

Electric Airless Sprayers

- For portable spray application of architectural paints and coatings. For professional use only.-

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

Hi-Boy Models

- ASM Zip-Spray™ 2100 Plus 110V: 247485
- ASM AllPro Mustang 4700 Plus 110V: 247486
- ASM Zip-Spray 2100 Plus 240V: 247487
- ASM L1900 Plus 110V: 247494
- ASM L1900 Plus 240V: 247495
- ASM AllPro Mach 5400 Plus (110V): 247532
- ASM Zip-Spray 2300 Plus (110V): 247531

Stand Models

- ASM Zip-Spray 2100 Plus 110V: 247482
- ASM AllPro Mustang 4700 Plus 110V: 247483
- ASM Zip-Spray 2100 Plus 240V: 247484
- ASM Z21 240V: 262901
- ASM L2100 Plus 240V: 24P912

Direct Immersion Stand Models

- ASM L 1900 Plus 110V: 255891
- ASM L 1900 Plus 240V: 255890

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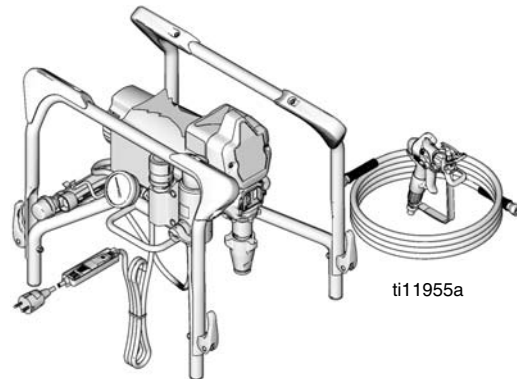
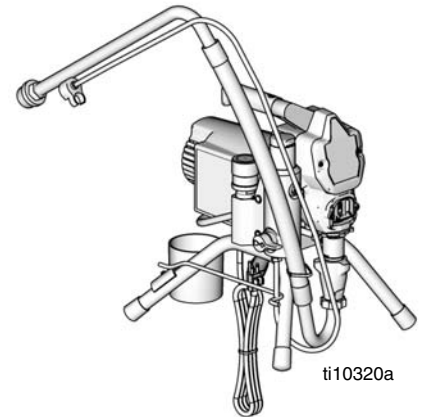
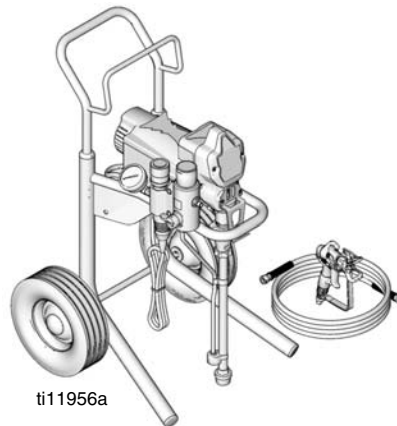
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Warning

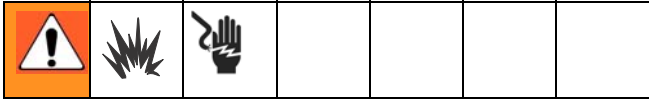
The following warnings are for the setup, use, grounding, maintenance and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risks. Refer back to these warnings. Additional, product-specific warnings may be found throughout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

 WARNING	
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • 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. • Keep work area free of debris, including solvent, rags and gasoline. • 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 operation immediately. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
	<p>ELECTRIC SHOCK HAZARD</p> <p>Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power cord before servicing equipment. • 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.
	<p>SKIN INJECTION HAZARD</p> <p>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. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not point gun at anyone or at 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. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.

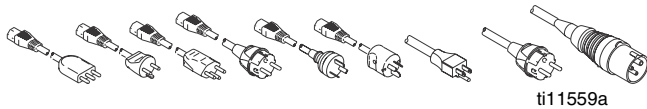
	WARNING
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. Read Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. Read 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. • Comply with all applicable safety regulations. • Keep children and animals away from work area. • Do not operate the equipment when fatigued or under the influence of drugs or alcohol.
	<p>PRESSURIZED ALUMINUM PARTS HAZARD</p> <p>Do not use 1, 1, 1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use can cause serious chemical reaction and equipment rupture, and result in death, serious injury, and property damage.</p>
	<p>BURN HAZARD</p> <p>Equipment surfaces can become very hot during operation. To avoid severe burns, do not touch hot equipment. Wait until equipment has cooled completely.</p>
	<p>MOVING PARTS HAZARD</p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> • 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.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read MSDS's to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>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"> • Protective eye wear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection

Installation

Grounding and Electric Requirements



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



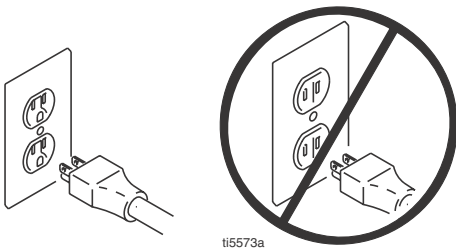
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The sprayers require:

110-120V Units: 100-130 VAC, 50/60 Hz, 11A, 1 phase, circuit with a grounding receptacle.

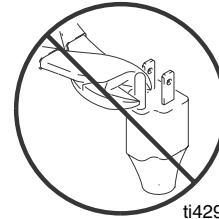
240V Units: 210-255 VAC, 50/60 Hz, 7.5A, 1 phase, circuit with a grounding receptacle.

Never use an outlet that is not grounded or an adapter.



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Do not use the sprayer if the electrical cord has a damaged ground contact. Only use an extension cord with an undamaged ground contact.



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Recommended extension cords:

- 110-120V: 3-wire, 12 AWG (2.5 mm²) minimum.
- 240V: 3-wire, 16 AWG (1.0 mm²) minimum.

NOTE: Smaller gauge or longer extension cords may reduce sprayer performance.

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

Fluid supply container: follow local code.

Solvent and Oil-based fluids: follow local code. Use only conductive metal pails placed on a grounded surface such as concrete. Do not place the pail on a non-conductive 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.

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



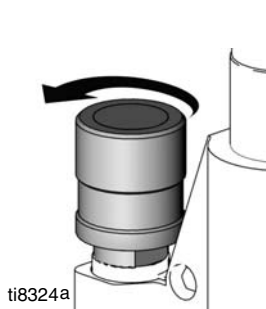
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Pressure Relief Procedure

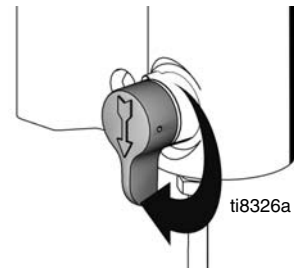


Follow this **Pressure Relief Procedure** whenever you are instructed to relieve pressure, stop spraying, check or service equipment or install or clean spray tip.

1. Turn OFF power and turn pressure control to lowest pressure setting.
2. Hold gun against side of grounded metal flushing pail. Trigger gun to relieve pressure.



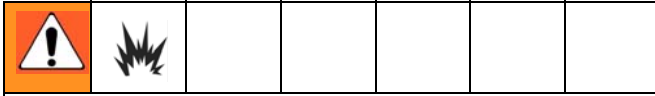
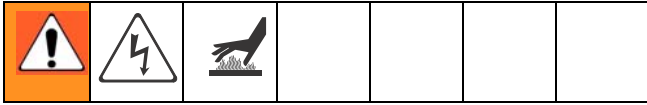
3. Turn prime valve down.



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

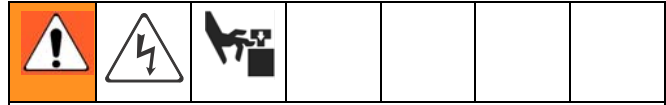
4. Engage trigger safety lock on gun if unit is being shut down or left unattended.

General Repair Information



Flammable materials spilled on hot, bare, motor could cause fire or explosion. To reduce risk of burns, fire or explosion, do not operate sprayer with cover removed.

- Keep all screws, nuts, washers, gaskets, and electrical fittings removed during repair procedures. These parts usually are not provided with replacement kits.
- Test repairs after problems are corrected.
- If sprayer does not operate properly, review repair procedure to verify you did it correctly. See **Troubleshooting**, page 7.
- Overspray may build up in the air passages. Remove any overspray and residue from air passages and openings in the enclosures whenever you service sprayer.
- Do not operate the sprayer without the motor shroud in place. Replace if damaged. Motor shroud directs cooling air around motor to prevent overheating and insulates the control board from accidental electric shock.



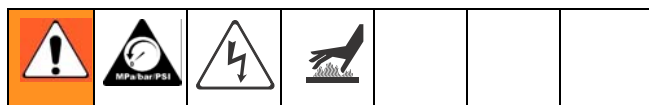
To reduce risk of serious injury, including electric shock:

- Do not touch moving or electric parts with fingers or tools while testing repair.
- Unplug sprayer when power is not required for testing.
- Install all covers, gaskets, screws and washers before you operate sprayer.

NOTICE

- Do not run sprayer dry for more than 30 seconds. Doing so could damage pump packings.
- Protect the internal drive parts of this sprayer from water. Openings in the cover allow for air cooling of the mechanical parts and electronics inside. If water gets in these openings, the sprayer could malfunction or be permanently damaged.
- Prevent pump corrosion and damage from freezing. Never leave water or water-base paint in sprayer when its not in use in cold weather. Freezing fluids can seriously damage sprayer. Store sprayer with Pump Armor to protect sprayer during storage.

Troubleshooting



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 Won't Operate		
Basic Fluid Pressure	1. Pressure control knob setting. Motor will not run if set at minimum (fully counter-clockwise).	Slowly increase pressure setting to see if motor starts.
	2. Spray tip or fluid filter may be clogged.	Relieve pressure , page 5. Then clear clog or clean gun filter. Refer to gun instruction manual, 312363.
Basic Mechanical	1. Pump frozen or hardened paint	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 11, Displacement Pump Replacement .
	2. Displacement pump connecting rod pin. Pin must be completely pushed into connecting rod and retaining spring must be firmly in groove or pump pin.	Push pin into place and secure with spring retainer. See page 11, Displacement Pump Replacement .
	3. Motor. Remove drive housing assembly. See page 13, Drive Housing Replacement . Try to rotate fan by hand.	Replace motor if fan won't turn. See page 25, Motor Replacement .

<p>Problem</p>	<p>What To Check <i>(If check is OK, go to next check)</i></p>	<p>What To Do <i>(When check is not OK, refer to this column)</i></p>
<p>Basic Electrical <i>See wiring diagram, page 26</i></p>	<p>1. Electric supply. ON/OFF switch in OFF position. Meter must read 100-130 Vac; 210-260 Vac.</p>	<p>Turn ON/OFF switch to ON position. Reset building circuit breaker, replace building fuses. Try another outlet.</p>
	<p>2. Extension cord. Check extension cord continuity with volt meter.</p>	<p>Replace extension cord.</p>
	<p>3. Sprayer power supply cord. Inspect for damage such as broken insulation or wires.</p>	<p>Replace power supply cord. See page 24, Power Cord Replacement.</p>
	<p>4. Fuse. Check replaceable fuse on control board (next to ON/OFF switch).</p>	<p>Replace fuse after completing motor inspection. See page 19, Fuse Replacement.</p>
	<p>5. Motor leads are securely fastened and properly connected to control board.</p>	<p>Replace loose terminals; crimp to leads. Be sure terminals are firmly connected. Clean circuit board terminals. Securely reconnect leads.</p>
	<p>6. Motor thermal switch. Yellow motor leads must have continuity through thermal switch.</p>	<p>Replace motor. See page 25, Motor Replacement.</p>
	<p>7. Brush cap missing or loose brush lead connections.</p>	<p>Install brush cap or replace brushes if leads are damaged. See page 16, Motor Brush Replacement.</p>
	<p>8. Brush length which must be greater than 1/4 in. (6 mm). NOTE: Brushes do not wear at the same rate on both sides of motor. Check both brushes.</p>	<p>Replace brushes. See page 16, Motor Brush Replacement.</p>
	<p>9. Motor armature commutator for burn spots, gouges and extreme roughness.</p>	<p>Remove motor and have motor shop resurface commutator if possible. See page 25, Motor Replacement.</p>
	<p>10. Motor armature for shorts using armature tester (growler) or perform Spin Test, page 14.</p>	<p>Replace motor. See page 25, Motor Replacement.</p>
	<p>11. Pressure control not plugged in to control board.</p>	<p>Insert pressure control connector into control board.</p>

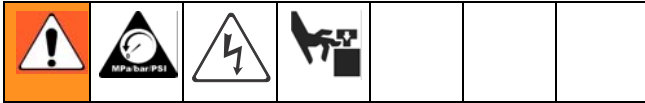
Problem	What To Check <i>(If check is OK, go to next check)</i>	What To Do <i>(When check is not OK, refer to this column)</i>
Low Output	1. Worn spray tip.	Relieve pressure , page 5. Replace tip. Refer to gun instruction manual, 312363.
	2. Verify pump does not continue to stroke when gun trigger is released.	Service pump. See page 11, Displacement Pump Replacement .
	3. Prime valve leaking.	Relieve pressure , page 5. Then repair prime valve. See page 22, Drain Valve Replacement .
	4. Suction tube connections.	Tighten any loose connections. Check o-ring on suction tube.
	5. Electric supply with volt meter. Meter must read 100-130 Vac; 210-260 Vac. Low voltages reduce sprayer performance.	Reset building circuit breaker; replace building fuse. Repair electrical outlet or try another outlet.
	6. Extension cord size and length.	Replace with a correct, grounded extension cord. See page 4, Grounding and Electric Requirements .
	7. Leads from motor to circuit board for damaged or loose wire connectors. Inspect wiring insulation and terminals for signs of overheating.	Be sure male terminal pins are centered and firmly connected to female terminals. Replace any loose terminals or damaged wiring. Securely reconnect terminals.
	8. Worn motor brushes which must be greater than 1/4 in. (6 mm).	Replace brushes. See page 16. Motor Brush Replacement .
	9. Motor brushes binding in brush holders.	Clean brush holders. Remove carbon dust by using compressed air to blow out brush dust.
	10. Low stall pressure. Turn pressure control knob fully clockwise.	Replace pressure control assembly. See page 20, Pressure Control Assembly Replacement .
	11. Motor armature for shorts by using an armature tester (growler) or perform Spin Test , page 14.	Replace motor. See page 25, Motor Replacement .

