

Maintenance

Series 26a Ball Valve



Fig. 1 - Series 26a Ball Valve with Series 31a Rotary Actuator

1 Introduction

These instructions are intended to assist the user on assembling and repairing Series 26a Ball Valves. Specifications are subject to change without notice. The text and drawings do not necessarily display the scope of supply or any ordering of spare parts. Drawings and graphics are not to scale. Customer-specific designs not in accordance with our standard product range are not shown.

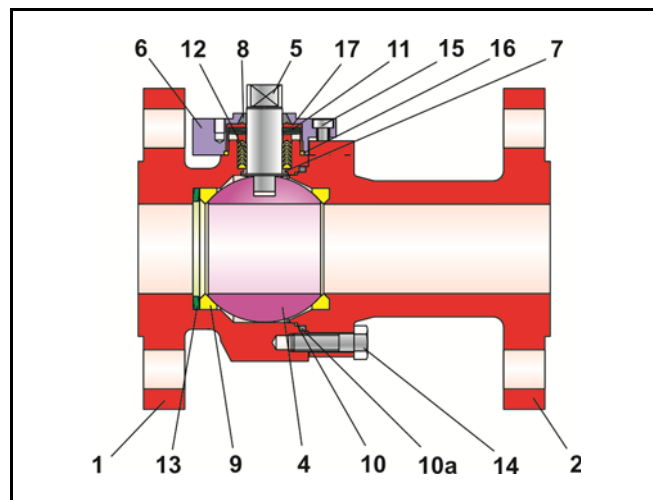


Fig. 2 – Fire-safe Series 26a Ball Valve => See Table 1 (on page 3) for parts list

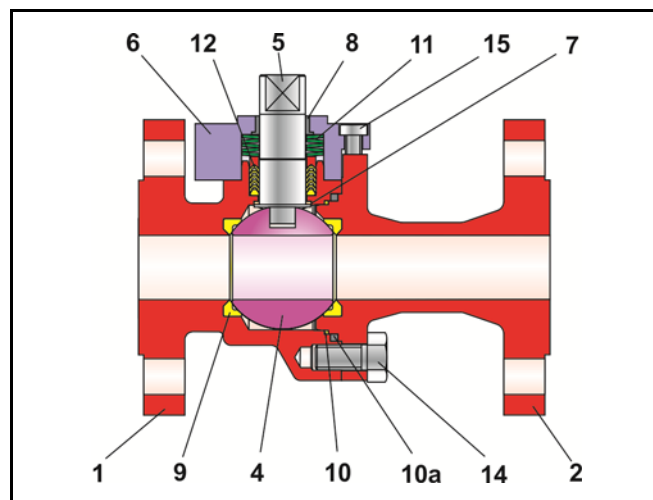


Fig. 3 – Standard Series 26a Ball Valve => See Table 2 (on page 5) for parts list

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The equipment may only be dismantled and disassembled by skilled staff who are familiar with the assembly, start-up and operation of this product.

In these maintenance and assembly instructions, the term skilled staff refers to individuals who are able to judge the responsibilities assigned to them as well as recognize potential hazards due to their specialized training, knowledge and experience as well as their special knowledge of the relevant standards.

2 Design, operation and dimensions

Design, operation and dimensions as well as all further details and technical data can be found in **Data Sheet <TB 26a_EN>**.

3 Installation, start-up and maintenance

Instructions for the installation, start-up and maintenance can be found in **Operating Instructions <BA 26a-01_EN>** for automated ball valves, **<BA 26a-02_EN>** for manually operated ball valves.

4 Assembly of standard ball valves

4.1 Preparation for assembly

Before assembling the ball valve, carefully clean all parts and place them on a soft surface (rubber mat or similar).

Plastic and graphite parts are nearly always soft and very sensitive. Take particular care when handling the sealing surfaces to ensure that they do not get damaged.



NOTICE

A high-performance grease paste (Fuchs Gleitmo 805 or Molykote 1000) is used during manufacturing to prevent the screws from cold welding in the bodies



Do not use this lubricant with valves intended for oxygen service. Use a lubricant suitable for valves that are free of grease, especially for oxygen service.



Note:

The position and arrangement of the individual parts shown in the detail drawing are to be observed during assembly.

4.2 Assembly of fire-safe ball valve

4.2.1 Assembling the main body

The assembly begins with the main body (1). Place the main body with the flange facing downwards on a flat, clean working surface to allow you to easily access the inside of the valve.

