CHeck–Mate\textsuperscript{TM} 450 Pumps

With Severe-Duty Rod and Cylinder, and Priming Piston

Model 222-770, Series A
10:1 Ratio Monark\textsuperscript{®} Pump
125 bar (1800 psi) MAXIMUM FLUID WORKING PRESSURE
12.5 bar (180 psi) MAXIMUM AIR INPUT PRESSURE

Model 222-768, Series A
20:1 Ratio President\textsuperscript{®} Pump
250 bar (3600 psi) MAXIMUM FLUID WORKING PRESSURE
12.5 bar (180 psi) MAXIMUM AIR INPUT PRESSURE

Model 222-769, Series A
34:1 Ratio Senator\textsuperscript{®} Pump
238 bar (3400 psi) MAXIMUM FLUID WORKING PRESSURE
7 bar (100 psi) MAXIMUM AIR INPUT PRESSURE

Model 222-778, Series A
55:1 Ratio Bulldog\textsuperscript{®} Pump
347 bar (4950 psi) MAXIMUM FLUID WORKING PRESSURE
6.3 bar (90 psi) MAXIMUM AIR INPUT PRESSURE

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SAFETY WARNINGS

HIGH PRESSURE FLUID CAN CAUSE SERIOUS INJURY. FOR PROFESSIONAL USE ONLY.

OBSERVE ALL WARNINGS. Read And Understand All Instruction Manuals Before Operating Equipment.

MOVING PARTS HAZARD

KEEP HANDS AND FINGERS AWAY FROM THE PRIMING PISTON DURING OPERATION AND WHENEVER THE PUMP IS CHARGED WITH AIR to reduce the risk of injury! On the pump downstroke the priming piston extends beyond the intake cylinder to pull the material into the pump. The priming piston works under extreme force. During operation and whenever the pump is charged with air, the priming piston can severely injure or amputate a hand or finger, or break a tool, caught between it and the intake cylinder. Always follow the Pressure Relief Procedure, below, before checking, clearing, cleaning, flushing or servicing any part of the pump.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the spray gun/dispensing valve, 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/dispensing valve at anyone or at any part of the body. NEVER put hand or fingers over the spray tip/nozzle.

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

ALWAYS follow the Pressure Relief Procedure, right, before cleaning or removing the spray tip/nozzle or servicing any system equipment.

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

Be sure all 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/Dispensing Valve Safety Devices

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

Safety Latch

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

Trigger Guard (if present)

Never operate the spray gun/dispensing valve with the trigger guard removed. This guard helps prevent the gun/valve from triggering accidentally if it is dropped or bumped.

Diffuser (only on spray guns)

The spray gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check the diffuser operation regularly. Follow the Pressure Relief Procedure, to the right, then remove the spray tip. Aim the spray gun into a grounded metal pail, holding the spray gun firmly to the pail. Using the lowest possible pressure, trigger the spray gun. If the fluid emitted is not diffused into an irregular stream, replace the diffuser immediately.

Tip Guard (only on spray guns)

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.

Spray Tip/Nozzle Safety

Use extreme caution when cleaning or changing spray tips/nozzles. If the spray tip/nozzle clogs while spraying/dispensing, engage the spray gun/dispensing valve safety latch immediately. ALWAYS follow the Pressure Relief Procedure and then remove the spray tip/nozzle to clean it.

NEVER wipe off build-up around the spray tip/nozzle until pressure is fully relieved and the spray gun/dispensing valve 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/dispensing system, when installing, cleaning or changing spray tips/nozzles, and whenever you stop spraying/dispensing.

1. Engage the spray gun/dispensing valve 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/valve safety latch.
5. Hold a metal part of the gun/valve firmly to the side of a grounded metal pail, and trigger the gun/valve to relieve pressure.
7. Open the drain valve (required in your system) and/or the pump bleed valve, having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray/disperse again.

If you suspect that the spray tip/nozzle 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/nozzle or hose.
EQUIPMENT MISUSE HAZARD

General Safety
Any misuse of the spray/dispensing equipment or accessories, such as overpressuring, 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/dispensing equipment regularly and repair or replace worn or damaged parts immediately.

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

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 ON BOTH ENDS! 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 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 safely contain the high pressure fluid.

System Pressure
NEVER exceed the recommended working pressure or the maximum air inlet pressure stated on your pump or in the TECHNICAL DATA on pages 22-29.

BE SURE that all spray/dispensing equipment 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 the system.

Fluid Compatibility
BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the TECHNICAL DATA on pages 22-29. Always read the manufacturer's literature before using fluid or solvent in this pump.

HANDLE AND ROUTE HOSES CAREFULLY. Do not pull on hoses to move equipment. Do not use hoses 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/dispensing system. Check the electrical resistance of your air and 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.

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

To ground the pump:
To ground the pump, loosen the grounding lug locknut (W) and washer (X). Insert one end of 1.5 mm² (12 ga) minimum ground wire (Y) into the slot in lug (Z) and tighten the locknut securely. See Fig 1. Connect the other end of the wire to a true earth ground. See the ACCESSORIES section to order a ground wire and clamp.

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

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.
NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.

See pages 20 and 21 for accessories available from Graco. If you supply your own accessories, be sure they are adequately sized and pressure-rated to meet the system's requirements.

The Typical installation shown on page 4 is only a guide for selecting and installing system components and accessories. Contact your Graco representative for assistance in designing a system to suit your particular needs.

SYSTEM ACCESSORIES

Refer to the Typical Installation drawing on page 4.

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WARNING

Two accessories are required in your system: a bleed-type master air valve (G) and a fluid drain valve (L). These accessories help reduce the risk of serious bodily injury including splashing in the eyes or on the skin, and injury from moving parts if you are adjusting or repairing the pump.

The bleed-type master air valve relieves air trapped between this valve and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. Locate the valve close to the pump.

The fluid drain valve assists in relieving fluid pressure in the displacement pump, hose, and gun. Triggering the gun to relieve pressure may not be sufficient.

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Air and Fluid Hoses

Be sure all air and fluid hoses are properly sized and pressure-rated for your system. Use only grounded air and fluid hoses. Fluid hoses must have spring guards on both ends. Use of a short whip hose between the main fluid hose and the gun allows freer gun movement.

Mounting Accessories

Mount the pump (A) to suit the type of installation planned. The pump dimensions and mounting hole layouts are shown on pages 30 and 31.

If you are mounting the pump on a ram (B), refer to the manual supplied with the ram unit for installation and operation instructions. The ram shown in the Typical Installation is a 19 liter (5 gal.) pail ram, used with an inductor plate (C). The ram shown includes an air regulator. It also requires an air supply hose and an air manifold (D), which divides the main air supply into separate lines for the pump and the ram.

The pump may be mounted on a floor stand. It may also be mounted on a 200 liter (55 gal.) ram, if the pump is equipped with Model 222-790 Displacement Pump. See Accessories for further information.

Air Line Accessories

Install the following accessories in the order shown in the Typical Installation, using adapters as necessary:

A pump runaway valve (E) senses when the pump is running too fast and automatically shuts off the air to the motor. A pump which runs too fast can be seriously damaged. Install closest to the pump air inlet.

An air line lubricator (F) provides automatic air motor lubrication.

A bleed-type master air valve (G) is required in your system to relieve air trapped between it and the air motor when the valve is closed (see the WARNING at left). Be sure the bleed valve is easily accessible from the pump, and is located downstream from the air regulator.

An air regulator (H) controls pump speed and outlet pressure by adjusting the air pressure to the pump. Locate the regulator close to the pump, but upstream from the bleed-type master air valve.

An air line filter (J) removes harmful dirt and moisture from the compressed air supply.

