DEZURIK DOUBLE-ACTING HYDRAULIC CYLINDER FOR T-SERIES ACTUATORS

Instruction **D10048**
August 2012

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Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause 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 DeZURIK product has been packaged to provide protection during shipment; however, items 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

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

If the valve has a data plate: please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be 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.

If there isn't any data plate visible on the valve: please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

DeZURIK Service

DeZURIK service personnel are available to 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 DeZURIK.com.

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Description

The double-acting hydraulic cylinder is used to operate a T-Series actuator.

WARNING!

This cylinder is a pressure-containing vessel. Release pressure from both ends of the cylinder before attempting any disassembly or repair. Failure to release pressure from both ends before disassembling could result in personal injury.

Supply

Maximum cylinder supply pressure is 100 psi.

Lubrication

The cylinder does not require routine maintenance lubrication. If the cylinder is rebuilt, lubricate all seals, O-rings and the inside of the cylinder tube using one of these lubricants.

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

Packing Adjustment

Tighten the packing nuts only when packing leakage occurs. Tighten the nuts just until leakage stops. Over tightening the nuts will result in premature packing wear.

Closed Position Adjustment

The set screw in the cylinder cap is the adjustable closed position stop. To adjust the stop, follow these steps:

1. Turn the stop screw five full revolutions counterclockwise.
2. Close the valve. The valve closed position is described in the Valve Instruction.
3. Pressurize the cylinder port nearest the actuator housing.
4. Loosen the lock nut on the closed position stop, then turn the stop screw in until resistance is felt as the stop screw contacts the piston rod.
5. Make sure the thread seal is in place, then tighten the lock nut on the stop screw.

Cylinder Removal

To remove the cylinder from the actuator, the actuator must be partially disassembled. To do this, you should have the Actuator Instructions on hand to use as reference. Follow these steps to remove the cylinder from the actuator.

Cylinder Removal (continued)

1. Discontinue pipeline flow. There cannot be flow in the pipeline at any time while the cylinder is off the actuator.
2. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic or electrical power to prevent accidental operation of the actuator.

> **WARNING!**
>
> **Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.**

3. Remove the actuator cover screws and cover.
4. Remove the guide rail screws and guide rail(s).
5. Remove the stay pin from the piston rod.
6. Remove the screws securing the cylinder to the actuator housing, and then unscrew the cylinder from the yoke nut and stop nut.

Cylinder Installation

To mount the cylinder on the actuator, some information will be required from the Actuator Instruction.

1. Screw the cylinder into the yoke nut and stop nut. Figure 1 shows the correct distance from the stay pinhole to the yoke nut.