<p>Problem</p>	<p>What To Check <i>(If check is OK, go to next check)</i></p>	<p>What To Do <i>(When check is not OK, refer to this column)</i></p>
<p>Motor runs and pump strokes</p>	<p>1. Prime Valve Open.</p>	<p>Close prime valve.</p>
	<p>2. Paint supply.</p>	<p>Refill and reprime pump.</p>
	<p>3. Intake strainer clogged.</p>	<p>Remove and clean, then reinstall.</p>
	<p>4. Suction tube leaking air.</p>	<p>Tighten nut. Check o-ring on tube.</p>
	<p>5. Intake valve ball and piston ball are seating properly.</p>	<p>See Pump Manual 312362. Strain paint before using to remove particles that could clog pump.</p>
	<p>6. Leaking around throat packing nut which may indicate worn or damaged packings.</p>	<p>See Pump Manual 312362.</p>
	<p>7. Pump rod damaged.</p>	<p>See Pump Manual 312362.</p>
<p>Motor runs but pump does not stroke</p>	<p>1. Displacement pump pin damaged or missing.</p>	<p>Replace pump pin if missing. Be sure retaining spring is fully in groove all around connecting rod. See page 11, Displacement Pump Replacement.</p>
	<p>2. Connecting rod assembly for damage.</p>	<p>Replace connecting rod assembly. See page 11, Displacement Pump Replacement.</p>
	<p>3. Gears or drive housing.</p>	<p>Inspect drive housing assembly and gears for damage and replace if necessary. See page 13, Drive Housing Replacement.</p>
<p>Motor is hot and runs intermittently</p>	<p>1. Be sure ambient temperature where sprayer is located is not more than 115°F (46°C) and sprayer is not located in direct sun.</p>	<p>Move sprayer to shaded, cooler area if possible.</p>
	<p>2. Motor has burned windings indicated by removing positive (red) brush and seeing burned adjacent commutator bars.</p>	<p>Replace motor. See page 25, Motor Replacement.</p>
	<p>3. Tightness of pump packing nut. Overtightening tightens packings on rod, restricts pump action and damages packings.</p>	<p>Loosen packing nut. Check for leaking around throat. Replace pump packings if necessary. See pump manual 312362.</p>

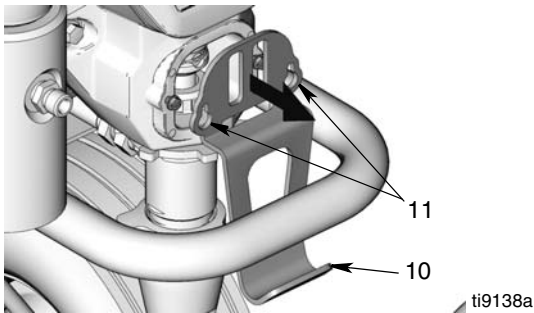
Displacement Pump Replacement

See manual 312362 for pump repair instructions.

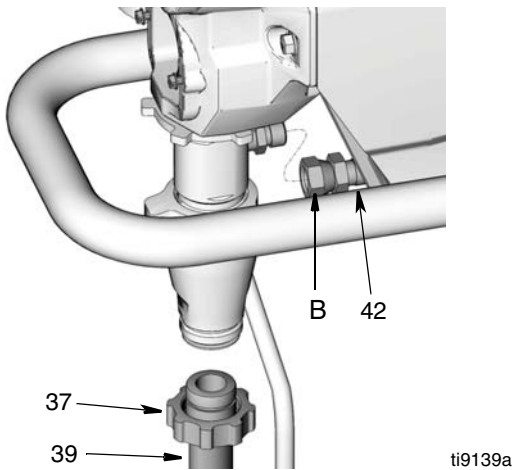
Removal



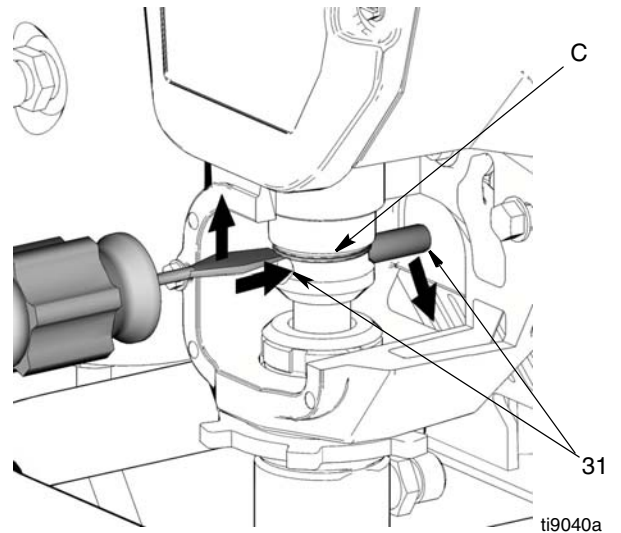
1. **Relieve pressure**, page 5. Unplug sprayer from outlet.
2. Loosen two screws (11) and remove pail hanger (10).



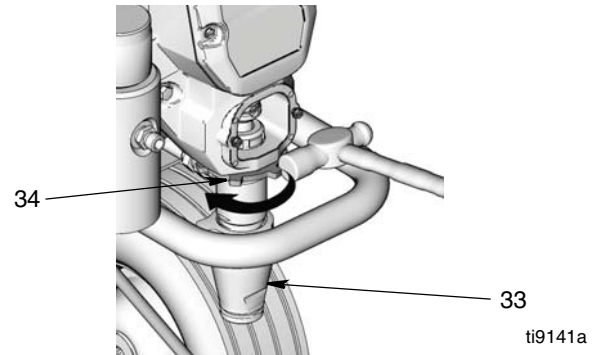
3. Loosen nut (37) and remove suction tube (39). Loosen nut (B) and remove coupled hose (42).





4. Cycle pump until pin (31) is in position to be removed.
5. Disconnect power cord from outlet.
6. Push up retaining spring (C). Push out pump pin (31).



7. Loosen pump jam nut (34). Unscrew and remove pump (33).



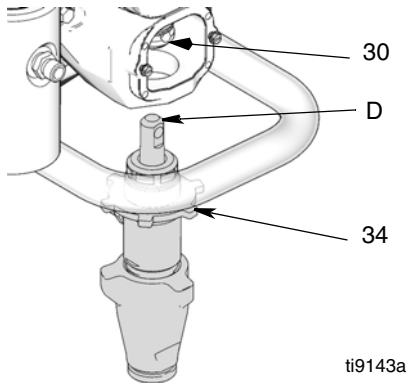
Installation

						
<p>If pump pin works loose, parts could break off due to force of pumping action. Parts could project through air and result in serious injury or property damage.</p>						

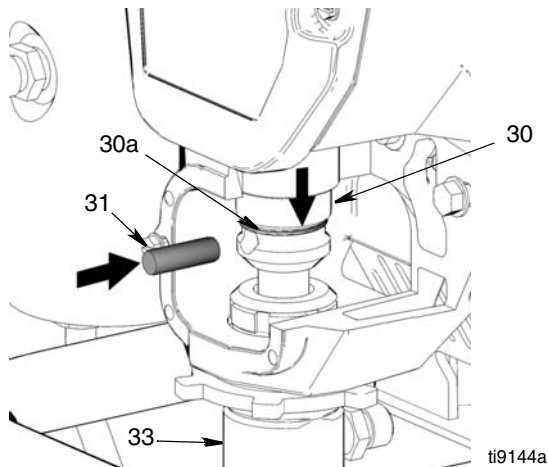
NOTICE

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

1. Extend pump piston rod fully. Apply grease to top of pump rod (D). Install jam nut (34) on pump threads.

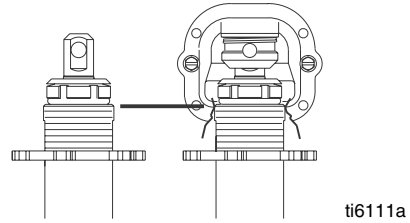


2. Install pump rod (D) into connecting rod (30).
3. Install pump pin (31). Verify retainer spring (30a) is in groove over pump pin.

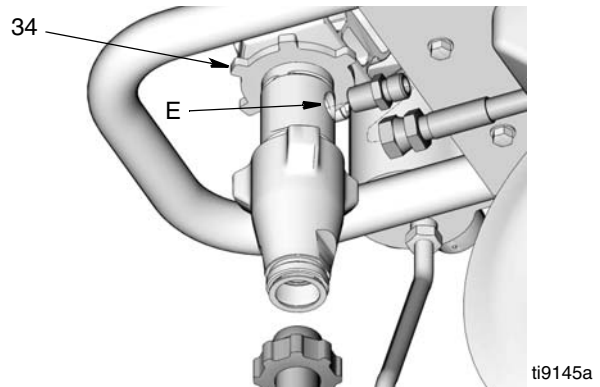


4. Push pump (33) up until pump threads engage.

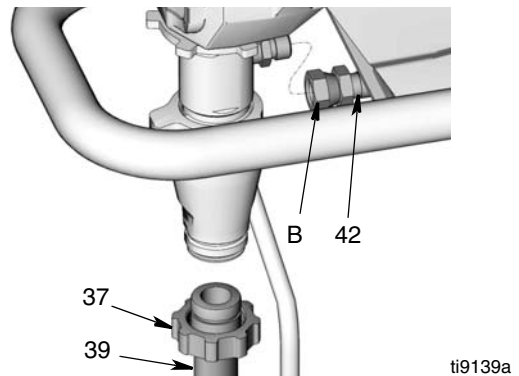
5. Screw in pump until threads are flush with top of drive housing opening.



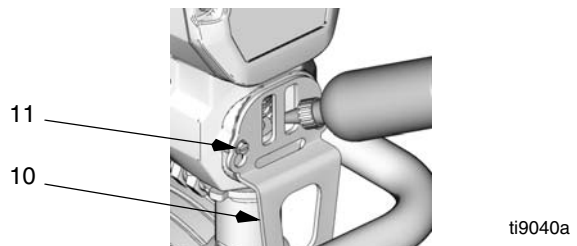
6. Align pump outlet (E) to back.



7. Screw jam nut (34) 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 ft-lb (102 N•m).
8. Install suction tube (39) and coupled hose (42). Tighten nuts (37) and (B).



9. Fill packing nut with ASM Packing Seal® until fluid flows onto top of seal. Install pail hanger (10) with screws (11).

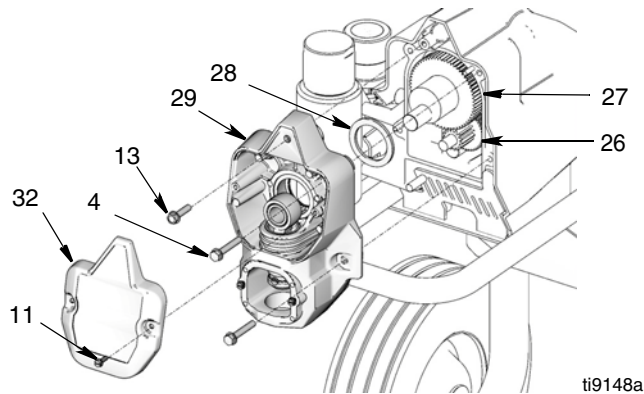


Drive Housing Replacement



Removal

1. **Relieve pressure**, page 5.
2. Remove pump (33). **Displacement Pump Replacement**, page 11.
3. Disconnect power cord from outlet.



