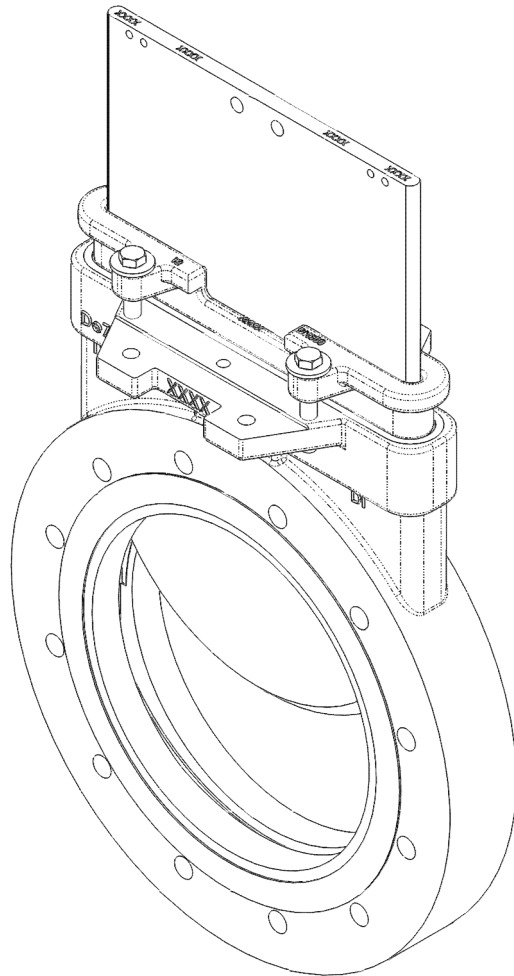




# DeZURIK KUL KNIFE GATE VALVES



Instruction **D11025**

July 2018



APCO

HILTON

WILLAMETTE

# DeZURIK

## KUL KNIFE GATE VALVES

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### Instructions

These instructions are intended for personnel who are responsible for the installation, operation and maintenance of your KUL knife gate valve.

### 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.



#### 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 KUL 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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### Description

KUL knife gate valves have a urethane lined ductile iron body with an embedded molded seat and stainless steel gate. The KUL knife gate valve is available to 150 psi CWP or 250 psi CWP. A choice of several actuators and accessories is available.

### Handling



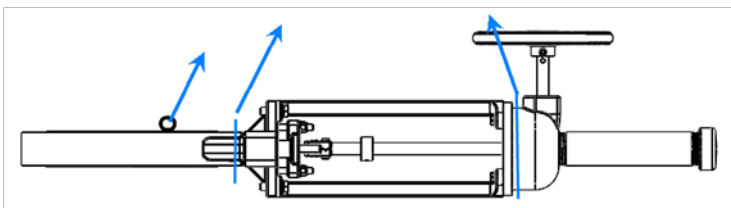
#### WARNING!

A potential hazard exists with handling valves. Failure to handle valves properly may cause a valve to shift, slip or fall causing serious injury or death and/or equipment damage.

*The points below are for reference purposes only, use safe and proper lifting and support techniques. DO NOT lift valves with any adjoining pipe or other equipment attached. Lift with properly rated lifting equipment. Follow jurisdictional safety requirements.*

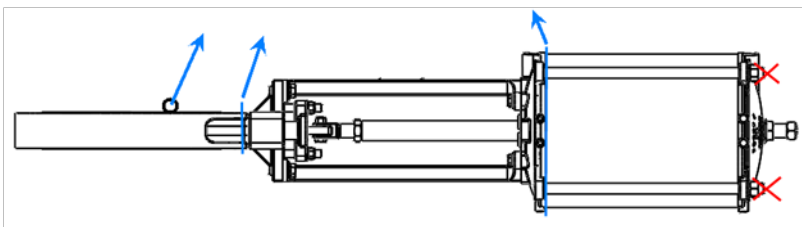
Suggested lifting points are as shown below to lift valve assemblies that are in a horizontal orientation. Eye bolts in flange through holes can be used to lift the valve body or, for 2” through 12” valves, a sling can be strapped around the top of the valve body.

