could work loose, parts could break off and project through the air due to force of pumping action and cause serious injury or property damage.



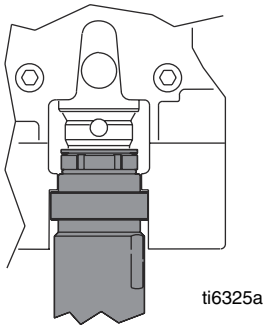
1. Adjust piston rod with pin holder to pull out piston rod. Tap piston rod on hard surface to push in piston rod.



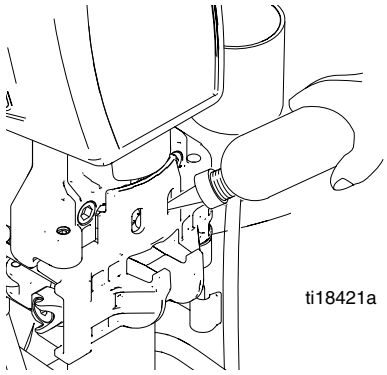
2. Slide pump into connecting rod. Push pump pin until it is fully retained. **NOTE:** Pin will snap into position.



3. Push pump collar flush with bearing housing ledge to be able to close pump door.



4. Close pump door and rotate latch into position. Do not tighten latch.
5. Rotate pump to align with paint hose. Connect hose and tighten to 8 N•m (70 in-lb).
6. Tighten latch and rotate latch lock into locked position.
7. Attach drain hose to sprayer.
8. Fill pump with Graco TSL until fluid flows onto top of seal.

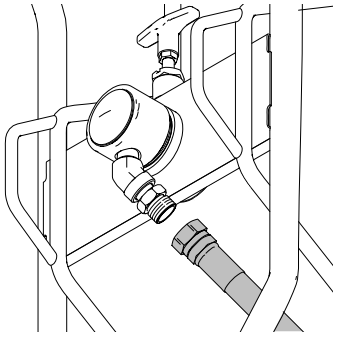


Hose Reel

Removal

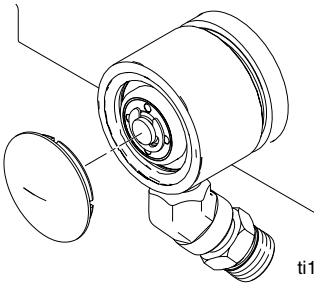
Be sure to keep your head clear of hose reel while winding up hose.

1. Remove hose fitting from swivel cap and completely remove hose.



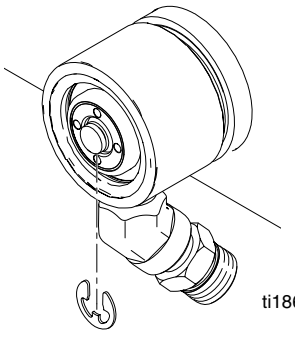
ti18462a

2. Remove cap from swivel.



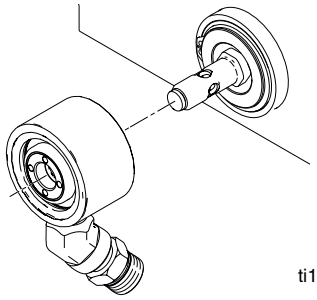
ti18680a

3. Remove E-clip from swivel shaft.



ti18681a

4. Remove swivel.



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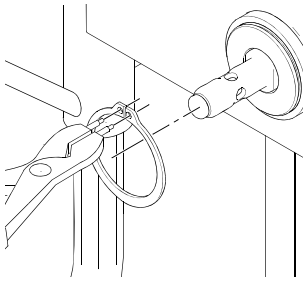
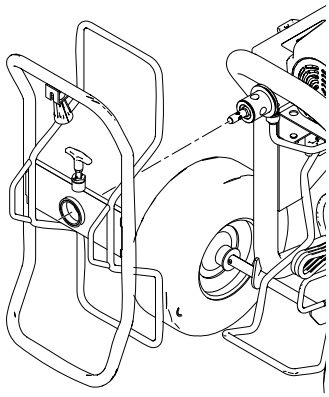
5. Remove snap ring.



