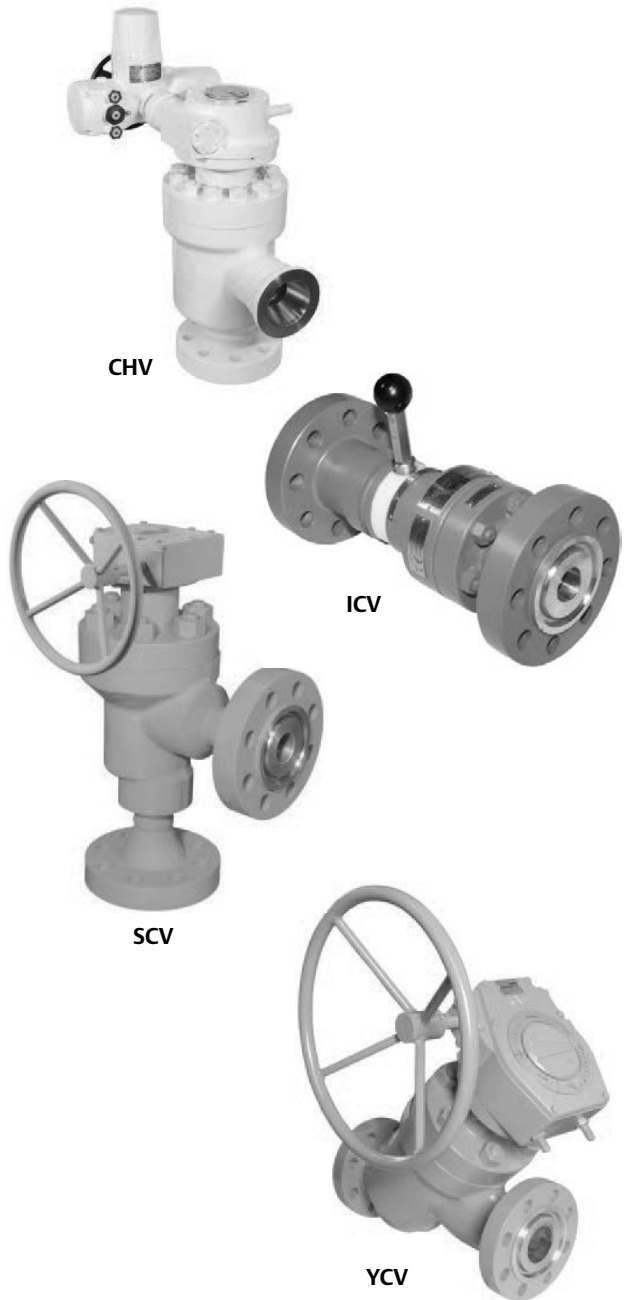


Vonk™ Choke Valve Series (CHV, ICV, SCV, and YCV)

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Figure 1. Vonk Choke Valves



Introduction

Scope of Manual

This instruction manual provides information on installation, adjustment, maintenance, and parts ordering for the Vonk choke valve. Refer to separate instruction manuals for information about the valve positioner and other accessories used with the valves.

Do not install, operate, or maintain a Vonk valve (see figure 1) without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

Description

Vonk choke valves are of the rotary type. The valve can be used for tight shut off service to Class V of ANSI/FCI 70-2 standard for contaminated fluids and high-pressure drops. The throttling mechanism consists of two polished disks, each provided with an eccentric orifice. One disk is fixed into the body; the other one is rotated to achieve Class V seat leakage performance.

Educational Services

For information on available courses, contact:

Emerson Automation Solutions
Educational Services - Registration
Phone: 1-641-754-3771 or 1-800-338-8158
E-mail: education@emerson.com
emerson.com/fishervalvetraining

Specifications

Contact your Emerson sales office for additional information.

Temperature Range

Vonk choke valves are designed for three temperature ranges:

The **Standard** version (STD) equipped with O-rings.

The **Low Temperature** version (LT) equipped with special LT-seals.

The **High Temperature** version (HT) is the same as the LT version but has an extended bonnet construction to withstand high temperatures.

Each version is available with special fugitive emissions (FE) or fire safe (FS) seal option depending on application and choke valve type. Refer to table 1 for configurations covered in this manual.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations.

To avoid personal injury or property damage resulting from the sudden release of process pressure or bursting of parts, do not install the valve assembly where service conditions could exceed the limits given in this manual or on the appropriate nameplates. Use pressure-relieving devices as required by government or accepted industry codes and good engineering practices.

Check with your process or safety engineer for any other hazards that may be present from exposure to process media.

If installing into an existing application, also refer to the **WARNING** at the beginning of the Maintenance section in this instruction manual.

When ordered, the valve configuration and construction materials were selected to meet particular pressure, temperature, pressure drop, and controlled fluid conditions indicated when the valve was ordered. Because some body/trim material combinations are limited in their pressure drop and temperature ranges, do not apply any other conditions to the valve without first contacting your [Emerson sales office](#).

1. Carefully remove the valve from the shipping package (box or pallet) avoiding any damage to the valve or, in case of automated valves, to the electric or pneumatic / hydraulic actuator or instrumentation.
2. The valves are shipped with the ends protected with caps and a thin layer of protective grease. Before installing the valve, remove the protective caps from the valve. Clean carefully and then de-grease both surfaces with a solvent. Clean the inside of the valve to ensure there are no solid objects such as pieces of wood, plastic or packing materials within the valve or on the valve seat. The valve must be free of all foreign matter.
3. Confirm that the materials of construction listed on the valve nameplate are appropriate for the service intended and are as specified.

Vonk chokes valves can be mounted in any position. Installation of the valve must match the flow direction is indicated by the arrow on the valve-body.

Unless otherwise recommended by Emerson:

1. The pipe ends must be properly aligned and supported so as to prevent the valve being subjected to unnecessary stress induced by connecting piping.
2. It is recommended to perform piping flushing before installation of valve.
3. After the down-stream flange (outlet flange), the piping shall be straight over a certain length (depending on the flow medium, the fluid phase and the pressure drop over the valve), but at least 1 meter (39-inches).
4. For choke valves provided with pneumatic actuators, the air pressure to the actuator shall be at least 4.5 bar (65 psi), and a maximum of 8 bar (116 psi), unless specified otherwise. Clean, dry compressed air can be used for the actuator. If a valve positioner is used, instrument air has to be used; do not install a drip feed lubricator in the supply line to the positioner.
5. During the installation of the valve, materials, such as connecting flanges, gaskets and bolting shall be used, appropriate for the design conditions of the application.
6. If present, do not cover or stop up the drain channels located at the actuator top-flange of the bonnet.

CAUTION

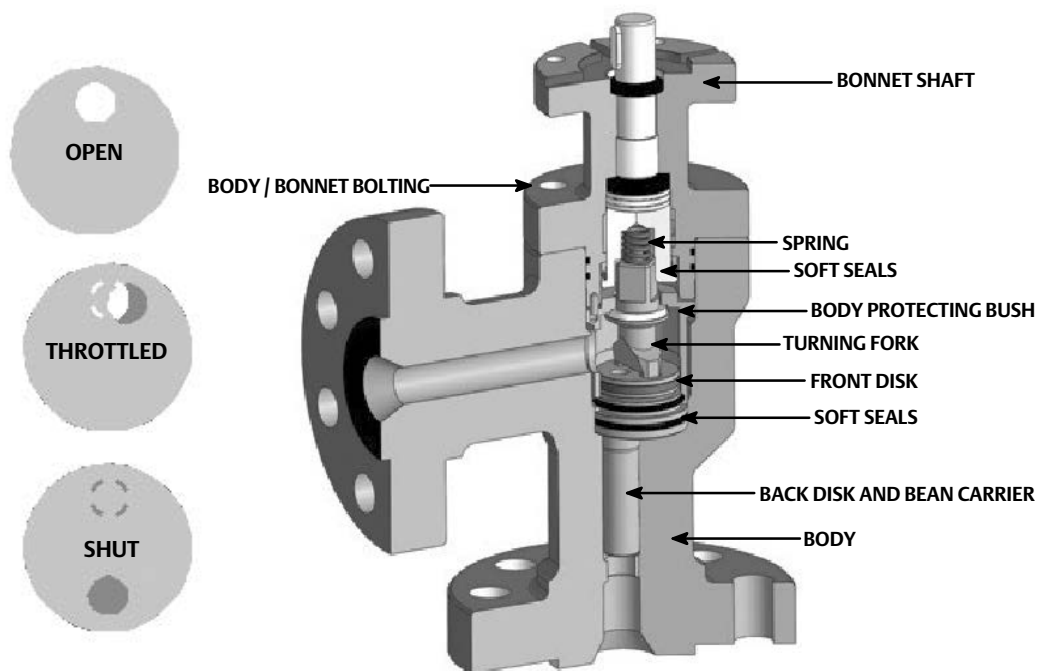
Make sure that the operating limits of the valve are the same or higher than the operating limits of the piping system. See the nameplate of the choke valve.

In case of a HT version valve, the bonnet should not be insulated (this may over-heat the bonnet).

After installation, check the operation of the valve by stroking it to 'full open' and 'full close'. The position of the valve can be indicated in the following ways:

1. Mechanical, by a dial plate showing the position of the valve. The following methods are available:
 - a. Percent of the full stroke of the actuator
 - b. Percent opening of the valve
 - c. Equivalent bean size in 1/64-inch increments
2. Electrical limit switches indicating end of stroke of the actuator.
3. Electronic valve position transmitter, presenting the position of the valve:
 - a. As a 4-20 ma signal
 - b. As a 4-20 ma signal with 'smart' transmitter information (HART® protocol)
 - c. As a fieldbus signal (e.g. FOUNDATION™ fieldbus, PROFIBUS)

Figure 2. Vonk Choke Valves Open / Throttled / Shut



Operation

Manual: Manual shut-off valves are designed to 'shut' when the handwheel is turned clockwise and 'open' when the handwheel is turned counter-clockwise (including valves with gearbox operators). Handwheels of electric actuators (or pneumatic actuators) are for emergency operation only.

Pneumatic / Hydraulic: Choke valves fitted with a pneumatic or hydraulic actuator must be connected and operated in accordance with the actuator manufacturer instructions. Refer to the actuator instruction manual.

Electric: Choke valves fitted with an electrical actuator must be connected and operated in accordance with the actuator manufacturer instructions. Refer to the actuator instruction manual.

Positioner: Choke valves fitted with a positioner must be connected and operated in accordance with the positioner manufacturers instructions. Refer to the positioner instruction manual.

Maintenance of Valve Internals

Valve parts are subject to normal wear and must be inspected regularly and replaced when necessary. The frequency of inspection and replacement depends on the severity of service conditions.

