



ISV Installation, Maintenance and Operation Manual

API 608 & MSS-SP110 Three Piece Threaded/Socket Weld End Floater Ball Valves

ISO1 – I-Series Forged Oilfield. (I-136, I-236, I-336, I-138, I-238, I-338)

IMO

006

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First Issue: 06/27/2011

Prepared By: D. Monteiro

Approved By: E. Gulgun

Rev. Date: 11/29/2012

Rev. No: 2

1. INTRODUCTION

1.1. WARNING

Do not install, maintain or operate valves before having carefully read this IMO in order to avoid prospective damages to people and property. Always use the valves within the limit of the working conditions as described in International Standard Valve (ISV) technical documents, and/or nameplate.

For your safety and protection, follow essential and best safety practices prior to removing the valve from service and before any disassembly of the valve

1.2. Applicable safety regulations should be followed at all times.

1.3. Never loosen or remove any bolting or fittings while valve is under pressure.

1.4. Keep hands and objects out of the valve if there is a possibility of unexpected valve actuation in order to prevent serious damage or injury.

1.5. For proper handling and disposition, obtain a Material Safety Data Sheet (MSDS) of the media that the valve is exposed to and follow the material handling precautions associated with the media. Immediately contact the proper authority if there is any additional concern.

1.6. Wear protective clothing or equipment regularly required when working with the media involved.

1.7. Depressurize the line and valve as follows prior to removal of the valve or valve parts:

1.7.1. Drain the line while the valve is in the open position.

1.7.2. Close and open the valve to relieve any pressure that may be trapped in the valve body cavity prior to removal from service. Leave the valve in the open position.

1.7.3. Remove the valve from the line carefully.

1.7.4. Carefully open and close the valve several times while the valve bore is in vertical position to drain any remaining media before disassembly.

1.8. ISV assumes no liability for damages, failures, or any other occurrences resulting from unauthorized modification, misuse, or use of non-original manufactured equipment parts.

1.9. Any unauthorized repair or modification may void the product warranty; refer to ISV warranty information for details.

1.10. ISV withholds the right to revise the valve design. This IMO may not exactly represent your valve's construction. If there are any concerns, please contact the ISV Engineering department.

2. STORAGE

2.1. ISV valves are shipped in the full open position with the exception of valves that are equipped with fail-closed actuators. A corrosion inhibitor is applied to all end connections, flanged sealing surfaces and bores (non-stainless steel valves). End protectors are installed to prevent foreign material from entering the body cavity and from scratching and damaging the sealing surfaces of the end connections. This will provide adequate protection for indoor storage.

2.2. Do not remove the end protectors except for inspection or installation.



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- 2.3. If valves require outdoor storage, ISV recommends a clean, dry, covered area off of the ground. Special packaging and additional lubrication may be required.
- 2.4. Never store the valve in a partially open position. If the valve is left in a partially open position for an extended period of time, the soft seat can be damaged.

3. INSTALLATION

- 3.1. Use proper handling equipment based on the weight of the valve. To avoid damage to the valve or personnel while handling, use a rig or sling if the weight is over 50lbs.
- 3.2. Valve can be installed in line bi-directionally.
- 3.3. With valves that have fittings or extensions, check and tighten before valve is put into service.
- 3.4. When the valve is ready for installation, remove the end protectors from both ends.
- 3.5. Inspect the valve internals, valve pipe connections and adjoining pipe to make sure they are free of damage, dirt and debris.
- 3.6. Install the valve in open position.
- 3.7. Threaded End Valves:
 - 3.7.1. To insure a leak tight threaded joint, use PTFE tape on the pipe before attaching valve.
 - 3.7.2. Hand-thread the valve onto the pipe, or pipe into the threaded end.
 - 3.7.3. **CAUTION: Tighten pipe into the end cap no more than 3/4 turn beyond hand tight to affect a seal. Tightening more than 3/4 a turn may cause damage.**
 - 3.7.4. When using a pipe wrench, make sure the wrench is always on the end cap into which the pipe is being threaded to prevent twisting or misalignment.
- 3.8. Weld End Valves:
 - 3.8.1. Verify that the weld area is clean. The weld area should be free of oil, dust, rust, paint or any other contaminants that could inhibit the welding process.
 - 3.8.2. Proper valve to pipe alignment should be verified. If necessary, make corrective adjustments.
 - 3.8.3. Any welding should be done by qualified personnel while using properly certified and approved welding procedures in accordance with all related regional codes and regulations.
 - 3.8.4. Any weld process related heat applied to the valve body could damage the seat and seals.
 - 3.8.5. Minimize heat generated by welding to prevent damage to seat and seal.
 - 3.8.6. **CAUTION: Keep the valve in open position and push cool air thru the valve to eliminate heat from the soft seats.**
 - 3.8.7. Perform localized post weld-heat treatment (PWHT) if necessary.
 - 3.8.8. Clean and inspect the weld.
 - 3.8.9. After the weld is completed, the pipeline and valves should be flushed to remove any foreign contaminants.
 - 3.8.10. Use caution during flushing to avoid trapping debris in the valve cavities that could damage or scratch the sealing surfaces.
- 3.9. Check with a piping engineer to assure that the pipeline stress is not concentrated on the valve.
- 3.10. For new construction, valve and line should be flushed to eliminate contaminants and debris prior to cycling the valve.



