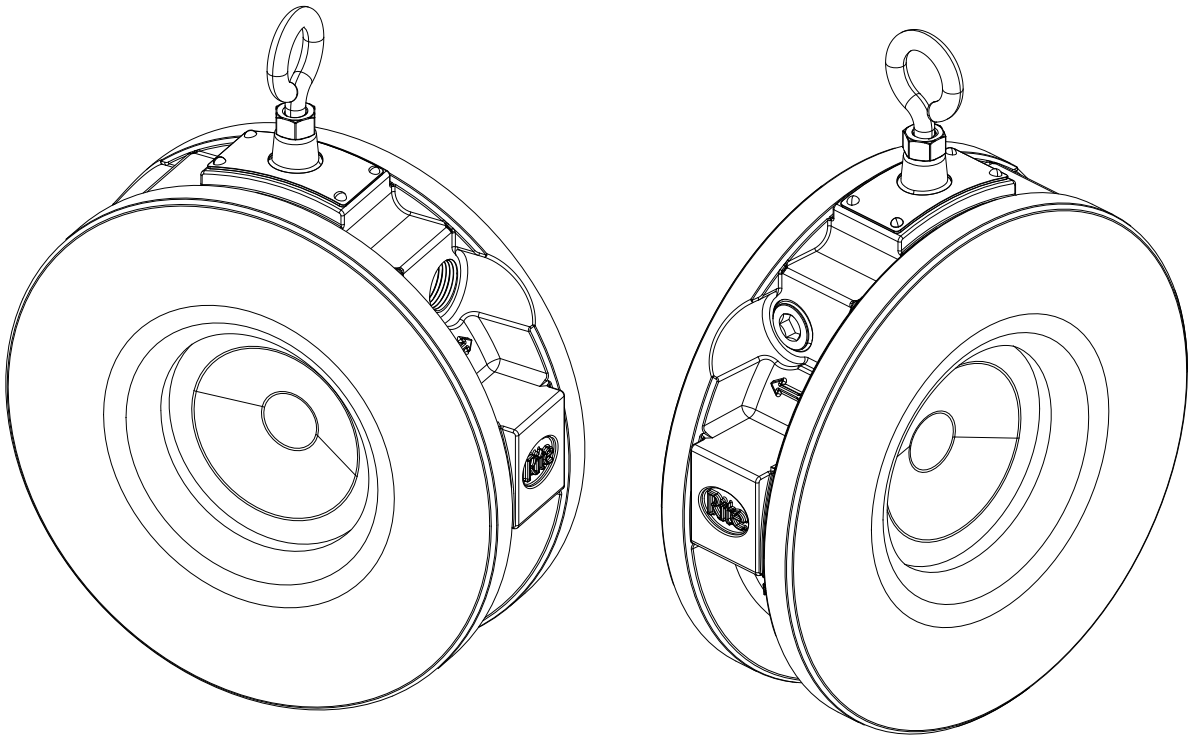
BRAY/RITE

SINGLE DOOR WAFER TYPE SWING CHECK VALVES

Installation and Maintenance Manual



Bray/Rite®

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READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY.
SAVE THIS MANUAL FOR FUTURE USE.

0.0 DEFINITION OF TERMS:

All information within this manual is relevant to the safe operation and proper care of your Bray valve. Please understand the following examples of information used throughout this manual.

0.0 IDENTIFIES CHAPTER HEADING

0.00 Identifies and explains sequential procedure to be performed.

NOTE: Provides important information related to a procedure.

SAFETY STATEMENTS: To prevent unwanted consequences.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

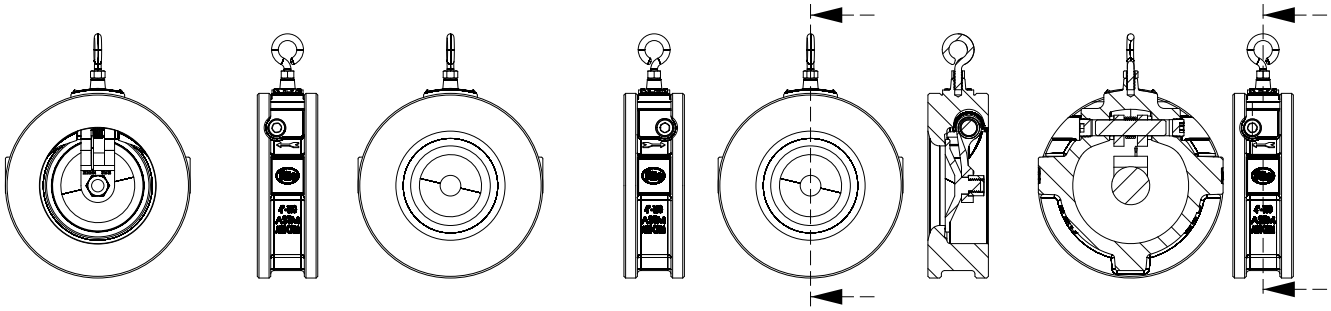
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

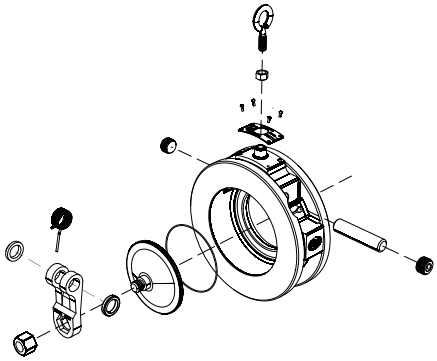
NOTICE

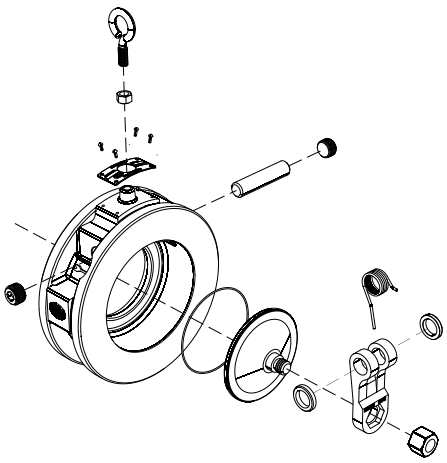
Used without the safety alert symbol, indicates a potential situation which, if not avoided, may result in an undesirable result or state, including property damage.

NOTE: This is a generic instruction manual common to above listed Bray/Rite standard check valves.

Please refer to the certified assembly drawing supplied with your order, for any dimensional and/or operational parameters that may not appear in this publication.







1.0 INTRODUCTION:

1.1 Instructions provided herewith should be thoroughly read and understood prior to actioning any installation or maintenance activities. Bray recommends that only experienced and skilled personnel be allowed to install and maintain these products.

This manual is an overview only and does not in anyway replace the vital functions of on-site, process engineer(s), pipe fitter(s), etc. Please retain this manual in an easily accessible location for any and all employees that may need to reference it routinely.

1.2 **Valve Selection Confirmation:**
A properly functioning valve requires adequate selection review process. Before installation efforts should be made to ensure valve being offered fits with application requirements, by evaluating some common characteristics (non-exhaustive list):

> Applicable operating conditions (condensation, flow reversal, frequency of operation, pressure drop, throttling, vacuum, etc.).
> Design and working pressure/temperature requirements.
> Materials of construction.
> Pipeline media flow-rate and viscosity.
> Service media type (abrasive, corrosive, dirty, gas, liquid, etc.)
> Site location for installation, ensuring adequate distance from sources of turbulence.

1.3 Modern piping applications demand better features, performance and economy in a check valve.

1.4 Bray/Rite Features:
> Compactness
> Minimum weight
> Simplicity

1.5 Bray/Rite Performance Characteristics:
> Bubble-tight shut-off
> Low pressure drop
> Non-slamming
> Rapid response
> Silent operation

1.6 Bray/Rite's combination of these features and performance characteristics ensure long service life of Bray/Rite products.

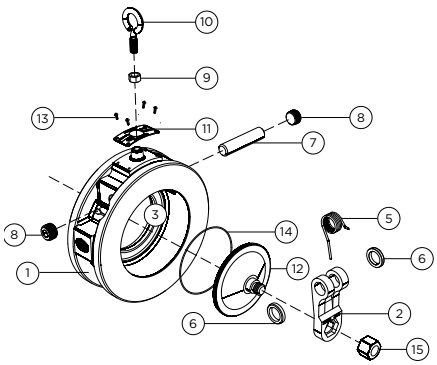
2.0 DESCRIPTION:

2.1 Bray/Rite Single Door Wafer Swing Check Valves consist of a compact Body (1) with a single plate Disc (12) attached to a Hinge (2) which in turn is supported by a Hinge Pin (7) inside an off-center body cavity.

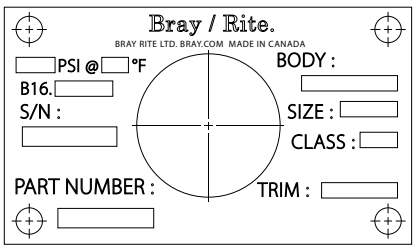
2.2 The Disc is mechanically biased to the closed position by a torsional Spring (5) located between the two Hinge (2) lugs. The Hinge Pin (7) is retained by two NPT Pipe Plugs (8) inside the Body (1). The Seat (3) can be:

> Metal to Metal
> Metal to Resilient (Buna, EPDM, Teflon, Viton, etc.)

2.3 An Eyebolt (10) is typically shipped separately in the check valve box from Bray/Rite to avoid damage resulting from transportation to it or the accompanying valve/packaging. Item (10) can be installed/threaded on the top of the Bray/Rite single door wafer swing check valves prior to assembly & has the purpose of aiding alignment/installation. Once successfully installed in proper alignment, the Eyebolt (10) can be removed after installation if required.



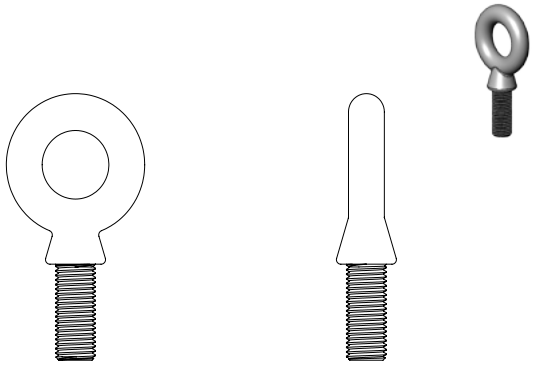
2.4 The Nameplate (11) located on the top pad of the body specifies:
> Manufacturer Name (Bray/Rite)
> Pressure @ Temperature Rating, Design Code, Serial Number, and Part Number
> Body Material, Size, Class, and Trim



2.5 Bray/Rite Single Door Wafer Swing Check Valves are typically designed to open when a pressure of less than 1 psi (.07 bar) is applied across the face of the Disc (12). Bray/Rite Single Door Wafer Swing Check Valves are provided for installation inside the bolt circle and between standard flanges, using a suitable gasket for the application, or as specified.

2.6 Bray/Rite's combination of these features and performance characteristics ensure long service life of Bray/Rite products.

2.7 Bray/Rite Single Door Wafer Swing Check Valves are normally installed with the Eyebolt pointing vertically upwards in a horizontal run of pipe, with the arrow on the Body pointing in the direction of flow.



2.8 All Bray/Rite Single Door Wafer Swing Check Valves are hydrostatically tested in accordance with MSS-SP-61, ANSI B16.34 and API-598 test procedures.

3.0 INSPECTION & UNPACKING:

3.1 INSPECTION OF PACKAGING:
Care should be given to inspect the product packaging for damage on all goods received while the freight carrier is still present. **Any observed packaging damage should be reported immediately to the carrier**, & any claim requirements followed through.

3.2 UNPACKING: Open the shipping container with adequate care ensuring to leave containers intact.

3.3 Any/all externally listed container specific markings must be followed.

3.4 Remove any packing material and carefully lift the product(s) from the container.

3.5 All shipping container and packing materials provided should be used (when space permits to do so) for product storage.

3.6 INSPECTION OF GOODS:
Care must be given to do a thorough visual inspection of all goods received in a timely manner. Any damage, or missing components expected where the expectation relates to mishandling during transit, should be noted to carrier immediately.

3.7 Items that are damaged during shipment fall under the liability involved with quoted incoterms. If damage is observed, file a claim with the freight carrier immediately. Refer to Bray Terms and Conditions for Sale for our full warranty policy.

3.8 Preparation for Shipment:
Bray/Rite valves are normally shipped from the factory in a combination of boxes, crates, or on skids (size & model dependent).

3.9 Product packaging (when customer intends to ship to an additional location) must be completed in a manner to protect against deterioration and physical damage during transit and storage.

3.10 Any protruding accessories, deemed to be at heightened risk to damage by their design (such as the levers, springs, and/or weights) may (if required for safekeeping) be removed & packaged separately.

3.11 All customer-driven packing requirements, must be clearly called out and quoted separately prior to placing the purchase order.

3.12 Any/all special shipping conditions must be reviewed by Bray/Rite for compliance at time of quotation, & be clearly defined in writing. Such instructions also need to be of a quality standard such that they adequately protect (a.) goods during transport, & (b.) goods during site storage requirements.

4.0 STORAGE & HANDLING:

Storage:

4.1 SHORT TERM: For short term storage (defined as within 3 months of order release) all products must be kept indoors in in the original packaging in a moderate temperature range (defined as between 32°F and 85°F). General guidelines for short and long term storage:

> Do not stack the valves on top of each other.
> Do not leave valves outdoor or exposed to the elements/ sunlight.
> Keep any/all protective end-caps on to protect the valve against damage from dust, dirt, etc.

4.2 LONG TERM: For long term storage (defined as greater than 3 months after order release), all valves must be kept in a clean, dry, fire-resistant, flood resistant, temperature controlled, and adequately ventilated, storage facility.

4.3 All valves should be adequately secured in place by banding/ other means to prevent damage resulting from valve movement.

4.4 A desiccant may be necessary (based upon the local, environmental storage conditions) for long-term storage situations.

4.5 OUTDOOR:
Where outdoor storage is a necessity, special crating and valve packaging can be provided, at an additional charge but must be quoted before the order has been placed. Periodic checks on valves in storage are required to ensure all conditions listed above have been met.

4.6 HANDLING:
Most standard check valves are supplied with a removable lifting Eyebolt (10) which must be used to lift the valve, & support the valve during alignment/installation. Improper use will result in valve body damage.

4.7

NOTICE

Valve should never be used as pipeline alignment tool. The area where the valve will be installed should have proper spacing afforded by pipeline flanges being mounted on both sides of the space prior to valve install.

NEVER lift or move the valve assembly by means of any attached accessory, internal part, or mounting holes.

4.8 Any provided valve protection accessories such as wooden plates or plastic caps should not be removed until the valves are ready to be installed, so as to keep foreign contaminants out.

4.9 Transportation for all packed goods should be carried out in accordance with relevant site & territory safety regulations.

5.0 TOOLS REQUIRED:

Hammer, hex key, nose punch, thread sealant, and wrench.

5.1

NOTICE

Personal protective equipment such as eye/foot/hand protection is required when installing or maintaining wafer check valves.

5.2

⚠ CAUTION

Please use caution. Preset spring(s) have capacity to cause serious injury when tension is released.

6.0 PRE-INSTALLATION CHECKLIST:

6.1

NOTICE

Location for valve should be selected based on distance from turbulent conditions.

> Media flowing to valve should be filtered first to remove unwanted debris.
> Non-compliance can effect check valve sealing, and adversely effect optimal performance.
> Valve pressure/temperature limits must align with the application requirements.
> Valve materials must be compatible with line media it will experience.

Before installation, all valves must be checked for any/all foreign materials that may have become entrapped during storage/ transportation. All contaminants should be removed by with solvent dampened cloths.

Sealing surfaces should be inspected to ensure there is no damage (cuts or nicks) & that general appearance is clean and smooth.

Check Valves must be placed a distance 5 to 10 pipe diameters away from any/all source of turbulence such as elbows, expansions, pumps, reductions, swages, tees, etc).

6.2

⚠ CAUTION

Standard check valves are typically designed for steady flow conditions, and not for use in physical/thermal shock-load applications (via reciprocating pump, compressor). In this type of application, standard check valve will not perform efficiently and have a greater tendency to fail.

(continued)

6.3 Standard check valves are designed to operate efficiently in flow rate scenarios between 5 ft./sec. to 10 ft./sec. Operating outside of this range will adversely effect performance & may lead to premature failure.

6.4 Any provided valve protection accessories such as wooden plates or plastic caps should not be removed until the valves are ready to be installed, so as to keep foreign contaminants out.

6.5 Step 1:
Remove the plastic flange protectors (if present) and other packaging materials from the Check Valve

6.6

⚠ CAUTION

For vertical down-flow applications, consult Bray/Rite Technical team for custom solutions that may be available.

6.7 Step 2:
Orient the valve such that the flow arrow (cast/etched onto body or printed on the nameplate) points in the direction of the desired pipeline flow.

6.8 Step 3:
The appropriate material handling equipment must be used in order to prevent injury and possible damage to the check valve and personnel responsible for installation.

6.9

⚠ CAUTION

OPERATION START-UP:
After the installation has been verified (at start-up, & after shut-down conditions) as safe and complete, it is important for operators to start the pipe system flow gradually. The goal is to not stress the check valve (and other line equipment) via sudden shock.

7.0 DIS-ASSEMBLY INSTRUCTIONS FOR BRAY/RITE SINGLE DOOR WAFER SWING CHECK VALVES:

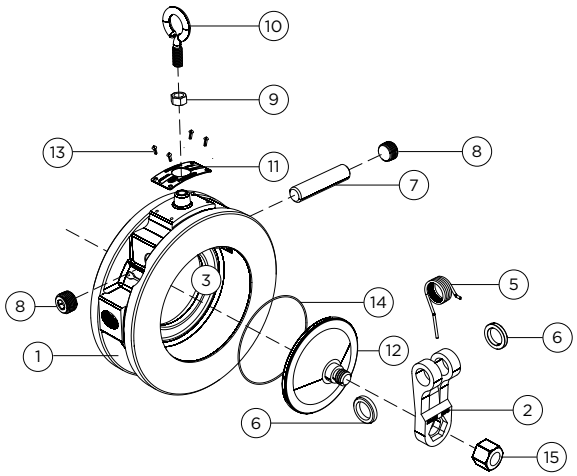
TOOLS REQUIRED: Hammer, hex key, nose punch, thread sealant, and wrench.

