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## I & M Mark 50/51 (1/4" - 2")

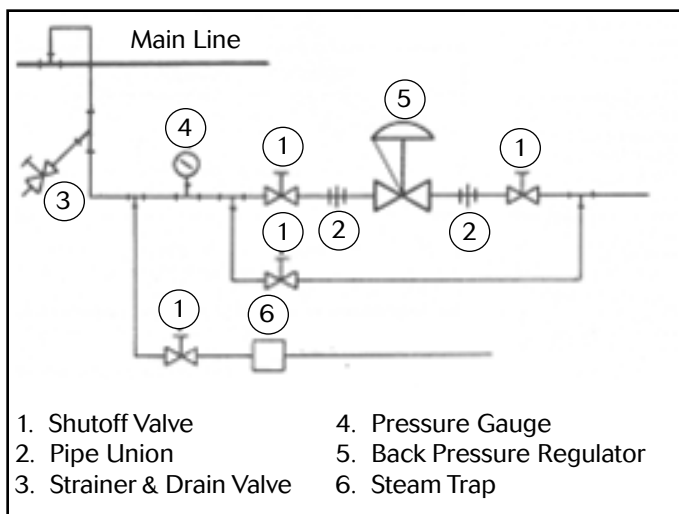
### Installation & Maintenance Instructions for Mark 50/51 (1/4" - 2") Back Pressure Regulators

**Warning:** Jordan Valve Pressure Regulators 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.

### Installation Schematic



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. A line strainer should be installed on the inlet side of the valve to protect it from grit, scale, and other foreign matter. A 0.033 perforated screen is usually suitable for this purpose. Line strainers are available from Jordan Valve.
4. For best control, 3' 0" straight sections of pipe should be installed on either side of the valve.
5. In preparing threaded pipe connections, care should be exercised to prevent pipe-sealing compound from getting into pipelines. Pipe sealing compound should be used sparingly, leaving the two end threads clean.

Jordan uses, and recommends, thread sealer Teflon ribbon.

6. The flow arrow on the valve body must be pointed in the direction of the flow. Ideally the valve should be installed in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to prevent water hammer, and to obtain faster response.
7. If possible, install a relief valve upstream from the valve. Set at 15 PSI above the control point of the valve.
8. In hot vapor lines, upstream and downstream piping near the valve should be insulated to minimize condensation.
9. In gas service, if the downstream pressure is 25% of the inlet pressure or less, expand the outlet piping at least one pipe size. A standard tapered expander connected to the outlet of the valve is recommended.
10. Where surges are severe, a piping accumulator is recommended.
11. On steam control applications, install a steam trap with sufficient capacity to drain the coil or condenser. Be sure to have a good fall to the trap, and no backpressure. Best control is maintained if the coil or condenser is kept dry.

### Start-Up

With the inlet and outlet shut off valves closed:

1. Throttle the bypass shutoff valve so that the pressure to be controlled is maintained near the set point.
2. Open the outlet shutoff valve.
3. Slowly open the inlet shutoff valve.
4. Slowly close the bypass shutoff valve, but do not close it fully until you are certain that the regulator has control of the system.
5. To change the controlled pressure, turn the adjusting screw clockwise to increase the pressure, counter-clockwise to decrease pressure.
6. Body and cap bolts should be retightened per torque procedures after valve reaches operating temperature.

### Trouble Shooting

#### If You Experience Erratic Control:

- Over sizing causes cycling and hunting and reduces the rangeability of the valve. Make certain that the siz-

ing is correct.

- Steam traps may need attention.
- Safety valve may be jammed open. Repair as necessary.
- Excessive foreign matter on seats. Clean the seats.
- Valve stroke out of adjustment. Check and readjust as necessary.
- Valve disc may not be moving freely. Check disc guide clearance, and clearance of the stem to the bushings.
- Surges in the system. Check the accumulator.

#### If Valve Will Not Operate:

- Diaphragm ruptured. Replace the diaphragm.
- Improper spring setting. Reset the valve.

