

# Repair



# T-Max 405™ Texture Sprayer

309977G

**– For Water-Based Materials Only –**

*40 Bar (4 MPa, 580 psi) Maximum Working Pressure*

**Model 248195, Series A**

**Model 248269, Series A**

**Model 249075, Series A**



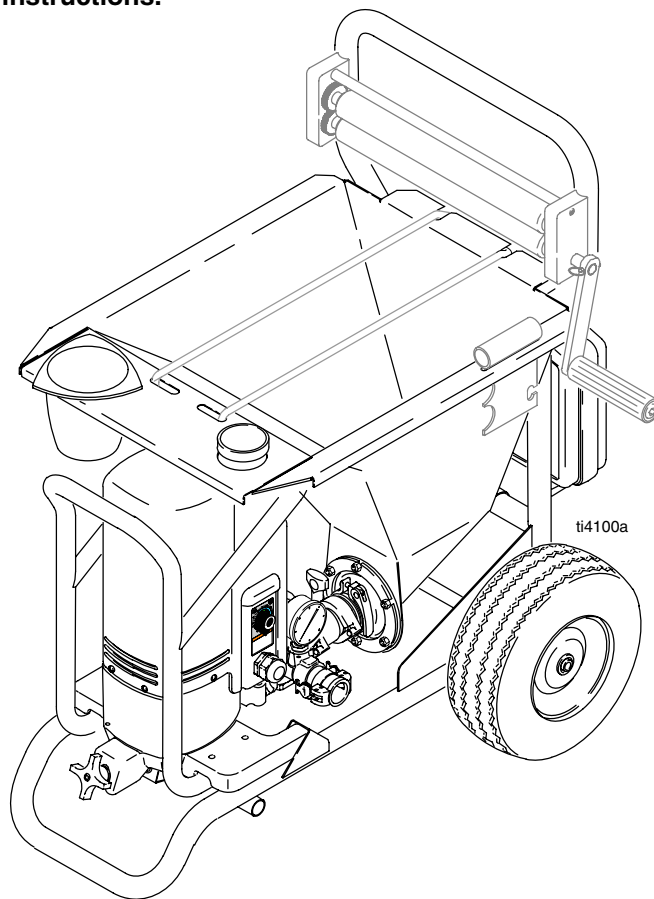
Read warnings and instructions.



..... [309973](#)



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PROVEN QUALITY. LEADING TECHNOLOGY.

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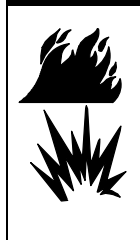

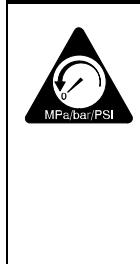
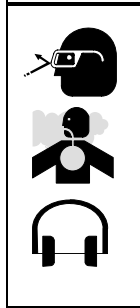

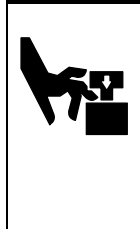


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# WARNING

	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"><li>● Keep work area free of debris, including solvent, rags and gasoline.</li><li>● Ground equipment in the work area. See Grounding instructions.</li><li>● If there is static sparking or you feel a shock, stop spraying immediately. Do not use equipment until you identify and correct the problem. Keep sprayer at least 20 ft (6m) away from explosive vapors.</li></ul>
 <p>INSTRUCTIONS</p>	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"><li>● Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals.</li><li>● Use water-based materials. 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. Do no use with quick-set materials.</li><li>● Check equipment daily. Repair or replace worn or damaged parts immediately.</li><li>● Do not alter or modify equipment.</li><li>● Use equipment only for its intended purpose. Call your Graco distributor for information</li><li>● Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li><li>● Do not use hoses to pull equipment.</li><li>● Keep children and animals away from work area.</li><li>● Comply with all applicable safety regulations.</li></ul>
 <p>MPa/bar/PSI</p>	<p><b>PRESSURIZED EQUIPMENT HAZARD</b></p> <p>Fluid from the applicator, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"><li>● Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li><li>● Tighten all fluid connections before operating the equipment.</li><li>● Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.</li></ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>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, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"><li>● Protective eyewear</li><li>● Clothing and respirator as recommended by the fluid and solvent manufacturer</li><li>● Gloves</li><li>● Hearing protection</li></ul>
	<p><b>ELECTRIC SHOCK HAZARD</b></p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"><li>● Turn off and disconnect power cord before servicing equipment.</li><li>● Use only grounded electrical outlets.</li><li>● Use only 3-wire extension cords.</li><li>● Ensure ground prongs are intact on sprayer and extension cords.</li><li>● Discharge any residual capacitor voltage with a resistive load across terminals.</li></ul>
	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"><li>● Keep clear of moving parts.</li><li>● Do not operate equipment with protective guards or covers removed.</li><li>● Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure in this manual. Disconnect power or air supply.</li></ul>

# General Repair Information

## Pressure Relief

### **⚠ WARNING**

#### **PRESSURIZED EQUIPMENT HAZARD**

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

- Are instructed to relieve the pressure
- Stop spraying
- Check or service any of the system equipment
- Install or clean the spray nozzle

## Pressure Relief Procedure

1. Turn pump control off (0).
2. Point applicator into hopper. Turn applicator on.
3. Open the applicator air valve (handle parallel with valve body).
4. Unplug the electrical power cord.
5. Hold hose firmly in one hand and slowly open one cam arm at a time. Remove hose from pump outlet.

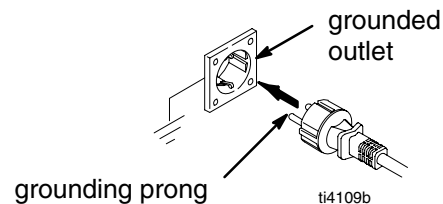
## Grounding and Electrical Requirements

### **⚠ WARNING**

Improper installation or alteration of the grounding plug will result in a risk of electric shock, fire or explosion that could cause serious injury or death.

### **Voltage Requirements**

- Fig. 1. 220–240 Vac models require a 50 Hz, 16A circuit with a grounding receptacle. 100–120 Vac models require a 50/60 Hz, 16A circuit with a grounding receptacle.



**Fig. 1** **240 Vac model shown**

- Do not alter the ground prong or use an ungrounded adapter.

### **Extension Cords**

- Use only an extension cord with an undamaged, 3-prong plug.
- 120 Vac: A 12 AWG, 3 wires with grounding prong, 300 ft (90 m) extension cord may be used.
- 220–240 Vac: You may use a 3-wire, 1.0 mm (12 AWG) (minimum) extension cord up to 90 m long. Long lengths reduce sprayer performance..

# General Repair Information

## Auxiliary Air Compressor

An external air compressor may be connected to the applicator air line fitting. This may be useful for the application of decorative or hard-to-spray materials.

### **WARNING**

Overpressurizing the system may cause component rupture and result in serious injury. To reduce risk of overpressurizing system:

- Do not use a compressor with an output pressure greater than 250 psi (1.7 MPa, 17 bar).
- Attach Graco 25 mm x 5m hose to pump outlet.

## Hose Size and Lengths

The system comes with the following hoses:

Hose Type	Inside Diameter (ID) mm (in.)	Length m (ft)
Fluid	25 mm (1.0)	5 (16)
Fluid	19 mm (.75)	3 (10)
Air	9.5 mm (.375)	15 (49)

## Hose Usage

Always attach the 25 mm x 5m hose to the pump outlet. Other hoses may then be added up to the maximum fluid hose lengths:

- Use shortest fluid hose length required for the spray application [(25 mm x 5m) minimum; see Warning].
- Unnecessary hose length decreases sprayer performance.
- Maximum fluid hose lengths:  
15 m of 25 mm ID  
– or –  
10 m of 25 mm ID combined with 3 m of 19 mm ID fluid hose.

### **WARNING**

The motor has a thermal overload switch that shuts down the motor if it overheats.

To reduce the risk of serious bodily injury due to the system restarting unexpectedly, always turn the pressure control to OFF (0).

### **WARNING**

Quick-set materials can harden, plug passage ways and cause the sprayer to become overpressurized. An over-pressurized system can cause components to burst and cause bodily injury.

To reduce the risk of bodily injury due to overpressurization of the system, do not use quick-set materials.

# Troubleshooting



See **Pressure Relief Procedure** on page 4.

## MOTOR WON'T OPERATE

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Basic Fluid Pressure Problems	1. Pressure control knob setting. Motor will not run if at minimum setting (fully counterclockwise).	1. Slowly increase pressure setting to see if motor starts.
	2. Spray tip or fluid filter may be clogged.	2. Relieve pressure and clear clog or clean filter; refer to separate gun or tip instruction manual.
Basic Mechanical Problems	1. Pump (31) for frozen or hardened paint.	1. Thaw sprayer if water or water-based paint has frozen in sprayer. Place sprayer in warm area to thaw. Do not start sprayer until thawed completely. If paint hardened (dried) in sprayer, replace pump packing. See page 18 ( <b>Pump Repair</b> ).
	2. Displacement pump connecting rod pin (75). Pin must be completely pushed into connecting rod (45) and retaining spring (76) must be firmly in groove of pump pin. See Fig. 9.	2. Push pin into place and secure with spring retainer.
	3. Motor (33). Remove drive housing assembly (37). See page 13. Try to rotate fan by hand.	3. Replace motor (33) if fan won't turn. See page 13.
Basic Electrical Problems	1. Motor control board. Board shuts down and displays error code.	1. See <b>Motor Control Board Diagnostics</b> , page 15.
	2. Electrical supply. Meter must read: 210–255 Vac for 220–240 Vac models; 85–130 Vac for 100–120 Vac models.	2. Reset building circuit breaker; replace building fuse. Try another outlet.
	3. Extension cord. Check extension cord continuity with volt meter.	3. Replace extension cord.
	4. Sprayer power supply cord. Inspect for damage such as broken insulation or wires.	4. Replace power supply cord.

