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1 SCOPE

1.1 **CAUTION**

1.1.1 For your safety, read this manual before installation or servicing.

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 A-T Controls DR-Series Ball Valves are available in Threaded, Socket Weld, or Butt Weld Ends.

1.2.2 Maximum results and optimum valve life can be maintained under normal service conditions and in accordance with pressure/temperature ratings and corrosion data charts.

2 INSTALLATION

2.2 A-T Controls DR-Series are bi-directional and can be installed with the flow in any direction. The valve can be mounted in any position so that the handle, gear, or actuator has proper clearance, allows for optimal drainage, can be easily accessed, and the open/close indicator can be viewed. If the gear is equipped with a chain wheel, the valve shall be mounted in a way so that the chain does not come in contact with the valve or pipeline.

2.3 Before installation of the valves, the pipe must be flushed clean of dirt, burrs, and welding residues. Failure to do so can cause the seats, sealing surfaces, and internal polish to be damaged.

2.4 The pipe must be free from tension and in proper alignment.

2.5 Before installation of the valves, check to ensure that all connections are free from defects.

INSTALLATION OF THREADED VALVES

2.6 Use conventional sealant, such as hemp core, Teflon, etc. on the threads.

2.7 Apply wrench only on the hexagon of the valve ends. Tightening by using the valve body or lever can seriously damage the valve.

2.8 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.

INSTALLATION OF WELD-END VALVES

2.9 Prepare a clean working area.

2.10 With valve in open position, remove body bolts or screws.

2.11 Separate the ends from the body and remove the valve seats and joint gaskets, taking care not to damage plastic parts.
Place ball in part-open position to assist removal of seats.

2.12 Supporting ball to prevent it from falling out of body, turn the stem so that the stem indicator is parallel to the valve and remove the ball.

2.13 Reinstall bolts in each end cap, re-assemble the end caps with the body in the correct alignment.

2.14 Tack weld the ends to the pipeline only, remove the body to protect the stem assembly from welding heat, then complete the weld.

2.15 When cooled down, clean pipe end faces, replace ball carefully and turn until the stem indication is perpendicular to the valve. Reinstall seats and body gaskets.

3 VALVE OPERATION

3.1 MANUAL

3.1.1 Handle/Gear

A-T Controls Multi-Port Ball valves can be used for in 90 degrees increments by turning the handle based on different flow paths.

The flow path is clearly marked on top of the stem.

3.2 AUTOMATED

A-T Controls DR-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, POSSIBILY 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 by removing the body bolts (15) and body nuts (16).
4.4 Remove the seats (4) and joint gaskets (5). Once removed, with the valve stem (7) indicator in the perpendicular position, the ball (3) should slide freely out of the body (1).
4.5 If equipped, remove the handle nut (11) and handle (12).
4.6 Using a small screw driver, bend the locking saddle (10) down so that the packing nut (11) is able to turn freely.
4.7 While holding the stem (7) stationary, remove the packing nut (11). Once removed, the locking saddle (10), Belleville spring washers (17), packing gland (9), and stem should be free to remove.
4.8 Remove the packing set (8/8.1) 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 (8/8.1) 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 spring washers (17), lock 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 bend the locking saddle (10) over a flat side of the packing nut (11).

5.4 Ensure that the stem (7) indicator is in the parallel position with the bottom 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 body (1) and insert the other seat (4), body gaskets (5), cap seal (23).

5.5 Assemble the 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 bolts (15) from the nut (16) side 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 of the body bolts (15) to the final torque in a star pattern. Cycle the valve 3 times again. Check each body bolt torque (8) 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 handle (12), and handle nut (11).

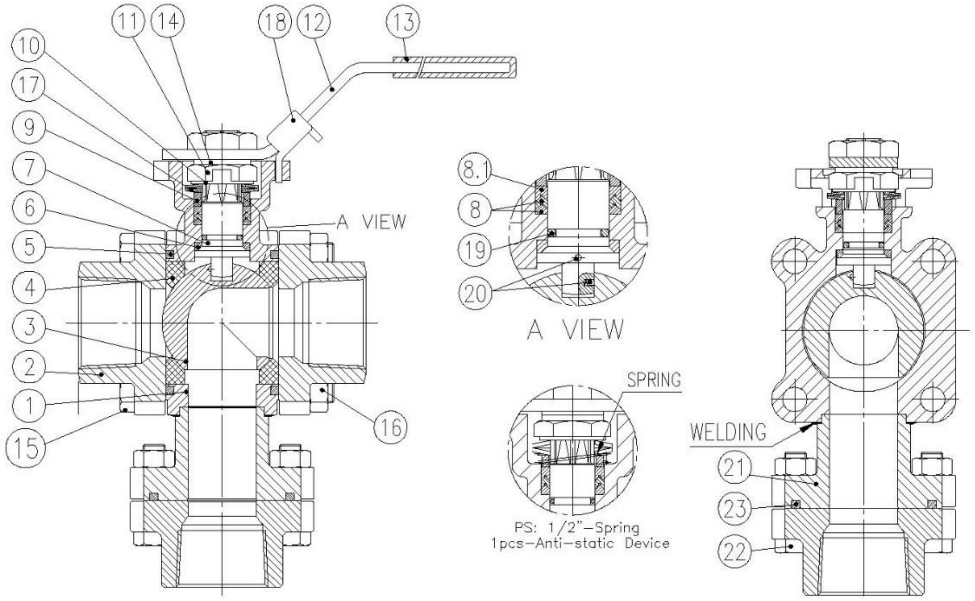
Fastener Torque Chart

Valve Size	Body Bolt Torque (in *lbs)		Packing Nut Torque (in*lbs)
	50% of Final Torque	Final Torque	
3/4"	80	160	95
1"	100	200	130
1-1/4"	110	220	130
1-1/2"	188	375	174
2"	203	405	174

6 REPAIR KITS

Repair kits are available to replace all soft goods.

7 BILL OF MATERIALS



MATERIAL LIST			
NO.	**Part Name**	**Qty**	**Material**
1	Body	1	ASTM A351 Grade CF8M
2	End Cap	3	ASTM A351 Grade CF8M
3	Ball	1	1/2"-3/4": ASTM A276 SS316 1"-2": ASTM A351 Grade CF8M
4	Seat	2	RTFE
5	Joint Gasket	2	PTFE
6	Stem Seal	1	RTFE
7	Stem	1	ASTM A276 SS316
8	Stem Packing	2	PTFE
8.1	Stem Packing	1	RTFE
9	Gland	1	AISI 304
10	Lock Saddle	1	AISI 304
11	Stem Nut	2	AISI 304
12	Handle	1	AISI 304
13	Handle Sleeve	1	VINYL
14	Stem Washer	1	AISI 304
15	Body Bolt	4	ISO 3506-1 A2-70
16	Body Nut	8	ISO 3506-2 A2-70
17	Belleville Washer	2	AISI 301
18	Handle Lock	1	AISI 304
19	O-Ring	1	Viton®
20	Anti-Static Device	*	AISI 316
21	Welding Cap	1	ASTM A351 Grade CF3M
22	End Cap Bolt	4	ISO 3506-1 A2-70
23	Cap Seal	1	PTFE

*For ½"-3/4"-1 PC; For 1"-2"-2 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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For product specifications go to https://a-tcontrols.com/Downloads/

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