

# Instructions – Parts List



STAINLESS STEEL, WATERBASE COMPATIBLE

## Fluid Pressure Regulator

307886K

For use in air-assisted system to regulate pressure to gun.  
Fluid regulator valve is cartridge mounted for quick, in-line replacement.

### Model 222121, Series B

1500 psi (10.3 MPa, 103 bar) Maximum Fluid Inlet Pressure

150–1200 psi (1.0–8.3 MPa, 10.4–83 bar) Regulated Fluid Pressure Range

Patent Pending

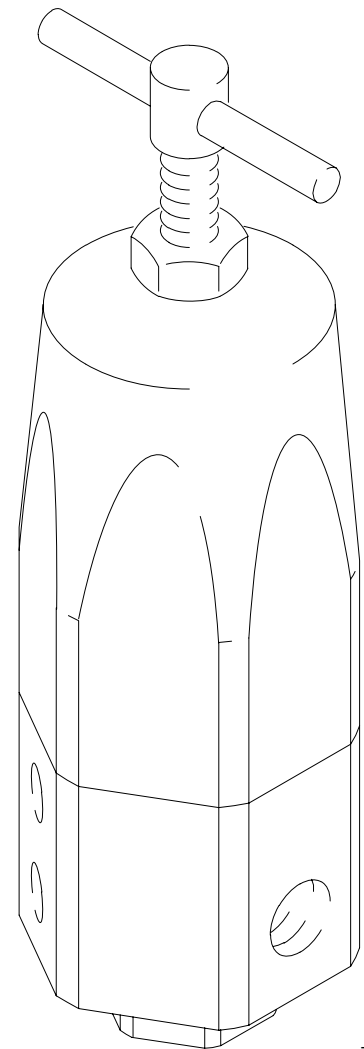


#### Important Safety Instructions

Read all warnings and instructions in this manual.  
Save these instructions.

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# Symbols

## Warning Symbol



This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

## Caution Symbol



This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

## WARNING



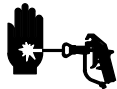
INSTRUCTIONS

### EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment. Use only genuine Graco parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. Refer to the **Technical Data** on page 13 for the maximum working pressure of this equipment.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 180°F (82°C) or below -40°F (-40°C).
- Do not kink or over bend the hoses or use the hoses to pull equipment.
- Wear hearing protection when operating this equipment.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# ⚠ WARNING



## INJECTION HAZARD

Spray from the gun, leaks or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.



- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Keep your hands away from the end of the drain valve when opening it.
- Lock the gun trigger safety when you stop spraying.
- Follow the **Pressure Relief Procedure** on page 5 if the spray tip clogs and before cleaning, checking or servicing the equipment.
- Follow the **Pressure Relief Procedure** on page 5 before removing the regulator's adjusting knob.
- Do not pressurize the system when the fluid regulator's adjusting knob is removed.
- Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Use only Graco approved hoses. Do not remove the spring guard that is used to help protect the hose from rupture caused by kinks or bends near the couplings.



## TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

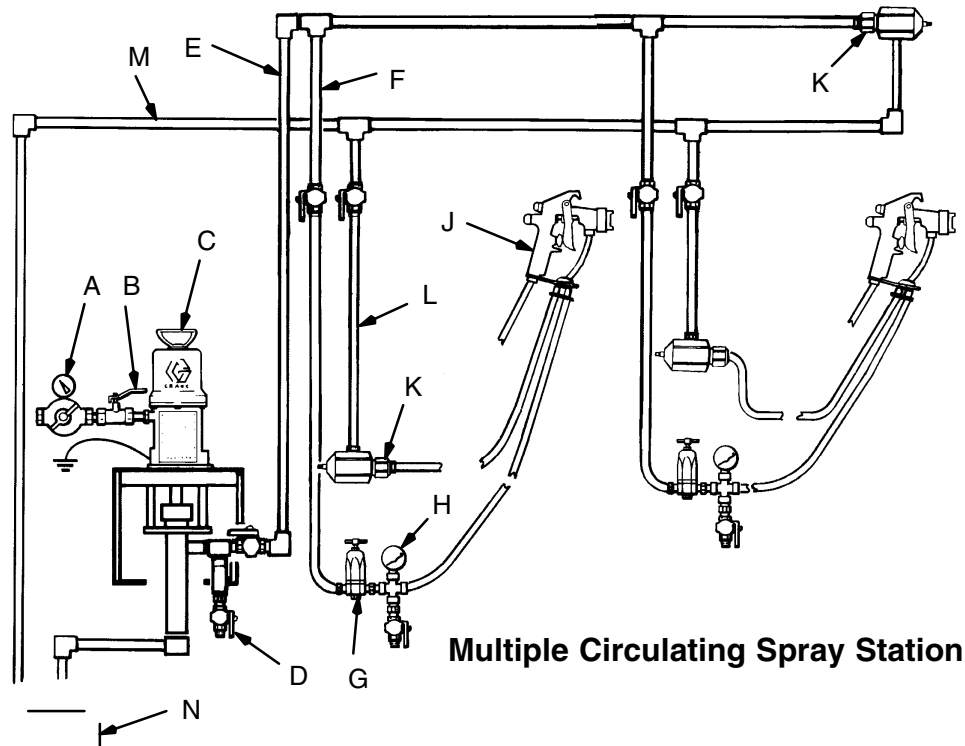
# Installation

## KEY

- A Air regulator
- B Bleed-type master air valve
- C Pump
- D Fluid filter & drain valve
- E Main fluid supply line
- F Gun fluid supply line
- G Fluid regulator
- H Fluid pressure gauge & drain valve
- J Air-assisted spray gun
- K Back pressure valve
- L Fluid return line
- M Main circulating line
- N Fluid supply container

## NOTE:

The Typical Installation drawings are only guides for selecting and installing a circulating or direct system. They are not actual system designs. Contact your Graco distributor for the particular type and size system best suited for your needs.



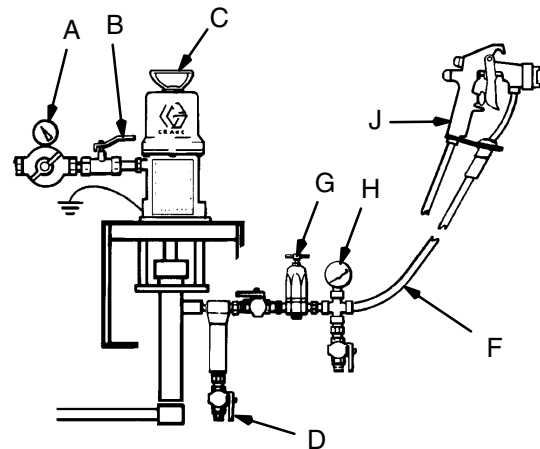
**Multiple Circulating Spray Station**

Install the fluid regulator(s) (G) in the spray gun fluid supply line (F) as shown in the Typical Installation drawing above or at right. Connect *only one* spray gun or dispensing valve to each fluid regulator.

Using pipe sealant on pipe threads, connect the fluid supply line (F) to the fluid regulator's 1/4 npt(f) inlet. Connect the line from the gun (J) to the regulator's 1/4 npt(f) outlet.

Make sure the direction of fluid flow agrees with the **IN** and **OUT** markings on the regulator body.

The regulator was tested in lightweight oil. Flush the entire system with a solvent compatible with the fluid being sprayed or dispensed, then test the system.



