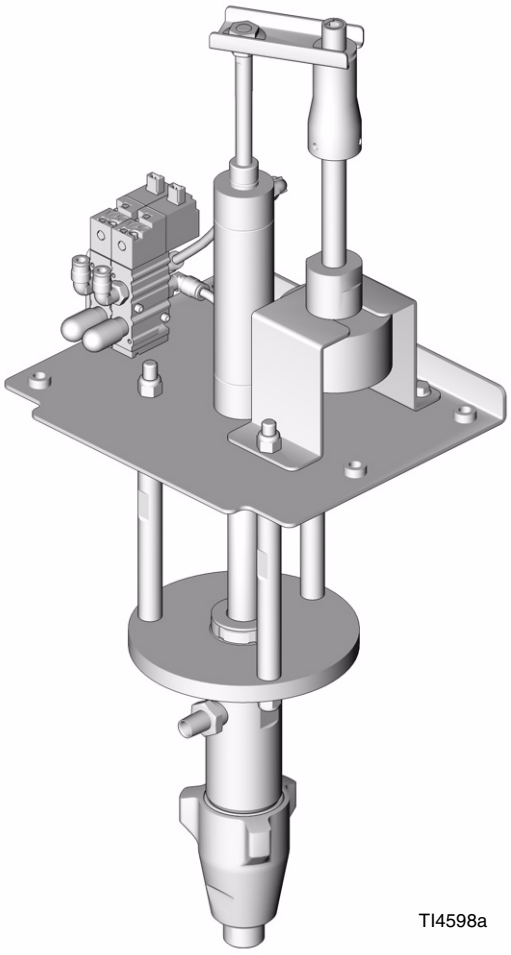
Repair - Parts

UltraMix™ Pumps

310671 Rev.A

Read warnings and instructions.
See page 3 for model information, including maximum working pressure and approvals.



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PROVEN QUALITY. LEADING TECHNOLOGY.

Graco Inc. P.O. Box 1441 Minneapolis, MN 55440-1441

CE

Contents

Manual Conventions

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Warnings included in instructions generally have a symbol indicating the hazard. Follow the instructions and read the hazard section on warning pages 4 to 5 for additional information.

CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage or destruction of equipment.

Note

A note indicates additional helpful information.

Models

Part No.	Series	Description	Maximum Working Pressure psi (MPa, bar)
248570	A	UltraMix cst Pump	250 (1.7, 17)
248571	A	UltraMix sst Pump	250 (1.7, 17)

Warnings

The following warnings include general safety information for this equipment. More specific warnings are included in the text where applicable.

⚠ WARNING	
	**FIRE AND EXPLOSION HAZARD** Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion: • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords or turn lights on or off when flammable fumes are present. • Ground equipment and conductive objects in work area. See **Setup** instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
	**PRESSURIZED EQUIPMENT HAZARD** Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury. • Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.
	**MOVING PARTS HAZARD** Moving parts can pinch or amputate fingers and other body parts. • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** in this manual. Disconnect power or air supply.

⚠ WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not alter or modify equipment.
- For professional use only.
- Use equipment only for its intended purpose. Call your Graco distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not use hoses to pull equipment.
- Comply with all applicable safety regulations.

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Protective eyewear
- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Gloves
- Hearing protection

Setup

Grounding

WARNING


Your system must be grounded. Read warnings, page 4.

Pump: connect ground wire and clamp to a true earth ground.

Air and fluid hoses: use only electrically conductive hoses.

Air compressor: follow manufacturer's recommendations.

Spray gun: ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: follow local code.

Object being sprayed: follow local code.

Solvent pails used when flushing: follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

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

Accessories

Install the following accessories in the order shown in FIG. 1, using adapters as necessary.

Air Line

- **Bleed-type master air valve (D):** required in your system to relieve air trapped between it and the air motor when the valve is closed.

WARNING


Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.

  Be sure the valve is easily accessible from the pump and located downstream from the air regulator.

- **Pump air regulator (E):** to control pump speed and outlet pressure. Locate it close to the pump.

Fluid Line

- **Fluid drain valve (G):** required in your system, to relieve fluid pressure in the hose and gun.

WARNING

Read warnings, page 4.

Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Flushing**, page 8.