A second bleed-type air valve (K) isolates the air line accessories for servicing. Locate upstream from all other air line accessories.

Fluid Line Accessories

Install the following accessories in the positions shown in the Typical Installation, using adapters as necessary:

A fluid drain valve (L) is required in your system to relieve fluid pressure in the hose and gun (see the WARNING at left). Screw the drain valve into the open branch of a tee mounted in the fluid line. Install the drain valve pointing down, but so the handle points up when the valve is opened.

A fluid regulator (M) controls fluid pressure to the gun/valve, and dampens pressure surges.

A gun or valve (N) dispenses the fluid. The gun shown in the Typical Installation is a dispensing gun for highly viscous fluids.

A gun swivel (P) allows freer gun movement.

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GROUNDING

Before operating the pump, ground the system as explained under FIRE OR EXPLOSION HAZARD and Grounding on page 3.
OPERATION/Maintenance

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

1. Engage the spray gun/dispensing valve safety latch.
2. Shut off the air to the pump.
3. Disengage the gun/valve safety latch.
4. Disengage the gun/valve safety latch.
5. Hold a metal part of the gun/valve firmly to the side of a grounded metal pail, and trigger the gun/valve to relieve pressure.
7. Open the drain valve (required in your system) and/or the pump bleeder valve, having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray/dispense again.

If you suspect that the spray tip/nozzle 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 and coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

Packing Nut/Wet-Cup
Fill the packing nut/wet-cup (2) 1/3 full with Grace Throat Seal Liquid (TSL) or compatible solvent. See Fig. 2. Adjust the packing nut weekly so it is just snug; do not overtighten. Follow the Pressure Relief Procedure Warning above before adjusting the packing nut.

Flushing the Pump
The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent before using the pump.

Warning

For your safety, read the warning section, FIRE OR EXPLOSION HAZARD on page 3 before flushing, and follow all the recommendations given there.

Starting and Adjusting the Pump
See the TYPICAL INSTALLATION on page 4. If you are using a ram or inductor plate with the pump, refer to the separate instructions for those components for set-up and operation instructions.

Lower the pump into a fluid container. Be sure the air regulator (H) is closed. Then open the pump's bleed-type master air valve (G). Hold a metal part of the spray gun/dispensing valve (N) firmly to the side of a grounded metal pail and hold the trigger open. Now slowly open the air regulator until the pump starts.

Moving parts can pinch or amputate your fingers or other body parts. When the pump is operating, the priming piston (25) (located at the pump intake) and the air motor piston (located behind the air motor plates or shield) move. See Fig. 2. Therefore, NEVER operate the pump with the air motor plates or shield removed, and keep your fingers and hands away from the priming piston.

Before attempting to clear an obstruction from the priming piston (25) or service the pump, follow the Pressure Relief Procedure Warning at left to prevent the pump from starting accidentally.

Cycle the pump slowly until all the air is pushed out and the pump and hoses are fully primed. Release the spray gun/dispensing valve trigger and engage the safety latch.

If the pump fails to prime properly, open the bleeder valve (35) slightly. Use the bleeder hole (R) as a priming valve until the fluid appears at the hole. See Fig 2. Close the bleeder valve.

NOTE: When changing fluid containers with the hose and gun already primed, be sure to open the bleeder valve (35), to assist in priming the pump and venting air before it enters the hose. Close the bleeder valve when all air has been eliminated.

Warning

To reduce the risk of fluid injection, DO NOT use your hand or fingers to cover the bleeder hole (R) when priming the pump.

With the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the spray gun/dispensing valve is opened and closed.

Use the air regulator (H) to control the pump speed and the fluid pressure. Always use the lowest air pressure necessary to get the desired results. Higher pressures cause premature tip/nozzle and pump wear.

Warning

To reduce the risk of overpressurizing your system, which could result in component rupture and cause serious bodily injury, NEVER exceed the specified MAXIMUM INCOMING AIR PRESSURE to the pump (see the Technical Data on pages 22-29).

Never allow the pump to run dry of the fluid being pumped. A dry pump will quickly accelerate to a high speed, possibly damaging itself. A pump runaway valve (E), which shuts off the air supply to the pump if the pump accelerates beyond the pre-set speed, is available. See the Typical Installation on page 4 and ACCESSORIES on pages 20 and 21. 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 container and prime the pump and the lines with fluid, or flush and leave it filled with a compatible solvent. Be sure to eliminate all air from the fluid system.
Shutdown and Care of the Pump

For overnight shutdown, follow the Pressure Relief Procedure Warning on page 6. Always stop the pump at the bottom of the stroke to prevent the fluid from drying on the exposed displacement rod and damaging the throat packings.

Always flush the pump before the fluid dries on the displacement rod. Never leave water or water-based fluid in the pump overnight. First, flush with water or a compatible solvent, then with mineral spirits. Relieve the pressure, but leave the mineral spirits in the pump to protect the parts from corrosion.
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump fails to operate</td>
<td>Restricted line or inadequate air supply</td>
<td>Clear; see TECHNICAL DATA on pages 22-29.</td>
</tr>
<tr>
<td></td>
<td>Obstructed fluid hose or gun/valve; fluid hose ID is too small</td>
<td>Clear*; use hose with larger ID.</td>
</tr>
<tr>
<td></td>
<td>Fluid dried on the displacement rod</td>
<td>Clean. See SERVICE.</td>
</tr>
<tr>
<td></td>
<td>Dirty or worn air motor parts</td>
<td>Clean or repair. See air motor manual, supplied.</td>
</tr>
<tr>
<td></td>
<td>Bleeder valve open</td>
<td>Close.</td>
</tr>
<tr>
<td></td>
<td>Air leaking into supply drum</td>
<td>Check inductor or ram plate seal.</td>
</tr>
<tr>
<td></td>
<td>Fluid too heavy for pump priming</td>
<td>Use bleeder valve (see page 6). Use inductor or ram unit. Remove piston spacer (33) and intake spacer (32).**</td>
</tr>
<tr>
<td></td>
<td>Worn packings in displacement pump</td>
<td>Replace packings.</td>
</tr>
<tr>
<td>Pump operates, but output low on both strokes</td>
<td>Restricted line or inadequate air supply</td>
<td>Clear; see TECHNICAL DATA on pages 22-29.</td>
</tr>
<tr>
<td></td>
<td>Obstructed fluid hose or gun/valve; fluid hose ID is too small</td>
<td>Clear*; use hose with larger ID.</td>
</tr>
<tr>
<td></td>
<td>Held open or worn piston valve or seals</td>
<td>Clear valve; replace seals.</td>
</tr>
<tr>
<td>Pump operates, but output low on downstroke</td>
<td>Fluid too heavy for pump priming</td>
<td>Use bleeder valve (see page 6). Use inductor or ram unit. Remove piston spacer (33) and intake spacer (32).**</td>
</tr>
<tr>
<td>Pump operates, but output low on upstroke</td>
<td>Held open or worn piston valve or seals</td>
<td>Clear valve; replace seals.</td>
</tr>
<tr>
<td>Erratic or accelerated pump speed</td>
<td>Exhausted fluid supply</td>
<td>Refill and prime.</td>
</tr>
<tr>
<td></td>
<td>Fluid too heavy for pump priming</td>
<td>Use bleeder valve (see page 6). Use inductor or ram unit. Remove piston spacer (33) and intake spacer (32).**</td>
</tr>
<tr>
<td></td>
<td>Held open or worn piston valve or seals</td>
<td>Clear valve; replace seals.</td>
</tr>
<tr>
<td></td>
<td>Held open or worn priming piston</td>
<td>Clear; service.</td>
</tr>
<tr>
<td></td>
<td>Worn packings in displacement pump</td>
<td>Replace packings.</td>
</tr>
</tbody>
</table>

* To determine if the fluid hose or gun is obstructed, follow the Pressure Relief Procedure Warning below. Disconnect the fluid hose and place a container at the pump fluid outlet to catch any fluid. Turn on the air just enough to start the pump (about 1.4-2.8 bar [20-40 psi]). If the pump starts when the air is turned on, the obstruction is in the fluid hose or gun.