For valves with bevel gear actuators, a sling or chain can be wrapped around the bevel gear actuator body, between the mounting plate and the input shaft housing. This would be in conjunction with lifting from the valve body as well. See Figure 1.



**Figure 1— Knife Gate Valve with Bevel Gear Actuator, Horizontal Lifting**

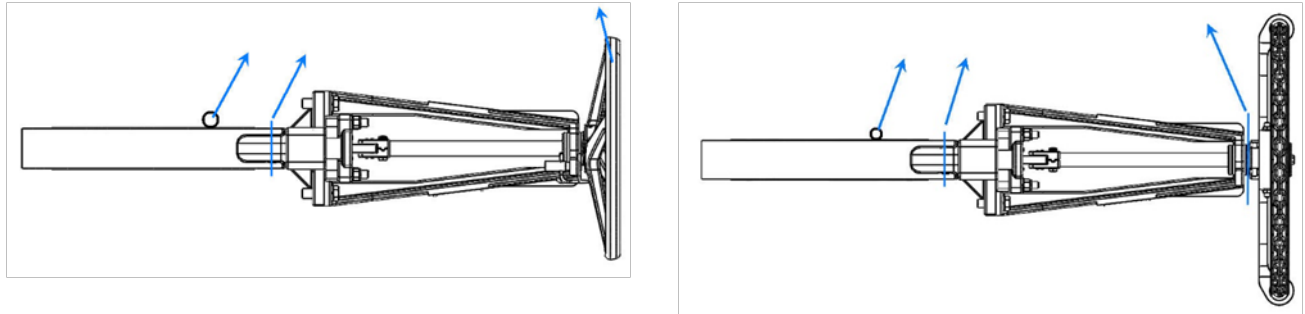
For valves with pneumatic cylinder actuators, a sling can be wrapped around the cylinder, near the cylinder head (piston rod end). This would be in conjunction with lifting from the valve body. Utilize caution to not bump, dent or damage the cylinder tube. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 2.



**Figure 2, Knife Gate Valve with Pneumatic Cylinder Actuator, Horizontal Lifting**

**Handling *continued***

For valves with handwheel actuators, a sling or chain can be wrapped through the rim of the handwheel. For chainwheel actuators, a sling can be wrapped in the area between the yoke/legs and the chainwheel/guide assembly. This would be in conjunction with lifting from the valve body as well. See Figure 3.

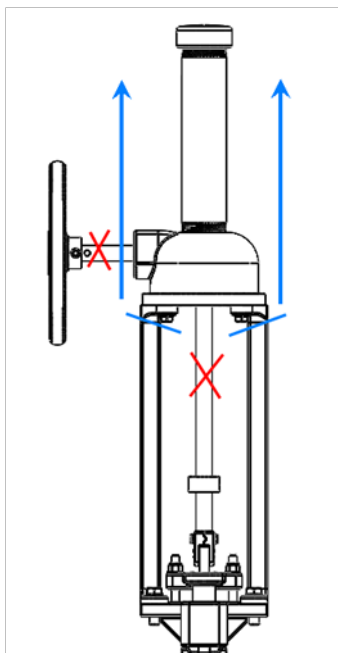


**Figure 3, Knife Gate Valve with Handwheel or Chainwheel Actuator, Horizontal Lifting**

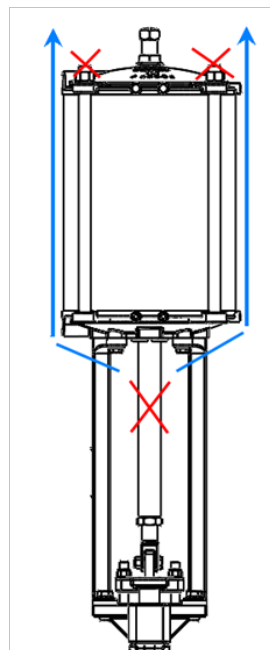
Suggested lifting options are as shown below to lift valve assemblies that are in a vertical orientation. For valves with bevel gear actuators, wrap slings or chains around the top of each leg. Use caution not to put any side load on the bevel gear input shaft or on the valve's threaded stem. See Figure 4.

For valves with pneumatic cylinder actuators, wrap slings around the top of each leg. Use caution to not bump, dent or damage the cylinder tube and avoid any side load on the cylinder piston rod. DO NOT utilize the cylinder tie-rod ends to lift. See Figure 5.

