

REPAIR-PARTS LIST



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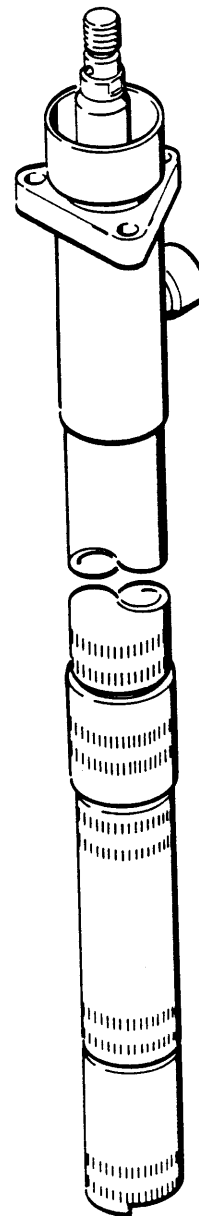
Rev B
SUPERSEDES A

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

DISPLACEMENT PUMP

2200 psi (154 bar) MAXIMUM WORKING PRESSURE

Model 218-612, Series A



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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.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the gun/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 in the eyes or on the skin can **cause** serious damage.

NEVER point the spray gun or dispensing valve at anyone or at any part of the body. NEVER put hand or fingers over the spray tip or fluid tip.

ALWAYS have the tip guard in place on the gun/valve when used in an airless spray application.

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

NEVER try to "blow back" paint; this is not an air spray pump.

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 in 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 and Dispensing Valve Safety Devices

Be sure all gun/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 (if applicable)

Whenever you stop spraying, even for a moment, **always** set the gun/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.

Diffuser (if applicable)

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

Tip Guard (if applicable)

ALWAYS have the tip guard in place on the gun/valve when used in an airless spray application. 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 (if applicable)

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

Spray Tip and Nozzle Safety

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

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

1. Engage the spray gun or dispensing valve safety latch.
2. Close the pump air regulator.
3. Close the master bleed-type air valve (required in your system).
4. Disengage the gun or dispensing valve safety latch.
5. Hold a metal part of the gun or valve firmly to a grounded metal waste container and trigger to relieve the fluid pressure.
6. Engage the safety latch again.
7. Open the pump drain valve (required in your system), having a 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 clogged or that fluid pressure is not fully relieved after following the steps above, VERY SLOWLY loosen the tip guard or hose end coupling and allow pressure to be relieved gradually, then remove completely. Now clear the tip or hose obstruction.

WARNINGS continued on next page.

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.

ALWAYS read and follow the fluid and solvent manufacturer's recommendations regarding the use of protective clothing and equipment.

System Pressure

This displacement pump has a 2200 psi (154 bar) MAXIMUM WORKING PRESSURE. NEVER exceed the stated maximum working pressure of the pump or of the lowest rated component in your system.

Be sure that all accessories you add to the spray system are properly rated to withstand the maximum air and fluid working pressures of your pump.

Fluid Compatibility

BE SURE that all fluid and solvent used are chemically compatible with the wetted parts shown in the Technical Data on the back cover. Always read the fluid and solvent manufacturer's literature before using them in your system.

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 SPRAY HOSES MUST HAVE SPRING GUARDS ON BOTH ENDS (except certain mastic applications). 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.

HANDLE AND ROUTE HOSES CAREFULLY. Do not pull on hoses to move equipment. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose.

Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray 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, at the right.

Static electricity is created by the high velocity flow of fluid through the pump and hose. If every part of the spray equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparking may also occur when plugging in or unplugging a power supply cord. 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. Do not plug in or unplug any power supply cords in the spray area when there is any chance of igniting fumes still in the air.

