



Introduction	2
1. Spare parts	2
2. Service and maintenance	2
3.1 Disassemble the parts of the WB knife gate valve	3
3.2 To change box packing, sealing profile and gate	3
3.3 Torque for gland nuts	5
3.4 Installation of stem and stem nut for hand wheel (HW)	5
3.5 Installation of top for hand wheel (HW) and pneumatic cylinder (AC)	6
3. Pictures	7
4.1. Figure 1 - main components in the Stafsjö knife gate valve WB	7
4.2. Figure 2 - part list of the Stafsjö knife gate valve type WB	8

Introduction

This service instruction is a step-by-step instruction for service and maintenance of Stafsjö knife gate valve type WB. This instruction shall be available to the persons responsible for service and maintenance of the knife gate valve.

More detailed information on specific knife gate valve, its actuator and accessories is available in data sheets at www.stafsjo.com. You can also contact Stafsjö Valves AB or your local representative.

Stafsjö Valves AB takes no responsibility for the product if service and maintenance of the knife gate valve is not performed according to this instruction. Neither takes Stafsjö Valves AB any responsibility for the product if it has been changed from its original condition.

1. Spare parts

Recommended spare parts are described in spare part data sheets for each type of knife gate valve at www.stafsjo.com. Stafsjö recommends the customer to keep one set in store of spare parts for each valve type.

Spare parts can be ordered from Stafsjö Valves AB or your local representative. Spare part data sheets and addresses are available at www.stafsjo.com.



NOTE

No work is allowed on the knife gate valve when the system is pressurised or the actuator is installed. The system must be free from pressure and empty. Actuator and accessories must be disconnected before any work begins.

All gate guards must be installed after finished maintenance on the knife gate valve.

2. Service and maintenance

See figure 1 and 2 for identification of the parts in the WB knife gate valve. Parts may differ depending on the valve size and date of manufacture. Please contact Stafsjö Valves AB or your local representative if you have any questions.

Information about installation and operating the knife gate valve and its pneumatic cylinder is available in operating instructions at www.stafsjo.com.

Stafsjö Valves AB offers the customer service and maintenance of Stafsjö knife gate valves, either in the customer's plant or at the Stafsjö workshop. Please contact Stafsjö Valves AB or your local representative for more information.



NOTE

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All gate guards must be installed after finished maintenance on the knife gate valve.

3.1 Disassemble the parts of the WB knife gate valve

To simplify the disassembling of the knife gate, place the valve upright in a screw vice. Large valves shall be placed on a horizontal work bench. See figure 1 and 2 for identification of the parts in the WB knife gate valve.

1. Open the valve completely.
2. Disassemble the actuator and top.

Hand wheel (1)

1. Take out the pin (1b) and remove the hand wheel (1).
2. Loosen the nuts (7f), bolt (7g) and washer (7e).
3. Remove the bearing (2c), bearing washer (2b), yoke (2), bearing washer (2b) and bearing (2a) from the stem (3).
4. Loosen the bolt (7c) and washer (7d) on each side and remove both beams (7).
5. Loosen the bolts (4b) from the stem nut (4).
6. Remove stem (3), stem nut (4), bolts (4a) and washers (4b).

Pneumatic cylinder (18)

1. Loosen the gate guards (16).
 2. Loosen the nut (20b), washer (20a) and bolt (20).
 3. Keep the cylinder (18) in place and loosen the nuts (7f), bolt (7g) and washer (7e).
 4. Lift off the cylinder (18).
-
3. Loosen all the nuts (8c) on the gland (8).
 4. Lift off the gland (8) from the stud bolts (8a).
 5. Remove the box packing braids (9).
 6. Clean the box from residues.
 7. Remove the gate (6) and check for damages such as dents and scrapes. If the gate is damaged it can wear out the box packing (9) and the sealing profile (13), and causing leakage. Stafsjö recommends changing the gate if it is damaged to ensure the function of the valve.
 8. Remove the sealing profile (13).
 9. Clean the sealing profile groove from residues.

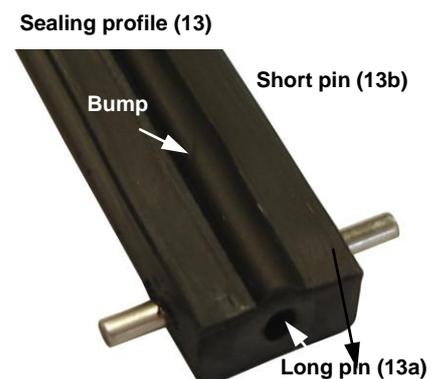
NOTE

The box packing and sealing profile are often damaged when they are removed from the valve body. Stafsjö recommend that both box packing and sealing profile is changed if they are removed from the valve body.

