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SAFETY

- Assess all the risks to eliminate the risk of personal injury and material damage. Read these instructions thoroughly!
- Always use the necessary protective equipment and comply with applicable safety directives when working with hazardous or hot/cold medium.
- Never operate a valve without first ensuring that there is no risk of crush injuries. The risk is highest with automatic valves.
- Take necessary safety precautions to prevent unintentional manoeuvre - i.e to atmosphere.
- Never dismantle a valve or part of a valve without ensuring that the line is free of pressure and any content.
- Always check that the valve type and material is suitable for its intended use. This applies especially to highly oxidising and corrosive medium. Observe also the risk of erosion and explosion as well as decaying medium. If in doubt, always request a written recommendation from NAF AB.

1. General

The instructions and list of spare parts as follows are applicable to NAF-Setball ball segment valves in accordance with data sheet Fk 41.51GB and Fk 41.54GB.

The product codes of NAF-Setball valves are as follows:

878XEX-XXXX-XX

2. Lifting

All lifting must be carried out in the valve itself and not in the actuator. The joint between the valve and the actuator is designed principally for carrying the operating torque and the deadweight of the actuator - see Fig. 1.

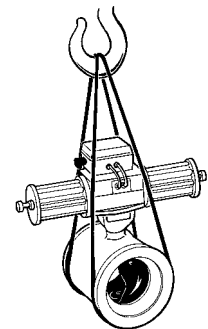


Fig.1 Lifting of the valve

3. Receiving Inspection

All valves leaving our works are inspected and tested in accordance with the relevant requirements or in accordance with the special conditions specified by the purchaser. Valves equipped with actuators are subjected to functional testing and are adjusted in such a manner that every unit is completely ready for direct installation in the pipework. However, in view of damage that may have occurred during transport, it is advisable that receiving inspection is carried out, if possible.

We suggest the following inspection procedure:

- Check that **the valve delivered is correct in terms of type, size, equipment, etc.**
- Examine the valve, actuator and valve positioner **regarding possible damages.**
- **Check the settings of the limit stops.**

4. Installation

Before installing the valve, ensure that **the pipework is free from impurities**, that the pipe ends between which the valve is to be installed are parallel and are correctly aligned, and that the distance between the pipe ends corresponds to the valve length, including gaskets. **The valve must not be used for drawing together or aligning incorrectly run pipes** as this will cause needless loads on the valve and pipe which may lead to severe damages during operation. See Fig. 3.

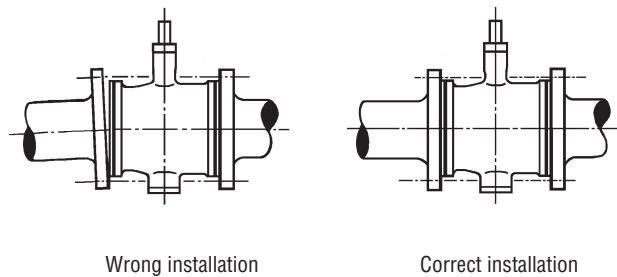


Fig. 3. Ensure that the pipe ends align and have the correct distance

NAF-Setball valves should be installed in the direction of flow which is shown by an arrow on the valve body. We also recommend that the valve is mounted with the stem pointing vertically upwards when the valve is installed in a horizontal run of pipe.

The pipes should be supported on each side of the valve in order to relieve the valve from loads and avoid vibrations.

Locate the valve so that it will be easily accessible for inspection and service, particularly if the valve is equipped with a pneumatic actuator and valve positioner.

5. Flange Gaskets

Gaskets with sizes according to ANSI B16.5, Table E1 Figure E2, SS 359 or DIN 2690 are recommended.

6. Starting up

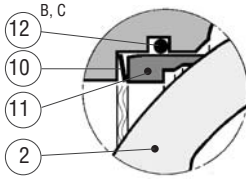
Before starting up, flush the pipework - with all valves in the open position - so that any impurities that may damage the sealing surfaces of the valve and impede its operation will be flushed away.