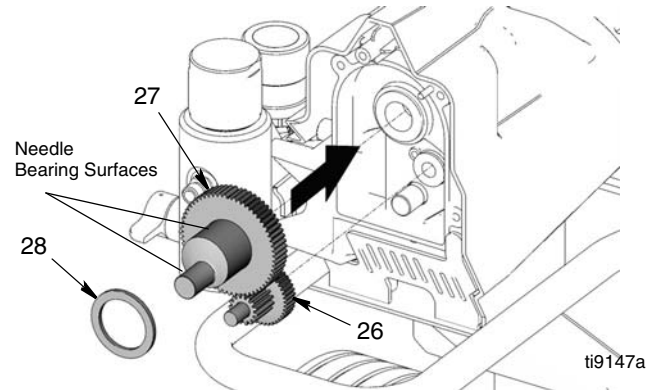
4. Remove two screws (11) and cover (32).
5. Remove screw (13) and four screws (4).
6. Pull drive housing (29) out of motor front endbell.
7. Remove gear cluster (27) and (26) and thrust bearing (28) from drive housing.

NOTICE

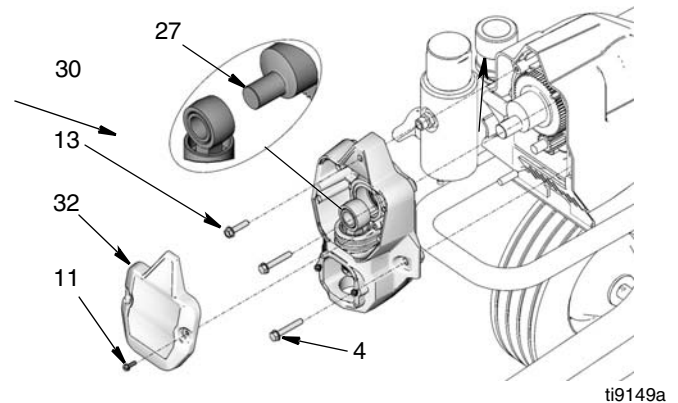
Do not drop gear cluster (27) and (26) when removing drive housing (29). Gear cluster may stay engaged in motor front endbell or drive housing.

Installation

1. Apply a liberal coat of grease to gears and needle bearing surfaces. Install thrust bearing (28) and gears (26) and (27) in motor front endbell.



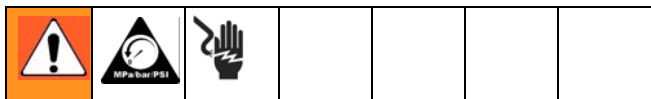
2. Push drive housing (29) into motor front endbell. Insert gear crank (27) through hole in connecting rod (30).



3. Install four screws (4) and screw (13).
4. Install cover (32) with two screws (11).
5. Install pump (33). **Displacement Pump Replacement**, page 11.

Spin Test

See **Wiring Diagrams**, page 26.



To check armature, motor winding and brush electrical continuity:

1. **Relieve Pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12).
4. Remove drive housing (29) (see page 13).
5. Disconnect motor connector (H).

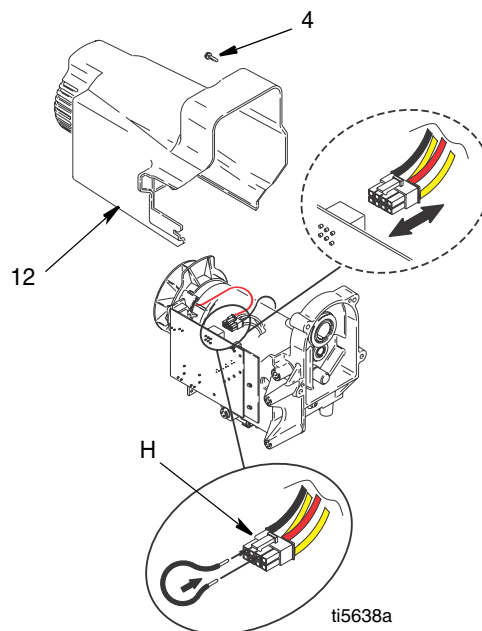
Armature Short Circuit Test

Quickly turn motor fan by hand. If motor coasts two or three revolutions before complete stop, there are no electrical shorts. If motor does not spin freely, armature is shorted. Replace motor, page 25.

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.

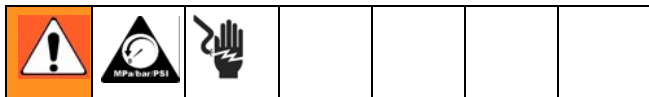
2. If uneven or no resistance, check for missing brush caps, broken brush springs, brush leads, and worn brushes. Repair as needed, page 16.
3. If still uneven or no resistance, replace motor, page 25.



4. Reattach motor connector (H).
5. Replace drive housing (see page 13).
6. Replace shroud (12) and two screws (4).
7. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).

Fan Replacement

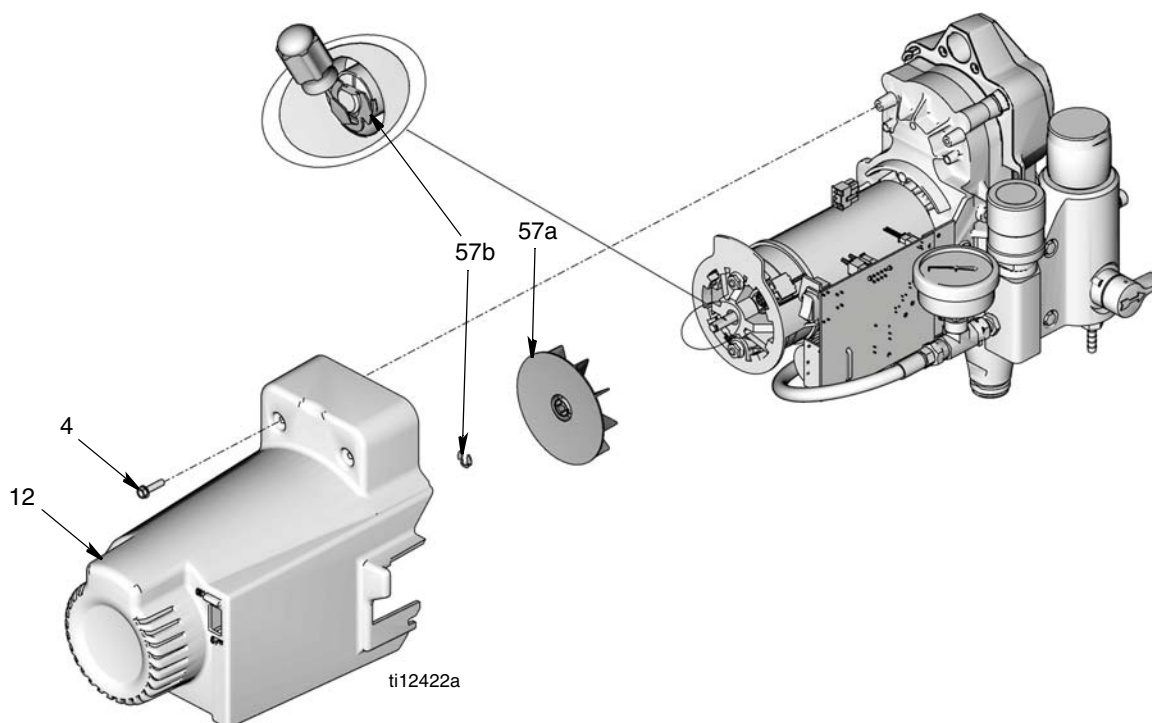
Removal



1. **Relieve Pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12).
4. Remove spring clip (57b) on back of motor.
5. Pull off fan (57a).

Installation

1. Slide new fan (57a) in place on back of motor. Be sure blades of fan face motor as shown.
2. Install spring clip (57b).
3. Replace shroud (12) and two screws (4).
4. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).



Motor Brush Replacement

See *Wiring Diagram*, page 26.

Removal

Replace brushes worn to less than 1/4 in. (6 mm). Brushes wear differently on each side of motor, check both sides.



1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12) (see illustration on page 15).
4. Disconnect motor connector (D) from control board (18).
5. Cut tie wrap (F).
6. Locate two yellow wires (C). Cut each yellow wire at the center.
7. Pry off two brush caps (A). Remove brushes (B) from motor.
8. Discard old brush assembly.
9. Rotate fan by hand and blow compressed air into top brush holder to remove brush dust.

NOTE: Place end of a shop vacuum hose over lower brush holder. Turn on shop vacuum when you blow compressed air into top brush holder.

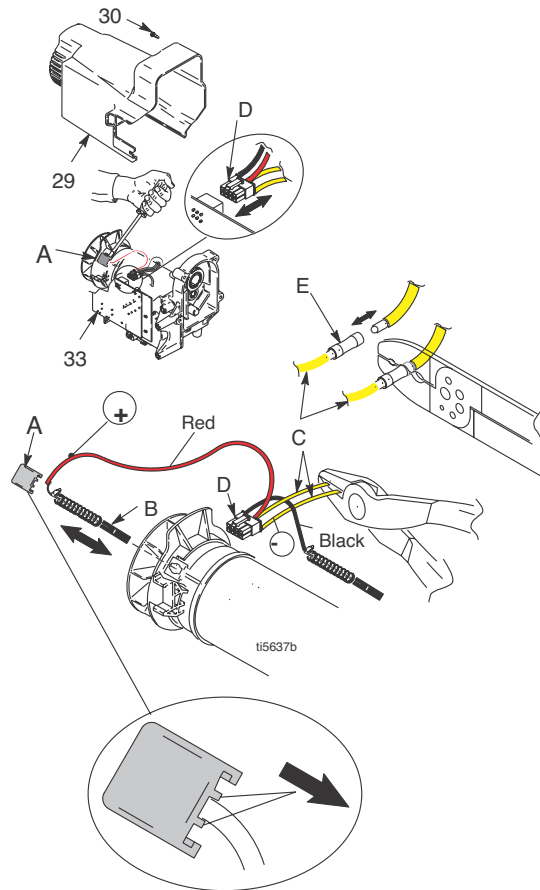
Installation

NOTE: Use all new parts included in brush kit. Do not reuse old parts if new replacement parts are provided.

1. Install new brushes (B) in motor with wires facing toward front of motor. Install positive (red) brush lead in top of motor and negative (black) brush lead in side of motor.
2. Push each cap (A) into place over brush. Orient each cap with the two projections on either side of

the brush lead. You will hear a snap when cap is securely in place.

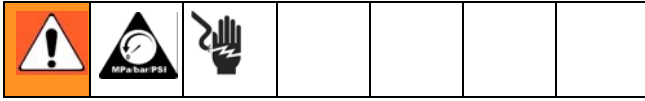
3. Strip approximately 1/4 inch (6 mm) of insulation from end of each yellow wire (C) from motor.
4. Insert stripped end into end of a butt splice (E) on new brush assembly.
5. Crimp ends of butt splice (E) around each wire. Pull gently on each wire to be sure wire does not pull out of butt splice.
6. Wrap new tie wrap around motor and wires only. Trim off excess. Be sure pressure hose is not caught in tie wrap.
7. Connect motor connector (D) to control board (18).



8. Replace shroud (12) and two screws (4) (see illustration, page 15).
9. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).

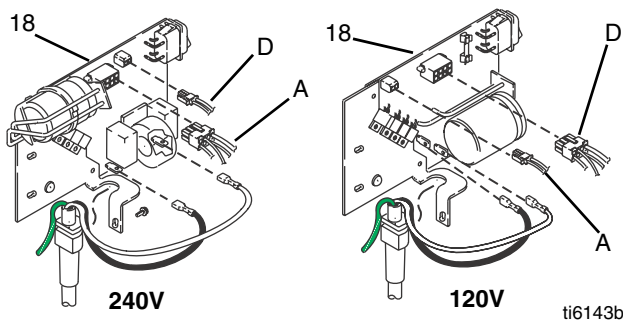
Control Board Replacement

See Wiring Diagram, page 26.

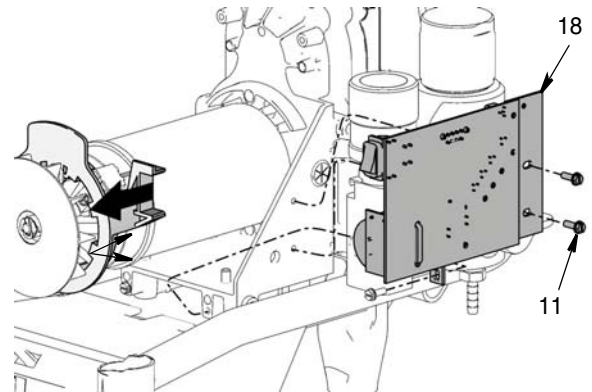


Removal

1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12) see illustration, page 15).
4. Disconnect pressure control assembly connector (A) from control board (18).



5. Disconnect motor connector (D) from control board (18).
6. Remove three screws (11) securing control board to housing (two are located on the front and one on the back next to the power cord).

