



INSTRUCTIONS

This manual contains important warnings and information.  
**READ AND KEEP FOR REFERENCE.**

*First choice when quality counts.™*

## GH Series Roof Rigs Gas-Hydraulic Airless Sprayers

### GH5030

Model 687100

*Maximum Working Pressure 4900 psi (337 bar, 33.8MPa)*

### GH3640

Model 687327

*Maximum Working Pressure 3600 psi (245 bar, 24.5 MPa)*

### GH2560

Model 965168

*Maximum Working Pressure 2400 psi (166 bar, 16.6 MPa)*

### GH2075

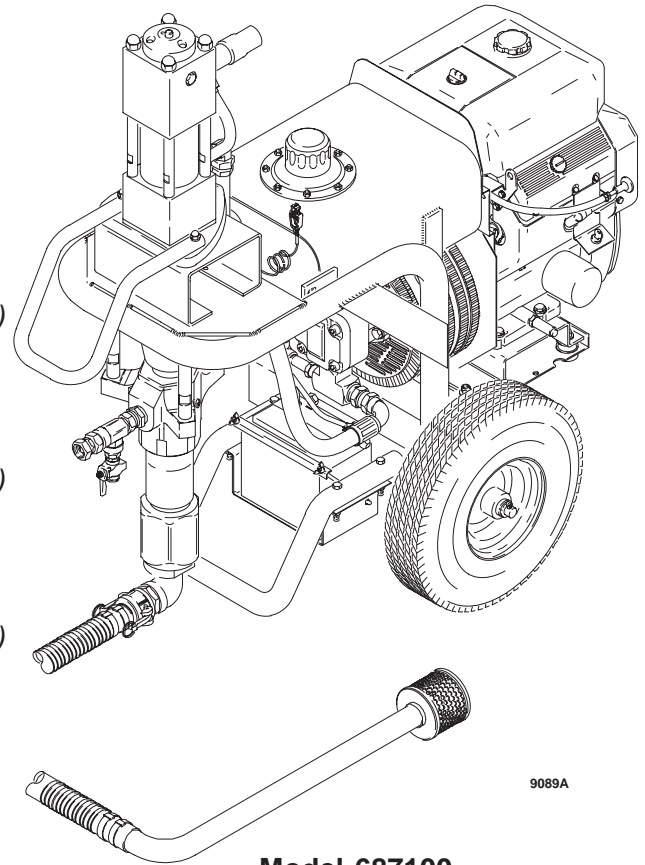
Model 965171

*Maximum Working Pressure 1800 psi (124 bar, 12.4 MPa)*

### GH1015

Model 965165

*Maximum Working Pressure 1000 psi (70 bar, 0.70 MPa)*



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## Symbols

### Warning Symbol



This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

### Caution Symbol



This symbol alerts you to the possibility of damage to equipment if you do not follow the instructions.

**WARNING**

 <small>INSTRUCTIONS</small>	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.</p> <ul style="list-style-type: none"> <li>● This equipment is for professional use only.</li> <li>● Read all instruction manuals, tags, and labels before operating the equipment.</li> <li>● Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.</li> <li>● Do not alter or modify this equipment. Use only genuine Graco parts.</li> <li>● Check equipment daily. Repair or replace worn or damaged parts immediately.</li> <li>● Do not exceed the maximum working pressure of the lowest rated system component. Refer to the <b>Technical Data</b> on page 27 for the maximum working pressure of this equipment.</li> <li>● Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the <b>Technical Data</b> section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.</li> <li>● Do not use hoses to pull equipment.</li> <li>● Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).</li> <li>● Do not lift pressurized equipment.</li> <li>● Comply with all applicable local, state, and national fire, electrical, and safety regulations.</li> <li>● Wear hearing protection when operating this equipment.</li> <li>● Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use could result in a chemical reaction, with the possibility of explosion.</li> </ul>
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# WARNING



## INJECTION HAZARD

Spray from the gun, leaks or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin may look like just a cut, but it is a serious injury. **Get immediate medical attention.**
- Do not point the gun at anyone or at any part of the body.
- Do not put your hand or fingers over the spray tip.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Do not “blow back” fluid; this is not an air spray system.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Check the gun diffuser operation weekly. Refer to the gun manual.
- Be sure the gun trigger safety operates before spraying.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 10 if the spray tip clogs and before cleaning, checking or servicing the equipment.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Fluid hoses must have spring guards on both ends, to help protect them from rupture caused by kinks or bends near the couplings.



## TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.



## FUEL HAZARD

The fuel used in this unit is combustible and when spilled on a hot surface can ignite and cause a fire.

- Do not fill the fuel tank while the engine is running or hot.



## EXHAUST HAZARD

The exhaust contains poisonous carbon dioxide which is colorless and odorless.

- Do not operate this equipment in a closed building.

# ⚠ WARNING



## FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.



- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately**. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.
- Keep the spray area free of debris, including solvent, rags, and gasoline.
- Disconnect all electrical equipment in the spray area.
- Extinguish all open flames or pilot lights in the spray area.
- Do not smoke in the spray area.
- Do not turn on or off any light switch in the spray area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray area.
- Ground the sprayer to a true earth ground with the ground wire and clamp (supplied).
- Use only electrically conductive hoses.



## MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers.

- Keep clear of all moving parts when starting or operating the sprayer.
- Before servicing the equipment, follow the **Pressure Relief Procedure** on page 10 to prevent the equipment from starting unexpectedly.

**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.

⚠ <b>DANGER</b> ⚠	
	<b>FIRE AND EXPLOSION HAZARD</b>
<p>Spray painting, flushing or cleaning equipment with flammable liquids in confined areas can result in fire or explosion.</p> <p>Use outdoors or in extremely well ventilated areas. Ground equipment, hoses, containers and objects being sprayed.</p> <p>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.</p> <p>Failure to follow this warning can result in death or serious injury.</p>	<div style="text-align: center; vertical-align: middle;"> </div> <p style="text-align: center;"><b>SKIN INJECTION HAZARD</b></p> <p>Liquids can be injected into the body by high pressure airless spray or leaks – especially hose leaks.</p> <p>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.</p> <p>Never spray without a tip guard.</p> <p>In case of accidental skin injection, seek immediate “Surgical Treatment”.</p> <p>Failure to follow this warning can result in amputation or serious injury.</p>
<b>READ AND UNDERSTAND ALL LABELS AND INSTRUCTION MANUALS BEFORE USE</b>	

# Component Identification

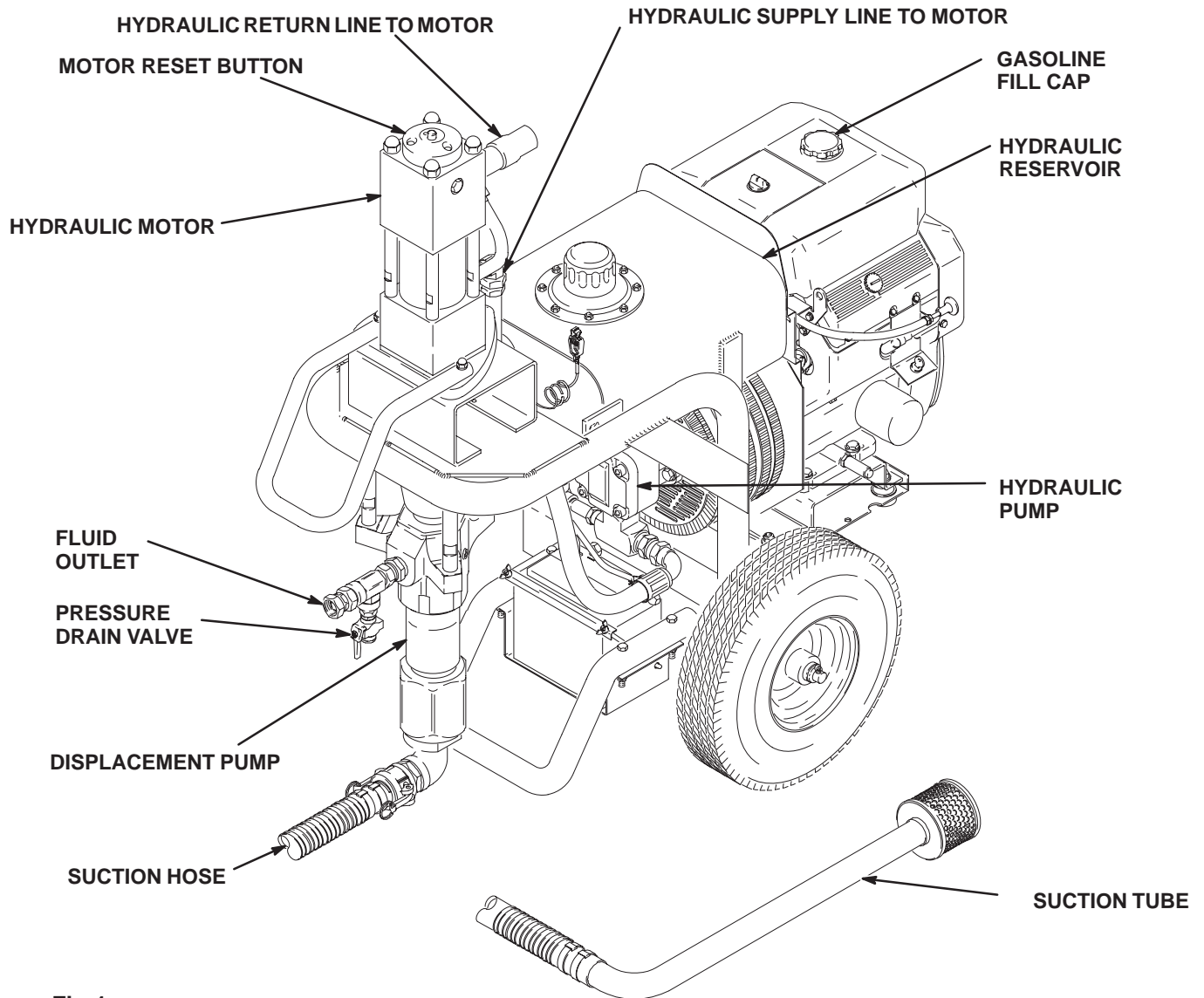


Fig 1

## Setup

### 1. Connect the Hose and Gun

- Remove the plastic cap plug from the outlet tee and screw an accessory, conductive or grounded spray hose onto the 1/4 npsm(f) outlet nipple. See Fig 1.
- Connect a small diameter, 3 ft (0.9 m) whip hose between the main hose and a spray gun, if desired, for more flexible gun movement. See Fig 1.

- Don't use thread sealant on the swiveling nut of the hose couplings, and **don't install the spray tip yet.**

**NOTE:** Use thread sealant on all male threads except at swivel unions. Swivel unions are made to self-seal, and using thread sealant prevents the swivel from turning freely.

- Fill the Packing Nut/Wet Cup** 1/3 full with Graco Throat Seal Liquid (TSL), supplied. See Fig. 2.

# Setup

## 3. Check the Hydraulic Oil Level

- a. Unscrew the hydraulic oil fill cap. See Fig 2. The dipstick is attached to the cap. The oil should be up to the full line on the dipstick.