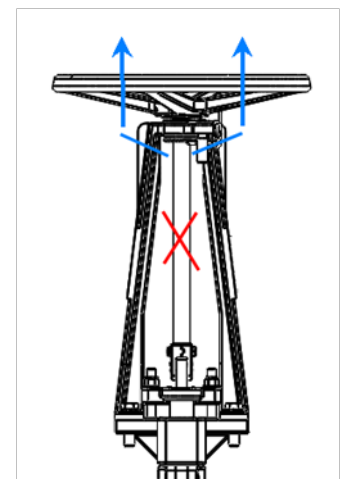
For valves with handwheel or chainwheel actuators, wrap slings or chains around the top of the each leg or yoke side. Use caution to not put any side load on the valve's threaded stem. See Figure 6.



**Figure 4- Knife Gate Valve with Bevel Gear Actuator, Vertical Lifting**



**Figure 5- Knife Gate Valve with Pneumatic Cylinder Actuator, Vertical Lifting**



**Figure 6- Knife Gate Valve with Handwheel or Chainwheel Actuator, Vertical Lifting**

## Installation

Install the valve between ANSI Class 125 or Class 150 pipeline flanges or other flanges that match the valve end connection. Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the valve and pipeline.

Although the KUL is a bi-directional valve, the preferred direction is to 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.

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 blind holes near the chest area of the valve do not bottom out when tightened. We recommend using studs with nuts in the blind holes.
- Tighten the flange bolts evenly, in a crisscross pattern. Refer to Table A for recommended flange bolt/stud torques.
- No gasket required

**Note:** Torque ranges are based on ASME Pressure Vessel Code Calculations and lab test data.

After installing the valve, pressurize pipeline and ensure the packing is not leaking. If the packing leaks, adjust the packing as described on page 5.

**Table A: Recommended Flange Bolt/ Stud Torque Range in ft-lbs (non-lubricated)**

VALVE SIZE	For 150psi CWP	For 250psi CWP
2" (50mm)	9 - 10	15 - 17
3" (80mm)	17 - 19	29 - 32
4" (100mm)	14 - 15	23 - 25
5" (125mm)	21 - 23	34 - 37
6" (150mm)	26 - 29	43 - 47
8" (200mm)	40 - 44	67 - 74
10" (250mm)	45 - 50	76 - 84
12" (300mm)	66 - 73	109 - 120
14" (350mm)	90 - 99	149 - 164
16" (400mm)	87 - 96	145 - 160
18" (450mm)	110 - 121	184 - 202
20" (500mm)	107 - 118	179 - 197
22" (550mm)	141 - 155	235 - 259
24" (600mm)	166 - 183	276 - 304
26" (650mm)	161 - 177	268 - 295
28" (700mm)	159 - 175	264 - 290
30" (750mm)	178 - 196	296 - 326
32" (800mm)	242 - 266	403 - 443
36" (900mm)	261 - 287	435 - 479
42" (1050mm)	313 - 344	522 - 574
48" (1200mm)	329 - 362	548 - 603

## **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 valve port in the open position. Refer to the Actuator Instructions for adjustment and maintenance requirements for the actuator.

## **Lubrication**

The valve does not require lubrication. Refer to the Actuator Instructions for lubrication requirements for the actuator.