ti13542a

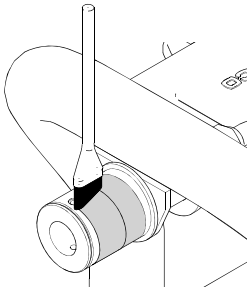
6. Remove hose reel.



ti18434a

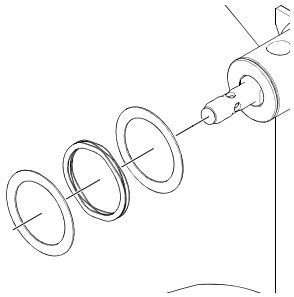
Installation

1. Grease shaft.



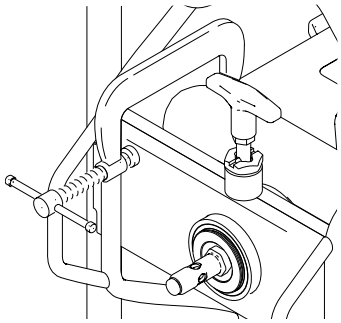
ti13537a

2. Make sure two washers and wave spring are on hub before hose reel is installed.



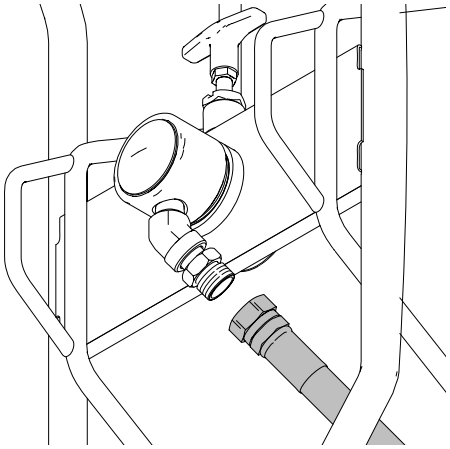
ti13545a

3. Install hose reel onto frame. Place C-clamp on reel and frame to allow snap ring to fit into place. Install snap ring.



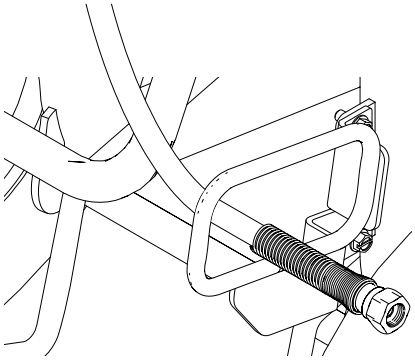
ti18436a

4. Install swivel.
5. Install E-clip and swivel cap.
6. Route hose through bottom rails and install hose to swivel.



ti18462a

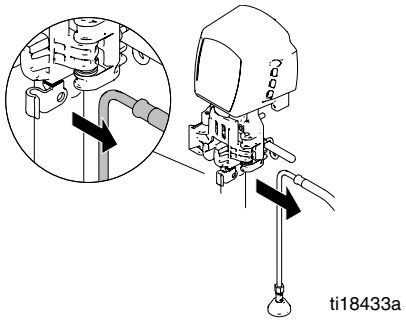
7. Turn hose reel clockwise to wrap up hose. Make sure hose is routed through hose guide.



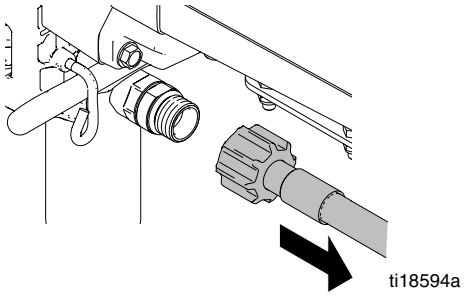
ti18438a

Check Valve Repair

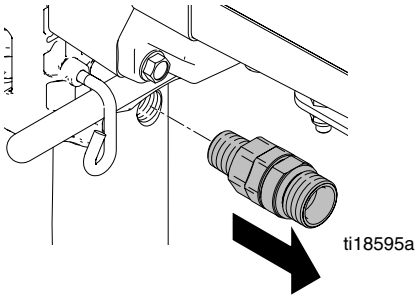
1. Flush pump. Turn power OFF. Wait 5 minutes for power to dissipate. Perform **Pressure Relief Procedure,** page 9.
2. Separate drain hose from sprayer.



