Roto-Disc® Inc.
514 Enterprise Dr., Unit A
Erlanger, KY 41017
TEL (513) 871-2600 FAX (513) 871-9013
www.rotodisc.com info@rotodisc.com

ROTO-DISC® &
ROTO-DISC II VALVE
USER'S GUIDE

Roto-Disc® Valve

Roto-Disc® II Valve

TABLE OF CONTENTS

ROTO-DISC® & ROTO-DISC® II VALVE

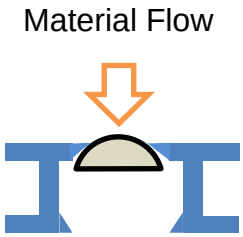
INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

The Roto-Disc and Roto-Disc II are quarter-turn valves designed primarily for solids, slurries & pastes. Roto-Disc, Inc. provides a wide-range of features and options with respect to materials of construction (M.O.C.), controls, seating/sealing types, flange drilling, flange adaptors and surface finishes/coatings/hardfacing, etc… All Roto-Disc valves are specified and built based on the expected application conditions and other guidance as given by the specifying entity and as agreed to with Roto-Disc, Inc. Use of the valve in a manner that differs from that to which the valve was built may result in poor performance and/or premature wear of the valve and its components and is hereby not authorized by Roto-Disc, Inc.

1.0 INSTALLATION

1.1 ORIENTATION

The recommended orientation of the Roto-Disc valve is 'dome-up'. In some applications, it may be beneficial to install the valve in the 'dome-down' position. Consult Roto-Disc, Inc. before installing the valve in the dome-down position.



'Dome-up' Installation
Illustration 1-1

1.2 TEMPERATURE INFORMATION

The temperature rating for an individual valve depends on a variety of application conditions and features of the valve. Refer to the specifying entity or contact Roto-Disc, Inc. to determine the temperature range for a specific Roto-Disc valve.

Maximum Temperature Range: -40°F to 1,200°F
Typical Temperature Range: -25°F to 425°F

1.3 PRESSURE INFORMATION

The pressure rating for an individual valve depends on a variety of application conditions and valve features, including principally the seating type, seat calibration and direction of applied pressure/vacuum. Refer to the specifying entity or contact Roto-Disc, Inc. to determine the pressure range rating for a specific Roto-Disc valve.

Typical Pressure Range: Full vacuum to 150 psig below the dome
Full vacuum to 25 psig above the dome

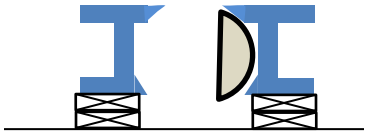
1.4 CHEMICAL ATTACK AND MATERIAL COMPATABILITY

Roto-Disc, Inc. does not offer any warranty against chemical attack or material compatibility of a valve's components with a particular application environment.

2.0 OPERATION

Roto-Disc, Inc. recommends each new valve be cycled (opened and closed) prior to installation to aid visualization and understanding of the valve's operation and condition.

Caution: As the dome rotates open, it may protrude below the bottom flange. Therefore it is necessary to support the body in a way that provides vertical clearance below the bottom flange for the dome to rotate into, as shown in illustration 2-1.



Dome Protrusion
Illustration 2-1

All Roto-Disc valves are calibrated during the assembly process & confirmed during a multi-point valve QC process and pressure test (when applicable).

2.1 VALVE (DOME) OPEN & CLOSE SETTINGS

Alert

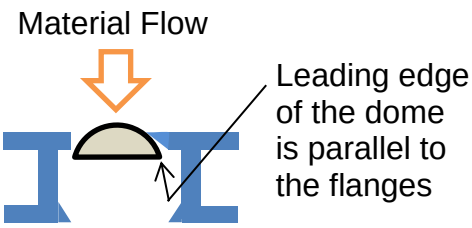
Your Position Indicator Is Properly Calibrated – Do Not Adjust

The visible beacon on most position indicator models signifies open and closed based on 90° of rotation. When a Roto-Disc valve rotates *more than* 90° to reach the full open position, the beacon will suggest the valve is not fully open (because the beacon has traveled *past* the 90° "open" mark) when in fact this is not the case. Beacon indicators are calibrated at the factory to be properly aligned to the closed position. Therefore, the imperfection of the beacon indicator will be exhibited when the valve is in the fully open position.

Example: A Roto-Disc valve requires 100° rotation to travel from the fully closed position to the fully open position. When the valve is fully closed, the visible beacon accurately indicates fully closed. When the valve is fully open, the beacon indicator indicates that the valve is not fully open because the beacon flaps are not accurately aligned in the open position. This is because the beacon is tracking the dome which has actually traveled 100° to reach the fully open position. In this instance the beacon will show that the valve is 10% off from fully open when in fact the valve is fully open.

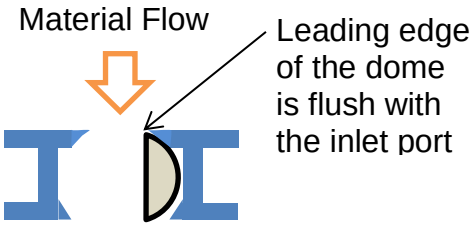
Contact Roto-Disc, Inc. before attempting to adjust actuator stop settings to correct readings in the beacon indicator.

Roto-Disc valves are considered (full) *closed* when the dome is rotated into the path of the material flow and the leading edge is parallel to the top flange of the body.



Roto-Disc Full Close
Illustration 2-2

Roto-Disc valves are considered (full) *open* when the leading edge has been rotated out of the material flow path to a point where the leading edge of the dome is flush with the edge of the inlet port.



Roto-Disc Full Open
Illustration 2-3

There are no mechanical stops on the valve itself.

2.1.1 VALVES WITH ACTUATORS

When a Roto-Disc valve is supplied with a pneumatic or electric actuator mounted and coupled, the open and close limits, or settings, are controlled by the mechanical stops in the actuator. These stops are set at the factory during final assembly of the valve and are confirmed during the multi-point QC process. The stop settings should not require further adjustment. Contact Roto-Disc, Inc. before making any adjustments to the stop settings on the valve actuator

2.1.2 MANUALLY OPERATED VALVES

The full open and full closed positions for valves with manual handles are usually controlled by a quick release pin which is aligned with strategic holes in the actuator bracket and when engaged lock the dome in the full open, or full closed position. These stops are confirmed during the multi-point QC process and should not require further adjustment. Contact Roto-Disc, Inc. before making any adjustments to the stop settings on a valve with a manual handle actuator.

Valves with hand wheel actuators include a mounted gear box with mechanical stops set for full open and full close. These stops are set at the factory during the final assembly of the valve and confirmed during the multi-point QC process and should not require further adjustment. Contact Roto-Disc, Inc. before making any adjustments to the stop settings on a valve with a manual hand wheel actuator.

2.1.3 SPECIAL CONTROLS

Some Roto-Disc valves are supplied with special controls for metering or dribble feeding, such as electro-pneumatic (4-20mA) positioners or Roto-Disc's own dribble-feed solution. These solutions provide the means to set intermediate positions between full open and full closed by way of an electric or pneumatic signal. These solutions do not affect the full open or full closed position of the valve and the valve stops are still controlled and set at the actuator.

