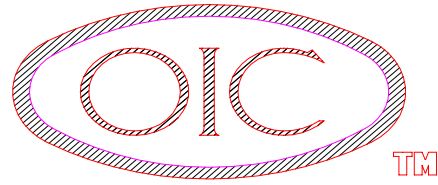


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NEWCO VALVES

Newmans Inc., Newmans Valve Ltd.



NEWCO/OIC Cast Valve Operation & Maintenance Manual



TABLE OF CONTENTS

1. Introduction and Safety Information	1
1.1. Introduction	1
1.2. Safety Information	1
2. Storage, preparation and Installation	2
2.1. Storage.	2
2.2. Preparation.	2
2.3. Installation.....	3
3. Maintenance and Repair.....	4
3.1. Inspection and Maintenance.....	4
3.2. Trouble-shooting.....	5
3.3. Stem Packing Replacement.....	6
4. Newco Cast Steel Valves	8
4.1. Bolted Bonnet Gate and Globe Valves	8
4.2. Bolted Cap Swing-Type Check Valves.....	10
4.3. Bolted Body Tilting Disc Check Valves	12
4.4. Pressure Seal Gate and Globe Valves	14
4.5. Pressure Seal Swing-Type and Tilting Disc Check Valves.....	16
5. About Newco Valves.....	18
5.1. Identifying Newco Figure Numbers.....	18
5.2. Ordering Parts	19
Appendix A	20
Table A -- Torque Values for Bonnet Bolting	20



1. INTRODUCTION AND SAFETY INFORMATION

1.1. Introduction

This manual has been prepared to serve as a guide to insure continuous satisfactory service and assist in restoring a valve to proper working condition.

It covers 'NEWCO' Class 150 through 2500, bolted bonnet, pressure seal, outside screw and yoke, flanged/buttweld ends, carbon steel, stainless steel and alloy steel valves. The installation, storage, operation, disassembly / reassembly inspection and repair, service problems, maintenance and preventive maintenance covering these valves are also included in this manual.

Prior to performing any work on these valves, it would be useful to have a general understanding of their construction. Chapter 4 shows the valve's basic construction.

1.2. Safety Information

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered herein.

- a. **To avoid injury, never attempt disassembly while there are pressures either upstream or downstream. Even when replacing packing rings, caution is necessary to avoid possible injury.**
- b. **Do not attempt to disassemble a valve while there is pressure in the line. Make sure both upstream and downstream pressures are removed. Disassemble with caution in the event all pressures have not been relieved.**
- c. **Prior to replacing packing rings, remove all pressure from the valve. The packing can also be replaced while there is pressure BUT the valve must be tightly backseated. This will not insure complete safety and it is not recommended. If the backseat faces have been damaged by foreign material the backseat may leak into the packing chamber.**
- d. **To prevent valve distortion, inefficient operation, or early maintenance problems, support piping on each side of the valve.**



2. STORAGE, PREPARATION AND INSTALLATION

2.1. Storage.

2.1.1. Temporary Storage.

If valves are to be stored before installation, the following should be observed:

- a. Keep the valves wrapped and protected as shipped from the manufacturer.
- b. Do not remove the protective end covering until the valve is ready for installation. This will reduce the possibility of foreign material damaging internal valve components.
- c. Valves stored outdoors should be positioned such that water does not accumulate in the valve body.

2.1.2. Long Term Storage.

If the valves are to be stored more than of one year, they should be prepared in the following manner:

- a. Remove the packing and apply a preservative to the packing chamber.
- b. Do not remove the protective end covering.
- c. Valve which will remain in storage for an excessive period of time should have a preservative applied to the external surface.
- d. Do not store the valves outdoors.

2.2. Preparation.

- a. Remove the valve end protection.
- b. Prior to shipment from the manufacturer, a preservative may have been applied to the inner body of the valve. This preservative may be removed with a solvent.
- c. The inside of the valve should be inspected and blown out with compressed air. Adjacent piping must be clean and free from debris to prevent damage to the valve.
- d. **To prevent valve distortion, inefficient operation or early maintenance problems, support piping on each side of the valve.**
- e. Make sure the valve is positioned such that there is sufficient space so that the hand wheel is easily and safely reached and there is enough clearance for the stem when the valve is open.
- f. Install the valve according to the flow indicator on the valve body. Note gate valves can be installed in any position without regard for the direction of the flow, unless marked in the flow direction.
- g. **Gate valves and globe valves are not designed for throttling and should be kept in the fully open or closed position. Should the valve be used in a partially open or closed position, the bottom of the wedge and the seat may become eroded in a very short time. This may also cause a chatter noise in the line.**



2.3. Installation

2.3.1. Flanged Valves.

Bolting and gasket material should be compatible with the valve's body material and pressure. Care should be taken that flanges are straight and parallel. Bolts should be evenly tightened in a star pattern. This will ensure a uniform gasket loading.

2.3.2. Buttweld End Valves.

Clean the weld ends as necessary and weld into the line using an approved weld procedure. Make sure the body and pipe material given on the nameplate is compatible with the welding procedure.

2.3.3. Valve Installation by Welding.

Unless the valve contains PTFE packing and/or gasket, leave valves assembled and in the lightly closed position during installation, welding and post-weld heat treatment. This will prevent the valve seat from floating or warping during the process. After welding completion, open the valve and flush the line to clean out any foreign matter.

Valves containing PTFE packing and/or gasket must be disassembled for installation as the welding temperature can adversely affect the PTFE components. Match mark each component during disassembly for proper reassembly.

The responsibility for welding of the valves into piping systems is that of those performing the welding. Refer to ASME B31.1, B31.3, etc. Written welding procedures covering all attributes of the process and materials to be welded shall be in accordance with Section IX of the ASME Boiler and Pressure Vessel Code and any additional requirements from the applicable piping code including any possible necessary localized PWHT depending on material specifications.



3. MAINTENANCE AND REPAIR

3.1. Inspection and Maintenance

A periodic inspection and maintenance schedule should be established for each valve. The time frame given for the implementation of these schedules are to be used as a guide only in establishing routine inspection and maintenance schedules. Exact time periods for performing these procedures cannot be provided due to the unknown nature of the service conditions each valve is in.

3.1.1. Periodic Inspection.

A periodic inspection should be performed on each unit. The time frame should be adjusted depending on usage and service conditions. An infrequently used unit may have more time between inspections than a valve in constant service.

