

INSTRUCTIONS - PARTS LIST



684-001

Revision G

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

5:1 Monark®

SANITARY PUMP

With Priming Piston

600 PSI (42 bar) MAXIMUM FLUID WORKING PRESSURE

120 PSI (8.4 bar) MAXIMUM AIR INLET PRESSURE

Model: 952-793

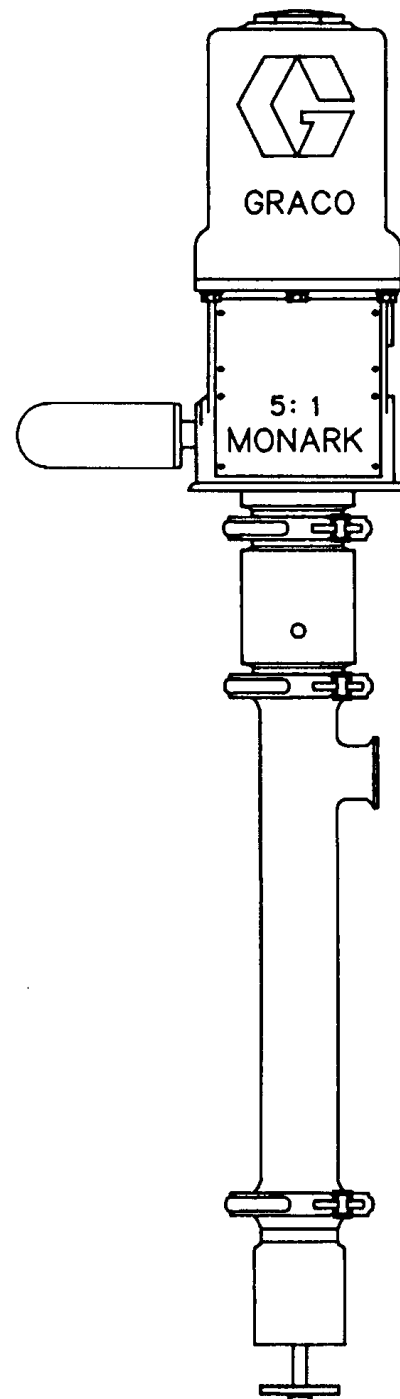
WARNING

Priming Piston Hazard

This pump has a priming piston which extends below the foot valve during operation. This piston could pinch or amputate your fingers or hands as it moves up, into the cylinder. To reduce the risk of injury, keep your fingers and hands and all tools away from the priming piston during operation and whenever the air and fluid pressure in the pump is not **fully relieved**.

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SAFETY WARNINGS

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.

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

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray equipment or accessories, such as overpressurizing, modifying parts, using incompatible fluids and solvent, or using worn or damaged parts, can cause them to rupture and result in 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 manufacturers recommendations regarding the use of protective clothing and equipment.

Always shut off the power to the pump and relieve all air and fluid pressure in the system before checking, adjusting or repairing the system to reduce the risk of bodily injury, including eye injury from the unexpected release of fluid from the system.

System Pressure

The maximum working pressure of this pump is 600 PSI (42 bar) at a maximum incoming air pressure of 120 PSI (8.4 bar).

Never exceed the maximum working pressure of this pump or of the lowest rated accessory in your system.

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/dispersing system, when installing, cleaning or changing spray tips/nozzles, and whenever you stop spraying/dispersing.

1. Engage the spray gun safety latch.
2. Shut off the air to the pump.
3. Close the bleed-type master air valve (required in your system).
4. Disengage the safety latch.
5. Hold a metal part of the spray gun firmly to the side of a grounded metal pail, and trigger the spray gun to relieve pressure.
6. Engage the spray gun safety latch.
7. Open the drain valve and/or the pump bleeder 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/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 retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip/nozzle or hose.

FIRE OR EXPLOSION HAZARD

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.

