HYDRA-SPRAY®
23:1 RATIO MONARK PUMP

2760 psi (190 bar) MAXIMUM WORKING PRESSURE

Model 218-058 Series A
with Standard Displacement Pump

Model 218-059 Series A
with Severe-Duty Displacement Pump*

*Severe-Duty Displacement Pumps have an abrasion and corrosion resistant displacement rod and sleeve. Refer to Technical Data for wetted parts information.

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**WARNING**

**HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY.**

FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.

Read and understand all instruction manuals before operating equipment.

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**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 anyone or at any part of the body. NEVER put hand or fingers over the spray tip.

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 bloodstream. 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 diffuser operation regularly. Follow the Pressure Relief Procedure, right, then remove the spray tip. Aim the gun into a grounded 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.

**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 or other serious bodily injury, 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.

Read and follow the fluid and solvent manufacturer’s literature regarding the use of protective clothing and equipment.

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, accidentally placing your fingers or any part of your body close to the spray tip.

**Trigger Guard**
NEVER operate the gun with the trigger guard removed. The trigger guard reduces 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 and then remove the spray tip to clean it.

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

**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 whenever you shut off the pump, 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. Shut off the air to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Disengage the gun safety latch.
5. 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 drain valve (required in your system), having a grounded metal container ready to catch the drainage.
8. Leave the drain 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, VERY SLOWLY loosen the trigger guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

**System Pressure**
The 23:1 Ratio Monark pump develops 2760 psi (190 bar) MAXIMUM WORKING PRESSURE at 120 psi (8 bar) air pressure. NEVER exceed 120 psi (8 bar) air supply pressure to the pump.

Be sure all system components and accessories are rated to withstand the maximum working pressure of the pump. DO NOT exceed the maximum working pressure of any component or accessory used in your system.

**Fluid Compatibility**
BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the Technical Data on the back cover. Always read the manufacturer’s literature before using fluid or solvent in this pump.
FIRE OR EXPLOSION HAZARD

Static electricity is created by the high velocity flow of fluid through the pump and hose. If every pan 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. 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.

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 pump and all other components used or located in the spray area. CHECK your local electrical code for detailed grounding instructions for your area and type of equipment and be sure to ground all of these components:

1. Pump: use ground wire and clamp as shown in Fig 1.
2. Air and fluid hoses: use only grounded hoses with a maximum of 500 feet (150 m) combined hose length to ensure grounding continuity. Refer to Hose Grounding Continuity.
3. Air compressor: follow air compressor manufacturer’s recommendations.
4. Spray gun or dispensing valve: obtain grounding through connection to a properly grounded fluid hose and pump.
5. Object being sprayed: according to local code.
6. Fluid supply container: according to local code.

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 SPRING GUARDS! The spring guards 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 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.

MOVING PARTS HAZARD

The piston in the air motor, located behind the air motor plates, moves when the air is supplied to the motor. Moving pans can pinch or amputate your fingers or other body pans. Therefore, NEVER operate the pump with the air motor plates removed. KEEP CLEAR of moving parts when staning or operating the pump. Before checking or servicing the pump, follow the Pressure Relief Procedure on page 2 to Prevent the pump from starting accidentally.

IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards—particularly the General Standards, Pan 1910, and the Construction Standards, Pan 1926—should be consulted.
The dimensional drawing on page 14 gives measurements needed for installing the pump on a custom designed mounting. Accessories are shown on page 13.

NOTE: Reference numbers and letters in parentheses in the text refer to the Typical Installation drawing, Figures 1-5 end the Parts Drawing.

Ground the Pump and Other System Components

WARNING

Ground the pump, all other components in the system, and the object being sprayed as instructed in FIRE AND EXPLOSION HAZARD on page 3.

System Accessories

The Typical Installation drawing is only a guide to selecting and installing required and optional components. To help ensure that your system suits your needs, contact your Graco representative for professional design assistance.

NOTE: To ensure maximum pump performance, be sure that any accessory used is properly sized to meet your system requirements.

