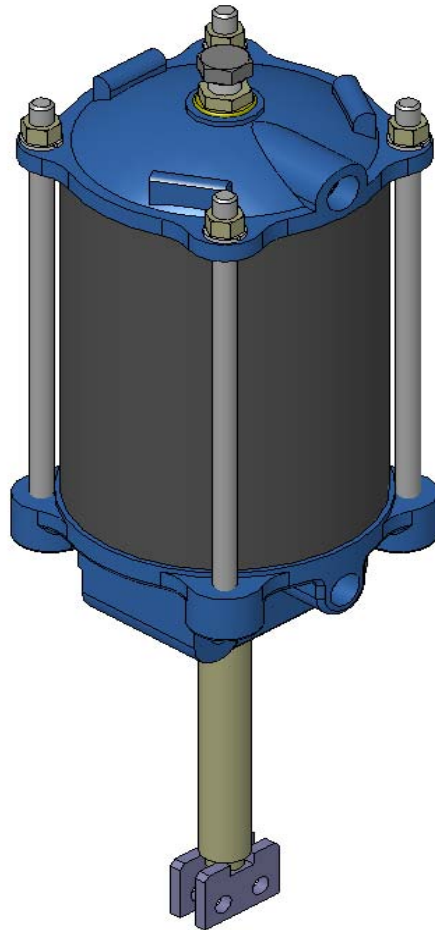




CYLINDER ACTUATOR FOR GKU KNIFE GATE VALVES



Instruction **D10451**
March 2009

DeZURIK

Cylinder Actuator for GKU Knife Gate Valves

Instructions

These instructions provide information about cylinder actuators. They are for use by personnel who are responsible for installation, operation and maintenance of cylinder actuators.

Safety Messages

All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages indicate procedures that 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 read, 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 pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your cylinder actuator has been packaged to provide protection during shipment, however, it can be damaged in transport. 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 sales representative or visit our website at www.dezurik.com.

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Cylinder Actuator for GKU Knife Gate Valves

Description

The pneumatic cylinder used with GKU Knife Gate Valves is a double-acting cylinder that requires an air supply pressure between 50 and 100 psi.

The hydraulic (water fitted) cylinder used with GKU Knife Gate Valves is a double-acting cylinder that operates with hydraulic fluid or water. The wetted surfaces of the head, cap and piston are coated with a special material to prevent rusting when water is used as an operating fluid.



WARNING!

The hydraulic (water fitted) cylinder should not be subjected to more than 145 psi (10 bar) pressure or 212° F (100° C) temperatures.

Lubrication

The cylinder only requires lubrication if it has been disassembled. When reassembling, lubricate the piston seal, o-rings, piston grooves and cylinder wall using one of these lubricants.

- Dow Corning Molykote No. 44 (**recommended**)
- Shell Retinax AM (alternate)
- Shell Lithall MDS (alternate)

Cylinder Support

The unit may be mounted in any position around the pipeline, however it is best to mount the valve with the cylinder in a vertical position. If the valve is installed with the cylinder in a position other than vertical, the customer must provide additional support on size 10 inch and larger valves. This support can be mounted using the holes in the cylinder head, but do not mount the supports on the cylinder tube. See the installation drawing for dimension location of cylinder support.

Adjustments

Aligning the Cylinder

To work properly, the piston rod and gate must be aligned. The mounting holes in the cylinder and yoke are designed to allow for adjustment. Visually check the alignment in the open and close positions, and adjust as needed.

Valve Open Position

The set screw (C1) at the top of the cylinder cap (C7) acts as the cylinder position adjustment. Adjust the set screw so that the cylinder does not pull the gate off the seat ring when the valve is fully opened. To adjust the position: (*See Figure 3 for Parts Identification*)

1. Stroke the valve fully open.
2. Note the distance between the bottom of the gate and the inside diameter of the seat.
3. Loosen the jam nut (C2).
4. Adjust the set screw (C1) until the gate is flush with the inside diameter of the seat.
5. Re-tighten jam nut (C2) to lock set screw (C1).

Cylinder Disassembly

See Figure 3 for Parts Identification.

1. Discontinue flow and relieve pipeline pressure. Close the valve.



WARNING!

Pipeline pressure can cause personal injury or equipment damage. Relieve pipeline pressure before disassembling actuator

2. Disconnect the supply lines.

Note: When flexible tubing is used, only one swivel connector is used on each piece of tubing. The swivel connector is located on the end of the tubing attached to the cylinder port.



WARNING!