# Troubleshooting

## MOTOR WON'T OPERATE (Continued)

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Basic Electrical Problems (continued)	5. That motor leads are securely fastened and properly mated.	5. Replace loose terminals; crimp to leads. Be sure terminals are firmly connected.  Clean circuit board terminals. Securely re-connect leads.
	6. For loose motor brush lead connections and terminals. See page 11.	6. Tighten terminal screws. Replace brushes if leads are damaged. See page 11.
	7. Brush length which must be 1/4 in. minimum. See page 11.  <b>NOTE:</b> Brushes do not wear at the same rate on both sides of motor. Check both brushes.	7. Replace brushes. See page 11.
	8. For broken or misaligned motor brush springs. Spring must rest squarely on top of brush. See page 11.	8. Replace brush if spring is broken. See page 11.
	9. Motor brushes may be binding in brush holders. See page 11.	9. Clean brush holders. Remove carbon with small cleaning brush. Align brush leads with slot in brush holder to assure free vertical brush movement.
	10. Motor armature commutator for burn spots, gouges and extreme roughness. See page 11.	10. Remove motor and have motor shop resurface commutator if possible. See page 13.
	11. Motor armature for shorts using armature tester (growler) or perform spin test. See page 11.	11. Replace motor. See page 13.
Refer to wiring diagram on page 27 to identify test points (TP).	1. Power supply cord. Connect volt meter between TP1 (L1, 240 Vac) and TP2 (L2, Neutral). Plug in sprayer. Meter must read: 210–255 Vac for 220–240 Vac models; 85–130 Vac for 100–120 Vac models. Unplug sprayer.	1. Replace power supply cord.
	2. Motor thermal cutoff switch. Turn sprayer OFF. Check for continuity between TO1 and TO2 with ohmmeter.	2. If thermal switch is open (no continuity), allow motor to cool. If switch remains open after motor cools, replace motor. If thermal switch closes after motor cools, correct cause of overheating.
	3. All terminals for damage or loose fit.	3. Replace damaged terminals and reconnect securely.

# Troubleshooting

## LOW OR FLUCTUATING OUTPUT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Low Output	1. For worn spray tip.	1. Follow <b>Pressure Relief Procedure Warning</b> , then replace tip. See your separate gun or tip manual.
	2. Verify pump does not continue to stroke when gun trigger is released.	2. Service pump. Check piston and intake valves for wear or obstructions. See page 18.
	3. Filter clogged (If optional filter is installed).	3. Relieve pressure. Check and clean filter.
	4. Material hose length. Longer hose length reduces sprayer performance.	4. Replace with hose length less than specified maximum.
	5. Pump hopper adapter connections.	5. Tighten any loose connections. Replace pump hopper adapter if cracked or punctured.
	6. Electrical supply with volt meter. Meter must read: 210–255 Vac for 220–240 Vac models; 85–130 Vac for 100–120 Vac models. Low voltages reduce sprayer performance.	6. Reset building circuit breaker; replace building fuse. Repair electrical outlet or try another outlet.
	7. Extension cord size and length; must be at least 1.0 mm <sup>2</sup> (12 awg) wire and no longer than 90 m (295 ft). Longer cord lengths reduce sprayer performance.	7. Replace with a correct, grounded extension cord.
	8. Leads from motor to pressure control circuit board (38) for damaged or loose wires or connectors. Inspect wiring insulation and terminals for signs of overheating.	8. Be sure male terminal blades are centered and firmly connected to female terminals. Replace any loose terminal or damaged wiring. Securely reconnect terminals.
	9. For loose motor brush leads and terminals. See page 11.	9. Tighten terminal screws. Replace brushes if leads are damaged. See page 11.
	10. For worn motor brushes which must be 1/4 in. minimum. See page 11.	10. Replace brushes. See page 11.
	11. For broken and misaligned motor brush springs. Spring must rest squarely on top of brush.	11. Replace brush if spring is broken. See page 11.
	12. Motor brushes for binding in brush holders. See page 11.	12. Clean brush holders, remove carbon dust with small cleaning brush. Align brush lead with slot in brush holder to assure free vertical brush movement.
	13. Low stall pressure.	13. Do either or both:  a. Turn pressure control knob fully clockwise. Make sure pressure control knob is properly installed to allow full clockwise position.  b. Try a new transducer.
	14. Motor armature for shorts by using an armature tester (growler) or perform spin test. See page 11.	14. Replace motor. See page 13.



# Troubleshooting

## LOW OR FLUCTUATING OUTPUT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Motor runs and pump strokes	1. Material supply.	1. Refill hopper and reprime pump.
	2. Loose fittings.	2. Tighten; use thread sealant or sealing tape on threads if necessary.
	3. Intake valve ball and piston ball are seating properly. See page 18.	3. Remove intake and piston valves and clean. Check balls and seats for nicks or obstructions; replace if necessary, page 18. Clean hopper before using to remove particles that could clog pump.
	4. Leaking around throat packing nut which may indicate worn or damaged packings. See page 18.	4. Replace packing, page 18. Also check piston valve seat for hardened paint or nicks and replace if necessary. Tighten packing nut.
	5. Pump rod damage.	5. Repair pump, page 18.
	6. Capacitor failure. Visually inspect capacitor near terminals. Ensure that orange safety relief plug is intact.	6. Replace capacitor.
Motor runs but pump does not stroke	1. Displacement pump pin (75) (damaged or missing), page 18.	1. Replace pump pin if missing. Be sure retainer spring (76) is fully in groove all around connecting rod, page 18.
	2. Connecting rod assembly (45) for damage, page 21.	2. Replace connecting rod assembly, page 21.
	3. Gears or drive housing, page 22.	3. Inspect drive housing assembly and gears for damage and replace if necessary, page 22.

# Troubleshooting

## MOTOR IS HOT AND RUNS INTERMITTENTLY

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Motor is hot and runs intermittently.	1. Determine if sprayer was operated at high pressure with small tips, which causes low motor RPM and excessive heat build up.	1. Decrease pressure setting or increase tip size.
	2. Be sure ambient temperature where sprayer is located is no more than 90°F and sprayer is not located in direct sun.	2. Move sprayer to shaded, cooler area if possible.

## ELECTRICAL SHORT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
<p>Building circuit breaker opens as soon as sprayer switch is turned on.</p> <p><b>CAUTION</b> Any short in any part of the motor power circuit will cause the control circuit to inhibit sprayer operation. Correctly diagnose and repair all shorts before checking and replacing control board.</p>	1. All electrical wiring for damaged insulation, and all terminals for loose fit or damage. Also wires between pressure control and motor. See page 13.	1. Repair or replace any damaged wiring or terminals. Securely reconnect all wires.
	2. Bent terminal forks or other metal to metal contact points which could cause a short.	2. Correct faulty conditions.
	3. Motor armature for shorts. Use an armature tester (growler) or perform spin test. See page 11. Inspect windings for burns.	3. Replace motor. See page 13.
	4. Motor control board (38) by performing motor control board diagnostics on page 15. If diagnostics indicate, substitute with a good board.  <b>CAUTION:</b> Do not perform this check until motor armature is determined to be good. A bad motor armature can burn out a good board.	4. Replace with a new pressure control board (38). See page 15.
<p>Building circuit breaker opens as soon as sprayer is plugged into outlet and sprayer is NOT turned on. Sprayer quits after sprayer operates for 5 to 10 minutes.</p>	1. Basic Electrical Problems on page 6.	1. Perform necessary procedures.
	2. For damaged or pinched wires in pressure control. See page 15.	2. Replace damaged parts. See page 15.
	1. Basic Electrical Problems on page 6.	1. Perform necessary procedures.
	2. Electrical supply with volt meter. Meter must read: 210–255 Vac for 220–240 Vac models; 85–130 Vac for 100–120 Vac models.	2. If voltage is too high, do not operate sprayer until corrected.
	3. Tightness of pump packing nut. Over tightening tightens packings on rod, restricts pump action, and damages packings.	3. Loosen packing nut. Check for leaking around throat. Replace pump packings, if necessary. See page 18.


# Spin Test

## Setup



**Electric Shock Hazard;** page 3.

To check armature, motor winding and brush electrical continuity:

1.  Relieve pressure; page 4.
2. Remove motor, page 13.
3. Fig. 3. Remove six screws (12) and motor cover (18).
4. Fig. 2. Disconnect wire harness (155) from control board.

## Armature Short Circuit Test

Quickly turn motor fan by hand. If no electrical shorts, motor coasts two or three revolutions before complete stop. If motor does not spin freely, armature is shorted. Replace motor; page 13.

## Armature, Brushes, and Motor Wiring Open Circuit Test (Continuity)

1. Connect wire harness (155) leads together with test lead (A). Turn motor fan by hand at about two revolutions per second.

2. If uneven or no resistance, check for: broken brush springs, brush leads, motor leads; loose brush terminal screws, motor lead terminals; worn brushes. Repair as needed; page 11.
3. If still uneven or no resistance, replace motor; page 13.

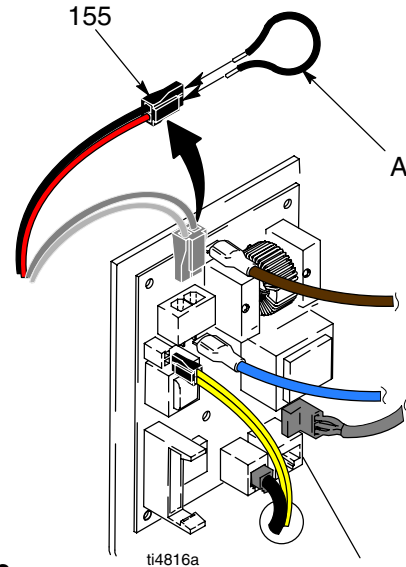




Fig. 2

# Motor Brush Replacement

## Motor Brush Removal

Replace brushes worn to less than 1/2 in. Check both sides. Order Brush Repair Kit 243642 for 220 – 240 Vac motors and 243215 for 100 – 120 Vac motors with external capacitor.

1. Read **General Repair Information;** page 4.
2.  Relieve pressure; page 4.
3. Fig. 6. Remove six screws (12) and motor cover (18).
4.  **Electric Shock Hazard;** page 3.  
Fig. 3. Discharge any residual capacitor voltage with a resistive load across terminal screws (41).
5. Fig. 4. Pry off two brush caps (A). Tag locations of red (+) and black (-) motor leads.
6. Fig. 5. Remove screws (41) and discard brushes (B) for motor with capacitor attached.

*(Continued on page 12)*

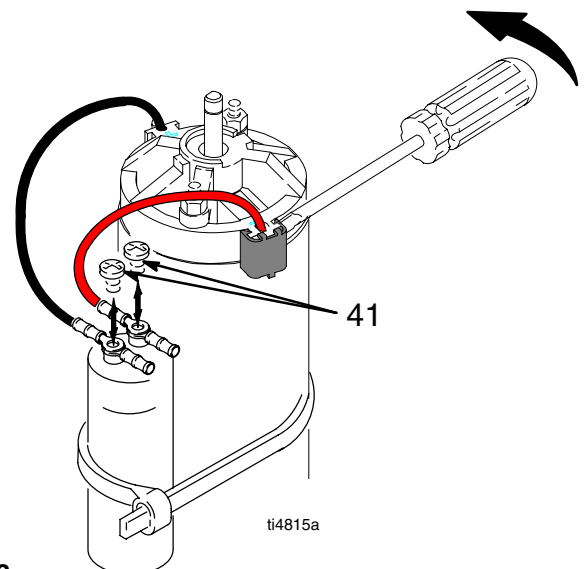


Fig. 3

# Motor Brush Replacement

## **⚠ CAUTION**

When installing brushes, follow all steps carefully to avoid damaging parts.

