

# Instructions—Parts List



STAINLESS STEEL, WATERBASE COMPATIBLE

308401E

## Back Pressure Regulator

ENG

For use in circulating systems to provide regulated back pressure to spray gun(s) and to maintain proper system pressure. Model 237503 is the back pressure regulator only. Model 236770 includes the gauge, tube, inlet adapter and outlet swivel union.

*300 psi (21 bar, 2.1 MPa) Maximum Inbound Pressure*

*180 psi (12.4 bar, 1.24 MPa) Maximum Regulated Pressure*

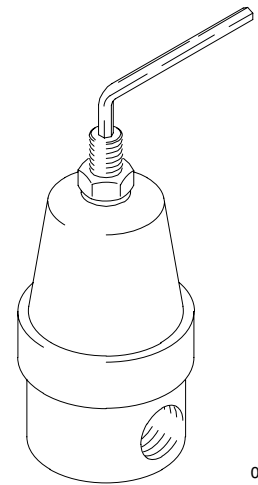
Model 236770, Series B

Model 237503, Series B



### Important Safety Instructions

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

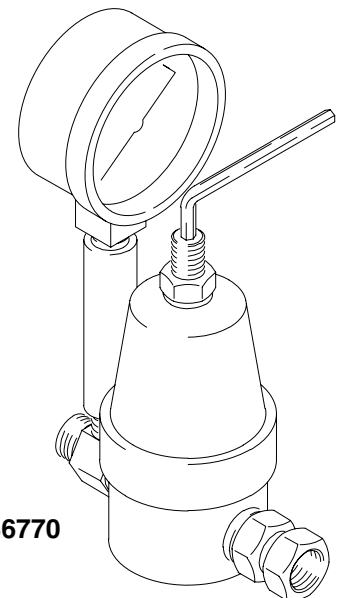


Model 237503

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Model 236770

03505

# WARNING



INSTRUCTIONS

## EQUIPMENT MISUSE HAZARD

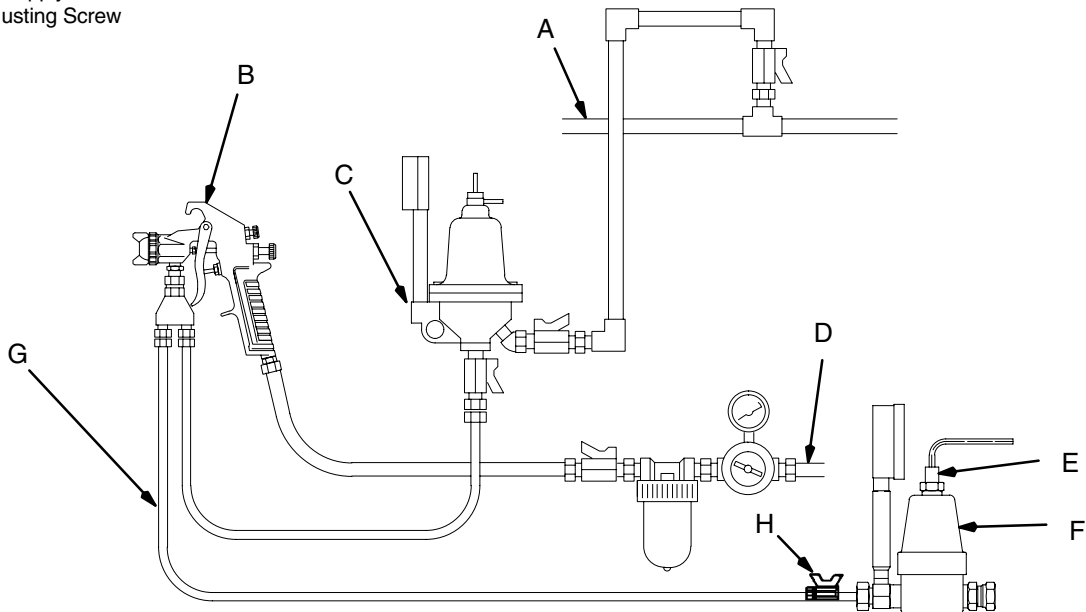
Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- 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 uncertain about usage, 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 component in your system. This equipment has a 300 psi (21 bar, 2.1 MPa) maximum inbound pressure and a 180 psi (12.4 bar, 1.24 MPa) maximum regulated pressure.
- Follow the **Pressure Relief Procedure** on page 4 if the spray tip clogs and before cleaning, checking or servicing the equipment.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Be sure all equipment safety devices are operating properly before each use.
- 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.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.
- Wear hearing protection when operating this equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# Installation

