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INTRODUCTION

Your new Airlessco or ALLPRO airless paint sprayer is designed to meet the demands of the professional painting contractor as well as the homeowner. The famous Airlessco slow-stroking stainless steel piston pump delivers extra long life for the piston, packings, valve seats and balls. The patented Triple-Life packing system is externally adjustable, extending packing life and reducing repacking costs. Its large high-torque electric motor runs slower reducing heat. The motor is fan cooled and totally enclosed to reduce brush wear and to prevent the ignition of paint fumes in the motor.

<table>
<thead>
<tr>
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<th>LP460/510E</th>
<th>LP540/610E</th>
<th>LP690/810E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Pressure</td>
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<td>3000 psi</td>
<td>3000 psi</td>
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<td>0.5 gpm</td>
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<td>Output (At Pressure)</td>
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<td>1 gun up to 0.023</td>
<td>1 gun up to 0.026</td>
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<td>Motor- Output</td>
<td>DC TEFC .6 hp</td>
<td>DC TEFC .8 hp</td>
<td>DC. TEFC. .8 hp</td>
</tr>
<tr>
<td>Weight</td>
<td>38 lbs</td>
<td>41 lbs.</td>
<td>65 lbs.</td>
</tr>
</tbody>
</table>

CARRY FRAME MODEL
LO-BOY FRAME
HI-BOY FRAME

WARNING
HANDLE THIS UNIT AS YOU WOULD A LOADED FIREARM!
High pressure spray can cause extremely serious injury.
OBSERVE ALL WARNINGS!

Before operating this unit, read and follow all safety warnings and instructions related to the usage of this equipment on pages 2, 3 & 4. READ, LEARN, and FOLLOW the Pressure Relief Procedure on Page 10 of this manual.

All Service Procedures to be performed by an Authorized Airlessco Service Center ONLY.

NO MODIFICATIONS or alterations of any AIRLESCCO Equipment or part is allowed.

MANUAL NOTATIONS
WARNING - Alerts user to avoid or correct conditions that could cause bodily injury.
CAUTION  - Alerts user to avoid or correct conditions that could cause damage to or destruction of equipment.
IMPORTANT - Alerts users to steps or procedures that are essential to proper equipment repair and maintenance.
NOTE     - Identifies essential procedures or extra information.
SAFETY WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE EXTREMELY SERIOUS INJURY.
Handle as you would a loaded firearm.
Follow the PRESSURE RELIEF PROCEDURE.

DO NOT USE HALOGENATED SOLVENTS IN THIS SYSTEM.
The prime valve, and most airless guns have aluminum parts and may explode. Cleaning agents, coatings, paints or adhesives may contain halogenated hydrocarbon solvents. DON'T TAKE CHANCES! Consult your material suppliers to be sure. Some of the most common of these solvents are: Carbontetrachloride, Chlorobenzene, Dichloroethane, Dichloroethyl Ether, Ethylbromide, Ethylchloride, Tethrachloethane. Alternate valves and guns are available if you need to use these solvents.

MEDICAL ALERT - Airless Spray Wounds
If any fluid appears to penetrate your skin, get EMERGENCY MEDICAL CARE AT ONCE. DO NOT TREAT AS A SIMPLE CUT.
Tell the doctor exactly what fluid was injected.

NOTE TO PHYSICIAN: Injection in the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible. DO NOT DELAY treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.

INJECTION HAZARD

• Fluids under high pressure from spray or leaks can penetrate the skin and cause extremely serious injury, including the need for amputation.
• NEVER point the spray gun at anyone or any part of the body.
• NEVER put your hand or fingers over the spray tip. Do not use a rag or any other materials over your fingers. Paint will penetrate through these materials & into the hand.
• NEVER try to stop or deflect leaks with your hand or body.
• ALWAYS have the tip guard in place when spraying.
• ALWAYS lock the gun trigger when you stop spraying.
• ALWAYS remove tip from the gun to clean it.
• NEVER try to "blow back" paint, this is not an air spray sprayer.
• ALWAYS follow the PRESSURE RELIEF PROCEDURE before cleaning or removing the spray tip or servicing any system equipment.
• Be sure the equipment safety devices are operating properly before each use.
• Tighten all of the fluid connections before each use.

MEDICAL TREATMENT

• If any fluid appears to penetrate your skin, get EMERGENCY CARE AT ONCE! DON'T TREAT AS A SIMPLE CUT.
• Go to an emergency room immediately.
• Tell the doctor you suspect an injection injury.
• Tell him what kind of material you were spraying with and have him read NOTE TO PHYSICIAN above.

GENERAL PRECAUTIONS

• NEVER alter equipment in any manner.
• NEVER smoke while in spraying area.
• NEVER spray highly flammable materials.
• NEVER use around children.
• NEVER allow another person to use sprayer unless he is thoroughly instructed on its safe use and given this operators manual to read.
• ALWAYS wear a spray mask, gloves and protective eye wear while spraying.
• ALWAYS ensure fire extinguishing equipment is readily available and properly maintained.

NEVER LEAVE SPRAYER UNATTENDED WITH PRESSURE IN THE SYSTEM.

FOLLOW PRESSURE RELIEF PROCEDURES.

NOTE: United States Government safety standards have been adopted under the Occupational Safety & Health Act. These standards, particularly the General Standards, Part 1910 & Construction Standards, Part 1926 should be consulted.
SAFETY WARNINGS

ALWAYS INSPECT SPRAYING AREA
• Keep the spraying area free from obstructions.
• Make sure the spraying area has good ventilation to safely remove vapors and mists.
• NEVER keep flammable material in spraying area.
• NEVER spray in vicinity of open flame or other sources of ignition.
• The spraying area must be at least 20 ft. away from spray unit.

SPRAY GUN SAFETY
• ALWAYS set gun safety lock in the "LOCKED" position when not in use & before servicing or cleaning.
• NEVER remove or modify any part of the gun.
• ALWAYS REMOVE THE SPRAY TIP when cleaning. Flush unit at the LOWEST POSSIBLE PRESSURE.
• ALWAYS check operation of all gun safety devices before each use.
• Be very careful when removing the spray tip or hose from the gun. A plugged line will contain fluid under pressure. If the tip or line is plugged, follow the PRESSURE RELIEF PROCEDURE.

TIP GUARD
• ALWAYS have the tip guard in place on the spray gun while spraying. The tip guard alerts you to the injection hazard and helps prevent accidentally placing your fingers or any part of your body close to the spray tip.

SPRAY TIP SAFETY
• Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the PRESSURE RELIEF PROCEDURE and then remove the spray tip to clean it.
• NEVER wipe off build up around the spray tip.

TOXIC FLUID HAZARD
• ALWAYS remove tip guard & tip to clean AFTER pump is turned off and the pressure is relieved by following the PRESSURE RELIEF PROCEDURE.
• Hazardous fluid or toxic fumes can cause serious injury or death if splashed in eyes or on skin, inhaled or swallowed. Know the hazards of the fluid you are using. Store & dispose of hazardous fluid according to manufacturer, local, state & national guidelines.
• ALWAYS wear protective eyewear, gloves, clothing and respirator as recommended by fluid manufacturer.

HOSES
• Tighten all of the fluid connections securely before each use. High pressure fluid can dislodge a loose coupling or allow high pressure spray to be emitted from the coupling and result in an injection injury or serious bodily injury.
• Only use hoses with a spring guard. The spring guard helps protect the hose from kinks or other damage which could result in hose rupture and cause an injection injury.
• NEVER use a damaged hose, which can result in hose failure or rupture and cause an injection injury or other serious bodily injury or property damage. Before each use, check entire hose for cuts, leaks, abrasions, bulging of the cover, or damage or movement of couplings. If any of these conditions exist, replace the hose immediately.
• NEVER use tape or any device to try to mend the hose as it cannot contain the high pressure fluid. NEVER ATTEMPT TO RECOUPLE THE HOSE. A high pressure hose is not recoupleable.

GROUNDING
• Ground the sprayer & other components in the system to reduce the risk of static sparking, fire or explosion which can result in serious bodily injury and property damage. For detailed instructions on how to ground, check your local electrical code.
• ALWAYS ensure switch is in OFF position before plugging unit in.

