

Parker Hannifin Corporation
 Veriflo Division
 250 Canal Blvd.
 Richmond, Ca 94804
 Phone (510) 235-9590
 Fax (510) 232-7396

PARKER
 P6 and P8 Series Miniature Actuator
 Bellows Valve
 Maintenance Instructions
 MI-132

Copyright 1995 Parker-Hannifin Corporation
 All Rights Reserved



P/N 17000853 Rev A



**SECTION 2: NORMALLY CLOSED VALVE
 (P6 and P8 -12AC)**

For **NORMALLY CLOSED VALVES** (P6 & P8-12AC) refer to Figures 1 and 2.

2A: GASKET REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Place the new Gasket in the Valve Body.
2. Lightly lubricate the Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
3. Preferably, pressurize the Bonnet Sub-assembly at the 10-32 UNF port in the Actuator Body to open the valve for the following step.
4. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

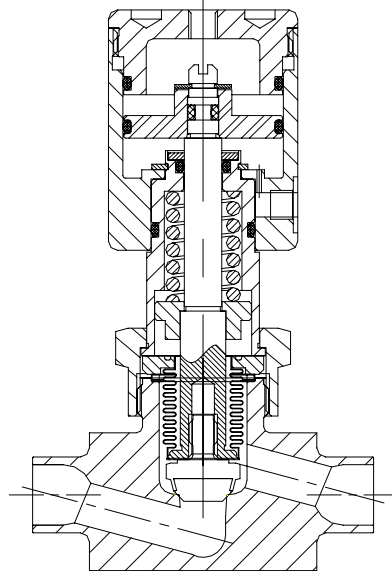
2B: STEM TIP REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Stem Tip Sub-assembly from the Stem Sub-assembly by unthreading with a 7/16 inch hex socket wrench. Insert a screw driver into the 10-32 UNF port of the Actuator Cap to prevent rotation of the Stem Sub-assembly. Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.
3. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Engage the new Stem Tip Sub-assembly into the Stem Sub-assembly to 1/8 turn past finger-tight or preferably torque to 15 In-lbs. (1.7 N-m). Rotate the Stem Tip Sub-assembly with a 7/16 inch hex socket wrench, while securing the Stem Sub-assembly from rotation with a screw driver inserted into the 10-32 UNF port in the Actuator Cap. Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.
2. Place the new Gasket in the Valve Body.
3. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
4. Preferably, pressurize the Bonnet Sub-assembly at the 10-32 UNF port in the Actuator Body to open the valve for the following step.
5. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.



**FIGURE 1:
 NORMALLY CLOSED VALVE
 (P6 AND P8-12AC)**

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

ALL PARKER VALVES MUST PASS A RIGID OPERATIONAL AND LEAKAGE TEST BEFORE LEAVING THE FACTORY. IT IS RECOMMENDED AFTER ANY REASSEMBLY, THE VALVE SHOULD BE TESTED BY THE USER FOR OPERATION AND LEAKAGE. IF THESE INSTRUCTIONS ARE NOT FULLY COMPLIED WITH, THE REPAIRED PRODUCT MAY FAIL AND CAUSE DAMAGE TO PROPERTY OR INJURY TO PERSONS. PARKER HANNIFIN CANNOT ASSUME RESPONSIBILITY FOR PERFORMANCE OF A CUSTOMER SERVICED VALVE.

SECTION 1: MANDATORY MAINTENANCE NOTES

THESE NOTES AND INSTRUCTIONS MUST BE PRECISELY FOLLOWED FOR ANY MAINTENANCE OF PARKER P-SERIES BELLOWS VALVES.

DISASSEMBLY OF BELLOWS VALVES:

1. **WARNING: MAKE CERTAIN THE SYSTEM IN WHICH THE VALVE IS INSTALLED IS DRAINED AND/OR EXHAUSTED OF ALL PRESSURE BEFORE STARTING VALVE REMOVAL OR DISASSEMBLY. FAILURE TO DO SO CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**
2. Verify that the Bellows Valve Maintenance Kit being used is appropriate for the Valve's size and service requirements. Always contact your authorized Parker representative if any questions arise.

REASSEMBLY OF BELLOWS VALVES:

1. Make certain all parts are free of dirt or other contamination before starting reassembly of the Valve.
2. Any instruction to lubricate any Valve component assumes the End User will select a lubricant that is consistent with the Valve's service requirements. Always contact your authorized Parker representative if any questions arise.