2.1.4 POSITION INDICATORS

Position Indicators do not control dome rotation. They indicate valve position (open or closed) by use of micro-switches and a visible beacon which are coupled to the dome rotation. Unless otherwise directed by the customer or specifying entity, Roto-Disc will set switch #1 (or the "top" switch) to make at the full closed position and set switch #2 (or the "bottom" switch) to make at the full open position. The switches will be connected to a terminal strip inside the position indicator housing will have an NPT (female) conduit connection point. If specified, solenoid controls may be wired to the position indicator terminal block for further connection to user's control source. The position switches are not directly coupled to visible beacons and thus they can be set to accurately indicate the open and closed position of the Roto-Disc valve. See section 2.1 above for more information about the inaccuracy of visible beacon indicators.

2.2 AIR & ELECTRIC CONNECTIONS

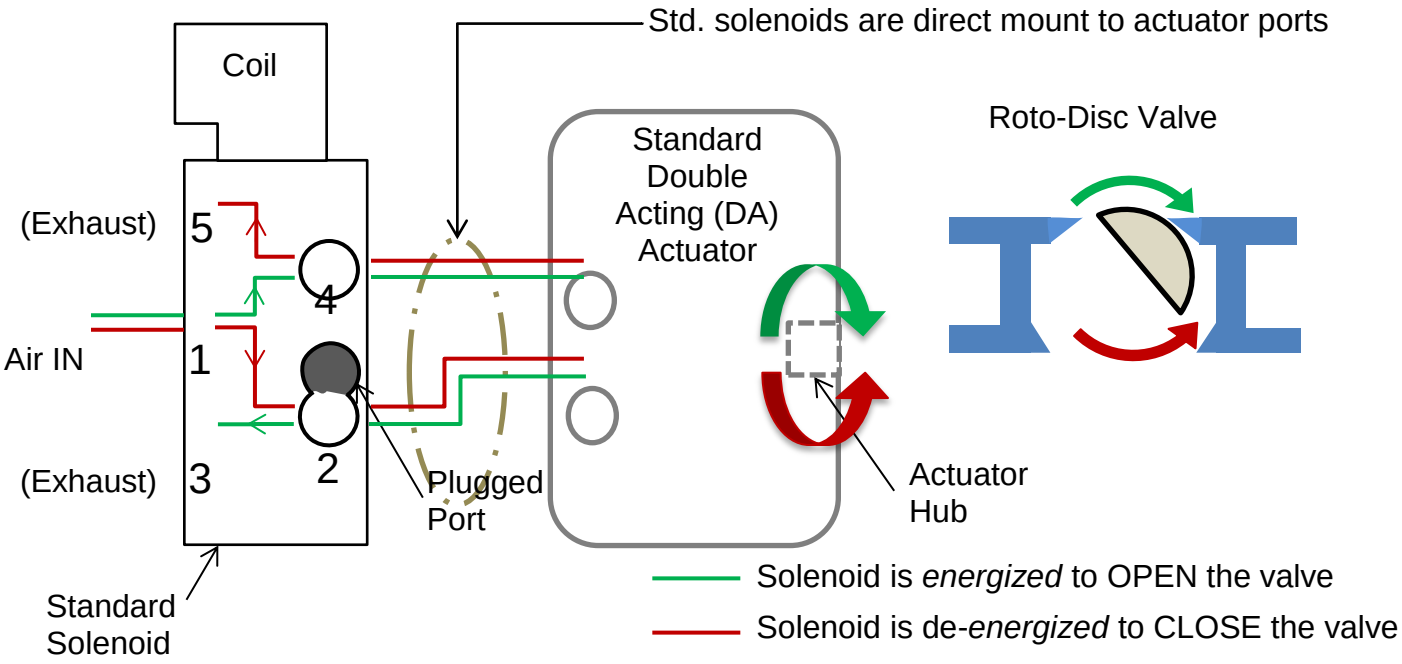
2.2.1 OVERVIEW

Solenoids supplied with pneumatically operated Roto-Disc valves are typically direct-mounted to the air inlet ports of the actuator. Most solenoids are supplied with dry contact leads for the specified voltage (typically 120VAC or 24VDC) and will have an NPT (female) conduit connection point. If specified, solenoid controls may be wired to the position indicator terminal block for further connection to user's control source.

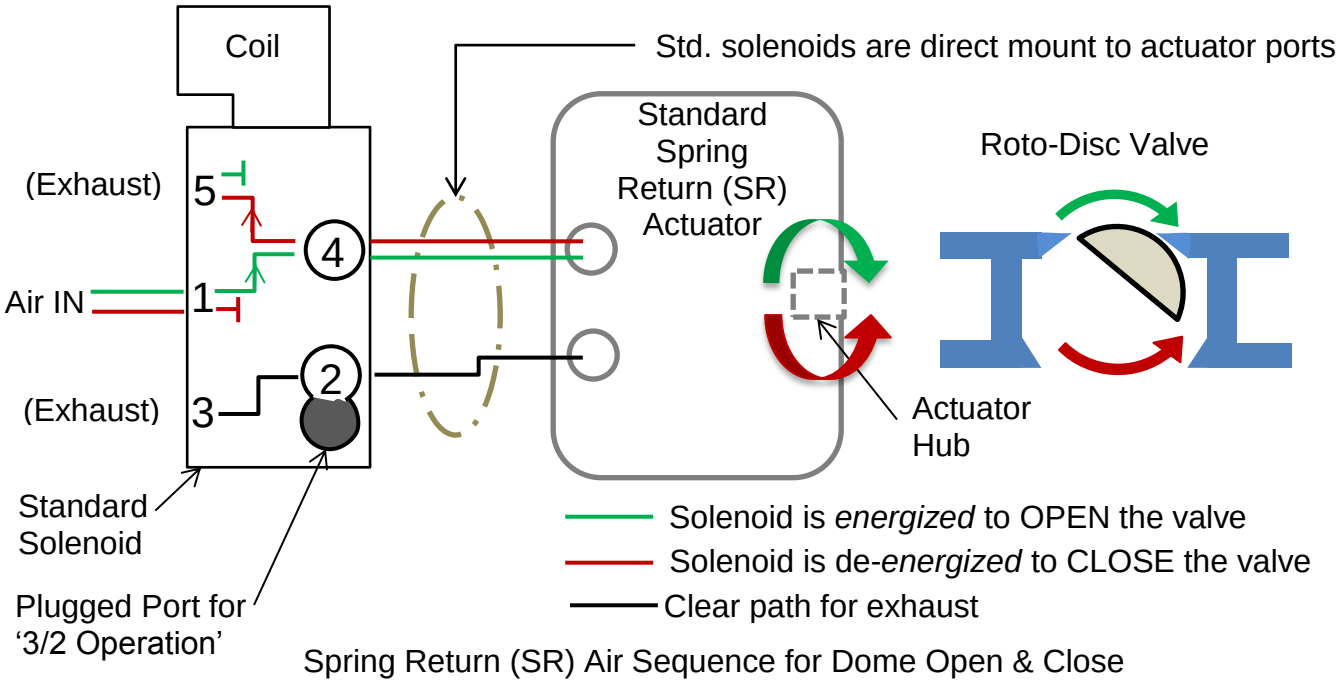
Refer to Roto-Disc, Inc. or the Solenoid manufacturer's literature for additional electrical connections information.