Always Ground All of These Components:
1. Sprayer: plug the power supply cord, or extension cord, each equipped with an undamaged three-prong plug, into a properly grounded outlet. DO NOT USE AN ADAPTER. Use only a 3 wire extension cord that has a 3 blade grounding plug, and a 3 slot receptacle that will accept the plug on the product. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. (Note: The table on the top of the next page shows the correct size to use depending on cord length and name plate ampere rating. If in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord.)
2. Fluid hose: use only grounded hoses.
3. Spray gun or dispensing valve: grounding is obtained through connection to a properly grounded fluid hose and pump.
4. Object being sprayed: according to your local code.
5. All solvent pails used when flushing:
• Once each week, check electrical resistance of hose (when using multiple hose assemblies, check overall resistance.) Overall (end to end) resistance of unpressurized hose must not exceed 29 megohms (max.) for any coupled length or combination of hose lengths. If hose exceeds these limits, replace it immediately.
• Never exceed 500 ft. (150 m) overall combined cord length to assure electrical continuity.
SAFETY WARNINGS

ALWAYS
NEVER
NEVER
ALWAYS

This sprayer operates at 3000 psi (205 bar). Always be
NEVER
ALWAYS

Vapors created when spraying can be ignited by sparks.

NEVER
Remove the spray tip before flushing. Hold the metal part of the gun firmly to the side of a metal pail & use the lowest

ALWAYS
Use only conductive fluid hoses for airless applications.

Reduce the risk of injection injury, static sparking or

FLUSHING

• ALWAYS use approved high pressure fittings and replacement parts.
• ALWAYS ensure fire extinguishing equipment is readily available and properly maintained.

PREVENT STATIC SPARKING FIRE/EXPLOSIONS

• ALWAYS be sure all of the equipment & objects being sprayed are properly grounded. Always ground sprayer, paint bucket and object being sprayed. See the grounding section of this manual for grounding information.
• Vapors created when spraying can be ignited by sparks. To reduce the risk of fire, always locate the sprayer at least 20 feet (6 m.) away from spray area. Do not plug in or unplug any electrical cords in the spray area. Doing so can cause sparks which can ignite any vapors still in the air. Follow the coating & solvent manufacturers safety warnings and precautions.
• Use only conductive fluid hoses for airless applications. Be sure the gun is grounded through the hose connections. Check ground continuity in hose & equipment. Overall (end to end) resistance of unpressurized hose must not exceed 29 megohms for any coupled length or combination of hose length. Use only high pressure airless hoses with static wire approved for 3000 psi.

KEEP CLEAR OF MOVING PARTS

Keep clear of moving parts when starting or operating the sprayer. Do not put your fingers into any openings to avoid amputation by moving parts or burns on hot parts. Precaution is the best insurance against an accident. When starting the motor, maintain a safe distance from moving parts of the equipment. Before adjusting or servicing any mechanical part of the sprayer, follow the PRESSURE RELIEF PROCEDURE.

AVOID COMPONENT RUPTURE

• This sprayer operates at 3000 psi (205 bar). Always be sure that all components and accessories have a maximum working pressure of at least 3000 psi to avoid rupture which can result in serious bodily injury including injection and property damage.
• NEVER leave a pressurized sprayer unattended to avoid accidental operation of it, which could result in serious bodily injury.
• ALWAYS follow the PRESSURE RELIEF PROCEDURE whenever you stop spraying and before adjusting, removing or repairing any part of the sprayer.
• NEVER alter or modify any part of the equipment to avoid possible component rupture which could result in serious bodily injury and property damage.
• NEVER use weak, damaged, or non-conductive paint hose. Do not allow kinking or crushing of hoses or allow it to vibrate against rough, sharp or hot surfaces. Before each use, check your hoses for damage and wear and ensure all of the fluid connections are secure.
• ALWAYS replace any damaged hose. NEVER use tape or any device to mend the hose.
• NEVER attempt to stop any leakage in the line or fittings with your hand or any part of the body. Turn off the unit and release pressure by following PRESSURE RELIEF PROCEDURE.

WHEN SPRAYING & CLEANING WITH FLAMMABLE PAINTS AND THINNERS

1. When spraying with flammable liquids, the unit must be located a minimum of 25 feet away from the spraying area in a well ventilated area. Ventilation must be sufficient enough to prevent the accumulation of vapors.
2. To eliminate electrostatic discharge, ground the spray unit, paint bucket & spraying object. See GROUNDING. Use only high pressure airless hoses approved for 3000 psi which is conductive.
3. Remove the spray tip before flushing. Hold the metal part of the gun firmly to the side of a metal pail & use the lowest possible fluid pressure during flushing.
4. Never use high pressure in the cleaning process. USE MINIMUM PRESSURE.
5. Do not smoke in spraying/cleaning area.
1. New Sprayer

Your sprayer was factory tested in an oil solution which was left in the pump. Before using oil-base paint, flush with mineral spirits only. Before using water-base paint flush with mineral spirits, followed by soapy water, then a clean water flush.

2. Changing Colors

Flush with a compatible solvent such as mineral spirits or water.

3. Changing from water-base to oil-base paint.

Flush with soapy water, then mineral spirits.


Flush with mineral spirits, followed by soapy water, then a clean water flush.

5. Storage

Always relieve pressure (See pressure relief procedure on page 10) prior to storage or when machine is unattended.

Oil-base Paint: Flush with mineral spirits. Ensure that there is no pressure in the unit, then close the prime/pressure relief valve.

Water-base Paint: Flush with water, then mineral spirits. For longer term storage use a 50/50 mixture of mineral spirits and motor oil. Always ensure that there is no pressure in the unit, and close the prime/pressure relief valve for storage.

6. Start-up after storage

Before using water-base paint, flush with soapy water and then a clean water flush.

When using oil-base paint, flush out the mineral spirits with the material to be sprayed.

Warning: NEVER leave pump unattended while under pressure!

FIGURE 1

Prime/Pressure Relief Valve (Prime/PR Valve)
Used to relieve pressure from gun, hose & tip and to prime the unit when in OPEN position.
(If is in open position when there is a wider gap between valve handle and cam body).

When valve is in the CLOSED position, there is only a very slight gap between handle & body. When closed the system is pressurized.

Handle as a Loaded Firearm!

FIGURE 2

Pressure Control Knob (Fig. 2)
Used to adjust pressure. Turn clockwise (CW) to increase pressure and counterclockwise (CCW) to decrease pressure.

FIGURE 3

Toggle Switch

Continued on next page.........
1. Be sure the gun safety latch is engaged and there is no spray tip in the gun. Refer to page 14 on how to lock the safety latch and the gun's safety features.

**FIGURE 4**

![REMOVE SPRAY TIP, ENGAGE GUN SAFETY LATCH.](image)

2. Pour enough clean, compatible solvent into a large, empty metal pail to fill the pump and hoses.

3. Place the suction tube into the pail.

4. Turn the Prime/Pressure Relief (PR) Valve to the "OPEN", priming position. Refer to Figure 1.

5. Point the gun into the metal pail and hold a metal part of the gun firmly against the pail. Refer to Figure 5.

6. Disengage the gun safety latch and squeeze the gun trigger. Turn the ON-OFF Toggle Switch to the "ON" position (Figure 3) and turn Pressure Control Knob (Figure 2) clockwise to increase pressure just enough to start the pump.

7. Turn the Prime/PR Valve to the PRESSURE "CLOSED" position. This will allow solvent to be flushed through the pump, hoses and gun. Allow the unit to operate until clean solvent comes from the gun.

8. Release the trigger and engage the gun safety latch.

9. Whenever you shut off the sprayer, follow the "PRESSURE RELIEF PROCEDURE".

---

**WARNING**

To reduce the risk of static sparking which can cause fire or explosion, always hold a metal part of the gun firmly against the metal pail when flushing. This also reduces splashing.

**FIGURE 5**

![MAINTAIN FIRM METAL TO METAL CONTACT BETWEEN GUN AND CONTAINER](image)
1. Connect the hose and gun.
   a. Remove the plastic cap plug from the outlet tee and screw a conductive or grounded 3000 psi airless spray hose onto fluid outlet.
   b. Connect an airless spray gun to the other end of the hose.
   c. Do not use steel braided airless hose. Use nylon braided airless hose only.

   **NOTE:** Do not use thread sealer on swivel unions as they are made to self-seal. Use thread seal on tapered male threads only.

2. Fill the packing nut/wet cup with 5 drops of Airlessco Throat Seal Oil (TSO). See (Figure 6).

3. Check the electrical service.
   Be sure the electrical service is 120 V AC, 15 amp minimum, and that the outlet you use is properly grounded.

   **NOTE:** *For Generator power, a minimum 7000 watt generator with voltage regulation must be used.*

4. Grounding

   **WARNING**

   To reduce the risk of static sparking, fire or explosion which can result in serious bodily injury and property damage, always ground the sprayer and system components and the object being sprayed, as instructed in the safety warning section of this manual.

5. Flush the sprayer
   As per "Flushing Procedure" in this manual.
1. Learn the functions of the controls.

**PRIME/PRESSURE (PR) RELIEF VALVE** is used to prime pump and to relieve pressure from gun, hose and tip.

2. Prepare the material

   a. Prepare the material according to the material manufacturer's recommendations.
   b. Place the suction tube into the material container.

