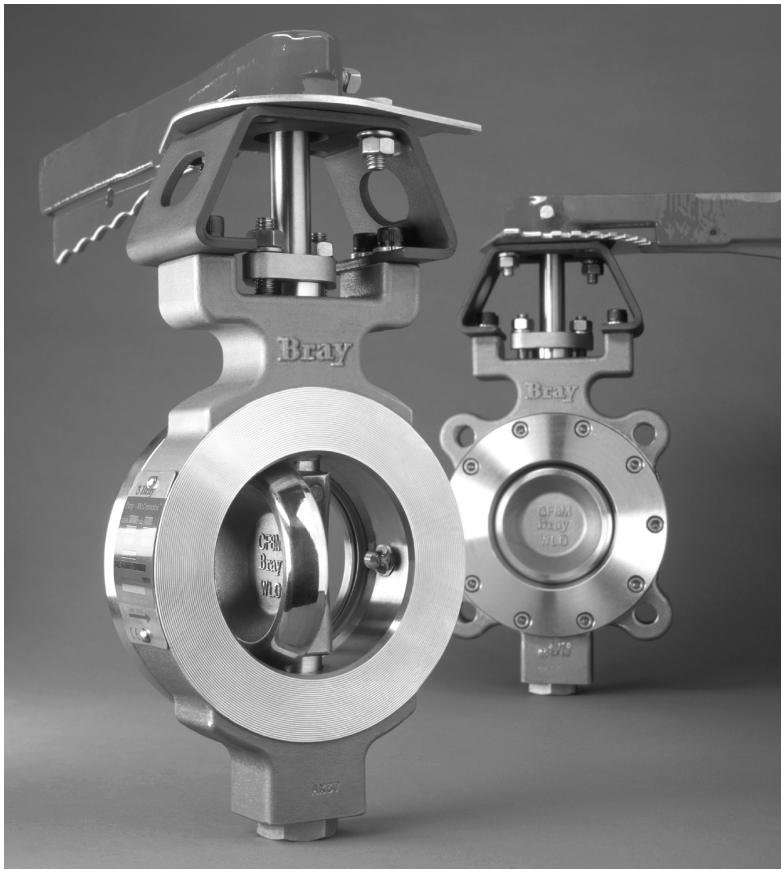
Bray/McCannalok Butterfly Valves

Installation and Maintenance Instructions
ANSI Classes 150 - Sizes 2-1/2" through 60"
ANSI Classes 300 - Sizes 2-1/2" through 48"
ANSI Classes 600 - Sizes 3" through 20"
Bidirectional Fire Safe ANSI Classes 150 and 300 - Sizes 2-1/2" through 24"



The Bray/McCannalok Series 40 high-performance butterfly valve combines the advantages of trunnion-type ball valves with the easy operation, light weight, and low cost of butterfly valves. One basic design is suitable for a wide range of services, including oxygen, chlorine, sour gas, vacuum, and steam applications.

Bubbletight shutoff is provided throughout a wide range of operating conditions.

Suitable for both modulating and on/off services, the Series 40 butterfly valve is easily automated with your choice of manual operators, electric and pneumatic actuators, positioners, and controls.

The Series 40 is available in a Fire Safe model qualified to API 607 4th Edition and BS 6755 part 2.

Additional information about Series 40 butterfly valves – including application data, engineering specifications, and actuator selection is available from your Bray distributor or sales representative.

Installation

Special instructions for Fire Safe valves appear on page 5.

1. The Series 40 valve is designed to be mounted between ANSI flanges. When the valve is open, the disc will extend into the pipe on both sides of the valve – further on the body side than the seat retainer side of the valve. Piping must be large enough to allow the disc to clear the pipe. The charts on page 2 show the minimum pipe ID allowable, and standard pipe IDs. In general, Class 150 valves will clear Schedule 40 pipe, and Class 300 valves will clear Schedule 80 pipe adequately. Class 600 will in general clear Schedule 80 sizes 3, 4, and 6; and Schedule 100 in sizes 8, 10, 12, 14, and 16.

2. If handle or actuator has been removed, do not rotate disc beyond full open or closed position – this could cause damage to sealing surfaces. (NOTE: Series 40 valves are equipped with stops to prevent over closure.) The valve is opened by turning counterclockwise, closed by turning clockwise. The double "D" flats or keyway at the top of the stem is parallel to the disc edge.

3. For maximum service life, install the valve with the seat retainer upstream. Positive shutoff will be obtained with the valve in either position; however, installation with the seat retainer upstream will give longer service life, especially in erosive services.

4. With the disc in closed position, carefully center valve between flanges. Guide holes (wafer pattern valve) or tapped holes (lugged valves) match ANSI Pipe flanges and assist in positive alignment.

5. Use standard torques when bolting valve into the line. The seat is sufficiently compressed by the seat retainer, and additional force from flange bolting is not required.

