

## 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:

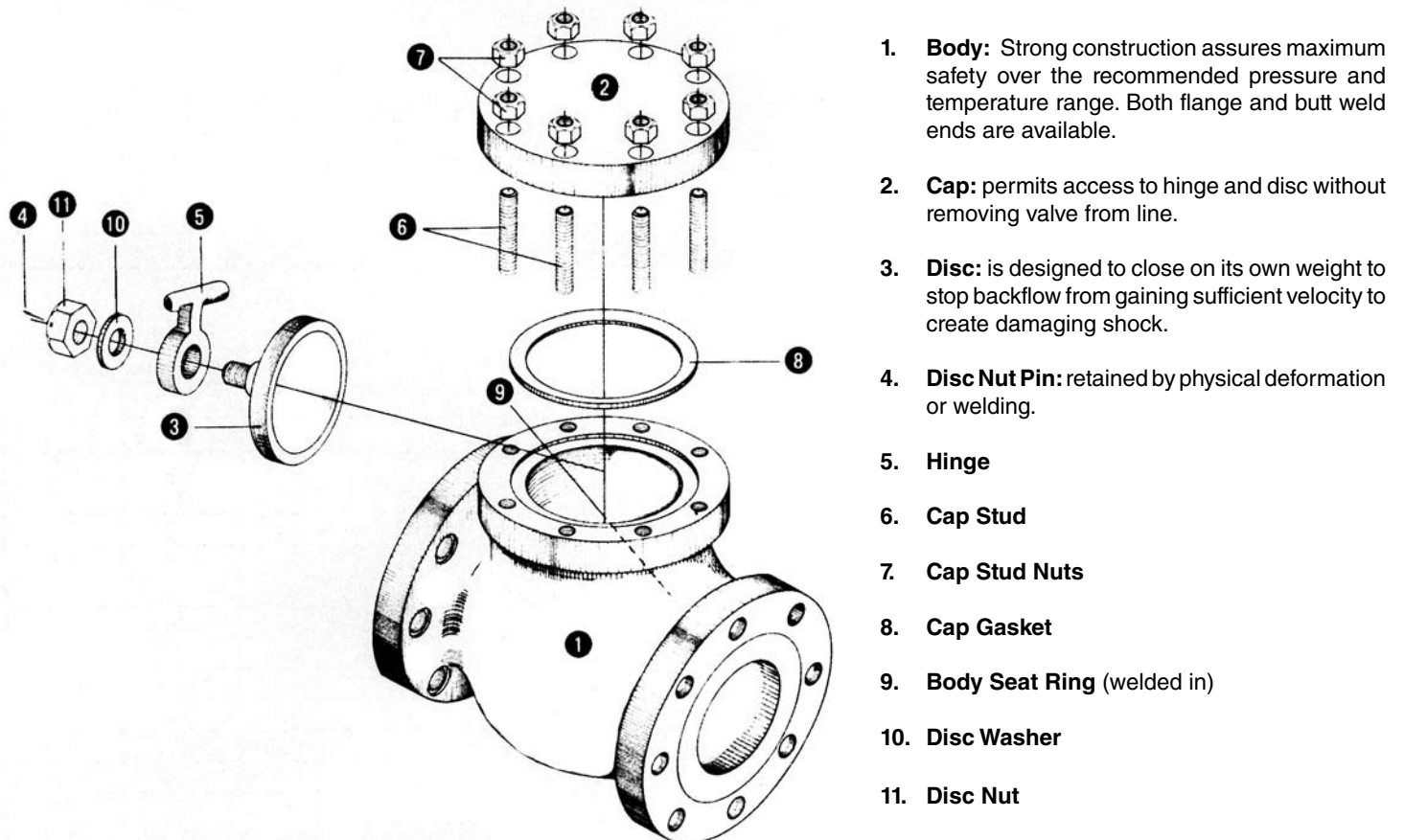
$$v = 60\sqrt{\bar{v}}$$

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 in certain sizes 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 flow velocities. For more information about the size range for which this modification is available, please consult your local sales representative or customer service office.

Swing check valves are used to prevent reversal of flow in horizontal pipe lines. Crane does not recommend the use of swing check valves in vertical pipelines, however when using this style of valve in a vertical application the valve must be installed 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:** retained by physical deformation or welding.
5. **Hinge**
6. **Cap Stud**
7. **Cap Stud Nuts**
8. **Cap Gasket**
9. **Body Seat Ring** (welded in)
10. **Disc Washer**
11. **Disc Nut**

**NOTE:** The above sketch is generic. Valve supplied may be internal hung or external hung type units depending upon pressure class and size.