Install an air line oiler (H) near the air inlet, for automatic pump lubrication, and an air regulator (J) to control pump speed and fluid pressure. Install an air line filter (K) to remove harmful dirt and moisture from the compressed air, and a bleed-type master air valve (E), located within reach of the pump area.

WARNING

Two accessories, the bleed-type master air valve (E), and the fluid drain valve (F) are required for your system to reduce the risk of serious bodily injury from moving parts, splashing, or fluid injection when shutting off the pump.

The bleed-type air valve relieves air trapped between the valve and pump, after the pump is shut off. Trapped air can cause the pump to cycle unexpectedly and result in serious bodily injury if you are adjusting or repairing the pump.

The fluid drain valve helps relieve fluid pressure in the displacement pump, hose end gun when shutting off the pump. Triggering the gun to relieve pressure may not be sufficient, especially if there is a clog in the hose, gun or tip.

Install a pump runaway control valve (R) to shut off the air supply to the pump if the pump accelerates beyond the pre-adjusted setting. A pump which operates too fast can be seriously damaged.

Downstream from the pump, on the fluid line, install a fluid filter (L) and a drain valve (F).

Connect Hoses

Connect a grounded fluid dispensing hose (M) to the 318 npt(f) fluid outlet.

Connect a suction hose (P) or siphon tube to the 314 npt(m) intake of the pump.

Connect a grounded 1/2 in. ID (minimum) air supply hose (G) to the pump's 3/8 npt(m) air inlet or the air regulator's inlet fitting.
Flush the Pump Before Using
Pumps are tested with light weight motor oil which is left in to protect the pump parts. To prevent contamination of the fluid, flush the pump with a compatible solvent before using it. If the pump is being used to supply a circulating system, allow the solvent to circulate until the pump is thoroughly flushed.

Starting and Adjusting the Pump
Fill the wet-cup one-half full with Graco Throat Seal Liquid (TSL) before operating the pump to help prolong the packing life. See Fig 2. See ACCESSORIES on page 12 to order TSL.

Trigger the spray gun into a grounded metal waste container, then slowly turn on the air regulator until the pump begins to cycle, about 40 psi (2.8 bar). Allow the pump to cycle slowly until all air is purged from the fluid lines. The lines are purged when the fluid emitted from the gun is flowing in a steady stream. Release the gun trigger; the pump will stall against pressure.

With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun is triggered and released. In a circulating system, it will run continuously and speed up or slow down as supply demands until the air supply is shut off.

Use the air regulator to control pump speed and fluid pressure. Always use the lowest air pressure needed to produce the results you want. Higher pressures waste fluid and cause premature wear of the pump packings and spray tip.

WARNING
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 the Pressure Relief Procedure on page 2, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

WARNING
Before flushing, be sure the entire system end flushing pails are properly grounded. Refer to Grounding on page 3. Follow the Pressure Relief Procedure on page 2, and remove the spray tip from the gun. Always use the lowest possible fluid pressure, and maintain firm metal-to-metal contact between the gun and the pail during flushing to reduce the risk of fluid injection injury, static sparking and splashing.

WARNING
To reduce the risk of serious bodily injury, including fluid injection, splashing in the eyes or on the skin, and property damage, never exceed the maximum air and fluid working pressure of the lowest rated component in your system. See EQUIPMENT MISUSE HAZARD, System Pressure, on page 2.

Care of the Pump
Keep the wet-cup packing nut (104) one-half full of Graco Throat Seal Liquid, see Accessories, to help protect and prolong throat packing life. Check the tightness of the packing nut weekly. See Fig 2. ALWAYS follow the Pressure Relief Procedure, on page 2, before adjusting the packing nut. Then tighten it just enough to stop leakage—no tighter. Overtightening will compress and damage the packings.