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## Maintenance

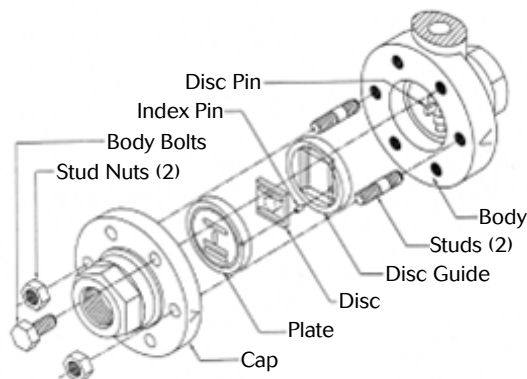
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**Caution:** Ensure that the valve is de-pressurized before loosening any fittings or joints. The following steps are recommended before performing any maintenance on the valve:

1. Close the inlet shutoff valve.
2. Turn the adjusting screw fully clockwise.
3. Allow pressure to bleed off through the downstream piping. Do not attempt to reverse the flow through the valve by bleeding pressure to the upstream side of the valve.
4. When the pressure gauges indicate that all pressure has been removed from the system, close the outlet shutoff valve and turn the adjusting screw counter-clockwise. The valve may be removed from the line and serviced.

**Note:** Refer to the drawing at the end of this document for description and proper orientation of parts.

Click here to view the Repair and Maintenance video for the Mark 50/51 Series or visit [jordanvalve.com/support/videos](http://jordanvalve.com/support/videos).



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## Valve Seats

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### A. Disassembly

Jordan Valve Sliding Gate Seats are lapped to light band flatness. Maintaining such tolerances is

of paramount importance for your assurance of excellent control and tight shutoff. **DO NOT use metallic objects in removing the seats.** Care in handling is important.

1. Follow the Maintenance procedures to remove the valve from line.
2. Note the scribed arrow (<) on the side of the body and cap. Secure the body flats in a vise. Remove the cap bolts and two nuts from the studs. Lift the cap straight up.
3. Next remove the plate and place it on the bench lapped surface up. You will notice that there is an index pin, which aligns the plate with the disc guide. The scribe on the out side of the body and cap indicates the side the index pin should be on.
4. Now remove the disc and disc guide, placing the disc on the bench with the lapped surface up. Finger tip pressure should be sufficient to remove these parts.

**It is imperative that the disc pin assembly (disc pin, stem and locknut is not rotated when disassembling, cleaning or reassembling, since this will affect the stroke adjustment of the valves.**

5. Clean all of the parts, body and cap with solvent. Place a piece of 4/0 polishing cloth or jewelers cloth on a smooth, flat surface, and polish the lapped seating surfaces of the disc, plate, and disc guide using a figure "8" motion. If the parts are scarred, do not attempt to re-lap them, but return them to the factory for repair or replacement. *Often parts can be repaired at a minimal cost if the parts are not scarred too deeply.*
6. The vertical sections of the disc guide serve as guides for the disc while stroking. A 0.005 feeler gauge should be used to check for clearance between this surface and the side of the disc. If the clearance is less, clean the guide surfaces in the disc guide with a fine file.

### B. Reassembly

1. Place the disc guide in the body, the index-pin hole should be on the same side of the body as the "<" on the body.
2. Place the disc in the aperture of the disc guide with the arrow pointing to the index pin hole and engage the disc pin. Insert the index pin into the index pin hole.
3. Place the plate in the valve body making sure to engage the index pin. Rotate the assembly slightly until the slot openings in the disc are parallel to the openings in the plate and perpendicular to the stem. Stroking the valve will aide in this alignment.
4. Align the ">" on the cap with the "<" on the body, and place the cap over the two studs in the body.
5. Install the nuts and cap bolts. Tighten uniformly. See section on "Torque Procedures".

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## Diaphragm Replacement

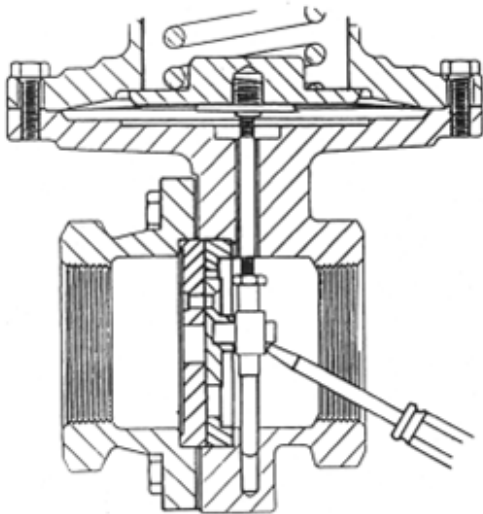
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### A. Disassembly

