

Direct-Acting Back Pressure | BS-Series

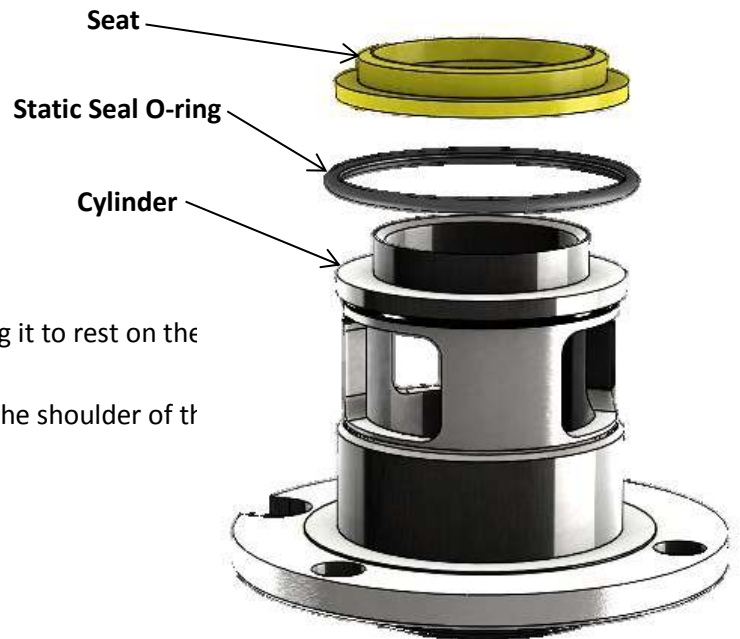
**Parts will differ for high pressure valves.*

**NOTE: This procedure is for a standard BS unit*

Load Cylinder

- Cylinder
- Static Seal O-ring
- Seat

1. Flip the cylinder so that the mounting flange is resting on the tabletop and place the static seal O-ring over the cylinder allowing it to rest on the mounting flange.
2. Place the seat over the cylinder so it rests on the shoulder of the cylinder.

