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

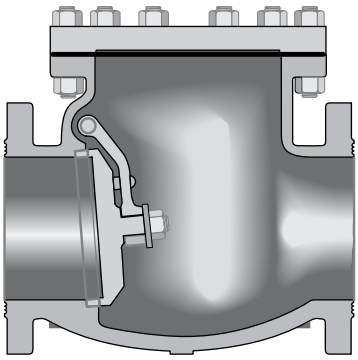
NOTE:
*Standard construction: WCB-Trim 8, other options are available.

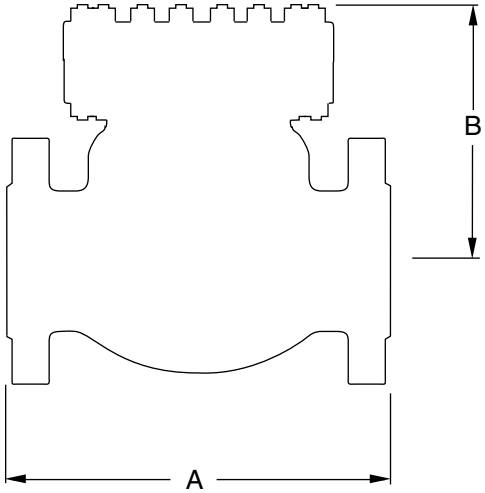
Figure 147
Flanged

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)





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. (147)	41 (18)	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)

CRANE

Figures 159 159½ Cast Steel Swing Check Valve

Class 300 • Bolted Cap

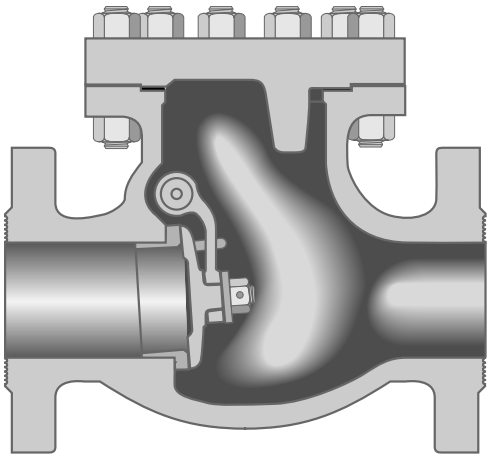


Figure 159
Flanged

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)

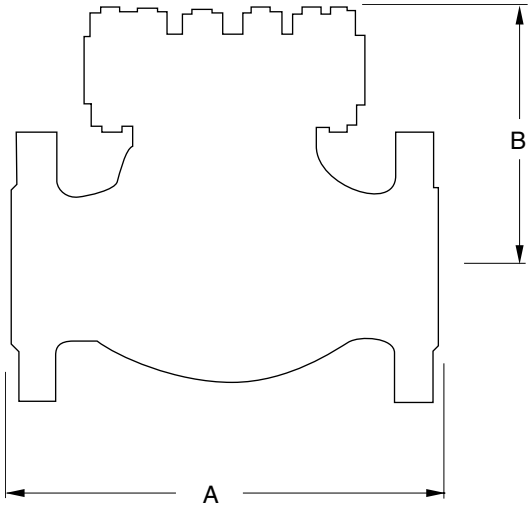
Material of Construction*

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)	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	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. (159)	46 (20)	66 (29)	86 (39)	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

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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

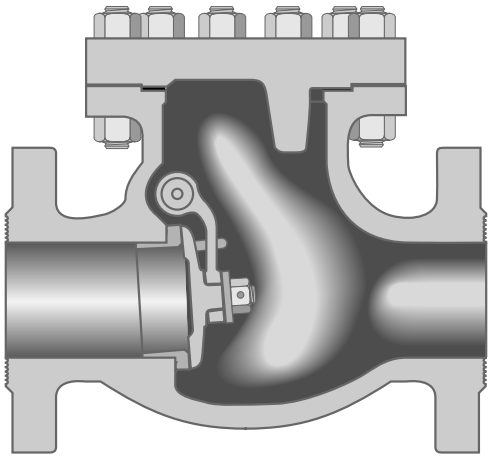
NOTE:
*Standard construction: WCB-Trim 8, other options are available.

