Ultimate NOVA™ 395
Ultimate Super NOVA™ 495/595
Airless Sprayers

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

<table>
<thead>
<tr>
<th>Ultimate Sprayer</th>
<th>826014</th>
<th>826015</th>
<th>826016</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOVA 395</td>
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<tr>
<td>Super NOVA 495</td>
<td>826017</td>
<td>826018</td>
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</tr>
<tr>
<td>Super NOVA 595</td>
<td>826052</td>
<td>826046</td>
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</tr>
</tbody>
</table>

All models not available in all countries.

Important Safety Instructions
Read all warnings and instructions in this manual.
Save these instructions.

Related manuals

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PROVEN QUALITY. LEADING TECHNOLOGY.
The following Warnings are for the safe setup, use, grounding, maintenance and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. Refer back to these Warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

**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:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop clothes (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Sprayer generates sparks. When flammable liquid is used in or near sprayer or for flushing or cleaning, keep sprayer at least 20 ft (6 m) away from explosive vapors.
- Do not clean with materials having flash points lower than 70°F (21°C). Use water-based materials or mineral spirits type material only. For complete information about your fluid, request the MSDS from the fluid distributor or retailer.
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Ground equipment and conductive objects in work area. Read **Grounding** instructions.
- If there is static sparking or you feel a shock, **stop operating immediately**. Do not use equipment until you identify and correct the problem.
- Keep a fire extinguisher in the work area.

**ELECTRIC SHOCK HAZARD**

Improper grounding, setup, or usage of the system can cause electric shock.

- Turn off and disconnect power cord before servicing equipment.
- Use only grounded electrical outlets
- Use only 3-wire extension cords.
- Ensure ground prongs are intact on sprayer and extension cords.
- Do not expose to rain. Store indoors.

**SKIN INJECTION HAZARD**

High pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Seek immediate surgical treatment.

- Do not point gun at anyone or any part of the body.
- Do not put your hand over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Do not spray without tip guard and trigger guard installed.
- Engage trigger lock when not spraying.
- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking or servicing equipment.
### WARNING

#### EQUIPMENT MISUSE HAZARD
Misuse can cause death or serious injury.
- 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.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine Graco replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your Graco distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts and hot surfaces.
- Do not kink or overbend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.
- Do not operate equipment when fatigued or under the influence of drugs or alcohol.

#### PRESSURIZED ALUMINUM PARTS HAZARD
Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in this equipment. Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious injury and/or substantial property damage.

#### MOVING PARTS HAZARD
Moving parts can pinch 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** in this manual. Disconnect power or air supply.

#### 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, inhalation of toxic fumes, burns, and hearing loss. This equipment includes, but is not limited to:
- Protective eye wear.
- Clothing and respirator as recommended by the fluid and solvent manufacturer.
- Gloves.
- Hearing protection.
Component Identification and Function

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>Motor</td>
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<tr>
<td>B</td>
<td>Drive Assembly</td>
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<tr>
<td>D</td>
<td>Displacement Pump</td>
</tr>
<tr>
<td>E</td>
<td>Fluid Outlet</td>
</tr>
<tr>
<td>F</td>
<td>Prime Valve</td>
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<tr>
<td>G</td>
<td>Fluid Filter</td>
</tr>
<tr>
<td>H</td>
<td>Pressure Adjusting Knob</td>
</tr>
<tr>
<td>J</td>
<td>Pressure Control</td>
</tr>
<tr>
<td>K</td>
<td>ON/OFF Switch</td>
</tr>
<tr>
<td>M</td>
<td>50 ft (15 m) Main Hose</td>
</tr>
<tr>
<td>N</td>
<td>Spray Gun</td>
</tr>
<tr>
<td>P</td>
<td>Spray Tip</td>
</tr>
<tr>
<td>R</td>
<td>HandTite™ Tip Guard</td>
</tr>
<tr>
<td>S</td>
<td>Gun Safety Latch</td>
</tr>
<tr>
<td>T</td>
<td>Power Cord Rack</td>
</tr>
<tr>
<td>U</td>
<td>Suction Hose</td>
</tr>
<tr>
<td>V</td>
<td>Drain Tube</td>
</tr>
</tbody>
</table>
General Repair Information

Pressure Relief Procedure

> **WARNING**

**INJECTION HAZARD**
System pressure must be manually relieved to prevent system from starting or spraying accidentally. Fluid under high pressure can be injected through skin and cause serious injury. To reduce risk of injury from injection, splashing fluid, or moving parts, follow Pressure Relief Procedure whenever you:
- are instructed to relieve pressure,
- stop spraying,
- check or service any system equipment,
- or install or clean spray tip.