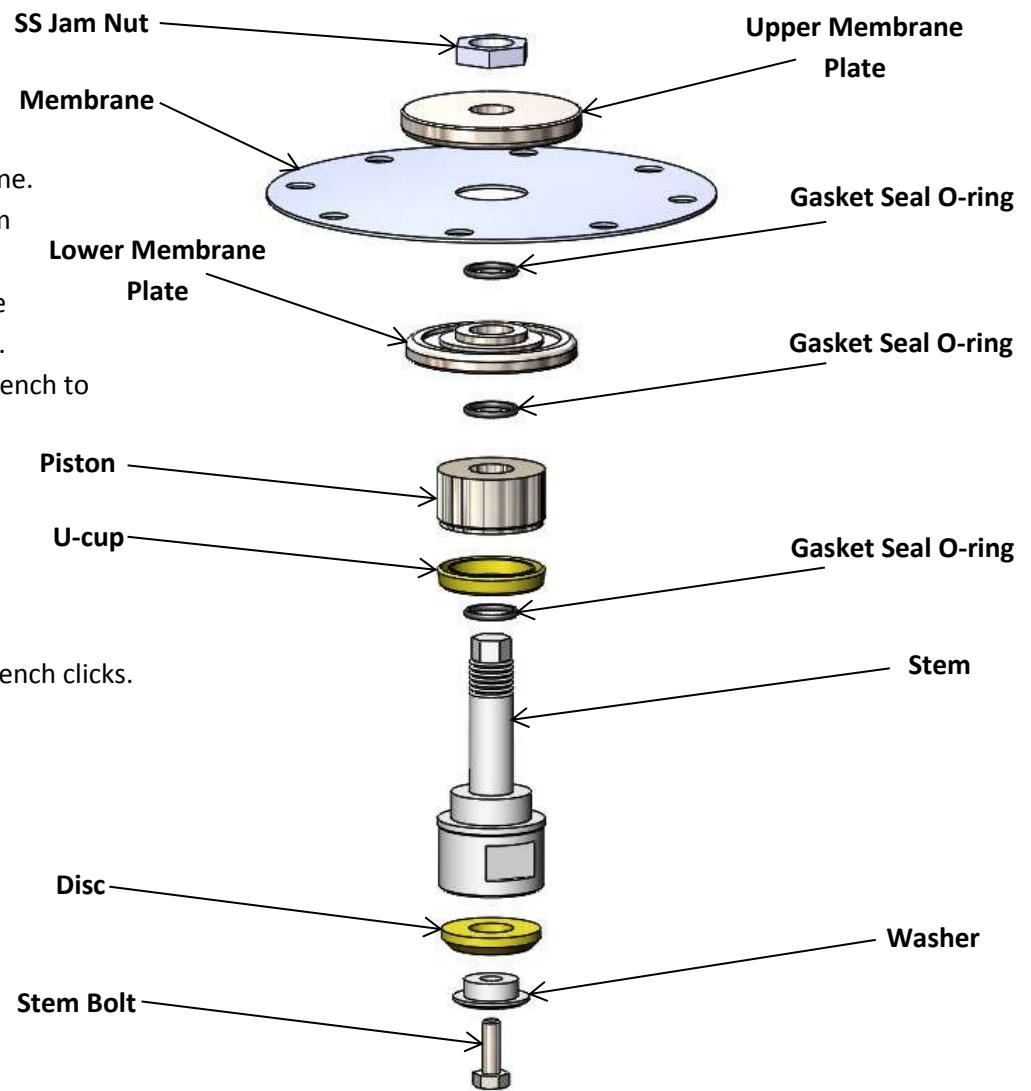


Internal Assembly

- Washer
- Disc
- Stem
- Hex Head Cap Screw (Stem Bolt)
- U-cup
- Gasket Seal O-ring
- Piston
- Lower Membrane Plate
- Membrane
- Upper Membrane Plate
- SS Jam Nut (Stem Nut)

1. Assemble the washer and disc with the center hole concentric and the chamfered sides facing in the same direction.
2. Orient the stem so that the larger portion is face up and tighten the stem into a workbench vise.
3. Place the washer/disc so that they rest in the relief located on the bottom side of the stem.
4. Apply Christo-lube grease to (1) hex head cap screw and thread it into the center opening of the washer/disc and the stem. (Tighten screw until snug.)
5. Now orient the stem so that the hex and threaded end is face up.
6. Place the U-cup over the stem so that it rests on the shoulder of the stem with the "U" facing up.

7. Lower (1) gasket seal O-ring down over the stud to rest on the top shoulder of the stem.
8. Place the piston over the stem with the bore end facing down.
9. Place a second gasket seal O-ring over the stud of the stem to rest on the top face of the piston.
10. Lower the lower membrane plate to rest on the gasket seal O-ring that was previously placed with the machined groove facing up.
11. Place a third gasket seal O-ring over the stud of the stem to rest on the top face of the lower membrane plate.
12. Die cut the membrane using the membrane steel rule die.
13. Place the center hole of the membrane over the stem allowing it to rest on the gasket seal O-ring and the lower membrane plate.
14. Place the upper membrane plate over the stem with the interlock face resting on the membrane.
15. Hand-tighten the SS jam nut (stem nut) down onto the top face of the upper membrane plate.
16. Use the appropriate wrench to hold the SS jam nut (stem nut) in place while using the appropriate heavy socket head on a torque wrench.
17. Tighten until torque wrench clicks.



Load Valve Body

- Spring Chamber
- Hex Head G5 Cap Screws (Body Bolts)
- Hex G5 Nuts (Body Nuts)
- 1/4" NPT SS Plug
- NPT Plug
- Hex Head Cap Screw (Cylinder Bolts)
- Internal Assembly
- Valve Body
- Adjusting Screw
- Locking Nut
- Spring Pusher
- Spring
- Loaded Cylinder

Torque Values Chart

Valve Body Size	Cylinder Bolts
1/2" - 1"	18 ft/lbs
1-1/2"	18 ft/lbs
2"	18 ft/lbs
3" - 4"	18 ft/lbs

