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FLOWSERVE

12630-B

Worcester Controls

Tube Bore Clean Valves
½" – 2" WK70 and ½" – 2" WK74
Installation, Operation and Maintenance Instructions

CAUTION: Flowserve recommends that this product be stored indoors prior to installation, in an environment suitable for human occupancy. Avoid areas where exposure to relative humidity above 85%, acid or alkali fumes, radiation above normal background, ultraviolet light, or temperatures above 1200°F/below 400°F may occur. Do not store within 50 feet of any source of ozone.

A. INSTALLATION

1. WK70/WK74 valves may be installed for flow or vacuum in either direction. Use care to exclude pipe sealants from the valve cavity. Valves with upstream relief hole in ball (V3 option) are directional (one-way) valves.
2. Weld End Valves:
   Prior to welding or brazing, ENSURE ALL JOINT SURFACES ARE CLEAN, to prevent contamination. Valves with XBO pipe ends can be welded in the line without disassembly of the valve.
3. **CAUTION**:
   a. With the exception of valve seats, no fluoropolymer parts are reusable.
   b. Special care should be taken to avoid scratching the fluoropolymer seals during installation. Light lubrication of these seals can help to prevent damage.
   c. WK70/WK74 valves and repair kits have been assembled, cleaned, and packaged for ultra-high purity systems. Caution should be used to maintain the cleanliness of the valve parts.
   d. WK70/WK74 valves are factory assembled with NO lubrication.

B. OPERATION

1. Valve operation consists of turning the handle a quarter-turn clockwise to close and a quarter-turn counter-clockwise to open. The valve is open when the handle and/or stem flats are in line with the pipeline. WK70/WK74 valves may be automated (used with actuators).
2. These valves will provide bubble-tight shut-off when used in accordance with Worcester's published pressure/temperature chart.
3. It is not good practice to leave a ball valve partly open (throttling operation) without knowledge of the pressure drop and flow at that position.
4. Media that can solidify, crystallize or polymerize should not be allowed to stand inside ball valve cavities.
5. Torque Requirements - Operating torque requirements will vary depending on the length of time between cycles, line pressure, type of valve seats, or the media in the piping system. For a detailed analysis of valve torque requirements, refer to the Worcester Actuator Sizing Manual.

C. MAINTENANCE

Tighten the retaining nut if leakage is visible in the stem area.

CAUTION: Over-tightening stem nuts results in high operating torque and shorter stem seal life. Follow proper stem adjustment procedure below.

For Manual Valves (with two stem nuts):

1. Tighten retaining nut (lower nut) clockwise until Belleville washers are "bottomed-out" flat.
2. Back off the retaining nut ⅛ of a turn.
3. Tighten handle nut securely to lock retaining nut in place.

For Automated Valves (with one self-locking stem nut):

1. Tighten self-locking stem nut until Belleville washers are "bottom-out" flat.
2. Back off nut ⅓ of a turn. NOTE: The self-locking nut requires a good amount of effort to tighten. Ensure that Belleville washers are fully compressed flat before backing off.

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D. REBUILDING

⚠ WARNING: BALL VALVES CAN TRAP PRESSURIZED FLUIDS INSIDE THE BALL CAVITY WHEN CLOSED.

If the valve has been subjected to hazardous media, it must be decontaminated before disassembly. Follow the steps below for safe removal and disassembly procedure.

• All personnel involved in the removal and disassembly of the valve should be equipped with proper protective gear such as face shield, gloves, apron, etc.

• Relieve the line pressure and cycle the valve back and forth a few times prior to removal.

• Position valve half-open and flush the line to remove any residual hazardous media.

1. A standard repair kit is available for these valves. Use repair kit designation WKRK70 for both WK70 and WK74 valves. The kit consists of seats, body seals, four Belleville washers, stem seals and thrust bearings. Specify the material of the seats and body seals, size, Series and R number (revision no.) of valve or for non-standard valve, the “P”, “T”, “C”, or similar number, as found on the handle, the valve nameplate or the actuator bracket nameplate.

   To Order: Valve Size/Series/RK 70/Material/Revison Number, or P,T,C, or similar number
   Example: 1" WK RK 70 RT T1510

   CAUTION: If the replacement seat and seal material differs from those being removed, the valve nameplate or stop MUST be replaced or altered to indicate the new material /new rating or valve tagged to so indicate.

