INSTRUCTIONS-PARTS LIST

This manual contains **IMPORTANT WARNINGS and INFORMATION**
READ AND RETAIN FOR REFERENCE

307–823

Rev D

Supersedes Rev B and PCN C

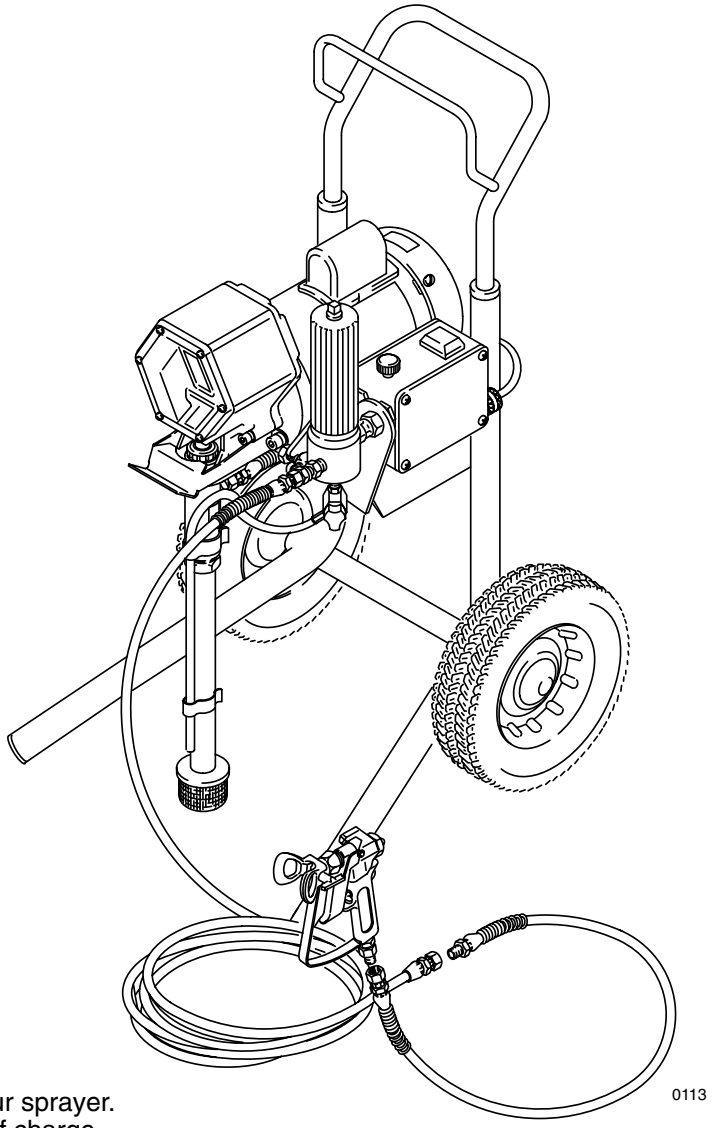
50 HZ, 220/110 V AC

EM 490®

PAINT SPRAYER

192 bar (2750 psi) MAXIMUM WORKING PRESSURE

Model 220–834, Series D
Includes hoses,"Contractor" gun, RACI IV® DripLess™ Tip Guard, 517 size SwitchTip



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CONTENTS

NOTE: This is an example of the DANGER label on your sprayer. This label is available in other languages, free of charge. See page 27 to order.

⚠ DANGER ⚠

FIRE AND EXPLOSION HAZARD	SKIN INJECTION HAZARD
Spray painting, flushing or cleaning equipment with flammable liquids in confined areas can result in fire or explosion.	**Liquids can be injected into the body by high pressure airless spray or leaks – especially hose leaks.**
Use outdoors or in extremely well ventilated areas. Ground equipment, hoses, containers and objects being sprayed.	**Keep body clear of the nozzle. Never stop leaks with any part of the body. Drain all pressure before removing parts.Avoid accidental triggering of gun by always setting safety latch when not spraying.**
Avoid all ignition sources such as static electricity from plastic drop cloths, open flames such as pilot lights, hot objects such as cigarettes, arcs from connecting or disconnecting power cords or turning light switches on and off.	**Never spray without a tip guard.**
Failure to follow this warning can result in death or serious injury.	**In case of accidental skin injection, seek immediate "Surgical Treatment".**
	Failure to follow this warning can result in amputation or serious injury.

READ AND UNDERSTAND ALL LABELS AND INSTRUCTION MANUALS BEFORE USE

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441

WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY.
FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.
Read and understand all instruction manuals before operating the equipment.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the gun, leaks or ruptured components can inject fluid through your skin and into your body, and cause extremely serious bodily injury, including the need for amputation. Also, fluid injected or splashed into the eyes or on the skin can cause serious damage.

NEVER point the spray gun at any one or at any part of the body. NEVER put your hand or fingers over the spray tip. NEVER try to "blow back" paint; this is NOT an air spray system.

ALWAYS have the tip guard in place on the spray gun when spraying.

ALWAYS follow the **PRESSURE RELIEF PROCEDURE**, below, before cleaning or removing the spray tip or servicing any system equipment.

NEVER try to stop or deflect leaks with your hand or body.

Be sure equipment safety devices are operating properly before each use.

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*.

Spray Gun Safety Devices

Be sure all gun safety devices are operating properly before each use. Do not remove or modify any part of the gun; this can cause a malfunction and result in serious bodily injury.

Safety Latch

Whenever you stop spraying, even for a moment, always set the gun safety latch in the closed or "safe" position, making the gun inoperative. Failure to set the safety latch can result in accidental triggering of the gun.

Diffuser

The gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check dif fuser operation regularly. Follow the **PRESSURE RELIEF PROCEDURE**, below, then remove the spray tip. Aim the gun into a metal pail, holding the gun firmly to the pail. Using the lowest possible pressure, trigger the gun. If the fluid emitted *is not* diffused into an irregular stream, replace the diffuser immediately.

Tip Guard

ALWAYS have the tip guard in place on the spray gun while spraying. The tip guard alerts you to the fluid injection hazard and helps reduce, but does not prevent, the risk of accidentally placing your fingers or any part of your body close to the spray tip.

Trigger Guard

Always have the trigger guard in place on the gun when spraying to reduce the risk of accidentally triggering the gun if it is dropped or bumped.

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,** below, and then remove the spray tip to clean it.

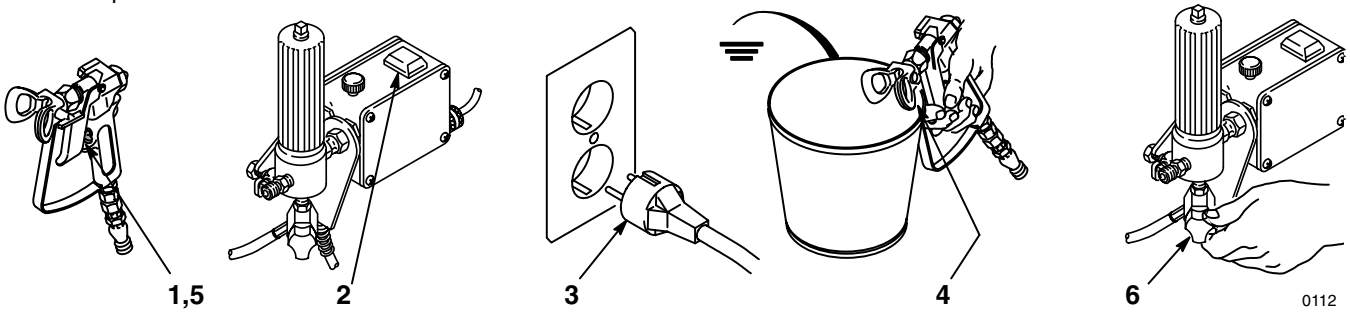
NEVER wipe off build–up around the spray tip until the pressure is fully relieved and the gun safety is engaged.

PRESSURE RELIEF PROCEDURE

To reduce the risk of serious bodily injury, including fluid injection, splashing fluid or solvent in the eyes or on the skin, or injury from moving parts or electric shock, always follow this procedure whenever you shut off the sprayer, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the gun safety latch.
2. Turn the ON/OFF switch to OFF.
3. Unplug the power supply cord.
4. Disengage the gun safety latch. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
5. Engage the gun safety latch.
6. Open the pressure drain valve, having a container ready to catch the drainage, if a drain tube is not used. Leave the valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, wrap a rag around the tip guard retaining nut or hose end coupling and VERY SLOWLY loosen the part to relieve pressure gradually, then loosen completely. Now clear the tip or hose.



MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers or other body parts. KEEP CLEAR of moving parts when starting or operating the sprayer. Follow the **Pressure Relief Procedure** on page 2 before checking or servicing any part of the sprayer, to prevent it from starting accidentally.

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in fluid injection, splashing in the eyes or on the skin, or other serious bodily injury, or fire, explosion or property damage.

NEVER alter or modify any part of this equipment; doing so could cause it to malfunction.

CHECK all spray equipment regularly and repair or replace worn or damaged parts immediately.

Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

System Pressure

This sprayer can develop 192 bar (2750 psi) *MAXIMUM WORKING PRESSURE*. Be sure all spray equipment and accessories used are rated to withstand this pressure. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Fluid and Solvent Compatibility

All chemicals used in the sprayer must be chemically compatible with the wetted parts shown in the **TECHNICAL DATA** on page 28. Consult your chemical supplier to ensure compatibility.

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

HOSE SAFETY

High pressure fluid in the hoses can be very dangerous. If the hose develops a leak, split or rupture due to any kind of wear , damage or misuse, the high pressure spray emitted from it can cause a fluid injection injury or other serious bodily injury or property damage.

ALL FLUID HOSES MUST HAVE STRAIN RELIEFS ON BOTH ENDS! The strain reliefs help protect the hose from kinks or bends at or close to the coupling which can result in hose rupture.

TIGHTEN all 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.

NEVER use a damaged hose. Before each use, check the entire hose for cuts, leaks, abrasion, bulging cover , or damage or movement of the hose couplings. If any of these conditions exist, replace the hose immediately. DO NOT try to recouple high pressure hose or mend it with tape or any other device. A repaired hose cannot contain the high pressure fluid.

HANDLE AND ROUTE HOSES CAREFULL Y. Do not pull on hoses to move equipment. Keep hoses clear of moving parts and hot surfaces of the pump. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose. DO NOT expose Graco hoses to temperatures above 82° C (180° F) or below –40° C (–40° F).

Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray system. Check the electrical resistance of your fluid hoses at least once a week. If your hose does not have a tag on it which specifies the maximum electrical resistance, contact the hose supplier or manufacturer for the maximum resistance limits. Use a resistance meter in the appropriate range for your hose to check the resistance. If the resistance exceeds the recommended limits, replace it immediately. An ungrounded or poorly grounded hose can make your system hazardous. Also read **FIRE OR EXPLOSION HAZARD,** below**.**

FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the spray equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparking may also occur when plugging in or unplugging a power supply cord or using a gasoline engine. Sparks can ignite fumes from solvents and the fluid being sprayed, dust particles and other flammable substances, whether you are spraying indoors or outdoors, and can cause a fire or explosion and serious bodily injury and property damage. Always plug the sprayer into an outlet located at least 6 m (20 feet) away from the sprayer and the spray area. Do not plug in or unplug any power supply cords in the spray area when there is any chance of igniting fumes still in the air.

If you experience any static sparking or even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY**. Check the entire system for proper grounding. Do not use the system again until the problem has been identified and corrected.

Grounding

To reduce the risk of static sparking, ground the sprayer and all other spray equipment used or located in the spray area. CHECK your local electrical code for detailed grounding instructions for your area and type of equipment. BE SURE to ground all of this spray equipment:

1. *Sprayer:* plug the power supply cord, or extension cord – each equipped with an undamaged, grounded plug, into a properly grounded outlet. Do not use an adapter. All extension cords must have three wires and be rated for 15 Amps.
2. *Fluid hoses:* use only grounded hoses with a maximum of 150 m (500 feet) combined hose length to ensure grounding continuity. See **Hose Grounding Continuity** above.
3. *Spray gun:* obtain grounding through connection to a properly grounded fluid hose and sprayer.
4. *Object being sprayed:* according to local code.
5. *Fluid supply container:* according to local code.
6. *All solvent pails used when flushing,* according to local code. Use only metal pails, which are conductive. Do not place the pail on a non–conductive surface, such as paper or cardboard, which interrupts the grounding continuity.
7. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun firmly to the side of a grounded metal pail, then trigger the gun.

Flushing Safety

Reduce the risk of fluid injection injury, static sparking, or splashing by following the flushing procedure given on page 9 of this manual. Follow the **PRESSURE RELIEF PROCEDURE** on page 2, and remove the spray tip before flushing. Hold a metal part of the gun firmly to the side of a grounded metal pail and use the lowest possible fluid pressure during flushing.

IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards – particularly the General Standards, Part 1910, and the Construction Standards, Part 1926 – should be consulted.

TERMS

NOTE: Identifies additional procedures and information.

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.