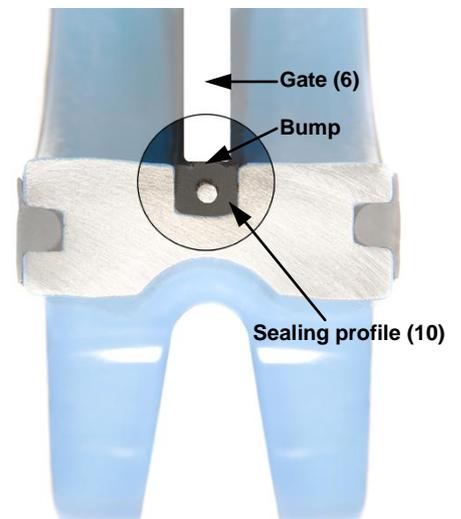
3.2 To change box packing, sealing profile and gate

See figure 1 and 2 for identification of the parts in the WB knife gate valve.

1. The box packing consists of three pieces of braid.
2. The sealing profile (13) consists of a rubber profile, one long pin (13a) and two short pins (13b). Put the long pin into the sealing and make sure it is centred. The short wires prevent the sealing profile from being pushed into the valve body by the gate (6).



3. Take the complete sealing profile **(13)**, including rubber profile, one long and two short pins, and put it into the valve body **(10)**. The bump of the sealing profile must be centred and it shall face the gate **(6)** of the valve.
4. Lubricate the sealing profile **(13)** with a synthetic lubricator (Multipurpose Grease OKS 1110 or similar grease approved for EPDM and Nitril).
5. Check the gate **(6)** for damages such as dents and scrapes. If the gate is damaged it can wear out the box packing **(9)** and the sealing profile **(13)**, and leakage can occur. To ensure the function of the valve Stafsjö recommends switching the gate if it is damaged.
6. Push down the gate **(6)** to the bottom of the valve body **(10)**. Check that the gate **(6)** is centred in the valve body **(10)** according to the bump of the sealing profile **(13)**. See picture to the right.
7. Add the first layer of box packing braids **(9)** into the bottom of the box. Use a blunt tool in plastic or wood and a hammer to push the braid into the box.
8. Add the second layer of box packing braid. The joint of the second braid must be placed on the opposite long side of the joint of the first braid.
9. Adjust the gate **(6)** and centre in the valve body **(10)** according to the bump of the sealing profile **(13)**.
10. Add the stud bolts **(8a)** and then the gland **(8)**, washers **(8b)** and nuts **(8c)**. (Do not use locking nuts in this operation.)
11. Put pressure on the gland **(8)** by tightening the nuts **(8c)** gradually and crosswise. The gland **(8)** must be centred and in line with the gate **(6)** with the same distance between the gland and the gate all around. Check that there is no metal contact between the gland **(8)** and the gate **(6)**. The sealing profile **(13)** and the first and second layer of box packing **(9)** shall be compressed enough to be able to add the third layer of box packing into the box.
12. Remove the gland **(8)**.
13. Add the third layer of box packing **(9)**. The joint of the third braid must be placed on the opposite long side of the joint of the second braid.
14. Reinstall the gland **(8)**, washers **(8b)** and nuts **(8c)**. Use locking nuts this time.
15. Put pressure on the gland **(8)** by tightening the nuts **(8c)** gradually and crosswise. The gland **(8)** must be centred and in line with the gate **(6)** with the same distance between the gland and the gate all around. Check that there is no metal contact between the gland **(8)** and the gate **(6)**.
16. Reinstall other components according to section 3.4 and 3.5.



NOTE

The box packing may start to leak when the system is pressurised and the temperature increases. This is caused by the box packing which is a soft material that moves depending on pressure and temperature and when the valve is operated. If the box packing leaks, retighten the gland nuts **(8c)** gradually and crosswise according to section 3.3.

3.3 Torque for gland nuts

The torque T_G in the table below is a recommended value for tightening the gland nuts (**8c**) when a new box packing has been installed and during operation if the box packing is leaking.