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:

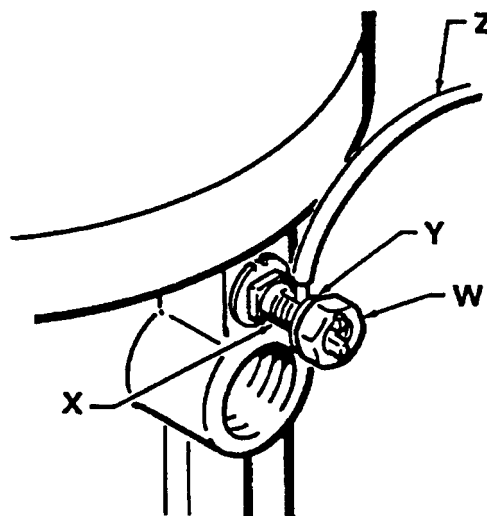
If you experience any static sparking or even a slight shock, STOP DISPENSING IMMEDIATELY. Check the entire system for positive grounding. Do not use the system again until the problem has been identified and corrected.

1. *Pump:* use a ground wire and clamp as instructed at the right.
2. *Air hoses:* use only grounded air hoses.
3. *Fluid hoses:* Use only grounded fluid hoses.

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 electrical resistance, contact the hose supplier or manufacturer for the resistance limits. Use a resistance meter in the appropriate range for your hose to check the resistance. If the resistance exceeds the limits, replace it immediately.

4. *Air compressors:* follow the air compressor manufacturer's recommendations.
5. *Spray gun or dispensing valve:* grounding is obtained through connection to a properly grounded fluid hose and pump.
6. *Object being sprayed:* according to your local code.

7. *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.
8. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun firmly to the side of a *metal* pail, then trigger the gun.



To ground the pump, connect a ground wire to the motor grounding lug. See the illustration above. Refer to ACCESSORIES for ordering a ground wire and clamp. Loosen the locknut (W) of the grounding lug (X) and washer (Y). Insert one end of the grounding wire (12 ga minimum) (Z) into the slot in the lug and tighten the locknut securely.

Connect the other end of the wire to a true earth ground, as recommended by your local electric code.