⚠ WARNING

Avoid personal injury or property damage from sudden release of process pressure or uncontrolled movement of parts. Before performing any maintenance operations:

- Do not remove the actuator from the valve while the valve is still pressurized.
 - Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.
 - Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
 - Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.
 - Vent the power actuator loading pressure and relieve any actuator spring pre-compression.
 - Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
 - The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.
 - Check with your process or safety engineer for any additional measures that must be taken to protect against process media.
-

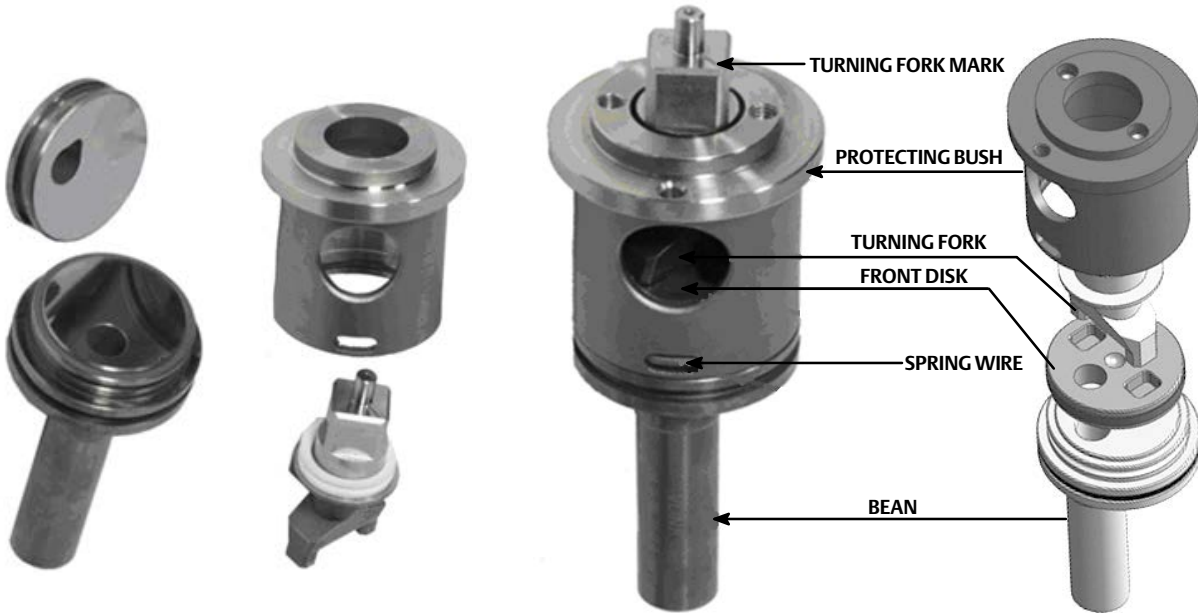
⚠ WARNING

Follow instructions carefully to avoid damaging the valve sealing and packing surfaces, which could result in excessive leakage at shutoff or allow process fluid to leak to atmosphere.

Note

Whenever a gasket seal is disturbed by removing or shifting gasketed parts, install a new gasket during reassembly. This ensures a good gasket seal because the used gasket may not seal properly.

Figure 3. Vonk Choke Valve Internals



Prior to any inspection or maintenance, refer to the appropriate parts list and associated figure for the choke valve type and seal configuration.

After the choke valve has been disassembled, a new set of soft seals must be used. The trim and bonnet can be replaced and/or inspected without removing the body out of the line.

For inspection of the choke valve, an internal wrench tool is required.

Disassembly

⚠ WARNING

Refer to the **WARNING** at the beginning of the Maintenance section in this instruction manual.

1. Isolate the choke valve from the line pressure, release pressure from both sides of the valve body, and drain the process media from both sides of the valve. If using a power actuator, also shut-off all pressure lines to the power actuator.
2. Unscrew the air tubing. In case of a conventional type valve positioner, check the cam in the valve positioner (zero position open when the actuator is spring to close, and zero position closed when the actuator is spring to open).
3. Unscrew the bonnet nuts and lift the bonnet and actuator from the body.

4. Check the position of the turning fork. If the mark on top of the turning fork is opposite the inlet flange, the valve is in the closed position. (See figure 3.)
5. Screw the bolts of the internal wrench tool into the thread holes of the body-protecting bush. (See figure 4.)
6. The complete trim can be removed out of the body by turning down the nuts of the internal wrench tool.
7. Disassemble the internals by removing the locking wire, and lift the protection bush from the bean.
8. Examine the internals for foreign material that may affect the operation of the choke.
9. Inspect the front disk and bean. The surface where the orifice is located should be smooth and free of any damage. If there is any visible damage, then the parts need to be replaced.
10. Clean the inside of the body very carefully. Special attention has to be given to places where soft seals are situated. Clean the sealing surfaces and inspect them for corrosion, pitting or scratches. After inspection, lightly grease the sealing faces (universal grease).

CAUTION

If a 'spring-energized seal' is used, use only a PTFE spray lubricant on the spring energized seal sealing face.

Assembly

1. Put one drop of light oil on the seating surface, and place the front disk on the bean.
2. Put the turning fork on the front disk, and ensure the mark on top of the turning fork is in the same position as the orifice in the front disk.
3. Install the scraper over the turning fork. Lightly grease it with an anti-seize lubricant.
4. Place the guide-strip of the internal and the scraper around the front disk. Mount the protecting bush. The protecting bush inlet hole should point to the same direction as the orifice of the bean. (See figure 3.)
5. Replace the locking-wire.
6. Using the turning fork, turn the orifice of the front disk and bean to a fully open position for valves with a spring-to-open actuator. For an actuator with a spring-to-close action, the orifice has to be put in a position of 180 degrees (90 degrees for NPS 1 choke valves) from the fully open position.
7. Mount the new seal around the bean.
8. Grease (universal grease) the seal slightly and insert the complete internal in the body.

CAUTION

If a 'spring-energized seal' is used, use only a PTFE spray lubricant on the spring energized seal sealing face.

9. Recheck the position of the turning fork and put spring in position.
10. Place the bonnet and the actuator on the body. Be sure that the adjusting pin is placed in the hole of the protecting bush.
11. Grease the stud bolts with anti-seize lubricant and tighten the nuts crosswise. See Retightening of Nuts Body Bonnet Connection in this manual for more information.
12. Connect the air tubing.
13. After assembling the choke valve, perform a functional test to check whether the valve functions properly.

Retightening Nuts Body Bonnet Connection

Due to the design of the choke valve, the nuts of the studs (body-bonnet connection) needs to be tightened sufficiently to provide a proper connection.

Valve Internals and Bonnet Maintenance

A replacement set of soft seals is required.

Disassembly

1. Complete steps 1 to 10 of the Maintenance of Valve Internals Disassembly section in this manual.
2. Take the shaft key out of the bonnet shaft and push the bonnet shaft out of the bonnet.
3. Remove all the seals, bearings, and scrapers.
4. Clean all the parts.
5. Clean all the sealing surfaces of bonnet and shaft very carefully and inspect them for corrosion, pitting or scratches.

Assembly

1. Complete steps 1 to 13 of Maintenance of Valve Internals Assembly section in this manual.
2. Grease all the sealing surfaces with PTFE spray lubricant.
3. Mount seals, bearings, and scrapers on the bonnet shaft. (For correct position, refer to applicable drawing and parts list.)

Note

For easy mounting, the O-ring needs to be pushed in (create a heart shaped form), to decrease the outer diameter. When the O-ring is in position push it back to its original shape.

4. Check if all the seals are mounted correctly (per applicable drawing and parts list) and fully in position.
5. Grease the seals with PTFE spray lubricant.

CAUTION

The seals are easily damaged. The right way to mount the seal holder is to carefully and gently push while turning it over the bonnet shaft.

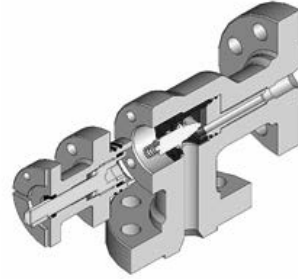
6. Mount the remaining seals around the bonnet. Then mount bearings and grease all with PTFE spray lubricant.
7. Push the bonnet shaft gently to the bonnet.
8. Place the bonnet on the body. Be sure the adjusting pin is placed in the hole of the protecting bush. (1-inch TS bonnet has no adjusting pin.)
9. Complete steps 11 to 13 of the Maintenance of Valve Internals Assembly section in this manual.

Figure 4. Vonk Choke Valve Service Procedure

1.



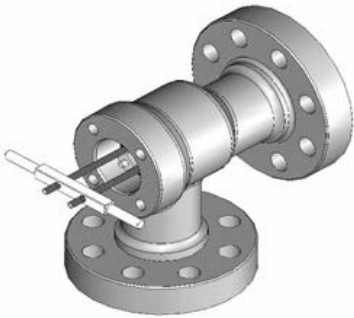
2.



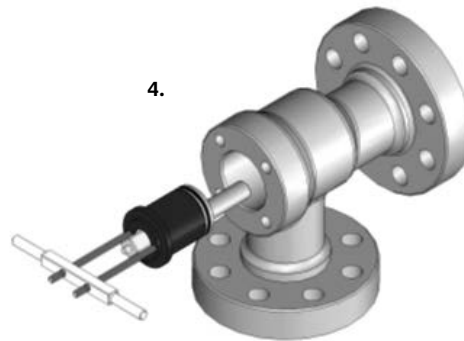
TRIM INSPECTION

- 1. Undo body/bonnet bolting.
- 2. Take off bonnet assembly.

3.



4.



TAKE OUT INTERNALS

- 3. Attach internal wrench tool.
- 4. Pull out internals.

Parts Ordering

Each actuator has a serial number stamped on the nameplate. Always mention this number when corresponding with your [Emerson sales office](#) regarding technical information or replacement parts.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Automation Solutions should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

Table 1. Vonk Assembly Arrangements

CHOKE TYPE	STD	STD/FE	STD/FE/FS	LT	LT/FE	LT/FE/FS	HT	HT/FE	HT/FE/FS
CHV	X	X	X	X	X	X	X	X	X
ICV	X			X					
SCV	X								
YCV	X		X	X			X		

Parts List

Note

Contact your [Emerson sales office](#) for Part Ordering information.

CHV Valve, STD (figure 5)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Guide Strip
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	O-Ring, qty 2
30.30	V-Seal
30.40	Guide Strip
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing, qty 2
30.90	Scraper
30.100	Wedge
30.110	Pin
30.120	Spring Sleeve
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2

CHV Valve, STD/FE (figure 6)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	O-Ring, Bean
20.40	Locking Wire
20.50	Guide Strip
20.60	Scraper
20.70	Turning Fork
20.80	Protecting Bush
20.90	V-Ring
30.10	Bonnet
30.20	O-Ring, qty 2
30.30	Seal
30.40	Bearing, qty 2
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing, qty 2
30.90	Scraper
30.100	Wedge
30.110	Pin
30.140	Spring Sleeve
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 4

CHV Valve, STD/FE/FS (figure 7)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	O-Ring
20.40	Locking Wire
20.50	Guide Strip
20.60	Scraper
20.70	Turning Fork
20.80	Protecting Bush
20.90	V-Ring
30.10	Bonnet
30.20	O-Ring, qty 2
30.30	Seal
30.40	Guide Strip
30.50	Spring
30.60	Bearing Ring
30.70	Shaft
30.80	Bearing
30.90	Scraper
30.100	Wedge
30.110	Pin
30.120	Bonnet Bush
30.130	O-Ring, qty 2
30.140	Spring Sleeve
30.150	Gland
30.160	Stem Packing, qty 3
30.170	Body Packing
30.180	Hex Screw, qty 6
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2
40.50	Bean Packing

CHV Valve, LT (figure 8)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal
20.40	Locking Wire
20.50	Guide Strip
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Guide Strip
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing
30.90	Scraper
30.100	Wedge
30.110	Pin
30.120	Support Ring
40.10	Stud Bolt, qty 4 Nut, qty 4
40.20	Nameplate
40.30	Rivets, qty 2

CHV Valve, LT/FE (figure 9)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Bearing
30.90	Scraper
30.100	Shaft Key
30.110	Pin
30.120	Bearing Holder
30.130	Spring Sleeve
40.10	Stud Bolt, qty 4 Nut, qty 4
40.20	Nameplate
40.30	Rivets, qty 2

CHV Valve, LT/FE/FS (figure 10)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.59	Ring
30.60	Bearing Ring
30.61	Ring
30.70	Shaft
30.80	Bearing
30.100	Shaft Key
30.110	Pin
30.120	Gland
30.130	Spring Sleeve
30.140	Body Packing
30.150	Hex Screw, qty 6
30.160	Stem Packing, qty 4
40.10	Stud Bolt, qty 4 Nut, qty 4
40.20	Nameplate
40.30	Rivets, qty 2
40.50	Bean Packing, qty 2

CHV Valve, HT (figure 11)

Key	Description
1	Body
10	Bean
20	Front Disk
31	Seal, Bean
32	Locking Wire
33	Bearing
35	Turning Fork
36	Protecting Bush
37	V-Ring
50	Bonnet
51	Seal
52	Seal, Back Up
53	Bearing
54	Spring
55	Bearing
56	Shaft
57	Radial Bearing
58	Protecting Ring
59	Wedge
60	Pin
61	O-Ring
63	Bearing Holder
80	Stud Bolt, qty 8
81	Nut, qty 8
82	Nameplate
84	Rivets, qty 2

