

INSTRUCTIONS-PARTS LIST



801-392
Rev. A

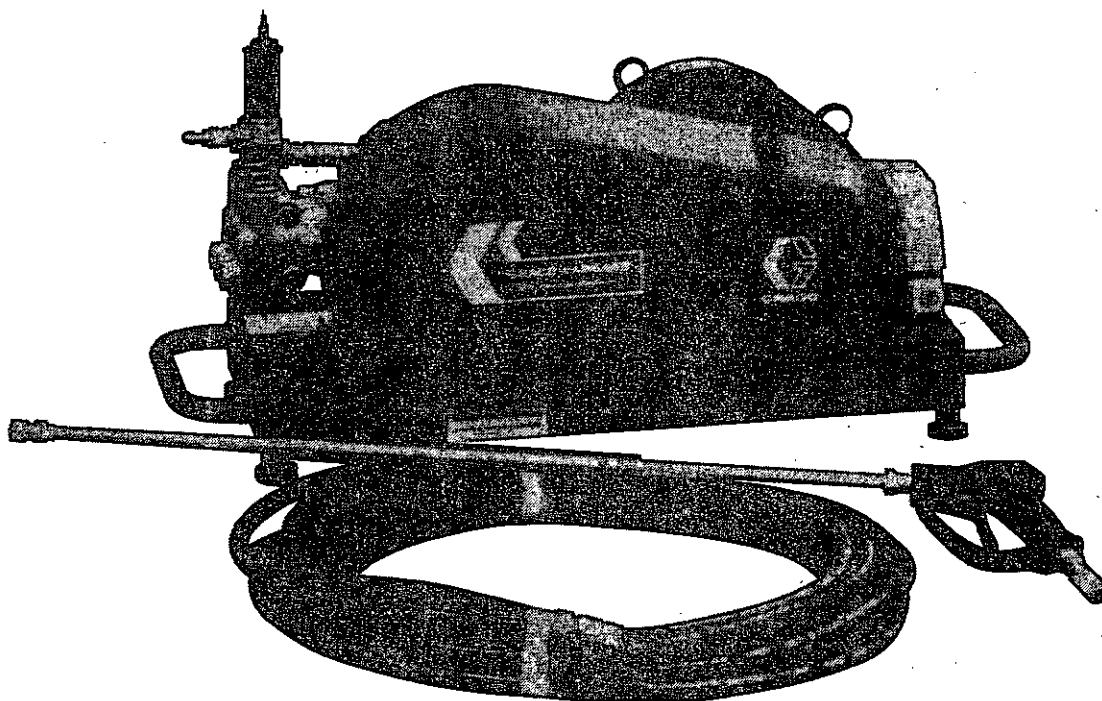
This manual contains **IMPORTANT WARNINGS** and **INSTRUCTIONS**
READ AND RETAIN FOR REFERENCE

HYDRA-CLEAN® 2104E

2104E MODEL 800-053 SERIES "A"

2150 psi (150 bar) OPERATING PRESSURE

2250 psi (155 bar) MAXIMUM WORKING PRESSURE



GRACO INC. P.O. Box 1441 MINNEAPOLIS, MN 55440-1444

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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.

INJECTION HAZARD

Fluids under high pressure from spray or leaks can penetrate the skin and cause extremely serious injury, including the need for amputation.

NEVER point the spray gun at anyone or any part of the body.

NEVER put hand or fingers over the spray tip.

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

ALWAYS have the tip guard in place when spraying.

MEDICAL TREATMENT

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. For treatment instructions have your doctor call the **NATIONAL POISON CENTER NETWORK**
(412)681-6669

AVOID COMPONENT RUPTURE

Even after you shut off the gasoline engine, there is high pressure in the pump, hose and gun until you release it by triggering the gun. So before removing the spray tip or servicing the unit, *always* shut off the unit *and* trigger the gun to release pressure.

Be sure that all accessory items and system components will withstand the pressure developed. **NEVER** exceed the pressure rating of any component in system. **NEVER** alter or modify equipment — your personal safety, as well as the function of the equipment, is at stake.

Before each use, check hose for weak, worn or damaged conditions caused by traffic, sharp corners, pinching or kinking. Tighten all fluid connections securely before each use. Replace any damaged hose.

Do not use chemicals or agents which are not compatible with Buna-N and PVC or neoprene cover of hose.

Do not leave a pressurized unit unattended. Shut off the unit and release pressure before leaving.

FIRE

Do not spray flammable liquids. Do not operate the engine where combustible fumes or dust may be present.

GENERAL

NEVER run the unit with the belt guard removed. Keep clear of moving parts when the unit is running.

Observe detergent manufacturer's safety precautions. Avoid getting detergent or other liquids in your eyes. Follow the directions on the container regarding contact with eyes, nose, and skin, breathing fumes, etc. Always wear full goggles to protect your eyes from the spray as well as any debris dislodged by the spray. If necessary, wear gloves or other protective clothing. If antidotes or treatment are recommended, be prepared to use them.

DON'T spray toxic chemicals such as insecticide or weed killer.

This unit is supplied with an 8-foot power cord made up of four AWG No. 12 wires. The green wire of the electric cord is connected to the unit chassis and motor frame. The other three wires are connected to the starter switch.

Be sure to connect the power cord to the appropriate approved plug to fit your requirements.

