



CYLINDER OPERATED  
T-SERIES ACTUATOR

## Instructions

These instructions provide information about Cylinder Operated T-Series Actuators. They are for use by personnel who are responsible for installation, operation and maintenance of Cylinder Operated T-Series 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 the assumption of pipeline material within the valve.**

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## Inspection

Your Cylinder Operated T-Series 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 local 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](http://www.dezurik.com).

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## Description

The Cylinder Operated T-Series Actuator is an economical actuator capable of providing a long-lasting, dependable means of valve operation. Scotch yoke-series actuators are available in three sizes: Size 3, Size 5 and Size 7. The actuator has been sized to achieve optimum performance from your valve.

Figure 1 and Table A provide the information needed to identify your actuator.

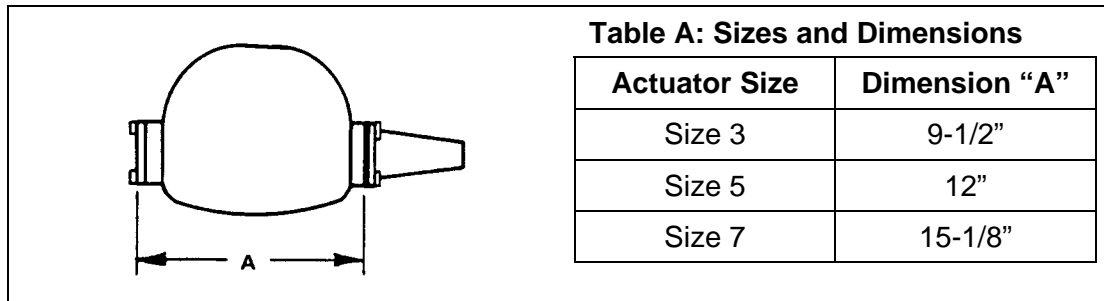


Figure 1 - Actuator Sizes and Dimensions

## Air Supply

Application of sufficient air (100 psi maximum) to the cylinder port closest to the actuator housing will close the valve. Application of sufficient air to the port at the opposite end of the cylinder will open the valve.

## Lubrication

Scotch yoke actuators do not require lubrication as regular maintenance. If this actuator is disassembled, the parts described below must be lubricated during reassembly with EXXON Unirex EP 2 Premium lubricant (**recommended**) or Petro-Canada Precision XL EP 2 (alternate). See the assembly drawing for parts identification.

- The threads in the yoke nut.
- The threads in the stop nut.
- The slots in the yoke.
- The sides of the yoke bearings.
- The side of the guide rail.

After the actuator is fully assembled, a layer of lubricant approximately 1/2" thick should be applied to the surfaces described above, which are accessible and inside the housing.

## Closed Position Stop Adjustment

The closed position stop is made by turning the set screw in the end of the cylinder.

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



### **WARNING!**

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

**Closed Position Stop Adjustment** *(Continued)*

2. Pressurize the cylinder so the valve is in the closed position.
3. Loosen the lock nut on the set screw in the cylinder cap.
4. Turn the set screw in or out until the desired closed position is attained.
5. Make sure the thread seal is in place, then tighten the lock nut.
6. If the actuator requires power, reconnect power to the actuator.

**Open Position Stop Adjustment**

The cylinder must be mounted on the actuator to perform this adjustment.

1. Cycle the valve to determine the need for stop adjustment.
2. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic or electrical power to prevent accidental operation of the actuator.

**WARNING!**

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3. Remove the pointer.
4. Remove the actuator cover.
5. Guide Rails.  
**Sizes 3 and 5:** Loosen the guide rail screw closest to the cylinder and remove the other screw.  
**Size 7:** On the guide rail held by two screws; loosen the screws.
6. Move the valve to mid-stroke, then turn the stop nut to adjust the actuator stroke length.
7. Open the valve to check the adjustment; readjust the stop if necessary.
8. Tighten the guide rail screws.
9. Install the cover gasket and cover.
10. Install the pointer.
11. If the actuator requires power, reconnect power to the actuator.

