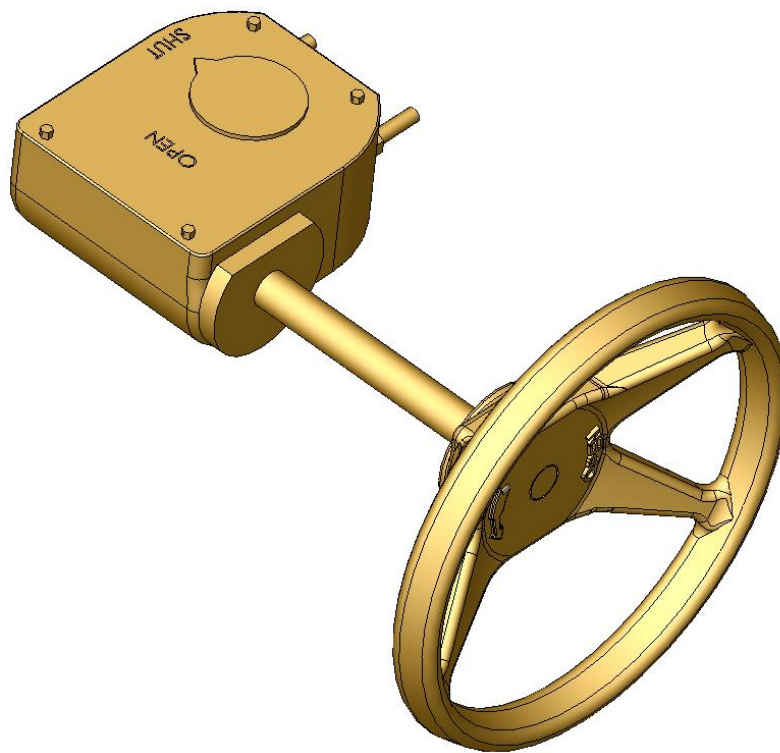




# DeZURIK MANUAL GEAR ACTUATOR



Instruction **D10408**  
August 2012

# DeZURIK

## Manual Gear Actuator

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### Instructions

These instructions provide information about Manual Gear Actuators. They are for use by personnel who are responsible for installation, operation and maintenance of Manual Gear 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.**

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### Inspection

Your Manual Gear 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](http://www.dezurik.com).

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## Manual Gear Actuator

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### Description

The Manual Gear Actuator is a quarter-turn gear actuator. The actuator is available with a handwheel, chainwheel or 2" (50mm) square nut operator. Each actuator has adjustable open and closed position stops and may be mounted on the valve in four positions.