7. Fig. 4. Insert brush (B). Push clip (A) until it snaps into place and secures brush.
8. Install red brush lead (+) and black brush lead (-) according to markings on the motor and capacitor. Install brush lead end to capacitor with screw (41).

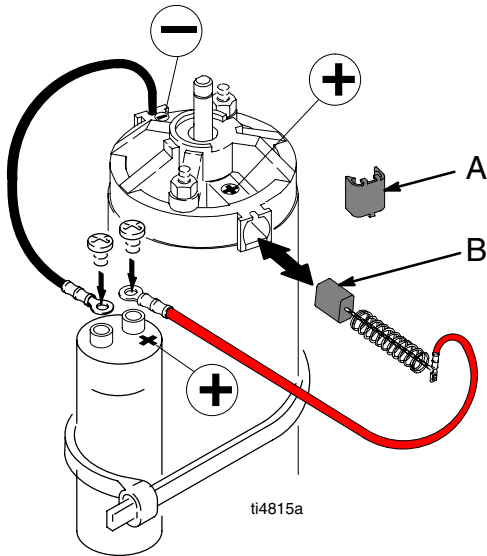



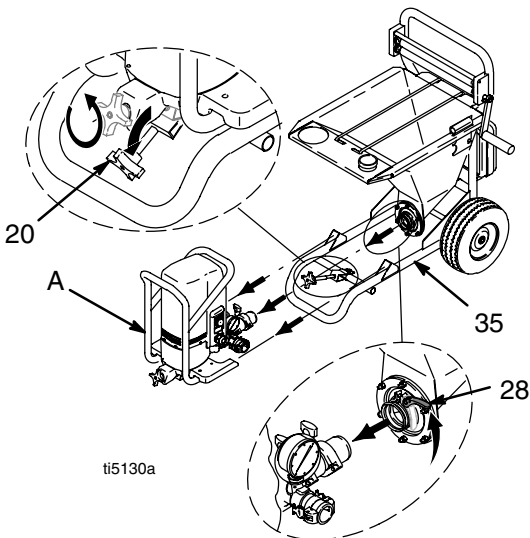
Fig. 4

9. Inspect commutator for excessive pitting, burning or gouging. A black color on commutator is normal. Have commutator resurfaced by a motor repair shop if brushes wear too fast.
10. Test brushes.
  - a. Disconnect pump (31); **Pump Repair, Removal**, steps 8 and 9, page 18.
  - b. With sprayer OFF, turn pump control knob fully counterclockwise to minimum pressure. Plug in sprayer.
  - c. Turn sprayer ON. Slowly increase pressure until motor is at full speed.
11. Break in brushes.
  - a. Operate sprayer 1 hour with no load.
  - b. Connect pump (31); **Pump Repair, Installation**, step 4, page 18.

# Motor Replacement

## Removal

1.  Relieve pressure; page 4.
2. Fig. 5. Remove pump module (A).
  - a. Loosen clamp rod (20).
  - b. Release hopper quick-release clamp (28).
  - c. Disconnect pump module (A) from frame (35).



**Fig. 5**

3. Fig. 6. Remove six screws (12) and motor cover (18).
4. Remove two screws (41) and disconnect leads from capacitor (42) to control board (38).
5. Disconnect two yellow leads (B) from control board (38).
6. Pull strain relief (49) out of bracket and thread yellow leads connector through bracket.
7. Remove four screws (90) and washers (71) from gear housing base (25), **Parts Drawing**, page 24.

8. Tip motor and drive housing assembly back and remove two screws (86) and washers (84).

## CAUTION

Do not drop gear cluster (D) when removing drive housing (37). Gear cluster may stay engaged in motor front end bell or drive housing.

9. Return motor and drive housing assembly to vertical position.
10. Remove four screws (85) and washers (84). Remove motor (33) from drive housing (37).

## Installation

## CAUTION

When installing motor, carefully align gears to avoid damaging mating parts.

1. Fig. 6. Place new motor (33) on drive housing (37). Rotate fan (C). When gears are felt to mesh, install four washers (84) and screws (85).
2. Tip motor and drive housing assembly back and install two washers (84) and screws (86).
3. Install motor and drive housing to gear housing base (25) with four screws (90) and washers (71).
4. Thread yellow lead (B) through strain relief (49) and connect to control board (38). Install strain relief in bracket.
5. Connect red brush lead (+) and black brush lead (-) according to markings on the motor and capacitor. Install brush lead ends and wire harness (155) lead ends to capacitor with screw (41). See **Wiring Diagram**, page 27 to verify polarity is correct.
6. Install motor cover (18) with five screws (12).

# Motor Replacement

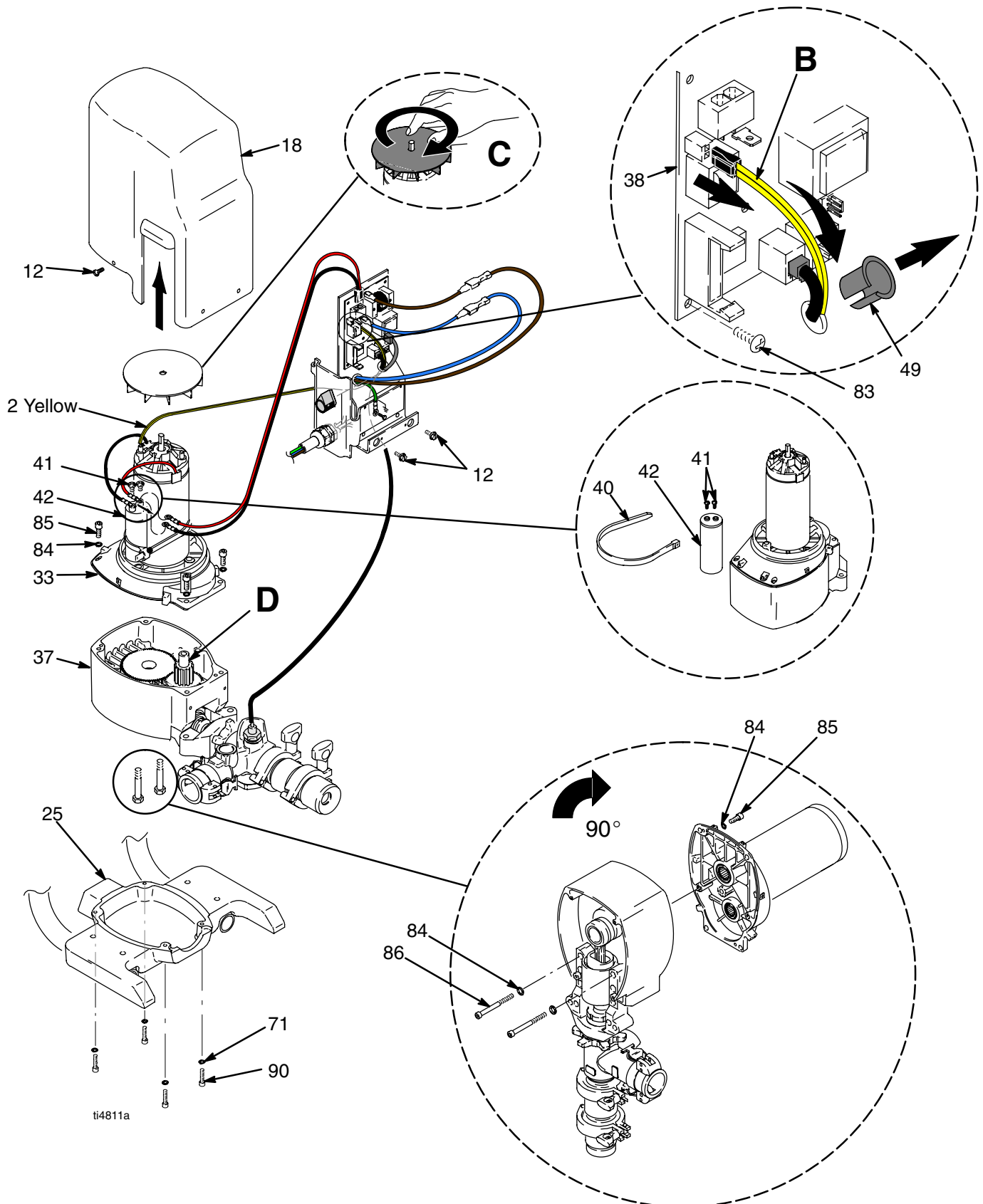


Fig. 6

# Pressure Control Repair

## Motor Control Board Diagnostics

**Note:** Keep a new transducer on hand to use for test.

- 

 Relieve pressure; page 4.

- Remove five screws (12) and motor cover (18).

### CAUTION

Do not allow sprayer to develop fluid pressure without transducer installed.

- Plug in power cord.
- Observe LED operation and reference following table:


LED BLINKS	SPRAYER OPERATION	INDICATES	WHAT TO DO
Once	Sprayer runs	Normal operation	Do nothing
Once and stays ON	Sprayer shuts down and LED stays ON	Motor open circuit or bad control board	Check motor brushes and armature. If OK, replace motor control board.
Two times repeatedly	Sprayer shuts down and LED continues to blink two times repeatedly	Run away pressure. Pressure greater than 57 bar (5.7 MPa, 830 psi).	Replace pressure transducer or motor control board. See following <b>Motor Control Board</b> procedure.
Three times repeatedly	Sprayer shuts down and LED continues to blink three times repeatedly	Pressure transducer is faulty or missing	Check transducer connection. Open drain valve. Substitute new transducer for transducer in sprayer. If sprayer runs, replace transducer.
Four times repeatedly	Sprayer shuts down and LED continues to blink four times repeatedly	Line voltage is too high	Check for voltage supply problems
Five times repeatedly	Sprayer shuts down and LED continues to blink five times repeatedly	Too much current	Check for locked rotor, shorted wiring or motor. Repair or replace failed parts.
Six times repeatedly	Sprayer shuts down and LED continues to blink six times repeatedly	Motor thermal switch open circuit	Check for binding in pump or drive. Check for bad motor.

# Pressure Control Repair

## Motor Control Board

### Removal

Refer to **Wiring Diagram**, page 27.