**Single Direct Spray Station**

# Operation

## Pressure Relief Procedure

### WARNING



#### INJECTION HAZARD

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you

- Are instructed to relieve the pressure
- Stop spraying
- Check or service any of the system equipment
- Install or clean the spray tip

1. Lock the gun trigger safety and any other equipment safety locks.
2. Turn off the power to the pump.
3. Unlock the gun trigger safety.
4. Close the bleed-type master air valve (required in your system).
5. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
6. Lock the gun trigger safety.
7. Slowly open the drain valve (required in your system), and have 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 completely clogged, or that pressure has not been fully relieved after following the steps above, **very slowly** loosen the tip guard retaining nut or hose end coupling, and relieve pressure gradually, then loosen completely, then clear the tip or hose.*

## Operating the Regulator

### CAUTION

- To avoid contaminants clogging or damaging the regulator, you **must** clean and test the new system thoroughly before you admit fluid to the regulator.
- **Always** use the lowest possible air and fluid pressures for your application. High pressures can cause premature spray tip and pump wear.

#### NOTES:

- The fluid pressure regulator controls pressure downstream from its outlet.
  - *If using an accessory fluid pressure gauge (H), to ensure a correct gauge reading, relieve the spray gun line pressure after reducing the regulator pressure.*
1. Back the regulator adjusting screw (18) out (turn *counterclockwise*) until there is no spring pressure. Relieve the spray gun line pressure.
  2. Turn the adjusting screw *clockwise* to *increase* the fluid pressure.
  3. Adjust the pump air pressure and fluid regulator for the desired spray pattern. Use the lowest possible air and fluid pressures for your application.
  4. *In a circulating system*, also adjust the back pressure valve.
  5. Record all the settings for future reference.

# Maintenance

## Flushing

- Flush before changing colors, before fluid can dry 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 dispensed and the equipment wetted parts.
1. Record the pressure adjustment setting of the regulator before flushing.

### **⚠ WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 5.

2. Shut off the pump and relieve fluid pressure in the system by triggering the gun and opening the back pressure valve or other bypass valve.
3. Never exceed the maximum working pressure of the lowest rated system component.
4. Open the fluid regulator by turning the adjusting screw (18) fully *clockwise*.
5. Supply solvent to the system. Set pump to the lowest possible pressure, and start pump.
6. Flush until thoroughly clean.
7. Adjust the fluid regulator to return to the desired fluid pressure setting.

## Cleaning

**NOTE:** Do not allow fluid to settle in the system.

### **⚠ WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 5.

1. **Relieve the pressure.**
2. Remove the regulator. Clean and inspect all parts.

### **⚠ CAUTION**

Handle the hard carbide parts, ball (5), valve actuator (9), and seat (6) carefully to avoid damaging them. Damage will cause poor operation and leakage.

## Cartridge Replacement

**NOTE:** Kit 222140 replaces the fluid regulator valve cartridge. See page 10 for the parts included.

### **⚠ WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 5.

1. **Relieve the pressure.**
2. Remove the cartridge by loosening the valve housing (1) and pulling the cartridge assembly out of the regulator housing (24). See Fig. 1.
3. Install the new cartridge assembly into the regulator housing (24). Torque the valve housing (1) to 30 to 35 ft-lbs (41 to 47 N•m).