1. Lock gun safety latch.
2. Turn ON/OFF switch to OFF.
3. Unplug power supply cord.
4. Unlock gun safety latch. Hold metal part of gun firmly to grounded metal pail. Trigger gun to relieve pressure.
5. Lock gun safety latch.
6. Open pressure drain valve. Leave pressure drain valve open until ready to spray again.

If suspected that spray tip or hose is completely clogged, or that pressure has not been fully relieved after following steps above, VERY SLOWLY loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Now clear tip or hose obstruction.

> **CAUTION**

To reduce risk of pressure control malfunction:
- Use needle nose pliers to disconnect wire. Never pull on wire, pull on connector.
- Mate wire connectors properly. Center flat blade of insulated male connector in female connector.
- Route wires carefully to avoid interference with other connections of pressure control. Do not pinch wires between cover and control box.

1. Keep all screws, nuts, washers, gaskets, and electrical fittings removed during repair procedures. These parts are not normally provided with replacement assemblies.

> **WARNING**

**ELECTRIC SHOCK HAZARD**
**MOVING PARTS HAZARD**
To reduce risk of serious injury, including electric shock, do not touch moving or electrical parts with fingers or tools while testing repair. Shut off and unplug sprayer when inspection is complete. Install all covers, gaskets, screws, washers and shroud before operating sprayer.

2. Test repair after problem is corrected.

3. If sprayer does not operate properly, review repair procedure to verify procedure was done correctly. If necessary, see Troubleshooting Guide, pages 7 - 11, for other possible solutions.

> **CAUTION**

**HOT SURFACES HAZARD**
**EXPLOSION HAZARD**
Motor housing may be very hot during operation and could burn skin if touched. Flammable materials spilled on hot, bare motor could cause fire or explosion. Have motor shroud in place during operation to reduce risk of burns, fire or explosion or cut fingers.

4. Install motor shroud before operation of sprayer and replace if damaged. Motor shroud directs cooling air around motor to prevent overheating. It can reduce risk of burns, fire or explosion, or cut fingers; see preceding WARNING.
Your system must be grounded. Read Warnings, page 2.

The sprayer requires:

- 100–120 VAC, 50/60 Hz, 15A circuit with a grounding receptacle.
- Do not alter ground prong or use adapter.
- Do not use sprayer if the electrical cord has a damaged ground prong. Only use an extension cord with an undamaged, 3-prong plug.

Recommended extension cord lengths:

- 120 Vac: 300 ft (90 m) 12 AWG (1.0 mm), 3 wire with grounding prong

Long lengths reduce sprayer performance.

Spray gun: ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: follow local codes.

Solvent pails used when flushing: follow local code. Only use conductive metal pails, placed on grounded surface such as concrete. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

Grounding the metal pail: connect a ground wire to the pail by clamping one end to pail and other end to ground such as a water pipe.

Maintaining grounding continuity when flushing or relieving pressure: hold metal part of spray gun firmly to the side of a grounded metal pail, then trigger gun.
## Troubleshooting