A periodic inspection should include the following:

- a. Examine the valve stem for cleanliness and lubrication. The stem threads should be coated with a clean grease lubricant.
- b. Some valves have a grease fitting in the bonnet or yoke. If it is dry, lubricate with a hand grease gun.
- c. Open and close the valve. The actions should be smooth without any binding of the stem through full travel.
- d. If valve is in service and under pressure:
 - i) **Examine the body to bonnet connection for leakage through the gasket. If leakage is found, tighten the bonnet nuts evenly in a star pattern until the leakage stops. Do not exceed the maximum torque values in Table A. If the leakage persists, see section 3.2.**
 - ii) **Check the stem packing for any leakage during the opening and closing action. If a leak is found tighten the gland nuts alternately with no more than a quarter turn on each nut until the leak stops. If the leakage persists, see section 3.2.**
 - iii) **Inspect the exterior of the valves for cleanliness. Remove any dirt, grime or oil from the valve body and bonnet.**

3.1.2. Post Inspection.

After completion of a periodic inspection, valves that are providing satisfactory service require no further disassembly or inspection. Should a valve be found which is not performing satisfactorily, see section 3.2 "Troubleshooting".

3.1.3. Maintenance.

Other than periodic inspection, no routine maintenance is required. Routine replacement of parts, such as gasket and packing is not usually performed until required. Once in service, it may become apparent that these and other parts require repair or replacement due to usage and service conditions. A maintenance schedule should be developed taking these conditions into consideration. Parts can be replaced during a routine overhaul.



3.2. Trouble-shooting

The following chart will cover the various problems which are common to most valves. The information provided will aid in isolating and correcting these problems.

Table 3-2 Valve Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
Leakage through the stem packing	a. Gland nuts are loose b. Gland is binding against the stem or packing chamber wall c. Inadequate amount of packing rings d. Packing is hard and dry e. Packing was not properly cut and staggered f. Stem is damaged	a. Tighten gland bolts. b. Check to insure gland is centered and evenly tightened c. Install additional packing rings see section 3.3 d. Replace with new packing see section 3.3 e. Replace with new packing see section 3.3 f. Repair or replace as required.
Problems in operating valve	g. Stem binding during travel h. Stem packing is exerting excessive force on the stem i. Stem is damaged j. Internal components may be damaged	g. Remove dirt and lubricate stem with grease h. Check torque on gland nuts. i. Examine stem through full open and close action. Repair or replace as required j. Disassemble the valve. Inspect and repair as needed.
Bonnet Leakage	k. Bonnet nuts are loose l. Gasket is damaged m. Flange faces are damaged	k. Tighten to values listed in Table A. l. Disassemble and install a new gasket. m. Repair and install a new gasket
Seat Leakage	n. Valve not properly seated o. Internal components are damaged or worn	n. Check to see if valve is tightly closed o. Inspect internal components and repair as required (for detailed repair consult Newmans representative).



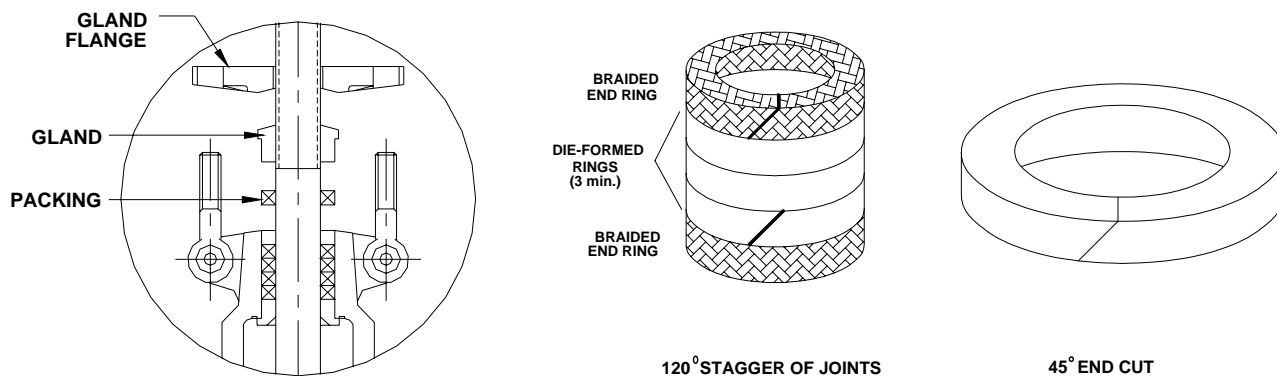
3.3. Stem Packing Replacement

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

- Check original tightness of valve operation. Remove gland nuts. Lift the gland up the stem clear of the packing chamber.
- Remove the existing or defective packing rings with a sharp tool or packing remover. Do not scratch or score the machined surfaces of the stem or packing chamber.
- Examine the machined surfaces of the stem and packing chamber. Remove any scratches, scoring or burrs with emery cloth or hand filing. Clean the stem with a solvent soaked rag.
- Count original number of rings and measure x-section thickness. If original packing cannot be counted or measured, follow the steps below:
 - 1.) Measure the stem diameter (OD), stuffing box diameter (ID) and stuffing box depth (d).
 - 2.) Packing x-section (R) = $(ID - OD)/2$
 - 3.) # rings = $(1.25 \times d)/R$
- Install new packing. Cut each ring at a 45-degree angle and stagger the joints at 120 degrees, every fourth joint will be in the same position as the first. Install rings individually using a split ring spacer, compressing each ring by hand tightening + 1/4 turns on each gland nut.
- When packing chamber becomes filled with packing, reassemble gland and gland flange. Alternate tightening gland flange nuts 1/4 turn at a time until eyebolts begin to get tight. (If gland travels more than the height of one packing ring into the packing chamber, insert one more ring and repeat step F until chamber is filled).
- Compare valve operation to original tightness. If valve operation is considerably tighter than original operating tightness, back off 1/4 turn on each gland nut and recheck tightness.
- Several hours after a repacked valve has been returned to service, inspect the packing area to ensure full compression, tight bolting and no leakage. Should leakage occur, tighten gland nuts at 1/4 turn increments until leakage stops.