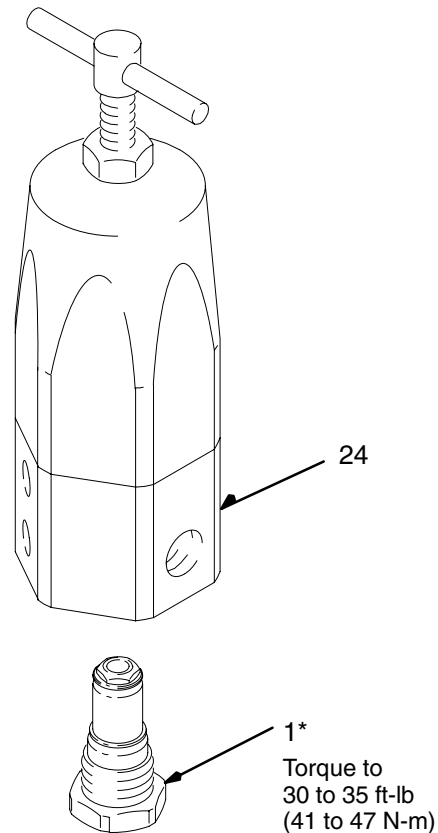


Fig. 1

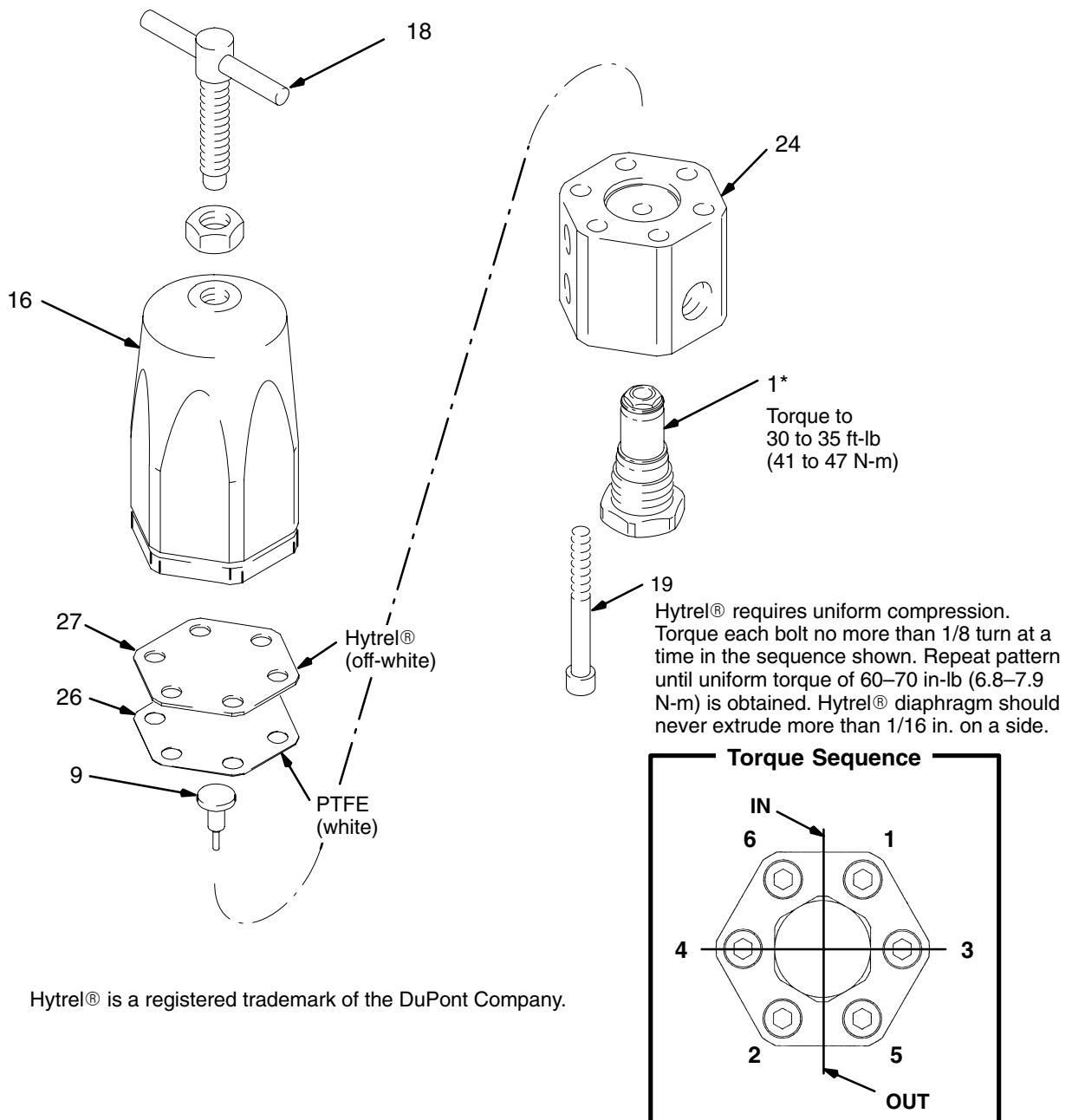
# Maintenance

## Diaphragm & Valve Actuator Replacement

### **⚠ WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 5.

1. **Relieve the pressure.**
2. Remove the regulator from the fluid line.
3. Remove the six cap screws (19) from the regulator housing (24). See Fig. 2.
4. Remove the diaphragms (26 and 27). Inspect the carbide pin in the valve actuator (9) for wear. Replace if necessary.