7. List of Materials and Spare Parts

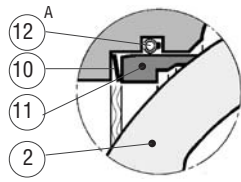
Item	Qty	Part	Material	Sealing type
1	1	Body	EN1.4408/CF8M	
2	1	Ball sector	EN1.4408/CF8M hard chrome plated	01, 02, 05, 06, 07
2	1	Ball sector	EN1.4408/CF8M	11, 12, 15, 16, 17
3	1	Key	Steel	
4	1	Stem, lower	EN1.4460	
5	1	Gland cover	EN1.4408/CF8M	01, 02, 05, 06, 11, 12, 15, 16
6	1	Bottom cover	EN1.4408/CF8M	
7	1	Gasket	Graphite	
8	1	Locking segment	EN1.4436	
9	1	Bearing seat	EN1.4460	
10	1	Compr ring	EN1.4436	
11	1	Seat ring	Alloy 6	01, 02, 05, 06, 07, 0A, 0B
12A	1	Seat seal	PTFE	01, 05, 07, 11, 15, 17, 1A, 1B
12B	1	Seat seal	EPDM	02, 12
12C	1	Seat seal	FPM	06, 16
13A	1	O-ring	EPDM	01, 02, 11, 12
13B	1	O-ring	FPM	05, 06, 15, 16
14	1	Backing ring	PTFE	01, 02, 05, 06, 11, 12, 15, 16
15A	1	O-ring	EPDM	01, 02, 11, 12
15B	1	O-ring	FPM	05, 06, 15, 16
16	1	Gland cover	EN1.4408/CF8M	07, 17,
17	2	Bolt	A4	07, 17, 0A, 0B, 1A, 1B
18	2	Nut	A4	07, 17, 0A, 0B, 1A, 1B
19A	1	Boxpacking Zebra-CL™	V-ring PTFE	0A, 1A
19B	1	Boxpacking Safeguard	V-ring PTFE liveloaded	0B, 1B
19C	1	Boxpacking	Graphite	07, 17
20	4	Bolt	A4	
21	2	Bolt	A4	01, 02, 05, 06, 11, 12, 15, 16
22	1	Stem, upper	EN1.4460	
23	1	Indicating pin	SS	
24	1	Cup spring	EN1.4310	0B, 1B
26	1	Washer	A4	
27	1	Thread insert	Stainless	
28	1	Bolt	A4	
29	1	Seat ring / Back-up ring	PTFE/SS	11, 12, 15, 16, 17
30	1	Stem bearing	Metaloplast	
31	1	Stem bearing	Metaloplast	
32	1	Washer	A4	
33	1	Cylindrical pin	EN1.4460	
34	1	Washer	Metaloplast	
35	1	Keyway ring	Stainless	