### Relieve pressure; page 5.

### MOTOR WON'T OPERATE

<table>
<thead>
<tr>
<th>TYPE OF PROBLEM</th>
<th>WHAT TO CHECK</th>
<th>WHAT TO DO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Fluid Pressure Problems</strong></td>
<td>1. Pressure control knob setting. Motor will not run if at minimum setting (fully counterclockwise).</td>
<td>1. Slowly increase pressure setting to see if motor starts.</td>
</tr>
<tr>
<td></td>
<td>2. Spray tip or fluid filter may be clogged.</td>
<td>2. Relieve pressure and clear clog or clean filter; refer to separate gun or tip instruction manual.</td>
</tr>
<tr>
<td><strong>Basic Mechanical Problems</strong></td>
<td>1. Pump (41) for frozen or hardened paint.</td>
<td>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 packings. See page 21 (<strong>Displacement Pump Replacement</strong>).</td>
</tr>
<tr>
<td></td>
<td>2. Displacement pump connecting rod pin (9a). Pin must be completely pushed into connecting rod (9) and retaining spring (9b) must be firmly in groove of pump pin. See Fig. 11.</td>
<td>2. Push pin into place and secure with spring retainer.</td>
</tr>
<tr>
<td></td>
<td>2. Electrical supply: Meter must read 85–130 Vac.</td>
<td>2. Reset building circuit breaker; replace building fuse. Try another outlet.</td>
</tr>
<tr>
<td></td>
<td>3. Extension cord. Check extension cord continuity with volt meter.</td>
<td>3. Replace extension cord.</td>
</tr>
<tr>
<td></td>
<td>4. Sprayer power supply cord (56). Inspect for damage such as broken insulation or wires.</td>
<td>4. Replace power supply cord.</td>
</tr>
<tr>
<td>TYPE OF PROBLEM</td>
<td>WHAT TO CHECK</td>
<td>WHAT TO DO</td>
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<td>-------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Basic Electrical Problems (continued)</td>
<td>1. That motor leads are securely fastened and properly mated.</td>
<td>1. Replace loose terminals; crimp to leads. Be sure terminals are firmly connected. Clean circuit board terminals. Securely re-connect leads.</td>
</tr>
<tr>
<td></td>
<td>2. For loose motor brush lead connections and terminals. See page 13.</td>
<td>2. Tighten terminal screws. Replace brushes if leads are damaged. See page 13.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Brushes do not wear at the same rate on both sides of motor. Check both brushes.</td>
<td></td>
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<tr>
<td></td>
<td>4. For broken or misaligned motor brush springs. Rolled portion of spring must rest squarely on top of brush. See page 13.</td>
<td>4. Replace spring if broken. Realign spring with brush. See page 13.</td>
</tr>
<tr>
<td></td>
<td>5. Motor brushes may be binding in brush holders. See page 13.</td>
<td>5. Clean brush holders. Remove carbon with small cleaning brush. Align brush leads with slot in brush holder to assure free vertical brush movement.</td>
</tr>
<tr>
<td>Refer to wiring diagram, Fig. 8, to identify test points (TP).</td>
<td>1. Power supply cord (56). Connect volt meter between TP1 (neutral) and L2. Plug in sprayer. Meter must read 85–130 Vac. Unplug sprayer.</td>
<td>1. Replace power supply cord.</td>
</tr>
<tr>
<td></td>
<td>2. ON/OFF switch (58). Connect volt meter between L1 and L2 terminal on ON/OFF switch. Plug in sprayer and turn ON. Meter must read 85–130 Vac</td>
<td>2. Replace ON/OFF switch. See page 15.</td>
</tr>
<tr>
<td></td>
<td>3. All terminals for damage or loose fit.</td>
<td>3. Replace damaged terminals and reconnect securely.</td>
</tr>
</tbody>
</table>
## Troubleshooting

### LOW OR FLUCTUATING OUTPUT

<table>
<thead>
<tr>
<th>TYPE OF PROBLEM</th>
<th>WHAT TO CHECK</th>
<th>WHAT TO DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Output</td>
<td>1. For worn spray tip.</td>
<td>1. Follow <strong>Pressure Relief Procedure Warning</strong>, then replace tip. See your separate gun or tip manual.</td>
</tr>
<tr>
<td></td>
<td>2. Verify pump does not continue to stroke when gun trigger is released.</td>
<td>2. Service pump. See page 21.</td>
</tr>
<tr>
<td></td>
<td>3. Filter clogged.</td>
<td>3. Relieve pressure. Check and clean filter.</td>
</tr>
<tr>
<td></td>
<td>5. Suction hose connections.</td>
<td>5. Tighten any loose connections.</td>
</tr>
<tr>
<td></td>
<td>7. Extension cord size and length; must be at least 12 gauge wire and no longer than 300 ft. Longer cord lengths reduce sprayer performance.</td>
<td>7. Replace with a correct, grounded extension cord.</td>
</tr>
<tr>
<td></td>
<td>8. Leads from motor to pressure control circuit board (49) for damaged or loose wires or connectors. Inspect wiring insulation and terminals for signs of overheating.</td>
<td>8. Be sure male terminal blades are centered and firmly connected to female terminals. Replace any loose terminal or damaged wiring. Securely reconnect terminals.</td>
</tr>
<tr>
<td></td>
<td>10. For worn motor brushes which must be 1/2 in. minimum. See page 13.</td>
<td>10. Replace brushes. See page 13.</td>
</tr>
<tr>
<td></td>
<td>11. For broken and misaligned motor brush springs. Rolled portion of spring must rest squarely on top of brush.</td>
<td>11. Replace spring if broken. Realign spring with brush. See page 13.</td>
</tr>
<tr>
<td></td>
<td>13. Low stall pressure.</td>
<td>13. Do either or both:</td>
</tr>
<tr>
<td></td>
<td>a. Turn pressure control knob fully clockwise. Make sure pressure control knob is properly installed to allow full clockwise position.</td>
<td>a. Turn pressure control knob fully clockwise. Make sure pressure control knob is properly installed to allow full clockwise position.</td>
</tr>
<tr>
<td></td>
<td>b. Try a new transducer.</td>
<td>b. Try a new transducer.</td>
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</tbody>
</table>
## Troubleshooting

