INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

VALVE TYPES: VBP-04-11
VBP-06-11
VBP-08-11
VBP-12-11
VBP-16-11

DESCRIPTION: VBP SERIES VOLUME BOOSTER RANGE

Greenside Way, Middleton, Manchester M24 1SW United Kingdom
Tel: +44 (0) 161-345 4777 **Fax:** +44 (0) 161-345 4780
E-mail: sales@bifold-fluidpower.co.uk **www.**bifold-fluidpower.co.uk

Registered in England 1787729 Registered Office: Greenside Way, Middleton, Manchester M24 1SW

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1.0 INTRODUCTION

The following procedures apply to all model VBP series volume boosters.

NOTE Bifold Fluidpower do not recommend that untrained personnel attempt any service work and strongly advise that valves are returned to Bifold Fluidpower for servicing as required.

2.0 INSTALLATION

The manufacturer strongly recommends that tube fittings are sealed into fluid ports using thread sealant, Loctite 577 or equivalent, and that PTFE tape is not to be used.

Where the volume booster is supplied with support brackets, these should be secured using appropriate fixings.

Where the volume booster is supported by connecting pipework or other plant, ensure the unit has adequate clearance to avoid vibration and that no individual connecting pipe is over stressed.

Non-filter units may be mounted in any orientation.

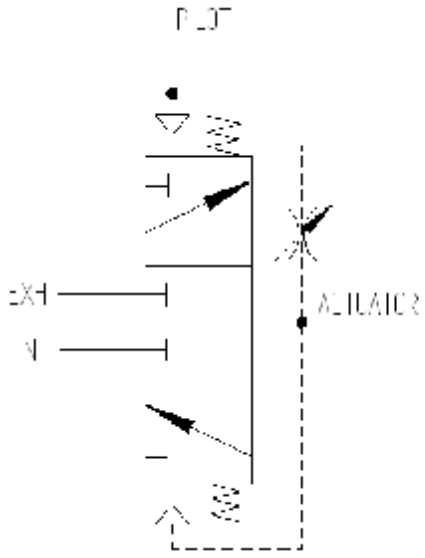
Filter models should **only** be mounted with the filter bowl pointing down.

Warning: Do not allow any debris to fall in any open port during installation as this may affect the operation of the unit.

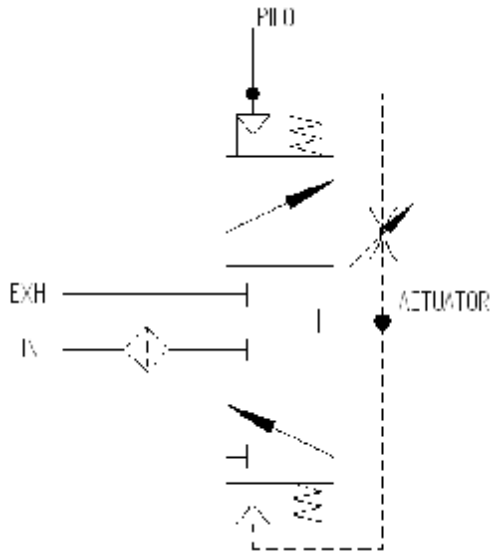
Take every precaution to prevent the ingress of dirt, fluids or other contaminants.

Prior to applying pressure, check that the unit is correctly orientated and that all the pipework/tubing connections are correct and secure.

Schematic Representation



VOLUME BOOSTER



WITH FILTER

3.0 OPERATION

The Bifold Volume Booster converts a low volume pressure signal into a 1:1 ratio high volume output. It is specifically designed for both modulating and On – Off pilot pressure signals.

When a low volume pilot pressure signal of 2 to 10 bar g is applied to the sensing port, the main valve assembly opens to allow high volume flow from the main inlet port to the outlet port. When the sensing assembly detects that the outlet pressure is equal to the pilot pressure, the main valve moves to the 'all ports blocked' rest position and will remain so until there is a change in the pilot pressure or outlet pressure.