Figure 3.1.3-1 (a) Valve Stuffing Box Assembly (b) Packing Detail





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4. NEWCO CAST STEEL VALVES

4.1. Bolted Bonnet Gate and Globe Valves

4.1.1. Operation

By turning the hand wheel counter-clockwise, the stem, to which the wedge (or disc) is attached at the base, is drawn up through the yoke sleeve. By turning the hand wheel clockwise, the action is reversed and the wedge (or disc) is lowered into the closed position.

4.1.2. Disassembly

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

- Close the valve and then open, two full hand wheel turns. Match or mark flange with a metal tool or paint to clearly show the original position for reassembly.
- Caution should be taken when loosening body-bonnet bolting, as pressure may still be present in bonnet.
- Once assured there is no more pressure in the line, remove the bonnet nuts and studs. Lift the bonnet-stem-wedge (or disc) assembly out of the body, taking care not to scratch the seating surface. For gate valves, as the assembly is drawn out of the body, match or mark the wedge so that it can be replaced in the same position.
- Remove the bonnet gasket from the valve body flange.
- For **gate valves**, remove the wedge from the stem "T" head, carefully protecting the seating surface. For **globe valves**, remove the disc from the stem by cutting tack welds and unthreading the disc nut or bushing.
- Unfasten the hand wheel nut. Remove the hand wheel from the valve.
- To remove the valve stem, loosen the gland bolting and gland. Disengage the stem from the yoke sleeve by rotating it counterclockwise and pulling from below until the stem is free of the packing chamber. Be careful not to score or scratch the stem machined surface or the threads.

4.1.3. Reassembly

- Thoroughly clean the valve interior and all components. Remove all scale, oil, grease or other foreign material. Wipe the seating surface of the wedge (or disc) and

valve seat with a solvent soaked cloth. Clean the body and bonnet flange surfaces and all bolting.

- Install the stem carefully, sliding it through the packing and gland until the threads are engaged with the yoke sleeve. Slowly rotate the stem clockwise until it extends beyond the bonnet.
- Place hand wheel in position atop the valve, stem nut for gate valves and stem for globe valves. Secure with hand wheel nut.
- Position a new gasket on the body flange aligned with the bolt holes. The gasket should not extend over the open body cavity. Do not reuse a gasket. The gasket may be coated with a light oil.
- For gate valves, install the wedge to the "T" head of the stem connection. For globe valves, install the disc and secure it with the bushing or disc nut to the stem and tackweld.
- Lift the bonnet-stem-wedge assembly up and over the body. Check the location marks on the body, bonnet flange and wedge. Carefully lower the assembly until the body and bonnet flanges and the location marks meet. Again, caution must be used to prevent scoring or scratching of the seating surfaces. Keeping the bonnet stationary, open the valve a few turns to ensure the wedge (or disc) is not touching the seat.
- Line up the body and bonnet holes. Make sure the gasket does not extend into any of the bolt holes. Install the bonnet bolting and tighten in a star pattern to evenly load the gasket to the torque values listed in Table A.
- Install new packing as per section 3.3.
- Align and center the gland in the packing chamber. Evenly tighten the gland nuts until snug, then alternate tightening with no more than a quarter turn on each.
- Open and close the valve using the hand wheel. The action should be smooth and regular through full stem travel.



Figure 4.1-1 Bolted Bonnet Gate Valve

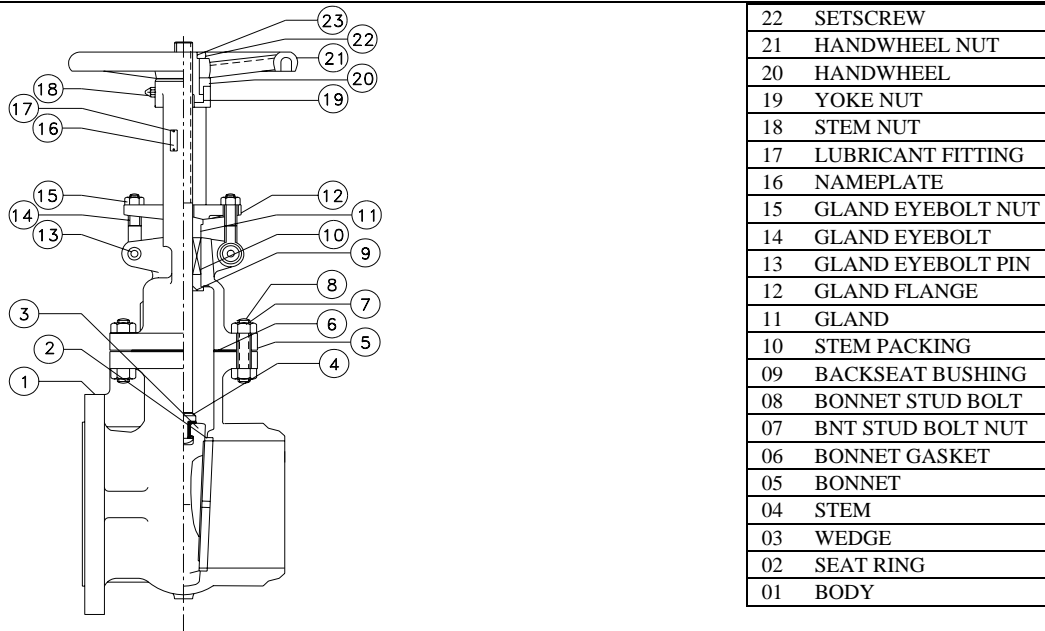
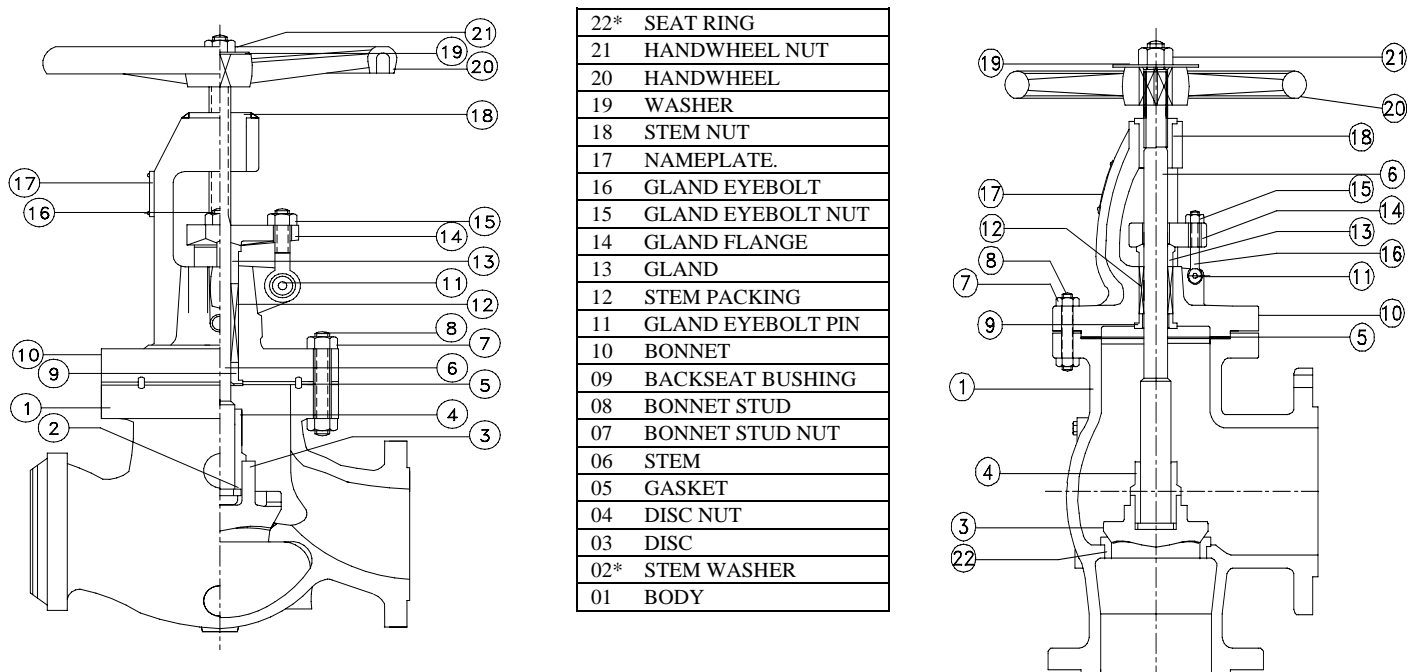


