Cast Steel Swing Check Valve

Figures 147 147½

Class 150 • Bolted Cap

Material of Construction

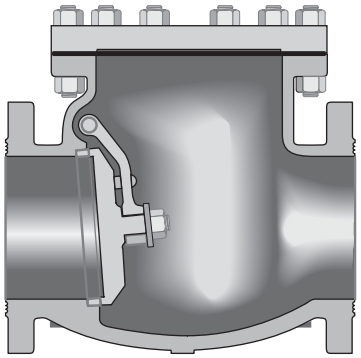
Description	Material
Body	WCB
Cap	WCB
Seat Ring	Hardfaced
Disc	13% CR Overlay
Hinge	WCB
Pins, Hinge	410 SS
Disc Washer	Steel
Cap Screw	A307 Gr. B
Cap Gasket	SS Tanged Ref. Flex. Graphite
Cap Studs	A193 Gr. B7
Cap Nuts	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

Figure 147
Flanged

Figure 147½
Butt Weld

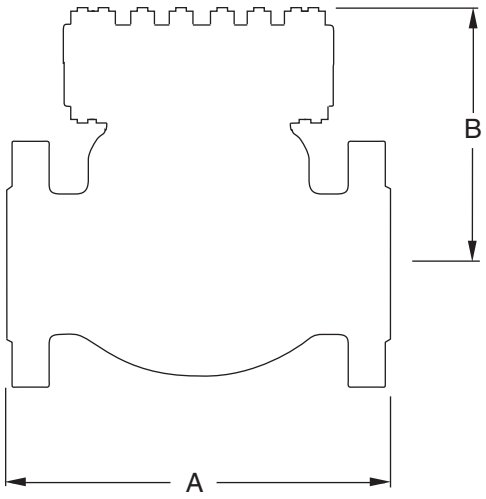
Size Range:
2 through 24 inches

Pressure Temperature Rating
Carbon Steel
ASTM A216 Grade WCB
285 psi @ -20°F to 100°F



Industry Standards

Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598
Acceptance	API RP591



Dimensions and Weights

Valve Size	Weight (pounds)		Dimensions (inches)	
			A	B
	147	147½	147 & 147½	
2	33	26	8.00	6.75
2½	57	37	8.50	7.12
3	59	40	9.50	7.38
4	93	71	11.50	8.50
5	152	126	13.00	9.50
6	165	132	14.00	10.25
8	275	235	19.50	11.88
10	440	385	24.50	13.88
12	680	570	27.50	15.75
14	950	810	31.00	17.75
16	1225	1065	34.00	19.00
18	1700	1500	38.50	21.25
20	1850	1600	38.50	23.58
24	2900	2550	51.00	26.75

Materials of Construction

Steel bolted bonnet valves described in this catalog are typically manufactured of carbon steel. When specified, the valves are available in the alloys shown below which are suitable for steam, water, oil, oil vapor, gas and general services. Please contact factory or customer service for availability and material breakdowns.

Body and Bonnet or Cap Materials

Part No. Suffix	ASTM Classification	Material Classification	Service Conditions
None	A216 WCB	Carbon Steel	For service up to 1000° F where corrosion and oxidation are not a factor. (1) (4) (5)
6	A217 WC6	1 ¼ CR, ½ Mo	For service up to 1000° F. (3) (4) (5)
9	A217 WC9	2 ¼ CR, 1 Mo	For service up to 1100° F where good creep strength is required. (3) (4) (5)
5	A217 C5	5% CR, ½ Mo	For service up to 1200° F. Best corrosion and oxidation resistance plus high creep strength are required.
12	A217 C12	9% CR, 1 Mo	For service up to 1200° F. Best corrosion and oxidation resistance than other grades.
2	A351 LCC	Low Carbon Steel	For service from –50° F to 650° F. This material must be quenched and tempered to obtain tensile and impact properties needed at sub-zero temperatures.

(1) Upon prolonged exposure to temperatures above 800° F, the carbide phase of carbon steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 800°F.
(2) Valve regularly rated to 1000° F.
(3) Considerations should be given to the possibility of excessive oxidation (scaling) when used above 1050° F.
(4) Product used within the jurisdiction of Section 1 Power Boilers of the ASME Boiler and Pressure Vessel code is subject to the same temperature limitations as specified in that document.
(5) Product used within the jurisdiction of Power Piping, ASME Code for Pressure Piping B31.1, is subject to the same maximum temperature limitations placed upon the material in paragraph 124.2.

Trim Material

Part No. Suffix	API Trim Number	Nominal Trim	Seating Surfaces	Stem Material	Temperature
X	1	F6 / F6 (1)	13 Cr ASTM A217 (CA15)	13 Cr (410)	1100° F
UF*	5	HF / HF (2)	Stellite 6	13 Cr (410)	1200° F
A	9	Monel / Monel (4)	Monel	Monel	450° F
L	10	316 / 316 (3)	316 SS	316 SS	850° F
XUF*	8	F6 / HF (1) (2)	13 Cr ASTM A217 (CA 215) Stellite 6	13 Cr (410)	1100° F
AUF*	11	Monel / HF (4) (2)	Monel Stellite 6	Monel	450° F
LUF*	12	316 / HF (3) (2)	316 SS Stellite 6	316 SS	850° F

(1) 13% Chromium AISI Type 410 Stainless Steel.
(2) Hard Facing is weld deposited Cobalt base alloy.
(3) Austenitic Stainless Steel is a Ni-Cr-Mo stainless steel in the AISI Type 316 category.
(4) Ni-Cu Alloy.