DN	T_G	
	Nm	lbf x ft
50-80	20	15
100-150	25	18
200-300	30	22
350-	35	26

If the gland nuts are pulled to hard, it shortens the lifetime of the box packing and the force needed to operate the valve will increase and the valve function will be affected.

The box packing may leak because it is made of a soft material that moves depending on pressure and temperature and when the valve is operated. If the box packing is leaking, tighten the gland nuts (**8c**). Each nut shall be tightened gradually and crosswise until the leakage stops, see figure 3 below.

Check that the gland (**8**) is level to the top of the valve body (**10**). Check that there is no metal contact between the gland (**8**) and the gate (**6**).

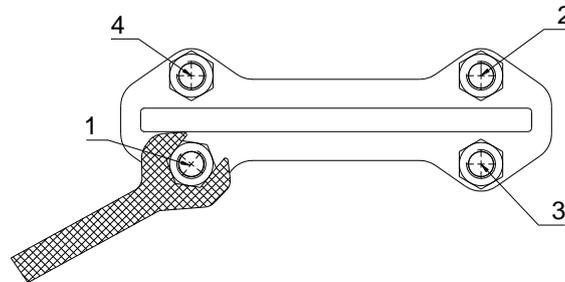


Figure 3: Tighten gland nuts crosswise

3.4 Installation of stem and stem nut for hand wheel (HW)

See figure 1 and 2 for identification of the parts in the WB knife gate valve.

1. Lubricate the thread on the stem (**3**) with grease and screw on the stem nut (**4**).
2. Mount the stem nut (**4**) with the stem (**3**) on the gate (**6**) with the washers (**4a**) and screws (**4b**).

Note!

Do not tighten the screws too hard, they shall be fully tightened after mounting the complete hand wheel manoeuvre.

3. Install hand wheel actuator according to section 3.5.

3.5 Installation of top for hand wheel (HW) and pneumatic cylinder (AC)

See figure 1 and 2 for identification of the parts in the WB knife gate valve.

1. Mount the beam **(7)** on the top of the valve body **(10)** with the bolts **(7c)** and the washers **(7d)**.
2. The holes are placed on different distances from the short side of the beam. The side of the beam with the longest distance between the hole and the short side shall be placed against the top of the valve body **(10)**.
3. Install the actuator.

Hand wheel

1. Mount the lower bearing **(2a)** and the bearing washer **(2b)** on the stem **(3)**.
2. Mount the yoke **(2)** on the beams **(7)**. Centre the stem **(3)** with the lower bearing **(2a)** and attach the yoke by slightly tighten the bolts **(7g)**, nuts **(7f)** and washers **(7e)**.
3. Rotate the stem **(3)** and make sure the lower bearing **(2a)** connects to the yoke **(2)**.
4. Mount the top bearing washer **(2b)** and bearing **(2c)** on the stem **(3)**.
5. Carefully tighten the bolts **(4b)** on the stem nut **(4)**.
6. Tighten the bolts **(7g)**, nuts **(7f)** and washers **(7e)** on the yoke.
7. Attach the hand wheel **(1)** with the pin **(1b)**.