7.1 The simple design of the Bray/Rite Single Door Wafer Swing Check Valves valve permits for easy assembly and disassembly. The following assembly procedure applies to all Bray/Rite Single Door Wafer Swing Check Valves.

7.2 To Dis-assemble the valve:

Item	Description
1	Body
2	Hinge
3	Seat
5	Spring
6	Spacer
7	Pin
8	Plug

Item	Description
9	Lock Nut
10	Eye Bolt
11	Name Plate
12	Disc
13	Rivet
14	O-Ring
15	Disc-Nut



7.3 a.) Place the Body (1) in a horizontal position with the Disc (12) assembly showing.
b.) Remove the Plugs (8) on both side of the Body (1) by using a hex-key or wrench.
c.) Hold the Spring (5) in position and slide the Pin (7) out of the Body (1). Use of Hammer and Nose Punch may be required to gently tap Pin (7) from one side out the opposite side. Pay attention to original orientation of Spacers (6).
d.) Slowly release the pressure on the Spring (5) and remove it from the valve.
e.) The Hinge-Disc Assembly (2, 12, 15) can now be lifted from the Body (1).
f.) Remove the O-Ring (14) if required.

7.4 We recommend Bray/Rite O-Rings get sourced everytime the valve is being repaired.

8.0 RE-ASSEMBLY INSTRUCTIONS FOR BRAY/RITE SINGLE DOOR WAFER SWING CHECK VALVES:

To re-assemble the valve:

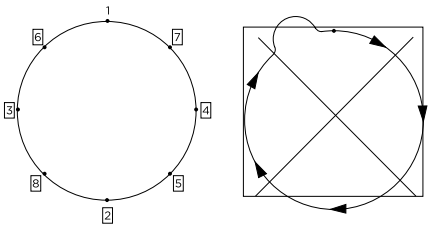
8.1 a.) Clean all parts with acceptable solvent while valve is being serviced.
b.) Place the Body (1) in a horizontal position with the seating face pointing upwards.
c.) If required, insert O-Ring (14) in the seat groove. (See below for installation instructions).
d.) Place the Hinge-Disc Assembly (2, 12, 15) in the body cavity.
e.) Slide Spacer in between Body (1) and adjacent Hinge (2) lug while inserting the Pin (7) through the Plug (8) hole on either side of the Body (1) and slide the first Spacer (6) in between the Body (1) and adjacent Hinge (2) lug.
f.) Press Spring (5) between the Hinge (2) lugs and Body (1) cavity, then advance the Pin (7) through the Spring (5) and the second Hinge (2) lug.
g.) Slide the second Spacer (6) between the Body and hinge lug and advance the Pin (7) into the Body (1). Position the Hinge Pin (7) central to the valve Body (1) prior to the installation of the retaining Plugs (8).
h.) Check that the Spring (5) ends are seated properly.
i.) Apply Teflon tape or sealing compound if required by application on retaining Plugs (8), install Plugs and tighten both sides with an hex key or wrench.

8.2 Verification:
a) check that the valve opens and closes freely.
b) check the Pin-Disc (7, 12) connection to ensure it has adequate freedom of movement provided for the Disc (12) to adapt a self-aligning position with the Seat (3).

8.3

NOTICE

INSERT O-RING AS FOLLOWS
(a.) Place O-Ring (14) on top of seat groove.
(b.) To prevent looping, insert the O-Ring as shown by pressing the O-Ring into the groove in the following numerical sequence.



Right Wrong

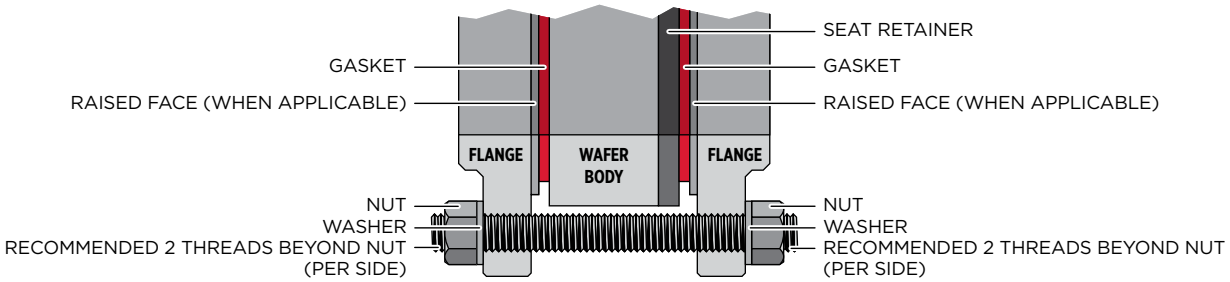
8.4 It is important to smooth out the O-Ring (14) so that there are no visible ripples or loops.

8.5 It should be noted that the O-Ring groove is slightly larger than the O-Ring (14) and it follows that the O-Ring (14) must be hoop stretched to engage the groove.

9.0 PRE-INSTALLATION REMINDERS:

9.1 Install all flangeless wafer valves between two pipe flanges (with gaskets on the contact faces) of the same series as the valve, centred in line by the surrounding flange bolts, and tightened as per industry standard practice.

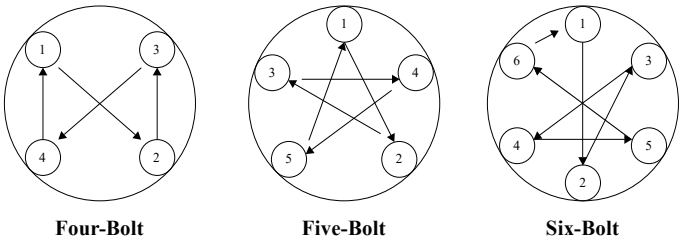
WAFER VALVE WITH THROUGH-STUDS

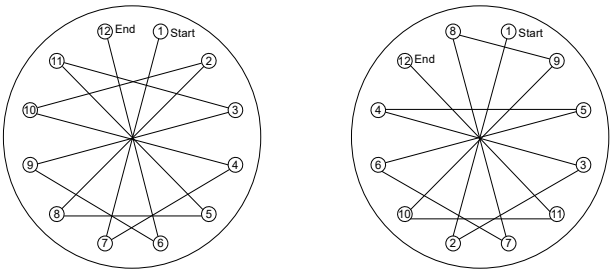


9.2 All internal parts designed to move should operate freely.

9.3 The normal installation of a Bray/Rite Single Door Wafer Swing Check Valves valve is for horizontal flow with the hinge Pin (7) in the horizontal upper position, or for vertical flow, with the flow direction upwards.

9.4 Bolting Guidance:





9.5 When removing a Bray/Rite Single Door Wafer Swing Check valve from the line, only the top half of the studs need to be removed and the others loosened.

(continued)

IMPORTANT:

9.6

⚠ CAUTION

1.) Double check the flow direction arrow on the body before inserting the Bray/Rite Single Door Wafer Swing Check valve between the flanges.
2) Pipeline flanges must be parallel and have the same pressure class rating as the valve.
3.) There must be no obstructions in the mating flange(s), or pipe bore(s) as this would prevent the valve from opening fully, leading to premature valve failure.

10.0 MAINTENANCE REQUIREMENTS AND INFORMATION:

VALVE REMOVAL FOR INSPECTION

10.1

⚠ WARNING

Before removing any check valve from the pipeline, ensure the media flowing in the pipeline is confirmed and any/all special handling protocols are followed/understood. Always review the applicable Material Safety Data Sheet (MSDS) for the media in advance of work performed.

Before removing any check valve from the pipeline, the vessel pressure must be reduced to atmospheric by means of suction/venting/other. **Failure to do so may result in serious bodily injury.**

10.2 Shutting off the upstream pump acts to isolate the check valve.

10.3 Close the downstream isolation valve.

10.4 Drain the system section featuring the check valve as much as possible.

10.5 Vent the line on both sides of the check valve to relieve pressure from the check valve. **Always loosen the outlet side first.**

10.6 Once pressure has been relieved successfully, move to loosen the inlet side.

10.7 Remove check valve from the pipeline, inspecting internals for signs of damage, & degradation.

10.8 If replacement parts are required, use exact valve drawing procured to identify any/all parts required for repair. Alternately please contact Bray/Rite for repair recommendations.

11.0 REPAIRS:

LEAKAGE CONDITIONS:

11.1 A schedule for routine inspection should be implemented and performed.

11.2

NOTICE

If leakage is identified, during maintenance check the flange gasket, and flange bolt torque to ensure they are within acceptable limits. Valve removal for inspection may be required. See above notes.

11.3 MINIMAL FLOW:

While flow is halted, verify flow direction arrow is installed in correct alignment with required direction of flow.

11.4 SLAM CONDITIONS:

Initiate valve removal to inspect spring condition and tension. Consult Bray/Rite technical staff to ensure valve is sized appropiately.

11.5 VIBRATION CONDITIONS:

When valves are found to be vibrating excessively, firstly Verify that flow rate is within acceptable ranges (5 ft./sec. to 10 ft./sec.).

11.6 Verify site installation location has at least 5 to 10 pipe diameters length from any source of turbulence (ie. elbows, expansions, pumps, reductions, swages, tees, etc.).

11.7 For replacement of O-Rings (14) refer to Section 7.0 and 8.0 for Assembly and disassembly instructions of Bray/Rite Single Door Wafer Swing Check Valves.

11.8 When visible damage is observed on O-Rings (14), they should be replaced with Bray/Rite sourced replacement O-Rings (14).

11.9 The standard O-Ring (14) numbers, Plug sizes and Hex key sizes for class 125/150/300 are listed below for valves 2”-42”. For other classes, contact the factory.

(continued)

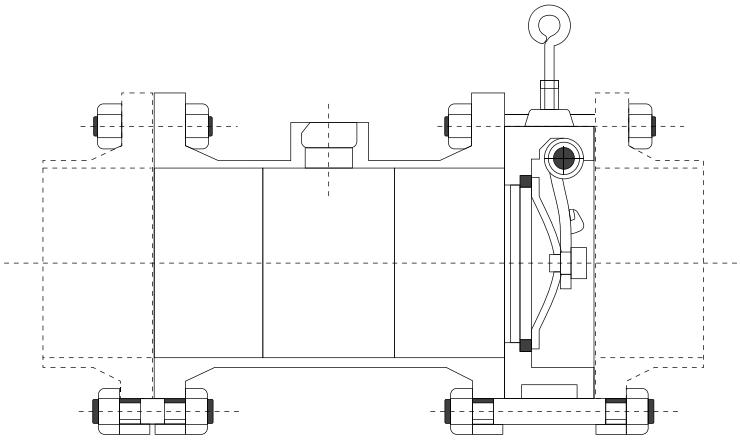
11.10 O-Ring, Plug, & Hex Key Sizes:

Valve Size	O-Ring Size Models 210	O-Ring Size Models 212	Plug Size NPT	Hex Key Size
2”	128	128	1/4”	1/4”
2.5”	133	133	1/4”	1/4”
3”	141	141	3/8”	5/16”
4”	235	235	3/8”	5/16”
5”	242	242	3/8”	5/16”
6”	248	248	3/8”	5/16”
8”	259	259	1/2”	3/8”
10”	368	368	1/2”	3/8”
12”	447	447	3/4”	9/16”
14”	449	-	3/4”	9/16”
16”	453	-	3/4”	9/16”
18”	455	-	3/4”	9/16”
20”	458	-	1”	5/8”
24”	462	-	1”	5/8”
30”	471	-	1 1/2”*	1 1/4”*
36”	473	-	1 1/2”*	1 1/4”*
42”	3/8 x 110”	-	2”*	1 5/16”*

Applies to all models (strictly size dependent). * Square Head Plug

12.0 SPOOL INSTALLATION FOR BRAY/RITE SINGLE DOOR WAFER SWING CHECK VALVES:

12.1 When a standard flanged valve is replaced with a shorter face-to-face wafer valve model, a spool piece can be inserted with the Bray/Rite Single Door Wafer Swing Check valve to obtain the required face to face dimension. The installation instructions in Section 8.0 above apply.



13.0 BODY MARKINGS, NAMEPLATE/SERIAL NUMBER:

13.1 Nameplates: The serial number gives the ability to trace valve internals and the date of manufacture of the valve.

13.2 UL/FM valves are identified by their nameplate.

BRAY/RITE SINGLE DOOR WAFER SWING CHECK VALVE PART NUMBER (SERIES SDCV):
EXAMPLE PART NUMBER: V0212CBT

SIZE	
INCHES	CODE
1 ***Only mfr in 316SS or higher grade	V01
1.5 ***Only mfr in CS or higher grade	V015
2	V02
2.5	V025
3	V03
4	V04
5	V05
6	V06
8	V08
10	V10
12	V12
14 ***Only offered in CS or SS Bodies, SS spacer	V14
16 ***Only offered in CS or SS Bodies, SS spacer	V16
18 ***Only offered in CS or SS Bodies, SS spacer	V18
20 ***Only offered in CS or SS Bodies, SS spacer	V20
24 ***Only offered in CS or SS Bodies, SS spacer	V24
30 ***Only offered in CS or SS Bodies, SS spacer	V30
36 ***Only offered in CS or SS Bodies, SS spacer	V36
42 ***Only offered in CS or SS Bodies, SS spacer	V42
48 ***Only offered in CS or SS Bodies, SS spacer	V48
54 ***Only offered in CS or SS Bodies, SS spacer	V54
60 ***Only offered in CS or SS Bodies, SS spacer	V60

PRESSURE CLASS	
CLASS	CODE
ASME 125	12
ASME 150	15
ASME 300 ***14" & larger become model 205 automatically.	30
ASME 600	60
ASME 900	90
ASME 1500	150
ASME 2500	250
PN 10	10
PN 16	16
PN 25	25
PN 40	40
PN 64	64

BODY MATERIAL	
MATERIAL	CODE
254SMO Material	X, then 254SMO at end of part number
Alloy20	X, then A20 at end of part number
ASTM A 126 CLB ***only manufacture in ANSI 125 or PN10/16 ***integral seat	C
ASTM A 216 WCB ***o-ring mounted in a 304 stainless steel seat ring	S
ASTM A 395 ***only manufacture in ANSI 150 or PN10/16 ***o-ring mounted in a 304 stainless steel seat ring	D
ASTM A351 CF8M **Integral seat	X
Duplex 6A	X, then 6A at end of part number
Duplex 5A	X, then 5A at end of part number
Hastelloy C-22	X, then C22 at end of part number
Hastelloy C-276	X, then C276 at end of part number
Monel M-53-1 Valves**Body/Disc/Seat/Trim	X, then MMM at end of part number
SS 316L	X, then 6L at end of part number
TITANIUM	X, then T at end of part number
OTHER **	-

INSERT (CI/CS/DI)/INTEGRAL (SS/HIGHER)	
MATERIAL	CODE
METAL	M
INSERT/RESILIENT	
MATERIAL	CODE
BUNA-N (DEFAULT)	B
EPDM	E
TEFLON	T
TEFLON ENCAPSULATED SILICONE	TES
VITON	V

SPACER MATERIAL	
MATERIAL	CODE
A479-316 as standard supply	Z
PTFE	T
-	OTHER **

MODEL CODE	
SERIES (COLOUR)	CODE
API 594 #600/PN64 ***our wider face to face	201
API 594 #900/1500 ***our wider face to face	203
API 594 #2500 our wider face to face	204
API 594 (ANSI125, 150, 300, PN10, PN16, PN25)	205
Heavy Duty Hinge ASME/DIN	260
STANDARD ASME/DIN ***(ANSI 125, 150, 300, PN10, PN16, PN25)	LEAVE BLANK (STANDARD 210 SERIES)
PVC Models	PEZ
CUSTOMER-SPECIFIC SERIES	**CODE**
ANSI 125, cast iron body, Te flon integral seat, te flon spacer.	12C37
ANSI 150, carbon steel body, Te flon integral seat, Te flon spacer.	15S37
ANSI 300, carbon steel body, Te flon integral seat, Te flon spacer, welded plugs.	30S17
ANSI 300, carbon steel body, Te flon integral seat, Te flon spacer, welded plugs.	30S27
ANSI 300, carbon steel body, Te flon integral seat, Te flon spacer, welded plugs.	30S47
Carbon steel body, Te flon integral seat, standard spring with a welded seat.	S27
Carbon steel body, EPDM integral seat.	S34
Carbon steel body, Viton integral seat.	S35
Carbon steel body, buna integral seat.	S36
Carbon steel body, Te flon integral seat, standard spring or heavy duty spring depending on the size.	S37
Carbon steel body, Te flon integral seat, light duty spring.	S47

SPECIAL APPLICATION ACCESSORIES	
CODE	ACCESSORY
BACKFLUSH LEVER	SA-4A
BACKFLUSH LEVER & EXTERNAL SPRING	SA-3
DUAL BALANCED WEIGHTS	SA-10
EMERGENCY SHUT-OFF, FUSIBLE LINK	SA-7
EXTERNAL COMPRESSION SPRING (14" + LARGER). ENGINEERING TO APPROVE SMALLER SIZES	SA-40
EXTERNAL COMPRESSION SPRING & WEIGHT & HYDRAULIC DAMPER (SA-40 COMPRESSION SPRING (***14" + LARGER)	SA-50
EXTERNAL COMPRESSION SPRING, WEIGHT, + LEVER (14" + LARGER) ENGINEERING TO APPROVE SMALLER SIZES	SA-40A
EXTERNAL LEVER SPRING & WEIGHT ***2-12"	SA-1
EXTERNAL POSITION INDICATOR	SA-4
EXTERNAL SPRING ***2-12"	SA-01
EXTERNAL SPRING & WEIGHT, & HYDRAULIC DAMPER (SA-01 SPRING) ***2" + above	H-100
EXTERNAL WEIGHT & LEVER	SA-16
FLANGED BODY	SA-11
FOOT VALVE	SA-6
LIMIT SWITCH	SA-2

Miscellaneous Notes: ***Pressure Boundary Components – Body, Plugs. We typically sell repair kits (everything except the body) as spare parts for of our check valves.