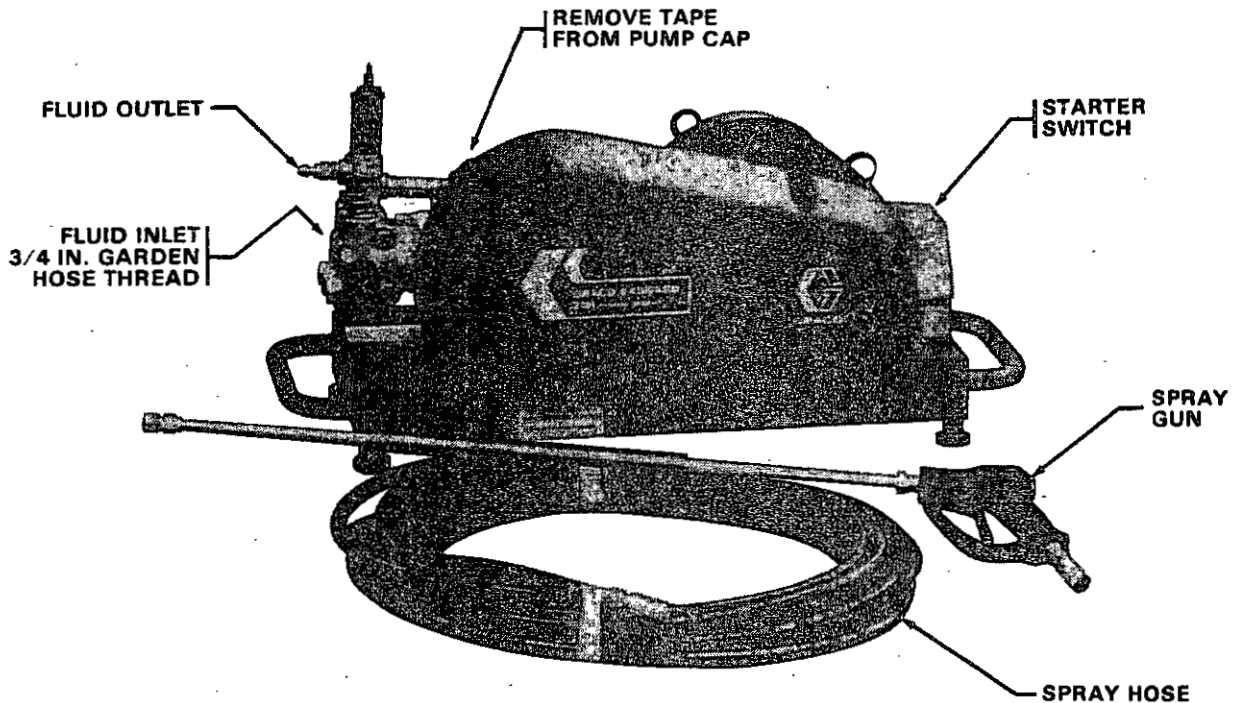
The starter switch has a built-in circuit breaker that will shut off the power to the unit whenever the circuit is overloaded.

Always check to be sure the switch is off and that the hoses and electric cord are clear of moving parts before plugging in the power cord.

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 in connection with your use of airless spray equipment.

INSTALLATION



Check Electrical Service and Plug In

Before plugging in the sprayer, be sure the electrical service is 3 phase 220 V, 60 HzAC, 20 Amp. With the ON-OFF switch in the OFF position, plug the power supply cord into a grounded outlet. If you use an extension cord, it must have 4 wires of at least 12 gauge (2.5 mm²) and should not be over 100 ft (30.3 m) long.

Install Hose and Spray Gun

Connect the spray hose to the spray gun by inserting the pin at the end of the hose into the quick disconnect coupler on the gun. Connect the hose to the fluid outlet in the same way.

Remove the tape from the cap on top of the pump.

Cleaning Accessories

For spraying detergent or other cleaning solution, we recommend using a chemical injector kit. See Accessories and instruction manual 801-192 for installation and operation.

For removing rust and old paint we recommend using a water sandblaster. See Accessories and instruction manual 801-190 for installation and operation.

Connect To Water Supply

CAUTION

Before attaching to water supply, check local plumbing code regarding cross-connection to water supply. Backflow check valve 801-133.

Do not exceed 160°F (70°C) water temperature to pump in a direct supply system.

Connect a hose with at least a 3/4 in. (19 mm) ID from your city water supply to the unit's 3/4 in. garden hose threaded inlet. The supply hose should not be more than 50 ft. (15 m) long.

NOTE: For a direct supply system, your water source at the unit *must* have a flow rate of **AT LEAST 5 GPM (19 LITER/MIN)**.

If your operating conditions are different from above, contact our Customer Service Department for assistance.

OPERATION

Startup

Before starting, be sure to read the safety warnings and setup instructions.

Turn on the water supply.

Trigger the gun to release any back pressure.

WARNING

DO NOT wire or tie the gun trigger into the open or triggered position.

CAUTION

Never run the cleaning unit dry. Costly damage to the pump will result. Always be sure water supply is completely turned on before operating.

Inspect all connections for any leaks. Tighten if necessary.

Cleaning

For Hydra-Clean technique, see the Chemical Injector manual, 801-192.

For abrasive cleaning, see the Water Sandblaster manual, 801-190.

WARNING

Follow these precautions when removing and installing nozzles:

1. Shut off the cleaning unit and trigger the gun to relieve pressure. Engage the trigger safety.
2. Keep the nozzle and the tube pointed away from you and everyone else.
3. Do not put your hand over the tip to push the nozzle into place. Grasp it from the side and keep your fingers away from the tip.
4. Do not let anyone else touch the spray valve while you are cleaning nozzles.
5. Be sure the slip ring is pushed forward to lock the nozzle in place before triggering the spray gun.

Shutdown and Care Of Unit

When unit is not in use, turn off water supply.

When shutting down for the day or weekend, shut off unit, shut off water supply valve, and trigger gun to release pressure. Wipe off the unit with a damp rag.

CAUTION

Shut off cleaning unit when not actually spraying, for longer pump life. The pump will overheat if left running for over 10 minutes without spraying.

Check the filter screen in the water inlet connection as often as necessary, at least daily. Do not operate the unit with the inlet and filter screen removed.

DO NOT try to adjust the unloader valve or change the engine speed. Changing these settings may cause excessive pressure, intermittent unloader operation, wasted fuel and increased wear on parts and will void the warranty.

PUMP MUST NOT BE RUN DRY and must be drained of water prior to exposure to freezing temperatures. Use and store the unit where it will not be subjected to freezing temperatures. If water does freeze in the unit, thaw before trying to start. A 50% anti-freeze solution may be pumped prior to cold weather storage.