2.2.2 SOLENOID AIR SEQUENCE OF OPERATION:

Energizing or de-energizing the solenoid directs, or blocks plant air, as shown in Illustrations 2-4 & 2-5. Port identifications (1-5) reflect the standard solenoid manufacturer's literature. See the solenoid manufacturer's literature for more information.



Double Acting (DA) Air Sequence for Dome Open & Close
Illustration 2-4



Spring Return (SR) Air Sequence for Dome Open & Close

Illustration 2-5

2.2.3 AIR FLOW CONTROLS

Air flow controls are installed on the exhaust ports of actuator solenoids. If no solenoid is supplied, air flow controls are installed on the actuator air ports. These flow controls regulate the plant air supply to increase or decrease the speed of dome rotation. *Without these flow controls, the dome may slam open and closed, increasing the chance for injury. This action may also increase mechanical stresses on several key valve components, which can have a negative effect on the longevity of the valve and components like the actuator.*

Turn the adjustments screw counter-clockwise to reduce dome rotation speed. Turn the adjustment screw clockwise to increase the dome rotation speed.

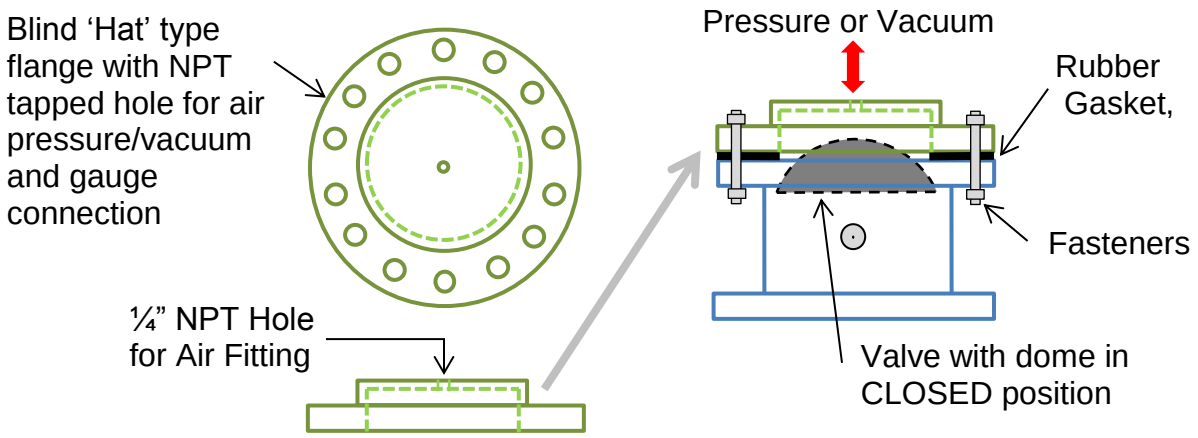
3.0 PRESSURE TEST

Caution: This process involves cycling the dome 'on the bench' where personnel are exposed to the leading edge of the dome as it rotates. Roto-Disc, Inc. recommends slowing down the dome rotation by adjusting the flow controls when operating the valve on the bench.

A valve test, *for pressure or vacuum*, requires a blind flange attached to one flange of the Roto-Disc valve, a rubber gasket & fastener set. The direction of applied pressure or vacuum determines location & type of flange required:

3.1 TEST FOR PRESSURE OR VACUUM

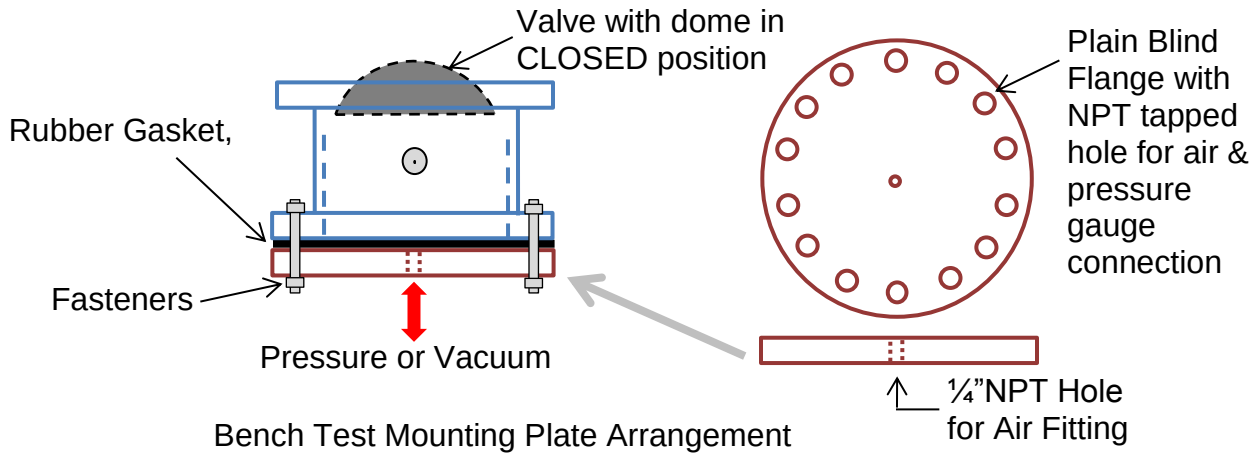
Testing for pressure or vacuum from *above the valve* requires use of a blind 'hat' type flange which includes clearance for the dome, per Illustration 3-1 below.



Pressure Test Mounting Plate Arrangement
For Pressure or Vacuum *Above* The Dome
Illustration 3-1

Pressure from *below the dome* usually requires only a flat, blind flange, as shown in Illustration 3-2.

Caution: Do not open the valve when the blind flange is in place on the bottom flange.



Bench Test Mounting Plate Arrangement
For Pressure or Vacuum *Below* The Valve
Illustration 3-2

3.2 TEST PROCEDURE:

Caution: Beware the dome can rotate open even when air & electric have been disconnected in a metal seated valve because there is no seat compression to hold the dome in place in the closed position. This is also true for a bare stem valve because there is no actuator to keep the dome in the closed position.

1. Disconnect ***all*** air and electrical connections, and remove the valve from service.

2. Set the dome in the CLOSED position. (If necessary, apply temporary air/electric for this step, then disconnect all air and/or electric.)

3. Mount the appropriate flange type to the valve flange, with a rubber gasket

sandwiched in between. Fasteners should be used at every flange hole using all applicable safety measures.

Roto-Disc, Inc. can assist or supply these components upon request.

4. Install an air fitting with pressure guage into the ¼" NPT hole of the blind test flange as oriented for your desired test per Illustration 3-1 or 3-2.

5. *Gradually* apply pressure or vacuum to the valve in the same direction as is applied in service.

Caution: Do not pressurize above 150 psi

6. Perform the test for pressure or vacuum as described for testing *above* or *below* the valve.

4.0 SEAT CALIBRATION

Caution: Roto-Disc, Inc. recommends the valve be removed from service for all maintenance. Under no circumstance should the Actuator, Position Indicator, brackets or shaft retaining plates be removed while the valve is pressured above atmospheric pressure.

4.1 SEAT-TO-DOME CALIBRATION

4.1.1 OVERVIEW

Seat-to-dome calibration is set during the assembly process and is confirmed during the multi-point QC process. Seat-to-dome calibration is determined by the valve's application conditions and falls into two categories:

1. Compression seats – 'soft' seats
2. Clearance – 'metal' seats

Valves with soft seats, such as reinforced Teflon, PEEK, Nylon, UHMW or other engineered plastics are typically set for *compression* to provide tight sealing.

