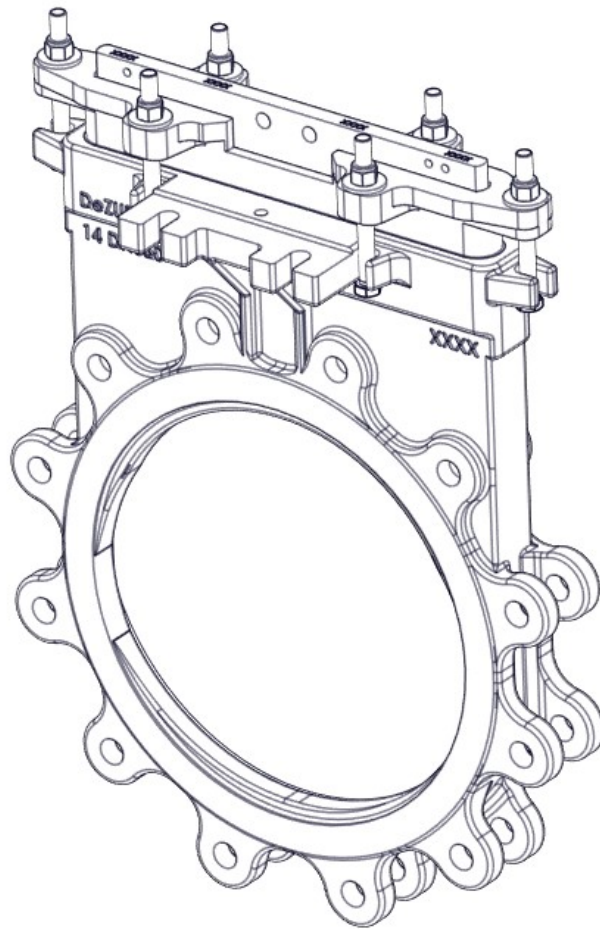




DeZURIK
2-36" (50-900mm)
KGC-BD BI-DIRECTIONAL
KNIFE GATE VALVES
WITH GUIDES



Instruction **D11050**

July 2018

DeZURIK

2-36" KGC-BD BI-DIRECTIONAL KNIFE GATE VALVES WITH GUIDES

Instructions

These instructions are intended for personnel who are responsible for the installation, operation and maintenance of your Bi-Directional Knife Gate Valve model KGC-BD in sizes 2-36".

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.

Inspection

Your KGC-BD 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 serial number or 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.

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Description

KGC-BD knife gate valves have a stainless steel body, gate and a resilient perimeter seat. The KGC-BD knife gate valve is available in 2-36" (50-900mm) sizes. 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.

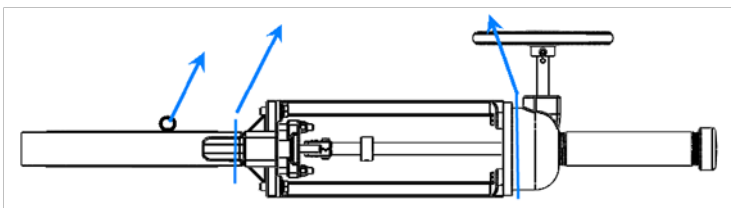


Figure 1— Knife Gate Valve with Bevel Gear Actuator, Horizontal Lifting

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.

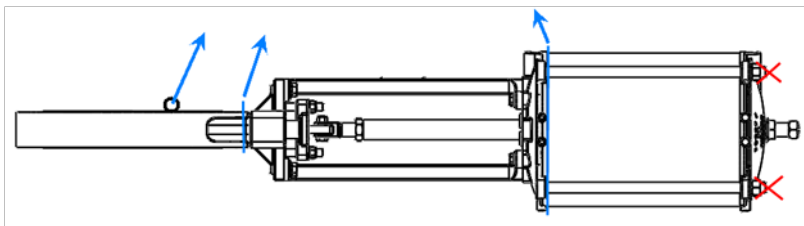


Figure 2, Knife Gate Valve with Pneumatic Cylinder Actuator, Horizontal Lifting

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.