## KEY

- |   |                          |   |   |
|---|--------------------------|---|---|
| A | Fluid Supply Line        | F | Back Pressure Regulator<br>(236770 shown) |
| B | Air Spray Gun            | G | Fluid Return Line                         |
| C | Fluid Pressure Regulator | H | Ball Valve                                |
| D | Air Supply Line          |   |   |
| E | Adjusting Screw          |   |   |



03506

Fig. 1

## Installing the Back Pressure Regulator

### ⚠ CAUTION

Handle the back pressure valve with care to avoid damaging the diaphragm.

Install the back pressure regulator in the spray gun return line. See Fig. 1.

Connect the line to the inlet and outlet. Make sure the flow direction agrees with the IN and OUT markings on the bottom of the regulator body.

The back pressure regulator is adjustable to control the fluid pressures in a circulating system from 5 to 180 psi (0.3 to 12.4 bar, .03 to 1.24 MPa).

If more than one spray station is used, install the back pressure regulator in the fluid supply line after the last station. This will help maintain proper circulating pressures in the system.

## Operation

**NOTE:** The back pressure regulator controls pressure ahead of its intake.

Turn the adjusting screw *clockwise* to increase pressure and *counterclockwise* to decrease pressure.

Adjust the pump pressure and back pressure regulator for the best spraying combination and for proper circulation of fluid.

Flush the back pressure regulator with a compatible solvent whenever the rest of the system or unit is being flushed. Open the back pressure regulator before flushing by turning the screw *counterclockwise*.

# Service

## Pressure Relief Procedure

### WARNING

#### PRESSURIZED EQUIPMENT HAZARD

The system pressure must be manually relieved to prevent the system from starting or spraying accidentally. To reduce the risk of an injury from accidental spray from the gun, 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,
- or install or clean the spray nozzle.

1. Shut off the pump.
2. Open the dispensing valve, if used.
3. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

## Service

**NOTE:** Regular cleaning and inspection of the regulator, based upon the degree and kind of service, is essential.

1. Shut off the pump and open the back pressure regulator by turning the adjusting screw (15) *counterclockwise* until no spring pressure is felt. Relieve all air and fluid pressures in the system.
2. Remove the back pressure regulator from the fluid line.

3. Disassemble the regulator and clean it with a suitable solvent. See the parts drawing, page 5.
4. Carefully inspect the diaphragm (14) for cracks or other damage. Replace if necessary.
5. Check for chips or dirt that could puncture the diaphragm before assembling the regulator.
6. Reassemble the diaphragm and related parts. Torque the cap nut (3) to 27 to 33 in-lb (3.1 to 3.7 N•m).
7. Carefully inspect the seat (1) for damage, wear, or dirt. These things could cause the regulated pressure to creep. Replace the seat if necessary.
8. Replace the seat gasket (6) when replacing the seat (1). Torque the seat to 70 to 80 in-lb (8 to 9 N•m).
9. To remove or install the gauge on model 236770 (20), use the wrench on the square portion of the gauge stud only.

### CAUTION

Use thread sealer sparingly on the gauge's male threads when installing it to avoid plugging the gauge.

10. Lubricate the adjusting screw (15) threads.
11. Assemble the remaining parts.
12. Tighten the regulator cap (4) to 324 to 396 in-lb (37 to 45 N•m).
13. Reinstall the back pressure regulator in the fluid line.

# Troubleshooting

### WARNING

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

## Checking the Ball and Seat

The ball and seat may be checked for wear by closing the ball valve directly upstream of the back pressure regulator (Fig 1). When the ball valve is closed, the gauge pressure should drop slightly. If the pressure continues to drop, then the ball or seat is worn and needs to be replaced. Follow the preceding Service procedure to replace the worn ball or seat.

