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PARKER
 HP4 Series High Pressure
 Bellows Valve
 Maintenance Instructions
 MI-134



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P/N 17000850 Rev A

**SECTION 2: NORMALLY CLOSED VALVE
 (HP4-14AC)**

For NORMALLY CLOSED VALVES (HP4-14AC) refer to Figures 1 and 2.

CAUTION: DO NOT ROTATE THE ACTUATOR. THIS CAN CAUSE IMPROPER ACTUATION OF THE VALVE OR, IN EXTREME CASES, SEPARATION OF THE ACTUATOR FROM THE BONNET.

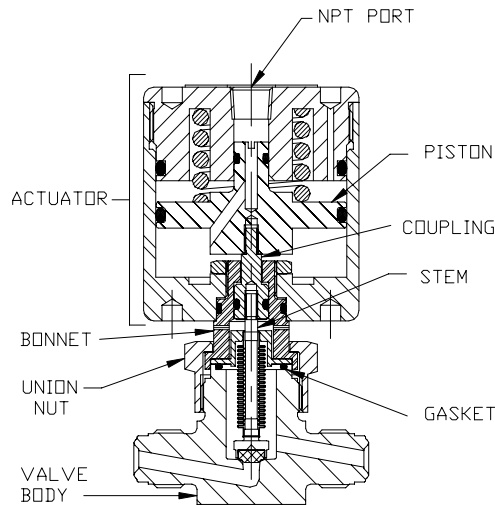
2A: GASKET REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 1/8 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. Pressurize the Bonnet Sub-assembly at the 1/8 NPT 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 60 Ft-lbs (81 N-M) while preventing the Actuator, Bonnet and Valve Body from rotating.



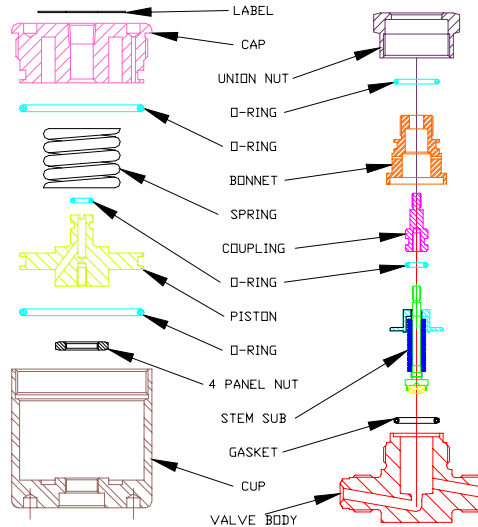
**FIGURE 1: SECTION
 NORMALLY CLOSED VALVE
 (HP4-14AC)**

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.

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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.



**FIGURE 2: EXPLODED VIEW
 NORMALLY CLOSED VALVE
 (HP4-14AC)**

SECTION 1: MANDATORY MAINTENANCE NOTES

THESE NOTES AND INSTRUCTIONS MUST BE PRECISELY FOLLOWED FOR ANY MAINTENANCE OF PARKER HP-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 the HP4 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 I

Maximum Allowable Working Pressure and Temperature

Bellows Valve Model	Max Allowable Working Pressure and Temperature
Air Supply Pressure	30 - 85 psig (0.2 MPa to 0.6 MPa)
Normally Open	3500 psig at 70° F (24.1 MPa at 21° C)
Normally Closed	3500 psig at 70° F (24.1 MPa at 21° C)

2B: STEM TIP AND BELLOWS SUB-ASSEMBLY REPLACEMENT

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 1/8 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.
3. Unthread the Stem Sub-assembly from the Bonnet Sub-assembly by holding the Piston in place with a flat head screw driver inserted in the slot of the Piston through the 1/8 NPT port of the Actuator and turning the stem with a 5/16 inch hex wrench.
4. If the Coupling is removed with the Stem Sub, apply Loctite 222 or equivalent to the external threads, insert the Coupling into the Bonnet and thread into the Piston. Torque to 12 in-lbs while holding the Piston in place with a flat head screw driver. **CAUTION: AVOID DAMAGE TO THE O-RING.**

REASSEMBLY

1. Apply Loctite 222 or equivalent to the threads of the stem.
2. Insert the Stem Sub-assembly into the Bonnet Sub-assembly and thread the Stem into the Coupling using a 5/16 inch hex wrench. Torque to 12 in-lbs while holding the Piston in place with a flat head screw driver.
3. Place the new Gasket in the Valve Body.
4. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements. Always contact your authorized Parker representative if questions arise.
5. Engage the Bonnet Sub-assembly onto the Valve Body finger tight.
6. Pressurize the assembly at the 1/8 inch NPT port in the Actuator Body to open the valve for the following step.
7. Torque the Union Nut to 60 Ft-lbs (81 N-M) while preventing the Actuator, Bonnet and Valve Body from rotating.