Insert the encapsulated disk springs (13) into the main body (1). Refer to Fig. 4 for the arrangement of the disk springs. Press in the seat ring (9a) until it touches the disk springs.

Push the bearing bushing (7), while slightly turning it, onto the shaft (5). Apply a small amount of lubricant to the shaft (5). Insert shaft together with the bearing bushing (7) through the shaft bore from the inside into the main body (1).



Note:

Take care not to damage the sealing surface of the shaft (5). Make sure the bearing bushing (7) is positioned, together with the shaft (5) in the groove of the main body (1) without being jammed.

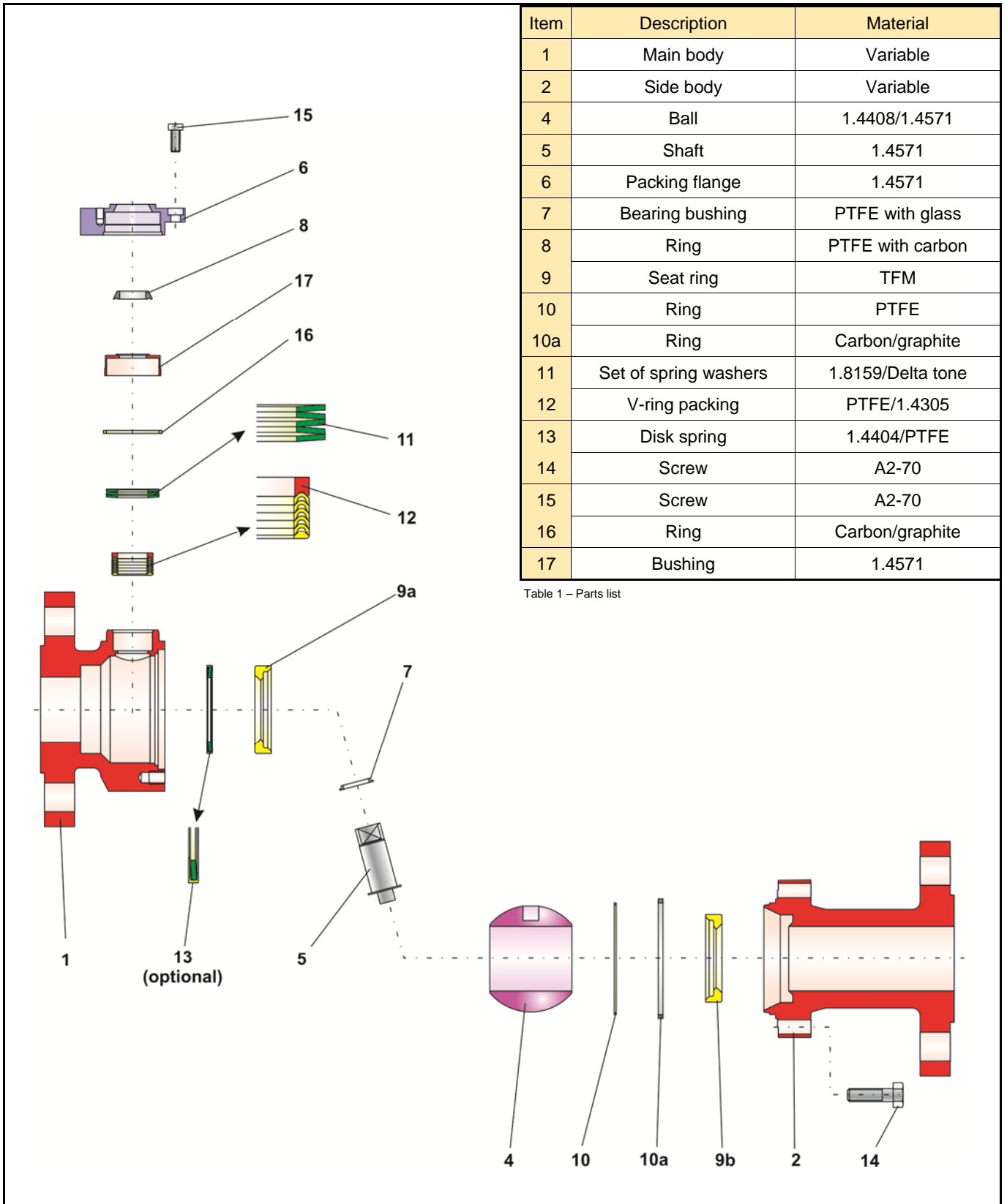
Turn the shaft (5) until the flattened part is at a right angle to the worktop. Lightly spray the ball (4) with silicone and carefully insert it.