Figure 4.1-2 Bolted Bonnet Globe Valve



* SEAT DESIGN MAY VARY WITH VALVE DESIGN



4.2. Bolted Cap Swing-Type Check Valves

4.2.1. Operation

The Swing Check valve's operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the disc's weight, the disc, which is set on a hinge, lifts allowing the flow to continue through the piping system. As the pressure decreases, the disc lowers until its own weight forces it to seat. This prevents the possibility of a reversal in the flow.

4.2.2. Disassembly

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

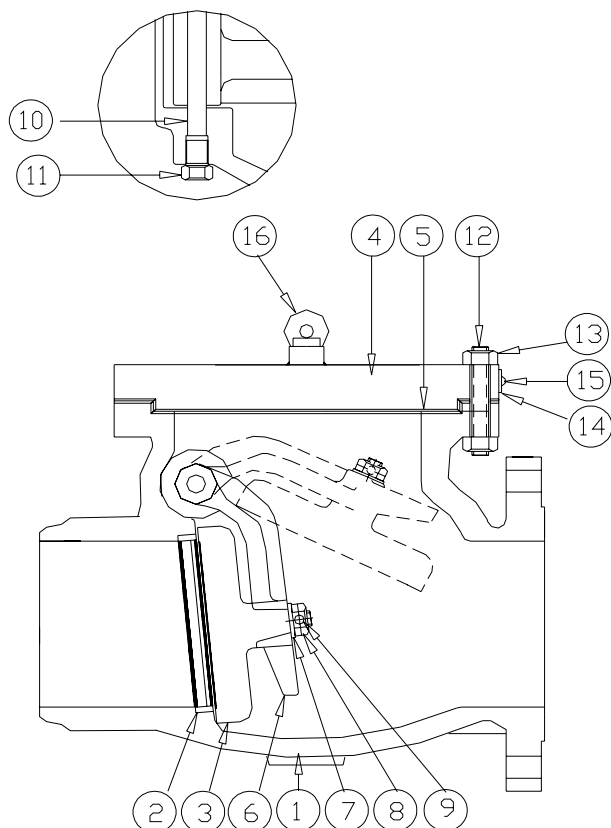
- a. Match or mark flange with a metal tool or paint to clearly show the original position for reassembly.
- b. Caution should be taken when loosening body-cover bolting, as pressure may still be present.
- c. Once assured there is no more pressure in the line, remove the cover bolting and lift the cover off the body.
- d. Remove the gasket from the valve body flange.
- e. If so equipped remove tack welds and bolts (for internally hung disc.). Remove the side plug. This will allow the hinge pin to be removed.
- f. Remove the hinge pin while supporting the disc and arm to prevent damage to the seating surface.
- g. To remove the disc from swing arm, remove the cotter pin and unfasten the disc nut.

4.2.3. Reassembly

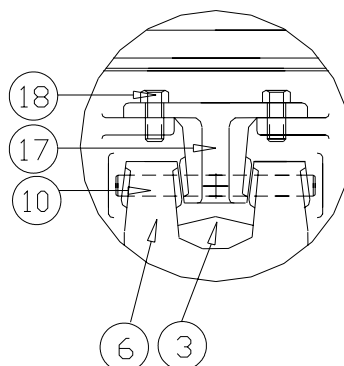
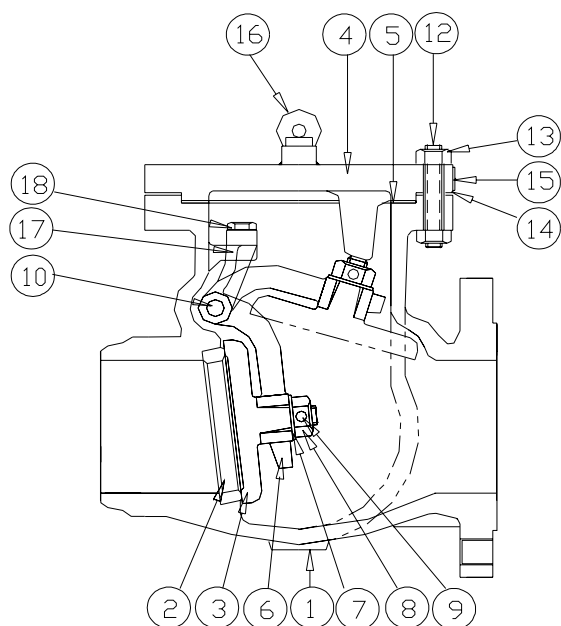
- a. Thoroughly clean the valve interior and all components. Remove all scale, oil, grease, or other foreign material. Wipe the seating surface of the disc and valve seat with a solvent soaked cloth. Clean the body and cover flange surfaces and all bolting.
- b. Install the disc and secure it to the arm with the disc nut. Insert and secure a new pin. Do not use the old pin unless a new one is unavailable.
- c. Place the disc-arm assembly in the valve and insert the hinge pin.
- d. Replace and secure the side plug, bolts and tack welds as required.
- e. Open the valve by lifting the arm. The action should be smooth and regular through full hinge pin rotation.
- f. Position a new gasket on the body flange aligned with the bolt holes. The gasket should not extend over the open body cavity. Do not reuse a gasket. The gasket may be coated with a light oil.
- g. Line up the body and cover holes. Make sure the gasket does not extend into any of the bolt holes. Install the cover bolting and tighten in a star pattern to evenly load the gasket to the torque values listed in Table A.