3. Starting the sprayer

   **(See Figure 7, 8 & 9)**

   a. Prime/PR Valve must be "OPEN" in the priming position.
   b. When you have ensured that the gun safety latch is engaged, attach tip and safety guard.
   c. Turn the ON-OFF Toggle Switch to the "ON" position.
   d. Turn Pressure Control Knob clockwise to prime the pump.
   e. After the pump is primed, turn Prime/PR Valve to the "Closed" position.
   f. Turn Pressure Control Knob to the desired spray pressure. Optional LCD displays pressure.
   g. Disengage the gun safety latch and you are ready to spray.

---

**FIGURE 7**

Prime/Pressure Relief Valve (Prime/PR Valve) Used to relieve pressure from gun, hose & tip and to prime the unit when in the OPEN position. (It is in open position when there is a wider gap between valve handle and cam body)

When in the CLOSED position, there is only a very slight gap between handle & body. When closed the system is pressurized. Handle as a loaded firearm!

**FIGURE 8**

ON OFF

TOGGLE SWITCH

**FIGURE 9**

PRESSURE CONTROL KNOB is used to adjust pressure. Turn clockwise (CW) to increase pressure and counterclockwise (CCW) to decrease pressure.
4. Adjusting the pressure

a. Turn the Pressure Control Knob Clockwise to increase pressure and counterclockwise to decrease pressure.

b. Always use the lowest pressure necessary to completely atomize the material.

Note: Operating the sprayer at higher pressure than needed, wastes material, causes early tip wear, and shortens sprayer life.

c. If more coverage is needed, use a larger tip rather than increasing the pressure.

d. Check the spray pattern. The tip size and angle determines the pattern width and flow rate.

Avoiding Tip Clogs

There is an easy way to keep the outside of the tip clean from material build up:

Every time you stop spraying, for even a minute, lock the gun and submerge it into a small bucket of thinner suitable for the material sprayed. Thinner will dissolve the buildup of paint on the outside of tip, tip guard and gun much more effectively if the paint doesn’t have time to dry out completely.

5. When Shutting off the Sprayer

a. Whenever you stop spraying, even for a short break, follow the "Pressure Relief Procedure".

b. Clean the tip & gun as recommended it the spray gun instruction manual.

c. Flush the sprayer at the end of each work day, if the material you are spraying is water-based, or if it could harden in the sprayer overnight. See "Flushing". Use a compatible solvent to flush, then fill the pump and hoses with an oil based solvent such as mineral spirits.

d. For long term shutdown or storage, refer to the "Flushing" section of this manual.
IMPORTANT!

To avoid possible serious body injury, always follow this procedure whenever the sprayer is shut off, when checking it, when installing, changing or cleaning tips, whenever you stop spraying, or when you are instructed to relieve the pressure.

1. Engage the gun safety latch. Refer to the separate instruction manual provided with your gun on its safety features and how to engage safety latch.

2. Turn the unit off & unplug it from the electrical outlet.

3. Disengage the gun safety latch and trigger the gun to relieve residual fluid pressure.

   Hold metal part of the gun in contact with grounded metal pail.
   USE MINIMUM PRESSURE!

4. Turn Prime/Pressure Relief Valve (PR Valve) to the open (priming) position to relieve residual fluid pressure.

   There will be a wider gap between valve handle and cam body when in open position. In the closed position there is only a very slight gap.

   NOTE: The valve handle can move both clockwise & counter clockwise and can face different directions.

5. Re-engage gun safety latch and close Prime/Pressure Relief Valve.

   If the SPRAY TIP OR HOSE IS CLOGGED, follow Step 1 through 5 above. Expect paint splashing into the bucket while relieving pressure during Step 4.

   If you suspect that pressure hasn’t been relieved due to damaged Prime/Pressure Relief Valve or other reason, engage the gun safety latch and take your unit to an authorized Airlessco Service Center.

DAILY MAINTENANCE

1. Keep the displacement pump packing nut/wet cup lubricated with Airlessco TSO (Throat Seal Oil) at all times. The TSO helps protect the rod and the packings.

2. Inspect the packing nut daily. Your pump has a patented Triple Life Packing System. Packing life will be extended a minimum of three times if the following “Packing Adjustment” procedure is followed:

   If seepage of paint into the packing nut and/or movement of the piston upward is found (while not spraying), the packing nut should be tightened enough to stop leakage only, but not any tighter. Overtightening will damage the packings and reduce the packing life.
SPRAY GUN OPERATION

SPRAY GUN
Attach spray gun to airless unit and tighten fittings securely. Set the gun safety latch. (Also may be called gun safety lock, or trigger lock)

* The gun safety latch should always be set when the gun is not being triggered.

Read all warnings and safety precautions supplied with the spray gun and in product manual.

MAJOR COMPONENTS OF SPRAY GUN AND REVERSIBLE SPRAY TIP

SPRAY TIP ASSEMBLY
1. Be sure pressure relief procedure is followed before assembling tip and housing to the gun.
2. Lock gun safety latch.
3. Insert REV-TIP™ cylinder into the REV-GUARD™ (guard housing assembly).
4. Guide metal seat into REV-GUARD™ (guard housing assembly) through retaining nut & turn until it seats against the cylinder.
5. Insert O-Ring gasket on metal seat so it fits in the grooves.
6. Finger tighten REV-GUARD™ retaining nut onto the gun.
7. Turn guard in the desired position.
8. Completely tighten the retaining nut.

TO REMOVE CLOGS FROM SPRAY TIP
1. Lock gun safety latch.
2. Turn REV-TIP™ handle 180 degrees.
3. Disengage trigger lock & trigger gun into pail.
4. If the REV-TIP™ handle appears locked (resists turning), loosen the retaining nut. The handle will now turn easily.
5. Engage gun safety latch & return handle to the spray position.

CLEANING SPRAY GUN
Immediately after the work is finished, flush the gun out with a solvent. Brush pins with solvent and oil them lightly so they will not collect dried paint.

CLEANING FILTER IN GUN HANDLE
To clean the filter, use a brush dipped in an appropriate solvent. Change or clean filters at least once a day. Some types of latex may require a filter change after four hours of operation.

CLOGGED FLAT TIP
Should the spray tip become clogged, relieve pressure from hose by following the "Pressure Relief Procedure." Secure gun with the safety latch, take off guard, take out the tip, soak in appropriate solvent & clean with a brush. (Do not use a needle or sharp pointed instrument to clean the tip. The tungsten carbide is brittle and can chip.)
<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse Spray, Spotty Pattern</td>
<td>Pressure setting low</td>
<td>Increase pressure setting</td>
</tr>
<tr>
<td></td>
<td>Irratic spray gun/hand motion</td>
<td>Use a steady, parallel pass</td>
</tr>
<tr>
<td>Excessive Overspray (Fogging)</td>
<td>Pressure setting high</td>
<td>Reduce pressure setting</td>
</tr>
<tr>
<td></td>
<td>Paint over thinned/reduced/cut</td>
<td>Use less thinner/water/reducer</td>
</tr>
<tr>
<td>Spray Pattern Excessively Wide</td>
<td>Incorrect fan width selection</td>
<td>Select narrower fan width tip*</td>
</tr>
<tr>
<td>Spray Pattern Excessively Narrow</td>
<td>Incorrect fan width selection</td>
<td>Select wider fan width tip*</td>
</tr>
<tr>
<td>Excessive Paint Delivery</td>
<td>Large tip orifice for application</td>
<td>Select smaller tip orifice*</td>
</tr>
<tr>
<td>Paint Film Runs/Sags</td>
<td>Paint over thinned/reduced/cut</td>
<td>Use less thinner/water/reducer</td>
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<tr>
<td></td>
<td>Excessive pressure</td>
<td>Reduce pressure setting</td>
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<tr>
<td></td>
<td>Spray gun/hand speed slow</td>
<td>Increase pass speed</td>
</tr>
<tr>
<td>Spray Pattern Rounded and Heavy</td>
<td>Tip worn beyond use</td>
<td>Replace with new tip*</td>
</tr>
<tr>
<td>Pump Does Not Keep Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spray Pattern Pulsates/Irratic:</td>
<td>Pump worn or malfunctioning</td>
<td>Service pump</td>
</tr>
<tr>
<td>Pump Does Not Keep Up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thin or Spotty Coverage (Holidays)</td>
<td>Small tip orifice</td>
<td>Select larger tip orifice*</td>
</tr>
<tr>
<td></td>
<td>Spray gun/hand speed fast</td>
<td>Decrease pass speed</td>
</tr>
<tr>
<td>Thin Coverage in Center of Pattern (Fingers)</td>
<td>Tip size larger than pump specs</td>
<td>Replace with correct tip for pump*</td>
</tr>
<tr>
<td></td>
<td>Low pressure setting</td>
<td>Increase pressure setting</td>
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<tr>
<td></td>
<td>Pump worn or malfunctioning</td>
<td>Service pump</td>
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<tr>
<td>Spray Pattern Irregular, Deflected</td>
<td>Tip orifice partially clogged</td>
<td>Clean tip carefully</td>
</tr>
<tr>
<td></td>
<td>Tip damaged</td>
<td>Replace with new tip*</td>
</tr>
<tr>
<td>Excess Paint Builds on Tip Guard</td>
<td>Spray gun excessively close to surface</td>
<td>Hold gun further from surface sprayed</td>
</tr>
<tr>
<td></td>
<td>Pressure setting high</td>
<td>Reduce pressure setting</td>
</tr>
<tr>
<td>Drips, Spits From Tip</td>
<td>Valve seat and/or ball in gun head</td>
<td>Service spray gun, replace valve assembly</td>
</tr>
<tr>
<td></td>
<td>damaged or worn</td>
<td></td>
</tr>
<tr>
<td>Tip Clogs Continually</td>
<td>Debris in paint</td>
<td>Thoroughly strain paint before use</td>
</tr>
<tr>
<td></td>
<td>Gun filter missing</td>
<td>Insure gun filter is in handle</td>
</tr>
<tr>
<td></td>
<td>Coarse filter mesh</td>
<td>Use fine mesh filter in gun handle</td>
</tr>
<tr>
<td>Gun Filter Clogs Quickly</td>
<td>Debris in paint</td>
<td>Thoroughly strain paint before use</td>
</tr>
<tr>
<td></td>
<td>Pump inlet strainer missing</td>
<td>Do not operate without inlet strainer</td>
</tr>
</tbody>
</table>