Never allow the pump to run dry of the fluid being pumped. A dry pump will quickly accelerate to a high speed, and may damage itself. If your pump accelerates quickly or is running too fast, stop it immediately and check the fluid supply. If the supply container is empty and air has been pumped into the lines, refill the supply container and prime the pump. Be sure to purge all air from the fluid system, or flush the pump as described in Shutdown, below. A pump runaway valve automatically alerts you to this problem. See INSTALLATION.

Shutdown
Always follow the Pressure Relief Procedure on page 2, whenever you shut off the pump.

Always stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod and damaging the throat packings.

Always flush the pump with a compatible solvent before fluid can dry in the pump and hoses. After flushing, even for overnight storage, fill the pump with a rust-inhibiting solvent, such as mineral spirits, to prevent corrosion, then relieve pressure.

Fig 2
WARMING

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 whenever you shut off the pump, when checking or servicing any part of the system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Engage the gun safety latch.
2. Turn off the air to the pump.
3. Close the bleed-type master air valve (required).
4. Disengage the gun safety latch.
5. 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 drain valve (required), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

WARMING

Never operate the pump with the air motor plates removed to reduce the risk of accidentally pinching or amputating your fingers on moving parts in the air motor.

CHECK ALL POSSIBLE PROBLEMS AND SOLUTIONS BEFORE DISASSEMBLING PUMP.

TROUBLESHOOTING CHART

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump operates but output low on both strokes</td>
<td>Restricted line or inadequate air supply</td>
<td>Clear; increase air</td>
</tr>
<tr>
<td></td>
<td>Insufficient air pressure, closed or clogged air valves, etc.</td>
<td>Clean; open (be sure to use air filter)</td>
</tr>
<tr>
<td></td>
<td>Exhausted fluid supply</td>
<td>Refill; purge all air from pump and fluid lines</td>
</tr>
<tr>
<td></td>
<td>Clogged fluid line; valves, etc.</td>
<td>Clear' (be sure to use fluid filter)</td>
</tr>
<tr>
<td></td>
<td>Tight throat packing nut (104)</td>
<td>Loosen (see page 5)</td>
</tr>
<tr>
<td></td>
<td>Loose throat packing nut or worn packings (114, 124)</td>
<td>Tighten (see page 5), replace.</td>
</tr>
<tr>
<td>Pump operates but output low on up stroke</td>
<td>Held open or worn intake valve ball (112)</td>
<td>Clear, service</td>
</tr>
<tr>
<td>Pump operates but output low on down stroke</td>
<td>Held open or worn fluid piston ball (110) or packings (115, 123)</td>
<td>Clear, service</td>
</tr>
<tr>
<td>Irratic or accelerated operation</td>
<td>Exhausted fluid supply</td>
<td>Refill; purge all air from pump and fluid lines.</td>
</tr>
<tr>
<td></td>
<td>Held open or worn intake valve ball (112)</td>
<td>Clear, service</td>
</tr>
<tr>
<td></td>
<td>Held open or worn fluid piston</td>
<td>Clear, service</td>
</tr>
</tbody>
</table>

TROUBLESHOOTING CHART CONTINUED ON NEXT PAGE
Removing Air Motor or Displacement Pump
Flush the pump if possible, then stop it at the bottom of its stroke.

Follow the Pressure Relief Procedure, on page 6, before proceeding.

Disconnect the air and fluid lines connected to the pump, and remove the pump from its mounting.

Unscrew the tie rod locknuts(4), then remove the cotter pin (3) and pull the displacement pump away from the motor. See Fig 3.

See manual 307-043, supplied, for repairing the air motor.
Displacement Pump Repair (Refer to Figs 4 and 5.)

**NOTES:**

1. Packing Repair Kit No. 217-135 is available for Pump Model 218-058. Packing Repair Kit No. 220-398 is available for Pump Model 218-059. Use all the parts in the kits, even if the old ones still look good for best results.

2. Clean all parts thoroughly when disassembling. Check them carefully for damage or wear, replacing parts as needed.

3. Reference numbers in the text with a star, for example (112*), indicate that this part is included in the repair kit.

**Intake Valve**

Unscrew the intake valve housing (105) from the cylinder (107).

