Swagelok® Alternative Fuel Service (AFS) Ball Valve
Service Instructions

Seat Seal Kit
- Seat spring (2)
- Seat O-ring (2)
- Seat (2)
- Backup ring (2)
- Gasket (2)
- Lubricant

Stem and Seat Seal Kit
- Stem guide ring (2)
- Stem backup ring
- Stem O-ring
- Stem thrust washer
- Packing bolt gasket
- Backup ring (2)
- Seat O-ring (2)
- Seat (2)
- Gasket (2)
- Lubricant

Tools Required

<table>
<thead>
<tr>
<th>Part</th>
<th>Tool</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve body</td>
<td>Bench vise</td>
<td>—</td>
</tr>
<tr>
<td>End screw</td>
<td>Open-end wrench</td>
<td>1 1/2 in.</td>
</tr>
<tr>
<td>End screw</td>
<td>Open-end wrench</td>
<td>1 3/16 in. (30 mm)</td>
</tr>
<tr>
<td>End screw</td>
<td>Crow's foot</td>
<td>1 3/16 in. (30 mm)</td>
</tr>
<tr>
<td>End screw</td>
<td>Socket</td>
<td>13/16 in.</td>
</tr>
<tr>
<td>Packing bolt</td>
<td>Socket</td>
<td>13/16 in.</td>
</tr>
<tr>
<td>Packing bolt, end screw</td>
<td>Torque wrench</td>
<td>600 to 700 in.-lb (68 to 79.1 N-m)</td>
</tr>
<tr>
<td>Packing bolt, end screw</td>
<td>Torque wrench</td>
<td>(692 to 806 cm·kg)</td>
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</tbody>
</table>

⚠️ WARNING
BEFORE REMOVING A VALVE FROM THE SYSTEM FOR SERVICE, YOU MUST
- depressurize system
- cycle the valve
- purge the valve.
Refer to the Fig. 1 while following these instructions. Complete the maintenance on one end screw assembly before proceeding to the other end screw assembly.

**Disassembly**

**Seat Seal Disassembly**
1. Remove the valve from the system. Actuate the handle to the OPEN position.
2. Place the valve in a vise or use a 1 1/2 in. wrench to hold the body.
3. Loosen and remove one end screw assembly from the body.
4. Remove the seat, seat O-ring, seat backup ring, seat gland, seat spring, and end screw gasket from the end screw. (The use of a small, non-metallic pick or similar tool is optional.) Discard all removed components except the seat gland and end screw. Proceed to Reassembly if not replacing stem seal components.

**Stem Seal Disassembly**
5. Actuate the handle to the CLOSED position.
6. Remove the handle set screw and set aside.
7. Remove the ball and set aside.
8. Loosen and remove the packing bolt and packing bolt gasket from valve body. Remove the packing bolt gasket from the packing bolt and discard the packing bolt gasket.
9. Remove the stem assembly from the packing bolt.

10. Remove the stem guide rings, stem backup ring, stem O-ring, and stem thrust washer from stem and discard.

**Reassembly**

1. Clean all lubricant and contaminants from the seat gland, end screw, packing bolt, stem, and ball.

**Stem Seal Reassembly**
2. Apply a thin film of the provided lubricant to the stem thrust washer, stem O-ring, stem backup ring, and stem guide rings.
3. Place the stem thrust washer, stem O-ring, stem backup ring, and stem guide rings onto the stem. Note: The chamfer on the stem backup ring should point up.
4. Insert the stem assembly into the packing bolt. Note: Be careful not to pinch the stem assembly components when inserting into the packing bolt.
5. Place the packing bolt gasket on the packing bolt.
6. Place packing bolt in valve body and torque to 600 to 700 in.-lb (68 to 79.1 N·m) (692 to 806 cm·kg).
7. Lubricate the ball with the supplied lubricant. Place the ball into the body by aligning the ball slot with the stem tang. Note: Verify the ball and stem are aligned correctly by actuating the valve.

**Seat Seal Reassembly**
8. Apply a thin film of the provided lubricant to the seat, seat O-ring, backup ring, and seat gland.
9. Insert the seat spring, seat gland, backup ring, seat O-ring, and seat into the end screw as shown.
10. Place the end screw gasket on the sealing surface of the end screw.
11. Thread the end screw assembly into the body. Torque the end screw to 600 to 700 in.-lb (68 to 79.1 N·m) (692 to 806 cm·kg).
12. Repeat the procedure on the other end screw assembly, if required.
13. Replace handle and thread set screw into the handle. Torque the set screw to 80 to 110 in.-lbs (9.0 to 12.4 N·m) (92.1 to 123 cm·kg).
14. Test the valve for proper operation and leak-tight integrity.
Locking Bracket Kit

Tools Required

1. Loosen the set screw in the handle. Fig. 2
2. Remove the handle.
3. Place the bottom bracket on the valve aligning the cut out in the bracket with the notch on the valve. Fig. 3.
4. Turn the handle upside down and place the top bracket on the base of the handle aligning the cut out in the bracket with the notch on the handle. Fig. 4
5. Holding the top bracket against the handle, turn the handle right side up and place the handle on the valve stem, aligning the stem flat and set screw. Fig. 2.
   Note: The padlock hole in the top bracket must align with either one of the padlock holes in the bottom bracket for proper operation (Fig 5). If the holes do not align properly, remove the handle and repeat steps 3 through 5.
6. Thread the set screw into the handle and tighten to 80 to 110 in.-lb (9.0 to 12.4 N·m) (92 to 127 cm·kg).
7. Test the valve for proper operation.
Nylon Handle Kit

Tools Required

<table>
<thead>
<tr>
<th>Hex key 5/32 in.</th>
<th>Torque Wrench 80 to 110 in.-lb (9.0 to 12.4 N-m) (92 to 127 cm·kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hex bit 5/32 in.</td>
<td></td>
</tr>
</tbody>
</table>

Refer to Fig. 6 during these instructions.

1. Loosen the set screw in the handle.
2. Remove the handle.
3. Place the new handle on the valve stem, aligning the stem flat and set screw.
4. Thread the set screw into the handle and tighten to 80 to 110 in.-lb (9.0 to 12.4 N-m) (92 to 127 cm·kg).
5. Test the valve for proper operation.