*See “Tip Selection Guide” in this manual*
# Spray Tip Selection

Spray tip selection is based on paint viscosity, paint type, and job needs. For light viscosities (thin paints), use a smaller tip; for heavier viscosities (thicker paints), use a larger tip size.

Spray tip size is based on how many gallons of paint per minute can be sprayed through the tip. Do not use a tip larger than the maximum pump flow rate or capacity the sprayer can accommodate. Pump flow rate is measured in gallons per minute (GPM).

## REV-Tip for Painting 561-XXX

<table>
<thead>
<tr>
<th>Width (in)</th>
<th>Orifice Size (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6</td>
<td>0.023</td>
</tr>
<tr>
<td>6-8</td>
<td>0.025</td>
</tr>
<tr>
<td>8-10</td>
<td>0.025</td>
</tr>
<tr>
<td>10-12</td>
<td>0.027</td>
</tr>
<tr>
<td>12-14</td>
<td>0.027</td>
</tr>
<tr>
<td>14-16</td>
<td>0.027</td>
</tr>
<tr>
<td>16-18</td>
<td>0.031</td>
</tr>
<tr>
<td>20-24</td>
<td>0.035</td>
</tr>
<tr>
<td>22-24</td>
<td>0.035</td>
</tr>
</tbody>
</table>

## Pattern Width

Thickness of the paint coat per stroke is determined by spray tip "fan width", rate of the spray gun movement, and distance to surface.

## Spray Tip Selection

Two tips having the same tip size, but different pattern widths will deliver the same amount of paint over a different area (wider or narrower strip). A spray tip with a narrow pattern width makes it easy to spray in tight places.

## Spray Tip Replacement

During use, especially with latex paint, high pressure will cause the orifice to grow larger. This destroys the pattern.

Replace tips before they become excessively worn. Worn tips waste paint, cause overspray, make cutting-in difficult, and decreases sprayer performance.

## Fine Finish REV-Tip Part # 571-XXX

NEW! **Double Orifice** design for lower pressure airless spraying when you need finer atomization for a smoother finish on interior trim, cabinetry, shutters, and doors.

<table>
<thead>
<tr>
<th>Fan Width (in)</th>
<th>Orifice Size (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6</td>
<td>0.012</td>
</tr>
<tr>
<td>6-8</td>
<td>0.014</td>
</tr>
<tr>
<td>8-10</td>
<td>0.014</td>
</tr>
</tbody>
</table>

Protected By U.S. Patent No. 6,264,115  Other U.S. & Foreign Patents Applied For.
1. LUBRICATION - This motor is supplied with prelubricated ball bearings, lubricated for life of bearing.

2. MOTOR BRUSHES - These need periodic inspection and replacement as wear indicates. Brushes for the Leeson motor (LP540/690) PN 331-131 have an initial length of 3/4" and must be replaced when worn to 3/8." Brushes for the Airlessco DC Motor (LP400/460) PN 331-778 have an initial length of 13/16" and must be replaced when worn to 1/4".

3. TO CHANGE THE BRUSHES, follow the procedures below:
   a. Unplug the machine.
   b. Remove brush access plates at the rear of the motor.
   c. Loosen the screw holding the brush terminal and remove the brush lead.
   d. Push the brush retainer clip in and remove.
   e. Remove the worn brushes (one on each side of motor).
   f. Install new brushes in reverse order and replace plates.

NOTE: For longer life, new brushes need to have a "run in" period. After installing a new brushes, set up the machine for spraying. Use a bucket of water and Airlessco Pump Conditioner mixture, a 50 foot x 1/4" airless hose, airless gun with 0.017 tip on Gun. Turn the Prime/PR Control Valve to the Prime position and turn the unit on. Turn the Pressure Control Knob to maximum pressure (fully CW position) and let the pump cycle at high speed in the prime position for 20 minutes. This will allow the brushes to "run in" properly.

MANIFOLD FILTER - PN 111-200-99

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>FIGURE 10 PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>111-200-99</td>
<td>Filter Ass'y</td>
</tr>
<tr>
<td>2</td>
<td>301-356</td>
<td>Base</td>
</tr>
<tr>
<td>3</td>
<td>106-007</td>
<td>Spring</td>
</tr>
<tr>
<td>4</td>
<td>111-204</td>
<td>O-Ring</td>
</tr>
<tr>
<td>5</td>
<td>111-203</td>
<td>Filter 60 Mesh</td>
</tr>
<tr>
<td>6</td>
<td>111-201</td>
<td>Support</td>
</tr>
<tr>
<td>*7</td>
<td>100-159</td>
<td>Base</td>
</tr>
<tr>
<td>8</td>
<td>100-129</td>
<td>Swivel</td>
</tr>
<tr>
<td>9</td>
<td>100-028</td>
<td>Plug 3/8&quot; (2)</td>
</tr>
<tr>
<td>10</td>
<td>100-109</td>
<td>Plug 1/4&quot;</td>
</tr>
<tr>
<td>11</td>
<td>100-010</td>
<td>Nipple 3/8 x 1/4</td>
</tr>
</tbody>
</table>

* LP690 & 810E come equipped with fittings 100-201 and 169-010
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit doesn’t prime</td>
<td>Air leak due to:</td>
<td>• Tighten Suction Nut</td>
</tr>
<tr>
<td></td>
<td>• Loose Suction Nut</td>
<td>• Replace O-Ring (106-011) on suction seat, &amp;</td>
</tr>
<tr>
<td></td>
<td>• Worn O-Rings</td>
<td>O-Ring (106-020) below suction seat</td>
</tr>
<tr>
<td></td>
<td>• Hole in Suction Hose</td>
<td>• Replace Suction Hose (331-290)</td>
</tr>
<tr>
<td></td>
<td>• Stuck or Fouled Balls</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service outlet valve suction assembly</td>
</tr>
<tr>
<td>Unit primes but has no or poor pressure</td>
<td>Pressure set too low</td>
<td>• Turn up pressure</td>
</tr>
<tr>
<td></td>
<td>Filter(s) are clogged</td>
<td>• Clean or replace gun filter, inlet filter</td>
</tr>
<tr>
<td></td>
<td>Outlet Valve fouled/worn</td>
<td>and/or manifold filter</td>
</tr>
<tr>
<td></td>
<td>Prime/Pressure Relief valve bypassing</td>
<td>• Service outlet valve</td>
</tr>
<tr>
<td></td>
<td>Packings and/or piston worn</td>
<td>• Clean or replace primve valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tighten packing nut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Repack unit</td>
</tr>
<tr>
<td>Unit does not maintain good spraying pressure</td>
<td>Blown spray tip</td>
<td>• Replace spray tip</td>
</tr>
<tr>
<td></td>
<td>Packings and/or piston worn</td>
<td>• Repack unit</td>
</tr>
<tr>
<td></td>
<td>Upper Seat worn</td>
<td>• Replace upper seat</td>
</tr>
<tr>
<td>Unit does not run</td>
<td>Blown fuse</td>
<td>• Replace fuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 15A SlowBlow (pn. 331-256) - 4 Series</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 20A SlowBlow (pn. 331-328) - 5&amp;6 Series</td>
</tr>
<tr>
<td></td>
<td>Electrical failure</td>
<td>See electrical troubleshooting -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Series &amp; 5-6 Series</td>
</tr>
</tbody>
</table>
**SERVICING THE FLUID PUMP**