Valves with metal seats are set at the factory for *clearance* in order to prevent contact of the seat against the dome. Valves with both stainless steel domes and stainless steel seats are to be set for clearance to prevent galling.

Field adjustments of seat calibration may be required due to changes in operating temperature or pressure. The Roto-Disc valve calibration process provides flexibility using two levels of calibration:

1. Minor calibration - adjustment of torque of the seat retainer cap screws
2. Major calibration - addition/removal of shims

4.1.2 MINOR CALIBRATION

4.1.2.1 CAPSCREW TORQUE ADJUSTMENT

Seat Retainer cap screw torque is generally 25 to 35 in-lb. Adjustments can be made in

seat-to-dome calibration simply by adjusting torque on the seat retainer cap screws. To access the cap screws use the following procedure:

1. Disconnect ***all*** air and electrical connections, and remove the valve from service.

NOTE: This process involves cycling the dome, open and close, 'on the bench' where personnel are NOT protected from the leading edge of the dome as it rotates. Roto-Disc, Inc. recommends slowing down the dome rotation by adjusting the flow controls while working on the valve on the bench.

2. Set up the valve assembly for the appropriate test as described in section 3.0.

3. Perform the pressure or vacuum test, as described in section 3.0 for your application.

   Tighten the seat retainer cap screws in the area where bubbles appear during a soap test, or smoke draw appears during a vacuum test.

   Release test pressure or vacuum from the valve

   Cycle the valve open and closed to confirm any tightening adjustment did not bind-up or negatively impact the rotation of the dome.

4. Continue this process for each cap screw or until the original issue is resolved.

   If you have completed the process above, but detect a gap between the dome and seat in one area, the seat and seat retainer may be shifted laterally to close this gap. See section 4.1.2.2 for instructions on that process.

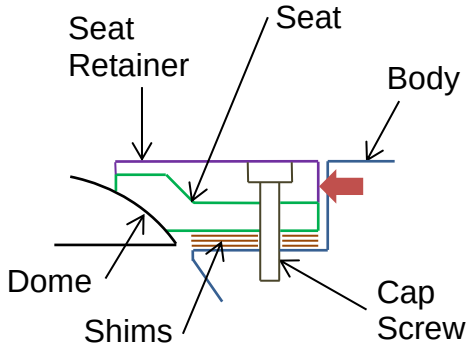
5. If necessary, reset the flow controls to the original speed, taking special care to keep personnel clear of the rotating dome and inlet port.

Note: Roto-Disc, Inc. recommends performing a final test of the reassembled valve before putting it back into service.

4.1.2.2 LATERAL SHIFT OF THE SEAT

In situations where cap screw torque adjustments have been made but there is a gap or insufficient compression in one area where the seat contacts the dome, it may be necessary to laterally shift the seat and seat retainer as described below.

1. Loosen all cap screws in the seat retainer.
2. Apply lateral force on the outside face of the seat retainer in the direction of the gap area as shown in illustration 4-1.
3. While maintaining lateral force, tighten Several cap screws on the side opposite the force being applied.
4. Tighten the remaining cap screws.



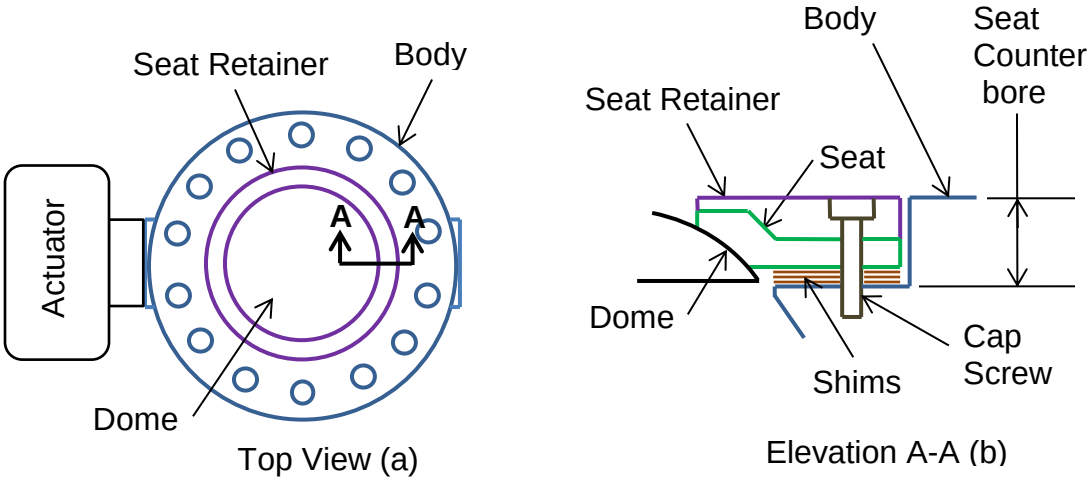
Lateral Seat Shift
Illustration 4-1

5. Recheck the seat-to-dome calibration, and recheck dome rotation for binding or other gaps.

4.1.3 MAJOR CALIBRATION

Due to machining tolerances the dome-to-seat calibration may change when a new seat is installed. A 'shim set' is a collection of shims of various thickness between .003" and .015", totaling .032" thick. This collection allows combinations for precise seat-to-dome calibration.

4.1.3.1 SHIM ADJUSTMENT:



Roto-Disc / Roto-Disc II, Soft Seat Arrangement
Illustration 4-2(a) & (b)

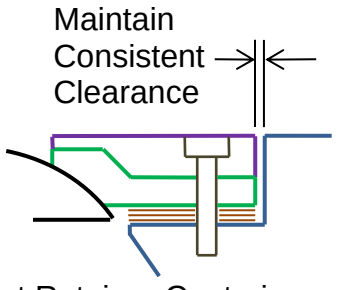
1. Unscrew the seat retainer capscrews. Remove the seat retainer and seat.

   Calibrate by adding or removing shim. *Removing shim will increase compression, and adding shim will decrease compression.*

   Note: Assuming the existing shims will be reinstalled, take care to store them flat. Allowing shims to fold or bunch-up can result in creases forming, which can complicate valve re-assembly.

2. Position the seat retainer over the seat, maintaining a consistent clearance around the perimeter of the seat retainer and the seat counter bore as shown in Illustration 4-3.

   The seat can be shifted slightly from side-to-side. See section 4.1.2.2 for more information on lateral shift of the seat.



Seat Retainer Centering
Illustration 4-3

3. Install 4 cap screws, spaced 90° apart, around the seat retainer. Then cycle the valve manually. The dome should rotate without significant resistance.

4. Install the remaining cap screws in a cross-pattern sequence and tighten accordingly. Reference section 4.1.2.1 for seat retainer cap screw torque range.

In the event of dome over-travel during calibration or operation, see section 5.6 for remedy procedure.

Note: Roto-Disc, Inc. recommends performing a final test of the reassembled valve before putting it back into service.

5.0 MAINTENANCE

Caution: Roto-Disc, Inc. recommends the valve be removed from service for all maintenance. Under no circumstance should the Actuator, Position Indicator, brackets or shaft retaining plates be removed while the valve is pressured above atmospheric pressure.