6. Gaskets should conform to the requirements of API Standard 601, Edition 3 for ASME/ANSI B16.5 class flanges. Spiral wound gaskets, such as Flexitallic CG or CGl series, conforming to ASME/ANSI B16.20 are acceptable.

MINIMUM INSIDE DIAMETER OF PIPE WITH THE RECOMMENDED CLEARANCE

Valve Size	Class 150	Class 300	Class 600
2.5	2.28	2.28	
3	2.86	2.86	2.75
4	3.72	3.72	3.56
5	4.80	4.80	
6	5.88	5.75	5.38
8	7.80	7.56	6.88
10	9.78	9.44	8.50
12	11.74	11.31	10.12
14	12.90	11.38	10.88
16	14.68	14.31	12.62
18			14.40
20			15.86
24	22.50	20.68	
30	28.55	27.06	
32	30.69		
36	34.50	33.63	
40	37.55	36.59	
42	39.55	38.67	
44		38.67	
48	51.09	45.13	
54	52.95		
60	58.25		

NOMINAL INSIDE DIAMETER OF PIPE

Valve Size	Schedule 40	Schedule 80	Schedule 100
2.5	2.469	2.323	
3	3.068	2.900	
4	4.026	3.826	
5	5.047	4.813	
6	6.065	5.761	
8	7.981	7.625	7.439
10	10.020	9.564	9.314
12	11.938	11.376	11.064
14	13.124	12.500	12.126
16	15.000	14.314	13.938
18	16.876	16.126	
20	18.814	17.938	
24	22.626	21.564	

NOTES:

1. Minimum I.D. of pipe with recommended clearances (per API 609) have been calculated by adding the minimum I.D. with zero clearance to a minimum recommended diametric clearance for each pipe size.

2. These charts assume that the pipe is on the body side of the valve and that the pipe is perfectly centered. The seat retainer side of the valve will always have more clearance than the body side.

3. A minimum of 1/16" thick gasket is used between the pipe flange and valve body face.

4. When using a pipe whose I.D. is smaller than the recommended minimum inside diameter of pipe with adequate clearance, a chamfer of 45° should be provided on the end of the pipe so that it clears the disc.

Maintenance

1. Reasonable precautions should be taken before beginning work on the valve. Protective clothing, as required by the specific line fluid, should be worn.
2. Before removing handle or the actuator from the valve, or before removing seat retainer from a valve in dead end service, close the valve and depressurize the line. The eccentric design of the Series 40 may allow line pressure to open the valve if the handle/actuator is not in place while the valve is under pressure.
   DO NOT PRESSURIZE THE LINE WITHOUT A HANDLE OR ACTUATOR ON THE VALVE.
3. The Series 40 valve must be in the closed position to be removed from the line.
4. Begin all work on a valve that has been removed from the line by cleaning the valve, removing any grit or scale. When handling the valve, care should be taken not to scratch the disc edge or seats.
5. Replacement seats, seals and other parts are available from authorized distributors. Contact your distributor or sales representative for details of price and delivery.

Stem Seal Replacement

Refer to drawing on page 4 for parts identification

1. If required, remove handle assembly. Remove socket head cap screws (21) and lock washers (22). Remove mounting bracket (20). For actuated valves, unbolt mounting bracket from body and lift actuator assembly off stem. Note assembly positions before removal.
2. Remove gland retainer nuts (14) and lock washers (13). Remove gland retainer (11) anti-blowout retaining ring or split ring (10) (depending on size), and gland ring (7).
3. Hook out stem seals (8), taking care not to scratch stem or stuffing box bore. Do not remove thrust washer (9), unless further valve disassembly is required.
4. Examine stuffing box bore and stem, clean as necessary to remove any corrosion or foreign matter before installing new seals.
5. Install new seals in stuffing box one at a time, TFE (white) seals first, with the carbon fiber ring at the top. Stagger seal ring joints 180° apart when installing. Tamp each ring to bottom before installing next ring. Note: On the larger valves it will be necessary to compress each seal before adding the next.
6. Slide gland ring (7) over stem on top of seals (8). Install anti-blowout retaining ring or split ring (10) (depending on valve size). Slide gland retainer (11) over stem and onto gland studs (12). Place lockwashers (13) and hex nuts (14) on studs (12) and tighten finger tight. Tighten gland nuts (14) evenly and alternately to the proper torque value given in Table 2.
7. Remount actuator, or mounting bracket (20) with lock washers (22) and cap screws (21) and handle (27). Tighten handle set screw (28) to secure the handle to the valve stem.
8. Operate valve open and closed several times, to check for binding and to set the stem seals. Loosen gland nuts (14) and retighten to torque value given in Table 2.

