

# "83" SERIES BALL VALVE MAINTENANCE INSTRUCTIONS

MS-INS-83  
CP Revision I  
July, 2000

## Kit Contents:

|   |  |
|---|--|
| Ball  | Stem (X-pattern only)                        |
| Trunnion Bearings (X-pattern only)                | O-Rings (straight pattern-6,<br>X-pattern-3) |
| Seat Carrier Back-up Rings                        | Seat Carrier Assemblies                      |
| Springs   | Seat Screw Seals                             |
| Stem Bearing (straight pattern-1,<br>x-pattern-2) | Lubricant                                    |
| Instruction Sheet                                 | Material Safety Data Sheet                   |
| Stem Back-up Rings (X-pattern only)               | Ball Back-up Rings                           |
| Seat Carrier Guides                               |  |

- WARNING:** Before servicing any installed valve, you must
- depressurize system
  - cycle valve

**WARNING:** Residual material may be left in the valve and system.  
**NOTE:** It is important to refer to the exploded view drawing while following the maintenance instructions.

## DISASSEMBLY

### End Screws:

- Remove end screws (18) from valve body (4).
- Discard the backup rings (15), quad rings or carrier o-rings (16), seat spring (13), seat carrier assemblies (12), end screw seals (17), and seat carrier guides (14).

### Ball & Stem:

- Remove the set screw (not pictured) in handle (1) and remove handle. For X-pattern assemblies, note the position of the handle for reassembly.
- Remove the ball (9) assembly through the bottom of the valve body (4). For X-pattern assemblies, note the position of the ball orifices for reassembly. (It may be necessary to place an object into the ball orifice and press down to release the ball.) Discard the ball (9).

- Press down on the top of the stem (5) and remove through the bottom of valve body (4).
- 6a. Straight pattern assembly (2-way on/off) – remove and discard the stem o-rings (6) and stem bearing (8). Set stem (5) aside for later use.
- 6b. X-pattern assembly (3-way switching) – remove and discard the stem o-rings (6), back-up rings (7), stem bearing (8), and stem.
- Carefully, remove all lubricants and contaminants from inside the valve body.

## REASSEMBLY

### End Screws:

- Clean all lubricant or contaminants from end screws (18) (reusable).
- Apply a moderate coating of MS-LT-WL8-1 to the seat carrier back-up rings (15), carrier o-rings, and end screw seals (17).
- Place seat springs (13) onto the shank of the seat carrier assembly (12). Note: Valves with TFE seats have 3 seat springs per end screw. Valves with PCTFE, PEEK or Nylon seats have 6 seat springs per end screw.
- Place other components onto the shank of the seat carrier assembly (12) in the following order:
  - Metal seat carrier guide (14)
  - One plastic back-up ring (15)
  - Seat carrier o-ring (16)
  - One plastic back-up ring (15)
- Insert the seat carrier assemblies (12) into the end screws (18). Place an end screw seal (17) over each seat carrier assembly (12) and position on the end screws (18).

### End screw assemblies are now complete.

Proceed to either step #6a or 6b.

### Ball & Stem:

- 6a. **Straight pattern assembly (2-way on/off):**  
Before installing the stem (5) and the new ball (9), remove all lubricant and any contaminants from the stem (5).
- NOTE:** The ball (9) must be replaced to ensure a leak-tight seal with the new seat assemblies.

#### STEM Preparation:

- Apply a moderate coating of MS-LT-WL8-1 lubricant to the stem (smallest) o-rings (6).
- With the chamfer side up, place the stem bearing (8) on the stem (5).
- Place the stem o-rings (6) into the stem grooves.

### Stem assembly is now complete.

### BALL Preparation:

Place the two (largest) o-rings (11) and then the back-up rings (10) into the ball grooves.

### Ball assembly is now complete.

Skip to step #7.

### 6b. X-pattern assembly (3-way switching):

#### STEM Preparation:

- Apply a moderate coating of MS-LT-WL8-1 lubricant to the stem o-ring (6).
- With the chamfer side up, place the stem bearing (8) on the stem (5).
- Place the o-ring, TFE back-up ring, and the PEEK back-up ring (concave up) in the lower stem groove.
- Place the remaining TFE back-up ring in the upper stem groove.