5.1 SEAT REPLACEMENT

1. Disconnect ***all*** air and electrical connections and remove the valve from service.

   NOTE: This process involves cycling the dome, open and close, 'on the bench' where personnel are NOT protected from the leading edge of the dome as it rotates. Roto-Disc, Inc. recommends slowing down the dome rotation by adjusting the flow controls while working on the valve on the bench.

2. Unscrew the seat retainer cap screws. Remove the seat retainer and seat.

3. Inspect the seat for wear on the seating surface. A PTFE seat can be cleaned using soap and water.

4. If it is determined that the seat does *not* need replacement, reinstall the shims and existing seat. Then proceed to step 2 of section 4.1.3.1, Shim Adjustment.

5. If it is determined that the seat does need replacement, install a new seat with existing shim arrangement. Replacement seats usually come with a full set of replacement shims.

5.2 DOME REPLACEMENT

When replacing a dome, Roto-Disc, Inc. recommends purchasing a dome, both shafts & shaft O-rings. The dome will include any polish, hard-facing and/or coating that was supplied with the original dome.

To replace the dome, use the following procedure.

5.2.1 DOME REMOVAL

1. Disconnect ***all*** air and electrical connections, and remove the valve from service.

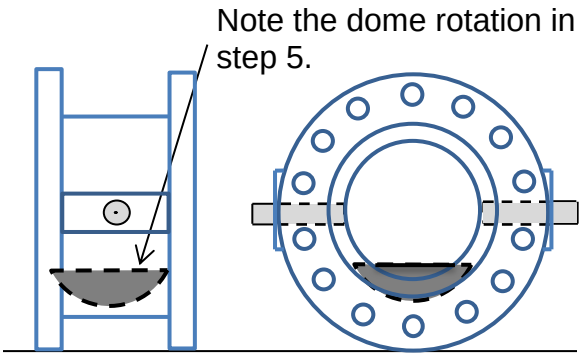
2. Mark the body on the actuator side to maintain orientation for reassembly. Then remove the actuator, position indicator and brackets.

3. Remove the seat retainer cap screws, seat retainer and seat, as instructed in section 4.1.3.1.

4. Place valve on its side, as shown in Illustration 5-1 on a flat, stable surface.

   Note: The perimeter of the dome is an edge. Roto-Disc, Inc. advises using gloves or applying heavy tape over this edge to protect personnel when handling the dome.

   Take precaution not to scar or nick the sealing surface of the dome sphere during removal or temporary storage.



Valve orientation for dome removal
Illustration 5-1

5. Rotate the dome downward to the open position as shown in illustration 5-1.

Note: Take precaution to capture the dome as the shafts disengage from the dome ear. When working with large valves, install sections of cardboard, or cloth, between the dome face and body to protect the dome face and support the weight of the dome

6. Remove the shaft retaining plates from each side to access the shafts.

7. Push/drive the shafts through each dome ear from the inside of the valve. Domes of large valves are heavy. Carefully allow the weight of the dome to rotate itself, as needed, in order to free it from valve body.

8. The dome should now be free for removal from the valve body.

5.3 SHAFT O-RING REPLACEMENT

1. Remove the four (4) worn O-rings from both shafts.

2. Inspect the shafts at the O-ring grooves for nicks or burrs that may have occurred during removal of the shafts from the valve body. Any nicks or burrs can impact the sealing efficiency and life of an O-ring.

3. Install new O-rings into the grooves on each shaft.

4. Apply O-ring lubricant generously over all four (4) O-rings.

5.4 BUSHING REPLACEMENT

Roto-Disc bushings are designed to press-fit into the valve body in order to prevent leakage between the valve body and the bushing OD. Roto-Disc valves can be ordered with bushings of various materials, but the basic replacement procedure is as follows.

5.4.1 BUSHING REMOVAL

1. Disconnect *all* air and electrical connections and remove the valve from service.

2. Mark the body on the actuator side to maintain orientation for re-assembly. Then remove the actuator, position indicator and brackets.

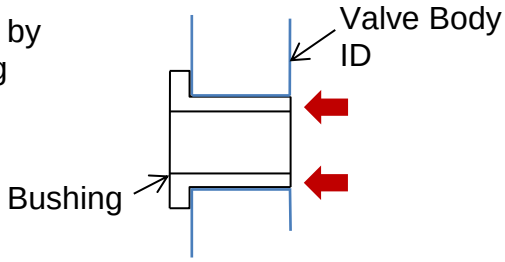
3. Remove the seat retainer and seat & shims as described in section 4.1.3.1.

   Note: Assuming the existing shims will be reinstalled, take care to store them flat. Allowing shims to fold or bunch-up can result in creases forming, which can complicate valve re-assembly.

4. Remove the valve dome & shafts as instructed in dome removal section 5.2.1.

5. Remove the worn bushings from the valve body by forcefully tapping the inside end of each bushing outward, as shown in illustration 5-2.

6. Clean the inside of the body bushing bores of any debris.

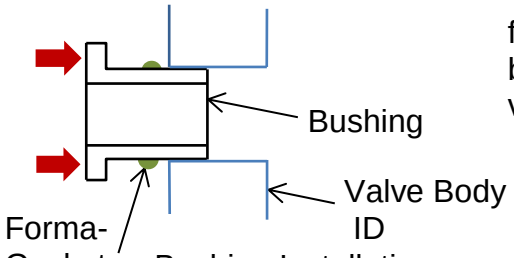


Bushing Removal
Illustration 5-2

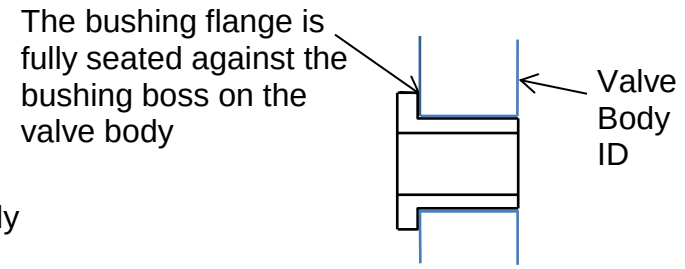
5.4.2 BUSHING INSTALLATION

1. Apply a bead of Forma-Gasket type sealant around the OD of each bushing approximately mid-way on the barrel as shown in Illustration 5-3.

2. Drive the bushings into the valve body with a mandrel, or other tool that keeps constant contact on the outside face of the bushing flange. The bushing flange should be fully seated against the face of the bushing boss on the valve body as shown in Illustration 5-4.



Bushing Installation
Illustration 5-3



Bushing Installation Complete
Illustration 5-4

3. Roto-Disc bushings are designed to be press-fit into the valve body to prevent leakage between the body and bushing OD. The resulting compression on the bushing OD may cause the (new) bushing ID to collapse slightly. Therefore, it is possible the bushing ID may require reaming *after it is installed*, to regain clearance for the shaft (with O-Rings) to easily slide through the bushing into the body interior. A hand reaming tool, such as a spiral fluted hand reamer, is recommended for this purpose.

4. The ID of the bushing should be smooth before installing the shafts. If smoothing is necessary, a flap wheel or honing tool is recommended for this purpose.

5. Reassemble the valve per Dome Installation instructions in section 5.5, and Shim Adjustment in Section 4.1.3.1.

Note: Roto-Disc, Inc. recommends performing a final test of the reassembled valve before putting it back into service.

