

# INSTRUCTIONS-PARTS LIST

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



# 307-134

Rev. C  
Supersedes B

## STAINLESS STEEL, WATERBASE COMPATIBLE FLUID PRESSURE REGULATOR

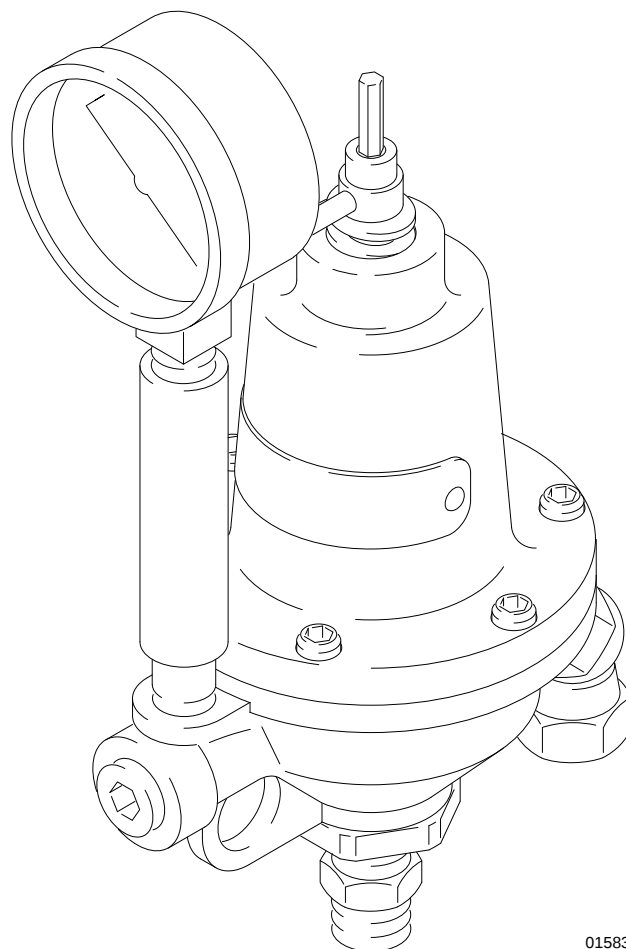
*250 psi (18 bar) MAXIMUM INLET PRESSURE*  
*5 to 100 psi (0.3 to 7 bar) REGULATED PRESSURE RANGE*

### Model 209-030, Series C

For accurate, positive control of fluid pressure to one low pressure spray gun, dispensing valve or atomizing head.

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# SAFETY WARNINGS

**FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS**

**Read and understand all instruction manuals before operating equipment.**

## General Safety

Any misuse of the equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in serious bodily injury, such as splashing fluid in the eyes or on the skin, or in fire, explosion or property damage.

*ALWAYS* relieve all fluid pressure in the system before removing or servicing the regulator. Close the fluid shut-off valve and relieve fluid pressure downstream of the regulator.

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

*NEVER* alter or modify any part of this equipment; doing so could cause it to malfunction.

*CHECK* the regulator weekly and repair or replace worn or damaged parts immediately.

Read and follow the fluid and solvent manufacturer's literature regarding the use of protective eyewear, gloves, clothing, respirator and other equipment.

## Fluid Compatibility

BE SURE all fluids and solvents used are chemically compatible with the "Wetted Parts" shown in the **TECHNICAL DATA** on the back cover and with the wetted parts in all other system components. Always read the fluid and solvent manufacturer's literature before using the fluid/solvent in this regulator.

## System Pressure

Use this regulator only in low pressure, air spray systems. *NEVER* exceed the 250 psi (18 bar) **MAXIMUM INLET PRESSURE** of this regulator. DO NOT exceed the maximum working pressure of any component or accessory used in your system.

## TYPICAL INSTALLATION

### KEY

- A Fluid Supply Line
- B Regulator Inlet Ball Valve
- C Fluid Regulator
- D Regulator Outlet Ball Valve
- E Fluid Hose
- F Spray Gun
- G Fluid Return Line
- H Back Pressure Valve
- J Air Regulator
- K Air Filter