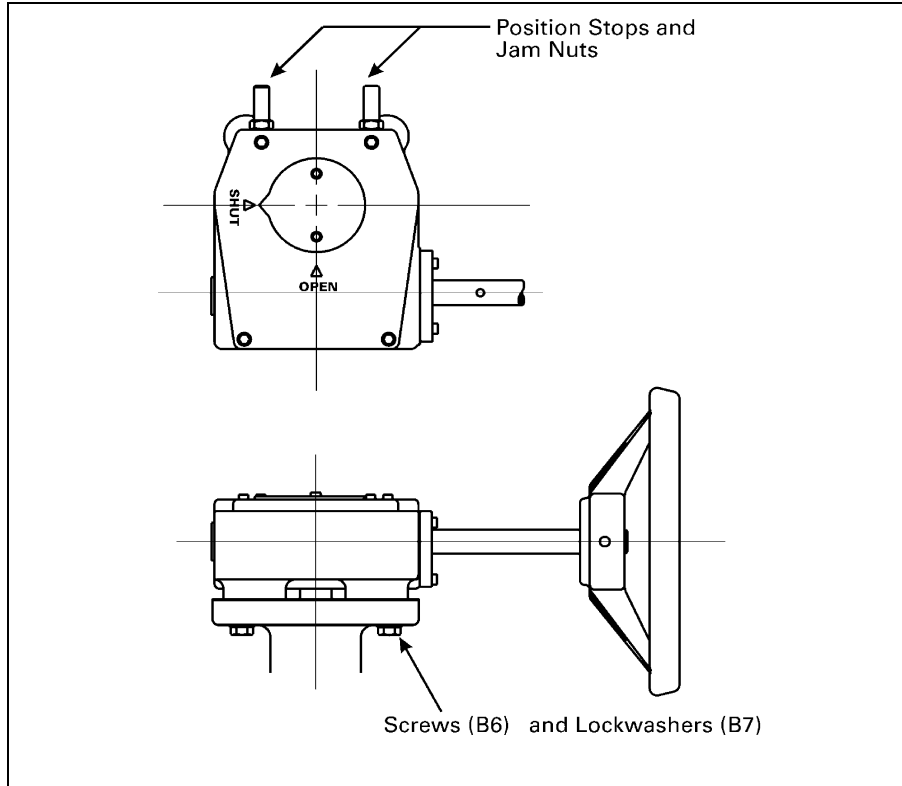


Figure 1— Component Identification

### Operation

Clockwise rotation of the operator closes the valve; counterclockwise rotation opens the valve.

### Lubrication

The actuator is lubricated at the factory, and does not require further lubrication.

## Position Stops

The open and closed position stops prevent the actuator from rotating beyond the open and closed positions of the valve. Each stop is adjustable. If the actuator is factory-mounted, the stops do not require adjustment. If the actuator is not factory mounted, or if the actuator has been removed, adjust the stops as described below. See Figure 1 for component identification.

### ***Adjusting the Closed Position Stop***

1. Loosen the jam nut on the closed position stop screw and loosen the stop screw about two turns.
2. Turn the handwheel so that the valve is in the closed position.
3. Turn the closed position stop screw clockwise until resistance is felt from the screw coming into contact with the gear inside of the actuator.
4. Hold the stop screw to prevent it from turning and tighten the jam nut to the torque shown in Table A.

### ***Adjusting the Open Position Stop***

1. Loosen the jam nut on the open position stop screw and loosen the stop screw about two turns.
2. Turn the handwheel so that the valve is in the open position.
3. Turn the open position stop screw clockwise until resistance is felt from the stop screw contacting the gear inside of the actuator.
4. Hold the stop screw to prevent it from turning and tighten the jam nut to the torque shown in Table A.

**Table A : Jam Nut Torque**

	<b>Actuator</b>			
	<b>MG-7</b>	<b>MG-1012</b>	<b>MG-1216</b>	<b>MG-16</b>
<b>Torque, ft lbs</b>	<u>6±2</u>	<u>21±5</u>	<u>21±5</u>	<u>45±5</u>
<b>Jam Nut Nm</b>	8±3	28±7	28±7	61±7

## Removing Actuator

Refer to Figure 1 for component identification.



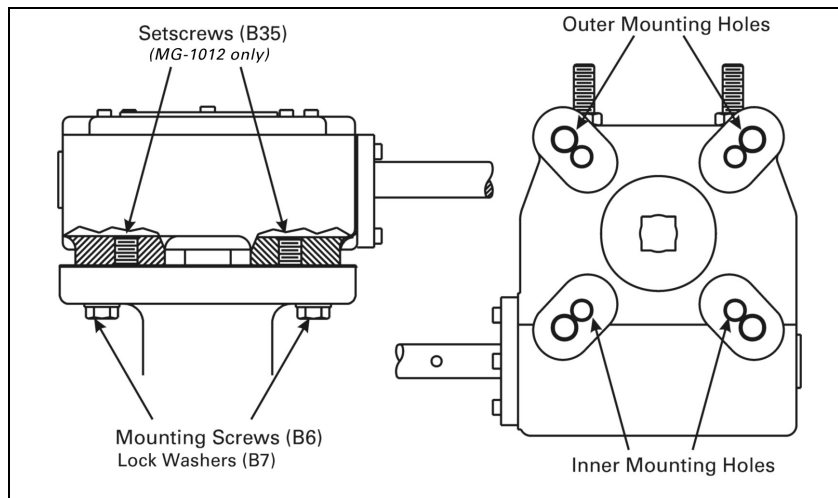
**WARNING!**

**Flow in the pipeline with the actuator removed can slam the valve closed causing personal injury and damaging the flow system. Shut down the flow in the pipeline before removing the actuator from the valve.**

1. Close the valve.
2. Remove the four mounting screws (B6) and lockwashers (B7).
3. Remove the actuator from the valve.

**Adaptor Mounting Screws**

The MG-1012 and MG-1216 Manual Gear Actuators have two sets of mounting holes.



