MANUAL
Ball valve AL 35-77

Introduction

Three-piece ball valve allows easy replacement of gasket, seal, and seats without special tools. AL 35-77 ball valves use "floating ball design. Induced by the line pressure, the ball is free to move horizontally inside the valve body. The valve is capable of tight shutoff with flow in either direction or dead-end, regardless of the position of the valve in the line. The downstream seat, opposite the pressurized side of a closed valve, carries the load exerted by the line pressure on the ball, while the upstream seat is subject to little load or wear. For this reason, it is sometimes possible to increase seat life by turning the valve end-for-end in the pipeline.

1. Use

1.1 Maximum results and long life of the valves can be maintained under normal working conditions and according with pressure/temperature rating and corrosion data chart.

2. Manual operation

2.1 The opening and closing of the valve is done by turning the lever a ¼" turn (90 degrees).

A. Valve in Open Position the lever is in line with the valve or pipe line.

B. Valve in Closed Position the lever is at right angle with the valve or pipeline.

3. Disassembly and cleaning procedure

Caution: ball valve can trap fluids in the ball cavity when closed.

3.1 If the valve has been used to control hazardous media, it must be decontaminated before disassembly. It is recommended that the following steps are taken for safe removal and reassembly.

A. Relief the line pressure.

B. Place valve in half-open position and flush the line to remove any hazardous material from the valve.

C. All persons involved in the removal and disassembly of the valve should wear the proper protective clothing, such as face shield, gloves, etc.

Maintenance of parts is easy, even if the valve is installed in the line: By removing all the body bolts except one and loosening the remain one, valve body can be swung out. Seats, gaskets and ball can be replaced without disturbing pipe alignment. On threaded lines, valve can be screwed on without the use of unions, as the three-piece construction makes valve ends free, by removing the bolts.

4. General information for installation

4.1 The valve can be installed in any position on the pipeline.

4.2 Before installation of the valves, the pipe must be flushed clean of dirt, burrs and welding residues, or the seat and ball surface will be damaged.

4.3 The pipe must be free from tension.

5. Installation of threaded valves

5.1 Use conventional sealant, such as hemp core, Teflon, etc. on the threads.

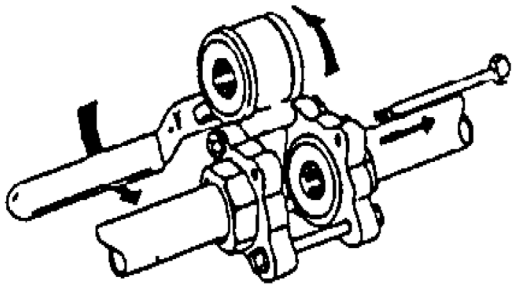
5.2 Apply wrench only on the hexagon of the valve ends. Tightening by using the valve body or lever can seriously damage the valve.

5.3 In some applications, screwed valves are back welded on site, These valves must be treated as per instructions for weld end valves before back welding.

6. Installation of weld-end valves

6.1 Make sure valve at close position. Put the valve horizontally. (Valve port is horizontal at the pipe line.)

6.2 Tack-weld the valve on the pipe in four points on both end caps.



6.3 Make the valve in open position (lever to be parallel to the axis of the pipe), loosen all nuts on the body bolts. Remove all the bolts except one. Swing the body outside the pipe.

6.4 Finish welding both end caps onto the pipe, make sure all the soft Teflon would not be damaged during welding.

6.5 After cools of the pipeline and valve, clean end caps and body then swing back the body.

6.6 Assemble the bolts & nuts by hands but not wrench, close & open the valve 3 ~ 5 times.

6.7 Turn the valve to closed position.

6.8 Use wrench to tighten the nuts in "star" pattern with the proper torque. Please refer to the Bolt Torque Table below.

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Bolt tightening specifications

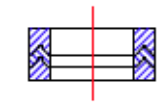
The body bolts of the valve should be tightened evenly. Tighten one-side snugly, then the one diagonal across. Repeat for the other bolts, bringing them all down tightly in sequence.

Size	Body bolts Torque - Nm	Stem nut Torque - Nm
DN 8 - 1/4"	8.3 - 9.8	6,9
DN 10 - 3/8"	8.3 - 9.8	6,9
DN 15 - 1/2"	10.8 - 12.7	7,8
DN 20 - 3/4"	11.8 - 13.7	7,8
DN 25 - 1"	12.7 - 15.7	10,8
DN 32 - 1 1/4"	19.6 - 24.5	10,8
DN 40 - 1 1/2"	32.3 - 35.3	15,7
DN 50 - 2"	44,1 - 49,0	15,7
DN 65 - 2 1/2"	70,6 - 78,4	18,6
DN 80 - 3"	78,4 - 88,2	20,6
DN 100 - 4"	78,4 - 88,2	22,5

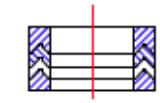
30% safety factor included.