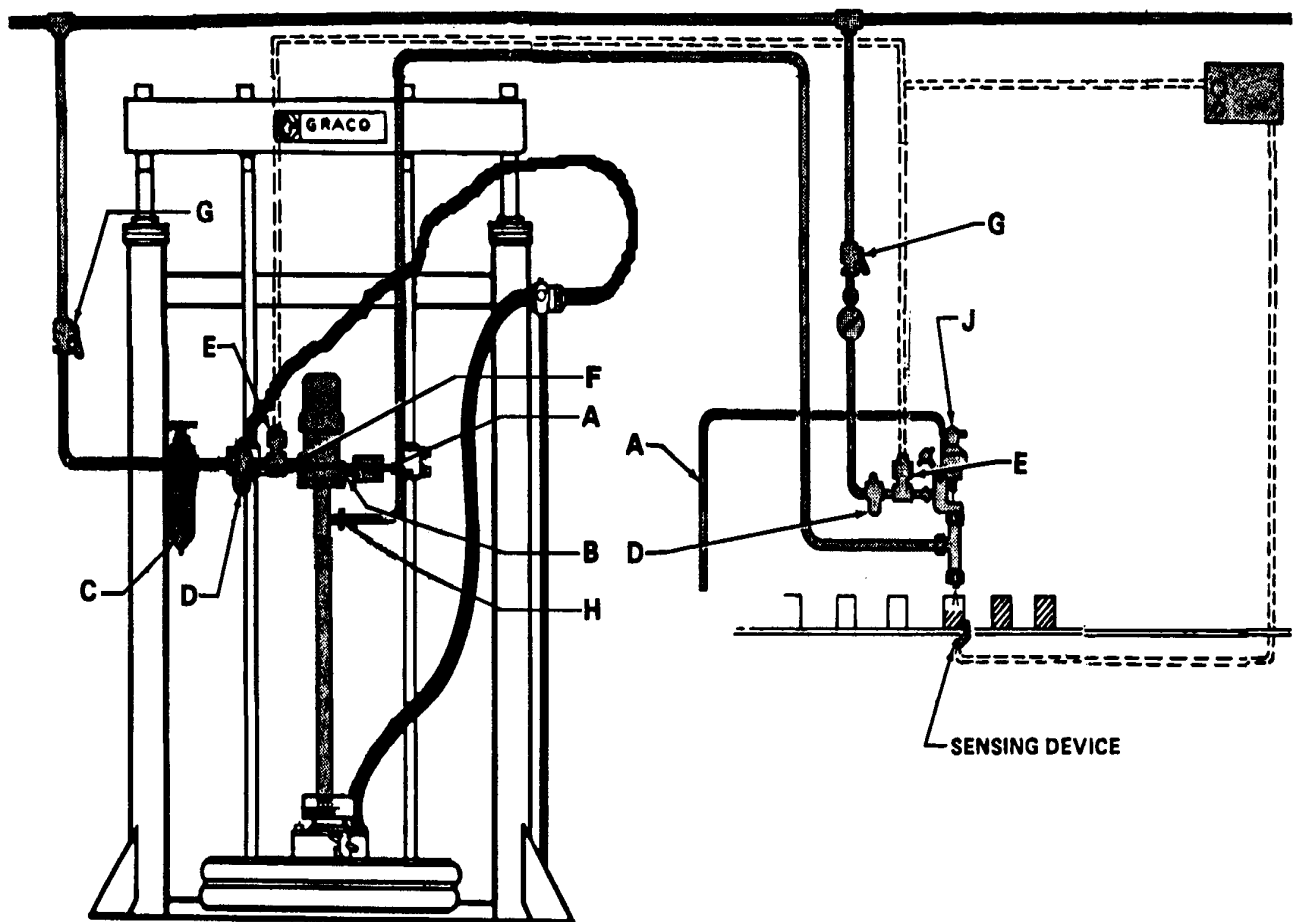
IMPORTANT

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.

TYPICAL INSTALLATION

KEY

- A. Air Exhaust Muffler or Hose
- B. Exhaust Air 3/4" NPT Outlet
- C. Air Filter-Regulator
- D. Air Line Lubricator
- E. Air Solenoid Valve
- F. Supply Air 3/8" NPT Inlet
- G. Bleed Type Master Air Valve (required)
- H. Fluid Flanged Outlet
- I. Automatic Valve
- J. Ground Wire (required) (Not Shown; See Page 3 for Grounding Instructions)



INSTALLATION

MOUNTING PUMP

Mount pump to suit the type of installation planned. Mounting accessories are available through your local distributor.

This is a sanitary shovel pump. The pump is designed to mount on a 55 gallon or 5 gallon ram with a ram plate attached to the foot valve of the pump. The warnings regarding MOVING PARTS HAZARD on page 2 should be paid close attention.

Screw the air exhaust muffler (A) into the 3/4" NPT outlet (B) in the air motor base. See the TYPICAL INSTALLATION. If lubricants, air line scale, rust, etc. could contaminate material, plumb exhaust air outside of the fluid product zone.

Ground the Pump and System

Read the warning section **FIRE OR EXPLOSION HAZARD** on page 3 and ground the pump and system as explained there.

CONNECT THE HOSES

Install an accessory air filter-regulator assembly (C), lubricator (D) and solenoid valve (E) in the pumps 3/8" NPT air inlet (F) as shown in the TYPICAL INSTALLATION. See page 10 for the recommended air filter-regulator and lubricator.

Connect a 0.5" (13 mm) ID air supply hose to the 1/2" NPT inlet of the filter regulator (C). The main air supply must include a bleed type master air valve (G), required, for shutting off and relieving air pressure that may be trapped between the valve and air motor and cause it to cycle unexpectedly.

Connect a fluid hose to the pump's flanged outlet (H). See the accessory sanitary hose fittings kit on page 10.

Installation of the complete system should be in accordance with all state sanitary codes and/or local requirements.

Connect air solenoid valves (E) to actuating mechanism (timer) and set so the automatic valve (J) will dispense at proper intervals.

OPERATION

NOTE: *If necessary, flush the pump with an approved cleaning solution or disassemble and sanitize the parts before using the pump. Refer to the CLEANING PROCEDURE. Check local and state codes for specific limitations.*

Adjusting the Pump Speed and Pressure

WARNING

Never allow the air pressure to the pump to exceed 120 PSI (8.4 bar). Higher pressures will cause the pump to exceed its maximum recommended safe operating pressure of 600 PSI (42 bar).

Before turning on the air to start the pump, fill the lubricator bowl to the level mark with a phosphate/ester-free SAE 10 machine oil.

