

BETTIS

GENERAL OPERATING

AND MAINTENANCE INSTRUCTIONS

FOR

LN-SERIES LINEAR ACTUATORS

PART NUMBER: 064920

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1.0 **GENERAL**

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

2.0 **STORAGE**

- 2.1 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.
- 2.2 Indoor storage, if available, is recommended for all actuators.
- 2.3 Care should be taken to plug the cylinder ports, control valve ports and body ports to keep out foreign particles and moisture.
- 2.4 Actuator should not be stored in an atmosphere harmful to resilient seals.
- 2.5 For extended storage, contact factory.

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

3.0 **INSTALLATION**

- 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 Determine valve position, i.e., open, close, or in between.
- 3.5 Using minimum pneumatic pressure, pressurize actuator inlet port (outer end cap) to extend 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.
- 3.6 Clean regulated pneumatic medium should be used and the pressure should never exceed the nominal operating pressure (NOP) marked on the actuator name tag.
- 3.7 Remove the pneumatic pressure and bolt the clamping block halves together and tighten bolts to the snug position.

4.0 VALVE LIMIT ADJUSTMENTS

- 4.1 Using minimum pressure, pressurize actuator inlet port (outer end cap) and extend the piston rod and close valve. Make sure valve is closed and gate is seated.
- 4.2 For actuators mounting on knife gate valves see 4.3, for actuators mounting on wedge gate valves see 4.4.
- 4.3 **KNIFE GATE VALVES:**
 - 4.3.1 For valve limit stop in closed position the knife gate has to be stopped by the actuator stop.
 - 4.3.2 Remove clamping block.
 - 4.3.3 Using minimum pressure, pressurize inlet port in the outer end cap and move actuator piston rod to its full "down" position
 - 4.3.4 Take clamping blocks (both halves) and install over both the piston rod and stem nut.
 - 4.3.5 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.
 - 4.3.6 Back-out stop screw in actuator outer end cap.
 - 4.3.7 Stroke actuator to "open" position.
 - 4.3.8 Adjust actuator outer end cap stop screw until it contacts piston rod. After contact, continue turning stop screw 1/4 turn.
 - 4.3.9 "Lock" down seal nut on actuator stop screw.

4.4 WEDGE GATE VALVES:

- 4.4.1 Wedge gates have to be driven into the valve seat.
- 4.4.2 Remove clamping blocks.
- 4.4.3 Move actuator piston rod to its full "down" position and back-off 1/4 inch.
- 4.4.4 Take clamping blocks (both halves) and install over both the piston rod and stem nut.
- 4.4.5 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.
- 4.4.6 Back-out stop screw in actuator outer end cap.

- 4.4.7 Stroke actuator to "open" position.
- 4.4.8 Adjust actuator outer end cap stop screw until it contacts piston rod. After contact, continue turning stop screw 1/4 turn.
- 4.4.9 "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 The actuator speed of operation will be determined by a number of factors including:
 - 5.2.1 Power supply line length.
 - 5.2.2 Power supply line size.
 - 5.2.3 Power supply line pressure.
 - 5.2.4 Control valve and fitting orifice size.
 - 5.2.5 Torque requirements of the valve.
 - 5.2.6 Size of the actuator.
 - 5.2.7 Setting of speed controls.
- 5.3 Due to the interaction of these variables it is difficult to specify a "normal" operating time. Faster operating times may be obtained by using one of more of the following:
 - 5.3.1 Larger supply lines.
 - 5.3.2 Larger control valve.
 - 5.3.3 Higher supply pressure (not to exceed minimum operating pressure of actuator or control components).
 - 5.3.4 Quick exhaust valves.
- 5.4 Slower operating times may be obtained by using flow control valves to meter the exhaust. Excessive exhaust flow metering may cause erratic operation. Normally, incoming supply should not be metered.

6.0 OPERATING OF GH BETTIS ACTUATORS

- 6.1 **CONTROLLED OPERATION:** Controlled operation is accomplished by pressuring and depressing to the appropriate cylinder inlet(s) of a double acting or spring return units by means of an appropriate control valve. Do not exceed pressures 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.

7.0 MAINTENANCE

- 7.1 **SERVICE INTERVAL:** Routine maintenance is generally unnecessary. Every five (5) years, or sooner, the actuator should be disassembled, cleaned, re-lubricated and all seals and gaskets replaced. It is recommended that seal kits be ordered approximately three (3) months prior to scheduled maintenance to assure availability. **NOTE:** Storage time is considered as service time.
- 7.2 **LUBRICANT REQUIREMENTS:**
- 7.2.1 Standard and high temperature service (-20 degrees F to 350 degrees F) use Kronaplate 100 on all mating wear surfaces including seals and cylinder walls. Kronaplate 100 is a petroleum base, Grade NLGI No. 2 lubricant and is furnished in all standard Bettis supplied service and seal kits.
- 7.2.2 Low temperature service (-50 F to 150 F) use Kronaplate 50.
- 7.2.3 For distributors of Kronaplate in you area call 800-428-7802.

8.0 SPARE PARTS

- 8.1 For availability of replacement parts, contact Bettis or nearest Bettis authorized representative. Assembly drawings are available that identify each individual part by a generic number applicable to each actuator series.
- 8.2 It should be remembered when ordering spare seal kits for shelf storage that the seals are made of resilient material and have a limited shelf life.
- 8.3 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.
- 8.4 More detailed information concerning your particular application may be obtained by writing Bettis, 19200 Northwest Freeway Houston, TX 77065 , Telephone: 281 477 4100.

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