INSTALLATION, OPERATION, & MAINTENANCE MANUAL

THREE PIECE BALL VALVES

MODELS 356 & 366

1) SCOPE

This manual describes the methods of installation, operation, maintenance, and proper storage of three piece stainless steel and carbon steel ball valves, also available in Alloy 20 and C-276. Warren's three piece ball valves come with threaded end, socket weld end, and butt weld end.

NOTE: *The procedures in this manual are to be performed in conjunction with the requirements and recommendations outlined in API specifications. Warren Valve will not be responsible for loss or expense resulting from any failure of equipment or any damage to any property or death or injury to any person resulting in whole or in part from any repairs performed by people other than authorized Warren Valve representatives. Such unauthorized repairs shall also serve to terminate any warranties, if any, on the equipment and may also result in equipment no longer meeting applicable requirements.*

1.1) Features:

- Locking Device
- 316L End Caps (On Model 366)
- ISO 5211 Mounting Pad
- Fire Safe to API 607 4th Edition
- NACE Compliant
- Graphite Package (Low Fugitive Emission)

2) SAFETY PRECAUTIONS

a) Ball valves are pressure equipment, therefore the appropriate safety measures have to be taken into account.
b) Any alterations or modifications on valves not performed by Warren valves voids any warranty issued on the valve by Warren. Without our knowledge, these alterations or modification might result in danger to equipment and/or personnel.
c) All valves are designed for use within the limits specified herein and as described on the valve body. Exceeding these specified limits is to be considered misuse and can lead to serious injuries and/or damage to the installation and environment.
d) When performing maintenance on the valves, operators must wear proper eye, head, and body protection.

e) The valve's body rating can be higher than the seat rating. Valve surface temperature may become extremely hot or cold due to the ambient or operating conditions. Prevent any type of direct contact with the valve that may harm the workers.

f) Valves are not to be used with unstable fluid.

g) To prevent valve distortion, inefficient operation, or early maintenance problems, support piping on each side of the valve.

h) Do not attempt to disassemble 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.

5) CONSIDERATIONS PRIOR TO INSTALLATION 3

1. Remove all left over particles of rust, slag, and debris from inside the pipeline and clean the mating thread thoroughly before engaging threaded end valve.
2. Prior to installation, confirm markings (pressure size, material) on the valve body and nameplate.
3. Ensure that only trained personnel should install, operate, and perform maintenance on all valves.
4. Always use tools to the intent they were designed to prevent damage to the valve and prevent injury or death to the user.
5. Remove all end protectors.

6) INSTALLATION

a) NPT Threaded End

Three piece threaded end ball valves are bi-directional and may be installed in any position with flow from either direction. These valves may be installed in vertical and horizontal pipe runs without regard to flow direction and without regard to stem orientation. For best service life there is a preferred vertical or horizontal position, to maximize sealing and minimize accumulation of sediment.

When handling or installing the valve, keep the valve in full open position whenever possible to prevent foreign object damage to the ball. Prepare the pipe connection and the valve connection using standard piping procedures. Prior to engaging male and female ends, confirm male NPT threads on piping to be assembled to valve meet gauging specifications of ASME B1.20.1 (NPT). PTFE pipe tape is suggested for use as pipe joint sealant.

b) Socket Weld and Butt Weld End

Socket weld and butt weld end valves must be partially disassembled to prevent heat damage during welding of the soft plastic seats and seals in the valve. Partially disassemble the valve by removing the bolts that attach each tailpiece to the valve body. With the valve in the open position, remove the body hex nuts and lock washers, and the body hex bolts. Carefully lift out the center section, making sure that the seats and body seals (joint gaskets) are held in position. Place the center section in a clean area where it will not be damaged and complete the welding of the end caps to the piping.

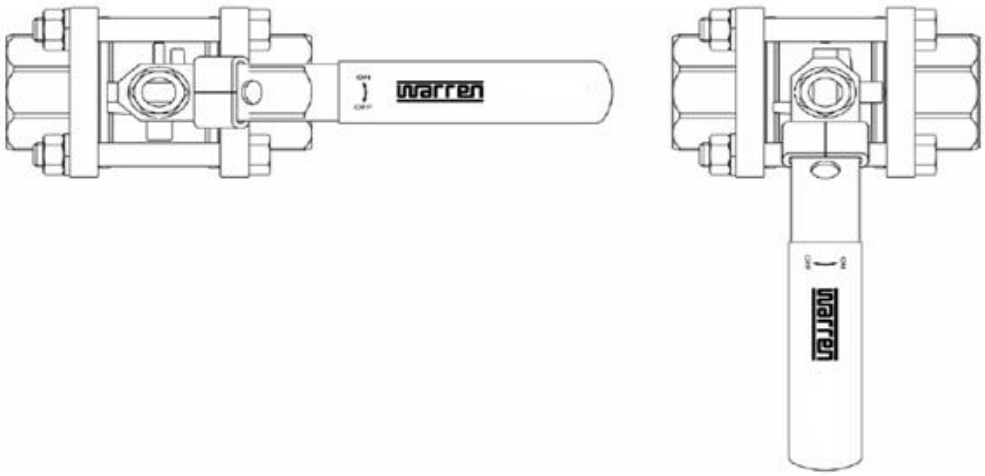
Also inspect socket weld and butt weld end for any damage. Weld pipe to tailpiece using appropriate wire/filler materials. Allow assembly to cool and repeat the process for the opposite site.