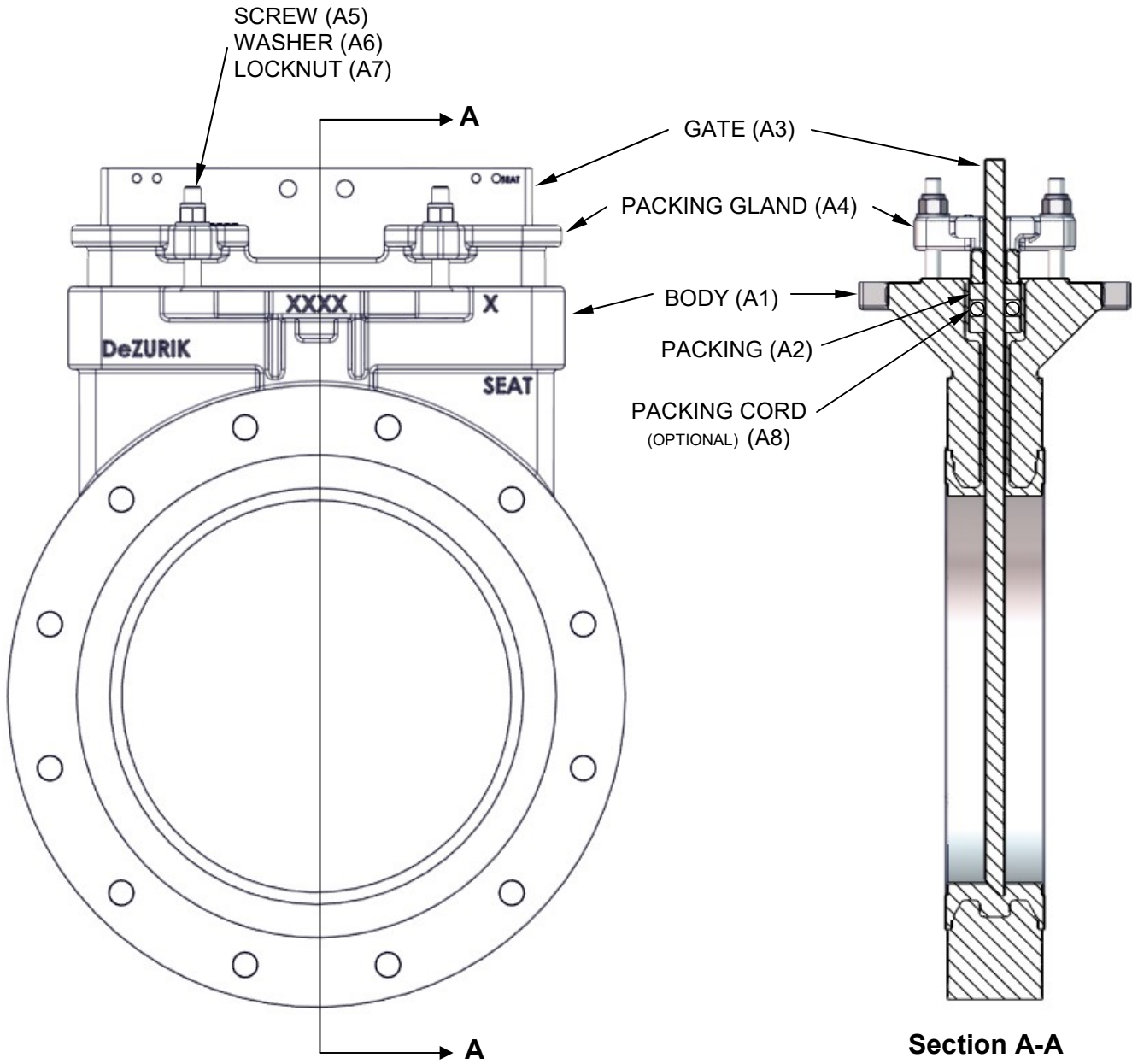
## **Packing**

The gate packing is contained and compressed by the packing gland. See Figure 1 for component identification (Page 6).

## **Adjustment**

If packing leaks, tighten the adjustment nuts on top of the packing gland. Tighten the nuts evenly 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**

### *Removing the Old Packing*



**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 stem from the gate by stroking the actuator (not the valve) to the open position.
  4. Remove the gland locknuts (A7) and washers (A6) and gland (A4).
  5. Remove the used packing (A2) and packing cord (A8), if provided, from the packing chamber.

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## KUL KNIFE GATE VALVES

### Installing New Packing

Packing (A2) ring length and quantity are shown in Table B. Ensure the inside and outside edges of each ring are packed against the gate and packing chamber, so that each strip is compressed flat and evenly. DeZURIK provides extra packing in their packing kits, but do not try to put more packing into a layer than shown in Table B.

1. Ensure the gate (A3) is fully closed and centered in the body before packing.
2. Assemble and pack the rings one at a time, with the ends together, but not overlapped

**Note:** Stagger the joints on the long side of the packing chamber. For packing rings, we recommend using a square-ended wood or plastic tool, driven by a hammer or mallet. Do not use a sharp hard metal tool to pack the rings.

