

JC BALL VALVES
ASSEMBLY AND MAINTENANCE PROCEDURES
DOC. MMM2500I

STF SERIES (Split body, Internal full trunnion and Full port)

Fig. 2510, 2516, 2525, 2540, 2563 & 2599

Fig. 2515, 2530, 2560

STR SERIES (Split body, Internal full trunnion and Reduced port)

Fig. 2610, 2616, 2625, 2640, 2663 & 2699

Fig. 2615, 2630, 2660

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1.- GENERAL INFORMATION

1.1. DELIVERY

- 1.1.1. All JC valves are delivered packed and protected.
- 1.1.2. Flanges must remain protected with end caps up to the assembly to pipe or equipment.
- 1.1.3. Valves are shipped in fully open position to prevent damage of seats and ball surface.
- 1.1.4. All remarks and instructions attached to valves and actuators must be followed strictly.

1.2. IDENTIFICATION

- 1.2.1. Usually the valves take attached his identification dossier.
- 1.2.2. Following valve characteristics are marked in the body:
JC mark, flanges size and rating, shell material, pouring number both of body and adapter (except in cast iron valves where pouring number is not included) and pattern number.
- 1.2.3. Carbon and stainless steel valves are identified by a stainless steel label welded on the flange with the information according the standard applicable. Use this label always as reference.

2.- INSPECTION AT RECEPTION AND STORAGE

- 2.1. All valves will be inspected at reception, to check if there are damages due to transport. Supplier will be informed about all damaged valves as soon as possible.
- 2.2. Valves will be stored in closed area duly protected.
- 2.3. Valves must not remain unpacked before assembly except for inspection.

3.- INSTALLATION

- 3.1 Connections caps will be removed before installation and threads or flanges facing must be cleaned.
- 3.2 Valves can be installed in any direction. So, flow will be in the way of arrow. Connections flanged meet ANSI B16.5 or DIN 2501 Standards. Connections threaded meet DIN 299 or ANSI B.2.1. female.
- 3.3 Counter flanges must be parallel and their centers aligned. The distance between their raised faces must be sufficient to mount the valve and the gaskets without producing traction or compression stresses on the valve.

4.- INSTALLATION HYDROSTATIC TEST

- 4.1. If a hydrostatic test has to be carried out, this will be done with the valve in the half-open position.

5. - LEAKS FOR THE PACKING

- 5.1 If a packing leak is observed:
Valves to DN-10" Class 150 and 300 or to DN-4" Class 600: Tighten the gland nut 1/8 of turn.
Valves greater than 10" Class 150 and 300 or greater DN-4" Class 600: Tighten the gland (10) by means of the bolts (26); repeat the operation until parts (10) or (9) come into contact with the body (1).
If the leak still continues substitute the packing.

6. - LEAKS FOR THE BODY CONNECTOR SEALS

- 6.1. Should a leak be observed in the body connector seals (13) (52), this seals must be changed.

7. REPLACING OF THE PACKING

We recommend, when the gland packing needs to be replaced, that the seats, the body connector seal and the stem thrust seals should also be changed. However if, due to production requirements, it is not possible to remove the valve from the line, then the sequence below should be followed:

DISASSEMBLY

- 7.1** Make sure that the installation is not under pressure.
- 7.2.a** Valves to DN-10" Class 150 and 300 or to DN-4" Classes 600: Remove the wrench (6) or the worm gear (92), the locking washer (46), the gland nut (7), the disk springs (8), and the spacer (41) should there be one. Remove the stop plate (9), marking the top face for the assembly, the PTFE thrust washer, packed with glass fibre (18) and the gland (10).
- 7.2.b** Valves greater than 10" Class 150 and 300 or greater DN-4" Class 600: Remove the worm gear (92), the key (47), the stop (9) marking the top face for the assembly, the retaining washer (471), the spring protector (58), the spring (8) and the gland (10) that it takes housed the case guides (75).
- 7.3** Take out the gland packing (11), without damaging the surfaces of the body and the stem.
- 7.4** Fit the new gland packing (11).