5. Install the new diaphragms, with the PTFE diaphragm (26) facing toward the regulator housing (24), as shown in Fig. 2.
6. Install the valve actuator (9) and six cap screws (19). Torque the cap screws in the order shown in Fig. 2.



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Fig. 2

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# Troubleshooting

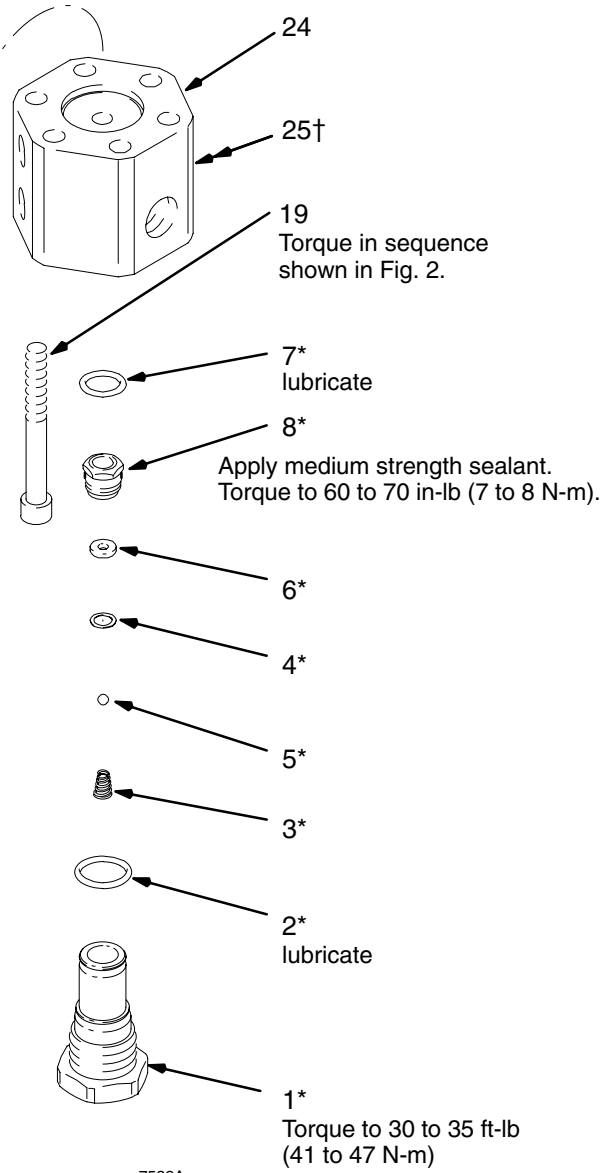
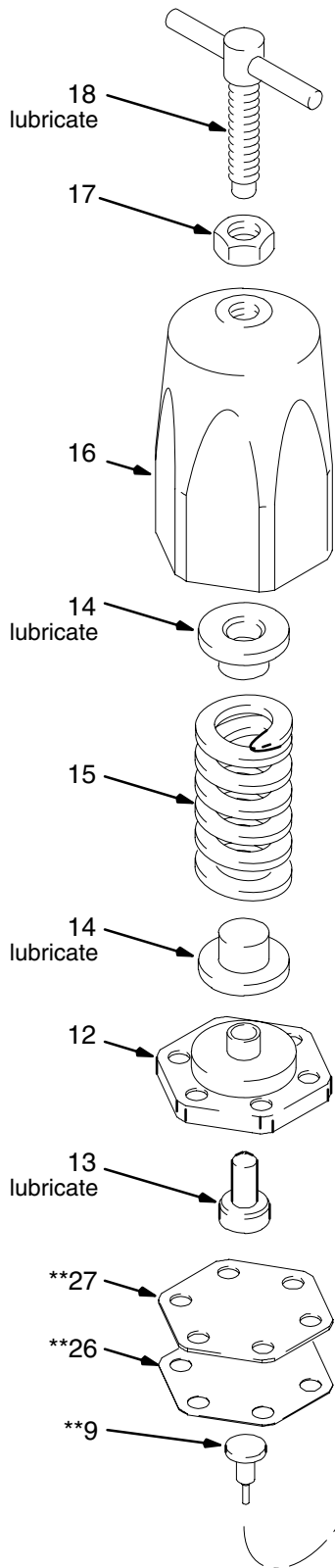
## **WARNING**