Materials

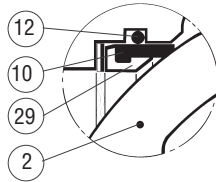
Seat ring



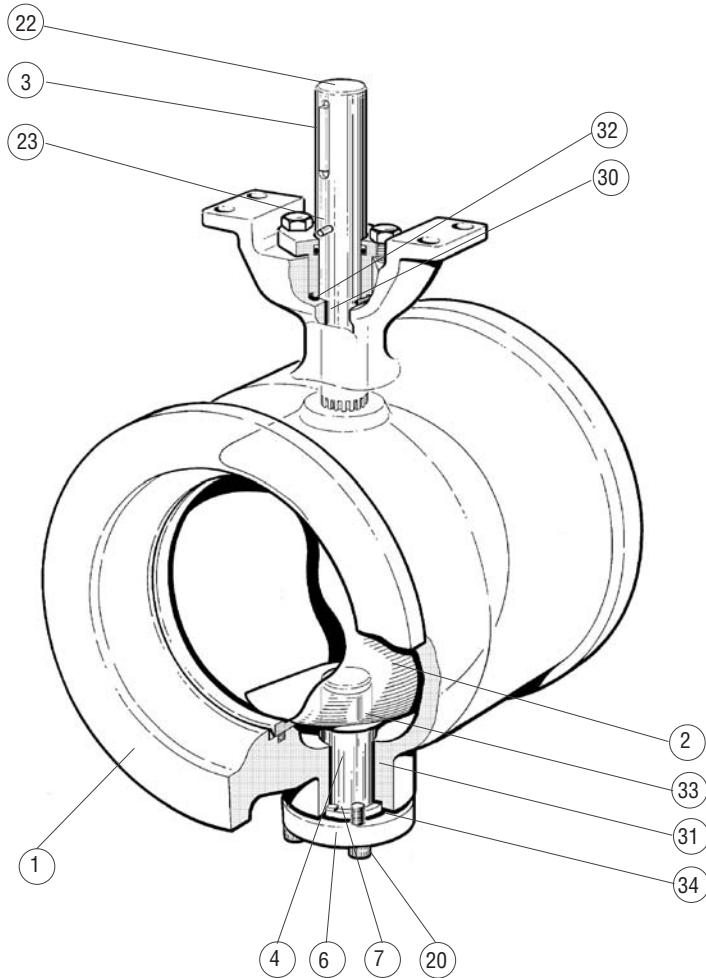
With O-ring sealing
Type -02, -06



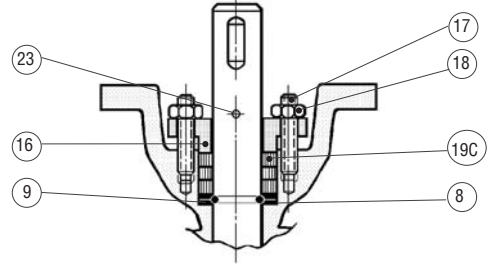
With springloaded sealing
Type -01, -05, -07



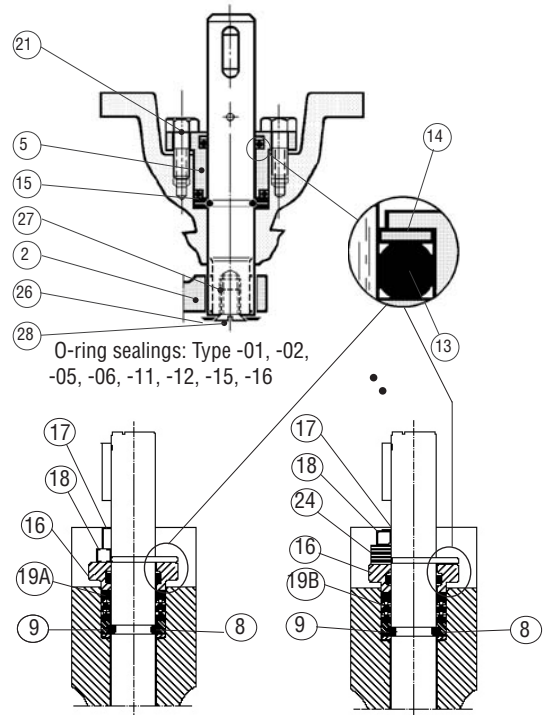
O-ring sealing
Type -01, -02, -05, -06



Stem sealing

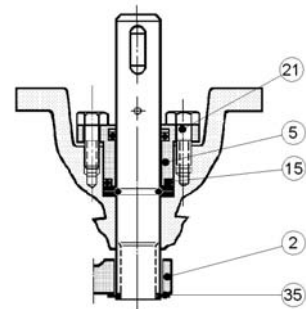


Boxpacking: Type -07, -17



Zebra-CL™: Type 0A, 1A

Safeguard: Type 0B, 1B



Earlier performance until 1991.

Fig. 4. NAF-Setball - spare parts, types of stem sealings and seat rings

8 Spare Parts

When placing orders for spare parts, specify:

1. Product code of the valve - incl. DN according to Fk 41.51 and Fk 41.54 and the Manuf. No. specified on the identification plate of the valve.
2. Description of the part, its item No and quantity required. See table section 7.
Ordering example: NAF 8780EB-0100-02, manuf. No. 1234567, Seating item 11
Quantity 1 pc.