**⚠ CAUTION**

To prevent damage to the cooling system and hydraulic pump, use *only* Graco Hydraulic Fluid, 169236 (5 gal./20 liter) or 207428 (1 gal/3.8 liter). Other types of hydraulic oil may damage the hydraulic components.

- b. Add oil as needed to the proper level. A completely full hydraulic system contains about 5 gallons (20 liters) of oil.

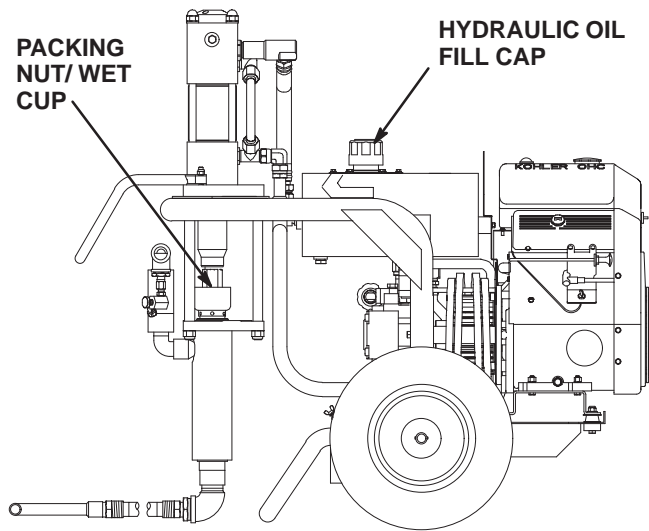


Fig 2 7871A

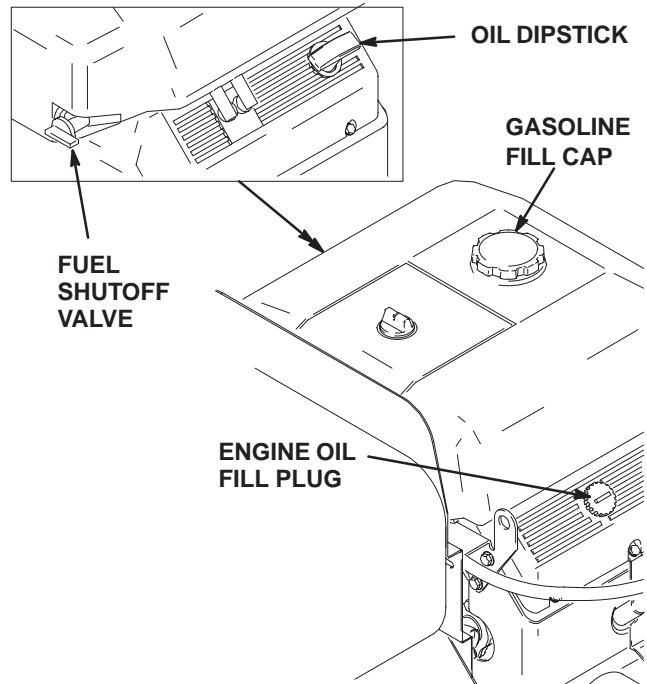


Fig 3 7872A

## 4. Check the Engine Oil Level

- a. Remove the dipstick. See Fig 3.
- b. Check to be sure the oil is up to the full mark on the dipstick.
- c. If oil is needed, see the chart below for the recommended oil type and weight.
- d. Crank case capacity: 1.5 quarts (1.4 liters)

**RECOMMENDED LUBRICATION OIL:** Use a high quality detergent oil of American Petroleum Institute (API) service class SG or SH for regular use and for breaking in a new engine.

GRADE OF OIL CHART	
SEASON OR TEMPERATURE	GRADE OF OIL
Spring, Summer, Autumn	SAE 10W-30
30°F to 0°, Winter	SAE 5W-20 or 10W-20

# Setup

## 5. Fill the Fuel Tank

**! WARNING**



**FIRE AND EXPLOSION HAZARD**  
Fuel spilled on a hot surface can cause a fire or explosion and serious bodily injury and property damage. Shut off engine and let it cool before filling the tank. Carefully follow steps 5.a. to 5.c., below, being sure not to spill any fuel.

- a. Close the fuel shutoff valve. See Fig 3.
- b. Use only clean, fresh, well-known brands of *unleaded regular grade gasoline*. The minimum octane requirements are 87 octane in the U.S.A. and 96 octane elsewhere.
- c. Remove the gasoline fill cap and fill the tank. Be sure the air vent in the fill cap is not plugged so gasoline can flow to the carburetor, then replace the cap. See Fig 3.
- d. Fuel tank capacity: 1.7 gallons (6.5 liters)
- e. Gasoline consumption at the maximum operating speed of 2900 RPM is about 1.3 gallons/hour (4.9 liters/hour).

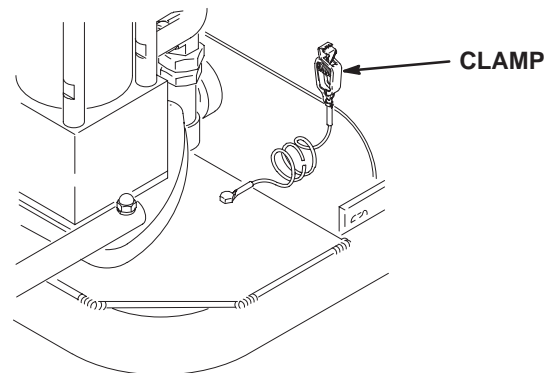
## 6. Grounding

**! WARNING**



**FIRE AND EXPLOSION HAZARD**  
To reduce the risk of static sparking, fire or explosion which can result in serious bodily injury and property damage, ground the sprayer, all system components, and the object being sprayed as instructed under **FIRE OR EXPLOSION HAZARD** on page 3.

Connect the ground wire and clamp (provided) to a true earth ground. See Fig 4.



**Fig 4**

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7. **Flush the sprayer** to remove the oil which was left in the pump after factory testing to protect the pump from corrosion. See **Flushing**.

# Flushing

## When to Flush

1. **New sprayer.** Your new sprayer was factory tested with lightweight oil which was left in to protect pump parts from corrosion.  
**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 rinse.
2. **Changing colors.** Flush with a compatible solvent such as mineral spirits.
3. **Changing from water-base to oil-base paint.** Flush with soapy water, then mineral spirits.

4. **Changing from oil-base to water-base paint.** Flush with mineral spirits, followed by soapy water, then a clean water flush.
5. **Storage.**  
**Water-base paint:** flush with water, then mineral spirits and leave the pump, hose and gun filled with mineral spirits. Follow the **Pressure Relief Procedure Warning**, page 10.  
**Oil-base paint:** flush with mineral spirits. Follow the **Pressure Relief Procedure Warning**, page 10.
6. **Startup after storage.**  
**Before using water-base paint,** flush out mineral spirits with soapy water and then clean water.  
**When using oil-base paint,** flush out mineral spirits with fluid to be sprayed.

## How to Flush

### **WARNING**



#### **INJECTION HAZARD**

Follow the **Pressure Relief Procedure Warning** on page 10. Remove the spray tip before flushing.

1. Engage the gun safety latch. Remove the spray tip from the gun.
2. Pour enough clean, compatible solvent to fill the pump and hoses into a large, grounded metal pail.
3. Place the suction tube into the pail or tilt the sprayer back (it will support itself) and place the pail under the pump. Then tilt the sprayer forward to lower the pump into the pail.
4. Turn the pressure control knob *counterclockwise* until all spring tension is relieved. You will be able to feel it. The sprayer is now set at the lowest pressure setting. Turning the knob further will remove it. Tighten the knob locknut to set. See Fig 5.
5. Open the bypass valve. The valve lever will be parallel to the body of the valve. See Fig 5.
6. Open the fuel shutoff valve by turning it to horizontal. See Fig 5.
7. Close the choke by pulling out on the choke head. See Fig 5.

### **CAUTION**

The bypass valve must be opened when starting the sprayer to prevent damaging the starter.

8. Turn and hold the ignition key to START until you hear the engine "catch", then release the key to RUN. See Fig 5. If the engine does not start, open the choke a little (push in on head). If the engine floods, open the choke all the way and try again.

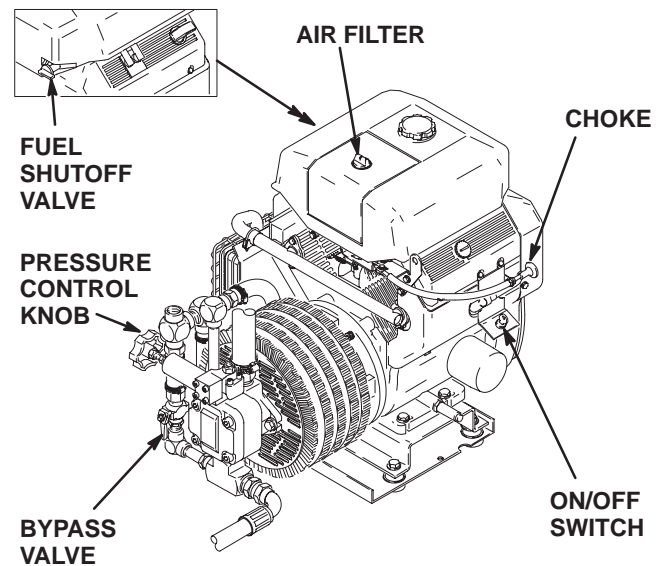


Fig 5

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9. After the engine is warm, gradually open the choke lever (push choke head in completely) and close the bypass valve. See Fig 5.
10. Point the gun into the grounded metal pail and hold a metal part of the gun firmly against the pail.

**NOTE:** To save the fluid in the pump and hose, trigger the gun into the paint container or a separate clean container. At the same time, slowly turn the pressure control knob clockwise just enough to start the pump. When solvent appears, release the trigger and continue as below.



# Flushing

## WARNING



### FIRE AND EXPLOSION HAZARD

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.

11. Making firm metal-to-metal contact, hold the gun firmly to the side of the grounded solvent pail. Trigger the gun. At the same time, slowly turn the pressure control knob clockwise just enough to start the pump.
12. Circulate the solvent until the system is thoroughly flushed.
13. Release the trigger and engage the gun safety latch.
14. **If you are going to start spraying**, place the pump or suction tube into the supply container. Follow the **Pressure Relief Procedure** on page 10. Engage the gun safety latch until you are ready to prime the pump. See Step 3, page 9.
15. **If you are going to store the sprayer**, be sure your final flush is with an oil-based solvent, such as mineral spirits. Remove the suction tube or pump from the solvent pail. Follow the **Pressure Relief Procedure** on page 10. Engage the gun safety latch, but leave the drain valve open.

# Operation

## Pressure Relief Procedure

### **WARNING**



#### **INJECTION HAZARD**

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve the pressure,
- stop spraying,
- check or service any of the system equipment,
- install or clean the spray tip.