Table 1

Maximum Allowable Working Pressure and Temperature

Bellows Valve Model	Max Allowable Working Pressure and Temperature
Air Supply Pressure	50 - 150 psig (0.3 MPa to 1.0 MPa)
Normally Open	600 psig at 70° F (4.1 MPa at 21° C)
Normally Closed	200 psig at 70° F (1.4 MPa at 21° C)
Double Acting	700 psig at 70° F (4.8 MPa at 21° C)

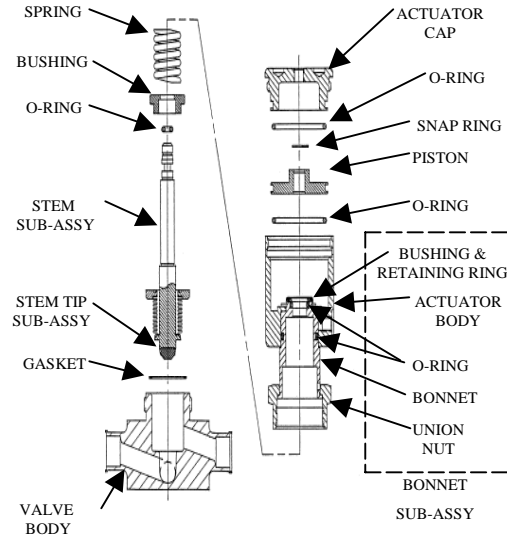
2C: BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Air Operator Cap from the Actuator Body using a 3/16 inch hex socket wrench.
2. Remove the Piston by first removing the Snap Ring from the upper portion of the stem.
3. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 inch hex socket wrench.
4. Remove the Gasket from the Valve Body.
5. Remove the Stem Sub-assembly from the Bonnet Sub-assembly.
6. Remove the O-ring/Bushing/Spring from the Stem Sub-assembly.
7. Remove the Stem Tip Sub-assembly from the Stem Sub-assembly by unthreading with a 7/16 inch hex socket wrench. A screw driver slot on the stem can be used to prevent rotation of the Stem Sub-assembly. Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.

REASSEMBLY

1. Engage the Stem Tip Sub-assembly into the new Stem Sub-assembly to 1/8 turn past finger-tight or preferably torque to 15 In-lbs. (1.7 N-m). Rotate the Stem Tip Sub-assembly with a 7/16 inch hex socket wrench. A screw driver slot on the stem can be used to prevent rotation of the Stem Sub-assembly. Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.
2. Insert the Bushing and Spring over the Stem Sub-assembly.
3. Install the assembly of step 2 into the Bonnet Sub-assembly. Exercise caution to prevent damage to the O-rings.
4. Place the new Gasket onto the Valve Body.
5. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
6. Engage the Bonnet Sub-assembly onto the Valve Body finger tight.
7. Insert the O-ring and Piston onto the Stem Sub-assembly and secure the Piston with the Snap Ring.
8. Engage the Actuator Cap into the Actuator Body.
9. Preferably, pressurize the Bonnet Sub-assembly at the 10-32 UNF port in the Body to open the valve prior to the following step.
10. Install the Bonnet Sub-assembly and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.



**FIGURE 2:
 NORMALLY CLOSED VALVE
 (P6 AND P8-12AC)**

SECTION 3: NORMALLY OPEN & DOUBLE ACTING VALVES (P6 and P8 -12AO & 12AD)

3A: GASKET REPLACEMENT

For **NORMALLY OPEN VALVES** (P6 & P8-12AO) refer to Figures 3 and 4.
For **DOUBLE ACTING VALVES** (P6 & P8-12AD) refer to Figures 5 and 6.

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Place the new Gasket in the Valve Body.
2. Lightly lubricate the Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
3. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