EM 490 COMPONENTS

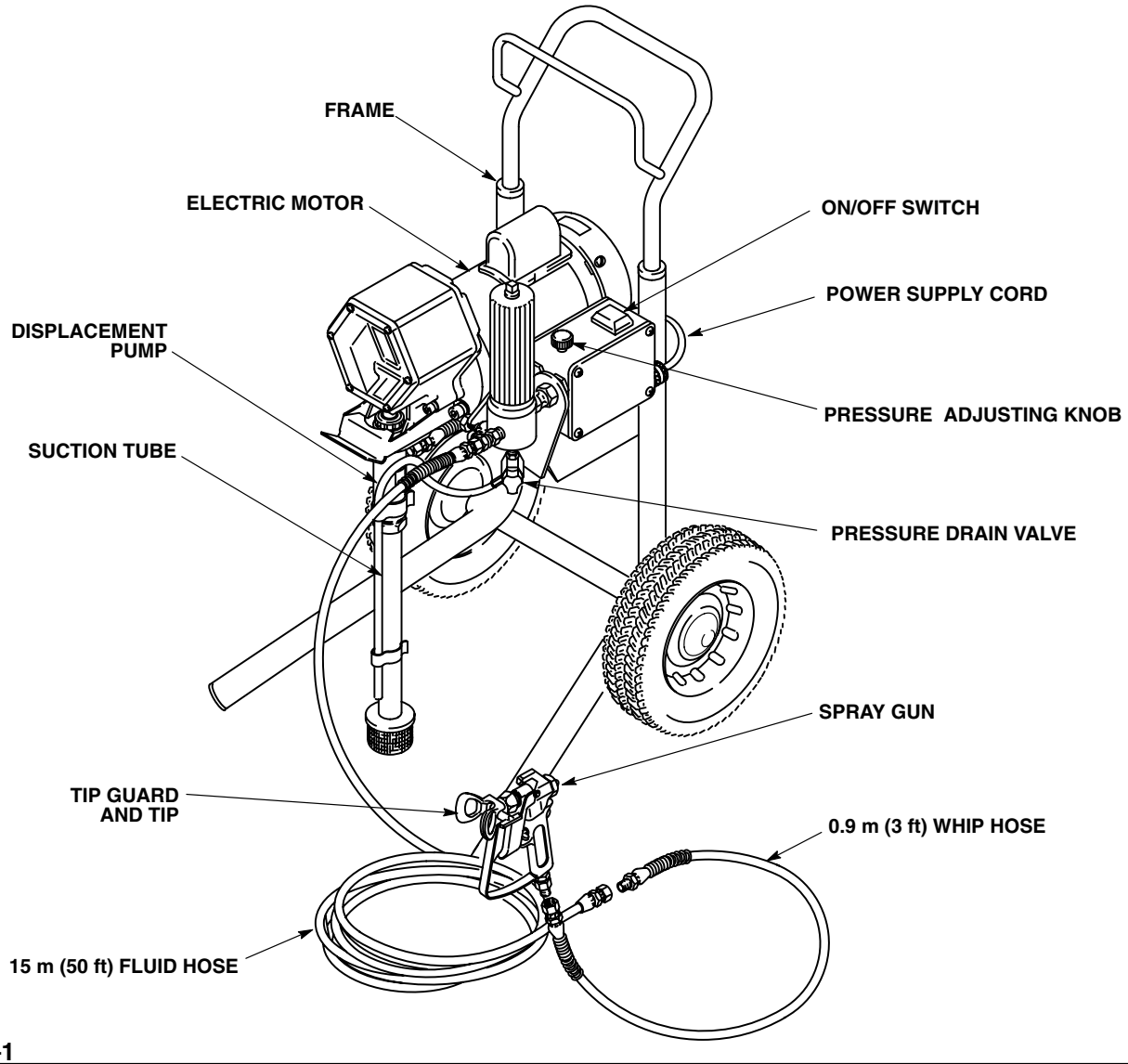


Fig 7–1 0113

SETUP

1. Connect the hose and gun. *(See Fig 1.)*

Remove the plastic plug from the outlet nipple and screw the 15.2 m (50 ft) fluid hose onto the nipple. Don't use thread sealant, and don't install the spray tip yet!

WARNING

If you are supplying your own hoses and spray gun, be sure the hoses are electrically conductive, that the gun has a tip guard, and that each part is rated for at least *192 bar (2750 psi) Working Pressure*. This is to reduce the risk of serious bodily injury caused by static sparking, fluid injection or overpressurization and rupture of the hose or gun.

CAUTION

To avoid damaging the pressure control, which may result in poor equipment performance and component damage, follow these precautions:

1. Always use grounded, flexible spray hose at least 15.2 m (50 ft) long.
2. Never use a wire braid hose as it is too rigid to act as a pulsation dampener.
3. Never install any shutof f device between the outlet of the pressure control and the main hose. *See Fig 1.*
4. Always use the main filter outlet for one gun operation. Never plug this outlet.

2. **Fill the packing nut/wet–cup** 1/3 full with Graco Throat Seal Liquid (TSL), supplied. *See Fig 2.*

3. **Check the electrical service.**
   a. The motor is factory wired for 220 V. To rewire the motor for 110 V, unplug the sprayer, remove the cover plate of the voltage change box (located on the left side of the motor) and rewire the motor as shown in Fig 3. *Also see Fig 2.*
   b. Be sure the electrical service is properly rated for your sprayer and that the outlet you use is properly grounded.
   c. Have a licensed electrician attach an appropriate plug to the power supply cord.
   d. Use a grounded extension cord which has 3 wires of a minimum 2.5 mm (12 gauge) size, and a maximum of 30 m (100 ft) long. Longer lengths or smaller gauges may af fect sprayer performance.

WARNING

Proper grounding is essential to reduce the risk of static sparking which can cause a fire or explosion and result in serious bodily injury and property damage.

Read the warning section **FIRE OR EXPLOSION HAZARD** on page 3 of this manual and ground the sprayer as explained there.

4. **Plug in the sprayer.** Be sure the ON/OFF switch is OFF. *See Fig 4.* Plug the power supply cord into a grounded electrical outlet that is at least 6 m (20 ft) away from the spray area to reduce the chance of a spark igniting the spray vapors.

5. **Flush the pump** to remove the lightweight oil which was left in to protect pump parts after factory testing. See **FLUSHING GUIDELINES** on page 9.

6. **Prepare the paint** according to the manufacturer 's recommendations.

   Remove any skin that may have formed. Stir the paint to dissolve pigments. Strain the paint through a fine nylon mesh bag (available at most paint dealers) to remove particles that could clog the filter or spray tip. This is probably the most important step toward trouble–free spray painting.

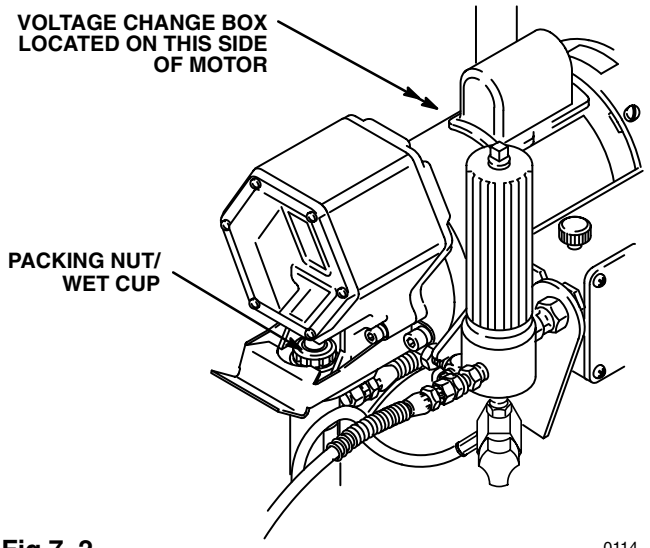


Fig 7–2 0114

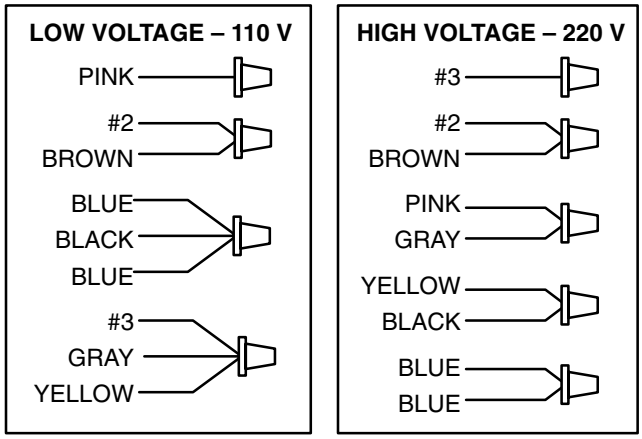


Fig 7–3 0115

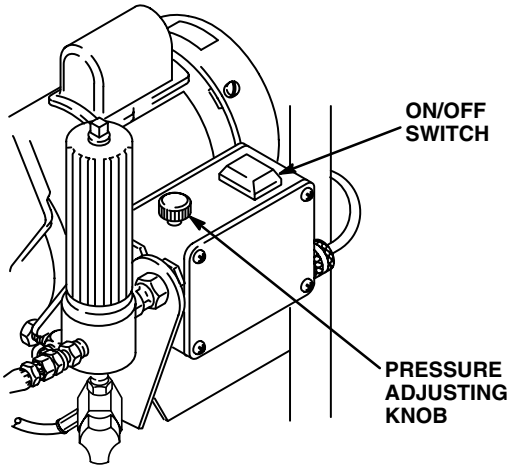


Fig 7–4 0116

WARNING

To reduce the risk of serious bodily injury, including fluid injection, splashing fluid or solvent in the eyes or on the skin, or injury from moving parts or electric shock, always follow the **PRESSURE RELIEF PROCEDURE** on page 2 whenever you shut off the sprayer, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

Startup

Use this procedure each time you start the sprayer to help ensure the sprayer is ready to operate and that you start it safely.

NOTE: Before starting the sprayer for the first time, flush it. See page 9 for **FLUSHING GUIDELINES.**

1. **Close the pressure drain valve.** *See Fig 6.*
2. **Don't install the spray tip yet!**
3. **Put the suction tube into the paint container**.
4. **Lower the pressure setting** by turning the pressure adjusting knob all the way counterclockwise. See *Fig 6.*
5. **Disengage the gun safety latch.** *See Fig 7.*
6. **To prime the pump** , hold a metal part of the gun firmly against and aimed into a grounded metal pail. *See Fig 5.* Squeeze the trigger and hold it open, turn the ON/OFF switch to ON, and slowly increase the pressure setting until the sprayer starts. Keep the gun triggered until all air is forced out of the system and the paint flows freely from the gun. Release the trigger and engage the gun safety latch.

NOTE: If the pump is hard to prime, open the drain valve. When fluid comes from the valve, close it. Disengage the gun safety latch and proceed as in Step 6.

7. **Check all fluid connections for leaks**. If any leaks are found, relieve pressure before tightening the connections.

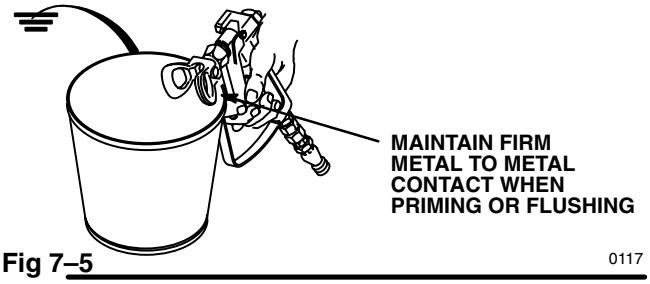


Fig 7–5

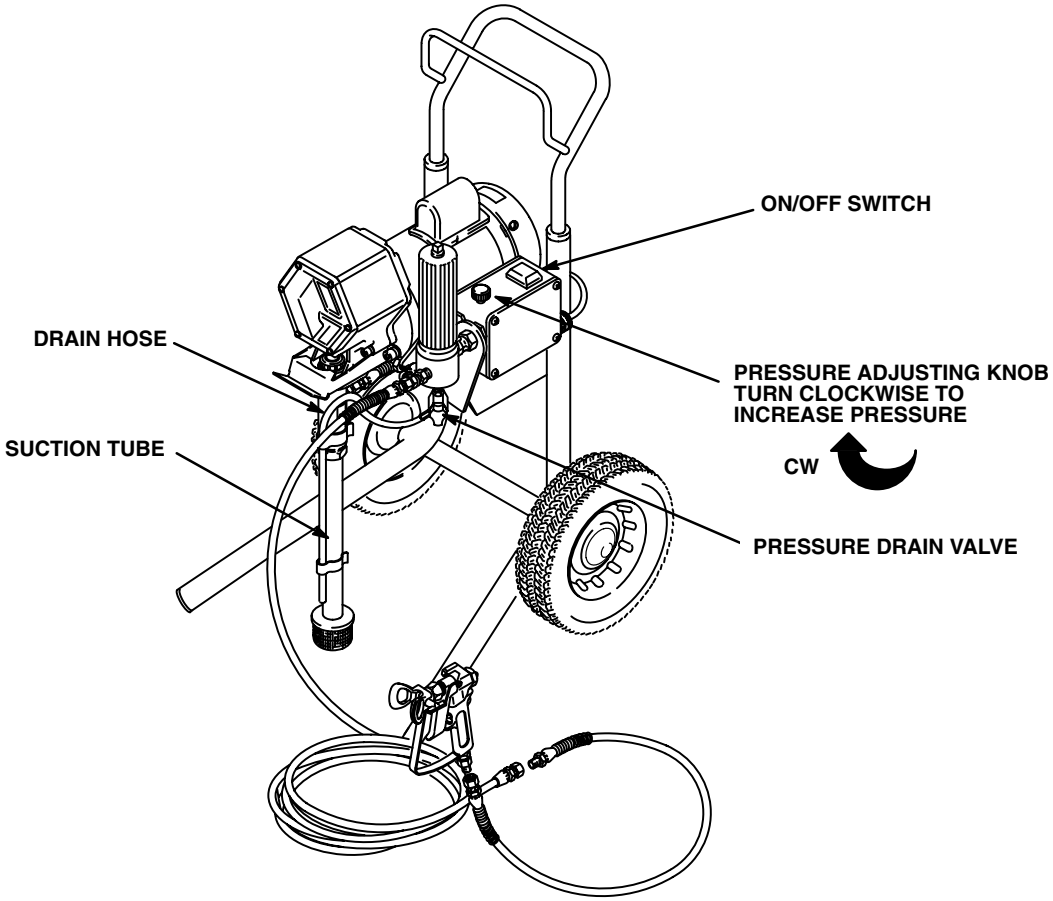


Fig 7–6

8. **Install the spray tip and tip guard.** If the system is pressurized, follow the **PRESSURE RELIEF PROCEDURE** on page 2. Be sure the gun safety latch is engaged. *See Fig 7.* Install the spray tip. Refer to the instructions supplied with the tip guard.