Use only spray tips that are matched to the unit to avoid excessive cycling and wear of the unloader valve. See Accessories.

CAUTION

Let a frozen pump thaw in a warm place. Don't pour hot water on a frozen pump. A sudden temperature change may crack the ceramic plungers.

Do not pump caustic materials.

Before extended storage, flush the pump with light oil.

Avoid dragging hose over an abrasive surface such as cement. This causes excessive wear and shorter hose life.

Clean the intake line strainer daily.

Lubrication and Care

Fill pump crankcase to dot on oil gauge window with 25 oz. (0.75 liters) of crankcase oil (part no. 801-144) or equivalent SAE 40 weight hydraulic oil with antiwear and rust inhibitor additives. Change initial fill after 50 hour running period. Change oil every 3 months or at 500 hour intervals.

WARNING

NEVER alter adjustment or modify the unloader valve.

Altering or adjusting unloader *will not* increase performance of unit.

SERVICE

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Low pressure.	<p>Worn nozzle.</p> <p>Belt slippage.</p> <p>Air leak in inlet plumbing.</p> <p>Relief valve stuck, partially plugged or improperly adjusted; valve seat worn.</p> <p>Inlet suction strainer clogged or improper size.</p> <p>Worn packing. Abrasives in pumped fluid or severe cavitation. Inadequate water supply.</p> <p>Fouled or dirty inlet or discharge valves.</p> <p>Worn inlet or discharge valves. Leaky discharge hose.</p>	<p>Replace with nozzle of proper size.</p> <p>Tighten or replace; use correct belts and replace both at same time.</p> <p>Disassemble, reseal, and reassemble.</p> <p>Clean, and adjust relief valve; check for worn and dirty valve seats. Kit available.</p> <p>Clean. Use adequate size. Check more frequently.</p> <p>Install proper filter. Check flow available to pump.</p> <p>Clean inlet and discharge valve assemblies.</p> <p>Replace worn valves, valve seats and/or discharge hose.</p>
Pump runs extremely rough, pressure low.	<p>Restricted inlet or air entering the inlet plumbing.</p> <p>Inlet restrictions and/or air leaks. Stuck inlet or discharge valve.</p> <p>Leaking H.P. seals.</p>	<p>Proper size inlet plumbing; check for airtight seal.</p> <p>Clean out foreign material, replace worn valves.</p> <p>Replace seals.</p>
Water leakage from under the manifold.	Worn packing.	Install new packing.
Water in pump crankcase.	May be caused by humid air condensing into water inside the crankcase.	Change oil at 3 month or 500 hour intervals using Graco Crankcase Oil (other approved oil every month or 200 hours) P.N. 801-144.
Frequent or premature failure of the packing.	<p>Scored plungers.</p> <p>Over pressure to inlet manifold.</p> <p>Damaged or worn plungers.</p> <p>Abrasive material in the fluid being pumped.</p> <p>Excessive pressure and/or temperature of fluid being pumped.</p> <p>Over pressure of pumps.</p> <p>Running pump dry.</p>	<p>Replace plungers.</p> <p>Reduce inlet pressure.</p> <p>Replace plungers.</p> <p>Install proper filtration on pump inlet plumbing.</p> <p>Check pressures and fluid inlet temperature; be sure they are within specified range.</p> <p>Reduce pressure.</p> <p>Do not run pump without water.</p>
Strong surging at the inlet and low pressure on the discharge side.	Foreign particles in the inlet or discharge valve, or worn inlet and/or discharge valves.	Check for smooth lap surfaces on inlet and discharge valve seats. Discharge valve seats and inlet valve seats may be lapped on a very fine oil stone.

PROBLEM	CAUSE	SOLUTION
Electric motor won't run.	Power cord unplugged, or building circuit fuse blown.	Check, replace.
	Overload switch has opened.	Unplug power cord*, decrease pressure.
Electric motor stops while spraying.	Power cord unplugged, or building circuit fuse blown.	Check, replace.
	Overload breaker has opened.	Unplug power cord*, relieve pressure—allow to cool.
	Extension cord.	Don't use more than 100 ft of 12 ga extension cord.
	Tip plugged.	Remove and clean.
Electric motor runs, but no output.	Displacement pump frozen or gear train damage.	Thaw.

*This unit has an overload breaker built into the switch assembly. If it opens, unplug power cord and let sprayer cool for 30 to 60 minutes. Also, try to correct the cause of overheating. Always use the lowest pressure setting needed.

NOTE: A M11 and M30 metric wrenches are required for servicing pump.

PUMP

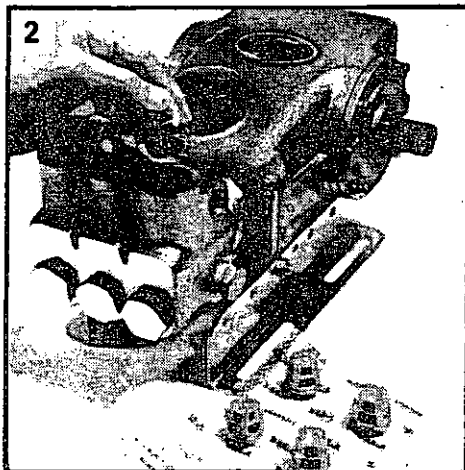
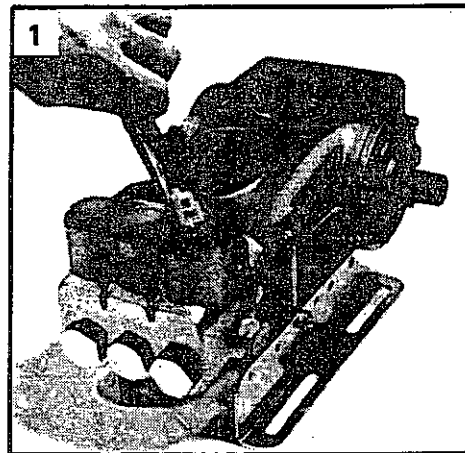
Valves

Photo 1 and 2.

