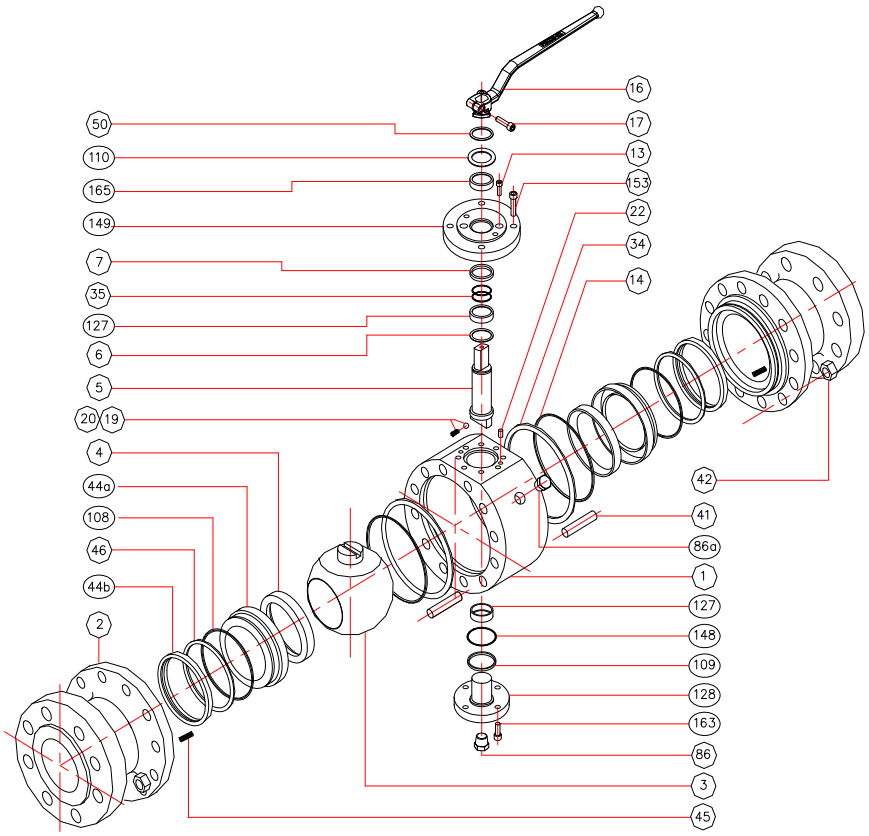

Table 1

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	2	*Cover bolt*
• 14	2	*Stem seal*
16	1	*Handle*
17	1	*Handle bolt*
•• 19	1	*Spring*
•• 20	1	*Antistatic ball*
22	-	*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	1	*Cover seal*
110	1	*Subjection ring seal*
• 127	2	*Bearing*
128	1	*Body cover 2*
• 148	1	*Cover O-ring*
149	1	*ISO cover*
153	-	*ISO cover bolt*
163	-	*Body cover 2 bolt*
• 165	1	*Stem bearing*

- • Start-up: 5% of ordered quantity
- • SOFT PARTS
- •• 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 ½" – 1 ½" Class 300, NPS ½" – 1 ½" Class 600 & Reduced Bore: NPS ¾" – 2" Class 300, NPS 3/4" – 2" 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.
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. Protective filters should remain installed on dirty applications.

5. MAINTENANCE

PEKOS recommends inspecting the valves at least every five (5) years. Although the inspection intervals depend on service (fluid, temperature, pressure, and cycles), and environmental condition and Pekos' recommendations.

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-rings (35), seat seals (46), seat o-rings (108), cover seal (109), bearings (127), cover o-ring (148) and *stem bearings (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. Loosen *bolts (13 and 153)* from *ISO cover (149)*. Remove the *ISO cover (149)*, and *subjection ring (50), subjection ring seal (110)* and *stem bearing (165).*
b. Remove the *studs and bolts (41, 42)* from one *body 2 (2)*.
c. Remove the *cover 2 bolts (163)* from the *cover 2 (128)*.
d. Once the body 2 (2) and cover body 2 (128) have been separated from body 1 (1), *ball (3)* and *stem (5)* can be removed.
e. Remove the *stem o-ring (35),* the *stem packing (7)*, the *stem seal (6)* and the *bearing (127),* and replace them.
f. Reassemble the pieces accordingly as it is indicated in point 6.

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 *studs (41)* 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 seat 1 (44a)* sets and change them. If necessary replace the *seat o-rings (108)* and the *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 2 (128)* has to be removed loosening the *bolts (163).*
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. Put the *stem o-rings (35)* and the *bearing (127)* in the *body 1(1)*.
c. Put the *stem seal (6)* into the *stem (5)*. Check the *antistatic devices (pos. 19, 20)*.
d. Assembly the *stem (5)* into the *body 1 (1)* and put the *stem packing (7)* into its housing.
e. Insert the *bearing (127)* in the *ball (3)*, and introduce the *ball (3)* aligning it with the *stem (5).*
f. Put the *cover seal (109) and* the *cover o-ring (148)* in the *body cover 2 (128)*.
g. Join the *body cover (128)* with the *body 1 (1)* by means of *bolts (163).* Assure that the *ball (3)* is guided through the *body cover 2 (128).*
h. 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).*
i. 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)* tightening them in diagonal using a torque wrench and the values indicated attached in document DC-08-07-03 PF "Screw torque".
j. After placing the *pins (22)*, place the *ISO cover (149)* and the *stem bearing (165)* in the *body 1 (1),* place the *cover bolts (153 and 13)* and tighten them.
g. Place de *subjection ring seal (110)* and *subjection (50)* into the *stem (5).*
h. Screw the *drain* and *vent plugs (86 and 86a).*
i. If the valve contains handle, put the *handle (16)* into its housing in the *stem (5)*, and tighten the *handle bolt (17)*.
j. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and *ball (3)*.
k. 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.