This cylinder is a pressure-containing vessel! Removing any parts while under pressure could cause personal injury or equipment damage. Release the pressure from both ends of the cylinder before attempting disassembly or repair.

3. Remove the 2 nuts (P3) and screws (P2) holding the piston rod (C14) to the gate.
4. Remove the 2 nuts (P5) and screws (P4) holding the yokes (P1) to the cylinder head (C16) and remove the cylinder assembly.
5. Remove the nuts (C5) and lockwashers (C6) from the tie rods (C4).
6. Remove the cylinder cap (C7) and remove the o-ring (C8) from the cylinder cap.
7. Remove the cylinder tube (C13) from the piston (C10).

Note: Rotating the cylinder tube while pulling makes it easier to get it off the piston.

8. Remove the lock nut (C9) from the piston rod (C14) and carefully slide the piston (C10) off the piston rod being careful not to lose o-ring (C18).
9. Remove the piston seal (C11) and o-ring (C12) from the piston (C10). Clean the grooves in the piston. See Figure 1.

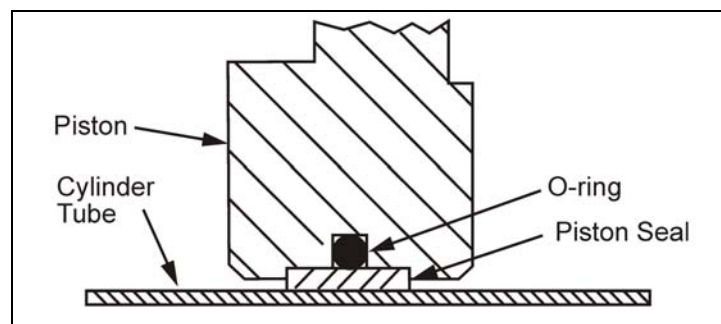


Figure 1—Piston Seal Detail

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Cylinder Disassembly *(Continued)*

10. Carefully slide the cylinder head (C16) off the piston rod (C14).
11. Remove the seal (C15), bearing (C17) and o-ring (C8) from the cylinder head (C16) and clean the grooves in the cylinder head.

Cylinder Re-assembly

See Figure 3 for Parts Identification.

1. Install a new seal (C15) and bearing (C17) into the cylinder head (C16).
2. Lubricate a new o-ring (C8) and place it on the cylinder head (C16).
3. Lubricate a new piston seal (C11), o-ring (C12) and the groove in the piston and place the piston seal and o-ring on the piston.
4. Carefully slide the piston rod (C14) into the cylinder head (C16).
5. Slide the o-ring (C18) onto the piston rod (C14), then slide the piston (C10) onto the piston rod making sure the ribs in the piston will be towards the lock nut (C9). Install the lock nut (C9).
6. Slide the cylinder tube (C13) onto the piston (C10). The piston seal (C11) must be well lubricated. Start the cylinder tube at a 45° angle and rotate it into position onto the piston.

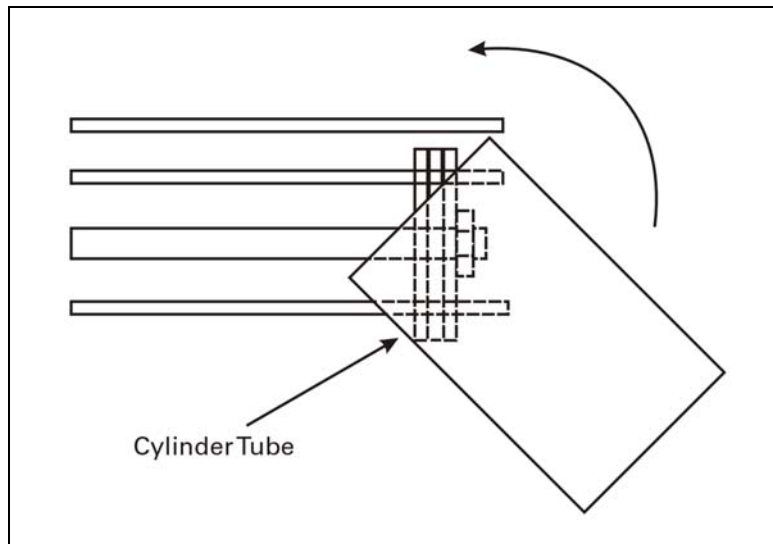


Figure 2—Assembling Cylinder Tube

Cylinder Re-assembly *(Continued)*

7. Lubricate a new o-ring (C8) and place it on the cylinder cap (C7).
8. Place the cylinder cap (C7) on the cylinder tube (C13) and install the lockwashers (C6) and nuts (C5) on the tie rods (C4). Tighten the nuts to the torque listed in Table A.

