JORDANVALVE

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# I & M V1C

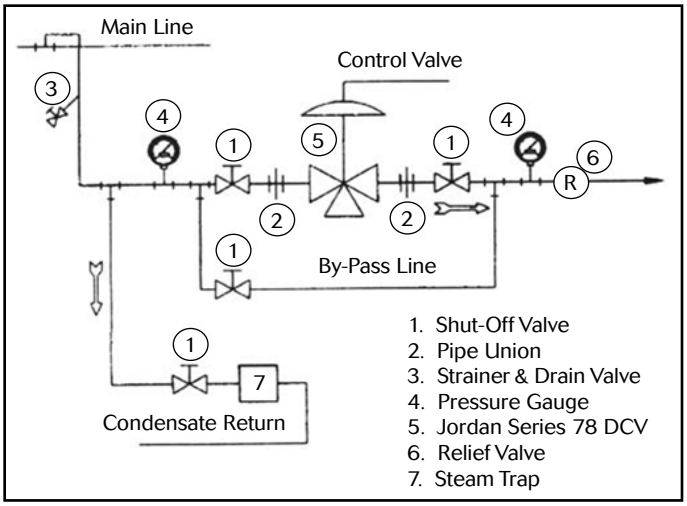
*Installation & Maintenance Instructions for V1C Control Valve*

**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.

## 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 Installation Schematic to provide easier adjustment, operation, and testing.
3. In preparing pipe connections, care should be exercised to prevent pipe-sealing compound from getting into the pipelines. Pipe sealing compound should be used sparingly, leaving the first two threads clean. Jordan Valve uses and recommends, thread sealer Teflon ribbon.
4. 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.
5. Install the valve in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to reduce 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 should not be installed in a vertical line with the flow going upwards as damage to the seats may occur.
7. To minimize condensation in hot vapor lines and to protect the motor from excessive heat, piping near the valve should be insulated.
8. If possible, install a relief valve downstream from the valve, set at 15 psi above the control point of the valve.
9. Expand the piping at least one pipe size if the downstream pressure 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.
11. For best control, 3' 0" straight sections of pipe should be installed on either side of the valve.

## Start Up

1. Be sure that the action of the control valve and of the controller are such as to give the desired results.
2. The control valve has been pre-set by Jordan Valve. However, finer adjustments may be required to compensate for pressure drop conditions of the application.
3. With the inlet, outlet, and bypass shutoff valves closed, and no pressure in the downstream line, fully open the shutoff valve. Slowly open the inlet valve just enough to start flow through the control valve. Increase flow gradually by slowly continuing to open the inlet shutoff valve. Do not fully open the inlet valve until you are sure that the controller and control valve have control of the system. Usually, the handwheel on the inlet valve will turn freely when the valve has control.
4. To shut off the line fluid, close the inlet shut-off valve first, then the outlet shut off valves.

## Maintenance

Routine maintenance should be expected due to normal wear and tear, damage from external sources or debris. The regulator components, especially the moving and sealing parts, should be inspected periodically and replaced as necessary. Frequency of inspection/replacement depends upon severity of conditions, but may also be required by local/state/federal law or industry standards.

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

1. Close the inlet shutoff valve.
2. Allow pressure to bleed off through the downstream piping. Do not attempt to reverse the flow through the valve by bleeding pressure from the upstream side of the valve.
3. Disconnect any airlines to the valve or positioners. Label any wiring to positioners or I/P and disconnect before removing valve from line.
4. When the pressure gauges indicate that all pressure has been removed from the system, close the outlet shutoff valve and the valve may be service.

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

## Actuator Removal

Secure adequate rigging to the actuator prior to beginning any attempt to remove from the valve.

1. Follow procedures under *Maintenance Section* to isolate the valve, or remove it from line before proceeding.

2a. **Reverse Acting Valve (ATO):** Remove the seating load by turning the stem connector to the right two full turns. Remove the stem connector coupling by removing the two side bolts. Unscrew the yoke lock ring from the bonnet in a counter-clockwise direction by placing a dowel rod on the locking ring lugs and striking with a mallet.

2b. **Direct Acting Valves (ATC):** Remove the stem connector coupling by removing the two side bolts. Unscrew the yoke lock ring from the bonnet in a counter-clockwise direction by placing a dowel rod on the locking ring lungs and striking with a mallet.

3. Using the proper lifting techniques, remove the actuator assembly by lifting over the top of the valve stem. If work is required on the actuator refer to the actuator I & M.

