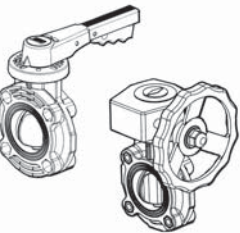




BUTTERFLY VALVE

Installation Instructions

BF-3A-0410



Spears® Butterfly Valves are designed for the system connection either between two flanges, or with single-side (flange one side only) connection for dead-end service. Valve can be installed for flow in either direction in a dual-flange installation.

Spears® Standard Butterfly Valves (12" & smaller) accept field installable lug insert sets for quick conversion to a lug style.

Attention to direction of flow is required when installed with single-side flange connection. Spears® True Lug Butterfly Valves offer factory installed lugs which allow flange connections from either side, regardless of direction flow.

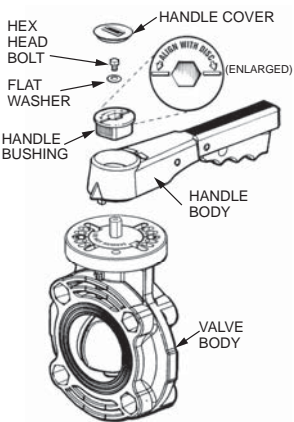
This instruction covers general Installation for all Spears® PVC, CPVC, & PP Butterfly Valves. All applicable instructions and procedures should be read thoroughly before starting. Suitability of the intended service application should be determined before installation. Plastic piping systems should be engineered, installed, operated & maintained in accordance with accepted standards and procedures for plastic piping systems.

CAUTION: Connecting Flanges must have an inside diameter not less than that of PVC Schedule 80 Pipe (ASTM D 177-85) to maintain operation clearance with the disc. Flange bolt pattern conforms to ANSI Class 125/150.

IMPORTANT: Read Precautions & Warnings for all Valve Installations at the end of these instructions. It is absolutely necessary that all design, installation, operation & maintenance personnel be trained in proper handling, installation requirements and precautions for installation & use of plastic piping systems before starting.

HANDLE INSTALLATION & REVERSAL

The Valve Handle (or optional Gear Operator) can be installed for either left or right side operation. **CAUTION:** *Do not* remove Orange Disc Timing-Stop Plate located below handle assembly.



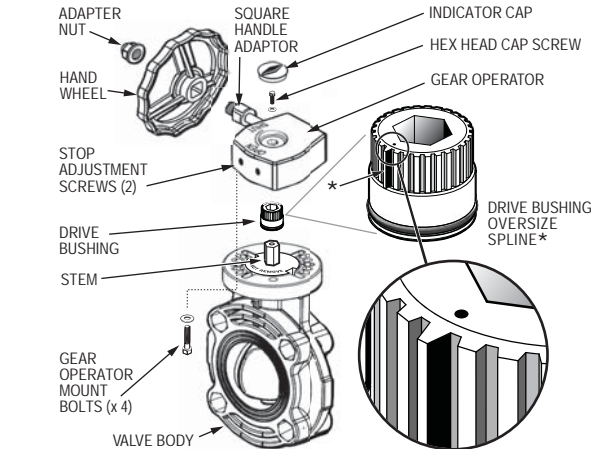
HANDLE INSTALLATION:

Place handle and bushing over metal stem in one of two desired positions being sure that arrows on valve body match direction of pointer on handle body. Install hex nut & flat washer onto top of stem, tighten and torque to 40 in-lb. Snap cover back to handle body.

To reverse the Handle position by 180°, first set valve to the fully open position. Remove the snap-in cover from the top of the handle to expose the retaining nut, remove it & the flat washer. Lift handle & handle bushing assembly from valve stem, reposition handle 180° on valve stem, reinstall flat washer & retaining nut, torque to 40 in-lb. Snap cover back into place.

