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I & M Mark 79/79MX

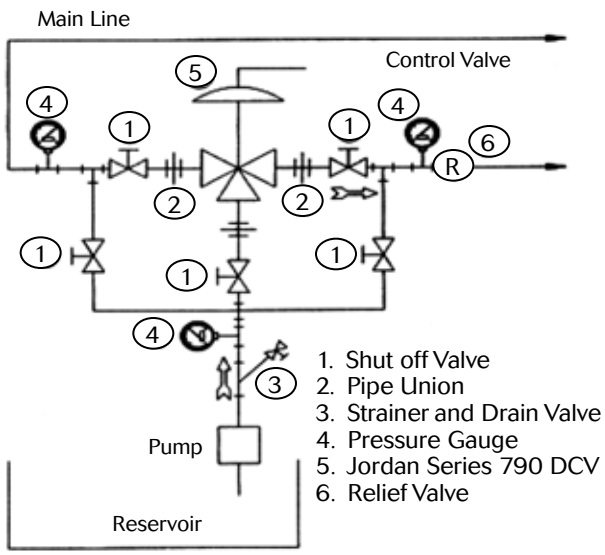
Installation & Maintenance Instructions for Mark 79 Three Way Control Valves (1/4" - 2")

Warning: Jordan Valve Control Valves must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard. Before servicing any valve, disconnect, shut off, or bypass all pressurized fluid. Before disassembling a valve, be sure to release all spring tension.

Please read these instructions carefully!

Your Jordan Valve product will provide you with long, trouble-free service if it is correctly installed and maintained. Spending a few minutes now reading these instructions can save hours of trouble and downtime later. When making repairs, use only genuine Jordan Valve parts, available for immediate shipment from the factory.

Ideal Installation



1. To protect the valve from grit, scale, thread chips and other foreign matter, ALL pipelines and piping components should be blown out and thoroughly cleaned before the installation process begins.
2. Shutoff valves, pressure gauges and by-pass piping should be installed as indicated in the Ideal Installation Schematic to provide easier adjustment, operation, and testing.
3. In preparing threaded pipe connections, care should be exercised to prevent pipe-sealing compound from getting into the pipe lines. Pipe sealing compound should be used sparingly, on male threads only, leaving the two lead threads clean. Jordan uses and recommends Seyco #2415 thread sealer Teflon ribbon.
4. A line strainer should be installed on the inlet side of the valve. A 0.033 perforated screen is usually suitable. Line strainers are available from Jordan Valve.
5. Install the valve in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to prevent water hammer and to obtain faster response.
6. The flow arrow on the valve body must be pointed in the direction of flow. The valve may be installed vertically or horizontally without affecting its operation.
7. For best control, 3' 0" straight sections of pipe should be installed on either side of the valve.
8. In hot vapor lines, upstream and downstream piping near the valve should be insulated to minimize condensation.
9. If possible, install a relief valve downstream from the valve. Set at 15 psi above the control point of the valve.
10. Expand the outlet piping at least one pipe size if the controlled pressure (downstream) is 25% of the inlet pressure or less. A standard tapered expander connected to the outlet of the valve is recommended.
11. Where surges are severe, a piping accumulator is recommended.
12. The air piping or tubing to the diaphragm case should be 1/4" or 3/8". The length of tubing should be less than 150 feet.

Start Up

1. The MK79 Control Valve has been pre-set by Jordan; however, finer adjustments may be required to compensate for pressure drops of the application. See the "Spring Pre-Loaded Adjustment" section.
2. Close all inlet, outlet and by-pass shut-off valves. Remove all pressure from downstream lines.
3. Fully open the outlet shut-off valves. Slowly open the inlet shut-off valve just enough to start flow through the control valve. Increase the flow

gradually by slowly opening the inlet shut-off valve. DO NOT fully open the inlet shut-off valve until you are sure that the controller and control valve have control of the system.

4. To shut off the line fluid, close the inlet shut-off valve first, then the outlet shut-off valves.
5. Body and cap bolts should be re-tightened per torque procedures after valve reaches operating temperature.

Maintenance

Caution: Be sure that there is no pressure in the valve before loosening any fittings or joints. The following steps are recommended:

1. Close inlet shut-off valve.
2. Allow pressure to bleed off through downstream piping. Do not cause a reverse flow through valve by bleeding pressure from the upstream side of valve.
3. Shut off air supply to controller and remove control air line from the valve.

Valve Seats

The valve seats in all Jordan valves are lapped to a critical flatness. Maintaining such tolerances is of paramount importance for your assurance of excellent control and tight shut-off. Do not use metallic objects in removing the seats. Care in handling is imperative.