5.5 DOME INSTALLATION

1. Install new O-rings on each shaft as described in section 5.3.

2. Place the valve body on a flat, secure surface with the bottom flange down.

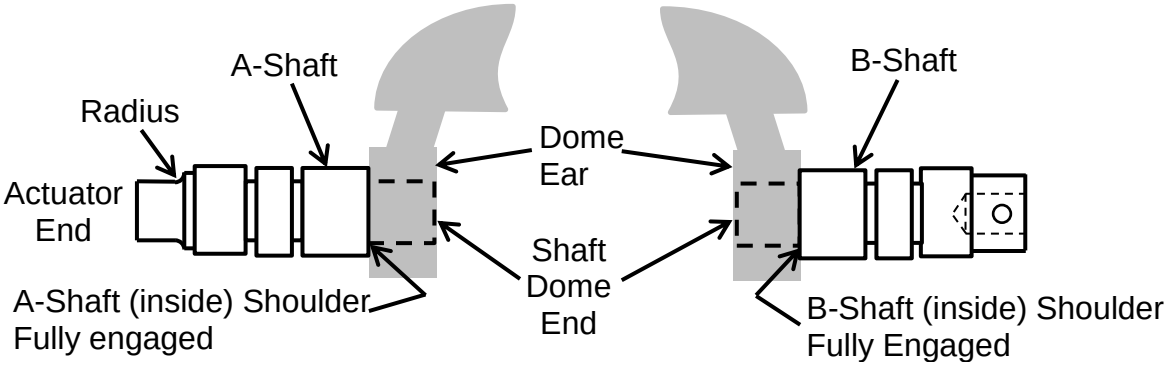
3. Insert the 'dome end' of the actuator shaft (*longer* of the two shafts) through the bushing on the actuator side of the valve, as marked in step 2 of section 5.2.1.

   Note: The 'dome end' of both shafts is identified by the square shaft (inside) shoulder shown in illustrations 5-5 & 5-6. (On the A-Shaft, the 'actuator end' is identified by a radius on the opposite end of the shaft.)

   Insert the A-shaft until it is fully visible inside the body cavity.

4. Insert the 'dome end' of the B-Shaft through the bushing on the other side of the valve until the 'dome end' of the shaft is fully visible inside the body cavity

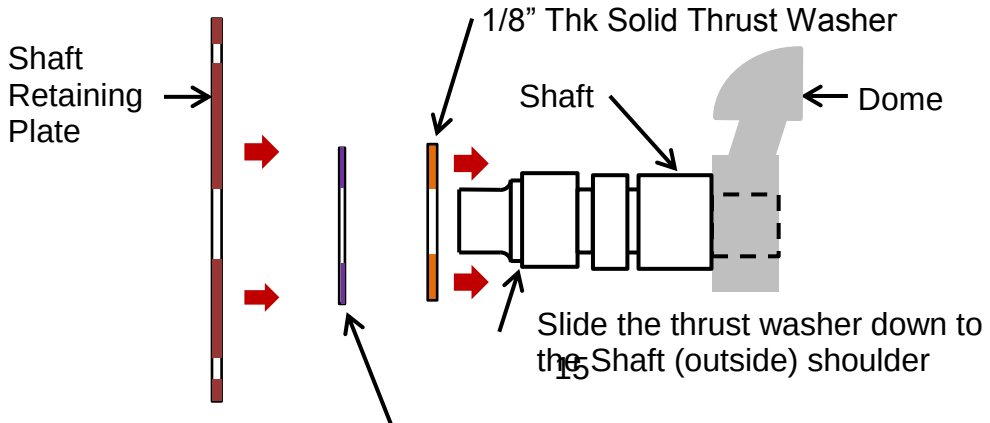
5. Carefully place the dome inside the valve body. *Place cardboard protection as noted in step 5 of the Dome Removal section 5.2.1 to support the dome.* Insert the shafts through the square holes in each dome so the dome is supported by both shafts. The shaft (inside) shoulder is where the dome square meets the round shaft. *The shaft is in place when the shaft (inside) shoulder is seated against the outer face of the dome ear, as shown in Illustrations 5-5 & 5-6*



A-Shaft To Dome Orientation & Engagement, Illustration 5-5

B-Shaft To Dome Orientation & Engagement, Illustration 5-6

Roto-Disc Valves make use of thrust washers & shaft retaining plates to keep the dome in position laterally. After both shafts are fully engaged at the dome ears place one 1/8" thick (solid) thrust washer over the exposed end of each shaft outside the body, until it sits flush against the shaft (outside) shoulder, as shown in Illustration 5-7 .



‘Peel-away’ Thrust Washer
As Required, See Step 7
For More Information

Thrust Washer & Shaft Retainer Placement
Illustration 5-7

6. Slide the shaft retaining plates over each exposed shaft until it is flush against the thrust washer. The thrust washers must be firmly sandwiched between the shaft retaining plates and each shaft when the shaft retaining plate is fastened to the mounting bosses on the body.

   Thrust Washer Check: If either thrust washer can be rotated when the shaft retainer plates are fastened in place, the union is loose, *which allows room for the dome to shift*. In this situation, it may be necessary to add a peel-away thrust washer, as referenced in Illustration 5-7. Peel-away thrust washers are available from Roto-Disc, Inc.

7. PEEL-AWAY THRUST WASHER INSTALLATION (AS NEEDED)

   1. Remove the shaft retaining plate from the side where the solid thrust washer can be rotated by hand.

   2. Insert a peel-away thrust washer between the shaft retaining plate and the solid thrust as shown in Illustration 5-7.

   3. If the shaft retaining plate can be rocked, or there is a visible gap between the shaft retaining plate and the mounting pad on the body, modify the peel-away thrust washer as described below.

      Peel-away Thrust Washer Modification: Peel-away thrust washers are laminated for separation into thinner sections if needed. Slice through the OD of the peel-away thrust washer with razor blade or knife to separate the laminations into thin sections as needed. Place the new section over the shaft and against the solid thrust washer. Then resume assembly of the valve. Repeat this process as necessary.

   When capturing the B-Side thrust washer, there is often no bracket installed. The shaft retaining plate is still required to keep the thrust washer and dome securely in place.

8. Rotate the dome manually to ensure smooth rotation, and there is no interference from the valve body.

   Caution: Beware of dome over-travel when manually rotating the dome in a tightly shimmed valve. See section 5.6 for more information on this condition.

9. Rotate the dome to the closed position and proceed with seat installation and calibration, as instructed in Section 4.1.3.1.