8. **Install the spray tip and tip guard.** If the system is pressurized, follow the **PRESSURE RELIEF PROCEDURE** on page 2. Be sure the gun safety latch is engaged. See Fig 7. Install the spray tip. If using the RAC IV tip guard, refer to manual 307–848, supplied, for installation instructions.

9. **Adjust the spray pattern**
   a. Increase the pressure just until spray from the gun is completely atomized. To avoid excessive overspray and fogging, and to decrease tip wear and extend the life of the sprayer, always use the lowest possible pressure needed for good atomization.
   b. If more coverage is needed, use a larger tip rather than increasing the pressure.
   c. To adjust the direction of the spray pattern, engage the gun safety latch and loosen the retaining nut. Position the tip guard horizontally for a horizontal pattern or vertically for a vertical pattern. Then tighten the retaining nut.

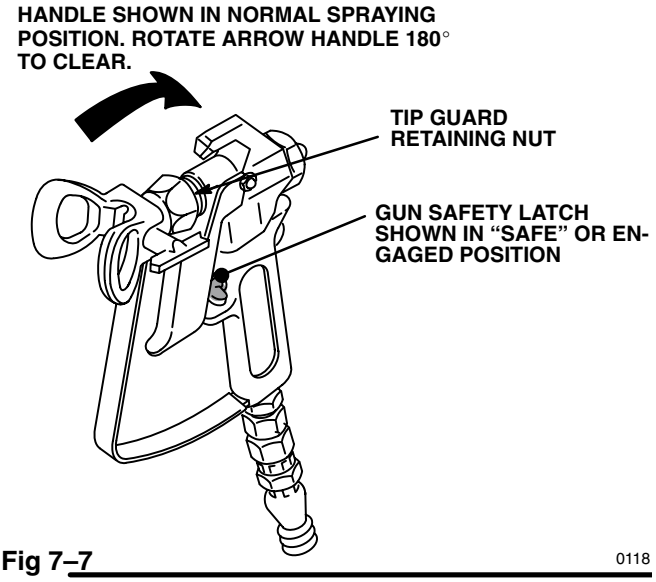


Fig 7–7

Cleaning a Clogged Tip

WARNING

To reduce the risk of serious bodily injury from fluid injection;

NEVER operate the spray gun with the tip guard removed.

DO NOT hold your hand, body, or a rag in front of the spray tip when cleaning or checking a clogged tip. Always point the gun toward the ground or into a pail when checking to see if the tip is clear.

DO NOT try to "blow back" paint; this is NOT an air spray sprayer.

1. Clean the front of the tip frequently during the day' s operation. Follow the **PRESSURE RELIEF PROCEDURE** on page 2. Use a solvent–soaked brush to clean the tip.

2. If the spray tip clogs, release the gun trigger, engage the gun safety latch, and rotate the RAC IV handle 180° so the arrow is pointing back. *See Fig 7.*

3. Disengage the gun safety latch and trigger the gun into a grounded metal pail. Engage the gun safety latch again.

4. Return the arrow handle to the normal spraying position, disengage the gun safety latch, and resume spraying.

5. If the tip is still clogged, engage the gun safety latch, shut off and unplug the sprayer, and open the pressure drain valve to relieve pressure. Remove and clean the spray tip as shown in manual 307–848, supplied.

1. **Check the packing nut/wet–cup daily .** Relieve pressure. Keep the wet–cup 1/3 full of TSL to help prevent fluid buildup on the piston rod and premature wear of packings. *See Fig 8.* Tighten the packing nut just enough to stop leakage. Over tightening the packing nut may cause binding and excessive packing wear. Use a round punch or brass rod and light hammer to adjust the nut.

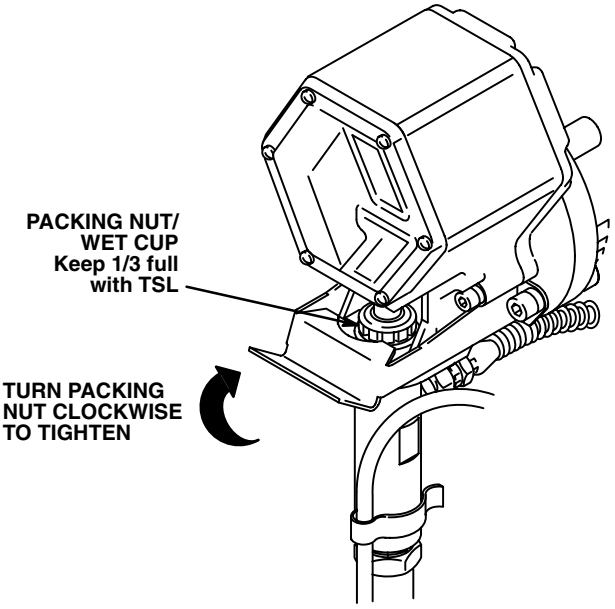


Fig 7–8 0069

2. **Flush the sprayer at the end of each work day** and fill it with mineral spirits. Proper flushing helps prevent performance problems and costly equipment damage. See **FLUSHING GUIDELINES** on page 9.

CAUTION

Never leave water or any paint in the sprayer over–night to prevent pump corrosion and to prevent the fluid from freezing or setting up in the pump, pressure control, or hoses. Fluid which is allowed to freeze or set up in the sprayer or other accessories can cause loss of pressure, stalling or serious equipment damage.

Always eliminate water or water–base fluid from the spray system by using mineral spirits for the final flush. Then relieve pressure and leave the mineral spirits in the sprayer.

3. **Lubricate the bearing housing** after every 100 hours of operation. Remove the drive housing cover. Fill the bearing housing cavity with SAE non–detergent oil. *See Fig 9.*

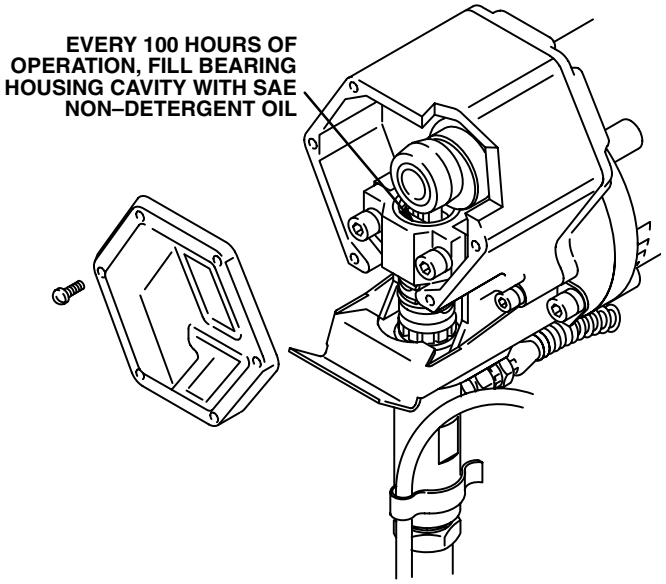


Fig 7–9 0070

4. For very short shutoff periods, leave the suction tube in the paint, follow the **PRESSURE RELIEF PROCEDURE** on page 2, and clean the spray tip.

5. Coil the hose and lay it on top of the sprayer when storing it, even for overnight, to help protect the hose from kinking, abrasion, coupling damage, etc.

WARNING

See the warning section **HOSE SAFETY** on page 3 for information on the hazard of using damaged hoses.

FLUSHING GUIDELINES

When To Flush

CAUTION

NEVER leave water in the sprayer if there is the slightest chance it could freeze. Flush out the water with mineral spirits. W ater frozen in the pressure control tube prevents the sprayer from being started and causes serious damage to the pressure control.

1. **New Sprayer.** Flush out the test oil.

   Before using water-base paint , flush with mineral spirits, followed by a soapy water flush, and then a clean water flush.

   Before using oil-base paint, flush with mineral spirits, only.

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 warm, soapy water , and then flush with mineral spirits.

4. **Changing from oil-base to water-base paint.** Flush with mineral spirits, followed by warm, soapy water, and then a clean water flush.

5. **Storage.** Flush, leave the pump, hose and gun filled with mineral spirits. Shut off the sprayer and open the pressure drain valve to relieve pressure.

   Water-base paint: Flush with water, and then mineral spirits.

   Oil-base paint: Flush with mineral spirits.

6. **Startup after storage.**

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

   When using oil-based paint , with the paint to be sprayed.

How To Flush

1. Relieve pressure. *See page 11.*
2. Close the pressure drain valve. *See Fig 10.*

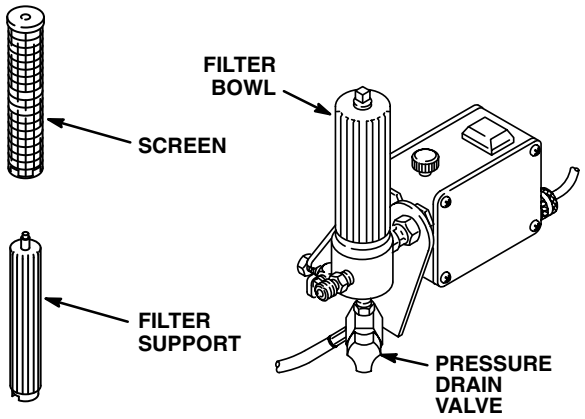


Fig 7–10

3. Pour one–half gallon (2 liters) of compatible solvent into a grounded metal pail. Put the suction tube in the pail.
4. Remove the spray tip and tip guard, if installed, and clean separately.
5. Turn the pressure adjusting knob all the way counterclockwise to the lowest setting.

WARNING

To reduce the risk of static sparking and splashing when flushing, always remove the spray tip from the gun, and hold a metal part of the gun firmly to the side of a grounded metal pail. *See Fig 11.*

6. Disengage the gun safety latch. Hold a metal part of the gun firmly against and aimed into a grounded metal pail. Start the sprayer, trigger the gun, and slowly turn the pressure adjusting knob clockwise just until the pump starts. Keep the gun triggered until clean solvent comes from the nozzle. Release the trigger and engage the gun safety latch.

NOTE: If the pump is hard to prime, open the pressure drain valve. When fluid comes from the drain tube, close the valve. Repeat Step 6.

7. Check all fluid connections for leaks. Relieve pressure before tightening the connections. Start the sprayer.

8. Remove the suction tube from the pail. Disengage the gun safety latch. Trigger the gun to force solvent from the hose. Do not run the pump dry for more than 30 seconds to avoid damaging the pump packings! Relieve pressure.

9. Leave the pressure drain valve open until you use the sprayer again.

10. If you flushed with mineral spirits and are going to use a water-base paint, flush with soapy water followed by a clean water flush. Relieve pressure.

11. Remove the suction tube and hose and clean them separately. Flushing alone is not sufficient to remove paint buildup.

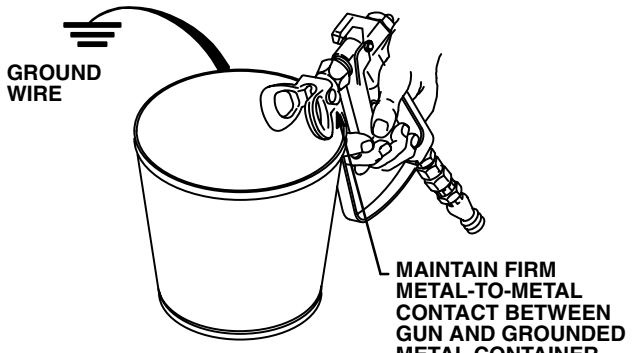


Fig 7–11

Hold the gun perpendicular to the surface. Keep the gun at an even 300–356 mm (12 to 14 in.) from the surface you are spraying. *See Fig 12.*

Begin moving the gun horizontally at a steady rate. Start the spray stroke off the target surface and pull the trigger as the gun is moving. Then, while the gun is still moving, and as you approach the other edge of the surface, release the trigger. This method avoids excess paint buildup at the end of each stroke.