**Figure 2 — Mounting Screw Locations**

**MG-1012**

When using the outer mounting holes on the MG-1012 actuator, you must first remove the setscrews from the two mounting holes that are inline with the input shaft. When using the outer mounting holes, plug all interior holes with setscrews.

**Note:** Tighten the setscrews only until they are flush with the edge of the body. Make sure the setscrews are not protruding into the gears.

**Table B: Mounting Bolt Torque ft. lb./Nm**

Mounting Bolts	Actuator			
	MG-1012		MG-1216	
Torque, <b>ft lbs</b> Carbon Steel <b>Nm</b>	<u>47±6</u>	<u>83±10</u>	<u>83±10</u>	<u>435±60</u>
Torque, <b>ft lbs</b> Stainless Steel <b>Nm</b>	<u>33±4</u>	<u>58±8</u>	<u>58±8</u>	<u>300±40</u>

## Mounting Actuator

Refer to Figure 1 for component identification.

1. Place both the actuator and the valve in the closed position.
2. Select the desired actuator mounting position from the optional positions shown on the installation drawing. Place the gasket in position (see note below), engage the actuator with the valve shaft, and slide the actuator into position on the top of the valve.

**Note:** All chainwheel actuators use a 1/32" (0.8 mm) thick gasket (B28) between the actuator and the chainwheel support (B29). High-temperature valves use a 1/16" (1.6 mm) thick insulating gasket (P5) on both handwheel and chainwheel operators. The insulating gasket is used only when the gasket is included with the valve.

3. Mount the actuator and gasket (see note above) to the valve with the four mounting screws (B6) and lockwashers (B7). Tighten the screws as shown in Table C or Table B.

**Table C: Mounting Bolt Torque ft. lb./Nm**

Mounting Bolts	Actuator			
	MG-7	MG-1012	MG-1216	MG-16
Torque, <u>ft lbs</u> Carbon Steel Nm	<u>23±3</u> 31±4	See Table B	See Table B	<u>435±60</u> 592±81
Torque, <u>ft lbs</u> Stainless Steel Nm	<u>16±2</u> 22±3	See Table B	See Table B	<u>300±40</u> 407±54

4. Adjust the open and closed position stops as shown in the Adjustments section.

### **Changing the Mounting Position**

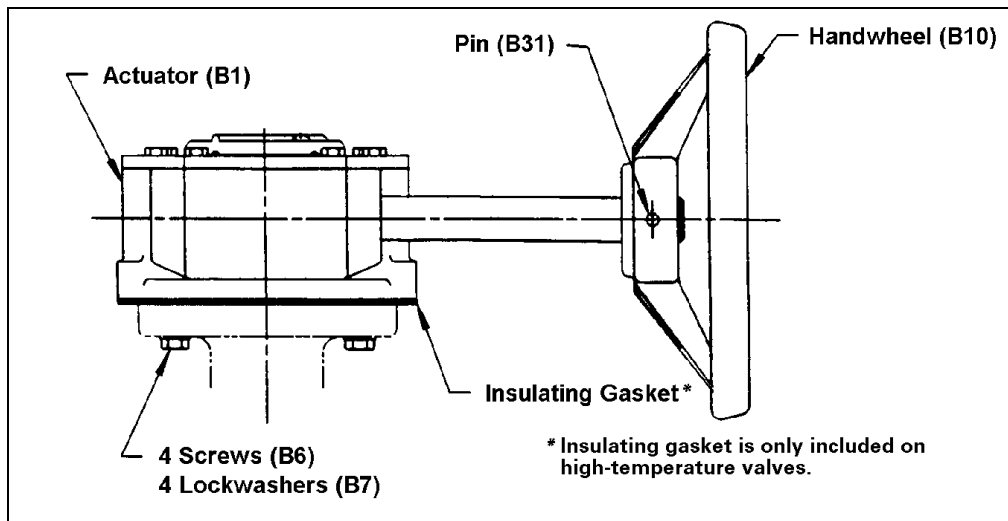
No additional components are needed to change the mounting position of the Manual Gear Actuator.