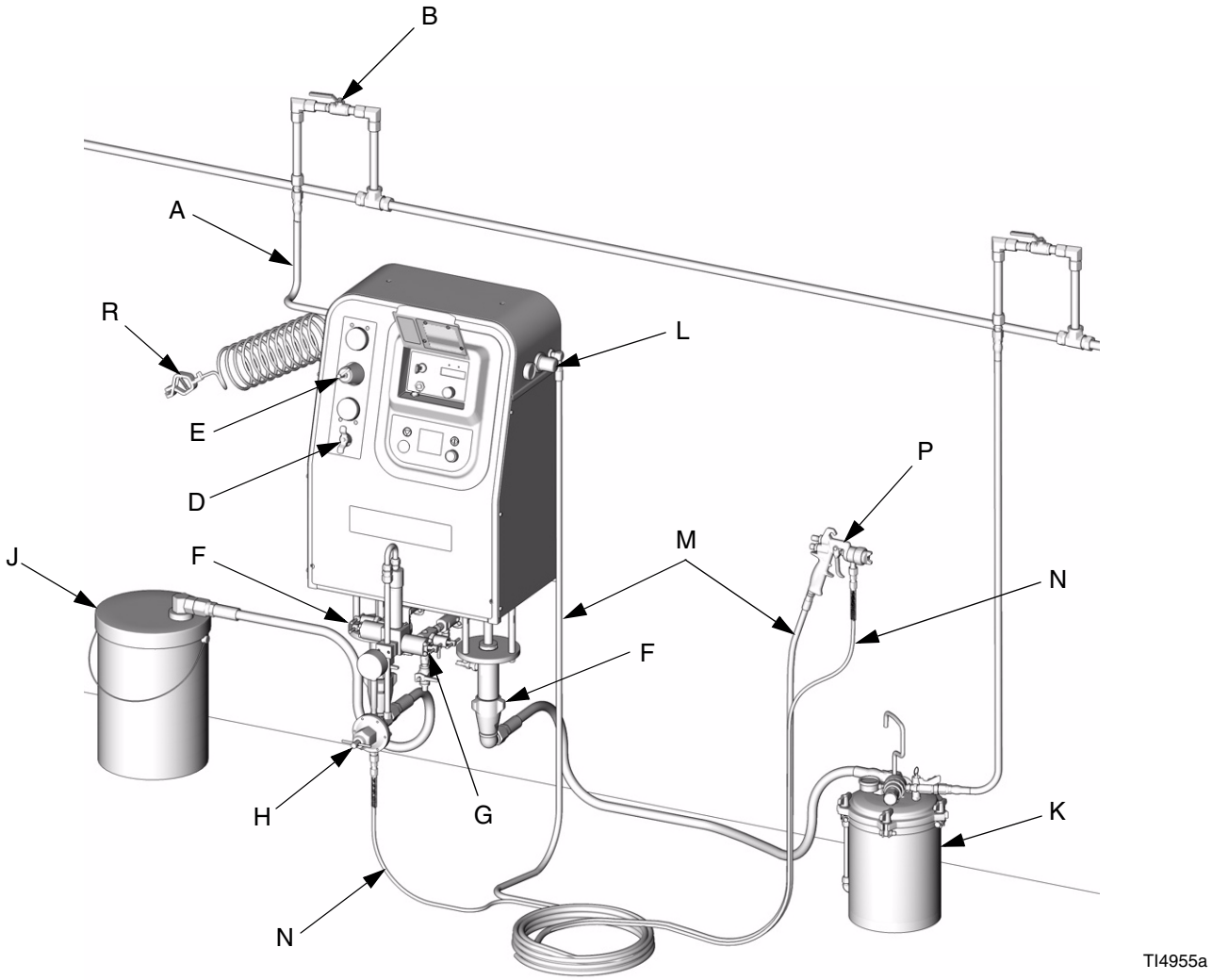


FIG. 1: Typical Installation, shown on a ProMix *Easy* Plural Component Proportioner

Key:

A Main Air Supply Line
B Air Shutoff Valve
C Pump Air Filter (inside cabinet)
D Bleed-type Master Air Valve (required)
E Pump Air Regulator
F UltraMix Pumps
G Fluid Mix Manifold and Valves
H Fluid Pressure Regulator
J Component A Fluid Supply
K Component B Fluid Supply
L Gun Air Pressure Regulator
M Gun Air Supply Line
N Gun Fluid Supply Line
P Airspray Gun
R Ground Wire

Operation

Pressure Relief Procedure

WARNING

Follow **Pressure Relief Procedure** when you stop spraying and before cleaning, checking, servicing, or transporting equipment. Read warnings, page 4. Also follow the **Pressure Relief Procedure** in your separate system manual.

1. Engage trigger lock.
2. Close the bleed-type master air valve.
3. Disengage the trigger lock.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.
5. Engage the trigger lock.
6. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to spray again.
7. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or tip obstruction.

Flushing

WARNING

Read warnings, page 4. Follow **Grounding** instructions, page 6.

Flush before changing colors, before fluid can cure in the equipment, at the end of the day, before storing, and before repairing equipment.

Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.

Flush with a fluid that is compatible with the fluid being pumped and the equipment wetted parts.

1. Follow **Pressure Relief Procedure**, page 8.
2. Remove spray tip from the gun.
3. Change the fluid source to solvent.
4. Set the pump to the lowest possible fluid pressure, and start the pump.
5. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until clean solvent flows from the gun.
6. Follow **Pressure Relief Procedure**, page 8.

Priming

Do not install the gun spray tip yet. Use the lowest possible pressure while priming, to avoid splashing.