1. In removing the diaphragm, you must first remove the disc and plate. This is outlined in the section "VALVE SEATS".
2. Remove all of the compression from the spring by rotating the adjusting screw counterclockwise until it moves freely. *(Failure to remove the pressure from the spring could result in personal injury or damage to the valve.)*
3. Remove the spring housing bolts and spring housing. Remove the spring, and spring seat.
4. Hold the disc pin with an open-end wrench and remove the diaphragm assembly by rotating counterclockwise. The diaphragm assembly consists of the upper diaphragm plate, diaphragm, and lower diaphragm plate.
5. If the diaphragm must be replaced, secure the upper diaphragm plate in a vise. A face spanner wrench should be used to remove the lower diaphragm plate from the assembly. If a face spanner is not available, use a punch and hammer, but make certain to remove all burrs prior to reassembling.
6. Remove the diaphragm and reassemble in reverse order.

#### B. Assembly and Stroke Adjustment

1. In assembly, note that the valve stroke adjustment is determined by how far the diaphragm assembly is screwed onto the stem. Holding the disc pin with an open-end wrench, screw the diaphragm assembly onto the stem until the disc pin is centered in the valve body.
2. Place the disc guide, disc, and the plate in the valve body using the same precautions as outlined under "VALVE SEATS".
3. Secure the spring housing to the body with two bolts 180° apart.



4. Using a small screwdriver through the upstream opening of the valve, stroke the valve against the upper travel stop of the spring housing. The orifices should be aligned and in the full open position.
5. If the orifices are not in perfect alignment, remove the spring housing and rotate the diaphragm assembly counterclockwise to lower the disc and clockwise to

raise the disc.

6. A further check of the stroke adjustment can be made by checking the orifices in the closed position. This is a normally closed valve, and there should be a 1/32" overlap when the diaphragm assembly is down against the body. When seats are in perfect alignment proceed with the assembly of the spring housing. *Remove the valve plate and disc to eliminate the possibility of damage during the top works reassembly.*
7. If the diaphragm is metal, be sure that the diaphragm is aligned in the body recess. This recess also aligns the spring housing. Be sure that the bleed hole is facing up stream.
8. If the diaphragm is elastomer, make sure that after the seats are in perfect alignment that the bolt holes are in alignment. If an adjustment needs to be made to align the bolt hole, make the adjustment by turning the diaphragm assembly clockwise.
9. Install and tighten the spring housing bolts per the torque instructions on the back page.

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### Disc Pin & Stem Replacement

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1. Remove the disc and plate, following the procedure outlined under VALVE SEATS.
2. Remove the diaphragm as outlined under DIAPHRAGM REPLACEMENT.
3. Holding the disc pin assembly with an open-end wrench, loosen the locknut. The stem can now be unscrewed from the disc pin and the locknut removed from the stem.
4. Remove the stem upward through the diaphragm area and the disc pin through the body orifice.
5. Check the condition and clean all parts. Clean the lower guide hole in the valve body and replace any defective parts.
6. Reassemble in reverse order and follow the procedures outlined under DIAPHRAGM REPLACEMENT and VALVE SEATS for proper adjustment. When reassembling, thread the stem fully into the disc pin and then tighten the locknut.