# Cast Steel Swing Check Valve

Figures 147  
147½

**CRANE**

## 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	Corrugated Soft Steel or Steel/ Stainless Steel w/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

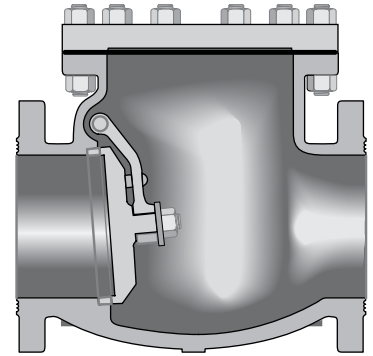
### Size Range:

2 through 24 inches  
(50 - 600 mm)

### Pressure Temperature Rating

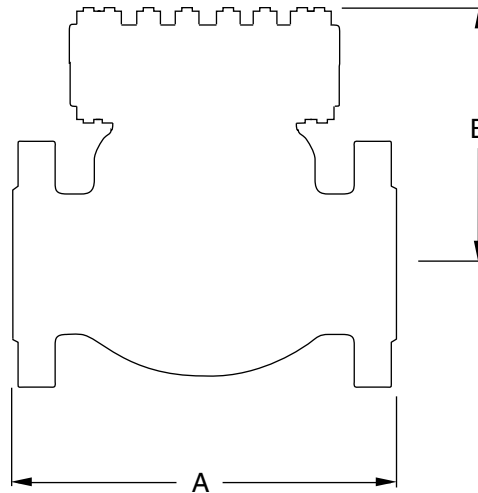
Carbon Steel

ASTM A216 Grade WCB  
285 psi @ -20°F to 100°F  
(20 bar @ -28°C to 37°C)



### NOTE:

\*Standard construction: WCB-Trim 8, other options are available.



### Industry Standards

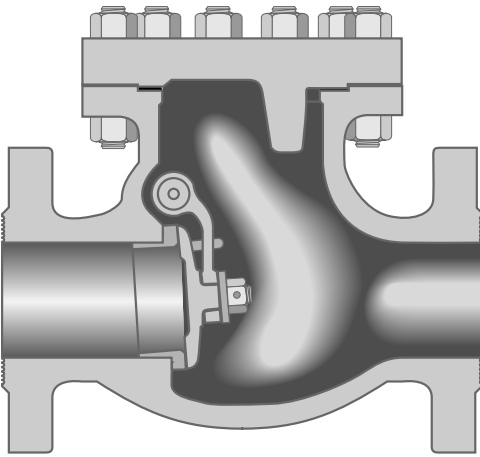
Steel Valves	ASME B16.34
Face-to-Face/End-to-End	ASME B16.10
Flange Dimensions	ASME B16.5
Weld End	ASME B.16.25
Testing	API 598

### Dimensions and Weights

Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A	8.00 (203)	8.50 (216)	9.50 (241)	11.50 (292)	14.00 (356)	19.50 (495)	24.50 (622)	27.50 (698)	31.00 (787)	34.00 (863)	38.50 (977)	38.50 (977)	51.00 (1295)
B (Open)	9 (229)	7 (178)	7 (178)	9 (229)	11 (279)	13 (330)	15 (381)	17 (432)	15 (381)	17 (432)	18 (457)	19 (482)	22 (558)
Wt.	41 (147)	57 (25)	64 (29)	101 (45)	170 (77)	360 (163)	485 (219)	765 (346)	950 (430)	1225 (555)	1700 (771)	1850 (839)	2600 (1179)
Wt. (147½)	42 (19)	57 (25)	64 (29)	101 (45)	170 (77)	360 (163)	485 (219)	807 (366)	950 (430)	1225 (555)	1700 (771)	1850 (839)	2600 (1179)

**Class 300 • Bolted Cap**



**Figure 159**  
Flanged  
**Figure 159½**  
Butt Weld

**Size Range:**  
2 through 24 inches  
(50 - 600 mm)

**Pressure Temperature Rating**  
Carbon Steel  
ASTM A216 Grade WCB  
740 psi @ -20°F to 100°F  
(51 bar @ -28°C to 37°C)

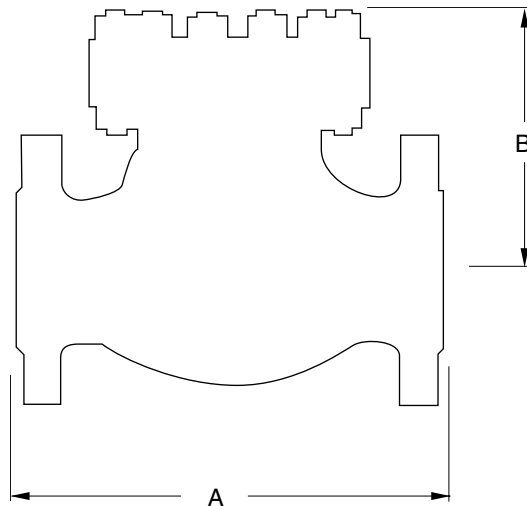
**Material of Construction\***

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	Stainless Steel spiral wound Graphite
Cap Studs	A193 Gr. B7
Cap Nuts	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