- 1) Remove the hex plug using an M30 wrench.
- 2) Examine o-ring under plug and replace if evidence of cuts or distortion.
- 3) Remove valve assembly including retainer, spring, valve and valve seat from valve cavity.

NOTE: Valve assembly may come apart during removal.

- 4) Replace valve parts with service kit (801-041) including retainer, spring, valve, valve seat, o-ring and back-up-ring.
- 5) Replace valve cover and torque to 75 ft-lb (100 N·m).



Pumping Section

Photo 3.

- 1) Remove the four (4) hex nuts from the manifold.
- 2) Separate the manifold from the crankcase.

NOTE: It may be necessary to tap manifold lightly with mallet to loosen.

CAUTION

Keep manifold properly aligned with ceramic plungers when removing to avoid damage to either plungers or seals.

- 3) Carefully examine each plunger for any scoring and replace if necessary.

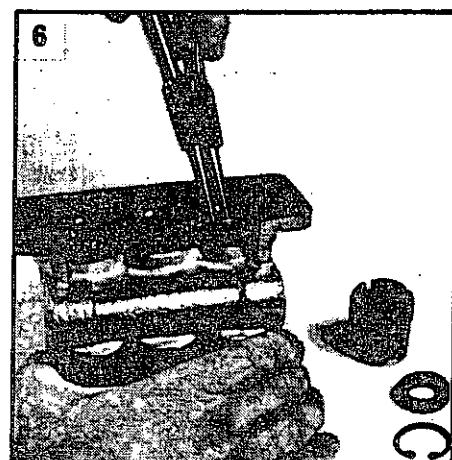
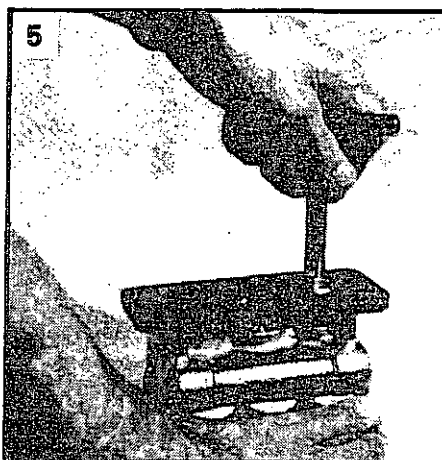
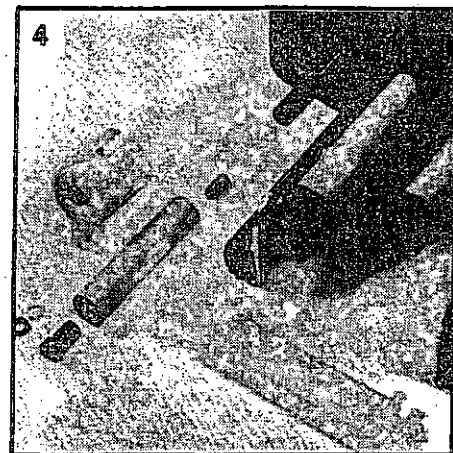
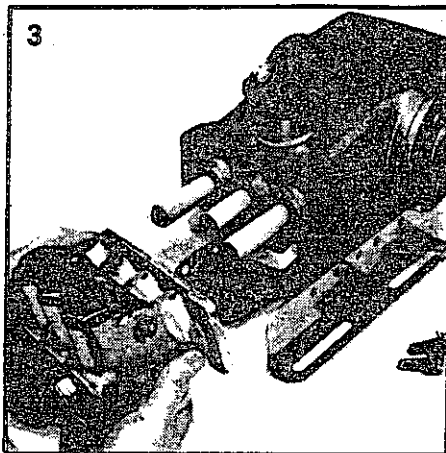
Plungers

Photo 4.

- 1) Using an M11 wrench, remove the plunger retainer.
- 2) Slide out the seal retainer with oil wick and rubber barrier slinger.
- 3) With a slight twisting motion, loosen the plunger from the plunger rod and remove.

NOTE: The stud may remain with the retainer when removed. Disassemble and screw stud into plunger rod finger tight.

- 4) Replace o-ring and back up ring on plunger retainer.
- 5) Saturate new oil wick by soaking in oil.
- 6) Install new plunger.
- 7) Replace plunger retainer and torque to 80 in-lb (9 N-m).
- 8) Install new oil wick in seal retainer.
- 9) Replace barrier slinger over new plunger.
- 10) Lubricate each plunger sleeve and carefully slide manifold onto crankcase.



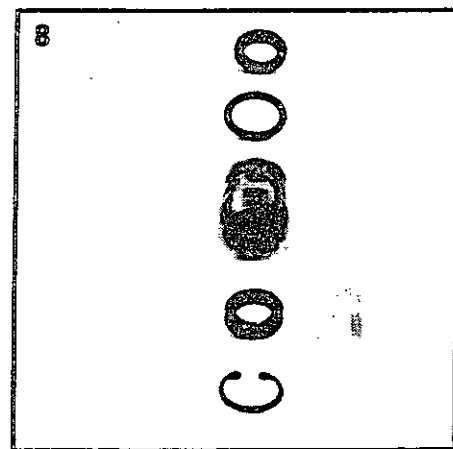
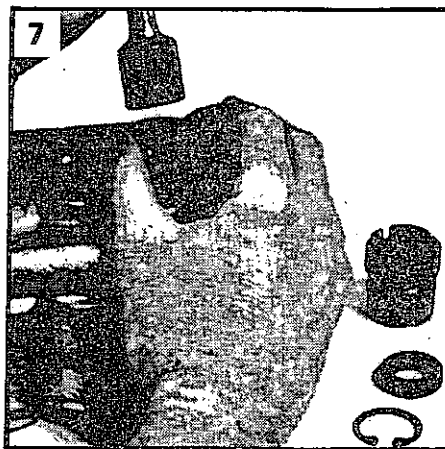
Seals or V-Packings

Photo 5, 6, 7 and 8.