With the air supply turned on, the pump starts when the automatic dispensing valve is opened,

and stalls against pressure when the automatic dispensing valve is closed. In a circulating system, the pump operates until the air supply is turned off. Always use the lowest air pressure needed to give the desired results.

Lubrication and Care of the Pump

Do not subject the air motor to temperatures higher than 200°F (93°C), and the immersion fluid pump to temperatures higher than 200°F (93°C). Excessive temperatures may damage the pump packings and seals.

If the pump accelerates quickly, or is running too fast, stop the pump immediately and check the fluid supply. If the fluid supply is empty and air has gotten in to the system, re-primer the pump and lines with material, or flush and clean the pump and the system. Always stop the pump at the bottom of its stroke to prevent material from drying on the displacement rod (the air motor exhausts at the bottom of the stroke).

To shut off the pump, close the air regulator and open the master bleed-type air valve. Trigger the dispensing valve to relieve fluid pressure.

Shut down and Displacement Pump Cleaning Procedure

NOTE: *The pump and the system should be cleaned in accordance with your state and sanitary codes and local regulations.*

Remove the pump from the fluid container and operate the pump until as much of the material as possible has been pumped out.

Flush the system thoroughly with warm cleaning solution.

Shut off the air to the pump and relieve the fluid pressure by opening the automatic dispensing valve. Remove the air and fluid hoses from the pump.

Disassemble the fluid pump and accessories.

Wash all the pump parts with an alkaline detergent at the manufacturer's recommended temperature and concentration, using either a brush or other C.O.P. methods.

Rinse all the pump parts again with water.

Allow all the pump parts to dry.

Inspect all the pump parts and reclean any soiled parts. Any damaged rubber parts must be replaced because they will harbor micro-organisms.

Immerse all the pump parts and the tube of lubricant in an approved sanitizer before assembly. Leave the pump parts in the sanitizer during assembly, taking them out one by one as needed.

Lubricate the moving pump parts and o-rings, packings and seals with waterproof sanitary lubricant.

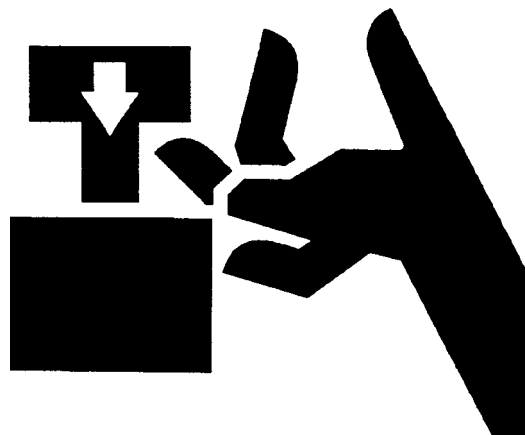
Circulate the sanitizing solution through the pump and the system prior to use.

SERVICE

WARNING

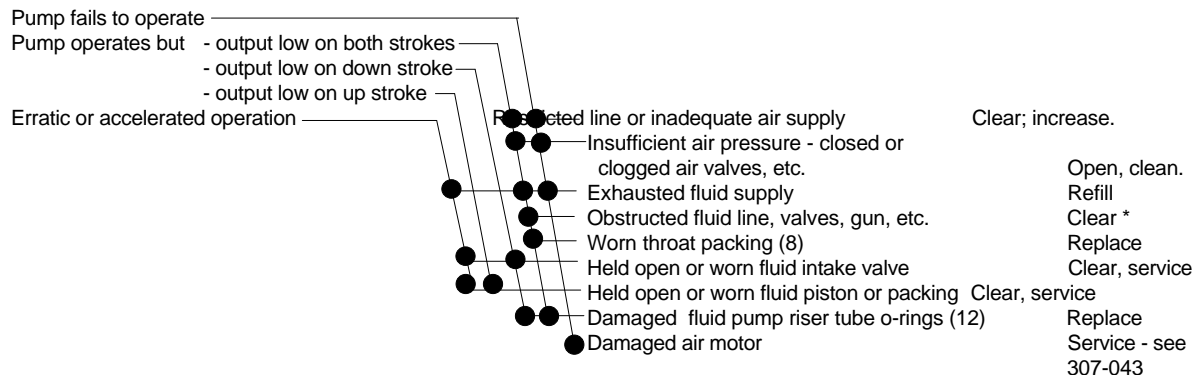
Moving parts can pinch or amputate your fingers or other body parts. When the pump is operating, the priming piston (located at the pump intake) and the air motor piston (located behind the air motor shield) move. Therefore, NEVER operate the pump with the air motor should removed, and keep your fingers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