**NOTE:** Check everything in the Troubleshooting Chart before disassembling the Fluid Pump.

**Fluid Pump Removal - Refer to Figure 11**

1. Follow the Pressure Relief Procedure page 10.
2. Flush the material you are spraying out of the machine.
3. Remove the connecting rod shield (331-111).
4. Move the piston rod (331-093) to its lowest position by cycling pump slowly or by rotating the motor fan.
5. Disconnect the sensor (331-294-99) by holding it in place with a 7/8” wrench and unscrewing the swivel connector (100-003) with an 11/16” wrench.
   **DO NOT TURN THE SENSOR.**
6. Remove the retaining ring (331-062) from the connecting rod (331-038) and slide the sleeve (331-117) down revealing the connecting rod pin (331-065).
7. Remove the suction tube assembly from the fluid pump by unscrewing the suction nut (331-034) with the packing adjustment tool.
8. Using a 1/2” wrench unscrew the two bolts (100-318) from the cover assembly 331-234). The fluid pump (331-209) will be hanging loosely at this point.
9. Remove the connecting rod pin (331-065) out of the connecting rod (331-038), allowing the removal of the fluid pump (331-209) from the machine.

**Fluid Pump Reinstallation - Refer to Figure 11 & 14**

1. Loosen the packing nut and ensure that the piston rod (331-093) is in its upper position in the fluid pump body. Slip the sleeve (331-117) & the retaining ring (331-062) over the piston rod.
2. Push the piston rod up into the connecting rod (331-038) & align the holes. Insert the connecting rod pin (331-065) through the connecting rod & piston. Slip the sleeve over the connecting rod pin and insert the retaining ring into the groove on the connecting rod.
3. Push the two bolts (100-318) through the tube spacers (331-074) & screw them into the cover assembly (331-234). Using a 1/2” wrench, tighten the two bolts evenly (alternating between them) until you reach 20 ft-lbs.
4. Reassemble the lower suction valve assembly by placing the suction seat assembly: O-ring (106-011), suction ball (331-030) and suction ball guide (331-029) in the suction nut (331-034) and screw onto the fluid pump body.
5. Reconnect the sensor (331-294-99) to the fluid pump body. Hold the sensor with a 7/8” wrench while tightening the swivel connector (100-003) with an 11/16” wrench.
   **DO NOT TURN THE SENSOR.**
6. Start the machine and operate slowly to check the piston rod for binding. Adjust the two bolts, holding the fluid pump body to the cover assembly, if necessary. This will eliminate any binding.
7. Tighten the packing nut counter clockwise until resistance is felt against the Belleville Springs, then go 3/4 of a turn more. Put five drops of Airlessco Throat Seal Oil into the packing nut.
8. Run the machine at full pressure for several minutes. Release the pressure by following the Pressure Relief Procedure & readjust the packing nut per step 7 above.
9. Install the connecting rod shield (331-111) so that the small hole is in the upper right hand corner.
GEAR AND PUMP ASSEMBLY

WARNING
- Do not operate machine without cover guard in place.

Servicing Gear Box Assembly
1. Remove fluid pump as per "Fluid Pump Disconnect" procedures.
2. Remove frame from the gearbox by loosening the four mounting screws.
3. Refer to Figure 12. Separate cover assembly from box by removing bolts from front of cover & back of box & shoulder bolts from front of cover & back of box.
4. Lay unit on its back and disassemble gearbox.
5. Inspect bearings, Crosshead Assembly, Gearcrank & sleeve bearing inside cover assembly for wear/damage. Replace worn/damaged parts.
6. If gear grease needs replacing, replace with gear grease (Part No. 331-132).
7. Clean mating surfaces of cover and box thoroughly. Use Part No. 105-331 BLUE XST™ ADVANCED RTV SILICONE INSTANT GASKET.
8. Reassemble in reverse order.

Part Number | Description
--- | ---
100-318 | Bolt (2)
100-380 | Shoulder Bolt (2)
100-381 | Bolt (2)
115-019 | Hose Connector (1/4 NPSXNPT)
331-038 | Crosshead Assembly
331-040 | Gearbox Casting *
331-046 | Bearing
331-047 | Bearing
331-061 | Sleeve Bearing
331-062 | Retaining Spring
331-065 | Pin
331-074 | Tube Spacer (2)
331-088 | Retaining Ring
331-111 | Cover Guard
331-117 | Sleeve
331-209 | Pump Ass’y - Carry/LoBoy
331-234 | Cover
331-236 | Pump Ass’y - HiBoy
331-406 | Gear Crank (4 Series)
331-407 | Gear Crank (5 Series)
331-408 | Gear Crank (6 Series)

*NOTE: Can be ordered separately, but is included with Motor Ass’y (Part No. 331-490, 331-068)

GEARBOX SLEEVE BEARING REPLACEMENT

NOTE: When replacing item (1), cover outside of sleeve with clear silicone prior to inserting into cover assembly.

FIGURE 10 PARTS LIST

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>331-061</td>
<td>Sleeve Bearing</td>
</tr>
<tr>
<td>2</td>
<td>331-103</td>
<td>Washers (2)</td>
</tr>
<tr>
<td>3</td>
<td>331-197</td>
<td>Screws (2)</td>
</tr>
</tbody>
</table>
Servicing the Piston Rod - Outlet Valve

DISASSEMBLY OF THE OUTLET VALVE

REFER TO FIGURE 13
1. Disconnect the Fluid Pump.
2. Place piston holder (331-195) in a vise. Slide piston into the holder & lock in place with a 3/8” dowel (331-196).
3. Use a 1/4” allen wrench to unscrew the outlet seat retainer (331-314) from the piston.
4. Remove the outlet seat (331-026), O-ring (331-100) and outlet ball (331-027).
5. Inspect outlet ball & seat for wear. Replace as necessary.
6. While piston is still locked in the holder, install parts back into the piston in the following order:
   - ball, outlet seat and O-ring

Before reinstalling the outlet seat retainer, apply two drops of Loctite No. 242 (blue) on the threads & torque to 20 ft-lbs.

* Available in LP tool kit PN 188-397

Servicing the Suction Assembly

Refer to Figure 14
1. Unthread and remove suction nut from the fluid pump body.
2. Remove suction seat (331-409), O-ring (106-011), suction ball (331-030) and suction retainer (331-029).
3. Clean all parts and inspect them for wear or damage, replacing parts as needed.
4. Clean inside of the fluid pump body.
5. Reassemble lower suction valve assembly by placing the suction seat (331-409), O-ring (106-011), suction ball (331-030) & suction ball guide (331-029) in the suction nut (331-034) & screw onto fluid pump body.
**Packing Replacement Procedures**

### Replacement Instructions:

#### Fluid Pump Removal - Refer to Figure 11
1. Follow the Pressure Relief Procedure above.
2. Flush material you are spraying out of the machine.
3. Remove the connecting rod shield (331-111).
4. Move the piston rod (331-093) to its lowest position by cycling pump slowly or by rotating the motor fan.
5. Disconnect the sensor (331-294-99) by holding it in place with a 7/8” wrench & unscrewing the swivel connector (100-003) with an 11/16” wrench.

**DO NOT TURN THE SENSOR.**

6. Remove the retaining ring (331-062) from the connecting rod (331-038) and slide the sleeve (331-117) down revealing the rod pin (331-065).
7. Remove the suction tube assembly from the fluid pump (331-708) by unscrewing the suction nut (331-034) with the packing adjustment tool.
8. Using a 1/2” wrench unscrew the two bolts (100-318) from the cover assembly 331-234). The fluid pump (331-209) will be hanging loosely at this point.
9. Remove the connecting rod pin (331-065) out of the connecting rod (331-038), allowing the removal of the fluid pump (331-209) from the machine.

#### Disassembly of the Fluid Pump - Figure 15

1. Unscrew & remove the packing nut (331-037).
2. Push the piston rod (331-708) down through the packings & out of the pump.
3. Now push the packing removal tool (187-249) up through the pump & remove from the top bringing packings, spacer & springs along with it, leaving fluid body (331-011) empty.

*Make sure all old packings & glands have been removed from fluid pump.

5. Disassemble all parts & clean for reassembly. Discard any old packings.
6. Lubricate leather packing in lightweight oil for 10 minutes prior to reassembly.