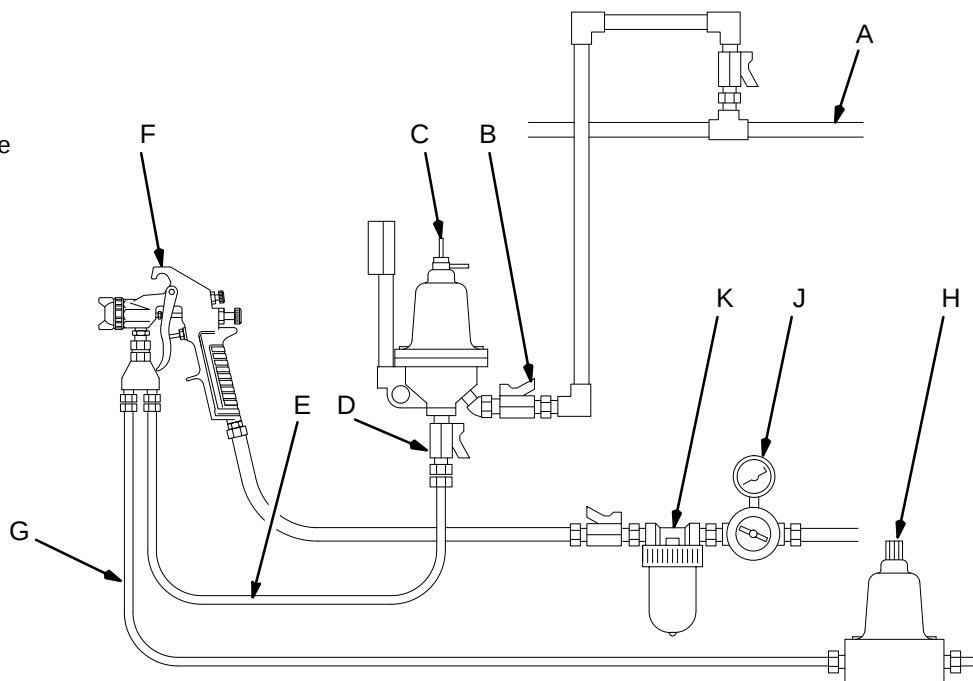


Fig 1

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## INSTALLATION

**NOTE:** Reference numbers and letters in parentheses in the text refer to the numbers and letters in the figure drawings and parts drawing.

### Before Installing the Fluid Regulator

1. Determine the placement of the fluid regulator in your system. install it as close as possible to the spray gun/dispersing valve (F) for easy operator control. See Fig 1.
2. Install a ball valve at the inlet (B) and outlet (D) of the regulator (C) to isolate the regulator to remove it for cleaning.
3. Install temporary plumbing between the ball valves.
4. Thoroughly flush the system to remove metal chips and other contaminants and to check for leaks.

### CAUTION

1. To avoid contaminants clogging or damaging the regulator, the new system must be cleaned and tested thoroughly before admitting paint to the regulator.
2. Do not pressure test the regulator with air; use solvent. Air may cause leaks between the fluid seals that result in fluid leaks during normal operation. If the rest of the system must be pressure tested with air, bypass the regulator during the test.

### Installing the Fluid Regulator

1. Remove the temporary plumbing and install one regulator (C) for each spray gun (F). See page 10 for regulator dimensions.

The regulators should be mounted in a vertical position, as shown above, for the best flow and minimum pigment settling and so the gauge can be easily read.

2. Connect the fluid supply line (A) to the regulator's 3/8 npt(f) swivel inlet. The swivel-type inlet can be connected to either a vertical or horizontal supply line.
3. Connect the fluid hose (E) between the spray gun and one of the two regulator outlets.

To allow either vertical or horizontal spray gun hose connection, the regulator has one 3/8 npsm(f) vertical outlet and one (alternate plugged) 3/8 npt(f) horizontal outlet. Choose the outlet most convenient for your system.

4. Put sealer on threaded connections, except on swivel unions as it interferes with the swivel action.
5. Flush and test the entire system. Be sure to follow the **CAUTION** at left and the flushing procedure on page 4.

## CAUTION

Do not exceed the regulated pressure specification of your regulator. Pressures higher than specified could damage the gauge.

## Regulating Fluid Pressure

1. Before opening the fluid ball valve or starting the pump, insert the hex end of the regulator key (27) into the adjusting screw (9) and turn it counterclockwise, all the way, to relieve the spring tension. See Fig 2, **Regulating Position**.
2. Start the pump and open the fluid ball valve (B) to admit fluid to the regulator inlet. See Fig 1.
3. Turn the key clockwise until the desired fluid pressure shows on the regulator gauge.

