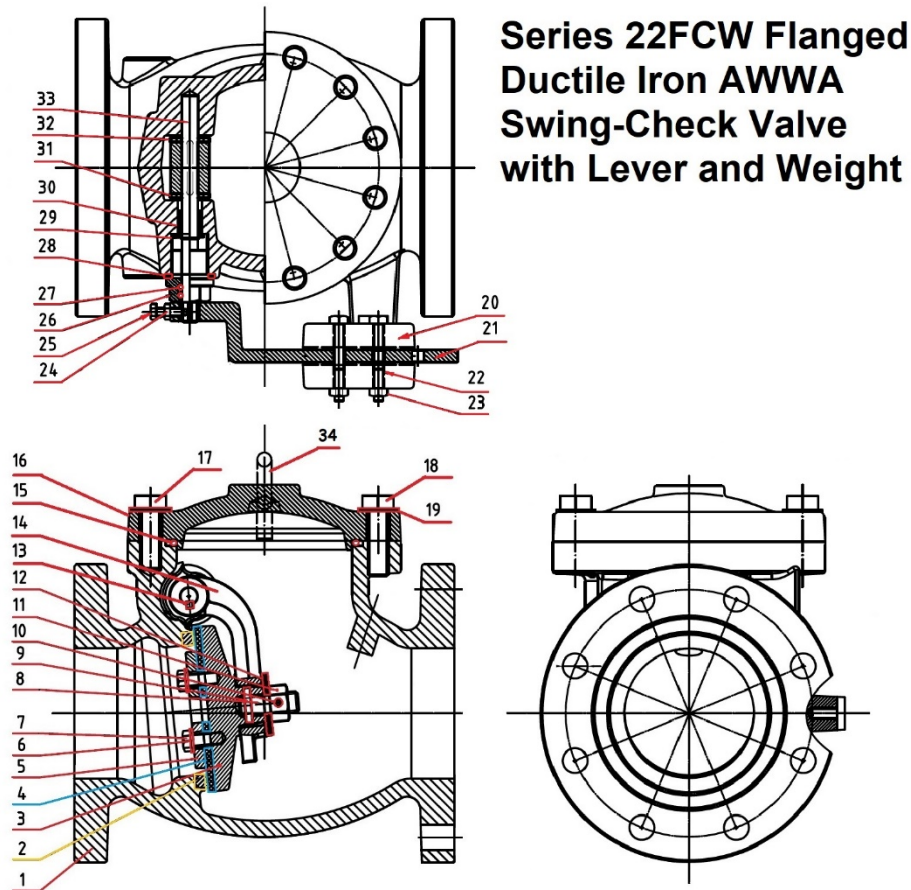


# **SCI Series 22FCW Flanged Ductile Iron AWWA Swing-Check Valve with Lever & Weight Installation, Operation and Maintenance Instructions**



