

Back Pressure Regulator

Description

The Nordson back pressure regulator is a spring-loaded, hand-operated fluid pressure regulator designed for use with general liquid coating materials. The regulator increases or bleeds pressure to maintain the set pressure in the line upstream of the regulator. The regulator body is constructed of 316 stainless steel with a nickel-plated bonnet and can be used with a variety of coating materials.

NOTE: All upstream fittings must be rated for 104 bar (1500 psi).

Two service kits repair the standard flow regulator. The high-flow service kit increases the flow capacity of the regulator. Refer to *Parts* for more information.

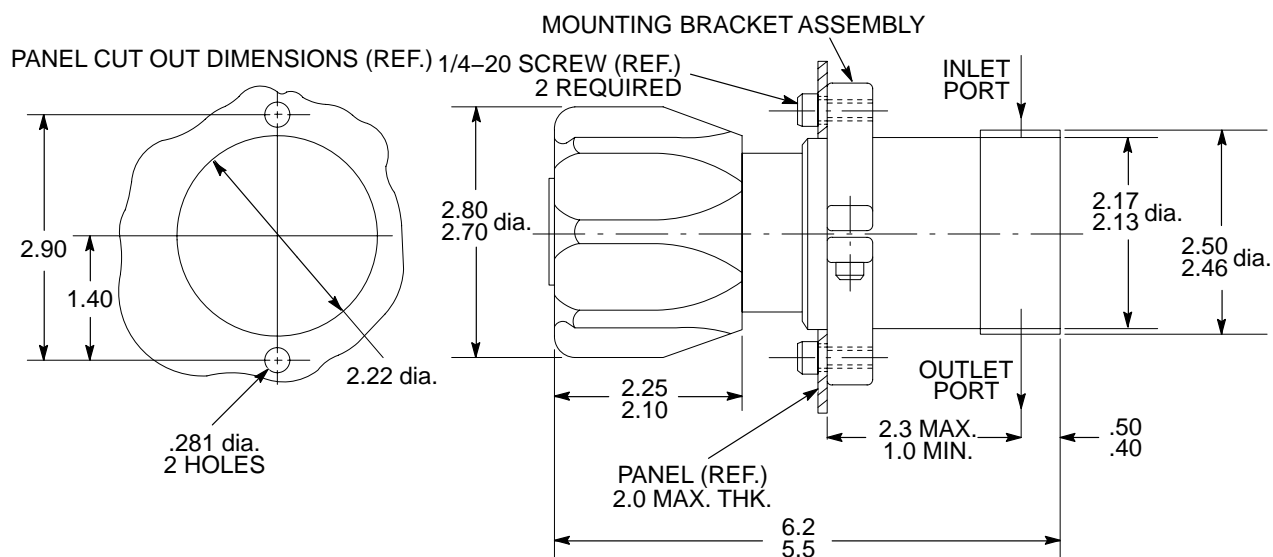
Specifications

Operating Temperature: 4.5–74 °C (40–165 °F)
 Inlet and Outlet Ports: 3/8-in. NPT
 O-rings: Buna-N
 Flow Capacity (standard) $C_v = 0.08$
 with high flow service kit: $C_v = 0.14$

Pressures	bar (psi)
Minimum–Maximum inlet pressure	0.7–104 (10–1500)
Proof pressure	155.2 (2250)
Burst pressure	413.8 (6000)

Dimensions

The regulator is typically panel-mounted. See Figure 1 for regulator, cut out, and mounting bracket dimensions.



1200143A

Figure 1 Regulator, Cut Out, and Mounting Bracket Dimensions

Note: The mounting bracket is optional.

Repair



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.



WARNING: High Pressure Fluid Hazard. Relieve system fluid pressure before disconnecting fluid lines or servicing the regulator.

The regulator can be disassembled and rebuilt without removing it from its mounting, if mounted in a convenient location with sufficient clearance.

Required Tools and Materials

- Hex wrench sets (English and metric)
- Open-end or adjustable wrenches
- Flat-tip screwdriver set
- External snap ring pliers
- Regulator service kit or piston service kit

NOTE: Order the piston service kit if you need to replace the piston and backup adapter.

Piston Design Change

See Figures 2, 3 and 4. An engineering change to the standard flow piston (21) enlarged the O-ring groove and added wear rings (26). Use the parts shown depending on your piston design.