Torque Values Chart

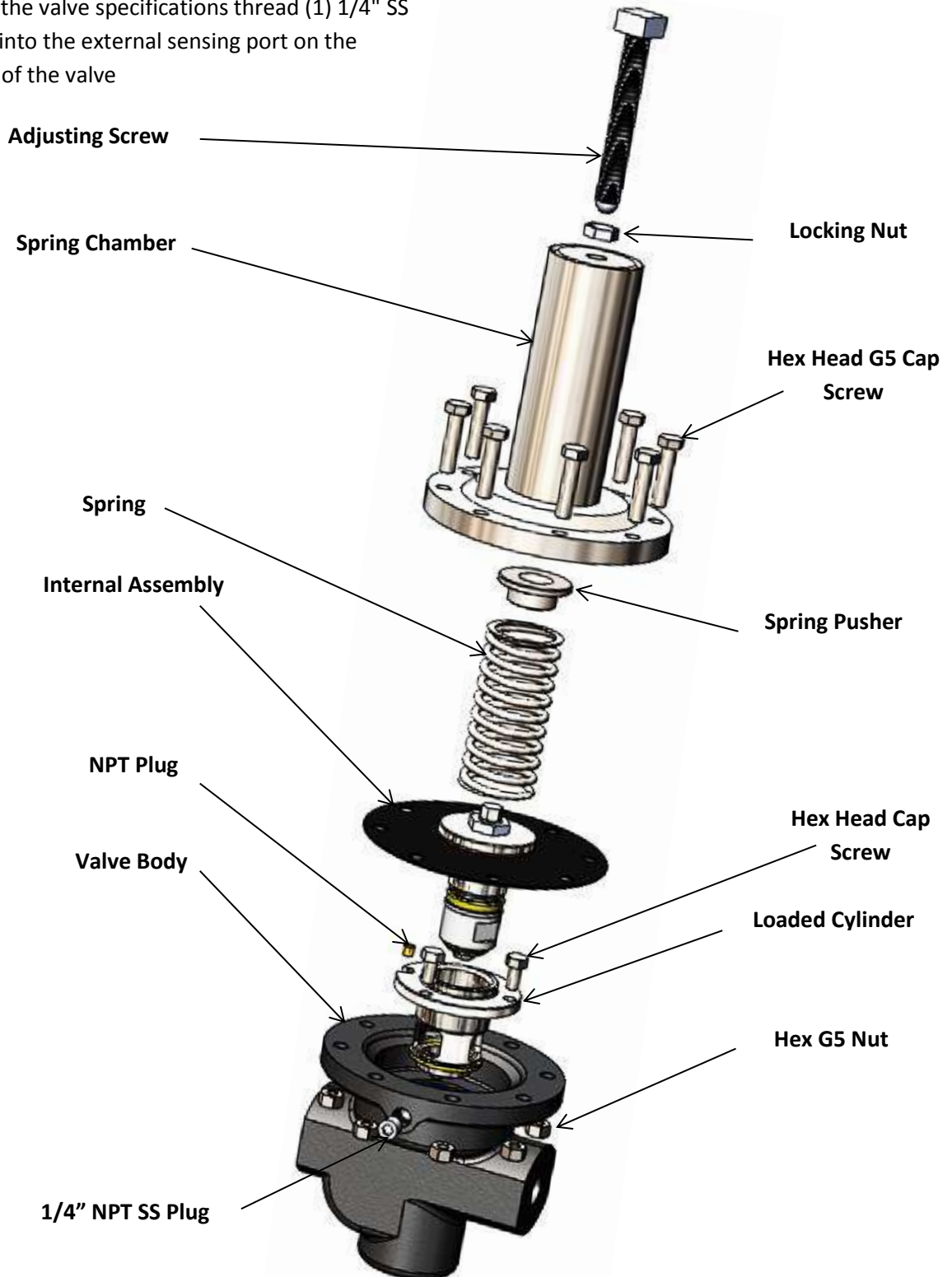
*Grade 8 bolts, increase torque value by 15%

Valve Body Size	Cylinder Bolts	Stem Nut	Body Bolts
1/2" - 1"	18 ft/lbs	85 ft/lbs	35 ft/lbs
1-1/2"	18 ft/lbs	130 ft/lbs	35 ft/lbs
2"	18 ft/lbs	130 ft/lbs	40 ft/lbs
3" - 4"	18 ft/lbs	160 ft/lbs	40 ft/lbs