Remove the pin (113), ball (112*), ball guide (101), O-ring retainer (108) and O-ring (109). Inspect the seat in the valve housing; if it is chipped or worn, replace the intake valve housing (105). If the seat is damaged, the ball will not seat properly and the pump will not stop completely when there is no fluid demand.

**Piston**

Loosen the throat packing nut (104). Push the displacement rod (103) down until you can grasp the piston, then pull the piston and displacement rod down through the bottom of the cylinder (107).

Scoring or irregular surfaces on the displacement rod (103) or polished inner wall of the sleeve (106) causes premature packing wear and leaking. Check these parts by rubbing a finger on the surfaces or by holding the parts up to a light at an angle. Replace worn parts.

**NOTE:** If you replace the sleeve, be sure to install the new one with the inside tapered end down and to reinstall the gasket (120). If you can't remove the sleeve easily, contact your nearest Graco Factory Branch or Service Depot.

**Reassembling the Pump**

Coat the displacement rod and inside of the sleeve with oil.

Install the throat packings in the order indicated below. **BE SURE** the lips of the v-packings face DOWN, against fluid pressure. Lubricate the inside of the packings with grease compatible with the fluid being pumped. Always use new glands with new packings.

**Model 218-058**

One at a time, install the washer (119), a male gland (118*), three leather v-packings (114*), a PTFE v-packing (124*), and a female gland (116*) into the throat of the cylinder (107). See Fig 4.

**Model 217-556**

One at a time, install the washer (119), a male gland (118*), a UHMWPE v-packing (124*), two leather v-packings (114*), a UHMWPE v-packing (124*), and a female gland (116) into the throat of the cylinder (107). See Fig 5.

Loosely install the packing nut (104).
Install the packings on the piston in the order indicated below. **BE SURE** the lips of the v-packings face **UP**, against fluid pressure. Lubricate the packings with grease compatible with the fluid being pumped. Always use new glands with new packings for a good seal.

**Model 218-058**

One at a time, install a female gland (121*), a PTFE v-packing (123*), three leather v-packings (115*), a male gland (117*), end the packing retainer (122) onto the piston (102). See Fig 4.

**Model 217-556**

One at a time, install a female gland (121*), a UHMWPE v-packing (123*), two leather v-packings (115*), a UHMWPE v-packing (123*), a male gland (117*), and the packing retainer (122) onto the piston (102). See Fig 5.

Apply locking compound to the threads of the piston (102). Install the piston, packings, and ball (110°) into the displacement rod (103). Torque the piston to 35-40 ft-lb (47-54 N·m). Insert the displacement rod through the bottom of the pump cylinder.

Assemble and install the intake valve and tighten.

Connect the pump and air motor and remount them.

Tighten the packing nut just enough to stop leakage, but no tighter. Fill the packing nut/wet-cup one-half full of Graco Throat Seal Liquid before operating the pump.

**NOTE:** If the grounding wire was disconnected before servicing, be sure to reconnect it before operating the pump.
# PARTS LIST

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<thead>
<tr>
<th>REF NO.</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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<td>101-946</td>
<td>PIN, cotter</td>
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<td>4</td>
<td>101-666</td>
<td>LOCKNUT</td>
<td>3</td>
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<td>6</td>
<td>164-771</td>
<td>O-RING: Buna-N°</td>
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<td>10</td>
<td>164-722</td>
<td>ROD, tie</td>
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</tr>
<tr>
<td>12</td>
<td>205-530</td>
<td>MOTOR, air</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>218-057</td>
<td>PUMP, displacement</td>
<td>1</td>
</tr>
</tbody>
</table>