*F denotes Flex Wedge (only applies to Gate Valves).

Valve Modification Suffix Identification

S.I.	Description	S.I.	Description	S.I.	Description	S.I.	Description	
TD	Drain, Drill, and Tap	ST	Special Trim	SP	Special Paint	OV	(1) Gear	(4) Pneumatic
BP	Bypass	BW	Special Butt-Weld End Prep	LD	Locking Device		(2) Chainwheel	(5) Hydraulic
PG	Special Packing and/or Gasket	RJ	Ring Joint	LR	Lantern Ring		(3) Electric	(6) Other

Cast Steel Swing Check Valve

CRANE

Typical Swing Check Valve Features

Check valves are automatically actuated. They are opened and sustained in the open position by the force of velocity pressure, and closed by the force of gravity. Seating load and resultant tightness is dependent upon back pressure. The disc and associated moving parts may be in a constant state of movement if the velocity pressure is not sufficient to hold the valve in a wide open and stable position. Premature wear and noisy operation or vibration of the moving parts can be avoided by selecting the size of check valve on the basis of flow conditions. The minimum velocity required to hold a swing check valve in the wide open and stable position has been developed by analysis of extensive test data and is expressed by the formula:

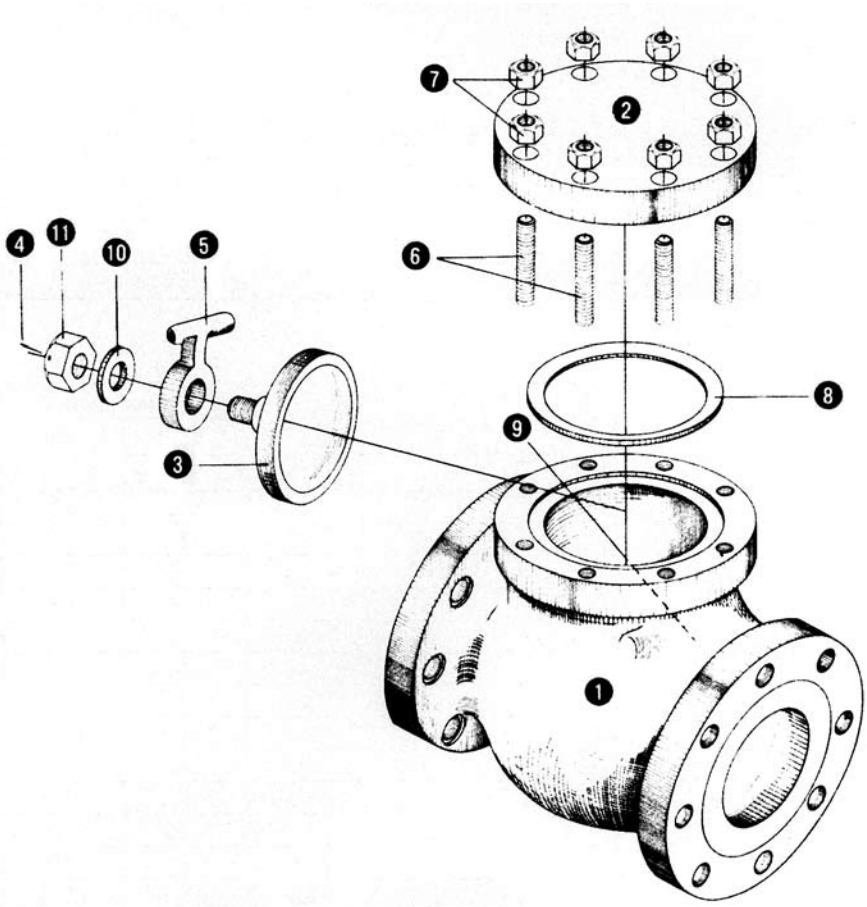
$$v = 60\sqrt{\bar{v}}$$

The value for v is equal to flow in feet per second and $\bar{v}$ is the specific volume of fluid in cubic feet per pound. Sizing swing check valves on this basis may often result in the use of valves that are smaller than the pipe in which they are used, necessitating the use of reducers for installation. The pressure drop will be no greater than that of the larger valve that is only partially open, and valve life will be greatly extended. The added bonus, of course, is the lower cost of the smaller valve.

There is no tendency for the seating surfaces of swing check valves to gall or score, because the disc meets the flat seat squarely without rubbing contact upon closing.

Crane cast steel swing check valves can be furnished with outside lever and adjustable weight when so ordered. With the lever and weight mounted so that the weight assists the disc in closing, the valve closes more rapidly when flow stops, thus minimizing reversal of flow and resultant surge and shock. With the lever and weight mounted to balance the weight of the disc, the valve becomes more sensitive to low inlet velocities.

Swing check valves are used to prevent reversal of flow in horizontal or vertical pipe lines. In vertical lines, or for any angle from horizontal to vertical, they can be used for upward flow only.



1. **Body:** Strong construction assures maximum safety over the recommended pressure and temperature range. Both flange and butt weld ends are available.
2. **Cap:** permits access to hinge and disc without removing valve from line.
3. **Disc:** is designed to close on its own weight to stop backflow from gaining sufficient velocity to create damaging shock.
4. **Disc Nut Pin**
5. **Hinge**
6. **Hinge Pin Plug**
7. **Cap Stud**
8. **Cap Stud Nuts**
9. **Cap Gasket**
10. **Body Seat Ring** (welded in)
11. **Disc Washer**
12. **Hinge Pin**
13. **Disc Nut**