If you experience any static sparking or even a slight shock while using this equipment, STOP SPRAYING IMMEDIATELY. Check the entire system for positive 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 spray equipment used or located in the spray area. CHECK your local electrical code for detailed grounding instructions for your area and type of equipment. BE SURE to ground all of this spray equipment:

1. *Pump:* use a ground wire and clamp as instructed in your separate pump instruction manual.
2. *Air hoses:* use only grounded air hoses.
3. *Fluid hoses:* use only grounded fluid hoses.
4. *Air compressor:* follow manufacturer's recommendations.
5. *Spray gun or dispensing valve:* grounding is obtained through connection to a properly grounded fluid hose and pump.
6. *Fluid supply container:* according to local code.
7. *Object being sprayed:* according to your local code.
8. *All solvent pails used when flushing,* according to local code. Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.
9. *To maintain grounding continuity when flushing or relieving pressure,* always hold a metal part of the gun/valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

Flushing Safety

To reduce the risk of fluid injection injury, static sparking, or splashing in the eyes or on the skin follow the Pressure Relief Procedure on page 2, and remove the spray tip (airless spray guns or spray valves only) before flushing. Hold a metal part of the gun/valve firmly to the side of a grounded metal pail and use the lowest possible fluid pressure during flushing.

MOVING PARTS HAZARD

The piston in the air motor, located behind the air motor shield, moves when air is supplied to the motor. Moving parts can pinch or amputate your fingers or other body parts. Therefore, KEEP CLEAR of moving parts when starting or operating the pump. Follow the Pressure Relief Procedure before checking or servicing the sprayer to prevent it from starting accidentally. Never operate the pump or air motor with any parts removed.

IMPORTANT

PUMP REPAIR

WARNING

To reduce the risk of serious bodily injury, follow the Pressure Relief Procedure on page 2 before servicing this pump.

NOTE: A packing repair kit, 218-711, is available. Use all the new parts in the kit, even if the old ones still look good. Old and new parts do not seal well together, and the pump may leak.

Reference numbers followed by an asterisk, for example (3*), indicate that this part is included in the repair kit.

1. Unscrew the foot valve (27). Remove the ball stop (26), pin (25) and ball (30). See Fig 1.
2. Unscrew the lower cylinder (14) from the cylinder coupling (12). Remove the o-ring (6) and gasket (13). Using a soft mallet, gently tap on the top of the rod (8) and pull the rod assembly (B) out of the pump housing.

NOTE: If only the piston needs repair, don't remove the rod assembly (B).

3. Remove the piston assembly from the cylinder. Hold the flats of the piston rod (15) with a wrench and unscrew the piston valve (24). Refer to Fig 2. Sealant on the threads of the piston valve will make this hard to remove.
4. Pull the piston assembly (A) off of the rod (15). Refer to Fig 1.
5. Unscrew the piston stud (23) from the piston housing (16), and remove the packings and glands, but leave the spring washers (18) on the piston. Refer to Fig 2.
6. Remove the wet-cup (1), u-cup packing (2), washer (3) and bearing (4) from the pump housing (5) throat. See Fig 1.
7. Unscrew the upper cylinder (10) from the pump housing (5). Remove the o-ring (6).
8. Clean all parts thoroughly in a compatible solvent and dry. Inspect for wear or damage such as nicks and scratches. If the outer surface of the rod assembly (B) or the inner surface of the cylinders are scored or worn, disassemble the rod and replace parts as needed.
9. If you disassembled the rods, place the flats of the displacement rod (8) in a vise. Apply thread locking compound to the threads of the connecting rod (11). Screw the rod (11) into the displacement rod (8), torquing to 60-70 ft-lb (82-96 N·m). Screw the piston rod (15) onto the connecting rod, torquing to 60-70 ft-lb (82-96 N·m). Refer to Fig 1.