CHV Valve, HT/FE (figure 12)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Bearing
30.90	Protection Ring
30.100	Shaft Key
30.110	Pin
30.120	O-Ring
30.130	Bearing Holder
30.140	Spring Bush
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2

CHV Valve, HT/FE/FS (figure 13)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.59	Ring
30.60	Bearing Ring
30.61	Ring
30.70	Shaft
30.80	Bearing
30.100	Shaft Key
30.110	Pin
30.120	Gland
30.130	Spring Sleeve
30.140	Body Packing
30.150	Hex Screw, qty 6
30.160	Stem Packing, qty 4
40.10	Stud Bolt, qty 4 Nut, qty 4
40.20	Nameplate
40.30	Rivets, qty 2
40.50	Bean Packing, qty 2

YCV Valve, STD (figure 14)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	O-Ring
30.30	Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing
30.90	Scraper
30.100	Shaft Key
30.110	Pin
30.120	Bearing Holder
30.130	Spring Bush
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2

YCV Valve, STD/FE (figure 15)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Guide Strip
20.60	Scraper
20.70	Turning Fork
20.80	Protecting Bush
20.90	V-Ring
30.10	Bonnet
30.20	O-Ring, qty 2
30.30	Seal
30.40	Guide Strip, qty 2
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing, qty 2
30.90	Scraper
30.100	Wedge
30.110	Pin
30.120	Bonnet Bush
30.130	O-Ring, qty 2
30.140	Spring Sleeve
40.10	Stud Bolt, qty 6 Nut, qty 6
40.30	Nameplate
40.40	Rivets, qty 2

YCV Valve, STD/FE/FS (figure 16)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Guide Strip
20.60	Scraper
20.70	Turning Fork
20.80	Protecting Bush
20.90	V-Ring
30.10	Bonnet
30.20	O-Ring, qty 2
30.30	Seal
30.40	Guide Strip, qty 2
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radical Bearing, qty 2
30.90	Scraper
30.100	Wedge
30.110	Pin
30.120	Bonnet Bush
30.130	O-Ring, qty 2
30.140	Spring Sleeve
30.150	Gland
30.160	Stem Packing, qty 3
30.170	Body Packing
30.180	Hex Screw, qty 6
40.10	Stud Bolt, qty 4 Nut, qty 4

Key	Description
40.30	Nameplate
40.40	Rivets, qty 2
40.50	Bean Packing

YCV Valve, LT/FE (figure 17)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
20.90	Dowel Pin
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Bearing
30.90	Scraper
30.100	Shaft Key
30.110	Pin
30.120	Bushing Holder
30.130	Spring Bush
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2

YCV Valve, HT (figure 18)

Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	Seal, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
20.90	Dowel Pin
30.10	Bonnet
30.20	Seal
30.30	Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Radial Bearing
30.90	Protecting Ring
30.100	Shaft Key
30.110	Dowel Pin
30.120	O-Ring
30.130	Bearing Holder
40.10	Stud Bolt, qty 4 Nut, qty 4
40.30	Nameplate
40.40	Rivets, qty 2

ICV Valve, STD (figure 19)

Key	Description
10.10	Inlet Flange
10.20	Outlet Flange
20.10	O-Ring
20.20	O-Ring, qty 3
20.30	Back Disk
20.40	Rotating Shaft
20.45	Back-up Ring, qty 2
20.50	Spring
20.60	O-Ring, qty 4
20.70	Bearing
20.80	Front Disk
20.90	Spring Bush
30.10	Wedge
30.20	Stud Bolt, qty 6 Nut, qty 6
30.40	Nameplate
30.50	Rivets, qty 4
30.60	Protecting Ring
30.70	Grease Cap
30.80	Outlet Nameplate

ICV Valve, LT (figure 20)

Key	Description
10.10	Inlet Flange
10.20	Outlet Flange
20.10	V-Seal
20.20	Rotating Shaft
20.40	Locking Wire
20.50	Pin
20.90	Spring Bush
20.100	Spring
20.110	Guide Bearing, qty 2
20.120	Seal, qty 2
20.130	O-Ring
20.140	Front Disk
20.170	Bean
20.180	Rotating Shaft
30.10	Wedge
30.20	Stud Bolt, qty 6 Nut, qty 6
30.40	Nameplate
30.50	Rivets, qty 4
30.60	Protecting Ring
30.70	Outlet Nameplate

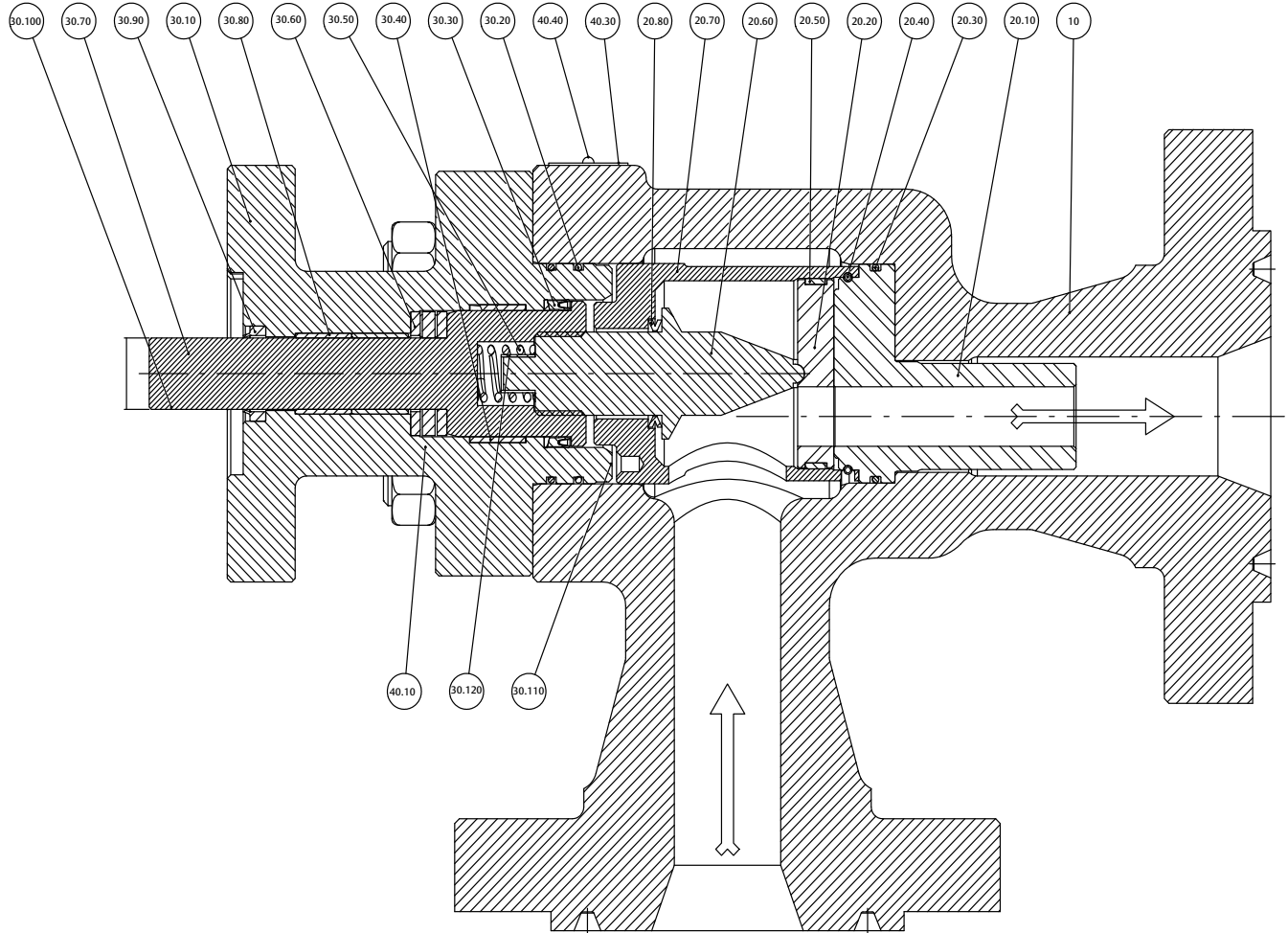
ICV Valve, HT (figure 21)

Key	Description
1	Inlet Flange
2	Outlet Flange
6	Seal
7	Seal
9	Bean
11	Pin
12	Handle Part, Rotating Shaft
13	Front Disk, Rotating Shaft
14	Spring Bush
15	Spring
16	Guide Bearing, qty 2
17	Seal, qty 2
18	O-Ring
19	Front Disk
20	Locking Wire, Rotating Shaft
22	Wedge
23	Stud Bolt, qty 6
24	Nut, qty 6
26	Nameplate
27	Rivets, qty 4
28	Protecting Ring
30	Outlet Nameplate
40	Rotating Shaft, Handle
41	Nut, qty 3
42	Fork, qty 2
43	Set-Screw, qty 2
44	Set-Screw
45	Eye-Bolt, Right
46	Eye-Bolt, Left
47	Nut
48	Shaft
49	Actuator Handle
50	Washer
51	Bolt
55	Mounting Plate
56	Pin
57	Retaining Ring
58	Bearing Ring
59	Coupling Shaft
60	Bolt, qty 2
61	Washer, qty 2
62	Bolt, qty 4
63	Washer, qty 4

SCV Valve, STD (figure 22)

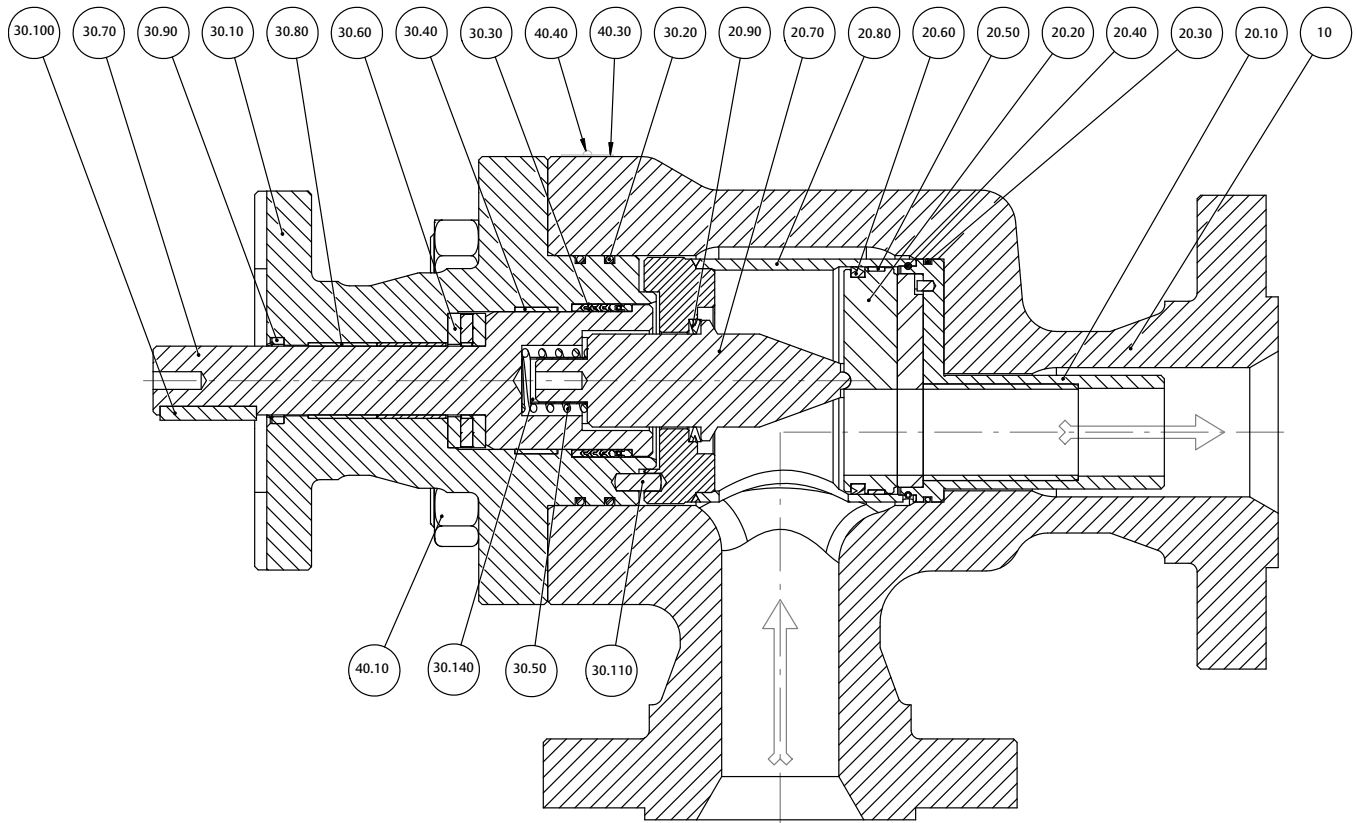
Key	Description
10	Body
20.10	Bean
20.20	Front Disk
20.30	O-Ring, Bean
20.40	Locking Wire
20.50	Bearing
20.60	Turning Fork
20.70	Protecting Bush
20.80	V-Ring
30.10	Bonnet
30.20	O-Ring
30.30	Lip Seal
30.40	Bearing
30.50	Spring
30.60	Bearing
30.70	Shaft
30.80	Bearing
30.90	Scraper
30.100	Shaft Key
30.110	Pin
30.130	Spring Bush
40.10	Stud Bolt, qty 6 Nut, qty 6
40.30	Nameplate
40.40	Rivets, qty 2