** Remove the piston spacer (33) and intake spacer (32) only as a last resort, as the pump may not perform as well without them.

NOTE: If you experience air motor icing, call Graco Product Service (1-800-543-0339).

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

1. Engage the spray gun/dispensing valve 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/valve safety latch.
5. Hold a metal part of the gun/valve firmly to the side of a grounded metal pail, and trigger the gun/valve to relieve pressure.
7. Open the drain valve (required in your system) and/or the pump bleeder valve, having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray/dispense again.

If you suspect that the spray tip/nozzle 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 and coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.
REQUIRED TOOLS
- Spanner wrench
- Torque wrench
- Bench vise, with soft jaws
- Hammer
- Rubber mallet
- 13 mm (1/2") dia. brass rod
- 11 mm open-end wrench
- 12 mm open-end wrench
- 17 mm box or socket wrench
- 19 mm open-end wrench
- 22 mm open-end wrench
- 26 mm open-end wrench
- 28 mm open-end wrench
- 32 mm crow's foot wrench
- 400 mm adjustable wrench
- Spud wrench
- Thread lubricant
- Anaerobic thread sealant

DISCONNECTING THE DISPLACEMENT PUMP

WARNING
KEEP HANDS AND FINGERS AWAY FROM THE PRIMING PISTON DURING OPERATION AND WHENEVER THE PUMP IS CHARGED WITH AIR to reduce the risk of injury! On the pump downstroke the priming piston extends beyond the intake cylinder to pull the material into the pump. The priming piston works under extreme force. During operation and whenever the pump is charged with air, the priming piston can severely injure or amputate a hand or finger, or break a tool, caught between it and the intake cylinder. Always follow the Pressure Relief Procedure Warning on page 8, before checking, clearing, cleaning, flushing or servicing any part of the pump.

The air motor piston (located behind the air motor plates or shield) also moves when air is supplied to the motor. NEVER operate the pump with the air motor plates or shield removed. Before servicing the pump, follow the Pressure Relief Procedure Warning on page 8, to prevent the pump from starting accidentally.

1. Flush the pump if possible. Follow the Pressure Relief Procedure Warning on page 8. Stop the pump at the bottom of its stroke.
2. Disconnect the air hose. Hold the fluid outlet fitting (8) with a wrench to keep it from being loosened while you disconnect the fluid hose. Remove the pump from its mounting. Note the relative position of the pump's fluid outlet to the air motor's air inlet.
3. Using a spanner wrench, unscrew the coupling nut (104) from the connecting rod (103). Remove the coupling collars (105). See Fig 3.
4. Hold the tie rod flats with a wrench to keep them from turning. Use the wrench provided with the pump (or a 17 mm box or socket wrench) to unscrew the tie rod locknuts (106) from the tie rods (102). Carefully pull the displacement pump (107) off the air motor (101).
5. Refer to page 10 for displacement pump service. To service the air motor, refer to the separate air motor manual, supplied.

RECONNECTING THE DISPLACEMENT PUMP
1. Orient the pump's fluid outlet to the air motor's air inlet as was noted in step 2 under Disconnecting the Displacement Pump. Position the displacement pump (107) on the tie rods (102). See Fig 3.

NOTE: If you removed the tie rods (102) from the air motor (101) or air motor adapter plate, reinstall them using an 11 mm wrench. Torque the rods to 20-25 N.m (15-18 ft-lb) on President pumps, and 41 N.m (30 ft-lb) on Monark, Senator, and Bulldog pumps.
2. Screw the locknuts (106) onto the tie rods (102) and torque to 27 N.m (20 ft-lb), using the wrench provided (or a 17 mm box or socket wrench).
3. Place the coupling collars (105) in the coupling nut (104). Screw the coupling nut onto the connecting rod (103) loosely. Hold the connecting rod flats with a wrench to keep it from turning. With a spanner wrench, torque the coupling nut to 54 N.m (40 ft-lb).
4. Using a torque wrench in the square hole of the supplied wrench (110), torque the packing nut (2) to 45-53 N.m (33-39 ft-lb).
5. Mount the pump and reconnect all hoses. Reconnect the ground wire if it was disconnected during repair. Turn on the air to the motor and run the pump slowly.
6. Fill the packing nut/wet-cup 1/3 full of Grace Throat Seal Liquid or compatible solvent.
DISPLACEMENT PUMP SERVICE

Disassembly
When disassembling the pump, lay out all removed parts in sequence, to ease reassembly. Refer to Fig 6.

NOTE: Repair Kit 222-773 is available to replace the piston and intake valve seals. For the best results, use all the new parts in the kit. Parts included are denoted with one asterisk, for example (11*).

Repair Kit 222-774 is available to replace the throat packings. For the best results, use all the new parts in the kit. Parts included are denoted with two asterisks, for example (3**).

1. Remove the displacement pump from the air motor as explained on page 9.
2. Place the displacement pump in a vise, with the jaw on the outlet housing (10).
3. Hold the flats of the priming piston rod (24) with a 12 mm wrench. Using a 22 mm wrench, unscrew the priming piston nut (30) from the rod. Slide the priming piston (25) and priming piston guide (31) off the rod. Inspect the outer surface of the guide (31) and the inner and outer surfaces of the piston (25) for scoring, wear, or other damage.
4. Loosen the packing nut (2) using the packing nut wrench (110) supplied, or a hammer and brass rod.
5. Remove the intake cylinder (23), using a spud wrench. Remove the seal (21) from the intake valve housing (17); always replace with a new one.
6. Unscrew the intake valve housing (17) from the cylinder (12), using a spud wrench. Pull the housing off the pump. The intake valve spacer (32) and intake check valve assembly (5) should slide down the priming piston rod (24) as you remove the housing; if they do not slide easily, firmly tap the top of the housing (17) with a rubber mallet to loosen them. Take care not to drop them as they come free. Set the check valve assembly aside for disassembly later.
7. Using a hammer and brass rod, drive the intake valve seat (22) out the bottom of the housing (17).
8. Push the displacement rod (1) down as far as possible, then pull it and the priming piston rod (24) out of the outlet housing (10) and cylinder (12).
9. Remove the packing nut (2), throat packings (3, 5) and glands (4, 6) from the outlet housing (10). DO NOT remove the fluid outlet nipple (8) and o-ring (9) from the outlet housing unless they need replacement.
10. Use a 400 mm adjustable wrench on the flats of the pump cylinder (12) and unscrew the cylinder from the outlet housing (10). Remove the o-rings (11). Inspect the inside surface of the cylinder for wear, scoring or other damage by holding it up to the light at an angle or running a finger over the surface.
11. Inspect the outer surfaces of the displacement rod (1) and priming piston rod (24) for wear, scoring or other damage by holding them up to the light at an angle or running a finger over the surface.
12. Use a vise with soft jaws to hold the displacement rod (1) by its flats. Place a 19 mm wrench on the flats of the piston and unscrew the piston (13) and priming piston rod (24) from the displacement rod (1). Remove the spacer (33). Disassemble the piston guide (14) from the piston (13).
13. It is not necessary to remove the priming piston rod (24) from the piston (13) unless your inspection reveals scoring, wear, or other damage to either part. To disassemble, place the flats of the piston (13) in a vise and unscrew the rod (24), using a 12 mm wrench on the flats.
14. Place the flats of the piston seat (16) in a vise. Using a 13 mm (1/2 in.) dia. brass rod, unscrew the piston guide (14) from the piston seat (16). See Fig 4. Remove the piston seal (15); always replace with a new one. Inspect the mating surfaces of the piston (13) and piston seat (16) for nicks, scoring, or wear.
15. To disassemble the intake check valve assembly (5), place the nut (18) in a vise and unscrew the intake valve body (19) from the nut, using a 28 mm wrench. See Fig 5. Remove the intake valve seal (20) from the valve body; always replace with a new one. Inspect the mating surfaces of the intake valve body (19) and seal (22) for wear, scoring, or other damage.
16. Inspect all parts for damage. Clean all parts and threads with a compatible solvent before reassembling.
THROAT PACKING DETAIL

