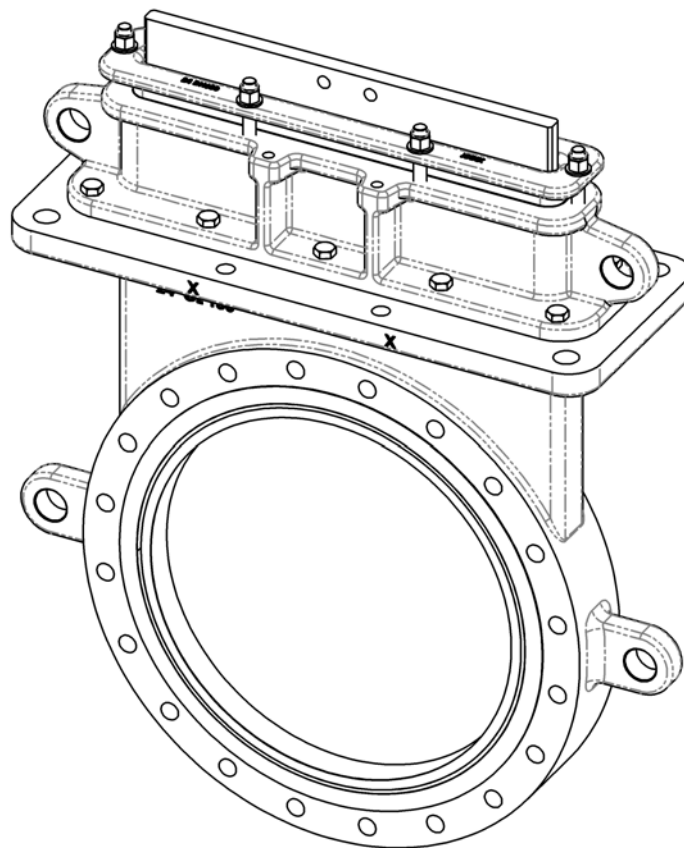




**DeZURIK**  
**KSV CL150 & CL300**  
**BONNETLESS**  
**KNIFE GATE VALVES**



Instruction D11021  
October 2016

### Instructions

These instructions provide information about DeZURIK KSV CL150 & CL300 knife gate valves. They are intended for personnel who are responsible for the installation, operation and maintenance of KSV knife gate valves.

### Safety Messages

All safety messages in the instructions are flagged with the word Caution, Warning or Danger. These messages must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see, or if a label has been removed, please contact DeZURIK for replacement label(s).



#### **WARNING!**

**Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of process material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous process materials. Handle valves which have been removed from service with the assumption of process material within the valve.**

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### Inspection

Your KSV knife gate valve has been packaged to provide protection during shipment. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

### Parts

Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

Order parts from your DeZURIK sales representative, or directly from DeZURIK. When ordering parts, please include the 7-digit part number and 4-digit revision number (example: **9999999R000**) located on the data plate attached to the valve assembly. Also include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

### DeZURIK Service

DeZURIK Service personnel are available to install, maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK representative or visit our website at [www.dezurik.com](http://www.dezurik.com).

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# DeZURIK

## KSV CL150 & CL300 BONNETLESS KNIFE GATE VALVES

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### Description

The DeZURIK KSV bonnetless knife gate valves are constructed with a one-piece cast body, gate, packing chamber, replaceable seat rings and either an all-metal or metal/resilient seat. A choice of several actuators and accessories are available.

### Installation

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#### **CAUTION!**

**When installed with rubber lined pipe/flange faces, additional flange seals would be required. Factory consultation is advised.**

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Install the valve between appropriate ASME Class pipeline flanges. Flange gaskets are required. Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the valve and pipeline.

#### ***Metal Seat***

Install the valve so that the side marked "SEAT" is on the lower pressure side of the valve when the valve is closed; the pipeline pressure will then help seal the valve in the closed position.

#### ***Resilient Seat***

Resilient seat valves are bi-directional and can be installed with the "SEAT" side on the high or low pressure side of the pipeline. It is preferred that the "SEAT" side be on the low pressure side.