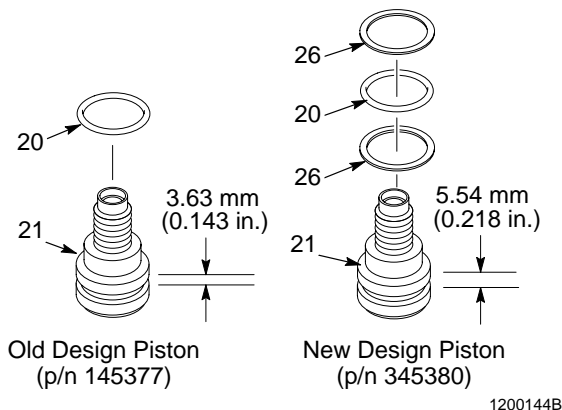


Figure 2 Piston Design Change

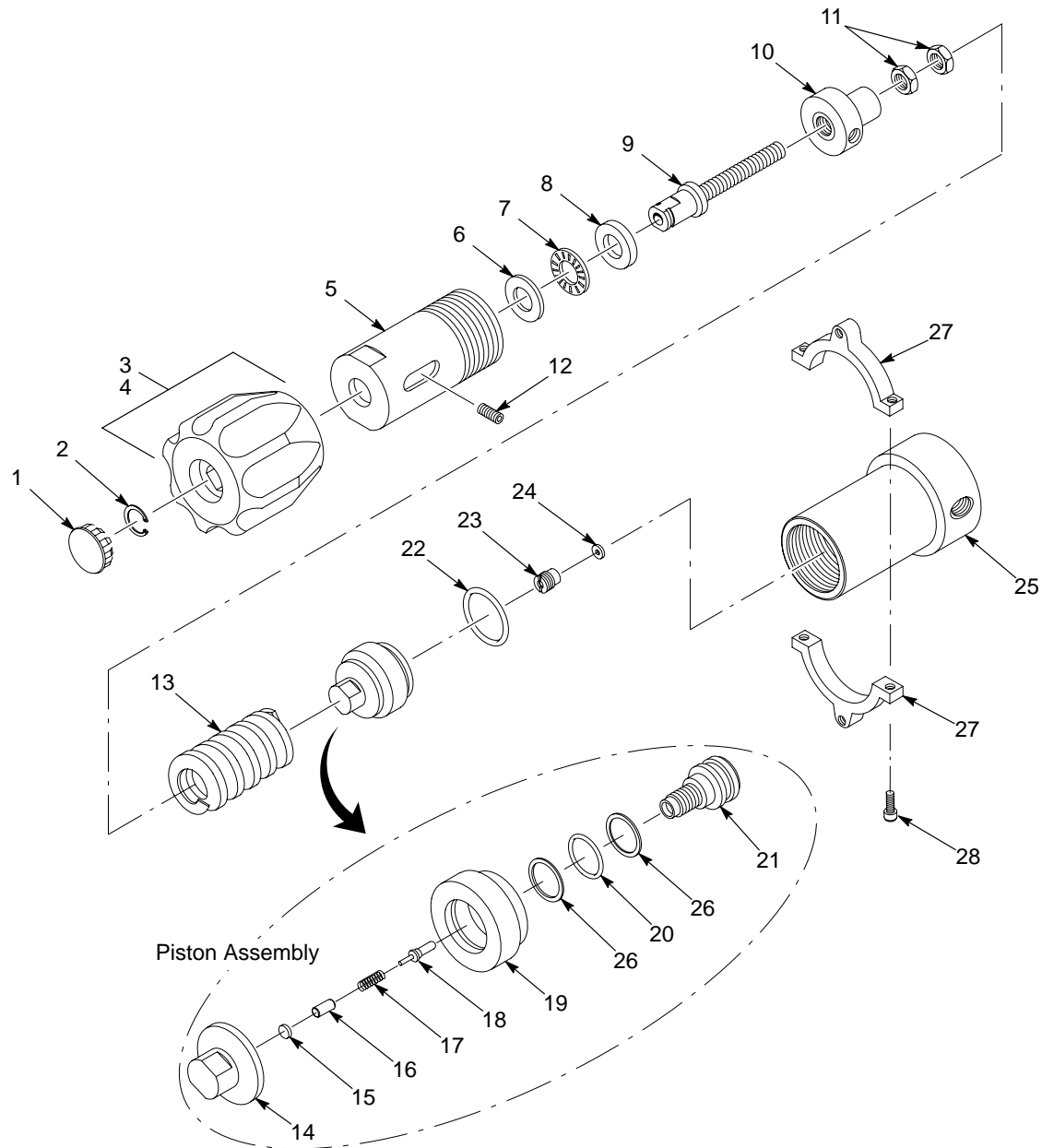
Disassembly

See Figures 3 and 4.