9. Maintenance

Many valves are installed in such locations that their performance is of **vital importance** to the entire process. Such valves should be **inspected regularly and any faults should immediately be corrected.**



Exhaust fuse

The primary exhaust fuse consisting of bearing seat (9) and locking segment (8) and the secondary exhaust fuse consisting of washer (26) and bolt (28) should always be inspected during maintenance. See section 9.7. In older valves, before 1992, a keyway ring (35) can be mounted as the secondary exhaust fuse instead of the washer (26) and bolt (28). The design with keyway ring is no longer a part of our product range. If it needs to be changed a new stem must be mounted.

To ensure the safety of the valve the primary and secondary exhaust fuse must be correctly mounted.

Stem sealing

The stem sealing should be changed regularly and in intervals that are in proportion with the use of the valve.

**9.1 To remove the valve from the pipework
Ensure that the valve is free of pressure.**

The procedure is as follows:

1. Ensure that the recommended spare parts and the gaskets for the pipe flanges are available.
2. Close the valve.
3. Shut off all compressed air connections and isolate all electrical connections to the actuator.
4. Disconnect all compressed air lines and electric cables connected to the actuator.
5. Release the flanged joint between the valve and the pipework. Then lift out the valve. Don't use the actuator for lifting. **Apply all lifting forces to the valve itself and not to the actuator** - see fig. 1.

Note the flow direction which is shown by an arrow on the valve body.

9.2 To change the stem seal of O-ring type.

The upper o-ring (13) should be changed if the upper stem sealing is leaking.

Ensure that the valve is free of pressure.

1. Dismount the actuator.
2. Remove the key.
3. Loosen the bolts (21) and remove the gland cover (5).
Then remove the o-rings (13) and (15) as well as the washer in PTFE (14).
Inspect the primary and secondary exhaust fuse, see section 9.7.
4. Clean and inspect all easily accessible surfaces. The surfaces must be completely free from scratches. Remove any burrs from the keyways.
5. Replace the two o-rings (13) and (15) as well as the washer in PTFE (14). Grease the o-rings with suitable silicone grease.
6. Mount the gland cover (5) with the bolts (21).

9.3 To change and inspect the upper stem seal, boxpacking

The sealing requires inspection and adjustment when it has been taken into operation.

Ensure that the valve is not under pressure.

1. Dismount the actuator.
2. Remove the nuts (18). Lift off the gland cover (16). Then remove the boxpacking (19C).
Inspect the primary and secondary exhaust fuse, see section 9.7.
3. Clean the surfaces of the stem, gland cover (16) and the recess in the valve body.
4. Carefully examine the stem surface to make sure that it is completely free from marks and scratches.
5. Replace the boxpacking (19C) with a new one. Then mount the gland cover (16) and the nuts (18).
6. Tighten the nuts (18) until the boxpacking gets in place and is in contact with both the stem and valve body. Check the tightness of the packing and retighten the nuts (18) – if necessary - when the valve is taken into operation.

9.4 To inspect and change the upper stem sealing, Boxpacking Zebra-CL™

The sealing requires inspection and adjustment when the valve is taken into operation.

Ensure that the valve is free of pressure.

1. Dismount the actuator.
2. Remove the nuts (18). Lift off the gland cover (16). Then remove the boxpacking (19A) and the o-ring (13).
Inspect the primary and secondary exhaust fuse, see section 9.7.
3. Clean the stem surfaces, gland cover (16) and the recess in the valve body.
4. Inspect the stem surface thoroughly. It should be free from marks and scratches.
5. Lubricate the stem with suitable lubrication.
6. Replace the packing (19A) and the greased o-ring. Then mount the gland cover (16) and nuts (18).
7. Tighten the nuts (18) until the boxpacking gets in place and is in contact with both the stem and valve body. Check the tightness of the packing and retighten the nuts (18) – if necessary - when the valve is taken into operation.

9.5 To inspect and change the upper stem sealing, Boxpacking Safeguard

The sealing requires inspection and adjustment when the valve is taken into operation.

Ensure that the valve is free of pressure.