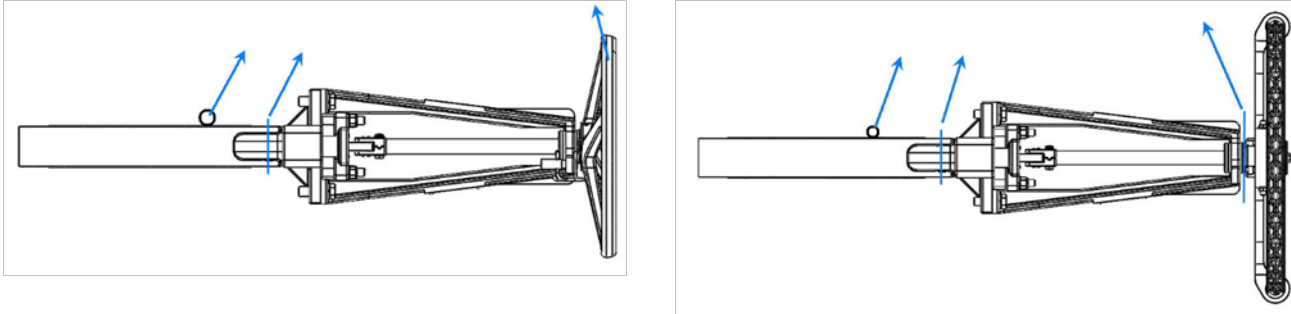


Figure 3, Knife Gate Valve with Handwheel or Chainwheel Actuator, Horizontal Lifting

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.

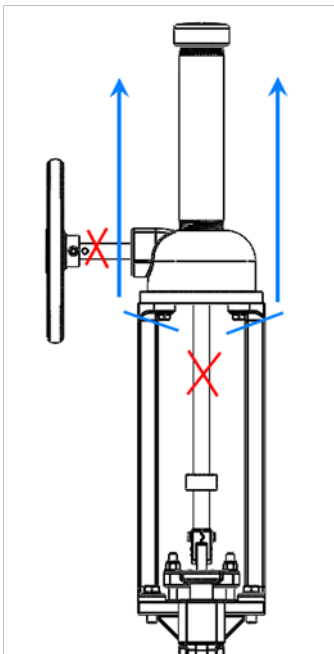


Figure 4- Knife Gate Valve with Bevel Gear Actuator, Vertical Lifting

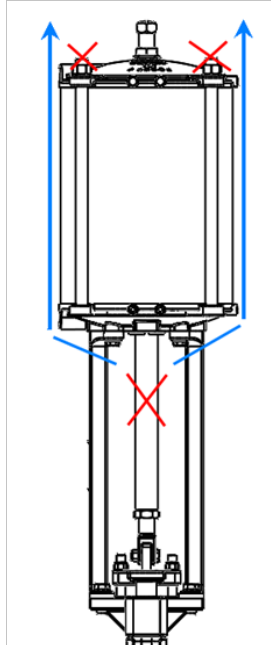


Figure 5- Knife Gate Valve with Pneumatic Cylinder Actuator, Vertical Lifting

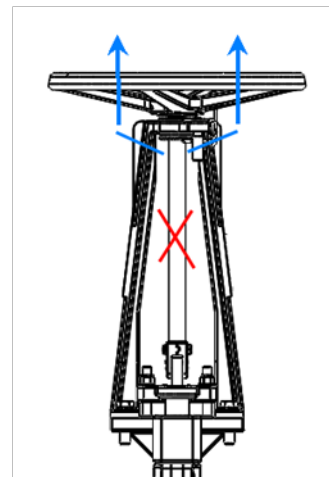


Figure 6- Knife Gate Valve with Handwheel or Chainwheel Actuator, Vertical Lifting

Installation

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

Normal Installations

The bi-directional KGC-BD knife gate valve can be oriented either way in the pipeline. The perimeter seat in the valve will seal the valve in the closed position in both directions.

The bi-directional KGC-BD knife gate valves are not intended for gravity (dry) service applications.

General 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 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.

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

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

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

Valve Size	ASME Gasket Types	
	Rubber with Soft Fabric Filler, & 1/8" Thick Hard	Soft Elastomer Gasket Shore Durometer < 75A
2" (50mm)	26 - 29	8 - 9
3" (80mm)	37 - 41	14 - 16
4" (100mm)	26 - 29	11 - 12
5" (125mm)	36 - 40	17 - 19
6" (150mm)	41 - 45	22 - 24
8" (200mm)	55 - 61	35 - 39
10" (250mm)	56 - 62	40 - 44
12" (300mm)	80 - 88	59 - 65
14" (350mm)	107 - 118	81 - 89
16" (400mm)	103 - 114	79 - 87
18" (450mm)	128 - 141	102 - 112
20" (500mm)	123 - 136	99 - 109
24" (600mm)	188 - 207	155 - 171
26" (650mm)	181 - 199	151 - 166
28" (700mm)	178 - 196	149 - 164
30" (750mm)	198 - 218	168 - 185
32" (800mm)	269 - 296	228 - 251
36" (900mm)	289 - 318	248 - 273

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 open position. 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.

