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1. SCOPE

1.1. CAUTION

- 1.1.1. For your safety, read this manual before installation or service.
- 1.1.2. Before installing or servicing, please ensure the line pressure has been relieved and any hazardous fluids have been drained or purged from the system.
- 1.1.3. Ensure that all Lockout and Tagout procedures for the system have been properly implemented.

1.2. USE

- 1.2.1. Maximum results and long life of the valves can be maintained under normal working conditions and according with pressure/temperature rating and corrosion data chart.

2. INSTALLATION

2.1. GENERAL INFORMATION FOR INSTALLATION

- 2.1.1. The valve can be installed in any position on the pipeline.
- 2.1.2. Before installation of the valves, the pipe must be flushed clean of dirt, burrs, and welding residues, or the seats and ball surface can be damaged. The pipe must be free from tension and in proper alignment. Check to ensure that all connections are free from defects.

2.2. INSTALLATION OF THREADED VALVES

- 2.2.1. Use conventional sealant, such as hemp core, Teflon, etc. on the threads. Apply wrench only on the hexagon of the valve ends. Tightening by using the valve body or lever can seriously damage the valve. In some applications, screwed valves are back welded on site. These valves must be treated as per instructions for weld end valves before back welding.

2.3. INSTALLATION OF WELD-END VALVES

- 2.3.1. Tack weld the valve on the pipe in four points on both end caps.
- 2.3.2. With the valve in the open position, (lever to be parallel to the axis of the pipe), remove all the body bolts except one. Loosen the nut on the remaining bolt. Swing the body outside the pipe. Finish welding both end caps on the pipe.
- 2.3.3. When cooled down, clean both end caps and body surface.
- 2.3.4. Swing the body back in position and replace the bolts. Tighten all nuts slightly. This operation is very important to keep the body and end caps perfectly parallel, thus preventing distortion of the end caps. Tighten body bolts evenly (see section 5.5). Make sure that maximum tightening torque is observed. Check proper operation of the valve.

3. VALVE OPERATION

3.1. MANUAL

3.1.1. HANDLE

3.1.1.1. To OPEN the valve, turn the handle counterclockwise until the handle is parallel with the pipeline and the handle has contacted the handle stop.

3.1.1.2. To CLOSE the valve, turn the handle clockwise until the handle is perpendicular with the pipeline and the handle has contacted the stop.

3.1.1.3. A handle lock is incorporated into the handle.

For sizes up to 2": To use, slide the lock into the mounting pad, in the full open or full closed position. Insert an appropriate size lock or hasp into the hole in the handle. If it can be performed safely, try to turn the handle to ensure that the valve has been locked properly.

For sizes larger than 2": To use, turn the handle to the full open or full closed position. Insert an appropriate size lock or hasp into the hole in the handle and through the mounting pad. If it can be performed safely, try to turn the handle to ensure that the valve has been locked properly.

3.1.2. GEAR

3.1.2.1. To OPEN the valve, turn the hand wheel counterclockwise. The indicator will be pointing to the open position and stop rotating when fully opened. The flow can be adjusted by stopping the indicator anywhere between open and close.

3.1.2.2. To CLOSE the valve, turn the hand wheel clockwise. The indicator will be pointing to the close position and the hand wheel will stop rotating when fully closed. The flow can be adjusted by stopping the indicator anywhere between open and close.

3.2. AUTOMATED

3.2.1. A-T Controls 88-Series Ball Valves can be mounted with quarter turn actuators. Valves with actuators shall be checked for proper valve stem alignment. Angular or linear misalignments may result in high operational torque and unnecessary wear on the valve stem. See the actuator IOM for information on operating the actuator.

4. DISASSEMBLY

!!! WARNING!!!

CAUTION, FLUIDS CAN BE TRAPPED IN THE BODY OF THE VALVE, POSSIBLY UNDER HIGH PRESSURE. FOR YOUR SAFETY, IT IS IMPORTANT THAT PRECAUTIONS ARE TAKEN BEFORE REMOVAL OF THE VALVE FROM THE LINE OR ANY DISASSEMBLY.

4.1. Remove actuator or gear if equipped.

4.2. Care should be taken to not damage the surface finish of the valve components.

4.3. Remove the ends (2) from the body (1) by removing the body bolts (15) and body nuts (16).

- 4.4. Remove the seat (4) and body gasket (5) from both sides of the body (1). Once removed, with the valve in the fully closed position, the ball (3) should slide freely out of the body (1).
- 4.5. If equipped, remove the handle nut (25), handle (12), and the handle stop assembly items (18 & 19).
- 4.6. While holding the stem (7) stationary, remove the packing nut (11). Once removed, the locking saddle (10), Belleville washers (17) and packing bushing (9) should be free to remove.
- 4.7. While holding the bottom of the stem (7), push the stem (7) through the inside of the valve body (1).
- 4.8. Remove the packing set (8) and stem seal (6).
- 4.9. Inspect all components for damage and if necessary clean or replace.

