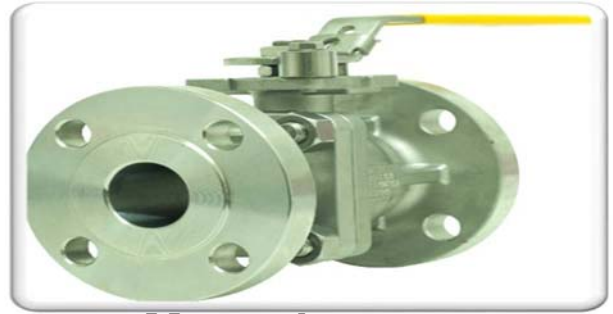




## **Flo-Tite Full Flo Series** **Models F150 and F300** **Flanged End Ball Valves**



## **Installation, Operation and Maintenance Manual**

Note: Before using a valve, read the entire IOM carefully and make sure you have a clear understanding of all information included.

This manual describes the procedures for the safe and efficient installation, operation and maintenance of Flo-Tite Flanged Series Ball Valves. **Failure to follow the procedures in this manual may result in Flo-Tite warranties being voided.** Problems with the operation and maintenance of these valves should be directed to the nearest Flo-Tite Representative.

The Flo-Tite Flanged Series are designed as a split body, two-piece construction, to allow ease of access for maintenance of the valve ball and seat without special tools. This line of valves utilizes the “free floating” ball principle. The ball is not fixed, but is free to move with the line pressure. As a result, these valves are capable of tight shut-off with the flow in either direction or dead-ended, regardless of the position of the valve in the line. The downstream seat, which is opposite the pressurized side, of a closed valve must carry the load exerted by the line pressure on the ball, while the upstream seat is subject to little load or wear. For this reason, it is sometimes possible to increase useful seat life by turning the valve end-for-end in the pipeline.

**NOTE:** Please note that Models F150 and F300 are supplied in two size ranges, ½” to 2” and 2 ½” and larger. Instructions and components may be different by size range. Please ensure that the correct size range instructions and drawing reference is used for the valve being serviced.

### **INSTALLATION:**

#### **A. Receiving and Preparation Procedure**

- A1. Remove shipping protection
- A2. Inspect the valve(s) for transportation damage\*
- A3. Inspect the valve bore and remove any debris
- A4. Cycle the valve and inspect the valve for smooth operation, size permitting
- A5. As shipped from the factory, valves may contain a silicone based lubricant. This is for break-in and may be removed if it is objectionable for a particular application by disassembling and solvent washing.

\*If transportation damage is found, immediately take pictures for record purposes and contact the inbound carrier to submit a claim.

#### **B. Installation Procedure**

B1. General – The valve may be fitted in any position in the pipeline. Prior to installing the valve, the pipe on either side of the intended installation should be checked to be free of dirt, debris, weld slag, etc. to prevent damage to the seats, seals and surface of the ball. The piping must also be free of tension or compression.

**WARNING** – Never use the valve as a pipe support or structural member.

**B2.** Installation of the Flo-Tite Flanged Series valves is accomplished by inserting the valve between flanges attached to piping and supplied by others and attaching the valve to the mating flanges with fasteners of the size and type specified by industry standards. Fasteners should be tightened in a “star” pattern.

**Caution** – Ensure that mating flanges are of the same size, type and pressure rating as the valve and that fasteners are of the size and type approved for the flange.

**B3.** Valves with actuators should be checked for actuator-valve alignment. Angular or linear misalignment will result in high operational torque. Electric and/or pneumatic connections should be made in accordance with the correct actuator IOM instructions.

### C. OPERATION:

**C1.** Manual operation of the valve is accomplished by turning the handle ¼ turn (90 degrees).

\*The valve is open when the handle is “in-line” with the valve or pipeline. The valve is closed when the handle is “across” or perpendicular to the valve or pipeline.

**C2.** Flo-Tite Flanged Series valves can be operated with either electric or pneumatic actuators. For instructions on installation and operation, refer to the IOM for the correct actuator.

**C3.** Flo-Tite Flanged Series valves may include one of several different styles of limit switches and positioners. Please refer to the appropriate IOM for each device.