Figure 4.2-1 Bolted Cap Swing-Type Check Valve



18	BOLT
17	BEARING BRACKET
16	EYEBOLT
15	NAMEPLATE SCREW
14	NAME PLATE
13	BONNET NUT
12	BONNET BOLT
11	PLUG
10	HINGE PIN
09	PIN
08	HEX NUT
07	WASHER
06	SWING ARM
05	GASKET
04	BONNET
03	DISC
02	SEAT RING
01	BODY





4.3. Bolted Body Tilting Disc Check Valves

4.3.1. Operation

The tilting disc check valve's operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the disc's weight, the disc lifts allowing the flow to pass. As pressure decreases, gravity forces the disc to seat preventing a possibility of a flow reversal.

4.3.2. Disassembly

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

- a. Match or mark body with a metal tool or paint to clearly show the original position for reassembly.
- b. Caution should be taken when loosening body-body bolting, as pressure may still be present.
- c. Once assured there is no pressure in the line, remove the body bolting and separate the two body halves.
- d. Remove the gasket from the body flange.
- e. Grind off the backwelds, securing the hinge pins to the body.
- f. Slide the hinge pins out of the disc to free the disc from the body.

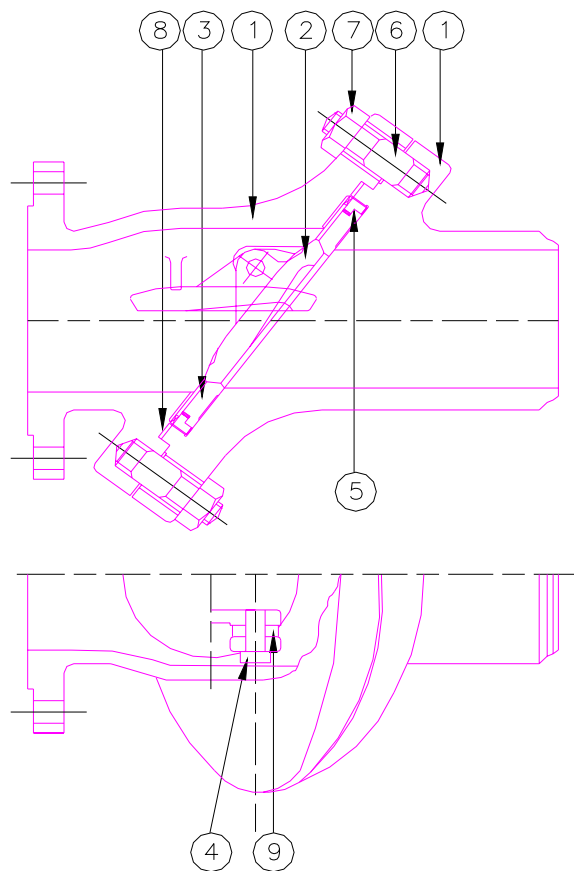
4.3.3. Reassembly

- a. Thoroughly clean the valve interior and all components. Remove all scale, oil, grease or other foreign material. Wipe the seating surface of the disc and valve seat with a solvent soaked cloth. Clean the body surfaces and all bolting.
- b. Install the disc into the seat, aligning the hinge pinholes of the body with those of the disc.
- c. Place the collar between the arms and insert the hinge pin. Repeat for the other hinge pin (note some valves may have only one pin depending on design).
- d. Tackweld the hinge pin(s) to the body only after ensuring the disc swings freely and seats properly.
- e. Position a new gasket on the body flange. Do not reuse a gasket. The gasket may be coated with a light oil.
- f. Line up the body markings. Install the bolting and tighten in a star pattern to the torque values listed in table A.



Figure 4.3-1 Bolted Body Tilting Disc Check Valve

09	COLLAR
08	GASKET
07	NUT
06	STUD
05	LOCKING NUT
04	PIVOT PIN
03	SEAT RING
02	DISC
01	BODY





4.4. Pressure Seal Gate and Globe Valves

4.4.1. Operation

By turning the hand wheel counter-clockwise, the stem, to which the wedge (or disc) is attached at the base, is drawn up through the yoke sleeve. By turning the hand wheel clockwise, the action is reversed and the wedge (or disc) is lowered into the closed position.

4.4.2. Disassembly

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

- a. Close the valve and then open two full hand wheel turns. Mark the bonnet flanges with a metal tool or paint to clearly show the original position for reassembly.
- b. Loosen and remove the body-yoke bolting,
- c. For **gate valves**, and **globe valves with non-rotating stems**: i) un-fasten the stopper located at the top of stem, and ii) remove the yoke assembly by rotating it clockwise until the yoke sleeve is clear of the stem.
- d. For **globe valves with rotating stems**: i) remove the handwheel nut and handwheel, ii) remove the yoke assembly by rotating it counterclockwise until the yoke sleeve is clear of the stem, and iii) remove the washer located above the body flange.
- e. Loosen and remove the gland nuts. Remove the gland flange and gland.
- f. Loosen the bolting located on the bonnet retainer.
- g. Unthread the bonnet retainer and remove from valve.
- h. Strike the bonnet in a star pattern using a soft punch to release pressure on the seal ring retainer (segment rings).
- i. Remove the segment rings from the valve.
- j. Replace the yoke assembly by rethreading it onto the stem (For **globe valves with rotating stems**, replace the handwheel). Place spacer blocks on the body flange and backseat of the valve. Continue to open the valve until the "seal" on the spacer ring and seal ring is broken.
- k. Lift the internal assembly out of the valve. For **gate valves**, as the wedge is lifted, mark it so it can be placed in its original position.
- l. For **gate valves**, remove the wedge from the stem "T" head, carefully protecting the seating surface. For **globe valves**, remove the disc from the stem by unthreading the disc nut or bushing.
- m. Loosen the set screw located in the nut on top of the stem. Remove the nut and the hand wheel.