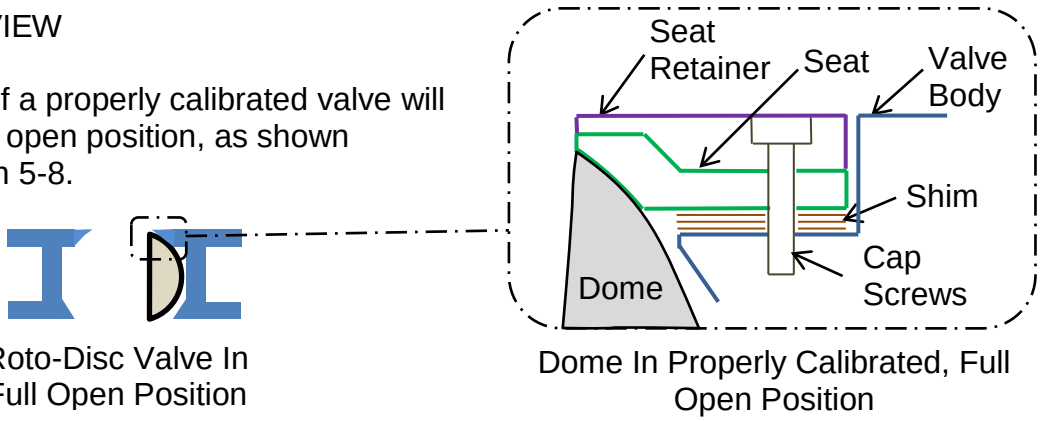
10. Attach the actuator bracket; actuator, and position indicator (if applicable). Re-check the dome to seat calibration to ensure the dome has not shifted during the process of mounting the actuator onto the A-Coupling & A-Shaft.

Note: Roto-Disc, Inc. recommends performing a final test of the reassembled valve before putting it back into service

5.6 DOME OVER-TRAVEL CONDITION

5.6.1 OVERVIEW

The dome of a properly calibrated valve will rotate to full open position, as shown in Illustration 5-8.

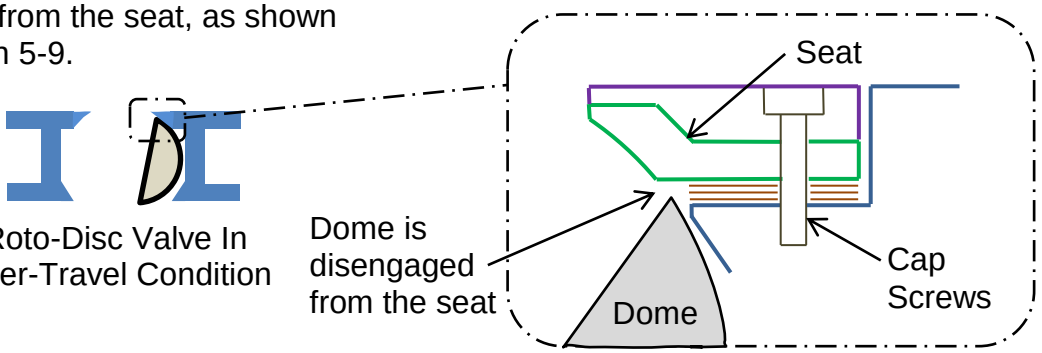


Roto-Disc Valve In Full Open Position

Dome In Properly Calibrated, Full Open Position

Illustration 5-8

If the dome rotates *past* the seat it will dis-engage from the seat, as shown in Illustration 5-9.



Roto-Disc Valve In Over-Travel Condition

Dome In Over-Travel Condition

Illustration 5-9

Caution: In a tightly shimmed valve, simply rotating the dome back into seat contact may damage the sealing surface of the seat.

5.6.2 REMEDY:

1. Loosen all the cap screws in the seat retaining ring.

2. Rotate the dome back to the full closed position.

3. Tighten all the cap screws as described in section 4.1.3.1.

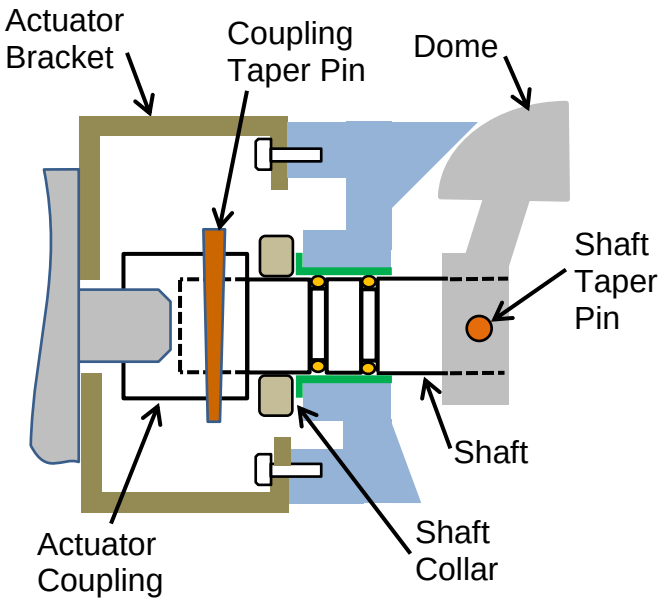
Note: As described in section 2.1.1, the stop positions of all actuated Roto-Disc valves are set at the factory. At full open position, some Roto-Disc valves may appear out of sequence with the visible beacon as described in section 2.1. This does not necessarily indicate incorrect stop setting at the open position of the Roto-Disc valve.

6.0 CONVERT TAPER-PIN STYLE VALVE TO DIRECT-DRIVE STYLE VALVE

NOTE: This process involves cycling the dome open and close 'on the bench' where personnel are exposed to the leading edge of the dome as it rotates. Roto-Disc, Inc. recommends slowing down the dome rotation by adjusting the flow controls while working on the valve on the bench.

6.1 OVERVIEW

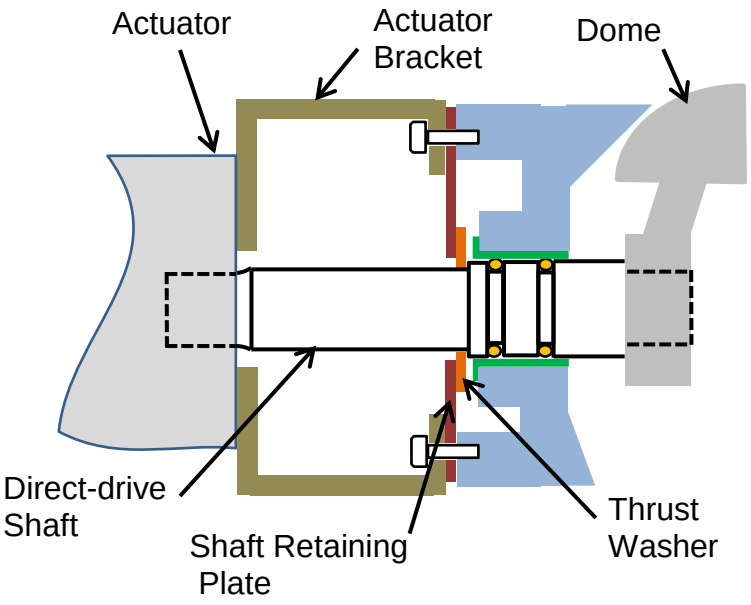
The 'Taper Pin' valve design makes use of taper pins to connect the shafts to both the dome, and the Actuator Coupling. The lateral position of the dome is held in place by a shaft collar on the each shaft, outside the valve body as shown in Illustration 6-1.