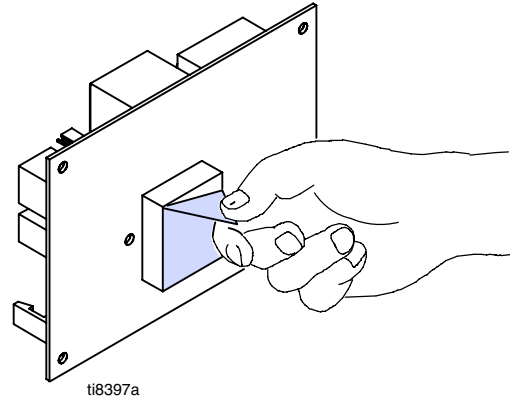
-  Relieve pressure; page 4.
- Remove five screws (12) and motor cover (18).
- Cut wire tie holding wiring to motor control board (38).
- Disconnect at motor control board (38):
  - Motor wire harness: brown (+), blue (-).
  - Two line voltage leads: brown (+), blue (-).
  - Lead (D) from potentiometer.
  - Lead (E) from transducer.
  - Two leads (F) from motor thermal switch.
- Remove six screws (83) and circuit board (38).

### Installation

#### CAUTION

Electrostatic discharges can damage components on motor control board. Use a ground strap when handling or installing motor control board.

- Fig. 7. Remove old thermal paste from control box. Remove protective cover from thermal pad on new motor control board.



**Fig. 7**

- Fig. 6. Install motor control board (38) with six screws (83).
- Connect to motor control board (38):
  - Two leads (F) from motor thermal switch.
  - Lead (E) to transducer.
  - Lead (D) to potentiometer.
  - Two line voltage leads: brown (+), blue (-).
  - Motor wire harness: brown (+), blue (-).
- Bundle and tie all loose wires together.
- Install motor cover (18) with five screws (12).



# Pressure Control Repair

## Pressure Control Transducer

### Removal

Refer to **Wiring Diagram**, page 27.



1. Relieve pressure; page 4.
2. Remove five screws (12) and motor cover (18).
3. Disconnect lead (E) from motor control board (38).
4. Remove strain relief (49) from circuit board bracket (21). Thread transducer connector through bracket.
5. Remove pressure control transducer (43) and packing o-ring (89) from pump housing (202).

### Installation

1. Install packing o-ring (89) and pressure control transducer (43) in pump housing (202). Torque to 30–35 ft-lb.
2. Thread transducer connector through circuit board bracket (21). Install strain relief (49) in circuit board bracket.
3. Connect lead (E) to motor control board (38).
4. Install motor cover (18) with five screws (12).

## Pressure Adjust Potentiometer

### Removal

Refer to **Wiring Diagram**, page 27.




1. Relieve pressure; page 4.
2. Remove five screws (12) and motor cover (18).
3. Disconnect potentiometer lead (47) from motor control board (38).
4. Remove potentiometer knob (16), gasket (88) and pressure adjust potentiometer (47).

### Installation

1. Install pressure adjust potentiometer (47), gasket (88) and potentiometer knob (16).
  - a. Turn potentiometer fully clockwise.
  - b. Install knob at full clockwise position.
2. Connect potentiometer lead (47) to motor control board (38).
3. Install motor cover (18) with five screws (12).

# Pump Repair

## Removal

1.  Relieve pressure; page 4.
2. Perform **Storage More than 24 hours** procedure in Operation Manual 309973, 309974 or 309975.
3. Fig. 8. Loosen clamp rod (20).

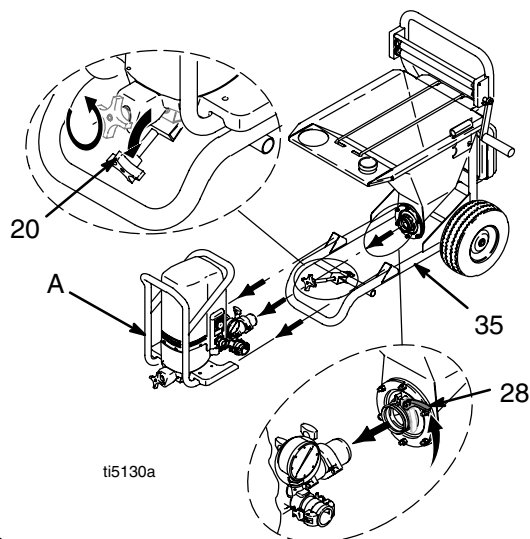


Fig. 8

4. Release hopper quick-release clamp (28).
5. Disconnect pump module (A) from frame (35).
6. Remove five screws (12 ) and motor cover (18).
7. Fig. 10. Disconnect transducer connector (B) from control board (38). Pull strain relief from bracket. Thread transducer connector through bracket.
8. Fig. 9. Slowly rotate fan blade on back of motor until connecting rod (45) near bottom of stroke.

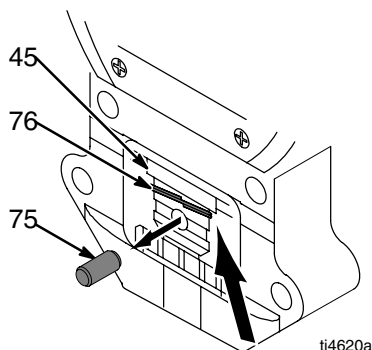


Fig. 9

9. Pry retaining spring (76) up on connecting rod (45). Push pin (75) out with a screwdriver.
10. Fig. 10. Loosen retaining nut (27).

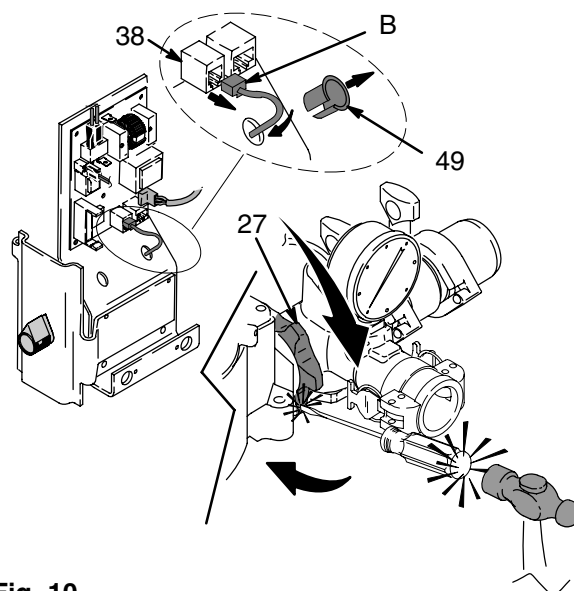


Fig. 10

11. Fig. 11. Unscrew pump (31) from bearing housing (34).

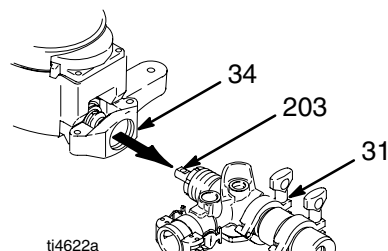


Fig. 11

## Repair

See page 19 for pump repair instructions.

## Installation

1. Fig. 17. Push piston rod (203) out of pump (31) 50 to 75 mm (2 to 3 inches).
2. Fig. 11. Screw retaining nut (27) onto pump until it stops. Screw pump (31) into bearing housing (34) until pump stops. Unscrew pump until pump outlet is 13° from horizontal, but no more than one turn.

## WARNING



### MOVING PARTS HAZARD

If pin works loose, parts could break off due to force of pumping action. Parts could project through the air and result in serious injury or property damage. Make sure pin and retaining spring are properly installed.

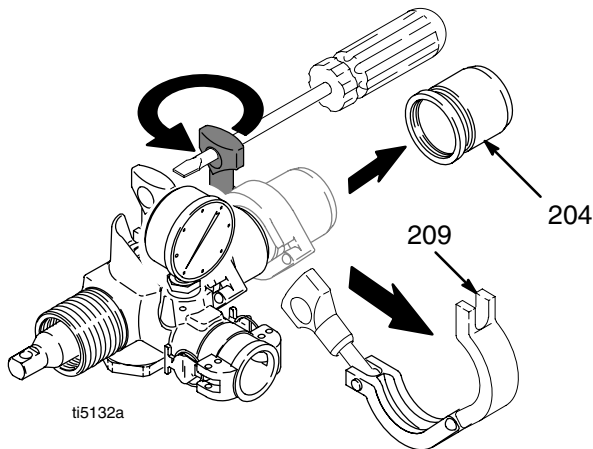
3. Tighten retaining nut (27).
4. Push pin (75) in with a screwdriver. Push retaining spring (76) down on connecting rod (45).
5. Fig. 10. Connect transducer connector (B) to motor control board (38).

# Pump Repair

## Disassemble Pump

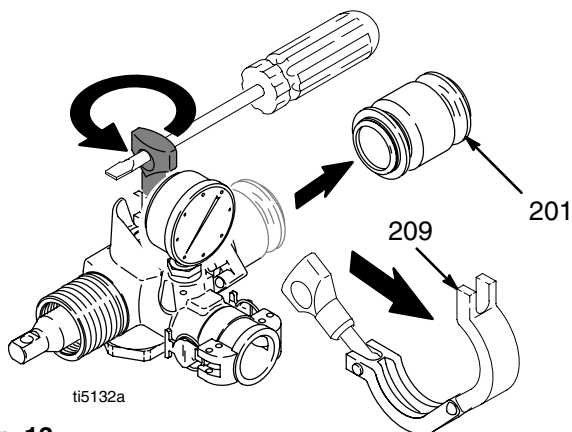
**TIP:** It may be easier to leave the pump connected to the connecting rod and bearing housing if the only assemblies to be cleaned and inspected is the intake housing or piston valve.

1.  Relieve pressure; page 4.
2. See **Pump Repair, Removal** on page 18 to remove pump.
3. Fig. 13. Remove clamp (209) and intake housing (204).