EXAMPLE PART NUMBERS BY MATERIAL

EXAMPLE PART NUMBERS (210)
V0212CBT
V0215DBT
V0215SBT
V0215XBT
V0230SBZ
V0230XBZ

EXAMPLE PART NUMBERS (205)
V0212CBT20S
V0215DBT20S
V0215SBT20S
V0215XBT20S
V0230SBZ20S
V0230XBZ20S

** = Available in most exotic materials, please consult factory. / *** = Inserted pressed-in interference seat at a minimum of 304 SS for carbon steel and ductile iron bodies, or seat is integral to body.

Note 1: Spacers are located on both sides of the disc hinge, ensuring a uniform seal. / Note 2: The standard Check Rite is a wafer body style. Flanged Ends, RTJ style and other connections are available, please consult factory.

BRAY/RITE SINGLE DOOR WAFER SWING CHECK VALVE PART NUMBER (SERIES SDCV) + ULC/FM:
EXAMPLE PART NUMBER: V02 212

SIZE	
INCHES	CODE
1	V01
1.5	V015
2	V02
2.5	V025
3	V03
4	V04
5	V05
6	V06
8	V08
10	V10
12	V12
14	V14
16	V16
18	V18
20	V20
24	V24
30	V30
36	V36
42	V42
48	V48
54	V54
60	V60

MODEL CODE	
SERIES (COLOUR)	CODE
ULC FM APPROVED ASME* ***ANSI 125 cast iron body, stainless steel disc & trim, buna integral seat, Teflon spacers.	212
ULC FM APPROVED DIN* ***PN10/16 cast iron body, stainless steel disc & trim, buna integral sear, Teflon spacers.	312

EXAMPLE PART NUMBERS BY MATERIAL

EXAMPLE PART NUMBERS:
V02212
V025212
V03212
V0421
V0521
V06212
V08212
V10212
V12212

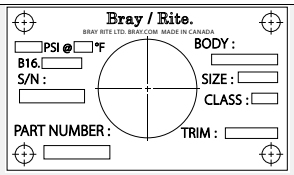
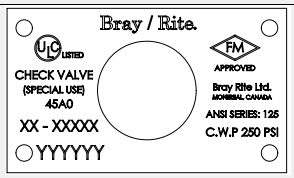
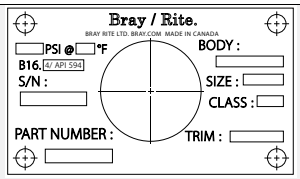
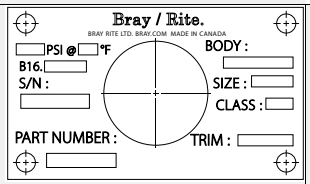
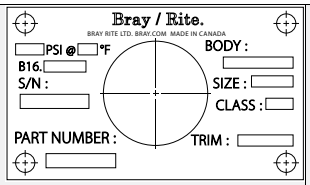
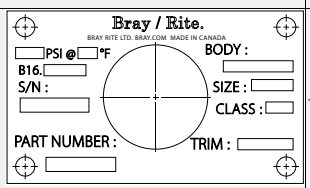
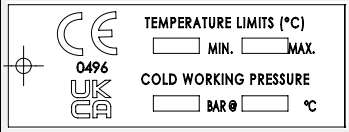
EXAMPLE PART NUMBERS:
V02312
V025312
V03312
V04312
V05312
V06312
V08312
V10312
V12312

* = ULC Approved under NFPA No. 11, 13, 14, 15, 20, 22, 24. FM Approved.
** = Available in most exotic materials, please consult factory.

Note 1: Spacers are located on both sides of the disc hinge, ensuring a uniform seal.

Below nameplates are examples at time of publishing and are subject to change.
All valves shall be marked in accordance with ASME B16.34 which is listed in Table 126.1 of ASME B31.1, except in the following conditions:

> 205 Series Valves, as per standard API 594.
> Cast Iron Valves: as per standard MSS SP-71.
> CE Valves.
> Ductile Iron Valves: as per standard ASME B16.42.
> FM/UL Valves.
> Special Project Valves: as per Engineering designer.
> Valves designed to different design standard

Standard	Name plate illustrated	Additional tag
B16.34		Not required.
UL/FM		Not required.
Standard	**Name plate illustrated**	**Additional tag:**
API 594 **Model:** **205**		Not required.
UL 207 & C22.2 #140.3 **Model:** **CS5**	  *Aluminium*	"The design pressure marked on this component shall not be less than the installed system working pressure or less than the values outlined in ASHRAE 15 for the charged refrigerant. After charging, mark the installed equipment with the refrigerant type and oil used" *Paper*
Standard	**Name plate illustrated**	**Additional tag:**
CSA NSF 61		 *Aluminium*
CE/ PED & UKCA/PER Approval		 Required values as per sect. 4.4. *Aluminium*

14.0 SAFETY WARNINGS:

14.1 1.) The valve must be installed in the correct line size between flanges of the correct class.

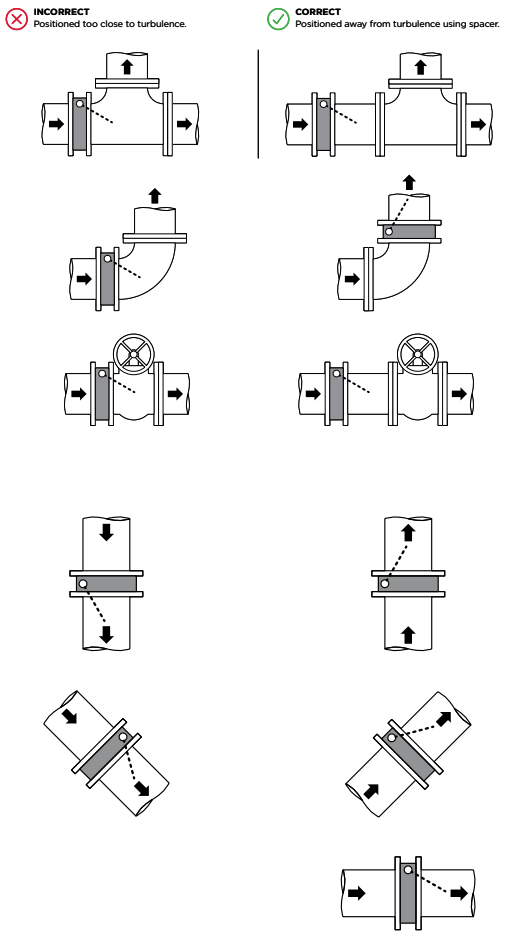
2.) The valve materials of construction must be compatible with the media being handled.

3.) Pressures and temperatures must be kept within the limits specified by the appropriate standard, ie: ANSI B16.1, B16.34, B16.42, or within the limits specified by the particular design.

4.) An arrow on the body indicates the direction of flow through the valve. The valve must be installed with the arrow pointing in the correct direction.

5.) For flow in the horizontal direction, the valve shall be installed with the Pin (7) in the horizontal upper position with the Eyebolt (10) pointing vertically upwards.

6.) The valve must be installed in the correct location in the pipeline. The disc must not open into or against other piping components such as valves, elbows, or tees. For the best performance and to extend/maximize life of the valve, a minimum of 10 pipe diameters of straight pipe upstream of the valve is suggested. Any reduction in this length upstream of the valve reduces the life of the valve proportionally.



7.) Plugs (8) must not be removed from the valve while the pipeline is under pressure.

8.) Flow rates must be within the acceptable limits. Excessively high flow rates may cause extreme pressure drops and erosion of the components. Excessively low flow rates may cause the Disc Assembly (2, 12) to oscillate and cause wear which may lead to premature failure of the internals.

9.) Care should be taken in handling the valve. Mishandling may lead to damage of the sealing components or damage to the externals.

14.2 Care must be taken to ensure dangerous media is handled according to your company site safety protocol and industry best practice.

15.0 LIMITATIONS AND PRECAUTIONS:

15.1 Bray/Rite standard check valves are NOT recommended for the following service conditions:

> Installed directly on to a Butterfly valve (or other piping accessory) that may interfere with the opening or closing of Disc (12) component.
> Pulsating flow conditions.
> Service condition requiring a “Full Port” opening.
> Vertical **Down**-Flow (without consulting Factory for approval based on required accessories to meet application criteria).
> Accurate sizing is crucial to ensure an acceptable pressure drop, and a resulting long service life.
> Flow velocities should be in the following ranges:

Pressure Drop with Water				
Valve Size	**Cv**	**Min Flow to Fully Open Valve**		**Approx Pressure Drop w/Water**
Inch/mm		**GPM**	**Ft/sec.**	**PSI @ 10 ft/sec.**
1/25	30	28	10.4	0.78
1.5/40	38	68	10.7	2.1
2/50	84	46	4.4	1.7
2.5/65	137	76	5.1	1.4
3/75	221	197	8.5	1.1
4/100	373	157	4	1.4
5/125	679	352	5.6	1.1
6/150	931	367	4.1	1.5
8/200	1,440	428	2.7	1.6
10/250	2,623	837	3.4	1.1
12/300	3,531	1,229	3.5	1.2
14/350	3,226	1,180	2.7	2
16/400	3,911	1,447	2.5	2.6
18/450	5,799	3,376	4.8	1.7
20/500	7,769	6,500	6.3	1.5
24/600	10,105	8,321	5.9	1.6
26/650	13,350	9,200	5.5	1.5
28/700	15,000	9,520	5.6	1.5
30/750	18,041	10,303	5.1	0.9
32/800	20,900	12,150	5	1.4
36/900	25,675	15,850	5.2	2
40/1,000	39,340	25,310	6.1	2.4
42/1,050	47,914	31,304	7.5	2.7
48/1,200	44,983	33,095	5.9	1.6
54/1,350	63,000	45,000	6	0.9
60/1,500	70,500	62,800	6.2	1.1

Notice the full open stable minimum velocity and the efficiency calculated at a normal velocity of 10 f/sec.

(continued)

15.2 See Bray Terms and Conditions provided with quotation for complete warranty details.

15.3 Approximate Flow Rate Guidance:

Media	Flow Rate
Liquid	5 to 10 feet/second
	1.524 to 3.048 m/second

Cast Iron (ASTM A126-CLB) Ratings from ANSI B16.1 Class 125

16.0 NON-SHOCK PRESSURE-TEMPERATURE RATINGS:

B16.42 Table 3.1-1C, Pressure-Temperature Ratings		
		Class 150
Sizes	Temperature, °F	Working Pressure, PSI
1-12”	-20 to 100	250
	200	235
	300	215
	400	200
	500	170
	600	140
	650	125

Note: (1) The maximum temperature for ASTM A536 Grade 65-45-12 is 500 °F.

Pressure-Temperature Ratings		
		Class 150
Sizes	Temperature, °F	Working Pressure, PSI
>14-24”	-20 to 100	200
	200	185
	300	165
	400	150
	500	120
	600	90
	650	75

Note: (1) The maximum temperature for ASTM A536 Grade 65-45-12 is 500 °F.

Pressure-Temperature Ratings		
		Class 150
Sizes	Temperature, °F	Working Pressure, PSI
>28-48”	-20 to 100	200
	200	185
	300	165
	400	150
	500	120
	600	90
	650	75

Note: (1) The maximum temperature for ASTM A536 Grade 65-45-12 is 500 °F.

	Temperature (°F), Pressure (PSI)						
Size	**-20 to 100**	**200**	**300**	**400**	**500**	**600**	**650**
2" - 42"	250	235	215	200	170	140	125

Carbon Steel (ASTM A216-WCB) Ratings from ANSI B16.34
Permissible, but not recommended for prolonged usage above about 800°F.

	Pressure Class				
Temperature (°F), Pressure (PSI)	**150**	**300**	**600**	**900**	**1500**
-20 to 100	275	720	1440	2160	3600
200	240	620	1240	1860	3095
300	215	560	1120	1680	2795
400	195	515	1030	1540	2570
500	170	480	955	1435	2390
600	140	450	905	1355	2255
650	125	445	890	1330	2220
700	110	430	865	1295	2160
750	95	425	845	1270	2110
800	80	415	830	1245	2075
850	65	405	810	1215	2030
900	50	395	790	1180	1970
950	35	385	775	1160	1930
1000	20	365	725	1090	1820
1050		360	720	1080	1800
1100		325	645	965	1610
1150		275	550	825	1370
1200		205	410	620	1030
1250		180	365	545	910
1300		140	275	410	685
1350		105	205	310	515
1400		75	150	225	380
1450		60	115	175	290
1500		40	85	125	205

	Pressure Class				
Temperature (°F), Pressure (PSI)	**150**	**300**	**600**	**900**	**1500**
-20 to 100	285	740	1480	2220	3705
200	260	675	1350	2025	3375
300	230	655	1315	1970	3278
400	200	635	1270	1900	3170
500	170	600	1200	1795	2995
600	140	550	1095	1640	2735
650	125	535	1075	1610	2685
700	110	535	1065	1600	2665
750	95	505	1010	1510	2520
800	80	410	825	1235	2060
850	65	270	535	805	1340
900	50	170	345	515	860
950	35	105	205	310	515
1000	20	50	105	155	260

Stainless Steel (ASTM A351-CF8M) Ratings from ANSI B16.34

Carbon Steel (ASTM A216-WCB)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 48"	Deg °C	0-120	0-149	0-425	0-105	0-120	0-260	0-200
		Deg °F	32-248	32-300	32-797	32-221	32-248	32-500	32-392

Carbon Steel (ASTM A216-WCB)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	N/A	19	51	102	153	255	425
			PSI	N/A	275	739	1479	2219	3698	6164
		Temperature	Deg °C	N/A	38	38	38	38	38	38
			Deg °F	N/A	100	100	100	100	100	100

Cast Iron (ASTM A216-CLB)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 12"	Deg °C	0-120	0-149	0-204	0-105	0-120	0-204	0-200
		Deg °F	32-248	32-300	32-399	32-221	32-248	32-399	32-392
	14"-24"	Deg °C	0-120	0-149	0-178	0-105	0-120	0-178	0-178
		Deg °F	32-248	32-300	32-354	32-221	32-248	32-354	32-354
	30"-48"	Deg °C	0-120	0-149	0-148	0-105	0-120	0-148	0-148
		Deg °F	32-248	32-300	32-298	32-221	32-248	32-298	32-298

Cast Iron (ASTM A216-CLB)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	13	N/A	N/A	N/A	N/A	N/A	N/A
			PSI	200	N/A	N/A	N/A	N/A	N/A	N/A
		Temperature	Deg °C	38	N/A	N/A	N/A	N/A	N/A	N/A
			Deg °F	100	N/A	N/A	N/A	N/A	N/A	N/A
	14"-48"	Pressure	Bar	10	N/A	N/A	N/A	N/A	N/A	N/A
			PSI	150	N/A	N/A	N/A	N/A	N/A	N/A
		Temperature	Deg °C	38	N/A	N/A	N/A	N/A	N/A	N/A
			Deg °F	100	N/A	N/A	N/A	N/A	N/A	N/A

Ductile Iron (ASTM A395)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 48"	Deg °C	0-120	0-149	0-343	0-105	0-120	0-260	0-200
		Deg °F	32-248	32-300	32-649	32-221	32-248	32-500	32-392

Ductile Iron (ASTM A395)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	N/A	17	N/A	N/A	N/A	N/A	N/A
			PSI	N/A	246	N/A	N/A	N/A	N/A	N/A
		Temperature	Deg °C	N/A	38	N/A	N/A	N/A	N/A	N/A
			Deg °F	N/A	100	N/A	N/A	N/A	N/A	N/A

Hastelloy C-22 (ASTM A494-CX2MW)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 48"	Deg °C	0-120	0-149	0-315	0-105	N/A	0-260	0-200
		Deg °F	32-248	32-300	32-599	32-221	N/A	32-500	32-392

Hastelloy C-22 (ASTM A494-CX2MW)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	N/A	19	49	99	149	248	413
			PSI	N/A	275	710	1435	2161	3596	5990
		Temperature	Deg °C	N/A	38	38	38	38	38	38
			Deg °F	N/A	100	100	100	100	100	100

Monel 400 (ASTM A494-M35-1)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 48"	Deg °C	0-120	0-149	0-315	0-105	N/A	0-260	0-200
		Deg °F	32-248	32-300	32-599	32-221	N/A	32-500	32-392

Monel 400 (ASTM A494-M35-1)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	N/A	15	41	82	124	206	344
			PSI	N/A	217	594	1189	1798	2987	4989
		Temperature	Deg °C	N/A	38	38	38	38	38	38
			Deg °F	N/A	100	100	100	100	100	100

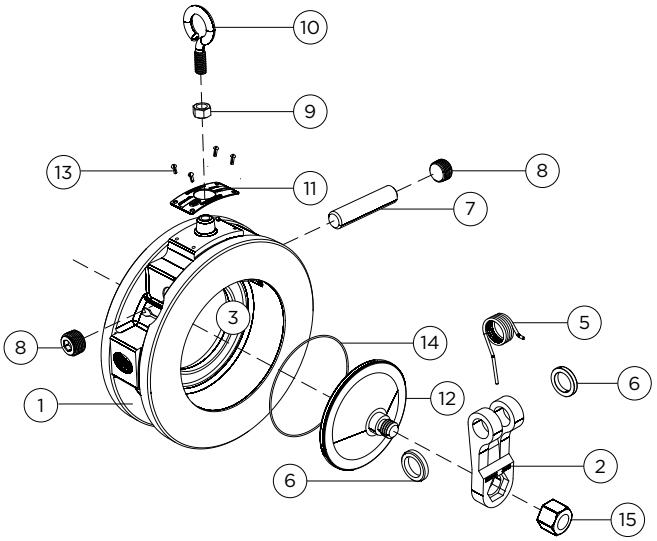
Stainless Steel (ASTM A351-CF8M)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2" - 48"	Deg °C	-40-120	-54-149	-196-538	-37-105	-40-120	-253-260	-20-200
		Deg °F	-40-248	-65-300	32-1000	-34-221	-40-248	-423-500	-4-392

Stainless Steel (ASTM A351-CF8M)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2" - 48"	Pressure	Bar	N/A	19	49	99	149	248	413
			PSI	N/A	275	710	1435	2161	3596	5990
		Temperature	Deg °C	N/A	38	38	38	38	38	38
			Deg °F	N/A	100	100	100	100	100	100

Super Duplex 5A (ASTM A890-CE3MN)									
Seat Temperature Range	Size	Temperature	Buna	EPDM	Metal	Neoprene		Teflon	Viton
						Standard	Super		
	2” - 48”	Deg °C	0-120	0-149	0-135	0-105	N/A	0-260	0-200
		Deg °F	32-248	32-300	32-599	32-221	N/A	32-500	32-392

Super Duplex 5A (ASTM A890-CE3MN)									
CWP	Size	Pressure/ Temperature		Class 125	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500
	2” - 48”	Pressure	Bar	N/A	19	49	99	149	248	413
			PSI	N/A	275	710	1435	2161	3596	5990
		Temperature	Deg °C	N/A	38	38	38	38	38	38
			Deg °F	N/A	100	100	100	100	100	100

17.0 EXAMPLE BILL OF MATERIALS:



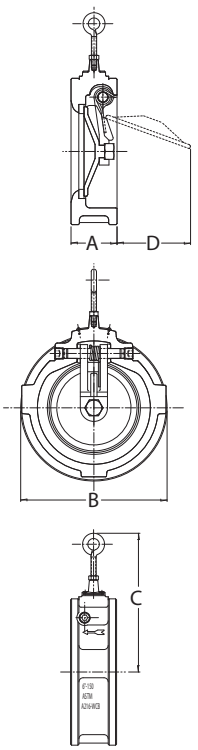
Item	Description	Standard Material
1	Body	ASTM A216-WCB*
2	Hinge	ASTM A351-CF8M
3	Seat	ASTM A240-304
5	Spring	ASTM 313-316
6	Spacer	ASTM A479-316, Teflon
7	Pin	ASTM A479-316
8	Plug	Steel, or 316 SS

Item	Description	Standard Material
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	316 SS
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring	Buna, EPDM, Teflon, Teflon Encapsulated Silicone, Viton

* Other body materials available: A126-CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO.