1

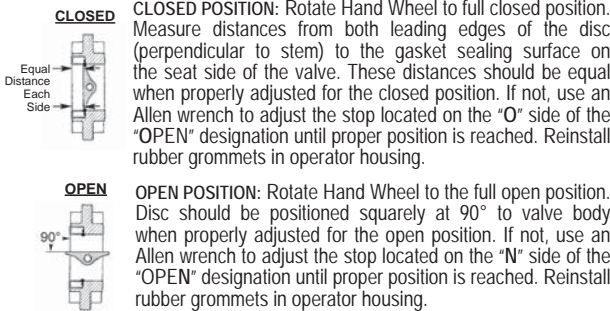
GEAR OPERATOR INSTALLATION & REVERSAL



STEP 1 GEAR OPERATOR HAND WHEEL INSTALLATION: Place hand wheel hub over square handle adaptor and install the adaptor nut. Torque to 10 ft-lb.

TO REVERSE THE GEAR OPERATOR POSITION 180°: Set the valve in the open position. Remove the 4 mounting bolts & flat washers that secure the gear operator to the valve body, lift the assembly & drive bushing from the valve stem. **NOTE:** Drive bushing is timed to operator with a single oversize spline tooth & index mark. Turn gear operator assembly 180° and reinstall onto valve stem being sure to align bushing oversize spline with its matching oversize groove in the gear operator. Reinstall all mounting bolts & flat washers, and torque to 10 ft-lb.

STEP 2 GEAR OPERATOR POSITION ADJUSTMENT: Remove 2 rubber grommets from end of Gear Operator housing adjacent to the "OPEN" designation, to allow access to the "stop adjustment screws".



BOLT PREPARATION FOR ASSEMBLY

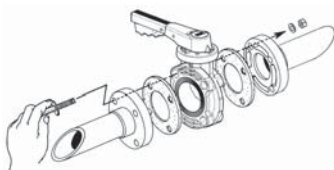
Once a flange is attached to the pipe or valve, the method of joining two flanges is as follows:

LUBRICATION WARNING: Some Lubricants, including vegetable oils, are known to cause stress cracking in thermoplastic materials. Formulation changes by lubricant manufacturers may alter compatibility of previously acceptable materials and are beyond our control.



2

STEP 1 Use of well lubricated bolts & flat washers are required. An anti-seize thread lubricant (IMS Copperflake or equivalent) is highly recommended.

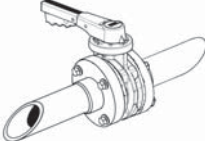


SEE BOLT SPECIFICATION TABLES AT THE END OF THESE INSTRUCTIONS FOR SELECTION OF PROPER BOLT, SIZE & QUANTITIES

STEP 2 Place the valve and handle in a closed position. Place a user-supplied 1/8" gasket having a shore "A" durometer of approximately 60 between the valve body and flange, align the bolt holes of the mating flanges and gasket. Insert all bolts, washers, and nuts.

AT THIS TIME, BE SURE THAT THE FLANGE AND GASKET SURFACES ARE FLUSH AND SQUARELY ALIGNED. Tighten the nuts by hand until they are snug.

STEP 3 Using a 180° opposing sequence, tighten flange bolts in 5 ft-lb increments to required specifications (See Torque Sequence Chart).



DO NOT USE BOLTS TO BRING TOGETHER IMPROPERLY MATED FLANGES.

TRUE LUG BUTTERFLY VALVE INSTALLATION

Connects from either side, regardless of direction flow.

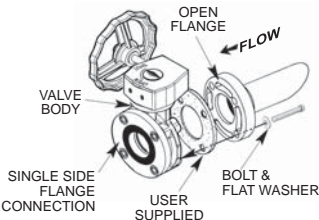
STEP 1 With the valve in the closed position, place user-supplied gasket and pipe-mounted flange on the desired side of the valve body. Insert the proper size & length hex head bolts (see Bolt Specification Chart at the end of these instructions) with flat washers, through the pipe-mounted flange and gasket. Hand thread hex head bolts into lug inserts.

AT THIS TIME, BE SURE THAT THE FLANGE AND GASKET SURFACES ARE FLUSH AND SQUARELY ALIGNED.

Tighten the bolts *by hand* until they are snug.

Open valve and check axial displacement & disc clearance. No more than 1/8" displacement on the pipe centerline is allowed.