## KEY

27-A Hex Key with threaded end inserted

27-B Hex Key with hex end inserted

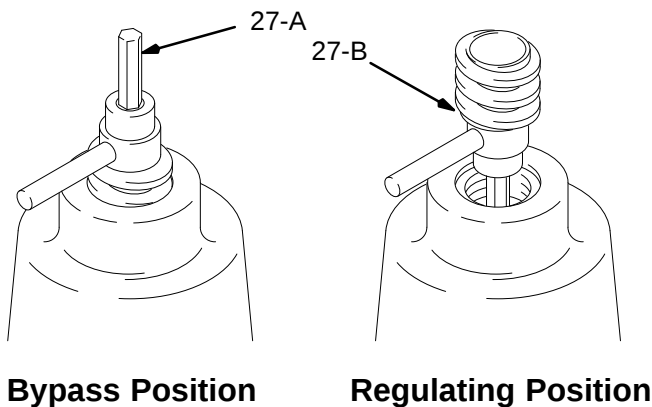


Fig 2 \_\_\_\_\_ 01585

## Flushing Procedure

1. Flush the regulator with a compatible solvent when the rest of the system is flushed.
2. Shut off the supply pump and relieve fluid pressure in the system by opening the back pressure valve (H) or other bypass valve. See Fig 1.
3. Screw the threaded end of the adjusting key (27), as far as possible into the regulator cap to open the regulator valve. See Fig 2, **Bypass Position**.
4. Flush until thoroughly clean. Always use the lowest possible pressure when flushing.
5. After flushing, remove the adjusting key. **Do not use the threaded end of the key to adjust pressure.**

## TROUBLESHOOTING CHART

### WARNING

#### Pressure Relief Procedure

To reduce the risk of serious bodily injury, including fluid splashing in the eyes or on the skin, before servicing the regulator, always close the fluid shut-off valve and relieve fluid pressure downstream of the regulator.

### NOTES:

1. Check all possible remedies in the Troubleshooting Chart before disassembling the regulator.
2. Reference numbers in parentheses in the chart refer to the numbers in the figure drawings and parts drawing. See the **SERVICE** Section to repair the regulator.

| PROBLEM:                           | CAUSE                                                           | SOLUTION                                                  |
|------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------|
| No pressure regulation             | Damaged diaphragm (26).                                         | Replace diaphragm.                                        |
|                                    | Broken spring (14)                                              | Replace spring.                                           |
| Fluid leaks from under housing (1) | Loose cap (19).                                                 | Tighten screws (1).                                       |
|                                    | Worn or damaged gasket (25).                                    | Replace gasket.                                           |
|                                    | Worn or damaged diaphragm (26).                                 | Replace diaphragm.                                        |
|                                    | Fluid flow shut-off downstream of fluid regulator.              | Open fluid flow downstream.                               |
| Pressure creeps above setting      | Loose cap (19).                                                 | Tighten screws (1).                                       |
|                                    | Worn or damaged gasket (25).                                    | Replace gasket.                                           |
|                                    | Worn or damaged diaphragm (26).                                 | Replace diaphragm.                                        |
|                                    | Empty/clogged supply line                                       | Fill/flush supply line.                                   |
|                                    | Clogged air spray gun or fluid dispensing valve.                | Replace, see gun or valve manual for service instruction. |
| Pressure drops below setting       | Using regulator beyond its rated flow capacity, see back cover. | Install additional regulators.                            |
|                                    | Loose cap (19).                                                 | Tighten screws (1).                                       |
|                                    | Worn or damaged gasket (25).                                    | Replace gasket.                                           |
|                                    | Clogged supply line                                             | Flush supply line.                                        |
|                                    | Clogged air spray gun or fluid dispensing valve.                | Replace, see gun or valve manual for service instruction. |

## Disassembly

1. Follow the **Pressure Relief Procedure Warning** on page 2 before servicing the regulator.
2. Remove the regulator from the system.
3. Using the hex end of the key (27) turn the adjusting screw (9) all the way counterclockwise to relieve spring tension. See Fig 2, **Regulating Position**.
4. Remove the adapter nut (15). See Fig 3.
5. Unscrew the valve stem (28) with the key (27).
6. Remove the screws (1), cap (19), adjusting screw (9), and spring (14).
7. Lift the diaphragm (26) and hanger (21) assembly from the housing; do not disassemble the parts unless they are damaged.
8. Unscrew the valve seat (30) with a 9/16 in. socket wrench.
9. Thoroughly clean all parts with compatible solvent and inspect for wear or damage. Replace all parts that appear to be worn or damaged.

### CAUTION

Use special care when handling the valve stem (28) and seat (30) to avoid damaging the hard carbide parts.