A. DISASSEMBLY

1. Shut off pressure to the valve. See caution above.
2. Remove the valve from the line.
3. Note the scribed line on the side of valve body and caps. Secure one of the outlet cap hexes (1) in a vise. Remove the cap screws (2) from the other cap and lift the cap straight up.
4. Next remove the valve plate (3) and place it on the bench with the lapped surface up. You will notice that there is a locating pin which aligns the valve plate with the disc guide (5). The scribe line on the outside of the valve cap and valve body indicates that this locating pin should be on this side.
5. Now remove the valve disc (4) and the disc guide (5), placing the valve disc on the bench with the lapped surface up. Fingertip pressure should be sufficient to remove these parts.

It is imperative that the disc pin is not rotated in disassembly, cleaning, or reassembly, since this affects the stroke adjustment of the valve.

Improper handling of the seats will result in leakage or improper control.

6. Clean all parts of the body and cap with a good quality solvent. The valve disc and the valve plate then may be cleaned. Place a piece of 4/0 polishing cloth or jeweler's cloth on a smooth, flat surface, and polish the lapped surfaces. If the parts are badly scarred, DO NOT attempt to re-lap them, but return to the factory for repair or replacement. USE ONLY JORDAN REPLACEMENT PARTS. The use of other than genuine Jordan parts may impair their ability to serve you.

B. REASSEMBLY

1. On the normally open side, place the disc guide in the body bore with the index pin on the same side as the scribe line on the valve body. Apply a small amount of anti-seize compound to the body bore.
2. Place the disc in the aperture of the disc guide and engage the disc pin.
3. In placing the plate in the body, notice that the index pin hole in the lapped surface of the plate engages the index pin of the disc guide.
4. **On Normally Open Side**: with no pressure on the actuator, the disc and plate should have the orifices in perfect alignment, with the slots at 90° to the stem. It may be necessary to move the seat set in the bore to obtain this critical positioning. **On Normally Closed Side:** apply 20-25 psi to the actuator to assure the valve is stroked fully. Follow alignment instructions for Normally Open Side.
5. Apply a small amount of anti-seize compound to the cap bore and set the cap onto the plate, being careful not to move the position of the plate.
6. Tighten the cap screws uniformly, being cautious not to apply too much torque. See table on page 4 for torque recommendations. Repeat disassembly and reassembly per "A" and "B" above for second set of seats.

Special Instructions for Mark 79MX:

All instructions for the MX version are the same as above with the following modifications:

1. The disc pin protrudes through the plate, with the disc and disc guide located on top.
2. Upon start-up, it is important to simultaneously open both inlets slowly. If only one can be done at a time, open the normally closed side first.

Disc Pin

1. Remove the valve disc and plate (3, 4) following the procedure outlined under "VALVE SEATS" above.
2. Loosen the stem connector nut and bolt (19, 20) and remove connector assembly (18).

3. Back out the four alien head set screws (22) which will allow the valve body (12) to be separated from the valve yoke (21).
4. Loosen the disc pin nut (7) and rotate the disc pin (6) counterclockwise, pulling valve stem (17) upward while doing so. DO NOT remove the valve stem completely but raise it sufficiently so that the disc pin may be removed by pulling up and out.
5. Replace the disc pin so that the cast "B" on the disc pin faces up and is on the normally open side of the body and reassemble in reverse order following the procedures outlined under "VALVE SEATS" and "STROKE ADJUSTMENT".

Packing

To replace the packing, the valve need not be removed from the line; however, PRESSURE MUST BE REMOVED FROM THE VALVE!

1. Remove connector assembly (18).
2. Remove both packing flange nuts (16).
3. Remove packing flange (14) and packing follower (13).
4. Should packing spring (9) not eject packing set (10), a slight amount of upstream pressure might be necessary to remove the packing set. (Note: on Mark 79**MX** version, **downstream** pressure might be necessary to remove packing.)
5. Remove packing retainer (11) and packing spring (9).
6. Clean packing bore with solvent and blow out thoroughly.
7. Assemble in reverse order and tighten packing nut (16) so that packing follower (13) bottoms out on top of valve body.
8. Engage valve stem (17) and actuator stem (27) with connector. Tighten connector nut and bolt. No stroke adjustment is required.

Valve Stroke Adjustments

If the valve requires a stroke adjustment after maintenance on one of the above points, follow these procedures.