Each repair kit (Teflon set) includes following parts ;

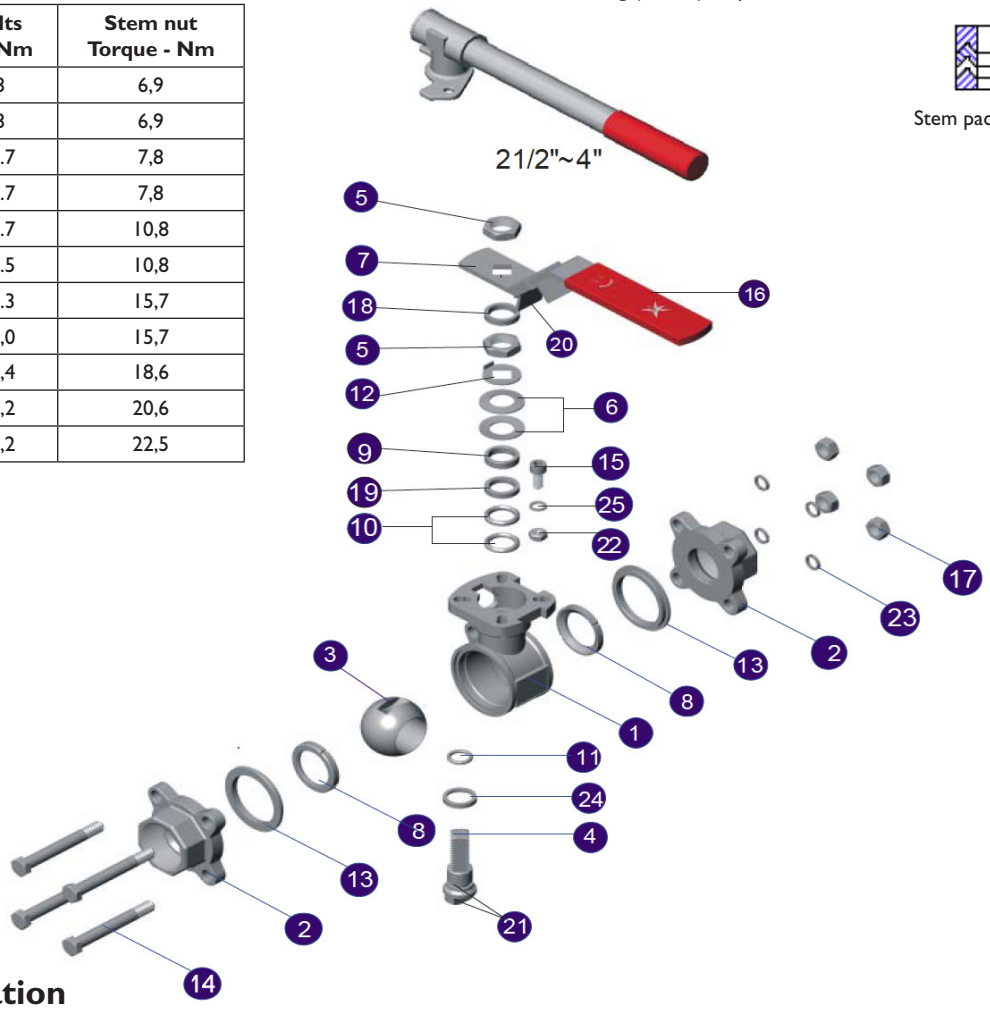
1. Seat (No. 8) x 2pcs
2. Stem packing (No. 10 and 19)
3. Stem Seal (No.11) x 1pc
4. Joint Gasket (No. 13) x 2pcs
5. O-Ring (No. 24) x 1pc



Stem packing 1/4" - 2"



Stem packing 2 1/2" - 4"



Material specification

No	Part name	Qty	Material
1	Body	1	CF8M
2	End cap	2	CF8M (CF3M for socket weld and butt weld)
3	Ball	1	AISI 316
4	Stem	1	AISI 316
5	Stem nut	2	AISI 304
6	Belleville washer	2	AISI 301
7	Handle	1	AISI 304
8	Seat	2	RTFE
9	Gland	1	AISI 304
10	Stem packing	*	PTFE
11	Stem seal	1	RTFE
12	Lock saddle	1	AISI 304