## Assembly

### CAUTION

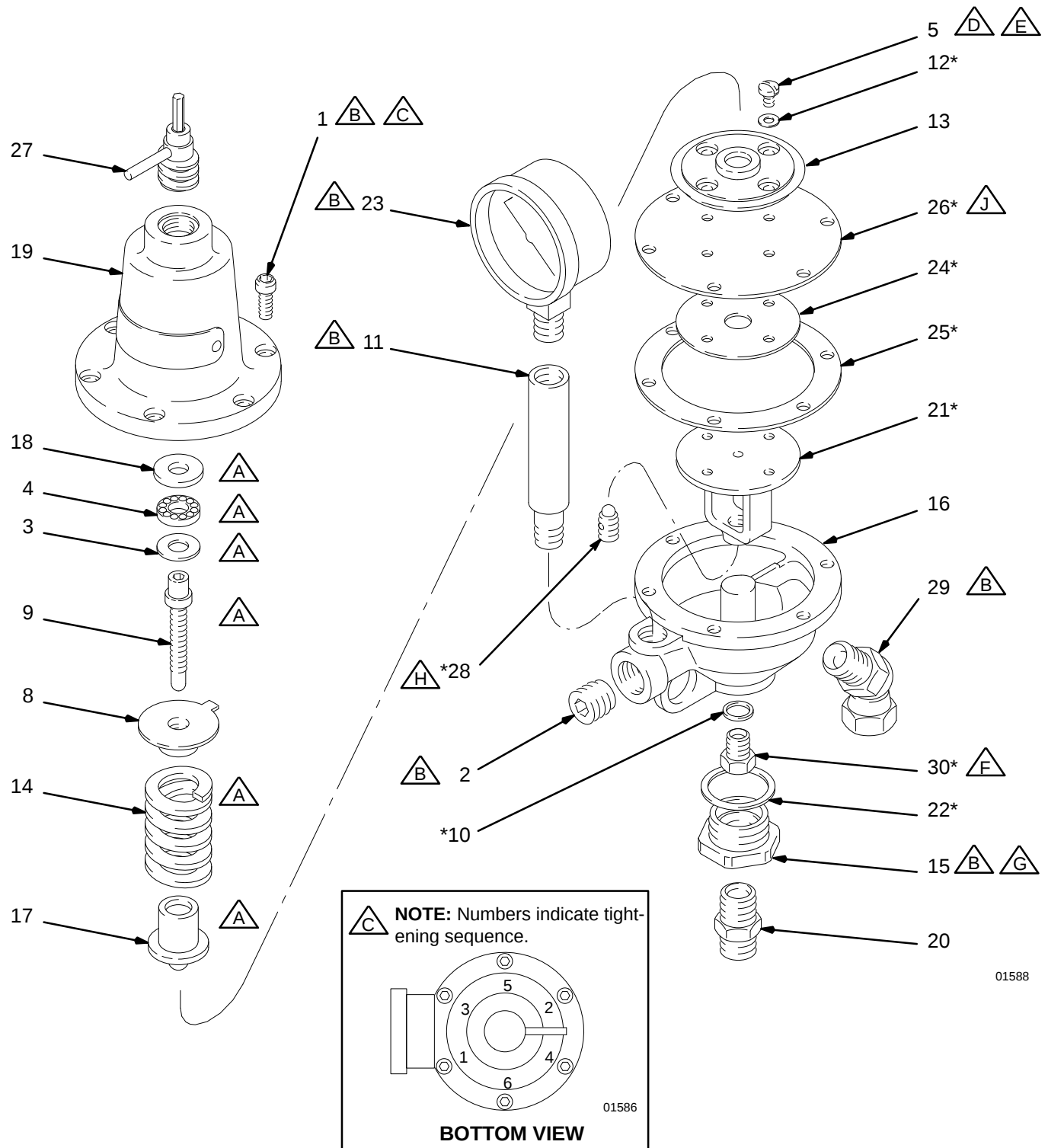
When assembling the diaphragm and hanger, be sure all surfaces are clean and smooth. Any dirt or roughness could damage the diaphragm.

**NOTE:** Follow the assembly notes in Fig 3.

1. Install the valve seat (30) and washer (10). Torque the valve seat to 70–80 in-lb (7.9–9.0 N•m).
2. If the diaphragm (26) and hanger (21) assembly was disassembled, be sure to correctly align the hanger (21), gaskets (24 & 25), diaphragm (26), and plate (13) as shown in Fig 3.