Before attempting to clear an obstruction from the priming piston or service the pump, follow the **Pressure Relief Procedure Warning** on page 2 to prevent the pump from starting accidentally.



TROUBLESHOOTING CHART

What's Wrong



* Relieve pressures and disconnect fluid line. Turn on air; if pump starts, the line, etc. is clogged

Check all other remedies before disassembling pump

Displacement Pump Service

Use all parts of repair kit 948-147 when servicing the pump.

Remove the pump from the fluid container and operate it until as much of the material has been pumped out as possible.

Shut off the air to the pump by closing the regulator and opening the bleed-type master air valve, and relieving the fluid pressure by triggering the automatic dispensing valve. Remove the air and fluid hoses from the pump.

Intake Valve

1. Remove retaining pin (28) from connecting rod (26). Release clamp (7) to remove foot valve cylinder (18) from pump cylinder (2).
2. Slide priming piston (27), foot valve poppet (23), foot valve packing (29), poppet spring (30), bearing (10) and foot valve stop (16) off the connecting rod (26). Clean and inspect the parts.
3. Release clamp (7) holding the retainer housing (22) to the air motor base. Slide the pump cylinder (2) down from the air motor. Pull the displacement rod (3) out of the connecting rod (21). Push the displacement rod out through the bottom of the pump cylinder (2).

4. Remove the connecting rod (26) by removing the retaining pin (25) and the o-ring (20) and pulling the connecting rod (26) from the displacement rod (3).
5. Release clamp (7) to take the retainer housing (22) off of the pump cylinder (2). Remove packing housing (24), bearing (17) and packing (8) from housing retainer (22).
6. Clean and inspect all of the parts. Replace the parts as necessary. The rubber parts that are damaged or cut must be replaced, as any damaged parts will harbor micro-organisms. Reassemble the pump in the reverse from disassembly. Sanitize all parts (see CLEANING PROCEDURE, page 2). Lubricate the o-rings, throat packing and piston seal with waterproof sanitary lubricant when reassembly.

NOTE: When reinstalling the housing (22), the hole must be slanting down.

PARTS LIST

MODEL: 952-793

Includes items 1-31

REF NO.	PART NO.	DESCRIPTION	QTY
1	207-546	AIR MOTOR (see 307-043 for parts)	1
2	902-980	CYLINDER, pump	1
3	902-983	ROD, displacement	1
4	* 101-946	PIN, cotter; 1/8 dia; 1" lg	1
5	102-218	CLAMP, hinged; 1-1/2"	1
6	512-913	MUFFLER, air exhaust	1
7	102-657	CLAMP, hinged; 2-1/2"	3
8	** 180-238	PACKING, "V" block	1
9	* 103-462	BALL; 3/4" dia.	1
10	** 604-016	BEARING, 4" dia.	1
11	* 166-114	SHIELD, drip; neoprene	1
12	** 166-117	GASKET, sanitary	3
13	** 166-119	PACKING, o-ring; neoprene	1
14	* 166-129	SHIELD, drip; neoprene	1
15	* 166-130	GASKET, 1-1/2" dia; neoprene	1
16	604-017	STOP, foot valve	1
17	** 180-919	BEARING, sleeve	1
18	605-570	CYLINDER, foot valve	1
19	** 167-971	SEAL, piston; neoprene	1
20	** 167-972	PACKING, o-ring; nitrile rubber	1
21	167-974	ROD, connecting	1
22	167-975	HOUSING, retainer	1
23	604-018	POPPET, foot valve	1
24	180-018	HOUSING, packing	1
25	169-845	PIN, retaining; piston housing	1
26	902-982	ROD, connecting	1
27	604-015	PISTON, priming	1
28	604-008	PIN, retaining	1
29	** 603-778	PACKING, foot valve	2
30	** 501-095	SPRING, ball check	1
31	172-573	PLATE, instruction	1

* **Suggested "tool box" spare parts. Keep on hand to reduce down time.**

** **Included in Repair Kit 948-147**

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.