- 1) Remove C-ring from seal case.
- 2) Then remove the low pressure seal from the seal case.
- 3) Unscrew the seal case from the manifold using a special key wrench (801-044).
- 4) Remove the high pressure seal and examine. Before replacing, lubricate ID and OD of new high-pressure seal and press into manifold.

NOTE: A socket and extension may be used to pressure seal from manifold.

- 5) Install new o-ring on seal case and lubricate OD of o-ring.
- 6) Screw seal case into manifold.
- 7) Lubricate ID and OD of low pressure seal and press into seal case.
- 8) Replace C-ring holding low pressure seal in place.



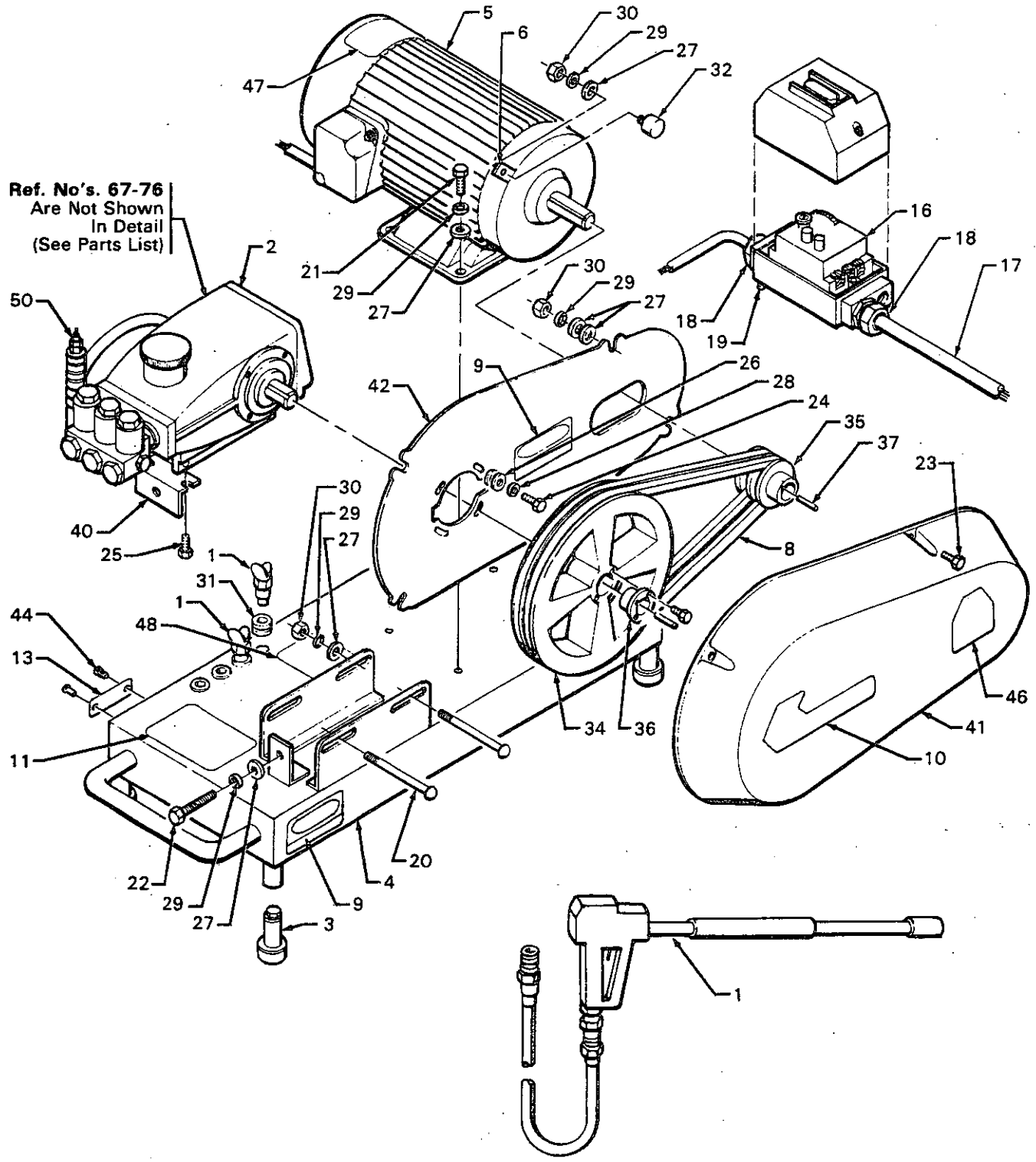
- 9) Lubricate each plunger sleeve and carefully slide manifold onto crankcase.

NOTE: When replacing manifold onto plungers, extreme caution should be exercised to avoid damage to the seals.

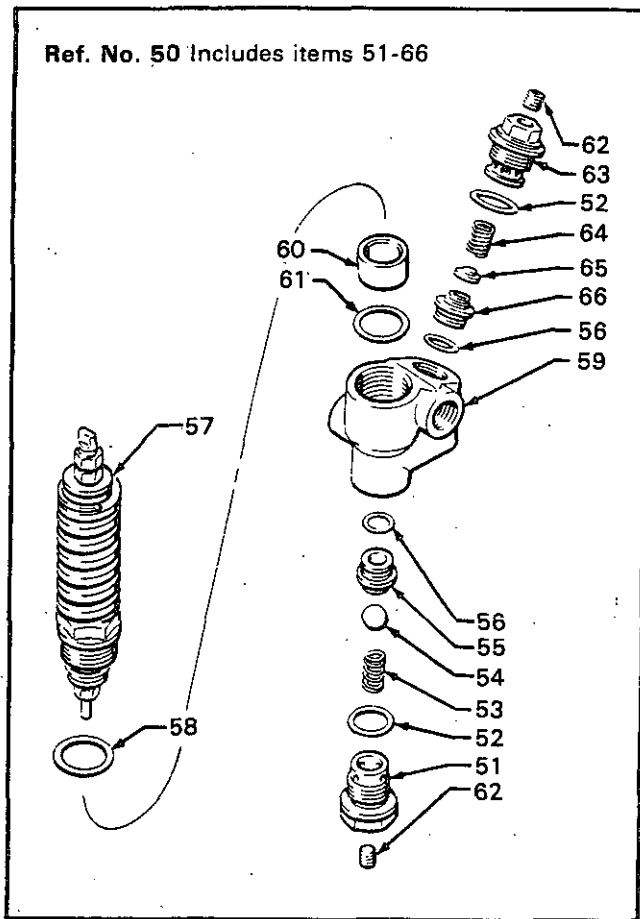
- 10) Torque all four (4) bolts to 240 in-lb (27 N-m).