## Valve Disassembly

1. Remove all body/bonnet stud nuts and lift the bonnet with the plug and stem sub-assembly carefully off the body. Hold the stem to prevent the plug from dropping. The cage usually remains in the body. Withdraw the plug and stem subassembly from the bonnet, packing box.
2. Unscrew the gland stud nuts and remove the gland flange, felt wiper, packing gland, and other packing box parts as required. (*Refer to Figures 2 & 3 for details*).
3. Remove the bonnet gasket, cage, seat ring, and spiral gasket from the body. A special tool may be required to remove the cage from the body. Contact Jordan Valve for the appropriate tool for your valve (1½" — 2" valves: J0164TR; 3" — 6" valves: J0164TS).
4. Check the plug and stem assembly for damage. If the subassembly is damaged a new sub-assembly and seals must be purchased from the factory. *Note: Seals cannot be removed without causing damage. When ordering a new sub-assembly be sure to specify the type of service (liquid, Gas, or steam) and action so that seals may be installed correctly.*
5. If you need to replace the seals go to Seal Installation Section.
6. Clean all parts with solvent and inspect for damage or unusual wear. Remove any encrusted material from the stem, and gasket areas. Clean the packing box thoroughly.

## Body Reassembly

**Refer to Figures 1-3:**

1. Apply a standard anti-seize compound to the bottom of the seat ring and the bore of the body. Make sure that the inside of the cage is clean. Install the seat ring gasket, seat ring with the surface marked "top" facing up, optional soft seal, and cage into the body. Be sure that all parts are properly seated and in concentric alignment.
2. Apply Dow Corning 111 or other media compatible lubricant to the inside surface of the cage and to the outside surface of the seal ring of the plug. Carefully slide the plug and stem sub-assembly into the cage until required to allow the proper installation of the plug.
3. Apply anti-seize to the bonnet, cage and body seal areas, which contact the bonnet gasket.
4. Place the bonnet over the stem and apply anti-seize or thread lubricant to the exposed portion of bonnet studs. Thread the stud nuts loosely onto the bonnet studs.
5. Install the packing set (see Figure 2 for TFE, Figure 3 for graphite ring). When using TFE v-rings, lubricate and install each ring individually. For graphite, install

the rings so that each "cut" is 120° apart from the preceding ring. Install gland studs, gland flange and gland nuts. Use only the minimum torque required to produce a seal. DO NOT over-tighten.

6. Lift the stem and force back down until plug seats to insure concentricity before tightening bonnet stud nuts.
7. Cross tighten the bonnet stud nuts as follows: 1½" — 65 ft.-lbs., 2" — 85 ft.-lbs., 3" — 140 ft.-lbs., 4" — 220 ft.-lbs.

## Seal Installation

**Refer to Figures 4-7:**

Lubricate all seals with a Teflon compatible lubricant that is compatible with the system media when installing.

1. For 1½" - 2" TFE seal plugs, install the seal washers, seal retainer and the seal ring with the open end up as shown in figure 4 for reverse flow (steam/gas service), or with the open end down for forward flow (liquid service). Use the special installation tool (available from Jordan Valve) when installing the seal ring.
2. For 3" - 6" TFE seal plugs, install the seal ring with the open end up for reverse flow (steam/gas service) as shown in Figure 5, or open end down for forward flow (liquid service). Use the special installation tool (available from Jordan Valve) when installing the seal ring.
3. For 1½" - 6" metal seal plugs, install the expander ring (butt joint) into the retainer groove, then the seal ring (lap joint) into the same groove. For NPT, 150# and 300# valves, install one set in the lower groove as shown in Figure 6. For 600# valves, install one set in each groove as shown in Figure 7.

*The special tools for seal installation are as follows:*

*1½" Seall Installation Tool — J0168SA-101*
*2" Seal Installation Tool — J0168SB-101*
*4" Seal Installation Tool — J0168SD-101*
*6" Seal Installation Tool — J0168SE-101*

## Actuator Installation & Set Up

- **Reverse Acting**

| Size | Model # | Act Size $in^2$ | Bench Set without Positioner, psi | Bench Set with Positioner, psi |
|---|---|---|---|---|
| 1½" | RAG5BA | 56 | 8.4 - 18 | 12 - 21.6 |
| 2" | RBF5GA | 84 | 8 - 18 | 11.3 - 21.3 |
| 3" | RCEBHA | 140 | N/A | 21.8 - 39.8 |
| 4" | RCM2GA | 140 | N/A | 11.3 - 35.3 |
| 6" | RCH2LA | 140 | N/A | 13.8 - 37.8 |