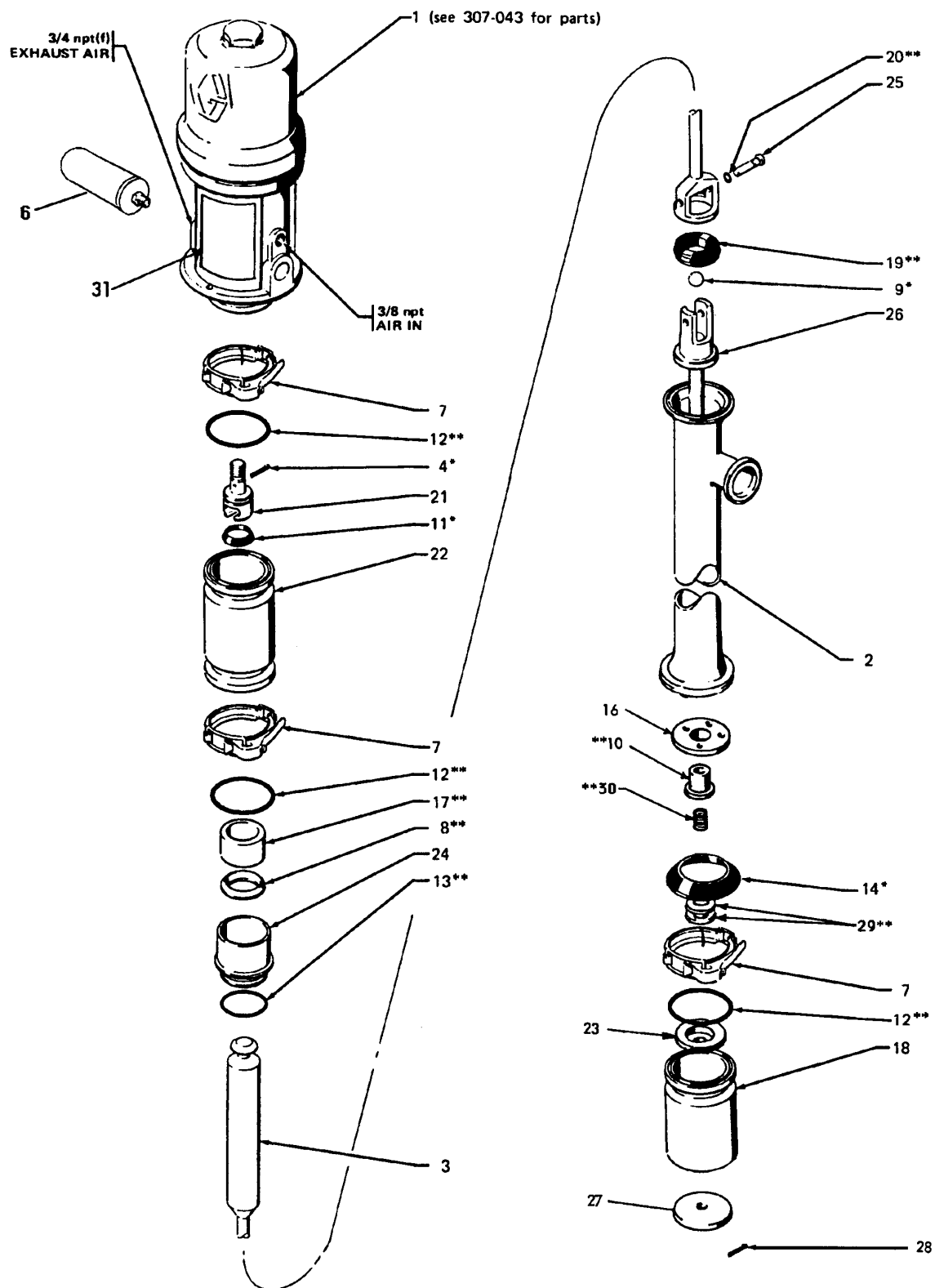
6 digit PART NUMBER	QTY	DESCRIPTION

948-147 REPAIR KIT

(Must be purchased separately)