Before changing the actuator mounting position, check to assure that dimensional clearance is available for the proposed actuator location. The actuator may be mounted in any one of two or four positions as indicated on the installation drawing for the valve. To change the position, follow the steps in the "REMOVING ACTUATOR" and "MOUNTING ACTUATOR" sections.

## Replacing a Handwheel with a Chainwheel

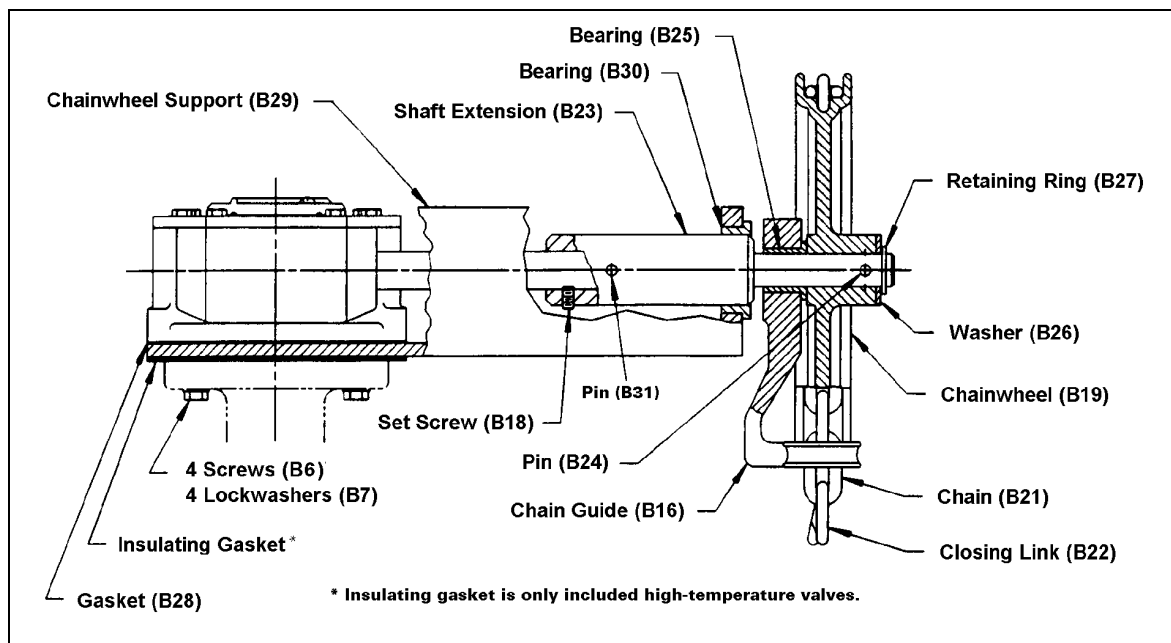
On sizes MG-7 through MG-16, the handwheel can be replaced with a chainwheel. Refer to Figure 1 for component identification.

1. Remove the actuator from the valve as described in the “*REMOVING ACTUATOR*” section.
2. Support the actuator shaft on a solid surface, drive out the handwheel pin (B31), and remove the handwheel (B10).



**Figure 3—Handwheel**

3. Place the shaft extension (B23) on the actuator shaft, and align the pin holes. Support the shaft extension on a solid surface, and drive the pin (B31) into position.



**Figure 4—Chainwheel Assembly**

4. Turn the set screw (B18) into the threaded hole in the shaft extension, and tighten the set screw to  $7 \pm 1$  foot pounds ( $9 \pm 1$  Nm).



### Replacing a Handwheel with a Chainwheel *(Continued)*

5. Place the gasket (B28) on the chainwheel support (B29) and align the holes in the gasket with the mounting holes.
6. Insert the shaft extension (B23) through the bearing (B30) in the chainwheel support (B29).
7. Place the chain guide (B16) and the chainwheel (B19) onto the shaft extension, and align the pin holes in the shaft and the chainwheel.
8. Place the hub of the chainwheel on a solid surface, and drive the pin (B24) into position.
9. Place the washer (B26) on the end of the shaft extension, and then place the retaining ring (B27) in the groove on the end of the shaft extension.