STEP 2 Using a 180° opposing sequence, tighten flange bolts in 5 ft-lb increments to required specifications (See Torque Sequence Chart).



DO NOT USE BOLTS TO BRING TOGETHER IMPROPERLY MATED FLANGES.

3

STANDARD LUG BUTTERFLY VALVE INSTALLATION

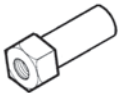
(And Lug Insert Installation)

Lug Insert-style Butterfly Valves require attention to FLOW direction. Mating Flange must be placed on side of valve **opposite** the Lug Insert hex recesses.

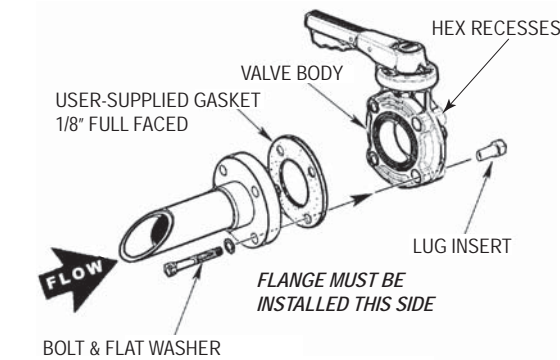
For installation of Standard Lug Butterfly Valves or Lug Insert Sets, pass *lug inserts* through each bolt hole from the side of the valve body containing the hex recesses. Press lightly until the lug insert is fully seated into the recess.

Install Pipe-Mounted Mating Flange on side of valve *opposite* the Lug Insert Hex recesses. Secure with the proper size & length hex bolts & flat washers from opposing side of hex recesses. Pass bolts with washers through flange, gasket and thread into Lug Insert. (See Bolt Specification Chart in next column).

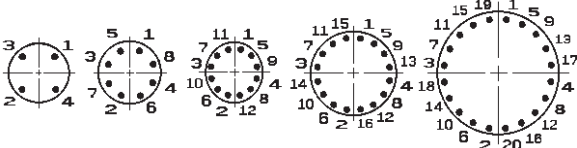
Tighten the nuts by hand until they are snug. AT THIS TIME, BE SURE THAT THE FLANGE AND GASKET SURFACES ARE FLUSH AND SQUARELY ALIGNED. Using a 180° opposing sequence, tighten flange bolts in 5 ft-lb increments to required specifications (See Torque Sequence Chart).



Typical Lug Insert
(Shape may vary with size).



TORQUE SEQUENCES



| Flange Size (in.) | Recommended Torque (ft. lbs.) |
|-------------------|-------------------------------|
| 1/2 - 1-1/2 | 12 |
| 2 - 4 | 25 |
| 5 | 30 |
| 6 - 8 | 40 |
| 10 | 64 |
| 12 | 95 |
| 14 - 24 | 110 |

4

BUTTERFLY VALVE BOLT SPECIFICATION TABLE

| PVC & CPVC STANDARD BUTTERFLY VALVE | | | | | | | |
|-------------------------------------|-------------------|------------------------|---------------------|--------------|---------------------|-----------------------|------------------------|
| Valve Size (in.) | No. of Bolt Holes | Bolt Torque (ft.-lbs.) | Bolt Lengths¹ (in.) | | Bolt Diameter (in.) | Bolt Threads per inch | Flat Washer O.D. (in.) |
| | | | Single Side | Dual Flange³ | | | |
| 1-1/2 | 4 | 12 | 3-1/4 | 4-1/4 | 1/2 | 13 | 1-3/8 |
| 2 | 4 | 25 | 3-3/4 | 4-3/4 | 5/8 | 11 | 1-3/4 |
| 2-1/2 | 4 | 25 | 4-1/4 | 5-1/4 | 5/8 | 11 | 1-3/4 |
| 3 | 4 | 25 | 4-1/4 | 5-1/2 | 5/8 | 11 | 1-3/4 |
| 4 | 8 | 25 | 4-1/2 | 5-3/4 | 5/8 | 11 | 1-3/4 |
| 6 | 8 | 40 | 5-1/4 | 6-3/4 | 3/4 | 10 | 2 |
| 8 | 8 | 40 | 5-3/4 | 7-1/4 | 3/4 | 10 | 2 |
| 10 | 12 | 64 | 6-1/2 | 8-1/4 | 7/8 | 9 | 2-1/4 |
| 12 | 12 | 95 | 6-3/4 | 8-1/2 | 7/8 | 9 | 2-1/4 |
| 14 | 12 | 110 | 9-1/2 or 10 | 12 | 1 | 8 | 2-1/2 |