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4. OPERATION

WARNING: To prolong the life of the seats, ensure that the ball valve is either fully OPEN or fully CLOSED. If the ball is left in the half-open position, damage could be caused to the soft seats.

- 4.1. Make sure the pipeline is clean.
- 4.2. Confirm that the ball is in the OPEN position when doing a pipeline pressure test.
- 4.3. Maximum permitted shell pressure test is 1.5 times working pressure of the valve.
- 4.4. Maximum permitted pipeline shell pressure test is 1.1 times working pressure of the valve while the valve is in closed position.
- 4.5. Directional closing is clockwise for both the lever and gear operated valves.
- 4.6. In the event a new operator such as lever, gear or actuator is installed, the open and close stops of the new operator shall be properly adjusted if needed and as minimum air seat test shall be performed prior to service.

5. MAINTENANCE

- 5.1. Maintenance intervals should be established and performed by the operational personnel according to service conditions.
- 5.2. Maintenance consists of tightening the Lever Nut (14) 1/4 turn as needed to compensate for the wear caused by the stem turning against the stem seals.
 - 5.2.1. In the event that retightening the packing is ineffective, consider replacing the stem packing (10) and stem o-ring (6).
- 5.3. Performance observations and should be done periodically to ensure safety and function.
 - 5.3.1. More frequent observation is recommended for valves under extreme conditions.
- 5.4. It is highly recommended to operate the valve at least once a month and generally as often as possible, to avoid torque increase and prevent deposit formations.

6. OVERHAUL MAINTENANCE

- 6.1. Overhaul maintenance consists of replacing the seats and all seals. Replacement of ball and stem may be required. See Warning, Disassembly and Assembly section for part replacement.

7. DISASSEMBLY

NOTE: If complete disassembly becomes necessary, replacement of all soft goods such as o-rings, gaskets, and packings is recommended. Prior to disassembly, read the complete IMO including the Warning section.

- 7.1. Verify the valve has been fully drained and depressurized per section 1, and close the valve for disassembly.
- 7.2. Remove the lever and related hardware.
- 7.3. Remove the gland flange (12), Belleville washer (15), stop screws (16), and the packing follower (11).
- 7.4. Mark the body-end cap connections with a line of reference for reassembly.



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- 7.5. WARNING: Make sure that the valve and disassembly work area are clear of flammable materials. Sparks from grinder may cause ignition of flammable substances left in valve or disassembly area.**
- 7.6.** Remove the tack welds from the end cap-body connection.
- 7.7.** Carefully unscrew and remove one end cap sub-assembly and set it on a clean surface. This may require a vice and wrench.
- 7.7.1. End cap sub-assemblies consist of the end cap (2), body-cap gasket (7), and body-cap o-ring (8).
- 7.8.** Remove the ball (3) while it is in the closed position, and set it on a clean surface.
- 7.9.** Remove the second end cap sub-assembly.
- 7.10.** With both end cap sub-assemblies off, remove the seats (5) without damaging or scratching the sealing surfaces.
- 7.11.** To remove the stem sub-assembly, push the stem sub-assembly inward, through the body.
- 7.11.1. Stem sub-assembly consists of stem (4), thrust washer (9), and stem o-ring (6).
- 7.11.2. To disassemble the stem sub-assembly, separation of the remaining parts will complete this task.
- 7.12.** Remove the stem packing (10) from the stuffing box.
- 7.13.** Clean all metallic parts with approved industrial cleaner.
- 7.14.** Inspect all parts for scratches and damages on critical surfaces.
- 7.15.** Only use OEM replacement parts as needed.