#### ***General Installation Guidelines***

Observe the following points to prevent distortion of the valve body and gate when the flange bolts are tightened:

- Align the mating pipeline flanges.
- Select the length of the flange bolts so that the bolts used in the chest blind holes do not bottom out when tightened. We recommend studs and nuts.
- Tighten the flange bolts evenly, in a crisscross pattern. Refer to Table A for recommended flange bolt/stud torques.

**Note:** Torque ranges are based on ASME Pressure Vessel Code Calculations and lab test data. These torques are only spiral wound type gaskets. For other gasket types listed in ASME, consult DeZURIK.

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**KSV CL150 & CL300 BONNETLESS KNIFE GATE VALVES**

**Table A: Bolt Torques**

Valve Size	CL150 Lubricated Min. Torque	CL150 Lubricated Max. Torque	CL150 Non -lubricated Min. Torque	CL150 Non -lubricated Max. Torque	CL300 Lubricated Min. Torque	CL300 Lubricated Max. Torque	CL300 Non -lubricated Min. Torque	CL300 Non -lubricated Max. Torque
<u>in.</u> mm.	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm	<u>ft.lbs.</u> Nm
<u>3"</u> 75mm	<u>41</u> 56	<u>45</u> 61	<u>73</u> 99	<u>81</u> 110	<u>41</u> 56	<u>45</u> 61	<u>73</u> 99	<u>81</u> 110
<u>4"</u> 100mm	<u>30</u> 41	<u>32</u> 43	<u>53</u> 72	<u>59</u> 80	<u>35</u> 47	<u>38</u> 52	<u>64</u> 87	<u>70</u> 95
<u>6"</u> 150mm	<u>58</u> 79	<u>64</u> 87	<u>107</u> 145	<u>117</u> 159	<u>39</u> 53	<u>47</u> 64	<u>71</u> 96	<u>85</u> 115
<u>8"</u> 200mm	<u>79</u> 107	<u>87</u> 118	<u>144</u> 195	<u>158</u> 214	<u>61</u> 83	<u>81</u> 110	<u>112</u> 152	<u>149</u> 202
<u>10"</u> 250mm	<u>74</u> 100	<u>82</u> 111	<u>136</u> 184	<u>149</u> 202	<u>71</u> 96	<u>106</u> 144	<u>131</u> 178	<u>197</u> 267
<u>12"</u> 300mm	<u>94</u> 127	<u>104</u> 141	<u>172</u> 233	<u>190</u> 258	<u>90</u> 122	<u>144</u> 195	<u>166</u> 225	<u>267</u> 362
<u>14"</u> 350mm	<u>117</u> 159	<u>129</u> 175	<u>214</u> 290	<u>236</u> 320	<u>78</u> 106	<u>133</u> 180	<u>145</u> 197	<u>246</u> 334
<u>16"</u> 400mm	<u>109</u> 148	<u>120</u> 163	<u>200</u> 271	<u>220</u> 298	<u>107</u> 145	<u>188</u> 255	<u>199</u> 270	<u>351</u> 476
<u>18"</u> 450mm	<u>156</u> 212	<u>171</u> 232	<u>288</u> 390	<u>317</u> 430	<u>114</u> 155	<u>203</u> 275	<u>213</u> 289	<u>377</u> 511
<u>20"</u> 500mm	<u>137</u> 186	<u>151</u> 205	<u>253</u> 343	<u>279</u> 378	<u>126</u> 171	<u>238</u> 323	<u>234</u> 317	<u>444</u> 602
<u>24"</u> 600mm	<u>188</u> 255	<u>207</u> 281	<u>350</u> 475	<u>385</u> 522	<u>185</u> 251	<u>387</u> 525	<u>350</u> 475	<u>729</u> 988
<u>26"</u> 650mm	<u>121</u> 164	<u>133</u> 180	<u>225</u> 305	<u>248</u> 336	<u>132</u> 179	<u>365</u> 495	<u>251</u> 340	<u>674</u> 914
<u>28"</u> 700mm	<u>111</u> 150	<u>122</u> 165	<u>207</u> 281	<u>228</u> 309	<u>142</u> 193	<u>405</u> 549	<u>269</u> 365	<u>766</u> 1039
<u>30"</u> 750mm	<u>119</u> 161	<u>138</u> 187	<u>221</u> 300	<u>257</u> 348	<u>163</u> 221	<u>490</u> 664	<u>309</u> 419	<u>931</u> 1262
<u>32"</u> 800mm	<u>158</u> 214	<u>185</u> 251	<u>297</u> 403	<u>349</u> 473	<u>194</u> 263	<u>594</u> 805	<u>371</u> 503	<u>1132</u> 1535
<u>36"</u> 900mm	<u>169</u> 229	<u>204</u> 277	<u>319</u> 433	<u>385</u> 522	<u>222</u> 301	<u>696</u> 944	<u>424</u> 575	<u>1332</u> 1806
<u>42"</u> 1050mm	<u>181</u> 245	<u>241</u> 327	<u>341</u> 462	<u>454</u> 616	<u>220</u> 298	<u>759</u> 1029	<u>416</u> 564	<u>1437</u> 1948
<u>48"</u> 1200mm	<u>175</u> 237	<u>253</u> 343	<u>330</u> 447	<u>476</u> 645	<u>297</u> 403	<u>1113</u> 1509	<u>566</u> 767	<u>2123</u> 2878
<u>54"</u> 1400mm	Contact DeZURIK							
<u>60"</u> 1500mm								