| PVC & CPVC BUTTERFLY VALVE WITH LUG INSERT | | | | | | | |
|--|-------------------|------------------------|---------------------|-------------|---------------------|-----------------------|------------------------|
| Valve Size (in.) | No. of Bolt Holes | Bolt Torque (ft.-lbs.) | Bolt Lengths¹ (in.) | | Bolt Diameter (in.) | Bolt Threads per inch | Flat Washer O.D. (in.) |
| | | | Single Side | 2nd Flange² | | | |
| 1-1/2 | 4 | 12 | 1-3/4 | 1-1/2 | 1/2 | 13 | 1-3/8 |
| 2 | 4 | 25 | 2 | 1-3/4 | 5/8 | 11 | 1-3/4 |
| 2-1/2 | 4 | 25 | 2-1/4 | 2 | 5/8 | 11 | 1-3/4 |
| 3 | 4 | 25 | 2-1/4 | 2 | 5/8 | 11 | 1-3/4 |
| 4 | 8 | 25 | 2-1/2 | 2 | 5/8 | 11 | 1-3/4 |
| 6 | 8 | 40 | 3-1/4 | 2-1/4 | 3/4 | 10 | 2 |
| 8 | 8 | 40 | 3-3/4 | 2-1/4 | 3/4 | 10 | 2 |
| 10 | 12 | 64 | 4 | 3 | 7/8 | 9 | 2-1/4 |
| 12 | 12 | 95 | 4-1/4 | 3 | 7/8 | 9 | 2-1/4 |
| 14* | 12 | 110 | 7 | 3-1/2 | 1 | 8 | 2-1/2 |

*14" CPVC Lug Insert not available

| PVC & CPVC TRUE LUG BUTTERFLY VALVE | | | | | | |
|-------------------------------------|-------------------|------------------------|---------------------|---------------------|----------------------|------------------------|
| Valve Size (in.) | No. of Bolt Holes | Bolt Torque (ft.-lbs.) | Bolt Lengths¹ (in.) | Bolt Diameter (in.) | Lug Threads per inch | Flat Washer O.D. (in.) |
| 1-1/2 | 4 | 12 | 1-1/2 | 7/16 | 14 | 1-1/4 |
| 2 | 4 | 25 | 1-1/2 | 1/2 | 13 | 1-3/8 |
| 2-1/2 | 4 | 25 | 1-3/4 | 1/2 | 13 | 1-3/8 |
| 3 | 4 | 25 | 2 | 1/2 | 13 | 1-3/8 |
| 4 | 8 | 25 | 2 | 1/2 | 13 | 1-3/8 |
| 6 | 8 | 40 | 2-1/4 | 5/8 | 11 | 1-3/4 |
| 8 | 8 | 40 | 2-1/4 | 5/8 | 11 | 1-3/4 |
| 10 | 12 | 64 | 2-3/4 | 3/4 | 10 | 2 |
| 12 | 12 | 95 | 2-3/4 | 3/4 | 10 | 2 |
| 14* | 12 | 110 | 3-1/2 | 1 | 8 | 2-1/2 |

*14" CPVC True Lug not available

- Minimum bolt lengths based on use of Spears® flanges, 1/8" full faced gaskets, standard S.A.E. hex bolts and Standard Plate "W" Series flat washers.
- Specified bolt lengths are maximum allowable for maintaining proper clearance in initial Single-Side installation with Lugs where anticipated 2nd Flange installation option is to be retained without removal of valve.
- Minimum bolt length through 2-flanges, 2-gaskets, 2-flat washers and 1-valve body.

5