ASSEMBLY

- 7.5.a** Valves to DN-10" Class 150 and 300 or to DN-4" Classes 600:: Fit the gland (10), the new PTFE thrust washer, packed with glass fibre (18), the stop plate (9), marked on the top face, the spacer (41), should there be one, the disk springs (8), the locking washer (46) and tighten the gland nut (7) to the torque specified in section 11. Then, to bend the fluke (46) that coincides with one of the faces of the nut on her.
- 7.5.b** Valves greater than 10" Class 150 and 300 or greater DN-4" Class 600: To house the case guides (75) into the gland (10). To mount it by means the bolt (26) to the original point of tightness. Fit the spring (8), the spring protector (58), the retaining washer (471) and the stop (9) with its surface marked on the top face.
- 7.6.** Before refitting the handle, or wrench, test the valve under pressure to make sure that the gland is seal tight. Should you detect a leak then consult section 5.
- 7.7.** Re-assemble the wrench (6), or the worm gear (92).

8. DISASSEMBLY AND REPLACEMENT OF SEATS, PACKING AND GASKETS

- 8.1. Make sure that the installation is not under pressure.
- 8.2. Remove the valve from the line. If the circulating fluid is noxious or inflammable, then all necessary precautions must be taken to avoid accidents.
- 8.3. Undo the bolts (15), or nuts (28) which attach the body connector to the body, bearing in mind that there may well be fluid trapped in the body cavity. Separate the body connector (2) from the body (1). Remove the seal (13) and the "O" ring (52). Take the precaution of retaining the keys (43) of the ball trunnion (21).
- 8.4. Remove the seat-subset, consisting of:
Valves to DN-4": The seat carrier (31) with the seat ring (5), the "O" ring (33), the graphite seat seal (54) and the spring (32).
Valves greater DN-4": The seat carrier (31) with the seat ring (5), the "O" ring (33), the graphite seat seal (54). Remove the carrier spring (35) and the spring (32).

Note: in valves with metal seats, the seat (31) disappears, forming a part of the seat ring (5).
- 8.5. Turn the ball (3) to the closed position and remove it from the body. The trunnion bearings (22) the trunnion (21) and the bearing (23) are mounted on the ball trunnions, check them to make sure they have not seized.
Clean the exterior surface of the ball, of port and the slot.
Make sure that the exterior surface of the ball, particularly the part which comes into contact with the seats and the transition radius, between the exterior surface and the port. If the surface or the slot of the ball are damaged, replace the ball with a new one.
- 8.6. Remove the seating subset, as in 8.4.
- 8.7. To disassemble the stem. For this operation follow sections 7.2.a., 7.2.b and 7.3., subsequently take the stem out through the interior of the body. Remove the stem thrust seal (12) and the stem "O" rings (72), where applicable: if it is a question of a design for gas then the stem will incorporate one or two (as in the figures) "O" rings, which must be replaced.
- 8.8. Clean the interior surfaces of the body and the body connector, particularly those areas which house the seats, the body seal, the stem thrust seal and the gland packing.
- 8.9. Clean and check the stem. Make sure that the antistatic device (19) is working correctly, by pushing the balls inwards in their housings, and checking that they return to their position. If any of the balls are seized, or the surface of the stem is damaged, replace the stem with a new one.