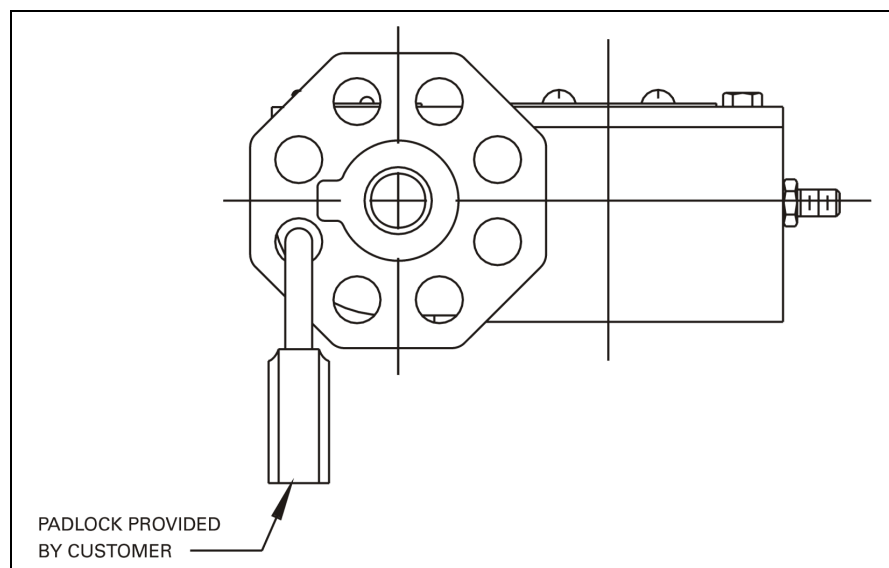
### Replacing a Chainwheel with a Handwheel

1. Remove the actuator from the valve as described in the “*REMOVING ACTUATOR*” section.
2. Loosen the set screw (B18), and drive out the pin (B31). Remove the support (B29) and the shaft extension (B23)—including the chain guide (B16) and the chainwheel (B19)—from the actuator.
3. Place the handwheel (B10) on the actuator shaft. Align the pin holes, support the actuator shaft on a solid surface, and drive the pin (B31) into position.
4. Replace the actuator on the valve as described in the “*MOUNTING ACTUATOR*” section.