### LOW OR FLUCTUATING OUTPUT

<table>
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<th>TYPE OF PROBLEM</th>
<th>WHAT TO CHECK</th>
<th>WHAT TO DO</th>
</tr>
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<tbody>
<tr>
<td>Motor runs and pump strokes</td>
<td>1. Paint supply.</td>
<td>1. Refill and reprime pump.</td>
</tr>
<tr>
<td></td>
<td>2. Intake strainer clogged.</td>
<td>2. Remove and clean, then reinstall.</td>
</tr>
<tr>
<td></td>
<td>3. Suction tube or fittings loose.</td>
<td>3. Tighten; use thread sealant or sealing tape on threads if necessary.</td>
</tr>
<tr>
<td></td>
<td>4. To see if intake valve ball and piston ball are seating properly.</td>
<td>4. Remove intake valve and clean. Check balls and seats for nicks; replace if necessary, page 21. Strain paint before using to remove particles that could clog pump.</td>
</tr>
<tr>
<td></td>
<td>5. Leaking around throat packing nut which may indicate worn or damaged packings. See page 21.</td>
<td>5. Replace packings, page 21. Also check piston valve seat for hardened paint or nicks and replace if necessary. Tighten packing nut/wet-cup.</td>
</tr>
<tr>
<td>Motor runs but pump does not stroke</td>
<td>1. Displacement pump pin (32) (damaged or missing), page 21.</td>
<td>1. Replace pump pin if missing. Be sure retainer spring (31) is fully in groove all around connecting rod, page 21.</td>
</tr>
<tr>
<td></td>
<td>2. Connecting rod assembly (43) for damage, page 19.</td>
<td>2. Replace connecting rod assembly, page 19.</td>
</tr>
<tr>
<td></td>
<td>3. Gears or drive housing, page 19.</td>
<td>3. Inspect drive housing assembly and gears for damage and replace if necessary, page 19.</td>
</tr>
</tbody>
</table>
# Troubleshooting

## MOTOR IS HOT AND RUNS INTERMITTENTLY

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

## ELECTRICAL SHORT

<table>
<thead>
<tr>
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<th>WHAT TO CHECK</th>
<th>WHAT TO DO</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>If check is OK, go to next check</td>
<td>When check is not OK refer to this column</td>
</tr>
<tr>
<td></td>
<td>All electrical wiring for damaged insulation, and all terminals for loose fit or damage. Also wires between pressure control and motor. See page 20.</td>
<td>1. Repair or replace any damaged wiring or terminals. Securely reconnect all wires.</td>
</tr>
<tr>
<td></td>
<td>2. For missing inspection plate gasket (see page 20), bent terminal forks or other metal to metal contact points which could cause a short.</td>
<td>2. Correct faulty conditions.</td>
</tr>
<tr>
<td></td>
<td>4. Motor control board (49) by performing motor control board diagnostics on page 16. If diagnostics indicate, substitute with a good board.</td>
<td>4. Replace with a new pressure control board (35). See page 18.</td>
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</tbody>
</table>

**CAUTION: 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.**

<table>
<thead>
<tr>
<th>TYPE OF PROBLEM</th>
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<tbody>
<tr>
<td></td>
<td>Basic Electrical Problems on page 7.</td>
<td>Perform necessary procedures.</td>
</tr>
<tr>
<td></td>
<td>2. ON/OFF switch (58) See page 15. Be sure sprayer is unplugged! Disconnect wires from switch. Check switch with ohmmeter. Reading must be infinity with ON/OFF switch OFF, and zero with switch ON.</td>
<td>2. Replace ON/OFF switch. See page 15.</td>
</tr>
<tr>
<td></td>
<td>3. For damaged or pinched wires in pressure control. See page 18.</td>
<td>3. Replace damaged parts. See page 18.</td>
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</table>

Sprayer quits after sprayer operates for 5 to 10 minutes.