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 the **Pressure Relief Procedure** on page 5 whenever the pump is shut off, before installing, cleaning, adjusting, removing or servicing the valve or any part of the system, and whenever you stop spraying.

**NOTE:** Check all possible remedies in the table below before you disassemble the valve.

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
No pressure regulation	Damaged diaphragm (26 or 27). Damaged valve actuator (9).	Replace diaphragm. See page 7. Replace valve actuator. See page 7.
Pressure creeps above setting	Damaged diaphragm (26 or 27). Ball (5) or seat (6) leaking or dirty.	Replace diaphragm. See page 7. Replace the cartridge or clean seat. See page 7.
Pressure drops below setting	Empty/clogged supply line. Using valve beyond its rated flow capacity. See page 13.	Fill/flush supply line. Install valve for each spray gun or dispensing valve.
Fluid leaks from under spring housing (16)	Loose spring housing. Damaged diaphragm (26 or 27).	Tighten screws (19) in sequence and to torque shown in Fig. 2 on page 7. Replace diaphragm. See page 7.

# Parts Drawing



**\* Valve Cartridge Repair Kit 222140**  
Includes the following:

Ref No.	Qty
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1

# Parts List

Ref. No.	Part No.	Description	Qty.
1*	187882	HOUSING, valve; SST	1
2*	102982	O-RING; PTFE	1
3*	111737	SPRING, compression, conical; SST	1
4*	183876	GASKET, seat, nylon	1
5*	101680	BALL; carbide	1
6*	183875	SEAT, valve; carbide	1
7*	107505	O-RING, PTFE	1
8*	188001	RETAINER, spring; SST	1
9**	235204	ACTUATOR, valve; carbide & SST	1
12	183881	GUIDE, plunger	1
13	183883	PLUNGER, spring	1
14	183882	GUIDE, spring	2
15	109141	SPRING, compression	1
16	183880	HOUSING, spring	1
17	101448	NUT, jam; 3/8–24 NF	1
18	236590	SCREW, adjustment	1
19	103926	SCREW, cap, sch; 1/4–20 UNRC	6
24	187885	HOUSING, regulator; SST	1
25†	185052	LABEL, warning	1
26**	192051	DIAPHRAGM, PTFE	1
27**	192052	DIAPHRAGM, Hytrel®	1

\* Included in Valve Cartridge Repair Kit 222140.

\*\* Recommended “tool box” repair parts. Keep on hand to reduce down time. Diaphragms, Ref. No. 26 and 27, are included in Regulator Repair Kit 239789.

† Additional warning labels available at no charge.