### MAINTENANCE:

**CAUTION** – Ball valves can trap fluid in the ball cavity when closed. Be prepared to capture and manage any liquid retained in the valve body when disassembling the valve.

**WARNING** – **If the valve has been in hazardous fluid service, review applicable MSDS sheet and decontaminate the valve before disassembly. All persons involved with the disassembly should wear personal protective equipment such as aprons, gloves, face shield, etc. to prevent personal injury.**

Access to the valve internals starts with relieving pressure in the pipeline. Turn the valve handle to the 45 degree, half open, position and flush the line, when applicable, to remove any hazardous material from the line. Consult the metal tag attached to the valve body to determine the correct seat and seal materials. Repair kits can be ordered from the local Flo-Tite Representative. This should be done prior to any disassembly work.

**CAUTION** - Valves with actuators, limit switches or positioners should have these devices disassembled from the valve prior to disassembling of the valve.

**WARNING-** **Use extreme caution disconnecting any electrical and/or pneumatic sources to the valve to protect against personal injury. Isolate the valve actuator prior to disconnecting.**

### **Stem Packing**

Stem seal leakage may be corrected without disassembly. Tighten the packing gland nuts one flat at a time alternating between nuts, until leakage stops. If leakage continues, or the valve’s operating torque becomes excessive, the seals are worn and replacement of the packing will be necessary.

**WARNING-** **Do not remove packing gland while the line is under pressure. Personal injury could occur.**

## D. Valve Disassembly-

**WARNING** – Use extreme caution when removing the flanged valve from the pipeline to prevent personal injury that may be caused by “cold springing” of the piping.

**CAUTION** – valves shall be adequately supported prior to unfastening the studs and nuts that hold the valve in line and secured with lifting straps or slings to hold the weight of the valve.

**D1.** Remove the flange bolts and nuts and lift the valve from the line for servicing. Note – care should be taken to avoid scratching or damaging the flange gaskets. Damaged gaskets must be replaced prior to reinstalling in the line.

**D2.** Safely place the valve on a clean, secure and stable work surface. Protect the flange faces when handling to prevent scratching and damage.

**D3.** Match mark the body and body end to insure correct alignment when the valve is reassembled.

**D4.** Remove body end nuts and lift off the body end. One body seal and seat should come out with the body end.

**D5.** The ball may be removed by first placing the valve in the fully closed position. Use a lifting strap and lifting device for safety purposes when the weight of the ball dictates

**CAUTION** – Use extreme care in handling the ball to avoid damage.

**D6.** Remove the second seat and seal.

**D7.** Remove Stem -

- a. 1/2” to 2” valves – Remove handle nut, handle, lock washer, Belleville washer and packing follower.
- b. 2 1/2” to 12” – Remove handle nut, handle, snap ring, travel stop, packing gland and packing follower.

The stem must be removed from the inside of the body. Gently tap the top of the stem with a non-metallic mallet. The thrust washer should come out with the stem. Stem packing can now be removed. If a packing pick is used to remove packing, care must be taken not to scratch any surface.

## Visual Inspection-

Clean and inspect all metal parts. It is not necessary to replace the ball and stem unless the seating surfaces have been damaged by abrasion or corrosion. Flo-Tite strongly recommends that all seats, seals and packing be replaced whenever a valve is disassembled for reconditioning. This is the surest protection against subsequent leakage after reassembly. Replacement parts are sold in kit form. Refer to the metal tag attached to the side of the valve body to identify the specific sealing materials used. Kits can be obtained via the local Flo-Tite Distributor. Replacement parts should be purchased prior to valve disassembly. Required information to purchase replacement parts include:

- a. Line size
- b. Model designation
- c. Seat/seal materials – see stamping on metal tag attached to the valve body.

## Valve Reassembly -

**Note-** the valve may be reassembled and operated dry when no lubricants are allowed in the system; however, a light lubricant on the ball and stem will aid in assembly or reduce initial operating torque. Lubricant used must be compatible with the intended system fluid.

Install one new seat and seal in the body cavity with the spherical curvature facing the ball. Replace the stem in the reverse order from above based on valve size, including reattaching the handle. Turn the handle to the closed position. This will align the stem tang and the ball slot. Slide the ball into position. Turn the handle to the open position to help hold the ball in place. Install the second seal and seat into the body end.