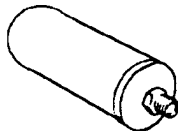
REF NO.	QTY	REF NO.	QTY
8	1	19	1
10	1	20	1
12	3	29	2
13	1	30	1
17	1		

PARTS DRAWING



ACCESSORIES (Must be purchased separately)

AIR EXHAUST MUFFLER 512-913

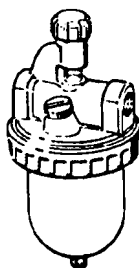


AIR LINE LUBRICATOR 214-874

250 PSI (17.5 bar) MAXIMUM WORKING PRESSURE

For automatic lubrication of air motor

3/8" NPT (F) Inlet and Outlet



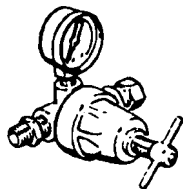
AIR FILTER and REGULATOR 106-146

5-125 PSI (0.4-9 bar) Regulator Pressure

250 PSI (17 bar) MAXIMUM WORKING PRESSURE

For filtering and regulating air to pump

1/2" NPT (F) Inlet and Outlet



METERING CONTROLS

Pneumatic controls enclosed in an optional 304 Stainless Steel splashproof enclosure available on special order.

SANITARY DISPENSING VALVE 208-378

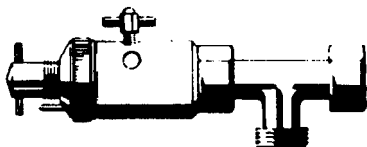
200 PSI (14 bar) MAXIMUM FLUID PRESSURE

50-150 PSI (3.5-10 bar) Cylinder Air Range

1,46207 ACME (M) Fluid Inlet

1/4 NPT (F) Air Inlet

See instruction manual 307-054.



SANITARY SPRAY VALVE 208-379

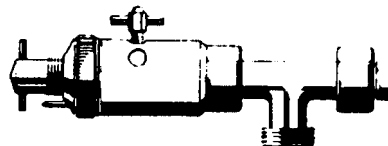
200 PSI (14 bar) MAXIMUM FLUID PRESSURE

50-150 PSI (3.5-10 bar) Cylinder Air Range

1,462-8 ACME Fluid Inlet

1/4 NPT (F) Air Inlet

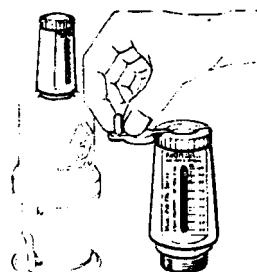
See instruction manual 307-054



ADJUST-A-STROKE 210-516

Meters pump delivery by varying length of pump stroke.

See instruction manual 307-205.



BLEED-TYPE MASTER AIR VALVE 107-142

300 PSI (21 bar) MAXIMUM WORKING PRESSURE

Relieves air trapped in the air line between the pump air inlet and this valve when closed. 1/2" NPT (M X F) inlet and outlet.

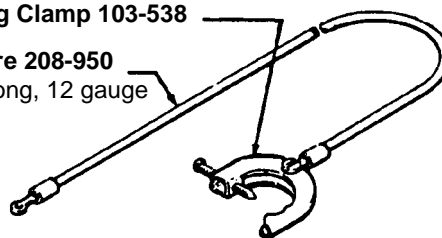
DRUM COVER

Stainless steel drum cover available on special order.