No	Part name	Qty	Material
13	Joint gasket	2	PTFE
14	Bolt	**	AISI 304
15	Stop bolt	1	AISI 304
16	Handle sleeve	1	Vinyl
17	Bolt nut	***	AISI 304
18	Stem washer	1	AISI 304
19	Stem packing	1	25 % glass fiber filled + PTFE
20	Locking device	1	AISI 304
21	Antistatic device	****	AISI 316
22	Stop nut	1	AISI 304
23	Bolt washer	***	AISI 304
24	O-ring	1	Viton
25	Washer	1	AISI 304

* For 1/4" - 2" 2 pcs, 2 1/2" - 4" 3 pcs
** For 1/2" - 3" 4 pcs, 4" 6 pcs.
For 2 1/2" - 3" 4 pcs of bolts (double ends, external thread).
For 4" 6 pcs of bolts (double ends, external thread).
*** For 1/4" - 2" 4 pcs, 2 1/2" - 3" 8 pcs, 4" 12 pcs
**** 1/4" - 1/2" 1 pcs, 3/4" - 4" 2 pcs

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It's necessary to take apart ball valve for maintenance under following leaking situation:

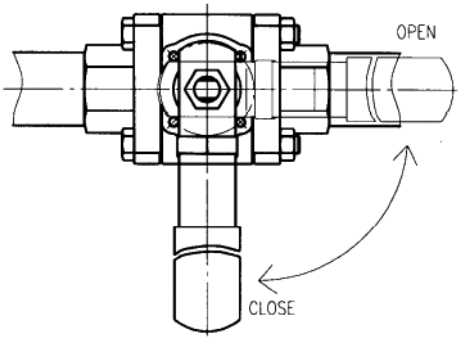
1. Stem Leaking :
Tighten Stem Nut according to Tighten Torque. If stem is still leaking continuously, thus, it's necessary to take apart ball valve and change Stem Packing (No. 10, 19)

2. Joint Gasket Leaking :
Tighten bolt, bolt nut according to Tighten Torque. If gasket is still leaking continuously, thus, it's necessary to take apart ball valve and change Joint Gasket (No. 13).

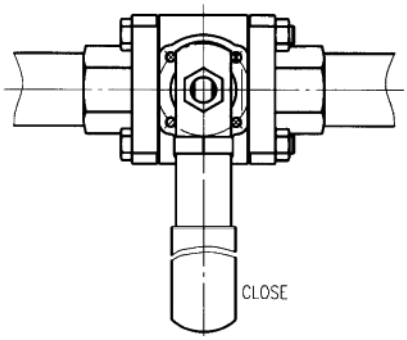
3. Seat Leaking :
Check ball valve if in "Normally Closed" position first. If seat is still leaking continuously, thus, it's necessary to take apart ball valve and change Seat (No. 8).

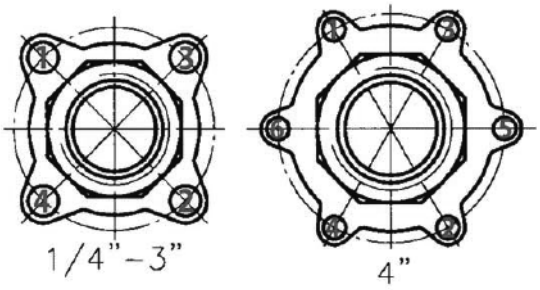
Maintenance Instruction

1. While ball valve still in pipe line, it's necessary to relieve the line pressure first. Then make ball valve in "normally open" & "normally closed" once again, and let the remaining pressure inside body be out of pipe lines, in order to avoid any accidents to occur.
2. Loosen all Bolts (No. 14), Bolt Washer (No. 23), Bolt Nut (No. 17) on End Cap (No. 2).
3. While taking off body away from end caps, pay attention to seats & other parts which are "Not Falling Down".
4. Take out Seat (No. 8) and Joint Gasket (No. 13) from body.
5. Turn the handle in "closed" position, take out Ball (No. 3) from body and pay attention to "Not Falling Down" while taking the ball out. Put ball in clean and safe place in order to install ball back.
6. Loosen Handle Nut (No. 5), take off Handle (No. 7) and Stem Washer (No. 18).
7. Knock the plate of Lock Saddle (No. 12) open, it might loosen Stem Nut (No. 5), take off Lock Saddle (12), Belleville Washer (No. 6), Gland Bush (No. 9) and Stem Packing (No. 10, 19)
8. All taken-out parts need to put in clean and safe place.
9. Push Stem (No. 4) downward and take off it.
10. Take off Stem Seal (No. 11) & O-Ring (No. 24) from Stem.
11. To clean and check up the stem if any damage.
12. Put new stem seal & O-Ring on stem, O-Ring needs to be greased (LE4025 or same grade lubricant) then put them into body.
13. Put new packing into body, then put Gland Bush, Belleville Washer, Lock Saddle and Stem Nut orderly back.
14. Refer to Stem Nut Tightening Torque (Table 1), tighten stem nut accordingly. And turn the plate of Lock Saddle toward stem nut and fix it exactly, in order to avoid stem nut to be loosen.
15. Put stem washer and handle back.
16. Then Screw the handle nut tightly.
17. Pay attention to the handle which must be in "closed" position, then put ball back into body.
18. Change to use new joint gasket and seat, put seat into gasket and install them together on body (on both sides).
19. Put body back between two end caps.
20. Put on bolt, bolt washer and screw bolt nut on bolt tightly by hands. Then make BV in "open" & "closed" position within 3 ~ 5 times (see drawings), and finally put BV in "closed" position.