## Lockout

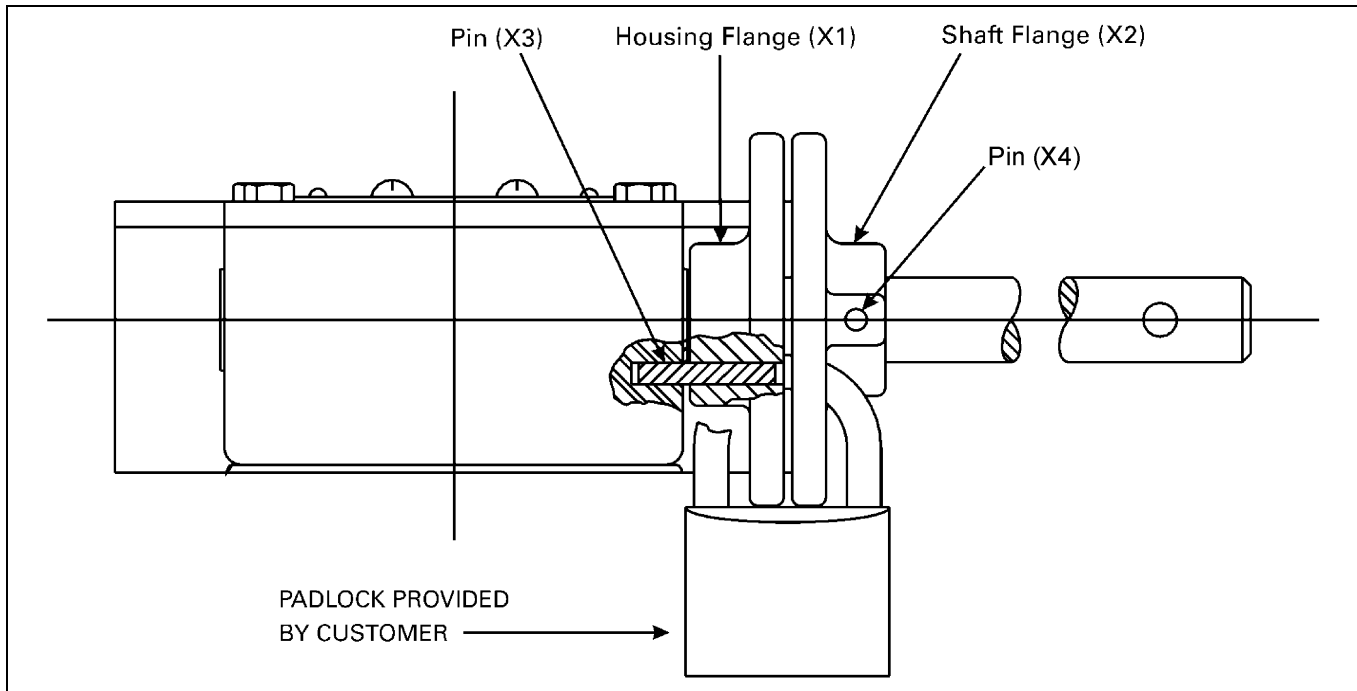
### Operation

The handwheel actuator is available with an optional lockout that allows the handwheel to be locked with a padlock at any 1/8-turn increment. Lockouts may be ordered with a valve or ordered separately as a kit. A padlock is not included with the lockout accessory.