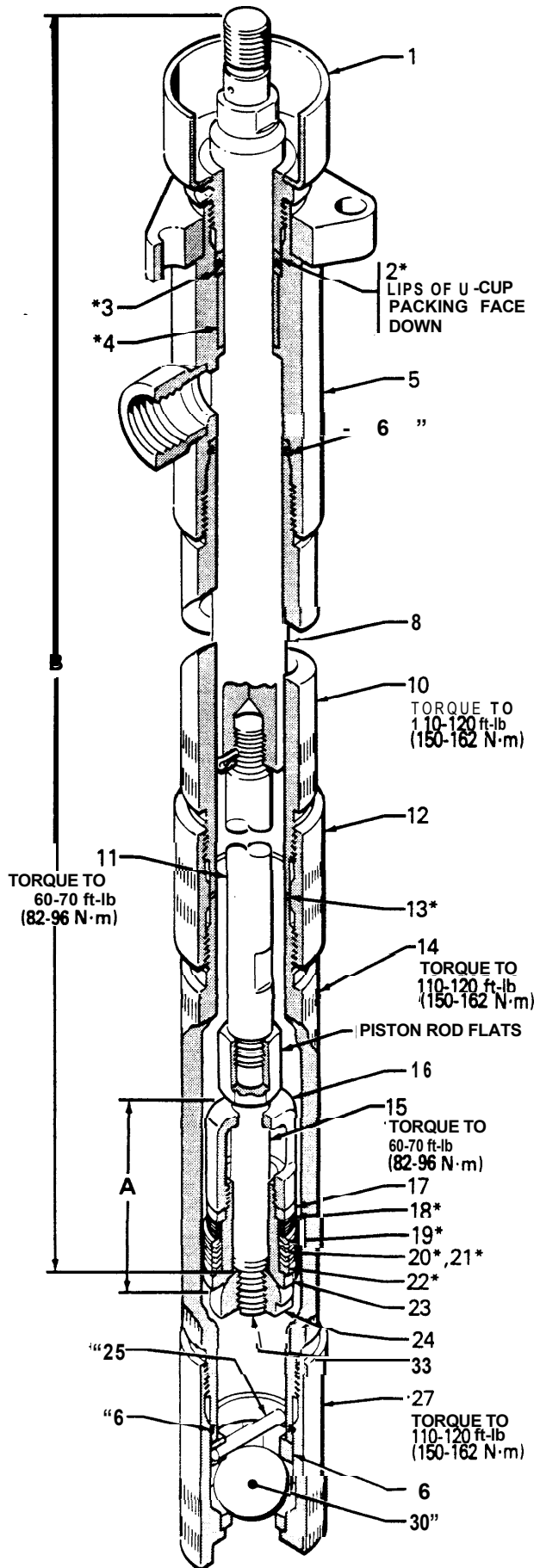


Fig 1

10. Lubricate the outer surface of the piston stud (23) and the new packings and glands. When installing the packings, *be sure the lips of the v-packings face on the stud.* One at a time, install the female gland (22*), alternately install the PTFE packings (21*) and the leather packings (20*), and then install the male gland (19*). See Fig 2.

CAUTION
The six spring washers (18*) must be assembled accurately to provide the proper spring action for the piston. If installed incorrectly, the piston will not open and close properly and the pump will leak. Also, a protruding washer will permanently scratch the lower cylinder (14).

11. Notice when looking at the washer (18*) from the side, that one side bows out. Place this bowed-out side against the male gland (19*). Install the next washer so the bowed-out side faces away from the first washer. Alternate the direction of each washer until all six are installed. See the detail in Fig 2. Install the packing retainer (17*) on the washers (18).

12. Apply thread locking compound, such as Loctite® No. 271 (red), to the piston stud (23) threads. Hold the retainer (17) down to keep the washers (18) from sliding up on the threads. Now screw the piston housing (16) onto the stud and torque to 80-90 ft-lb (108-122 N·m).

NOTE: If any of the washers (18) protrude, tap them lightly all around with a plastic mallet to set them in place. If this doesn't work, loosen the piston housing and realign the washers.

13. Lubricate the new bearing (4*), washer (3*) and u-cup packing (2*), and install in the pump housing (5). *The lips of the u-cup packing must face down in the throat.* Install the wet-cup (1) and screw in tightly. See Fig 1.

14. Lubricate the new o-ring (6*) and install on the upper cylinder (10). Screw the cylinder snugly in to the pump housing (5). Torque to 110-120 h-lb (150-162 N·m). See Fig 1.