**SECTION 3: NORMALLY OPEN VALVE
(HP4-14AO)**

For **NORMALLY OPEN VALVES** (HP4-14AO) refer to Figures 3 and 4.

CAUTION: DO NOT ROTATE THE ACTUATOR. THIS CAN CAUSE IMPROPER ACTUATION OF THE VALVE OR, IN EXTREME CASES, SEPARATION OF THE ACTUATOR FROM THE BONNET.

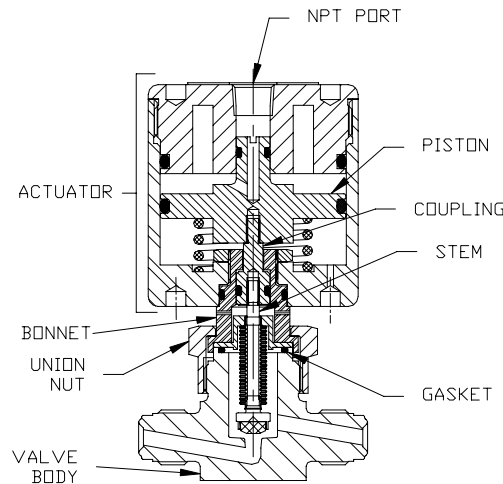
3A: GASKET REPLACEMENT

DISASSEMBLY

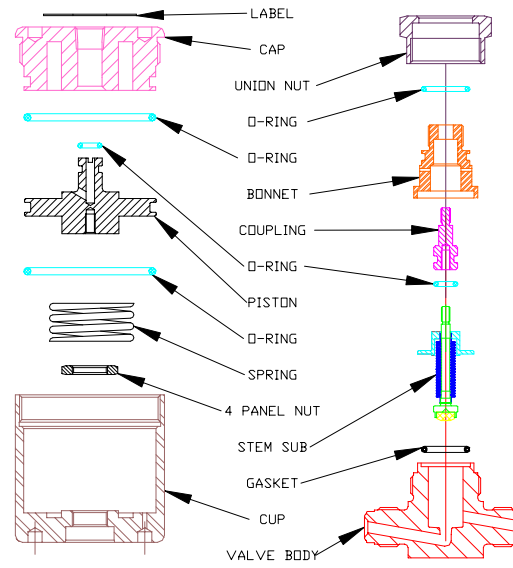
1. Remove the Bonnet Sub-assembly by unthreading the Union Nut from the Valve Body with a 1 1/8 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.

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 60 Ft-lbs (81 N-M) while preventing the Actuator, Bonnet and Valve Body from rotating.



**FIGURE 3: SECTION
NORMALLY OPEN VALVE
(HP4-14AO)**



**FIGURE 4: EXPLODED VIEW
NORMALLY OPEN VALVE
(HP4-14AO)**

**3B: STEM TIP AND BELLOWS SUB-ASSEMBLY
REPLACEMENT**

DISASSEMBLY

1. Remove the Bonnet Sub-assembly by unthreading the Union Nut with a 1 1/8 inch hex socket wrench.
2. Remove the Gasket from the Valve Body.
3. Unthread the Stem Sub-assembly from the Bonnet Sub-assembly by holding the Piston in place with a flat head screw driver inserted in the slot of the Piston through the 1/8 NPT port of the Actuator and turning the stem with a 5/16 inch hex wrench.
4. If the Coupling is removed with the Stem Sub, apply Loctite 222 or equivalent to the external threads, insert the Coupling into the Bonnet and thread into the Piston. Torque to 12 in-lbs while holding the Piston in place with a flat head screw driver. **CAUTION: AVOID DAMAGE TO THE O-RING.**

REASSEMBLY

1. Apply Loctite 222 or equivalent to the threads of the stem.
2. Insert the Stem Sub-assembly into the Bonnet Sub-assembly and thread the Stem into the Coupling using a 5/16 inch hex wrench. Torque to 12 in-lbs while holding the Piston in place with a flat head screw driver.
3. Place the new Gasket in the Valve Body.
4. Lightly lubricate the Valve Body or Union Nut threads with an appropriate lubricant, as consistent with the Valve's service requirements. Always contact your authorized Parker representative if questions arise.
5. Engage the Bonnet Sub-assembly onto the Valve Body finger tight.
6. Torque the Union Nut to 60 Ft-lbs (81 N-M) while preventing the Actuator, Bonnet and Valve Body from rotating.

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 1/8 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 60 Ft-lbs. (81 N-m) while preventing the Actuator, Bonnet and Valve Body from rotating.

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.