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## Introduction

This instruction manual includes installation adjustment, operation, and maintenance for the Pro-Gear manual gear actuator.

## Description

The Pro-Gear manual gear actuator is for use with butterfly, ball, plug and damper applications or any other 90 degree device. In the actuator, torque is transmitted from the handwheel through the handwheel input shaft to a worm and drive sleeve gear sector. The worm and drive sleeve gear multiply the torque and transmit it to the valve shaft. The units with PR3 have a spur gear reduction drive for increased torque capability.

## Installation

The Pro-Gear manual gear actuator is normally shipped mounted on a valve body. If the actuator has been shipped separately for installation on a valve body, or if the actuator was removed for maintenance, mount the actuator by following the instructions presented in this section before installing the valve body in the pipeline.

1. Rotate the valve disc or ball to the closed position.
2. Rotate the handwheel to move the drive sleeve gear to the position that is to correspond to the closed position of the valve disc or ball as follows: turn the handwheel so that the drive sleeve gear and travel indicator are rotated fully clockwise.
3. Remove the travel indicator pointer by removing the machine screws.
4. Making certain that alignment is correct, slide the actuator onto the valve shaft in the desired mounting position. Check to be sure the valve shaft is still aligned with the proper gear hub keyway, square or flats.
5. Check the alignment of the mounting holes with those in the bracket or valve body. If the holes are not aligned, rotate the handwheel to allow for repositioning. It may be necessary to loosen the hex nuts and back out the travel stop screws to allow thos repositioning.
6. When hole alignment is correct, secure the actuator to the valve body with hex head cap screws.
7. Making certain that the travel indicator pointer is aligned as it was prior to assembly, install the travel indicator.
8. Before installation the valve body with actuator in the pipline perform the procedures presented in the adjustment section of this manual.

## Adjustment

Perform the following steps to adjust the travel stops. Travel stops consist of two set screws and two hex locking nuts

1. Loosen the hex nuts and back out both set screws.
2. Rotate the handwheel to move the valve disc, plug or ball to the fully closed position.
3. With the valve disc, plug or ball closed, rotate the set screw that is to limit valve closing until this set screw just hits the drive sleeve gear. Lock the set screw with the hex nut.
4. Rotate the handwheel until the open position is indicated by the pointer tip on the travel indicator dial. Rotate the remaining travel stop set screw until it just hits the drive sleeve gear. Lock the set screw with the hex nut.
5. Install the valve body and actuator in the pipeline by following the instructions in the separate valve body instruction manual; then proceed to the operation section.

## Operation

After the travel stops have been adjusted and the control valve assembly installed, the actuator is ready for operation.

Do not use wrenches or other devices on the handwheel or handwheel shaft to increase operating force.

If the force required to rotate the handwheel is excessive, check for the following conditions:

- Insufficient Lubrication
- Seized actuator parts due to misalignment
- Excessive pressure drop across the valve body
- Obstruction to the valve body disc

If the actuator does not seem to control the process fluid, worm or drive sleeve gear teeth may be broken, the pin may be sheared, or internal valve body parts may be broken.

Avoid personal injury or property damage from sudden release of pressure or uncontrolled process fluid. Before starting disassembly:

- Isolate the valve from the process
- Release all process pressure



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## Lubrication

The interior parts should be lubricated whenever difficulty in handwheel rotation indicates a need for lubrication.

To lubricate the actuator, perform the following steps:

1. Note the location of the travel indicator pointer in relation to the indicator dial. Remove the machine screws and the travel indicator pointer. When reassembling the actuator, the travel indicator pointer must be returned to its original position.
2. Remove the cap screws which secure the gearbox cover plate and remove the gearbox cover plate.
3. Coat the worm, the drive sleeve gear teeth, and the bearing surfaces of the gearbox housing and worm with a quality gear lubricant. Too much is better than too little.
4. Install the cover on the gearbox and secure it with the cap screws.
5. Attach the travel indicator pointer so that it indicates the same point of rotation as was before the pointer was removed. Secure the pointer with the machine screws.