### Operation

The gate in the valve is positioned by the valve actuator. The actuator moves the gate over the valve port in the closed position, and withdraws the gate from the port in the throttling and open positions. Refer to the Actuator Instructions for adjustment and maintenance requirements for the actuator.

### Lubrication

The valve does not require lubrication. If applicable, ensure that valve threaded stems are maintained with proper lubrication. Refer to the Actuator Instructions for lubrication requirements for the actuator.

### Purging

Purge connections allow for optional pressurized purging fluid to be circulated through the valve to clear out sedimentation or other material buildup. Purge lines should be the same size as the purge ports. The recommended maximum purge pressure is 25-50 psi (170-345 kPa) above the pipeline pressure.

### Packing

The gate packing is contained and compressed by the packing gland (A13). See Figure 1 and Figure 2 for component identification.

**Note:** The packing gland (A13) is slightly loosened prior to shipping. This is done to increase the life of the packing during extended storage. It must be tightened just enough to stop a packing leak prior to energizing the pipeline.

### Adjustment

If packing leaks, tighten the adjustment nuts (A15) on top of the packing gland (A13). Tighten all the nuts equally and gently just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

Drawings

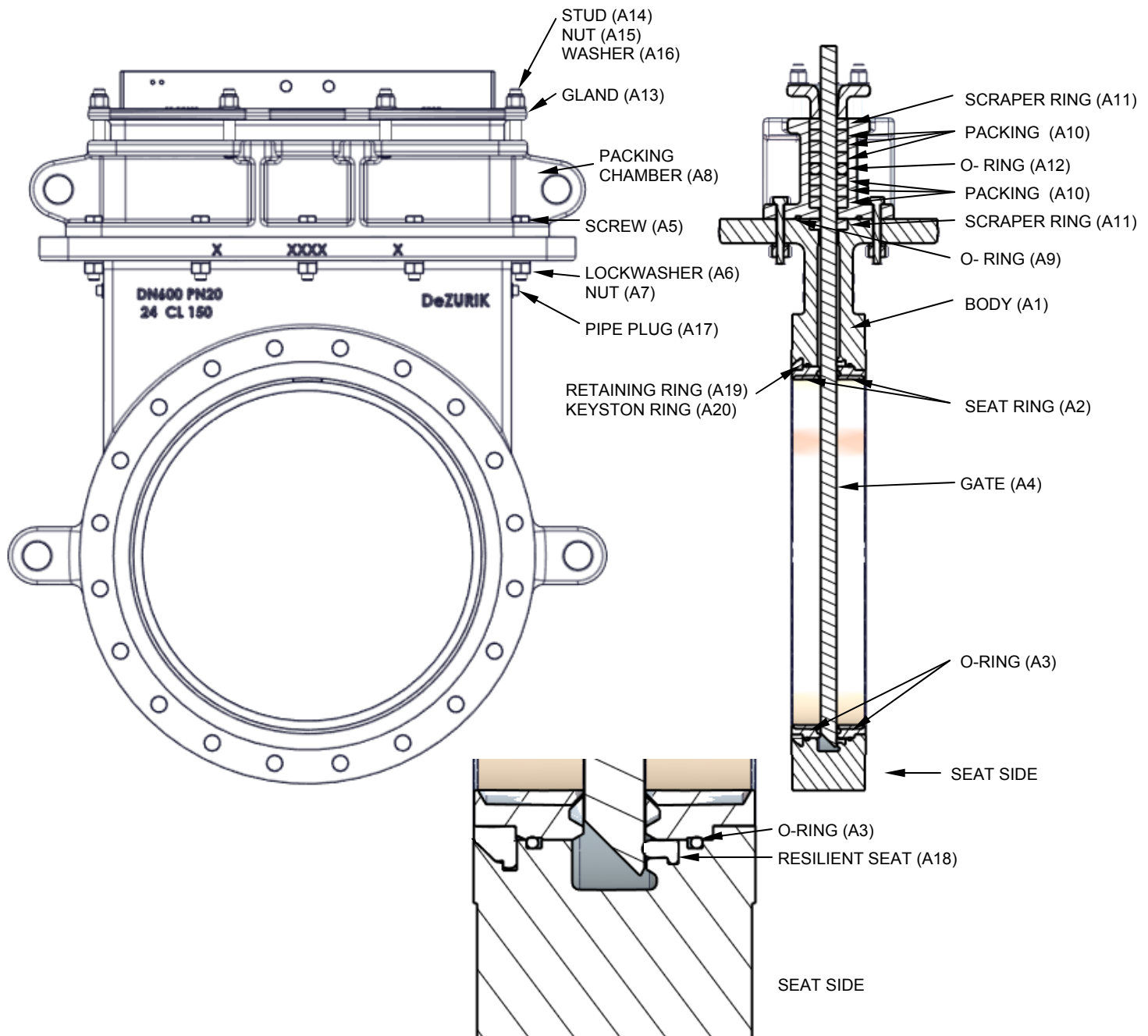


Figure 1—Component Identification

## Packing Replacement Only

### Removing the Old Packing

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**WARNING!**

**Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.**

---

1. Relieve the pressure in the pipeline and close the valve.
- 



**WARNING!**

**Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.**

---

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.
  3. Remove the two screws and nuts near the top of the gate and disengage the clip from the gate by stroking the actuator (not the valve) to the open position. Remove closed position lockout bars if so equipped.
  4. Remove the gland nuts (A15), washers (A16) and the packing gland (A13).
  5. Remove the used top scraper ring (A11), packing (A10) and o-ring (A12) from the packing chamber (A8).
- 

### Replacing the Scraper Ring in the Body

If the bottom scraper ring (A11) in the body (A1) needs to be replaced, use the following steps:

1. Remove the screws (A5), nuts (A7) and lockwashers (A6) and remove the packing chamber (A8) from the body.
2. Remove the used o-ring (A9) from the packing chamber (A8) and remove the used scraper ring (A11) from the body (A1).



## Packing Replacement Only continued

**Installing the New Packing**

DeZURIK recommends using a square-ended wood or plastic tool, driven by a hammer or mallet for packing rings.