2. To replace seats and seals:

   a. Place valve in open position. Remove three body nuts and bolts and LOOSEN the fourth, swing out the valve center section from between the pipe ends.

   b. Now, with valve in closed position, remove old seats, body seals and ball.

   c. Remove handle nut, lockwasher, and handle (if manual valve). This step is not applicable to valves with single self-locking stem nut.

   d. Using handle or a wrench to prevent stem from turning, remove retaining or self-locking stem nut, Belleville washers, and follower from the stem. Remove stem through body cavity.

   e. Remove thrust bearings from body or stem, stem seals and seal protector from the recess in the top of the body.

   f. Clean/remove all foreign matter from the sealing surfaces of the valve and the ball.

   ***NOTE**: The ball and the surfaces against which the seats and seals are installed should be undamaged, clean, and free of pit marks and scratches. Light marring from the action of the ball against the seats is normal and will not affect the operation of the valve. Flaws that can be seen but barely detected with fingertips are acceptable. The stem and body surfaces that the thrust bearing and stem seals contact must be undamaged, clean, and free from pit marks and scratches.*

   g. For stem area rebuilding, refer to exploded view and stem build illustrations on the next page.

      Order of Assembly:

      Place new thrust bearings on stem and insert assembly through body cavity. Place new stem seals, stem seal protector, and the follower in position. PEEK thrust bearing and stem seal protectors are placed outside of seals and bearings. The seals/bearings must contact the body.

      Stem seals, stem seal protectors and thrust bearings that are the same size and color are generally interchangeable.

   h. Place two new Belleville washers in position with their larger diameter faces touching each other.

      For those valves with single self-locking stem nut, place four new Belleville washers in position (two pairs of washers with larger diameter faces touching).

   i. Thread retaining or self-locking stem nut onto stem and using handle or a wrench to prevent rotation, tighten the nut snugly. Follow Section C-Maintenance for proper stem adjustment.

   j. Replace one-piece handle and stop (if manual valve), lockwasher and handle nut onto stem. (This step is not applicable to valves with self-locking stem nut).

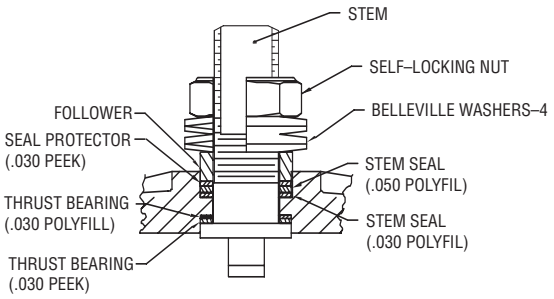
   k. With valve in closed position (stem flats oriented across the pipeline) replace ball (see note on page 4) and new seats. With valve in open position, carefully insert new body seals and place center section between the pipe ends.

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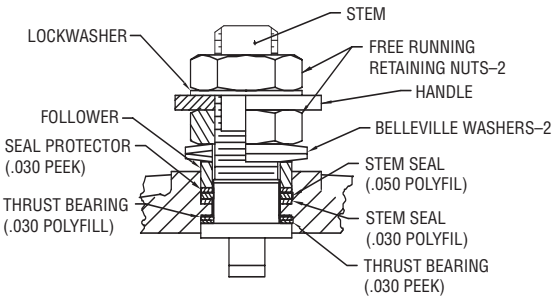
½" – 2" WK70/WK74 VALVES