Figure 5. Vonk CHV Valve, STD



94.10.360

Figure 6. Vonk CHV Valve, STD/FE



94.10.884

Figure 7. Vonk CHV Valve, STD/FE/FS

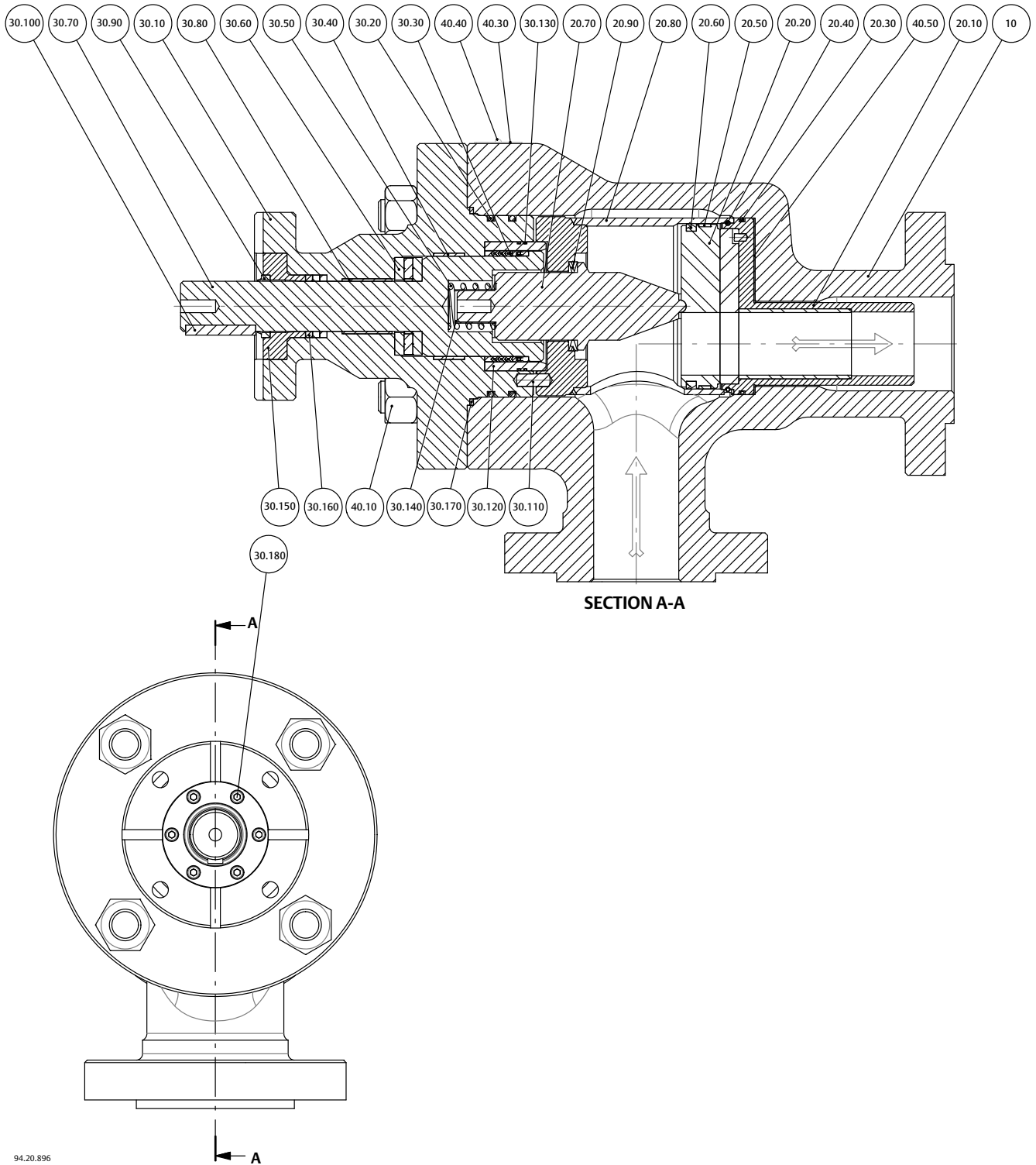
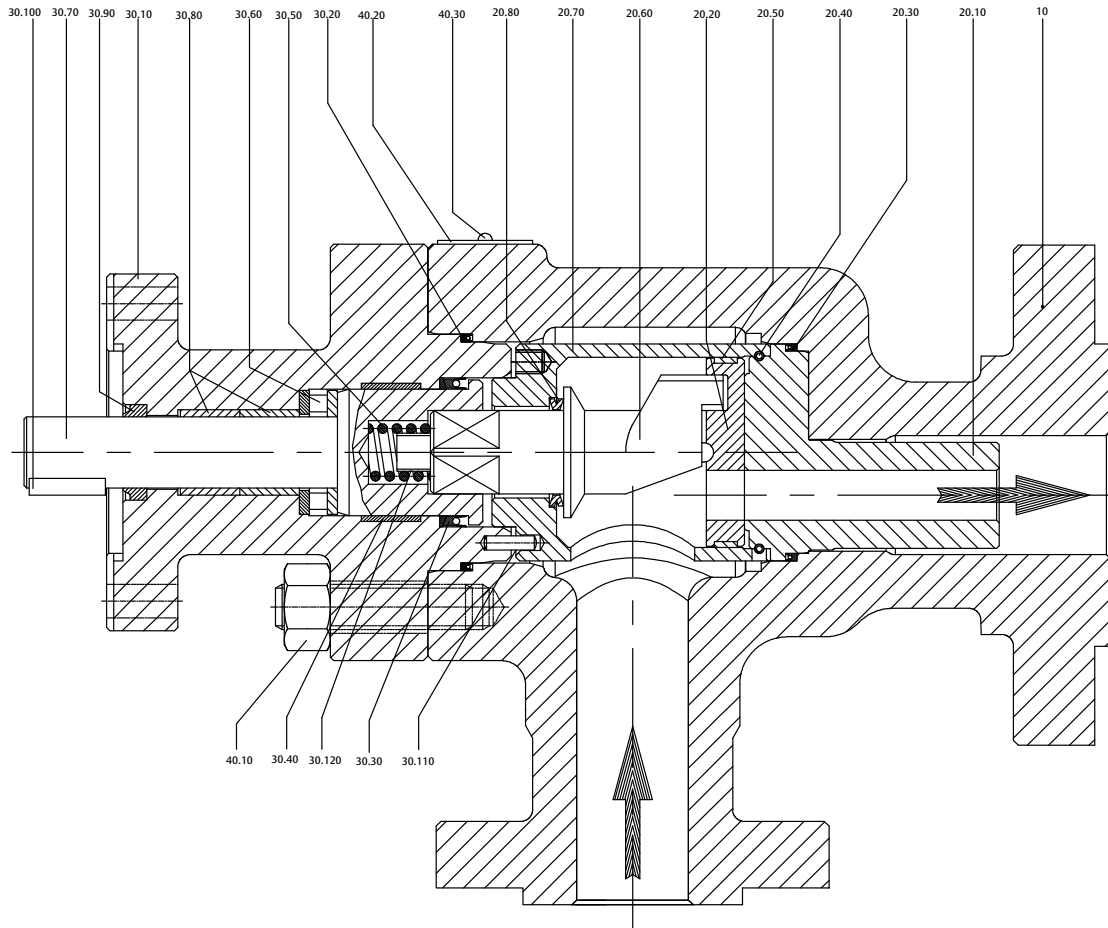
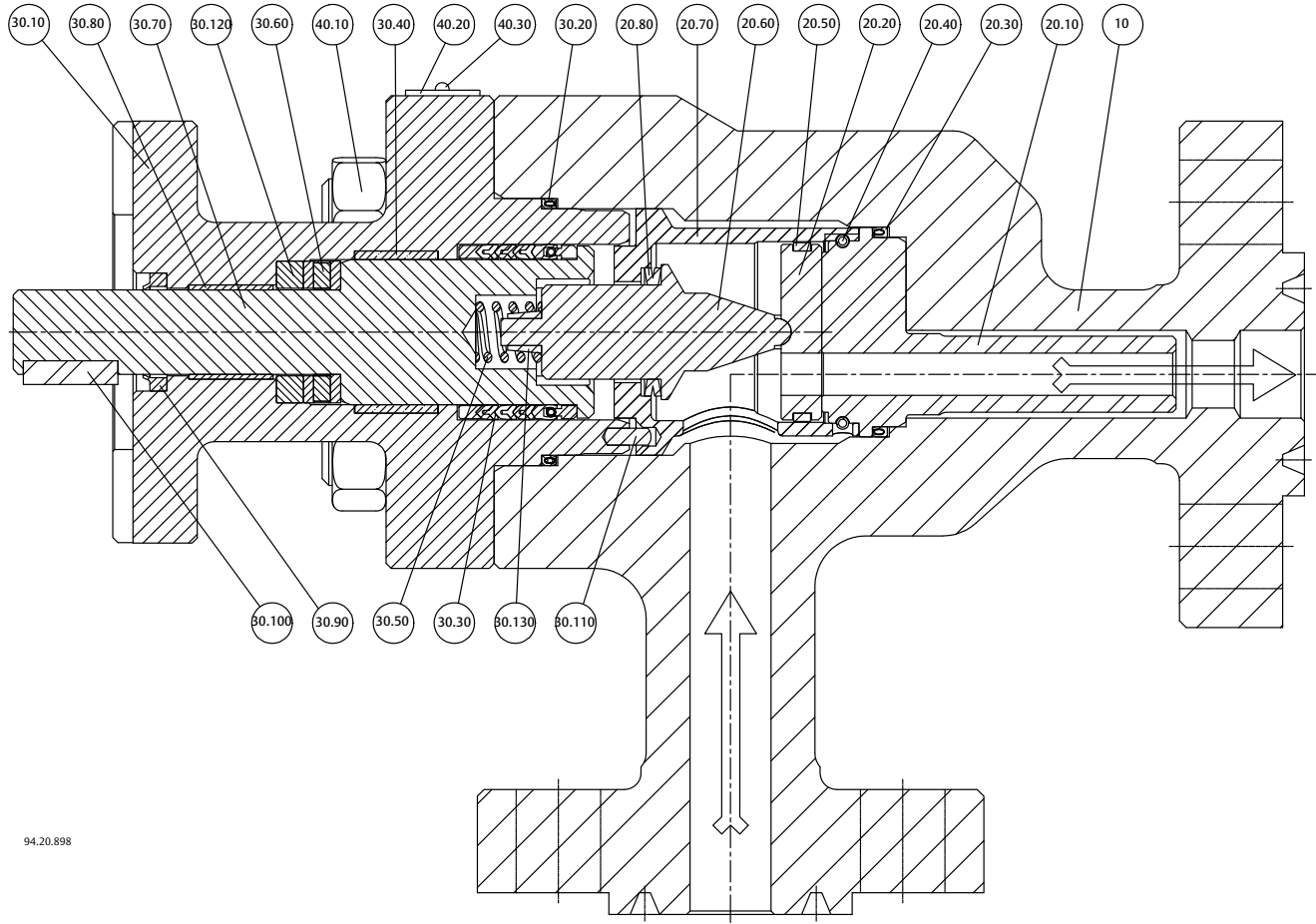