TABLE 1

TOTAL NUMBER OF STEM SEALS

Valve Size	Class 150	Material CF / TFE	Class 300	Material CF / TFE	Class 600	Material CF / TFE
2.5	4	1 / 3	4	1 / 3		
3	4	1 / 3	4	1 / 3	12	2 / 10
4	4	1 / 3	4	1 / 3	12	2 / 10
5	4	1 / 3	4	1 / 3		
6	4	1 / 3	4	1 / 3	16	2 / 14
8	5	1 / 4	5	1 / 4	16	2 / 14
10	5	1 / 4	5	1 / 4	18	0 / 18
12	5	1 / 4	5	1 / 4	18	0 / 18
14	6	0 / 6	6	0 / 6	18	0 / 18
16	6	0 / 6	9	0 / 9	16	0 / 16
18					16	0 / 16
20					16	0 / 16
24	10	0 / 10	8	0 / 8		
30	8	0 / 8	9	0 / 9		
32	8	0 / 8				
36	8	0 / 8	9	0 / 9		
40	9	0 / 9	9	0 / 9		
42	9	0 / 9	9	0 / 9		
44			9	0 / 9		
48	9	0 / 9	9	0 / 9		
54	9	0 / 9				
60	9	0 / 9				

CF=Carbon Fiber

Seat Replacement

1. With the disc in the closed position, remove the valve from the line.
2. Lay the valve down with the disc in the closed position and the seat retainer side facing up.
3. Remove the socket head cap screws (17), the seat retainer (16), and seat (15).
4. Carefully clean the seat area in the body and seat retainer. Remove foreign matter, dirt, etc. Check disc seating area for nicks or scratches.
5. Place the new seat (15) on disc (2), carefully centering it in the recess in the body.
6. Align the holes in the seat retainer (16) with matching holes in body and carefully place in position on top of seat (15). Be careful not to shift retainer to align holes so that seat is not shifted from correct position. Lightly grease cap screw (17) threads and tighten down evenly, alternating from top to bottom and side to side. Tighten to the torque value in Table 2.
7. Operate valve several times and examine seat for any damage before reinstalling the valve in the line.

TABLE 2

GLAND RETAINER NUT AND SEAT RETAINER SCREW TORQUE

Valve Size	Gland Nut			Seat Retainer Screws		
	150	300	600	150	300	600
2.5	60	60		100	100	
3	60	60	80	100	100	100
4	60	60	100	175	175	175
5	80	100		100	175	
6	80	120	140	100	175	300
8	80	140	200	175	175	300
10	110	190	200	175	300	300
12	130	220	200	300	300	300
14	130	200	240	300	300	500
16	150	220	240	300	300	750
18			400			1500
20			480			1500
24	190	240		500	500	
30	210	310		500	750	
32	210			750		
36	240	360		500	1500	
40	280	420		500	1500	
42	280	420		500	1500	
44		420			1500	
48	300	600		750	1500	
54	360				1500	
60	500				1500	

Disc and Stem Replacement

Refer to drawing on page 4 for parts identification. NOTE: Stem and disc are supplied as a matched set with taper pins and are to be replaced as a set.