5. ASSEMBLY

- 5.1. Care should be taken to not damage the surface finish of the valve components.
- 5.2. Place stem seal (6) on the stem (7) and install it by going through the body (1). Insert V-style packing set (8) over stem (7), with the V pointing away from the valve (see Bill of Materials for correct orientation).
- 5.3. Install the packing gland (9), the Belleville washers (17), locking saddle (10), and packing nut (11). While holding the stem (7), tighten the packing nut (11) to the torque listed in the Fastener Torque Chart. Tighten further if needed in order to be able to place the locking saddle (10) over the packing nut (11).
- 5.4. Ensure the stem (7) is in the closed position with the body tang parallel with the flow of the valve. Insert a seat (4) and body gasket (5) in one side of the body (1). Carefully slide the ball (3) into the body (1) and insert the other seat (4) and body gasket (5).
- 5.5. Assemble ends (2) onto body (1). Insert all body bolts (15) and nuts (16) into valve and tighten to finger tight, making sure that the ends (2) are flat against the body (1). Tighten all body bolts (15) (on both sides for valves 2-1/2"-4") from the nut (16) side (if equipped) in a star pattern to 50% of the final torque shown in the Fastener Torque Chart. Using the handle (12) or an adjustable wrench, cycle the valve 3 times. Tighten all body bolts (15) to the final torque in a star pattern. Check each body bolt (15) torque and tighten if needed a final time. It is acceptable for the torque to relax slightly over time due to relaxation of the polymer components, but the valve will still seal properly. If leakage is detected, repeat the steps for tightening the body bolts.
- 5.6. If required, assemble the locking device (21), handle stop (18 & 19), handle (12), and handle nut (25).

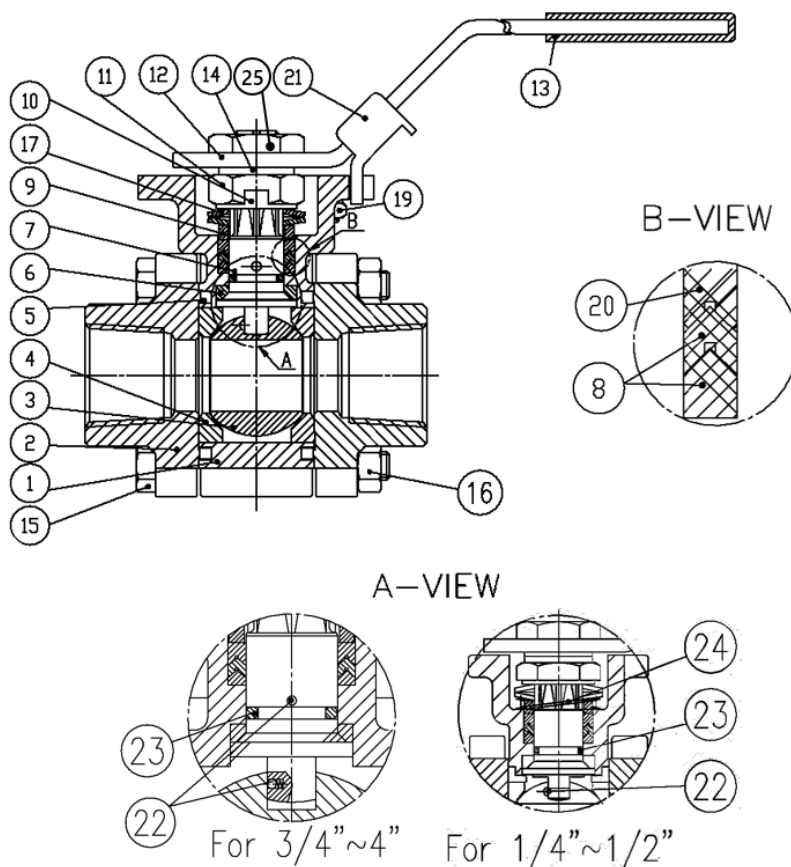
Fastener Torque Chart			
Valve Size	50% of Max Body Bolt Torque (In-lbs.)	Max Torque of Body Bolt (In-lbs.)	Max Torque of Stem Nut (In-lbs.)
1/4"	50	100	69
3/8"	50	100	69
1/2"	65	130	78
3/4"	80	160	78
1"	100	200	122
1-1/4"	110	220	122
1-1/2"	188	375	165
2"	203	405	165
2-1/2"	220	440	191
3"	243	485	191
4"	258	515	217

6. REPAIR KITS

Repair kits are available to replace all soft goods. See Bill of Materials for components that are included in the repair kits.

7. BILL OF MATERIALS

MATERIALS LIST			
NO.	PART NAME	QTY	REPAIR KIT
1	BODY	1	
2	END CAP	2	
3	BALL	1	
4	SEAT	2	X
5	GASKET	2	X
6	STEM SEAL	1	X
7	STEM	1	
8	GLAND PACKING	2^	X
9	GLAND	1	
10	LOCK SADDLE	1	
11	PACKING NUT	2	
12	HANDLE	1	
13	HANDLE SLEEVE	1	
14	STEM WASHER	1	
15	BODY BOLT	*	
16	BODY BOLT NUT	#	
17	BELLEVILLE WASHER	2	
18	STOP BOLT	1	
19	BOLT NUT	1	
20	STEM PACKING	1^	
21	HANDLE LOCK	1	
22	ANTI-STATIC DEVICE	2	
23	O-RING	1	X
24	SPRING	1	
25	HANDLE NUT	1	
SIZE 2-1/2" THRU 4" INCLUDE SEAT RETAINER RINGS			
^ PACKING SET			
* 1/4" THRU 1-1/2" QTY= 4 PCS			
* 2" THRU 4" QTY= 6 PCS			
# 1/4" THRU 1-1/2" QTY= 4 PCS			
# 2" THRU 4" QTY= 12 PCS			



A-T Controls product, when properly selected, is designed to perform its intended function safely during its useful life. However, the purchaser or user of A-T Controls products should be aware that A-T Controls products might be used in numerous applications under a wide variety of industrial service conditions. Although A-T Controls can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser / user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of A-T Controls products. The user should read and understand the installation operation maintenance (IOM) instructions included with the product and train its employees and contractors in the safe use of A-T Controls products in connection with the specific application.

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