Pneumatic cylinder

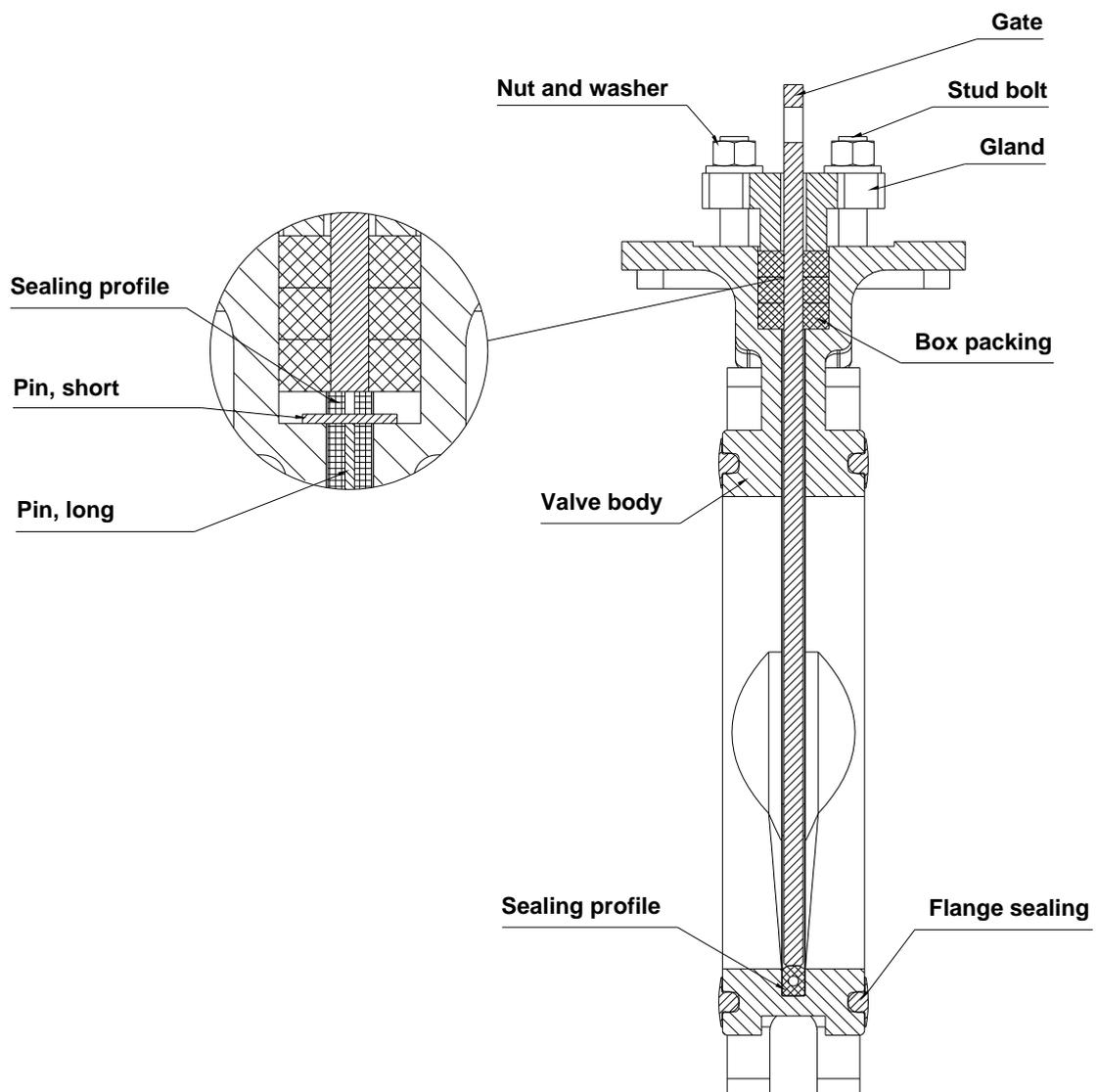
1. Mount the pneumatic cylinder on the beams **(7)** and attach it by slightly tighten the bolts **(7g)**, nuts **(7f)** and washers **(7e)**.
 2. Attach the piston rod **(25)** to the gate with bolt **(20)**, washer **(20a)** and nut **(20b)** and tighten it according to correct torque of each type of pneumatic cylinder. See ACWB data sheet at www.stafsjo.com.
 3. Tighten the bolts **(7g)**, nuts **(7f)** and washers **(7e)**.
 4. Open the valve completely by gently operating the pneumatic cylinder **(18)**. In this position, the bolts **(4b)** should be in the centre of the upper hole in the beam **(7)**.
 5. Reinstall the gate guards **(16)**.
4. Test the function of the knife gate valve.
 5. Install the knife gate valve in the system according to the operating instruction. Available at www.stafsjo.com.
 6. Operate the valve a few times before the system is pressurised.