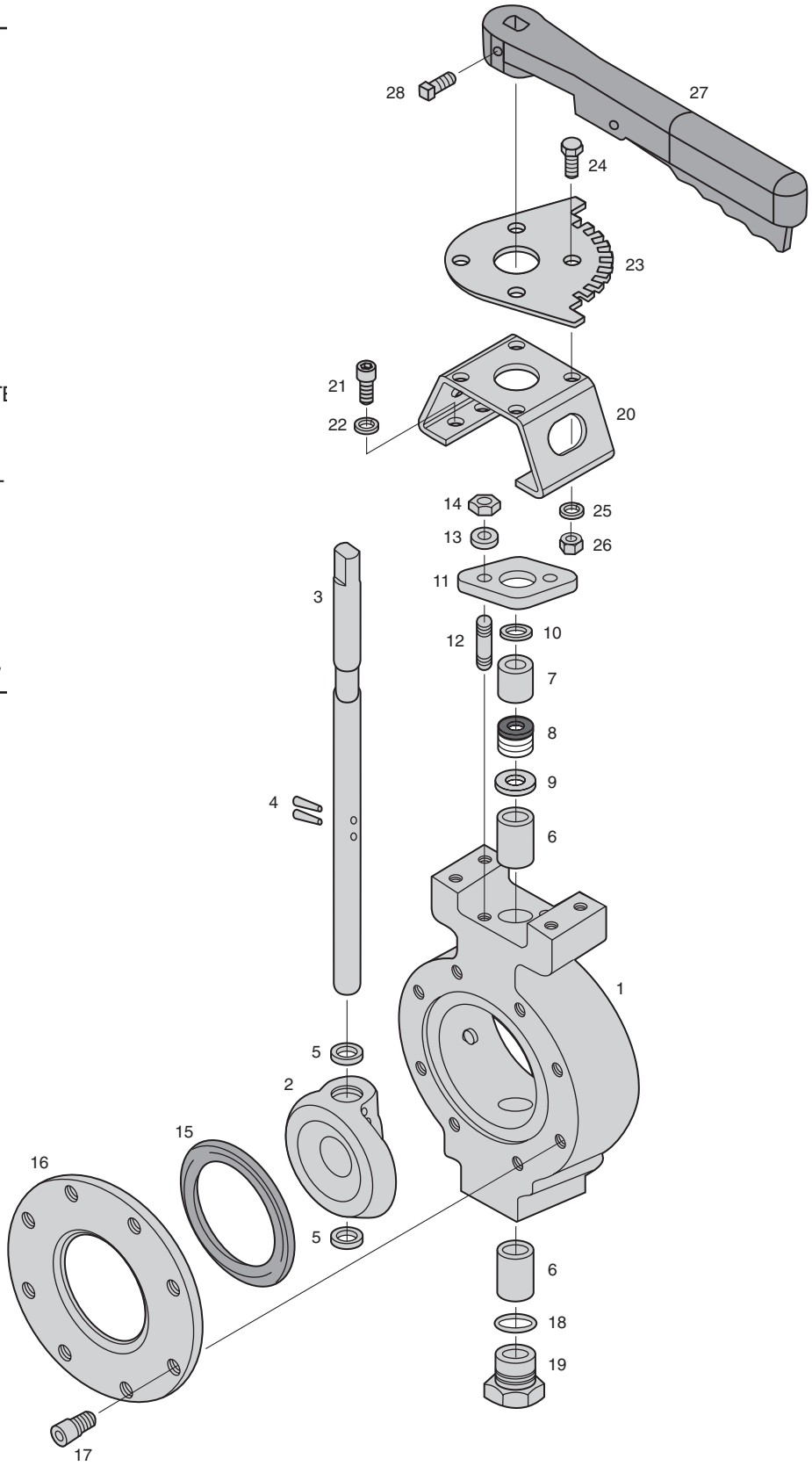
1. For handle-operated valves, loosen set screw (28) and remove handle assembly (27). Remove socket head cap screws (21) and lock washers (22). Remove mounting bracket (20). For actuated valves, unbolt mounting bracket from body and lift actuator assembly off stem. Note assembly positions before removal.
2. Remove gland retainer nuts (14) and lock washers (13). Remove gland retainer (11), anti-blowout retaining ring or split ring (10) (depending on valve size), and gland ring (7).
3. Hook out stem seals (8) taking care not to scratch stem or stuffing box bore.
4. Remove locating plug (19) and gasket (18).
5. Remove cap screws (17), seat retainer (16), and seat (15).
6. Turn disc to the full open position and drill out tack welds on large end of taper pins (4). Take care to support valve so that disc surfaces are not scratched. Drill sizes to remove tack welds as given in Table 3.
7. Place valve in flat position, with flat face of disc up. Support disc and body on wooden blocks to protect disc and body surfaces. Disc will rest in partially open position.
8. Knock out taper pins (4) using a rod or punch on small end of pin (opposite tack weld). It may be necessary to lift body and rotate disc slightly to do this. Make sure disc is resting on wood block since it will swing freely on stem with pins removed. When pins (4) are out, lay body down so disc and body are evenly supported on flat surface.
9. Using a brass bar or drift punch, knock stem (3) loose and pull from body. After long or severe service this may take considerable force. Be careful not to damage bearings, spacers or body.
   NOTE: Disc spacers (5) are used at top and bottom of disc to properly position disc in body. Proper spacers were selected at initial assembly and rarely require replacement. The location of these spacers should be noted, and the spacers marked at disassembly so that they are reinstalled in the same positions, top and bottom.
10. Separate body from disc, and remove thrust washer (9) from packing bore.
11. Examine stem bearings (6) for excessive wear. If removed from body, note position and mark to reinstall in same location. Replacement is rarely needed, however, if bearing liner is worn through to the shell, or severe damage is evident they should be replaced.
12. Clean body thoroughly to remove all dirt, foreign matter, rust, etc.
13. Place the body (1) flat, seat retainer side up, and support it on wooden blocks sufficiently above the work surface as to facilitate insertion of the disc (2) in open position. Lower the disc into position, aligning the bores in body and disc.
14. Insert new stem (3) in body (1) with large end of the taper pin holes toward the top. Assemble disc spacers (5) as stem (3) is inserted, making sure that spacers are returned to original locations as marked.
15. Align taper pin holes in disc and stem, and install taper pins (4). Drive pins in tightly with rod or punch, and tack weld each pin (4) to disc (2) at large end of pin.
16. Install new gasket (18) on locating plug (19) and install plug in body.
17. Install new stem seals, following instructions in “Stem Seal Replacement” section.
18. Install new seat, following instructions in “Seat Replacement” section.
19. Remount handle assembly or actuator, and operate valve several times to verify proper operation. Examine disc and seat for any damage before reinstalling in line.

TABLE 3

DRILL SIZE TO REMOVE TACK WELD (In.)