- **Direct Acting**

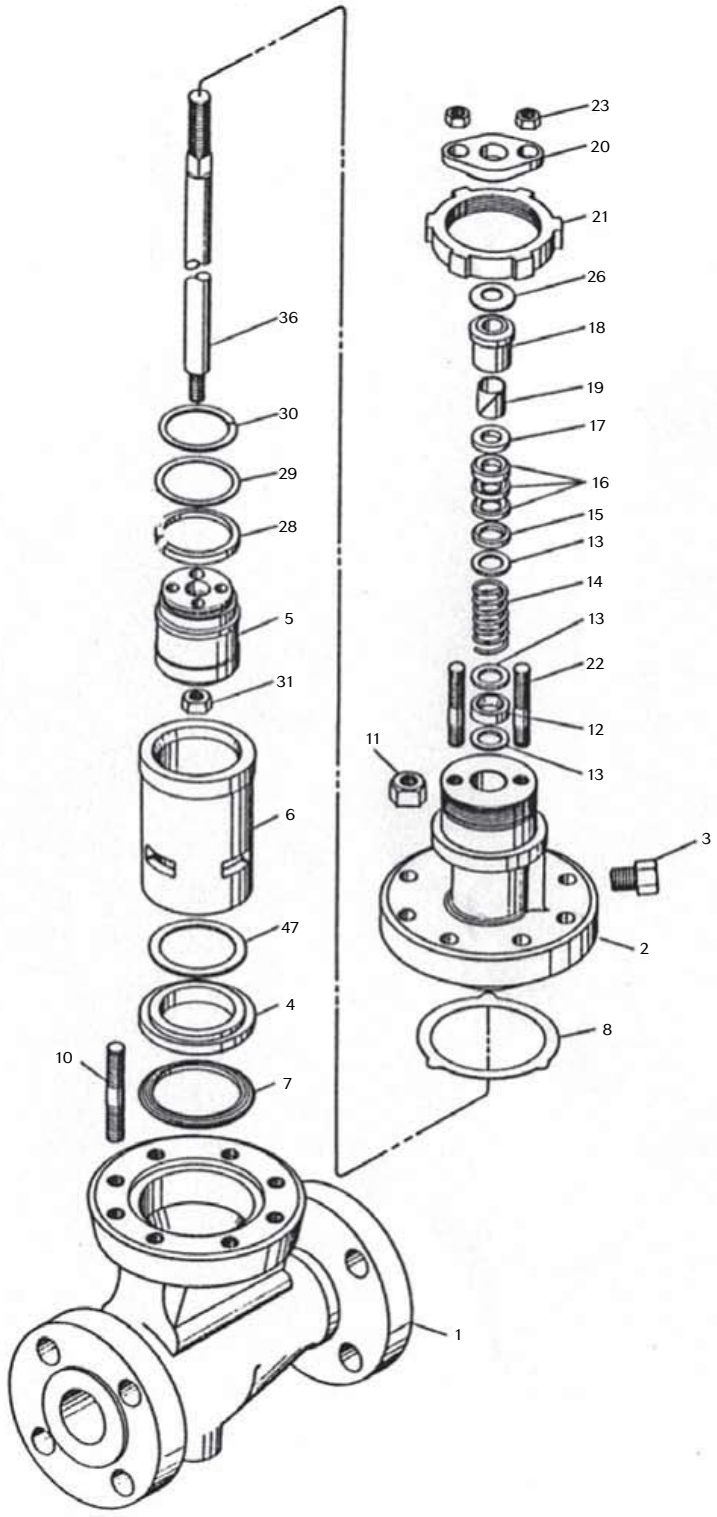
| Size | Model # | Act Size $in^2$ | Bench Set, psi |
|---|---|---|---|
| 1½" | DAG5BA | 56 | 1 - 10.6 |
| 2" | DBF5GA | 84 | 1 - 11 |
| 3" | DCEBHA | 140 | 1 - 17 |
| 4" | DCM2GA | 140 | 1 - 25 |
| 6" | DCH2LA | 140 | 1 - 25 |