#### Disassembly of the Outlet Valve - Figure 13

1. Place piston holder (331-195) in a vise. Slide piston into the holder & lock in place with a 3/8” dowel.
2. Use a 1/4” allen wrench to unscrew the outlet seat retainer (331-026) from the piston.
3. Remove the outlet seat (331-026), O-ring (331-100) and outlet ball (331-027).
4. Inspect outlet ball & seat for wear. Replace as necessary.
5. While piston is still locked in the holder, install parts back into the piston in the following order:
   - **ball, outlet seat and O-ring**

Before reinstalling the outlet seat support, apply two drops of Loctite No. 242 (blue) on the threads & torque to 20 ft-lbs.

#### Fluid Pump Reinstallation - Figure 11 & 14

1. Take lower male gland (331-014) & place it down on the flat side.
2. Take three of the lower polyethylene packings (331-016) & two of the leather packings (331-306) & place onto the male gland in the following order with the inverted side down:
   - polyethylene, leather, polyethylene, leather, polyethylene.
3. Take the female adaptor (331-305), which is inverted on both sides, & place it on top of your assembled lower packings.
4. Follow step 2 above with your packings inverted side up.
5. Take the second lower male gland and place it on top of your assembled packings with the rounded side down.
6. Take assembled glands & packings (13 pieces) & slide on to the lower half of the piston.
7. Take the spacer (331-018) & slide over the top of the piston (it doesn’t matter which direction it sits), falling onto lower packings.
8. Take three Belleville Springs (331-025) & slide over the top of the piston in the following order:
   - First spring, curve facing down
   - Second spring, curve facing up
   - Third spring, curve facing down
9. Take the upper male gland (331-022) & place it rounded side up.
10. Take three upper polyethylene packings (331-023) & two leather packings (331-307) & assemble with inverted side down, on to the male gland in the following order:
    - polyethylene, leather, polyethylene, leather, polyethylene.
11. Take upper female gland (331-021) & place on top of the assembled upper packings with the inverted side down.
12. Take assembled upper glands & packings (7 pieces) & slide on to the over the top of the piston, making sure inverted sides are down.
13. Take the packing holder (331-019) & replace the white O-ring (106-009) & the black O-ring (106-010) with new ones from the packing kit.
14. Slide the packing holder over the top of the upper packings so they fit inside.
15. Lubricate inside of the fluid pump body & the outside of the packings with a light weight oil.
17. Tighten packing nut (331-037) onto the top of the fluid pump body & tighten until you feel slight resistance against the Belleville Springs (331-025). Using the Packing Adjustment Tool (189-211), tighten another 3/4 of a turn.

*To keep packings secured in correct position, hold the pump body upside down & push the completed assembly upwards into the pump body. Once placed inside, tilt pump body back up to keep all pieces in.*

18. Loosen packing nut & ensure that the piston rod (331-093) is in its upper position in the fluid pump body (331-209). Slip the sleeve (331-117) & the retaining ring (331-062) over the piston rod.
19. Push piston rod up into the connecting rod (331-038) & align the holes. Insert the connecting rod pin (331-065) through the connecting rod & piston. Slip the sleeve up over the connecting rod pin & insert retaining ring into the groove on the connecting rod.
3. Push the two bolts (100-318) through the tube spacers (331-074) & screw into the cover assembly (331-234). Using a 1/2” wrench, tighten the two bolts evenly (alternating between them) until you reach 20 ft-lbs.

4. Reassemble lower suction valve assembly by placing the suction seat (331-409) O-ring (106-011), suction ball (331-030) and suction ball guide (331-029) in the suction nut (331-034) & screw onto the fluid pump body.

5. Reconnect the sensor (331-294-99) to the fluid pump body. Hold sensor with a 7/8” wrench while tightening the swivel connector (100-003) with an 11/16” wrench. **DO NOT TURN THE SENSOR.**

6. Start the machine & operate slowly to check the piston rod for binding. Adjust the bolts, holding the fluid pump body to the cover assembly, if necessary. This will eliminate any binding.

7. Tighten packing nut counter clockwise until resistance is felt against the Belleville Springs, then go 3/4 of a turn more. Put five drops of Airlessco Throat Seal Oil into the packing nut.

8. Run the machine at full pressure for several minutes. Release the pressure by following the Pressure Relief Procedure & readjust the packing nut per step 7 above.

9. Install the connecting rod shield (331-111) so that the small hole is in the upper right hand corner.

**FIGURE 15**

* Included in Packing Kit
PN #331-210
† Included in Piston Replacement
PN #331-093

**FIGURE 16**
### Part Number | Description
--- | ---
100-003 | Swivel
100-180 | Prime P/R Valve
100-312 | Screw (4)
100-318 | Bolt (2)
106-500 | Sensor Seal
111-037 | Heatsink Screw (4)
115-019 | Hose Connector (1/4 NPSXNPT)
117-044 | Knob
117-090 | Fan Cover Screws (3)
119-048 | Screw (4)
301-191 | Fan Retaining Clip
301-405 | Blank Plate for LCD Panel
331-048 | Rubber Boot (2)
331-068 | .8 HPDC Motor (5/6 Series)
331-074 | Tube Spacer (2)

### Part Number | Description
--- | ---
331-111 | Shield
331-143 | Frame
331-212 | Fan
331-213 | Fan Cover
331-215 | Screw (LP 5/6 Only)
331-234 | Cover
331-248 | Cover (690 Models)
331-294-99 | Sensor
331-315-99 | Press. Ass’y
331-490 | .6 Airlessco DC Motor (4 Series)
331-321 | Terminal Box
331-337 | Rubber Edge (2) (690 Only)
331-398 | Brush Spring (2) (5/6 Series)
331-131 | Motor Brush (2) (5/6 Series)
331-778 | Motor Brush (2) (4 Series)
### LO-BOY MODELS

#### FIGURE 18

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-003</td>
<td>Swivel</td>
</tr>
<tr>
<td>331-476</td>
<td>Cup Assembly</td>
</tr>
<tr>
<td>100-180</td>
<td>Prime Valve</td>
</tr>
<tr>
<td>100-318</td>
<td>Bolts (2)</td>
</tr>
<tr>
<td>100-377</td>
<td>Screw (4)</td>
</tr>
<tr>
<td>106-500</td>
<td>Sensor Seal</td>
</tr>
<tr>
<td>111-037</td>
<td>Heatsink Screws (4)</td>
</tr>
<tr>
<td>113-019</td>
<td>Wheel 10” (2)</td>
</tr>
<tr>
<td>113-030</td>
<td>Spacer (2)</td>
</tr>
<tr>
<td>115-019</td>
<td>Hose Connector (1/4” NPSXNPT)</td>
</tr>
<tr>
<td>117-044</td>
<td>Knob</td>
</tr>
<tr>
<td>117-090</td>
<td>Fan Cover Screws (3)</td>
</tr>
<tr>
<td>117-129</td>
<td>Screw (2)</td>
</tr>
<tr>
<td>119-032</td>
<td>Screw (2)</td>
</tr>
<tr>
<td>119-033</td>
<td>Nut (2)</td>
</tr>
<tr>
<td>143-029</td>
<td>Collar (2)</td>
</tr>
<tr>
<td>301-191</td>
<td>Fan Retaining Clip</td>
</tr>
<tr>
<td>331-048</td>
<td>Rubber Boot (2)</td>
</tr>
<tr>
<td>331-068</td>
<td>.8 HP DC Motor 110V (5/6 Series)</td>
</tr>
<tr>
<td>331-069</td>
<td>.75 HP DC Motor 230V (5/6 Series)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>331-074</td>
<td>Tube Spacer (2)</td>
</tr>
<tr>
<td>331-111</td>
<td>Shield</td>
</tr>
<tr>
<td>331-171</td>
<td>Frame</td>
</tr>
<tr>
<td>331-174</td>
<td>Handle</td>
</tr>
<tr>
<td>331-175</td>
<td>Spacer (2)</td>
</tr>
<tr>
<td>331-176</td>
<td>Bushing (2)</td>
</tr>
<tr>
<td>331-212</td>
<td>Fan</td>
</tr>
<tr>
<td>331-213</td>
<td>Fan Cover</td>
</tr>
<tr>
<td>331-215</td>
<td>Bolt (5/6 Series)</td>
</tr>
<tr>
<td>331-222</td>
<td>Pin (2)</td>
</tr>
<tr>
<td>331-234</td>
<td>Cover</td>
</tr>
<tr>
<td>331-248</td>
<td>Motor Cover (690 Only)</td>
</tr>
<tr>
<td>331-294-99</td>
<td>Sensor</td>
</tr>
<tr>
<td>331-315-99</td>
<td>Pressure Ass’y 110V</td>
</tr>
<tr>
<td>331-490</td>
<td>.6 Airlessco DC Motor (4 Series)</td>
</tr>
<tr>
<td>331-321</td>
<td>Terminal Box</td>
</tr>
<tr>
<td>331-337</td>
<td>Rubber Edge (2) (690 Only)</td>
</tr>
<tr>
<td>331-396-99</td>
<td>Pressure Ass’y 230V</td>
</tr>
<tr>
<td>301-405</td>
<td>Blanking Plate, LCD Panel</td>
</tr>
<tr>
<td>331-477</td>
<td>Cup Support</td>
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## HI-BOY MODELS