Valve Size	Class					
	150		300		600	
2.5	.234	15/64	.234	15/64		
3	.234	15/64	.234	15/64	.250	1/4
4	.234	15/64	.234	15/64	.289	9/32
6	.234	15/64	.234	15/64	.341	1-1/32
8	.234	15/64	.234	15/64	.591	19/32
10	.234	15/64	.234	15/64	.706	45/64
12	.234	15/64	.234	15/64	.706	45/64
14	.591	19/32	.234	15/64	.706	45/64
16	.706	45/64	.706	45/64	1.032	1-1/32
18					1.032	1-1/32
20					1.241	1-1/4
24	.706	45/64	1.032	1-1/32		
30	1.033	1-1/32	1.241	1-1/4		
32	1.033	1-1/32				
36	1.033	1-1/32	1.241	1-1/4		
40	1.241	1-1/4	1.521	1-17/32		
42	1.241	1-1/4	1.521	1-17/32		
44			1.521	1-17/32		
48	1.241	1-1/4	1.521	1-17/32		
54	1.521	1-17/32				
60	1.521	1-17/32				

No.	DESCRIPTION
1.	BODY
2.	DISC
3.	STEM
4.	TAPER PIN
5.	DISC SPACER
6.	BEARING ASS'Y
7.	GLAND RING
8.	STEM SEAL
9.	THRUST WASHER
10.	RETAINING RING
11.	GLAND RETAINER
12.	STUD
13.	LOCK WASHER
14.	HEX NUT
15.	SEAT ASSEMBLY
16.	SEAT RETAINER PLATE
17.	CAP SCREW
18.	O-RING GASKET
19.	LOCATING PLUG
20.	MOUNTING BRACKET
21.	CAP SCREW
22.	LOCK WASHER
23.	NOTCH PLATE
24.	BOLT
25.	LOCK WASHER
26.	HEX NUT
27.	HANDLE ASSEMBLY
28.	HANDLE SET SCREW



Special Instructions Fire Safe Butterfly Valve

Installation

1. The Fire Safe Series 40 valve will provide fire-safe shutoff with flow in either direction, meeting API 607 and British Standard 6755 part 2 criteria, as well as bubble-tight shutoff in either direction in normal service. However, installation with the seat retainer upstream provides maximum protection to the soft seat, and will increase seat life, especially in erosive services.
2. Installation bolting information and dimensional data given for the standard McCannalok valves is also applicable to the Fire Safe versions.

Stem Seal Replacement

The procedure for replacement on page 2 also applies to Fire Safe valves, with the following exceptions:

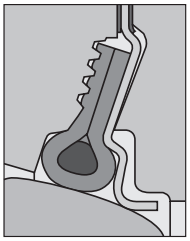
1. Graphite stem seals are used in the Fire Safe valves. The arrangement of the two types of stem seals when installed is: bottom seal carbon fiber braided ring; center seals – graphite rings; top seal carbon fiber braided ring.
2. Table 4 shows stem seal quantities for class 150 and 300 valves.

TABLE 4

	TOTAL NUMBER OF STEM SEALS					GLAND NUT TORQUE	
Valve Size	**Class 150**	**Material CF / G**	**Class 300**	**Material CF / G**	**Class 600**	**Class 150**	**Class 300**
2.5	4	2 / 2	4	2 / 2	NO FIRE SAFE VERSION	35	45
3	4	2 / 2	4	2 / 2		35	45
4	4	2 / 2	4	2 / 2		35	45
5	4	2 / 2	4	2 / 2		45	65
6	4	2 / 2	4	2 / 2		45	65
8	5	2 / 3	5	2 / 3		45	80
10	5	2 / 3	5	2 / 3		65	100
12	5	2 / 3	5	2 / 3		65	100
14	6	2 / 4	8	2 / 6		80	125
16	6	2 / 4	9	2 / 7		100	150
18	9	2 / 7	9	2 / 7		100	150
20	9	2 / 7	9	2 / 7		100	150
24	10	2 / 8	8	2 / 6		150	200

CF = Carbon Fiber
G = Formed Graphite

Seat Replacement



1. With the disc in the closed position, remove the valve from the line.
2. Lay the valve down with the disc in the closed position and the seat retainer side facing up.
3. Remove socket head cap screws, seat retainer, metal fire seat, gaskets, and soft seat.
4. Carefully remove graphite gaskets from metal seat. Do not bend or crimp metal seat. All traces of the old gaskets must be removed.
5. Clean seat retainer and body surfaces to remove any adhering gasket material, corrosion, or other foreign material. Examine disc seating surfaces for damage, and examine seating surface of metal seat for wear or damage. Replace if damaged.
6. Place new seat on disc, carefully centering in body recess.
7. Place new graphite gasket on the body. Position metal seat over the disc, lip facing out, on top of the polymer seat. Place another graphite gasket on top of the metal seat. Graphite gaskets can be first attached to the metal seat to simplify the assembly. Spray a suitable adhesive, like 3M Super 77 general purpose adhesive or similar, in 3 or 4 spots on both sides of the metal seat to hold the gaskets in position. Handle the gaskets carefully as they are very thin and are easily torn or scratched.
8. Align holes in seat retainer with holes in body and seat, and carefully place seat retainer in position, on top of seat. Be careful that seats do not shift when retainer is installed. Lightly grease cap screw threads and tighten down evenly in a criss-cross pattern to assure proper centering and uniform compression. Torque cap screws to the values given in Table 2 on page 3.
9. Lubricate the disc edge with molybdenum disulfide spray or similar lubricant, if available. As a minimum, lubricate the disc edge with light machine oil or light grease. Operate valve several times and examine seat for damage before reinstalling in line.