1. Connect fluid supply hose to pump fluid inlet.
2. Set pump air regulator to 0.
3. Start the pump, and set it to the lowest possible fluid pressure.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun until fluid flows smoothly from the gun.
5. Follow **Pressure Relief Procedure**, page 8.

Shutdown

Follow this procedure before prolonged shutdown or servicing equipment.

1. Follow **Pressure Relief Procedure**, page 8. Engage trigger lock, set air regulator to 0, and close main air shutoff valve. Remove spray tip.
2. Follow **Flushing**, page 8.
3. Follow **Pressure Relief Procedure**, page 8. Engage trigger lock.
4. *Before prolonged shutdown:* cap fluid outlets to keep solvent in the lines. Fill pump wet cup with throat seal liquid (TSL).

Maintenance

Air Filters

Check weekly. Drain and clean as necessary.

Preventive Maintenance Schedule

Establish a preventive maintenance schedule, based on the pump's repair history.

Wet Cup

Check wet-cup daily. Keep filled with Graco Throat Seal Liquid (TSL), Part No. 206995, to prevent material from hardening on displacement rod.

Storage

Before storing the pump, always flush it, page 8. Relieve the pressure, page 8.

Troubleshooting

WARNING

Read warnings, page 4-5.

Problem	Cause	Solution
Pumps do not run.	Air pressure to pump too low	Increase pressure to 50 psi (0.35 MPa, 3.5 bar).
	Air lines are obstructed	Check air lines for kinks or pinches.
	Solenoid valve stuck.	Actuate solenoid manually, if it does not operate, replace solenoid. Page 12.
	Dispense valve not opening.	Service or replace valve(s). See system manual.
	Paint cured in pump/valves.	Repair displacement pump. See 310662.
	Pump packings swollen.	Use different flushing solvent.
Pump test volume is not correct.	Air pressure to pump too low	Increase pressure to 50 psi (0.35 MPa, 3.5 bar).
	Sensor not functioning properly.	Check position of sensor. Check board calibration and recalibrate if necessary. See system manual. Replace sensor. Page 14.
	Pump cavitating excessively.	Check for air in lines caused by loose fitting or use of agitator. Material too viscous. Use heater.
Paint does not cure consistently.	Pump not operating correctly.	Observe whether pump is loading and checking correctly, if not, clean and repair displacement pump. See 310662.
Pump runs erratically.	Air filter clogged.	Clean. Replace element.
	Air supply hoses undersized.	Replace hoses with appropriate size.
	Air compressor undersized.	Use larger air compressor.
	Rod moves up when not dispensing; worn piston valve or packings.	Repair displacement pump. See 310662
	Rod moves down when not dispensing; worn intake valve.	Repair displacement pump. See 310662
Pump leaking.	Worn packings.	Replace packings. See 310662.
Flow rate too low.	Inadequate air supply.	Use larger CFM compressor.
	Air pressure to pumps too low.	Increase pressure.
	Fluid filter plugged.	Clean filter.
	Spray tip too small.	Relieve pressure. Install larger tip. Follow gun manual instructions.
	Fluid hose partially plugged or too restrictive.	Inspect for cured material. Clean or replace, or use larger hose

Repair

Follow **Shutdown** procedure, page 9, if service time may exceed pot life time, before servicing fluid components, and before transporting equipment to a service area.

WARNING

Read warnings, page 4.