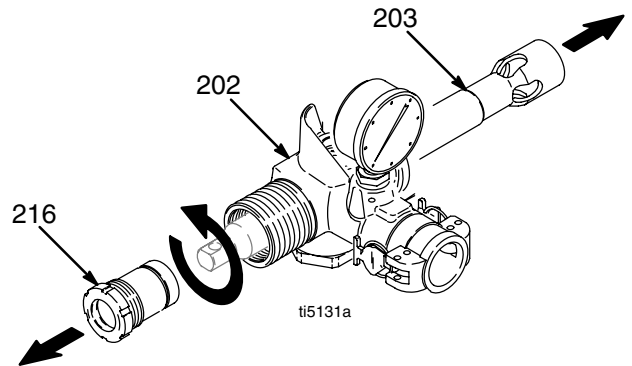
**Fig. 12**

4. Remove clamp (209) and pump cylinder (201).



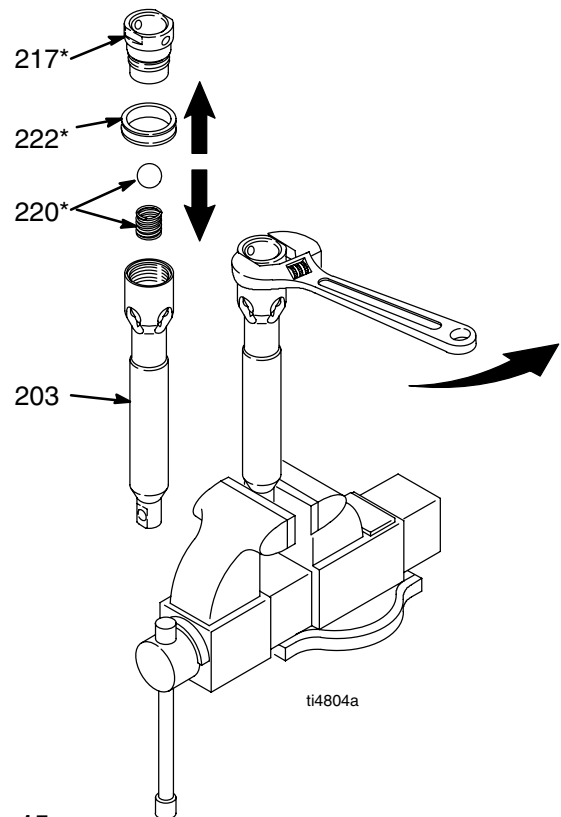
**Fig. 13**

5. Fig. 14. Remove packing nut (216). Push piston rod (203) from outlet housing (202).



**Fig. 14**

6. Place end of piston rod in vise and remove piston valve (217). Remove piston seal (222).



**Fig. 15**

7. Inspect all part for nicks and scratches. Replace worn or damaged parts as they may result in poor pump performance.

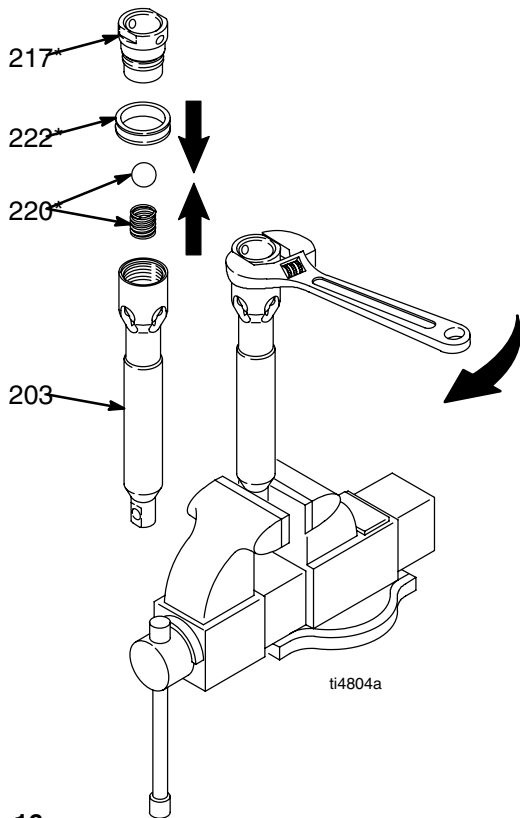
## Repair Kit

Piston Seal Repair Kit 248530 is available. Replace all parts in kit for best results.

Parts included in kit are marked with an asterisk in text and drawings. For example, 208\*.

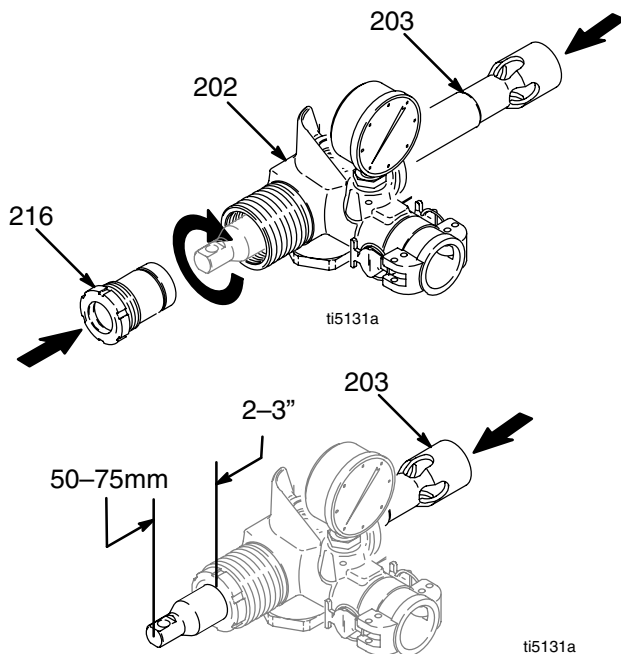
## Assemble Pump

1. Fig. 16. Place end of piston rod (203) in vise. Install new piston seal (222). Torque piston valve to 27 ft-lb (36.6 N·m).



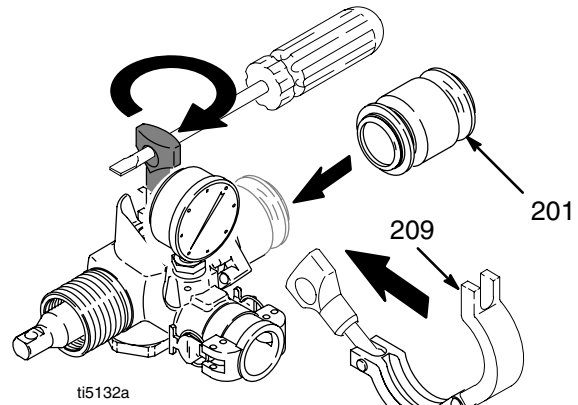
**Fig. 16**

2. Fig. 17. Install packing nut (216). Hand tighten and then tap with screw driver. Push piston rod (203) into outlet housing (202) and extending 50 – 75 mm out of outlet housing.



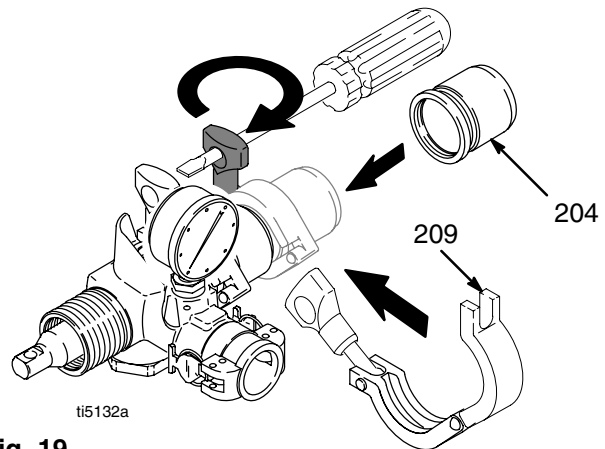
**Fig. 17**

3. Install clamp (209) on pump cylinder (201). Torque clamp to 25 in-lb (2.82 N·m).



**Fig. 18**

4. Install clamp (209) on intake housing (204). Torque clamp to 25 in-lb.



**Fig. 19**

5. See **Pump Repair, Installation** on page 18 to install pump.

# Bearing Housing & Connecting Rod

## Removal



1. Relieve pressure; page 4.
2. Fig. 20. Do **Pump Repair, Removal**, page 18.
3. Tip motor/drive housing assembly horizontal. Remove four screws (90), washers (71) and gear housing base (25).
4. Remove four screws (7) and lockwashers (6) from bearing housing (34).
5. Pull connecting rod assembly (45) and lightly tap lower rear of bearing housing (34) with a plastic mallet to loosen it from drive housing (37). Pull bearing housing and connecting rod assembly off drive housing.
6. Inspect crank (A) for excessive wear and replace drive housing, if necessary, page 22.

## Installation

1. Evenly lubricate inside of bronze bearing (E) in bearing housing (34) with high-quality motor oil. Liberally pack top roller bearing (B), lower bearing (C) inside connecting rod assembly (45) with bearing grease.
2. Assemble connecting rod (45) and bearing housing (34).
3. Clean mating surfaces of bearing housing (34) and drive housing (37).

## CAUTION

Do not use bearing housing screws (7) to align or seat bearing housing with drive housing. Align these parts with locating pins (D), to avoid premature bearing wear.

4. Align connecting rod with crank (A) and carefully align locating pins (D) in drive housing (37) with holes in bearing housing (34). Push bearing housing onto drive housing or tap it into place with a plastic mallet.
5. Install four screws (7) and lockwashers (6) on bearing housing (34). Torque screws evenly to 25 ft-lb (34 N.m).
6. Tip motor/drive housing assembly horizontal. Install gear housing base (25) with four washers (71) and screws (90).
7. Do **Pump Repair, Installation**, page 18.