1. To remove the regulator from the optional mounting bracket (27), loosen the screws (28) with a $\frac{5}{32}$ -in. hex wrench.
2. Pry the button plug (1) from the top of the hand knob (4) with a flat-tip screwdriver.
3. Use external snap ring pliers to remove the retaining ring (2) from the adjusting screw (9). Remove the hand knob and attached label (3).
4. Hold the regulator body (25) in a vise and unscrew the bonnet (5) with a $1\frac{5}{8}$ -in. wrench. Remove the load spring (13).
5. Unscrew the set screw (12) that secures the adjusting screw assembly (9 through 11) within the bonnet.
6. Remove the adjusting screw assembly, washers (6, 8), and thrust bearing (7). The washers and thrust bearing may remain inside the bonnet.
7. Pull the piston assembly (14 through 21) out of the regulator body. Use pliers if necessary.
8. Use a screwdriver to remove the seat retainer (23) and seal (24) from the regulator body.

Piston Repair

1. See Figures 3 and 4. Hold the spring pad (14) with a $\frac{1}{2}$ -in. wrench or vise and unscrew the piston (21) with a screwdriver.
2. Press the piston out of the back-up adapter (19). Be careful not to lose the seal (15), spacer (16), spring (17), or main valve (18).
3. Remove the O-rings and wear rings (20, 22, 26). Install new, lubricated O-rings and wear rings on the piston and the back-up adapter.
4. Replace the seal, spacer, spring, and main valve (items 15 through 18) as necessary.
5. Push the piston into the back-up adapter until it snaps tight.
6. Lubricate the piston threads and screw the spring pad onto the piston. Hold the spring pad with a $\frac{1}{2}$ -in. wrench or vise and tighten the piston to 8.5–10.2 N•m (75–90 in.-lb).



1200145B

Figure 3 Back Pressure Regulator (Exploded View)

- | | | |
|--------------------|---------------------|----------------------|
| 1. Button plug | 11. Hex nuts | 20. O-ring |
| 2. Retaining ring | 12. Set screw | 21. Piston |
| 3. Label | 13. Load spring | 22. O-ring |
| 4. Hand knob | 14. Spring pad | 23. Seat retainer |
| 5. Bonnet | 15. Seal | 24. Seat |
| 6. Thin washer | 16. Spacer | 25. Regulator body |
| 7. Thrust bearing | 17. Spring | 26. Wear ring |
| 8. Thick washer | 18. Main valve | 27. Mounting bracket |
| 9. Adjusting screw | 19. Back-up adapter | 28. Screw |
| 10. Spring cap | | |

Note: The mounting bracket (27) is optional.

Adjusting Screw Repair

See Figures 3 and 4. Typically, the adjusting screw assembly (9, 10, 11) does not need to be disassembled. Lubricate the screw threads (9) and make sure the two hex nuts (11) are tightened against each other so they do not vibrate loose during operation.

To tighten the hex nuts, follow these steps:

1. Turn the top hex nut counterclockwise until it is 1.5 cm (0.6 in.) from the bottom of the spring cap (10).
2. Tighten the bottom hex nut against the top hex nut.

Assembly

NOTE: Make sure all wetted parts (items 14 through 24, plus 28) are clean. Contaminants in the fluid path can cause the main valve to seat improperly or incompletely.

See Figures 3 and 4.

1. Install the seat (24) into the regulator body (25) with the chamfered side facing up toward the main valve (18) stem. Lubricate the threads of the seat retainer (23) and tighten it into the regulator body.
2. Insert the piston assembly (14 through 21) and O-ring (22) into the regulator body.

3. Lubricate the thrust bearing (7) and washers (6 and 8) and install them on the adjusting screw (9).
4. Insert the adjusting screw assembly (items 6 through 11) into the bonnet (5).
5. Align the threaded hole of the spring cap (10) to the opening in the bonnet. Tighten the set screw (12).
6. Set the load spring (13) on the spring pad (14) and lubricate the bonnet threads.
7. Thread the bonnet into the regulator body.
8. Place the regulator body into a vise and tighten the bonnet to 54.2–67.8 N•m (40–50 lb-ft).
9. Place the hand knob (4) and label (3) over the adjusting screw. Install a new retaining ring (2). Install the button plug (1).

High-Flow Service Kit

Installing the high-flow service kit will increase the flow capacity of the regulator. The kit replaces all the parts of the piston assembly except the spring pad. Refer to *Parts* for the service kit parts list.