1. After insuring that the actuator is securely rigged and using proper technique, lift the actuator on top of the valve assembly being careful not to damage the bonnet threads.
2. *If the valve is Reverse Acting*, apply a signal to the actuator to raise the stem enough to allow the ring nut to pass between the plug stem and the actuator stem. The ring nut may have to be worked over the packing flange. The machined surface of the nut should be placed against the yoke.
3. Align the actuator so the signal port is facing the downstream side of the valve and securely tighten the ring nut using a hammer and dowel rod.
4. Release the pressure from the actuator. Refer to the charts for the proper bench set. Apply the bench set pressure to the actuator. The stem should just start to move at this point. If the stem moves before the minimum pressure is reached, or does not start moving at the required bench set pressure, then the spring preload will have to be adjusted. This is done by turning the spring adjuster (11), clockwise to increase the set, or counterclockwise to decrease the set.
5. Once the proper bench set has been attained, install the stem connector (split coupling (26)) to the valve and actuator stems. The valve stem should be firmly seated in the seat ring. *All signals to the actuator should be removed prior to this installation and reverse acting valves.* On direct action, the actuator should be stroked to its upper bench set limit.
6. Snug the stem connector bolts just tight enough to hold it in place. Turn the connector 1½ turns counter-clockwise to place a load on the seat. Tighten the stem connector bolts securely, and align the travel scale (23) to the travel indictor (29).
7. Attach the positioner take off arm to the stem connector and secure.
8. Attach the positioner and set up according to the manufacturer's instructions.
9. To adjust the pre-mounted positioner, follow the adjustment instructions in the vendor's installation manual.

- **Reverse Valve Action**

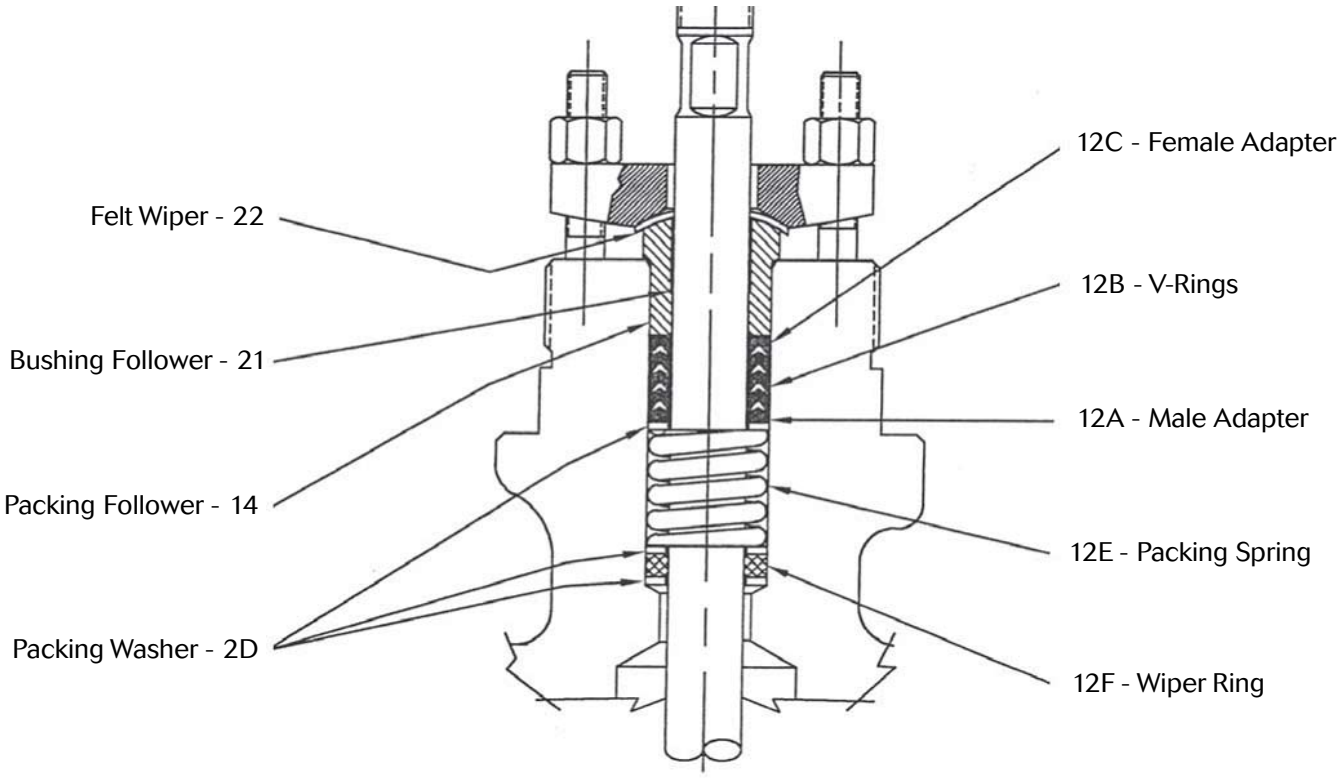
A special kit is required for converting valve action. Contact the Jordan Valve Customer Service Department for details.