Air Cylinder

Removal

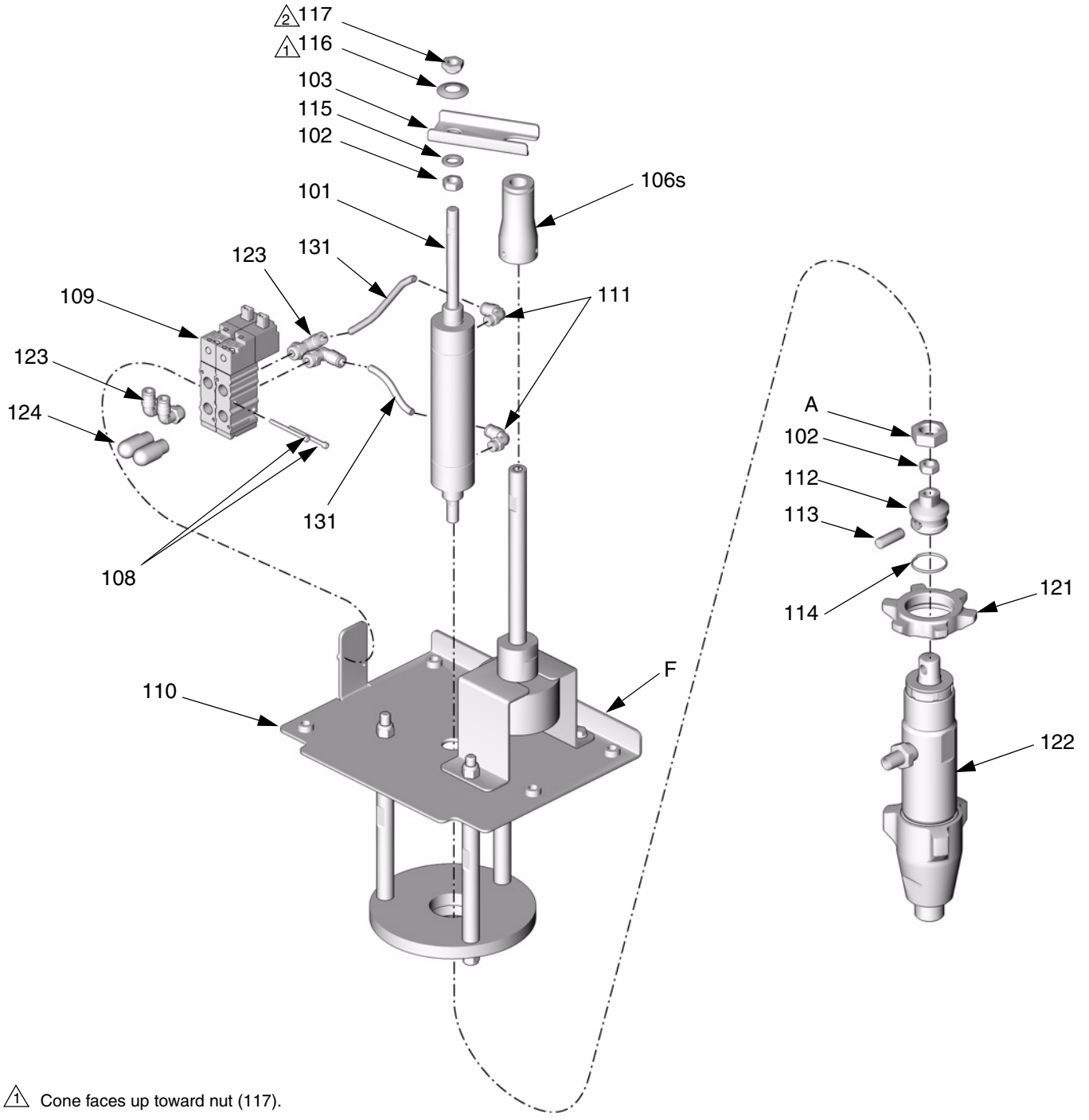
1. Follow **Pressure Relief Procedure**, page 8.
2. Push retaining spring (114) up. Push pin (113) out.
3. Disconnect the cylinder (101) from the displacement pump (122), using two wrenches to loosen jam nut (102) from connecting rod (112). Remove both parts from cylinder lower rod.
4. To disconnect the cylinder (101) from the yoke (103), hold jam nut (102) with a wrench while removing nut (117) and spring washer (116) from cylinder upper rod. Lift off yoke (103) and magnet holder (106s). Remove washer (115) and jam nut (102) from upper rod.
5. Note that air tube elbows (111) face flange (F) on mounting plate (110). Mark which air tube (131) connects to top elbow, which to bottom. Press on collars of elbows (111) and pull on tubing (131) to release air lines.
6. Remove large nut (A) under mounting plate (110) and remove cylinder (101).

Installation

1. Install cylinder (101) on mounting plate (110); either end of cylinder can face up. Air tube elbows (111) must face mounting plate flange (F). Install and tighten large nut (A) under mounting plate.
2. Screw jam nut (102) fully onto cylinder upper rod. Place washer (115) on nut.
3. Install magnet holder (106s) into slot in yoke (103). Place this assembly over the sensor (106) and cylinder (101) rods. Place spring washer (116) and nut (117) on cylinder upper rod; washer's cone must face up, and nut's smaller diameter must face down.
4. Hold jam nut (102) with wrench and tighten nut (117), making sure its smaller diameter fits through the hole in the yoke.
5. Screw jam nut (102) fully onto cylinder lower rod. Holding flats of lower rod with wrench, install connecting rod (112) and tighten securely onto rod. Using two wrenches, tighten jam nut (102) against connecting rod (112) to lock in place.
6. Align hole in connecting rod (112) with hole in displacement pump rod. Push retaining spring (114) up. Install pin (113) and pull retaining spring down.
7. Reinstall air lines in positions noted in step 5 under **Removal** above.
8. Recalibrate sensor. See system manual.

Solenoid Replacement

1. Follow **Pressure Relief Procedure**, page 8.
2. Note location of solenoid wire harnesses. Press tab on connectors and remove wire harnesses. FIG. 2.
3. Mark which air tube (131) connects to left elbow, which to right. Press on collars of elbows (123) and pull on tubing (131) to release air lines.
4. Remove screws (108) and take solenoids (109) off mounting plate (110).
5. Reinstall in reverse order. Ensure that air tubes and wire harnesses are connected to the proper solenoids.