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<tr>
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<tbody>
<tr>
<td></td>
<td>Basic Electrical Problems on page 7.</td>
<td>Perform necessary procedures.</td>
</tr>
<tr>
<td></td>
<td>2. Electrical supply with voltmeter. Meter must read 85 - 130 Vac.</td>
<td>2. If voltage is too high, do not operate sprayer until corrected.</td>
</tr>
</tbody>
</table>
Spin Test

Setup

Electric Shock Hazard; page 5.

To check armature, motor winding and brush electrical continuity:

1. Relieve pressure; page 5.

2. Remove drive housing; page 19.

3. Fig. 4. Remove pressure control cover (50). Disconnect connector (F).

4. Fig. 5. Remove motor shroud (23) and inspection covers (A).

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 20.

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

1. Connect red and black motor leads with test lead. 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 13.

3. If still uneven or no resistance, replace motor; page 20.
Motor Brush Replacement

The 395/495/595 sprayer’s motors are supplied by two different motor manufacturers. Style A motor has brush caps held on with screws. Style B has brush caps that snap onto the motor. Determine which style motor you are servicing and refer to the appropriate illustration in the following instructions.

**Motor Brush Removal**

Replace brushes worn to less than 1/2 in. Brushes wear differently on each side of motor, check both sides. Brush Repair Kit 287735 is available.

1. Read General Repair Information; page 5.

2. Relieve pressure; page 5.

3. Fig. 5. Remove motor shroud and two inspection covers (A).

4. Fig. 6. Push in spring clip (A) to release hook (B) from brush holder (C). Pull out spring clip (A).

5. Fig. 6. Pull brush lead (D) off of terminal (E). Remove brush (F).

6. 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.

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![Fig. 5](image1)

![Fig. 6](image2)
Motor Brush Replacement

Motor Brush Installation

⚠️ CAUTION

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

1. Fig. 7. Install new brush (F) with lead into brush holder (C).
2. Fig. 7. Slide brush lead (D) onto terminal (E).
3. Fig. 7. Install spring clip (A). Push down to set hook (B) into brush holder (C).
4. Repeat for other side.
5. Test brushes.
   a. Remove pump (41); **Displacement Pump Replacement**, page 21.
   b. With sprayer OFF, turn pressure control knob fully counterclockwise to minimum pressure. Plug in sprayer.
   c. Turn sprayer ON. Slowly increase pressure until motor is at full speed.

⚠️ CAUTION

Do not run sprayer dry for more than 30 seconds while checking brushes to avoid damaging displacement pump packings.

6. Install brush inspection covers and gaskets.
   a. Operate sprayer 1 hour with no load.
   b. Install pump (41); **Displacement Pump Replacement**, page 21.
**On/Off Switch Replacement**

**Removal**

1. ![Warning Icon] Relieve pressure; page 5.

2. Fig. 8. Remove four screws (12) and pressure control cover (50).

3. Disconnect two wires (A) from ON/OFF switch (58).

4. Remove toggle boot (30) and locking ring. Remove ON/OFF switch (58).

**Installation**

1. Install new ON/OFF switch (58). Install locking ring and toggle boot (30).

2. Connect two wires (A) to ON/OFF switch.

3. Install pressure control cover (50) with four screws (12).
Pressure Control Repair

Motor Control Board

Removal
Refer to Fig. 8.

1. Relieve pressure; page 5.
2. Remove four screws (12) and cover (50).
3. Disconnect all leads to motor control board (49).
4. Remove six screws (6) and circuit board (49).

Installation
1. Clean pad on rear of motor control board. Apply small amount of thermal compound 073019 to pad.
2. Fig. 8. Install motor control board (49) with six screws (6).
3. Connect all leads to motor control board (49). See Fig. 8.
4. Bundle and tie all loose wires so none lay in contact with inductor coil (not 120 Vac sprayers).
5. Install cover (50) with four screws (12).