**Figure 5—Lockout**

***Adding a Lockout to Actuator***



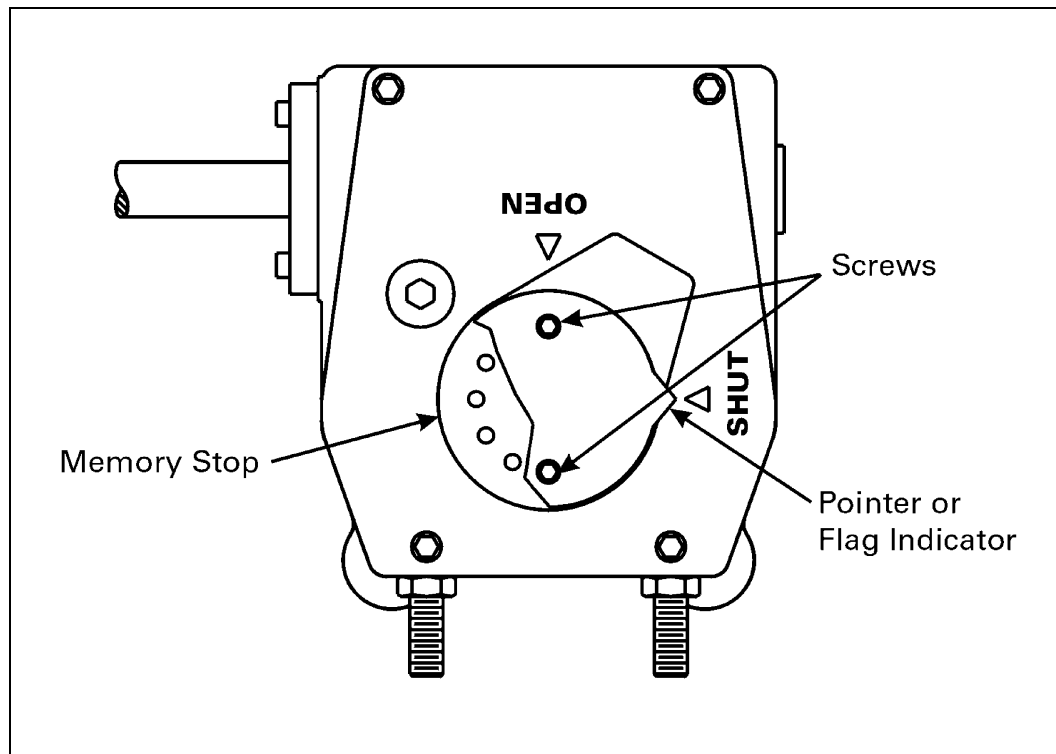
**Figure 6—Lockout Parts**

1. Remove the handwheel pin (B31), and remove the handwheel (B10) from the handwheel shaft.
2. Note the drilled hole in the side of the actuator next to the shaft. Insert the pin (X3) into the hole so that the pin is bottomed out in the hole.
3. With the hub side of the housing flange (X1) facing the actuator, slide the flange onto the shaft so that the hole in the flange is aligned with the pin (X3) in the actuator. Carefully drive the flange onto the pin until the flange hub is against the side of the actuator.
4. With the flat side of the shaft flange (X2) facing the actuator, slide the flange onto the shaft. Align the hole in the flange hub (X2) with the hole in the actuator shaft. Drive the shaft pin (X4) through the hole in the flange hub and into the hole in the shaft so that the pin is approximately flush with the flange hub.
5. Place the handwheel (B10) in the original position on the handwheel shaft, and secure the handwheel with the pin (B31).

## Adjustable Memory Stop

### MG-7 & MG-1012

The Manual Gear Actuator (MG-7 & MG-1012) has an optional adjustable memory stop. The memory stop adjusts by rotating it around the pins. One side of the stop adjusts to 0, 30 and 60°; the other side adjusts to 15, 45, 75 and 90°.



**Figure 7—Memory Stop (MG-7 and MG1012)**

To adjust the memory stop:

1. Remove the two screws, the pointer or flag indicator and the memory stop.
2. Position the actuator where you want it to stop.
3. Place the memory stop in position on the pins located on the gear.  
**Note:** If needed, flip the stop over to adjust to the correct position.
4. Replace the pointer or flag indicator and tighten the screws to secure the stop. Ensure the pointer or flag indicator is aligned with the valve position.

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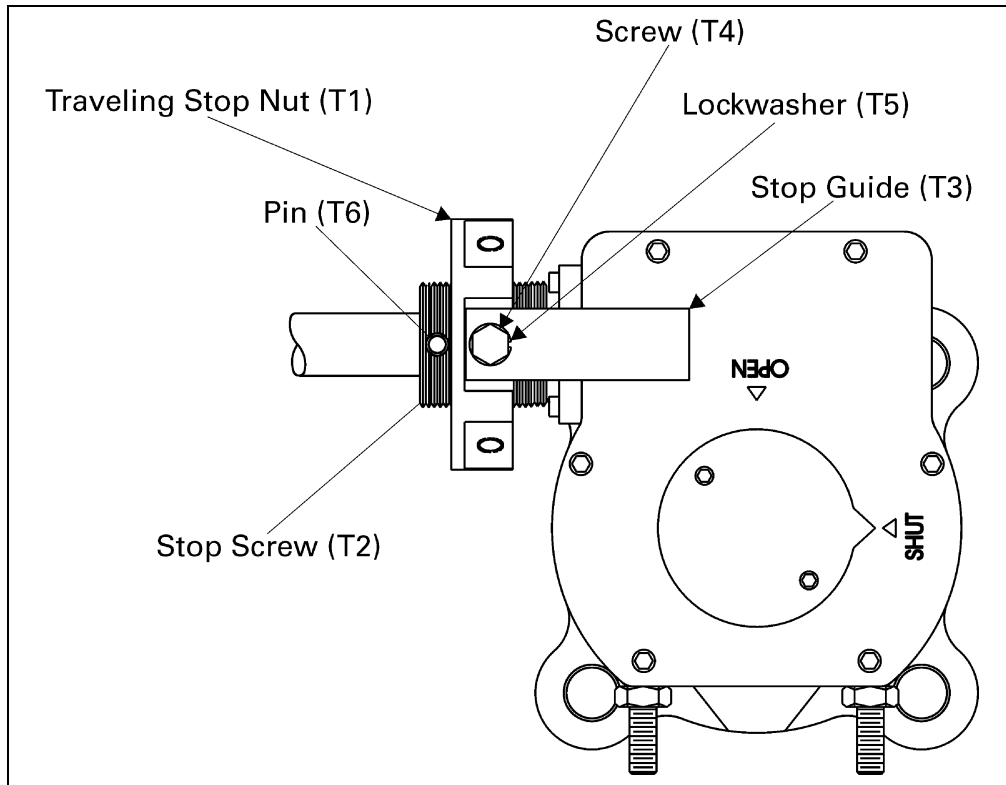
## Manual Gear Actuator