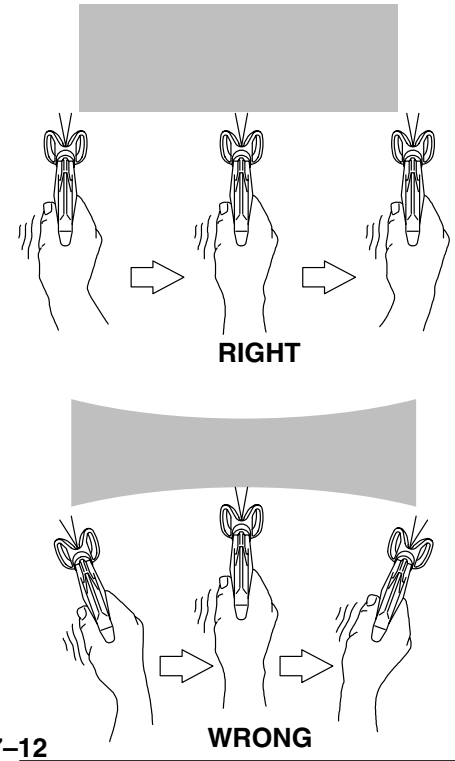


Fig 7–12 0072

Move the gun at a speed that provides a full, wet coating to be applied without runs or sags. Lap each stroke 50% over the previous stroke to produce a uniform paint thickness. Spray in a uniform pattern from right to left and then left to right for a professional finish. *See Fig 13.*

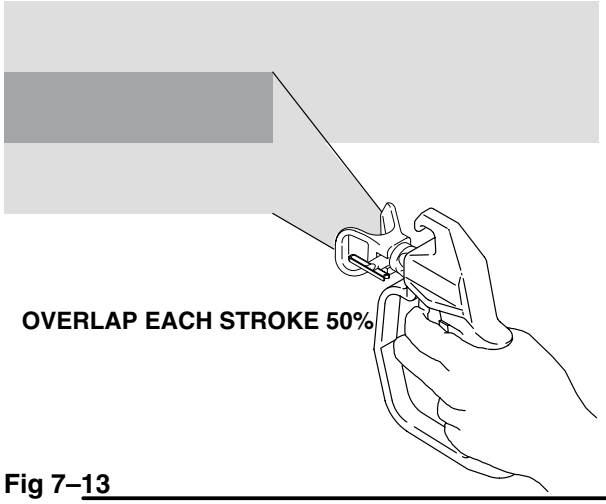


Fig 7–13 0073

The best way to control the rate of coverage is with the gun tip size. A small tip orifice applies less paint. A larger tip orifice applies more paint. The width of the pattern depends on the fan pattern of the tip you choose.

Do not try to increase coverage by increasing the fluid pressure! Use the lowest pressure needed for good results. This prolongs the life of your sprayer and reduces paint lost by overspray.

For interior corners aim the gun toward the center of the corner to be sprayed. By dividing the spray pattern this way, the edges on both sides are sprayed evenly . *See Fig 14.*

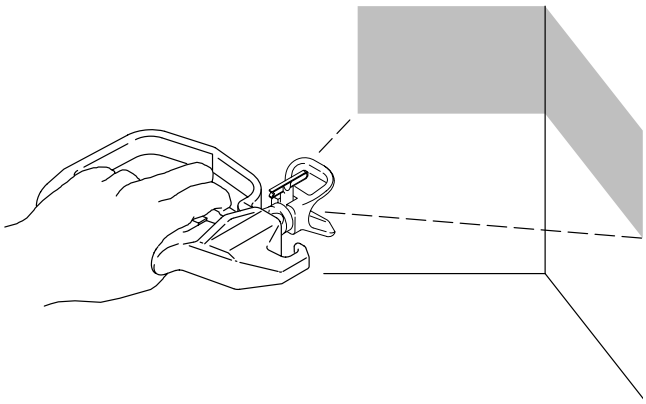


Fig 7–14 0074

If there is a wind, angle the spray pattern into the wind to minimize drifting. Paint from the ground to the roof.

Shrubs. Tie back shrubs with rope and stakes. Cover them with a dropcloth as the painter approaches the area. Remove the dropcloth as soon as the area is painted to prevent damage.

Concrete walks. If the walkways will be walked on, cover them with a canvas dropcloth to avoid slipping. Otherwise a plastic cloth can be used.

Electrical outlets and lamps. Protect electrical outlets with masking tape. Cover lamps with plastic bags secured with masking tape.

Nearby objects. Move portable objects upwind of the surface to be sprayed. If there is a nearby home, make a protective barrier by hanging plastic drop cloths between two long poles.

TROUBLESHOOTING GUIDE

WARNING

Pressure Relief Procedure
To reduce the risk of serious bodily injury , including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow this procedure when you shut off the sprayer, when checking, adjusting or cleaning the system, and when changing spray tips.

1 Engage the gun safety latch.
2 Turn the ON/OFF switch OFF.
3 Unplug the power supply cord.
4 Disengage the gun safety latch. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun.
5 Engage the gun safety latch.
6 Open the fluid pressure drain valve and leave it open until you start the sprayer again.

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

Check everything in the chart before disassembling the sprayer.

PROBLEM	CAUSE	SOLUTION
Electric motor won't run	Power cord or extension cord unplugged, or damaged, or building circuit breaker or fuse has tripped.	Check, reset or replace.
	Motor overload switch[1] has opened.	Unplug power supply cord, relieve pressure, allow motor to cool, decrease pressure.
	Pressure setting is too low.	Increase pressure.
	Pressure control frozen or damaged by overpressurization.	Try to thaw[2], or replace pressure control.
Electric motor stops while spraying	Power cord or extension cord unplugged, or damaged, or building circuit or fuse is blown.	Check, reset or replace.
	Motor overload switch[1] has opened.	Unplug the power supply cord, relieve pressure, allow motor to cool, decrease pressure.
	Pressure setting is too low.	Increase pressure.
	Spray tip is plugged.	Remove and clean.
	Wrong type of extension cord.	Use maximum 15 m (50 ft), 3 wires, 2.5 mm (12 gauge) minimum gauge, grounded extension cord.
Electric motor runs, but low paint output or no paint output, OR pump is not stroking See the **PROBLEM, "**Not enough paint pressure", on page 12, also .	Piston ball check not seating.	Service the pump. See page 19.
	Piston packings are worn or damaged.	Replace the piston. See page 19.
	Intake valve ball check not seating.	Service the pump. See page 19.
	Pump is frozen.	Thaw[2]
	Pressure control frozen or damaged by overpressurization[3].	Try to thaw[2], or replace pressure control.
	Drive assembly damaged.	Replace the drive housing. See page 14.
	Displacement pump worn or damaged.	Replace the displacement pump. See page 19.
	Sprayer is not primed.	Prime the sprayer. See page 6.
Electric motor labors when starting, and trips building circuit breaker , fuse or motor overload switch	Start switch has failed.	Replace the start switch. See page 16.
	Motor capacitor has failed.	Replace the capacitor. See page 16.
	Motor is incorrectly wired for voltage being used.	Verify wiring. See page 5.

PROBLEM	CAUSE	SOLUTION
Paint leaks into wet–cup	Throat packings are worn or damaged.	Replace the packings. See page 19.
Excessive surging from spray gun	Spray tip is plugged.	Disassemble and clean.
	Spray tip too big or worn.	Change the spray tip.
	Paint too viscous.	Thin the paint.
	Wrong type hose.	Use minimum 15 m (50 ft) grounded, flexible hose (wire braid hose is unacceptable).
Not enough paint pressure	Pressure setting too low.	Increase the pressure.
	Spray tip too big or worn.	Change the spray tip.
	Pressure control frozen[2] or damaged by overpressurization[3].	Try to thaw[2], or replace the pressure control.
	Displacement pump worn or damaged.	Replace the displacement pump. See page 19.
Tails or fingers in spray pattern	Pressure setting too low.	Increase the pressure.
	Spray tip too big or worn.	Change the spray tip.
	Fluid supply is low or empty.	Refill and prime the pump. Check fluid supply often to prevent running the pump dry.
	Paint too viscous.	Thin the paint.
	Wrong type hose.	Use minimum 15 m (50 ft), grounded, flexible hose (wire braid hose is unacceptable).
Paint runs or sags	Spray tip to big or worn.	Change the spray tip.
Spitting from gun	Air in fluid pump or hose.	Check for loose connections at pump intake and tighten. Then prime the pump.
	Spray tip is partially clogged.	Clear the tip. See page 7.
	Fluid supply is low or empty.	Refill and prime the pump. Check fluid supply often to prevent running the pump dry.
Static sparking from the gun	Spray or work being sprayed is not properly grounded.	Correct problem before continuing. Follow the warning section, **FIRE OR EXPLOSION HAZARD** on page 3.

[1] The electric motor has an over–temperature switch which automatically resets upon cooling. If it opens and the electric motor shuts itself off, unplug the power supply cord and let the sprayer cool for 30 to 60 minutes. Always use the lowest pressure setting needed when spraying.

[2] Freezing results from failure to replace the water–base paint or flushing water with mineral spirits, and usually causes permanent damage to the pressure control.

[3] Over–pressurization results from (1) using less than 15 m (50 ft) of flexible spray hose, (2) from using a wire braid spray hose, (3) from adding a shutoff device between the pump outlet and the spray gun, or (4) from attaching a spray hose to the pressure drain valve.

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

NOTE: *See Fig 15.*

1 Remove pump as described on page 19.

2 Remove the screws (19) and the cover (35). Remove the screws (20) and slide the connecting rod and bearing assembly (A) off the crankshaft (B).

3 Use a screwdriver to push the retaining spring (33) up and remove the pin (34) from the coupling (36). Remove the coupling from the connecting rod (54).

4 Pull the connecting rod (54) out of the bearing (53). Wipe off these parts; do not use solvent. Inspect the surfaces of the bearing and connecting rod link for wear or damage. If either part needs replacing, replace both. When installing the rod and bearing, coat the surfaces with SAE 10 non–detergent motor oil.

5 Clean and inspect the crankshaft. Wipe it clean with a rag; do not use solvent. If the crankshaft (B) is badly worn, replace the drive assembly (55) as described on page 14.

6 Clean and inspect the connecting rod needle bearing (C). Repack the bearing with industrial grade, heavy duty, extreme-pressure lithium soap grease.

NOTE: After every 100 hours of operation, or whenever servicing the pump (whichever comes first), fill the cavity (D) in the connecting rod (54) with SAE 10 non–detergent motor oil.

7 Assemble the new rod and bearing, being sure to push the spring (33) down in place over the pin (34) ends, and install the remaining parts in the reverse order.

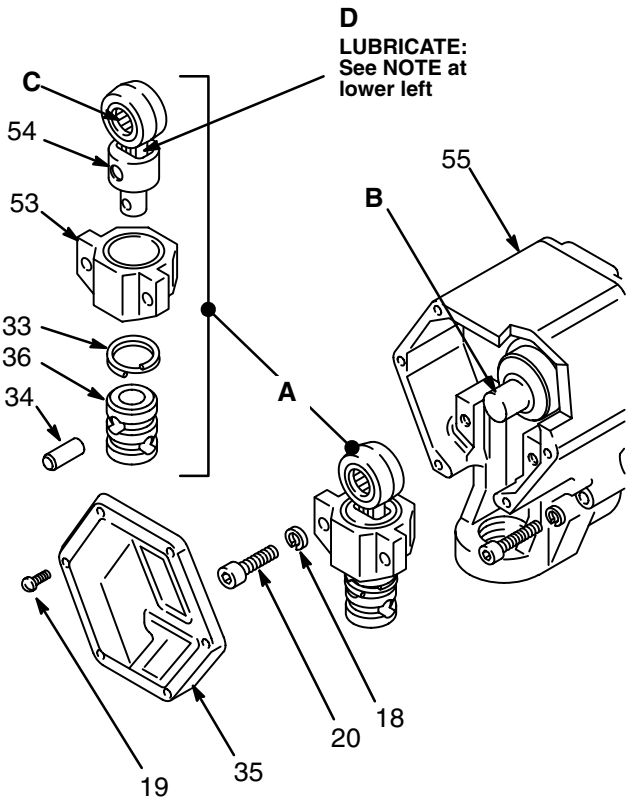


Fig 7–15 0075

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

1 Remove the pump. See page 19. Remove the connecting rod and bearing. See page 13.

NOTE: *See Fig 16 for this procedure.*

2 Remove the screws (55d) from the front of the drive housing (C). Remove the screws (55f) from the top rear of the motor housing (B). Pull the drive housing (C) off the motor housing (B).

3 Remove the screws (55c) from the front of the motor housing (B). Pull the motor housing off the motor.

4 Clean and inspect the gear (37). Replace the gear if it is worn or damaged. To remove the gear, drive out the pin (27) and pull the gear off the motor shaft (A). Before reassembling the gear, apply molybdenum disulfide spray lubricant to it, allow it to dry, then apply industrial grade, heavy duty, extreme-pressure lithium soap grease.