**4**
LIPS OF V-PACKINGS MUST FACE DOWN

**5**

**6**

**8**
REMOVE ONLY IF DAMAGED.
TORQUE TO 70-75 N.m (51-55 ft-lb)

**9**

APPLY THREAD SEALANT AND TORQUE TO 27-34 N.m (20-25 ft-lb)

T

(SEE FIG 5)

APPLY ADHESIVE TO FEMALE THREADS

1
TORQUE TO 120-130 N.m (88-95 ft-lb)

11*

12
TORQUE TO 235-250 N.m (172-182 ft-lb)

13

14

15*

11*

16
APPLY THREAD SEALANT AND TORQUE TO 27-34 N.m (20-25 ft-lb)

17
TORQUE TO 235-250 N.m (172-182 ft-lb)

22
LARGE BEVEL MUST FACE DOWN

18
TORQUE TO 45-53 N.m (33-39 ft-lb)

21*

19

20

23
TORQUE TO 235-250 N.m (172-182 ft-lb)

24
APPLY THREAD SEALANT AND TORQUE TO 45-53 N.m (33-39 ft-lb)

25
FLAT SIDE MUST FACE UP

30
TORQUE TO 45-53 N.m (33-39 ft-lb)

31

26

27

28

29

32

33

3

Fig 6

308-017 11
Reassembly

1. Place a 13 mm (1/2 in.) dia. brass rod lengthwise in a vise. Install a new piston seal (15*) on the piston seat. Apply thread sealant to the threads of the piston seat. Place the piston guide (14) securely on the brass rod. Using a 32 mm crow's-foot, screw the piston seat (16) into the piston guide. Torque to 27-34 N.m (20-25 ft-lb).

2. If it was necessary to remove the priming piston rod (24) from the piston (13), apply thread sealant to the threads of the rod. Place the flat of the piston (13) in a vise. Hold the flats of the rod with a 12 mm wrench, and screw the rod into the piston. Torque to 45-53 N.m (33-39 ft-lb).

3. Use a vise with soft jaws to hold the displacement rod (1) by its flats. Install the spacer (33, see the following note) on the rod. Install the assembled piston guide/seat on the piston (13). Apply thread sealant to the threads of the displacement rod, and screw the piston assembly onto the rod, using a 19 mm wrench on the flats of the piston. Torque to 120-130 N.m (88-95 fl-lb). There will be a small gap between the top of the piston (13) and the shoulder of the rod (1).

NOTE: The piston spacer (33) is not required when pumping fluids with a viscosity greater than 1 million centipoise.

4. Place the outlet housing (10) in a vise. Lubricate the o-rings (11) and install them on the cylinder (12). Apply thread lubricant to the threads of the cylinder. Using a 400 mm wrench on the flats of the cylinder, screw it into the outlet housing (10). Torque to 235-250 N.m (172-182 ft-lb).

5. Lubricate the throat packings and glands, and install them in the outlet housing (10) one at a time in the following order, with the lips of the v-packings facing male gland (6**), UHMWPE v-packing (5**), PTFE v-packing (3**), UHMWPE (5**), and female gland (4**). Apply thread lubricant to the packing nut (2) and install the packing nut loosely in the outlet housing.

6. Carefully insert the displacement rod (1) into the bottom of the cylinder (12). Push the rod up into the cylinder and through the outlet housing (10), until it protrudes from the packing nut (2). Be careful not to damage the piston seal (15*) while performing this step.

7. Apply thread lubricant to the bottom threads of the cylinder (12). Be sure the o-ring (11*) is in place on the cylinder. Guide the intake valve housing (17) up onto the priming piston rod (24) and screw it onto the cylinder, using a spud wrench. Torque to 235-250 N.m (172-182 ft-lb).

8. Slide the intake valve spacer (32, see the following note) onto the priming piston rod (24) until it reaches the stop (T) of the intake valve housing (17).

NOTE: The intake valve spacer (32) is not required when pumping fluids with a viscosity greater than 1 million centipoise.

9. Apply thread lubricant to the threads of the intake packing nut (18) and slide the nut up onto the priming piston rod (24) until it clears the flats of the rod. Lubricate a new intake valve seal (20*) and slide it onto the rod, being careful not to damage the seal when passing over the flats of the rod. Slide the seal up until it reaches the packing nut (18). Slide the intake valve body (19) onto the rod until it reaches the nut (18).

10. Apply adhesive to the female threads of the valve body (19). Place a 26 mm wrench on the flats of the packing nut (18) and a 28 mm wrench on the flats of the valve body (19). Screw the nut into the body, making certain they remain in position above the flats of the rod (24). Torque to 45-53 N.m (33-39 ft-lb). Slide the assembled intake check valve up the priming piston rod until it reaches the stop (T); this may be difficult due to high friction between the seal and rod.

11. Position the intake valve seat (22) so its large beveled side faces down toward the pump intake. Slide the seat (22) onto the priming piston rod (24) and into the intake valve housing (17) until it seats on the lower lip of the housing. Lubricate a new seal (21*) and push it up into the gap around the bottom outer edge of the seat (22).

12. Apply thread lubricant to the threads of the intake cylinder (23) and screw the cylinder into the intake valve housing (17), using a spud wrench. Torque to 235-250 N.m (172-182 ft-lb).

13. Slide the priming piston guide (31) onto the rod (24) until it stops. Then install the priming piston (25) as shown in Fig 7, with the flat side of the priming piston (25) facing up toward the pump. Apply thread sealant to the threads of the priming piston rod (24). Hold the rod steady with a 12 mm wrench on the flats, and screw the priming piston nut (30) onto the rod with a 22 mm wrench. Torque to 45-53 N.m (33-39 ft-lb).