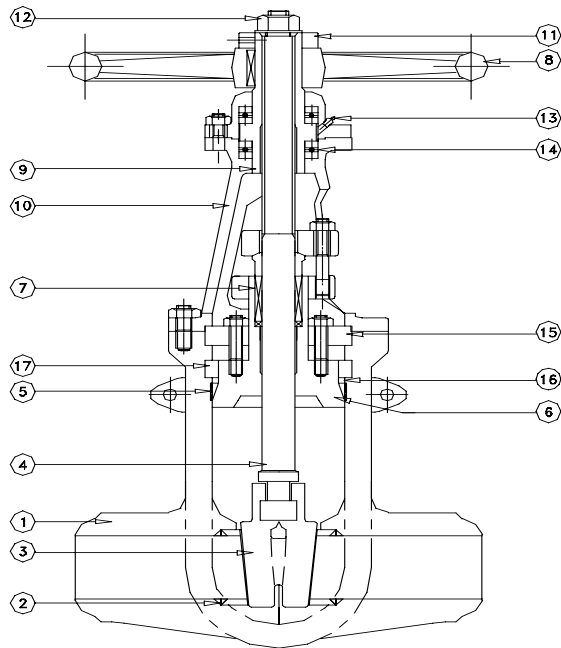
- n. To fully expose the stem, unthread the yoke assembly and remove the bonnet. Be careful not to score or scratch the stem machined surface or the threads.
- o. Remove the spacer ring and discard the seal ring.

4.4.3. Reassembly

- a. Thoroughly clean the valve components. Wipe the seating surface of the wedge (or disc) and valve seat with a solvent soaked cloth.
- b. Slide the stem through the bonnet. For **gate valves**, install the wedge in the "T" head of the stem connection. Check the location marks to ensure wedge is installed in it's original position. For **globe valves**, install the disc and secure it with the bushing or disc nut to the stem. Lift the assembly up and over the body.
- c. Insert a new seal ring and existing spacer ring on the bonnet.
- d. Replace the segment rings in the body, and place the washer in position on top of the body flange.
- e. Secure the bonnet retainer by threading it onto the bonnet.
- f. Slide the gland down the stem until it rests on the bonnet retainer. The gland flange should then be placed on the gland sliding it down the stem and through the gland bolts.
- g. Tighten the bonnet bolting in a star pattern to evenly load the seal ring
- h. Tighten the gland bolting evenly until snug, then alternate tightening with no more than a quarter-turn on each.
- i. Place the yoke assembly on the valve stem and thread it down until the yoke-body holes are aligned. Install body-yoke bolting and tighten in a star pattern.
- j. Secure the hand wheel in position by placing the hand wheel nut on top of the hand wheel and tightening the set screw.
- k. Insert the stopper at the top of the stem.
- l. Open and close the valve using handwheel. The action should be smooth and regular through full stem travel.

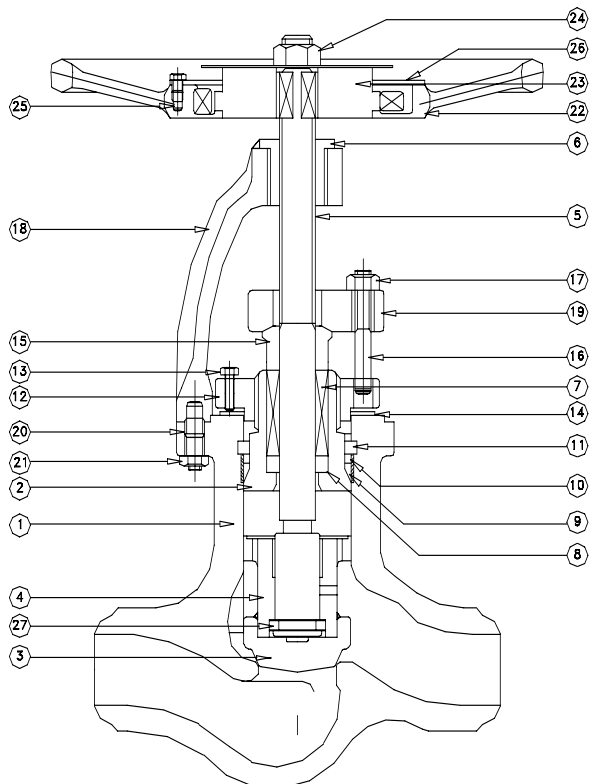


Figure 4.4-1 Pressure Seal Gate Valve



17	SEAL RING RETAINER
16	SPACER RING
15	BONNET RETAINER
14	BALL BEARING
13	GREASE FITTING
12	STOPPER
11	HANDWHEEL NUT
10	YOKE
09	YOKESLEEVE
08	HANDWHEEL
07	PACKING
06	BONNET
05	SEAL RING
04	STEM
03	WEDGE
02	SEAT RING
01	BODY

Figure 4.4-2 Pressure Seal Globe Valve



27	DISC RING
26	HANDWHEEL COVER
25	BOLT
24	HW NUT
23	CLUTCH
22	HW
21	NUT
20	STUD
19	GLAND FLANGE
18	YOKE
17	NUT
16	STUD
15	GLAND
14	WASHER
13	BOLT
12	BONNET RETAINER
11	SEAL RING RETAINER
10	SPACER RETAINER
09	SEAL RING
08	BACK SEAT BUSHING
07	PACKING
06	YOKE SLEEVE
05	STEM
04	DISC GUIDE
03	DISC
02	BONNET
01	BODY



4.5. Pressure Seal Swing-Type and Tilting Disc Check Valves

4.5.1. Operation

The Swing Check and Tilting Disc operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the disc's weight, the disc, which is set on a hinge, lifts allowing the flow to continue through the piping system. As the pressure decreases, the disc lowers until its own weight forces it to seat. This prevents the possibility of a reversal in the flow.