Figure 8. Vonk CHV Valve, LT



94.10.904

Figure 9. Vonk CHV Valve, LT/FE



94.20.898

Figure 10. Vonk CHV Valve, LT/FE/FS

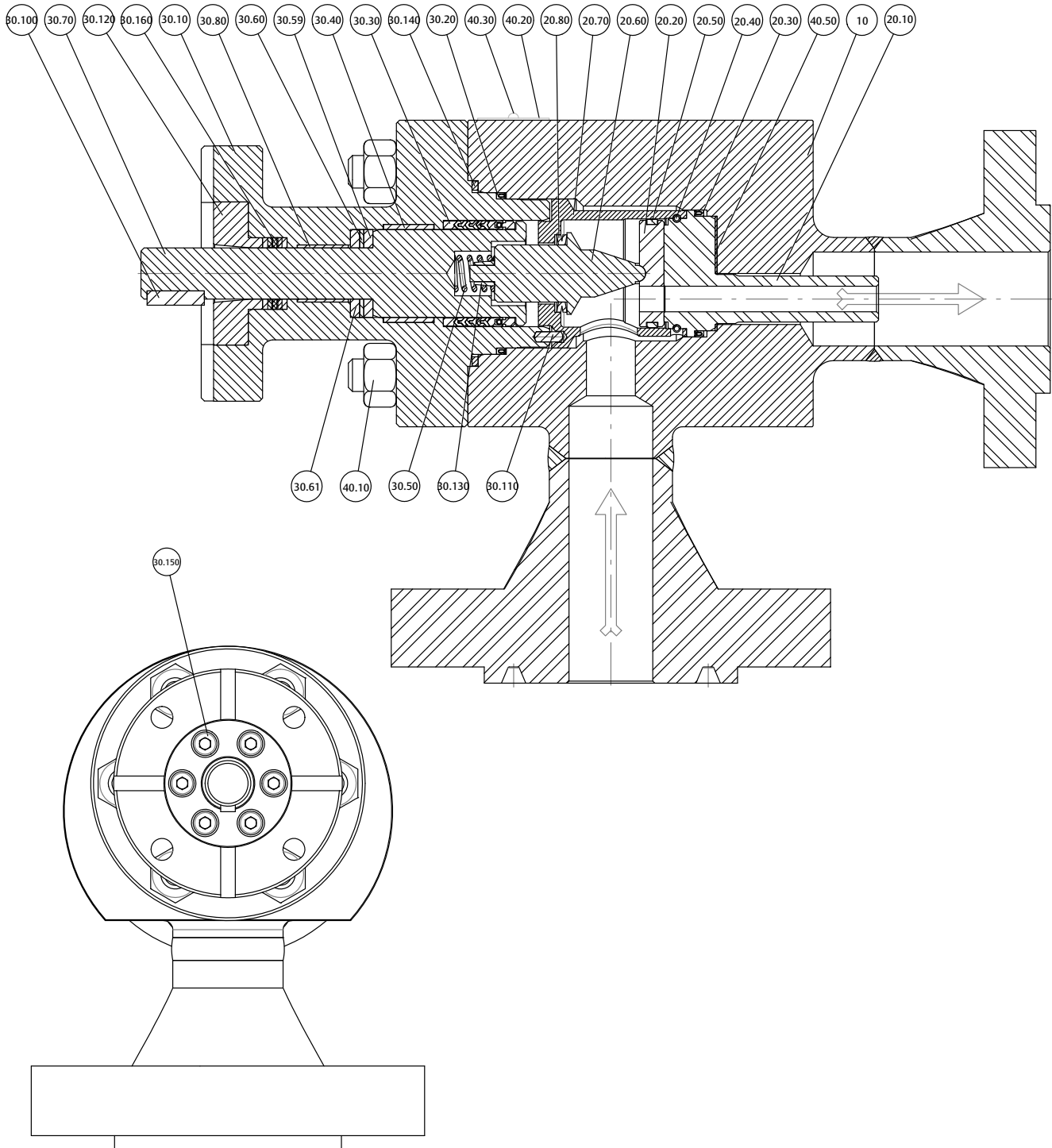
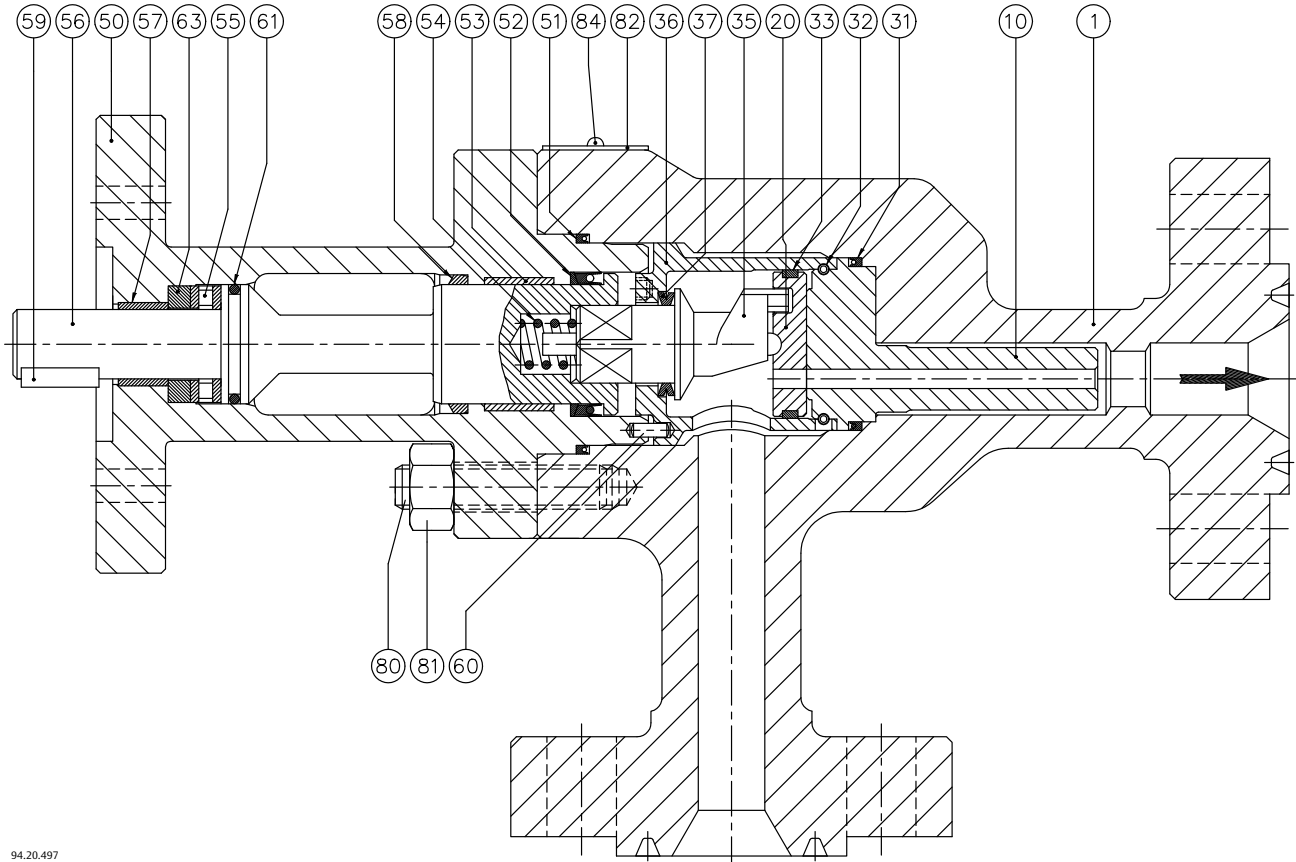
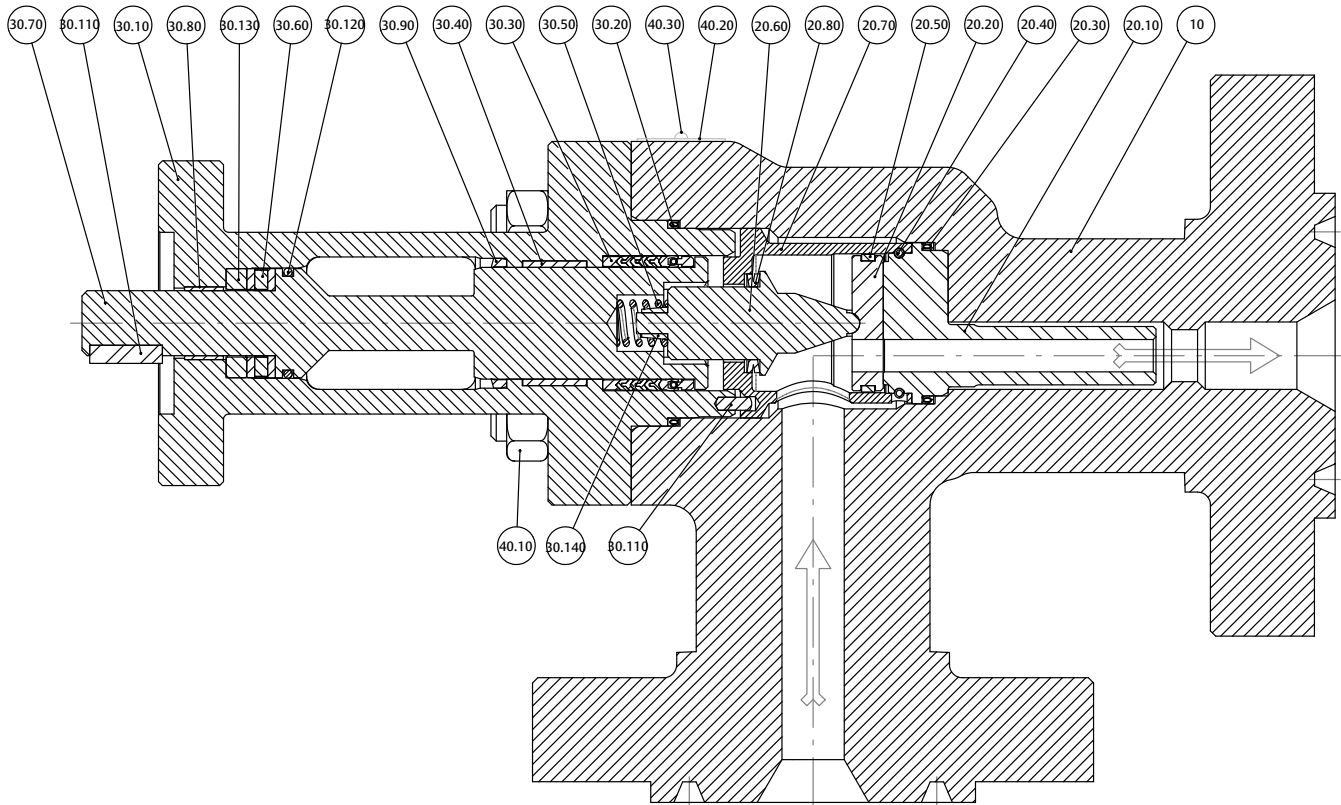