Series A Includes items 101 to 124

- 101: 170-257 GUIDE, ball
- 102: 206-638 STUD, piston
- 103: 207-094 ROD, displacement
- 104: 206-269 NUT, packing; with wet-cup
- 105: 206-399 HOUSING, valve, intake
- 106: 167-077 SLEEVE, housing
- 107: 207-011 CYLINDER, pump
- 108: 165-967 RETAINER, g
- 109: *165-052 O-RING: PTFE
- 110: *101-823 BALL, bearing
- 112: *100-084 BALL
- 113: 165-049 PIN, ball stop
- 114: *164-397 V-PACKING, leather: throat
- 115: *164-715 V-PACKING, leather; piston
- 116: *179-983 GLAND, female
- 117: *179-987 GLAND, male
- 118: *179-984 GLAND, male
- 119: 164-399 WASHER
- 120: 164-480 GASKET, PTFE
- 121: 179-988 GLAND, female
- 122: *164-713 RETAINER
- 123: *164-912 V-PACKING, PTFE piston
- 124: *164-913 V-PACKING, PTFE throat

* Included in repair kit 218-135.

See "How to Order Replacement Parts", page 13.

307 Number in description refers to a separate instruction manual.

# REPAIR KIT 218-135

Must be purchased separately

Consists of:

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<td>*101-846 PIN, cotter</td>
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<tr>
<td>4</td>
<td>101-566 LOCKNUT</td>
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<tr>
<td>6</td>
<td>154-771 O-RING: Buna-N*</td>
</tr>
<tr>
<td>10</td>
<td>164-722 ROD, tie</td>
</tr>
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<td>12</td>
<td>205-530 MOTOR, air (see 307-043 for parts)</td>
</tr>
<tr>
<td>13</td>
<td>217-566 PUMP, displacement Series A Includes items 101 to 124</td>
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<tr>
<td>101</td>
<td>170-257 GUIDE, ball</td>
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<td>205-538 STUD, piston</td>
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<td>103</td>
<td>217-563 ROD, displacement</td>
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<tr>
<td>104</td>
<td>206-293 NUT, packing; with wet-CUP</td>
</tr>
<tr>
<td>105</td>
<td>206-299 HOUSING, valve, intake</td>
</tr>
<tr>
<td>106</td>
<td>178-598 SLEEVE, housing</td>
</tr>
<tr>
<td>107</td>
<td>217-011 CYLINDER, pump</td>
</tr>
<tr>
<td>108</td>
<td>165-967 RETAINER, O-ring</td>
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<tr>
<td>109</td>
<td>*185-052 O-RING; PTFE</td>
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<tr>
<td>110</td>
<td>*101-523 BALL, bearing</td>
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<td>112</td>
<td>*100-084 BALL</td>
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<td>185-048 PIN, ball stop</td>
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<td>114</td>
<td>*164-497 V-PACKING, leather; throat</td>
</tr>
<tr>
<td>115</td>
<td>*164-715 V-PACKING, leather; piston</td>
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<tr>
<td>116</td>
<td>*179-983 GLAND, female</td>
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<tr>
<td>117</td>
<td>*179-847 GLAND, male</td>
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<td>118</td>
<td>*179-948 GLAND, male</td>
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<tr>
<td>119</td>
<td>164-799 WASHER, flat</td>
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<td>120</td>
<td>164-480 GASKET, PTFE</td>
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<tr>
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<td>*179-988 GLAND, female</td>
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<tr>
<td>122</td>
<td>*184-713 RETAINER</td>
</tr>
<tr>
<td>123</td>
<td>*108-455 V-PACKING, UHMWPE</td>
</tr>
<tr>
<td>124</td>
<td>*108-456 V-PACKING, UHMWPE</td>
</tr>
</tbody>
</table>

*Included in repair kit 220-398.

See "How to Order Replacement parts", page 13.

307 Number in description refers to a separate instruction manual.

## REPAIR KIT 220-398

Must be purchased separately

Consists of:

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Qty.</th>
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<td>123</td>
<td>2</td>
</tr>
<tr>
<td>124</td>
<td>2</td>
</tr>
</tbody>
</table>
ACCESSORIES
(Must be purchased separately)

AIR PRESSURE REGULATOR AND GAUGE
206-237
300 psi (20 bar) MAXIMUM WORKING PRESSURE
1/2 npt inlet
3/8 npt Outlet

GROUNDING CLAMP 103-538
GROUND WIRE 208-960
25 ft (7.6 m) lg., 12 ga.