**NOTE:**  
\*Standard construction: WCB-Trim 8, other options are available.

**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



**Dimensions and Weights**

Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
A	10.50 (266)	11.50 (292)	12.50 (317)	14.00 (356)	17.50 (444)	21.00 (533)	24.50 (622)	28.00 (711)	33.00 (838)	34.00 (863)	38.50 (977)	40.00 (1016)	53.00 (1346)
B (Open)	7 (178)	8 (203)	8 (203)	9 (229)	11 (279)	14 (355)	16 (406)	19 (482)	19 (482)	22 (558)	23 (584)	25 (635)	30 (762)
Wt.	46 (159)	66 (20)	86 (29)	154 (69)	276 (125)	460 (208)	675 (306)	860 (390)	1500 (680)	1850 (839)	2250 (1020)	2900 (1315)	4350 (1973)
Wt. (159½)	33 (14)	49 (22)	86 (39)	97 (43)	276 (125)	460 (208)	677 (307)	992 (449)	1500 (680)	1850 (839)	2250 (1020)	2900 (1315)	4350 (1973)

# Cast Steel Swing Check Valve

Figures 175  
175½

**CRANE**

## Class 600 • 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	Ring Type Joint
Cap Studs	A193 Gr. B7
Cap Nuts	A194 Gr. 2H
I.D. Tags	SS
I.D. Pins	Steel

### Figure 175

Flanged

### Figure 175½

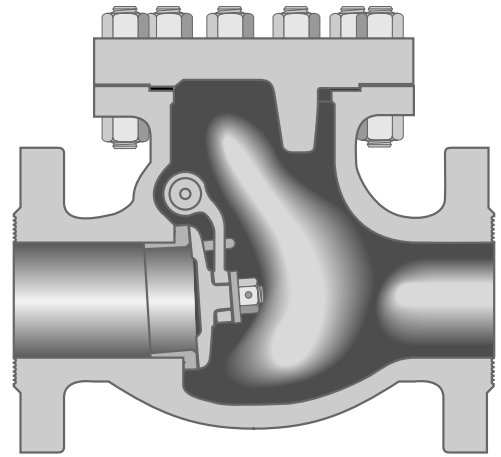
Butt Weld

### Size Range:

2 through 12 inches  
(50 - 300 mm)

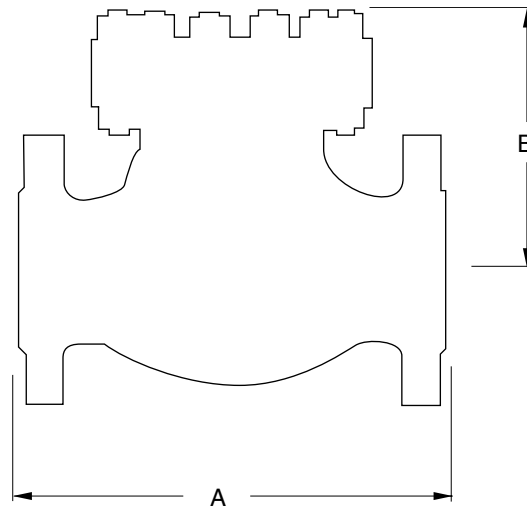
### Pressure Temperature Rating

Carbon Steel  
ASTM A216 Grade WCB  
1480 psi @ -20°F to 100°F  
(102 bar @ -28°C to 37°C)



### NOTE:

\*Standard construction: WCB-Trim 8, other options are available.



### 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

### Dimensions and Weights

Inches (millimeters) - pounds (kilograms)

Valves	2 (50)	2 ½ (65)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
A	11.50 (292)	13.00 (330)	14.00 (356)	17.00 (431)	22.00 (558)	26.00 (660)	31.00 (787)	33.00 (838)
B (Open)	7 (178)	8 (203)	9 (229)	11 (279)	13 (330)	16 (406)	19 (482)	21 (533)
Wt. (175)	115 (52)	145 (65)	161 (73)	284 (128)	500 (226)	1025 (464)	1400 (635)	1950 (884)
Wt. (175½)	100 (45)	125 (56)	154 (69)	250 (113)	450 (204)	850 (385)	1300 (589)	1800 (816)