5 Install the new drive assembly in the reverse order of removal.

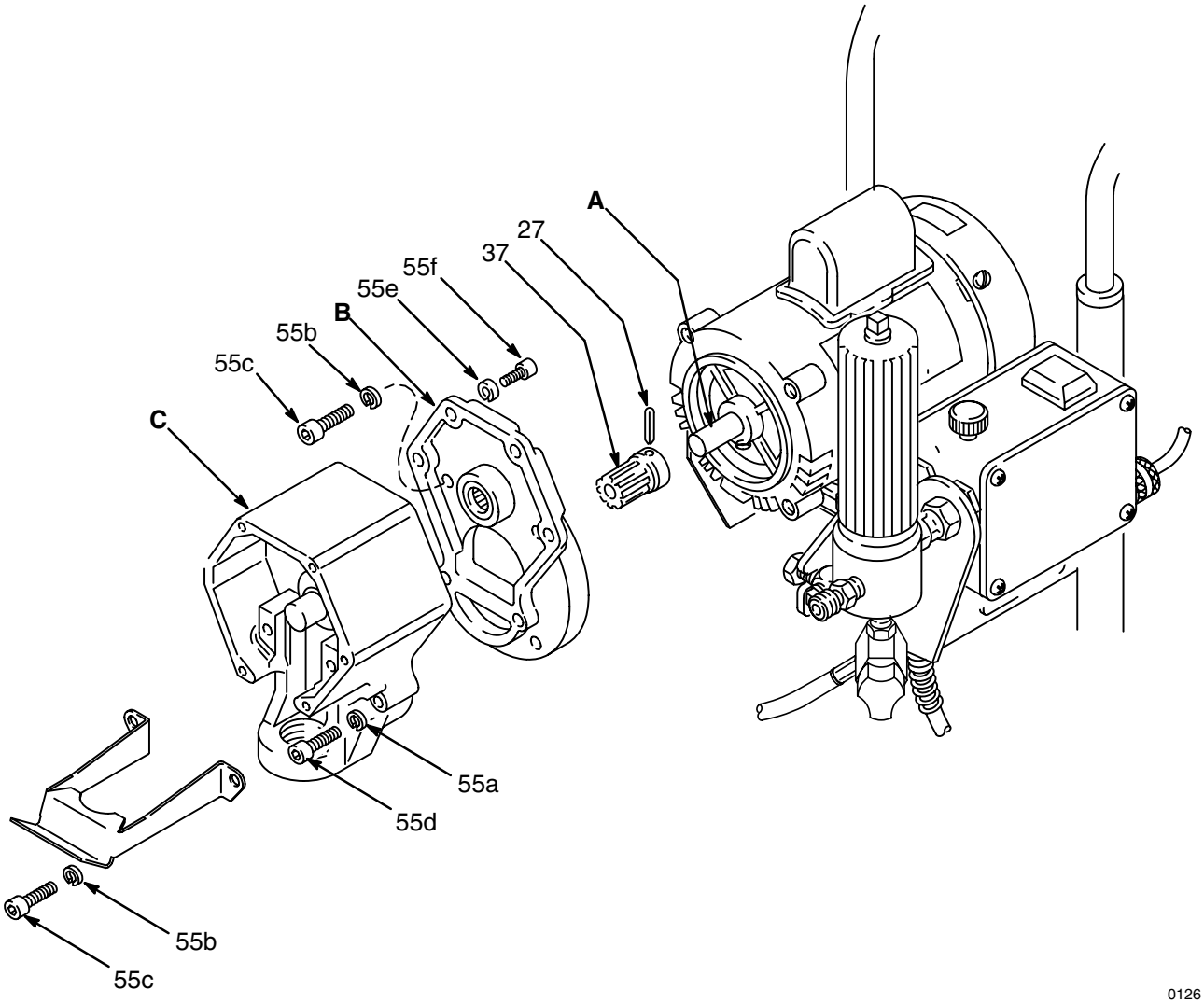


Fig 7–16

REMOVING and REPLACING ELECTRIC MOTOR

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

1 Disconnect the hose (52) at the displacement pump. See page 19.

2 Remove the drive assembly. See page 14. You can leave the pump, connecting rod and bearing assembled to the drive assembly.

3 Drive out the pin (27) and remove the gear (37). Remove the screws (135) and cover (41) from the pressure control (50). *See Fig 17.*

4 Disconnect the green/yellow motor lead from the grounding screw (302), the brown motor lead from the microswitch and the blue lead from the on/off switch. *See Fig 18.*

5 Unscrew the connector (130 and 305) nuts on both ends of the conduit (1). Remove the screws (7), nuts (3) and lockwashers (4). *See Fig 17*. Remove the motor from the frame while carefully guiding the wires through the connector (305) in control box. Remove the conduit (1) from the wires.

6 Loosen the locknut and unscrew the connector (130) from the motor , being careful to avoid twisting the wires.

7 Install the new motor in the reverse order.

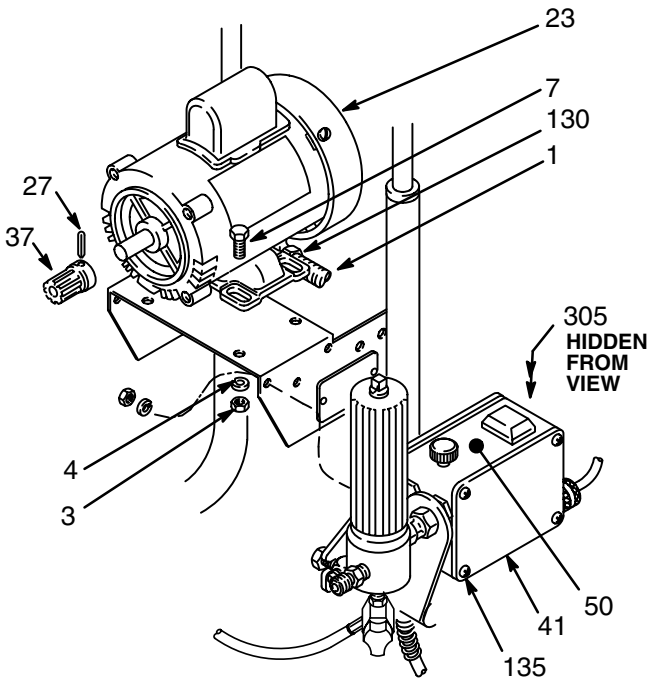
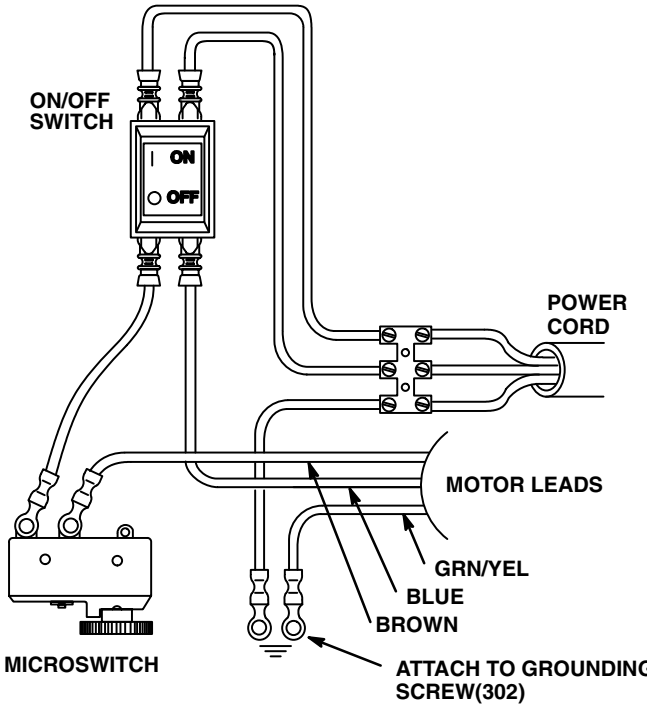


Fig 7–17 0133



WIRING DIAGRAM

Fig 7–18 0131

START SWITCH

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

1 Be sure the sprayer is unplugged.

2 Remove the cover on the voltage change box. *See Fig 19*. Disconnect the terminals, taking note of their locations. Remove the two screws holding the start switch, and remove the start switch.

3 Reassemble in the reverse order. To verify the wiring, refer to Fig 3, page 5.

CAPACITOR

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

1 Remove the two screws and the cover of capacitor (23d). *See Fig 19.*

2 Remove the flag connectors from the old capacitor . Connect the flag connectors of the new capacitor and replace the cover.

NOTE: The replacement capacitor includes a new resistor, installed.

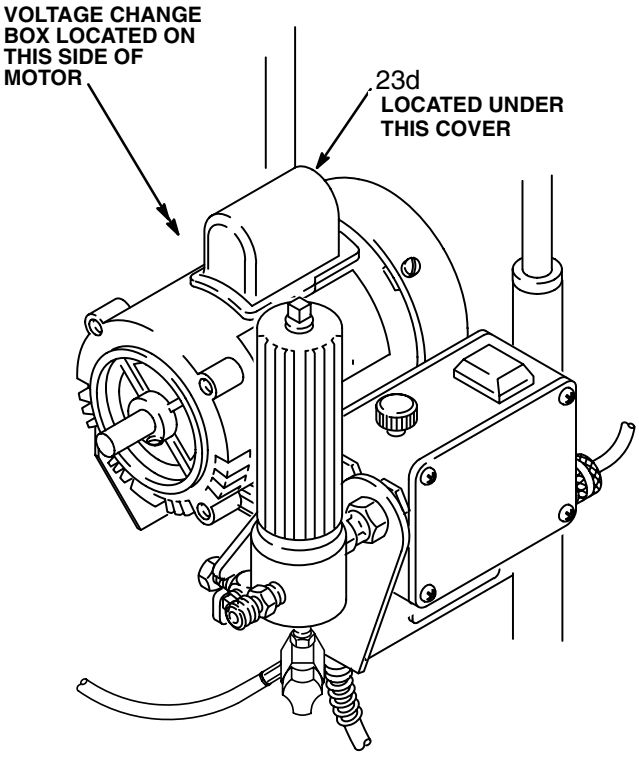


Fig 7–19 0120

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

CAUTION

Use extreme caution when removing the elbow (309) or nipple (103) from the pressure control. Any twisting or jarring of the pressure control fittings could alter the factory setting of the control or permanently damage the control.

NOTE: Refer to Fig 20 except where noted otherwise.

NOTE: If you purchased a bare pressure control, remove items 302 to 322 as listed on page 24, and item 103 from the old box and install them on the new one.

1 Remove the nut (122) and washer (123). Hold the nut (A) at the pressure control with a wrench and unscrew the swivel union (84) from the pressure control. Remove the filter assembly (47).

2 Disconnect the hose (52) from the pressure control.

3 Remove the screws (135) and cover (41) from the pressure control (50).

4 Disconnect the motor leads. *See Fig 21.*

5 Loosen the knurled part of the strain relief bushing (306) and unscrew it from the pressure control. Slide the strain relief bushing up on the power cord to provide clearance and unscrew the conduit connector (305). *See Fig 20.*

6 Remove the screws (7), lockwashers (4) and nuts (3). Pull the pressure control away from the frame, carefully guiding the motor leads through the connector (305).

7 Remove the mounting bracket (40) and screws (25) and install them on the new pressure control.

8 Reasemble the pressure control in the reverse order of disassembly.

CAUTION

Failure to observe the following may cause poor performance or excessive pressure and permanent damage to the pressure control:

1. Always use nylon spray hose at 15.2 m (50 ft) minimum length.
2. Never use a wire braid spray hose.
3. Never attach a spray hose to the pressure drain valve.
4. Never add any type of shutoff device between the pump outlet and the spray gun.
5. Never allow flushing water or water base paint to freeze in the system.

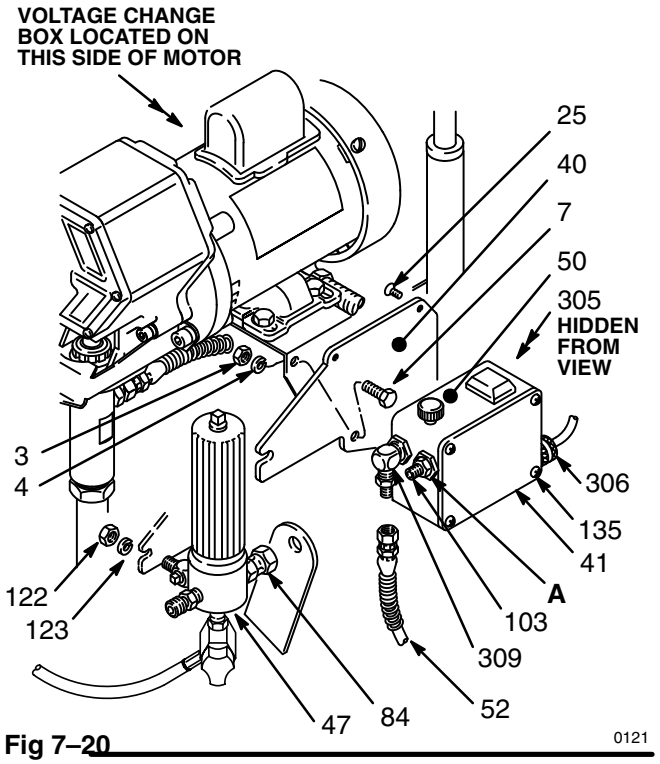


Fig 7–20

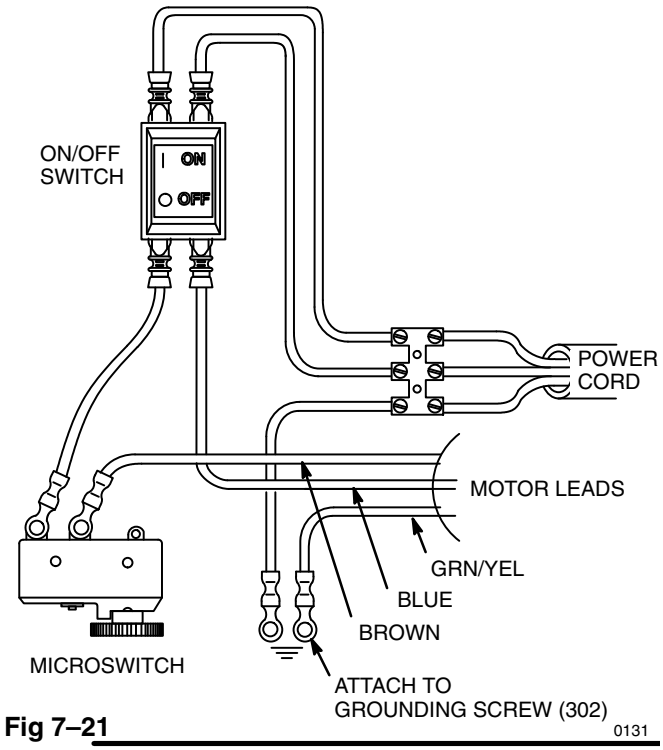


Fig 7–21

NOTES

WARNING

To reduce the risk of serious bodily injury, including fluid injection; splashing in the eyes; injury from moving parts or electric shock, follow the **Pressure Relief Procedure Warning** on page 11 before continuing.