If the sensing head detects that the outlet is higher than the pilot pressure, the high flow exhaust opens to vent the excess pressure.

If the sensing head detects that the outlet pressure is too low, the main valve opens to recharge the system to the correct 1:1 ratio pressure.

Volume Boosters are supplied tested at 1.5 times the maximum working pressure stated on the identification label. Do not exceed this pressure during system proof pressure testing, or the stated working pressure under normal operating conditions.

WARNING Do not exceed the maximum valve inlet pressure of 20 bar g or attempt to operate the unit outside the specified operating temperature range as this may damage the valve.

4.0 MAINTENANCE

Important Note

Prevent contamination entering the Volume Booster by conducting maintenance or servicing under workshop or covered conditions. If the unit is to be shelved always ensure that the ports are plugged.

No annual maintenance is necessary on pilot operated Volume Boosters. Care should be taken to avoid ingress of dirt. The repair kit number is VBP-¬ , please specify seal material. ¬ - V = Viton, S = Nitrile).

Filtered Volume Boosters

Annually check and replace the filter element as necessary. The Element Repair Kit is number ERK/VBP/¬ is available, please specify seal material. ¬ - V = Viton, S = Nitrile).

5.0 SERVICING

With reference to section 1, Bifold recommend valves are returned to their workshop for servicing and complete valves are held in stores as spares. However, if a spare valve is not available refer to these servicing procedures.

WARNING : - Prior to removal from system, ensure the connecting pipework holds no pressure.

5.1 **Disassembly** (Refer to outline detail page 7 and section drawing page 8)

1. Remove the Flow Control device '20', (various types) from the Pilot Cap '7'.
2. Remove the Pilot Cap '7' complete with Feed Plate '22' by unscrewing the four M4 cap screws.
3. On withdrawal, note and record the orientation of both Pilot Cap and the Feed Plate for re-assembly reference.
4. The Feed Plate may be removed from the Pilot Cap once the o-ring '18' has been removed
5. The Feed Plate seals are a sub-kit as part of the main seal repair kit.
6. Lower End Components

   Non-filter Booster

   i. Place the unit upside down on a protective surface.

   ii. Remove the 2 M6 cap screws '27' securing the Feedplate 'P' and Regulator Bowl '26'.

   iii. Carefully remove the Feedplate, Bowl, Seal '14', Spring '10' and the complete Poppet Seat assembly '2'.

   Filter Booster

   i. Place the unit upside down on a protective surface.

   ii. Remove the 2 M6 cap head screws '27' securing the Bowl '26'.

   iii. Remove the Bowl with its base Seal '14'.

   iv. Unscrew the Drain Screw '37' to service the Seal '36' – CAUTION left-hand thread.

   v. Remove the M6 Jam nut '35' with its Washer '34', along with the Baffle '32', Filter Element '33' and its Support '30' – Inspect and clean or replace as necessary.

   vi. Remove and replace the Seal '36' on the Centre Pillar '28' beneath the Filter Element.

   vii. Using a 10mm spanner on the flats, unscrew the Centre Pillar '28' and carefully remove along with the Spring '10' and Poppet Seat '2' assembly beneath.
7. The Poppet Seat '2' assembly may be dismantled further to service the seals***
8. Prevent rotation of the Stem '9' using a 4mm AF spanner and undo the M3 nut '17' from the Stem top (5.5mm socket), the Stem can be withdrawn from beneath.
9. Using a suitable push-rod (3.5mm DIA), from beneath push the Sensing Piston '5' and Washer '6' out of the bore.