14. Reconnect the displacement pump to the air motor as explained on page 9.

15. Allow 2 hours for the thread sealant to cure before returning the pump to service.
PARTS DRAWINGS
AND
PARTS LISTS
Model 222-770, Series A
10:1 Ratio Monark Pump
Includes items 101-111

<table>
<thead>
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<th>REF NO.</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
<th>QTY</th>
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<td>222-791</td>
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<td>See 307-043 for parts</td>
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<tr>
<td>102</td>
<td>184-076</td>
<td>ROD, tie; 295 mm (11.61&quot;) shoulder to shoulder</td>
<td>3</td>
</tr>
<tr>
<td>103</td>
<td>184-092</td>
<td>ROD, adapter</td>
<td>1</td>
</tr>
<tr>
<td>104</td>
<td>184-059</td>
<td>NUT, coupling</td>
<td>1</td>
</tr>
<tr>
<td>105</td>
<td>184-128</td>
<td>COLLAR, coupling</td>
<td>2</td>
</tr>
<tr>
<td>106</td>
<td>109-209</td>
<td>NUT, hex, self-locking; with nylon insert; M10 x 1.5</td>
<td>3</td>
</tr>
<tr>
<td>107</td>
<td>222-759†</td>
<td>PUMP, displacement</td>
<td></td>
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<tr>
<td></td>
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<td>See pages 18 &amp; 19 for parts</td>
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</tr>
<tr>
<td>108</td>
<td>184-077</td>
<td>PLATE, adapter</td>
<td>1</td>
</tr>
<tr>
<td>109</td>
<td>109-212</td>
<td>SCREW, cap, socket hd; 3/8-16 unc-3a x 0.75&quot; (19 mm)</td>
<td>3</td>
</tr>
<tr>
<td>110</td>
<td>184-119</td>
<td>WRENCH, packing nut (not shown)</td>
<td>1</td>
</tr>
<tr>
<td>111</td>
<td>101-946</td>
<td>PIN, cotter</td>
<td>1</td>
</tr>
</tbody>
</table>

† This pump can also be assembled using Displacement Pump 222-790 (see pages 18 & 19).

PUMP MOUNTING KIT 222-776
(Must be ordered separately)
To mount the pump on a 200 liter (55 gal.) ram 223-634.
Includes instructions.
Consists of:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
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</thead>
<tbody>
<tr>
<td>276-025</td>
<td>Lug</td>
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</tr>
<tr>
<td>102-637</td>
<td>Bolt</td>
<td>4</td>
</tr>
<tr>
<td>184-086</td>
<td>Gasket</td>
<td>1</td>
</tr>
</tbody>
</table>

HOW TO ORDER PARTS

1. To be sure you receive the correct replacement parts, kits 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 Graco distributor.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Qty</th>
<th>Part Description</th>
</tr>
</thead>
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<td></td>
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</tbody>
</table>

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14 308-017
Model 222-768, Series A  
20:1 Ratio President Pump  
includes items 101-111

### PARTS DRAWING AND LIST

<table>
<thead>
<tr>
<th>REF PART NO.</th>
<th>DESCRIPTION</th>
<th>QTY</th>
</tr>
</thead>
</table>
| 101 222-772  | AIR MOTOR, President  
See 306-982 for parts | 1 |
| 102 184-076  | ROD, tie; 295 mm (11.61") shoulder to shoulder | 3 |
| 103 184-091  | ROD, adapter | 1 |
| 104 184-059  | NUT, coupling | 1 |
| 105 184-128  | COLLAR, coupling | 2 |
| 106 109-209  | NUT, hex, self-locking; with nylon insert; M10 x 1.5 | 3 |
| 107 222-759† | PUMP, displacement  
See pages 18 & 19 for parts | 1 |
| 110 184-119  | WRENCH, packing nut (not shown) | 1 |
| 111 101-946  | PIN, cotter | 1 |

† This pump can also be assembled using Displacement Pump 222-790 (see pages 18 & 19).

### PUMP MOUNTING KIT 222-776  
(Must be ordered separately)

To mount the pump on a 200 liter (55 gal.) ram 223-634. Includes instructions. Consists of:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>276-025</td>
<td>Lug</td>
<td>4</td>
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<tr>
<td>102-637</td>
<td>Bolt</td>
<td>4</td>
</tr>
<tr>
<td>184-086</td>
<td>Gasket</td>
<td>1</td>
</tr>
</tbody>
</table>

#### HOW TO ORDER PARTS

1. To be sure you receive the correct replacement parts, kits 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 Graco distributor.

<table>
<thead>
<tr>
<th>6 digit Part Number</th>
<th>Qty</th>
<th>Part Description</th>
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Model 222-769, Series A
34:1 Ratio Senator Pump
Includes items 101-110

<table>
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<th>PART NO.</th>
<th>DESCRIPTION</th>
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</thead>
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<td>101</td>
<td>217-540</td>
<td>AIR MOTOR, Senator</td>
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</tr>
<tr>
<td>102</td>
<td>184-076</td>
<td>ROD, tie; 255 mm (11.61&quot;) shoulder to shoulder</td>
<td>3</td>
</tr>
<tr>
<td>103</td>
<td>184-127</td>
<td>ROD, adapter</td>
<td>1</td>
</tr>
<tr>
<td>104</td>
<td>184-059</td>
<td>NUT, coupling</td>
<td>1</td>
</tr>
<tr>
<td>105</td>
<td>184-128</td>
<td>COLLAR, coupling</td>
<td>2</td>
</tr>
<tr>
<td>106</td>
<td>109-209</td>
<td>NUT, hex, self-locking; with nylon insert; M10 x 1.5</td>
<td>3</td>
</tr>
<tr>
<td>107</td>
<td>222-790t</td>
<td>PUMP displacement</td>
<td>1</td>
</tr>
<tr>
<td>108</td>
<td>184-094</td>
<td>PLATE, adapter</td>
<td>1</td>
</tr>
<tr>
<td>109</td>
<td>109-211</td>
<td>SCREW, cap, socket hd; 5/8-11 unc-2a x 2&quot; (51 mm)</td>
<td>3</td>
</tr>
<tr>
<td>110</td>
<td>184-119</td>
<td>WRENCH, packing nut (not shown)</td>
<td>1</td>
</tr>
</tbody>
</table>

† If this pump is NOT being mounted on a 200 liter (55 gallon) ram, it can be assembled using Displacement Pump 222-759 (see pages 18 & 19).

PUMP MOUNTING KIT 222-776
(Must be ordered separately)
To mount the pump on a 200 liter (55 gal.) ram 223-634. Pump must use Displacement Pump 222-790.
Includes instructions.
Consists of:

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<thead>
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<th>Description</th>
<th>Qty</th>
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<tbody>
<tr>
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<td>Lug</td>
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<tr>
<td>102-037</td>
<td>Bolt</td>
<td>4</td>
</tr>
<tr>
<td>184-086</td>
<td>Gasket</td>
<td>1</td>
</tr>
</tbody>
</table>

HOW TO ORDER PARTS

1. To be sure you receive the correct replacement parts, kits 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 Graco distributor.

<table>
<thead>
<tr>
<th>6 digit Part Number</th>
<th>Qty</th>
<th>Part Description</th>
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</thead>
<tbody>
<tr>
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</table>
PARTS DRAWING AND LIST

Model 222-776, Series A
55:1 Ratio Bulldog Pump
Includes items 101-110

<table>
<thead>
<tr>
<th>REF</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>101</td>
<td>208-356</td>
<td>AIR MOTOR, Bulldog</td>
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<tr>
<td>102</td>
<td>184-076</td>
<td>ROD, tie; 295 mm (11.61&quot;) shoulder to shoulder</td>
</tr>
<tr>
<td>103</td>
<td>184-127</td>
<td>ROD, adapter</td>
</tr>
<tr>
<td>104</td>
<td>184-059</td>
<td>NUT, coupling</td>
</tr>
<tr>
<td>105</td>
<td>184-128</td>
<td>COLLAR, coupling</td>
</tr>
<tr>
<td>106</td>
<td>109-209</td>
<td>NUT, hex, self-locking; with nylon insert: M10 x 1.5</td>
</tr>
<tr>
<td>107</td>
<td>222-790†</td>
<td>PUMP, displacement See pages 16 &amp; 19 for parts</td>
</tr>
<tr>
<td>108</td>
<td>184-094</td>
<td>PLATE, adapter</td>
</tr>
<tr>
<td>109</td>
<td>109-211</td>
<td>SCREW, cap, socket hd; 1/2-11 unc-2a x 2&quot; (51 mm)</td>
</tr>
<tr>
<td>110</td>
<td>184-119</td>
<td>WRENCH, packing nut (not shown)</td>
</tr>
</tbody>
</table>

† If this pump is NOT being mounted on a 200 liter (55 gallon) ram, it can be assembled using Displacement Pump 222-759 (see pages 18 & 19).