Motor Control Board Diagnostics

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

CAUTION
Do not allow sprayer to develop fluid pressure without transducer installed. Leave drain valve open if test transducer is used.

1. For sprayers with digital display, see Digital Display Messages, page 17.

<table>
<thead>
<tr>
<th>LED BLINKS</th>
<th>SPRAYER OPERATION</th>
<th>INDICATES</th>
<th>WHAT TO DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Once</td>
<td>Sprayer runs</td>
<td>Normal operation</td>
<td>Do nothing</td>
</tr>
<tr>
<td>Two times repeatedly</td>
<td>Sprayer shuts down and LED continues to blink two times repeatedly</td>
<td>Run away pressure. Pressure greater than 4500 psi (310 bar, 31 MPa) or damaged pressure transducer.</td>
<td>Replace motor control board or pressure transducer.</td>
</tr>
<tr>
<td>Three times repeatedly</td>
<td>Sprayer shuts down and LED continues to blink three times repeatedly</td>
<td>Pressure transducer is faulty or missing</td>
<td>Check transducer connection. Open drain valve. Substitute new transducer for transducer in sprayer. If sprayer runs, replace transducer.</td>
</tr>
<tr>
<td>Four times repeatedly</td>
<td>Sprayer shuts down and LED continues to blink four times repeatedly</td>
<td>Line voltage is too high</td>
<td>Check for voltage supply problems</td>
</tr>
<tr>
<td>Five times repeatedly</td>
<td>Sprayer does not start or shuts down and LED continues to blink five times repeatedly</td>
<td>Motor fault</td>
<td>Check for locked rotor, shorted wiring or disconnected motor. Repair or replace failed parts.</td>
</tr>
<tr>
<td>Six times repeatedly</td>
<td>Sprayer shuts down and LED blinks six times repeatedly</td>
<td>Motor is too hot or there is a fault in the motor thermal device</td>
<td>Allow sprayer to cool. If sprayer runs correctly when cool, check motor fan function and airflow. Keep sprayer in cool location. If sprayer does not run when cool and continues to blink 6 times, replace motor.</td>
</tr>
</tbody>
</table>
## Pressure Control Repair

### Digital Display Messages

No display does not mean that sprayer is not pressurized. Relieve pressure before repair; page 5.

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>SPRAYER OPERATION</th>
<th>INDICATION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Display</td>
<td>Sprayer stops. Power is not applied. Sprayer may be pressurized.</td>
<td>Loss of power</td>
<td>Check power source. Relieve pressure before repair or disassembly.</td>
</tr>
<tr>
<td>$\text{E} = 02$</td>
<td>Sprayer stops. Power is applied. Sprayer may continue to run.</td>
<td>Normal operation</td>
<td>Spray</td>
</tr>
<tr>
<td>$\text{E} = 03$</td>
<td>Sprayer stops. Power is applied. Sprayer does not start or stops.</td>
<td>Pressure greater than 4500 psi (310 bar, 31 MPa) or pressure transducer faulty</td>
<td>Replace pressure control board or pressure transducer.</td>
</tr>
<tr>
<td>$\text{E} = 04$</td>
<td>Sprayer stops. Power is applied. Sprayer stops. Power is applied.</td>
<td>Line voltage too high</td>
<td>Check for voltage supply problem</td>
</tr>
<tr>
<td>$\text{E} = 05$</td>
<td>Sprayer stops. Power is applied. Sprayer does not start or stops.</td>
<td>Motor fault</td>
<td>Check for locked rotor, shorted wiring or disconnected motor. Repair or replace failed parts.</td>
</tr>
<tr>
<td>$\text{E} = 06$</td>
<td>Sprayer stops. Power is applied. Sprayer stops. Power is applied.</td>
<td>Motor it too hot.</td>
<td>Allow sprayer to cool. If sprayer runs correctly when cool, check motor fan function and air flow. Keep sprayer in cool location. If sprayer does not run when cool and continues to blink 6 times, replace motor.</td>
</tr>
<tr>
<td>$\text{---}$</td>
<td>Power is applied.</td>
<td>Pressure less than 200 psi (14 bar, 1.4 MPa)</td>
<td>Increase pressure if desired. Drain valve may be open.</td>
</tr>
</tbody>
</table>
Pressure Control Repair

Pressure Control Transducer

Removal
Refer to Fig. 8.