GROUND WIRE 208-960
25 ft (7.6 m) lg., 12 ga.

GROUNDED BUNA-N® AIR SUPPLY HOSE
3500 psi (242 bar) MAXIMUM WORKING PRESSURE
112 in. ID; 1/2 npt (mbar) couplings
214962 15 ft (4.5 m) lg
214-963 25 ft (7.5 m) lg
214-964 50 ft (15.2 m) lg

GRACO THROAT SEAL LIQUID
Non-evaporating solvent for wet cup
206-995 1 quart (0.95 liter)
206-996 1 gallon (3.8 liter)

55 GAL. (200 liter) SUCTION KIT 208-259

WALL BRACKET 207-365
For mounting Monark pump to wall
See Manual 306-783

COVER & AGITATOR 207-199
Fits 55 gallon drum.
See Manual 306-983

BLEED-TYPE AIR VALVE 107-142
3W psi (21 bar) MAXIMUM WORKING PRESSURE
Relieves air trapped in the air line between the pump air inlet and the valve when closed. 112 npt (fx m)

214711 DRAIN VALVE
5000 psi (350 bar) MAXIMUM WORKING PRESSURE
114 npt(m), Viton seals

GROUNDED BUNA-N® AIR SUPPLY HOSE
175 psi (12 bar) MAXIMUM WORKING PRESSURE
1/2 in. ID, 1/2 npt(m) couplings
206-418 6 ft (1.8 m)
206-216 15 ft (4.6 m)
206-273 25 ft (7.6 m)
208-594 50 ft (15.2 m)

AIR LINE OILER 214-847
250 psi 117.5 bar MAXIMUM WORKING PRESSURE
3/8" NPT INLET & OUTLET

AIR LINE FILTER 106-149
200 psi (14 bar) MAXIMUM WORKING PRESSURE
1/2" NPT INLET & OUTLET
**PUMP RUNAWAY VALVE 215-362**

**180 psi (12 bar) MAXIMUM WORKING PRESSURE**

Shut off air supply to the pump if the pump accelerates beyond the pre-adjusted setting due to an empty supply container, interrupted fluid supply to the pump, or excessive cavitation. 3/4 npt(f).

**HOW TO ORDER REPLACEMENT PARTS**

1. To be sure you receive the correct replacement parts, kit or accessories, always give all of the information requested in the chart below.

2. Check the parts list to identify the correct part number; **do not use the ref. no when ordering.**

3. Order all parts from your nearest Gram distributor.

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**GROUNDED NYLON FLUID HOSE**

3000 psi (210 bar) **MAXIMUM WORKING PRESSURE**

Urethane Cover

<table>
<thead>
<tr>
<th>Part No. ID</th>
<th>Length</th>
<th>Thd. Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>214-700</td>
<td>3/16&quot; (4.8 mm)</td>
<td>1/4 nptm(fbe) swivel</td>
</tr>
<tr>
<td>214-701</td>
<td>3/16&quot; (4.8 mm)</td>
<td>11/16 npt(m) x</td>
</tr>
<tr>
<td>210-540</td>
<td>1/4&quot; (6.4 mm)</td>
<td>11/16 nptm(fbe) swivel</td>
</tr>
<tr>
<td>210-541</td>
<td>1/4&quot; (6.4 mm)</td>
<td>11/16 npsm(fbe) swivel</td>
</tr>
<tr>
<td>214-702</td>
<td>3/8&quot; (9.5 mm)</td>
<td>11/16 npt(mbe)</td>
</tr>
<tr>
<td>214-705</td>
<td>3/8&quot; (9.5 mm)</td>
<td>3/8 npt(mbe)</td>
</tr>
<tr>
<td>214-920</td>
<td>3/8&quot; (9.5 mm)</td>
<td>3/8 npt(mbe)</td>
</tr>
<tr>
<td>214-921</td>
<td>2&quot; (0.6 m)</td>
<td>2&quot; nptm(fbe) swivel</td>
</tr>
<tr>
<td>210-740</td>
<td>25' (7.6 m)</td>
<td>25' npsm(fbe) swivel</td>
</tr>
<tr>
<td>210-741</td>
<td>50' (15.2 m)</td>
<td>50' npsm(fbe) swivel</td>
</tr>
<tr>
<td>210-742</td>
<td>100' (30.4 m)</td>
<td>100' npsm(fbe) swivel</td>
</tr>
</tbody>
</table>