Image on page 4 for this procedure

1. Apply a thin layer of Christo-lube to the internal and external walls of the cylinder.
2. Also apply a thin layer of Christo-lube to the internal wall of the top center opening of the valve body and the external walls of the piston.
3. Lower the loaded cylinder into the top center opening of the valve body.
4. Align the (3) cylinder mounting holes with the internal mounting holes on the valve body.
5. Apply Christo-lube to (3) hex head cap screws and tighten the screws into the mounting holes using a 1/2" drive tool.
6. Using a 1/2" heavy socket head and a torque wrench, tighten the hex head cap screws to 18 ft/lbs.
7. Tighten until torque wrench clicks.
8. Based on the valve specifications apply Teflon tape and tighten either a drilled or undrilled NPT plug into the internal sensing port using the appropriate Allen wrench.
9. Insert the internal assembly into the valve body with the hex end of the stem stud facing upward.
10. Place the spring so that it rests concentrically on the top face of the membrane plate.
11. Place the spring pusher so that it rests concentrically in the top opening of the spring.
12. Align the mounting holes on the spring chamber with the mounting holes on the valve body.
13. Grease then hand-tighten (8) hex head G5 cap screws (body bolts) into the mounting hole on the valve body with (8) hex G5 nuts (body nuts) on the bottom of the mounting flange.
14. Tighten the hex head G5 cap screws (body bolts) using the appropriate socket head holding the hex G5 nuts (body nuts) in place and the appropriate heavy socket head on a torque wrench set to the appropriate torque value.
15. Tighten until torque wrench clicks.
16. Thread the locking nut onto the adjusting screw.

17. Thread the adjusting screw into the threaded opening in the top of the spring chamber. Tighten the adjusting screw and use the appropriate wrench to lock the locking nut in place at the proper position for the specified force. (The applied tension to the spring should reflect the specified force to be applied on the top side of the membrane.)
18. Based on the valve specifications thread (1) 1/4" SS NPT plug into the external sensing port on the back side of the valve body.



Back Pressure BS Valve Assembly Section View



Master Tools List

Tools List (1/2 to 1 inch Bodies)

5/32 Allen Wrench (Internal Plug)
1/4 Allen Wrench (External Plug)
1/2 Drive
1/2 Socket Head (Cylinder Bolts)
1/2 Heavy Socket Head (Stem Stud)
9/16 Socket Head (Body Bolts)
9/16 Wrench (Body Nuts)
15/16 Wrench (Stem Nuts)
Torque Wrench (Set to 18 ft/lbs) (Cylinder Bolts)
Torque Wrench (Set to 35 ft/lbs) (Body Bolts)
Torque Wrench (Set to 85 ft/lbs) (Stem Nut)
Teflon Tape
Christo-lube

Tools List (1-1/2 inch Body)

5/32 Allen Wrench (Internal Plug)
1/4 Allen Wrench (External Plug)
1/2 Drive
1/2 Socket Head (Cylinder Bolts)
9/16 Socket Head (Body Bolts)
9/16 Heavy Socket Head (Stem Stud)
9/16 Wrench (Body Nuts)
1-1/8 Wrench (Stem Nut)
Torque Wrench (Set to 18 ft/lbs) (Cylinder Bolts)
Torque Wrench (Set to 35 ft/lbs) (Body Bolts)
Torque Wrench (Set to 130 ft/lbs) (Stem Nut)
Teflon Tape
Christo-lube

Tools List (2 inch Body)

5/32 Allen Wrench (Internal Plug)
1/4 Allen Wrench (External Plug)
1/2 Drive
1/2 Socket Head (Cylinder Bolts)
5/8 Socket Head (Body Bolts)
9/16 Heavy Socket Head (Stem Stud)
11/16 Wrench (Body Nuts)
1-1/8 Wrench (Stem Nut)
Torque Wrench (Set to 18 ft/lbs) (Cylinder Bolts)

Torque Wrench (Set to 40 ft/lbs) (Body Bolts)
Continue to next page
Torque Wrench (Set to 130 ft/lbs) (Stem Nut)
Teflon Tape
Christo-lube

Tools List (3 inch Body)

3/16 Allen Wrench (Internal Plug)
1/4 Allen Wrench (External Plug)
1/2 Drive
1/2 Socket Head (Cylinder Bolts)
5/8 Socket Head (Body Bolts)
11/16 Wrench
3/4 Heavy Socket Head
1-1/2 Wrench
Torque Wrench (Set to 18 ft/lbs)
Torque Wrench (Set to 40 ft/lbs)
Torque Wrench (Set to 160 ft/lbs)
Teflon Tape
Christo-lube

Tools List (4 inch Body)

3/16 Allen Wrench
1/4 Allen Wrench
1/2 Drive
1/2 Socket Head
5/8 Socket Head
11/16 Wrench
3/4 Heavy Socket Head
1-1/2 Wrench
Torque Wrench (Set to 18 ft/lbs)
Torque Wrench (Set to 40 ft/lbs)
Torque Wrench (Set to 160 ft/lbs)
Teflon Tape
Christo-lube



BURLING VALVE, LLC.

