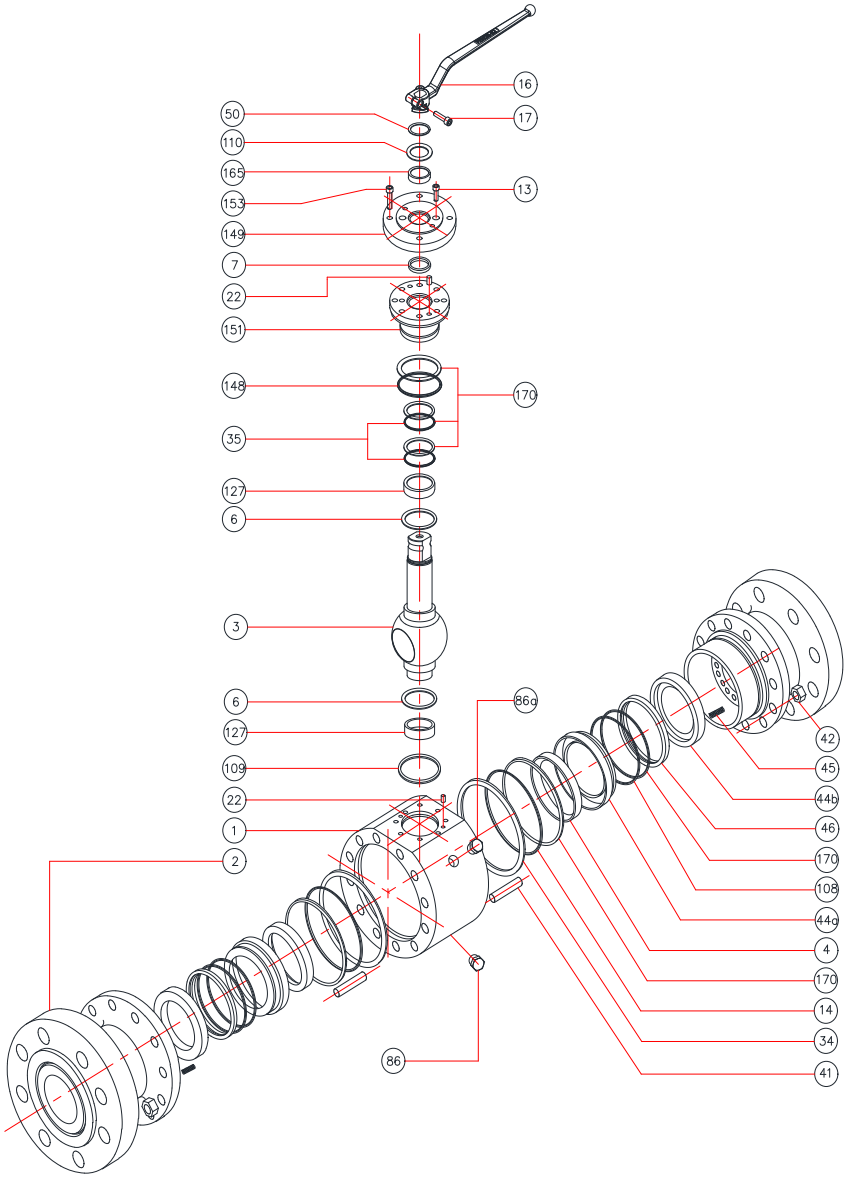

Table 1

Pos.	Quant.	Description
1	1	*Body 1*
2	2	*Body 2*
•• 3	1	*Ball-stem*
• 4	2	*Seat*
• 6	2	*Stem seal*
• 7	1	*Stem packing*
13	2	*Cover bolt*
• 14	2	*Body seal 1*
16	1	*Handle*
17	1	*Handle bolt*
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*
• 148	1	*Cover O-ring*
149	1	*ISO cover*
151	1	*Body cover 1*
153	-	*ISO cover bolt*
• 165	1	*Stem bearing*
• 170	7	*Stop seal*

- • 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 2500 & Reduced Bore: NPS ¾" – 2" Class 2500.