Nominal Pipe Size		A		B Class 125/150		B Class 300		C		D		Weight	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	lbs	kg
2	50	1.75 (*2.125)	44.5	4.13	104.8	4.38	111.1	4.25	108	1.19	30	3.5	1.6
2 1/2	65	1.88 (*2.375)	47.6	4.88	123.8	5.13	130.2	4.50	114	1.50	38	5.0	2.3
3	80	2.00 (*2.625)	50.8	5.38	136.5	5.88	149.2	5.00	127	1.69	43	6.5	2.9
4	100	2.25	57.2	6.88	174.6	7.13	181.0	5.75	146	2.44	62	11	5.0
5	125	2.50	63.5	7.75	196.9	8.50	215.9	6.50	165	3.38	86	15	6.8
6	150	2.75	69.9	8.75	222.3	9.88	250.8	7.25	184	4.25	108	20	9.0
8	200	2.88	73.0	11.00	279.4	12.13	308.0	8.25	210	5.38	136	30	13.6
10	250	3.13	79.4	13.38	339.7	14.25	362.0	9.63	244	7.00	178	47	21.3
12	300	3.38	85.7	16.13	409.6	16.63	422.3	10.75	273	8.13	206	70	32

* Face to face for Cast Iron Class 125.



18.0 TYPICAL BOLT/STUD DETAILS:

Nominal Pipe Size		Series 125 & 150			Series 300		
		A	Stud Size B*C		A	Stud Size B*C	
Inch	mm	Studs	Inch	mm	Studs	Inch	mm
2	50	4	5/8*4.75	16*20	8	5/8*5.00	16*130
2 1/2	65	4	5/8*5.25	16*135	8	3/4*5.75	20*145
3	80	4	5/8*5.50	16*140	8	3/4*6.00	20*155
4	100	8	5/8*5.75	16*145	8	3/4*6.50	20*165
5	125	8	3/4*6.25	20*160	8	3/4*7.00	20*180
6	150	8	3/4*6.50	20*165	12	3/4*7.50	20*190
8	200	8	3/4*7.00	20*180	12	7/8*8.25	22*210
10	250	12	7/8*7.75	22*200	16	1*9.25	24*235
12	300	12	7/8*8.00	22*205	16	1 1/8*10.00	28*255
14	350	12	1*9.25	24*235	20	1 1/8*14.00	28*280
16	400	16	1*9.50	24*245	20	1 1/4*14.75	32*295
18	450	16	1 1/8*10.25	28*260	24	1 1/4*15.50	32*300
20	500	20	1 1/8*10.50	28*295	24	1 1/4*16.75	32*345
24	600	20	1 1/4*12.75	32*325	24	1 1/2*17.75	38*385
30	750	28	1 1/4*18.00	32*460			
36	900	32	1 1/2*19.50	38*495			
42	1050	36	1 1/2*20.50	38*520			

Nominal Pipe Size		Series 600			Series 900			Series 1500		
		A	Stud Size B*C		A	Stud Size B*C		A	Stud Size B*C	
Inch	mm	Studs	Inch	mm	Studs	Inch	mm	Studs	Inch	mm
2	50	8	5/8*6.50	16*165	8	7/8*9.50	22*245	8	7/8*9.50	22*245
2 1/2	65	8	3/4*7.25	20*185	8	1*9.50	24*245	8	1*9.50	24*245
3	80	8	3/4*7.75	20*200	8	7/8*9.00	22*230	8	1 1/8*10.25	28*260
4	100	8	7/8*8.75	22*225	8	1 1/8*10.75	28*275	8	1 1/4*11.75	32*300
6	150	12	1*12.00	24*305	12	1 1/8*14.00	28*360	12	1 3/8*16.50	35*420
8	200	12	1 1/8*14.00	28*360	12	1 3/8*16.75	35*425	12	1 5/8*19.50	35*495
10	250	16	1 1/4*16.75	32*425	16	1 3/8*18.75	35*480	12	1 7/8*23.50	35*600
12	300	20	1 1/4*17.50	32*435	20	1 3/8*21.50	35*545	16	1*27.00	50*685

Nominal Pipe Size		Series 150				Series 300			
		A		B		A		B	
Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2	50	6.19*	157*	8.0	203	8.69	221	10.5	267
2 1/2	65	6.56*	167*	8.5	216	9.56	243	11.5	292
3	80	7.44*	189*	9.5	241	10.44	265	12.5	318
4	100	9.19	233	11.5	292	11.69	297	14.0	356
5	125	10.44	265	13.0	330	13.19	335	15.75	400
6	150	11.19	284	14.0	356	14.69	373	17.5	445
8	200	16.56	421	19.5	495	18.06	459	21.0	533
10	250	21.31	541	24.5	622	21.31	541	24.5	622
12	300	24.06	611	27.5	699	24.56	624	28.0	711
14	350	26.69	678	31.0	787	25.69	652	33.0	838
16	400	29.69	754	34.0	864	26.44	672	34.0	864
18	450	34.19	868	38.5	978	30.44	773	38.5	978
20	500	32.94	837	38.5	978	31.31	795	40.0	1016
24	600	44.96	1141	51.0	1295	44.18	1122	53.0	1346
30	750	50.94	1294	60.0	1524				
36	900	65.44	1662	77.0	1956				

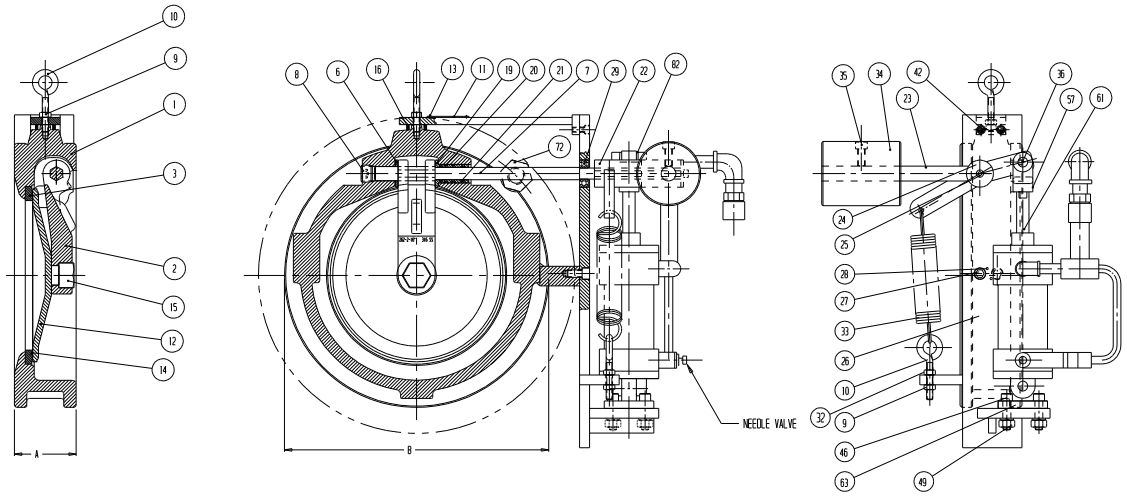
Dimension *B* corresponds to ANSI B16.10

Nominal Pipe Size	Series 125	
	A	
Inch	Inch	mm
2	5.81	148
2 1/2	6.06	154
3	6.81	173

Remaining dimensions are the same as Series 150.

18.1 The following pages (32-74) are written for the various optional Special Accessories in their standard right-hand-mount configurations. Any customer-requested left-hand-mount configurations would need written instructions to be adjusted accordingly.

19.0 H-100 (External Spring, Weight & Hydraulic Damper), Special Application Model:



Item	Description	Material
1	Body	ASTM A 216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	ASTM A564-630 (17-4 PH)
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
16	Spacer	Steel
19	Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel
23	Weight Lever	Steel

Item	Description	Material
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel
29	Ball Bearing	Steel
32	Nut	Steel Zinc Plated
33	Spring	ASTM A313 302/304 (Optional ASTM A313 316, 17-7 PH Stainless Steel, Inconel X 750)
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated
36	Pin	Steel
42	Socket Head Screw	Steel Zinc Plated
46	Bolt	Steel Zinc Plated
49	Nut	Steel Zinc Plated
57	Rod Clevis	Steel
61	Cylinder Assembly	Aluminium / Steel
63	Eye Bracket	Steel
72	Threaded Bushing	Steel
82	Spacer	Teflon

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

19.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with a hydraulic cylinder and an external spring, is to provide external control, which is field adjustable, in applications such as: multiple pumping installations terminating in common headers, where transient forces are difficult to ascertain and control.

(continued)

19.2 2) GENERAL DESCRIPTION

A Model H-100 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) mounted in a Seal Bushing (19) seal the Shaft (7) and the Body (1).
The Spring/Cylinder Adaptor (22) engaged on the Shaft (7), is inter-connected to the Rod Clevis (57) through the Cylinder Assembly (61) as well as the Spring (33), and then anchored to the Bracket (26). The Weight Lever (23), which supports the Weight (34), is connected to the Shaft (7) with a hexagon bushing. The Weight Lever (23) can be rotated together with the Shaft (7).
The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection. Threaded Bushing (72) is optional if the Shaft (7) interferes with the flange's stud.

19.3 3) ADJUSTMENT:

The limited adjustment of the Spring (33) and Cylinder Assembly (61) is designed to suit most applications. Adjustment by qualified mechanic, allows for the design to be adjusted to suit a variety of applications. The valve has been set at the factory to estimated operating conditions.

a) The flow control valve (needle valve on hydraulic damper) is set at the factory to give a controlled opening speed and a fast closing speed. If slower opening is required, the control valve should be closed slowly until the desired speed is obtained.
b) If a faster opening is required, the control valve should be opened slowly until the desired speed is obtained.

19.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair, the following procedure is recommended to dis-assemble the valve and its major components.

1. The Cylinder Assembly (61) should be removed first to reduce the chances of damaging any of the components. The Cylinder Assembly (61) is filled with hydraulic oil. If possible, it is best to remove this unit while the valve is inline. To remove the Cylinder Assembly (61):
a. Remove the Pin (36) in the Rod Clevis (57) and the Eye Bracket (63) of the Cylinder Assembly (61).
b. Support the Cylinder Assembly (61) and remove the Pin (36). The Cylinder Assembly (61) is free from the valve assembly.

2. Remove valve from the line.

3.Mark the hole that the Spring (33) mounts to Spring/Cylinder Adaptor (22), mark the location of the Nut (32) tight to the Eyebolt (31), loosen Nut (32) to remove tension from the Spring (33) and remove the Spring (33).

4. Mark the location between the Weight Lever (23) and the Weight (34), loosen the Socket Head Screw (35) and carefully remove the Weight (34) from Weight Lever (23).

5. Remove Socket Head Screw (25) and the Retaining Plate (24) from the end of the Shaft (7).

6. Mark the orientation between the Weight Lever (23) and Spring/Cylinder Adaptor (22) with the Shaft (7), remove the Weight Lever (23) and Spring/Cylinder Adaptor (22) from the Shaft (7).

7. Remove the Plug (8) from the opposite side of the Body (1).

8. The Shaft (7) can now be removed. You may be required to tap the free end of the Shaft (7) to remove it.

9. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

10. Remove the Bushings (19) and Spacer (6) from the Body (1).

11. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure.

NOTICE

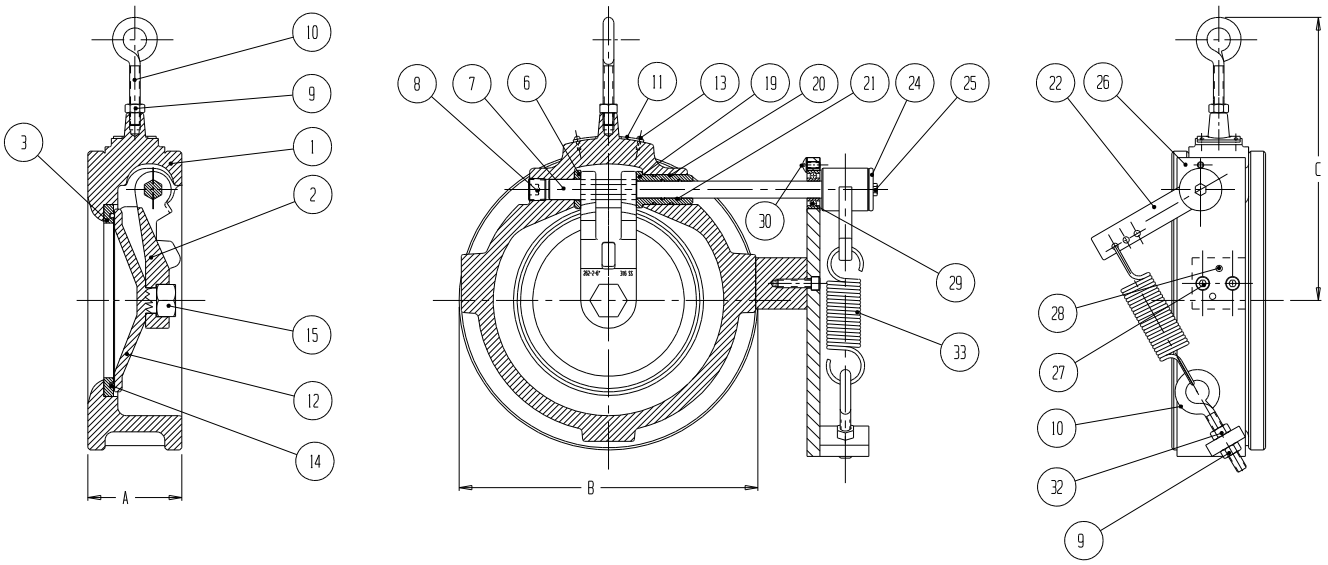
O-Rings: Surfaces that the O-Ring (14, 20, 21) will contact in operation should be smooth and free from sharp edges, burrs and deep scratches.

When installing the O-Rings (14, 20, 21), lubricate the O-Rings (14, 20, 21) and all contact surfaces with clean oil or grease. When filling the Cylinder Assembly (61), cycle the valve a few times to ensure the circuit is completely full of oil. Oil may seep from the muffler if the Cylinder Assembly (61) is overfilled. Cycle the valve until the seeping stops.

NOTICE

Cylinder: The Cylinder is filled with a light hydraulic oil, Esso Nuto 46. When filling the Cylinder Assembly (61), cycle the valve a few times to ensure the circuit is completely full of oil. Oil may seep from the muffler if the cylinder is overfilled. Cycle the valve until the seeping stops.

20.0 SA-01 (EXTERNAL LEVER, & SPRING), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A 216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel

Item	Description	Material
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Round Head Screw	Steel Zinc Plated
32	Nut	Steel Zinc Plated
33	Spring	ASTM A313 302/304 (Optional ASTM A313 316, 17-7 PH Stainless Steel, Inconel X 750)

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
This model is only available up to 12" in size.

20.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external spring, is to provide external control, which is field adjustable, in applications such as: multiple pumping installations terminating in common headers, where transient forces are difficult to ascertain and control.

(continued)

20.2 2) GENERAL DESCRIPTION:

A Model SA-01 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7) and the Body (1). A Spring (33) mounted between the Bracket (26) and the Shaft (7) through the Spring Adaptor (22) provides for adjustment and rapid closure. The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection.

20.3 3) ADJUSTMENT:

The limited adjustment of the spring is designed to suit most applications. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications. The valve has been set at the factory to estimated operating conditions.

20.4 4) MAINTENANCE REQUIREMENTS:

No special tools are required to replace shaft seals. The following steps are recommended:

1. Remove valve from the line.

2. Mark the hole that the spring mounted to the Spring Adaptor (22), mark the position that the Nut (32) tightened to the Eyebolt (10). Loosen Nut (32) to remove tension from the Spring (33), remove the Spring (33).

3. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of the Shaft (7). Mark the orientation between the Spring Adaptor (22) and the Shaft (7).