# Figure 1 Illustration and Parts List - V1C 1½" - 6"

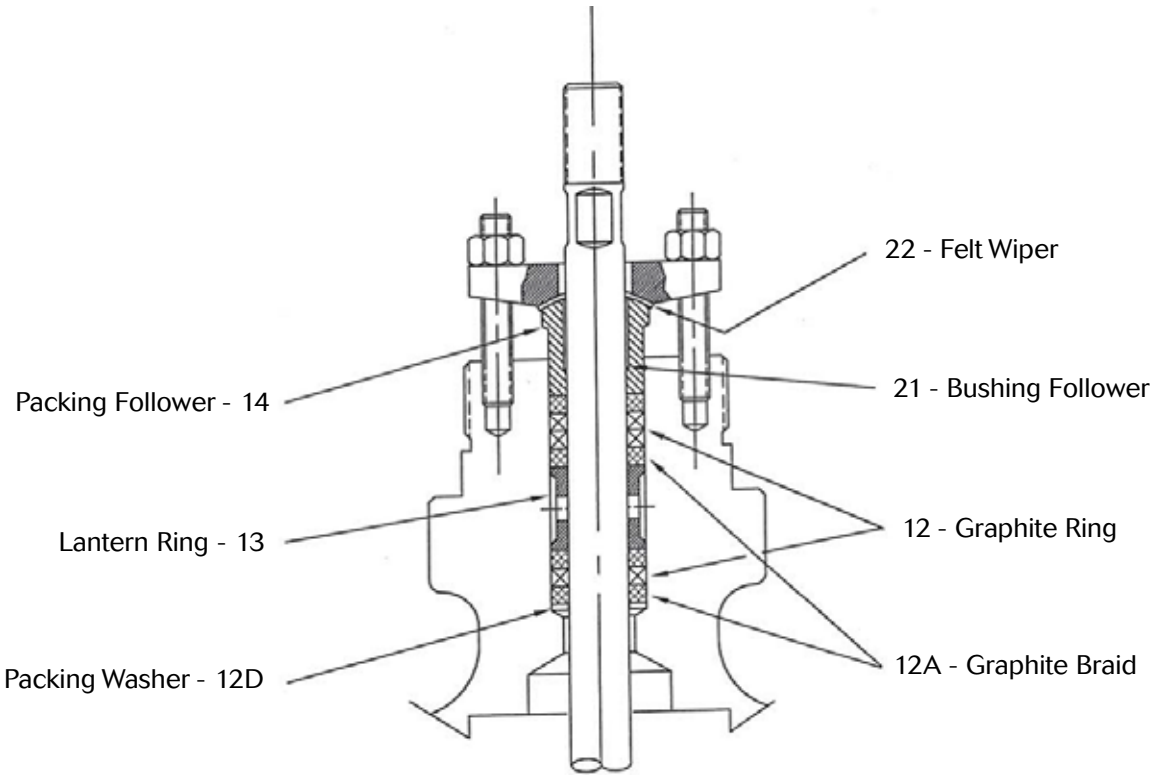



| Item | Description |
|---|---|
| 1 | Body |
| 2 | Bonnet |
| 3 | Pipe Plug (or lubricator) |
| 4 | Seat Ring |
| 5† | Plug |
| 6 | Cage Guide |
| 7 | Spiral Gasket |
| 8‡ | Bonnet Gasket |
| 10 | Bonnet Studs |
| 11 | Stud Nuts |
| 12‡ | Scraper Ring |
| 13‡ | Packing Washer |
| 14‡ | Packing Spring |
| 15‡ | Male Adapter |
| 16‡ | Packing Ring |
| 17‡ | Female Adapter |
| 18‡ | Packing Gland |
| 19‡ | Gland Bushing |
| 20 | Gland Flange |
| 21 | Locking Ring |
| 22 | Gland Stud |
| 23 | Gland Nut |
| 26‡ | Felt Washer |
| 28† | Seal Ring |
| 29† | Seal Washer |
| 30† | Seal Retainer |
| 31† | Retaining Nut |
| 36† | Stem |
| 47 | Soft Seal (optional) |
| † | Replacements will be shipped as an assembly. |
| ‡ | Replacements will be shipped as a packing kit. |