8. ASSEMBLY

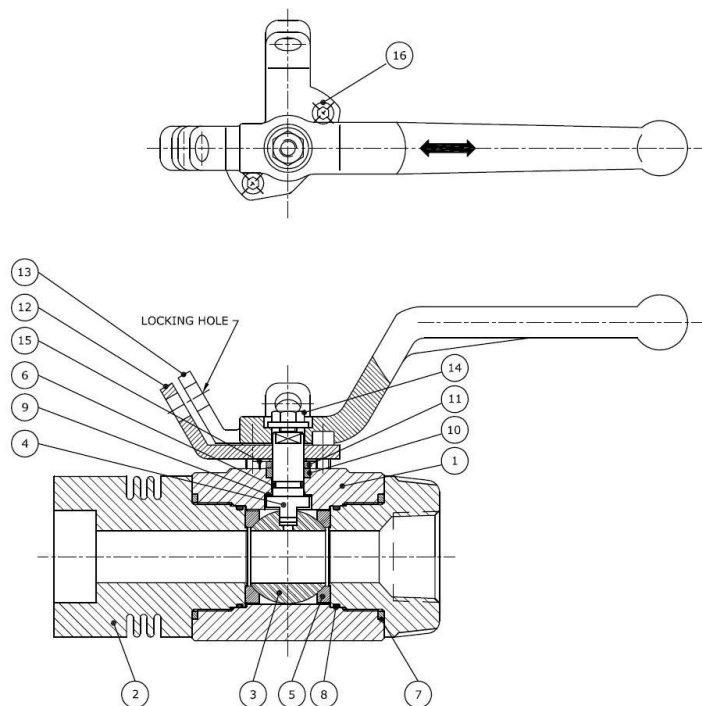
- 8.1.** Prior to assembly, verify all parts are free of scratches, damages, dirt and debris.
- 8.2.** Lubricate all moving parts and threaded connections.
- 8.3.** Assemble the stem sub-assembly.
- 8.4.** Assemble the end cap sub-assemblies.
- 8.5.** Install and hand-tighten one end cap (2) into the body (1).
- 8.6.** Install one seat (5) into the body cavity with the ball contact surface facing up.
- 8.7.** Install the stem sub-assembly and stem packing (10).
- 8.8.** Turn the stem to the closed position.
- 8.9.** Place the ball (3) into the body (1).
- 8.10.** Rotate the ball (3) to the open position.
- 8.11.** Center the ball (3) in the valve body (1).
- 8.12.** Install the second seat (5) onto the ball with the ball contact surface facing down.
- 8.13.** Install and hand-tighten the second end cap sub-assembly into the body (1).
- 8.14.** Using wrenches and the line of reference, tighten the end caps into place.
- 8.15.** Install the packing follower (11), belleville washer (15), gland flange (12), and stop screws (16).
- 8.16.** Install lever and related hardware.
- 8.17.** Verify the fully open and closed stops are set correctly.
- 8.18.** After assembly, valve needs to be pressure tested per owner's specifications.
- 8.19.** After testing, it is recommended to drain and dry the valve completely. Apply corrosive inhibitors to the machined surfaces, use protective end covers, and make sure the valve is in the fully open position.
- 8.20.** Valve shall be marked as "repaired".



9. DISPOSAL

- 9.1. If disposal of the valve is necessary, check with local environment authorities for disposal regulations.
- 9.2. Remove ISV nameplate, logo and markings before disposal to prevent improper usage.

FIGURE 1 – LEVER OPERATED ISV 2pc ISFO SERIES VALVE



PRODUCT STANDARDS	
BASIC DESIGN:	ASME B16.34
END TO END:	MANUFACTURER'S STANDARD
END CONNECTION:	ASME B16.11 THREADED
FIRE SAFE TEST:	API 607 5th Ed.

Test Standards: API 598		
	psi	bar
SHELL	4500	310.3
BACKSEAT	---	---
SEAT (HIGH)	3300	227.6
SEAT (LOW)	100	6.9

1	BODY
2	END CAP
3	BALL
4	STEM
5	SEAT
6	STEM O-RING
7	BODY-CAP GASKET
8	BODY-CAP O-RING
9	THRUST WASHER
10	STEM PACKING
11	PACKING FOLLOWER
12	GLAND FLANGE
13	LEVER
14	LEVER BOLT
15	BELLEVILLE WASHER
16	STOP SCREW

NOTES:
 1.) MEETS NACE MR-0175/ISO-015156 & MR-0103 PREDEFINED MATERIAL REQUIREMENTS
 2.) RECOMMENDED SPARE PARTS
 3.) BODY AND ENDCAPS ARE TACK WELDED.

*This sketch is provided for reference only. For detailed information contact the ISV Engineering Department.