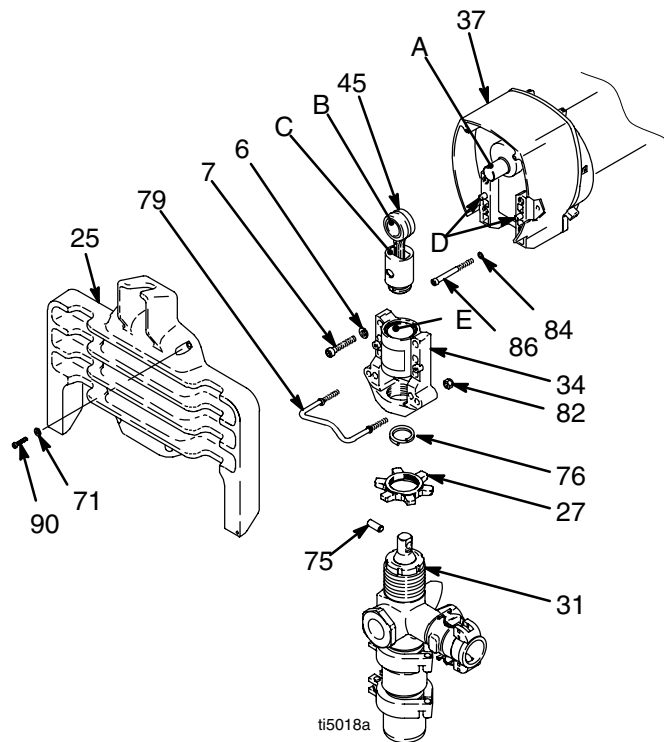




Fig. 20

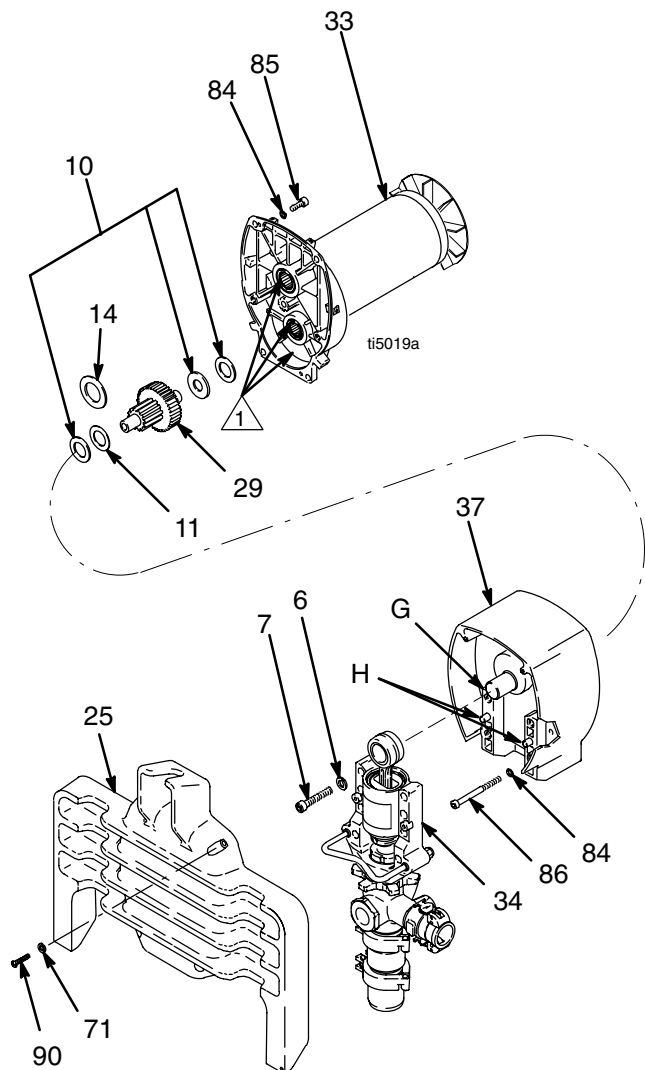
# Drive Housing


## Removal

1.  Relieve pressure; page 4.
2. Fig. 5. Remove pump module (A).
  - a. Loosen clamp rod (20).
  - b. Release hopper quick-release clamp (28).
  - c. Disconnect pump module (A) from frame (35).
3. Fig. 6. Remove five screws (12 ) and motor cover (18).
4. Fig. 21. Lay pump module horizontal. Remove four screws (90) and washers (71) and gear housing base (25).
5. Remove two screws (86) and washers (84) from front of drive housing.
6. Disconnect transducer lead (E) from control board (38). Pull strain relief bushing (49) from circuit board bracket (21). Thread transducer connector through circuit board bracket.
7. Remove bearing housing and pump assembly:
  - a. Remove four screws (7) and lock washers (6) from bearing housing (34).
  - b. Pull connecting rod assembly (45) and lightly tap lower rear of bearing housing with a plastic mallet to loosen bearing housing from drive housing (37). Pull bearing housing and pump assemblies from drive housing.
  - c. Inspect crank (G) for excessive wear and replace drive housing, if necessary.
8. Return motor and drive housing assembly to vertical position.
9. Remove two screws (12) and circuit board bracket (21) from from drive housing (37).
10. Remove four screws (85) and washers (84).

 <b>CAUTION</b>
<p>Do not drop combination gear (29) and thrust washers (10,11,14) when removing drive housing (37). Combination gear and thrust washers may stay engaged in motor front end bell or drive housing.</p>

11. Lightly tap around drive housing (37) to loosen from motor (33). Pull drive housing straight off motor. Be prepared to support combination gear (29) and thrust washers (10,11,14) which may also come out.
12. Remove combination gear (29) and thrust washers (10,11,14) that do not come out.



**Fig. 21**  Liberal apply bearing grease

# Drive Housing

## Installation

1. Fig. 21. Install thrust washers (10,11,14) on combination gear (29). Install combination gear in drive housing (37).
2. Liberally apply bearing grease (supplied with combination gear) to all gear teeth and to drive housing areas called out by note 1.

 <b>CAUTION</b>
--

When installing motor, carefully align gears to avoid damaging mating parts.
--

3. Align gears and push new drive housing straight onto motor (33).
4. Install four screws (85) and washers (84).
5. Install circuit board bracket (21) on drive housing (37) with two screws (12).

 <b>CAUTION</b>
--

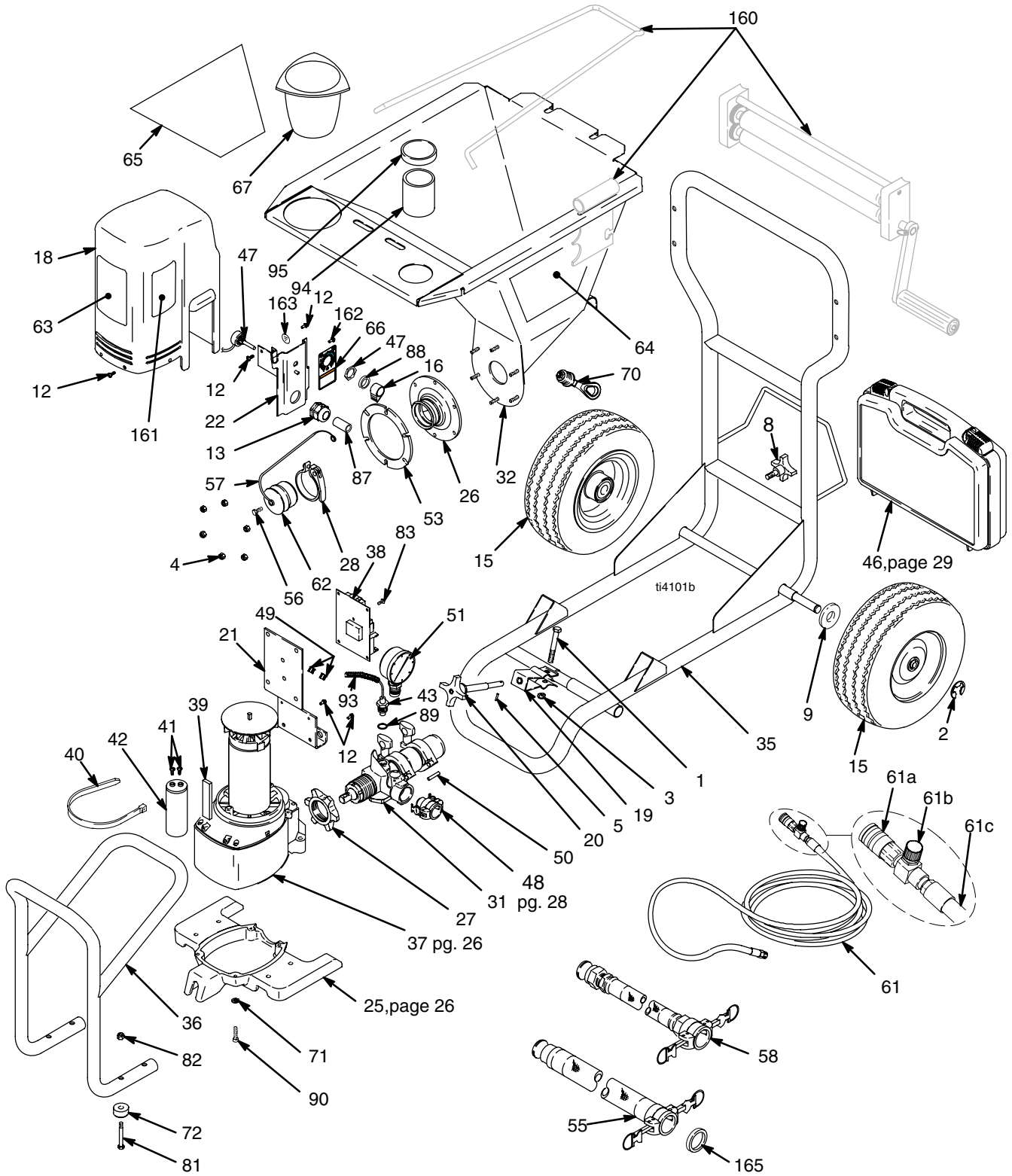
Do not use bearing housing screws (7) to align or seat bearing housing with drive housing. Align these parts with locating pins (H), to avoid premature bearing wear.
---

6. Install bearing housing and pump assembly:

- a. Align connecting rod with crank (G) and carefully align locating pins (H) in drive housing (37) with holes in bearing housing (34).
- b. Push bearing housing and pump assemblies onto drive housing. Push connecting rod assembly (45) and lightly tap lower front of bearing housing with a plastic mallet to seat bearing housing to drive housing (37).
- c. Install bearing housing (34) with four screws (7) and lock washers (6).

7. Thread transducer connector through circuit board bracket. Push strain relief bushing (49) into circuit board bracket (21). Connect transducer lead (E) to control board (38).
8. Install two screws (86) and washers (84) into front of drive housing.
9. Fig. 21. Lay pump module horizontal. Install gear housing base (25) with four washers (71) and screws (90).
10. Fig. 6. Install motor cover (18) with five screws (12).
11. Fig. 5. Install pump module (A).
  - a. Connect pump module (A) onto frame (35).
  - b. Secure hopper quick-release clamp (28).
  - c. Tighten clamp rod (20).