Insert the PTFE ring (10) and carbon/graphite ring (10a) into the corresponding grooves of the main body (1).

4.2.2 Assembling the side body

Insert the seat ring (9b) into the side body (2).

Place the side body (2) together with the ready-mounted seat ring (9b) on the main body (1) and carefully push them together.



Item	Description	Material
1	Main body	Variable
2	Side body	Variable
4	Ball	1.4408/1.4571
5	Shaft	1.4571
6	Packing flange	1.4571
7	Bearing bushing	PTFE with glass
8	Ring	PTFE with carbon
9	Seat ring	TFM
10	Ring	PTFE
10a	Ring	Carbon/graphite
11	Set of spring washers	1.8159/Delta tone
12	V-ring packing	PTFE/1.4305
13	Disk spring	1.4404/PTFE
14	Screw	A2-70
15	Screw	A2-70
16	Ring	Carbon/graphite
17	Bushing	1.4571

Table 1 – Parts list

Fig. 4 - Detail drawing of fire-safe version of Series 26a Ball Valve

4.2.3 Final assembly of the ball valve

Turn the side body (2) until the bolting holes of the two body halves (1 and 2) are aligned with one another.

Tighten the slightly greased screws (14) evenly in a criss-cross pattern to fasten the bodies together.



Note:

Refer to Table 3 in Section 4.4 for the tightening torques for each nominal size.

Slide the parts of the V-ring packing (12), turning them slightly, over the mounted shaft (5) and insert them into the packing seat of the main body (1). Refer to Fig. 4 for the arrangement of the V-rings.

Stack the spring washers (11) on the packing. Refer to Fig. 4 for the arrangement of the spring washers.

Press the carbon/graphite ring (16) into the bushing (17).

Push the bushing (17) together with the carbon/graphite ring (16) over the shaft (5) until they rest on the spring washers.

Slide the carbon/graphite ring (8) carefully over the shaft until it touches the bushing (17).

Place the packing flange (6) over the shaft onto the body. Use the greased cap screws (15) to align the packing and tighten the screws evenly in a criss-cross pattern.



Note:

Before performing a leak test, open and close the valve several times. This allows the ball to center itself on the seat rings and provides optimal shut-off performance.

Assembly of the ball valve is now completed.

4.3 Assembly of the standard ball valve

4.3.1 Assembling the main body

The assembly begins with the main body (1). Place the main body with the flange facing downwards on a flat, clean working surface to allow you to easily access the inside of the valve.

For version without spring-loaded ball:

Press the seat ring (9a) into the main body.

Only for versions with spring-loaded ball:

Insert the encapsulated disk springs (13) into the main body (1). Refer to Fig. 5 for the arrangement of the disk springs. Press the seat ring (9a) until it touches the disk springs.

Assembly for all versions:

Push the bearing bushing (7), while slightly turning it, onto the shaft (5). Apply a small amount of lubricant to the shaft (5). Insert shaft together with the bearing bushing (7) through the shaft bore from the inside into the main body (1).



Note:

Take care not to damage the sealing surface of the shaft (5).

Make sure the bearing bushing (7) is positioned, together with the shaft (5) in the groove of the main body (1) without being jammed.

Turn the shaft (5) until the flattened part is at right angle to the worktop. Lightly spray the ball (4) with silicone and carefully insert it.

Insert the PTFE ring (10) and carbon/graphite ring (10a) into the corresponding grooves of the main body (1).

4.3.2 Assembling the side body

Insert the seat ring (9b) into the side body (2). Place the side body (2) together with the ready-mounted seat ring (9b) on the main body (1) and carefully push them together.

4.3.3 Final assembly of the ball valve

Turn the side body (2) until the boreholes of the two body halves (1 and 2) are aligned with one another.

Tighten the slightly greased screws (14) evenly in a criss-cross pattern to fasten the bodies together.



Note:

Refer to Table 3 in Section 4.4 for the tightening torques for each nominal size.

Slide the parts of the V-ring packing (12), turning them slightly, over the mounted shaft (5) and insert them into the packing seat of the main body (1). Refer to Fig. 5 for the arrangement of the V-rings.