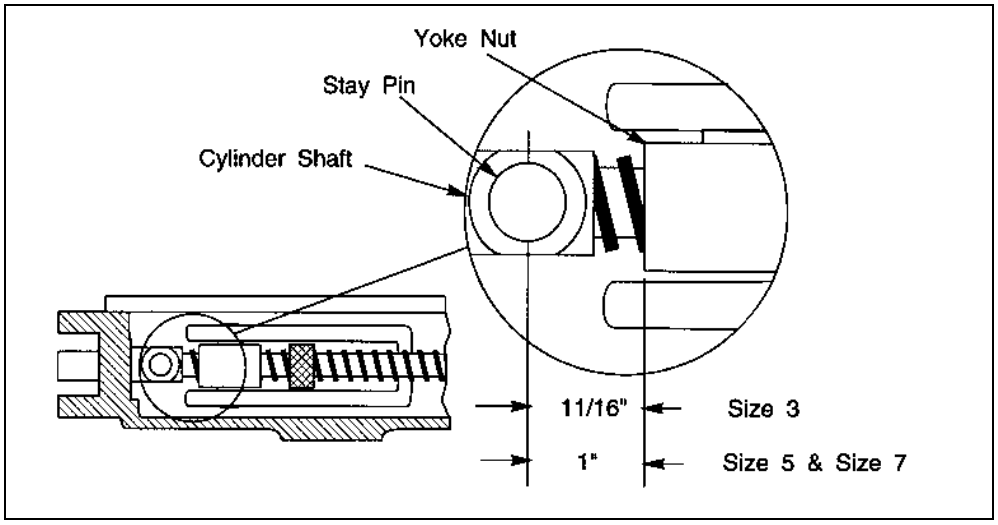

Figure 1- Distance from Stay Pin Hole to Yoke Nut

2. Push the cylinder in until it contacts the actuator housing. Fasten the cylinder to the housing with screws and lockwashers.
3. Push the stay pin into the hole in the piston rod.
4. Install the guide rail(s) and secure in place.

Cylinder Installation (continued)

5. Perform the Open and Closed Position Stop Adjustments as described in the Actuator Instruction.
6. Apply lubrication to the inside of the actuator as described in the LUBRICATION Section of the Actuator Instruction.
7. Install the gasket and cover on the actuator housing.
8. If the actuator is a powered actuator, reconnect power to the actuator.

Cylinder Repair Kit Installation

It is easier to rebuild the cylinder if it is left mounted on the actuator; to install the cylinder repair kit components, follow these steps.

1. Relieve the pipeline pressure and the cylinder pressure.

> **WARNING!**
>
> **This cylinder is a pressure-containing vessel. Release pressure from both ends of the cylinder before attempting any disassembly or repair. Failure to release pressure from both ends before disassembling could result in personal injury.**

2. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic, or electrical power to prevent accidental operation of the actuator.

> **WARNING!**
>
> **Moving parts from accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.**

3. Disconnect the tubing from the cylinder.
4. Remove the nuts and washers from the tie rods.
5. Remove the cylinder cap from the cylinder.
6. Remove the O-ring from the cylinder cap.
7. Pull the cylinder tube off the piston. The cylinder tube will come off easier if you rotate it while pulling it off the piston.
8. Unscrew the nut holding the piston on the piston rod, and then slide the piston off.
9. Take the piston seal and O-ring off the piston.
10. Remove the four screws fastening the cylinder head to the adapter, then slide the cylinder head (with gland and packing) off the piston rod.
11. Take the O-ring off the cylinder head.
12. Remove the gland nuts, and then slide the gland and packing from the cylinder head.

Cylinder Repair Kit Installation (continued)

13. Remove the scrapers from the cylinder head and gland. Figure 2 shows the locations of the scrapers.
14. Thoroughly clean all components that will be reused.
15. Push new scrapers into the head and gland until they bottom out in the counterbores. The open side of the scraper should face away from the counterbore (see Figure 2).