1. Make sure that the actuator stem (27) is stroked fully upward by the spring (29) [no pressure on actuator.]
2. Loosen the stem connector nut (20) only enough to allow the stem adaptor to rotate. DO NOT remove the stem connector (18). Proper positioning of the valve stem and actuator stem must be maintained during adjustment of seats.
3. Orifices on the disc and plate must be in perfect alignment, in the full open position, on the normally open seats. Adjust the position of the disc on the plate by moving the stem adaptor in or out of the actuator stem until the seats are in perfect alignment, in the fully open position.
4. After perfect alignment is obtained, tighten the stem adaptor lock nut and the stem connector bolt. Recheck the seat alignment to check that nothing has moved.
5. To check the normally closed side, apply 20-25 psi signal to the actuator. If the seats are not in perfect alignment, refer to "Valve Seats – Reassembly, Step 4."

Diaphragm Replacement

To replace the diaphragm, the valve need not be removed from the line, however, PRESSURE MUST BE REMOVED FROM THE ACTUATOR.

1. Remove the control air line from the actuator
2. Remove the stem connector (18) by removing stem connector bolt and nut (19, 20).
3. Remove compression from springs (29) by turning actuator stem (27) clockwise (when viewed from top of the valve).
4. Remove the actuator case bolts and nuts (37, 38) and lift the upper case (36) off of the lower case (28).
5. Screw the actuator screw (30) completely out of the actuator stem (27). Remove the diaphragm assembly.
6. Remove the two lock nuts (31) and remove the diaphragm plate (32) and the diaphragm (33) from the actuator screw (30).
7. Clean all parts with a good quality solvent. Remove encrusted material with crocus or very fine aluminum oxide cloth. Inspect all parts for excessive wear and/or damage. Replace the worn or damaged parts. USE ONLY JORDAN REPLACEMENT PARTS. The use of other than genuine JORDAN parts may impair their ability to serve you.
8. Reassemble Actuator:
   a. Assemble the seal (35), diaphragm stop (34), diaphragm (33), and diaphragm plate (32) to actuator screw (30). Assemble and tighten two lock nuts.
   b. Place the six springs (29) in lower case (28) so that they nest over the six screw heads (26).
   c. Thread the actuator stem (27) onto the actuator screw until the springs are slightly compressed. The formed bosses in the diaphragm plate must also nest in the springs.
   d. Replace the upper case (36).
   e. Replace four of the actuator case bolts and nuts (37, 38) 90° apart and tighten finger-tight. Replace the remaining bolts and nuts and tighten evenly alternating across the actuator case.

9. Adjust spring preload. See "SPRING PRELOAD ADJUSTMENT" section.

Spring Pre-Loaded Adjustment

The signal range (3 to 15 psi, or other) is preset by Jordan; however, when the valve is installed this range may shift slightly due to pressure drops across the valve. Additionally, preload adjustment may be required after one of the previous maintenance procedures.

1. Remove the air signal line from the actuator and replace with a pressure gauge and an air regulator.
2. Loosen, but do not remove, the stem connector bolt and nut (19, 20).
3. Adjust the actuator air pressure to just below the starting point of the range and rotate the actuator stem (27) until the stem just starts to move. Continue to rotate the actuator stem about one-half turn. Remove the air pressure. Increase the air pressure and check the pressure at which the valve just starts to move. Repeat actuator stem adjustment if necessary and again check pressure at which the stem starts to move.
4. After the preload has been properly adjusted, tighten the stem connector bolt and nut, and reattach the control air line.

Trouble Shooting

If You Experience Erratic Control:

- Oversizing causes cycling and hunting and reduces the rangeability of the valve. Make certain that your sizing is correct.
- Steam traps downstream may need attention.
- Safety valve may be jammed open. Repair as necessary.
- Excessive foreign matter on seats. Clean them.
- Valve stroke out of adjustment. Check and readjust if necessary.
- Valve disc may not be moving freely.

If Valve Will Not Operate:

- Diaphragm may be ruptured. Replace as needed.
- Adjusting spring broken. Replace as needed.
- Improper spring setting. Reset as needed.

Ordering Spare Parts

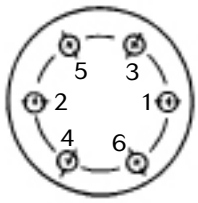
Use only genuine Jordan Valve parts to keep your valve in good working order. So that we can supply the parts, which were designed for your valve, we must know exactly which product you are using. The only guarantee to getting the correct replacement parts is to provide your Jordan Representative with the valve serial number. This number is located on the valve identification tag. If the serial number is not available, the parts needed for your valve might be determined using the following information: Model Number, Valve Body Size, Seat Material and Cv Rating, Spring Range and Set Point, Trim Material, Part Name - Number and Quantity.

NOTE: Any parts ordered without a valve serial number that are found to be incorrect are subject to up to a minimum 25% restock charge when returned.