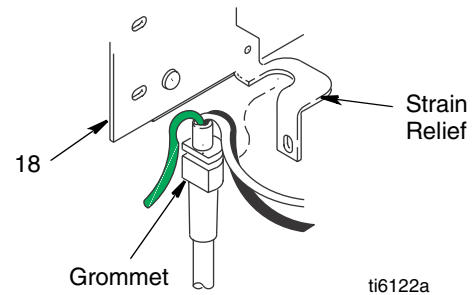


7. Pull control board out slightly and then slide control board back and off of frame.

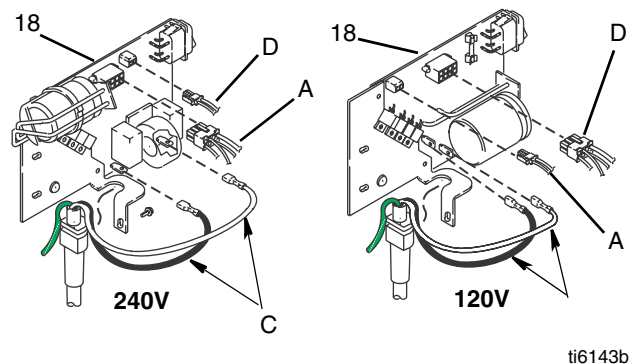
NOTE: Make sure power cord is free and not wrapped around cord wrap.

8. Remove grommet and wires from strain relief.

NOTE: Ground wire remains attached to sprayer with grounding screw.

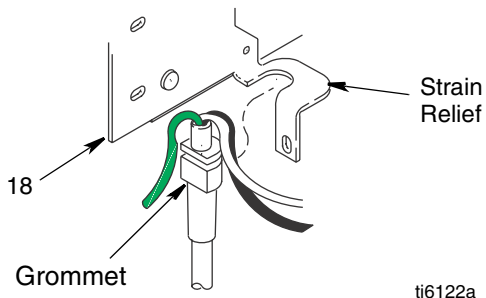


9. Remove two power cord (C) connectors from control board.

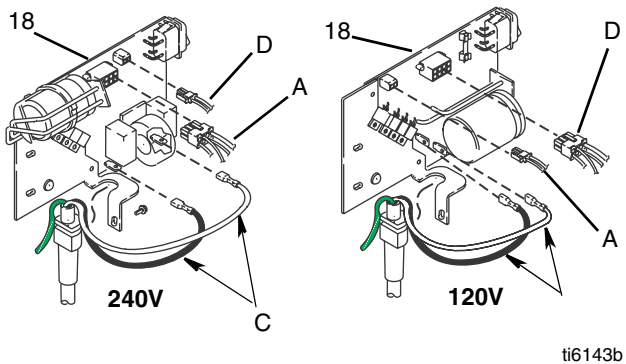


Installation

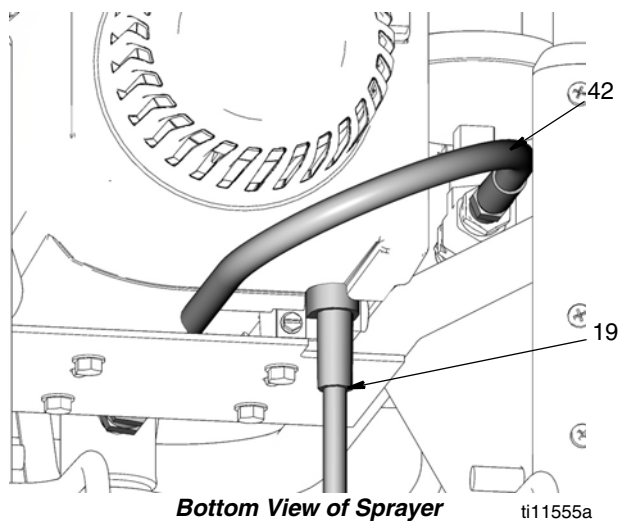
1. Push grommet and power cord wires into strain relief in control board (18).



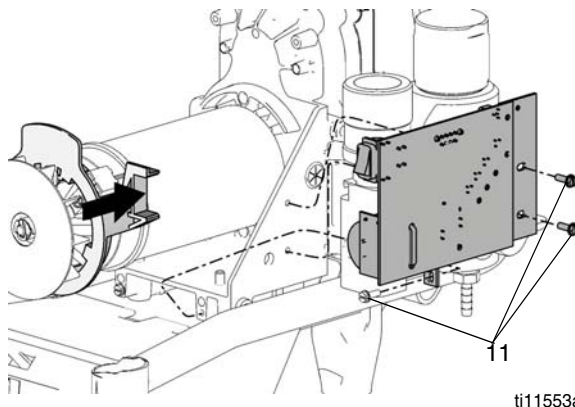
2. Connect power cord connectors to terminals indicated on control board (18).



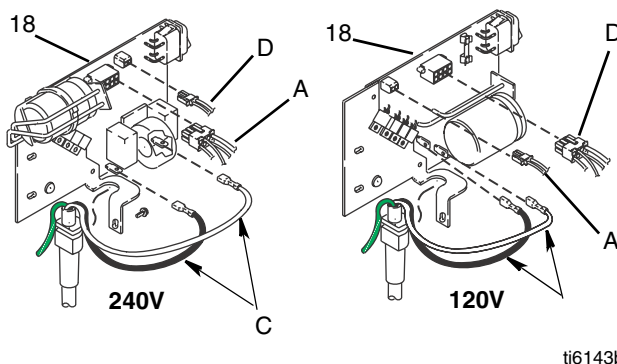
NOTE: Route power cord (19) between coupled hose (42) to filter manifold and sprayer frame.



3. Slide control board into place on side of motor front endbell.

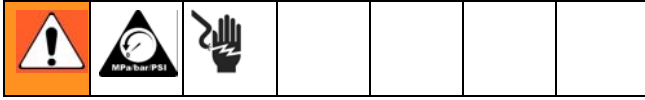


4. Replace three screws (11). Torque to 30-35 in-lb (3.4-3.9 N.m).



5. Connect motor connector (D) and pressure control assembly connector (A).
6. Install shroud (12) with two screws (4) (see page 15).
7. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).

Fuse Replacement



If the fuse is blown, check for:

- Pinched or shorted wires
- A defective motor (see **Spin Test**, page 14)
- A locked or frozen pump

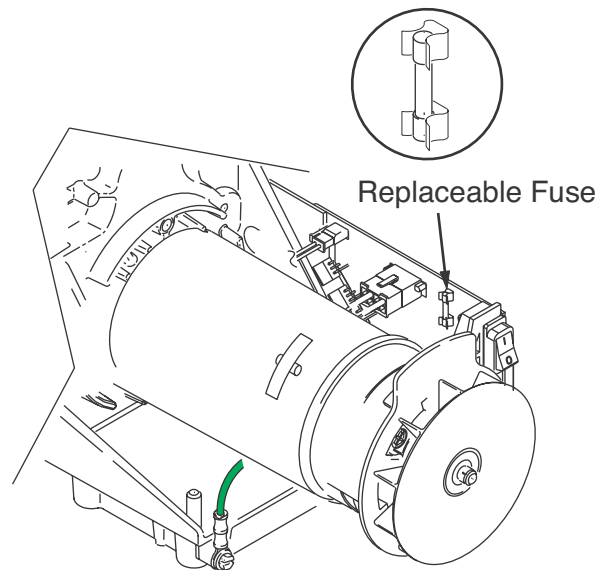
Correct defective condition before replacing fuse.

Removal

1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12) (see illustration, page 15).
4. Remove fuse from control board.

Installation

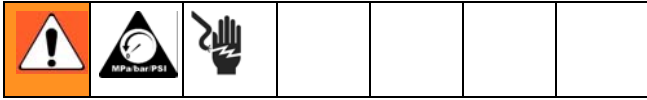
1. Install Fuse on control board.
2. Install shroud (12) and two screws (4) (see illustration, page 15).
3. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).



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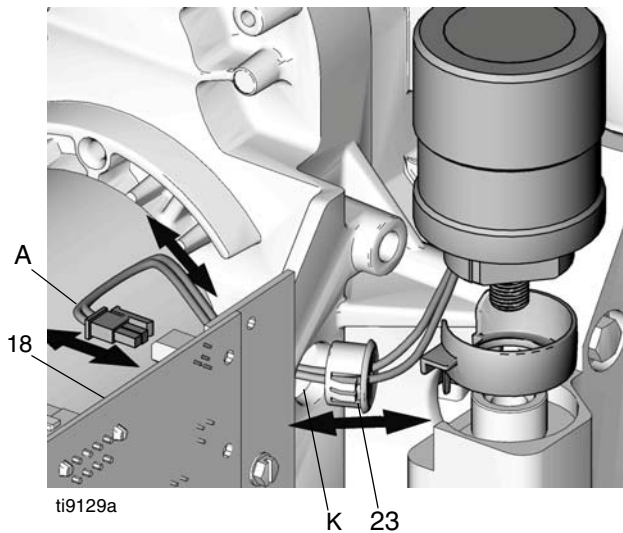
Pressure Control Assembly Replacement

See *Wiring Diagram*, page 26.

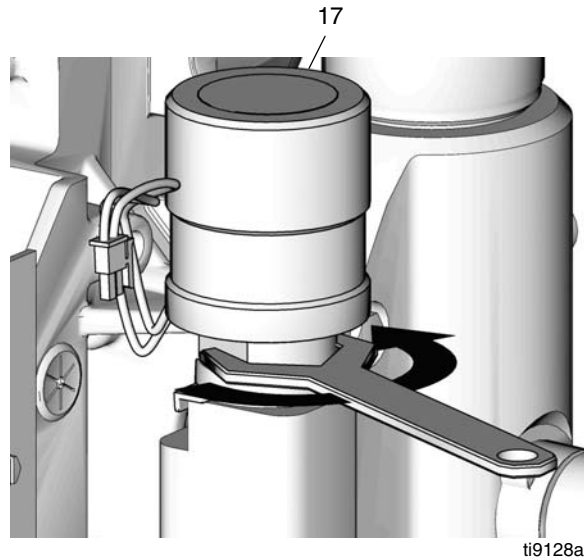


Removal

1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove two screws (4) and shroud (12) (see illustration, page 15).
4. Disconnect pressure switch connector (A) from control board (18). Pull bushing (23) from hole (K).



5. Pull wires through hole (K).
6. Turn pressure control knob (17) counter clockwise as far as you can to access flats on either side of pressure control.
7. Loosen and unscrew pressure control.

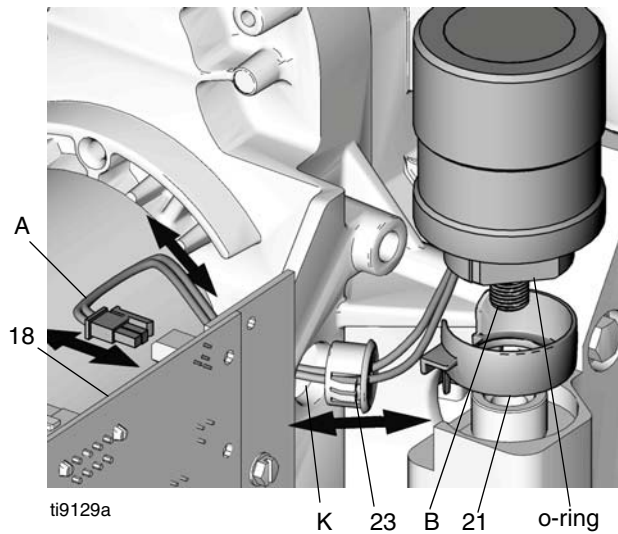


Caution

If you plan to reuse pressure control, be careful not to damage or tangle wires when unscrewing pressure control.

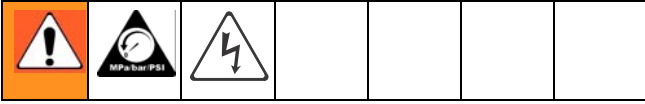
8. Remove pressure control.

Installation



1. Inspect pressure control before installation to verify o-ring is installed.
 2. Align pressure control wire cap (21) on fluid manifold so opening faces toward motor.
 3. Apply loctite to pressure control knob (B) threads.
 4. Screw pressure control threads (B) into manifold and torque to 150 in-lb (17.0 N.m).
- NOTICE**
- Be careful when tightening pressure control knob that wires are not pinched between pressure control and fluid manifold.
5. Tuck wires into pressure control wire cap (21) and route wires toward cap opening. Feed wires through housing hole (K).
 6. Insert bushing (23) in hole (K).
 7. Connect pressure switch connector (A) to control board (18).
 8. Install shroud (12) and two screws (4) (see illustration, page 15).
 9. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).