Removing the Pump. *See Fig 22.*

1 Flush the sprayer. Relieve pressure.

2 Hold the intake valve (223) steady with a wrench and unscrew the inlet tube (29).

3 Unscrew the hose (52) from the pump nipple (10).

4 Use a screwdriver to push the retaining spring (33) aside, and then push out the pin (34).

5 Loosen the locknut (112) and unscrew the pump (58).

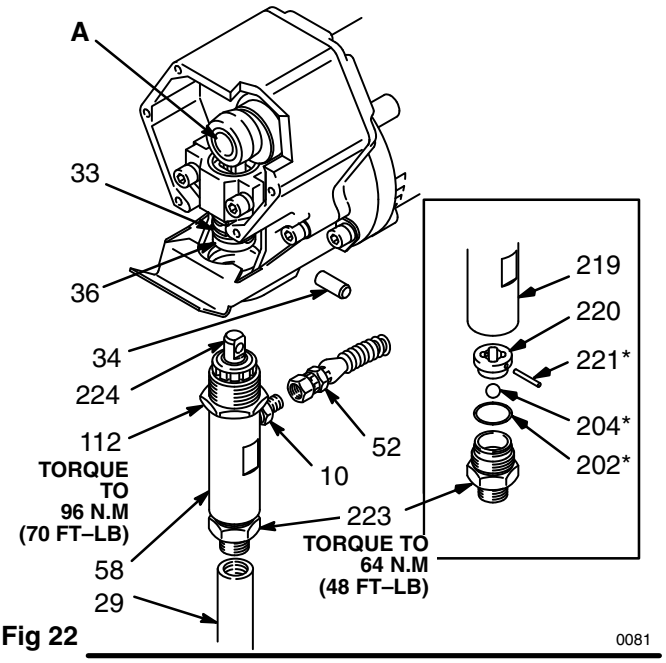


Fig 22

Reinstalling the Pump. *See Fig 22.*

1 Rotate the crankshaft (A) so the pump coupling (36) is in its lowest position. (Rotate the fan blades at the rear of the motor with a screwdriver to rotate the crankshaft.) The pump piston rod (224) should protrude about 25 mm (1 in.) above the pump cylinder. Insert the pump into the pump coupling (36) until the pin holes are aligned. Insert the pin (34). Position the spring (33) so it covers the ends of the pin. Screw the pump into the drive housing (55) until it stops at the locknut (112). Unscrew the pump just until the fitting (10) faces straight back.

WARNING

Be sure the retaining spring (33) is firmly and completely in the groove of the connecting rod to prevent the pin (34) from working loose due to vibration. *See Fig 22.*

If the pin works loose, it or other parts could break off due to the force of the pumping action. These parts could be projected through the air and result in serious bodily injury or property damage, including damage to the pump, connecting rod or bearing housing.

2 Torque the locknut (112) to 96 N.m (70 ft–lb).

3 Reassemble the remaining parts, in the reverse order of removal.

Disassembly

1 Remove and disassemble the intake valve (223). If no further service is needed, reassemble the valve, using a new gasket (202*). Torque to 64 N.m (48 ft–lb). *See Fig 22.*

2 Remove the packing nut (216) and plug (205).

3 Tap the piston rod (224) down with a plastic mallet. Pull the rod out of the bottom of the cylinder (219).

4 Remove the packings and glands from the throat of the cylinder (219).

NOTE: Whenever you disassemble the pump for cleaning or repair, remove the sleeve. Use the special tool, p/n 222–585. See ACCESSORIES, page 27 to order it.

WARNING

Always use the special sleeve removal tool to remove the sleeve. Other removal methods could cause the pump to rupture, resulting in serious bodily injury. If the sleeve cannot be removed easily using the tool, return the sleeve and cylinder to your Graco distributor for removal.

5 Screw the large nut (A) of the tool into the top of the cylinder (219). Screw down the rod (B) to push the sleeve out. Remove the tool. *See Fig 23.*

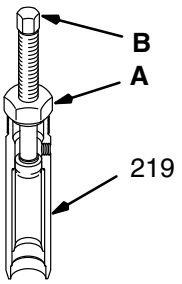


Fig 23

6 Clamp the flats of the piston rod (224) in a vise. Unscrew the retaining nut (21 1). Unscrew the piston valve (222) from the rod. Remove all parts from the piston. *See Fig 24.*

Reassembly Notes

A. Packing Repair Kit 222–587 is available. Parts included in the kit are marked with an asterisk (*) in the text and drawings.

B. Clean all parts thoroughly. Check the outside of the piston rod (224) and the inside of the sleeve (218) for scoring or scratches, which prevent the packings from sealing properly. Replace all worn parts.

C. Alternate polyethylene and leather packings as shown in Fig 27. Notice that:
the lips of the throat v–packings face down;
the lips of the piston V–packings face up;
the lips of the U–cup seal (203*) face down. Incorrect installation damages the packings and results in pump leakage.

D. Coat the piston rod and the inside of the cylinder with lightweight oil, and soak the packings in the oil, before reassembling.

Reassembly Procedure

1 Stack the backup washer (214*), U–cup seal (203*) *lips down* , and female gland (215*), alternate the polyethylene and leather v–packings (212*, 206*) *lips up,* and stack the male gland (210*) onto the piston valve (222). *See Fig 27.*

2 Tighten the packing retaining nut (21 1) onto the piston valve (222) and torque to 0.7 N.m (6 in–lb). *See Fig 24.*

NOTE: NOTE THE ALIGNMENT of the piston (222) to the nut (211). Maintain this alignment throughout Steps 2, 3 and 4.

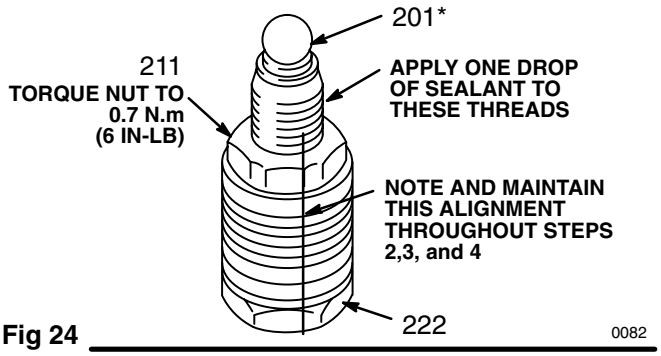


Fig 24

3 Apply *1 drop only* of sealant, supplied with the repair kit, to the piston valve threads. Place the small ball (201*) on the valve. *See Fig 24.* Hand tighten the valve into the rod (224) just until the nut contacts the rod. Place the flats of the displacement rod in a vise.

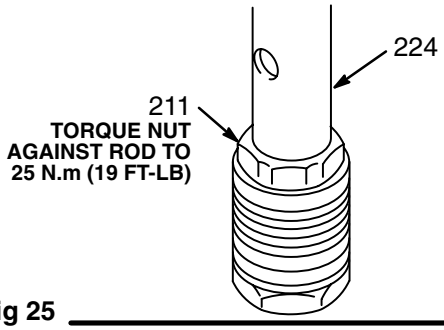


Fig 25

4 Torque the nut (211) against the rod (224) to 25 N.m (19 ft–lb). Use two wrenches to maintain the alignment as mentioned in the **NOTE.** *See Fig 25.*

5 Stack the male gland (208*), alternate the polyethylene and leather v–packings (213*, 207*) *lips down* and stack the female gland (209*) one at a time into the top of the cylinder. *See Fig 27.*

6 Loosely install the packing nut (216) and plug (205).

7 Place a new o–ring (202*) firmly in the cylinder groove. *See Fig 27.*

8 Coat the piston rod and packings with oil. Carefully slide the assembly **INT O THE T OP OF THE SLEEVE**.

And then slide the sleeve/piston rod assembly **INTO THE BOTTOM OF THE CYLINDER**. This procedure helps prevent damaging the packings during reassembly. *See Fig 26.*

NOTE: The tapered end of the sleeve is the bottom of it. Do not install it upside down. *See Fig 26.*

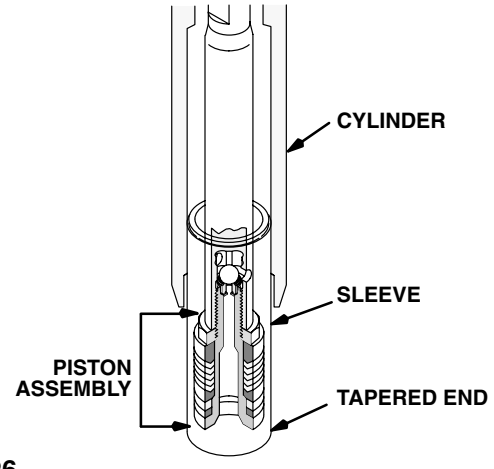


Fig 26

9 Assemble the intake valve. Use a new gasket (202*). Screw the valve into the cylinder and tighten to 64 N.m (48 ft–lb). *See Fig 27.*

10 Screw down the cylinder locknut (112) until it is finger tight at the bottom of the external cylinder threads. *See Fig 27.*

11 Install the displacement pump on the sprayer . See page 19.

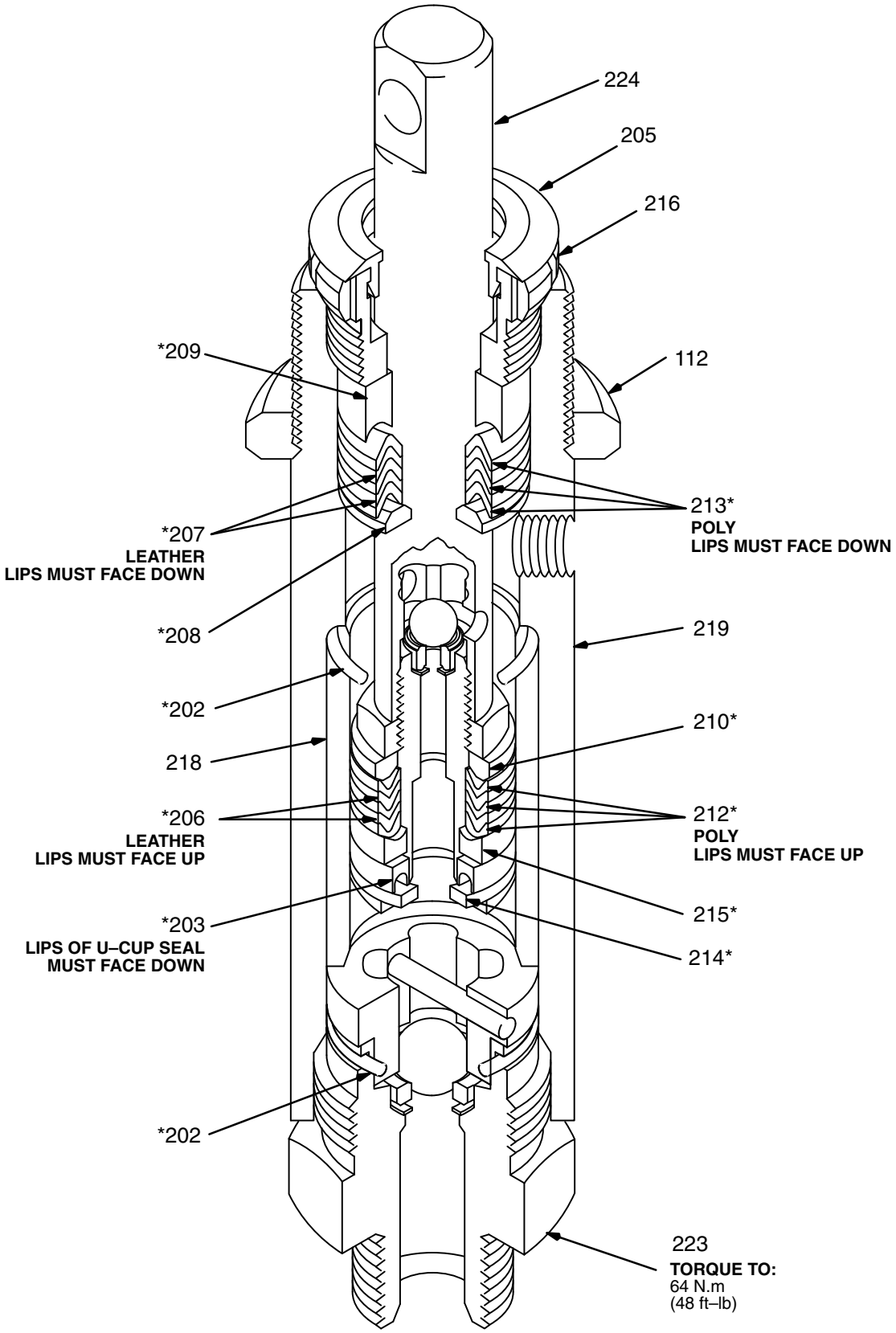

224
205
216
*209
112
213*
POLY
LIPS MUST FACE DOWN
*207
LEATHER
LIPS MUST FACE DOWN
*208
219
*202
210*
218
*206
LEATHER
LIPS MUST FACE UP
212*
POLY
LIPS MUST FACE UP
215*
*203
LIPS OF U–CUP SEAL
MUST FACE DOWN
214*
*202
223
TORQUE TO:
64 N.m
(48 ft–lb)