1. Engage the gun safety latch.
2. Open the bypass valve.
3. Turn the ignition key to OFF.
4. Close the fuel shutoff valve.
5. 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.
6. Engage the gun safety latch.
7. Open the pressure drain valve, having a container ready to catch the drainage. 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.*

#### 1. Prepare the Fluid

- a. Prepare the fluid according to the fluid manufacturer's recommendations.
- b. Place the pump or suction tube into the fluid container.

#### 2. Starting the Sprayer

- a. Open the bypass valve to make startup easier. In the open position, the valve lever is parallel to the body of the valve. See Fig 6. Close the filter drain valve.
  - b. Turn the pressure control knob *counterclockwise* until all spring tension is relieved. You will be able to feel it. The sprayer is now set at the lowest pressure setting. Turning the knob further will cause it to fall off.
  - c. Open the fuel shutoff valve. See Fig 6.
  - d. If the engine is cold, close the choke by turning the lever to the ON position (horizontal). See Fig 6.
3. Turn and hold the ignition key to START until you hear the engine "catch", then release the key to RUN. See Fig 6. If the engine does not start, open the choke a little (push the choke head in). If the engine floods, open the choke all the way and try again.
  - e. After the engine is warm, gradually open the choke lever (push choke head in completely) and close the bypass valve. See Fig 6.

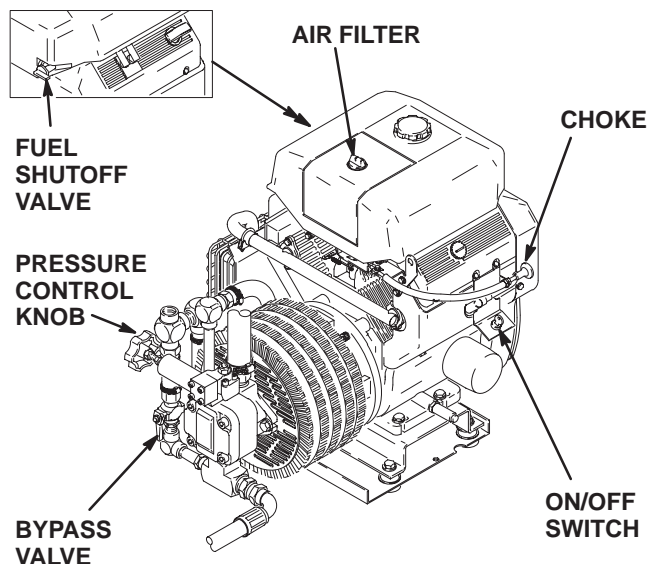


Fig 6

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**NOTE:** In cold weather, run the engine for about 15 minutes with the bypass valve open before starting the displacement pump, to help avoid hydraulic motor stalling.

- f. Follow the **Pressure Relief Procedure Warning** on page 10, to shut off the sprayer.

### **WARNING**

**To stop the engine in an emergency, turn OFF the ignition key. Close the bypass valve if possible. See Fig 6. Then follow the **Pressure Relief Procedure Warning** on page 10.**

# Operation

If the motor stalls during operation, turn OFF the ignition key. With your hand, firmly press straight down on the motor reset button. Now try to restart the sprayer. If it will not start, refer to the separate motor manual, 307158.

## ⚠ CAUTION

Never use a hammer to depress the reset button, as it could cause serious internal motor damage.

### 4. Prime the Pump

- a. Be sure the gun safety latch is engaged.
- b. Don't install the spray tip yet!
- c. If the engine has not been started, follow the procedure in Step 2., page 10.
- d. Disengage the gun safety latch.
- e. Point the gun into a grounded metal pail and hold a metal part of the gun *firmly* against the pail. See the WARNING below.
- f. Squeeze the trigger and *slowly* turn the pressure control knob *clockwise* just enough to start the pump. See Fig 6.
- g. Operate the pump until all air is purged from the pump and hoses and the fluid is flowing freely from the gun.
- h. Release the trigger and engage the safety latch.
- i. Turn the pressure control knob *counterclockwise* until all spring tension is relieved. You will be able to feel it. The sprayer is now at the lowest pressure setting. Turning the knob further will remove it.
- j. Follow the **Pressure Relief Procedure** on page 10. Then install the spray tip in the gun as instructed in the separate gun or tip instruction manual. If you are using the RAC IV supplied with this sprayer, see manual 308644.

### 5. Adjusting the Pressure

- a. Turn the pressure control knob *clockwise* to increase and *counterclockwise* to decrease the pressure. Tighten the knob locknut to set.
- b. Always use the lowest pressure that is necessary to completely atomize the fluid.

## ⚠ CAUTION

Operating the sprayer at a higher pressure than necessary wastes fluid, causes early tip wear, and shortens the 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. See the separate manual received with your gun.

## ⚠ CAUTION

The engine throttle has been set and locked at 3000 RPM. The sprayer warranty will be voided and the hydraulic pump life shortened if this adjustment is changed.

### 6. Cleaning a Clogged Tip

## ⚠ WARNING



### INJECTION HAZARD

To reduce the risk of a fluid injection injury, NEVER hold your hand, body or a rag in front of the spray tip when cleaning or checking for a cleared tip. To reduce the risk of a fire or explosion, always hold the gun firmly against the side of a grounded metal waste container when checking to see if the tip was cleared or when using a self-clearing tip.

- a. Follow the **Pressure Relief Procedure Warning** on page 10.
- b. Clean the front of the tip frequently during the day to keep the fluid from building up and clogging the tip. To clean, and to clear a tip if it clogs, refer to your separate gun instruction manual. If you are using the RAC IV tip guard and SwitchTip, refer to manual 308644.

### 7. Shutting Off the Sprayer

- a. Whenever you stop spraying, even for a short break, follow the **Pressure Relief Procedure Warning** on page 10.
- b. Clean the tip and gun as recommended in your separate gun or tip manual.
- c. Flush the sprayer at the end of each work day if using water-based fluid or if it could harden in the sprayer over night. See **FLUSHING**, page 8. Use a compatible solvent to flush, then fill the pump and hoses with solvent such as mineral spirits to help prevent pump corrosion. **Relieve pressure!**
- d. For long term shutdown or storage, *always* fill the sprayer with mineral spirits to prevent pump corrosion. **Relieve pressure!**

### 8. Adjusting the Intake Valve Ball Travel.

- a. The pump is set to handle medium volume, low viscosity fluid. To adjust the pump for higher flow or heavier viscosity fluid, disassemble the intake valve as instructed in the appropriate pump manual listed in the parts list and move the ball stop pin to a higher set of holes. This increases the ball travel.

# Maintenance

1. **Always stop the pump at the bottom of its stroke** when you take a break and at the end of the day. This helps keep fluid from drying on the rod and damaging the packings.
2. **Keep the displacement pump packing nut/wet cup 1/3 full of TSL** at all times. The TSL helps protect the packings and rod.
3. **Check the tightness of the packing nut daily.** It should be tight enough to stop leakage but no tighter.

## ⚠ CAUTION

Proper engine and hydraulic oil level is important to prevent costly damage to the sprayer. Check it as often as recommended in Steps 4 and 5., below.

4. **Check the hydraulic oil level weekly.** The oil must be up to the top mark on the dipstick. Use only Graco Hydraulic Oil.
5. **Check the engine oil level at least weekly.** The oil must be up to the FULL mark on the dipstick. The engine should not use more than one ounce of oil per hour of operation. Consult the engine manual, supplied, for additional recommended maintenance.
6. **Inspect the return line filter frequently** for clogging. Replace it after every 500 hours of operation or every 6 months, whichever comes first. A clogged or worn out filter reduces filter capability and will damage the hydraulic pump.
7. **Check the battery water level** periodically and refill as necessary.
8. **Change the hydraulic oil after every 2000 hours** of operation or every 12 months, whichever comes first. For continuous operation in temperatures above 85°F (30°C), change the oil after every 1000 hours or 6 months of use. See Step 9. for the procedure.

## ⚠ CAUTION

Cleanliness is essential when servicing the hydraulic system. Use special care to avoid getting dust or dirt into the hydraulic system to prevent damage to the hydraulic components.

9. **To change the hydraulic oil:**
  - a. Follow the **Pressure Relief Procedure Warning** on page 10.
  - b. Place a waste container under the drain plug of the hydraulic reservoir. See Fig 7. Unscrew the plug and drain the reservoir. Reinstall the plug before proceeding.
  - c. Remove the nuts and reservoir cover.
  - d. Remove the return line filter and install a new filter assembly.
  - e. Inspect the inlet filter and replace it if needed.
  - f. Install the reservoir cover and nuts. Then pour in five gallons (19 liters) of Graco Hydraulic Oil through the intake filter. See Fig 7. Install the fill cap.

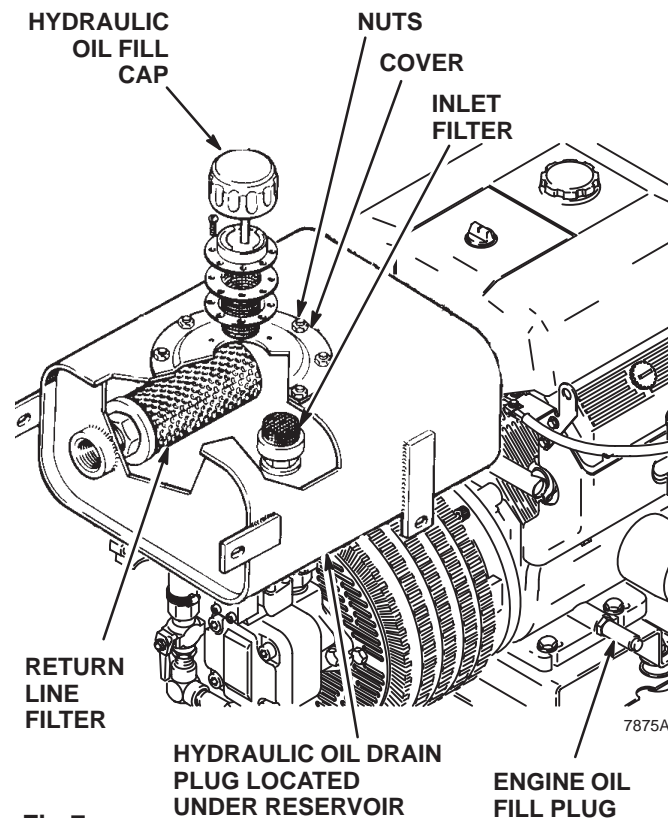


Fig 7

# Troubleshooting

## ⚠ WARNING



### INJECTION HAZARD

To reduce the risk of serious injury, whenever you are instructed to relieve pressure, follow the **Pressure Relief Procedure** on page 10.

Check everything in the troubleshooting chart before disassembling the sprayer.