**Table B: Packing Ring Lengths**

**Note:** DO NOT USE ANY SHARP OR HARD METAL TOOLS TO PACK THE RINGS.

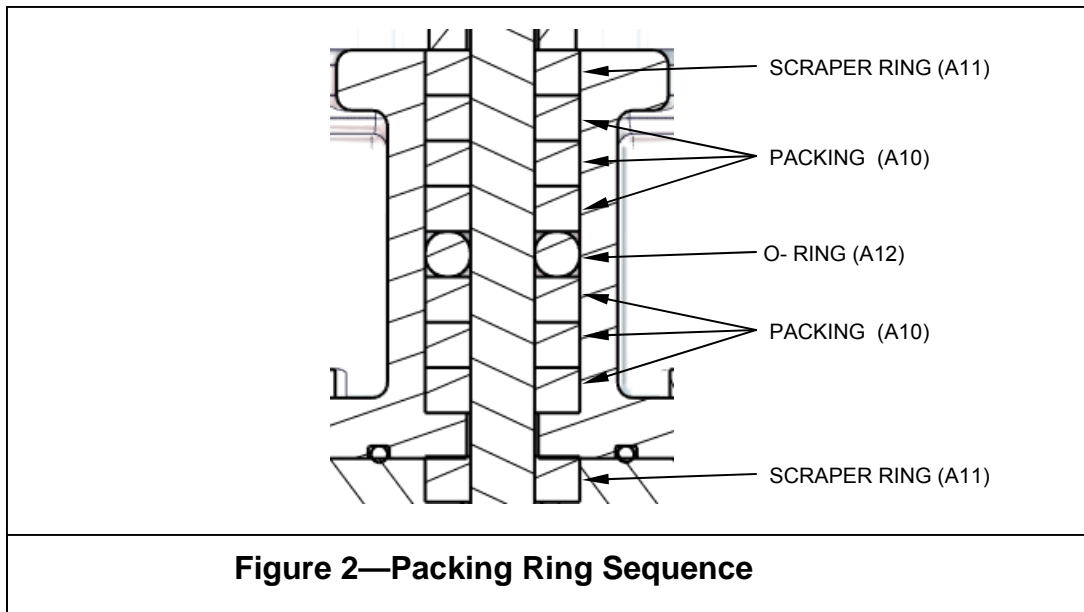
If the bottom scraper ring (A11) in the body (A1) is being replaced, use steps 1 and 2. If not, go to step 3.

1. With the gate (A4) closed, center the gate in the body (A1) and place the scraper ring (A11) into the top of the body (A1).
2. Place the o-ring (A9) into the groove in the bottom of the packing chamber (A8).
3. With the gate closed, center the gate (A4) in the body (A1) and attach the packing chamber (A8) to the body (A1) using the screws (A5), nuts (A7) and lockwashers (A6). Leave snug, but not tight.
4. Cut new packing rings (A10) to the length and quantity shown in Table B.
5. Install and pack the scraper ring (A11), packing rings (A10) and o-ring (A12) one at a time in the sequence shown in Figure 2.
6. Install packing gland (A13) and snug all nuts (A15) equally just enough to stop a packing leak.
7. Tighten nuts (A7) on packing chamber (A8)

**Note:** Install the packing with the ends together, but not overlapped. Stagger the packing joints on the long sides of the packing chamber. Make sure the inside and outside edges of each ring are tightly packed against the gate and packing chamber, especially in the corner areas. Pack each ring until it is flat and even.

Valve Size in. mm	Size square in. mm	CL 150 Length in. mm	CL 300 Length in. mm	Number of O-rings	Number of Scraper Rings	Number of Pack- ing Rings
3" 75mm	0.375 9.5	<u>11.25</u> 286	<u>11.25</u> 286	1	2	6
4" 100mm		<u>14.00</u> 356	<u>14.00</u> 356			
6" 150mm		<u>18.25</u> 464	<u>17.50</u> 445			
8" 200mm		<u>22.50</u> 572	<u>23.25</u> 591			
10" 250mm	0.500 12.7	<u>28.00</u> 712	<u>27.50</u> 699			
12" 300mm		<u>32.00</u> 813	<u>32.75</u> 832			
14" 350mm		<u>35.50</u> 902	<u>35.50</u> 902			
16" 400mm	0.625 15.9	<u>39.25</u> 997	<u>39.75</u> 1010			
18" 450mm		<u>43.75</u> 1112	<u>44.25</u> 1124			
20" 500mm		<u>47.25</u> 1201	<u>48.25</u> 1226			
24" 600mm		<u>56.50</u> 1436	<u>57.25</u> 1455			
26" 650mm	0.750 19.1	<u>60.75</u> 1544	<u>61.75</u> 1569			
28" 700mm		<u>65.00</u> 1651	<u>65.75</u> 1671			
30" 750mm		<u>68.50</u> 1740	<u>70.75</u> 1798			
32" 800mm		<u>73.50</u> 1867	O/A			
36" 900mm		<u>81.50</u> 2071	O/A			
42" 1050mm	0.750 19.1	<u>94.00</u> 2388	O/A			
48" 1200mm		<u>107.00</u> 2718	O/A			
54" 1400mm		Contact DeZURIK				
60" 1500mm						