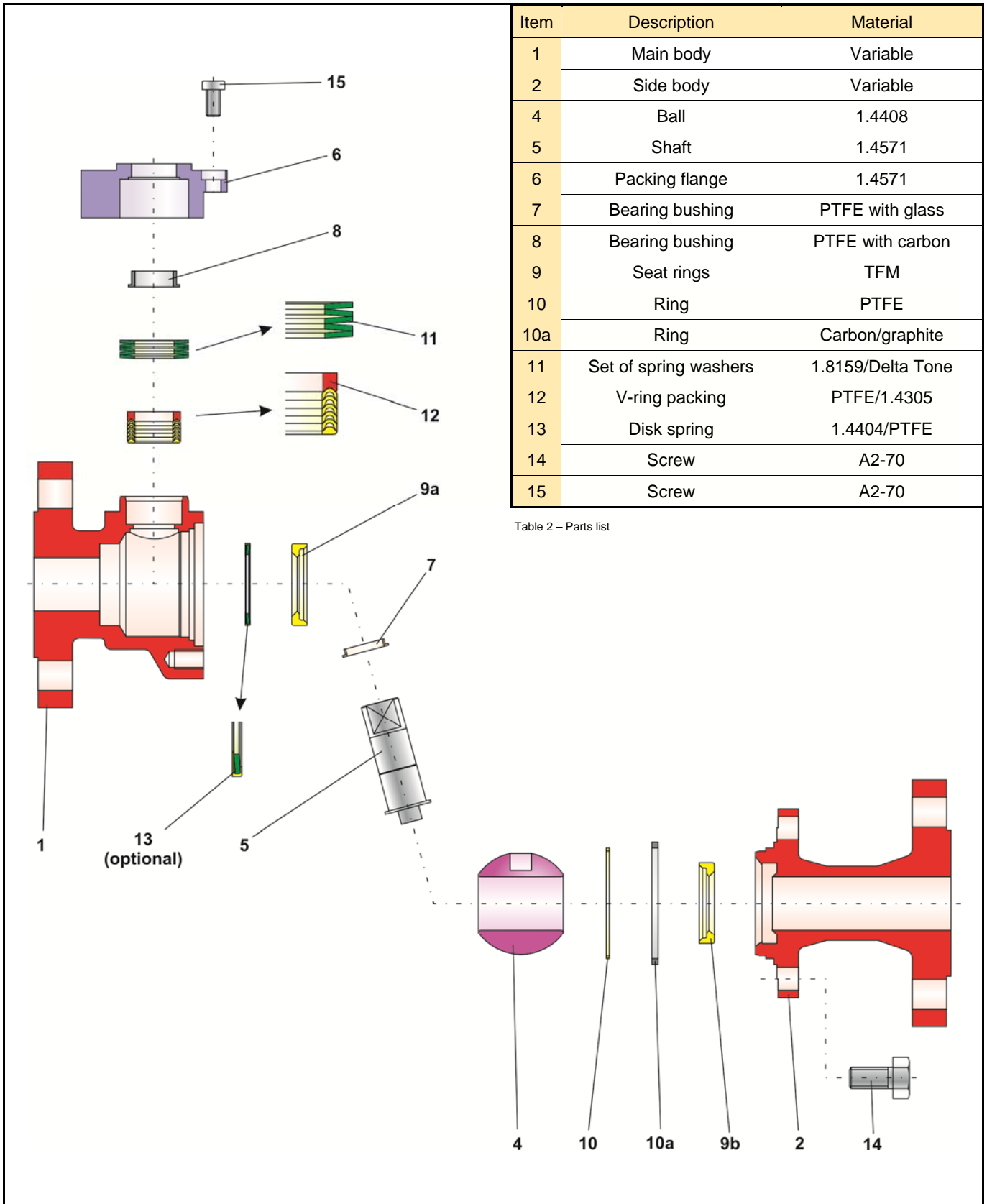


Fig. 5 - Detail drawing of standard version of Series 26a Ball Valve

Stack the spring washers (11) on the V-ring packing.
Refer to Fig. 5 for the arrangement of the spring washers.

Press the bearing bushing (8) into the packing flange (6).
Place the packing flange (6) over the shaft onto the body.
Use the greased cap screws (15) to align the packing and
tighten the screws evenly in a criss-cross pattern.