21. After make sure BV in "closed" position (see below drawing). Refer to 1,2,3,4… orderly (see below right drawings), screw bolt nut on bolt tightly according to Body Bolt Tightening Torque.





22. After finish assembling, check the ball valve if it can open and close smoothly and then do a piping test.

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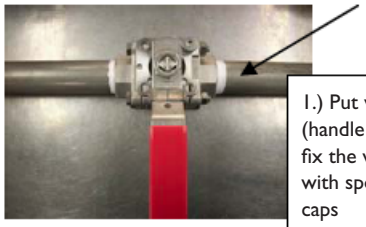
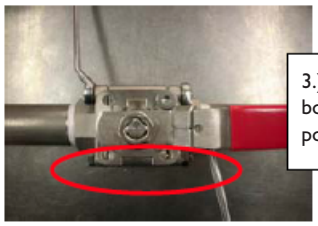
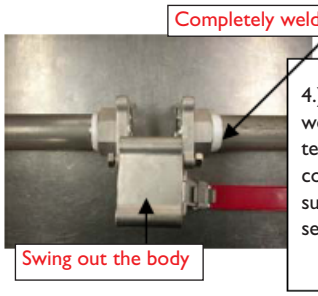


1.) Put valve in close position first (handle and pipe are in vertical position), fix the valve on the pipe temporarily with spot welding on four points of end caps

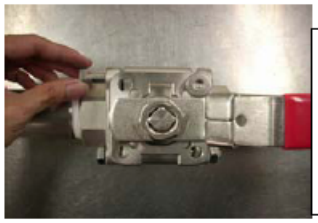
2.) Then, turn the valve in open position (handle and pipe are in parallel position)



3.) Use a tool to take off three bolts, and keep one bolt in loose position.

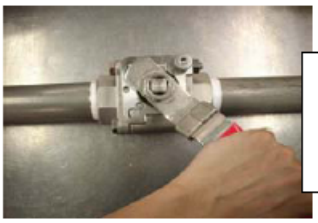


4.) Swing body outside of pipe, and weld the ends on pipe completely, pay attention and keep off the contact of end joint and seats during such process, in order to avoid the seals being burned and damaged.

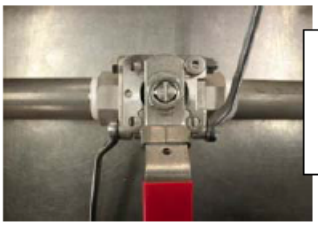


5.) After cooling, clean the surface of whole ends and body. And swing body back to original position, then put back bolts and nuts to original position as well.

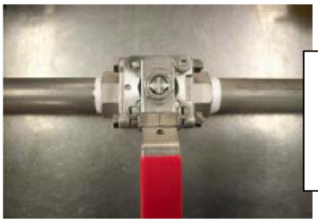
6.) Adjust body and ends by hand, and make sure they're in alignment. Use a tool to screw bolts and nuts together, and avoid the displacement to occur between body and ends.



7.) Open and close valve within 3~5 times repeatedly, and finally put valve in close position.



8.) Use tools to screw bolts and nuts together tightly (in diagonal line) according to standard torque.



9.) After assembling, check if the valve can open or close smoothly ? Then, do a piping test.

Remark

- Do not connect the system before valve pipeline installation to the earthing connection has been tested, examined and approved by the customer.
- There shall be no existence of the explosive atmosphere inside the pipeline.
- Other limitations, pls. refer to Statement issued by TÜV Rheinland, Report No. 16804569, Clause 5.

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