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I & M Mark 70PG Series

Installation & Maintenance Instructions for Mark 70PG Pump Governors with 930 Actuators

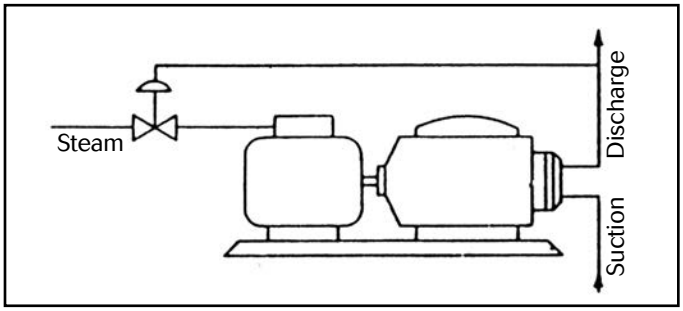
Warning: Jordan Valve pump governors must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation 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 pipe lines and piping components should be blown out and thoroughly cleaned before the valve is installed.
2. Shutoff valves, pressure gauges, and bypass piping should be installed as indicated in the diagram to provide easier adjustment, operation, and testing.
3. A line strainer should be installed on the inlet side of the regulator to protect it from grit, scale and other foreign matter. A 0.033 perforated screen is usually suitable. Line strainers are available from Jordan Valve.



4. 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, leaving the two lead threads clean. Jordan uses, and recommends Teflon ribbon.
5. Install the regulators in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to prevent water hammer, and to obtain faster regulation.
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. To minimize condensation in hot vapor lines, upstream and downstream piping near the valve should be insulated.
9. 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.
10. Where surges are severe, a piping accumulator is recommended.

Troubleshooting

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.
- Excessive foreign matter on seats. Clean them.
- Valve stroke out of adjustment. Check and readjust if necessary.
- Valve disc may not be moving freely.

Will Not Operate

- Diaphragm ruptured. Replace
- Adjust spring broken. Replace.
- Improper spring setting. Reset.

Start-up Procedure

1. The valve has been pre-set by Jordan, however, finer adjustments may be required to compensate for pressure drop conditions of the application.
2. With the inlet, outlet, and by-pass shut-off valves closed, and no pressure in the downstream line, fully open the outlet shut-off valve. Slowly open the inlet valve just enough to start flow through the control valve. Increase flow gradually by slowly opening the inlet shut-off valve. Do not fully open the inlet valve until you are sure that the governor has control of the system.
3. To shut off the line fluid, close the inlet shut-off valve first, then the outlet shut-off valve.

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 thru downstream piping. Do not cause a reverse flow through valve by bleeding pressure from upstream side of valve.
3. When downstream pressure gauge indicates no pressure in the line, close the outlet shut-off valve.

Valve Seats

Disassembly:

The valve seats in all Jordan Governors are lapped to a light band 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.

1. Close shut-off valve on each side of the regulator.
2. Remove governor from the line.
3. Note the scribed line on the side of the valve body and cap. Secure the outlet body hex (1) in a vise. Remove the cap screws (17) and lift the cap (2) straight out. Please note that there is an index pin (6) secured in the valve cap that fits into the index pin hole in the valve plate (3). This index pin is on the same side as the scribed line on the valve cap and body, and it positions the valve plate in the valve body.
4. Before removing, check the valve disc (4) for a stamped arrow. This arrow points to the scribed line and the index pin hole in the valve plate. Since the disc can be rotated 180° in some sizes without affecting the stroke adjustment, there may be no arrow on the valve disc. Remove the valve disc and place on the bench with the lapped surface up.
5. A light tapping on the valve body is normally sufficient to loosen the pressure ring (5). Invert the valve body while holding the pressure ring and plate in place; then slowly let them drop out of the body into your hand.

IMPROPER HANDLING OF THE SEATS WILL RESULT IN LEAKAGE OR IMPROPER CONTROL.

It is imperative that the disc pin (7) is not rotated when disassembling, cleaning, or reassembling, since this affects the stroke adjustment of the valve.

6. Clean all the parts of the body and cap with solvents. The valve disc and plate then may be cleaned. Place a piece of 4/0 polishing paper or jeweler's cloth on a smooth, flat surface such as a surface plate and polish the lapped seating surfaces using a figure eight motion. If the parts are scarred, do not attempt to relap them, but return them to the factory for repair or replacement. If the seats are not scarred deeply, they can be repaired many times at nominal cost.
7. The vertical milled sections of the valve cap serve as guides for the disc while stroking. A 0.005 feeler gauge should be used to check the clearance between the valve disc and the disc guides. To do so, place the valve disc in the cap with the lapped surfaces facing upward and check this clearance. If the clearance is less than 0.005, clean the disc guides with a smooth file.