### Installing the New Packing continued



### Reassembling the Valve

1. Reconnect the clip to the gate (A4) with the screws and nuts.
2. Reinstall the lockouts in their original locations if they were removed.
3. If the actuator is a powered actuator, reconnect power to the actuator.
4. Pressurize the pipeline and inspect packing for leakage.
5. If packing leaks, tighten the adjustment nuts (A15) on top of the packing gland. Tighten the nuts evenly and slowly, just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

## Seat Ring, Seat and Packing Replacement

See Figure 1 for component identification.

---



**WARNING!**

Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before removing gate stem and packing gland nuts.

---

1. Relieve the pressure in the pipeline and close the valve.
- 



**WARNING!**

Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

---

2. If the actuator is powered, disconnect and lock out power to prevent accidental operation of the actuator.
3. Remove the valve from the pipeline.

**Note: If not replacing packing, go to the Note after step 9 to replace the seat rings without removing the packing and packing chamber**

4. Remove the screws and nuts near the top of the gate and disengage the actuator stem from the gate (A4).
5. Remove the actuator yoke and actuator from the valve.
6. Remove the gland nuts (A15), washers (A16) and the gland (A13).
7. Remove the packing chamber screws (A5), lockwashers (A6), nuts (A7) and the packing chamber (A8).
8. Remove the used o-ring (A9) from the packing chamber (A8) and remove the used scraper ring (A11) from the top of the body (A1).
9. Remove the gate (A4) from the body (A1). Go to step 10.

**Note:** If not replacing the packing and scraper rings, then the seat rings may be replaced without removing the gate by following the subsequent steps.

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**WARNING!**

Exercise care to maintain top structure upright.

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- a Open gate a few inches by retracting actuator.
  - b Once gate is retracted, undo screws, nuts and washers to loosen legs from valve body.
  - c Slowly actuate gate closed (extend cylinder or turn handwheel to close). Due to packing friction, this will result in the legs being raised up from the valve body. Do this until the legs have been raised approximately an inch.
  - d Place blocks between the legs and the valve body and fasten the legs to the valve body with the blocks between them. Longer screws may be required.
  - e Fully retract the gate and check to see that the bottom gate edge has cleared the top of the rubber seat.
  - f If the gate has not cleared the rubber seat, repeat steps a thru e with additional or thicker blocks between the legs and the valve body. Also, longer screws may also be required. Continue to Step 10.
-

### Seat Ring & Seat Replacement continued

10. Push seat ring (A2) on the side opposite the seat towards the center of the valve just far enough so that the retaining ring (A19) is exposed.
11. Remove the keystone ring (A20) and retaining ring (A19), prying it out by starting with the keystone (A20).
12. Remove the first o-ring (A3) and then slide out the first seat ring (A2).
13. Press out the seat side seat ring (A2), the o-ring (A3) retaining it will be damaged by this and will need to be replaced.
14. Remove the resilient seat (A18) (if applicable).
15. Install the new ring and seat:
  - a. Note the gate side and body side of the seat as shown in Figure 1 (enlarged view).
  - b. Coat new o-ring (A3) and resilient seat (A18) (if applicable) with anti-seize compound or heavy grease and install them into the body.
  - c. Coat seat diameters inside body with anti-seize compound or heavy grease.
  - d. Insert the new seat ring (A2) into the body, pressing it in until it rests against the shoulder in the body (end face should be flush with exterior face of valve body).
16. Install second seat ring (A2), properly orientated so it goes in far enough to expose retaining ring groove —See step 15 a, b and c.
17. Place retaining ring (A19) into its groove in the body and install the keystone ring (A20) and the keystone at the bottom of the valve.
18. Slide the second seat ring (A2) back over the retaining ring (A19). If packing was not removed in steps 4 thru 9, then go to step 30.
19. Insert gate (A4) fully into the body (A1) until it rests against the jams.
20. Insert one scraper ring (A11) into the top of the body (A1).
21. Place o-ring (A9) into the packing chamber (A8) and slide the packing chamber (A8) over the gate (A4) and onto the body (A1).
22. Center the packing chamber (A8) on the gate (A4) and insert screws (A5), lockwashers (A6) and nuts (A7).
23. With the gate (A4) closed, center the gate (A4) in the body (A1) and place the scraper ring (A11) into the top of the body (A1).
24. Place the o-ring (A9) into the groove in the bottom of the packing chamber (A8).
25. With the gate closed, center the gate (A4) in the body (A1) and attach the packing chamber (A8) to the body (A1) using the screws (A5), nuts (A7) and lockwashers (A6). Leave snug, but not tight.
26. Tighten nuts (A7) on packing chamber (A8)