1. Dismount the actuator.
2. Remove the nuts (18) and the cup spring (24). Lift off the gland cover (16). Then remove the boxpacking (19B) and the o-ring (13).
Inspect the primary and secondary exhaust fuse, see section 9.7.
3. Clean the stem surfaces, gland cover (16) and the recess in the valve body.
4. Inspect the stem surface thoroughly. It should be free from marks and scratches.
5. Lubricate the stem with suitable lubrication.
6. Replace the boxpacking (19B) and the greased O-ring (13). Then mount the gland cover (16) and nuts (18).
7. Tighten the nuts (18) until the boxpacking gets in place and is in contact with both the stem and valve body. Check the tightness of the packing and retighten the nuts (18) – if necessary - when the valve is taken into operation.

9.6 To change the gasket at the lower stem

1. Remove the bolts (20) and the cover (6).
2. Carefully pull out the stem (4) and remove the bearing in metaloplast (31) and the gasket (7).
Inspect the primary and secondary exhaust fuse, see section 9.7.
3. Carefully clean the inside of the cover (6) and the stem (4).
4. Replace the gasket (7) with a new one.
5. Mount the stem (4) with the gasket (7).
6. Fit the cover (6) and tighten the bolts (20).

9.7 To inspect and change the primary and secondary exhaust fuse.



The locking devices requires inspection after long operating time and/or many cycles.

1. Remove the cover (6).
2. Carefully pull out the lower stem (4) and remove the bearing in metaloplast (31) and the gasket (7).
3. Loosen the bolt (28) and remove the washer (26).
4. Carefully pull out the upper stem (22) and remove the stem sealings and bearing.
5. Inspect the bearing seat (9), locking segment (8), washer (26) and bolt (28). Replace them if they are worn out.
6. Remount the stem (22), washer (26) and bolt (28).
7. Grease and remount the locking segments (8) and bearing seat (9). Ensure that it is properly placed over the locking segments.
8. Mount the bearing and gland cover.

10. Fitting the Actuator to the Valve

1. The actuator can be mounted directly on the valve. The mounting flange and the valve stem follow the NAF standard for securing the actuator.
2. Turn the valve to the closed position. The key should face towards the inlet.
3. Fit the actuator.
4. Connect the compressed air supply to the actuator - applies to pneumatic actuators. If the end position stop is correctly set, the ball segment will not move when compressed air pressure is applied.
5. If moving - adjust the end position stop until the actuator has turned the ball segment to the closed position.
6. **General**
The actuator may be fitted either in line with the connected pipes or transversely to them. An intermediate plate is necessary for mounting the actuator in line with the pipework.

N.B. The direction of closure must always be clockwise, as viewed from the actuator.

Before fitting the actuator, it is important to ensure that the actuator fits the stem. First try without key to check that the drive slips onto the stem. Also check that the key fits and matches the keyways in the stem. Grease the actuator stem entry. Push the actuator onto the stem.

The rotary movement of the ball sector should be restricted to 90°, which is the movement needed between fully open and fully closed position. If the sector is turned beyond this range, the sealing surfaces of the sector and seat ring may be damaged. When an attempt is made to turn the ball sector back to the correct position the sector may jam against the seat ring.

In practice, this is prevented by the indicating pin. It will come in contact with the bolts retaining the top cover if an attempt is made to turn the ball sector outside the range between fully open and fully closed position.

When adjusting the actuator, make sure that the sphere of the ball sector (2) is centered against the seat ring (11) in closed position, i.e. that the sphere projects equally on both sides of the seat ring as shown in Fig. 5.

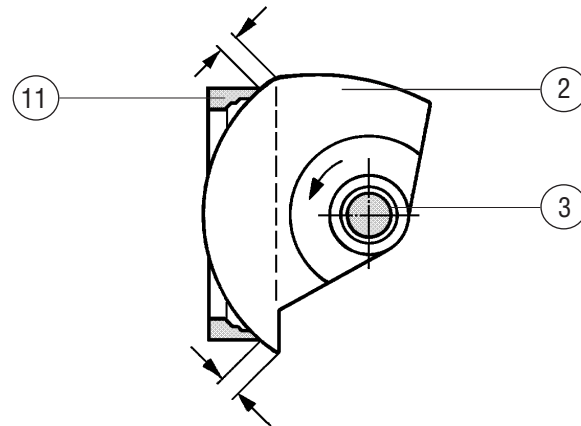


Fig. 5. Locating of the ball sector sphere when adjusting the actuator