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### Adjustable Memory Stop (Continued)

#### MG-1216 & MG-16

The Manual Gear Actuator (MG-1216 & MG-16) has an optional field mountable adjustable memory stop. The memory stop adjusts by rotating the traveling stop screw (T2) around the actuator shaft. For every rotation of the actuator shaft, there are 6 positions for stop adjustment.



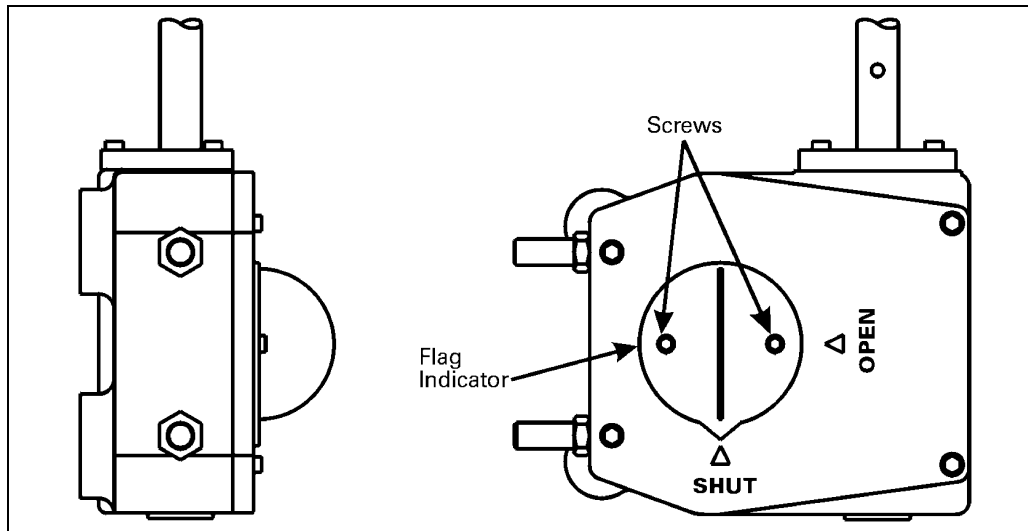
**Figure 8—Memory Stop (MG-1216 & MG-16)**

To adjust the memory stop:

1. Remove the handwheel, chainwheel or nut from the actuator shaft.
2. Slide the stop screw (T2) on to the actuator shaft.
3. Align the pin hole in the stop screw (T2) with the hole in the actuator shaft nearest the actuator housing.
4. Insert the pin (T6) into the pin hole in the stop screw (T2) and through the actuator shaft.  
**Note:** Ensure the pin (T6) is recessed below the threads on both ends of the stop screw (T2).
5. Install the handwheel, chainwheel or nut on the actuator shaft. Position the actuator to the desired stop location.
6. Rotate the traveling stop nut (T1) until it makes contact with the actuator housing.
7. Attach the stop guide (T3) to the traveling stop nut (T1) so it is extended over the actuator housing with the screw (T4) and lockwasher (T5).

## Replacing Pointer with Flag Indicator

1. Remove the screws holding the pointer and remove the pointer.



**Figure 9—Flag Indicator**

2. Using the same screws, attach the flag indicator to the actuator.

**Note:** Make sure the arrow is aligned with the valve position.

## Troubleshooting

Condition	Possible Cause	Corrective Action
Actuator closes to wrong position.	Closed position stop is set incorrectly.	Adjust closed position stop.
Actuator opens to wrong position.	Open position stop is set incorrectly.	Adjust open position stop.
Actuator will not fully operate valve.	Internal pipeline obstruction is preventing closure.	Remove obstruction.
Actuator will not operate or will move only in one direction. *	Setscrews are interfering with gear operation.	Make sure the setscrews are flush with body.

\* Models MG-1012 and MG-1216