Stem and Disc Replacement

The same procedures apply to Fire Safe valves as to the standard valves, with the addition of the special requirements for stem seal and seat replacement.

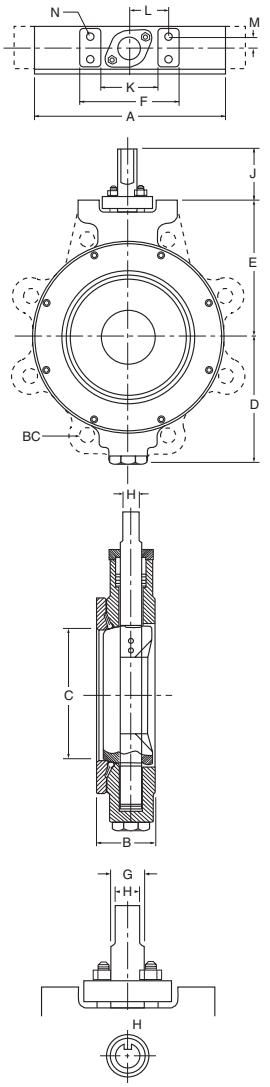
Field Adjustments – All Valves

Stem Seal Leakage – Should leakage occur at the stem seals, it may be stopped by retightening the gland retainer nuts to the values specified in Tables 2 or 4. Do not overtighten gland nuts, as this may cause increased operating torque, and improper valve operation or closure. If the leakage cannot be stopped by this action, the stem seals require replacement.

Adjusting Valve Closure – Valves with gear actuators or electric/pneumatic actuators may require adjustment of the travel stops in the actuator to properly close valve for tight shut-off. The following procedure should be followed to set travel or limit stops. (It is recommended that the valve must be removed from line for this procedure and actuator mounting.)

1. Using a straight-edge and vernier or depth caliper, measure the distances from the face of the seat retainer to the disc (valve closed) face at the 3 o'clock and 9 o'clock positions (stem is at 12 o'clock position). The measurements must agree within 1/16" (0.062").
2. If they do not agree, disc must be rotated in the direction of the larger dimension. If the 3 o'clock dimension is larger, the disc is not fully closed, and must be rotated in the "close" direction more. If 9 o'clock dimension is larger, disc is over-closed, and must be opened slightly.
3. The valve disc is at the full open position when the disc is perpendicular to the body. Set the "open" actuator stop for this position. Do not allow the valve to over-open as this may damage the disc seating surfaces by hitting body or attached piping.
4. On gear operators, loosen and adjust the closing stop screw to permit proper disc positioning. Adjust and lock down when disc closure is within measured tolerance in paragraph 1. Open and close valve; recheck measurements before reinstalling in line.
5. For other power actuators, consult the manufacturer's instructions for setting travel stops, as these vary with actuator model and type.
6. If removing the valve from the line is not practical, as a crude remedy the disc can be placed into a position in the seat at which the leakage stops and travel stops are adjusted to this position.

Series 40 Butterfly Valves
Basic Dimensions - inches (mm)