PROBLEM	CAUSE	SOLUTION
Gas engine doesn't work properly.		Consult engine manual, supplied.
Gas engine will not start.		Check battery.
Gas engine operates, but displacement pump doesn't operate.	Hydraulic motor stalled.  Pressure setting too low. Displacement pump outlet filter (if used) is dirty or clogged. Tip or tip filter (if used) is clogged. Hydraulic fluid too low.  Hydraulic pump worn or damaged. Hydraulic motor worn or damaged. Displacement pump rod seized by dried paint.	Turn the ignition key to OFF. Firmly press straight down on motor reset button. Restart sprayer, see page 10. If it doesn't start, see manual 307158.  Increase pressure. See page 11.  Clean the filter.  Remove tip and/or filter and clean. Shut off sprayer and add fluid immediately*. See page 5.  Return sprayer for repair. Return sprayer for repair. Service pump. See pump manual.
Displacement pump operates, but output is low on upstroke.	Piston ball check not seating properly. Piston packings worn or damaged.	Service piston ball check. See pump manual. Replace packings. See pump manual.
Displacement pump operates but output is low on downstroke and/ or on both strokes.	Piston packings worn or damaged. Intake valve ball check not seating properly.	Replace packings. See pump manual. Service intake valve ball check. See pump manual.
Paint leaks into wetcup.	Loose wet-cup. Throat packings worn or damaged.	Tighten just enough to stop leakage. Replace packings. See pump manual.
Excessive leakage around hydraulic motor piston rod wiper.	Piston rod seal worn or damaged.	Replace these parts. See manual 307158.
Fluid delivery is low.	Pressure setting too low. Displacement pump outlet filter (if used) is dirty or clogged. Hydraulic pump is worn or damaged. Hydraulic motor is worn or damaged. Large pressure drop in fluid hose.	Increase pressure. See page 11. Clean filter.  Return sprayer for repair. Return sprayer for repair. Use larger diameter hose.
The sprayer overheats.	Cooler or blower is worn or damaged.	Replace. See page 15.
Spitting from gun.	Air in fluid pump or hose.  Fluid supply is low or empty.	Check for loose connections on siphon assembly, tighten, then reprime pump. Refill supply container.

\*Check hydraulic fluid level often. Do not allow it to become too low. Use only Graco approved hydraulic fluid. See pages 6 and 27.

## Replacing the Hydraulic Pump

1. Follow the **Pressure Relief Procedure Warning** on page 10. Let the hydraulic system cool before beginning the service procedure.
2. Unscrew the reservoir drain plug (51, page 24), having a container ready to catch the draining fluid.
3. Disconnect the hose (7) from the bypass valve (9) by loosening the hose clamp (8). See Fig 8.
4. Loosen the hose clamp (8) and pull the hose (85) off the hose insert (5) near the elbow (3). See Fig 8.
5. Loosen the hose clamp (54) on the hose (53) just above the hydraulic pump (107). See Fig 8.
6. Loosen the tube fitting nut (18) of hose (22). See Fig 8.
7. Remove the two capscrews (150), lockwashers (66) and washers (64) holding the pump (107) to the support (117). See Fig 8.

8. Pull the pump straight off the pump support.
9. Loosen the setscrews (108) on the pump half of the coupler (109). See Fig 9.
10. Remove all fittings from the old pump and install them on the new pump in the same order.
11. Check Dimension A as shown in Fig 9. When the dimension is correct, tighten the setscrews (108), slide the new pump assembly onto the pump support (117) and recheck the dimension.
12. Reconnect the hoses. Reinstall the reservoir plug (51, page 24), and refill the reservoir with clean, Graco approved hydraulic oil.

### **CAUTION**

The correct coupling dimension is critical to avoid improper coupler engagement to the coupler spider which will damage the coupler and make the sprayer inoperable.

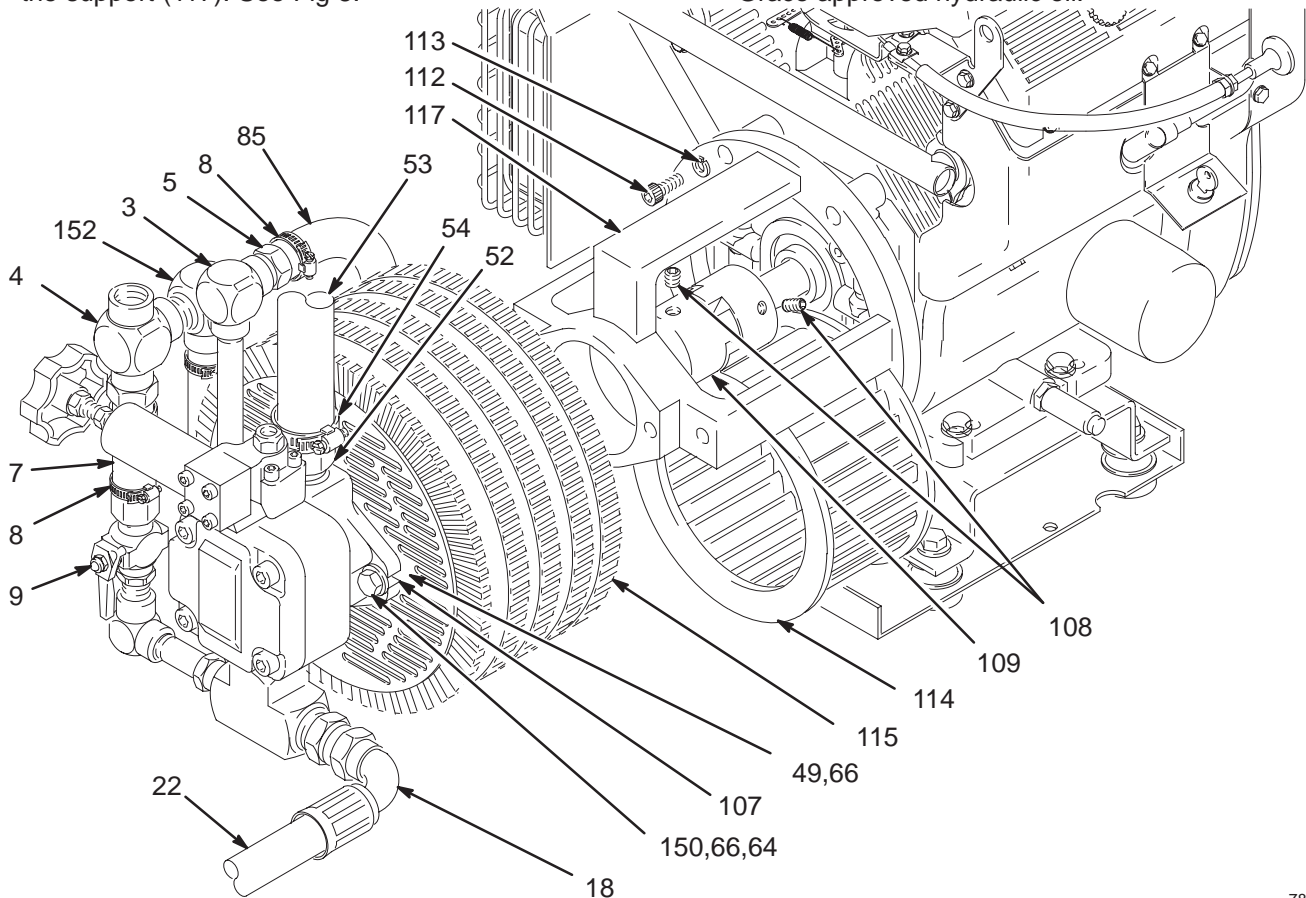


Fig 8

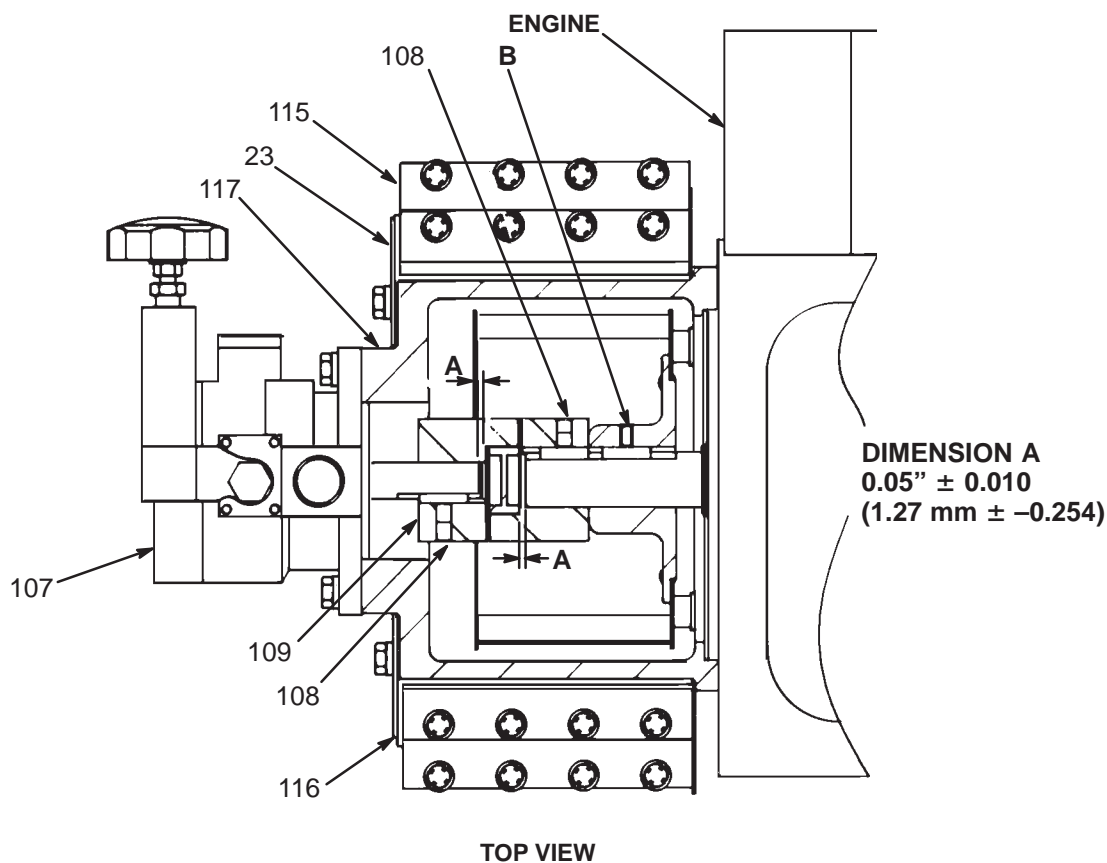
7876A

## Replacing the Cooler and Blower

1. Follow the **Pressure Relief Procedure Warning** on page 10. Let the hydraulic system cool before beginning the service procedure.
2. Remove the hydraulic pump as instructed in the previous section.
3. Disconnect the cooler to reservoir return hose (7.) by loosening the hose clamp (8). See Fig 8.
4. Remove the cooler capscrews (49) and lockwashers (66). See Fig 8.
5. Remove the fan guard (23, page 24). See Fig 8.
6. Pull the cooler (115) straight out.
7. Inspect the rubber pad (116) for wear and replace if necessary. See Fig 9.
8. Inspect the blower wheel (114) for wear. See Fig 8. If it needs to be replaced, follow Steps 8a–8e.
  - a. Unscrew the setscrews (108) from the engine half of the coupler (109). Unscrew the blower setscrews (B). See Fig 9.
  - b. Remove the capscrews (112) and lockwashers (113) holding the pump support (117) to the engine and pull the support off. See Fig 8.
  - c. Pull the pump support and blower off far enough for the blower to fall out of the bottom of the housing.
  - d. Install a new blower. Secure the pump support (117) to the engine. See Fig 8.
  - e. Check Dimension A as shown in Fig 9 and tighten the coupler setscrews (108). Butt the blower hub up to the coupler half, keeping the blower in full contact with the coupler, and tighten the blower setscrews (B).
9. Install the cooler.
10. Fold the flaps of the pad (116) toward the cooler fins and install the fan guard (23, page 24), capscrews (49) and lockwashers (66). See Fig 8.
11. Reinstall the hydraulic pump and reconnect all hoses.