# Parts Drawing



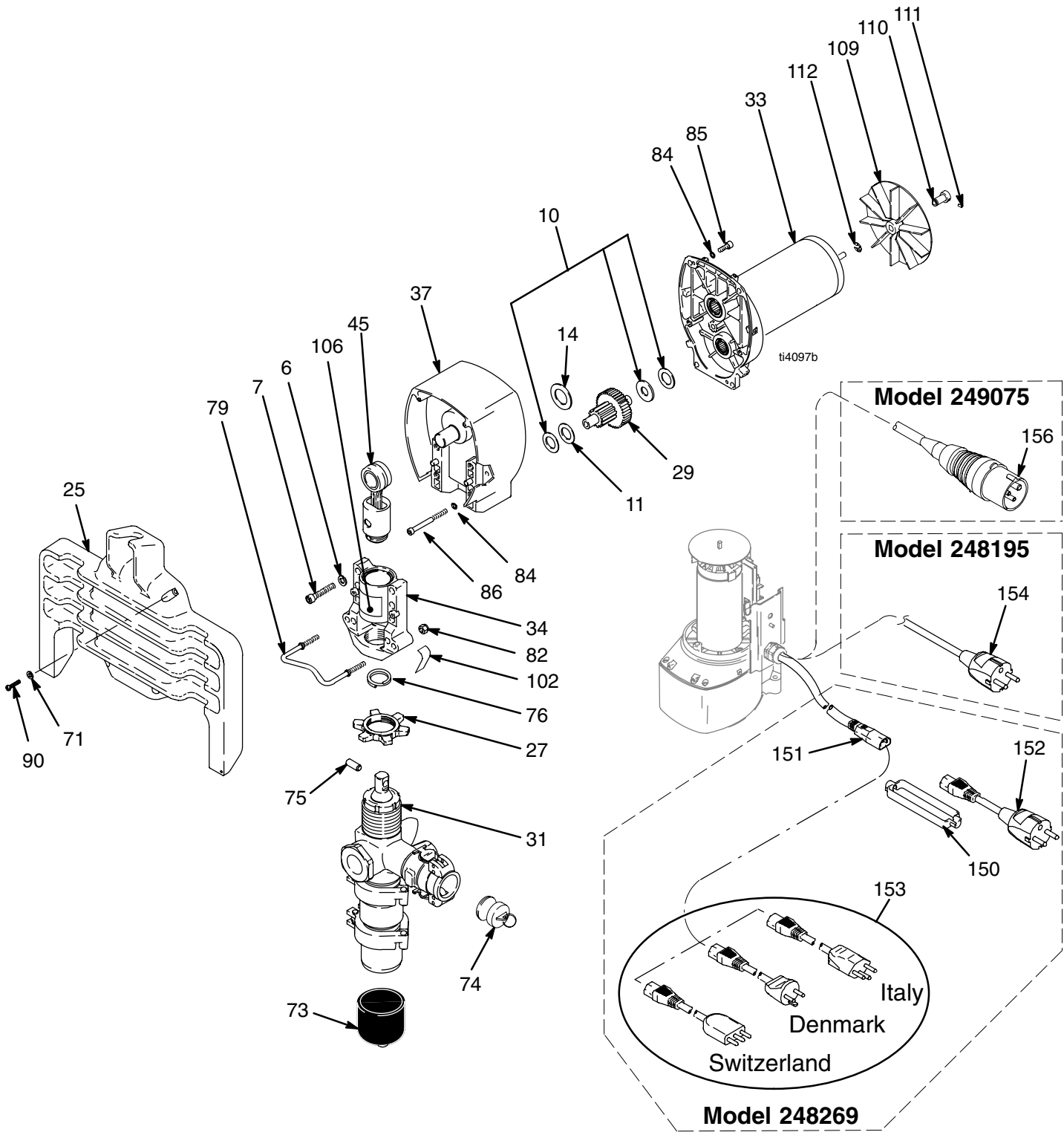


# Parts List

## Models 248195, 248269, 249075; Series A

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	100004	SCREW, cap, hex hd	1	53	15D151	RING, retainer, hopper	1
2	101242	RING, retaining, ext.	2	*55	248519	HOSE, fluid 25 mm x 5 m (includes 165)	1
3	101566	NUT, lock	1	56	100333	SCREW, cap, hex hd	1
4	102040	NUT, lock, hex	6	57	118751	TIE, lanyard	1
5	104430	PIN, cotter	1	*58	248520	HOSE, fluid, 19 mm x 3 m cpld (includes 165)	1
8	111145	KNOB, pronged	1	61	248557	KIT, replacement, hose includes 61a, 61b, 61c	1
9	111841	WASHER, plain, 5/8	2	61a	114558	COUPLER, line, air	1
12PM	115492	SCREW, mch, slot hex wash hd	9	61b	112779	VALVE, needle	1
13PM	116171	BUSHING, strain relief	1	61c	15C899	HOSE, cpld, air, 9,5 mm x 15m	1
15	116478	WHEEL, pneumatic	2	62	15D306	PLUG, adapter, hopper, texture	1
16PM	116167	KNOB, potentiometer	1	63PM	15D896	LABEL, TMAX, pump	1
18PM	15C730	COVER, motor	1	64	15D895	LABEL, TMAX, left	1
19	15C797	BRACKET, swivel	1	65	15D894	LABEL, TMAX, right	1
20	15C799	ROD, clamp	1	66PM	15D898	LABEL, TMAX, pump	1
21PM	15D308	BRACKET, circuit board	1	67	551390	SIGHTGLASS, beaker, grad	1
22PM	15D309	BRACKET, control	1	70	119347	PLUG, hopper, texture	1
26	15D865	ADAPTER, pump, hopper	1	71PM	100020	WASHER, lock	4
27PM	193031	NUT, retaining	1	72PM	113817	BUMPER	4
28	234188	CLAMP, quick release		81PM	119365	SCREW, cap, hex head	4
31PM	248764	PUMP, displacement, texture	1	82PM	111040	NUT, lock	6
32	248256	HOPPER, weldment	1	83PM	111839	SCREW, mach, pn hd, sems	6
35	287273	FRAME, weldment	1	87PM	116307	HOSE, strain relief	1
36PM	287317	FRAME, pump	1	88PM	15C973	GASKET	1
37PM	287319	HOUSING, drive	1	89PM	111457	O-RING	1
38PM	248760	KIT, repair, board, control, 240V	1	90PM	101888	SCREW, cap, sch	4
	249475	KIT, repair, board, control, 110V	1	93PM	198586	CONDUIT, corrugated	1
39PM	115711	TAPE, foam, 1/2 in. wide	1	94	119293	JAR, 6 Oz	1
40PM	116028	TIE, wire	1	95	119316	LID, 6 Oz	1
41PM	115762	SCREW, plastic head	2	160		ACCESSORY, Bag Roller, not included See Manual 309976	
42PM		KIT, repair, capacitor includes 39, 40, 41		161PM	15D939	LABEL, safety	1
	248765	Models 248195, 248269	1	162PM	111593	SCREW, grounding	1
	243415	Model 249075	1	163PM	186620	LABEL, symbol, ground	1
43PM	246320	TRANSDUCER, pressure	1	164	119390	TOOL, scraper (not shown)	1
44	290340	LABEL, designation, artwork, CE	1	165	15G352	GASKET, Coupler, T-Max	1
46	248405	TOOL BOX, applicator	1	PM		Included in pump module kits 248634, 248651, 249519	
47PM	256219	POTENTIOMETER, assembly	1			* Includes 165 (15G352)	
*48PM	118506	COUPLER, male, 1 in. npt (includes 165)	1				
49PM	114678	BUSHING, strain relief	2				
50PM	119284	PIN, straight, slotted	1				
51PM	248391	GAUGE, pressure, pump, texture	1				