Drain Valve Replacement

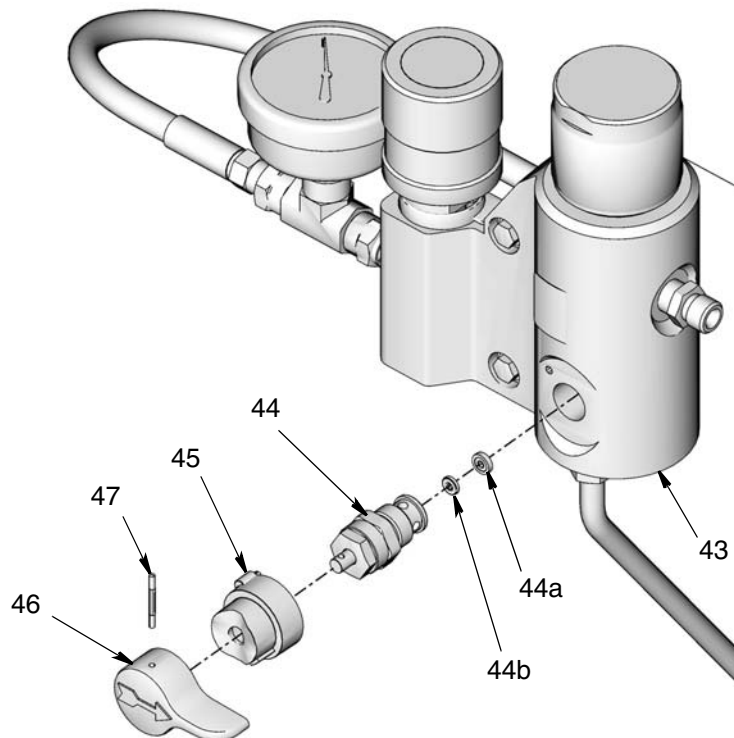


Removal

1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. Remove pin (47) from drain valve handle (46).
3. Pull drain valve handle and valve base (45) from drain valve (44).
4. Unscrew drain valve from filter manifold (43).
5. Remove valve seat (44b) and seat gasket (44a) from inside of filter manifold or end of drain valve.

Installation

1. Install new seat gasket (44a) and valve seat (44b) on end of drain valve.
2. Screw drain valve (44) into filter manifold (43). Torque to 120 to 130 in-lb.
3. Push valve base (45) over drain valve (44) and then valve drain handle (46) over valve base.
4. Install pin (47) in drain valve handle. If necessary, use a hammer to tap pin in place completely.



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Drain Line Replacement

Removal

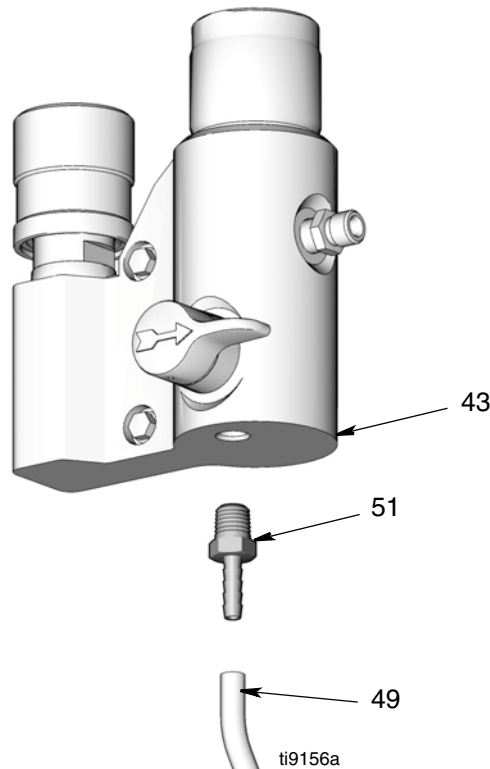
1. Cut drain line (49) from barbed fitting (51).
2. Unscrew barbed fitting from filter manifold (43).

NOTE: To reuse existing barbed fitting (51) and drain line (49), cut and remove remaining drain line material from end of barbed fitting.

Installation

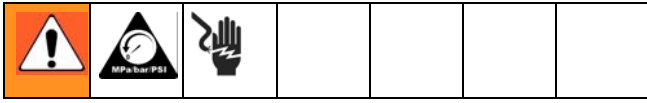
1. Screw barbed fitting (51) into filter manifold (43).
2. Push drain line (49) onto barbed fitting.

NOTE: To make drain line more pliable and easier to install over barbed fitting, heat end of drain line (49) with a hair dryer or place end in hot water a few seconds.



Power Cord Replacement

See *Wiring Diagram*, page 26.

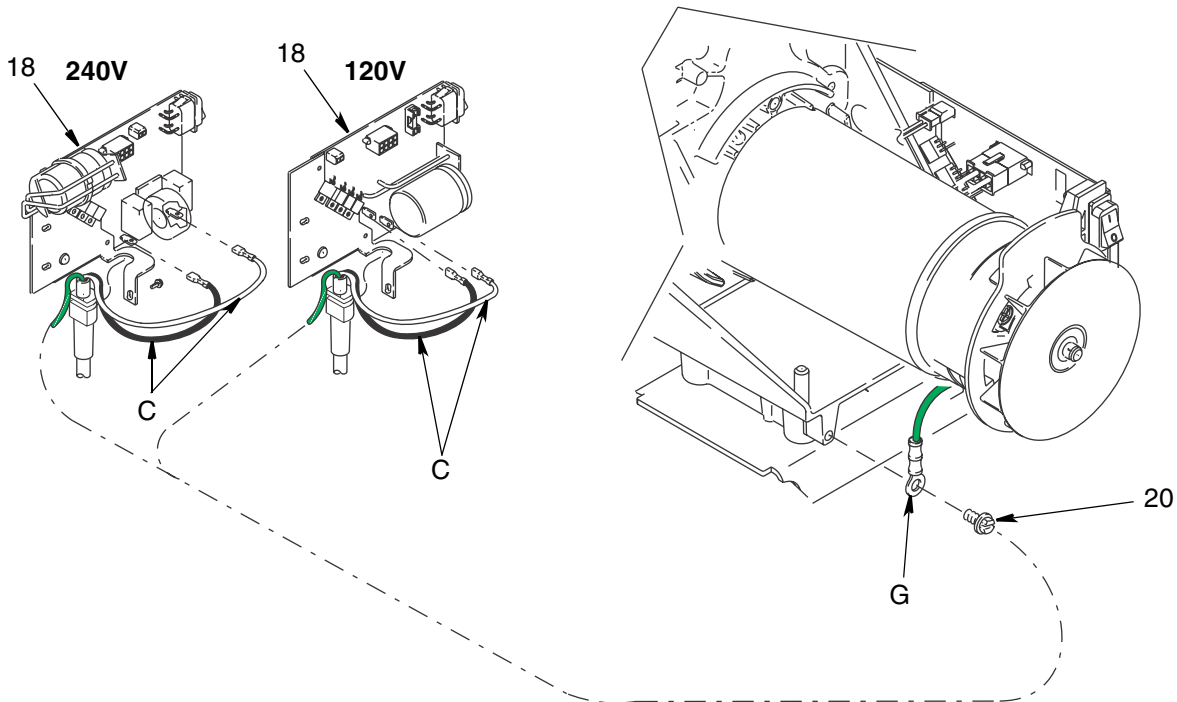


Removal

1. Remove control board, **Control Board Replacement, Removal**, page 17.
2. Remove green ground screw (20) and disconnect green ground wire (G) from frame.

Installation

1. Connect green ground wire (G) to frame with green ground screw (20). Be sure green ground wire terminal faces up or wires could get caught in shroud.
2. Install control board, **Control Board Replacement, Installation**, page 18.



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Motor Replacement

See Wiring Diagram, page 26.



NOTICE

Do not drop gear cluster (27) and (26) when removing drive housing (29). Gear cluster may stay engaged in motor front end bell or drive housing.

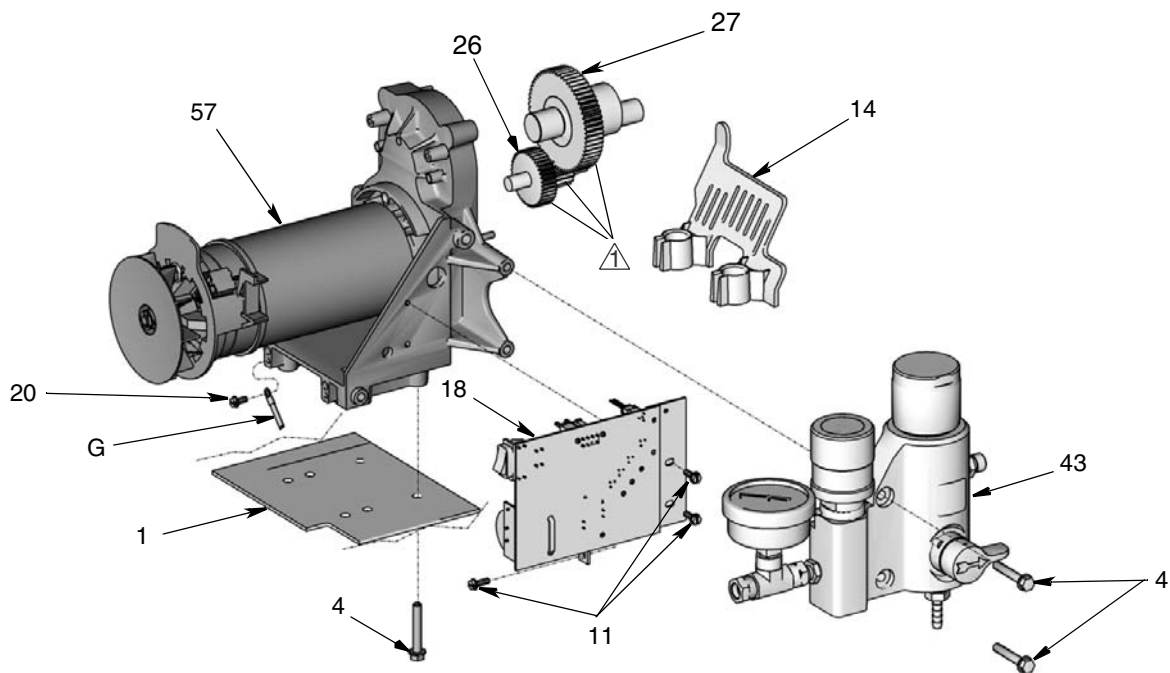
Removal

1. **Relieve pressure**, page 5. Disconnect power cord from outlet.
2. **Hi-Boy Models Only** - Disconnect high-pressure hose at pump outlet (see page 11).
3. Remove pump, **Displacement Pump Replacement**, page 11.
4. Remove drive housing, **Drive Housing Replacement**, page 13.
5. Remove control board, **Control Board Replacement**, page 17.

6. Remove two screws (4) and filter manifold (43).
7. Remove green ground screw (20) and ground wire (G) from motor endbell.
8. Remove cover (14). Remove four screws (4) and motor (57) from frame (1).

Installation

1. Install cover (14) on motor (57). Install motor on frame (1) with four screws (4).
2. Connect green ground wire (G) to frame with green ground screw (20). Be sure green ground wire terminal faces up or wires could get caught in shroud. (See illustration, page 25.)
3. Install manifold (43) with two screws (4).
4. Install control board, **Control Board Replacement**, page 17.
5. Install drive housing. **Drive Housing Replacement**, page 13.
6. Install pump. **Displacement Pump Replacement**, page 11.
7. **Hi-Boy Models Only** - Connect high-pressure hose at pump outlet (see page 12).

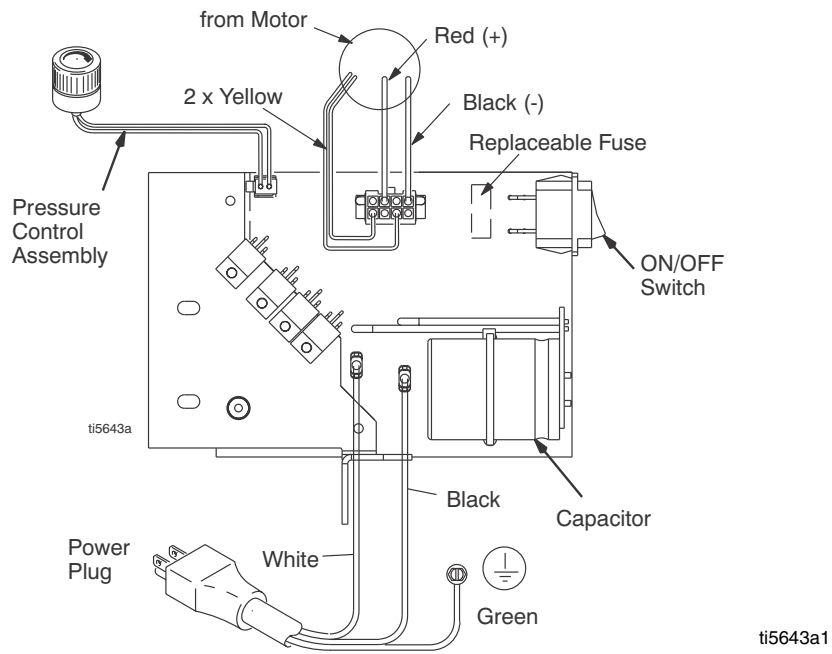


Liberally apply grease

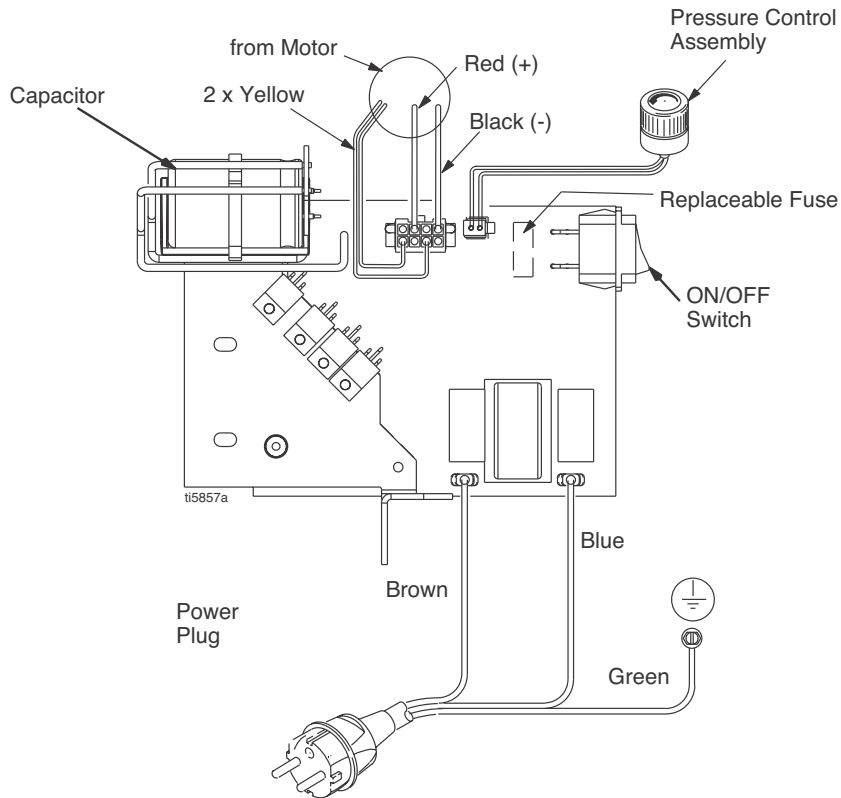
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Wiring Diagrams