NOTE: Carefully study the order of respective parts and note position of seals to assure proper re-assembly and operation.

PARTS DRAWING



Ref. No. 50 Includes items 51-66



PARTS LIST

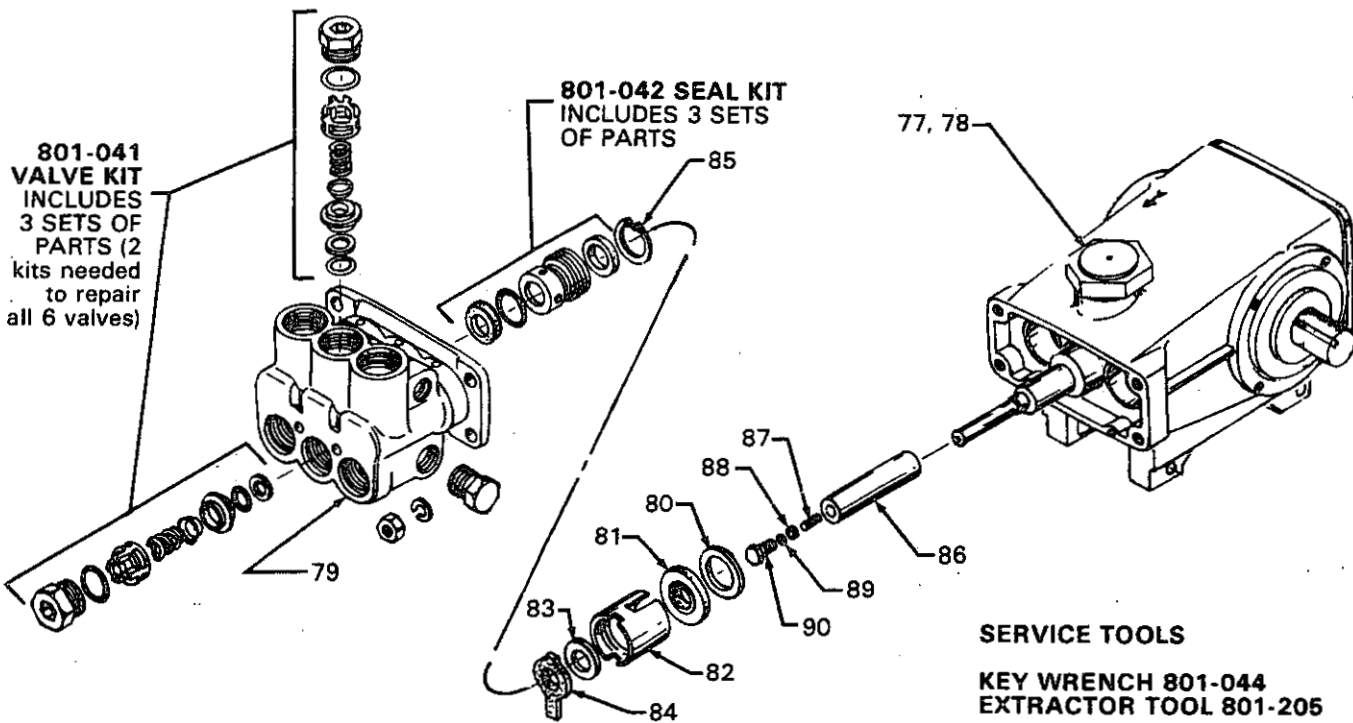
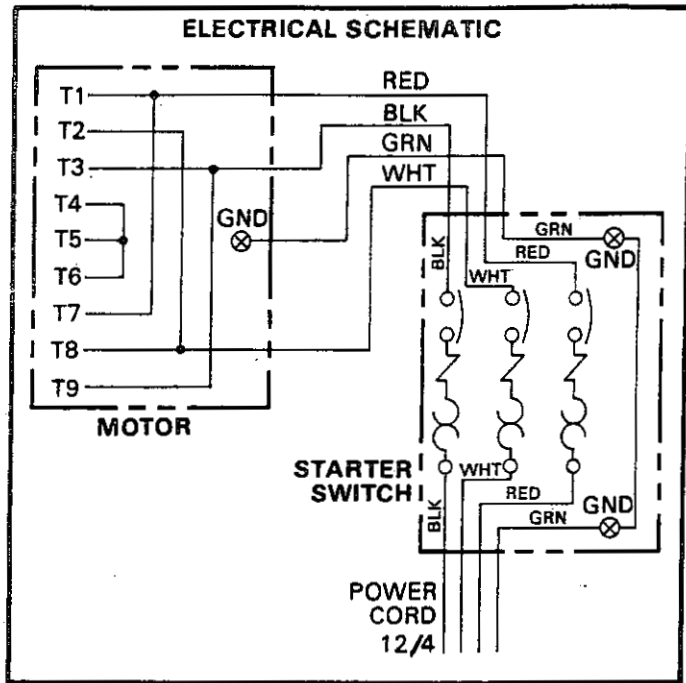
REF PART NO. NO.	DESCRIPTION	QTY
1	HOSE & GUN ASSY, see gun detail for parts	1
2 801-001	PUMP, REPLACEMENT PARTS, includes items 77-90	1
3 800-015	ANTI VIBRATION FOOT	4
4 800-036	CHASSIS	1
5 800-037	ELECTRIC MOTOR ASSY	1
6 801-390	BRACKET, spacer	1
8 801-285	BELT, drive	2
9 801-231	LABEL, warning	2
10 801-140	LABEL, identification	1
11 801-129	LABEL, warning	1
13 801-131	PLATE, serial no.	1
14 801-221	CONNECTOR, crimp	2
16 801-379	SWITCH, starter	1
17 801-382	CORD, power (8 ft lg)	1
18 801-380	STRAIN RELIEF	2
19 801-292	SCREW, self tapping, no. 6-32 NC x 1/2	2
20 801-021	BOLT, carriage, 5/16-18 NC x 5"	2
21 801-088	SCREW, machine, hex hd, hd, 5/16-18 NC x 1-1/2"	4
22 801-298	SCREW, machine, hex hd, hd, 5/16-18 NC x 2-1/2"	1
23 801-302	SCREW, machine hex hd, 5/16-18 NC x 1"	4
24 801-082	SCREW, machine, hex hd, M6 x 30 mm	4
25 801-081	SCREW, machine, hex hd, M8 x 20 mm	2