Note:

Before performing a leak test, open and close the valve several times. This allows the ball to center itself on the seat rings and provides optimal shut-off performance.

Assembly of the ball valve is now completed.

4.4 Tightening torques

On joining the two body halves, tighten the screws evenly in criss-cross pattern using the following specified torques.

DN	Body halves			Packing		
	Qty.	Screws	Tighten. torque	Qty.	Screws	Tighten. torque
15	4	M8x20	22 Nm	4	M4x10	5 Nm
25	4	M10x20	49 Nm	4	M6x8	6 Nm
40	5	M10x25	49 Nm	3	M8x12	14 Nm
50	7	M10x25	49 Nm	3	M8x12	14 Nm
80	6	M16x30/ M16x40	105 Nm	4	M10x16	30 Nm
100	8	M16x30/ M16x40	105 Nm	4	M10x16	30 Nm

Table 3 – Tightening torques

5 Assembly of special ball valves

5.1 Assembling the high-temperature ball valve
(version with HSB metal seals)

5.1.1 Preparation for assembly

Before assembling the ball valve, carefully clean all parts and place them on a soft surface (rubber mat or similar).

Sealing parts are nearly always soft and very sensitive. Take particular care when handling the sealing surfaces to ensure that they do not get damaged.

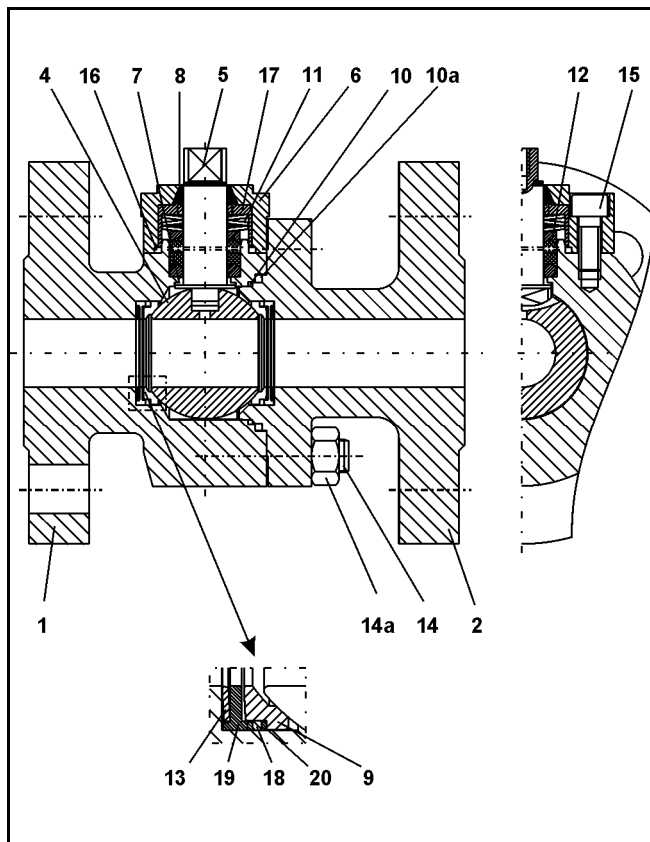


Fig. 6 – High-temperature Series 26a Ball Valve => Refer to Table 4 (page 7) for parts list



NOTICE

A high-performance grease paste (Molykote 1000) is used during manufacturing to prevent the screws from cold welding in the bodies.



NOTICE

Do not use these valves for oxygen service.



Note:

The position and arrangement of the individual parts shown in the detail drawing (Fig. 7) are to be observed during assembly



NOTICE

Graphite seals are very sensitive and must always be handled with great care, otherwise the sealing performance cannot be guaranteed.

It is not necessary to lubricate the seat sealing. Lubrication causes the operating performance to deteriorate. The seat ring and ball are mate-lapped and must only be installed as a unit. Do not install a seat ring which has been lapped-in with another ball. Do not perform the lapping-in yourself. The seat ring in DN 15 version is spring-loaded and sealed on both sides of the ball by just one graphite ring seal.

