

**Table 1**

Pos.	Quant	Description
1	1	Body 1
2	2	Body 2
•• 3	1	Ball
• 4	2	Seat
•• 5	1	Stem
• 6	1	Stem seal
• 7	1	Stem packing
13	-	Cover bolt
• 14	2	Body seal 1
•• 19	1	Spring
•• 20	1	Antistatic ball
22	4	Stop pin
• 34	2	Body seal 2
• 35	2	Stem O-ring
41	-	Stud
42	-	Nut
• 44a	2	Ring seat 1
44b	2	Ring seat 2
45	-	Spring seat
• 46	2	Seat seal
50	1	Subjection ring
86	1	Drain plug
86a	1	Vent plug
• 108	2	Seat O-ring
• 109	2	Cover seal
•• 110	1	Subjection ring seal
• 127	2	Stem bearing
128	1	Body cover 2
• 148	2	Cover O-ring
149	1	ISO cover
151	1	Body cover 1
152	-	Body cover 1 bolt
153	-	ISO cover bolt
163	-	Body cover 2 bolt
• 165	1	Stem bearing

- Start-up: 5% of ordered quantity
- SOFT PARTS KIT
- METALLIC PARTS

Suggested materials to be checked at least every five (5) year service.  
**See point 5 (Maintenance)**

Torque screw tightness values for bolts (Nr. 41 & 42) can be found attached in document DC-08-07-03 PF "Screw torque".

## 1. SCOPE

This manual is intended as a guide to assist customers or end-users in the correct storage, installation and maintenance of PEKOS ball valves.

## 2. APPLICABILITY

This manual is applicable to full trunnion ball valves as per norm ANSI in the following pressures and sizes: Full Bore: NPS 2" & 3" Class 300; NPS 2" – 3" Class 600 & Reduced Bore: NPS 2 1/2" & 4" Class 300; NPS 2 1/2" – 4" Class 600.

## 3. STORAGE

### 3.1 Maintenance during storage


- a. Stainless steel and carbon steel valves should be stored separately, to protect the stainless steel against corrosion.
- b. Valves must remain in open position with plastic end covers fitted.
- c. If possible, it would be advisable to leave the ball valves in their own packing cases.
- d. Valves to be stored for a long time shall be checked by the quality control personnel every 6 months.
- e. Degreased valves shall only be unpacked before installation.

### 3.2 Environment conditions

- a. Valves shall be stored in dry conditions. Other corrosive environment conditions must be also avoided.
- b. Valves must be protected against ambient dust.

## 4. INSTALLATION

- a. Verify that valves have not been damaged during transit. Inspect inside of the valves and the pipeline of the installation to be able to verify there are no strange particles.
- b. It is advisable to use protective filters during the installation and check-in period while the possibility of dirt or even oxidation of the pipes exists. They have to be used until pipes are absolutely free of particles in suspension.
- c. If possible, valve shall be mounted in such way to allow periodic inspections.
- d. Valves are bidirectional, so fluid can run in both directions.
- e. Valves can be mounted in any position, but it is advisable to mount the valves with the stem in vertical position.
- f. It is necessary to obtain correct alignment and parallelism to avoid any kind of stress.

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		Full Bore	Reduced Bore	
		Class 300 NPS 2" & 3" Class 600 NPS 2" – 3"	Class 300 NPS 2 ½" & 4" Class 600 NPS 2 ½" -4	

- g. Once the installation is completed, valve must be operated for at least one opening and closing action to ensure perfect operation.
- h. After cleaning, protective filters could be removed.
- i. Protective filters should remain installed on dirty applications.

## 5. MAINTENANCE

Pekos recommends inspecting the valves at least every five (5) years. These inspection intervals could be affected by the process service (fluid, temperature, service, and cycles), and environmental condition.

### 5.1 Valves revision

PEKOS ball valves do not need lubrication.

*Ball (3), seats (4), stem (5), stem seal (6), stem packing (7), body seals (14 and 34), stem o-ring (35), seat seals (46), seat o-ring (108), cover seal (109), bearings (127), cover o-ring (148) and stem bearing (165)* can be replaced easily using common tools. As replacement pieces is advisable to follow the instructions below table 1.

Prior to carrying out work on valves the pipeline must be completely empty, including the ball valve body cavity by half opening valve to allow any pressure build up to escape.

Care must be taken to avoid contact with dangerous or toxic chemical products. The valves must be thoroughly cleaned, in particular the body cavity, before handling and dismantling.

### 5.2 Stem leakage

- a. Remove *subjection ring (50) and o subjection ring seal (110)*. Remove *ISO cover (149) and body cover 1 (151)* by loosening *cover bolts (153) and body cover 1 bolts (152)*.
- b. Remove the *stem o-ring (35)*, the *cover o-ring (148)*, the *cover seal (109)*, the *stem packing (7)*, the *stem seal (6)* and the *stem bearing (165)*, and replace them.
- c. Reassemble the pieces accordingly as it is indicated in point 6.
- d. This process can be carried out with the valve under pressure due to the *double block and bleed* characteristic. The only condition is that the valve must be totally opened or totally closed.