REF PART NO. NO.	DESCRIPTION	QTY
26 801-023	WASHER, flat, 1/4	8
27 801-015	WASHER, flat, 5/16	16
28 801-139	WASHER, lock, 1/4	4
29 801-025	WASHER, lock, 5/16	10
30 801-024	NUT, hex, 5/16-18 NC	7
31 801-012	GROMMET	4
32 801-367	BUMPER	1
34 801-004	PULLEY, pump	1
35 801-381	PULLEY, motor	1
36 801-135	HUB, pulley	1
37 801-137	KEY, pulley (2" lg)	1
40 801-018	BRACKET, tensioner	1
41 801-364	BELTGUARD, cover	1
42 801-365	BELTGUARD, baseplate	1
44 801-132	RIVET, drive	2
46 801-008	LABEL, identification	1
47 801-388	LABEL, warning	1
48 801-389	LABEL, identification	1
50 801-084	UNLOADER, includes items 51-66	1
51 801-045	CAGE, valve	1
52 801-046	O-RING	2
53 801-047	SPRING	1
54 801-048	BALL	1
55 801-049	SEAT	1
56 801-050	O-RING	2
57 800-012	UNLOADER SUB-	1
58 801-059	O-RING	1
59 801-060	HOUSING	1
60 801-061	CYLINDER	1
61 801-062	O-RING	1
62 801-063	PLUG	2
63 801-068	HOUSING VALVE	1
64 801-069	SPRING	1
65 801-070	VALVE	1
66 801-071	SEAT	1
67 801-090	COUPLER, male quick disconnect	1
68 801-105	NIPPLE, straight, brass, 1/2 NPT x 3-1/2"	1
69 801-106	TEE, brass, 1/2 NPT	1
70 801-236	NIPPLE, hex, steel, 1/2 x 3/8 NPT	1
71 801-108	NIPPLE, hex, brass, 1/4 x 1/2 NPT	1
72 801-109	PLUG, hex, brass, 3/8 NPT	1
73 801-110	ADAPTER, 1/2 hose	1
74 801-111	NUT, brass, adapter	1
75 801-112	SCREEN, inlet	1
76 801-113	HOSE, coupled, 1/2 NPT (MBE) 17-1/2" lg	1

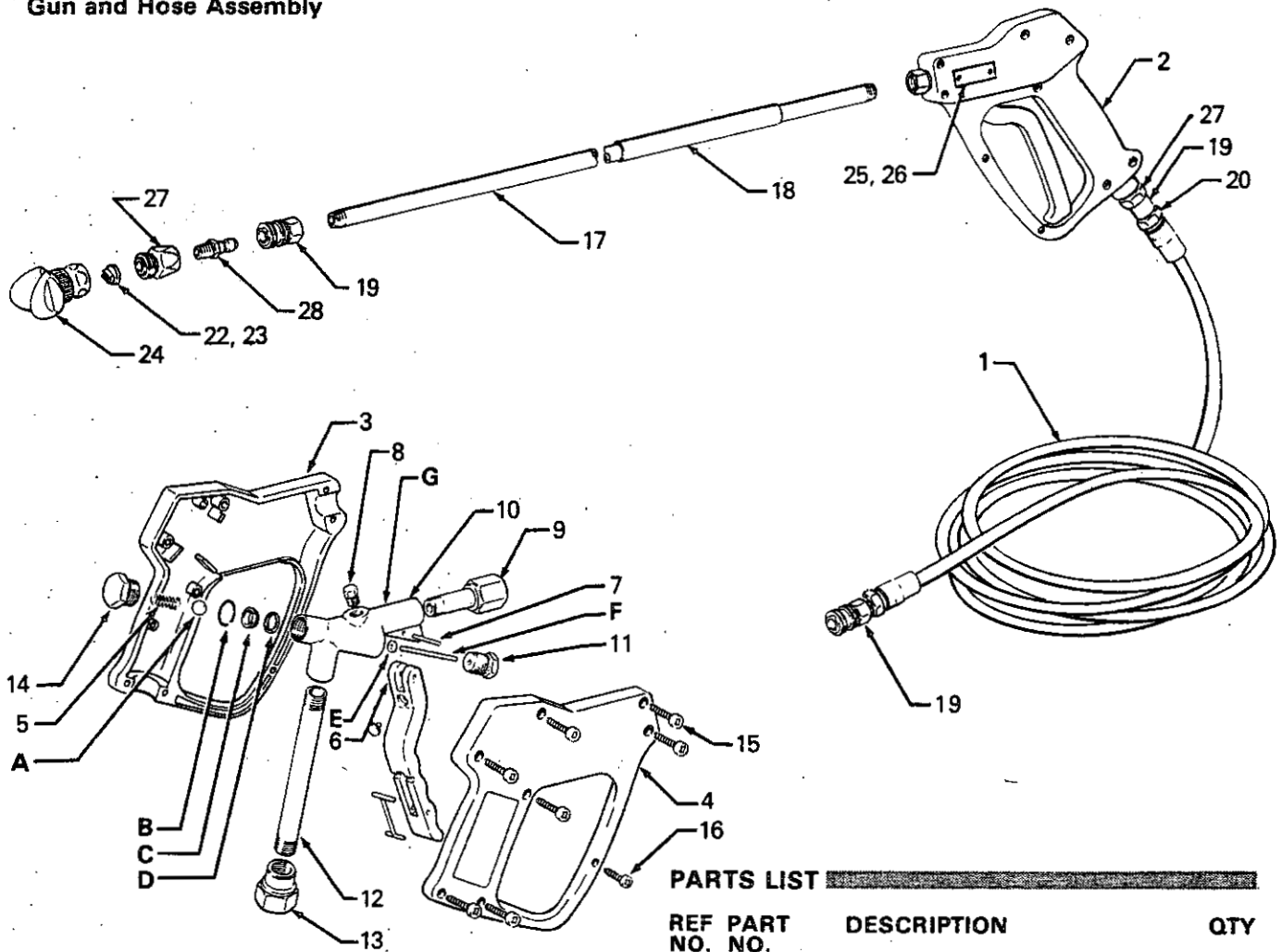
PARTS LIST (continued)