Place the body seal gasket into the shoulder counter-bore at the flange in the valve body. Using the match marks to realign the body and body end, carefully place the cap end back into the body. Install the cap end nuts and tighten in a star pattern to the torque values specified below.

**Note: Make sure ball is in closed position before tightening up the end connections.**

**WARNING- extreme care must be exercised during tightening of the body end nuts to make sure that complete engagement of studs with the body flange is maintained. There should be at least one stud thread exposed on each side.**

**Cycle the valve slowly, with a gentle back and forth motion to build gradually to a full quarter turn. By cycling slowly, the new seat lips will conform to the seal shape against the ball. An initial fast turning motion, at this point, may cut the seats before they have a chance to form the proper seal. When possible and practical, test the valve prior to reinstalling into the pipeline.**

**Reinstallation-**

Carefully inspect the faces of both the valve flanges and the mating flanges to ensure they are clean and undamaged. Place the valve in the preferred position and support it from moving. Install a sealing gasket between each pair of flanges and reinsert the bolting and hand tighten. Secure the bolting to the recommended torque values in a star pattern to ensure that the gasket is compressed evenly around the entire circumference.

**Repair Kits –**

Repair kits typically consist of replaceable seats, body seals and packing seals. Refer to the unit nameplate, as shown below, to confirm what materials are currently installed. Contact your local Flo-Tite Representative to order and receive the kits prior to any maintenance work.

VALVE - SOFT PARTS							
SEAT		STEM SEALS		BODY SEAL		O-RINGS	
TFM	F	TFM	F	TFM*	F	VITON	V
CTFM	Y	CTFM	Y	CTFM	Y	EPDM	E
PTFE	T	RTFM	X	PTFE*	T	PTFE	T
RPTFE	R	PTFE	T	RPTFE*	R	BUNA	B
50/50	S	RPTFE	R	50/50	S	NONE	N
UHMWPE	U	50/50	S	UHMWPE	U		
PEEK	P	UHMWPE	U	PEEK	P		
Cavity Filled	C	PEEK	P	Graphite	G		
Metal	M	Graphite	G	Kel-F	K		
Kel-F	K						

**For all Soft Body Seals\* add 15% to bolt torques**

**Body Assembly Torque Values**

Valve Size	Hex Socket Size	Bolt Torque (in-lb)
1/2", 3/4"	1/2"	188
1"	11/16"	290
1 1/2"	7/8"	290
2"	7/8"	385
2 1/2", 3", 4"	7/8"	500
6", 8"	1 1/16"	1050

**Standard Seated Valve Torque (In-Lb)**

Class	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	6"	8"	10"	12"
150	62	90	100	270	360	620	800	1700	4600	9900	17000	23000
300	65	95	105	284	378	651	840	1785	4830	10395	17850	24150

**Flo-Tite's marking system follows MSS SP-25-1998**

**Valve Markings**- Casted into valve bodies include the following; Flo-Tite Name, Model Numbers, Body Material, Valve Size, & Class Pressure Rating

All Flo-Tite valves have metal nameplates spot welded to the valve body.