When the welds are cool to the touch, reinstall the center section of the valve between the body end caps. Make sure that the seats and seals are in place and have not been damaged. Re-install the body bolting and tighten.

NOTE: *Valves must be installed in piping systems that comply with the applicable portions of ASME B31 standards. Special considerations must be taken with respect to pipe line expansions and contractions and the media expansions and contractions within the piping system.*

7) OPERATION

Valve operation works by operating the valve handle 90˚ turn counter-clockwise to open and 90˚ to close. Direction of flow can be determined by the handle position. If the handle is in line with the piping, the valve is open. If the handle is perpendicular to the piping the valve is in the closed position.



8) MAINTENANCE

Warren's three piece ball valves are designed for long life; however, periodic inspection is suggested for possible stem leakage. Valve is self-cleaning and provides reliable leak free

performance over a long period of time. The only preventive maintenance suggested is to periodically inspect the valve for leaks around the stem. Should a leak be noticed, using a wrench snug up stem nut and gland nut about ¼ of a turn in nut in a clockwise direction. Also, snug up each of the bolt nuts against the bolts in clockwise direction while backing up the bolt to ensure tightness.

8.1) Valve Disassembly.

To safely disassemble the valve please follow the following instructions:

1. Verify that there is no pressure in line and in the system.
2. Make sure the valve is in open position.
3. Using an appropriate wrench, loosen the nut by turning it counter-clockwise while backing up the bolt head with another wrench.
4. Carefully pull each bolt out while holding the body to prevent valve from falling.
5. Make sure to remove the joint gasket between valve body and end cap.
6. Hold valve body steady and loosen the stem nut. Pull the spring washer and spring handle out.
7. Carefully loosen the gland nut by turning it in counter-clockwise direction.
8. Using spring handle turn stem 90° to closed position and pull valve ball out of the body.
9. Once the ball is out of the body. Push stem down and remove it from body.
10. Remove thrust washer out of stem.
11. Using an appropriate tool, pull stem packing out of the body.

Replace parts as needed and assemble the valve back. It is suggested to have spare joint gaskets for 356 & 366 models to replace in case of a joint gasket leaks.

CAUTION: *Over tightening of the packing can cause increased torque and reduce the life of the valve. Do not disassemble valve while under pressure nor with entrapped hazardous fluids therein.*

9) VALVE STORAGE

Valves are positioned in the full open position and plastic covers are pressed firmly into the ends of the valves to ensure that no foreign debris enters the valve at any time before installation. If valve is not equipped with a gear operator and the stem is open to the elements, it is suggested that you cover the stem or stem adapter to prevent any water from accumulating and possibly penetrating into the valve. Valves should be stored in a suitably sheltered space to prevent contamination by weather, dirt, or moisture. Valves may rust and or get contamination inside them over time if proper storage is not exercised.

10) TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION

Valve not opening or closing.	1. Iced up due to restricted flow or low temperature. 2. Pressure locked. (It is a condition when the body pressure exceeds the line pressure by an excessive amount.	1. Flush out with warm material. 2. Reduce valve temperature or pressurize line to rated working pressure to reduce pressure differential sufficient to operate valve.
Irregular ball movement.	1. Foreign matter between the ball and seats. 2. Foreign matter in ball-body cavity and ball seats.	1. Flush line to remove debris. In some cases valve may have to be removed from line to clean. 2. Clean the sealing surfaces and seats.
Valve too hard to operate / valve torque too high.	1. Accumulation or solidification of material in valve body. 2. Swelling seats. 3. Corrosion between stem and valve body. 4. Operator not installed properly.	1. Flush valve to get material out of body. 2. Install correct trim. 3. Apply penetration oil around stem. If still won't operate disassemble valve and polish stem. 4. Check with operator.
Leakage from stem.	1. Loose stem packing. 2. Tailpiece and valve body are not tightened together properly.	1. Adjust stem packing screws. 2. Replace stem packing.
Leaking between end cap and body.	1. Joint gasket is bad. 2. Lose bolts and nuts holding end cap and body together.	1. Replace joint gasket. 2. Tighten bolts and nuts until leak stops.

11) Revisions

Revision	Description	Revision Date	Approved By
A	Original Issue	8.22.16	G. Mundy
B	Corrected body seal part and specified 316 Caps part to only Model 366	8.23.16	G. Mundy
C	Added watermark to the document	9.15.2016	G. Mundy