10. Remove and replace the Seals ‘11’, ‘42’ from the Sensing Piston.
11. Remove the Internal circlip ‘23’ carefully avoiding damage to the bore.
12. The Retainer ‘3’, Exhaust Seat ‘4’, Spring ‘10’ and Guide Top Seat ‘8’ should slide out of the bore when inverted, if not use a suitable push-rod (8-10mm DIA) from beneath.
13. Remove and replace the Seal ‘18’ beneath the Guide Top Seat.
14. The Piston Exhaust ‘4’ Seat assembly can be dismantled further to service the seals***

***For models with screw-in retainers, Poppet and Piston Exhaust Seat assemblies are separated by unscrewing the threaded Retainer using circlip pliers.

For models having press-fit Poppet and Piston Exhaust Seat assemblies, further dismantling is not recommended unless visible seal damage is evident. The integrity of the re-fitted pressed assembly cannot be assured.

5.2 **Re-assembly** (Refer to outline detail page 7 and section drawing page 8)

1. Ultrasonically clean all machined parts where possible.
2. Lightly smear all replacement o-ring seals with silicone grease.
3. Assemble the Piston Exhaust ‘4’ Seat and Poppet ‘2’ Seat assemblies with new seals, taking care not to mix them up.
4. Fit a new Seal ‘18’ in the bottom of the main bore of the Body.
5. Place the Piston Exhaust ‘4’ Seat assembly at the base of the bore and centralise visually.
6. Fit the Spring ‘10’ into the above.
7. Lower the Guide Top Seat ‘8’ into the bore, push it down against the Spring whilst the circlip ‘23’ is refitted.
8. Place the Washer ‘6’ and Sensing Piston ‘5’, complete with new seals into the bore.
9. From beneath offer the Stem ‘9’ up through the assembly until it protrudes through the piston.
10. Fit and fasten the M3 nut ‘17’ to the Stem top, prevent rotation of the Stem using a 4mm AF spanner.
11. Place the unit upside down on a protective surface and fit the Seal ‘14’ into the Body base.
12. Lower End Components

Non-filter Booster

i. Place the Poppet Seat assembly ‘2’ onto the Stem ‘9’.
ii. Fit the Spring ‘10’, Bowl ‘26’ and Feed Plate ‘P’.
iii. Refit and secure the 2 M6 cap head screws ‘27’, tightening each after both are nipped.

Filter Booster

i. Place the Poppet ‘2’ Seat assembly onto the Stem ‘9’.
ii. Fit the Spring ‘10’ and, using a 10mm spanner on the flats, fasten the Centre Pillar ‘28’.
iii. Fit a new Seal ‘36’ to the Centre Pillar.

iv. Refit the Filter Support ‘30’, Filter Element ‘33’, Baffle ‘32’, washer ‘34’ and jam nut ‘35’.

v. Refit the Drain Screw ‘37’ with new Seal ‘36’ into the Bowl ’26’ – CAUTION left-hand thread.

vi. Position the Bowl and secure with the 2 M6 cap head screws ‘27’, tightening each after both are nipped.

13. With new Seals fitted, position the Feedplate ‘22’ on the Pilot Cap ‘7’ in the correct orientation.
14. Fit a new Seal ‘18’ to the Pilot Cap
15. Position the Pilot Cap correctly on the Valve Body and replace the four M4 Cap screws. Tighten each after all are nipped.
16. Replace the seal(s) on the Flow Control Device and refit it into the Pilot Cap.