120V

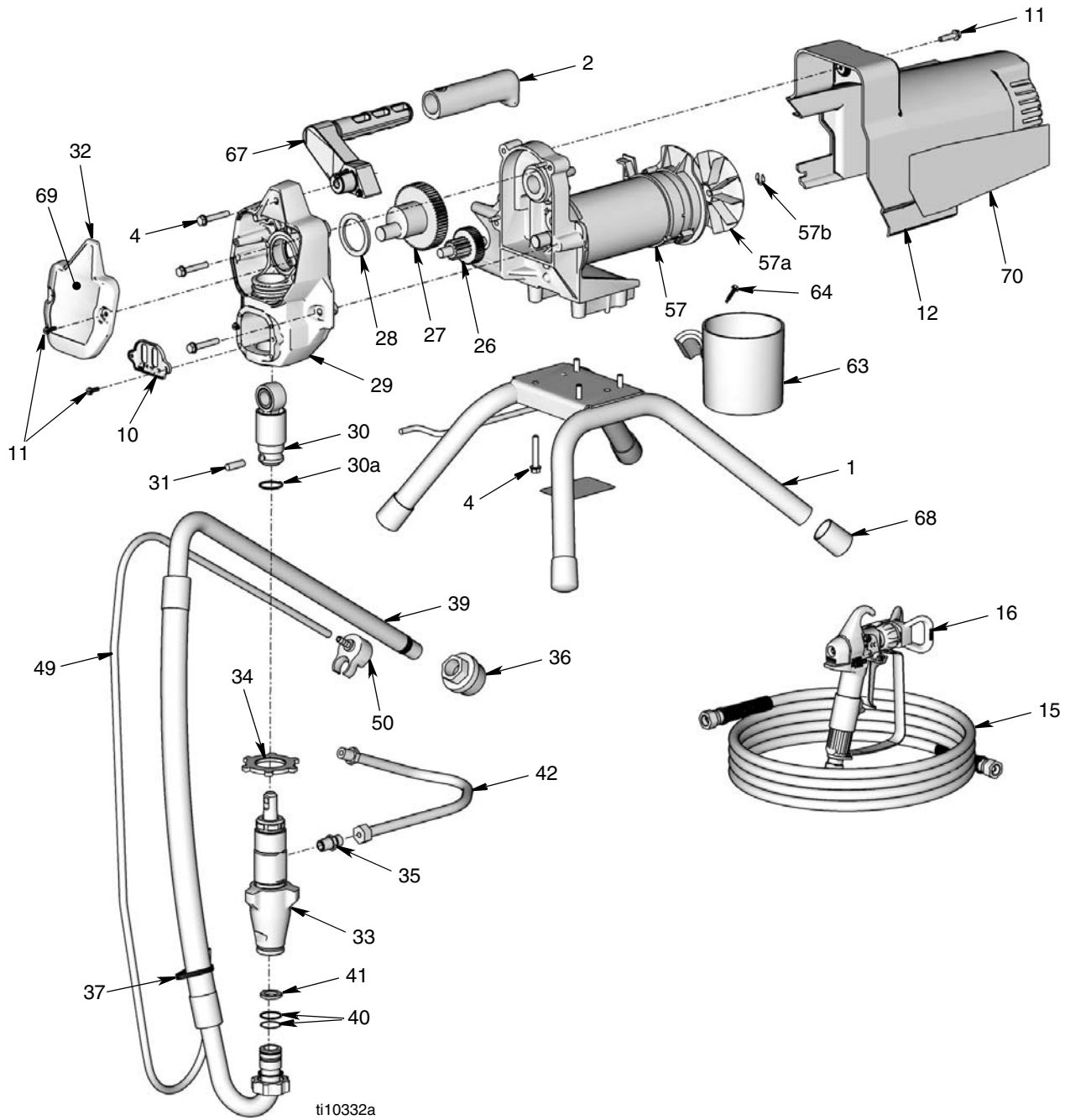


240V



Parts (Stand)

Models 247482, 247483, 247484, 24P912, 262901



Parts List (Stand)

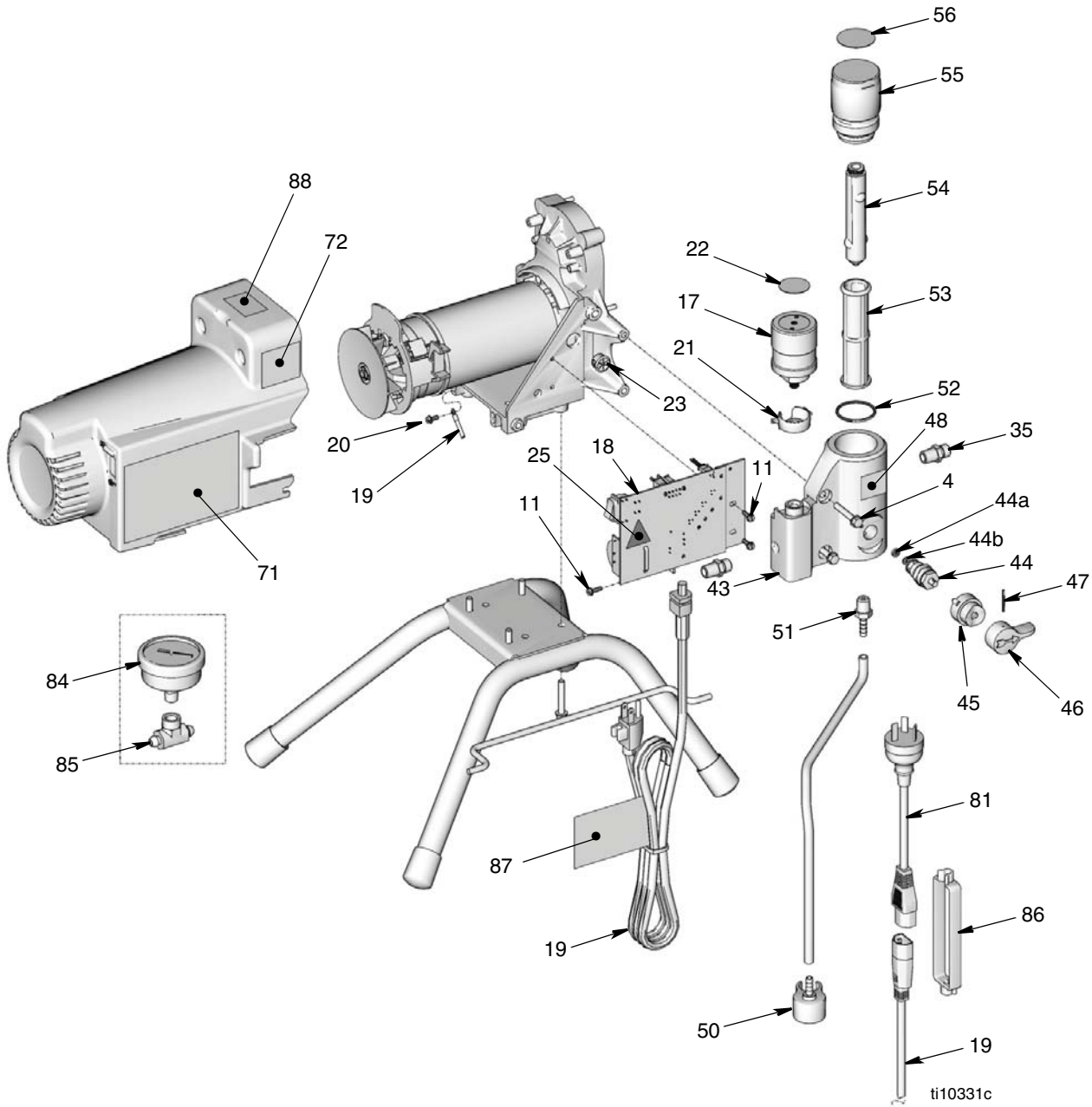
Models 247482, 247483, 247484, 24P912, 262901

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	15E823	FRAME, stand mount	1	41	115099	WASHER, garden hose	1
2	116139	GRIP, handle	1	42	15M670	HOSE, cpld	1
3	119723	TAPE, foam	1	49	249051	KIT, tube, drain, includes 51, 50, 37	1
4	117493	SCREW, mach, hex washer hd	11	50	244035	DEFLECTOR, barbed	1
10	15B589	COVER, pump rod	1	57❖		MOTOR, electric, includes 57a, 57b	
11	117501	SCREW, machine, hex washer head	9		255485	Models 247482, 247483	1
12		KIT, shield, motor includes 11, 71, 72, 70			249041	Model 247484, 262901, 24P912	1
	255432	Model 247482, 247484	1	57a	249043	FAN, motor, includes 57b	1
	255433	Model 247483	1	57b	119653	RING, retaining	1
	24R018	Model 24P912	1	63	15G838	CUP, suction/drain	1
12a	277420	SHIELD, motor, model 262901	1	64	122667	SCREW, drill, hex washer head	1
15	HSE1450	HOSE, cpld, 1/4 x 50 ft	1	67	276864	HANDLE, includes 4, 2	1
16	289316	GUN #500 2 Finger	1	68	112759	CAP, tubing	4
26	249194	GEAR, reducer	1	69		LABEL, front	
27	287054	GEAR, crankshaft, includes 28	1		15M774	Model 247482, 247484	1
28	180131	BEARING, thrust	1		15M766	Model 247483	1
29	255488	HOUSING, drive, includes 4, 11, 10	1		16U188	Model 262901	1
30	287053	ROD, connecting, includes 30a, 31	1		16U166	Model 24P912	1
30a	196750	SPRING, retaining	1	70		LABEL, side	
31	196762	PIN, straight	1		15M775	Model 247482, 247484	1
32	276883	COVER, front	1		15M763	Model 247483	1
33	255475	PUMP, displacement, includes 35 (Manual 312362)	1		16U189	Model 262901	1
34	195150	NUT, jam, pump	1		16U167	Model 24P912	1
35	162453	FITTING, (1/4 npsm x 1/4 npt)	2		‡119688	FUSE, replacement (240V)	
36	246385	STRAINER, 7/8-14 unf	1		‡119277	FUSE, replacement (110V)	
37	114958	STRAP, tie	1		❖249042	KIT, brush, motor, replacement	
39	246386	HOSE, suction set, includes 41, 40, 36	1				
40	117559	O-RING	2				

Y Replacement Danger and Warning labels, tags, and cards are available at no cost. † Other filters available: 245528, 100 mesh; 245526, 200 mesh.