9. ASSEMBLING THE VALVES

- 9.1.** Before assembling the parts make sure that they have not suffered any damage and that both they, and the inside of the valves, are perfectly clean.
- 9.2.** Make sure that any replacement parts are JC originals, using the same materials and with the same dimensions as the parts which they replace.
- 9.3.** The stem thrust seal (12) is fitted onto the stem (4). In the spare parts set there are two thrust seals. In certain of the rated dimensions these are the same: should they be different then the stem thrust seal will be the one with the larger gauge.
Fit the "O" ring (72) (two in the figures) over the stem slot, in the case of gas designed valves.
- 9.4.** To house the case guides (39) in the body and next to introduce the stem into its housing.
- 9.5.** Assemble the packing and the rest of the parts, as described in sections 7.5.a and 7.5.b.
- 9.6.** Fit the seat-subset into the body, following in reverse order the steps indicated in section 8.4., do not forget to attach the new graphite seat seal (54) and the "O" ring (33).
- 9.7.** Turn the stem (4) to the closed position so that it can be inserted into the ball slot. Assemble the ball (3) in the closed position, with the trunnion (21), the trunnion bearing (22) and the bearing (23) mounted, making sure there is no give between the slot and the stem. To verify that the lodgings of the keys (43) of the trunnion are in the area of union of the body (1) with the body connector (2). To place the keys (43) in their lodgings.
- 9.8.** Fit the other seat-subset into the body connector, following the steps indicated in section 9.6. Fit the body connector seal (13) into the body housing and the "O" ring (52) onto the body connector.
- 9.9.** Attach the body connector (2) to the body. In some rated diameters, the body connector has a specific position, due to the fact that the number of bolts which attach the body to the body connector is not the same as or a multiple of the number of flange bolts. Make sure that the holes on both flanges are in the same position in relation to the stem symmetry of the valve. Take care with the keys (43).
- 9.10.** Make up the nuts (28), or bolts (15), depending on the type of valve, following the established sequence until there is metal to metal contact between the body and the body connector.
- 9.11.** Assemble the wrench (6), or the worm gear (92).
- 9.12.** Before re-connecting the valve to the line, test it in the half-open position, to make sure that the gland packing and the body connector seals are leak-tight and, in continuation, close it to test the leak-tightness of the seats and seat rings.

10. MAINTENANCE

- 10.1.** One of the distinguishing factors of ball valves is that they do not need any maintenance. However, after they have initially been brought on line, after every adjustment, or when they have been stripped down, they need checking over to make sure that there are no leaks caused by the possible presence of foreign matter in the pipes, which could damage the seats. This check is not necessary if you are 100% certain that the installation has been thoroughly cleaned.
- 10.2.** The state of the paint- work on the carbon steel of the valves must be regularly checked to avoid the oxidation of areas without surface protection.
- 10.3.** Should any parts need to be replaced then this must be done with JC originals.
- 10.4.** When asking for spare parts, specify whether the valves are DIN or ANSI, or whether they differ in any way from our manufacturing standard. In all cases quote the data from the identification plate.

11. GLAND NUT MAXIMUM TIGHTENING TORQUE

RATED DIAMETER (1) MAX. TIGHTNESS TORQUE IN m.Kp

15	2
20	2
25	2
32	2.5
40	4
50	4
65	6.5
80	7.5
100	8
125	8.5
150	9
200	21
250	21

(1) See PORT DIAMETER for valves with a reduced port.

12. BOLTS BODY-INSERT FLANGE TIGHTENING TORQUE

- THREAD METRIC (*)

- THREAD UNC (**)

YIELD POINT 0.2%					YIELD POINT 0.2%				
(Kg/mm ²)	30	64	108	45	(Kg/mm ²)	21	55	72.4	55
Material	5.6	8.8	12.9	A.2	Material	B8/B8M	L7M	B7	B7M
ØBolt					ØBolt				
M.6	0.61	1.26	2.06	0.95	3/8"	1.57	4	5.44	4
M.8	1.48	3.06	5.0	2.3	7/16"	2	5.5	7.4	5.5
M.10	2.94	6.06	10	4.55	1/2"	2.6	7	9.5	7
M.12	4.27	10.5	17	7.9	9/16"	4.2	11	15	11
M.14	8.2	17	27	12	5/8"	6.3	16.5	22.5	16.5
M.16	12	26	43	20	3/4"	10	27	37	27
M.18	17	36	59	27	7/8"	16.8	44	59	43
M.20	25	54	86.5	40	1"	25	65	87	72
	34	70	114	52	1.1/8"	35	93	125	93
					1.1/4"	48	128	171	128
					1.3/8"	70	167	223	167
					1.1/2"	95	247	330	247

(*) It is assumed: Lubrication with SAE 10 and load lower than 80% of Yield Point.

(**) It is assumed: Coefficient of friction 0.12 and load lower than 75% of Yield point.