**Standard Trim Soft Parts**

ID-Codes

Seat material  
Stem seal material



**Valve Side A**

- Viton O-ring
- Body seal material

Flo-Tite Name  
Valve Model



**Valve Side B**

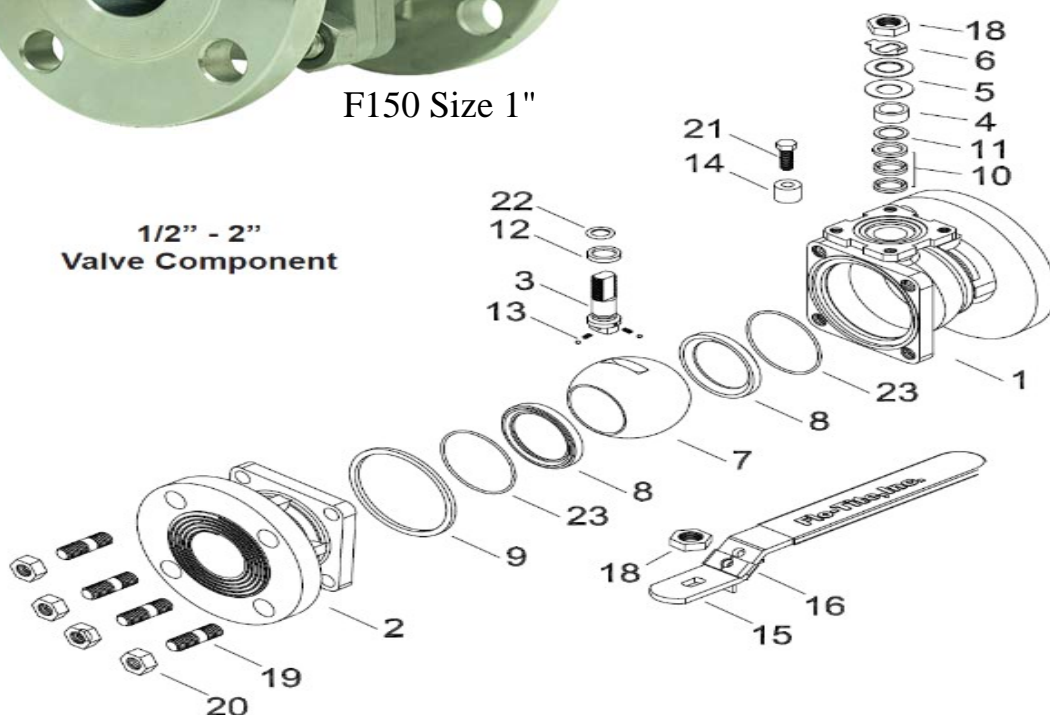
- ANSI Class
- Body Material

No.	Part List
1	Body
2	End Cap
3	Stem
4	Packing Follower
5	Belleville Washer
6	Locker Washer
7	Ball
8	Seat
9	Gasket
10	Stem Packing
11	Packing Protector
12	Thrust Washer
13	Anti-Static
14	Valve Stop
15	Handle
16	Locking Device
17	Handle Sleeve
18	Thin Nut
19	Body Stud
20	Body Nut
21	Bolt
22	O-Ring
23	Seat O-Ring



F150 Size 1"