4. Remove the Spring Adaptor (22) from the Shaft (7).

5. Remove the Plug (8) from the Body (1).

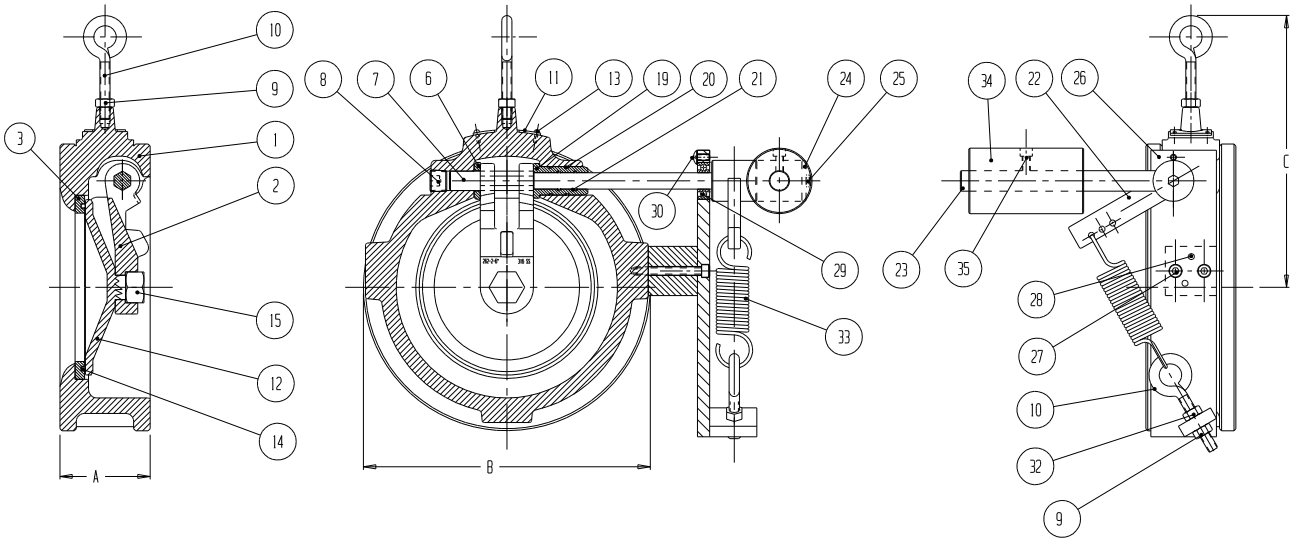
6. Remove the Shaft (7) from the Plug (8) side of the Body (1) by tapping gently.

7. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

8. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure.

21.0 SA-1 (External Lever, Spring, & Weight), Special Application Model:



Item	Description	Material
1	Body	ASTM A 216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316

Item	Description	Material
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel
23	Weight Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Round Head Screw	Steel Zinc Plated
32	Nut	Steel Zinc Plated
33	Spring	ASTM A313 302/304 (Optional ASTM A313 316, 17-7 PH Stainless Steel, Inconel X 750)
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
This model is only available up to 12" in size.

21.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external lever with spring & weight, is to provide an external control, which is field adjustable, in applications such as: multiple pumping installations terminating in common headers where transient forces are difficult to ascertain and control. Other applications include those that require fast closure such as solids handling, & wastewater. The basic principle is to start closing the valve as soon as the flow starts to decrease.

With the external spring it is possible to close the valve before the flow reverses. This reduces or eliminates water-hammer and the associated problems.

21.2 2) GENERAL DESCRIPTION:

A Model SA-1 is a basic Bray/Rite Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7) and the Body (1). A Spring (33) mounted between the Bracket (26) and the Shaft (7) provides for the adjustment and rapid closure. The Spring (33) and Weight (34) are attached to the Shaft (7) with hexagon drive bushings. The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection.

21.3 3) ADJUSTMENT OF VALVE:

The limited adjustment of the Spring (33) & Weight (34) is designed to suit most applications. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications. The valve has been set at the factory to estimated operating conditions. To reduce valve closing time, the Spring (33) can be tightened, or the Weight (34) moved further from the Shaft (7). To increase the valve closing time, the Spring (33) can be loosened, or the Weight (34) moved closer to the Shaft (7). Make sure that there is preload on the Spring (33) to ensure that the valve is closed when there is no flow.

21.4 4) MAINTENANCE REQUIREMENTS:

No special tools are required to replace shaft seals. The following steps are recommended:

1. Remove valve from the line.

2. Mark the location between the Weight Lever (23) and the Weight (34), loosen the Socket Head Screw (35) and carefully remove the Weight (34) from Weight Lever (23).

3. Mark the hole that the Spring (33) mounts to the Spring Adaptor (22), mark the location where the Nut (32) tightens to the Eyebolt (10), loosen the Nut (32) to remove tension from the Spring (33) and remove the Spring (33).

4. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of Shaft (7). Mark the orientation between the Weight Lever (23) and Spring Adaptor (22) with the Shaft (7).

5. Remove the Weight Lever (23) and Spring Adaptor (22) from the Shaft (7).

6. Remove the Plug (8) from the Body (1).

(continued)

7. Remove the Shaft (7) from the Plug (8) side of the Body (1) by tapping gently.

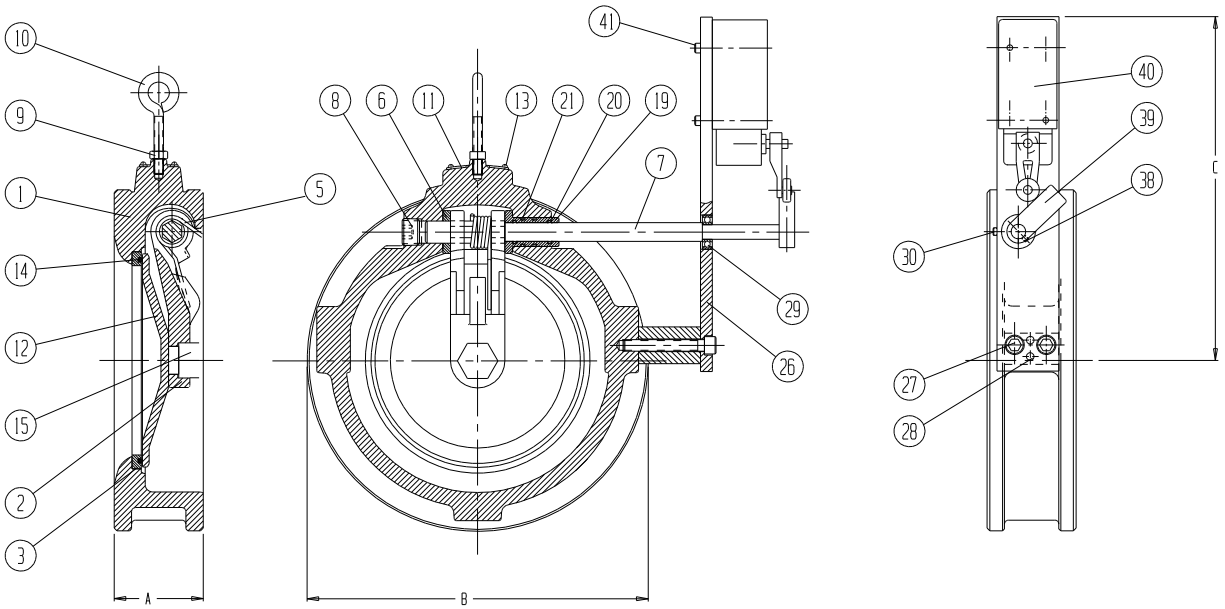
8. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

9. Remove the Bushings (19) and Spacer (6) from the Body (1).

10. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure.

22.0 SA-2 (LIMIT SWITCH), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A 216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
5	Spring	ASTM A313-316
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton

Item	Description	Material
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Set Screw	Steel Zinc Plated
38	Set Screw	Steel Zinc Plated
39	Actuator	Steel
40	Limit Switch	Electrostatic Epoxy Coated Zinc (Housing)
41	Socket Head Screw	Steel Zinc Plated

* Other materials available: A126-CLB, A395, A351-CF8M, Monel, Alloy 20, 254 SMO.
All external components can be offered in SS where required.

22.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with a Limit Switch, is to provide remote indication of valve position and a positive indication of flow within an automated control system environment.

(continued)

22.2 2) GENERAL DESCRIPTION:

The Model SA-2 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified to allow the use of a limit switch to indicate the valve is in the closed position. The basic valve has a Hinge/Disc Assembly (2, 12) connected to a positive hexagonal drive Shaft (7) which extends through the Body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7), Bushings (19) and the Body (1) to prevent leakage.

22.3 3) ADJUSTMENT:

No transient adjustments available.

22.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to dis-assemble the valve and its major components.

1. Remove valve from the line.

2. Loosen the Set Screw (38) and remove the Actuator (39) from the Shaft (7).

3. Remove the Plug (8) from the Body (1).

4. Remove the Shaft (7) from the Plug (8) side of the Body (1) by tapping gently.

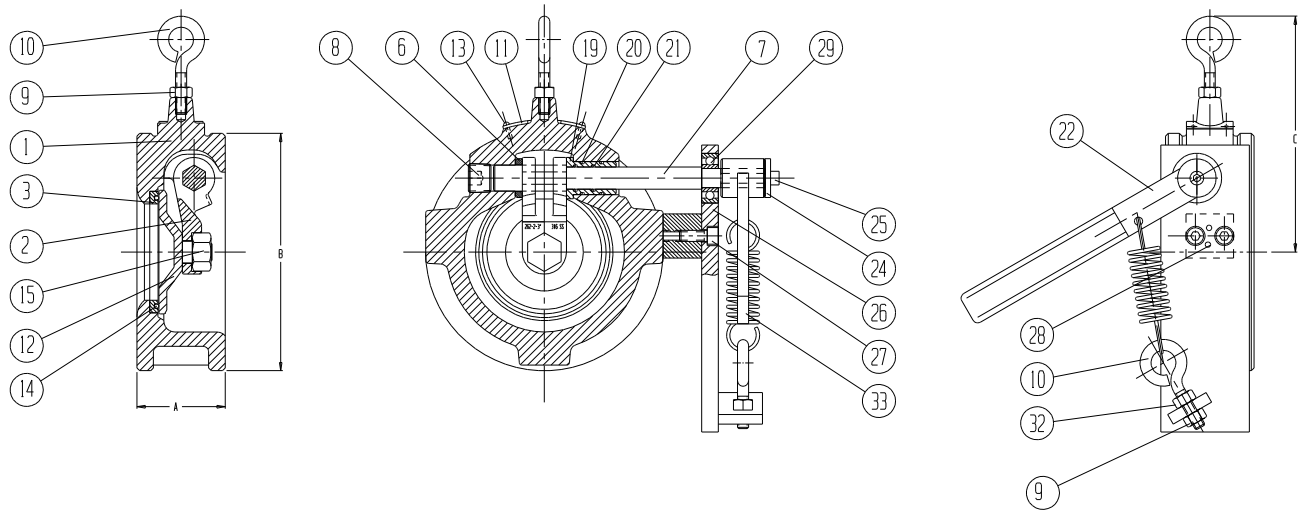
5. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

6. Remove the Bushing (19) and Spacer (6) from the Body (1).

7. Clean parts, replace O-Rings (14, 20, 21) if necessary and add compatible grease.

Assembly is accomplished by reversing the above procedure.

23.0 SA-3 (BACKFLUSH LEVER, & EXTERNAL SPRING), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel

Item	Description	Material
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor/ Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
32	Nut	Steel Zinc Plated
33	Spring	ASTM A313 302/304 (Optional ASTM A313 316, 17-7 PH Stainless Steel, Inconel X 750)

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
This model is only available up to 12" in size.

23.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with a Backflush Lever & External Spring, is to allow backflush process while retaining elements of external control, that is field adjustable, in applications such as: backflushing pipelines for chemical washes in the food and beverage industry.

(continued)

23.2 2) GENERAL DESCRIPTION:

A Model SA-3 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball Bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7) and the Body (1). A Spring (33) mounted between the Bracket (26) and the Shaft (7) provides for adjustment and rapid closure. The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection. The Spring Adaptor/Lever (22) is mounted onto the Shaft (7) with a hexagon connection.

23.3 3) ADJUSTMENT:

The limited adjustment of the Spring (33) is designed to suit most applications. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications. The valve has been set at the factory to estimated operating conditions. To reduce valve closing time, the Spring (33) can be tightened. To increase the valve closing time, the Spring (33) can be loosened. Make sure that there is preload on the Spring (33) to ensure that the valve is closed when there is no flow. It is not recommended to attempt to open the valve in the presence of any back-pressure as the resulting forces may damage the mechanism.

23.4 4) MAINTENANCE REQUIREMENTS:

No special tools are required to replace shaft O-Rings. The following steps are recommended:

1. Remove valve from the line.

2. Mark the hole where the Spring (33) is mounted to the Spring Adaptor/Lever (22), mark the position that the Lock Nut (9) tightened to the Eyebolt (10). Loosen Nut (32) to remove tension from the Spring (33), and remove the Spring (33).

3. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of Shaft (7). Mark the orientation between the Spring Adaptor/Lever (22) and the Shaft (7).

4. Remove the Spring Adaptor/Lever (22) from the Shaft (7).

5. Remove the Plug (8) from Body (1).

6. Remove the Shaft (7) from the Plug (8) side of the Body (1). The Shaft (7) may be tapped gently to remove it from the Body (1).

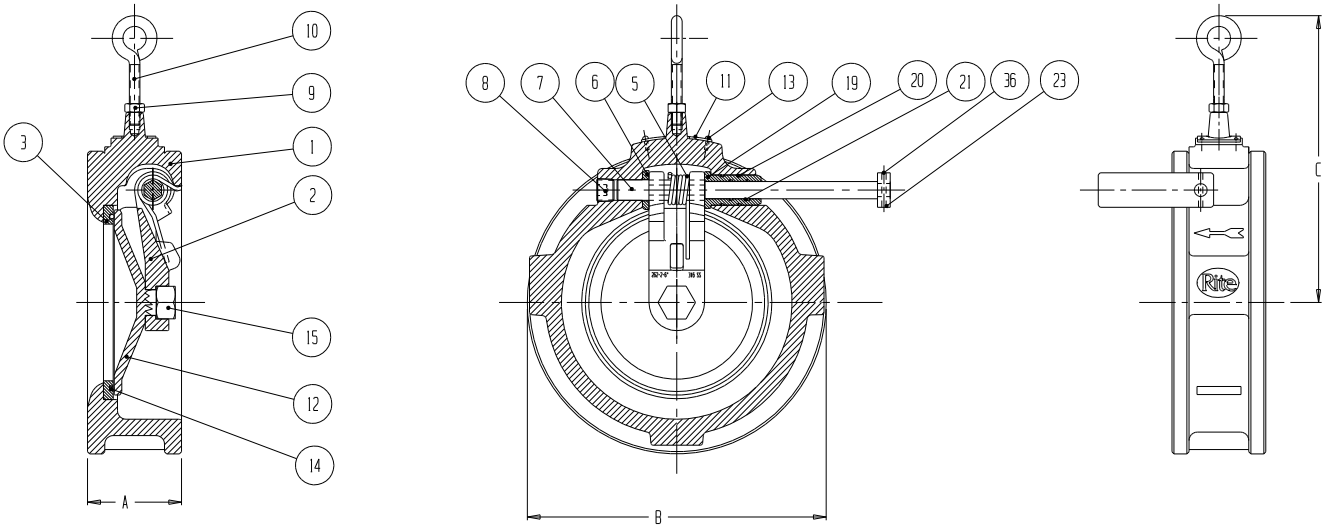
7. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

8. Remove the Seal Bushings (19) and Spacer (6) from the Body (1).

9. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

10. Assembly is accomplished by reversing the above procedure.

24.0 SA-4 (EXTERNAL POSITION INDICATOR), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
5	Spring	ASTM A313-316
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316

Item	Description	Material
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
23	Indicator	Aluminum
36	Pin	Steel

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
(*) Integral seat offered for stainless steel valves

24.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external position indicator, is to provide a visual indication of the internal disc position.

(continued)

24.2 2) GENERAL DESCRIPTION:

A Model SA-4 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive shaft (7), which extends through the Body (1). The Shaft (7) extends through and is supported in the Body (1) on one side. Four O-Rings (20, 21) seal the shaft (7) and the Body (1). The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection.

24.3 3) ADJUSTMENT:

There are no transient adjustments available.

24.4 4) MAINTENANCE REQUIREMENTS:

No special tools are required to replace shaft seals.

The following steps are recommended:

1. Remove valve from the line.

2. Remove the Pin (36) from the Indicator/Shaft (7).

3. Remove the Indicator (23) from the Shaft (7).

4. Remove the Plug (8) from the Body (1).

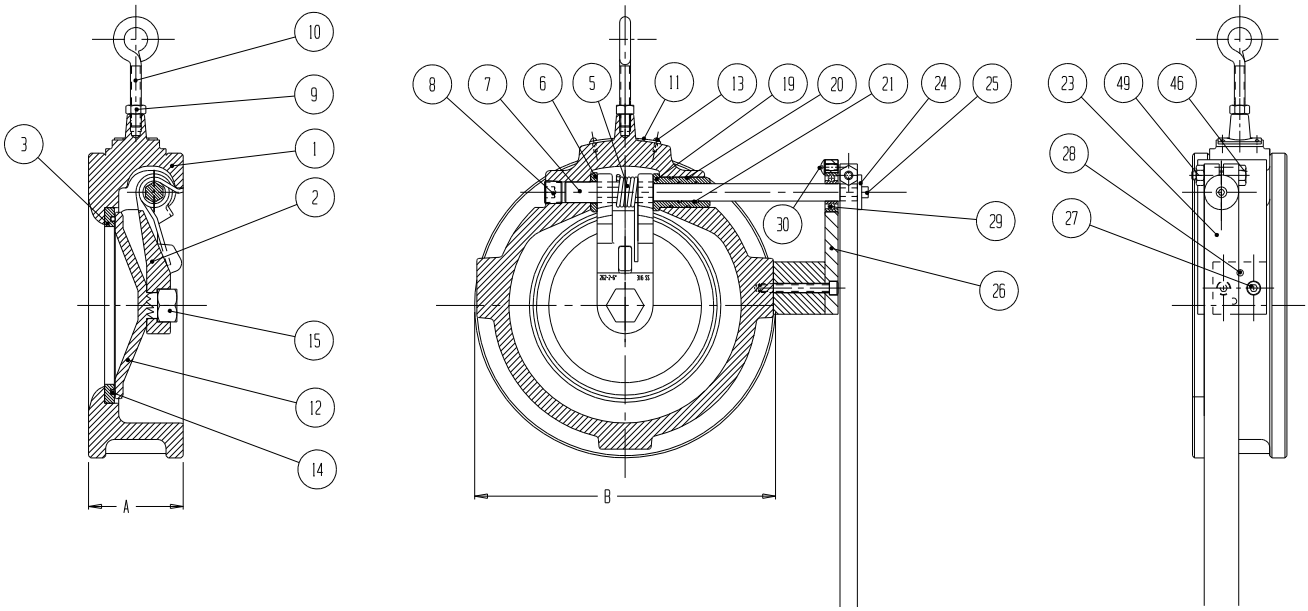
5. Remove the Shaft (7) from the Plug (8) side of the Body (1).