3. For packing systems with the packing cord (A8), assemble and pack one row of packing (A2) and then insert the packing cord (A8). Assemble and pack the last row of packing. See detail below:

Valve Size	Square Size	Length, inches	Quantity		Quantity Cord
			w/o Cord	with Cord	
2" (50mm)	3/8"	7.15	3	2	1
3" (80mm)		9.50			
4" (100mm)		11.50			
5" (125mm)		13.50			
6" (150mm)		15.50			
8" (200mm)	20.00				
10" (250mm)	1/2"	25.00			
12" (300mm)		29.00			
14" (350mm)		32.00			
16" (400mm)	5/8"	36.75			
18" (450mm)		41.25			
20" (500mm)		45.25			
22" (550mm)		49.11			
24" (600mm)		53.50			
26" (650mm)		57.52			
28" (700mm)	3/4"	61.54			
30" (750mm)		66.25			
32" (800mm)		70.39			
36" (900mm)		79.00			
42" (1050mm)		91.82			
48" (1200mm)		104.25			

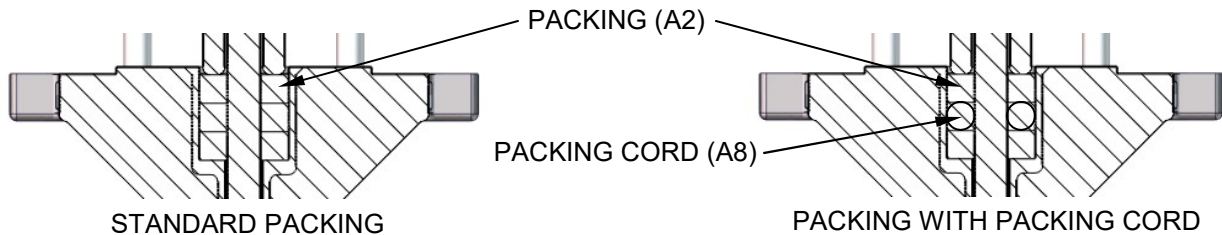


Figure 2—Packing Detail

For all packing types, push excess packing toward the side opposite the seat.

### **Reassembling Valve**

1. Replace the packing gland (A4), locknuts (A7) and washers (A6). Tighten the locknuts (A7) evenly and finger tight, plus 1/2 turn.
2. Reconnect the stem to the gate with the two screws and nuts.
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 locknuts (A7) on top of the packing gland. Tighten the locknuts evenly and gently - just enough to stop the leak. Over tightening will cause excessive operating forces, and will decrease the life of the packing.

### **Replacing the Gate**

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 pipeline flange bolts, and remove the valve from the pipeline.
  4. Remove the actuator, actuator yoke, packing gland (A4), packing (A2) and packing cord (A8), if provided, from the valve.
  5. Remove and inspect the gate (A3). If the gate appears to be scratched or galled due to too-long flange bolts in the chest area of the body, check for body damage in the tapped flange holes and within the chest cavity. Carefully check the seat for damage. Repair or replace the body, as appropriate
  6. Place the new gate (A3) in the body, in the fully closed position.
  7. Replace or reinstall the packing (A2) as described in "Installing New Packing."
  8. Replace the yoke and actuator on the valve.
  9. Adjust the actuator, yoke, and packing gland so that the valve actuates smoothly through the full stroke in both directions, and so that there is no evidence of binding or scratching on the gate when the gate is visible in the fully open position.

## Replacing the Gate continued

10. Reinstall the valve in the pipe line —see “Installation” section.
11. If the actuator is a powered actuator, reconnect power to the actuator.
12. Pressurize the pipeline and inspect the valve for leaks.
13. If the packing leaks, tighten the adjustment locknuts (A7) on top of the packing gland.

**Note:** Tighten the locknuts (A7) 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 Causes	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, check seat for damage
Valve leaks when fully closed, with no evidence of galling on gate	Seat is worn or torn	Replace urethane lined body
Valve leaks when fully closed and gate is galled	Seat is worn or torn	Replace gate and urethane lined body

## 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.

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