Reassembly:

1. Place the valve plate in the body seat recess. In replacing, be sure that the index pin hole is on the same side as the scribed line on the valve body. Align the disc pin so that it is centered in the body bore and protrudes through the center slat of the valve plate.
2. Place the valve disc on the valve plate, engaging the disc pin. Be sure that the arrow which is stamped on the disc points to the scribed line of the valve body.
3. Note that the pressure ring has one lapped surface. In replacing the pressure ring, make certain that the lapped surface faces the valve plate.
4. In replacing the valve cap, note that the scribed line on the valve cap and body must be in alignment. Use care to insure that the disc guides and the index pin are properly aligned with the valve disc and index pin hole in the valve plate. Normally, a slight rotation of the valve cap is sufficient to obtain proper alignment.
5. Install the cap screws and tighten uniformly, diagonally from each other. See back page for torque requirements.

Stem & Disc Pin Replacement

1. Remove the valve disc and valve plate (4,3) following the procedure outlined under "Valve Seats".

2. Loosen the stem connector nut and bolt (31, 32) and remove connector assembly (30).
3. Back out the four allen head screws (22) which will allow the valve body (1) to be separated from the valve yoke (21).
4. Loosen the stem locknut (8) and rotate the disc pin (7) counter-clockwise, pulling valve stem (9) 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 and reassemble in reverse order following the procedures outlined under "valve Seats" and "Stroke Adjustment".

Packing

1. Remove connector assembly (30).
2. Remove both packing flange nuts (16).
3. Remove packing flange (14) and packing follower (13).
4. Remove packing retainer (11) and packing spring (10).
5. Clean packing bore with solvent and blow out thoroughly.
6. Assemble in reverse order and tighten packing nut (16) so that packing follower (13) bottoms out on top of valve body.
7. Engage valve stem (9) and actuator stem (29) with connector (30). Tighten connector nut and bolt. No stroke adjustment is required.

Actuator

1. Release all spring compression before performing any maintenance on the actuator.
2. The entire actuator assembly may be removed as a complete unit by removing the four fillister head screws (27). The actuator assembly consists of upper case (38), lower case (37), diaphragm (39), diaphragm plate (40), and case bolts (36).
3. Parts may be disassembled as necessary.
4. When reassembling, position the actuator assembly on the valve yoke (21). Be sure that the diaphragm plate plug (41) is engaged properly in the stroke stop (35).
5. Replace the fillister head screws (27) and tighten them uniformly.

Diaphragm Replacement

1. The diaphragm (39) can be reduced with the valve in the line. Remove the diaphragm case bolts (37) and lift the upper case (38) from the lower case (37). Replace the diaphragm and reassemble in reverse order. A valve stroke adjustment is not required.

Valve Stroke Adjustment

A. Direct Acting (Air-to-close)

1. Remove the valve seats as outlined in "Valve Seats".
2. Remove diaphragm case bolts (36). Remove upper case (38), diaphragm (39), and diaphragm plate (40).
3. Loosen stroke stop nut (34).
4. Compress the spring (28) by turning the adjusting wheel (25) just enough to hold the stroke stop (35) against the shoulder in the lower case (37). The valve is now in its uppermost position.
5. Install the seats in the valve body following the steps outlined in "Valve Seats". The orifices of the disc (4) and plate (3) must be perfectly aligned in the up and open position. Adjust the position of the disc on the plate by rotating the stroke stop (35) to raise or lower the disc until the seats are in the fully open position with the orifices fully aligned.
6. After orifices are fully aligned, tighten stroke stop nut (34) and reassemble the actuator.