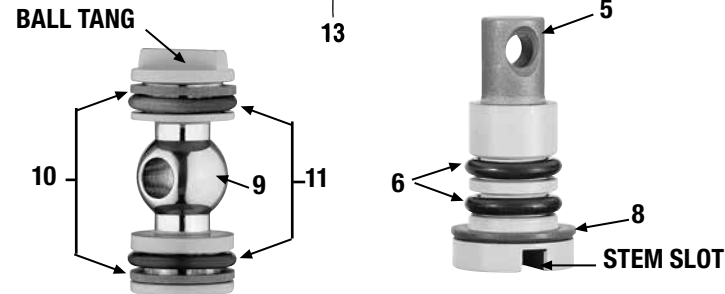
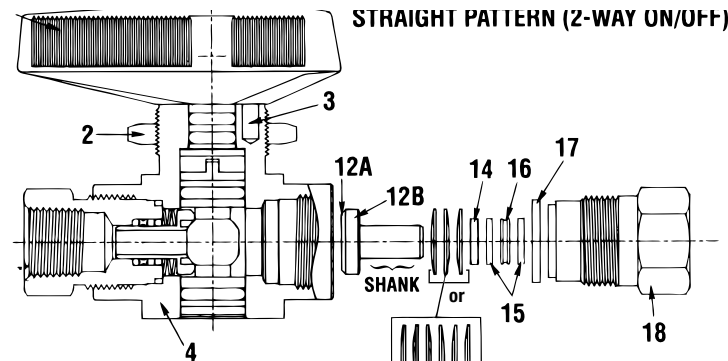
#### BALL Preparation:

- Place the upper and lower trunnion bearings (9A) into the ball grooves.

### Stem assembly is now complete.

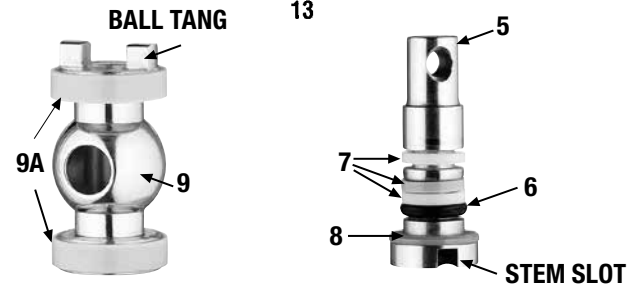
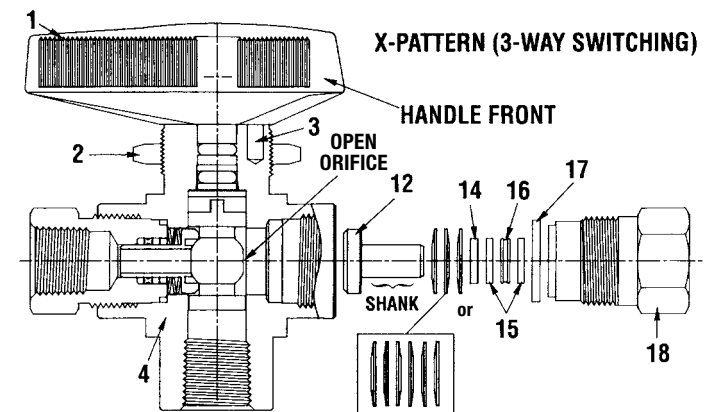
Proceed to step #7.

- Insert the stem (5) through the bottom of the valve body (4) and gently press the stem (5) up into position using a blunt instrument. Gently press upwards until the stem reaches its uppermost position against the body bore. Take care not to score the inside walls of the body bore, or to clip the stem o-rings (6) during installation. The stem hole should be perpendicular to the end screw holes to allow proper alignment with the handle (1).
- Place the handle (1) over the stem (5). {The X-pattern handle (1) should be installed by aligning the arrow on the top of the stem (5) with the arrow on the underside of the handle (1)}. Align the handle set screw hole with the stem hole. Place the set screw in handle (1) and tighten.
- Lightly lubricate the new ball and the trunnion bearings with MS-LT-WL8-1 and insert (tang up) through bottom of valve body (4). Press upward until the ball tang engages the stem slot. To test; turn handle, if ball rotates tang is engaged.
- NOTE:** For an X-pattern assembly, be sure the open orifice is positioned towards the handle (1) front.
- Fully** close (straight pattern) or center-off (X-pattern) the valve. Failure to do so may cause damage to the seat during torque procedure.
- Insert the end screw assemblies (18) and torque to 500 in.-lb each. (56.5 N-m).