# Parts

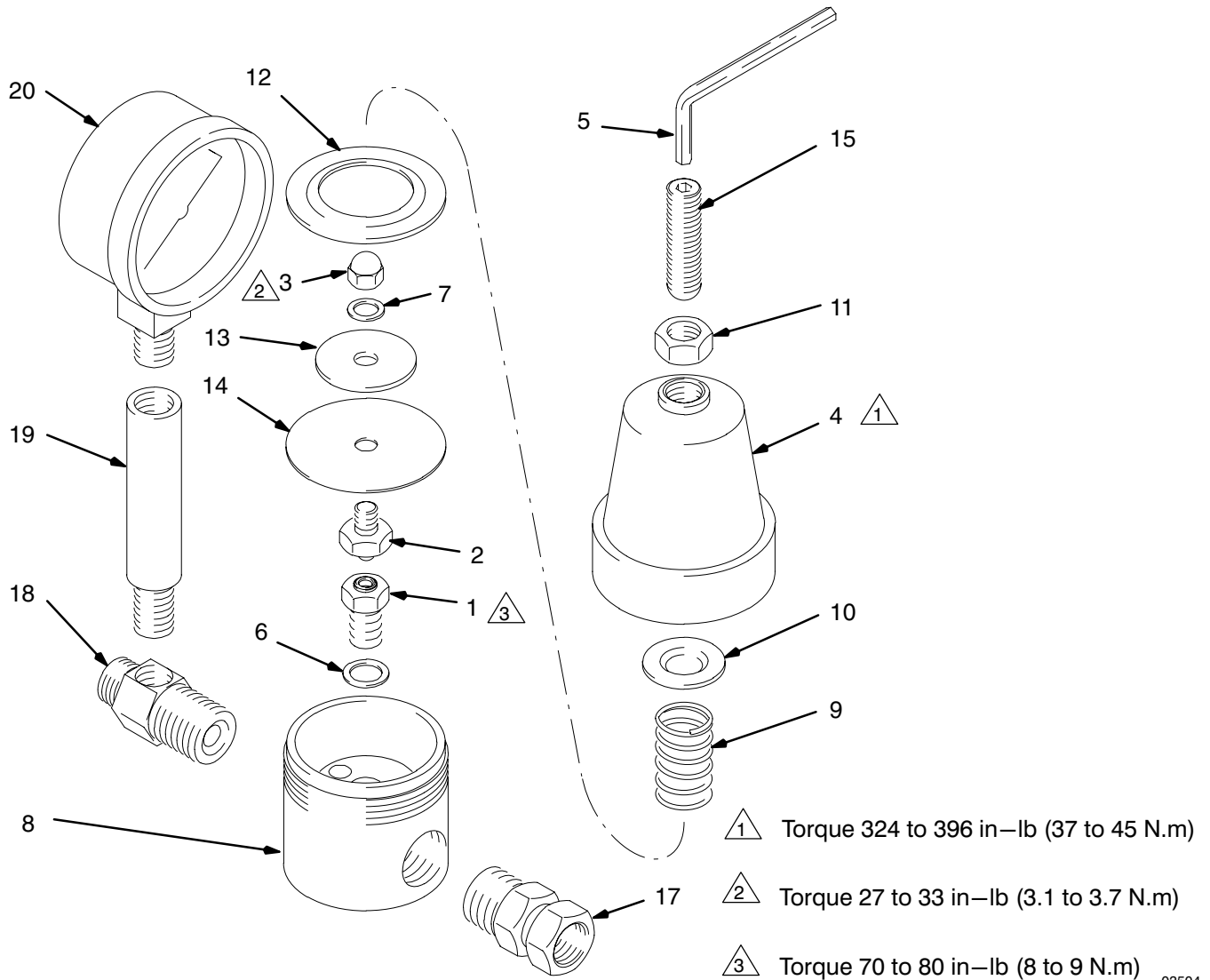
## Stainless Steel Back Pressure Regulator –