15. Slide the piston assembly (A) onto the piston rod (15). Apply thread locking compound to the piston rod threads and to the inner threads of the piston valve (24). Install the piston valve and tighten until there is a 0.35 in. (8.9 mm) clearance between the top of the piston housing (16) and the bottom of the piston rod hex. See Fig 2. Now snug the plug (33) in the bottom of the piston valve (24) which may have been loosened during repair; apply thread locking compound to the plug if it was completely removed. Place the flats of the piston valve in a vise and torque the piston rod to 60-70 h-lb (82-96 N·m).

16. Screw the coupling (12) onto the upper cylinder (10) until *just about one full thread of the cylinder is exposed.* See Fig 4.

17. Place a piece of wood, such as 2x4, on the floor. Place the o-ring end of the lower cylinder (14) on the wood. Guide the piston and rod assembly into the cylinder, being very careful not to shear the edges of the packings. Lightly tap the top of the rod (8) with a plastic mallet until the hex of the piston rod is just visible beyond the top of the cylinder. See Fig 3.

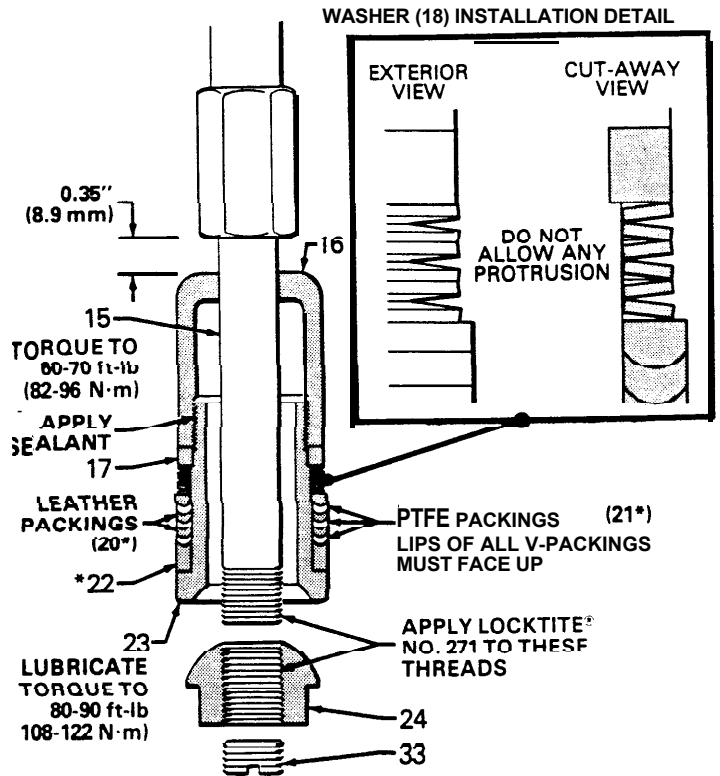


Fig 2

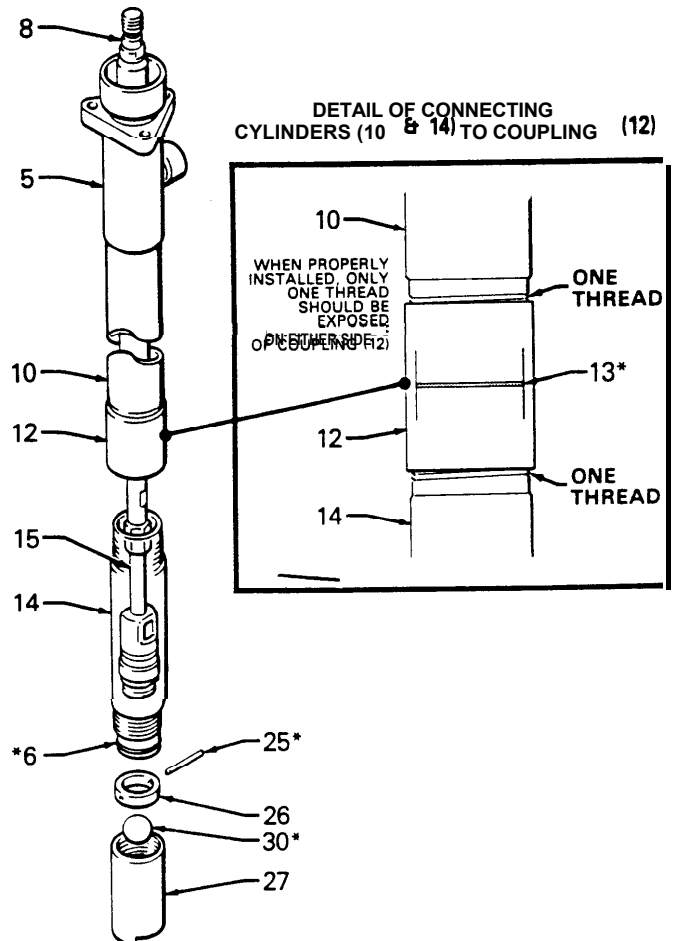


Fig 3

18. Apply grease to the coupling gasket (13) and install the gasket in the coupling (12). The grease helps hold it in place.
19. Lubricate the end of the displacement rod (8) and slide the rod assembly into the bottom of the upper cylinder (10) and guide it carefully through the throat bearing (4). See Fig 1.
20. Screw the coupling down far enough to engage the threads of the lower cylinder (14). Screw the coupling up again and continue screwing in the cylinder. Torque to 110-120 ft-lb (150-162 N·m). *When properly adjusted, only one full thread of each cylinder (10 and 14) can be exposed on each side of the coupling; otherwise, the gasket (13) will not seat correctly.*