PUMP MOUNTING KIT 222-776
(Must be ordered separately)
To mount the pump on a 200 liter (55 gal.) ram 223-634. Pump must use Displacement Pump 222-790. Includes instructions. Consists of:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>276-025</td>
<td>Lug</td>
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<tr>
<td>102-637</td>
<td>Bolt</td>
</tr>
<tr>
<td>184-086</td>
<td>Gasket</td>
</tr>
</tbody>
</table>

HOW TO ORDER PARTS

1. Check the parts list to identify the correct part number; do not use the ref. no. when ordering.
2. Order all parts from your nearest Graco distributor.

<table>
<thead>
<tr>
<th>6 digit Part Number</th>
<th>Qty</th>
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</table>

308-017 17
Model 222-759, Series A Displacement Pump
(Standard on Monark and President Pumps; may also be used on Senator and Bulldog except when used with a 200 liter [55 gallon] ram)
Includes items 1-35

Model 222-790, Series A Displacement Pump
(Standard on Senator and Bulldog Pumps; may also be used on Monark and President)
Includes items 1-35

2
TORQUE TO
45-53 N.m
(33-39 ft-lb)

1
APPLY THREAD SEALANT AND TORQUE TO
120-130 N.m
(86-95 ft-lb)

3**
LIPS OF V-PACKINGS MUST FACE DOWN

16
APPLY THREAD SEALANT AND TORQUE TO
27-34 N.m
(20-25 ft-lb)

24
APPLY THREAD SEALANT AND TORQUE TO
45-53 N.m
(33-39 ft-lb)

17
TORQUE TO
235-250 N.m
(172-182 ft-lb)

8
TORQUE TO
70-75 N.m
(51-55 ft-lb)

11*

12
TORQUE TO
235-250 N.m
(172-182 ft-lb)

*11

11
TORQUE TO
235-250 N.m
(172-182 ft-lb)

10

9

20*

19
APPLY ADHESIVE TO FEMALE THREADS

22
LARGE BEVEL MUST FACE DOWN

*21

23
TORQUE TO
235-250 N.m
(172-182 ft-lb)

24 (REF)

31

25
FLAT SIDE MUST FACE UP

30
TORQUE TO
45-53 N.m
(33-39 ft-lb)

18
TORQUE TO
45-53 N.m
(33-39 ft-lb)

18
TORQUE TO
45-53 N.m
(33-39 ft-lb)

32

2

1

4**

5

6**
Model 222-759, Series A Displacement Pump
(Standard on Monark and President Pumps; 
may also be used on Senator and Bulldog except 
when used with a 200 liter [55 gallon] ram) 
Includes items 1–35

Model 222-790, Series A Displacement Pump
(Standard on Senator and Bulldog Pumps; 
may also be used on Monark and President) 
Includes items 1–35

<table>
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<td>184-039</td>
<td>NUT, packing; carbon steel</td>
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<td>3</td>
<td>109-302**</td>
<td>V-PACKING; PTFE</td>
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<td>184-058**</td>
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<td>109-252**</td>
<td>V-PACKING; UHMWPE</td>
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<tr>
<td>6</td>
<td>184-126**</td>
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<tr>
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<td>10</td>
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<td>184-040</td>
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<td>184-042</td>
<td>PISTON, alloy steel</td>
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<td>14</td>
<td>184-043</td>
<td>GUIDE, piston; alloy steel</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>184-053*</td>
<td>SEAL, piston; UHMWPE</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>184-052</td>
<td>SEAT, piston; alloy steel</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>184-044</td>
<td>HOUSING, intake valve; ductile iron</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>184-048</td>
<td>NUT, packing, intake valve; carbon steel</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>184-050</td>
<td>VALVE BODY, intake; alloy steel</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>184-049*</td>
<td>SEAL, intake valve; PTFE*</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>184-163</td>
<td>CYLINDER, intake; ductile iron (Model 222-759 only)</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>184-046</td>
<td>SEAT, intake valve; ductile iron (Model 222-790 only)</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>184-075</td>
<td>CYLINDER, intake; ductile iron (Model 222-790 only)</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>184-047</td>
<td>ROD, priming piston; nitralloy</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>184-051</td>
<td>PISTON, priming; carbon steel</td>
<td>1</td>
</tr>
<tr>
<td>30</td>
<td>184-121</td>
<td>NUT, priming piston; alloy steel</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>184-122</td>
<td>GUIDE, priming piston; alloy steel</td>
<td>1</td>
</tr>
<tr>
<td>32</td>
<td>184-123</td>
<td>SPACER, intake valve; sst</td>
<td>1</td>
</tr>
<tr>
<td>33</td>
<td>184-124</td>
<td>SPACER, piston; sst</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>206-256</td>
<td>VALVE, bleeder; carbon steel</td>
<td>1</td>
</tr>
</tbody>
</table>

* Supplied in Seal Repair Kit 222-773.

** Supplied in Throat Packing Repair Kit 222-774.

222-775 THROAT PACKING CONVERSION KIT
To convert the pump throat to all PTFE packings. 
Must be purchased separately. Consists of:

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

222-793 INTAKE SEAT REPAIR KIT
To replace the intake seat and seal. 
Must be purchased separately. Consists of:

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
</tr>
</tbody>
</table>

222-777 PRESIDENT MOUNTING KIT
To mount Displacement Pump 222-759 or 222-790 to a President Air Motor, Model 207-352. 
Must be purchased separately. Includes instructions. Consists of:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>184-076</td>
<td>ROD, tie</td>
<td>3</td>
</tr>
<tr>
<td>184-141</td>
<td>PLATE, adapter</td>
<td>1</td>
</tr>
<tr>
<td>184-142</td>
<td>ROD, adapter</td>
<td>1</td>
</tr>
<tr>
<td>109-453</td>
<td>SCREW, cap, socket hd</td>
<td>3</td>
</tr>
<tr>
<td>184-059</td>
<td>NUT, coupling</td>
<td>1</td>
</tr>
<tr>
<td>184-128</td>
<td>COLLAR, coupling</td>
<td>2</td>
</tr>
<tr>
<td>109-209</td>
<td>NUT, lock</td>
<td>3</td>
</tr>
<tr>
<td>101-946</td>
<td>PIN, cotter</td>
<td>1</td>
</tr>
</tbody>
</table>

HOW TO ORDER PARTS
1. To be sure you receive the correct replacement parts, kits 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 Graco distributor.

<table>
<thead>
<tr>
<th>6 digit Part Number</th>
<th>Qty</th>
<th>Part Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

308-017 19
USE GENUINE GRACO PARTS AND ACCESSORIES

Must be purchased separately.

**GROUNDING CLAMP 103-538**
**GROUND WIRE 208-950**
7.6 m (25 ft) long,
1.5 mm² (12 gauge)

**BLEED-TYPE MASTER AIR VALVE**
21 bar (300 psi) MAXIMUM WORKING PRESSURE
107-141 3/4 npt(m) inlet x 3/4 npt(f) outlet
107-142 1/2 npt(m) inlet x 1/2 npt(f) outlet
Relieves air trapped in the air line between the pump air inlet and this valve when closed.