## **Series 22FCW Flanged Ductile Iron AWWA Swing-Check Valve with Lever & Weight**

**Figure 1** – SCI Series 22FCW Flanged Ductile Iron Swing Check Valve with Lever & Weight



**Table 1** – SCI Series 22FC List of Materials (See Figure 1 for items illustrated)

Item No.	Part Description	Material – Series 22FCW	Item No.	Part Description	Material – Series 22FCW
1	Valve Body	Ductile Iron, ASTM A536 Gr 65-45-12	18	Bolt	AISI 316 Stainless Steel
2	Seat	Bronze, ASTM B62 Gr C83600	19	Washer	AISI 316 Stainless Steel
3	Disc	Ductile Iron, ASTM A536 Gr 65-45-12	20	Weight	Ductile Iron, ASTM A536 Gr 65-45-12
4	Disc Seat Ring	EPDM Rubber	21	Arm	Cast Steel, ASTM A216 Gr WCB
5	Retainer Washer	Ductile Iron, ASTM A536 Gr 65-45-12	22	Bolt	AISI 316 Stainless Steel
6	Washer	AISI 316 Stainless Steel	23	Nut	AISI 316 Stainless Steel
7	Bolt	AISI 316 Stainless Steel	24	Nut	AISI 316 Stainless Steel
8	Stud	Bronze, ASTM B62	25	Bolt	AISI 316 Stainless Steel
9	Roll Pin	AISI 304 Stainless Steel	26	Seat Nut	Bronze, ASTM B62 Gr C83600
10	Roll Pin	AISI 304 Stainless Steel	27	O-Ring	EPDM Rubber
11	Nut	Bronze, ASTM B62	28	Gasket	PTFE
12	Washer	Bronze, ASTM B62	29	Circlip	Carbon Steel
13	Flat Key	AISI 304 Stainless Steel	30	Shaft Sleeve Gland	Bronze, ASTM B62
14	Clapper Arm	Ductile Iron, ASTM A536 Gr 65-45-12	31	Washer	Bronze, ASTM B62
15	O-Ring	EPDM Rubber	32	Washer	Bronze, ASTM B62
16	Bonnet	Ductile Iron, ASTM A536 Gr 65-45-12	33	Hinge Pin	AISI 410 Stainless Steel
17	Bolt	AISI 316 Stainless Steel	34	Eye Bolt	Carbon Steel (4" to 12" sizes only)

## **Valve Installation** [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]

These valves – which conform to the requirements of AWWA C508 - may be installed in the pipeline in any orientation or position using good piping practice. However, it is recommended to install the valve with the bonnet (16) above the flow axis (in horizontal pipe) for optimum access and operation of the valve.

These valves should be installed in a horizontal pipeline with the body vertical (with bonnet (16) above flow axis) using good pipe installation practice. These valves can also be installed in a vertical run of pipe, as long as the flow arrow on the body points upward and the weight (20) and arm (21) assembly can be reoriented 90-degrees clockwise.

These valves are equipped with ANSI/ASME Class 125 flanges to attach to in-line pipe flanges. It is recommended to install the valves between flanges with the same system rating and sufficient gap to install suitable gaskets compatible with the system fluid. These valves have flat-faced flanges and should not be bolted to raised face flanges. Flange bolting should be tightened in an alternating (crisscross) pattern until the recommended bolt torque is reached.

## **Valve Operation** [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]


The operation of a swing check valve is automatic – no operator action is required.

The swing check valves are designed to permit flow in only one direction and stop flow in the reverse direction.

A flow arrow on the side of the valve body indicates the desired direction of fluid flow (free flow).

## **Valve Maintenance** [See Figure 1 and Table 1 for part numbers listed in parentheses ( )]

### **Safety Precautions Prior to Performing Maintenance:**

 **WARNING** – Do not attempt to perform maintenance on these valves in pressurized lines. Doing so may result in severe injury or burns due to hot fluids if there is an uncontrolled release of system pressure.

Before removing a valve from the pipeline, determine which media may be flowing through the valve. The media may be corrosive, toxic, flammable or contaminated. When there is evidence of hazardous fluids having flowed through the valve, additional precautions should be taken to avoid contact with these fluids and additional precautions should be taken when handling the valves during removal. Review the Safety Data Sheet (SDS) for any hazardous flowing fluids for any additional precautions. As a minimum, the following additional precautions should be taken.

1. Always wear OSHA-approved Safety Eyewear or face shields.
2. Always wear protective gloves and overalls or a chemical-resistant apron.
3. Wear protective footwear (e.g., safety shoes).
4. Wear protective headgear as required for the work area (e.g., hard hat – if required).
5. Ensure that running water is easily accessible (e.g., to rinse fluids from hands or valve / parts).
6. Have a suitable fire extinguisher ready if working with flammable media.

Check pipeline gauges to ensure that no pressure exists on either the upstream or downstream sides of the valve before performing any maintenance.

## **Valve Maintenance – continued:**

In normal service, no preventive maintenance is required to be performed on these valves.

These valves do not require lubrication or adjustment while in service.

Should the valve disc (3) or its seat (4) become worn over time – such that its performance (leakage) is unacceptable – the valve should be replaced.

However, should only minor work need to be performed on the valve internals (e.g., removal of an internal obstruction or debris) the following steps should be performed:

### **Disassembly of the valve to access internals:**

D1. Unbolt the valve bonnet (16) by removing the bolts (17,18) and washers (19) from the top of the valve body (1). Remove the bonnet rubber O-Ring (15) and set it aside if not damaged excessively – otherwise discard it.