# Parts Drawing

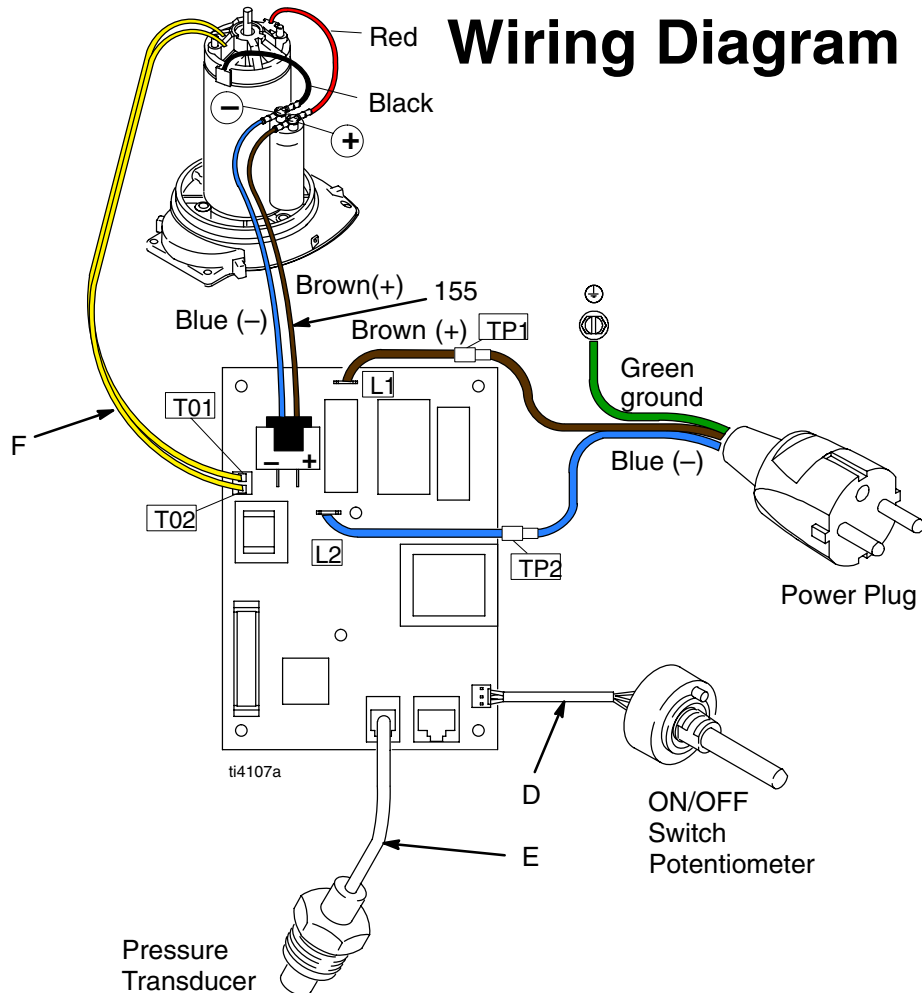


# Parts List

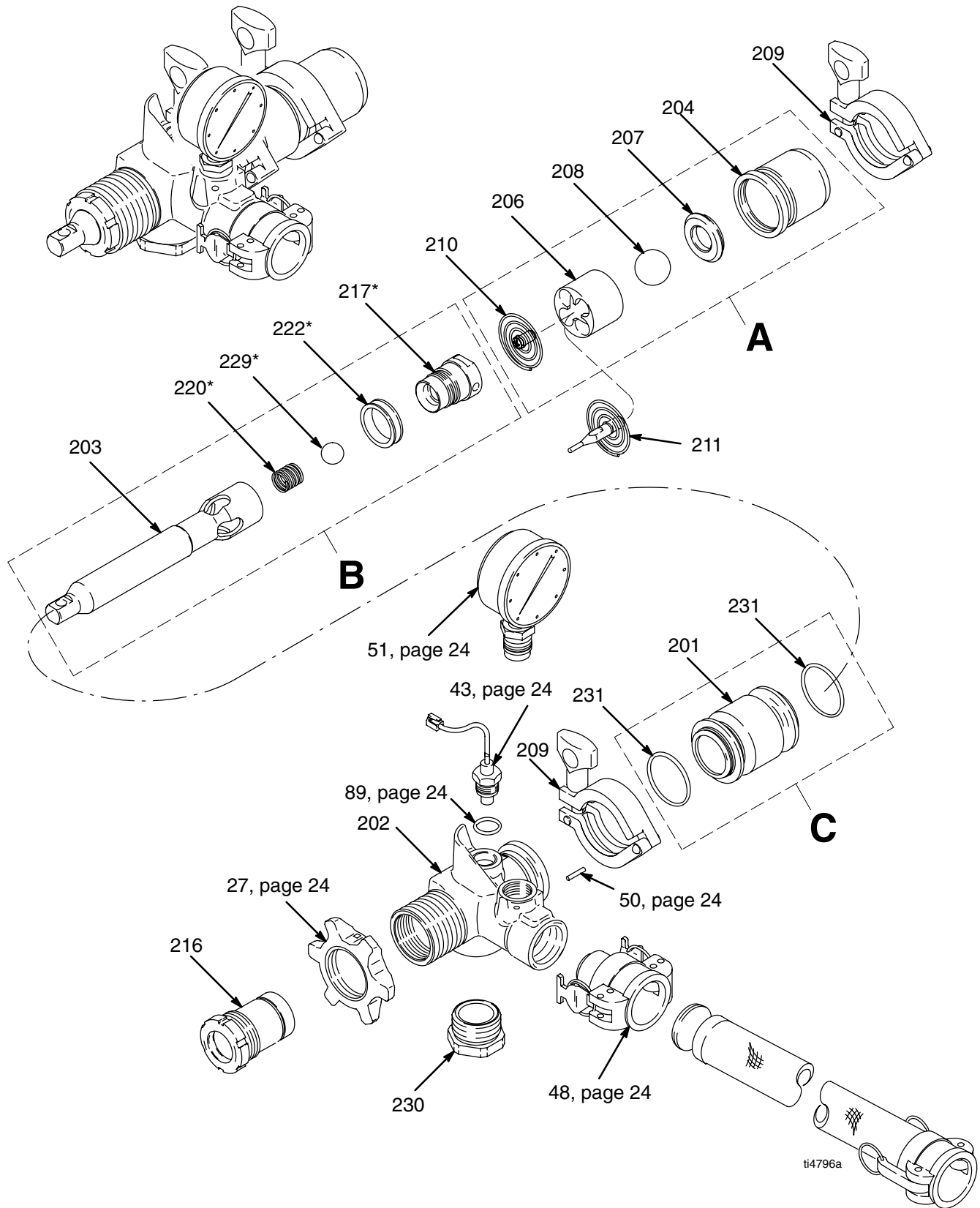
## Models 248195, 248269, 249075; Series A

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
6PM	106115	WASHER, lock spring (hi-collar)	4	85PM	100644	SCREW, cap, sch	4
7PM	107210	SCREW, cap, socket hd	4	86PM	107218	SCREW, cap, sch	2
10PM	114672	WASHER, thrust	3	90PM	101888	SCREW, cap, sch	4
11PM	114699	WASHER, thrust	1	102PM	192840	LABEL, warning	1
14PM	116191	WASHER, thrust	1	106PM	187436	LABEL, torque	1
25PM	15D708	BASE, gear housing	1	109PM	118715	FAN, motor	1
27PM	193031	NUT, retaining	1	110PM	15E287	BUSHING, shaft, fan	1
29PM	243870	GEAR, combination	1	111PM	103253	SCREW, set, hex soc	1
31PM	248764	PUMP, displacement, texture	1	112PM	113983	RING, retaining, ext	1
33PM	248759	KIT, repair, motor, 240V	1	150*	195551	RETAINER, adapter, cord	1
	249476	KIT, repair, motor, 110V	1	151*	15E259	Euro Multi cord	1
34PM	248633	HOUSING, bearing	1	152*	242001	CEE 7/7	1
37PM	248558	HOUSING, drive	1	153*	287121	Italy, Denmark, Switzerland	1
45PM	241008	KIT, repair, connecting rod, includes 76	1	154†	15E257	CEE 7/7	1
71PM	100020	WASHER, lock	4	155PM	15E271	HARNESS, wire	1
73	118768	CAP, pump	1	156‡	15F233	UK	1
74PM	119283	ADAPTER, plug, dust	1				
75PM	176818	PIN	1				
76PM	176817	SPRING, retaining	1				
79	15E107	LEG, support, pump	1				
82	111040	NUT, lock	6				
84PM	105510	WASHER, lock, spring (hi-collar)	6				

\* Included in Model 248269 and pump module kit 248651  
 † Included in Model 248195 and pump module kit 248634  
 ‡ Included in Model 249075 and pump module kit 249519  
 PM Included in pump module kits 248634, 248651, 249519



# Parts Drawing

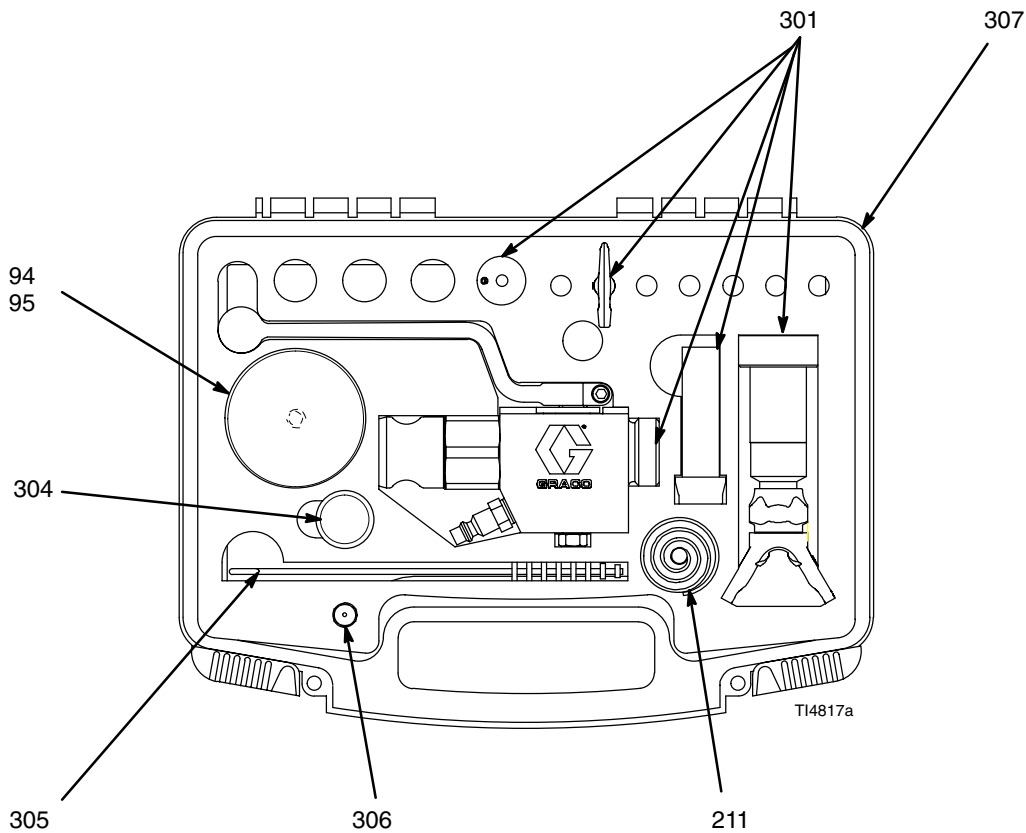


# Parts – Pump 248764

## Model 248764, Series A

Ref No.	Part No.	Description	Qty.	Ref No.	Part No.	Description	Qty.
201	15D113	CYLINDER, pump	1	216	248529	KIT, repair, seal, throat	1
202	15D108	HOUSING, outlet	1	217*	248232	VALVE, piston	1
203	15D532	ROD, piston	1	220*	101822	BALL, bearing	1
204	248769	KIT, repair, housing, intake includes PTFE o-ring	1	222*	15D116	SEAL, piston	1
206	15D115	GUIDE, ball	1	228	107098	O-RING	1
207	193395	SEAT, carbide	1	229*	501095	SPRING, ball check	1
208	107167	BALL, sst	1	230	15D740	PLUG, disc, rupture	1
209	118598	CLAMP	2	231	107563	O-RING	2
210	248162	SPRING, intake ball	1	* These parts are also included in Repair Kit 248530, which may be purchased separately.			
211	248304	SPRING, intake ball, plunger	1				

# 248405 Applicator Tool Box



Ref No.	Part No.	Description	Qty.
301		Included with Applicator 248164 See Manual 309978 for parts	1
94	119293	JAR, 6 oz	1
95	119316	LID, 6 oz	1
304	248515	BALL, sponge, 30 mm	1
305	M70613	BRUSH, cleaning	1
306	248395	TOOL, cleaning, applicator	1
307	248326	TOOL BOX, texture	1

# Notes

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# Technical Data

Maximum air working pressure ..... 250 psi  
(1.7 MPa, 17 bar)  
Maximum fluid working pressure ..... 580 psi  
(4.0 MPa, 40 bar)  
Generator required ..... 7 kW  
Hopper capacity  
    Maximum ..... 12 gallons (45 liters)  
    Operating ..... 10 gallons (38 liters)  
Maximum delivery with texture material .. 1 to 1.5 gpm  
(3.8 to 5.7 lpm)  
Fluid outlet size ..... 1.0 in. (f) cam and groove

Dimensions  
    Length ..... 23 in. (584 mm) with handle  
    Width ..... 24 in. (610 mm)  
    Height ..... 40 in. (1016 mm)  
Weight  
    Without hoses or applicator ..... 113 lb (51 kg)  
    With hoses and applicator ..... 125 lb (57 kg)  
Wetted parts ..... Buna-N, aluminum,  
  brass, polyethylene, neoprene,  
  stainless steel, chrome-plated  
  stainless steel, nickel-plated carbon steel,  
  fluoroelastomer, nickel-plated iron, inconel,  
  wool felt, tungsten carbide, PTFE

Sound data  
Sprayer  
    Sound pressure level \* ..... 79 dB(A)  
    Sound power level † ..... 87.5 dB(A)  
    \* Measured while spraying at 1 m.  
    † Measured per ISO-3744.  
Applicator ..... Manual 309978

# Graco Standard Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale by the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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

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

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## **ADDITIONAL WARRANTY COVERAGE**

Graco does provide extended warranty and wear warranty for products described in the "Graco Contractor Equipment Warranty Program".

# Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call **1-800-690-2894** to identify the nearest distributor.

*All written and visual data contained in this document reflect the latest product information available at the time of publication.*

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