Packing

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

Note: The packing gland is slightly loosened prior to shipping. This is done to increase the life of the packing during extended storage.

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

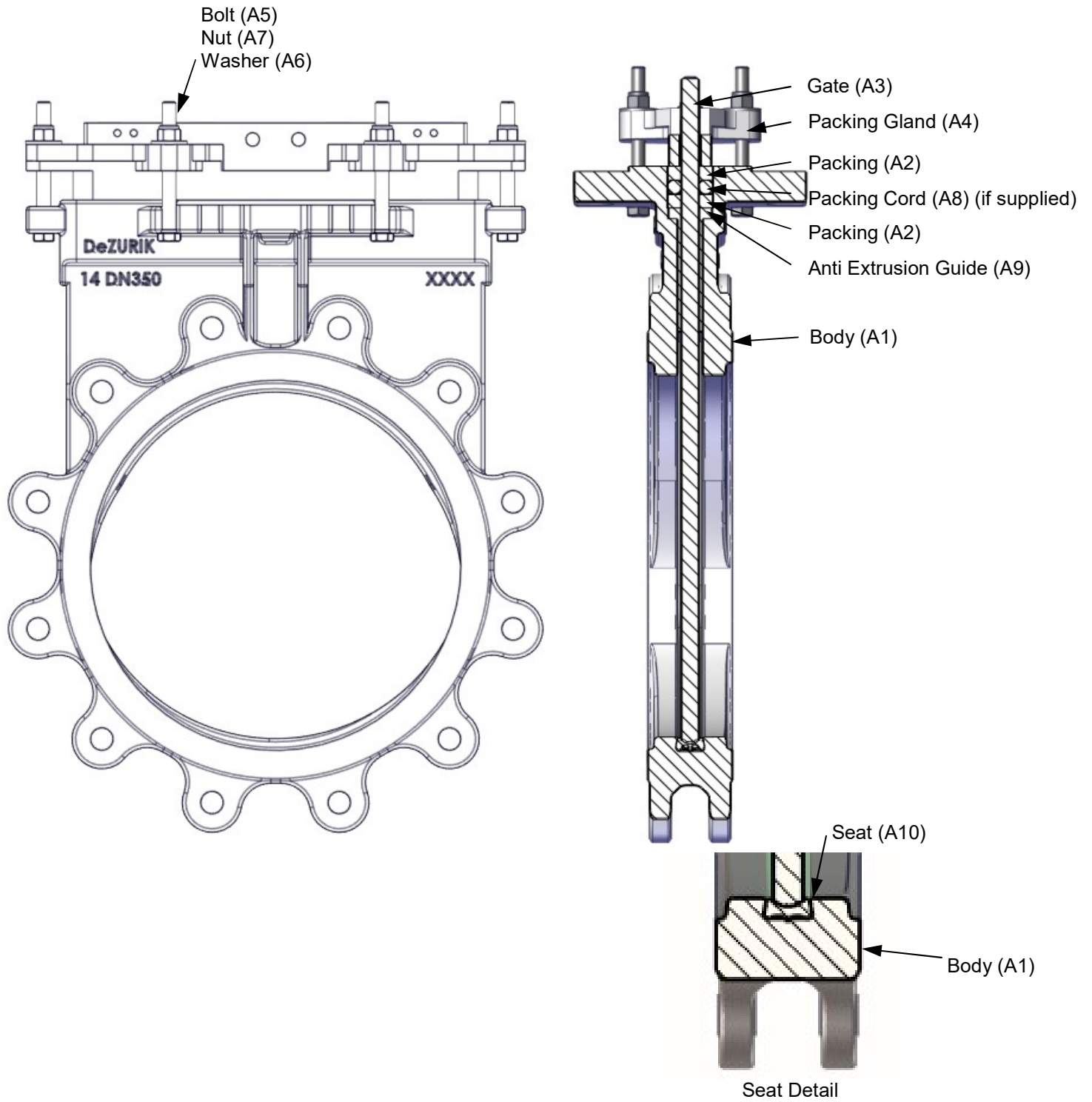


Figure 1—Component Identification

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 nuts (A7), bolts (A5) and packing gland (A4).
5. Remove the used packing (A2) and packing cord (A8), if supplied. Inspect and replace anti-extrusion guides (A9) if damaged.