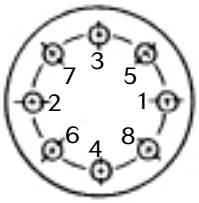
Torque Values

Torque for bolts connecting valve cap to valve body; torque in sequence shown to the following values:

Cast Iron, Ductile Iron or Bronze Valves	Carbon Steel or Stainless Steel Valves
140 in. - lbs.	150 in. - lbs.

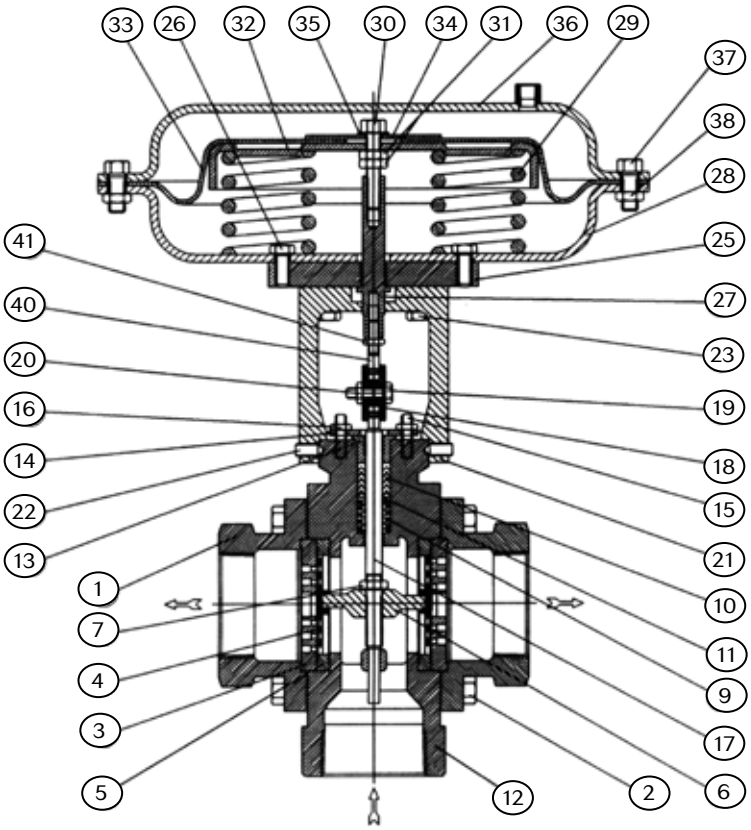


6 bolts
(or multiples)



8 bolts
(or multiples)

Illustration and Parts List



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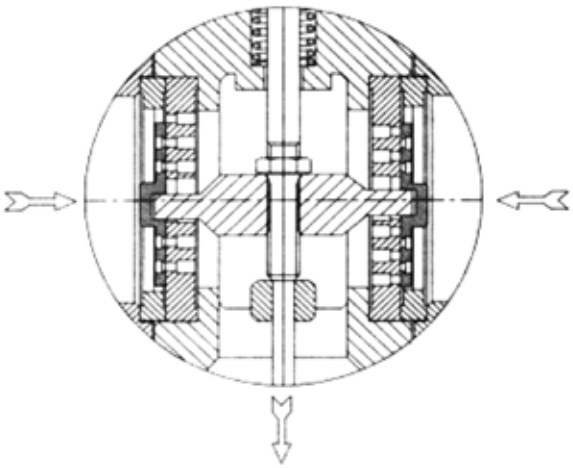

MK79MX

Item	Description	Qty.
1	Cap	2
2	Cap Bolts	12
*3	Plate	2
*4	Disc	2
*5	Disc Guide	2
*6	Disc Pin	1
*7	Disc Pin Nut	1
9	Packing Spring	1
*10	Packing Set	1
11	Packing Retainer	1
12	Body	1
13	Packing Follower	1
14	Packing Flange	1
15	Packing Stud	2
16	Packing Stud Nut	2
*17	Stem	1
18	Stem Connector	2
19	Stem Connector Bolt	1
20	Stem Connector Nut	1
21	Yoke	1
22	Yoke Set Screw	4
23	Yoke Adaptor Screw	4
25	Adaptor Plate	1
26	Screw	6
27	Actuator Stem	1
28	Lower Actuator Case	1
29	Spring	6
30	Actuator Screw	1
31	Locknut	2
32	Diaphragm Plate	1
33	Diaphragm	1
34	Diaphragm Stop	1
35	Seal	1
36	Upper Actuator Case Assembly	1
37	Bolt	3
38	Nut	3
40	Stem Adaptor	1
41	Locknut	1
42	Index Pin (not shown)	4
*	Recommended Spare Parts	

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