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. If the valves are degreased, they shall only be unpacked before installation. The cleanliness is of utmost importance as the functionality of the valve depends on a proper cleanliness.
b. Valves shall be stored in dry conditions. Other corrosive environment conditions must be also avoided.
c. 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. If the valves are bidirectional, the fluid can run in both directions. If the valves are unidirectional, the fluid can run in only one direction (as it is indicated in the valve).
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. 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.
Seats (4), ball-stem (3), stem seals (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), the *stem bearing (165) and stop seals (170)* can be replaced easily using common tools.
As replacement pieces is advisable to follow the instructions below table1.
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. To remove the *ball-stem (3)*, both *body 2 (2)* have to be disassembled.
b. Remove *subjection ring (50)* and *subjection ring seal (110).* Remove *ISO cover (149),* the *stem bearing (165)* and *body cover 1 (151)* by loosening *cover bolts (153 and 13)*.
c. Remove the *stem O-ring (35),* the *stop seals (170),* the *stem packing (7)*, the *stem seals (6*), the *cover seal (109),* the *cover O-ring (148)* and the *stem bearings (127) and* replace them.
d. 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 (1)* and 2 *body 2 (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 (1)* and *both body 2 (2)* prior to dismantling, to ensure a correct alignment when reassembling.
b. Remove *studs (41)* and disassemble the *body 2 (2).*
c. Substitute *body seals (14 and 34)* and *stop seals (170).*
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 both *body 2 (2)* from the *body 1 (1).* Remove the *seat (4) – ring seat 1 (44a)* sets and change them. If necessary, replace the *seat O-rings (108)*, *stop seals (170)* and the *seat seals (46).*
b. The *bearings (127)* can be replaced removing the *ball-stem (3)* from the *body 1 (1).*
c. Reassemble the pieces accordingly as it is indicated in point 6.

6. ASSEMBLY

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.

If the valves are degreased, prior to re-assembly, all components and body cavity should be totally cleaned and degreased.

If the valves are unidirectional, the ball must be assembled with the unidirectional hole pointing towards fluid exit.

a. Place one *bearing (127)*, the *stem O-rings (35),* the *cover O-ring (148),* the *stop seals (170)* and the *cover seal (109)* in the *body cover 1(151).*
b. Assembly the *ball-stem (3)* into the *body cover 1 (151)* and put the *stem packing (7)* into its housing.
c. Insert other *bearing (127)* in its housing in the *body 1 (1).*
d. Place the *stem seals (6)* in the *ball-stem (3).* Introduce the *ball-stem (3) / body cover 1(151)* set in the *body 1 (1).*
e. 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 2 (2).* Put the *seat O-rings (108)* and the *stop seal (170)* in the *seat (4) – ring seat 1 (44a)* sets and introduce them in the *body 2 (2).*
f. Put the *body seals (14*) into their housing of the *body 1 (1).* Put the *body seals (*34) and the *stop seal (170)* into their housing of the *body 2 (2).*

g. Assemble the *body 1 (1)* with the *body 2 (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".
h. Place the *ISO cover (149)* over the *body cover 1 (151)*. Place the *cover bolts (153 and 13)* and tightens them.
i. Place the *stem bearing (165)* into the *ISO cover (149)*. Place the *subjection ring seal (110)* and the *subjection ring (50)* into the *ball-stem (3)* and tighten the *bolts (13)*.
j. Screw the *drain* and *vent plugs (86 and 86a)*.
k. If the valve contains handle, put the *handle (16)* into its housing in the *ball-stem (3)*, and tighten the *handle bolt (17)*.
l. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and *ball-stem (3)*.
m. Carefully cycle the valve twice in order to check the correct working. *Ball-stem (3)* 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.