Fig 27

0085

PARTS LIST

Model 220–834, Series D
Includes items 1 to 135, 200 to 202, as listed below

REF NO.	PART NO.	DESCRIPTION	QTY
1	065–099	CONDUIT, electrical	92 mm
3	100–188	NUT, heavy, hex, 5/16–18	7
4	100–214	LOCKWASHER, spring, 5/16”	7
7	100–057	CAPSCREW, hex hd, 5/16–18 x 3/4”	7
10	162–453	NIPPLE, 1/4 npsm x 1/4 npt	3
14	183–770	STRAINER	1
18	104–008	LOCKWASHER, spring, 5/16”	2
19	107–156	SCREW, mach, pan hd, 6–32 x 5/8”	6
20	105–509	CAPSCREW, soc hd, 5/16–18 x 7/8”	2
23	222–226	MOTOR, electric, 0.75 HP *includes replaceable items 23a–23g*	1
23a	102–799	.TERMINAL, wire, ring *see page 25*	1
23b	185–954†	.LABEL, DANGER	1
23c	107–263	.TERMINAL, wire, female, slip–on *see page 25*	4
23d	105–771*	.CAPACITOR, motor, includes resistor	1
23f	110–101	.START SWITCH	1
23g	110–011	.CONNECTOR, terminal	1
25	106–078	SCREW, mach, flat hd, 10–24 x 3/8”	4
27	101–873	PIN, spring, straight, .167” dia. x 0.94”	1
29	185–417	TUBE, inlet	1
33	176–817	SPRING, retaining, 1.040” ID	2
34	176–818	PIN, str, hdls, .3125” dia. x 1.023”	2
35	181–062	COVER, drive housing	1
36	176–824	COUPLING, pump	1
37	177–670	GEAR, pinion	1
40	185–524	BRACKET, mounting, pres. control	1
41	183–997	COVER, pressure control	1
46	221–077	PRESSURE DRAIN VALVE	1
47	214–570	FLUID FILTER *Includes one of item 10, and 47a*	1
47a	100–040	PLUG, pipe, 1/4	1
48	108–928	CONNECTOR,1/8 nptm x 3/8” tube	1
50	222–227	PRESSURE CONTROL ASSEMBLY *see parts on page 24*	1
52	223–766	HOSE, nylon, 1/4” ID, cpld 1/4 npsm(fbe), 29” (737 mm), spring guard both ends	1
53	215–903	BEARING HOUSING	1
54	215–904	CONNECTING ROD	1
55	222–192	DRIVE ASSEMBLY *includes replacement items 55a – 55f*	1
55a	104–008	.LOCKWASHER, spring, 5/16”	2
55b	106–115	.LOCKWASHER, spring, 3/8”	4
55c	100–659	.CAPSCREW, soc hd, 3/8–16 x 1”	4
55d	100–657	.CAPSCREW, soc hd, 5/16–18 x 2”	2
55e	105–510	.LOCKWASHER, spring, 1/4”	4
55f	100–644	.CAPSCREW, soc hd, 1/4–20 x 3/4”	4
58	222–584	DISPLACEMENT PUMP *see parts on page 26*	1
84	155–665	UNION, straight adapter; 3/8 npt(m) x 3/8 npsm(f) swivel	1
92	177–762†	LABEL, WARNING	1
94	206–994	THROAT SEAL LIQUID, 8 oz	1
95	178–034†	TAG, WARNING	1
97	101–242	RING, retaining	2
99	106–062	WHEEL	2
100	178–341	CLIP, spring	1
101	186–245	CLIP, spring	1
102	186–495	HOSE, drain	1
103	157–350	NIPPLE	1
112	176–762	NUT, hex, 1 1/2–18	1
113	181–048	HANGER, pail	1
119	100–509	PLUG, pipe, 1/4 npt(f) x .44”	1
120	179–945	ADAPTER, elbow, 7/16” stud; 1/4 x 1/4 npt(f)	1
122	150–513	NUT, jam, 7/16”	1
123	100–322	WASHER, 7/16”	1
129	218–906	FRAME, sprayer	1
129a	105–521	.PLUG, tubing	2
130	102–932	CONNECTOR, conduit, 90°, 1/2 npt x 1/2 conduit	1
132	104–811	HUBCAP	2
135	110–037	SCREW, mach, pan hd, 10–24 x 1/2”	4
200	220–955	“CONTRACTOR” SPRAY GUN *See manual 307–614 for parts Includes items 200a, 200b*	1
200a	220–422	.TIP GUARD, RAC IV *See manual 307–848*	1
200b	221–517	.SPRAY TIP, Size 517	1
201	223–541	HOSE, nylon, 1/4” ID, cpld 1/4 npsm(fbe), 50 ft (15 m) long, spring guards both ends	1
202	214–701	HOSE, nylon, 3/16” ID, cpld 1/4 npsm(f) x 1/4 npt(m), 3 ft (0.9 m) long, spring guards both ends	1

**Recommended spare parts. Keep on hand to reduce down time.*

†*Extra warning labels are available at no charge.*

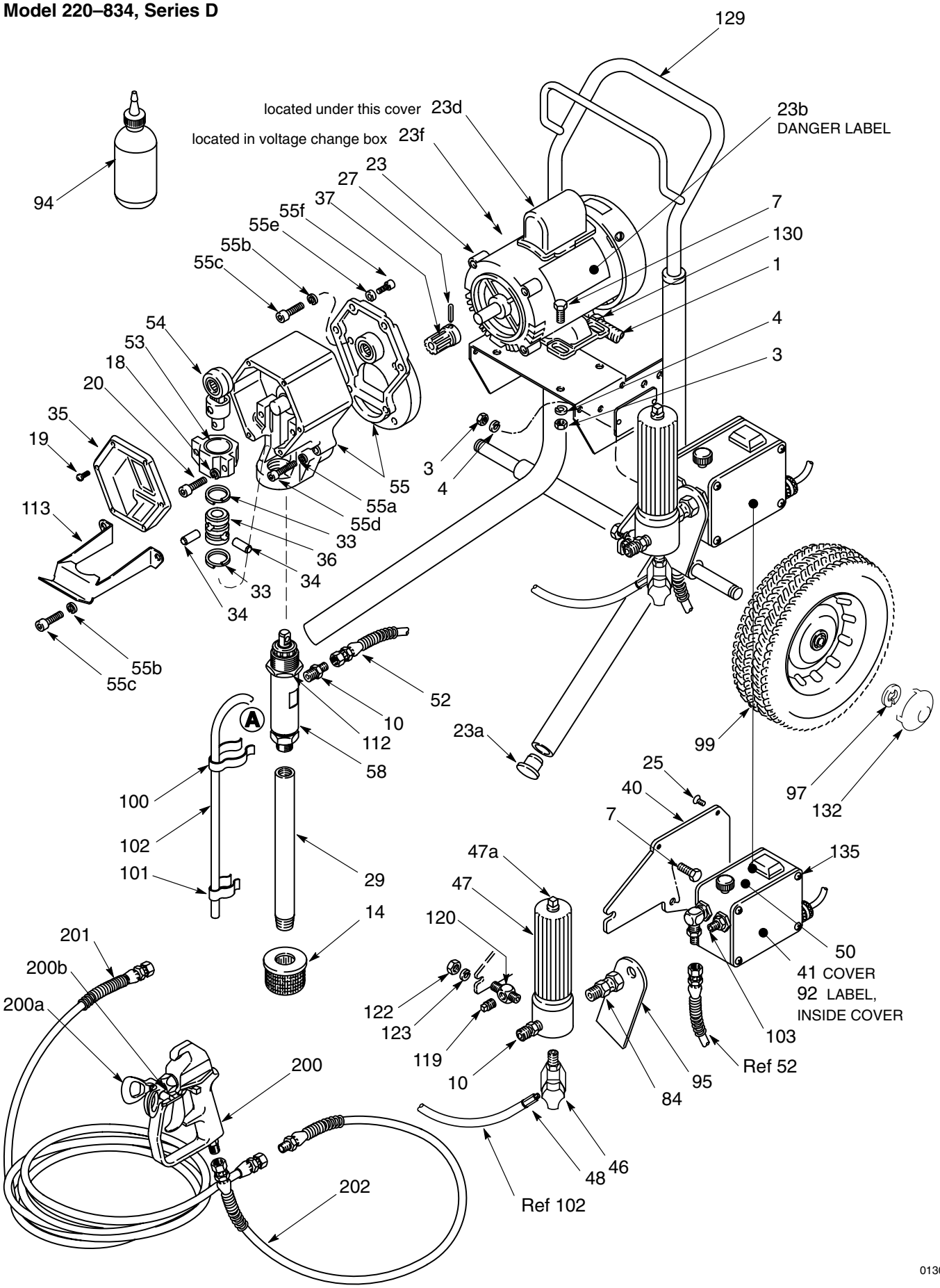
SERVICE INFORMATION

Listed below by the assembly changed are OLD, NEW and DELETED parts. Old and New parts are interchangeable.

Assembly Changed	Part Status	Ref No.	Part No.	Name
220–834	Old		181–060	Conduit
	New	1	065–099	Conduit
	Old		101–344	Capscrew
	New	7	100–057	Capscrew
	Old		181–073	Strainer
	New	14	181–770	Strainer
	Old		178–934	Label
	New	23b	185–954	Label
	Old		106–075	Screw
	New	25	106–078	Screw
	Old		181–070	Bracket
	New	40	185–524	Bracket
	Old		222–198	Valve
	New	46	221–077	Valve
	Add	48	108–928	Connector
	Old		218–083	Hose
	New	52	223–766	Hose
	Old		220–647	Pump
	New	58	222–685	Pump
	Old		210–541	Hose
	New	201	223–541	Hose
	Delete	38		

PARTS DRAWING – SPRAYER

Model 220–834, Series D



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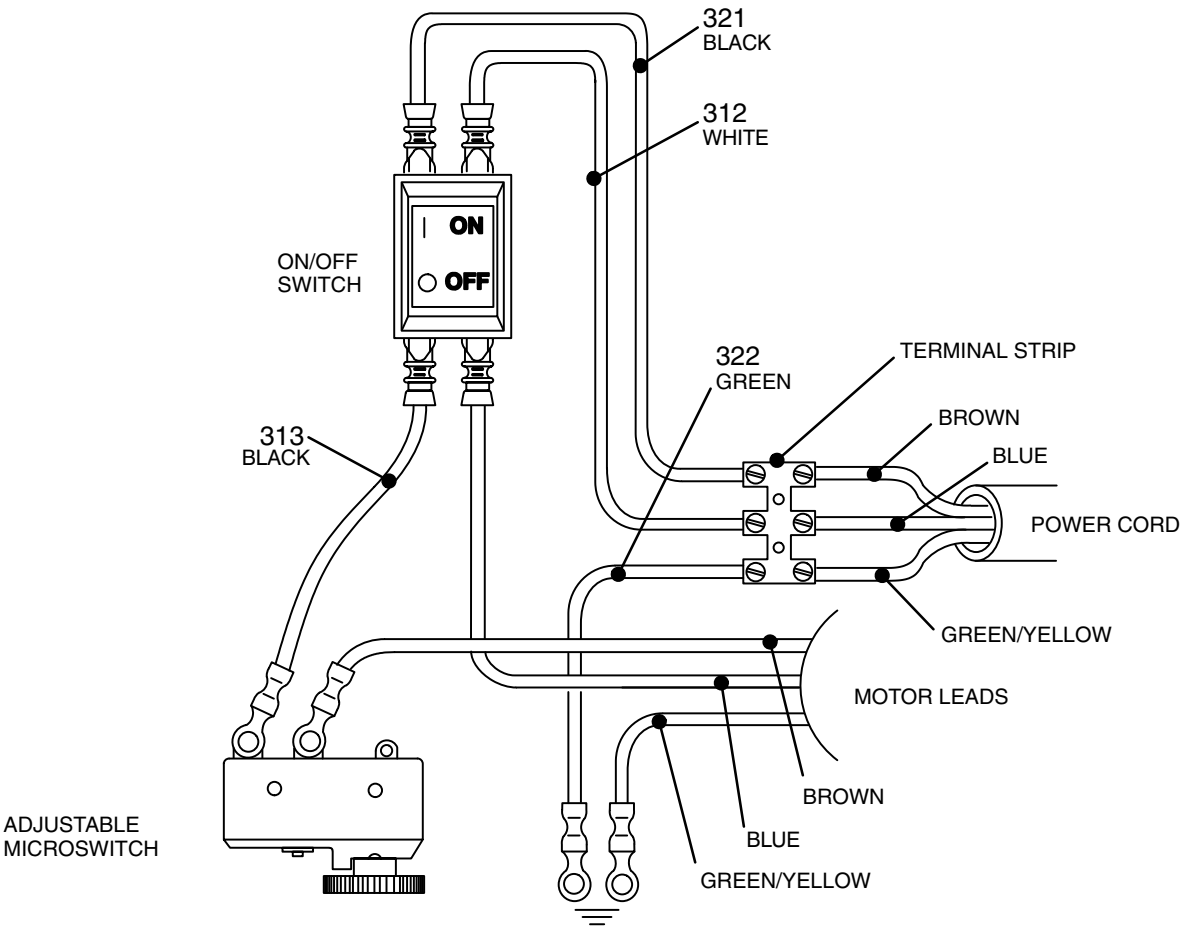
PARTS LIST & DRAWING – PRESSURE CONTROL