Note

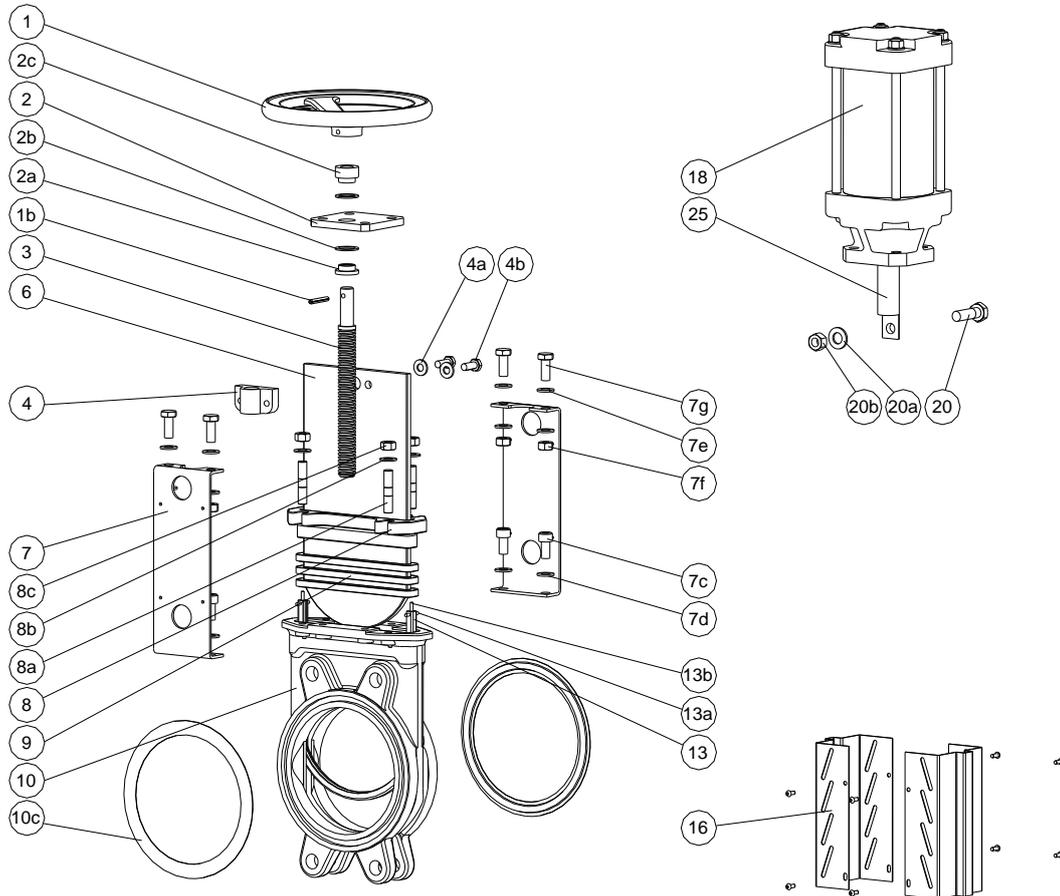
Large pneumatic cylinders installed horizontally must be supported in order to prevent tensions in the valve that can affect the valve tightness and ability to manoeuvre.

3. Pictures

4.1. Figure 1 - main components in the Stafsjö knife gate valve WB



4.2. Figure 2 - part list of the Stafsjö knife gate valve type WB



Pos	Part	Material
1	Hand Wheel	Cast iron (GG25), epoxy colour
1b	Straight pin	Stainless steel (A2/DIN 1481)
2	Yoke	Steel (Q235), epoxy colour
2a	Bearing	Bar brass (CuZn39Pb3)
2b	Slide Washer	POM
2c	Bearing	Bar brass (CuZn39Pb3)
3	Stem	Stainless Steel SS2320-02
4	Stem Nut	Bar brass (CuZn39Pb3)
4a	Washer	Stainless steel (A2)
4b	Bolt	Stainless steel (A2)
6	Gate	See equipment B
7	Beam	Steel (Q235) , epoxy colour
7c	Bolt	Stainless steel (A2)
7d	Washer	Stainless steel (A2)
7e	Washer	Stainless steel (A2)
7f	Nut	Stainless steel (A2)
7g	Bolt	Stainless steel (A2)

Pos	Part	Material
8	Gland	Ductile iron (GGG-50), epoxy colour
8a	PinnBolt	Stainless steel (A2)
8b	Washer	Stainless steel (A2)
8c	Nut	Stainless steel (A2)
9	Boxpacking *	See equipment D
10	Valve body	See equipment A
10c	Flange sealing *	NBR
13	Sealing profile *	See equipment C
13a	Pin, long *	Stainless Steel
13b	Pin, short *	Stainless Steel
16	Gate guard, Not for HW	Steel (Q235), epoxy colour
18	Cylinder	See data sheet
20	Bolt	Stainless steel (A2)
20a	Washer	Stainless steel (A2)
20b	Nut	Stainless steel (A2)
25	Piston rod	Stainless Steel (AISI303)

* Recommended spare parts.

All specifications are subject to change without notice.