# Accessories

Accessories must be purchased separately.

Use only **GENUINE GRACO PARTS AND ACCESSORIES.**

## 802072 Fluid Pressure Gauge

0 to 1500 psi (0 to 10.3 MPa, 0 to 103 bar) pressure range

1/4–18 npt(m), with gauge, also order

**166421** pipe nipple, 1/4–18 npt; SST

**110290** Tee, female; 1/4–18 npt; SST

## 110182 Fluid Pressure Gauge with Dampener

0 to 2000 psi (0 to 1.4 MPa, 0 to 138 bar) pressure range

1/4 npt(f), with gauge, also order

**166421** pipe nipple, 1/4–18 npt; SST

**185281** tee, male; 1/4–18 npt; SST

## 110191 Female Cross Fitting

For installing an additional outlet line.

1/4–18 npt; SST

## 214037 High Pressure Fluid Drain Valve

5000 psi (34 MPa, 345 bar) maximum working pressure

Use at fluid outlet to help relieve pressure.

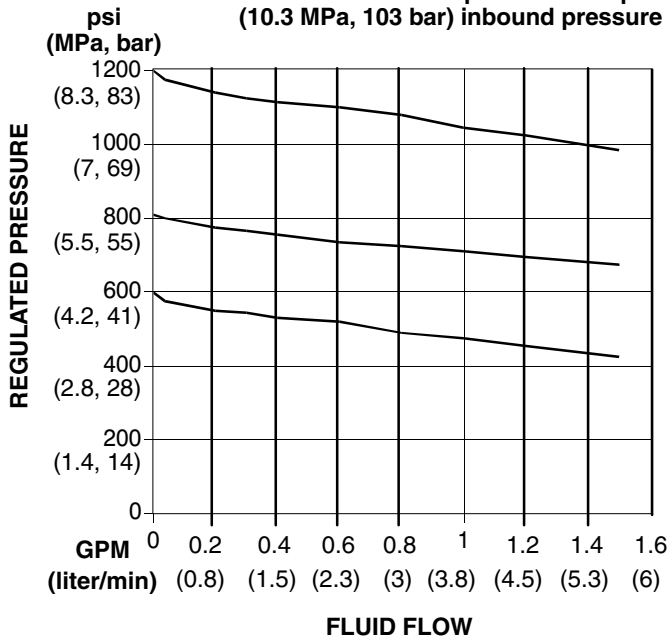
1/4 npt (mbe) carbon steel with PTFE seals

## 222515 Bracket Kit

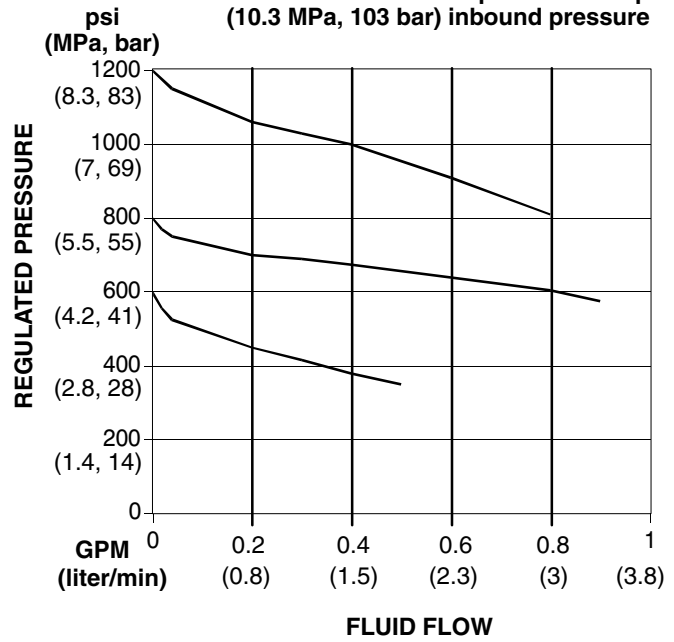
To attach fluid regulator to cart, pail, or wall units.