### FIGURE 19

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>100-003</td>
<td>Swivel</td>
<td>331-069</td>
<td>.75 HP DC Motor 230V (5/6 Series)</td>
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<tr>
<td>100-180</td>
<td>Prime Valve</td>
<td>331-074</td>
<td>Tube Spacer (2)</td>
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<tr>
<td>100-318</td>
<td>Bolt (2)</td>
<td>331-111</td>
<td>Shield</td>
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<tr>
<td>100-390</td>
<td>Screw (2)</td>
<td>331-212</td>
<td>Fan</td>
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<tr>
<td>106-500</td>
<td>Sensor Seal</td>
<td>331-213</td>
<td>Fan Cover</td>
</tr>
<tr>
<td>111-037</td>
<td>Heatsink Screws</td>
<td>331-215</td>
<td>Bolt (5/6 Series)</td>
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<tr>
<td>113-019</td>
<td>Wheel 10” (2)</td>
<td>331-234</td>
<td>Cover</td>
</tr>
<tr>
<td>113-031</td>
<td>Spacer (2)</td>
<td>331-248</td>
<td>Motor Cover (690 Only)</td>
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<tr>
<td>117-044</td>
<td>Knob</td>
<td>331-273</td>
<td>Frame</td>
</tr>
<tr>
<td>117-090</td>
<td>Fan Cover Screw (3)</td>
<td>331-294-99</td>
<td>Sensor</td>
</tr>
<tr>
<td>119-048</td>
<td>Screw (4)</td>
<td>331-315-99</td>
<td>Pressure Ass’y 110V</td>
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<tr>
<td>143-029</td>
<td>Collar (2)</td>
<td>331-490</td>
<td>.6 Airlessco DC Motor (4 Series)</td>
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<tr>
<td>115-019</td>
<td>Hose Connector (1/4” NPSXNPT)</td>
<td>331-321</td>
<td>Terminal Box</td>
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<tr>
<td>301-191</td>
<td>Fan Retaining Clip</td>
<td>331-336</td>
<td>Pail Hook</td>
</tr>
<tr>
<td>301-405</td>
<td>Cover Plate for LCD Opening</td>
<td>331-337</td>
<td>Rubber Edge (690 Only)</td>
</tr>
<tr>
<td>331-048</td>
<td>Rubber Boot</td>
<td>331-396-99</td>
<td>Pressure Ass’y 230V</td>
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<td>331-068</td>
<td>.8 HP DC Motor 110V (5/6 Series)</td>
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SUCTION ASSEMBLIES

FIGURE 20 - LoBoy & Carry Frames

FIGURE 21 - HiBoy Frame

PN 331-238 (Lo-Boy & Carry Chassis)

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>PART #</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>331-217</td>
<td>Inlet Strainer</td>
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<tr>
<td>2</td>
<td>331-135</td>
<td>Spring Clip</td>
</tr>
<tr>
<td>3</td>
<td>331-290</td>
<td>Suction Hose Ass’y (inc. strainer)</td>
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<tr>
<td>4</td>
<td>331-425</td>
<td>Bypass Hose</td>
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<tr>
<td>5</td>
<td>111-016</td>
<td>Nylon Tie</td>
</tr>
<tr>
<td>6</td>
<td>331-231</td>
<td>Bypass Hose Ass’y</td>
</tr>
<tr>
<td>7</td>
<td>331-090R</td>
<td>Fitting</td>
</tr>
<tr>
<td>8</td>
<td>331-035</td>
<td>Suction Elbow</td>
</tr>
<tr>
<td>9</td>
<td>331-034</td>
<td>Suction Nut</td>
</tr>
<tr>
<td>10</td>
<td>106-020</td>
<td>O-Ring PTFE</td>
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PN 331-284 (Hi-Boy Chassis)

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>PART #</th>
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<tbody>
<tr>
<td>1</td>
<td>331-034</td>
<td>Suction Nut</td>
</tr>
<tr>
<td>2</td>
<td>331-292</td>
<td>Suction Seat Ass’y</td>
</tr>
<tr>
<td>3</td>
<td>301-348</td>
<td>Bypass Hose</td>
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<tr>
<td>4</td>
<td>116-103</td>
<td>Spring Clip</td>
</tr>
<tr>
<td>5</td>
<td>331-400</td>
<td>Inlet Tube</td>
</tr>
<tr>
<td>6</td>
<td>141-008</td>
<td>Inlet Strainer</td>
</tr>
<tr>
<td>7</td>
<td>331-090R</td>
<td>Fitting</td>
</tr>
</tbody>
</table>
Note: Anytime a sensor, pressure control assembly (board) or both are replaced, the following calibrations must be performed.

1. **ZERO CALIBRATION**

1. Place prime/pressure relief valve in the prime (open) position.
2. Set the pressure control knob to the minimum setting (CCW).
3. Remove the screws and lower the pressure control assembly.
4. Ensure the jumper is on the "P-ZR" terminal. **Note:** This jumper comes with a new pressure control assembly (board) and is installed on the "P-ZR" terminals. If you are "Zero Calibrating" a pressure control assembly presently in the unit, remove jumper from single terminal P-ZR and place on both terminals P-ZR. When Zero Calibration is complete, replace jumper on a single terminal of P-ZR.
5. Turn machine "ON" and ensure it is not cycling.
6. If the yellow zero light on the electrical board is ON, use an insulated screwdriver to turn the "ZERO" trimpot counter-clockwise until the light goes out. Then turn it clockwise until the light just comes back on. If so equipped, look at the LCD Display and if "0000" is showing the zero calibration is complete. If the display shows more than "0000", turn the zero trimpot CCW until "0000" is showing. If "-- -- --" is showing, turn the zero trimpot CW until "0000" is displayed.
7. If the yellow light is OFF, turn the "Zero" trimpot clockwise, just until the light comes on and stop. Confirm "0000" is displayed.

   **NOTE:** If the yellow light remains constantly "ON", or "OFF" during this calibration, the sensor is defective and should be replaced.

8. IMPORTANT: When calibration is complete, move jumper from both "PZ-R" terminals to single terminal on P-ZR.

2. **PRESSURE CALIBRATION**

1. Complete the ZERO calibration, as per "ZERO CALIBRATION" prior to commencing this calibration.
2. Attach a 50', 1/4" airless hose, airless gun with 0.017 tip and a 5000 psi glycerin filled pressure gauge to the pump.
3. Place the suction tube into a bucket of Coro-check and water.
4. Turn prime/pressure relief valve to the prime (open) position.
5. Turn pressure control knob clockwise until machine starts to prime.
6. Place the prime/pressure relief valve in the pressure (closed) position.
7. While watching pressure gauge, slowly adjust the pressure trimpot (clockwise to increase and counterclockwise to decrease) until the maximum static pressure is 3000 psi, with the pressure control knob fully clockwise. Trigger the gun several times to ensure pressure returns to 3000 psi.

3. **LIQUID CRYSTAL DISPLAY (LCD) CALIBRATION**  (If so equipped)

1. Complete the "ZERO CALIBRATION" and "PRESSURE CALIBRATION" procedures prior to commencing this calibration.
2. Turn pressure control knob up until system pressure is above 2500 psi (as indicated on glycerin filled pressure gauge) and the machine is not cycling.
3. Use an insulated screwdriver to adjust the Set trimpot. Turn trimpot CCW until it clicks, then adjust to match pressure against pressure gauge reading.
4. Move the pressure control knob to different settings and trigger the gun several times to ensure that the LCD continues to match the pressure gauge reading.
4. PHASE LIMIT TRIMPOT CALIBRATION

Formerly known as the Low Voltage or Master Voltage Calibration

1. Attach a 50', 1/4" airless hose, airless gun with .017 tip and a 5000 psi glycerin filled pressure gauge to the pump.
2. Place the suction tube into a bucket of Pump Conditioner and water.
3. Turn pump ON and turn up pressure control until the machine starts to prime.
4. Place the prime/pressure relief valve in the pressure (closed) position.
5. Pressurize pump to 600 psi.
6. Trigger the gun several times noting the deadband (the amount of pressure drop before the pump rebuilds to set pressure).
7. If deadband is greater than 100 psi, adjust the low pressure voltage trimpot so that the deadband is less than 100 psi and the pressure increase after the gun trigger is released is less than 200 psi. These pressures are guidelines and may vary slightly from pump to pump.
8. Reattach Pressure Control Assembly being careful not to pinch wires.