## Seat Ring & Seat Replacement continued

27. Replace packing as described in “Installing New Packing”.
28. Place the gland (A13), centering about the gate (A4).
29. Install the gland studs (A14), nuts (A15) and washer (A16). Tighten the gland stud nuts (A15) evenly, applying only enough pressure to seal the packing at the rated test pressure.
30. Remove blocks and refasten actuator to the valve. Or, replace the yoke and actuator if removed in Step 5.
31. Reconnect the stem to the gate with the two screws and locknuts.
32. Replace the valve in the pipeline. Refer to the requirements in the “Installation” section.
33. If the actuator is a powered actuator, reconnect power to the actuator.
34. Pressurize the pipeline and inspect the valve for leaks.
35. If the packing leaks, tighten the adjustment nuts (A15 on top of the packing gland. Tighten the nuts evenly and slowly, just enough to stop the leakage. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

## Troubleshooting

Condition	Possible Cause	Corrective Action
Packing leaks, with no evidence of galling on gate.	Packing is loose.	Adjust packing gland.
	Packing is worn or torn.	Replace packing.
Packing leaks and gate is galled	Packing is worn or torn.	Replace packing and gate.
Valve leaks when fully closed, with no evidence of galling on gate.	Seats are worn or torn.	Replace seats.
Valve leaks when fully closed, and gate is galled.	Seats are worn or torn.	Replace seats and gate.

## Guarantee

Products, auxiliaries and parts thereof of DeZURIK, Inc. manufacture are warranted to the original purchaser for a period of twenty-four (24) months from date of shipment from factory, against defective workmanship and material, but only if properly installed, operated and serviced in accordance with DeZURIK, Inc. recommendations. Repair or replacement, at our option, for items of DeZURIK, Inc. manufacture will be made free of charge, (FOB) our facility with removal, transportation and installation at your cost, if proved to be defective within such time, and this is your sole remedy with respect to such products. Equipment or parts manufactured by others but furnished by DeZURIK, Inc. will be repaired or replaced, but only to the extent provided in and honored by the original manufacturers warranty to DeZURIK, Inc., in each case subject to the limitations contained therein. No claim for transportation, labor or special or consequential damages or any other loss, cost or damage shall be allowed. You shall be solely responsible for determining suitability for use and in no event shall DeZURIK, Inc. be liable in this respect. DeZURIK, Inc. does not guarantee resistance to corrosion, erosion, abrasion or other sources of failure, nor does DeZURIK, Inc. guarantee a minimum length of service. Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than DeZURIK, Inc. or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to install and operate said products and parts according to instructions furnished by DeZURIK, Inc., or misuse, modification, abuse or alteration of such product, accident, fire, flood or other Act of God, or failure to pay entire contract price when due shall be a waiver by you of all rights under this warranty.

The foregoing guarantee shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to, an actuator is attached to the item by anyone other than DeZURIK, Inc. Factory Service personnel. All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous Warranty, and this shall be the only effective guarantee or warranty binding on DeZURIK, Inc., despite anything to the contrary contained in the purchase order or represented by any agent or employee of DeZURIK, Inc., in writing or otherwise, notwithstanding, including but not limited to implied warranties.

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## Sales and Service

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