Parts (Stand)

Models 247482, 247483, 247484, 24P912,
262901



Parts List (Stand)

Models 247482, 247483, 247484, 24P912, 262901

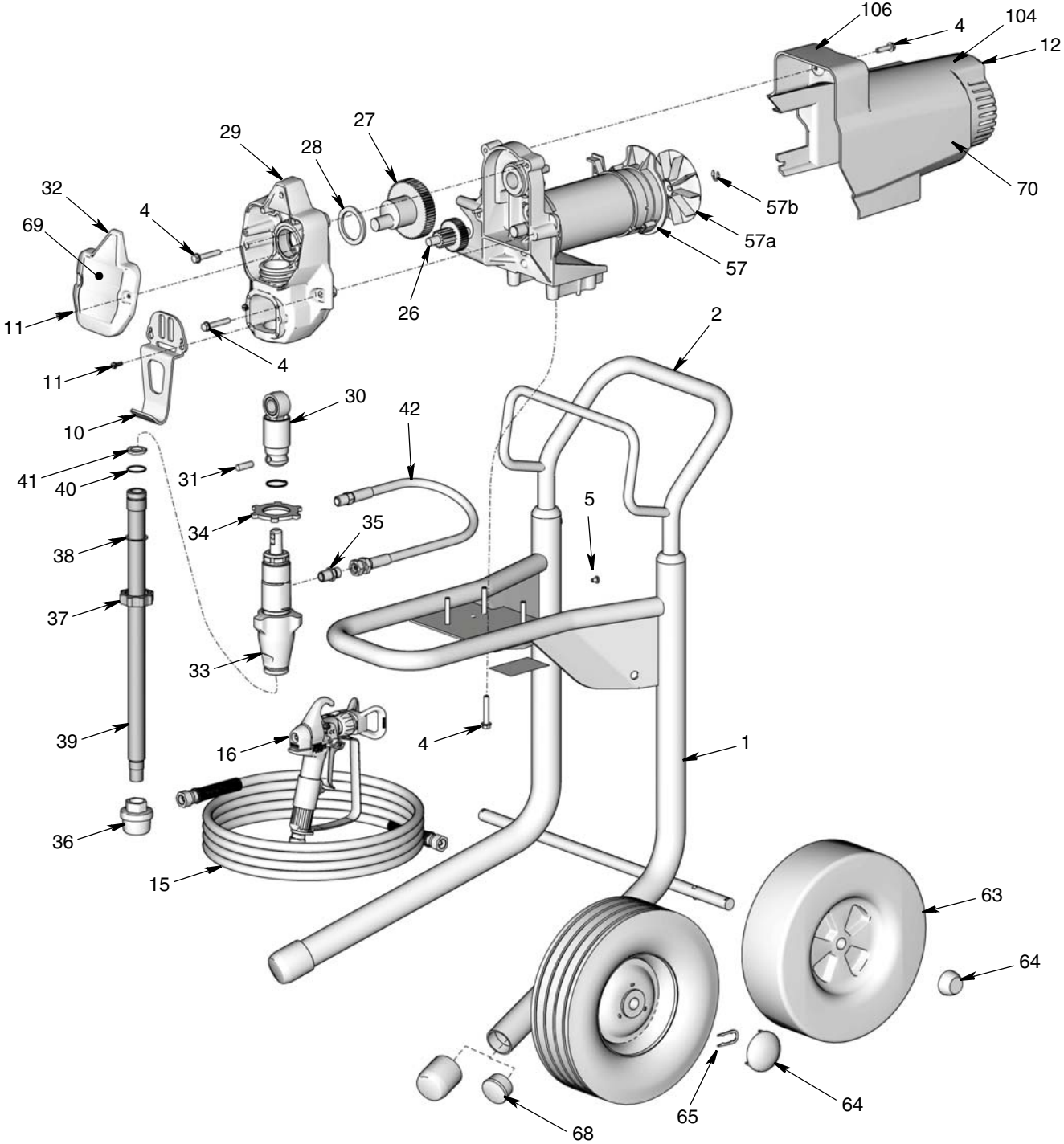
Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
4	117493	SCREW, mach, hex washer hd	11		244035	Models 247482, 247483, 247484, 262901	1
11	117501	SCREW, machine, hex washer head	9				
17		CONTROL, pressure includes 21, 23, 03		51	M70809	FITTING	1
	249005	Models 247482, 247183 120V	1	52	104361	O-RING	1
	248929	Model 247484, 262901 240V	1	53 †	245527	FILTER, fluid, 60 mesh	1
18 ‡		CONTROL BOARD		54	15E288	INSERT, filter	1
	255483	Models 247482, 247483 (120V)	1	55	15E289	CAP, filter	1
	255484	Model 247484, 262901 (240V)	1	56	195707	LABEL, identification	1
19		CORD		71 Y	15K359	LABEL, warning	1
	15B119	Models 247482, 247483 (120V)	1	72 Y	195792	LABEL, model 262901	1
	15B471	Model 247484 (240V)	1	81		CORD SET ADAPTER (Australia)	
	15B470	Model 262901 (240V)			242001	Model 24P912	1
20	115498	SCREW, mch, slot, hex, wash hd	1		242005	Models 247482, 247483, 247484	1
21	15E794	CAP, wire, control, pressure	1	84	115523	GAUGE, pressure, fluid; Model 254998, 262901	1
22	15A464	LABEL, control	1	85	119783	FITTING, swivel; Model 254998, 262901	1
23	115756	BUSHING	1	86	195551	RETAINER	1
25 Y	189930	LABEL, caution	1	87 Y	15H087	LABEL, warning, model 262901	1
35	162453	FITTING, (1/4 npsm x 1/4 npt)	2	88	15Y118	LABEL	1
43	15J745	MANIFOLD, filter	1		‡119688	FUSE, replacement (240V)	
44	235014	VALVE, drain, includes 44a, 44b	1		‡119277	FUSE, replacement (110V)	
44a	111699	GASKET, seat	1		❖249042	KIT, brush, motor, replacement	
44b	15E022	SEAT, valve	1				
45	224807	BASE, valve	1				
46		HANDLE, valve, drain					
	277089	Model 24P912	1				
	187625	Model 247482, 247483, 247848, 262901	1				
47	111600	PIN, grooved	1				
48	195811	LABEL, instruction	1				
50		DEFLECTOR, barbed					
	255465	Model 24P912	1				

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

† Other filters available: 245528, 100 mesh; 245526, 200 mesh.

Parts (Hi-Boy)

Models 247485, 247486, 247487, 247494, 247495, 247531, 247532



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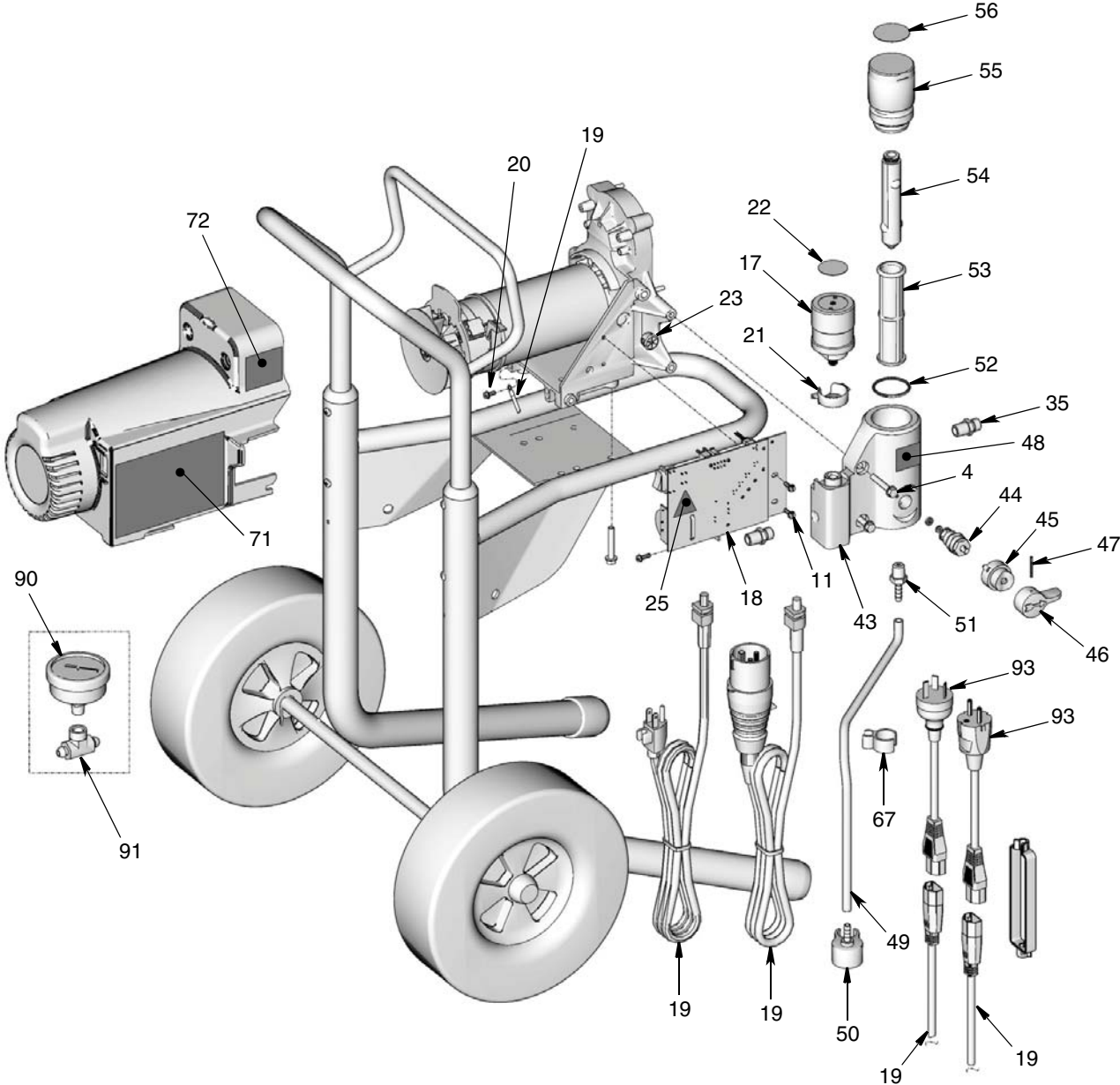
Parts List (Hi-Boy)

Models 247485, 247486, 247487, 247494, 247495, 247531, 247532

Ref	Part	Description	Qty	Ref	Part	Description	Qty
1	288216	FRAME, cart, hi	1	57a	249043	FAN, motor	1
2	287489	HANDLE, cart	1	57b	119653	RING, retaining	1
4	117493	SCREW, mach, hex washer hd	10	63		WHEEL, semi pneumatic	
5	109032	SCREW, mach, pnh	4		119451	Models 247485, 247486, 247487, 247531, 247532	2
10	15J812	HANGER, pail	1		119730	Models 247494, 247495	2
11	117501	SCREW, mach, slot hex wash hd	7		64	CAP, hub	
12		KIT, shield, motor (includes 4, 70, 71, 72)			119452	Models 247485, 247486, 247487, 247531, 247532	2
	255434	Models 247485, 247487	1		104811	Models 247494, 247495	2
	255435	Model 247486	1		65	CLIP, retaining	
	255492	Models 247494, 247495	1		15B999	Models 247494, 247495	2
	255490	Model 247531	1		68	CAP, leg	
	255491	Model 247532	1		15C871	Models 247485, 247486, 247487, 247531, 247532	2
15	HSE1450	HOSE, cpld, 1/4 in. x 50 ft	1		277091	Models 247494, 247495	2
16	289316	GUN, 500, 2-finger, ASM	1		69	LABEL, front, brand	
26	249194	GEAR, assembly, combination	1		15M775	Models 247485, 247487	1
27	287054	GEAR, crankshaft; includes 28	1		15M763	Models 247486	1
28	180131	BEARING, thrust	1		15R669	Models 247494, 247495	1
29	255487	HOUSING, drive; includes 4, 10, 11	1		15M777	Model 247531	1
30	287053	ROD, connecting; includes 30a, 31	1		15M768	Model 247532	1
30a	196750	SPRING, retaining	1	70		LABEL, side, brand	
31	196762	PIN, straight	1		15M774	Models 247485, 247487	1
32	276883	COVER, front	1		15M766	Model 247486	1
33	255475	PUMP, displacement; includes 35 Manual 312362	1		15M772	Model 247494, 247495	1
34	195150	NUT, jam, pump	1		15M776	Model 247531	1
35	162453	FITTING, (1/4 npsm x 1/4 npt)	2	78	245651	FLUID, TSL, 8 oz (not shown)	1
36	235004	STRAINER, 3/4-16 unf	1	90	115523	GAUGE, pressure, fluid	1
37	15E813	NUT, jam	1			Models 247487, 247494, 247495	
38	15B652	WASHER, suction	1	91	119783	FITTING, swivel	1
39	15J801	TUBE, suction, intake	1			Models 247487, 247494, 247495	
40	103413	O-RING	1	104	15R613	LABEL, shroud top	1
41	115099	WASHER, garden hose	1			Models: 247494, 247495	
42	15M671	HOSE, cpld	1	106	15R616	LABEL, crown	1
57❖		MOTOR, electric (includes 57a, 57b)				Models: 247494, 247495	
	255485	Models 247485, 247486, 247494, 247531, 247532	1	❖	249042	KIT, brush, motor	
	249041	Models 247487, 247495	1				

Parts (Hi-Boy)

Models 247485, 247486, 247487, 247494, 247495, 247531, 247532



Parts List (Hi-Boy)