Apply anaerobic pipe sealant to the plate screws (5) threads and torque them to 30–35 in-lb (3.4–4.0 N•m).

3. Hold the hanger (21) and valve stem (28) in place with your finger so the valve stem is correctly aligned with the valve seat (30) and install the hanger in the housing.
4. Turn the valve stem (28) until it is snug against the seat (30), then back it off 3/4 turn to set the valve clearance.
5. Assemble the remaining parts.
  - a. When installing the regulator cap (19), line up the adjusting nut tab (8) with the notch in the cap.
  - b. Torque the screws (1) in the order shown in Fig 3 **Bottom View**, to 125 in-lb (14 N•m) three times, consecutively, to compensate for diaphragm relaxation.
  - c. Apply TFE sealant tape to the adapter nut (15) threads and torque it to 30–35 ft-lb 40.50–47.25 N•m).



## NOTES:

- |                                                                                                       |                                                                             |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>A</b> Apply lubricant                                                                              | <b>F</b> Torque to 70–80 in-lb (7.9–9.0 N•m)                                |
| <b>B</b> Apply TFE Sealant Tape to threads                                                            | <b>G</b> Torque to 30–35 in-lb (40.50–47.25 N•m)                            |
| <b>C</b> Torque to 125 in-lb (14 Nm) three times, consecutively, in order shown in <b>BOTTOM VIEW</b> | <b>H</b> Turn valve stem snugly against the seat, then back it off 3/4 turn |
| <b>D</b> Apply anaerobic pipe sealant ( <i>white</i> ) to threads                                     | <b>J</b> PTFE side down                                                     |
| <b>E</b> Torque to 30–35 in-lb (3.4–4.0 N•m)                                                          |                                                                             |

Fig 3

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## PARTS LIST

| REF NO. | PART NO. | DESCRIPTION                             | QTY |     |         |                                   |   |
|---------|----------|-----------------------------------------|-----|-----|---------|-----------------------------------|---|
| 1       | 101-682  | SCREW, soc hd cap; 1/4-20 x 5/8"        | 6   | 17  | 171-192 | GUIDE, spring                     | 1 |
| 2       | 101-748  | PLUG, pipe; soc hd; 3/8 npt             | 1   | 18  | 171-193 | WASHER, plain                     | 1 |
| 3       | 101-971  | WASHER, thrust                          | 1   | 19  | 171-194 | CAP, fluid regulator              | 1 |
| 4       | 101-972  | BEARING                                 | 1   | 20  | 171-195 | NIPPLE; 3/8 npsm x 3/8 npt        | 1 |
| 5       | 103-962  | SCREW, pan hd mach;<br>no. 10-32 x 1/4" | 4   | 21* | 171-197 | HANGER                            | 1 |
| 8       | 161-349  | NUT, adjusting                          | 1   | 22* | 171-198 | GASKET                            | 1 |
| 9       | 164-863  | SCREW, adjusting                        | 1   | 23* | 171-200 | GAUGE; 0-100 psi (0-7 bar) range  | 1 |
| 10*     | 166-964  | WASHER, non-metallic                    | 1   | 24* | 171-913 | GASKET; cellulose fibre           | 1 |
| 11      | 187-877  | TUBE, gauge mounting                    | 1   | 25* | 171-912 | GASKET; cellulose fibre           | 1 |
| 12*     | 171-111  | SEAL                                    | 4   | 26* | 172-194 | DIAPHRAGM; PTFE face              | 1 |
| 13      | 171-119  | PLATE, diaphragm                        | 1   | 27  | 204-522 | KEY, regulating                   | 1 |
| 14      | 171-186  | SPRING, compression                     | 1   | 28* | 205-183 | STEM, valve                       | 1 |
| 15      | 171-190  | NUT, adapter                            | 1   | 29  | 209-029 | UNION, 45° swivel; 3/8 npt(m x f) | 1 |
| 16      | 171-191  | HOUSING, fluid regulator                | 1   | 30  | 212-030 | SEAT, valve                       | 1 |

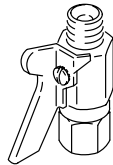
\* Recommended "tool box" spare parts. Keep on hand to reduce down time.

## ACCESSORIES

Accessories must be purchased separately.  
Use only **GENUINE GRACO PARTS AND ACCESSORIES**.

