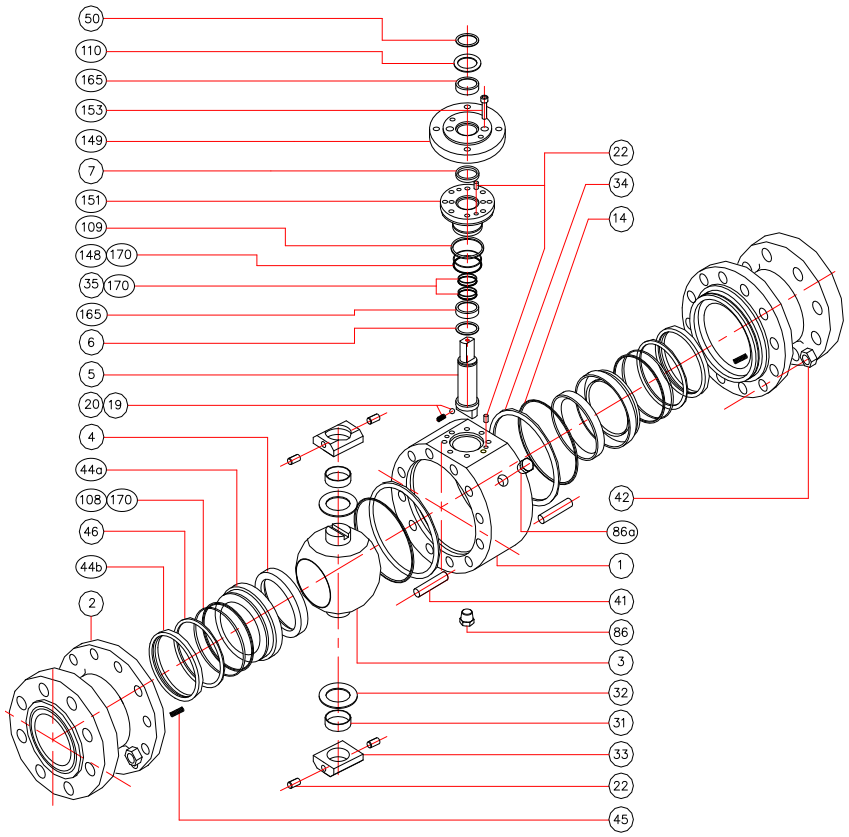

Table 1

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*
• 14	2	*Body seal 1*
•• 19	1	*Spring*
•• 20	1	*Antistatic ball*
22	4+4	*Stop pin*
• 31	2	*Bearing*
• 32	2	*Bearing disk*
33	2	*Support bearing*
• 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*
• 148	1	*Cover O-ring*
149	1	*ISO cover*
151	1	*Body cover 1*
153	-	*ISO cover bolt*
• 165	2	*Stem bearing*
• 170	7	*Stop seal*

- • 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 DIN in the following pressures and sizes: Full Bore: PN 160 -250 DN 80-500; PN 320 -400 DN 50-300 & Reduced Bore: PN 160 -250 DN 100-500; PN 320 -400 DN 65-300.

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.
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-rings (35), seat seals (46), seat o-rings (108), cover seal (109), cover o-ring (148), stem bearings (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. Remove *subjection ring (50)* and *subjection ring seal (110),* remove *ISO cover (149)* and *body cover 1 (151)* by loosening *cover bolts (153).*
b. Remove the *stem o-ring (35)*, the *cover o-ring (148), stop seals (170),* the *cover seal (109),* the *stem packing (7)*, the *stem seal (6)* and the *stem bearings (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 DIN 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.
e. This process has to be done in one *body end (2),* and later on, in the other one.

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),* stop seals *(170)* and the *seat seals (46).*
b. Reassemble the pieces accordingly as it is indicated in point 6.
c. This process has to be done in one *body end (2),* and later on, in the other one.

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 *bearings (31)* in the *support bearings (33)* and the *bearing disks (32)* in the *ball (3).*
c. Put the *stem bearing (165),* the *stem o-rings (35),* the *cover o-ring (148),* stop seals *(170),* the *stem packing (7)* and the *cover seal (109)* onto the *body cover 1(151).*
d. Check the *antistatic devices (pos. 19, 20).*
e. Put the *stem seal (6)* in the *stem (5).* Assembly the *stem (5)* into the *body cover 1 (151).*
f. Place the *spring seats (45)* into their housings in the *body 2 (2).* Introduce the *ring seats 2 (44b)* and *seat seals (46)* in the *body ends (2).* Put the *seat o-ring (108)* and *stop seals (170)* in the *seat (4) – ring seat 1 (44a)* sets, and introduce them in the *body ends (2).*
g. Assemble the *support bearing (33)* in the *ball (3)* using the *pins (22)* in one of the *body ends (2).*
h. 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).*
i. 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.
j. After placing the *pins (22)*, place the *body cover 1 (151)* together with the *stem (5)* into its housing in the *body 1 (1).*
k. After placing the *pins (22)*, place the *ISO cover (149)* together with the *stem bearing (165)* in the *body cover 1 (151),* place the *ISO cover bolts (153)* and tighten them.
l. Place the *subjection ring seal (110)* and *subjection ring (50)* into the *stem (5).*
m. Screw the *drain* and *vent plugs (86 and 86a).*
n. Slowly cycle the valve until completing 1 cycle to ensure coupling between the *seats (4)* and the *ball (3).*
o. 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 EN 12266-1, 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