21. Install the pin (25) in the ball stop (26) and install the ball (30) and stop (26) in the foot valve (27). Lubricate the bottom of the cylinder (14), then install the foot valve. See Fig 1. Place the pump housing in a vise so that outlet is against one vise jaw. Tighten the vise. Now tighten the foot valve firmly to 110 to 120 ft-lb (150-162 N·m).
22. Assemble the displacement pump to the motor. Reconnect the ground wire if it was disconnected during repair.

PARTS LIST

Model 218-612, Series A Displacement Pump

Includes items

REF PART NO. NO.	DESCRIPTION	QTY
1	218-164 NUT, packing/wet-cup	1
2	● 107-256 PACKING, U-cup, Buna-N®	1
3	*180-035 WASHER, backup	1
4	*180-031 RING, wear, acetal homopolymer	1
5	218-163 HOUSING, pump	1
6	● 107-249 O-RING, Buna-N®	2
8	180-655 ROD, displacement	1
10	180-654 CYLINDER, pump	1
11	180651 ROD, connecting	1
12	180-016 COUPLING, cylinder	1
13	*180-032 GASKET, coupling	1
14	180-653 CYLINDER, pump	1
15	180-017 ROD, piston	1
16	180-020 HOUSING, piston	1
17	RETAINER, packing	1
18	● 180-094 WASHER, spring, sst	6
19	180-038 GLAND, packing, male	1
20	● 180-025 V-PACKING, leather	2
21	● 186-026 V-PACKING, PTFE	3
22	*180-027 GLAND, packing, female	1
23	180-022 STUD, piston	1
24	180-023 VALVE, piston	1
25	● 18g-024 PIN, straight	1
26	180-021 STOP, bail	1
27	218-165 VALVE, foot	1
30	● 101-178 BALL, steel	1
33	180634 PLUG, pipe, hdls, slotted; 5/8" size	1

"Included in packing repair kit 218-711.

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 Graco distributor.

6 digit PART NUMBER	QTY	PART DESCRIPTION

SERVICE INFORMATION

Listed below by the assembly changed are DELETED parts.