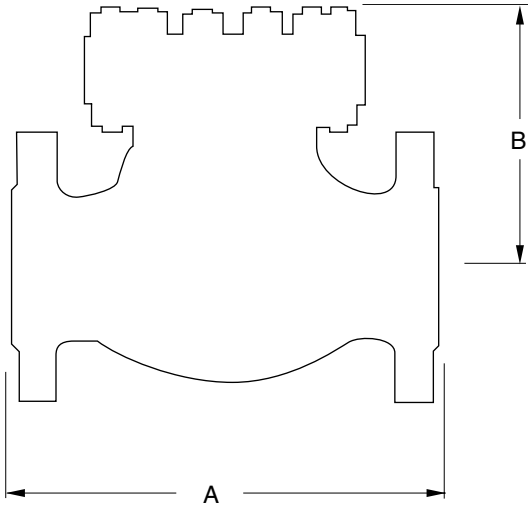
Figure 175
Flanged

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)





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)

General Information • Class 150, 300, and 600 Valves

Features

Disc Type

• For class 600 valves, a ring joint bonnet gasket assures positive seal against leakage and accurate alignment of moving parts

Welded-in Seat Ring

• Seat ring is seal welded to eliminate leak path.

Basic Standards

These valves comply with the applicable requirements of the following standards:

• API 598
• ASME B16.34
• ASME B16.25
• ASME B16.10
• ASME B16.5

Notes

• Standard material is ASTM A216 Grade WCB.
• Standard trim is XU (13% Cr to hardface) which is suitable for a wide range of applications.
• Butt weld end dimensions shall be in accordance with ASME B16.25 Figure 2a or Figure 3a (without backing ring) for standard pipe schedules, unless otherwise specified in the purchase order. Butt weld ends shall not be produced from flanged end castings unless specifically authorized in writing by CRANE Energy Flow Solutions.

Class	**Schedule**
150/300	Standard
600	Extra Strong
900/1500	Schedule 160

• See "Technical Data" section for locations of bypasses, taps and drains.

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:

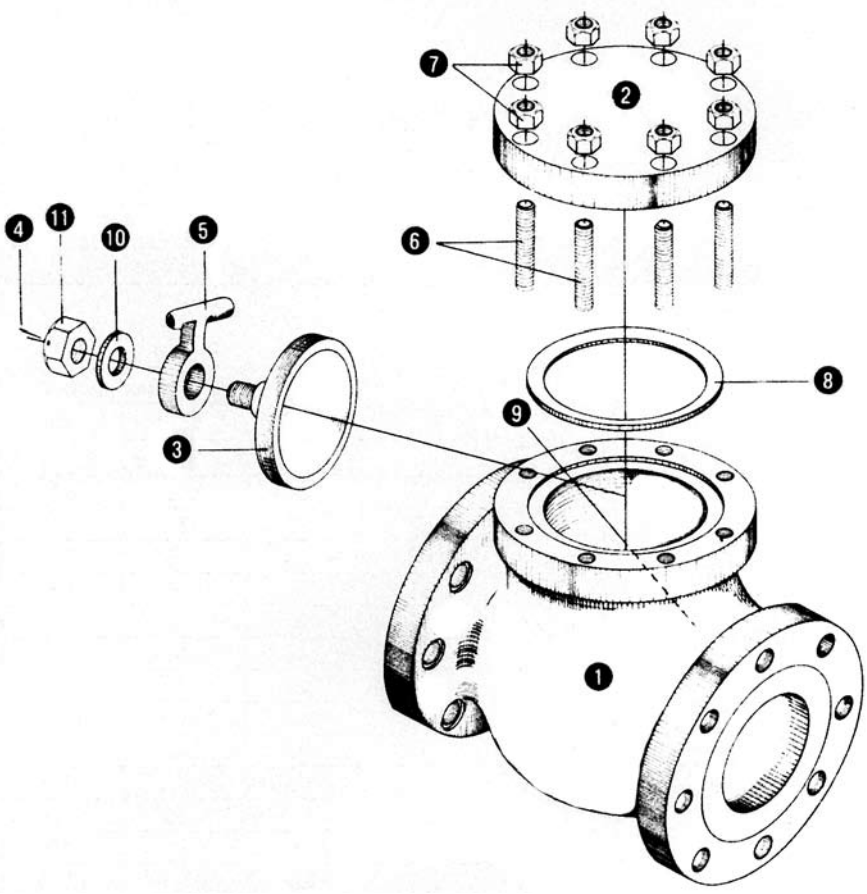
$$v = 60\sqrt{\bar{v}}$$

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 you 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.