**AIR LINE FILTER**
17.5 bar (250 psi) MAXIMUM WORKING PRESSURE
106-149 1/2 npt(f) inlet and outlet
106-150 3/4 npt(f) inlet and outlet

**AIR LINE LUBRICATOR**
17.5 bar (250 psi) MAXIMUM WORKING PRESSURE
214-848 0.24 liter (8 oz) bowl capacity.
1/2 npt(f) inlet and outlet
214-849 0.48 liter (16 oz) bowl capacity.
3/4 npt(f) inlet and outlet

**AIR REGULATOR**
21 bar (300 psi) MAXIMUM WORKING PRESSURE
104-266 For President and Monark pumps.
0-18 bar (0-250 psi) Regulated Pressure Range; 1/2 npt(f) inlet and outlet.
206-197 For Senator and Bulldog pumps.
0-9 bar (0-125 psi) Regulated Pressure Range; 1/2 npt(f) inlet and outlet.

**PUMP RUNAWAY VALVE 215-362**
12 bar (180 psi) MAXIMUM WORKING PRESSURE
Shuts 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) inlet and outlet.

**GROUNDED 19 mm (3/4 in.) BUNA-N AIR HOSE**
12 bar (175 psi) MAXIMUM WORKING PRESSURE

<table>
<thead>
<tr>
<th>Part No.</th>
<th>ID</th>
<th>Length</th>
<th>Thd. Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>208-610</td>
<td>19 mm (3/4&quot;)</td>
<td>1.8 m (6 ft)</td>
<td>3/4 npt(m)</td>
</tr>
<tr>
<td>205-546</td>
<td>19 mm (3/4&quot;)</td>
<td>4.5 m (15 ft)</td>
<td>3/4 npt(m)</td>
</tr>
<tr>
<td>208-611</td>
<td>19 mm (3/4&quot;)</td>
<td>7.6 m (25 ft)</td>
<td>3/4 npt(m)</td>
</tr>
<tr>
<td>208-612</td>
<td>19 mm (3/4&quot;)</td>
<td>15.2 m (50 ft)</td>
<td>3/4 npt(m)</td>
</tr>
</tbody>
</table>

**GROUNDED 13 mm (1/2 in.) BUNA-S AIR HOSE**
12 bar (175 psi) MAXIMUM WORKING PRESSURE

<table>
<thead>
<tr>
<th>Part No.</th>
<th>ID</th>
<th>Length</th>
<th>Thd. Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>205-418</td>
<td>13 mm (1/2&quot;)</td>
<td>1.8 m (6 ft)</td>
<td>1/2 npt(m)</td>
</tr>
<tr>
<td>205-216</td>
<td>13 mm (1/2&quot;)</td>
<td>4.5 m (15 ft)</td>
<td>1/2 npt(m)</td>
</tr>
<tr>
<td>205-273</td>
<td>13 mm (1/2&quot;)</td>
<td>7.6 m (25 ft)</td>
<td>1/2 npt(m)</td>
</tr>
<tr>
<td>208-594</td>
<td>13 mm (1/2&quot;)</td>
<td>15.2 m (50 ft)</td>
<td>1/2 npt(m)</td>
</tr>
</tbody>
</table>

**AIR PRESSURE REGULATOR KIT 205-712**
21 bar (300 psi) MAXIMUM WORKING PRESSURE
0-9 bar (0-125 psi) REGULATED PRESSURE RANGE
For Senator and Bulldog pumps. Includes air regulator, bleed-type master air valve, hose and swivel inlet.
USE GENUINE GRACO PARTS AND ACCESSORIES

**ACCESSORIES**

**NYLON FLUID HOSE**
- **184-138** 3/4 npt (mbe); 4.8 m (15 ft) long
- **184-139** 1/2 npt (mbe); 1.5 m (5 ft) long
- **184-156** 1/2 npt (mbe); 6.1 m (20 ft) long
- **276 bar (4000 psi) MAXIMUM WORKING PRESSURE**

**FLUID DRAIN VALVE**
- **350 bar (5000 psi) MAXIMUM WORKING PRESSURE**
- Open to relieve fluid pressure in hose and gun/valve.
- **210-657** 1/4 npt (mbe)
- **210-658** 3/8 npt (mbe)
- **210-659** 1/4 npt x 3/8 npt (mbe)

**FLUID REGULATOR 903-958**
- **350 bar (5000 psi) MAXIMUM WORKING PRESSURE**
- Regulates fluid pressure to the gun or dispensing valve, and dampens pressure surges. Spring operated, for highly viscous fluids. 3/4 npt(f) inlet, two 3/4 npt(f) outlets.

**FLOOR STAND KIT 222-780**
- Provides secure floor mounting for pump when used with bulk fluid containers. 3" npt fluid inlet. Includes floor stand, ball valve, pump mounting kit 222-776 and instructions.

**SINGLE POST 19 LITER (5 gallon) RAM 222-781**
- For extruding highly viscous fluids from 19 liter (5 gallon) pails. Use with inductor plate 222-767.

**200 LITER (55 gallon) RAM 223-634**
- For extruding highly viscous fluids from open 200 liter (55 gallon) drums. Pump must be equipped with Model 222-790 Displacement Pump. Also requires pump mounting kit 222-776.

**19 LITER (5 GAL.) RAM PLATE 222-767**
- For use with ram inductor units. Applies pressure on surface of highly viscous fluids, to force fluid into the pump intake and assist priming.

**PLASTIC SHIELD KITS**
- Covers the ram plate, to keep it clean. Package of 10 shields.
- **223-689** For 19 liter (5 gal.) ram plate
- **222-792** For 200 liter (55 gal.) ram plate

**PUMP MOUNTING KIT 222-776**
- Allows mounting of pump on 223-634 Ram. Included in 222-780 Floor Stand Kit.

**EXTRUSION FLO GUN 207-945**
- **420 bar (6000 psi) MAXIMUM WORKING PRESSURE**
- Pistol-type trigger. 1/2 npt(f) inlet.

**GUN SWIVELS**
- **420 bar (6000 psi) MAXIMUM WORKING PRESSURE**
- To connect the fluid hose to the gun, and allow freer gun movement. For non-abrasive fluids.
- **207-947** Straight swivel; 1/2 npt(f) x 1/2 npt(m)
- **207-948** Zee swivel; 1/2 npt(f) x 1/2 npt(m)

**GRACO THROAT SEAL LIQUID**
- Non-evaporating liquid for wet cup
- **206-995** 0.95 liter (1 quart)
- **206-996** 3.8 liter (1 gallon)
**TECHNICAL AND PERFORMANCE DATA (222-770 MONARK)**

- **Maximum fluid working pressure**: 125 bar (1800 psi)
- **Maximum air input pressure**: 12.5 bar (160 psi)
- **Pump cycles per 3.6 liters (1 gal.):** 60
- **Recommended pump speed for continuous operation**: 40 cycles per min
- **Maximum recommended pump speed**: 60 cycles per min
- **Maximum flow**: 3.6 liters/min (1.0 gpm) at 60 cycles/min
- **Air motor effective diameter**: 76 mm (3”)
- **Strokelength**: 76 mm (3”)
- **Displacement pump effective area**: 4.5 cm² (0.697 in²)
- **Maximum pump operating temperature**: 150°C (300°F)
- **Air inlet size**: 3/8 npt(f)
- **Fluid outlet size**: 3/4 npt(m)
- **Weight**: 21 kg (45 lb)
- **Wetted parts**: Carbon Steel: E52100, 41L40, and 4140 Alloy Steel; Nitralloy 135; 304, 316 and 17-4 pH Grades of Stainless Steel; Ductile Iron; Zinc and Nickel Platina; PTFE; Ultra-High Molecular Weight Polyethylene