### 5.3 Body leakage

These ball valves PEKOS ANSI are constructed in 3 pieces, *body (1)* and 2 *ends (2)*. Body fasteners should be checked for tightness. If leakage occurs and if necessary, *body seals (14) and (34)* should be replaced as it is shown:

- a. Make alignment marks on the *body (1)* and *ends (2)* prior to dismantling, to ensure a correct alignment when reassembling.
- b. Remove *nuts (42)* and disassemble the *adaptors (2)*.
- c. Substitute *body seals (14 and 34)*.
- d. Assemble the pieces accordingly as it is indicated in point 6.

### 5.4 Seat leakage


- a. Maintain the valve in the closed position, loosen and remove the *nuts (42)*, remove the *bodies 2 (2)* from the *body (1)*. Remove the *seat (4) – ring seat1 (44a)* sets and change them. If necessary, replace the *seat o-ring (108)* and *seat seals (46)*.
- b. The *bearings (127)* can be replaced removing the *ball (3)* from the *body 1 (1)*. To remove the *ball (3)*, the *body cover 1 (151)* and the *body cover 2 (128)* have to be removed loosening the *bolts (163 and 152)*.
- c. Reassemble the pieces accordingly as it is indicated in point 6.

### 5.5 Body cover 2 leakage

- a. Loosen the *body cover 2 bolts (163)* to remove the *body cover 2 (128)*.
- b. Replace the *cover seal (109)* and the *cover o-ring (148)*.
- c. If the *bearing (127)* is damaged, remove the *ball (3)* as it is indicated in the 5.4 point.
- d. Reassemble the pieces accordingly as it is indicated in point 6.

## 6. ASSEMBLY

- a. Prior to re assembly all components and body cavity should be cleaned of any incrustation, dirt, rust etc., especially in the locations of seats & seals.
- b. Place the *cover o-ring (148)* and the *cover seal (109)* in the *body cover 2 (128)*.
- c. Place the other cover seal (109) and the stop pins (22) in the body 1 (1).
- d. Put the *stem packing (7)*, the *stem o-rings (35)* and the *cover o-ring (148)* in the *body cover 1(151)*.
- e. Put the *stem seal (6)* into the *stem (5)*. Check the *antistatic devices (pos. 19, 20)* and assembly the *stem (5)* into the *body cover 1 (151)*.
- f. Insert the *bearings (127)* in the *ball (3)* and introduce the *ball (3)* into the *body 1 (1)*. Hold the *ball (3)* while the *body cover 2 (128)* and the *stem (5) – cover body 1 (151)* set are being introduced into the body 1 (1). The *ball (3)* must be guided by both body covers.
- g. Put the *stop pins (22)* into their housings of *body 1 (1)*.
- h. Join the body covers (128 and 151) with the body 1 (1) by means of bolts (163 and 152).
- i. Place the *spring seats (45)* into their housings in the *body 2 (2)*. Introduce the *ring seats 2 (44b)* and the *seat seals (46)* in the *body ends (2)*. Put the *seat o-rings (108)* in the *seat (4) – ring seat 1 (44a)* sets and introduce them in the *body ends (2)*.
- j. Put the *body seals (14 and 34)* into their housing of the *body 1 (1)* and assemble the *body 1 (1)* with the *body ends (2)*. Join them by means of *studs (41)* and *nuts (42)*.
- k. Maintain the valve in its closed position and position body adaptors (2) to body (1) ensuring that alignment marks are matched. Assemble studs (41) and the nuts (42) evenly tighten in diagonal using a torque wrench and the values indicated attached in document DC-08-07-03 PF "Screw torque".
- l. After placing the *pins (22)*, place the *ISO cover (149)* and the *stem bearing (165)* in the *body cover 1 (151)*, place the *ISO cover bolts (153)* and *cover bolts (13)* and tighten them.
- m. Place de *subjection ring (110)* and *subjection (50)* into the *stem (5)*.

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- n. Screw the *drain* and *vent plugs* (86 and 86a).
- o. If the valve contains handle, put the *handle* (16) into its housing in the *stem* (5), and tighten the *handle bolt* (17).
- p. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats* (4) and *ball* (3).
- q. Carefully cycle the valve twice in order to check the correct working. *Stem* (5) should rotate smoothly offering resistance as indicated by the manufacturers torque figures. Tests should be carried out according to API 598, at the pressure rating that corresponds to the valve, before reinstallation.

The end user is responsible, in case that the fluid is not communicated, checking the compatibility of the service media/ fluid with the valve materials.