

**GH BETTIS**

**GENERAL**

**OPERATING & MAINTENANCE INSTRUCTIONS**

**FOR**

**LN-SERIES LINEAR ACTUATORS**

**WITH HYDRAULIC MANUAL OVERRIDE**

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## 1.0 **GENERAL**

Since there are many valve and actuator combinations, it is not practical to include detailed instructions on each type. Mountings are designed to be as simple as possible to keep guesswork out of installation. Linear actuators are shipped from the factory with the piston rod in the full "up" position. Before attempting to install the actuator on the valve, refer to the valve manufacturer's recommendations for specific requirements.

## 2.0 **STORAGE**

For applications where the actuator is not put into immediate service it is recommended that the actuator be cycled by clean dry air or nitrogen pressure at least once per month. Indoor storage, if available, is recommended for all actuators. Care should be taken to plug the cylinder ports, control valve ports and body ports to keep out foreign particles and moisture. Also, actuators should not be stored in an atmosphere harmful to resilient seals. For extended storage, contact factory.

## 3.0 **INSTALLATION**

**CAUTION:** To prevent personal injury, stay clear of actuator moving parts during actuator operation.

- 3.1 Check to verify that the piston rod is in the full "up" position.
- 3.2 Install stem nut to valve stem. Engage minimum of one inch of valve stem per one inch of valve stem diameter.
- 3.3 Using hardware furnished, mount the actuator yoke/mounting bracket to the valve.
- 3.4 All actuators furnished with M4 hydraulic manual overrides are designed specifically for horizontal or vertical mounting. The M4 reservoir must be mounted vertical.
- 3.5 Remove plug from top of M4 reservoir and install a breather. The breather will be in a plastic bag attached to the actuator or shipping crate.
- 3.6 Determine valve position, i.e., open, close, or in between.
- 3.7 Using the M4 hydraulic manual override, rotate the handle clockwise (CW) to extend the piston rod down to the point where the two halves that make up the clamping block can be placed between piston rod and stem nut.
- 3.8 Bolt clamping block halves together and tighten bolts to the snug position.

## 4.0 **VALVE LIMIT ADJUSTMENTS**

Using the M4 hydraulic manual override, rotate the handle clockwise (CW) and extend the piston rod to close the valve. Make sure valve is closed and gate is properly seated. For actuators mounting on knife gate valves use paragraph 4.1, for actuators mounting on wedge gate valves use paragraph 4.2.

### 4.1 **KNIFE GATE VALVES:**

- 4.1.1 For valve limit stop in closed position the knife gate has to be stopped by the actuator stop.
- 4.1.2 Remove clamping block.
- 4.1.3 Again using M4, rotate the handle clockwise (CW) and move actuator piston rod to its full "down" position.
- 4.1.4 Take clamping blocks (both halves) and install over both the piston rod and stem nut.

4.1.5 Bolt clamping block halves together and torque bolts per the following requirements:

5/8" bolts torque to 150 ft. lbs.

3/4" bolts torque to 260 ft. lbs.

4.1.6 Back-out stop screw in actuator outer end cap.

4.1.7 Stroke actuator to "open" position.

4.1.8 Adjust actuator outer end cap stop screw until it contacts piston rod. After contact, continue turning stop screw 1/4 turn.

4.1.9 "Lock" down seal nut on actuator stop screw.

#### 4.2 WEDGE GATE VALVES:

4.2.1 Wedge gates have to be driven into the valve seat.

4.2.2 Remove clamping blocks.

4.2.3 Again using the M4, rotate the handle clockwise (CW) and move actuator piston rod to its full "down" position and back-off 1/4".

4.2.4 Take clamping blocks (both halves) and install over both the piston rod and stem nut.

4.2.5 Bolt clamping block halves together and torque bolts per the following requirements:

5/8" bolts torque range of 120 ft. lbs. to 150 ft. lbs.

3/4" bolts torque range of 208 ft. lbs. to 260 ft. lbs.

4.2.6 Back-out stop screw in actuator outer end cap.

4.2.7 Stroke actuator to "open" position.

4.2.8 Adjust actuator outer end cap stop screw until it contacts piston rod. After contact, continue turning stop screw 1/4 turn.

4.2.9 "Lock" down seal nut on actuator stop screw.

## 5.0 START-UP

5.1 When actuator is first put into service it should be stroked. This is necessary because the seals and packings having been stationary, causing them to take a "set". Therefore, the actuator should be operated through several cycles, exercising the seals and packings, resulting in a service ready condition.

5.2 Good instrument practices are also recommended. Clean, dry air is essential for long service life and satisfactory operation. It should be noted that new air lines often have scale and other debris in them. This debris can damage control valves, solenoids, seals, etc.

5.3 The speed of operation will be determined by a number of factors including: (1) The distance from the pressure source; (2) supply line size; (3) supply line pressure; (4) control valve orifice size; (5) the torque requirements of the valve; (6) the size of the actuator; (7) setting of speed controls in hydraulic manual override.

5.4 Due to the interaction of these variables it is difficult to specify a "normal" operating time. Fast operating times may be obtained by using one or more of the following: (1) Larger supply lines; (2) larger control valve; (3) higher supply pressure (within actuator design limitations); (4) quick exhaust valves.

- 5.5 Slower operating times may be obtained by using flow control valves to meter the exhaust. Incoming supply should not be metered or exhaust flow metered excessively, since this may cause erratic operation.

## 6.0 OPERATION OF GH BETTIS ACTUATOR

### 6.1 CONTROLLED OPERATION

Controlled operation is accomplished by applying pressure to the appropriate pressure inlet(s) of the double acting actuator by means of a appropriate control valve. Do not exceed pressure indicated on actuator nameplate.

### 6.2 MANUAL OPERATION

All pressure must be vented or equalized on both sides of the power piston prior to manual operation. Rotate the M4 handwheel in the appropriate direction to operate actuator and valve.

## 7.0 MAINTENANCE

### 7.1 SERVICE INTERVAL

Routine maintenance is generally unnecessary. Every five (5) years, or sooner, the actuator should be disassembled, cleaned, relubricated and all seals and gaskets replaced. It is recommended that service/seal kits be ordered approximately three (3) months prior to scheduled maintenance to assure availability. NOTE: Storage time counts as service time.

### 7.2 LUBRICATION REQUIREMENTS

7.2.1 Standard and high temperature service (-20°F to 350°F) use Kronaplate 100. Kronaplate 100 is furnished in the Bettis Service/Seal Kits.

7.2.2 Low temperature service (-50°F to 150°F) use Kronaplate 50 lubricant.

7.2.3 For distributors of Kronaplate in your area call 800-428-7802.

### 7.3 FLUID REQUIREMENTS

7.3.1 Standard and high temperature service (-20°F to 350°F) use Dexron II Automatic Transmission Fluid.

7.3.2 Low temperature service (-50°F to 150°F) use Exxon Univis J13 Hydraulic Fluid.

### 7.4 SPARE PARTS

7.4.1 For availability of replacement parts, contact GH Bettis or nearest Bettis authorized representative. Assembly drawings are available that identify each individual part by a generic number applicable to each actuator series. It should be remembered when ordering service/seal kits for shelf storage that the seals are made of resilient material and have a limited shelf life.

7.4.2 When ordering replacement parts, it is important to include the complete actuator model number, part number and serial number. This information is on the actuator name tag.

7.4.3 More detailed information concerning you particular application may be obtained by writing GH Bettis, 19200 Northwest Freeway Houston, TX 77065 , Telephone: 281 477 4100.

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