1 Cone faces up toward nut (117).

2 Smaller diameter fits through hole in yoke (103).

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FIG. 2. Air Cylinder and Solenoids

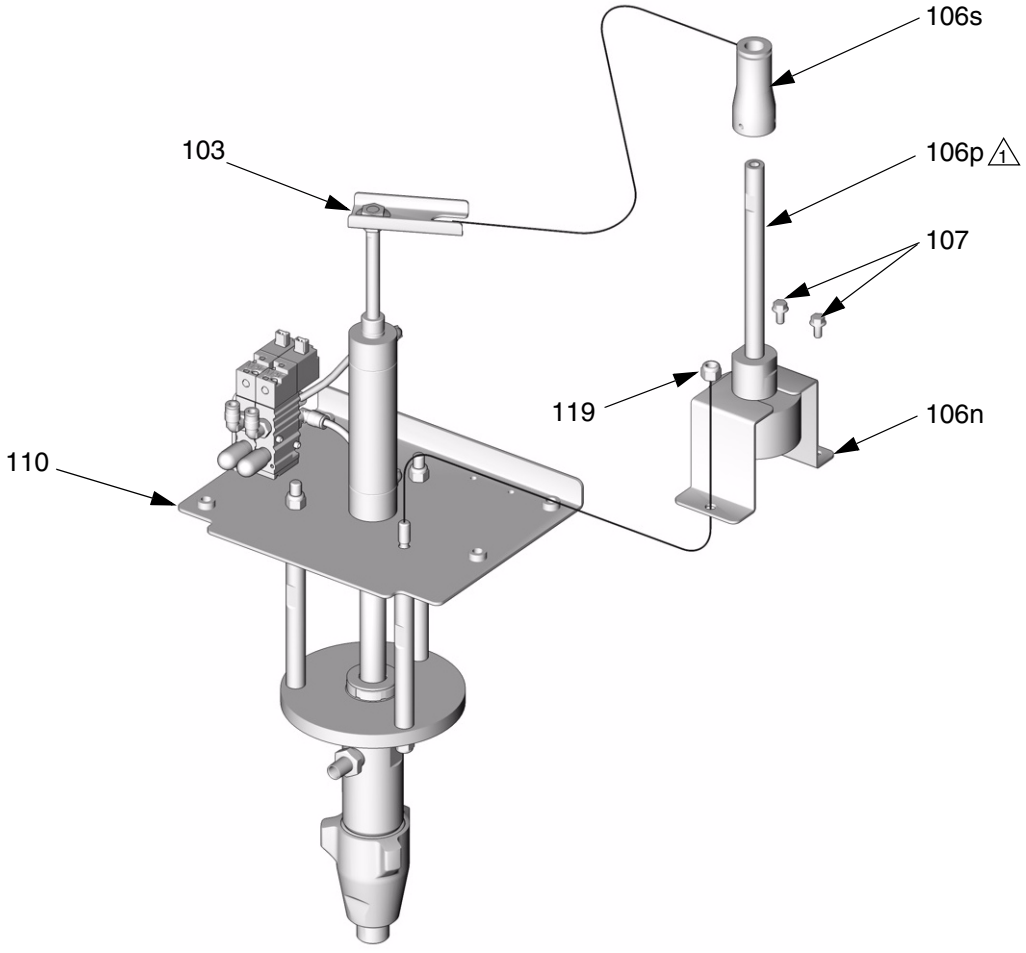
Sensor Replacement

Removal

1. Follow **Pressure Relief Procedure**, page 8.
2. Remove fasteners (107, 119) from sensor bracket (106n). FIG. 3.
3. Carefully pull magnet holder (106s) from yoke (103) while guiding sensor (106) and wire harness from mounting plate (110).
4. Disconnect sensor wire harness.

Installation

1. Apply small amount of grease to sensor shield (106p). Slide magnet holder (106s) down onto shield.
2. Connect wire harness to new sensor (106).
3. Carefully guide sensor (106) into position while pressing magnet holder (106s) into yoke (103).
4. Reinstall fasteners on sensor bracket (106n).
5. Recalibrate sensor. See system manual.



⚠1 Apply small amount of grease to sensor shield.