To install the kit, disassemble the regulator and piston assembly. Replace the piston assembly parts with the new parts included in the kit. Assemble the regulator.

This page intentionally left blank.

Parts

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or your local Nordson representative. Use the parts lists and illustrations to locate and describe parts correctly.

Back Pressure Regulator

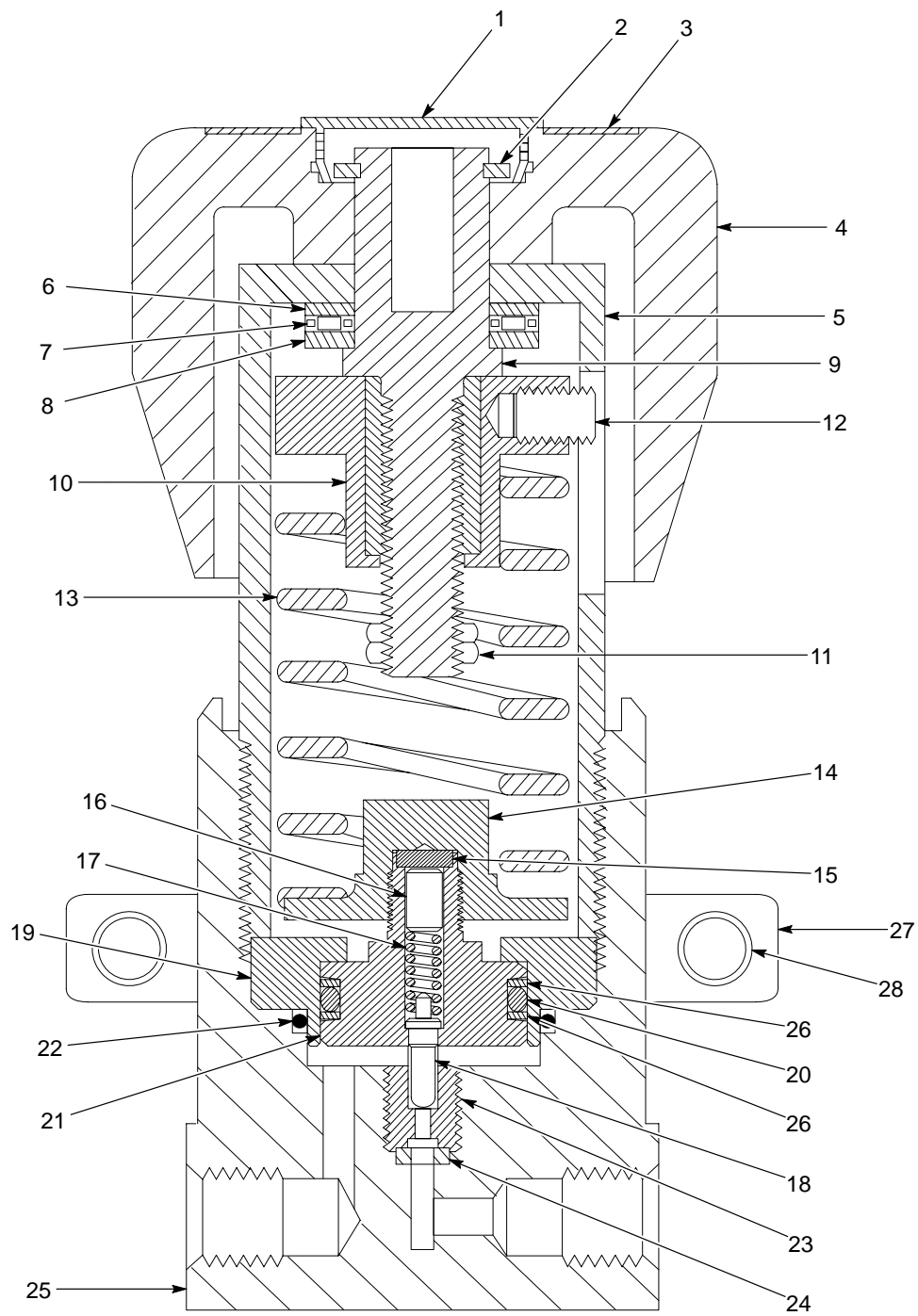
See Figures 3 and 4.