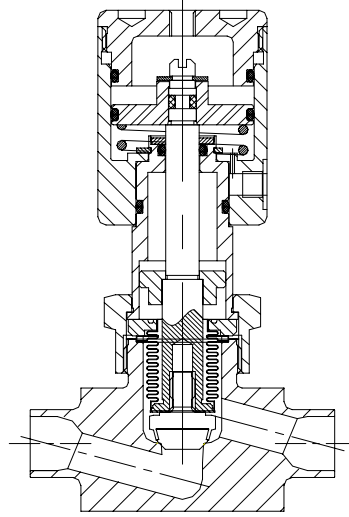
3B: STEM TIP REPLACEMENT

DISASSEMBLY

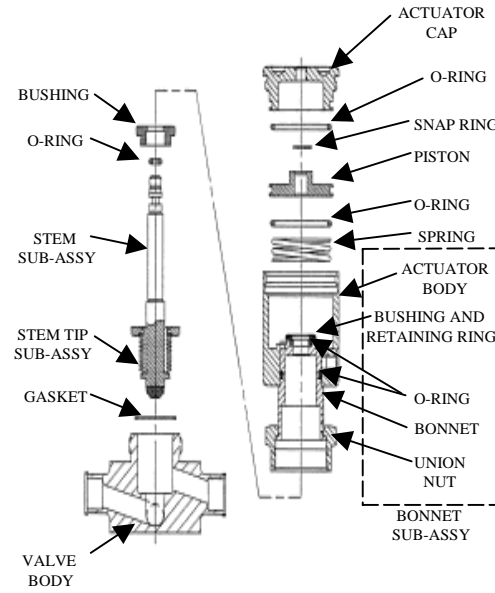
1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 inch hex socket wrench.
2. Remove the Stem Tip Sub-assembly from the Stem Sub-assembly by unthreading with a 7/16 inch hex socket wrench. Insert a screw driver into the 10-32 UNF port of the Actuator Cap to prevent rotation of the Stem Sub-assembly. **Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.**
3. Remove the Gasket from the Valve Body.

REASSEMBLY

1. Engage the new Stem Tip Sub-assembly into the Stem Sub-assembly to 1/8 turn past finger-tight or preferably torque to 15 In-lbs. (1.7 N-m). Rotate the Stem Tip Sub-assembly with a 7/16 inch hex socket wrench, while securing the Stem Sub-assembly from rotation with a screw driver inserted into the 10-32 UNF port in the Actuator Cap. **Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.**
2. Place the new Gasket in the Valve Body.
3. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
4. Engage the Bonnet Sub-assembly onto the Valve Body and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.



**FIGURE 3:
NORMALLY OPEN VALVE
(P6 AND P8-12AO)**



**FIGURE 4:
NORMALLY OPEN VALVE
(P6 AND P8-12AO)**

WELDED PORT CONNECTIONS

Always consult your authorized Parker representative if questions arise.

Careful welding procedures are recommended and welding should be performed by trained, qualified personnel. Socket weld ports require the tube be inserted into the socket until bottomed against the stop. The tube is then to be backed out approximately 1/16 of an inch and then welded. This procedure will help in avoiding excessive static stress on the weld.

It is recommended all Valves with socket weld or butt-weld ports be disassembled prior to welding. The Upper Bonnet assembly is easily removed from the Valve Body. To prevent potential damage to the Valve Seat (if the Valve is not disassembled), place the Valve in the full open position and properly purge with gas.

1. Loosen the Union Nut with a 1 inch hex wrench and unthread it completely from the Valve Body. The Upper Bonnet Assembly is easily removed from the body.
2. Remove the gasket from the Valve Body.
3. Perform the welding operation and then allow the Valve Body to properly cool. The cooling process must proceed naturally in room temperature air to help prevent metallurgical defects in either the weld or the Valve Body. Always consult your authorized Parker representative if questions arise.

WARNING: Do not damage the gasket or seat sealing surface on the Valve Body.

4. Place the new Gasket in the Valve Body.
5. Reassemble the upper bonnet assembly to the Valve Body. Apply a small amount of lubricant, as consistent with the Valve's service requirements, to the Valve Body threads. Always contact your authorized Parker representative if questions arise.
6. Secure the Valve Body with a smooth-jawed wrench.
7. Torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.

3C: BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Air Operator Cap from the Actuator Body using a 3/16 inch hex socket wrench.

CAUTION: EXERCISE CARE TO AVOID INJURY AND DAMAGE FROM THE COMPRESSED SPRING UNDER THE PISTON.

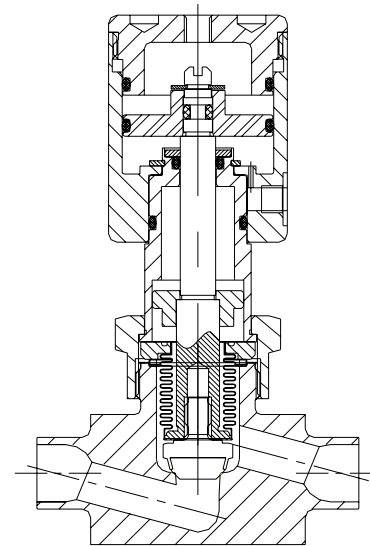
2. Remove the Piston and Spring (12AO only) by first removing the Snap Ring from the Stem Sub-assembly while stabilizing the piston.
3. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 inch hex socket wrench.
4. Remove the Gasket from the Valve Body.
5. Remove the Stem Sub-assembly from the Bonnet Sub-assembly.
6. Remove the Bushing and O-ring from the Stem Sub-assembly.
7. Remove the Stem Tip Sub-assembly from the Stem Sub-assembly by unthreading with a 7/16 inch hex socket wrench. A screw driver slot on the stem can be used to prevent rotation of the Stem Sub-assembly. **Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.**