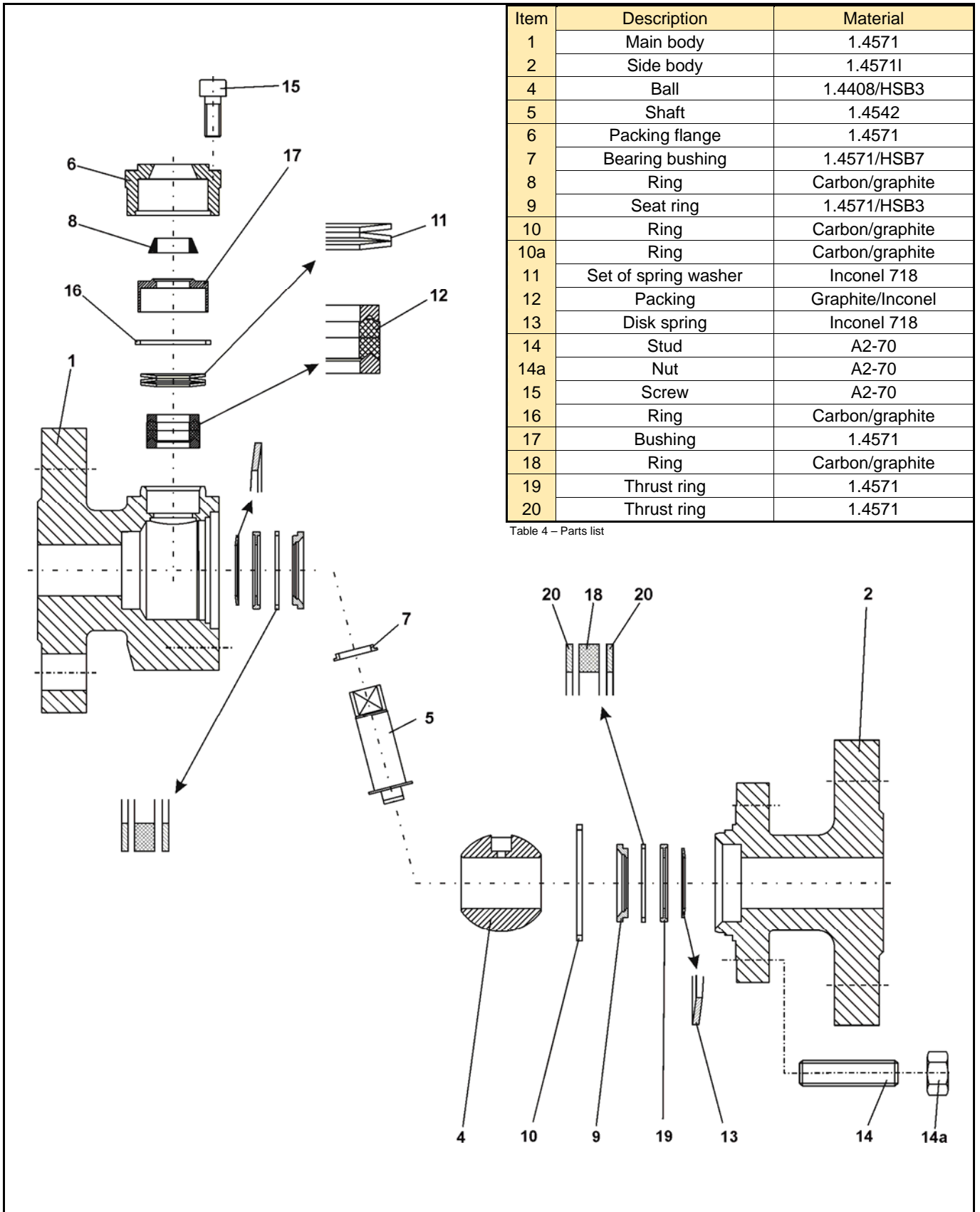


Fig. 7 - Detail drawing high-temperature Series 26a Ball Valve

5.1.2 Assembling the main body

The assembly begins with the main body (1).

Insert the disk springs (13) into the main body (1). Refer to Fig. 7 for the mounting position of the disk springs.

Place thrust ring (19) on the disk spring. It must be placed so that the chamber with the "T" mark rests on the disk spring.

Press the graphite ring (18) carefully into the chamber of the seat ring (9).

Insert the seat ring (9) fitted with the graphite ring (18) carefully into the main body, making sure that the graphite ring (18) with two thrust rings (20), rests on the thrust ring (19).

5.1.3 Assembling the side body

Proceed exactly as described above for the side body (2).