Table A: Tie-rod Nut Torques

Cylinder Size	Torque	
	Ft. Lbs.	Nm
C4	12	16
C6-C8	16	22
C10-16	20	27

9. Place the cylinder assembly between the yokes (P1) and replace the 2 nuts (P5) and screws (P4).
10. Slide the piston rod (C14) onto the gate and replace the 2 nuts (P3) and screws (P2).
11. Align the cylinder and re-check the open position stop per the "Adjustments" section of this instruction.
12. Re-connect the supply lines to the cylinder ports.
13. Pipeline pressure & flow can now be restarted.

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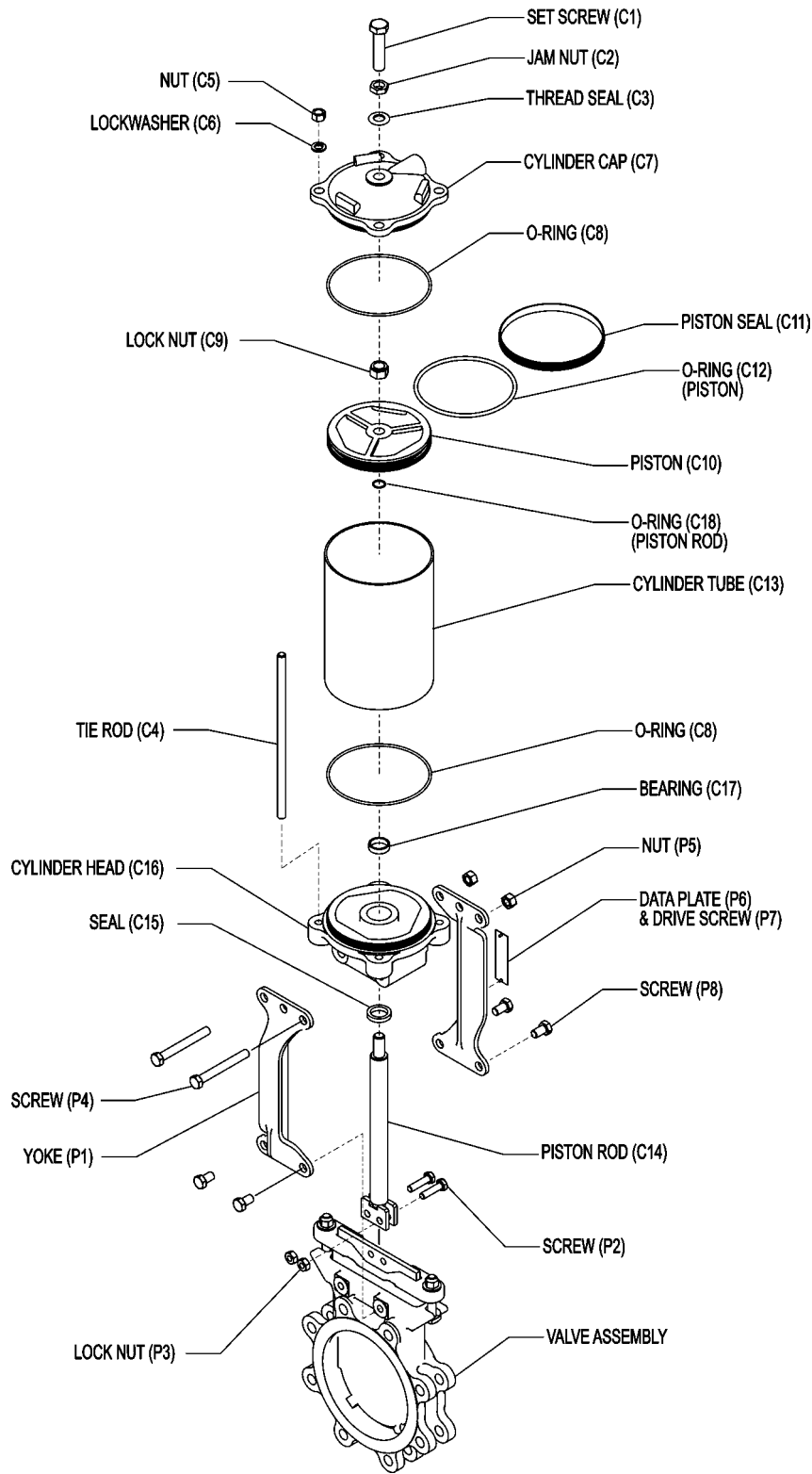


Figure 3 - Cylinder Actuator Assembly