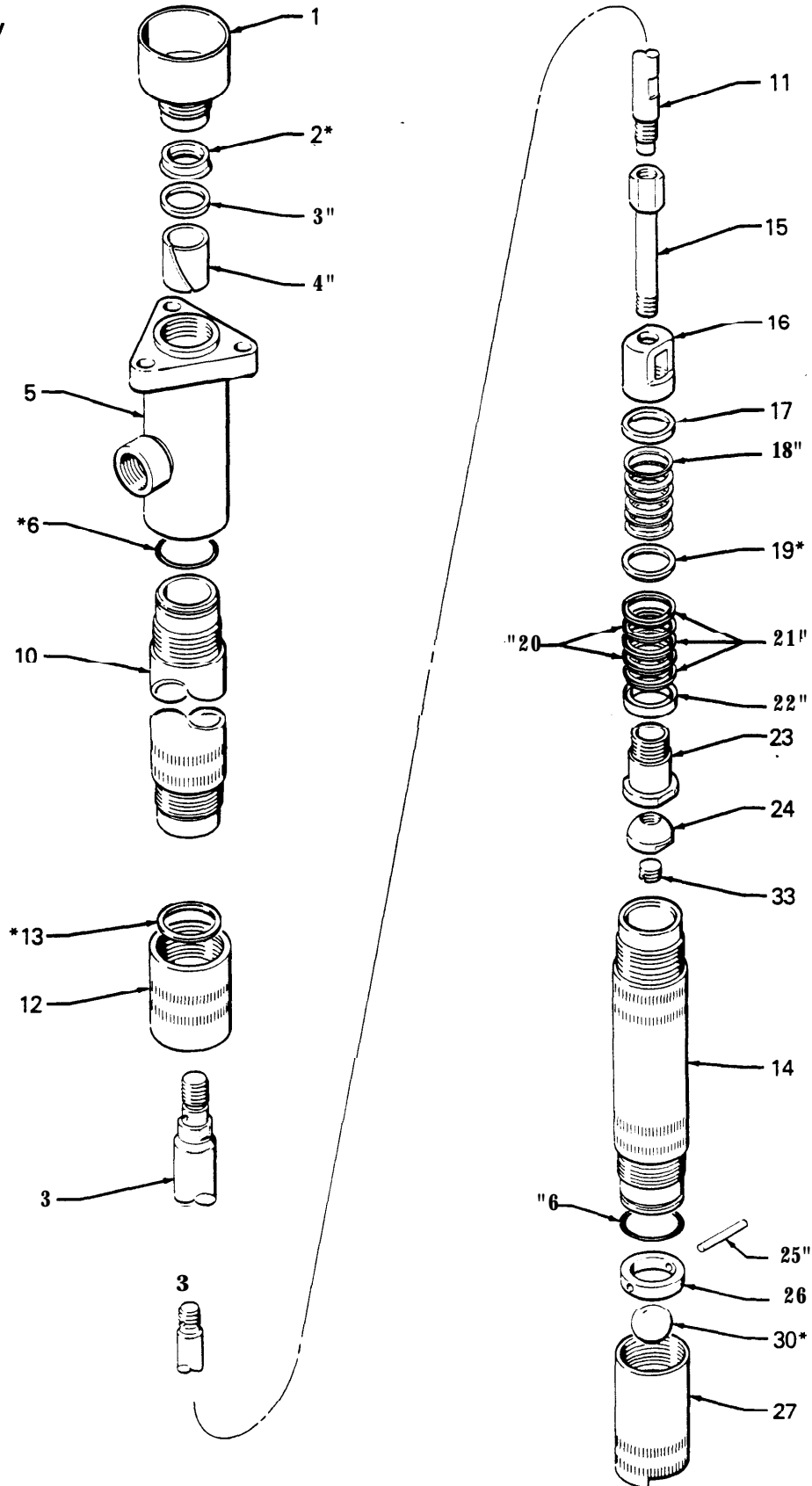
ASSEMBLY PART CHANGED	STATUS	REF PART NO. NO.	NAME
218-612	DELETED	9 108-003	Pin

PARTS DRAWING

Displacement Pump Model 218-612, Series A

Packing Repair Kit 218-711
(Must be purchased separately)
Includes:

Ref No.	Qty
2	1
3	1
4	1
6	2
13	1
18	6
19	1
20	2
21	3
22	1
25	1
30	1



WETTED PARTS

Carbon Steel, Steel,
Stainless Steel.

PTFE Leather,

Buna-N® is a registered trademark of the Pittway Corporation.

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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.

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

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, ANY 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.

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