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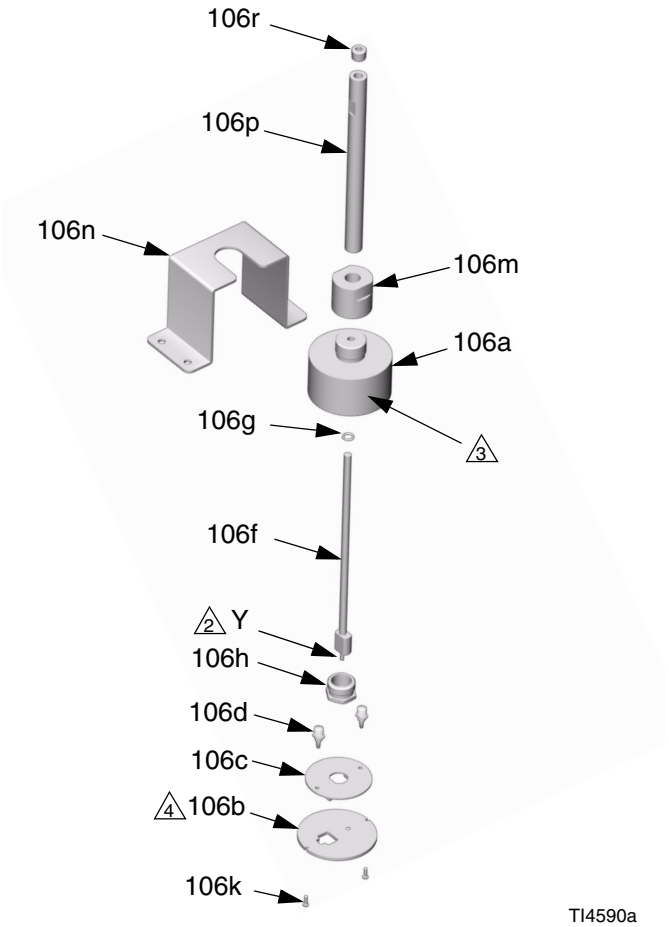
FIG. 3. Sensor Replacement

Sensor Repair

CAUTION
To avoid damaging board, wear a grounding strap.

1. Follow **Pressure Relief Procedure**, page 8.
2. Remove sensor, page 14.
3. Unscrew sensor cap (106a) from nut (106m). FIG. 4.
4. Remove screws (106k) and cover (106b).
5. Disconnect sensor cable (Y) from board (106c).
6. Remove and replace parts as needed.
7. Install sensor, page 14.
8. Recalibrate sensor. See system manual.



2 Plug cable (Y) into connector on board (106c).

3 Calibration value location.

4 Before assembling cover (106b) to cap (106a), assemble cable (Y) through cover (106b), and plug cable into connector on board (106c).

FIG. 4. Sensor Repair

Displacement Pump

Removal

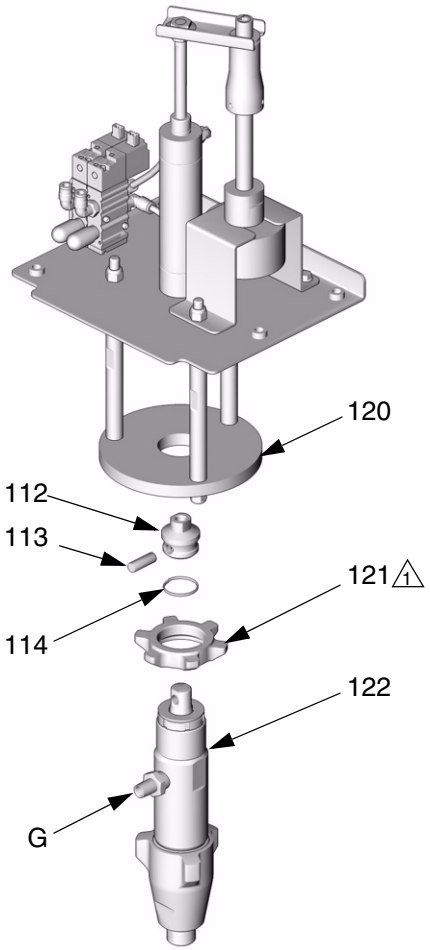
WARNING

Read warnings, page 4.

1. Flush pump, page 8.
2. Follow **Pressure Relief Procedure**, page 8.
3. Disconnect fluid inlet and outlet lines from displacement pump (122). Note orientation of pump fluid outlet (G) to rest of system.
4. Push retaining spring (114) up. Push pin (113) out. See FIG. 5.
5. Loosen star-shaped locknut (121) by hitting firmly with a non-sparking hammer and punch, and screw locknut all the way down onto displacement pump. Unscrew pump (122) from adapter plate (120).
6. See manual 310662 to repair displacement pump.

Installation

1. Ensure star-shaped locknut (121) is screwed on pump with flat side up. Screw pump into adapter plate (120) until top of outer cylinder aligns with top of plate. Install pin (113) through holes in connecting rod (112) and pump displacement rod. Pull retaining spring (114) down. See FIG. 5.
2. Adjust pump in either direction to align pump fluid outlet (G) as desired (see step 3 above), then screw star-shaped locknut (121) up against adapter plate (120). Tighten by hitting firmly with a non-sparking hammer and punch.
3. Reconnect fluid inlet and outlet lines to displacement pump (122). Return pump to service.