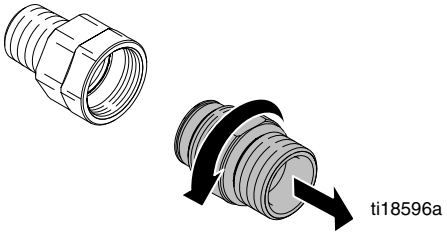
3. Disconnect paint hose from check valve.



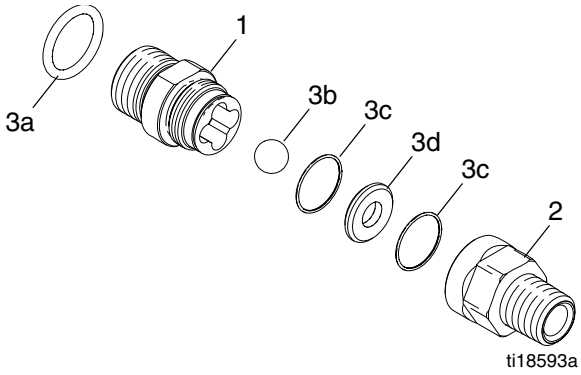
4. Remove check valve assembly from pump.



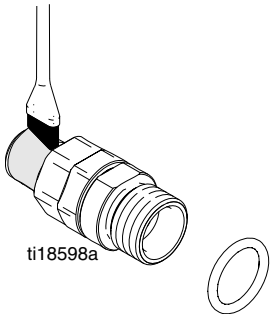
5. Remove check valve outlet fitting.



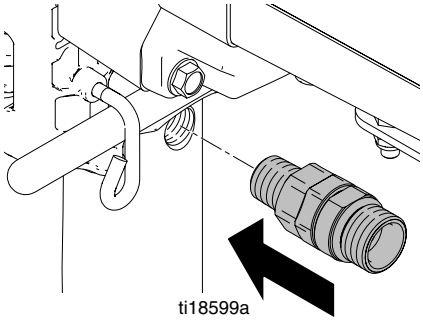
6. Replace o-rings (4), ball housing (2), ceramic ball (3), and seat (5).



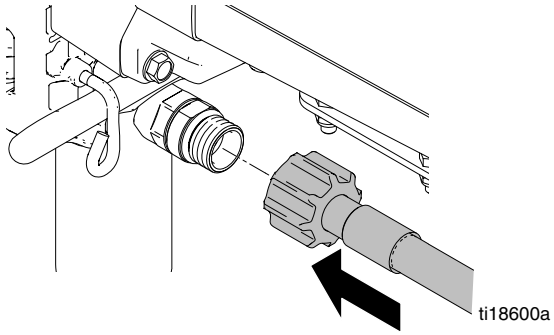
7. Apply pipe sealant to check valve inlet threads.



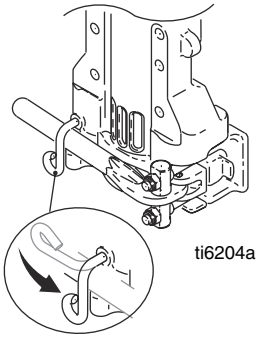
8. Use 1.5 in. wrench to securely tighten check valve to pump.



9. Connect paint hose and hand tighten to 70 in-lb (8 N•m).



10. Verify latch lock is in locked position.



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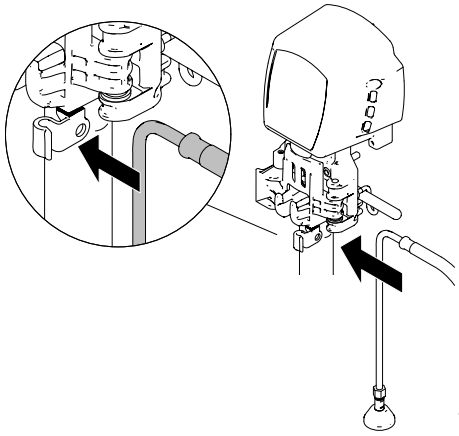
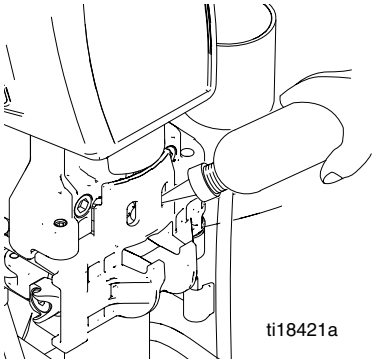
11. Attach drain hose to sprayer.