Diagram A
Outline Detail – Filter Booster / Booster

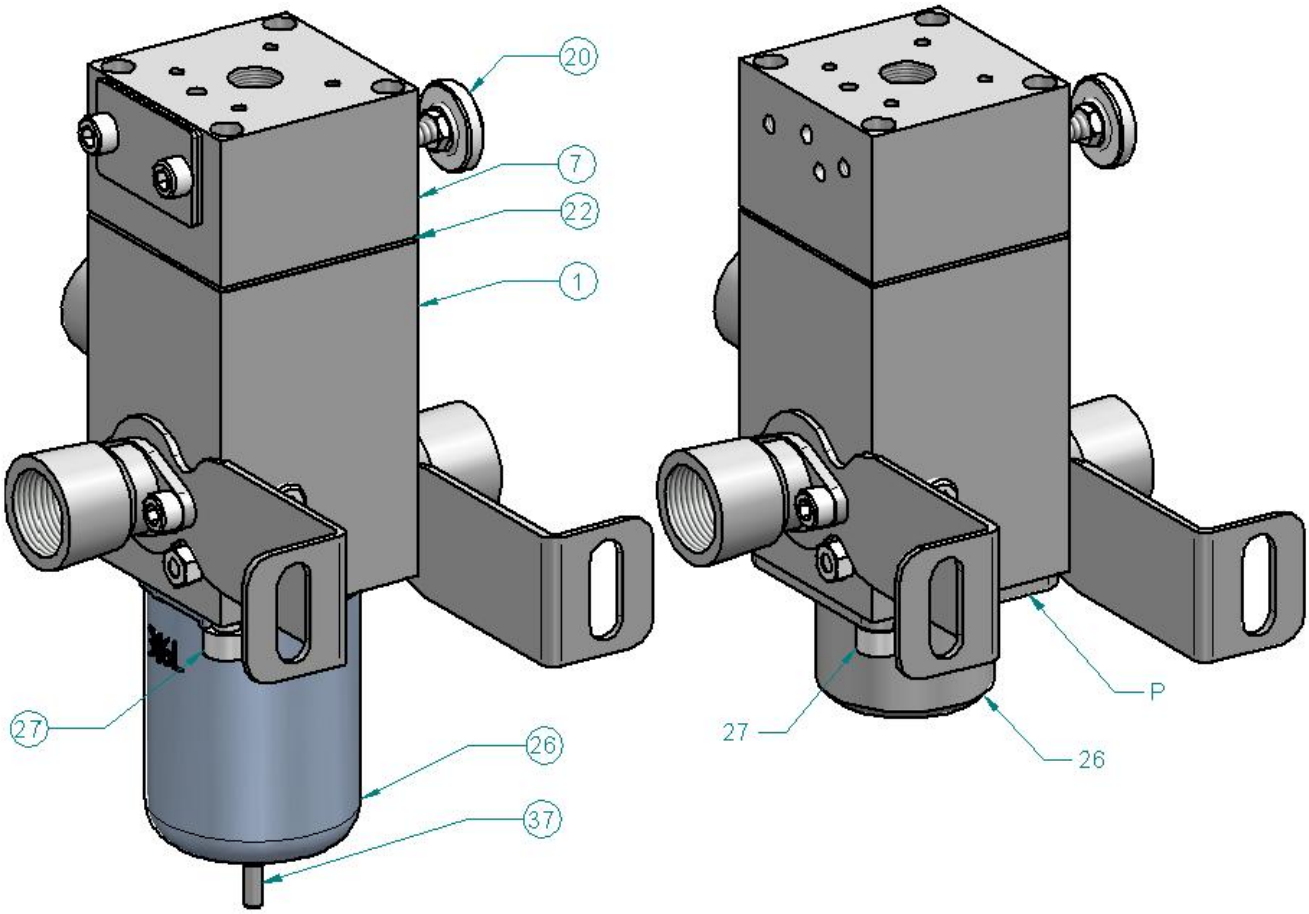
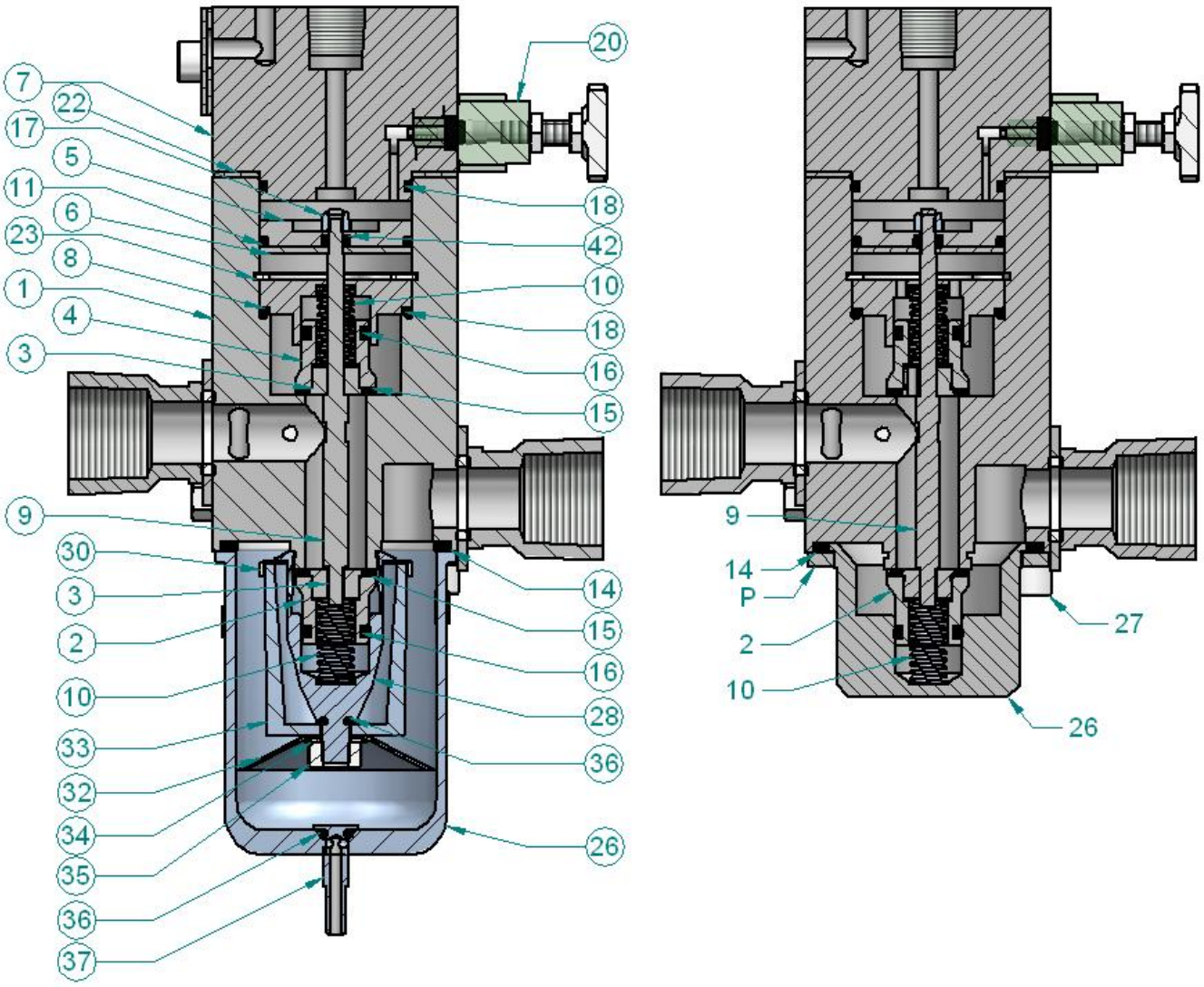


Diagram B
Sectional Detail – Filter Booster / Booster



6.0 TESTING

Refer to section 2.0 and 3.0.

With the Volume Booster correctly connected to a CLEAN air supply, function the unit twenty (20) times.

Check for internal leakage in all positions. Ensure that the unit is gas tight.

Raise pressure to 1.5 times maximum working pressure stated on the **VALVE** identification label. Leave for 10 minutes and inspect for external leakage.

Lower pressure to maximum working pressure and voltage to minimum system voltage, cycle 20 times check for leakage from the return port applicable.

<4 ml/hr Mineral Oil

<8 ml/hr Water Based Fluids

On satisfactory completion of above tests re-install valve into system or if being stored cap all open ports and suitable pack to protect from mechanical damage.