### **⚠ CAUTION**

The correct coupling dimension is critical to avoid improper coupler engagement to the coupler spider which will damage the coupler and make the sprayer inoperable.



**DIMENSION A**  
 $0.05'' \pm 0.010$   
 $(1.27 \text{ mm} \pm -0.254)$

Fig 9

# Displacement Pump Service

## 210–208 Displacement Pump

### Disconnect the Displacement Pump

1. Flush the pump if possible. Stop the pump on the down stroke.
2. Follow the **Pressure Relief Procedure Warning** on page 10.
3. Reference Roof Rig Parts Drawings, page 22.
4. Remove the suction tube and fluid hose from the displacement pump.
5. Unscrew the three tie rod locknuts (48). See appropriate sprayer parts drawing.
6. Unscrew the shouldered nut (35). Pull the displacement pump (46) off the tie rods (47).
7. Screw the jam nut (90) up onto the connecting rod (91).
8. Remove the lower cotter pin (89) and unscrew the connecting rod (91) from the connecting rod coupling (36, page 22).

9. Refer to separate pump manual for displacement pump repair instructions.

### Reconnecting the Displacement Pump

1. Screw the connecting rod (91) into the connecting rod coupling (36, page 22) and replace the lower cotter pin (89). Screw the jam nut (90) all the way down. See appropriate sprayer parts drawing.
2. Mount the displacement pump (46) onto the tie rods (47).
3. Screw the shouldered nut (35) onto the hydraulic motor (29). Screw the tie rod locknuts (48) onto the tie rods (47) and torque to 35–50 ft-lb (47–68 N.m).
4. Reattach the hoses to the displacement pump.
5. If the grounding wire was disconnected before service, be sure to reconnect it before operating the sprayer.
6. Start the pump and operate it slowly to check the tie rods for binding. Adjust the tie rod locknuts, if necessary to eliminate binding.



# Displacement Pump Service

## 236466, 237510, 222801 Displacement Pumps

### Disconnecting the Displacement Pump

1. Flush the pump, if possible. Stop the pump at the bottom of its stroke.

### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

2. **Relieve the pressure.**
3. Reference Roof Rig Parts Drawings, pages 18 through 21.
4. Disconnect the air or hydraulic hose and the fluid hose. Plug all hydraulic hoses immediately, to prevent contamination of the hydraulic system.
5. Disconnect the displacement pump (46) from the motor (29) as follows. Note the relative position of the pump fluid outlet (81) to the hydraulic inlet (76) of the motor. If the motor does not require servicing, leave it attached to its mounting.

### CAUTION

Use *at least* two people when lifting, moving, or disconnecting the pump. This pump is too heavy for one person. Support the displacement pump while it is being disconnected, to prevent it from falling and causing injury or property damage.

If the pump is mounted on a cart, slowly tip the cart backward until the handle rests on the ground, then disconnect the displacement pump.

6. Using an adjustable wrench (or hammer and punch), unscrew the coupling nut (170) from the motor shaft ( Ref. 29). Take care not to lose or drop the coupling collars (80).
7. Hold the tie rod flats with a wrench to keep the rods from turning. Unscrew the nuts (48) from the tie rods (47). Carefully remove the displacement pump (46) from the motor (29).
8. Refer to separate manual listed in parts list for displacement pump service. To service the hydraulic motor, refer to the separate motor manual, supplied.

### Reconnecting the Displacement Pump

1. Make sure coupling nut (170) and coupling collars (80) are in place on displacement rod (Ref. 29).
2. Use at least two people to hold the displacement pump while another reconnects it to the motor (see the preceding **CAUTION**). Orient the pump fluid outlet (81) to the hydraulic inlet (76) as was noted in step 5 under **Disconnecting the Displacement Pump**. Position the displacement pump (46) on the tie rods (47).
3. Screw the nuts (48) onto the tie rods (47) and torque to 81–89 N.m (60–66 ft-lb).
4. Screw coupling nut onto motor shaft (Ref. 29), loosely. Hold the motor shaft flats with a wrench to keep it from turning. Use an adjustable wrench to tighten the coupling nut. Torque to 196–210 N.m (145–155 ft-lb).
5. Reconnect all hoses. Reconnect the ground wire if it was disconnected. Fill the packing nut (2) 1/3 full of Graco Throat Seal Liquid or compatible solvent.
6. Turn on the hydraulic power supply. Open the hydraulic return line valve *first*, then the supply line valve. Run the pump slowly to ensure proper operation.

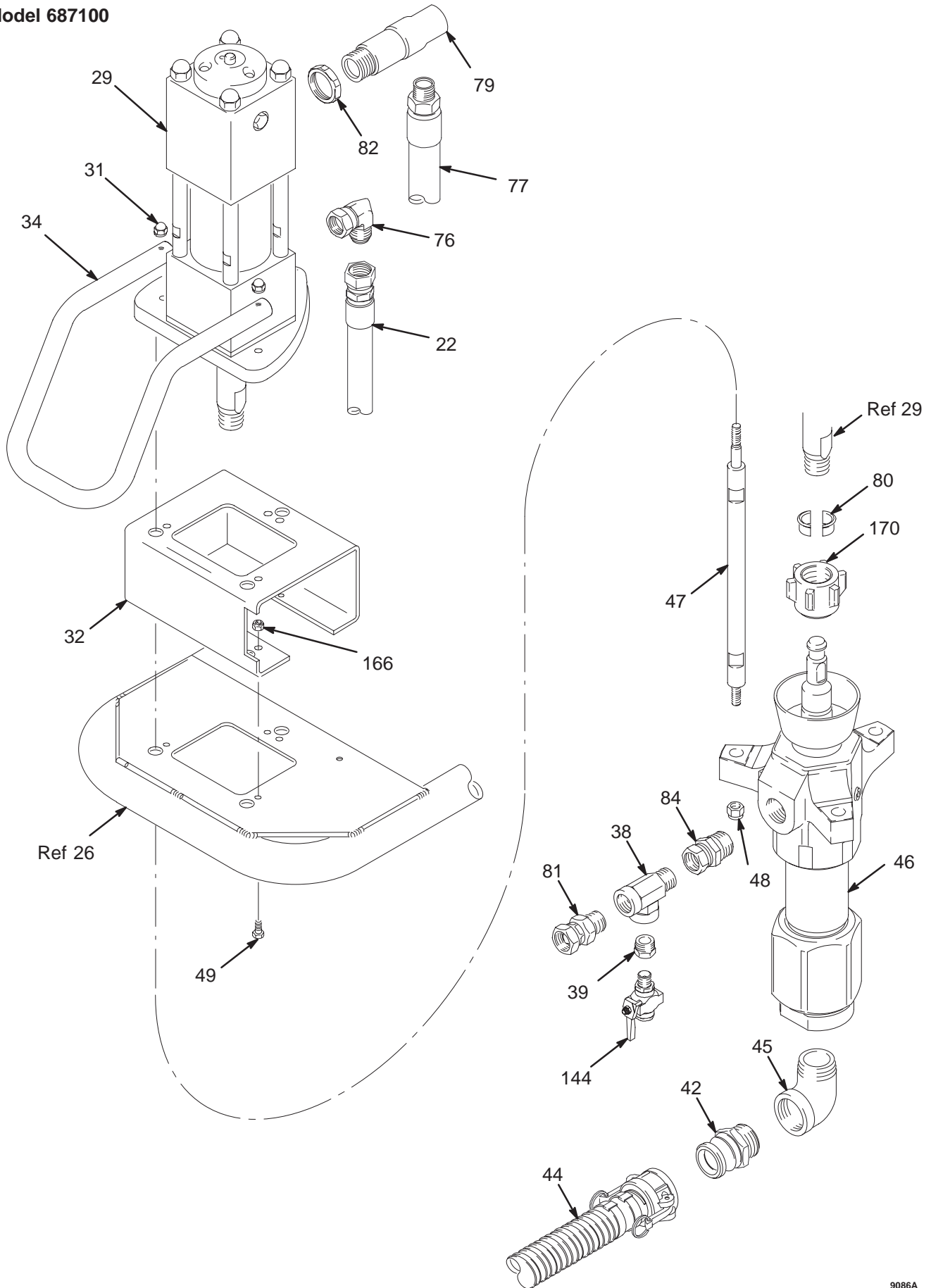
### WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 10.

7. Before returning the pump to production, **relieve the pressure** and retorque the packing nut (2) to 136–149 N.m (100–110 ft-lb).