Figure 11. Vonk CHV Valve, HT



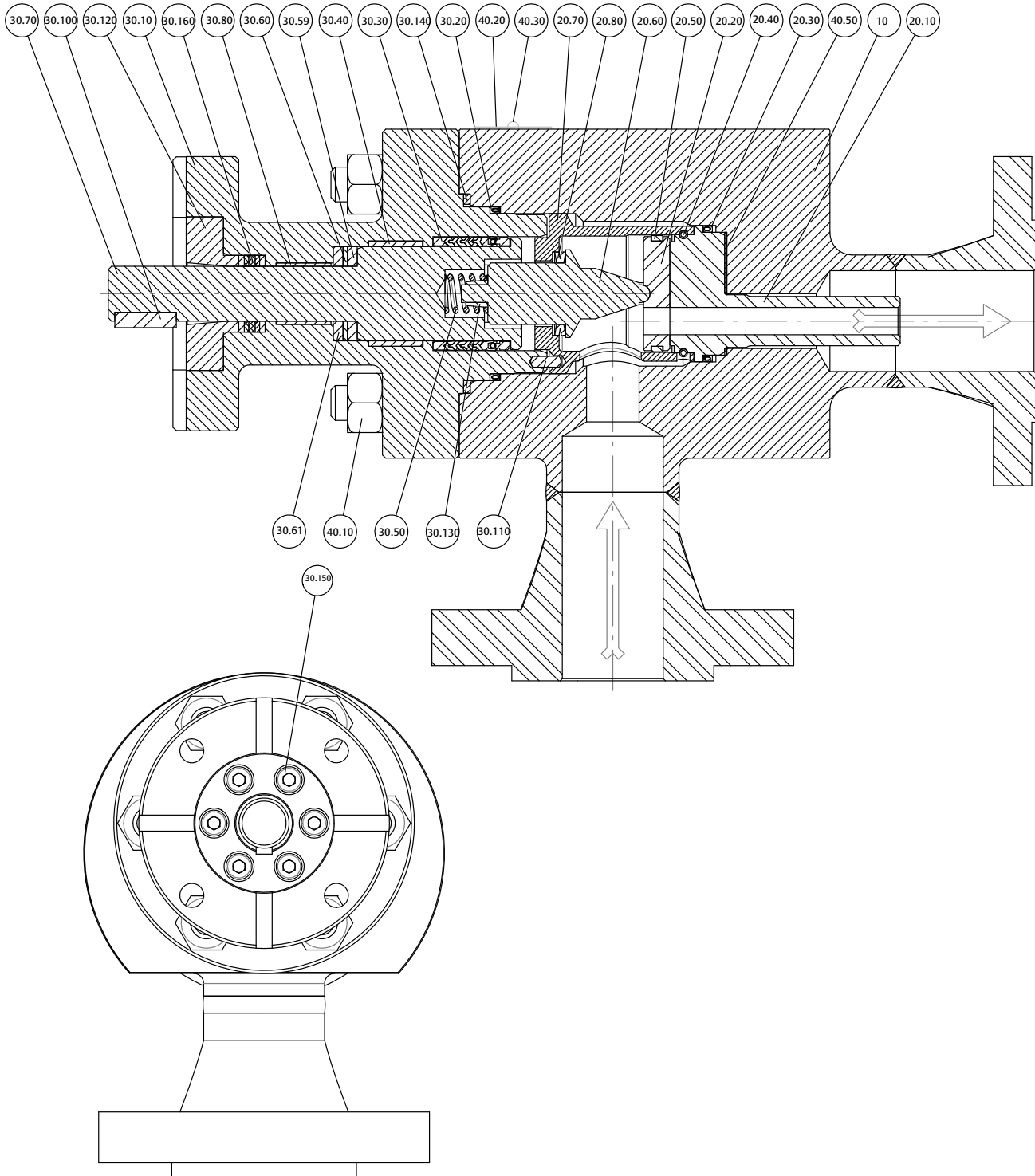
94.20.497

Figure 12. Vonk CHV Valve, HT/FE



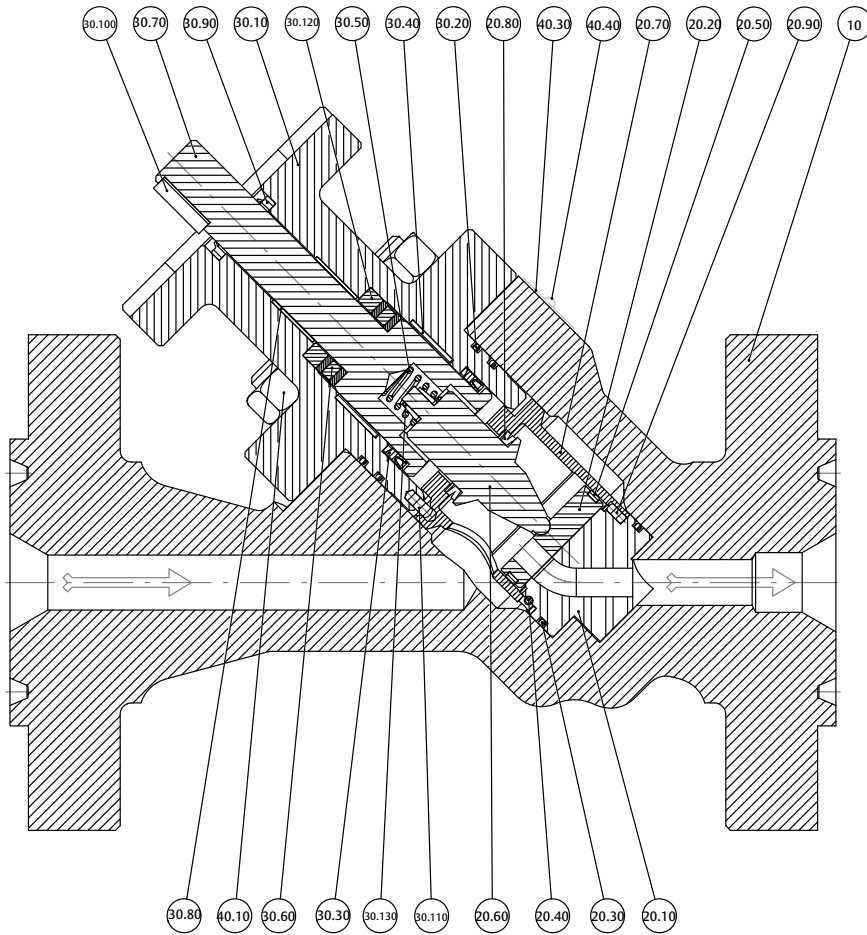
94.20.875

Figure 13. Vonk CHV Valve, HT/FE/FS



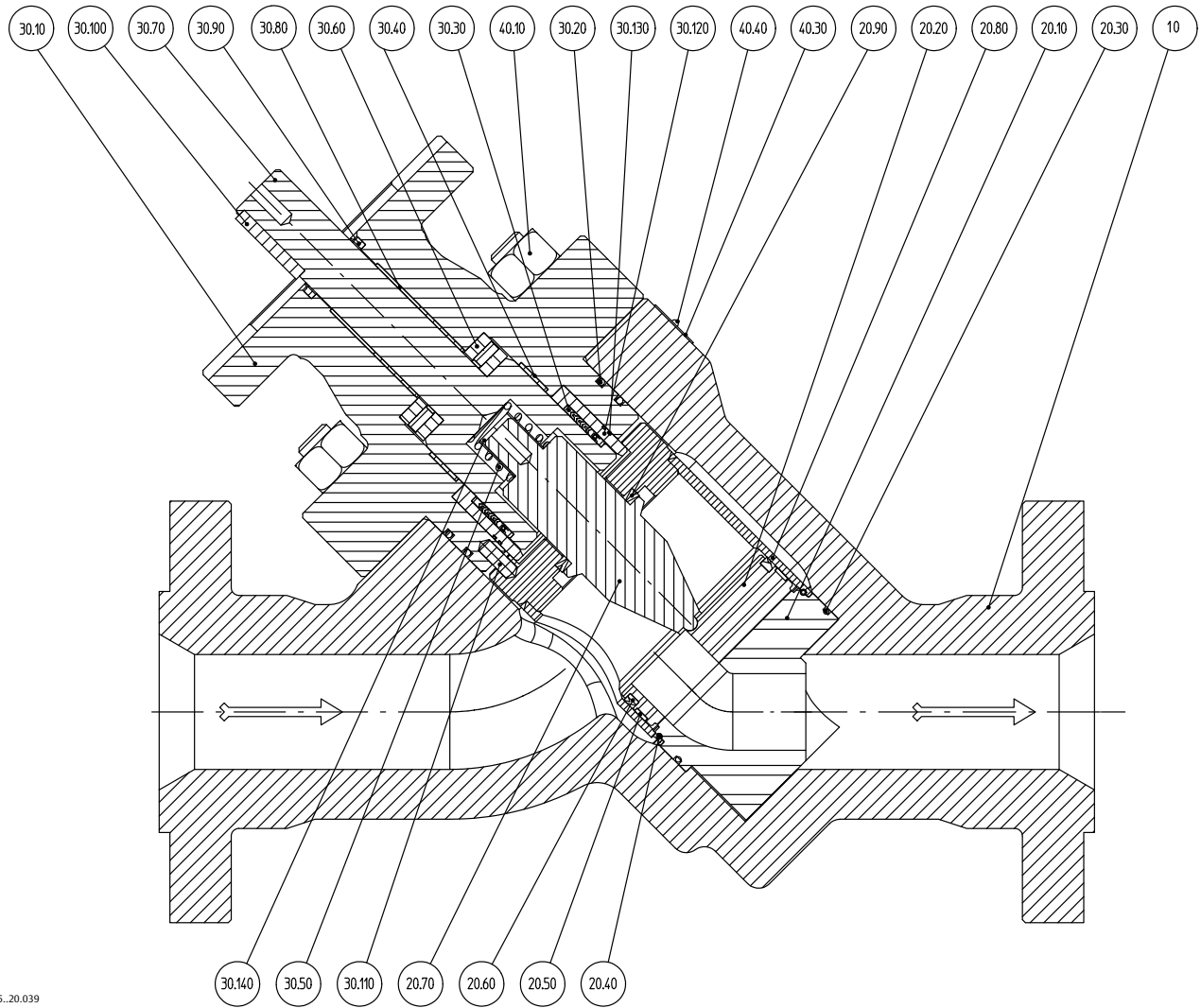
94.10.891