ANSI 150 Series 40 — Series 41 **WEIGHTS**

Valve Size ins	Valve Size mm	A	B	C	D	E	F	G	H*	J	K	L	M	N	Lug Bolting Data BC	No. Holes	Threads UNC-2B	Series 40	Series 41
2 1/2	65	4.75	1.88	2.28	3.81	4.29	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	5.50	4	5/8-11	14	19
3	80	5.25	1.88	2.86	4.09	4.54	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	6.00	4	5/8-11	16	20
4	100	6.75	2.03	3.72	4.71	5.41	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	7.50	4	5/8-11	21	29
5	125	7.50	2.23	4.80	5.07	5.12	4.32	.75	.51	3.63	2.63	1.75	.50	3/8-16	8.50	8	3/4-10	26	42
6	150	8.62	2.23	5.88	5.57	5.62	4.32	.75	.51	3.63	2.63	1.75	.50	3/8-16	9.50	8	3/4-10	33	47
8	200	10.75	2.40	7.80	6.94	7.12	4.29	.87	.63	3.63	2.63	1.75	.50	3/8-16	11.75	8	3/4-10	46	70
10	250	13.06	2.75	9.78	8.56	8.47	5.50	1.18	.87	4.28	3.50	2.19	.56	3/8-16	14.25	12	7/8-9	80	110
12	300	15.50	3.08	11.74	10.18	9.97	5.50	1.18	.87	4.28	3.50	2.19	.56	1/2-13	17.00	12	7/8-9	123	167
14	350	17.50	3.73	12.90	11.95	14.00	7.75	1.38	.39x.39	2.50	5.00	3.13	.69	5/8-11	18.75	12	1-8	206	268
16	400	19.81	4.11	14.68	12.94	16.75	10.38	1.97	.47x.39	3.50	7.12	4.38	1.00	3/4-10	21.25	16	1-8	315	400
18	450	21.41	4.61	16.60	14.15	19.00	10.38	1.97	.47x.39	3.50	7.12	4.38	1.00	3/4-10	22.75	16	1 1/8-8	412	509
20	500	23.68	5.03	18.50	15.26	21.75	10.38	2.50	.62x.62	5.00	7.12	4.38	1.00	3/4-10	25.00	20	1 1/8-8	534	649
24	600	28.00	6.00	22.50	18.21	24.25	15.38	3.00	.75x.75	4.75	11.25	6.63	1.50	1-8	29.50	20	1 1/4-8	820	1010
30	750	34.50	7.50	29.25	21.12	27.88	19.50	3.50	.88x.62	6.12	13.50	8.25	1.75	1 1/2-6	36.00	28	1 1/4-8	1473	1825
32	800	36.41	7.50	30.50	22.12	29.13	19.50	3.50	.88x.62	6.12	13.50	8.25	1.75	1 1/2-6	38.50	28	1 1/2-8	1643	2053
36	900	40.68	8.25	35.00	24.90	32.12	19.50	3.50	.88x.62	6.12	13.50	8.25	1.75	1 1/2-6	42.75	32	1 1/2-8	1953	2593
40	1000	45.75	9.50	38.00	34.50	36.12	19.50	4.50	1.00x.75	6.12	13.50	8.25	1.75	1 1/2-6	47.25	36	1 1/2-8	3843	3943
42	1050	48.00	9.50	39.12	29.00	37.12	19.50	4.50	1.00x.75	6.12	13.50	8.25	1.75	1 1/2-6	49.50	36	1 1/2-8	4243	4333
48	1200	54.00	10.00	47.00	32.75	41.00	24.00	5.00	1.25x.88	7.12	17.00	10.25	3.00	1 1/2-6	56.00	44	1 1/2-8	4603	5675
54	1350	61.00	11.50	53.25	35.65	44.38	24.00	6.00	1.50x1.00	7.62	17.00	10.25	3.00	1 1/2-6	62.75	44	1 3/4-8	7093	7205
60	1500	64.69	12.50	59.56	39.44	49.50	26.00	7.00	1.75x1.50	8.75	19.00	11.25	3.00	1 1/2-6	69.25	52	1 3/4-8	7420	7811

ANSI 300 Series 42 — Series 43 **WEIGHTS**

Valve Size ins	Valve Size mm	A	B	C	D	E	F	G	H*	J	K	L	M	N	Lug Bolting Data BC	No. Holes	Threads UNC-2B	Series 42	Series 43
2 1/2	65	4.75	1.88	2.28	3.81	4.29	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	5.88	8	3/4-10	14	19
3	80	5.25	1.88	2.86	4.09	4.54	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	6.62	8	3/4-10	16	20
4	100	6.75	2.03	3.72	4.71	5.41	3.81	.63	.43	3.34	2.44	1.56	.38	5/16-18	7.88	8	3/4-10	21	29
5	125	8.25	2.23	4.80	5.13	5.62	4.32	.75	.51	3.63	2.50	1.75	.50	3/8-16	9.25	8	3/4-10	33	49
6	150	8.88	2.42	5.75	6.25	6.37	4.25	.87	.63	3.63	2.50	1.75	.50	3/8-16	10.62	12	3/4-10	40	62
8	200	10.94	2.82	7.56	7.55	7.72	5.50	1.18	.87	4.28	3.25	2.19	.56	3/8-16	13.00	12	7/8-9	69	107
10	250	13.26	3.28	9.44	9.36	9.10	5.50	1.38	.39x.39	4.28	3.38	2.19	.56	1/2-13	15.25	16	1-8	114	165
12	300	15.57	3.62	11.31	10.89	13.00	7.75	1.38	.39x.39	2.50	5.00	3.13	.69	5/8-11	17.75	16	1 1/8-8	181	250
14	350	17.90	4.66	11.38	12.50	17.25	10.38	1.97	.47x.39	3.50	7.12	4.38	1.00	3/4-10	20.25	20	1 1/8-8	331	459
16	400	19.94	5.35	14.31	13.88	20.00	10.38	2.50	.62x.62	5.00	7.12	4.38	1.00	3/4-10	22.50	20	1 1/4-8	457	641
18	450	22.00	5.98	15.00	15.43	20.25	15.38	2.50	.62x.62	4.75	11.25	6.63	1.50	1-8	24.75	24	1 1/4-8	605	869
20	500	24.10	6.34	16.50	16.80	21.50	15.38	3.00	.75x.75	4.75	11.25	6.63	1.50	1-8	27.00	24	1 1/4-8	780	1065
24	600	28.88	7.05	20.68	19.80	25.37	19.50	3.50	.88x.62	6.13	13.50	8.25	1.75	1 1/2-6	32.00	24	1 1/2-8	1270	1760
30	750	35.12	9.00	28.00	23.03	31.12	24.00	4.50	1.00x.75	6.38	17.00	10.25	3.00	1 1/2-6	39.25	28	1 3/4-8	1307	3183
36	900	42.00	10.68	34.50	26.75	35.12	24.00	5.00	1.25x.88	7.12	17.00	10.25	3.00	1 1/2-6	46.00	32	2"-8	3450	4600
40	1000	43.88	11.50	38.00	28.25	38.25	26.00	6.00	1.50x1.00	7.75	19.00	11.25	3.00	1 1/2-6	45.50	32	1 5/8-8	3875	4840
42	1050	45.88	11.50	40.31	29.25	39.25	26.00	6.00	1.50x1.00	7.75	19.00	11.25	3.00	1 1/2-6	47.50	32	1 5/8-8	4100	5120
44	1100	48.00	12.00	40.00	29.25	39.25	26.00	6.00	1.50x1.00	7.75	19.00	11.25	3.00	1 1/2-6	49.75	32	1 3/4-8	4900	767
48	1200	52.12	12.50	47.00	33.25	43.50	29.00	7.00	1.75x1.50	8.75	22.00	12.75	3.50	1 1/2-6	54.00	32	1 7/8-8	6750	7087