## COMPONENTS

- HANDLE
- PANEL NUT
- STOP PIN  
(2 WITH 2-WAY, 1 WITH 3-WAY)
- BODY
- STEM
- STEM O-RINGS  
(2 WITH 2-WAY, 1 WITH 3-WAY)
- STEM BACK-UP RING (3) - (3-WAY ONLY)
- STEM BEARING
- BALL (3-WAY HAS TRUNNION BEARINGS)
- TRUNNION BEARINGS (3-WAY ONLY)
- BALL BACK-UP RINGS (2) - (2-WAY ONLY)
- BALL O-RINGS (2) - (2-WAY ONLY)
- SEAT CARRIER ASSEMBLY (2)
- SEAT SPRINGS
- SEAT CARRIER GUIDE (2)
- SEAT CARRIER BACK-UP RINGS (4)
- CARRIER O-RING (2)
- END SCREW SEAL (2)
- END SCREW (2)



# "H83P" SERIES BALL VALVE MAINTENANCE INSTRUCTIONS

MS-INS-83  
CP Revision I  
July, 2000

## Kit Contents:

|                            |                         |
|----------------------------|-------------------------|
| Ball                       | Stem                    |
| Seat Carrier Back-up Rings | Swagelok TFE Tape       |
| Springs                    | O-Rings                 |
| Carrier O-Rings            | Seat Carrier Assemblies |
| Stem Bearing               | End Screw Seals         |
| Instruction Sheet          | Stem Back-up Rings      |
| Seat Carrier Guides        | Lubricant               |
| Material Safety Data Sheet |                         |

**WARNING:** Before servicing any installed valve, you must  
 • depressurize system  
 • cycle valve

**WARNING:** Residual material may be left in the valve and system.  
**NOTE:** It is important to refer to the exploded view drawing while following the maintenance instructions.

## DISASSEMBLY

### End Screws:

1. Remove end screws (18) from valve body (4) and pull seat carrier assembly (12) apart from the end screw (18).
2. Discard all components except for the end screws (18). This includes the seat carrier assemblies (12), seat springs (13), seat carrier guides (14), backup rings (15), quad rings or carrier o-rings (16), and end screw seals (17).

### Ball & Stem:

3. Straight pattern only (2-way on/off) - remove plug (19) from bottom port. Clean and set aside for later re-installation.
4. Remove the set screw (not pictured) in handle (1) and remove handle. For X-pattern assemblies, note the position of the handle for reassembly.

**NOTE:** The ball (9) must also be replaced to ensure a leak-tight seal with the new seat assemblies.

5. Remove the ball (9) assembly through the bottom of the valve Body (4). (It may be necessary to place an object into the ball orifice and press down to release the ball). Discard the ball (9).
6. Press down on the top of the stem (5) and remove through the bottom of the valve body (4).
7. Remove and discard the stem o-rings (6), back-up rings (7), stem bearing (8), and stem.
8. Carefully, remove all lubricants and contaminants from the valve body (4).

## REASSEMBLY

### End Screws:

1. Clean all lubricant or contaminants from the end screws (18). Apply a moderate coating of MS-LT-WL7 to the seat carrier back-up rings (15), carrier o-rings (16), and end screw seals (17).
2. Place seat springs (13) onto the shank of each seat carrier assembly (12).
3. Place other components onto the shank of each seat carrier assembly (12) in the following order:
  1. Metal seat carrier guide (14)
  2. One plastic back-up ring (15)
  3. Seat carrier o-ring (16)
  4. One plastic back-up ring (15)
4. Insert the seat carrier assemblies (12) into the end screws (18). Place an end screw seal (17) over each seat carrier assembly (12) and position on the end screws (18).

### End screw assemblies are now complete.

Proceed to step #6

### Ball & Stem:

#### 5. STEM Preparation:

**NOTE:** The ball (9) must be replaced to ensure a leak-tight seal with the new seat assemblies.

- Apply a moderate coating of MS-LT-WL7 lubricant to the stem o-ring (6).
- With the chamfer side up, place the stem bearing (8) on the stem (5).
- Place the o-ring, a TFE back-up ring, and the PEEK back-up ring (concave up) in the lower stem groove.
- Place the remaining TFE back-up ring in the upper stem groove.