6. The Disc Assembly (2, 12) can now be lifted from the Body (1).

7. Clean parts, replace O-Rings (14, 20, 21) if necessary and add compatible grease.

Assembly is accomplished by reversing the above procedure.

25.0 SA-4A (BACKFLUSH LEVER), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3*	Seat (optional)	ASTM A240-304
5	Spring	ASTM A313-316
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton

Item	Description	Material
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
23	Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Rd. Hd. Screw	Steel Zinc Plated
46	Hex Bolt	Steel
49	Hex Nut	Steel

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
(*) Integral seat offered for stainles steel valves

25.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified to allow the user to open the valve manually to backflush a pipeline.

(continued)

25.2 2) GENERAL DESCRIPTION:

The Model SA-4A is a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified, featuring a positive hexagonal drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive shaft (7), which extends through the body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. Four O-Rings (20, 21) seal the Shaft (7) and the Body (1). The Ball Bearing (29) is used in the Bracket (26) to provide support and to reduce friction. The Lever (23) is mounted onto the Shaft (7) with a hexagon connection.

25.3 3) ADJUSTMENT:

No transient adjustment is available.

25.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to disassemble the valve and its major components.

1. Remove valve from the line.

2. Remove the Socket Head Screw (25) and Retaining Plate (24). Mark the orientation between the Lever (23) and the Shaft (7). Remove the Hex Nut (49) from the Hex Bolt (46) and slide Hex Bolt (46) out through the Lever (23). Mark the orientation between the Lever (23) and the Shaft (7). Remove the Lever (23).

3. Remove the Plug (8) from the Body (1).

4. While holding the Spring (5), remove the Shaft (7) from the Plug (8) side of the Body (1).

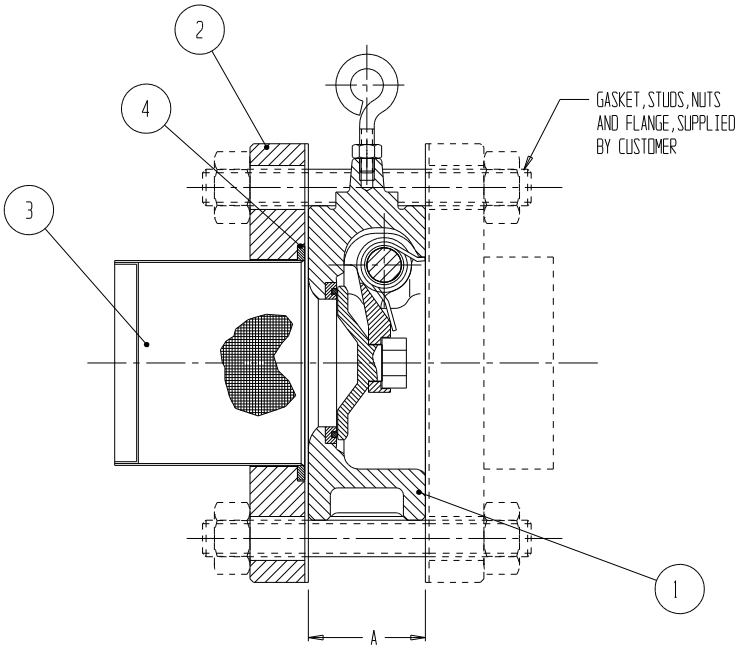
5. The Disc Assembly (2, 12) can now be lifted from the Body (1).

6. Remove the Bushing (19) and Spacer (6) from the Body (1).

7. Clean parts, replace O-Rings (14, 20, 21) if necessary and add compatible grease.

Assembly is accomplished by reversing the above procedure.

26.0 SA-6 (FOOT VALVE), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Check Valve	ASTM A216 WCB*
2	Flange	Steel
3	Basket	Stainless Steel
4	Gasket	Carbon Fiber

Basket supplied with 1/4" perforations, and 11/32" centers.
* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

26.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an Inlet Strainer basket, is to filter impurities from the line assisting downstream pump to maintain its prime. They are commonly found in the bottom/end of a pipeline in a suction lift application.

26.2 2) GENERAL DESCRIPTION:

A Model SA-6 is a standard wafer Bray/Rite Single Door Wafer Type Swing Check Valve which has been fitted with an inlet strainer. Foot valves are designed to block debris from entering the line The screen diameter opening is designed to be larger than the valve inlet itself, minimizing head loss.

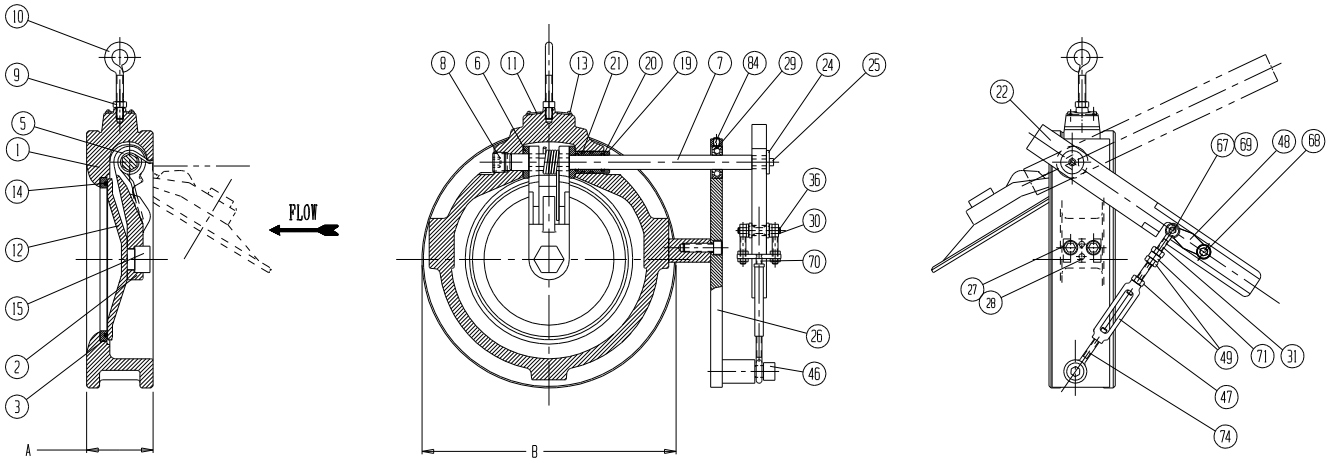
26.3 3) ADJUSTMENT:

No transient adjustment is available.

26.4 4) MAINTENANCE REQUIREMENTS:

No special maintenance required.

27.0 SA-7 (EMERGENCY SHUT-OFF, FUSIBLE LINK), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB**
2	Hinge	ASTM A351-CF8M
3*	Seat (optional)	ASTM A240-304
5	Spring	ASTM A313-316
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated

Item	Description	Material
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Retaining Clip	Steel
31	Eye Bolt	Steel Zinc Plated
36	Pin	Steel Zinc Plated
46	Bolt	Steel Zinc Plated
47	Turnbuckle	Steel Zinc Plated
48	Fusible Link	Bronze
49	Nut	Steel Zinc Plated
67	Bearing	Steel
68	Bolt	Steel Zinc Plated
69	Bushing	Steel
70	Stud	Steel
71	Plate	Steel
74	Turnbuckle Eye	Steel Zinc Plated
84	Set Screw	Steel Zinc Plated

* Temperature rating to be specified, as this can affect the mechanical and fusible design elements.
** Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
This model is only available up to 24" in size.

27.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with a fusible link, is to create a piping element that will provide failsafe protection in case of a fire. In event of an external fire, the fusible link will melt which will release the lever and allow the disc to close. Closing of the disc is started by the internal spring. The fluid itself will then force the disc closed quickly. With the valve closed, the flow of the fluid will stop.

These valves are frequently used by the Chemical/Petro-Chemical industry and installed in locations where there is a possibility of fire spreading from one tank to another. These valves help contain the damage to a local area by eliminating a potential source of fuel for the fire.

27.2 2) GENERAL DESCRIPTION:

A Model SA-7 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7) and the Body (1).

A turnbuckle/cam bearing arrangement (47, 74) holds the major component of the load generated by the flow torque. The Fusible Link (48) holds the Bearing (67) in its proper position. Due to the geometry of the linkage, a small load is applied to the Fusible Link (48) to ensure that it separates and frees the Bearing (67) in case of fire.

27.3 3) ADJUSTMENT:

No transient adjustment is available.

27.4 4) MAINTENANCE REQUIREMENTS:

The pipeline must be empty for the installation and setup of the Model SA-7 Fusible Link Valve.

1. To install the valve in the pipeline the Disc (12) must be closed. This requires disconnecting the Fusible Link (48) from the Lever (22) by removing Bolt (68).

2. With the valve Disc (12) closed, insert the valve and the gaskets between the pipeline flanges.

3. Align the valve with the bolt holes of the flange and install and tighten all the flange bolting.

4. Open the disc by pressing the Lever (22) down.

5. Insert the Bearing (67) into the slot in the Lever (22).

6. Attach the free end of the Fusible Link (48) to the Lever (22) with the two Bolt (68).

(continued)

7. Tighten the Turnbuckle (47) until the Hinge (2) is firmly in contact against the Body (1) wall.

8. Clamp the Turnbuckle (47) in position by tightening the Lock Nut (49).

9. The pipeline can now be filled with liquid and the pumps started.

10. If the Fusible Link (48) has to be replaced, first remove the Retaining Clips (30) and the Bushing/Bearing (67, 69) to remove the Fusible Link (48). Remove the two Bolts (68) that hold the Fusible Link (48) to the Lever (22).

11. Replace the Fusible Link (48) and install the Bearing/Bushing (67, 69) and Retaining Clips (30). Reset the Lever (22) in the sequence 4 through 8 above.

Assembly is accomplished by reversing the above procedure.

⚠ WARNING

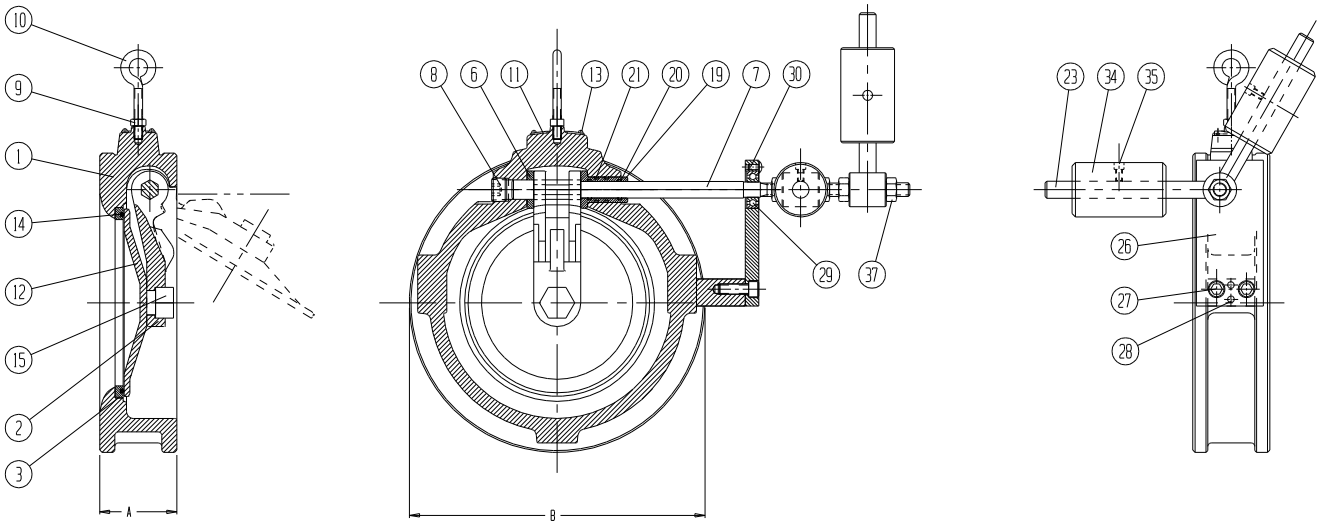
These valves to be installed in horizontal lines only.

⚠ CAUTION

Failure to install the valve as instructed may result in loosening of the turnbuckle and may eventually lead to unexpected closing of the valve with the resultant waterhammer and possible pipe and pump damage.

Assembly is accomplished by reversing the above procedure.

28.0 SA-10 (DUAL BALANCED WEIGHTS), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel

Item	Description	Material
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
23	Weight Lever	Steel
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Set Screw	Steel Zinc Plated
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated
37	Lock Nut	Steel Zinc Plated

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.
Downflow models available.

28.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with external balance weights is to provide a field adjustable external control, in applications such as blowers where the flow rates are often insufficient to keep a standard valve fully open. The basic principle is to adjust the balance weights so that the valve is fully opening while the fluid is flowing and fully closed when there is no flow. By using two weights it is easy to position the arms so that the valve operates correctly under most flow conditions.

(continued)

28.2 2) GENERAL DESCRIPTION:

A Model SA-10 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive shaft (7), which extends through the body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. Four O-Rings (20, 21) seal the Shaft (7) and the Body (1). The two weight levers (23), which support Weights (34) are screwed onto the Shaft (7) and locked in place with Lock Nuts (37). The Weight Levers (23) can be rotated on the Shaft (7) independently.

28.3 3) ADJUSTMENT:

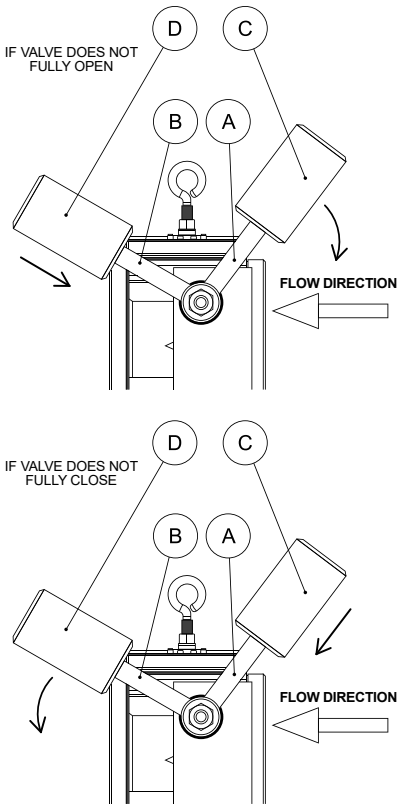
When operating conditions are known, the valve is set at the factory but may require minor field adjustment to optimize on-site performance. If the operating conditions are not provided the valve has to be adjusted in the following manner. These steps should be carried out singularly or in combination as the field setting dictates.

NOTICE

This valve is designed to be fully open or fully closed. Weights (34) and Weight Levers (23) are provided for this purpose.

Refer to diagram to the right.
(1) If the valve does not fully open (a) Move lever A clockwise, or (b) Move weight D towards the Shaft (7). (2) If the valve does not fully close. (a) Move lever B counterclockwise, or (b) Move weight C towards the Shaft (7). Changing any of the relative positions of the weights affects how the valve performs.

These steps may need to be repeated a number of times to obtain the desired setting.



NOTICE

If the valve is not fully biased to the open position under working conditions, an oscillating motion will be observed on the external assembly. This must be corrected as it can lead to premature wear and a shortened service life.

28.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to disassemble the valve and its major components.

The following steps are recommended:

1. Remove valve from the line.

(continued)

2. Mark the position between the Weight Levers (23) and the Weights (34), loosen the Socket Head Screw (35) and carefully remove the Weight (34) from Weight Lever (23).

3. Mark the orientation between the Weight Lever (23) and the Shaft (7). Remove the Lock Nuts (37) and unscrew the Weight Levers (23) from the Shaft (7).

4. Unscrew Plug (8). The Shaft (7) can now be withdrawn from the Body (1) through the Plug (8) hole. The Shaft (7) may be tapped gently to remove it from the Body (1).

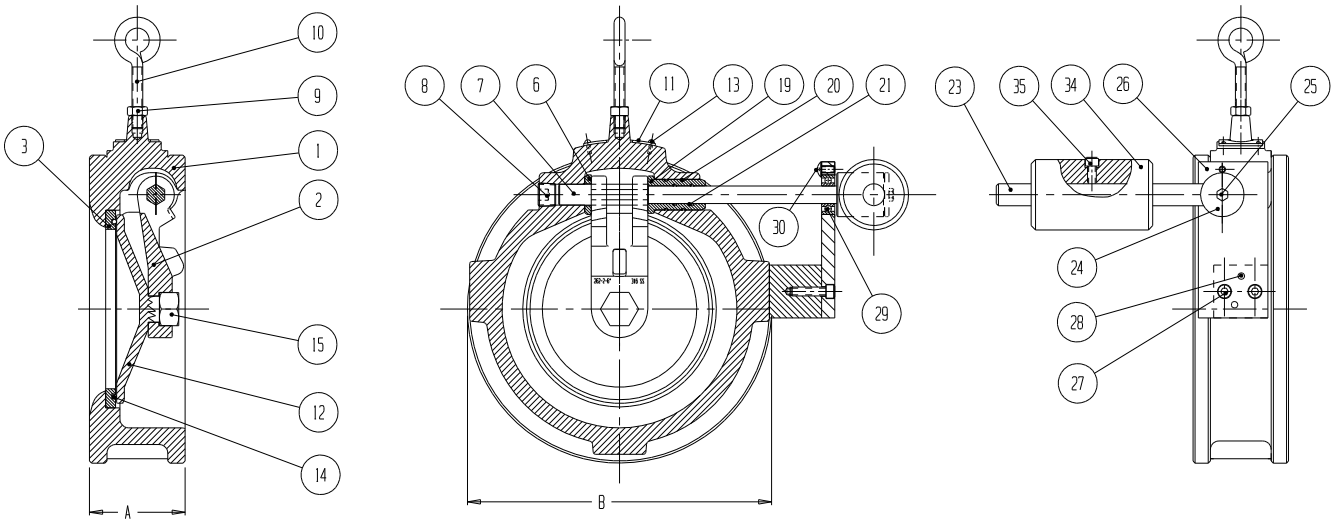
5. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

6. Remove the Bushings (19) and Spacer (6) from the Body (1).

7. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure.