**Model 236770, Series B** Includes items 1 to 20

**Model 237503, Series B** Includes items 1 to 15

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1✓	236893	SEAT, valve	1	12	189816	PLATE, backup	1
2✓	236894	STEM, valve	1	13	177432	PLATE, support, diaphragm	1
3	100529	NUT, hex, cap; 5/16–18	1	14✓	177431	DIAPHRAGM	1
4	189815	CAP, regulator, air	1	15	112844	SCREW, adjusting, 1/2–20 x 1–5/8 long	1
5	101976	WRENCH, Allen; 3/8	1	17	236892	UNION, adapter; 1/2–14 npt(m) x 3/8–18 npsm(f) swivel	1
6✓	189817	GASKET, acetal	1	18	16C760	ADAPTER, inlet; 3/8–18 npsm(m), 3/8–18 npt(m), 1/4–18 npt(f)	1
7✓	154789	GASKET, copper	1	19	187877	TUBE, fluid gauge	1
8	16C761	HOUSING, valve	1	20✓	187876	GAUGE, 0–300 psi (0–21 bar, 0–2.1 MPa)	1
9	157796	SPRING, compression	1				
10	160180	PLATE, spring	1				
11	100111	NUT, lock; 1/2–20	1				

✓ Keep these spare parts on hand to reduce down time.



03504



# Dimensions

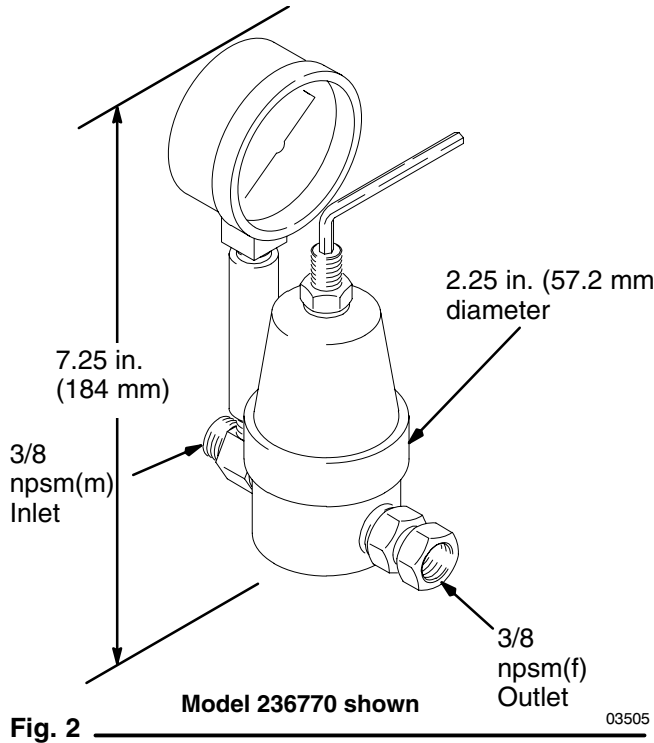


Fig. 2

# Technical Data

Maximum Inlet Pressure: . . . 300 psi (21 bar, 2.1 MPa)  
 Regulated Pressure Range . . . . . 5–180 psi  
 (0.3–12.4 bar, .03–1.24 MPa)

236770 Inlet Size . . . . . 3/8 npsm(m)  
 236770 Outlet Size . . . . . 3/8 npsm(f)  
 237503 Inlet . . . . . 3/8 npt(f)  
 237503 Outlet . . . . . 1/2 npt(f)  
 236770 Weight: . . . . . 3.5 lb (1.6 kg)  
 237503 Weight: . . . . . 2.4 lb (1.1 kg)

**Wetted Parts:**

316 stainless steel, tungsten carbide (with nickel binder), acetal and PTFE

**Maximum flow chart for 180 psi (12.4 bar, 1.24 MPa) inbound pressure and fluid viscosity of 65 cps**

<u>Regulated Pressure</u>	<u>Maximum Flow Rate</u>
50 psi (3.4 bar, 0.3 MPa)	4.7 gpm (17.8 lpm)
100 psi (7 bar, 0.7 MPa)	4.3 gpm (16.3 lpm)
150 psi (10.3 bar, 1.0 MPa)	3.7 gpm (12.9 lpm)

# Manual Change Summary

Assembly Changed	Part Status	Ref. No.	Part No.	Name
236770 and 237503, to Series B	Old	20	187873	Gauge
	New	20	187876	Gauge

Maximum inbound pressure is increased to 300 psi (21 bar, 2.1 MPa).

# Accessories

**Air-Charge Conversion Kit 237448**

Includes necessary parts to convert back pressure regulator from spring operated to air operated.

# The Graco Warranty and Disclaimers

Graco warrants all equipment listed in this manual which is manufactured by Graco 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. 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.

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, gas engines, 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.

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

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