Safety Precautions

Please read all of the following Safety Precautions before installing or operating any Burling Valve, LLC equipment or accessories. To confirm safety, be sure to observe 'ISO 4414: Pneumatic Fluid Power - General rules relating to systems' and other safety practices.



Warning

Improper operation could result in serious injury to persons or loss of life!

1. PRODUCT COMPATIBILITY

Burling Valve, LLC products and accessories are for use in industrial pneumatic applications with compressed air media. The compatibility of the equipment is the responsibility of the end user. Product performance and safety are the responsibility of the person who determined the compatibility of the system. Also, this person is responsible for continuously reviewing the suitability of the products specified for the system, referencing the latest catalog, installation manual, Safety Precautions and all materials related to the product.

2. EMERGENCY SHUTOFF

Burling Valve, LLC products cannot be used as an emergency shutoff. A redundant safety system should be installed in the system to prevent serious injury or loss of life.

3. EXPLOSIVE ATMOSPHERES

Products and equipment should not be used where harmful, corrosive or explosive materials or gases are present. Unless certified, Burling Valve, LLC products cannot be used with flammable gases or in hazardous environments.

4. AIR QUALITY

Clean, dry air is not required for Burling Valve, LLC products. However, a 40 micron particulate filter is recommended to prevent solid contamination from entering the product.

5. TEMPERATURE

Products should be used with a media and ambient environment inside of the specified temperature range of 32°F to 158°F. Consult factory for expanded temperature ranges.

6. OPERATION

Only trained and certified personnel should operate electronic and pneumatic machinery and equipment. Electronics and pneumatics are very dangerous when handled incorrectly. All industry standard safety guidelines should be observed.

7. SERVICE AND MAINTENANCE

Service and maintenance of machinery and equipment should only be handled by trained and experienced operators. Inspection should only be performed after safety has been confirmed. Ensure all supply pressure has been exhausted and residual energy (compressed gas, springs, gravity, etc.) has been released in the entire system prior to removing equipment for service or maintenance.



Caution

Improper operation could result in serious injury to persons or damages to equipment!

1. PNEUMATIC CONNECTION

All pipes, pneumatic hose and tubing should be free of all contamination, debris and chips prior to installation. Flush pipes with compressed air to remove any loose particles.

2. THREAD SEALANT

To prevent product contamination, thread tape is not recommended. Instead, a non-migrating thread sealant is recommended for installation. Apply sealant a couple threads from the end of the pipe thread to prevent contamination.

3. ELECTRICAL CONNECTION

To prevent electronic damage, all electrical specifications should be reviewed and all electrical connections should be verified prior to operation.

Exemption from Liability

- Burling Valve, LLC** is exempted from any damages resulting from any operations not contained within the catalogs and/or instruction manuals and operations outside the range of its product specifications.
- Burling Valve, LLC** is exempted from any damage or loss whatsoever caused by malfunctions of its products when combined with other devices or software.
- Burling Valve, LLC** and its employees shall be exempted from any damage or loss resulting from earthquakes, fire, third person actions, accidents, intentional or unintentional operator error, product misapplication or irregular operating conditions.
- Burling Valve, LLC** and its employees shall be exempted from any damage or loss, either direct or indirect, including consequential damage or loss, claims, proceedings, demands, costs, expenses, judgments, awards, loss of profits or loss of chance and any other liability whatsoever including legal expenses and costs, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

Warranty

Burling Valve, LLC products are warranted to the original purchaser only against defects in material or workmanship for one (1) year from the date of manufacture. The extent of Burling Valve's liability under this warranty is limited to repair or replacement of the defective unit at Burling Valve's option. Burling Valve shall have no liability under this warranty where improper installation or filtration occurred.

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