### Stem assembly is now complete.

Proceed to step #7

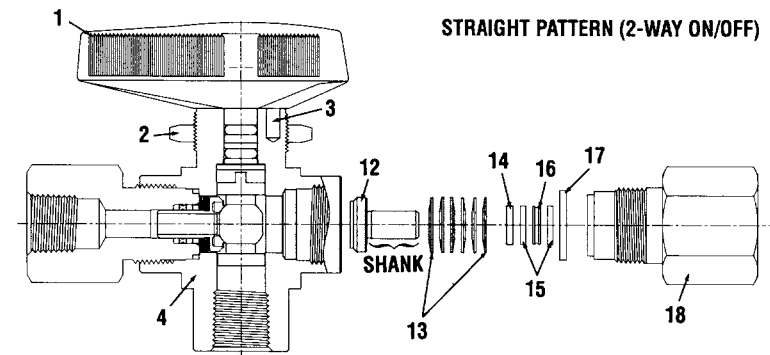
6. Insert the stem (5) through the bottom of the valve body (4) and gently press the stem (5) up into position using a blunt instrument. Gently press upwards until the stem reaches its uppermost position against the body bore. Take care not to score the inside walls of the body bore or to clip the stem o-rings (6) during installation. The stem hole should be perpendicular to the end screw holes to allow proper alignment with the handle (1).
7. Place the handle (1) over the stem (5). {The X-pattern handle (1) should be installed by aligning the arrow on the top of the stem (5) with the arrow on the underside of the handle (1)}. Align the handle set screw hole with the stem hole. Place the set screw in handle (1) and tighten.
8. Lightly lubricate the new ball with MS-LT-WL7 and insert (tang up) through bottom of valve body (4). Press upward until the ball tang engages the stem slot. To test; turn handle, if ball rotates tang is engaged.

**NOTE:** For an X-pattern assembly, be sure the open orifice is positioned towards the handle (1) front.

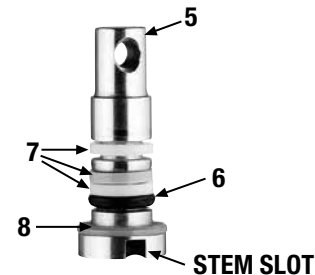
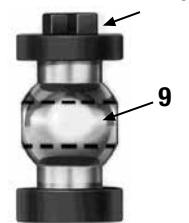
9. **Fully** close (straight pattern) or center-off (X-pattern) the valve. Failure to do so may cause damage to the seat during torquing procedure.

10. Insert the end screw assemblies (12-18) and torque to 600 in.-lb each. (67.8 N-m).

11. **Straight pattern assemblies (2-way on/off)** - use Swagelok TFE tape, supplied in kit, and wrap plug with two complete wraps. Insert plug into bottom valve body port and torque to 300 in.-lb. (33.9 N-m).



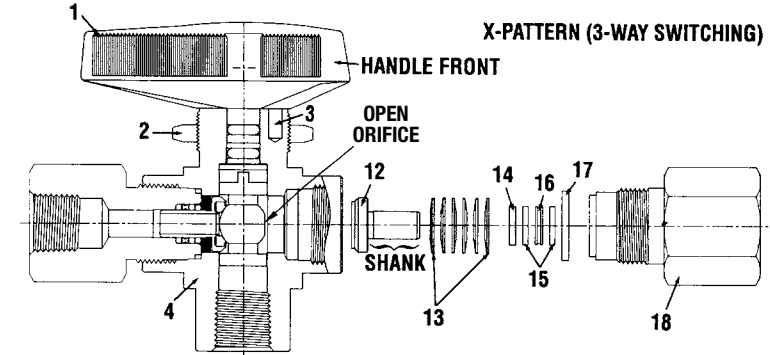
### BALL TANG



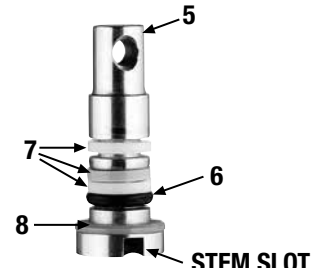
### STEM SLOT

## COMPONENTS

- 1 HANDLE
- 2 PANEL NUT
- 3 STOP PIN  
(2 WITH 2-WAY, 1 WITH 3-WAY)
- 4 BODY
- 5 STEM
- 6 STEM O-RING
- 7 STEM BACK-UP RINGS (3)
- 8 STEM BEARING
- 9 BALL
- 12 SEAT CARRIER ASSEMBLY (2)
- 13 SEAT SPRINGS (12)
- 14 SEAT CARRIER GUIDE (2)
- 15 BACK-UP RING (2)
- 16 CARRIER O-RINGS (2)
- 17 END SCREW SEALS (2)
- 18 END SCREW (2)
- 19 PLUG (2-WAY ONLY)



### BALL TANG



### STEM SLOT