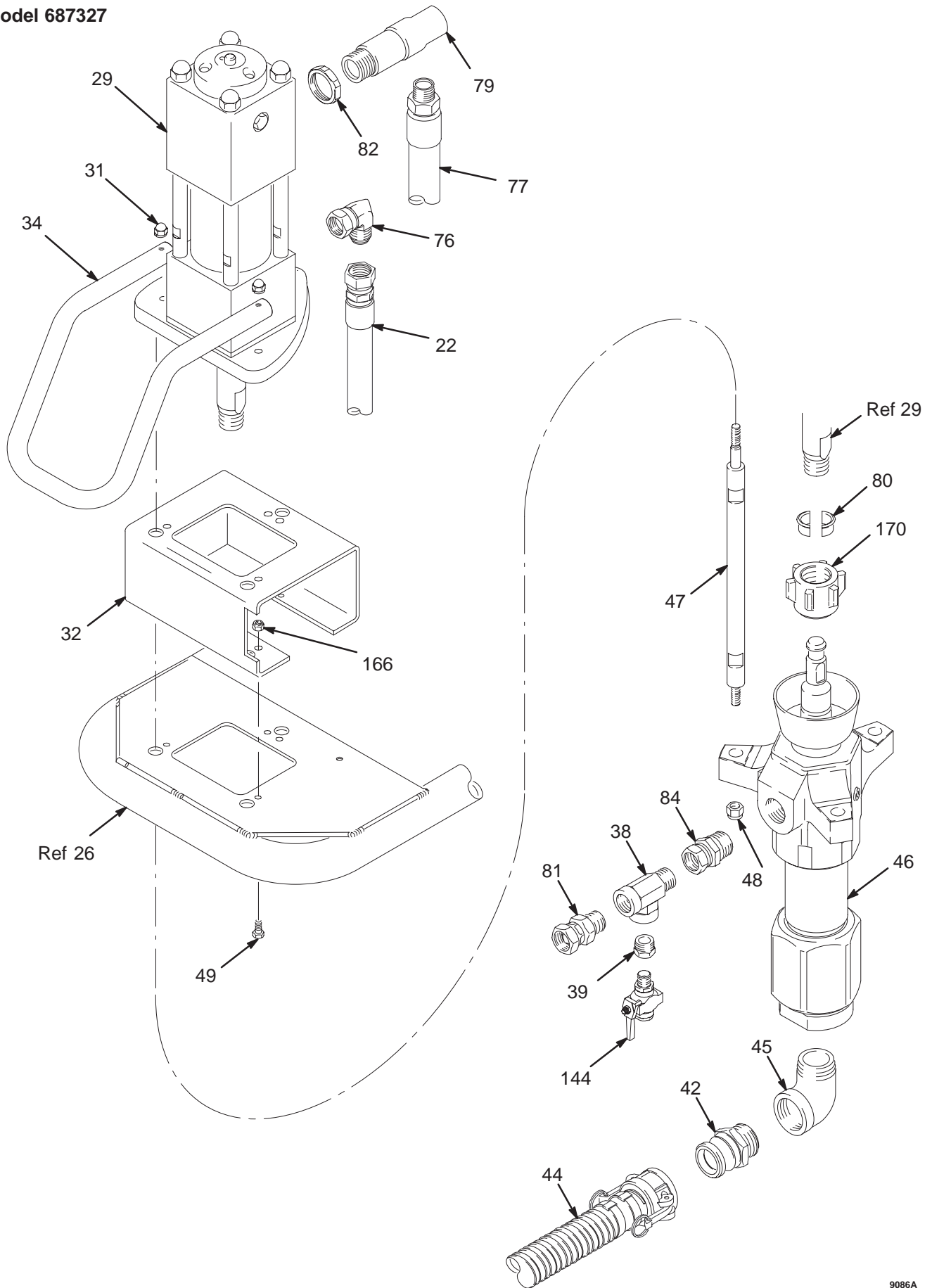
# GH5030 Roof Rig Parts Drawing

Model 687100



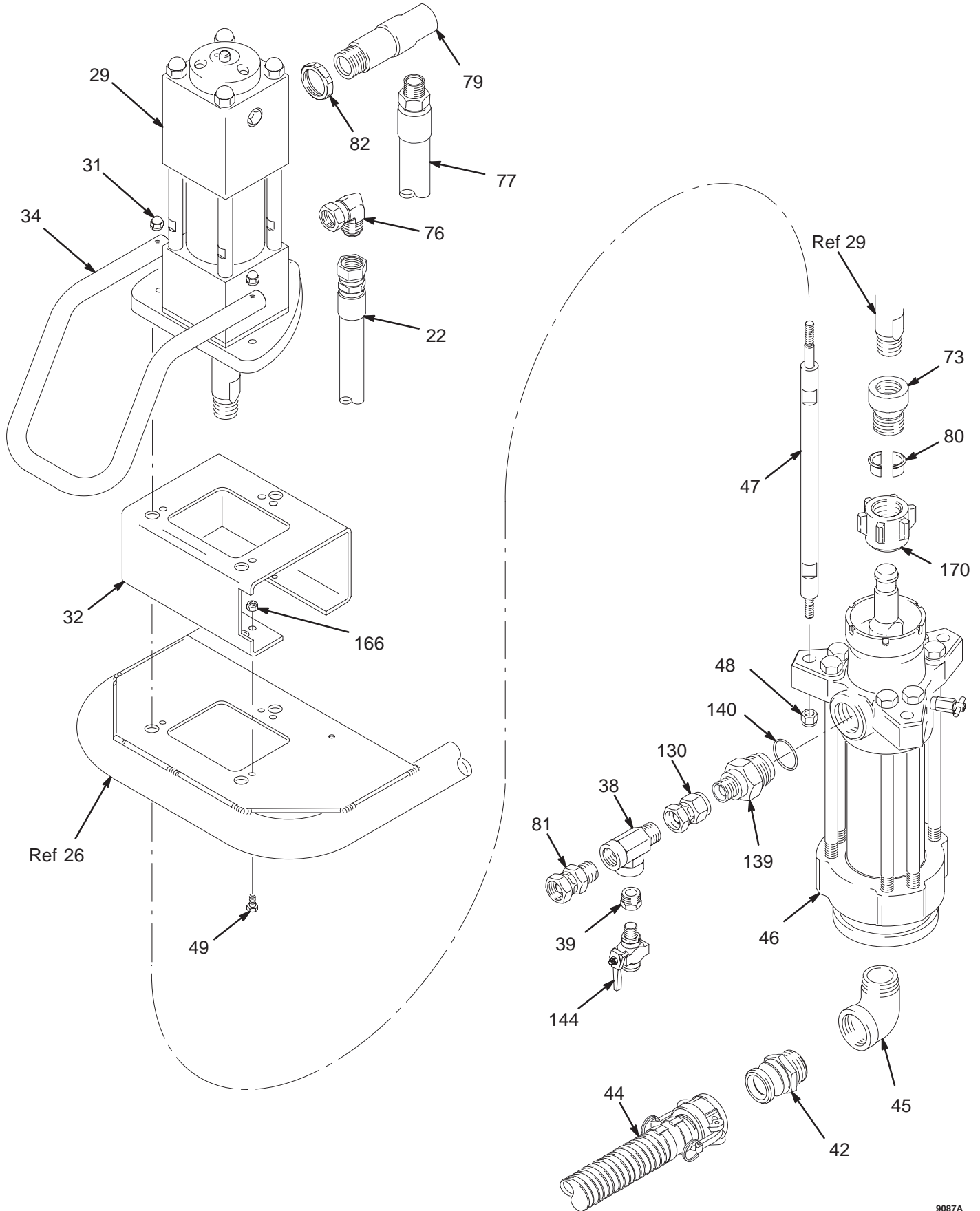
# GH3640 Roof Rig Parts Drawing

Model 687327



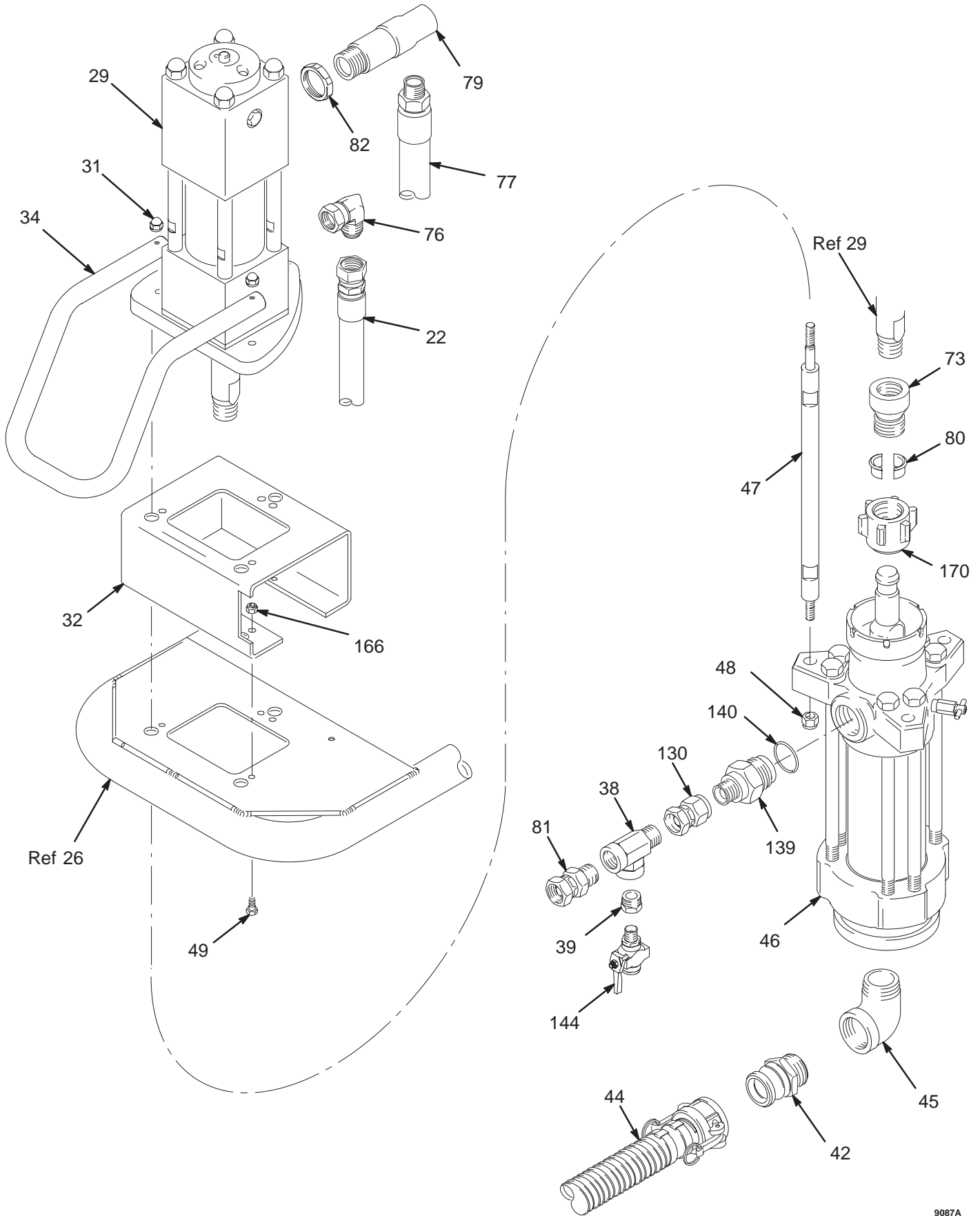
# GH2560 Roof Rig Parts Drawing

Model 965168



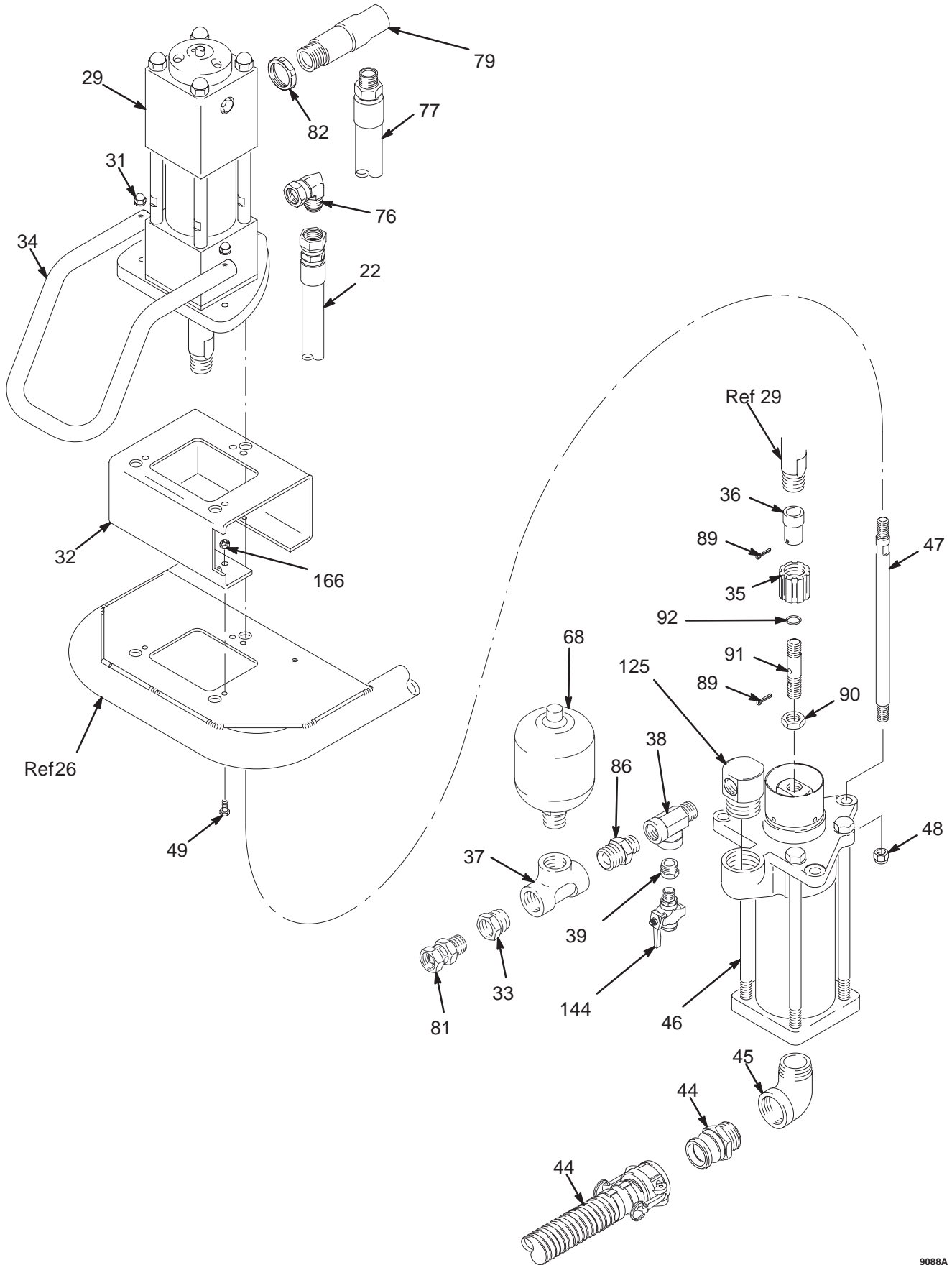