4.5.2. Disassembly

WARNING

To prevent injury ensure that all pressure is removed from the valve both upstream and downstream before disassembly.

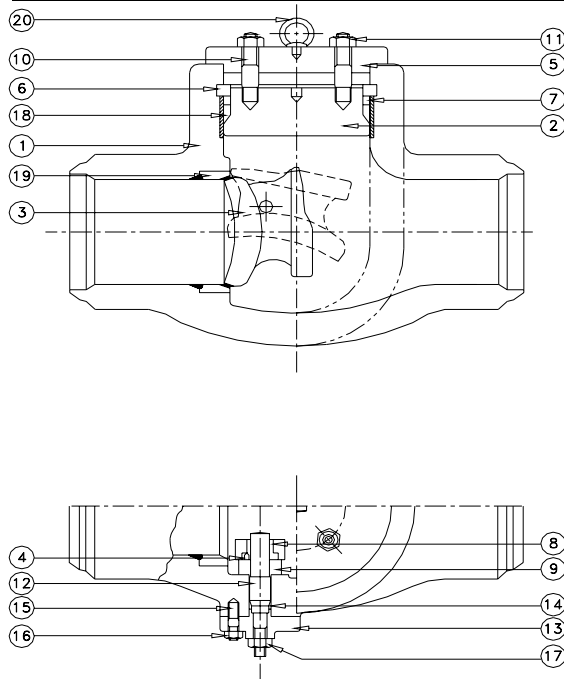
- a. Match/mark bonnet retainer to body to ensure original position.
- b. Remove bonnet retainer nuts.
- c. Remove bonnet retainer.
- d. Remove seal ring retainers.
- e. Remove spacer ring.
- f. Ensure inside of valve is clean and gently pull bonnet & seal ring out of body. Be sure to lift them out carefully so the seal ring is not scratched upon removal.
- g. Loosen set screws on both sides of disc and mark collars, bushings and disc to ensure original assembly.
- h. Remove hinge pin nut.
- i. Mark original alignment of flange to body.
- j. Unbolt and remove flange.
- k. Reach through top of valve and hold disc while sliding pin out of disc and through body. Be sure to remove hinge pin evenly so the seal ring is not damaged.
- l. Remove disc along with collar and bushing (also swing arm assembly for swing check).
- m. Remove old seal rings and clean all parts as well as inside of valve.

4.5.3. Reassembly

- a. Thoroughly clean the valve interior and all components. Remove all scale, oil, grease, or other foreign material. Wipe the seating surface of the disc and valve seat with a solvent soaked cloth. Clean the body, cover, flange surfaces and all bolting.
- b. Grease new seal rings and male counter parts as well as body guide areas of valve.
- c. Gently slide new seal ring onto hinge pin.
- d. Reach through top of valve and align disc (also swing arm assembly for swing check), collars and bushings to original position, with hinge pin hole in side of valve.
- e. Carefully slide hinge pin through side of body and into collars and bushings (do not force in or seal ring may be damaged)
- f. Realign flange in original position and bolt to body.
- g. Hold the hinge pin in place and tighten down hinge pin bolt just enough to ensure seal ring has been pulled tight.
- h. Align disc so that it is seating properly and tighten down set screws.
- i. Gently slide new seal ring over bonnet and lower into the valve body (do not force in or seal ring may be damaged).
- j. Grease and lower spacer ring onto bonnet.
- k. Grease and install seal ring retainers.
- l. Realign bonnet retainer to original position and tighten bolting in a star pattern to recommended torque.

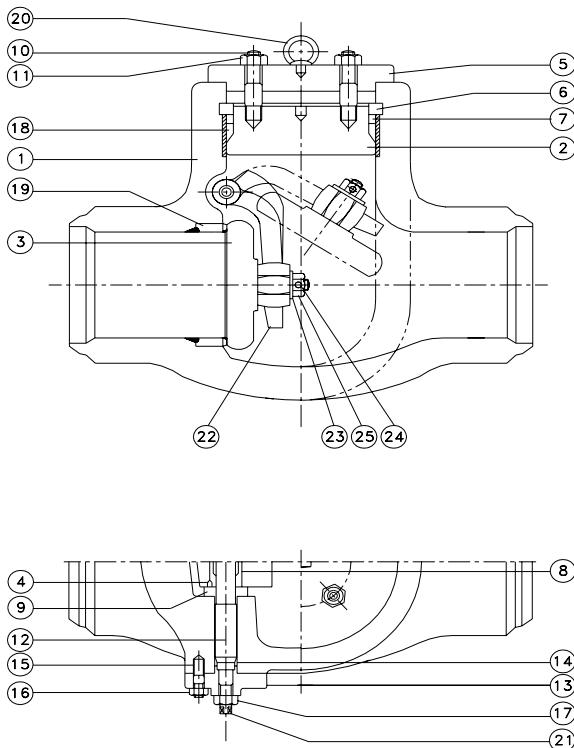


Figure 4.5-1 Pressure Seal Tilting Disc Check Valve



20	EYEBOLT
19	SEAT RING
18	SEAL RING
17	NUT
16	NUT
15	STUD
14	SEAL RING
13	FLANGE
12	PIN
11	NUT
10	STUD
09	COLLAR
08	BUSHING
07	SPACER RING
06	SEAL RING RETAINER
05	BONNET RETAINER
04	SET SCREW
03	DISC
02	BONNET
01	BODY