ANSI 600 Series 44 — Series 45 **WEIGHTS**

Valve Size ins	Valve Size mm	A	B	C	D	E	F	G	H*	J	K	L	M	N	Lug Bolting Data BC	No. Holes	Threads UNC-2B	Series 44	Series 45
3†	80	5.78	2.22	2.75	5.71	4.62	4.66	.75	.51	3.63	2.63	1.75	.50	3/8-16	6.62	8	3/4-10	24	31
4†	100	7.00	2.77	3.56	7.04	6.12	4.25	.87	.63	3.63	2.63	1.75	.50	3/8-16	8.50	8	7/8-9	41	58
6†	150	9.75	3.34	5.38	8.57	7.47	5.50	1.18	.87	4.28	3.25	2.19	.56	1/2-13	11.50	12	1-8	79	119
8†	200	11.80	4.23	6.88	10.80	11.75	7.75	1.38	.39x.39	2.50	5.00	3.13	.69	5/8-11	13.75	12	1 1/8-8	155	227
10†	250	14.09	4.82	8.50	14.62	16.00	10.38	1.97	.47x.39	3.50	7.12	4.38	1.00	3/4-10	17.00	16	1 1/4-8	280	400
12†	300	16.47	5.51	10.12	15.72	17.25	10.38	1.97	.47x.39	3.50	7.12	4.38	1.00	3/4-10	19.25	20	1 1/4-8	386	547
14†	350	18.03	6.09	10.88	17.48	19.00	15.38	2.50	.62x.62	4.75	11.25	6.63	1.50	1-8	20.75	20	1 3/8-8	549	750
16†	400	20.38	7.00	12.62	19.41	21.00	15.38	3.00	.75x.75	4.75	11.25	6.63	1.50	1-8	23.75	20	1 1/2-8	752	1100
18†	450	23.18	7.75	16.50	21.56	22.88	19.50	3.50	.88x.62	6.12	13.50	8.25	1.75	1 1/2-6	25.75	20	1 5/8-8	1100	1470
20†	500	25.18	8.50	18.25	23.21	24.88	19.50	4.00	1.00x.75	6.12	13.50	8.25	1.75	1 1/2-6	28.50	24	1 5/8-8	1550	1827

Dimensions are in inches and weights in lbs.

†**Note:** For mounting of actuators and manual gear operators, dimensions are for reference only. Consult factory for exact dimensions. Bray reserves the right to change product dimensions without notice.

*Keyway is applicable on valve sizes 14"-42" Class 150, 10"-36" Class 300, and 8"-14" Class 600.

NOTICE:
Series 40 Butterfly Valves are designed and manufactured using good workmanship and materials, and they meet all applicable industry standards.

Bray Controls, is anxious to avoid injuries and property damage which would result from misapplication of the product. Proper valve selection is imperative. Examples of the misapplication or misuse of a valve include but are not limited to use in a service in which the pressure/temperature rating is exceeded or in a chemical service incompatible with the valve materials; use of undersized valve actuators; use of extremely fast valve actuation and/or continuous valve cycling on standard valves; making modifications of the product of any kind; failure to use caution in operating valves in high temperature, high pressure, or highly hazardous services; and the failure to maintain valves as recommended.

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