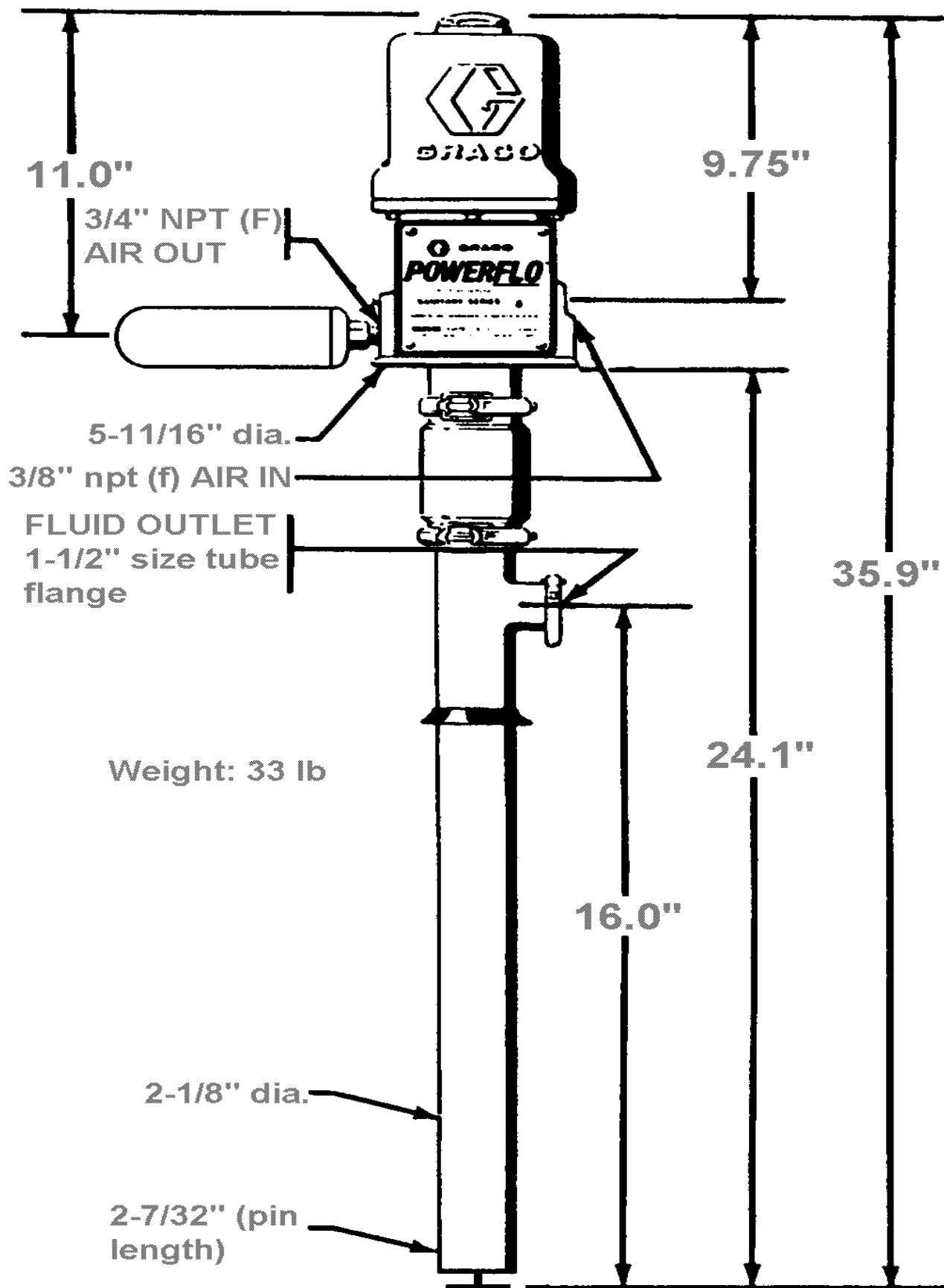
Grounding Clamp 103-538

Ground Wire 208-950

25' (7.6m) long, 12 gauge



DIMENSIONAL DRAWING



TECHNICAL DATA

Recommended air operating range	40 to 120 PSI (2.8 to 8.4 bar)
Air consumption	8 CFM per gallon pumped at 100 PSI (7 bar) air pressure
Pump cycles/gallon	25.6
Recommended maximum pump delivery	2.5 GPM (66 cycles/min)
Maximum material pressure at outlet	600 PSI (42 bar)
Wetted parts	316 Stainless Steel, Neoprene, PTFE Buna-N
Maximum operating temperature for displacement pump	200°F
Maximum operating temperature for air motor	200°F
Recommended minimum air supply hose size	1/2" ID

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 or two thousand hours of operation from time 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 production 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.

Sales Offices: Detroit, Los Angeles

Foreign Offices: Canada; England; Switzerland; France; Germany; Hong Kong; Japan; Korea

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