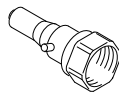
### BALL VALVE 208-937

500 psi (35 bar) MAXIMUM WORKING PRESSURE  
Stainless steel fluid shut-off valve  
3/8 npsm(m) x 3/8 npt(f)



### COUPLER STEM 208-087

200 psi (14 bar) MAXIMUM WORKING PRESSURE  
Connects gun to circulating adapter, Stainless steel



### CIRCULATING ADAPTER 210-017

200 psi (14 bar) MAXIMUM WORKING PRESSURE  
Connects fluid line to gun and circulates fluid,  
Stainless steel

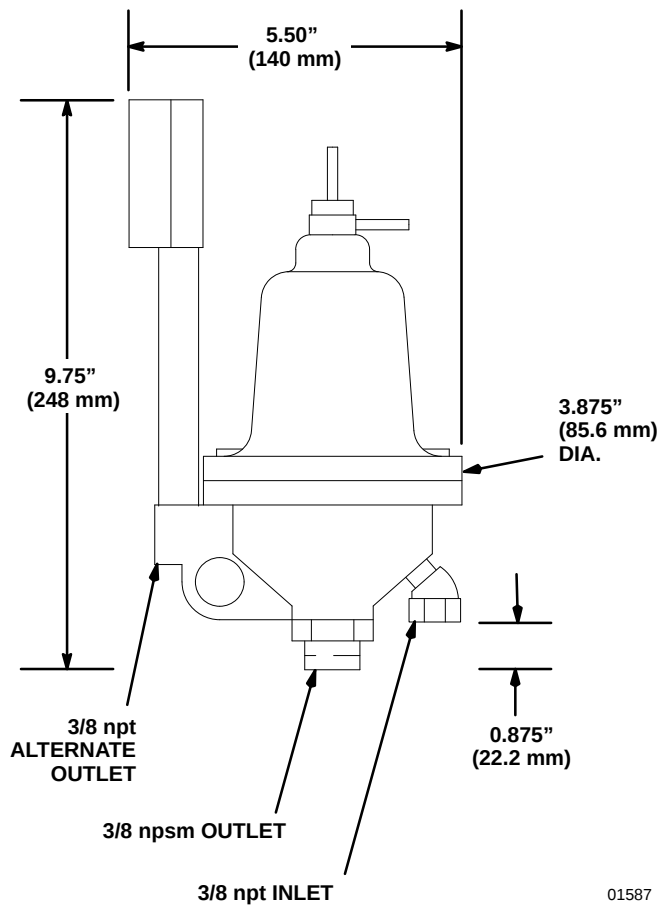
### HOSE COUPLINGS

With spring guard

**103-990** 1/4 ID hose x 1/4 npsm(f)

**103-991** 1/4 ID hose x 3/8 npsm(f)

## DIMENSIONAL DRAWING



## MANUAL CHANGE SUMMARY

This manual was changed from Rev B to Rev C to change the torque note on the cap screw, part no. 101-682 (item 1 in the parts list) and to change the gauge mounting tube (item 11) part no. from 170-745 to 187-877.

## NOTES

## THE GRACO WARRANTY AND DISCLAIMERS

### WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for, any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility with Graco equipment of structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective 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 product liabilities, based on negligence or strict liability. Every form of liability for direct, special or consequential damages or loss is expressly excluded and denied. In no case shall Graco's liability exceed the amount of the purchase price. Any action for breach of warranty must be brought within two (2) years of the date of sale.

### EQUIPMENT NOT COVERED BY GRACO WARRANTY

Graco makes no warranty, and disclaims all implied **warranties of merchantability and fitness for a particular purpose**, with respect to accessories, equipment, materials, or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

## TECHNICAL DATA

**Maximum Inlet Pressure** ..... 250 psi (18 bar)  
**Regulated Pressure Range** .... 5-100 psi (0.3-7 bar)  
**Approximate Maximum Flow Capacity** ..... 3 GPM  
(11.3 liters/min) with 70 CP fluid  
**Wetted Parts** ..... 304 & 316 Stainless Steel,  
Tungsten Carbide, Acetal, PTFE

PTFE ® is a registered trademark

## GRACO PHONE NUMBERS

**TO PLACE AN ORDER**, contact your Graco distributor, or call Graco: **1-800-328-0211 Toll Free**

**FOR TECHNICAL ASSISTANCE**, service repair information or answers about the application of Graco equipment, call: **1-800-543-0339 Toll Free**

**Factory Branches:** Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)

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PRINTED IN U.S.A. 307-134 3-74 Revised 12-92