D2. If it is necessary to remove the disc (3) to inspect the seating surfaces or get to an internal obstruction, first remove the arm (21) and weight (20) assembly by removing the nuts (24) and bolts (25) which attach the arm to the hinge pin (33). Then remove the seat nut (26) & internal o-rings (27), the gasket (28), the circlip (29) & shaft sleeve gland (30), and back out the hinge pin (33) and key (13) to free the disc assembly from the body (1). Use caution to not lose or damage the spacer washers (31 & 32) that are on either side of the disc (3) in the body. Remove the disc (3) and clapper arm (14) assembly from the valve and set it aside for further inspection.

D3. Remove any internal obstructions inside the valve that may be blocking the disc (3) and inspect the seat (2) surfaces (installed in the body) or the disc (3) assembly itself for any obvious damage or material that adheres to either surface. Note: extensive damage to the seat (2) surfaces or the disc (3) or clapper arm (14) may warrant replacement of the entire valve as refurbishment or replacement of the disc, arm and seating areas may be too costly.

D4. If the disc seat ring (4) appears to be the only thing damaged, it can be replaced – if a replacement part is available from the factory. To remove the rubber seat ring (4), remove the bolts (7), washers (6) and the retainer washer (5) from the disc (3) and set aside for re-assembly. Check the condition of the rubber seat ring (4) and determine if it must be replaced with a new one.

### Reassembly of the valve disc (3) after seat repair or replacement:

- R1. Place the original (or replacement) seat ring (4) back onto the disc (3) by installing using the bolts (7), washers (6) and retainer washer (5) back onto the disc (3) and torquing the bolts sufficiently without damaging or buckling the seat ring (4). **Note:** if thread sealants had been used on the original bolts (7), use the same or equivalent thread locking compound to secure the seat (4) to the disc. Use the same torque on the bolts (7) as was necessary to remove them – or at least snug plus ½ turn.
- R2. Do not remove any of the parts of the clapper arm (14) assembly attachment to the back of the disc (3) unless it looks like there is excessive play or damage to the roll pins (9, 10), stud (8), retention nut (11) or washer (12). Replacement of these parts may make it necessary to obtain original factory parts which may be prohibitive for a simple repair or adjustment of the disc or seat.
- R3. Re-install the disc (3) assembly, hinge pin (33), key (13), washers (31 & 32) and shaft sleeve gland (30) back into the body (1). Ensure the disc (3) lifts easily without excessive resistance, and that the rubber seat ring (4) makes sufficient contact with the seat (2) in the body. Replace the circlip (29), seat nut (26), o-rings (27) and gasket (28) back onto the end of the hinge pin (33) to secure the pin and disc assembly.
- R4. Reattach the arm (21) and weight (20) assembly back onto the hinge pin (33) by re-installing the nuts (24) and bolts (25) onto the end of the arm (21) and secure it by torquing the bolts (25) and nuts (24) securely to the pin (33). Check to ensure the disc (3) assembly lifts inside the body easily by lifting the arm (21) and weight (20) to ensure that it lifts and closes easily, and the parts are all secure.
- R5. Replace the bonnet seal O-ring (4) back into its groove on top of the body (1) – preferably with a new one. **Caution:** Ensure the sealing surfaces of the bonnet (16) to body (1) connection are sufficiently clean to accept the O-ring and are not scraped or gouged to cause a leak path. Install the bonnet bolts (17 & 18) and washers (19) to mount the bonnet (16) back onto the body (1) and tighten the bolts in an alternating (crisscross) fashion to the recommended torque. Note: if it is evident that thread sealants had been used on the bolts when the valve was disassembled, use the same or similar sealant (compatible with system fluid) prior to reassembly of the bonnet (16).
- R6. If the valve has been removed from the pipeline and the bonnet (16) has been removed, it is recommended to re-test the valve to a minimum of 330psig (110% of rating) with water, or 80 to 100psig air pressure to ensure the body-bonnet and hinge pin (33) penetration connections are tight. If the valve is installed in the pipeline, it is recommended to perform this test to maximum system pressure possible and to ensure the valve shuts off in the reverse flow direction.