Item	Part	Description	Quantity	Note
—	1047379	REGULATOR, back pressure, 0.7–103.5 bar (10–1500 psi)	1	
1	900768	• BUTTON, plug, 1.000 in.	1	
2	986106	• RETAINING RING, ext, 62, basic	1	A
3	145354	• LABEL, hand knob, increase/decrease	1	
4	145355	• KNOB, hand, regulator	1	
5	145356	• BONNET, regulator	1	
6	983030	• WASHER, thrust, thin, pressure regulator	1	
7	145357	• BEARING, thrust	1	
8	983031	• WASHER, thrust, thick, pressure regulator	1	
9	981486	• SCREW, adjusting, non-venting	1	
10	145408	• CAP, spring, regulator	1	
11	342294	• NUT, hex	2	
12	227414	• SCREW, set	1	
13	145358	• SPRING, comp, 2.080 x 1.480 in.	1	
14	145375	• PAD, spring, back pressure regulator	1	
15	145384	• SEAL, regulator, back pressure	1	A, B
16	145379	• SPACER, regulator, back pressure	1	A, B
17	145387	• SPRING, comp, 0.720 x 0.190 in. OD	1	A, B
18	145405	• VALVE, main, back pressure regulator	1	A, B
19	145409	• ADAPTER, back-up, back pressure regulator	1	B
20	941170	• O-RING, hot paint, 0.813 x 1.000 x 0.094 in.	1	A, B
21	345380	• PISTON, regulator, back pressure	1	B
22	941226	• O-RING, hot paint, 1.125 x 1.313 x 0.094 in.	1	A, B
23	145389	• RETAINER, seat, back pressure regulator	1	A, B
24	145391	• SEAT, regulator, back, pressure regulator	1	A, B
25	-----	• BODY, back pressure regulator	1	
26	345989	• RING, wear	2	A, B
NS	901940	WRENCH, rebuild, main valve	1	C
NOTE A: These parts available in the back pressure regulator service kit, part 109851. B: These parts available in the piston service kit, part 345379. C: This part is optional and must be ordered separately. NS: Not Shown				

Mounting Bracket

See Figures 3 and 4.

Item	Part	Description	Quantity	Note
27	145393	BRACKET, mounting, back pressure regulator	1	
28	-----	• SCREW, mounting	2	



1200146B

Figure 4 Back-Pressure Regulator (Cutaway View)

Standard Flow Service Kit

See Figures 3 and 4.

Item	Part	Description	Quantity	Note
—	109851	SERVICE KIT, back pressure regulator	1	
2	986106	• RETAINING RING, ext, 62, basic	1	
15	145384	• SEAL, regulator, back pressure	1	
16	145379	• SPACER, regulator, back pressure	1	
17	145387	• SPRING, comp, 0.720 x 0.190 in. OD	1	
18	145405	• VALVE, main, back pressure regulator	1	
20	941170	• O-RING, hot paint, 0.813 x 1.000 x 0.094 in.	1	
22	941226	• O-RING, hot paint, 1.125 x 1.313 x 0.094 in.	1	
23	145389	• RETAINER, seat, back pressure regulator	1	
24	145391	• SEAT, regulator, back pressure	1	
26	345989	• RING, wear	2	A
NOTE A: Use this part on the regulators with the 345380 (new design) piston only. To upgrade to the new design piston, order the standard flow piston service kit.				

Standard Flow Piston Service Kit

See Figures 3 and 4.

Item	Part	Description	Quantity	Note
—	345379	SERVICE KIT, piston back pressure regulator	1	
—	109851	• SERVICE KIT, back pressure regulator	1	
19	145409	• ADAPTER, backup, back pressure regulator	1	
21	345380	• PISTON, regulator, back pressure	1	

High Flow Service Kit

See Figures 3 and 4. This kit increases the flow capacity of the regulator.

Item	Part	Description	Quantity	Note
—	1039680	SERVICE KIT, high flow, back pressure regulator	1	
15	-----	• SEAL, regulator, back pressure	1	
16	-----	• SPACER, regulator, back pressure	1	
17	-----	• SPRING, comp, 0.720 x 0.190 in. OD	1	
18	-----	• VALVE, main, back pressure regulator	1	
19	-----	• ADAPTER, backup, back pressure regulator	1	
20	941170	• O-RING, hot paint, 0.813 x 1.000 x 0.094 in.	1	
21	-----	• PISTON, regulator, back pressure	1	
22	941226	• O-RING, hot paint, 1.125 x 1.313 x 0.094 in.	1	
23	-----	• RETAINER, seat, back pressure regulator	1	
24	-----	• SEAT, regulator, back, pressure regulator	1	
26	345989	• RING, wear	2	

Issued 3/04

Original copyright date 1990. Nordson and the Nordson logo are registered trademarks of Nordson Corporation.