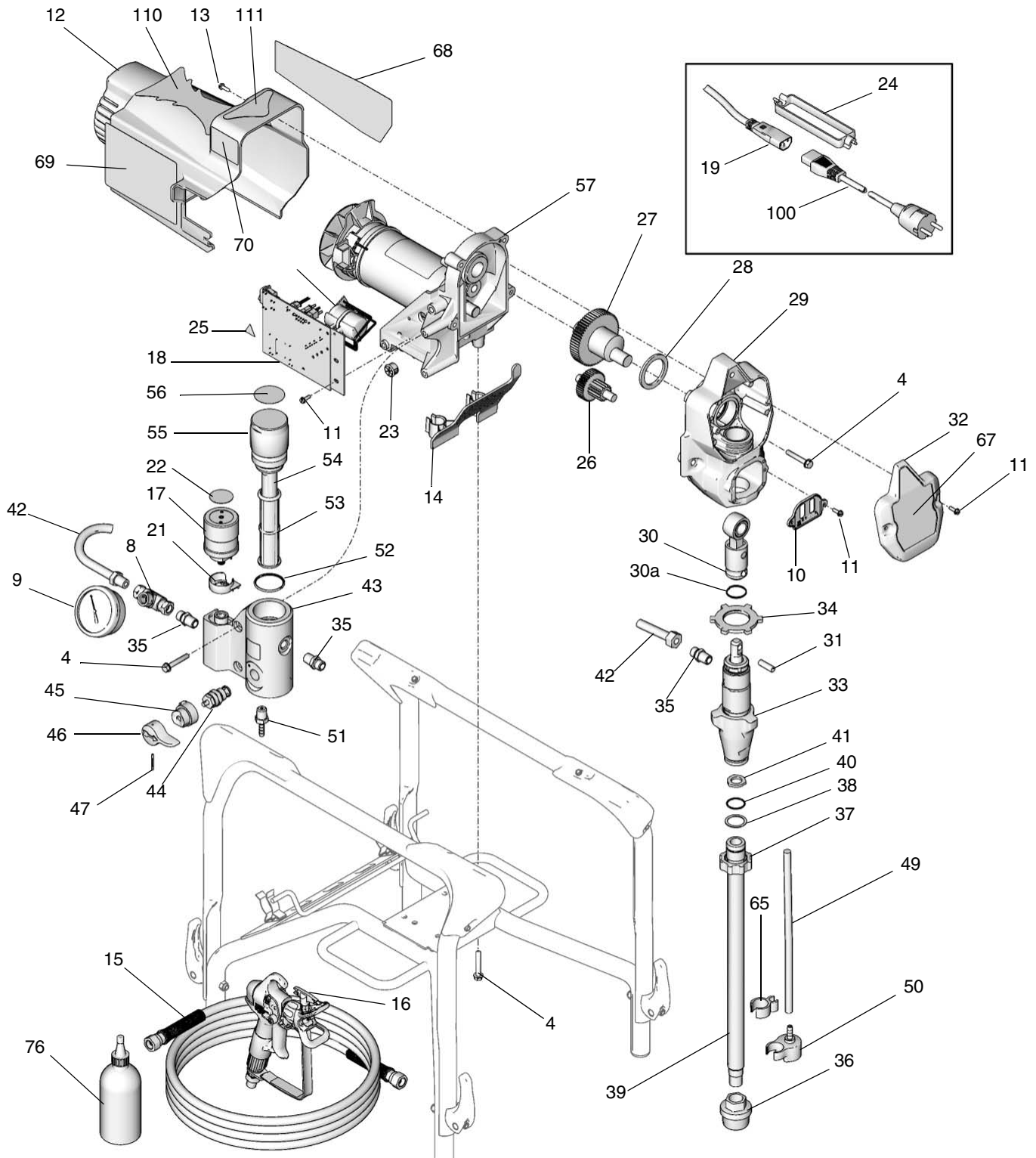
Models 247485, 247486, 247487, 247494, 247495

Ref	Part	Description	Qty	Ref	Part	Description	Qty
4	117493	SCREW, mach, hex washer hd	10		277089	Models 247494, 247495	1
11	117501	SCREW, mach, slot hex wash hd	7	47	111600	PIN, grooved	1
17		CONTROL, pressure (includes 21, 22, 23)		48	195811	LABEL, instruction	1
	249005	Models 247485, 247486, 247494, 247531, 247532 (110V)	1	49	15K092	TUBE, drain	1
	248929	Models 247487, 247495 (240V) CONTROL, board	1	50		DEFLECTOR, barbed	
18	255483‡	Model 247485, 247486, 247494, 247531, 247532 (110V)	1		244035	Models 247485, 247486, 247487, 247531, 247532	1
	255484‡	Models 247495, 247487 (240V) CORD, power	1		255465	Models 247494, 247495	1
19	15B119	Models 247485, 247486, 247531, 247532 (110V)	1	51	M70809	FITTING, barbed, hose	1
	15B471	Models 247487, 247495 (240V)		52	104361	O-RING	1
	253368	Model 247494 (110V)	1	53†	245527	FILTER, fluid, 60 mesh	1
20	115498	SCREW, mach, slot hex wash hd	1	54	15E288	INSERT, manifold	1
21	15E794	CAP, wire, control, pressure	1	55	15E289	CAP, filter	1
22	15A464	LABEL, pressure control knob	1	56	195707	LABEL, identification	1
23	115756	BUSHING, universal	1	67	195400	CLIP, spring	1
25	189930	LABEL, caution	1	71Y	15K359	LABEL, 190-210 261825 261830 war	1
43	15J745	MANIFOLD, Filter, 190/210 ES	1	72Y	195833	LABEL, warning	1
44	235014	VALVE, drain; includes 44a, 44b	1	93		CORD SET ADAPTER	
44a	111699	GASKET, seat	1		242005	Model 247487	1
44b	15E022	SEAT, valve	1		242001	Model 247495	1
45	224807	BASE, valve	1				
46		HANDLE, valve, drain					
	187625	Models 247485, 247486, 247487, 247531, 247532	1				

Y Replacement Danger and Warning labels, tags, and cards are available at no cost.
‡ 119277 Fuse replacement (110V)
‡ 119688 FUSE, replacement (240V)
† Other filters available: 245528, 100 mesh; 245526, 200 mesh.

Parts Drawing (Direct Immersion Stand)

Models 255890, 255891



ti11632a

Parts List (Direct Immersion Stand)

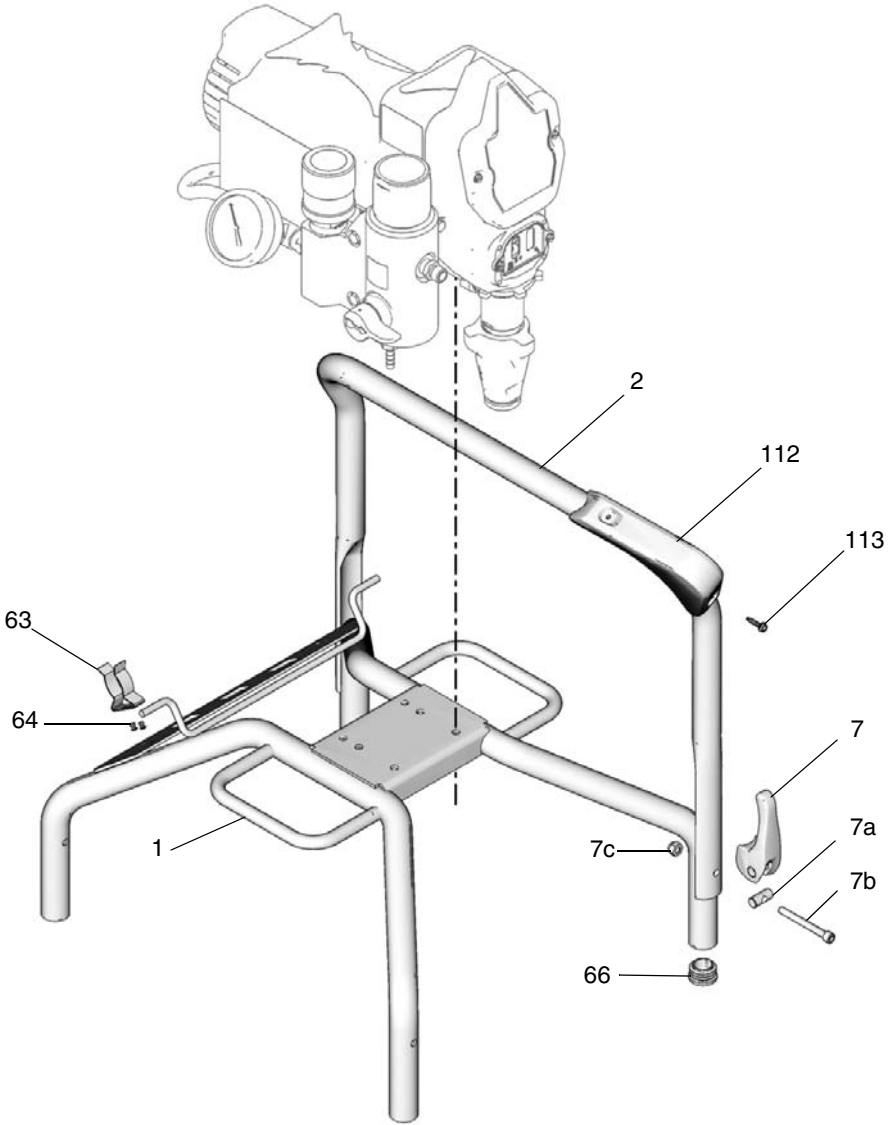
Models 255890, 255891

Ref	Part	Description	Qty	Ref	Part	Description	Qty
				37	15E813	NUT, jam	1
				38	15B652	WASHER, suction	1
				39	15J801	TUBE, suction, intake	1
				40	103413	O-RING	1
				41	115099	WASHER, garden hose	1
				42	15M670	HOSE, coupled	1
				43	15J745	MANIFOLD, filter, 190/210ES	1
				44	235014	VALVE, drain	1
				45	224807	BASE, valve	1
				46	277089	HANDLE, valve, drain	1
				47	111600	PIN, grooved	1
				48	195811	LABEL, instruction	1
				49	15K092	TUBE, drain	1
				50	244035	DEFLECTOR, barbed	1
				51	M70809	FITTING, barbed, hose	1
				52	104361	O-RING	1
				53	243080	FILTER, fluid	1
				54	15E288	INSERT, manifold	1
				55	15E289	CAP, filter	1
				56	195707	LABEL, identification	1
				57		MOTOR, electric, includes 57a, 57b	
					255485	Model 255891	1
					249041	Model 255890	1
				65	195400	CLIP, spring	1
				67	15R669	LABEL, front, L1900+, brand	1
				68	15M772	LABEL, side, L1900+, brand	1
				69Y	15K359	LABEL, warning	1
				70Y	195833	LABEL, warning, ENG/FRE/SPA	1
				76	245651	FLUID, TSL	1
				87	222385	TAG, warning	1
				88	111733	TOOL, wrench, adjustable	1
				89	197193	TOOL, hammer	1
				100		CORD SET	
					242001	190/210ES Europe adapter, 240V	1
					287121	190/210ES Italy, Denmark, Switzerland adapter 240V	1
				110	15R616	LABEL, crown	1
				111	15R613	LABEL, shroud, top	1
4	117493	SCREW, mach, hex washer hd	10				
8	119783	FITTING, tee, swivel	1				
9	115523	GAUGE, pressure, fluid	1				
10	15B589	COVER, pump rod	1				
11	117501	SCREW, mach, slot hex wash hd	7				
12	255432	SHIELD, motor	1				
13	114531	SCREW, mach, hex washer hd	1				
14	15J651	COVER, 210/190ES	1				
15	HSE1450	HOSE, cpld, 1/4 in. x 50 ft	1				
16	289316	GUN, 500, 2-finger, ASM	1				
17		CONTROL, pressure, includes 21, 22, 23					
	249005	Model 255891	1				
	248929	Model 255890	1				
18		CONTROL, board					
	249052†	Model 255891	1				
	249053	Model 255890	1				
19		CORD					
	253368	Model 255891	1				
	253370	Model 255890, jumper	1				
20	115498	SCREW, mach, slot hex wash hd	1				
21	15E794	CAP, wire, control, pressure	1				
22	15A464	LABEL, pressure control knob	1				
23	115756	BUSHING, universal	1				
24	195551	RETAINER, plug, adapter	1				
25	189930	LABEL, caution	1				
26	249194	GEAR, assembly, combination	1				
27	287054	GEAR, crankshaft	1				
28	180131	BEARING, thrust	1				
29	255168	HOUSING, drive	1				
30	287053	ROD, connecting; includes 30a, 31	1				
30a	196750	SPRING, retaining	1				
31	196762	PIN, straight	1				
32	276883	COVER	1				
33	246428	PUMP, displacement, ST	1				
34	195150	NUT, jam, pump	1				
35	162453	FITTING, (1/4 npsm x 1/4 npt)	3				
36	187651	STRAINER, 3/4-16 unf	1				

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

Parts Drawing (Direct Immersion Stand)

Models 255890, 255891



ti11633a

Parts List (Direct Immersion Stand)

Models 255890, 255891

Ref	Part	Description	Qty	Ref	Part	Description	Qty
1	258027	FRAME, stand	1	63	120595	CLIP, tool	2
2	15R792	LEG, cart	2	64		RIVET, blind, 1/8 x 1/4 in.	4
4	117493	SCREW, mach, hex washer hd	10	66	120151	RETAINER, caplug	4
7	289119	LEVER, handle, cam, includes 3, 5, 6, 7	4	112	15T783	ISOLATOR, foot	4
7a		PIN, pivot, handle, cart	4	113	122667	SCREW, drill, hex washer	8
7b		SCREW, cap, socket head	4				
7c		NUT, lock, hex	4				

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