Figure 4.5-2 Pressure Seal Swing Type Check Valve



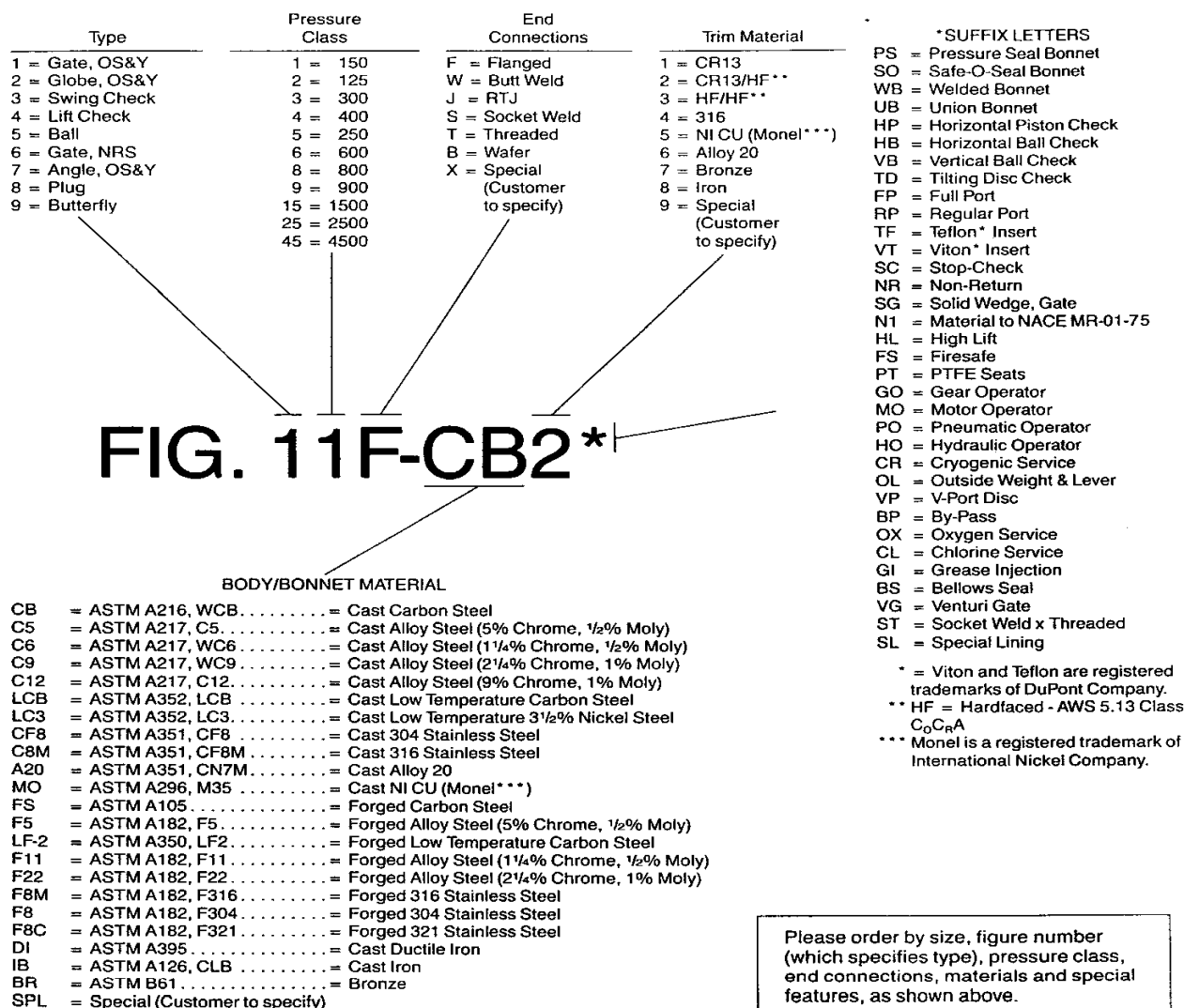
25	NUT
24	COTTER PIN
23	WASHER
22	HOLDER
21	SEAL PIN
20	EYEBOLT
19	SEAT RING
18	SEAL RING
17	NUT
16	NUT
15	STUD
14	SEAL RING
13	FLANGE
12	PIN
11	NUT
10	STUD
09	COLLAR
08	BUSHING
07	SPACER RING
06	SEAL RING RETAINER
05	BONNET RETAINER
04	SET SCREW
03	DISC
02	BONNET
01	BODY



5. ABOUT NEWCO VALVES

5.1. Identifying Newco Figure Numbers

Newco valves can be identified by a distinct figure number on the identification plate. This plate is located either on the body/bonnet flange or on the bonnet yoke. The figure number gives all the necessary information for identifying valve type, material, end connections, pressure rating, etc. Listed below is the basic set-up.



For End Connections, Body Materials and Trims not listed, please specify.



5.2. Ordering Parts

Although valves have many parts common to one another, other than those of identical material, size and pattern, they are not interchangeable. All the valve's parts can be replaced, but with proper care and maintenance they will provide continuous satisfactory service. Should a part require replacement, please contact your Newco Sales Representative and provide the following information:

- Valve Size and Pressure Class
- Newco Figure
- Two Digit Foundry Code (on body)
- Part Description
- Drawing Number (If known)
- Item Number (If known)

It is recommended that a spare gasket and set of packing rings for the various valves be kept in stock.



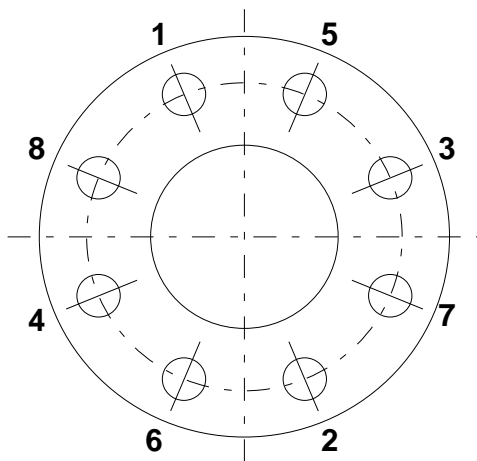
APPENDIX A

Table A -- Torque Values for Bonnet Bolting

Bolt Nominal Diameter (in.)	Torque		Bolt Nominal Diameter (in.)	Torque	
	(ft-lb)	(N-M)		(ft-lb)	(N-M)
1/4	4	5	1	200	271
5/16	8	11	1-1/8	375	509
3/8	12	16	1-1/4	525	712
7/16	20	27	1-3/8	715	970
1/2	30	41	1-1/2	925	1254
9/16	45	61	1-5/8	1200	1627
5/8	60	81	1-3/4	1500	2034
3/4	110	149	1-7/8	1850	2509
7/8	170	231	2	2260	3064

Notes:

1. Values are for B7 bolting only. For other bolting material, please consult your local Newco representative.
2. Values above are based on 30,000 psi (206.85 Mpa) bolting stress and lubricated with a heavy graphite and oil mixture. Non-lubricated bolts have an efficiency of 50% of the values stated.
3. Do not exceed by more than 25% of values stated when emergency torquing is required.
4. All bolts shall be torqued in a star pattern as shown below to ensure uniform gasket loading.



Bolt torquing sequence. 1-2-3-4-5-6-7-8