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Installing the New Packing

Packing (A2) strip length and quantity are shown in Table B. DeZURIK provides extra packing in their packing kits, but do not try to put more packing into a layer than shown in Table B.

Do not compress the packing any more than needed to stop leaks.

1. Ensure the gate (A3) is well within and centered in the body before packing.
2. Place the anti-extrusion guides (A9) in the bottom of the packing chamber (machined slots).
3. Assemble and pack the rings one at a time, with the ends together, but not overlapped

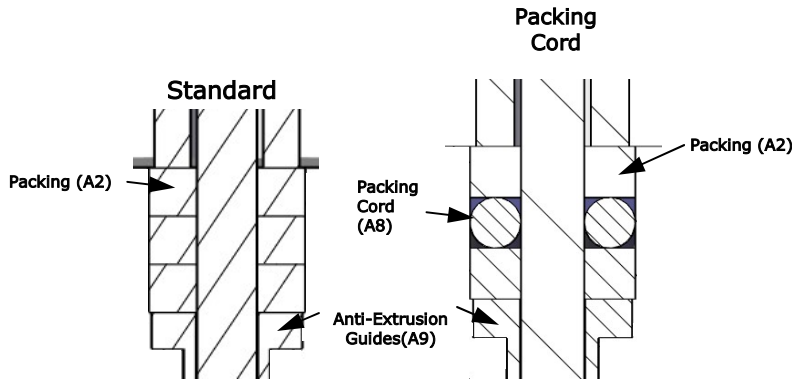
Note: Stagger the joints, on the long side of the packing chamber. For packing rings, we recommend using a square-ended wood or plastic tool, driven by a hammer or mallet. Do not use a sharp tool to pack the rings.

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.

4. 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:

Table B: Packing Ring and Packing Cord Length & Quantity

Valve Size	Square Size	Length, inches	Quantity (A2)	Qty Cord (A8)
2" (50mm)	3/8"	7.50	3 w/o cord	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	3 w/o cord	1
12" (300mm)		29.00		
14" (350mm)		32.00		
16" (400mm)		36.75		
18" (450mm)	5/8"	41.25	2 with cord	
20" (500mm)		45.25		
24" (600mm)		53.50		
30" (750mm)	3/4"	66.25	2 with cord	
36" (900mm)		79.0		



Reassembling Valve

1. Replace the packing gland (A4), bolts (A5), washer (A6) and nuts (A7). Tighten the nuts 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 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.

Replacing the Seat



See Figure 1 for component identification.
If seat replacement is required, contact DeZURIK for assistance.

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), and packing (A2) from the valve. Remove and inspect anti-extrusion guides (A9). Replace if damaged.
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 body for damage. Repair or replace the body, as appropriate.
6. Inspect the seat components.
7. Contact DeZURIK if seat replacement is required.
8. Place the new gate (A3) in the body, in the fully closed position.
9. Replace or reinstall the packing (A2) as described in "Installing the New Packing".
10. Replace the yoke and actuator on the valve.

Replacing the Gate *continued*

- 11. On KGC-BD valves, powered actuators should be set-up to avoid excessive compression of the perimeter seat when closing the valve. To accomplish this, have the cylinder actuator fully extended and the clip holes aligning with the gate when it is fully down into the valve. Then, retract the actuator and thread the clip outward two revolutions. After this, the clip can be attached to the gate.
- 12. Adjust the actuator, yoke, and packing gland so that the valve actuates smoothly 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.
- 13. Reinstall the valve in the pipe line —see “Installation” section.
- 14. If the actuator is a powered actuator, reconnect power to the actuator.
- 15. Pressurize the pipeline and inspect the valve for leaks.
- 16. If the packing leaks, tighten the adjustment nuts (A7) on top of the packing gland.

Note: 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 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 or wear
Valve leaks when fully closed, with no evidence of galling on gate	Seat is worn or torn	Contact DeZURIK if seat replacement is required
Valve leaks when fully closed	Seat is worn or torn	Contact DeZURIK if seat replacement is required, check gate condition

Guarantee

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