## Removing Actuator

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



### **WARNING!**

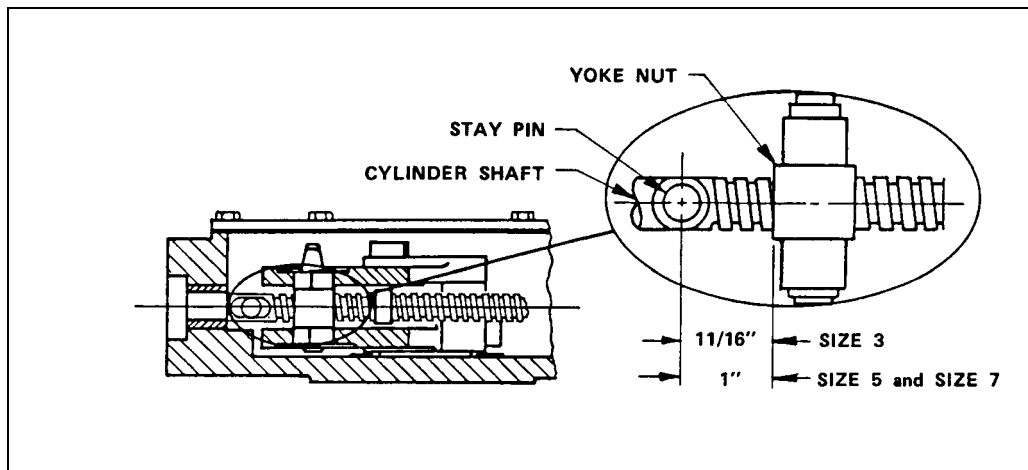
Accidental operation of power actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

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3. Place the valve in the closed position.
4. Remove the pointer.
5. Remove the cover screws and cover.
6. Loosen the screw clamping the yoke onto the valve shaft.
7. Remove the four screws securing the actuator to the bracket, then separate the actuator from the bracket.

## Installing Actuator

1. Close the valve.
2. Apply a thin layer of Permatex sealant to the machined bottom of the actuator housing.
3. Position the yoke so it points toward the cylinder end of the actuator as shown in Figure 2.



**Figure 2 – Detailed View of Yoke Nut and Cylinder Shaft**

4. Set the actuator on the valve so the valve shaft engages the yoke, then secure the actuator to the shaft with four screws.
5. Tighten the screw to clamp the yoke onto the valve shaft.
6. Stroke the valve to determine if stop adjust is necessary; readjust the stops if necessary.
7. Install the cover gasket, then fasten the cover in place.
8. Install the pointer.
9. Pipeline flow may now be restored.
10. If the actuator requires power, reconnect power to the actuator.

## Disassembling Actuator

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

**WARNING!**

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

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3. Place the valve in the closed position.
4. Remove the pointer.
5. Remove the cover screws and cover.
6. Remove the four screws securing the cap to the housing, then remove the cap and gasket.
7. Remove the guide rail screws and guide rail(s).
8. Remove the stay pin.
9. Remove the four screws securing the cylinder to the actuator housing, then unscrew the cylinder from the yoke nut and the stop nut.
10. Loosen the screw clamping the yoke onto the valve shaft.
11. Pull the yoke from the valve shaft. It may be necessary to use a wheel puller.
12. Remove the four screws securing the actuator to the bracket, then separate the actuator from the bracket.

## Reassembling Actuator

1. Close the valve.
2. Apply a thin layer of Permatex sealant to the machined bottom of the actuator housing.
3. Set the actuator housing on the valve, then secure it in place with the four screws.
4. Lubricate the actuator components as described in the LUBRICATION Section of this Instruction.
5. Install the yoke, yoke nut, upper yoke guide and lower yoke guide. Position the yoke so it points toward the cylinder end of the actuator as shown in Figure 2.
6. Tighten the screw to clamp the yoke onto the valve shaft.
7. Move the valve to mid-stroke.
8. Screw the cylinder into the yoke nut and stop nut. Figure 2 shows the correct distance from the stay pin hole to the yoke nut.
9. Move the valve to the closed position.
10. Secure the cylinder to the housing with four screws.
11. Install the stay pin.
12. Install the guide rail(s) and secure in place.

### **Reassembling Actuator** *(Continued)*

13. Perform the Open and Closed Position Stop Adjustments as described in the appropriate Section of this Instruction.
14. Fasten the gasket and cap to the housing.
15. Apply a layer of lubricant approximately 1/2" thick to the appropriate surfaces described in the LUBRICATION Section of this Instruction.
16. Install the cover gasket, then fasten the cover in place.
17. Install the pointer.
18. If the actuator requires power, reconnect power to the actuator.

### **Changing Mounting Positions**

The actuator may be mounted in 90-degree increments around the valve shaft. To change actuator mounting positions, remove the actuator from the valve, position it in the desired position, then reinstall it on the valve. Detailed removal and installation procedures are described in this manual.