**PTFE** is a registered trademark of the Co.

**KEY:**
- Fluid Outlet Pressure - Black Curves
- Air Consumption - Gray Curves

**NOTE:** Recommended pump speed for continuous operation: 40 cpm

- Maximum recommended pump speed (to shaded area): 60 cpm

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**FLUID FLOW (TEST FLUID: 1900 CENTIPOISE OIL)**

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
KEY: Fluid Outlet Pressure - Black Curves
Air Consumption - Gray Curves

NOTE: Recommended pump speed for continuous operation: 40 cpm
Maximum recommended pump speed (to shaded area): 60 cpm

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min/scfm) at a specific fluid flow (lpm/gpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
Maximum fluid working pressure .................................. 250 bar (3600 psi)
Maximum air input pressure ....................................... 12.5 bar (180 psi)
Pump cycles per 3.8 liters (1 gal.) ................................. 48
Recommended pump speed for continuous operation ........ 40 cycles per min
Maximum recommended pump speed ............................ 60 cycles per min
Maximum flow ..................................................... 4.5 liters/min (1.2 gpm) at 60 cycles/min
Air motor effective diameter ........................................ 102 mm (4")
Stroke length ...................................................... 106 mm (4.25")
Displacement pump effective area ................................. 0.697 in.²
Maximum pump operating temperature ......................... 150°C (300°F)
Air inlet size ...................................................... 1/2 npt(f)
Fluid outlet size ................................................... 3/4 npt(m)
Weight ............................................................... 314 lb (50 lb)
Wetted parts ........................................................ Carbon Steel; E52100, 41L40, 4140 Alloy Steel; Nitralloy 135;
Zinc and Nickel Plating; PTFE; Ultra-High Molecular Weight Polyethylene

PTFE is a registered trademark of the DuPont Co.

KEY:
Fluid Outlet Pressure – Black Curves
Air Consumption – Gray Curves

NOTE: Recommended pump speed for continuous
operation: 40 cpm
Maximum recommended pump speed
(to shaded area): 60 cpm

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm)
and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (lpm/m³ or scfm) at a specific fluid flow
(lpm/gpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.

FLUID FLOW (TEST FLUID: 1900 CENTIPOISE OIL)
To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (gpm/liters/min) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min or scfm) at a specific fluid flow (gpm/liters/min) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
### TECHNICAL AND PERFORMANCE DATA (222-769 SENATOR)

Maximum fluid working pressure ................................ 238 bar (3400 psi)
Maximum air input pressure ........................................ 7 bar (100 psi)
Pump cycles per 3.8 liters (1 gal.) ................................. 38
Recommended pump speed for continuous operation .......... 40 cycles per min
Maximum recommended pump speed ............................... 60 cycles per min
Maximum flow .......................................................... 6 liters/min (1.6 gpm) at 60 cycles/min
Air motor effective diameter ........................................ 146 mm (5.75")
Stroke length ............................................................ 120 mm (4.7")
Displacement pump effective area .................................. 4.5 cm² (0.697 in²)
Maximum pump operating temperature ......................... 150°C (300°F)
Air inlet size ............................................................ 3/4 npsm(f)
Fluid outlet size ......................................................... 3/4 npt(m)
Weight ................................................................. 45.5 kg (100 lb)
Wetted parts ............................................................ Carbon Steel; E851100, 4140, and 4140 Alloy Steel; Nitralloy 135; 304, 316 and 17-4 pH Grades of Stainless Steel; Ductile Iron; Ultra-High Molecular Weight Polyethylene

PTFE

**KEY:**
- Fluid Outlet Pressure - Black Curves
- Air Consumption - Gray Curves

**NOTE:**
- Recommended pump speed for continuous operation: 40 cpm
- Maximum recommended pump speed (to shaded area): 80 cpm

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### FLUID FLOW (TEST FLUID: 1900 CENTIPOISE OIL)

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (gpm/lpm) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min or scfm) at a specific fluid flow (gpm/lpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
TECHNICAL AND PERFORMANCE DATA (222-769 SENATOR)

**KEY:**
- Fluid Outlet Pressure - Black Curves
- Air Consumption - Gray Curves

**NOTE:**
- Recommended pump speed for continuous operation: 40 cpm
- Maximum recommended pump speed (to shaded area): 60 cpm

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
TECHNICAL AND PERFORMANCE DATA (222-778 BULLDOG)

- Maximum fluid working pressure: 347 bar (4950 psi)
- Maximum air input pressure: 6.3 bar (90 psi)
- Pump cycles per 3.8 liters (1 gal): 40
- Recommended pump speed for continuous operation: 40 cycles/min
- Maximum recommended pump speed: 60 cycles/min
- Maximum flow: 5.7 liters/min (1.5 gpm) at 60 cycles/min
- Air motor effective diameter: 146 mm (5.75"
- Stroke length: 120 mm (4.7"
- Displacement pump effective area: 4.5 cm² (0.697 in²)
- Maximum pump operating temperature: 150°C (300°F)
- Air inlet size: 3/4 npt (f)
- Fluid outlet size: 3/4 npt (m)
- Weight: 45.5 kg (100 lb)

- Wetted parts: Carbon Steel; E52100, 41L40, and 4140 Alloy Steel; Nitralloy 135; 304, 316, and 17-4 pH Grades of Stainless Steel; Ductile Iron; Zinc and Nickel Plating; PTFE; Ultra-High Molecular Weight Polyethylene

PTFE is a registered trademark of the Co.

KEY:
- Fluid Outlet Pressure - Black Curves
- Air Consumption - Gray Curves

NOTE: Recommended pump speed for continuous operation: 40 cpm
- Maximum recommended pump speed (to shaded area): 60 cpm

To find Fluid Outlet Pressure (bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Follow vertical line up to intersection with selected fluid outlet pressure curve (black). Follow left to scale to read fluid outlet pressure.

To find Pump Air Consumption (m³/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (bar/psi):
1. Locate desired flow along bottom of chart.
2. Read vertical line up to intersection with selected air consumption curve (gray). Follow right to scale to read air consumption.
<table>
<thead>
<tr>
<th>Pump Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>222-770</td>
<td>1188 mm</td>
<td>365 mm</td>
<td>826 mm</td>
<td>326 mm</td>
</tr>
<tr>
<td></td>
<td>(46.75 in.)</td>
<td>(14.35 in.)</td>
<td>(32.5 in.)</td>
<td>(12.9 in.)</td>
</tr>
<tr>
<td>222-768</td>
<td>1261 mm</td>
<td>418 mm</td>
<td>832 mm</td>
<td>328 mm</td>
</tr>
<tr>
<td></td>
<td>(49.25 in.)</td>
<td>(16.45 in.)</td>
<td>(32.75 in.)</td>
<td>(12.9 in.)</td>
</tr>
<tr>
<td>222-769</td>
<td>1400 mm</td>
<td>570 mm</td>
<td>830 mm</td>
<td>322 mm</td>
</tr>
<tr>
<td></td>
<td>(55.1 in.)</td>
<td>(22.4 in.)</td>
<td>(32.7 in.)</td>
<td>(12.7 in.)</td>
</tr>
<tr>
<td>222-778</td>
<td>1400 mm</td>
<td>570 mm</td>
<td>830 mm</td>
<td>322 mm</td>
</tr>
<tr>
<td></td>
<td>(55.1 in.)</td>
<td>(22.4 in.)</td>
<td>(32.7 in.)</td>
<td>(12.7 in.)</td>
</tr>
</tbody>
</table>
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 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 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.

IMPORTANT PHONE NUMBERS

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you:
1-800-328-0211 Toll Free

FOR TECHNICAL ASSISTANCE, service repair information or assistance regarding the application of Graco equipment:
1-800-543-0339 Toll Free