1 Flat side faces up.

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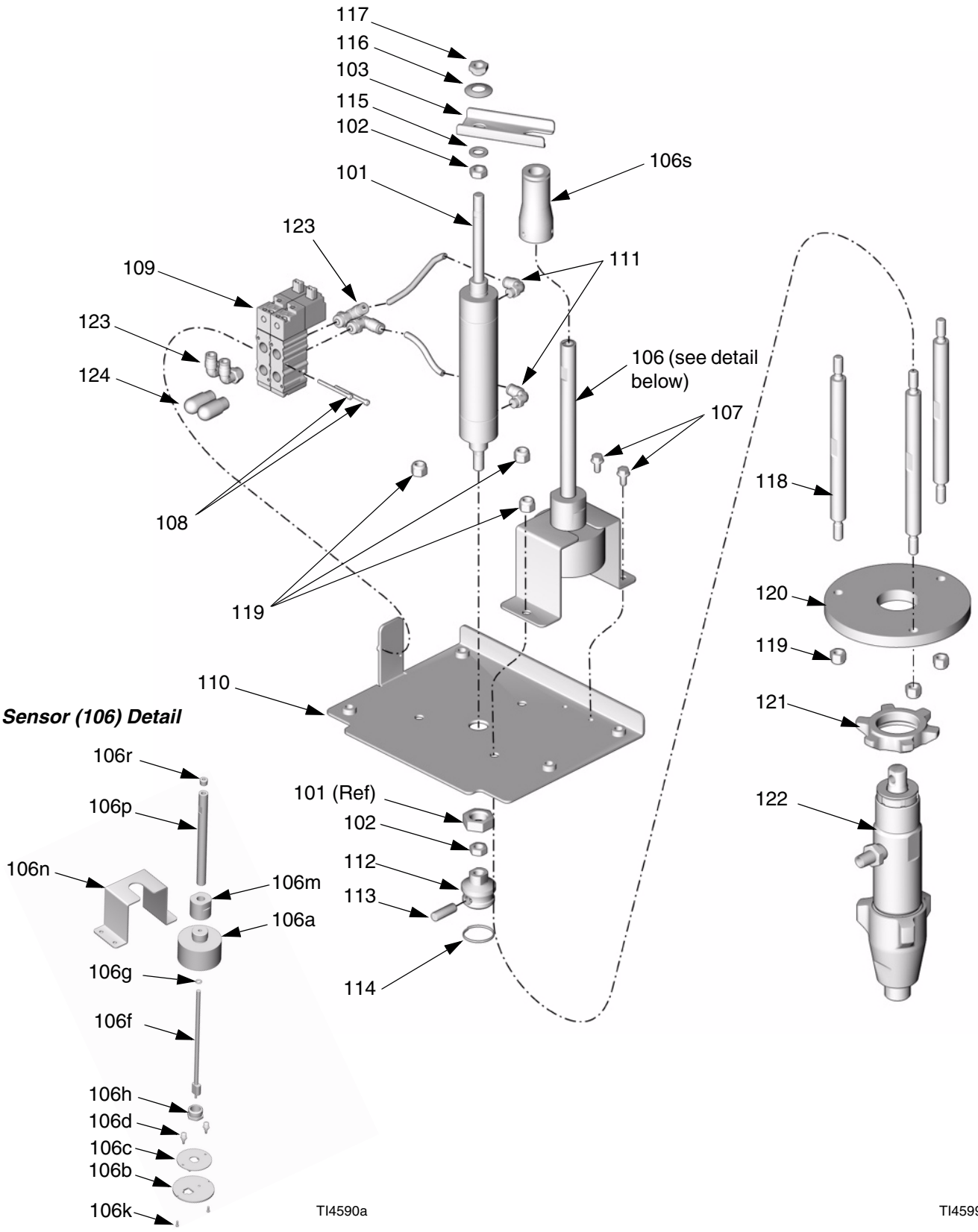
FIG. 5. Displacement Pump

Parts


117
116
103
115
102
101
106s
123
109
111
123
124
106 (see detail below)
107
108
119
110
118
120
119
121
122
101 (Ref)
102
112
113
114
Sensor (106) Detail
106r
106p
106n
106m
106a
106g
106f
106h
106d
106c
106b
106k
TI4590a
TI4599a