ti18426a

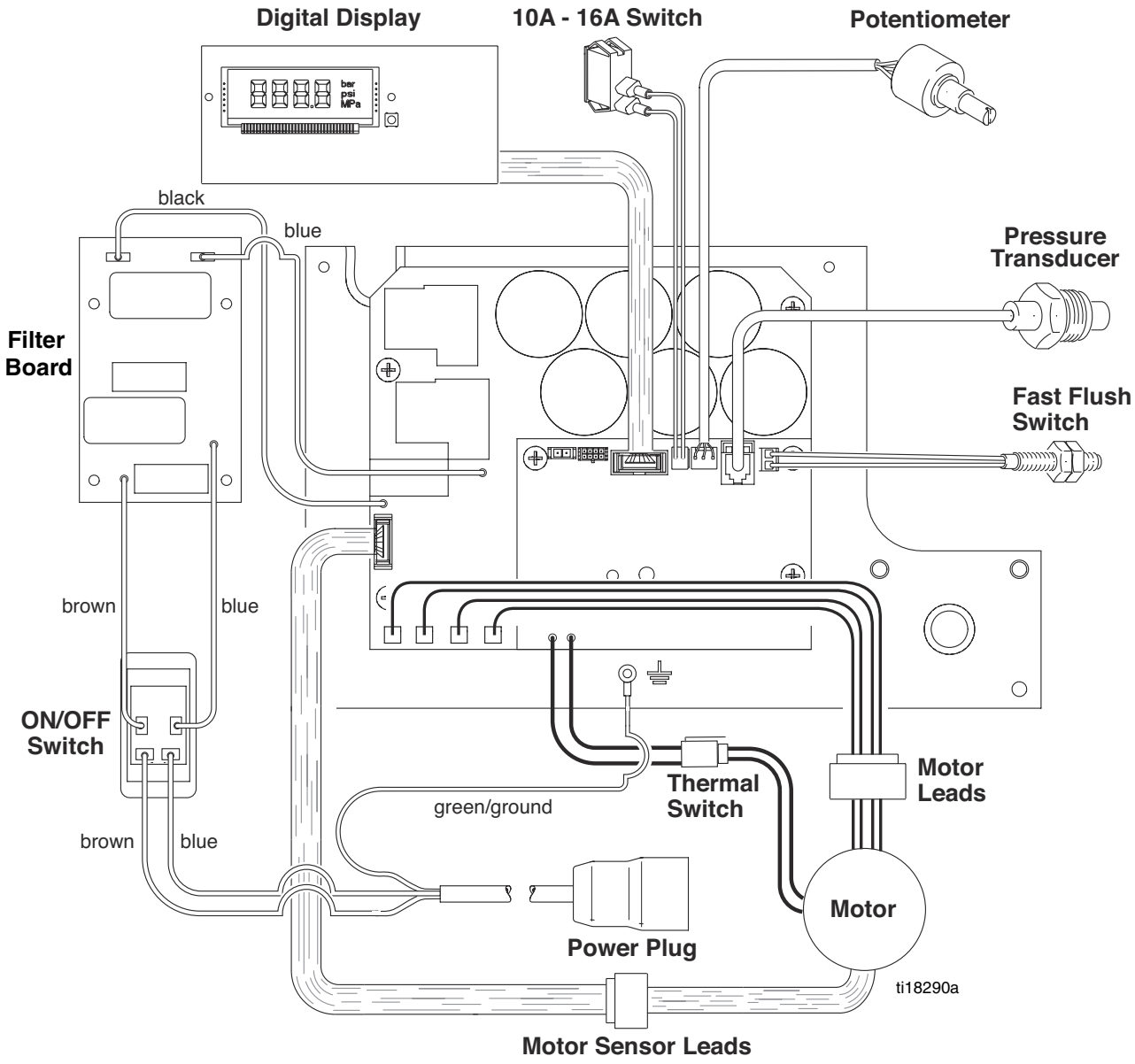
12. Fill pump with Graco TSL until fluid flows onto top of seal.