29.0 SA-16 (EXTERNAL WEIGHT & LEVER), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel

Item	Description	Material
19	Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
23	Weight Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
30	Round Head Screw	Steel Zinc Plated
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

29.1 1) APPLICATION:

The Model SA-16 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified to provide the user with the ability to change the opening/cracking pressure of the valve, within a certain range and/or change the closing characteristics of the valve. A weight is used to provide the necessary torque to close the valve.

(continued)

29.2 2) GENERAL DESCRIPTION:

The Model SA-16 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagonal drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive Shaft (7), which extends through the Body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. Four O-Rings (20, 21) seal the Shaft (7) and the Body (1). The Weight Lever (23), which supports the Weight (34), is connected to the Shaft (7) with a Bushing (19). The Weight Lever (23) can be rotated on the Shaft (7).

29.3 3) ADJUSTMENT:

When operating conditions are known, the valve is set at the factory but may require minor field adjustment. If the operating conditions are not provided the valve has to be adjusted in the field.

NOTICE

This valve is designed to be fully open or fully closed. If the valve oscillates in the flow, life expectancy will be reduced. Premature wear on the Shaft (7) and the Bushing (19) will lead to eventual failure of the valve.

1). If the valve does not fully open or opens at too high a pressure, move the Weight (34) towards the Shaft (7).
2) If the valve does not fully close or a higher opening pressure is required, move the Weight (34) toward the end of the Weight Lever (23).

Changing the position of the Weight (34) affects how the valve performs. These steps may need to be repeated a number of times to obtain the desired setting.

29.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to disassemble the valve and its major components.

1. Remove valve from the line.

2. Mark the position between the Weight Lever (23) and the Weight (34), loosen the Socket Head Screw (35) and carefully remove the Weight (34) from the Weight Lever (23).

3. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of the Shaft (7). Mark the orientation between the Weight Lever (23) and the Shaft (7). Remove the Weight Lever (23).

4. Remove the Plug (8) from the opposite side of the Body (1).

5. Remove the Shaft (7) from the Plug (8) side of the Body (1).

(continued)

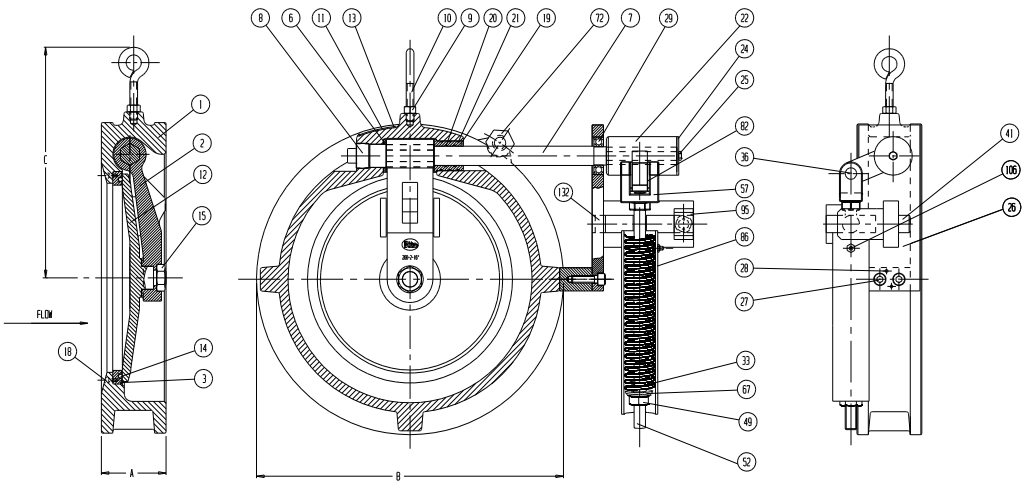
6. The Hinge-Disc (2, 12) Assembly. can now be lifted from the Body (1).

7. Remove the Bushing (19) and Spacer (6) from the Body (1).

8. Clean parts, replace O-Rings (14, 20, 21) if necessary and add compatible grease.

To assemble the valve, reverse the above procedure.

30.0 SA-40 (EXTERNAL COMPRESSION SPRING), SPECIAL APPLICATION MODEL:



Item	Description	Material
1*	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14*	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
18	Retaining Seat	Steel
19	Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel

Item	Description	Material
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
33	Spring	Steel (ASTM A228)
36	Cotter Pin	Steel Zinc Plated
41	Socket Head Screw	Steel Zinc Plated
49	Flanged Lock Nut	Steel Zinc Plated
52	Rod	Steel
57	Rod Clevis	Steel
67	Guiding Bushing	Steel
72	Threaded Bushing	Steel
82	Washer	Steel
86	Spring Chamber	Steel
95	Rod Eye	Steel
106	Grease Fitting	Alemite
132	Cam Bearing	Steel

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

30.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external compression spring, is to provide external control, which is field adjustable. For use in applications such as: multiple pumping installations terminating in common headers, where transient forces are difficult to ascertain and control.

(continued)

The basic principle is to start closing the valve as soon as the flow starts to decrease. With external springs it is possible to close the valve before flow reverses. This reduces or eliminates water-hammer and the associated problems.

30.2 2) GENERAL DESCRIPTION:

A Model SA-40 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive Shaft (7), which extends through the Body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. Four O-Rings (20, 21) seal the Shaft (7) and the Body (1). A Compression Spring (33) is mounted between the Bracket (26) and the Shaft (7) to provide for adjustment and rapid closure. The Disc (12) is supplied with a non-rotating feature to prevent it from "Spinning" and creating excessive wear at the Hinge-Disc (2, 12) connection. The external Spring (33) is enclosed in a Spring Chamber (86) which acts as guard against contact from foreign objects.

30.3 3) ADJUSTMENT:

The size of the Spring (33) is determined by flow rates and the required response of the valve. The limited adjustment of the Spring (33) allows fine tuning of the valve when it is installed. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications. To reduce valve closing time, the Spring (33) can be tightened. To increase the valve closing time, the Spring (33) can be loosened. Make sure that there is preload on the Spring (33) to ensure that the valve is closed when there is no flow.

⚠ WARNING

If the disc is not fully closed, the Spring (33) may be under compression. Sudden decompression may cause serious injury and/or damage.

30.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to disassemble the valve and its major components.

No special tools are required to replace shaft seals. The following steps are recommended:

1. Remove valve from the line.

2. Loosen Flanged Lock Nut (49) to remove tension from the Spring (33).

3. Remove Pin (36) from the Rod Clevis (57).

(continued)

4. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of Shaft (7).

5. Mark the orientation between the Spring Adaptor (22) and the Shaft (7).

6. Remove the Spring Adaptor (22) from the valve.

7. Remove the Plug (8) from the Body (1).

8. Remove the Shaft (7) from the Plug (8) side of the Body (1). The Shaft (7) may be tapped gently to remove it from the Body (1).

9. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

10. Remove the Bushing (19) and Spacer (6) from the Body (1).

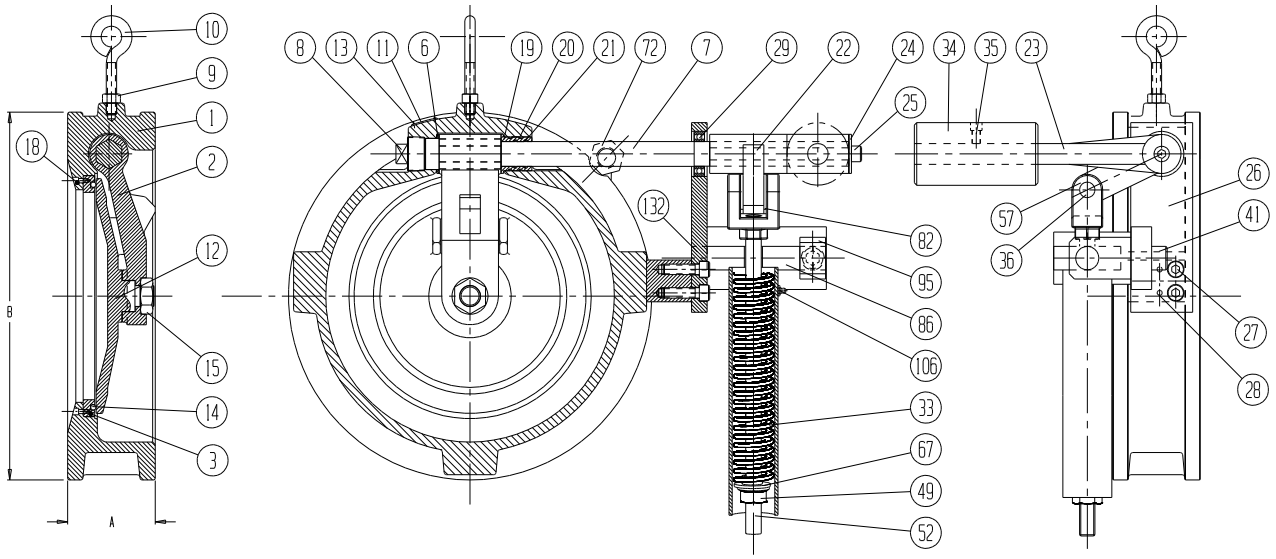
11. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure. The Spring Chamber (86) is provided with a grease fitting to allow greasing of the Spring (33) and Shaft (7).

Any compatible grease can be used. All pivot points of the Spring (33) should be lubricated on a regular basis to ensure that no binding occurs between the components.

Assembly is accomplished by reversing the above procedure.

31.0 SA-40A (EXTERNAL COMPRESSION SPRING, WEIGHT & LEVER), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Steel Zinc Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Steel
18	Seat Retaining Screws (optional)	Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel
23	Weight Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated

Item	Description	Material
26	Bracket	Steel
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
33	Spring	Steel (ASTM A228)
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated
36	Cotter Pin	Steel (ASTM A228)
41	Socket Head Screw	Steel Zinc Plated
49	Flanged Lock Nut	Steel Zinc Plated
52	Rod	Steel
57	Rod Clevis	Steel
67	Guiding Bushing	Steel
69	Needle Bearing	Steel
72	Threaded Bushing	Steel
82	Spacer	Teflon
86	Spring Chamber	Steel
93	Cotter Pin	Steel
95	Rod Eye	Steel
102	Headless Liner	Bronze
106	Grease Fitting	Alemite
132	Cam Bearing	Steel

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

31.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external compression spring, is to provide external control, which is field adjustable. For use in applications such as: multiple pumping installations terminating in common headers, where transient forces are difficult to ascertain and control. The basic principle is to start closing the valve as soon as the flow starts to decrease. With external springs it is possible to close the valve before flow reverses. This reduces or eliminates water-hammer and the associated problems

31.2 2) GENERAL DESCRIPTION:

A Model SA-40 is a basic Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge/Disc/Shaft (2, 12, 7) connection point. The basic valve has a Hinge-Disc (2, 12) Assembly connected to a positive hexagonal drive Shaft (7), which extends through the Body (1). The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. Four O-Rings (20, 21) seal the Shaft (7) and the Body (1). A Compression Spring (33) is mounted to the Bracket (26) and the Shaft (7) to provide adjustment and rapid closure. The Disc (12) is supplied with a non-rotating feature to prevent it from “Spinning” and creating excessive wear at the Hinge-Disc (2, 12) connection. The external Spring (33) is enclosed in a Spring Chamber (86) which acts as guard against contact from foreign objects.

31.3 3) ADJUSTMENT:

The size of the Spring (33) is determined by flow rates and the required response of the valve. The limited adjustment of the Spring (33) allows fine tuning of the valve when it is installed. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications. To reduce valve closing time, the Spring (33) can be tightened. To increase the valve closing time, the Spring (33) can be loosened. Make sure that there is preload on the Spring (33) to ensure that the valve is closed when there is no flow.

⚠ WARNING

If the Disc (12) is not fully closed, the Spring (33) may be under compression. Sudden decompression may cause serious injury and/or damage.

31.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair the following procedure is recommended to disassemble the valve and its major components.

(continued)

No special tools are required to replace shaft seals. The following steps are recommended:

1. Remove valve from the line.

2. Loosen Flanged Lock Nut (49) to remove tension from the Spring (33).

3. Remove Pin (36) from the Rod Clevis (57).

4. Remove Socket Head Screw (25) and Retaining Plate (24) from the end of the Shaft (7).

5. Mark the orientation between the Spring Adaptor (22) and the Shaft (7).

6. Remove the Spring Adaptor (22) from the valve.

7. Remove the Plug (8) from the Body (1).

8. Remove the Shaft (7) from the Plug (8) side of the Body (1). The Shaft may be tapped gently to remove it from the Body (1).

9. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

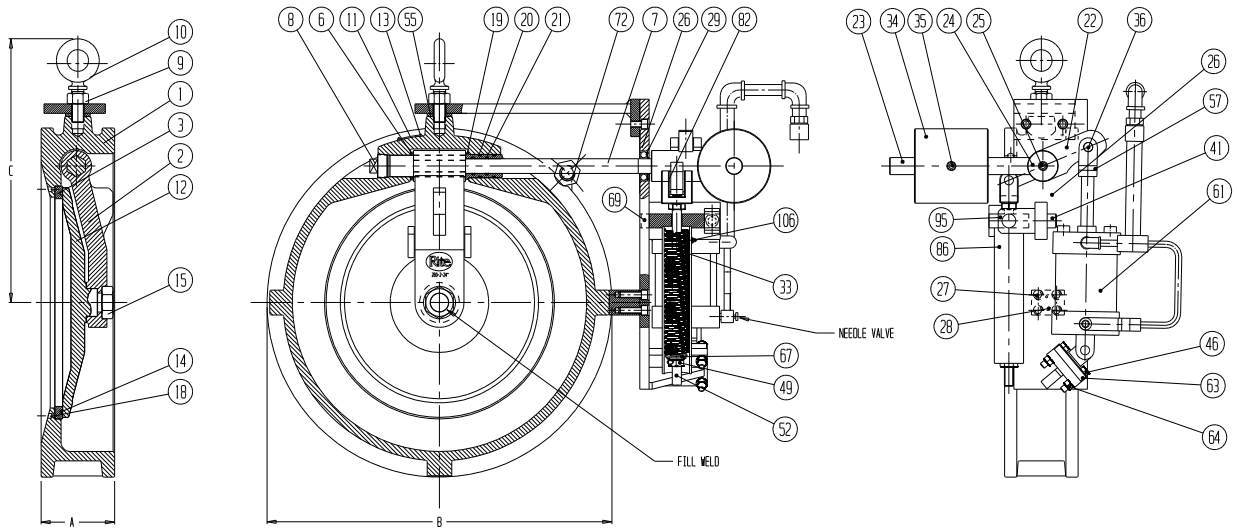
10. Remove the Bushing (19) and Spacer (6) from the Body (1).

11. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

12. The Spring Chamber (86) is provided with a Grease Fitting (106) to allow greasing of the Spring and Shaft. Any compatible grease can be used. All pivot points of the Spring (33) should be lubricated on a regular basis to ensure that no binding occurs between the components.

Assembly is accomplished by reversing the above procedure.

32.0 SA-50 (EXTERNAL COMPRESSION SPRING, WEIGHT & HYDRAULIC DAMPER), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM A216 WCB*
2	Hinge	ASTM A351-CF8M
3	Seat (optional)	ASTM A240-304
6	Spacer	ASTM A479-316
7	Shaft	F316 under 4", and ASTM A564-630 (17-4 PH) above 4"
8	Plug	Steel (or as per body)
9	Lock Nut	Steel Zinc Plated
10	Eye Bolt	Steel Zinc Plated
11	Name Plate	SS316
12	Disc	ASTM A351-CF8
13	Rivet	Steel Cad Plated
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Steel
18	Seat Retaining Screws (optional)	Steel Zinc Plated
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Spring Adaptor	Steel
23	Weight Lever	Steel
24	Retaining Plate	Steel
25	Socket Head Screw	Steel Zinc Plated
26	Bracket	Steel

Item	Description	Material
27	Socket Head Screw	Steel Zinc Plated
28	Dowel Pin	Steel Zinc Plated
29	Ball Bearing	Steel
33	Spring	Steel (ASTM A228)
34	Weight	Steel
35	Socket Head Screw	Steel Zinc Plated
36	Pivot Pin	Steel Zinc Plated
41	Socket Head Screw	Steel Zinc Plated
46	Bolt	Steel Zinc Plated
49	Flanged Lock Nut	Steel Zinc Plated
52	Rod	Steel
57	Rod Clevis	Steel
61	Cylinder Assembly	Aluminium
63	Eye Bracket	Steel
64	Nut	Steel Zinc Plated
67	Guiding Bushing	Steel
69	Needle Bearing	Steel
72	Threaded Bushing	Steel
82	Spacer	Teflon
86	Spring Chamber	Steel
95	Rod Eye	Steel
106	Grease Fitting	Alemite

* Other materials available: A126 CLB, A395, A351-CF8M, Monel, Alloy 20, Hastelloy, 254SMO, Titanium.
All external components can be offered in SS where required.

32.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with an external spring, weight, and a damper is to provide external control, which is field adjustable, in applications such as: multiple pumping installations terminating in common headers, where transient forces are difficult to ascertain and control. The basic principle is to close the valve as soon as the flow starts to decrease with the help of an external spring and weight. This reduces or eliminates water-hammer and associated problems. The hydraulic damper is used to reduce disc oscillations due to variations in the flow, and to stop the disc from being slammed open or closed. This model provides damping for the final few degrees of travel upon opening, and the last few degrees upon closing.