Note: The 331-315-99 pressure control assembly has a reddish brown terminal labelled "Inhibit Switch". At all times there should be a jumper on the two left terminals, which are the closest to the "S2" connection. Also on the Revision E is a terminal labelled "ON-SL". This terminal should never have a jumper on it.
<table>
<thead>
<tr>
<th><strong>TROUBLESHOOTING - Machine does not start</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAUSE</strong></td>
</tr>
<tr>
<td>Control Settings</td>
</tr>
<tr>
<td>Fuse</td>
</tr>
<tr>
<td><strong>STEP 3:</strong> Using a Phillips Head screwdriver, remove the four screws holding the pressure control assembly. Locate the light on the board indicating there is power (it will be red or green). If light is OFF proceed to step four. If light is ON go to step six.</td>
</tr>
<tr>
<td>Power Source</td>
</tr>
<tr>
<td>Thermal Overload</td>
</tr>
<tr>
<td>Pressure Control Assembly (Board)</td>
</tr>
<tr>
<td>Motor</td>
</tr>
<tr>
<td>Sensor</td>
</tr>
<tr>
<td>Pressure Control Knob (Potentiometer)</td>
</tr>
<tr>
<td>Pressure Control Assembly (Board)</td>
</tr>
<tr>
<td>Part Number</td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>117-044</td>
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<td>117-207</td>
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</tr>
<tr>
<td>331-256</td>
</tr>
<tr>
<td>331-377</td>
</tr>
</tbody>
</table>
PRESSURE CONTROL ASSEMBLY (Electrical Control Board)
1. Unplug machine's power cord.
2. Remove four screws from heatsink housing.
3. Disconnect all leads from pressure control assembly.
4. Reassemble in reverse order.

SENSOR
1. Remove the 4 screws heat sink and lower the pressure control assembly.
2. Disconnect swivel from sensor by holding sensor with 7/8” wrench and loosening swivel with 11/16” wrench.
3. Disconnect sensor lead from the board. Carefully pull sensor lead out of the terminal box and remove sensor.
4. Reassemble in reverse order.

POTENTIOMETER
1. Lower pressure control assembly as described above.
2. Disconnect potentiometer lead from pressure control assembly.
3. Use a 1/16” allen wrench, loosen set screw in the potentiometer knob (Fig. 22,) and remove knob and spacer.
4. Using a 1/2” wrench or deep socket, remove the nut from the potentiometer shaft assembly.
5. Pull entire potentiometer assembly out of terminal box.
6. Replace in reverse order.

LIQUID CRYSTAL DISPLAY (LCD)
1. Lower pressure control assembly as described above.
2. Unscrew the four nuts (6/32”) (Fig. 23, Item 5) and remove LCD Display assembly (Fig. 23, Item 6).
3. If unable to loosen the four nuts, hold them and unscrew the four screws (Fig. 23, Item 1). Then remove the LCD Display Assembly. If the display is removed in this manner, the mylar label (Fig. 23, Item 2) must be replaced.
4. Reassemble in reverse order, while making sure that the four spacers (Fig. 23, Item 4) and the four washers (Fig. 23, Item 7) are in place.
   Tighten the four nuts handtight and seal with blue loctite.
   DO NOT overtighten the nuts as this will damage the display.

ON-OFF TOGGLE SWITCH
1. Lower the pressure control assembly as described above.
2. Disconnect the two wires on the switch.
3. Use a 9/16” wrench to loosen the nut on the toggle switch shaft.
4. Reassemble in reverse order.

FUSE HOLDER
1. Lower pressure control assembly as described above.
2. Disconnect the two wires on the holder.
3. Remove holder cover and fuse.
4. Use 11/16” wrench to remove the nut from the holder shaft.
5. Reassemble in reverse order.
**OPERATION**

**Prime Pressure Relief Valve**

(Prime-PR Valve)

Used to relieve pressure from gun, hose & tip and to prime the unit when in OPEN position. (It is in open position when there is a wider gap between handle and body).

When in the CLOSED position, there is only a very slight gap between handle & body. When the relieving valve is closed the system is pressurized. **Handle as a loaded firearm!**

---

**STEP 1**

1A. Read safety rules! Read & understand all warnings & safety rules before operating equipment. Know how to lock the gun trigger safety lock before operating the equipment.

1B. Stir paint and if necessary strain paint using a paint strainer bag to remove lumps.

---

**STEP 2**

2A. Check gun/hose connections to make sure they are tight.

2B. Lock gun trigger safety lock (Airlessco gun shown)

   Note: Plug into 3 pronged grounded electrical outlet. Extension cord must be 3 wire, 12 gauge. Do not coil cord.

---

**STEP 3**

3A. Put pump suction tube into bucket of paint.

3B. Turn the Prime-Pressure Relief Valve to open position (wide gap between handle & body).

   Turn toggle switch ON, and adjust to low pressure on the pressure control knob. The unit will now self-prime.

---

**STEP 4**

4A. Wait about one minute until fluid comes out of the return tube (smaller diameter tube).

4B. Turn the Prime-Pressure Relief Valve to closed position (slight gap between handle and body)

   CAUTION: THE UNIT IS NOW PRESSURIZED.

---

**STEP 5**

Note: Leave the Prime-Pressure Relief Valve fully closed and very carefully unlock the guns trigger safety lock.

5A. Aim the gun 12” from test surface cardboard and spray out the storage solution. Turn the pressure control knob clockwise to increase pressure. Increase the pressure enough to atomize the paint & give a full pattern. Use the lowest pressure possible.

5B. Always keep the gun perpendicular to the surface. Move the gun at a steady rate. It is important to “trigger” the gun after gun movement has begun and release trigger before gun movement ends.

5C. Overlap half the width of each paint stroke.

---

**STEP 6**

6A. Release pressure when you stop spraying & before servicing gun or machine or before changing or cleaning gun tip by:

   1. Lock the gun trigger safety.

   2. Turn toggle switch to OFF position and unplug from electrical outlet.

   3. Release gun safety lock and trigger gun to relieve residual pressure.

   4. Turn Prime/PR Valve to open position.

   5. Relock gun safety latch.

6B. Submerge gun in water (if using latex) or thinner (oil-base) to prevent paint from drying in the gun nozzle.

---

**CLEANING**

**Pressure Control Knob**

Used to adjust pressure only. DOES NOT relieve pressure from gun and system! Turn clockwise to increase pressure, counterclockwise to decrease pressure.

**ON/OFF Toggle Switch**

Turns the unit ON and OFF.

---

**CLEANING**

Always use low pressure in the cleaning process.

- **Tools & Equipment Needed:**
  1. Soft bristle brush, clean-up rags.
  2. 8” crescent wrench for removing gun tip & filter in gun handle.
  3. Prepared 5 gal. bucket of soapy water if using latex, or mineral spirits if using oil-based. (Second bucket will usually be required).
  4. Empty bucket for wastes.
  5. Storage solution of Pump Conditioner mixed with 1 gal. of water if using latex or compatible paint thinner if using oil-based paint.

---

**CLEANING**

**STEP 1**

1A. IMPORTANT: Relieve pressure by following the Pressure Relief Procedure, Step 6 of Operation, and be sure gun safety lock (latch) is in locked position.

1B. Remove tip and tip guard from spray gun and place in mineral spirits or water.

---

**CLEANING**

**STEP 2**

Note: Release the gun trigger lock very carefully.

2A. Turn the Prime/PR Valve to the closed position. Adjust the pressure control knob for minimum pressure. **IMPORTANT: Never use high pressure for cleaning!**

2B. Trigger gun into paint bucket to allow paint to run out of hose and gun.

2C. Place suction tube into prepared bucket of water or mineral spirits.

---

**CLEANING**

**STEP 3**

3A. Turn the Prime/PR Valve to the closed position for storage.

3B. Leave bucket will usually be required).

3C. Trigger gun using VERY LOW PRESSURE & maintaining firm metal to metal contact for 3-4 minutes until it runs clean. (Second bucket may be required).

---

**CLEANING**

**STEP 4**

4A. IMPORTANT: Follow Pressure Relief Procedure Step 6A of Operation!

4B. Remove filters from suction tube and gun handle. Clean with water or mineral spirits and soft brush and reassemble suction and gun filter only. **DO NOT reassemble gun tip and tip guard at this point.**

---

**CLEANING**

**STEP 5**

5A. Mix bottle of Pump Conditioner with 1 gal. of water or prepared mineral spirits and put suction tube into pail. Prime unit (Prime/PR Valve Open Position & Pressure Control Knob in low position) Trigger gun to fill the hose & gun. LEAVE this mixture in the pump & hose for storage. **DO NOT DISCHARGE.** Turn motor off while the suction tube remains in the bucket.

5B. Disconnect from power.

5C. Roll up hose and tape. Now reassemble gun with spray tip and tip guard. After you have disconnected sprayer from electrical power, turn Prime/PR Valve to the closed position for storage.