**HYDRA-SPRAY GUN 218-132**

5000 psi (350 bar) **MAXIMUM WORKING PRESSURE**

With 0.09 in. (2.29 mm) orifice

**HYDRA-SPRAY GUNS**

5000 psi (350 bar) **MAXIMUM WORKING PRESSURE**

- 208-327 with 0.037 in. (0.94 mm) orifice
- 208-663 with 0.09 in. (2.29 mm) orifice
- 208-664 with 0.09 in. (2.29 mm) orifice, 4 finger trigger

**SERVICE INFORMATION**

Listed below by the assembly changed are OLD, NEW, ADDED and DELETED parts

<table>
<thead>
<tr>
<th>ASSEMBLY PART CHANGE</th>
<th>REF PART NO.</th>
<th>PART NAME</th>
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<tbody>
<tr>
<td>218-059</td>
<td>123</td>
<td>164-912</td>
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<tr>
<td>218-059</td>
<td>123</td>
<td>108-456</td>
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<td>164-913</td>
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<tr>
<td>218-059</td>
<td>124</td>
<td>108-455</td>
</tr>
</tbody>
</table>

**INTERCHANGEABILITY NOTE:** ADDED and DELETED parts are not interchangeable.
PUMP DIMENSIONS

<table>
<thead>
<tr>
<th>Pump No.</th>
<th>A Overall Length</th>
<th>B Pump Length</th>
<th>C Fluid Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Pumps</td>
<td>27.50 in. (698 mm)</td>
<td>14 in. (356 mm)</td>
<td>9.688 in. (246 mm)</td>
</tr>
</tbody>
</table>

MOUNTING HOLE

GASKET 161-023

4.375” dia (111 mm)

Two 17/64 in. dia holes on 5 in. dia circle

5-11/16 in. dia 1114 mm

3/8 npt(m)

4.6 in (114 mm)

3/8 npt(f)

3/4 npt(m)
### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Pump ratio</th>
<th>23:1</th>
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</thead>
<tbody>
<tr>
<td>Recommended air operating range</td>
<td>40-120 psi (2, 8 to bar)</td>
</tr>
<tr>
<td>Maximum working pressure</td>
<td>2760 psi (190 bar)</td>
</tr>
<tr>
<td>Maximum recommended pump speed for continuous duty</td>
<td>100 cycles per minute</td>
</tr>
<tr>
<td>Air consumption</td>
<td>Approx. 35 cfm per gallon (9 m³/liter/hr) of fluid at 100 psi (7 bar) air pressure</td>
</tr>
<tr>
<td>Pump cycles/gallon</td>
<td>150</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>218-068: Nitralloy, Steel, Cadmium Plating, Carbon Steel, Leather, PTFE</td>
</tr>
<tr>
<td></td>
<td>218-059: Chrome over Stainless Steel, Cadmium Plating, Carbon Steel, Leather, PTFE</td>
</tr>
<tr>
<td></td>
<td>UHMW Polyethylene</td>
</tr>
</tbody>
</table>

PTFE

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**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.

**Disclaimers and Limitations**

The terms of this warranty constitute the 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 expressly excluded and denied. In no case shall Graco’s liability exceed the amount of the purchase price. Any action for breach of warranty 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, while sold by Graco (such as electric motor, switches, hoses, etc.), are subject to the warranties, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of those warranties.