Model 222–227

REF NO.	PART NO.	DESCRIPTION	QTY
301	222–196	BARE PRESSURE CONTROL Includes replaceable item 301a	1
301a	109–191	.SWITCH, on/off	1
302	100–035	SCREW, mach, pan head, 8–32 x 5/16”	1
303	157–021	LOCKWASHER, internal, No. 8	1
304	108–295	RELIEF, strain, cord	1
305	102–932	CONNECTOR, conduit, 90°	1
306	183–963	CORD, supply, power	1
308	183–960	LABEL, CAUTION	1
309	100–840	ELBOW, street, 1/4 npt	1
311	178–034	TAG, WARNING	1
312	218–372	CONDUCTOR, with terminal	1
313	215–861	CONDUCTOR, with terminals	1
315	162–453	NIPPLE, 1/4 npsm x 1/4 npt	1
317	107–436	TERMINAL STRIP	1
318	107–438	SCREW, mach, flh, No. 5–40 x 7/8”	2
319	101–792	LOCKWASHER, No. 5, external	2
320	100–975	NUT, hex, No. 5–40	2
321	218–371	CONDUCTOR, with terminal	1
322	222–195	CONDUCTOR, with terminal	1
325	101–754	PLUG, pipe, 3/8 npt x .48”	1

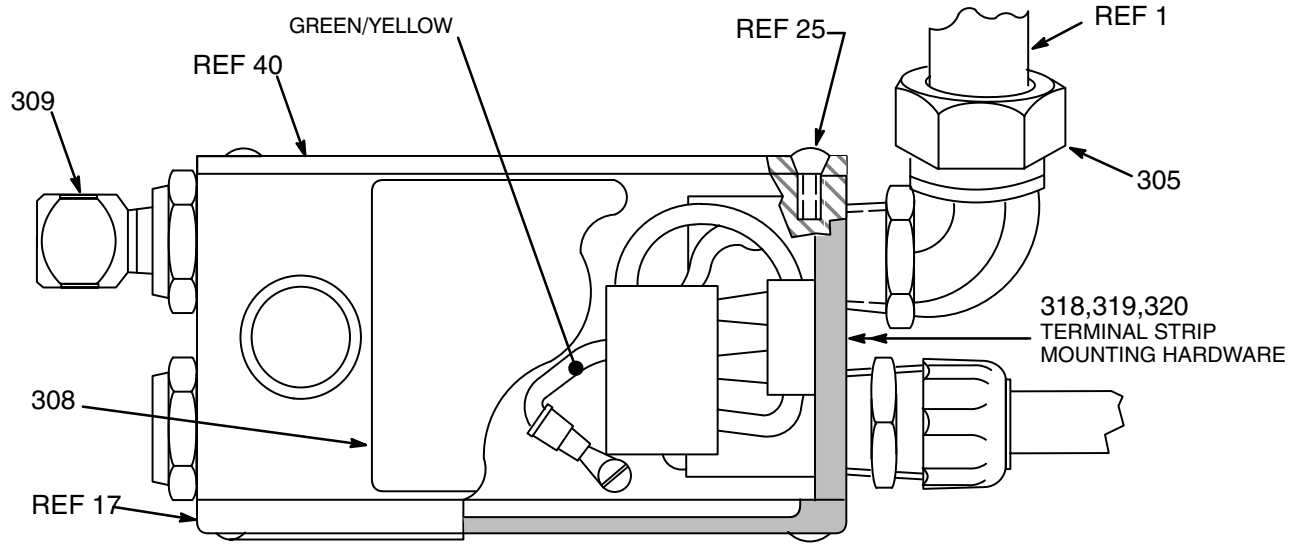
WIRING DIAGRAM



PRESSURE CONTROL BOX WIRING

0131

TOP VIEW



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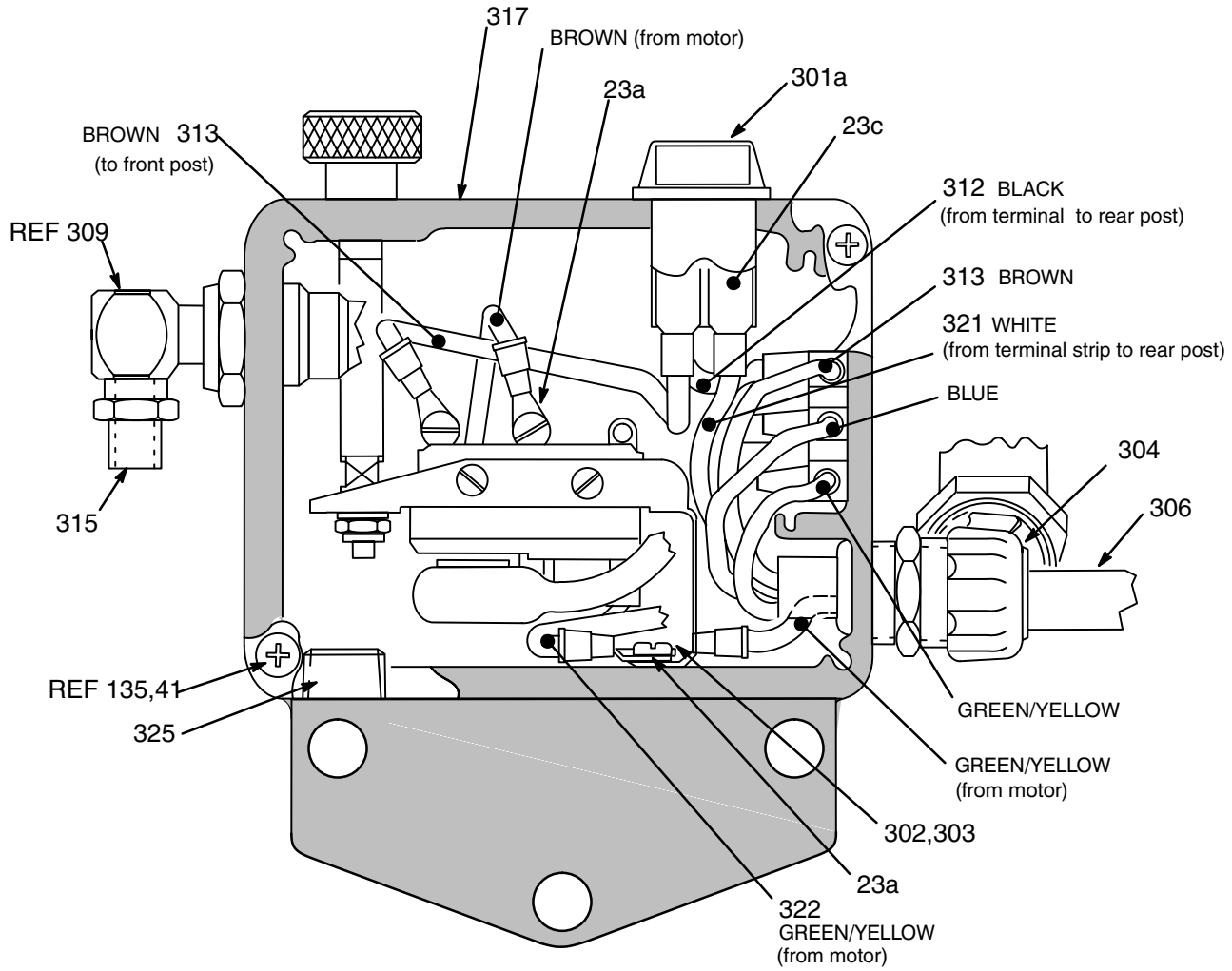
FRONT VIEW



0132

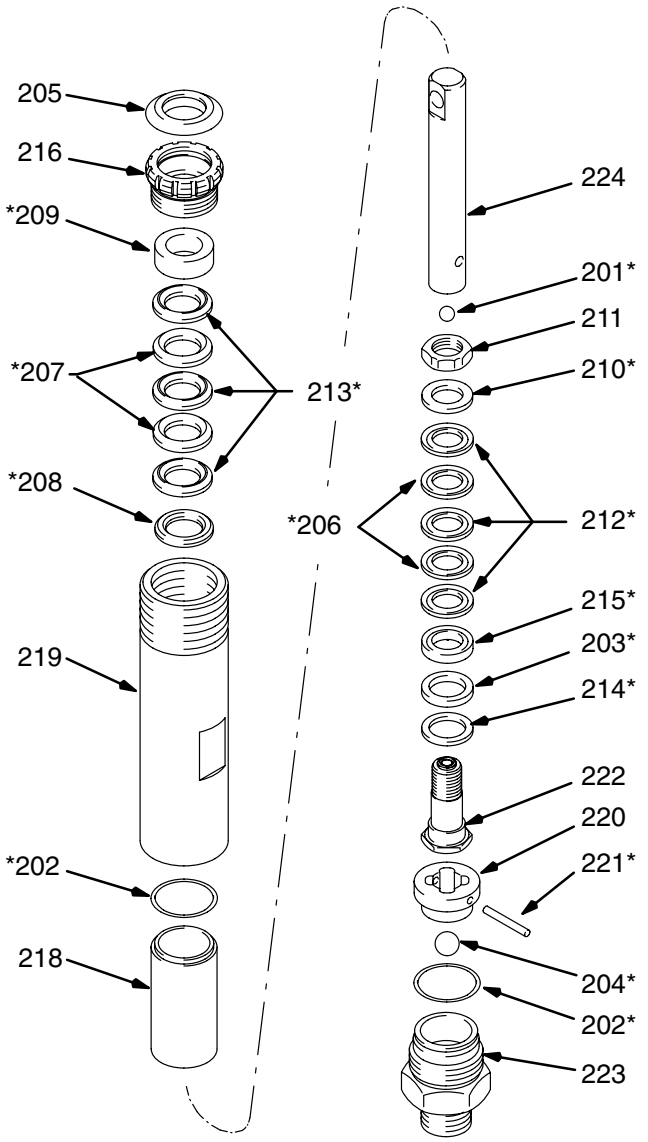
Model 222–584, Series A

Sleeved Displacement Pump

Includes items 201 to 224

REF NO.	PART NO.	DESCRIPTION	QTY
201	105–444*	BALL	1
202	108–954*	PACKING, o–ring, PTFE®	2
203	105–522*	SEAL, u–cup, polyurethane	1
204	105–445*	BALL, sst	1
205	180–656	PLUG 1	
206	176–749*	V–PACKING, leather	2
207	176–755*	V–PACKING, leather	2
208	176–754*	GLAND, male	1
209	176–757*	GLAND, female	1
210	176–750*	GLAND, male	1
211	176–751	NUT, hex, retaining	1
212	176–882*	V–PACKING, polyethylene	3
213	176–997*	V–PACKING, polyethylene	3
214	180–161*	WASHER, backup	1
215	180–073*	GLAND, female	1
216	176–758	NUT, packing	1
218	183–571	SLEEVE, cylinder	1
219	183–562	CYLINDER	1
220	183–559	GUIDE, ball	1
221	183–555*	PIN, ball stop	1
222	218–197	VALVE, piston	1
223	221–098	VALVE, intake	1
224	183–563	ROD, piston	1

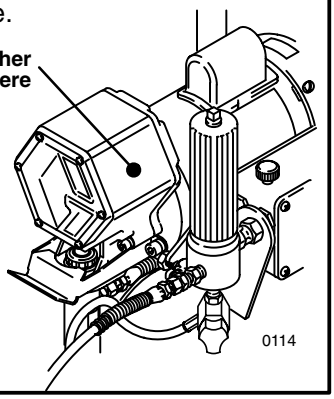
***Supplied in Repair Kit 222–587**
(purchase repair kit separately)



ACCESSORIES

MUST BE PURCHASED SEPARATELY

DANGER LABELS
The English language DANGER label shown on page 1 is also on your sprayer. If you have painters who do not read English, order one of the following labels to apply to your sprayer. The drawing below shows the best placement of these labels for good visibility. Order the labels directly from your Graco distributor, free of charge.



French	**185–956**
Spanish	**185–961**
German	**186–041**
Greek	**186–045**
Korean	**186–049**
English	**185–953**

222–587 DISPLACEMENT PUMP REPAIR KIT
See contents on page 26. Repair instructions are included with the kit.

222–585 SLEEVE REMOVAL TOOL
Required for removing the sleeve when repairing the pump.

THROAT SEAL LIQUID
Non–evaporating liquid for the wet–cup. Helps prevent buildup of paint on the rod and throat packings, to reduce premature wear.

206–994	8 oz.
206–995	1 quart
206–996	1 gallon

TECHNICAL DATA

Power requirements	50 HzAc, 220V/110V,1 phase, fused for 7.5 amp at 220V and 15 amp at 110 V
Electric motor	600 W (0.75 HP), 50 Cycle,1425 RPM with thermal overload protection and automatic reset switch
Max. recommended speed (continuous)	305 Cycles/min
Recommended operating range	192 bar (2750 psi)
Max. delivery (continuous duty)	1.7 liter/min (0.44 GPM)
Intake Strainer	1190 micron (16 mesh), stainles steel screen, reusable
Outlet Filter	250 micron (60 mesh), stainless steel screen, reusable
Wetted parts	Aluminum, Delrin®, Nylon, Rubber–impregnated Leather, Stainless Steel, PTFE®, Polyurethane, Tungsten Carbide, Zinc–plated steel

Delrin® and PTFE®

DIMENSIONS

Height	1042 mm (41 in.)
Length	521 mm (20.5 in.)
Width	521 mm (20.5 in.)
Weight	34 Kg (75 lb)

THE GRACO WARRANTY AND DISCLAIMERS

WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

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

DISCLAIMERS AND LIMITATIONS

THE TERMS OF THIS WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND ARE IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED), INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON–CONTRACTUAL LIABILITIES, INCLUDING PRODUCT LIABILITIES, BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSL Y EXCLUDED AND DENIED. IN NO CASE SHALL GRACO'S LIABILITY EXCEED THE AMOUNT OF THE PURCHASE PRICE. ANY ACTION FOR BREACH OF W ARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS OF THE DATE OF SALE.

EQUIPMENT NOT COVERED BY GRACO WARRANTY

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)
Subsidiary and Affiliate Companies: Canada, England, Korea, Switzerland, France, Germany, Hong Kong, Japan

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