AUTOMATED

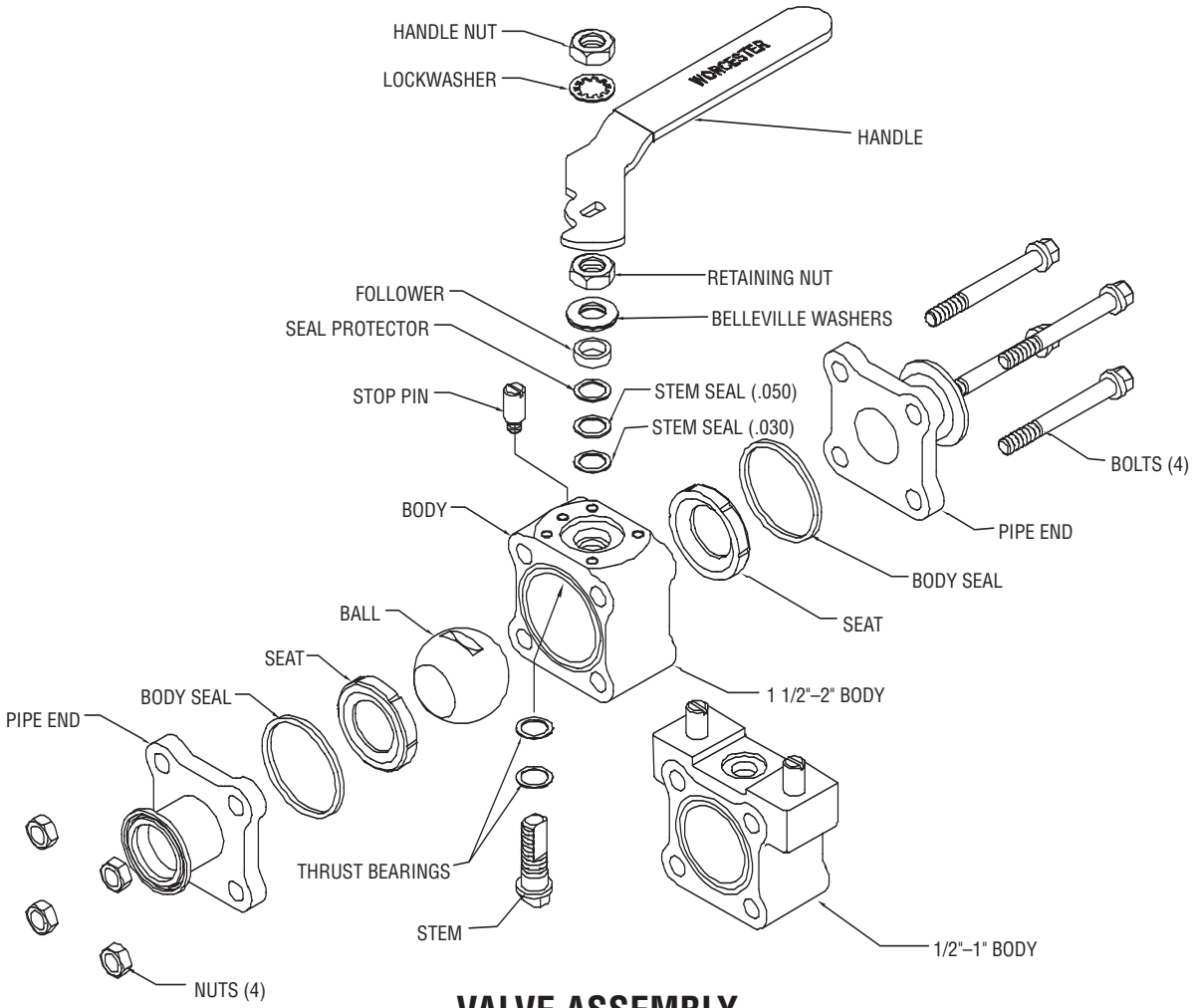


COLOR CHART FOR VARIOUS STEM COMPONENT MATERIALS	
MATERIAL	COLOR
POLYFILL	BLACK
PEEK	TAN

MANUAL



TO CONVERT A MANUAL VALVE STEM BUILD TO AUTOMATED: REMOVE THE TOP RETAINING (HANDLE) NUT, LOCKWASHER, HANDLE, LOWER RETAINING NUT, TWO BELLEVILLES AND STOP PIN(S). ADD FOUR BELLEVILLE WASHERS AND THE SELF-LOCKING NUT. SEE THIS I.O.M. FOR ADDITIONAL INSTRUCTIONS AND CAUTIONS.



VALVE ASSEMBLY

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***NOTE**: Valves with a pressure relief hole in the ball (V3 option) must be assembled and installed with the hole upstream, when the valve is closed, to ensure that cavity relief will occur upstream. Any valve with a relief hole will have a directional arrow pointing downstream. Arrow is either stamped on the body or on a metal tag welded to the valve body.*

Replace and tighten body bolts and nuts per torque figures found in table to the right.

CAUTION: Use care not to scratch the body seals when replacing the valve body back into the line.

When ordering parts, please provide the part name and the following information as found on the valve handle, valve nameplate, or mounting bracket nameplate:

1. Valve Size, Style and Revision Number, Example ½" WK70 66RT XBO R0 Stem.
2. Valve Size, Style and five-character code, known as a "P", "T", "C", or similar number, (the designation for a non-standard product). Example, ¾" WK7066RT TC T0726 Ball.

The terminology shown in the exploded view parts listing on the previous page is standard.

Tighten/torque all body bolts evenly and diagonally opposite each other, alternating in a crisscross pattern. Use torque figures below:

STAINLESS STEEL STUDS		
Bolt Diameter	**in-lb**	**ft-lb**
¼"	72-96	6-8
5/16"	120-144	10-12
⅜"	192-216	16-18
7/16"	336-384	28-32

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