32.2 2) GENERAL DESCRIPTION:

A Model SA-50 is a standard Bray/Rite Single Door Wafer Type Swing Check Valve which has been converted, featuring a positive hexagon drive at the Hinge-Disc-Shaft (2, 12) connection point. The Shaft (7) extends through and is supported in the Body (1) on one side and externally by a Ball bearing (29) mounted in a Bracket (26) on the other side. O-Rings (20, 21) seal the Shaft (7) and the Body (1). The Spring Adaptor (22) is engaged on the Shaft (7), and is connected to the Spring Chamber (86) which is anchored to the Bracket (26). The Spring Adaptor (22) is similarly connected to the Rod Clevis (57) with anchored to the Bracket (26) by the Cylinder Assembly (61). The Weight Lever (23) also engages the Shaft (7) and supports the Weight (34). Note: Lever (23) can be rotated on the Shaft (7) independently of the Spring Adaptor (22), all of which are retained on the Shaft (7) by the Retaining Plate (24) and Socket Head Screw (25). The Disc (12) is supplied with a non-rotating feature to prevent it from “Spinning” and creating excessive wear at the Hinge-Disc (2, 12) connection.

32.3 3) ADJUSTMENT:

The limited adjustment of The Cylinder Assembly (61) is designed to suit most applications. Adjustment by qualified mechanic, allows for design to apply to suit a variety of applications.

a) If a faster closing time is desirable, the Weight (34) can be moved further towards the end of the Lever (23) and the Spring (33) can be tightened.

b) The Cylinder Assembly (61) is set at the factory to give a controlled opening speed and a fast-closing speed. If slower opening is required, control needle valve on the Cylinder Assembly (61) should be closed slowly until the desired speed is obtained.

c) If faster opening is required, control needle valve on the Cylinder Assembly (61) should be opened slowly until the desired speed is obtained.

(continued)

d) To increase the valve closing time, the Spring (33) can be loosened, or the Weight (34) can be moved towards the Shaft (7). Make sure that there is preload on the Spring (33), or the Weight (34) is positioned to ensure that the valve is closed when there is no flow.

⚠ WARNING

If the Disc (12) is not fully closed, the Spring (33) may be under compression. Sudden decompression may cause serious injury and/or damage.

32.4 4) MAINTENANCE REQUIREMENTS:

No special tools are required to replace shaft seals. Should the valve require repair, the following procedure is recommended to disassemble the valve and its major components.

NOTICE

Before beginning, record the position of the Weight (34), Spring Adaptor (22) and the Lever (23) with respect to the Shaft (7).

1. The Cylinder Assembly (61) should be removed first to reduce the chances of damaging any of the components. The Cylinder (61) is filled with hydraulic oil. If possible, it is best to remove this unit while the valve is inline and the reservoir in the vertical position. To remove the Cylinder Assembly (61):

a) Remove the Pivot Pin (36) from the Rod Clevis (57) and the Eye Bracket (63).

b) Support the Cylinder Assembly (61) and remove the Pivot Pins (36) so that Cylinder Assembly (61) is free from the valve assembly.

2. Remove valve from the line.

3. Loosen Socket Head Screw (35) and remove the Weight (34).

4. Remove Socket Head Screw (25) and the Retaining Plate (24) from the end of the Shaft (7).

5. Remove Weight Lever (23).

6. Loosen Flanged Lock Nut (49) to remove tension from the Spring (33).

7. Remove Pivot Pin (36) from the Rod Clevis (57).

8. Remove Socket Head Screw (41) and remove Rod Eye (95).

9. The Spring Chamber (86) can now be removed.

10. Remove the Spring Adaptor (22) from the Shaft (7).

11. Remove the Plug (8) from the Body (1).

(continued)

12. The Shaft (7) may now be removed from the Plug (8) side of the Body (1). The Shaft (7) may be tapped gently to remove it from the Body (1).

13. The Hinge-Disc (2, 12) Assembly may now be removed from the Body (1).

14. Remove the Bushing (19) and Spacer (6) from the Body (1).

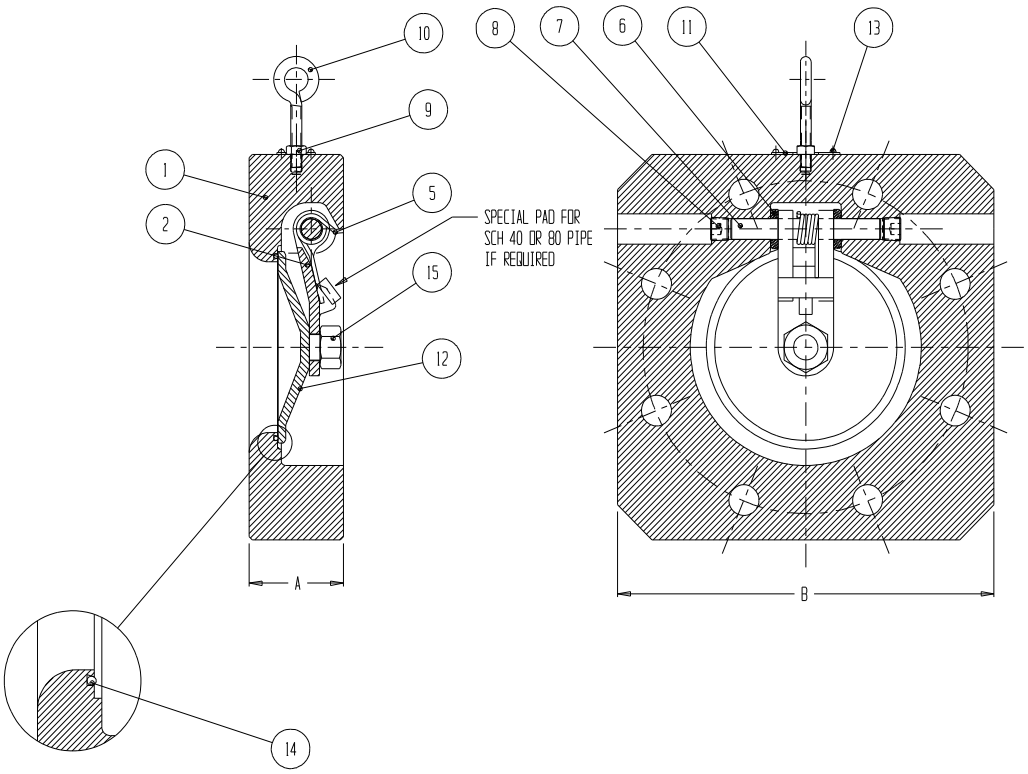
15. Clean parts, replace O-Rings (14, 20, 21) and add compatible grease.

Assembly is accomplished by reversing the above procedure.

When installing the O-Rings (14, 20, 21), lubricate the O-Rings and all contact surfaces with clean oil or grease.

The Spring Chamber is provided with a grease fitting (106) to allow greasing of the Spring (33) and Shaft (7). Any compatible grease can be used. All pivot points of the Spring (33) should be lubricated on a regular basis to ensure that no binding occurs between the components.

33.0 PVC (PLASTIC BODY), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM D1784 (PVC)
2	Hinge	ASTM A351-CF8M
5	Spring	ASTM A313-316, ASTM 302-304, Inconel X-750
6	Spacer	ASTM A479-316
7	Shaft	ASTM A479-316
8	Plug	Stainless Steel

Item	Description	Material
9	Lock Nut	Stainless Steel
10	Eye Bolt	Stainless Steel
11	Name Plate	SS316
12	Disc	ASTM A351-CF8M
13	Rivet	Stainless Steel
14	O-Ring (optional)	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel

* All external components can be offered in SS where required. This model is only available up to 24" in size.

33.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve with a PVC body is for exceptional resistance to salt and chlorine water environments.

33.2 2) GENERAL DESCRIPTION:

The PVC Model is a basic Bray/Rite Single Door Wafer Type Swing Check Valve in plastic body material that features no additional Special Application accessories.

(continued)

Check Rite Wafer type valves consist of a compact Body (1) with a single plate Disc (12) attached to a Hinge (2) which in turn is supported by a Shaft (7) inside an off-center body cavity. The Disc (12) is mechanically biased to the closed position by a Spring (5) located between the two Hinge (2) lugs. The Shaft (7) is retained by two NPT Pipe Plugs (8) inside the Body (1). The O-Ring (14) can be to Buna / EPDM / Teflon / TES / Viton. The standard connection is a welded sub-assembly, by means of a Hinge (2) in which the Disc (12) is attached to the Hinge (2) with a Nut (15) and a weld is used to secure the components.

The Eyebolt (10) located on the top of the Check valve aids easy installation.

Check valves are designed to open when a pressure of less than 1 psi (.07 bar) is applied across the face of the Disc (12).

Check valves are provided for installation between standard flanges. Check valves are normally installed with the Eyebolt (10) pointing vertically upwards in a horizontal run of pipe, with the arrow on the Body (1) pointing in the direction of flow.

Bray/Rite Single Door Wafer Type Swing Check Valves are designed for installation between ANSI class 125/150 lb. weld neck or slip on flanges.

33.3 3) MAINTENANCE REQUIREMENTS:

Should the valve require repair, the following procedure is recommended to dismantle the valve and its major components.

The simple design of the Check valve permits for easy assembly and disassembly. The following assembly procedure applies to all Check valves.

To Dis-assemble the valve:

a) Place the Body (1) in a horizontal position with the Disc (12) assembly showing.

b) Remove the Plugs (8) on either side of the Body (1).

c) Hold the Spring (5) in position and slide the Shaft (7) out of the Body (1).

d) Slowly release the pressure on the Spring (5) and remove it from the valve.

e) The Hinge-Disc (2, 12) Assembly can now be lifted from the Body (1) (and disassembled, if required, on large sizes).

f) Remove the Spacers (6) being careful to note their original orientation.

g) Remove the O-Ring (14) if required.

(continued)

To re-assemble the valve:

a) Clean the Body (1) with a suitable PVC cleaning agent and clean all internal parts with acceptable solvent.

b) Place the Body (1) in a horizontal position with the o-ring face pointing upwards.

c) If O-Ring (14) was removed, insert in seat groove.

d) Place the Hinge-Disc (2, 12) Assembly in the Body (1) cavity.

e) Insert the Shaft (7) through the Plug (8) hole on either side of the Body (1) and slide a Spacer (6) in between the Body (1) and adjacent Hinge (2) lug.

f) Press Spring (5) between the Hinge (2) lugs and Body (1) cavity, then advance the Shaft (7) through the Spring (5) and the second Hinge (2) lug.

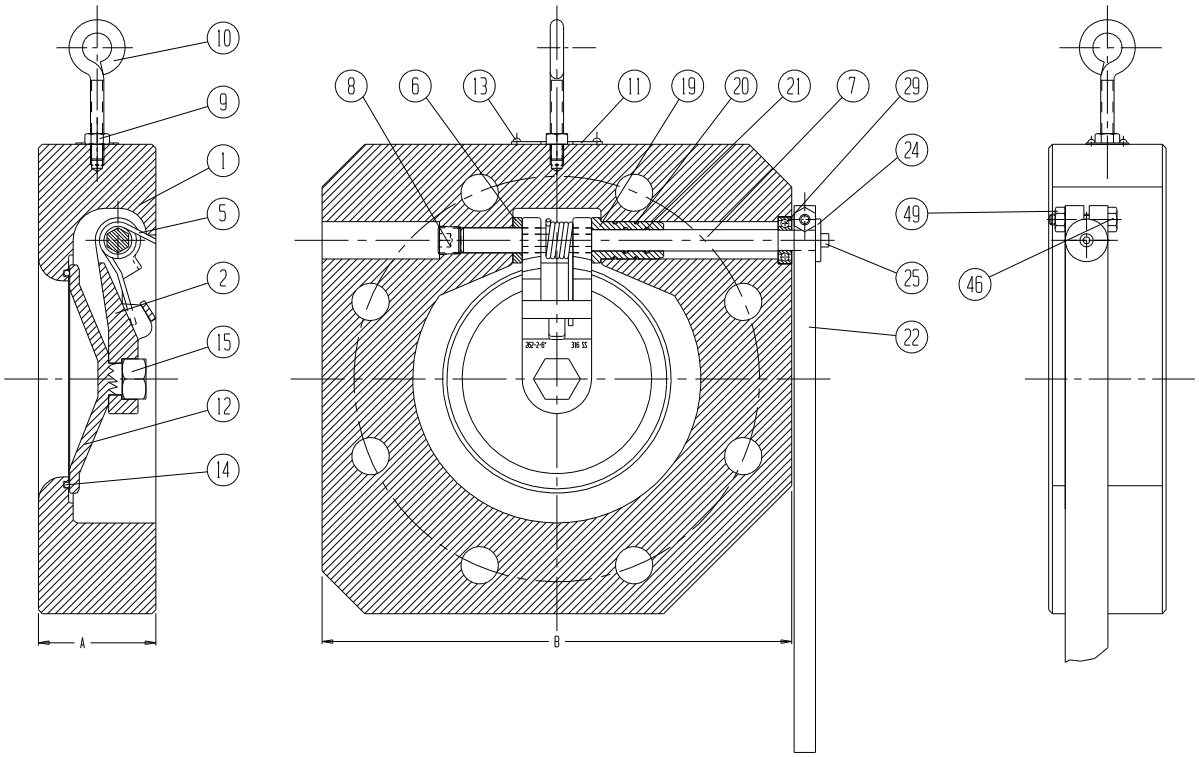
g) Slide the second Spacer (6) between the Body (1) and Hinge (2) lug and advance the Shaft (7) into the Body (1). Position the Shaft (7) central to the valve Body (1) prior to the installation of the retaining Plugs (8).

h) Check that the Spring (5) ends are seated properly.

i) If application necessitates it apply Teflon tape on retaining Plugs (8), install Plugs (8) and tighten both sides with a Hex wrench.

j) Check that the valve opens and closes freely and that adequate freedom of movement of the Hinge/Disc/Shaft (2, 12, 7) connection is provided for the Disc (12) to adapt a self-aligning position with the Body (1).

34.0 PVC (PLASTIC BODY) SA-4A (BACKFLUSH LEVER), SPECIAL APPLICATION MODEL:



Item	Description	Material
1	Body	ASTM D1784 (PVC)
2	Hinge	ASTM A351-CF8M
5	Spring	ASTM A313-316
6	Spacer	ASTM A479-316
7	Shaft	ASTM A479-316
8	Plug	Stainless Steel
9	Eye Bolt	Stainless Steel
10	Nut	Stainless Steel
11	Name Plate	Stainless Steel
12	Disc	ASTM A351-CF8M
13	Rivet	Stainless Steel

Item	Description	Material
14	O-Ring	Buna / EPDM / Teflon / TES / Viton
15	Disc Nut	Stainless Steel
19	Seal Bushing	ASTM A479-316
20	O-Ring	Buna / EPDM / Teflon / TES / Viton
21	O-Ring	Buna / EPDM / Teflon / TES / Viton
22	Lever	Stainless Steel
24	Retaining Plate	Stainless Steel
25	SHCS	Stainless Steel
29	Ball Bearing	Stainless Steel
46	Hex Bolt	Stainless Steel
49	Hex Nut	Stainless Steel

34.1 1) APPLICATION:

The purpose of equipping a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified to allow the user to open the valve manually to backflush a pipeline.

(continued)

34.2 2) GENERAL DESCRIPTION:

The Model SA-4AX is a standard Bray/Rite Single Door Wafer Type Swing Check Valve that has been modified to allow the user to open the valve manually to backflush a pipeline, featuring a positive hexagonal drive at the Hinge/Disc-shaft mounting. The basic valve has a Hinge-Disc assembly (2, 12) connected to a positive hexagonal drive Shaft (7), which extends through the Body (1). The Shaft (7) is supported by the Body (1) at one end, by a Bushing (19) in the body and by a Ball Bearing (29). Four O-Rings (20, 21) seal the Shaft (7) and the body. Ball Bearing (29) is used to support and to reduce friction. The Lever (22) is mounted onto the Shaft (7) with a hexagon connection.

34.3 3) ADJUSTMENT:

No transient adjustment is available.

34.4 4) MAINTENANCE REQUIREMENTS:

Should the valve require repair, the following procedure is recommended to disassemble the valve and its major components:

a) Remove valve from the line.

b) Remove the Socket Head Screw (25) and Retaining Plate (24) and remove the Hex Nut (49) from the Hex Bolt (46) and slide Hex Bolt (46) out through the Lever (22). Mark the orientation between the Lever (22) and the Shaft (7). Remove the Lever (22).

c) Remove the Plug (8) from the Body (1).

d) While holding the Spring (5), remove the Shaft (7) from the Plug (8) side of the Body (1).

e) The Hinge-Disc (2, 12) Assembly can now be lifted from the Body (1).

f) Remove the Bushing (19) and Spacer (6) from the Body (1).

g) Clean all internal parts with applicable solvent, replace O-Rings (14, 20, 21) if necessary and add compatible grease.

h) Insert Bushing (19) into Body (1). Be careful not to damage the O-Rings (14, 20, 21).

i) Slide Shaft (7) carefully into Body (1), through spacer (6), Hinge-Disc (2, 12) Assembly, Spring (5), Bushing (19) and the Bearing (29).

j) Replace and tighten the Plug (8).

k) Mount Lever (22) and Retaining Plate (24) and tighten Socket Head Screw (25) and reinstall Hex Bolt (46) through Lever (22) and into Hex Nut (49).

l) Reinstall the valve between flanges in the pipeline.

(continued)

The valve is inserted between two companion flanges with gaskets on the contact faces. Studs are installed, which will span the valve, and tightened in the same manner as typical flange connection. The check valve stud holes are designed to locate the valve in the same centerline as the companion flanges.

Assembly is accomplished by reversing the above procedure.

NOTICE

1) Check the flow arrow on the Body (1) before inserting the check valve between the flanges.
2) Pipeline flanges must be parallel.
3) Verify that the valve is properly centered with the piping.
4) There must be no obstructions to prevent the Disc (12) operation. Valves are designed for either schedule 40 or 80 piping. Note Schedule 40 valves may not function properly in schedule 80 pipe.
5) Certain Models require Threaded Bushings (72) which are located in areas where the stud location interferes with the external Shaft (7). Studs should be adequately sized, so that no interference is created with the Shaft (7), and the studs should be torqued evenly on both sides.
6) If slip-on flanges are used, make sure that no weld deposits projects into the pipe bore.

Refer to O-Ring instructions provided on page 14 as required.

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