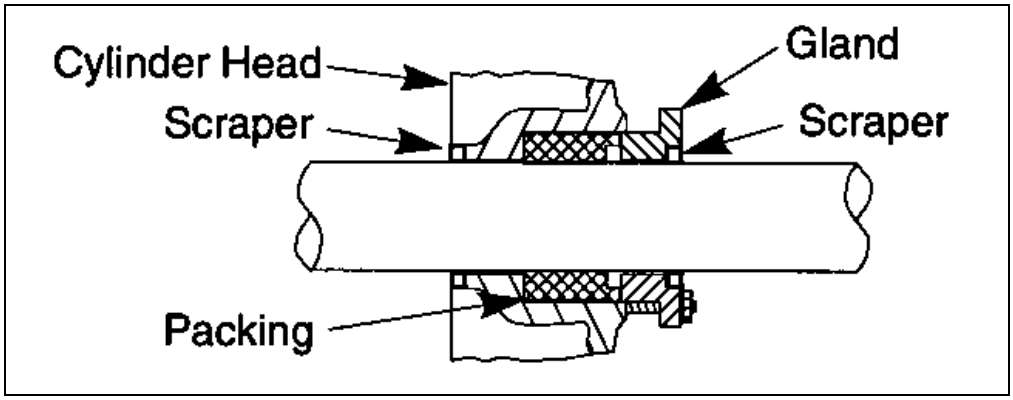

Figure 2 – Cylinder Repair Component Locations

16. Slide new packing, and the gland onto the piston rod.
17. Push the cylinder head on the piston rod so the packing pushes into the counterbore in the cylinder head.
18. Line up the holes in the gland with the studs in the cylinder head and push the cylinder head into place. Tighten the packing nuts finger tight plus 1/2 additional turn. These nuts must be tightened after the cylinder is pressurized.
19. Thoroughly lubricate a new O-ring and stretch it into the groove in the cylinder head.
20. Place the piston on the piston rod and secure in place with the nut.
21. Lubricate the new piston O-ring and install in the groove in the piston. After the O-ring is installed, slide the new piston seal in the wide groove in the piston.
22. Thoroughly lubricate the outside of the piston and the inside of the cylinder tube. Slide the tube onto the piston; rotate the tube while pushing it on.

    Note: The tube will push on easier if one or two of the tie rods are removed and the tube is held at a 45 angle while pushing it on (see Figure 3).

Cylinder Repair Kit Installation (continued)

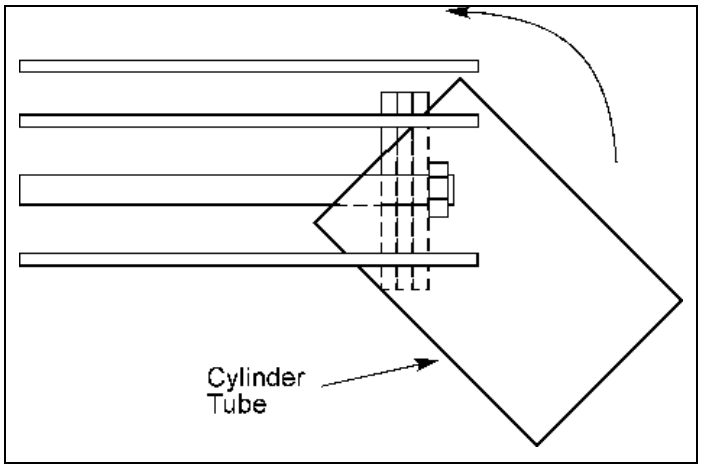

Figure 3 – Cylinder Tube Installation

23. Lubricate a new O-ring and stretch it into the groove in the cylinder cap.
24. Slide the cylinder cap into the cylinder tube. Place lockwashers and nuts on the tie rods; tighten the nuts in a crisscross pattern to the torque specified in Table A.

Table A: Tie Rod Nut Torque

Cylinder Size	Torque		
	(ft lbs)	(cm/kg)	(Nm)
3” & 4”	12	175	16
6” & 8”	16	225	22
10” & 12”	20	275	27

25. If the cylinder was removed from the actuator, reinstall the cylinder as described in the CYLINDER INSTALLATION Section of this Instruction.
26. If the actuator is a powered actuator, reconnect power to the actuator.
27. After the cylinder has been pressurized, check for packing leakage; if leakage is observed, tighten the packing nuts just until leakage stops. Over tightening the nuts will result in premature packing wear.

Limited Warranty

DeZURIK, Inc. (“Seller”) manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller’s factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller’s recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller’s option, FCA Incoterms 2020 Seller’s facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other’s products or parts only to the extent provided in and honored by the original manufacturer’s warranty to Seller, in each case subject to the limitations contained in the original manufacturer’s warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant 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 Seller 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 store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller’s product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty 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 a Seller factory authorized 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 Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

THE FOREGOING REPAIR AND REPLACEMENT LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE SELLER’S ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS. NEITHER ANY PERFORMANCE OR OTHER CONDUCT, NOR ANY ORAL OR WRITTEN INFORMATION, STATEMENT, OR ADVICE PREPARED BY SELLER OR ANY OF OUR EMPLOYEES OR AGENTS WILL CREATE A WARRANTY, OR IN ANY WAY INCREASE THE SCOPE OR DURATION OF THE LIMITED WARRANTY.

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Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

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