Figure 14. Vonk YCV Valve, STD



95.20.028

Figure 15. Vonk YCV Valve, STD/FE



95..20.039

Figure 16. Vonk YCV Valve, STD/FE/FS

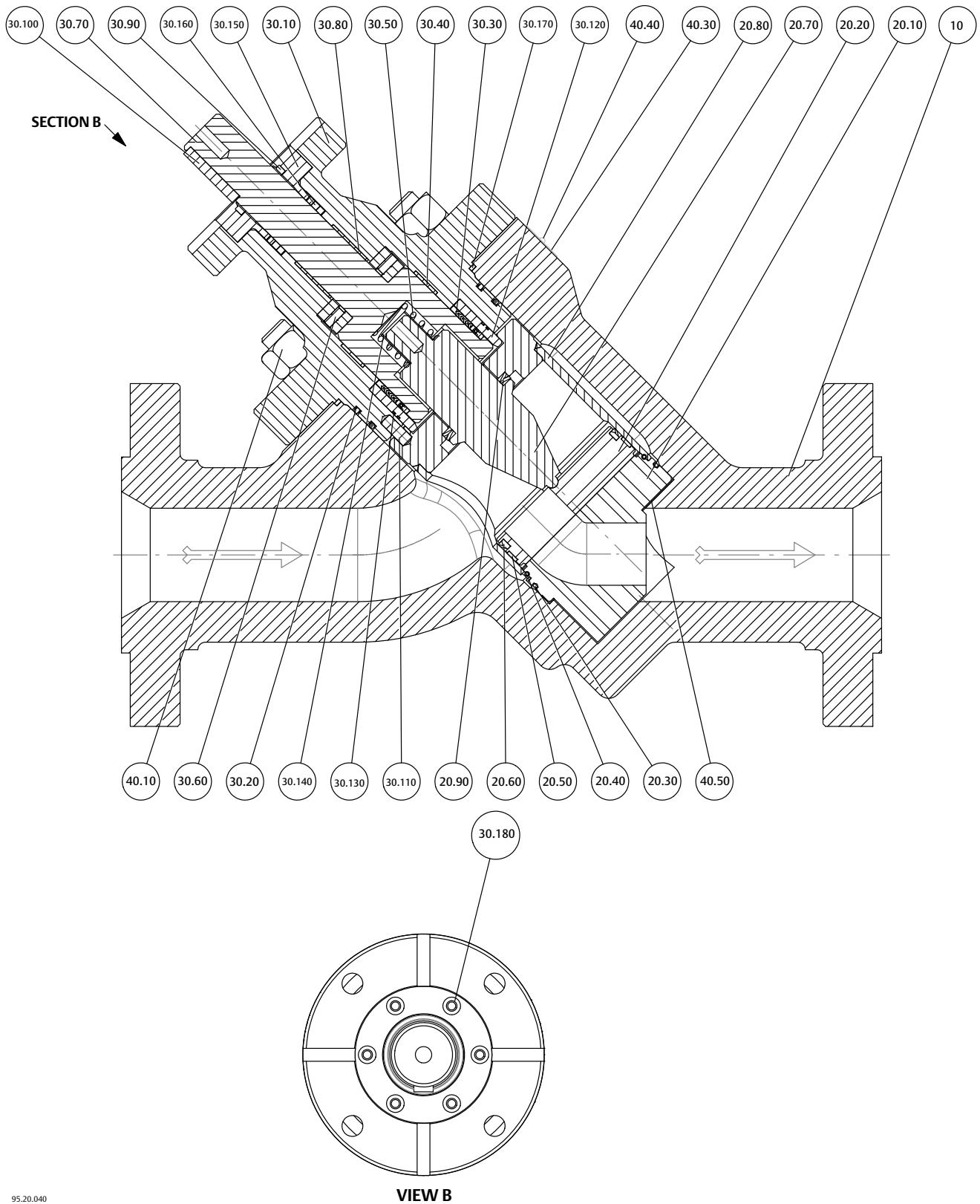
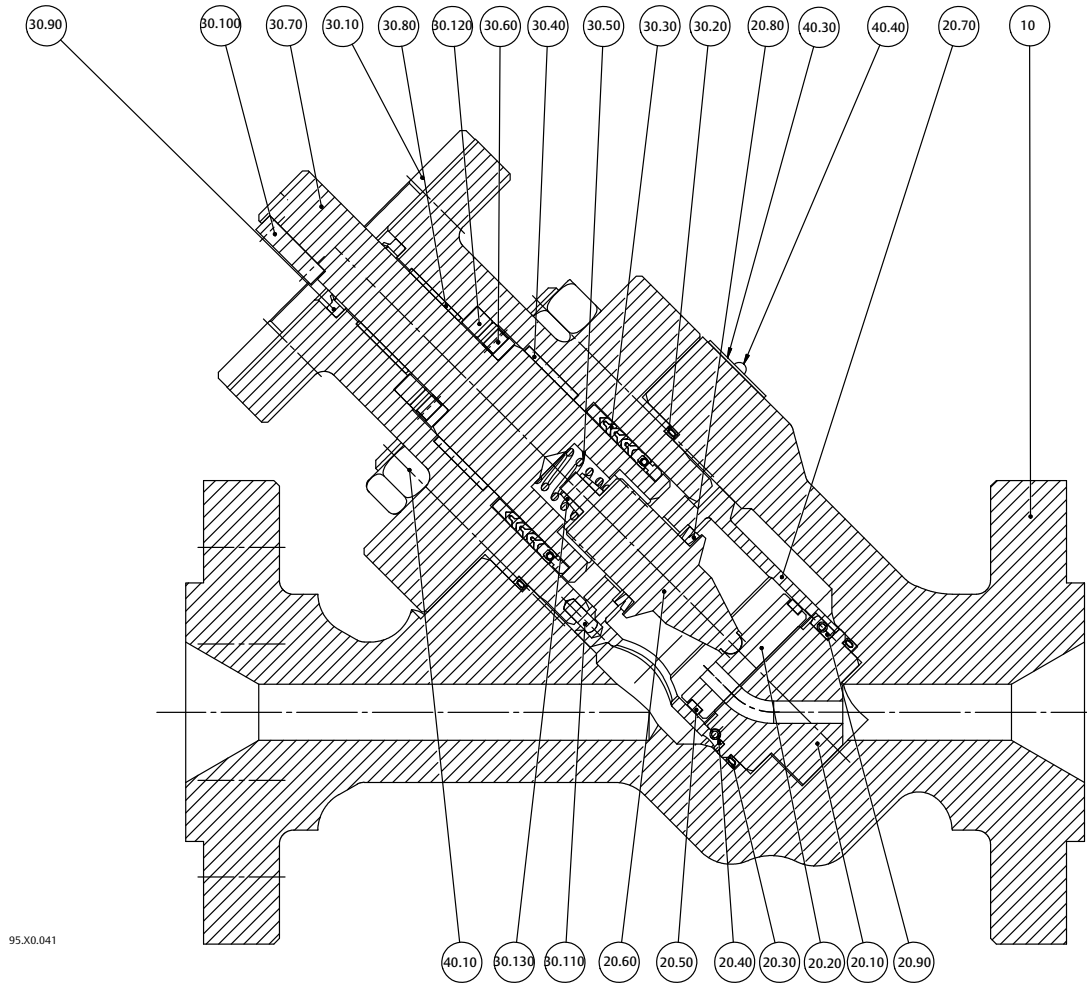
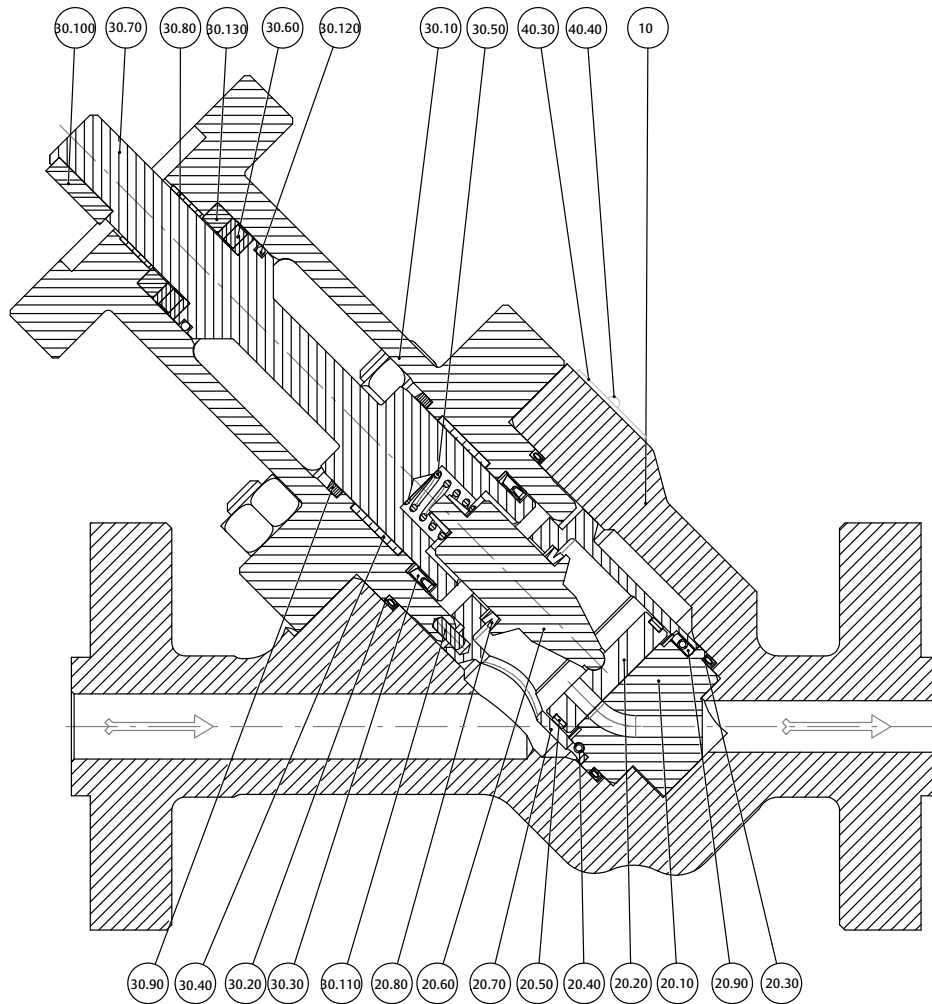