5.1.4 Final assembly of the ball valve

Pull bushing (7) over the shaft (5) until the collar of the bushing rests on the collar of the shaft (5). Insert the shaft (5) together with the bushing (7) into the main body (1) from the inside.

The flat head of the shaft (5) must point in the same direction as the passage in the main body (1). Place the ball (4) carefully using a tilting movement into the main body (1). The flat head of the shaft (5) must fit properly into the ball socket.

Insert the graphite ring (10) into the chamber of the body division. Place the assembled body (2) onto the main body (1) by carefully turning it.

Check whether there is an even gap all around the body division between both body sections. Turn the side body (2) so that the bolting holes of both body halves (1 and 2) are aligned.

Fasten the body halves (1 and 2) together by tightening the lightly greased nuts (14a) and studs (14) evenly in a criss-cross pattern.

Push the graphite packing (12), turning it slightly, over the mounted shaft (5) and position it in the packing seat of the main body (1).

Insert and press in the packing rings one at a time. Place the tool on the stuffing box and use it to tighten each nut evenly. Apply a torque as specified in Table 5 per inserted ring using a torque wrench. Actuate the shaft approximately four to six times after pressing in each ring to allow each ring to settle and to create a fine graphite coating on the surface of the shaft.

Nominal size	Tightening torque	Spring washer arrangement
DN 15	11 Nm	2GS/2WS
DN 25	24 Nm	2GS/2WS
DN 40	32 Nm	2GS/2WS
DN 50	38 Nm	3GS/2WS
DN 80	48 Nm	2GS/2WS
DN 100	55 Nm	2GS/2WS

Table 5 – Tightening torque per nut



Note:
Key for arrangement of spring washers

GS = Spring washers stacked parallel in the same direction
WS = Spring washers stacked parallel in the opposite direction



Example:
3GS/2WS means that a set of six spring washers is arranged with two sets of three spring washers stacked parallel in the opposite direction.

Fit the carbon/graphite ring (8) in the passage of the packing (6). Secure it into place with the bushing (17).

Pull the graphite ring (16) over the collar of the main body (1). Fasten the assembled packing (6) as before on the main body (1) using the screws (15).



Note:
We recommend to clean the shaft (5) at the place where the graphite ring (5) rests with a non-woven cloth and to apply high-temperature grease to it. This improves the sliding properties.

Check during and after assembly whether all moving parts can move freely.

To achieve optimal actuation torques and shut-off performance, the valve must be pressurized from both sides using water according to the table below.

5.1.5 Pressure specifications to press the graphite rings into the seat rings

Nominal size	Pressure
DN 15 to DN 50	=> 40 bar on both sides/water
DN 65 to DN 80	=> 25 bar on both sides/water
DN 100	=> 16 bar on both sides/water

Table 6 - Pressure specifications

Assembly of the ball valve is now completed.

6 Troubleshooting

Refer to section 7 of **Operating Instructions**
<BA 26a-01_EN> for automated ball valves or
<BA 26a-02_EN> for manually operated ball valves.

7 Repair of the ball valve

7.1 Replacing the packing

If a leak is detected at the packing, the PTFE rings of the V-ring packing (12) may be defective. We recommend checking the condition of the packing.

To remove the packing, disassemble the valve in reverse order to that described in the corresponding section. Check the rings of the packing and all sealing parts for damage. In case of doubt, replace the parts with new ones.

7.2 Replacing the seat rings and ball

If the ball valve does not shut off tightly, the set of seat rings and the ball (4) may be defective. We recommend checking the condition of these components.

To remove the seat rings and the ball, disassemble the valve in reverse order to that described in corresponding section.

Check the seat rings and the ball as well as all sealing parts for damage. In case of doubt, replace the parts with new ones.

7.3 Further repair work

In case of severe damage, we recommend the repair work to be carried out by Pfeiffer.

8 Customer inquiries

Should you have any inquiries, please submit the following details:

1. Order number (embossed on the ball valve body)
2. Type, product number, nominal size and version of the valve
3. Pressure and temperature of the process medium
4. Flow rate in m³/h
5. Installation sketch, if possible

For your special requirements please contact our technical sales department.

Pfeiffer Chemie-Armaturenbau GmbH

Hooghe Weg 41 • 47906 Kempen
Telefon: 02152 / 2005-0 • Telefax: 02152 / 1580
E-Mail: vertrieb@pfeiffer-armaturen.com • Internet: www.pfeiffer-armaturen.com

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