REASSEMBLY

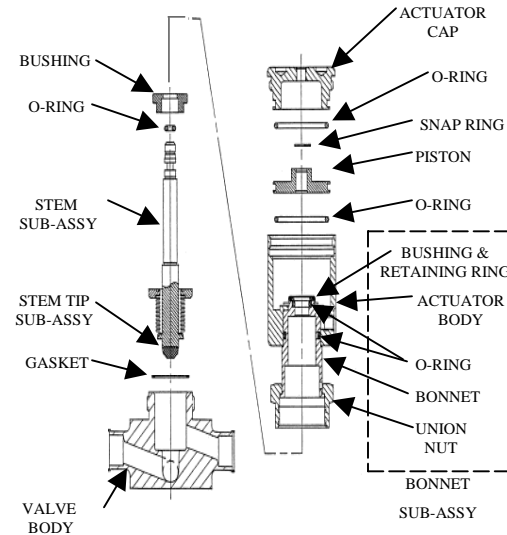
1. Engage the Stem Tip Sub-assembly into the new Stem Sub-assembly to 1/8 turn past finger-tight or preferably torque to 15 In-lbs. (1.7 N-m). Rotate the Stem Tip Sub-assembly with a 7/16 inch hex socket wrench. A screw driver slot on the stem can be used to prevent rotation of the Stem Sub-assembly. **Do not hold the Bellows or the Bellows Ring to prevent damage to the Bellows.**
2. Insert the Bushing and Spring over the Stem Sub-assembly.
3. Install the assembly of step 2 into the Bonnet Sub-assembly.
- CAUTION: Exercise caution to prevent damage to the O-rings.**
4. Place the new Gasket onto the Valve Body.
5. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements.
6. Engage the Bonnet Sub-assembly onto the Valve Body finger tight.

CAUTION: EXERCISE CARE TO AVOID INJURY AND DAMAGE FROM THE COMPRESSED SPRING UNDER THE PISTON.

7. Insert the O-ring, Spring (12AO only) and Piston onto the Stem Sub-assembly and secure the Piston with the Snap Ring.
8. Engage the Actuator Cap into the Actuator Body.
9. Install the Bonnet Sub-assembly and torque the Union Nut to 50 Ft-lbs. (67 N-m) maximum.



**FIGURE 5:
DOUBLE ACTING VALVE
(P6 AND P8-12AD)**



**FIGURE 6:
DOUBLE ACTING VALVE
(P6 AND P8-12AD)**

VALVE CONNECTOR MAKE-UP INSTRUCTIONS

TUBE FITTING CONNECTIONS

1. Insert the tube into the Valve port until the tube bottoms out in the Valve Body. Care should be exercised to insure the tube is properly aligned with the Valve Body and port.
2. Normal make-up for port sizes 1 thru 3 (1/16 inch thru 3/16 inch) is 3/4 turn from finger tight. Normal make-up for port sizes 4 thru 16 (1/4 inch thru 1 inch) is 1 1/4 turns from finger tight.

PLEASE FOLLOW THE ABOVE DIRECTIONS FOR COUNTING THE NUMBER OF TURNS FOR PROPER FITTING MAKE-UP. DO NOT MAKE-UP TUBE FITTINGS BY TORQUE OR "FEEL". VARIABLES SUCH AS TUBING AND FITTING TOLERANCES, TUBE WALL THICKNESS, AND THE LUBRICITY OF NUT LUBRICANTS CAN RESULT IN AN IMPROPERLY ASSEMBLED TUBE FITTING CONNECTION.

ULTRASEAL CONNECTIONS

1. Insert the proper O-ring into the UltraSeal fitting's O-ring groove. Position the UltraSeal gland sealing face against the O-ring, and then advance the nut to a finger-tight position.
2. A positive seal is obtained by advancing the nut no less than 1/4 turn from the finger-tight position. Proper UltraSeal make-up is achieved when a sharp rise in required application torque occurs, which indicates proper seal face contact and O-ring seal compression into the UltraSeal groove.

VACUSEAL CONNECTIONS

1. A positive seal is obtained by advancing the nut 1/8 turn from the finger-tight position.
2. A new gasket should be installed upon each fitting re-make to insure system pressure integrity.