## Figure 2

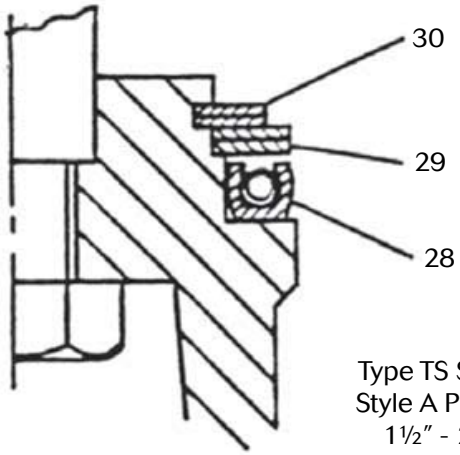



## Figure 3



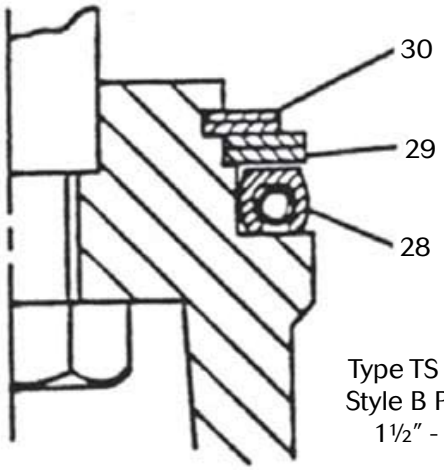

* Spare parts for optional configurations in Figures 2 through 8 are shipped in sets that include all called out parts.

## Figure 4



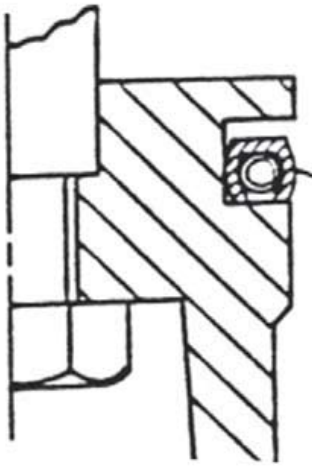

Type TS Seal
Style A Plugs
1½″ - 2″

## Figure 5




Type TS Seal
Style B Plugs
1½″ - 2″

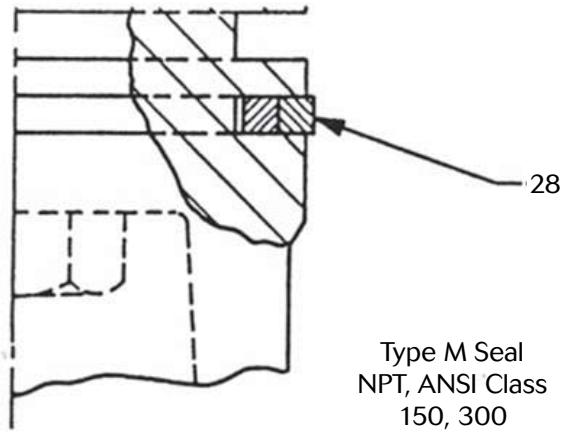
## Figure 6




**Forward Flow Shown**

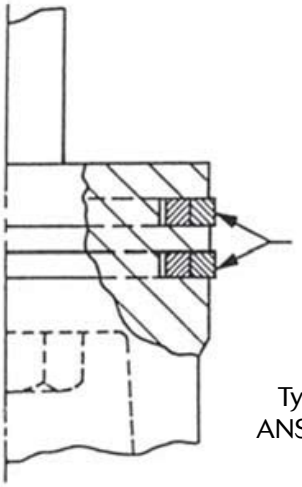
Type TS Seal
Style B Plugs
3″, 4″ and 6″

## Figure 7




Type M Seal
NPT, ANSI Class
150, 300

## Figure 8




Type M Seal
ANSI Class 600

## Ordering Spare Parts

Use only genuine Jordan Valve parts to keep your valve in good working order. So 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, Plug Material and Seat Size, Spring Range or Set Point, Trim Material, Part Name - Number and Quantity (see parts list chart).

Note: Without a valve serial number, any parts ordered incorrectly are subject to a minimum 25% restock charge when returned.



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