REF PART NO.	DESCRIPTION	QTY
Items 77-90 are pump internal replacement parts. See exploded view of pump for details.		
77	801-027 . CAP	1
78	801-028 . O-RING, cap	1
79	801-267 . DISCHARGE MANIFOLD	1
80	801-030 . WASHER	3
81	801-031 . SEAL	3
82	801-032 . RETAINER	3
83	801-033 . WASHER	3
84	801-034 . WICK	3
85	801-035 . RING, retaining	3
86	801-036 . PLUNGER	3
87	801-037 . STUD	3
88	801-038 . RING, backup	3
89	801-039 . O-RING	3
90	801-040 . RETAINER, plunger	3

Order parts by name and number. Always give the model number and series letter of the assembly for which you are ordering.



PARTS DRAWING
Gun and Hose Assembly



Repair Kit 801-083
Includes items A, B, C, D, E and F

SERVICE

1. Remove the 8 screws from the body halves (3) and (4). See the Parts Drawing. Separate the body halves.
2. Remove the plug (14), spring (5) and ball (A) from the valve body (G).
3. Remove the snap ring (B). Then remove the valve seat (C) and o-ring (D).
4. Remove the sleeve nut (11) and o-ring (E) with the actuator rod (F).
5. After installing the new seat (C) and ball (A), tap the ball lightly with a hammer to assure a proper seating between the ball and seat.
6. Reassemble in reverse order, using the remaining new parts from the repair kit.

PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY
1	801-007	SPRAY HOSE, 3/8" ID, 50 ft. (15 m) lg	1
2	800-017	SPRAY GUN, (replaceable parts include items 3-16)	1
3	801-244	. HANDLE, left	1
4	801-245	. HANDLE, right	1
5	801-249	. SPRING	1
6	801-254	. LEVER	1
7	801-256	. NEEDLE	1
8	801-262	. HEX PLUG	1
9	801-261	. DISCHARGE FITTING	1
10	801-247	. VALVE BODY	1
11	801-253	. GUIDE SLEEVE	1
12	801-246	. TUBE	1
13	801-263	. INLET FITTING	1
14	801-250	. CAP	1
15	801-264	. SCREW	7
16	801-265	. SCREW	1
17	801-134	TUBE, 32"	1
18	801-029	GRIP	1
19	801-009	COUPLER, female quick disconnect	3
20	*801-090	COUPLER, male quick disconnect	1
21	801-073	HOUSING, nozzle	2
22	*801-010	TIP, blasting; 0°	1
23	*801-011	TIP, cleaning; 15°	1
24	801-074	GUARD, tip	2
25	801-076	PLATE, warning	1
26	801-077	RIVET	2
27	801-103	NIPPLE, hex; 1/4 x 3/8" npt; brass	1
28	*801-091	COUPLER, male quick disconnect	2

Order parts by name and series letter of the assembly for which you are ordering.

*Recommended "tool box" spare parts.

ACCESSORIES (Must be purchased separately)

CHECK VALVE 801-133

Prevent back up of contaminated water into fresh supply. Install upstream from pump.

WATER SANDBLASTER 800-103

For abrasive cleaning of stubborn dirt and paint.

CHEMICAL INJECTOR KIT 800-102

For injecting harsh cleaning chemicals downstream from pump.

ADJUSTABLE SAND SAVER 800-031

For adjusting sand flow.

TECHNICAL DATA

MOTOR: 5 hp, 3 phase,
220 V, 60 Hz, 17 Amp

WATER PUMP: 2150 PSI (150 bar) max.
pressure; 4 GPM
(15 liter/min).

WETTED PARTS: Stainless Steel, Aluminum,
Phenolic Plastic, Ceramic
Liners, Nitrile Rubber.

WEIGHT: 140 lbs

OVERALL DIMENSION: Length: 36 in (914 mm)
Width: 18 in (457 mm)
Height: 17 in (432 mm)

MAX. WATER TEMPERATURE: 160°F (70°C)

INLET HOSE CONNECTION: 3/4-in. garden hose (f)

THE GRACO WARRANTY

Graco Inc. warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship under normal use and service. This warranty extends to the original purchaser for a period of 12 months from the date of purchase and applies only when the equipment is installed and operated in accordance with written factory recommendations. This warranty does not cover damage or wear which, in the reasonable judgment of Graco, arises from misuse, abrasion, corrosion, negligence, accident, substitution of non-Graco parts, faulty installation or tampering.

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 workmanship or material, repairs will be made at a reasonable charge and return transportation will be charged.

THIS LIMITED WARRANTY IS EXCLUSIVE, AND IS 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.

EQUIPMENT NOT COVERED BY GRACO WARRANTY. Accessories or components of equipment sold by Graco that are not manufactured by Graco (such as electric motors, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making such claims.

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