# Performance Charts

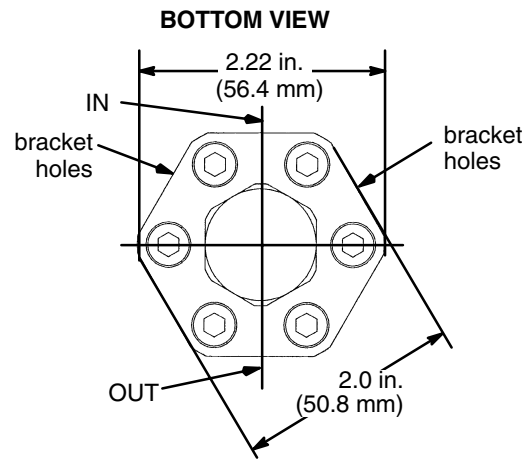
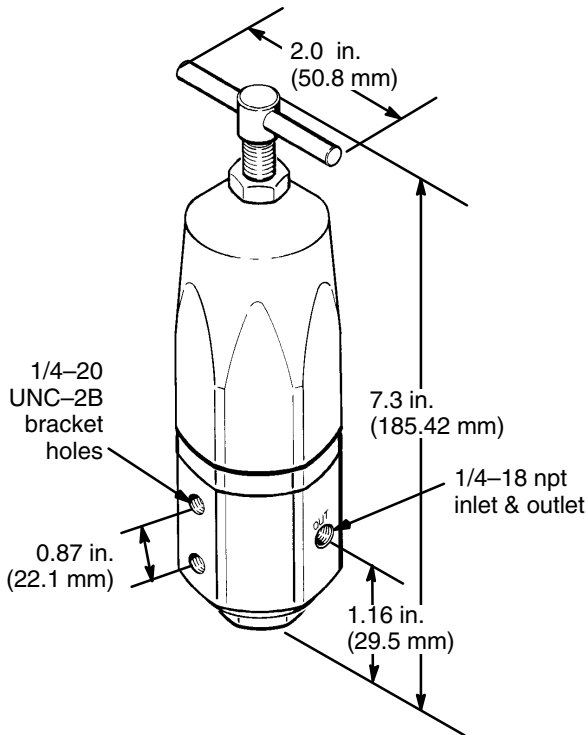
Test Media: 65 centipoise at 1500 psi  
(10.3 MPa, 103 bar) inbound pressure



Test Media: 1000 centipoise at 1500 psi  
(10.3 MPa, 103 bar) inbound pressure



## Dimensions



# Technical Data

Maximum fluid inlet pressure ..... 1500 psi  
(10.3 MPa, 103 bar)  
Regulated pressure range ..... 150 to 1200 psi  
(1 to 8.3 MPa, 10.4 to 83 bar)  
Maximum flow capacity ..... 1.5 gpm (5.7 lpm)  
Fluid viscosity ..... 1 to 1000 centipoise  
Weight ..... 4.5 lb (2.04 Kg)  
Wetted parts ..... 304 & 316 stainless steel,  
PTFE, nylon, tungsten carbide

*Hytre<sup>®</sup> is a registered trademark of the DuPont  
Company.*

# Graco Standard Warranty

Graco warrants all equipment 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.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but 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 any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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## Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

**1-800-328-0211 Toll Free**

**612-623-6921**

**612-378-3505 Fax**

*All written and visual data contained in this document reflects the latest product information available at the time of publication.  
Graco reserves the right to make changes at any time without notice.*

MM 307886

**Graco Headquarters:** Minneapolis

**International Offices:** Belgium, China, Japan, Korea

**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441**

**[www.graco.com](http://www.graco.com)**

PRINTED IN U.S.A. 307886 10/1988, Revised 6/2005

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