B. Reverse Acting (Air-to-open)

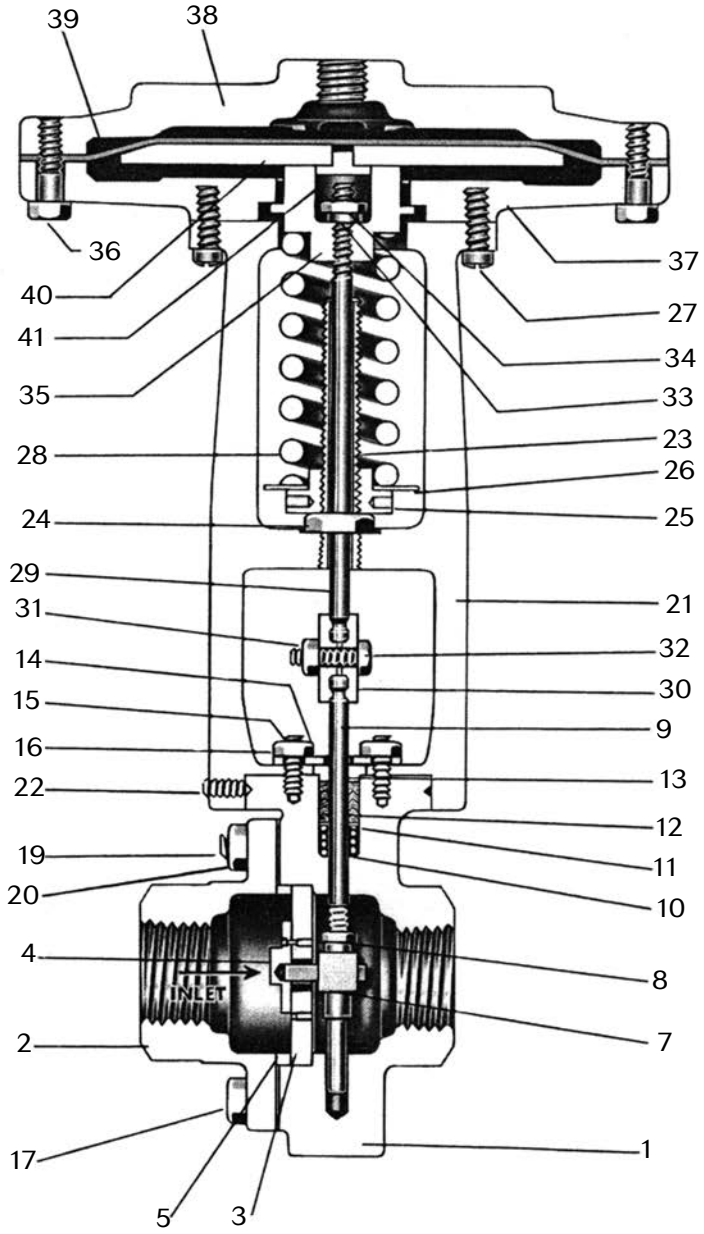
The stroke adjustment of the reverse acting valve is similar to that of the direct acting valve except that the valve seat orifices must be open and perfectly aligned when the valve is stroked downward.

1. Release compression on the spring (28) by rotating the adjusting wheel (26) downward.
2. Remove the actuator assembly by removing the four fillister head screws (27).
3. Loosen stroke stop nut (34).
4. Place the seats in the valve body as described in "Valve Seats" and firmly press the stroke stop (35) downward until it stops against the yoke. The valve seats should be in the down and fully open position.
5. Adjust the position of the disc (4) on the plate (3) by rotating the stroke stop (35) until the seats are in the fully open position and the orifices are in perfect alignment.
6. After the proper adjustment is obtained, tighten stroke stop nut (34) and assemble the actuator to the yoke. Be sure that the diaphragm plate engages the stroke stop.

Changing Valve Action

The action of a sliding gate valve may be changed from Direct Acting to Reverse Acting, or vice versa, by rotating the disc (4), plate (3) and valve cap (2) 180°. Check the valve stroke and orifice alignment and adjust, if required, as outlined in "Valve Stroke Adjustment".

Cross Section View



Item	Description
1	Body
2	Cap
*3	Plate
*4	Disc
*5	Pressure Ring
6	Index Pin (not shown)
*7	Disc Pin
*8	Locknut
*9	Valve Stem
10	Packing Spring
11	Packing Retainer
12	Packing
13	Packing Follower
14	Packing Flange
15	Packing Flange Stud
16	Packing Flange Nut
17	Body Cap Screw
19	Body Stud
20	Body Stud Nut
21	Yoke
22	Yoke Screw
23	Adjusting Screw
24	Jam Nut
25	Adjusting Wheel
26	Spring Washer
27	Actuator Screw
28	Adjusting Spring
29	Actuator Stem
30	Stem Connector
31	Connector Nut
32	Connector Bolt
33	Lockwasher
34	Stroke Stop Nut
35	Stroke Stop
36	Case Capscrews
37	Lower Case
38	Upper Case
*39	Diaphragm
40	Diaphragm Plate
41	Diaphragm Plate Plug

* Recommended spare parts

Torque for Bolts (17) connecting valve cap to valve body (inch/pounds)

Valve Size	Valve Body Material	
	Cast Iron Ductile Iron Bronze	Cast Steel Stainless Steel
1/4″ & 3/8″	70	150
1/2″ & 3/4″	110	150
1″ & 1-1/4″	120	150
1-1/2″ & 2″	140	150

When ordering spare parts, specify:

- Valve serial number
- Type of valve
- Body size and material
- End connection (if flanged give rating)
- Spring range
- Refer to parts list above and specify part name and number

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