1/2" - 2"  
Valve Component



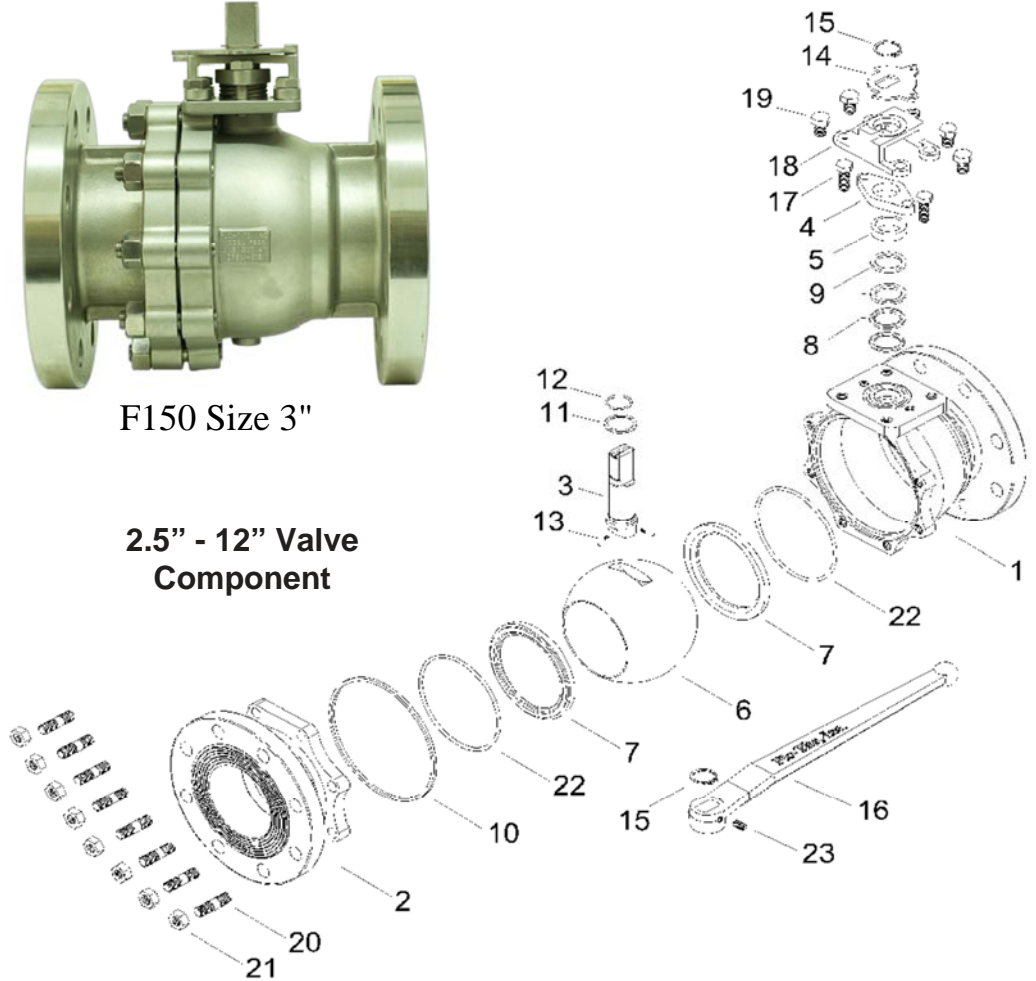


No.	Part List
1	Body
2	End Cap
3	Stem
4	Packing Gland
5	Packing Follower
6	Ball
7	Seat
8	Stem Packing
9	Packing Protector
10	Gasket
11	Thrust Washer
12	O-Ring
13	Anti-Static
14	Travel Stop
15	Snap Ring
16	Handle
17	Gland Bolt
18	Stop Housing
19	Housing Bolt
20	Body Stud
21	Body Nut
22	O-Ring
23	Set Screw



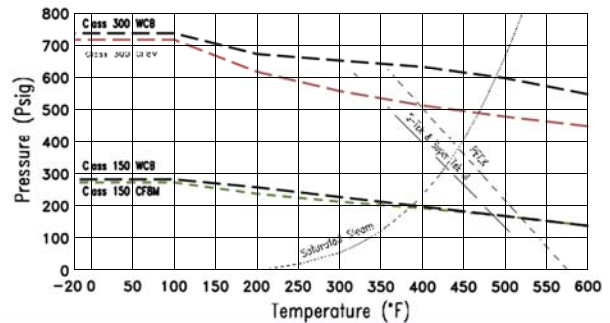
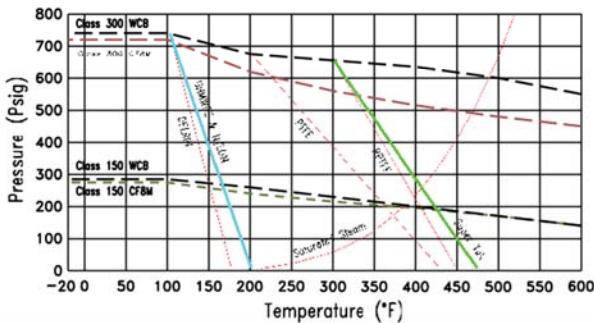
F150 Size 3"

2.5" - 12" Valve Component



## Pressure Temperature Rating

Higher Temperature Requirements



Saturated steam services above 150 psi use either Super Tek III or S-Tek. Saturated steam services above 250 psig use metal seats. Metal Seated Ball Valve will take full ANSI body metal material ratings

Please carefully review all important procedures in this manual. If anything is unclear, please feel free to contact Flo-Tite directly.



Flo-Tite, Inc.  
4815 West 5th St.  
Lumberton, NC 28358

P. O. Box 1293  
Lumberton, NC 28359  
Website: [www.maxsealinc.com](http://www.maxsealinc.com)

Tel: (910) 738-8904  
Fax: (910) 738-9112  
E-mail: [sales@maxsealinc.com](mailto:sales@maxsealinc.com)