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### Ordering Spare Parts

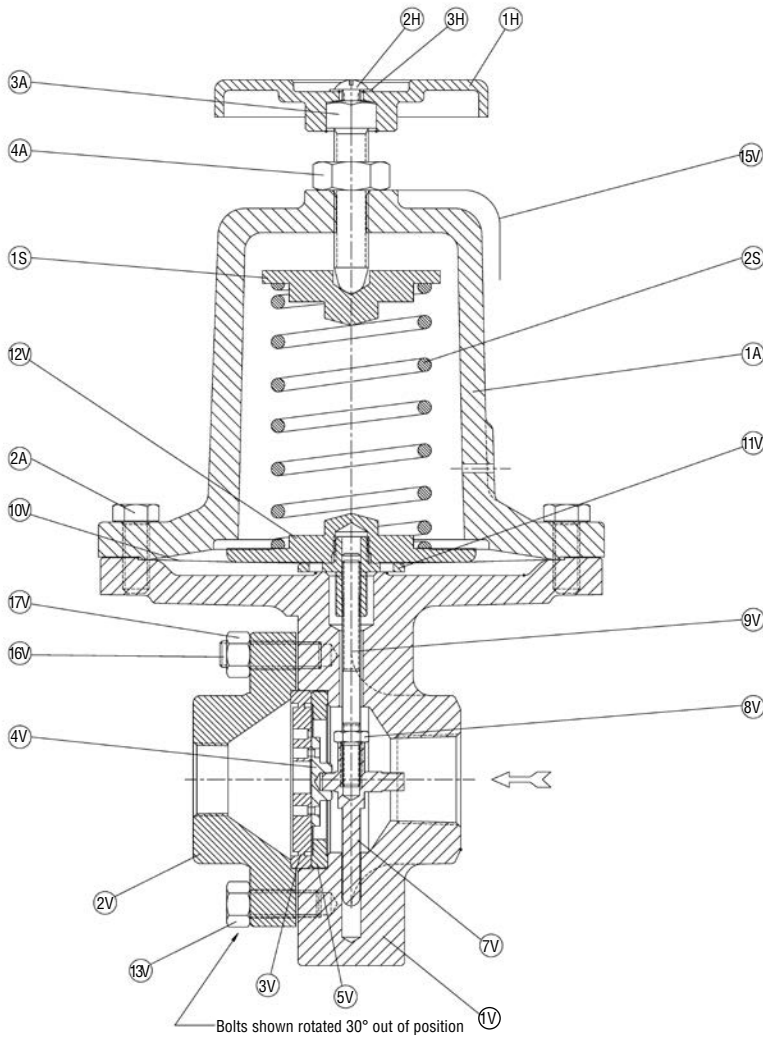
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Use only genuine Jordan Valve parts to keep your valve in good working order. So that we can supply the parts, which were designed for your valve, we must know exactly which product you are using. The only guarantee to getting the correct replacement 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: Without a valve serial number, any parts ordered incorrectly are subject to a minimum 25% restock charge when returned.

## Illustration and Parts List

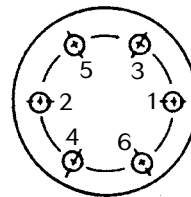


| Item | Description           |
|------|-----------------------|
| 1V   | Body                  |
| 2V   | Cap                   |
| 3V   | Plate                 |
| 4V   | Disc                  |
| 5V   | Disc Guide            |
| 7V   | Disc Pin              |
| 8V   | Stem Lock Nut         |
| 9V   | Stem                  |
| 10V  | Diaphragm             |
| 11V  | Lower Diaphragm Plate |
| 12V  | Upper Diaphragm Plate |
| 13V  | Body Bolt             |
| 14V  | Index Pin (not shown) |
| 15V  | Name plate            |
| 16V  | Stud (body)           |
| 17V  | Nut (body stud)       |
| 1A   | Spring Housing        |
| 2A   | Spring Housing Bolt   |
| 3A   | Adjusting Screw       |
| 4A   | Lock Nut              |
| 1S   | Spring Set            |
| 2S   | Spring                |
| 1H   | Handwheel             |
| 2H   | Screw                 |
| 3H   | Washer                |

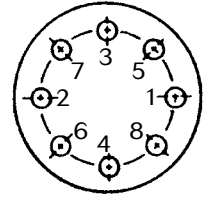
## Torque Values

| Connection             | Valve Size  | BRZ Body     | DI, CS or SS Body |
|------------------------|-------------|--------------|-------------------|
| Body to Cap            | 1/2" & 3/4" | 140 in.-lbs. | 200 in.-lbs.      |
|                        | 1" & 1 1/4" | 140 in.-lbs. | 200 in.-lbs.      |
|                        | 1 1/2" & 2" | 140 in.-lbs. | 200 in.-lbs.      |
| Body to Spring Housing | 1/2" - 2"   | 200 in.-lbs. | 200 in.-lbs.      |

### Bolt Pattern / Torque Sequence



6 bolts  
(or multiples)



8 bolts  
(or multiples)