# GH2075 Roof Rig Parts Drawing

Model 965171



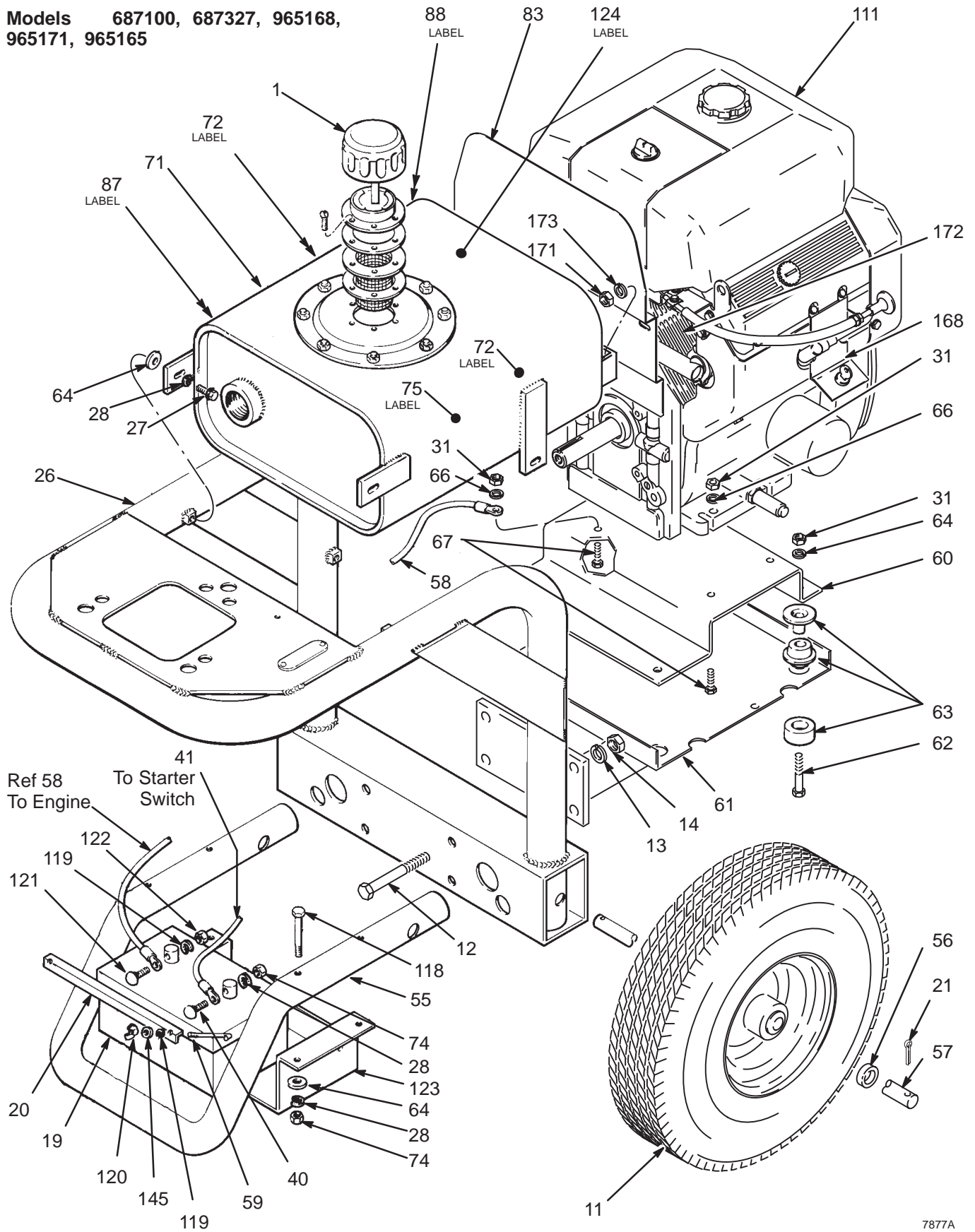
# GH1015 Roof Rig Parts Drawing

Model 965165



# Roof Rigs Sprayer Parts Drawing

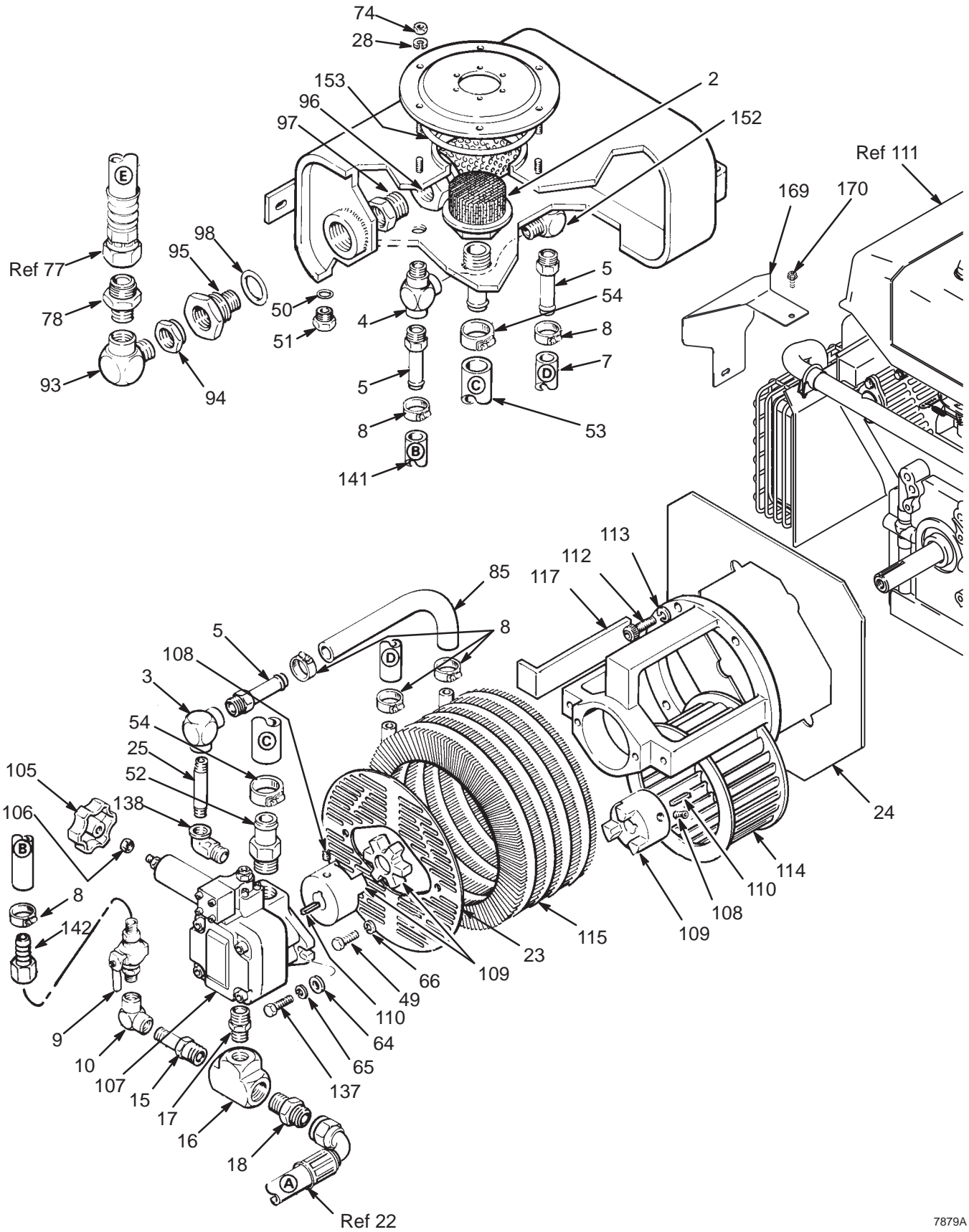
Models 687100, 687327, 965168,  
965171, 965165



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# Roof Rigs Sprayer Parts Drawing