Figure 17. Vonk YCV Valve, LT/FE



95.X0.041

Figure 18. Vonk YCV Valve, HT



95.20.033

Figure 19. Vonk ICV Valve, STD

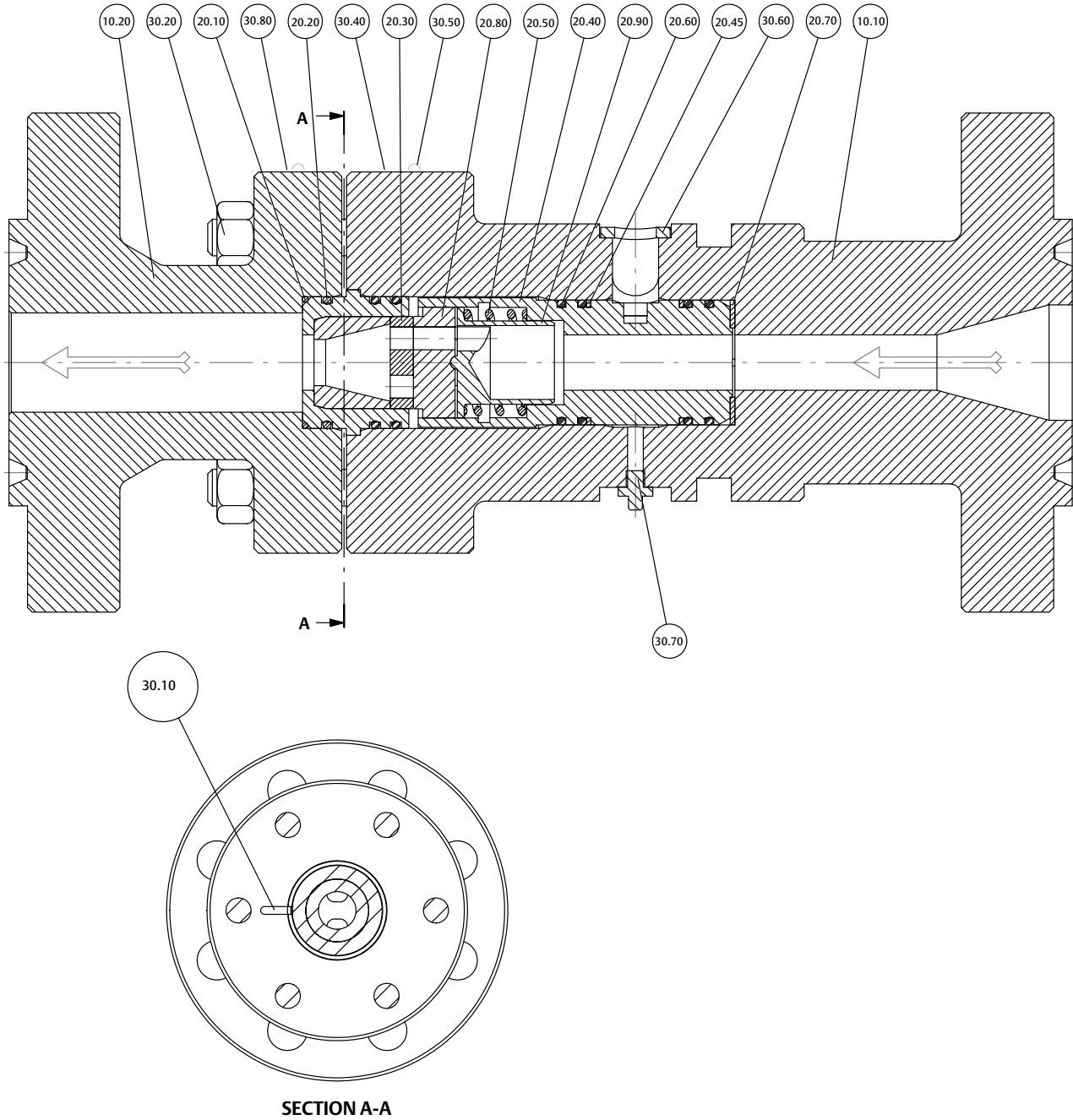


Figure 20. Vonk ICV Valve, LT

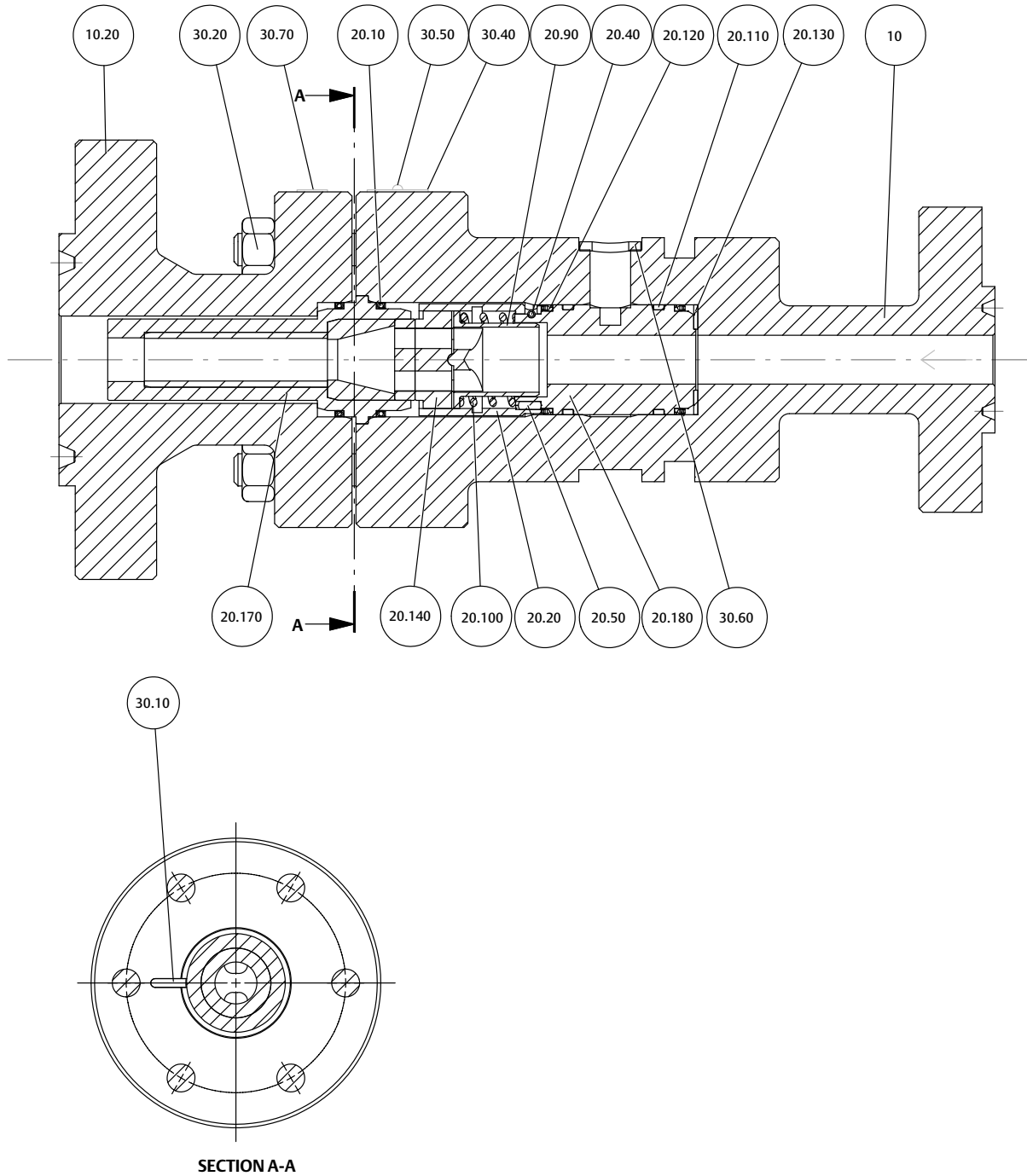
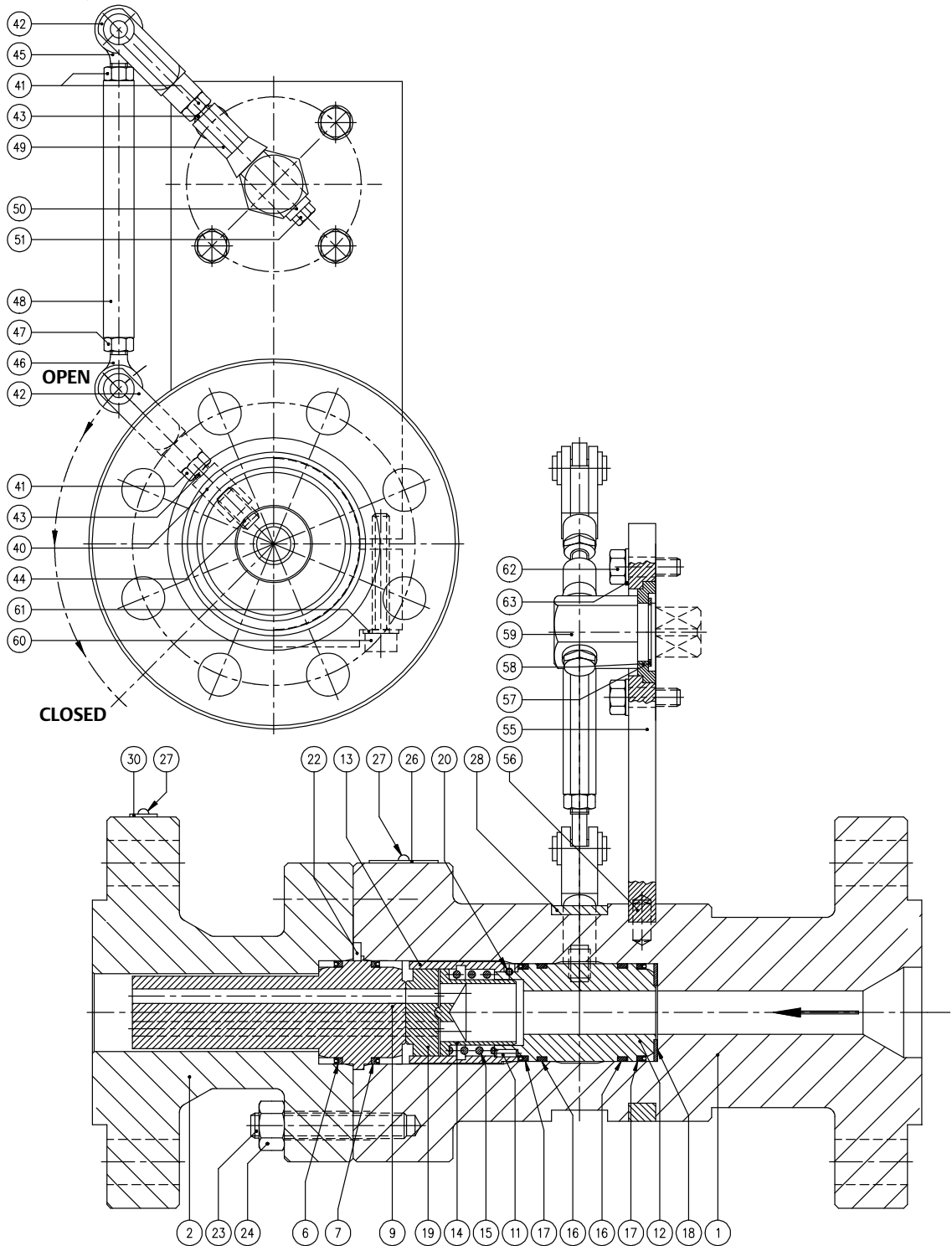
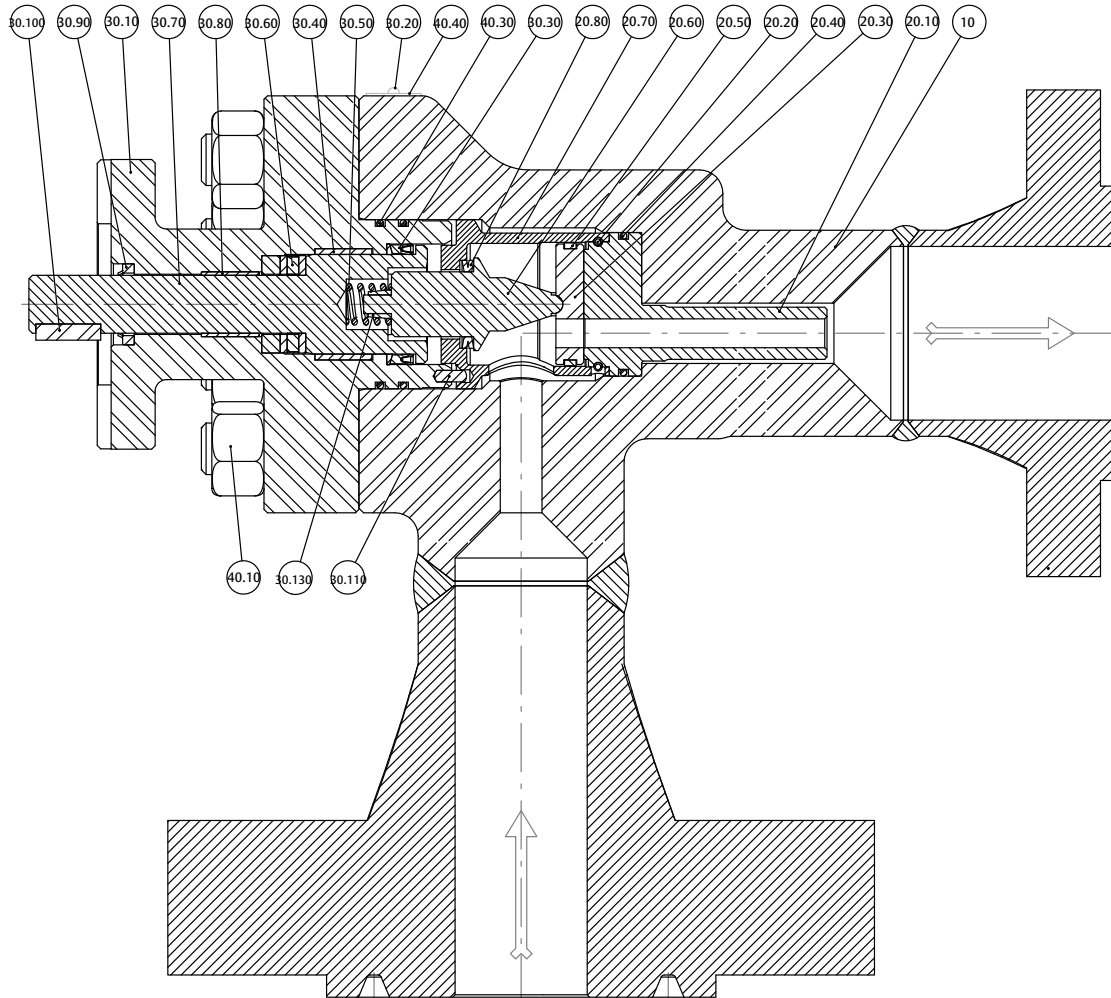


Figure 21. Vonk ICV Valve, HT



91.20.221

Figure 22. Vonk SCV Valve, STD



10.1A.000

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