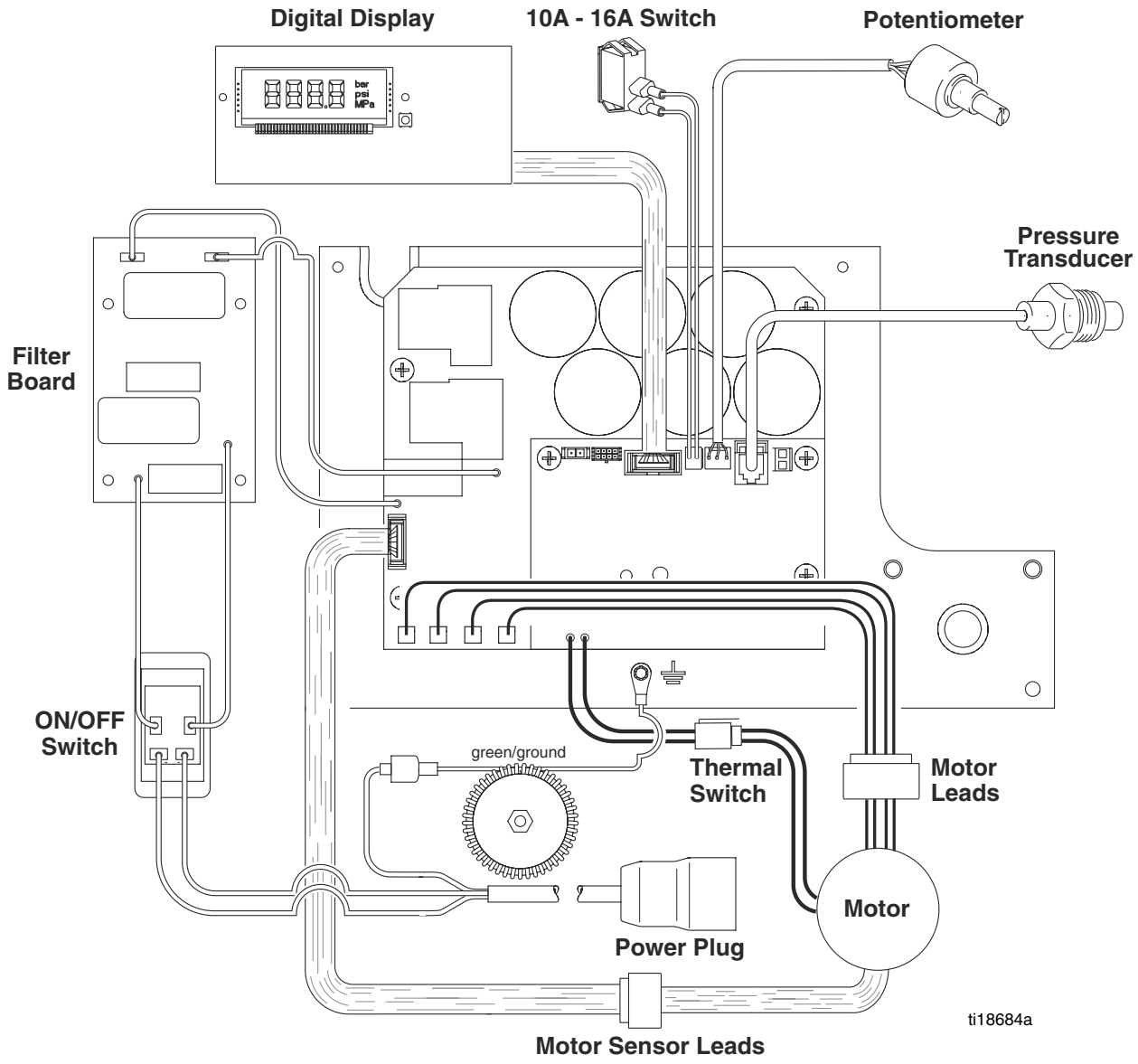
ti18421a

Wiring Diagrams

Mark VII Units:



Mark X Units:


Digital Display
10A - 16A Switch
Potentiometer
Pressure Transducer
Filter Board
ON/OFF Switch
green/ground
Thermal Switch
Motor Leads
Motor
Power Plug
Motor Sensor Leads
ti18684a

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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.

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This manual contains English. MM 3A2244

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Revision A - 2012