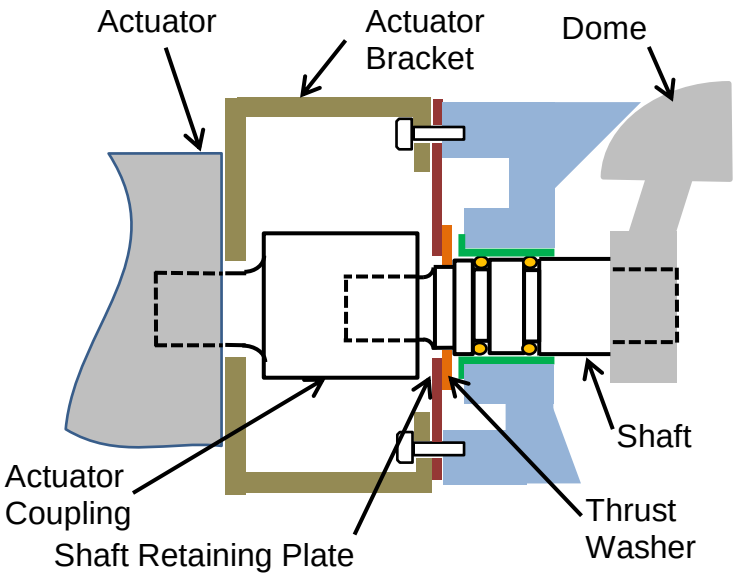
'Taper Pin' Valve Design (Elevation)
Illustration 6-1

The Direct-drive valve design eliminates taper pins and makes use of a female square in each dome ear that receives the square male end of each shaft. The dome is centered laterally by thrust washers that capture both shafts between two shaft retaining plates that mount to the outside of the valve body. See Illustration 6-3 for the Direct-drive style.

Some valves with the direct-drive design have shafts that mate directly to the actuator (i.e. do not use an actuator coupling). This design style is shown in Illustration 6-2.



Direct-Drive Valve Design (Elevation)
Illustration 6-2



Direct Drive Valve Design
With Actuator Coupling (Elevation)
Illustration 6-3

6.2 DIS-ASSEMBLY OF TAPER-PIN STYLE VALVE

1. Disconnect ***all*** air and electrical connections, and remove the valve from service.

2. Mark the body on the actuator side to maintain orientation for reassembly. Then disassemble the 'Taper Pin' valve as described below:

3. Dismount the actuator and position indicator assembly. Then remove the actuator and position indicator brackets.

4. Unscrew the seat retainer cap screws, and remove the seat retainer and seat.

5. Place the valve on its side and open it to full open as indicated in Illustration 5-1.

6. Locate the small diameter end of each taper pin that connect the dome to the shafts, then tap out both taper pins from the small diameter end.

7. Pull/drive the shafts through the dome ear, rotating the dome as needed to free it from valve body.

8. Remove the dome from the valve body.

6.3 VALVE ASSEMBLY

1. Assemble the direct-drive style valve as instructed beginning in section 5.5 Dome Installation, then section 4.1.3.1 Shim Adjustment.

7.0 ROTO-DISC RECOMMENDED SPARE PARTS

The following list represents typical replacement parts for the Roto-Disc valve. The items are rank ordered in terms of likely need for replacement, but this can vary depending on application conditions. As such, regular inspection of the valve is recommended to ensure long service life. For a complete listing of all parts, see the bill of materials section on the assembly drawings.

ITEM	REQ QTY	DESCRIPTION
1	1	Seat with Shim Set – material as supplied with the valve
2	4	Shaft 'O' Rings- material as supplied with the valve
3	2	Bushings – material as supplied with the valve
4	1	Actuator Repair Kit – for actuator as supplied with the valve
5	1	Dome – material & hardfacing/coating (if any) as supplied with the valve
6	1	A-Side (Actuator) Shaft – material as supplied with the valve
7	1	B-Side (undriven side) shaft – material as supplied with the valve

8.0 NOTES

1. FOR ROUTINE VALVE REFURBISHING, ROTO-DISC, INC. RECOMMENDS (1) NEW SEAT AND (4) NEW SHAFT 'O' RINGS.

2. FOR COMPLETE OVERHAUL, WE RECOMMEND (2) NEW BUSHINGS AND A NEW DOME WITH SHAFTS IN ADDITION TO THE PARTS LISTED IN NOTE #1.

3. IF THE ACTUATOR HAS OBTAINED MORE THAN (1) MILLION CYCLES, IT SHOULD BE EVALUATED FOR POSSIBLE REBUILD OR REPLACEMENT.

4. DUE TO TOLERANCES IN MACHINING, THE DOME-TO-SEAT SETTING MAY CHANGE WITH A NEW SEAT. THEREFORE, IT MAY BE NECESSARY TO TAKE-OUT OR ADD MORE SHIMS TO ATTAIN PROPER SETTING. NEW SHIM SETS (.032" TOTAL THICKNESS) ARE COMMONLY SUPPLIED WITH NEW SEATS, HOWEVER IT IS UNLIKELY THAT MORE THAN 1-2 SHIMS WOULD BE NEEDED, IF ANY, AND IT MAY BE NECESSARY TO REMOVE SOME OF THE EXISTING SHIMS.

5. ROTO-DISC BUSHINGS ARE DESIGNED TO PRESS-FIT INTO THE VALVE BODY IN ORDER TO PREVENT LEAKAGE BETWEEN THE BODY AND THE BUSHINGS OD. THE RESULTING COMPRESSION ON THE OD CAUSES THE ID TO COLLAPSE SLIGHTLY. THUS THE BUSHING ID MUST BE BORED OUT OR REAMED AFTER IT IS INSTALLED TO GAIN ENOUGH CLEARANCE BETWEEN THE SHAFT AND THE BUSHING ID TO ALLOW THE SHAFTS, WITH THE 'O' RINGS INSTALLED, TO EASILY SLIDE INTO AND THROUGH THE BUSHING. CONSULT THE ROTO-DISC VALVE CO. USER'S GUIDE FOR MORE INFORMATION ON BUSHING REPLACEMENT.

6. SINCE THE ACTUATOR COUPLING TAPER PIN ALSO ACTS AS A SHEAR PIN, IT IS RECOMMENDED THAT EXTRA ARE STOCKED (this part is not included on valves with the direct-drive design)

7. AS OF JANUARY 1, 2011, ROTO-DISC CO NO LONGER SUPPLIES DOME ASSEMBLIES WITH TAPER PINS. AS AN ALTERNATIVE, WE OFFER OUR NEW BARE-STEM DESIGN. THE NEW DESIGN IS MORE ROBUST AND WILL FIT INTO ANY ROTO-DISC VALVE THAT WAS ORIGINALLY SUPPLIED WITH TAPER PINS. THE BARE-STEM DESIGN REQUIRES A NEW COUPLING FOR THE ACTUATOR, (2) SHAFT RETAINING PLATES, AND THRUST WASHERS, IN ADDITION TO THE DOME ASSEMBLY. PLEASE NOTIFY ROTO-DISC, INC. OF THE ACTUATOR STYLE (MAKE/MODEL) WHEN REQUESTING A QUOTE.

8. Roto-Disc, Inc. SUPPLIES VALVES WITH A WIDE RANGE OF MATERIALS OF CONSTRUCTION. WHEN ORDERING SPARE PARTS, PLEASE REFERENCE THE JOB NUMBER (RD-XXXX) AND/OR THE SERIAL NUMBER OF THE VALVE FOR WHICH THE PARTS ARE INTENDED. THIS WILL ENSURE THAT THE PROPER REPLACEMENT PARTS ARE SUPPLIED. THESE NUMBERS WILL BE FOUND ON THE NAME PLATE ON THE VALVE AND ALL QUOTES, ACKNOWLEDGEMENTS, PACKING LISTS AND INVOICES FROM Roto-Disc, Inc.