1. \[\text{⚠️} \text{ Relieve pressure; page 5.}\]
2. Remove four screws (12) and cover (50).
3. Disconnect lead (E) from motor control board (49).
4. Remove two screws (47) and filter housing (15).
5. Thread transducer lead plastic connector down through transducer grommet (20).
6. Remove pressure control transducer (38) and packing o-ring (3) from filter housing.

Installation
1. Install packing o-ring (3) and pressure control transducer (38) in filter housing (15). Torque to 30–35 ft-lb.
2. Thread transducer lead plastic connector up through transducer grommet (20).
3. Install filter housing (15) with two screws (47).
4. Connect lead (E) to motor control board (49).
5. Install cover (50) with four screws (12).

Pressure Adjust Potentiometer

Removal
Refer to Fig. 8.

1. \[\text{⚠️} \text{ Relieve pressure; page 5.}\]
2. Remove four screws (12) and cover (50).
3. Disconnect all leads from motor control board (49).
4. Remove six screws (6) and board (49).
5. Remove potentiometer knob (11), nut (37a) and pressure adjust potentiometer (37).

Installation
1. Install pressure adjust potentiometer (37), nut (37a) and potentiometer knob (11).
   a. Turn potentiometer fully clockwise.
   b. Install knob at full clockwise position.
2. Install board (49) with six screws (6).
3. Connect all leads to motor control board (49). See Fig. 8.
4. Install cover (50) with four screws (12).

Stored Data (Not available on all sprayers)

The SmartControl contains stored data to assist with troubleshooting and maintenance. To view this stored data on the digital display, proceed as follows:

1. \[\text{⚠️} \text{ Relieve pressure; page 5.}\]
2. Plug in sprayer.
3. Hold down display button and turn sprayer ON.
4. Release display button about 1 second after turning on sprayer.

Sprayer model number displays (U395, U495) for a few seconds and then data point 1 is displayed.
5. Push display button and next data point displays.
6. Turn sprayer OFF and then ON to leave stored data mode.

<table>
<thead>
<tr>
<th>Data Point</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of hours power switch has been ON with power applied</td>
</tr>
<tr>
<td>2</td>
<td>Number or hours motor has been running</td>
</tr>
<tr>
<td>3</td>
<td>Last error code. Press and hold display button to clear error code to E=00</td>
</tr>
<tr>
<td>4</td>
<td>Software revision</td>
</tr>
</tbody>
</table>

\[\text{Not available on all sprayers}\]


Drive Housing Replacement

**CAUTION**
Do not drop gear cluster (44) and (40) when removing drive housing (42). Gear cluster may stay engaged in motor front end bell or drive housing.

**Disassembly**

1.  Relieve pressure; page 5.
2.  Remove two screws (12) and pump rod cover (70).
3.  Remove pump (41); **Displacement Pump Replacement**, page 21.
4.  Fig. 9. Remove two screws (12) and shroud (23).
5.  Remove two screws (12) and cover (22).
6.  Remove four front screws (47).
7.  Pull drive housing (42) off of motor (54).

**Assembly**

1.  Fig. 9. Push drive housing (42) onto motor (54).
2.  Install four front screws (47).
3.  Install cover (22) with two screws (12).
4.  Install shroud (23) with two screws (12).
5.  Install pump (41); **Displacement Pump Replacement**, page 21.
6.  Install pump rod cover (70) with two screws (12).

---

**Fig. 9**
Motor Replacement

Disassembly

1. Relieve pressure; page 5.

2. Remove pump (13); **Displacement Pump Replacement**, page 21.

   **CAUTION**
   Do not drop gear cluster (44) and (40) when removing drive housing (42). Gear cluster may stay engaged in motor front end bell or drive housing.