UltraMix Pumps

248571 Stainless Steel UltraMix Pump

248570 Carbon Steel UltraMix Pump

Ref. No.	Part No.	Description	Qty.
101	248544	ACTUATOR, pneumatic cylinder; includes item 111	1
102	150513	NUT, jam; 7/16-20	2
103	15D269	YOKE	1
106	248546	SENSOR, displacement; includes items 106a-106s	1
106a	196280	. CAP	1
106b	196282	. COVER	1
106c	243500	. BOARD	1
106d	115925	. SPACER	2
106e	117331	. CABLE	1
106f	115917	. SENSOR	1
106g	110004	. O-RING; PTFE	1
106h	196289	. CAP	1
106j	116024	. TAB TERMINAL	1
106k	112546	. SCREW; 4-40 taptite	2
106m	15D272	. NUT, coupling, sensor	1
106n	15D773	. BRACKET	1
106p	15D271	. SHIELD	1
106r	100721	. PLUG, pipe	1
106s	248645	. MAGNET HOLDER	1
107	113161	SCREW, hex hd, flange; 1/4-20 x 1/2 in. (13 mm)	2
108	115913	SCREW, socket hd; 6-32 x 1-3/4 in. (44 mm)	2
109	248545	VALVE, spool, solenoid; includes items 123 and 124	2
110	15D772	PLATE, mounting	1
111	112698	ELBOW; 1/8 npt(m) x 1/4 in. (6 mm) OD tube fitting; part of item 101	2
112	15D277	ROD, connecting	1
113	183210	PIN, straight	1
114	183169	SPRING, retaining	1
115	116886	WASHER; 7/16	1
116	119238	WASHER, spring	1
117	15D820	NUT, spacer	1
118	15D276	ROD, tie	3
119	101566	NUT, lock, w/nylon insert; 3/8-16	6
120	15D275	PLATE, adapter, lower	1
121	193031	NUT, retaining	1
122	248541	PUMP, displacement; stainless steel; 248571 only; see manual 310662	1
	248540	PUMP, displacement; carbon steel; 248570 only; see manual 310662	1
123	114109	ELBOW; 1/4 npt(m) x 1/4 in. (6 mm) OD tube fitting; part of item 109	4
124	114174	MUFFLER; part of item 109	2
131	054123	TUBE, nylon; 1/4 in. (6 mm) OD	1 ft

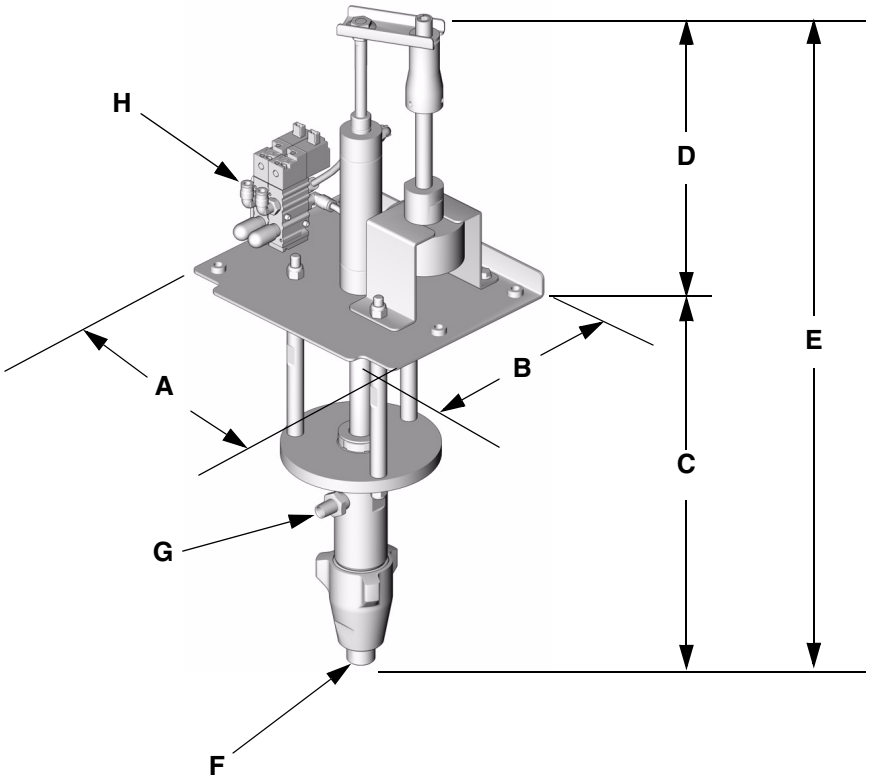
Technical Data

Flow rates	
Minimum	0.02 qt/min (0.02 lpm)*
Maximum	3/4 gpm (2.8 lpm)
Maximum fluid working pressure	250 psi (1.7 MPa, 17 bar)
Air supply pressure range	50-100 psi (345-700 kPa, 3.5-7.0 bar)
Maximum air consumption at 100 psi (0.7 MPa, 7 bar)	10.8 scfm at 1 gpm (0.30 m^3/min at 3.8 lpm)
cc/cycle	54 cc/cycle
Pump cycle length (one cycle = one upstroke and one downstroke)	6 in. (152 mm)/cycle
Wetted parts	See manual 310662.

* *Minimum flow rate is dependent on the material being sprayed and mixing capability. Test your material for specific flow rate.*

Dimensions

A 10.5 in. (267 mm)
B 8.5 in. (216 mm)
C 15.8 in. (402 mm)
D 11.9 in. (302 mm)
E 27.7 in. (704 mm)
F 3/4 npt (m)
G 1/4 npt(m) fitting, 3/8 npt(f) port
H 1/4 in. (6 mm) OD air tube fittings



Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be 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 general wear and tear, or 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 of Graco equipment with 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 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.

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Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211, **Fax:** 612-378-3505

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