Models 687100, 687327, 965168,  
965171, 965165





# Roof Rigs Parts List

## All Models

### REF

NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
1	107074	BREATHER, fill cap	1	71	218125	RESERVOIR KIT	1
2	106114	STRAINER, inlet	1	72	185951*	LABEL, DANGER	1
3	107053	ELBOW, pipe, 90°, 1/2 x 3/8 npt	1	73	184471	COUPLER	1
4	107128	TEE, service	1	74	100188	NUT, heavy hex, 5/16–18 unc–2a	11
5	107050	INSERT, hose, 1/2 npt(f)	3	75	177807	LABEL, identification	1
7	178859	HOSE, rubber, 5" (125 mm)	1	76	106053	ELBOW, 90°, 1–1/16" thread	1
8	102473	CLAMP, hose	6	77	513574	HOSE, coupled 1" X 20"	1
9	210658	VALVE, ball 3/8 npt(m)	1	78	107127	ADAPTER, male, 1–5/16" x 3/4"	1
10	165472	ELBOW, pipe, 90°, 3/8 npt(f)	1	79	620188	ADAPTER, 1" (m) x3/4 x 1/2 x 3/8 (f)	1
11	106039	WHEEL	2	80	184180	COLLAR coupling	2
12	106123	CAPSCREW, hex hd, 1/2 x 4"	4	81	157785	UNION 3/4" (M)–(F) Straight	1
13	100018	LOCKWASHER, spring, 1/2"	4	82	105430	NUT, seal, 1" npt	1
14	100321	NUT, hex, 1/2" thread	4	83	191957	SHIELD, heat	1
15	158979	NIPPLE, pipe, reducing, 3/8 x 1/2 npt	1	84	202965	UNION, 1" M–3/4" F	1
16	103475	TEE, pipe, 1/2 npt(f)	1	85	178795	HOSE, cooler, 0.625", 10.5" lg	1
17	158491	NIPPLE, short, 1/2 npt	1	86	158555	NIPPLE	1
18	107052	FITTING, tube, flared	1	87	177808	LABEL, identification	1
19	107126	BATTERY, 12 volt, "L" style terminals	1	88	178935	LABEL, caution	1
20	107069	CLAMP, battery	1	89	100103	PIN, cotter, 0.125" dia, 1.5" long	2
21	101354	PIN, straight, spring	2	90	101936	NUT, hex jam, 3/4"–10	1
22	513575	HOSE, coupled 3/4" X 30"	1	91	168212	ROD, connecting	1
23	178751	GUARD, fan	1	92	158674	PACKING, o–ring, buna–n	1
24	179714	SPACER	1	93	107125	ELBOW, 90° street, 3/4 npt(m)	1
25	100213	NIPPLE, pipe, 3/8 npt x 3"	1	94	105429	NUT, seal, 3/4 npt	1
26	217469	FRAME, pump	1	95	178750	FITTING, return, 1" npt(m) x 3/4 npt(f)	1
27	101578	CAPSCREW, hex head, no. 8–32 x 0.38"	4	96	178794	FILTER, fluid	1
28	100214	LOCKWASHER, spring, 5/16"	19	97	500054	BUSHING, hex hd	1
29	217022	MOTOR, hydraulic, <i>manual307158</i>	1	98	107067	O–RING, buna–n	1
30	177755	LABEL, identification	1	103	112798	SCREW, mach, hex washer hd, 8 x 3/8"	1
31	101566	NUT, lock, 3/8–16	6	105	219099	KNOB, pump	1
32	625057	Bracket, hydraulic motor	2	106	100187	NUT, hex, 5/16"	1
33	158586	REDUCER, 1"	2	107	178872	PUMP, vane, hydraulic	1
34	177652	HANDLE	1	108	100421	SETSCREW, 5/16" X 3/8"	2
35	168210	NUT, shouldered	1	109	106063	COUPLER	2
36	168211	COUPLING, connecting rod	1	110	605358	KEY, 1/4"	2
37	500566	TEE	2	111	113822	ENGINE, 16 HP, OHC	1
38	111337	TEE, 1" npt(f)	1	112	107143	CAPSCREW, sch, 7/16 x 1.25"	4
39	106466	REDUCER, 1" npt(m) x 1/4" npt(f)	1	113	100052	LOCKWASHER, spring, 7/16"	4
40	107129	BOLT, carriage, 5/16" x 1"	1	114	178792	BLOWER	1
41	113952	CABLE, battery, positive, 26", 6 awg	1	115	178788	COOLER	1
42	102000	BUSHING, 1–1/2" x 1" npt	1	116	178861	PAD	2
43	214959	HOSE, suction, 1"npt(mbe), 1" ID, 6 ft (1.8 m) long, spring guard both ends	1	117	178786	SUPPORT, pump	1
44	513631	KIT, suction, Roofing Rig	1	118	102169	CAPSCREW, hex hd, 5/16 x 1.5	4
45	101552	ELBOW, street, 90°, 1–1/2" npt	1	119	100016	LOCKWASHER, spring, 1/4"	3
46		PUMP, Displacement		120	100011	WING NUT, 1/2"	2
	236466	GH5030, GH2560; manual 308353	1	121	107139	BOLT, carriage, 1/4 x 1"	1
	237510	GH3640; manual 308359	1	122	100015	NUT, hex, 1/4–10 unc	1
	222801	GH2075; manual 308151	1	123	178787	SHELF, battery	1
	210208	GH1015; manual 308043	1	124	217286	CHECK VALVE, 1" npt (fbe)	1
47		ROD, Tie		130	156172	UNION	1
	626654	GH5030, GH3640, 12.83" shoulder to shoulder	3	131	206994	TSL, 8 oz. <i>not shown</i>	1
	625055	GH2560, GH2075, 14.44" shoulder to shoulder	3	132	185016	LABEL, Caution	1
	609822	GH1015, 11.01" shoulder to shoulder	3	137	100004	CAPSCREW, hex hd, 3/8–16" x 1.25"	2
48	101712	NUT, lock, type "E" 5/8"– 11	3	138	107032	ELBOW, 90° street, 3/8 npt (m x f)	1
49	100101	Screw, Hex HD 3/8–16 X 1"	5	139	184470	COUPLER	1
50	104444	O–RING, VITON®	1	140	109213	O–RING	1
51	104126	PLUG, box, 3/4"	1	141	183574	HOSE, rubber tube, 4.5"	1
52	107049	INSERT, hose, 3/4 npt(f)	1	142	183575	NIPPLE, barbed hose, 3/8–18 npt(f)	1
53	178791	HOSE, suction, 1" ID, 3' (9.9 m)	1	143	237686	GROUND WIRE & CLAMP	1
54	101818	CLAMP, hose, for 13/16" to 1–1/2" OD	2	144	224441	VALVE, ball	1
55	178773	LEG, frame	1	145	158233	WASHER, flat	2
56	177641	WASHER, flat	2	150	159841	ADAPTER	1
57	177570	AXLE	1	166	101566	NUT, Nylock 3/8–16	1
58	113951	CABLE, battery, negative, 13" , 6 awg	1	167	110838	LOCKNUT, 5/16"	4
59	107068	HOOK, bolt, 1/4" thread	1	168	191958	BRACKET, switch	1
60	191955	PLATE, engine	1	169	191959	GUARD, muffler	1
61	216141	SUPPORT, engine	1	170	184096	NUT, Coupling	1
62	100468	CAPSCREW, hex hd, 3/8 x 1.5"	4	171	113819	NUT, 1/4"	2
63	104766	MOUNT, motor	4	172	100022	SCREW, cap, 1/4"	2
64	100023	WASHER, 3/8"	18	173	100016	WASHER, lock	2
66	100133	LOCKWASHER, 3/8"	8	174	290320	LABEL, identification	1
67	102547	CAPSCREW, hex hd, 3/8 x 2.5"	4	175	290319	LABEL, caution	1
68	803444	DAMPNER, pulsation	1	176	070401	TUBING, electrical, 13"	1
70	184129	COLLAR, coupling	2	177	186925	NUT, Coupling	1

\*DANGER and WARNING labels are available at no charge.

## Notes

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# Technical Data

Engine .....	KOHLER Model TH16 OHC 4 cycle twin cylinder, air cooled, 16 HP, (12 Kw)
Gasoline .....	1.7 gallon (6.4 liter capacity) consumes 1.3 gal/hr (4.9 liter/hr)
Hydraulic Fluid Sump .....	5 gallon (19 liters)
Hydraulic Pressure .....	1300 psi (89 bar) 10.2 gpm (39 l/min)
Displacement Pump	
GH5030 .....	4900 psi (337 bar, 33.8MPa) Maximum Working Pressure 2.8 gpm (10.5 lpm) output, 15 cycles/gallon
GH3640 .....	3600 psi (245 bar, 24.5 MPa) Maximum Working Pressure 3.8gpm (14.4 lpm) output, 15 cycles/gallon
GH2560 .....	2400 psi (166 bar, 16.6 MPa) Maximum Working Pressure 6gpm (22.7 lpm) output, 15 cycles/gallon
GH2075 .....	1800 psi (124 bar, 12.4 MPa) Maximum Working Pressure 7.5gpm (28.4 lpm) output, 15 cycles/gallon
GH1015 .....	1000 psi (70 bar, .70 MPa) Maximum Working Pressure 15gpm (56.7 lpm) output, 15 cycles/gallon
Pump Fluid Outlet Size .....	1 in. npt(f)
Fluid Filter Outlet Size .....	1/4 npt(f)
Wetted Parts:	
Displacement Pump .....	Steel, Nitralloy, Tungsten Carbide, Teflon®, Leather
Filter .....	Aluminum, Carbon steel, Stainless Steel,
Weight (dry w/o packaging) .....	465 lb (103 kg)
Height .....	48 in. (1.2 m)
Length .....	48 in. (1.2 m)
Width .....	29 in. (736 mm)
Sound Levels*:	
Sound Pressure .....	91 dB(A)
Sound Power .....	106 dB(A)

\* Measured at maximum normal load conditions.

**NOTE:** Teflon® is a registered trademark of the DuPont Company.

# Graco Phone Number

**TO PLACE AN ORDER**, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-690-2894 Toll Free.**

## Accessories

*Must be purchased separately.*

### GRACO-APPROVED HYDRAULIC FLUID

<b>169236</b>	5 Gallons (20 liters)
<b>207428</b>	1 Gallon (3.8 liters)

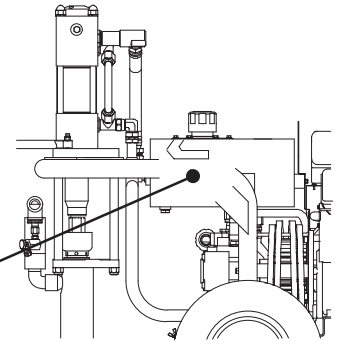
### DANGER LABELS

The English language DANGER label shown on page 4 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 Graco, free of charge. Toll Free: 1-800-328-0211

<b>French</b>	<b>186956</b>
<b>Spanish</b>	<b>185961</b>
<b>German</b>	<b>186041</b>
<b>Greek</b>	<b>186045</b>
<b>Korean</b>	<b>186049</b>
<b>English</b>	<b>185593</b>

Apply other language here



# Graco Warranty

Graco warrants all equipment listed in this manual which is manufactured by Graco 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. With the exception of any special extended or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

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

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

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, gas engines, 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.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

## **FOR GRACO CANADA CUSTOMERS**

The parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

## **ADDITIONAL WARRANTY COVERAGE**

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

*All written and visual data contained in this document reflects the latest product information available at the time of publication.  
Graco reserves the right to make changes at any time without notice.*

**Sales Offices:** Minneapolis, Detroit

**Foreign Offices:** Belgium, England, Korea, France, Germany, Hong Kong, Japan

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**<http://www.graco.com>**

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