3. Remove drive housing (42); **Drive Housing Replacement**, page 19.

4. Remove four screws (12) and cover (50).

5. Disconnect all leads from board (49). Remove six screws (6) and board.

6. Remove strain relief (19; page 12, 13).

7. Remove two screws (47) and control housing (48).

8. Remove two screws (47) and manifold (15).

9. Remove four screws (47) and motor (54) from frame (59).

Assembly

1. Install new motor (54) on frame (59) with four screws (47).

2. Install manifold (15) with two screws (47).

3. Install control housing (48) with two screws (47).

4. Install strain relief (19; page 12, 13).

5. Install board (49) with six screws (6). Connect all leads to board.

6. Install drive housing (42); **Drive Housing Replacement**, page 19.

7. Install pump (13); **Displacement Pump Replacement**, page 21.

---

![Image of motor replacement diagram with labels 47, 48, 49, 50, 54, 15, 47, 59, 44, 40, and 12 with a note to liberally apply grease.](t2545b)

**Fig. 10**
Displacement Pump Replacement

See manual 309250 for pump repair instructions.
See manual 309704 for sprayer part number references.

Removal

1. Flush pump (13).
2. ![Warning Icon] Relieve pressure; page 5.
3. Fig. 11. Loosen two screws (10b) and rotate cover (10a).
4. Cycle pump until pump pin (9a) is in position to be removed. Remove pump pin (9a).
5. Fig. 12. Remove suction tube (78) and hose (19).

Installation

**WARNING**
If pump 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.

**CAUTION**
If the pump jam nut loosens during operation, the threads of the drive housing will be damaged.

1. Fig. 13. Extend pump piston rod fully. Apply grease to top of pump rod at (A) or inside connecting rod.
2. Fig. 11. Install pump pin (9a). Verify retainer spring (9b) is in groove of pump pin.
3. Push pump up until pump threads engage.
4. Screw in pump until threads are flush with drive housing opening. Align pump outlet to back.
5. Fig. 12. Install suction tube (78) and hose (19).
6. Fig. 14. Screw jam nut (12) up onto pump until nut stops. Tighten jam nut by hand, then tap 1/8 to 1/4 turn with a 20 oz (maximum) hammer to approximately 75 ± 5 ft-lb (102 N-m).
7. Fig. 15. Fill packing nut with Graco TSL until fluid flows onto top of seal.
8. Fig. 11. Rotate cover (10a); tighten screws (10b).
Technical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>100-120V, 120V, A, Hz</th>
<th>Generator Minimum W</th>
<th>Motor HP (W)</th>
<th>Cycles per gallon (liter)</th>
<th>Maximum Delivery gpm (lpm)</th>
<th>Maximum Tip size</th>
<th>Fluid Outlet npsm</th>
</tr>
</thead>
<tbody>
<tr>
<td>395</td>
<td>1, 11, 50/60</td>
<td>3000</td>
<td>3/4 (560)</td>
<td>700 (185)</td>
<td>0.50 (1.9)</td>
<td>0.023</td>
<td>1/4 in.</td>
</tr>
<tr>
<td>495</td>
<td>1, 13, 50/60</td>
<td>3750</td>
<td>3/4 (560)</td>
<td>620 (165)</td>
<td>0.60 (2.3)</td>
<td>0.025</td>
<td>1/4 in.</td>
</tr>
<tr>
<td>595</td>
<td>1, 15, 50/60</td>
<td>4000</td>
<td>9/10 (671)</td>
<td>540 (143)</td>
<td>0.68 (2.6)</td>
<td>0.027</td>
<td>1/4 in.</td>
</tr>
</tbody>
</table>

Basic Sprayer Wetted Parts: zinc-plated carbon steel, nylon, stainless steel, PTFE, Delrin®, chrome plating, leather, UHMWPE, aluminum, tungsten carbide

NOTE: Delrin® is a registered trademark of the DuPont Co.

Noise Level
- Sound power: 100 dBA* per ISO 3744; measured at 3.1 feet (1 m)
- Sound pressure: 90 dBA*

Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Weight lb (kg)</th>
<th>Height in. (cm)</th>
<th>Length in. (cm)</th>
<th>Width in. (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>395</td>
<td>43 (20)</td>
<td>21 (53.3)</td>
<td>15 (38.1)</td>
<td>14 (35.6)</td>
</tr>
<tr>
<td>495</td>
<td>63 (29)</td>
<td>21 (53.3)</td>
<td>26 (66.0)</td>
<td>20.5 (52.1)</td>
</tr>
<tr>
<td>595</td>
<td>66 (30)</td>
<td>29.5 (74.9)</td>
<td>21 (53.3)</td>
<td>20.5 (52.1)</td>
</tr>
</tbody>
</table>

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