

**GH-BETTIS**

**SERVICE INSTRUCTIONS**

**OPERATION, TESTING,**

**REMOVAL AND INSTALLATION**

**LOCKING DEVICE MODELS**

**CBX15, CBX20 AND CBX25**

PART NUMBER: 108942

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## **SECTION 1.0 - INTRODUCTION**

- 1.1 SAFETY STATEMENT:** Products supplied by GH-Bettis, in its "as shipped" condition, are intrinsically safe if the instructions contained within this Service Instruction are strictly adhered to and executed by well trained, equipped, prepared and competent personnel.

**WARNING:** **FOR THE PROTECTION OF PERSONNEL WORKING ON GH-BETTIS PRODUCTS, THIS PROCEDURE SHOULD BE REVIEWED AND IMPLEMENTED. CLOSE ATTENTION SHOULD BE NOTED TO THE WARNINGS, CAUTIONS AND NOTES CONTAINED IN THIS PROCEDURE.**

### **DEFINITIONS:**

**WARNING:** If not observed, user incurs a high risk of severe damage to GH-Bettis product and/or fatal injury to personnel.

**CAUTION:** If not observed, user may incur damage to GH-Bettis product and/or injury to personnel.

**NOTE:** Advisory and information comments provided to assist personnel in implementing this procedure.

### **1.2 GENERAL DETAILS**

1.2.1 **TOOLS:** All required tools are American Standard inch. Two large adjustable wrenches, 8" or 12" and 1/2" drive socket set with allen sockets.

1.2.2 **REFERENCE MATERIALS:** Refer to locking device parts list for part number of the locking device assembly drawing part.

### **1.3 GENERAL NOTES**

**WARNING:** **On spring return actuators, the locking device is not intended to lock the actuator in any other position than it's fail position.**

1.3.1 Numbers in parentheses ( ), indicate the bubble number (reference number) used on assembly drawing and parts list.

1.3.2 On double acting actuators, the locking device can lock the actuator in the position specified at the time of purchase.

1.3.3 The purpose of the test stop is to test the actuator, controls, and valve for proper operation without allowing the valve to close, while limiting the actuator stroke.

## **SECTION 2.0 - LOCKING DEVICE OPERATION**

### **2.1 ENGAGEMENT OF THE LOCK SCREW:**

- 2.1.1 Make sure that the actuator is in the proper position for locking. NOTE: If the actuator is spring return then refer to the warning in step 1.3.2.
- 2.1.2 Unlock and remove the lock cover assembly (60).
- 2.1.3 Loosen the hex jam nut (50) and turn the stop screw (40) clockwise until resistance is encountered, then tighten stop screw (40) to approximately 100 ft-bs.
- 2.1.4 Tighten the hex jam nut (50) to 100 ft-lbs.
- 2.1.5 Replace the lock cover assembly (60).
- 2.1.6 Lock the lock cover assembly (60) in place and tag if desired.

### **2.2 DISENGAGEMENT OF THE LOCK SCREW:**

- 2.2.1 Make sure that there is no torque being applied to the locking device by the actuator or the valve.
- 2.2.2 Unlock and remove the lock cover assembly (60).
- 2.2.3 Loosen the hex jam nut (50).
- 2.2.4 Screw the stop screw (40) counter clockwise until the threads disengage. The resistance should drop rapidly!

**CAUTION:** After the stop screw threads disengage do not over tighten the hex jam nut (50)! Tightening the hex jam nut more than handtight may damage the retaining ring (120).

- 2.2.5 Replace the lock cover assembly (60) and lock in place.
- 2.2.6 The actuator is ready for normal service.

### **2.3 TEST STOP OPERATION**

NOTE: The following steps are for actuators equipped with a test stop. If the locking device has no test stop ignore this section.

- 2.3.1 Make sure the actuator is in the correct position to install the test pin (usually opposite the fail position).
- 2.3.2 Unlock and remove the test pin cover (190).
- 2.3.3 Place the test pin (180) in the test pin hole and hold in place by hand while testing.

- 2.3.4 After testing is completed, return the actuator to the position described in step 2.3.1, and remove the test pin.
- 2.3.5 Replace the test pin cover (190) and lock.
- 2.3.6 The actuator is ready for normal service.

## **SECTION 3.0 - ACTUATOR REMOVAL FROM LOCKING DEVICE**

### **3.1 GENERAL NOTES**

**WARNING      PRIOR TO REMOVING THE ACTUATOR FROM THE LOCKING DEVICE THE ACTUATOR MUST BE IN THE FULL FAIL POSITION, AND THE KEY REMOVED FROM THE ACTUATOR.**

- 3.1.1 The actuator may be heavy and require a means of assistance in lifting it from the locking device/valve assembly.
- 3.1.2 Remove all supply pressure, and insure that the actuator is in the full fail position.
- 3.1.3 Measure the exposed length of the actuator stop screws and record each. NOTE: Marking the torque shaft's position on the housing is helpful.
- 3.1.4 Record the orientation of the actuator, and mark appropriately.

### **3.2 DISASSEMBLY OF ACTUATOR FROM LOCKING DEVICE**

- 3.2.1 The actuator can be removed from the locking device with the locking device in either the lock screw engaged or disengaged position.
- 3.2.2 Adjust the actuator stop screw, located in the actuator housing, until the stem adapter becomes free.
- 3.2.3 While supporting the actuator remove the four hex cap screws (110) from locking device housing (10)/adapter plate (30).
- 3.2.4 Lift the actuator off of the locking device.
- 3.2.5 Remove the ferry head cap screws (100) from the adapter plate (30) and remove it from actuator. NOTE: This step is not required if the actuator is only being removed and then re-installed on the same locking device.

## SECTION 4.0 - INSTALLING ACTUATOR TO LOCKING DEVICE

### 4.1 REINSTALLING ACTUATOR TO ORIGINAL LOCKING DEVICE

- 4.1.1 If not already attached to the actuator, install the adapter plate (30) to the actuator and fasten using the ferry head cap screws (100).
- 4.1.2 Install the actuator on the locking device in the position recorded or marked in step 3.1.4.
- 4.1.3 Install the four hex head cap screws (110).
- 4.1.4 Return the actuator stop screws to the length noted in step 3.1.3 and align the marks on the torque shaft/housing.
- 4.1.5 Reconnect all supply pressure.
- 4.1.6 Replace lock cover assembly (60) and lock into place.

### 4.2 INITIAL INSTALLATION OF ACTUATOR ON LOCKING DEVICE

- 4.2.1 Before starting with this section refer to section 3.0 (Actuator removal from Locking Device) and do all of 3.1 (General Notes) steps.
- 4.2.2 Install the adapter plate (30) to the actuator and fasten using the ferry head cap screws (100).
- 4.2.3 Install the actuator on the locking device.
- 4.2.4 Install the four hex head cap screws (110).
- 4.2.5 Return the actuator stop screws to the length noted in step 3.1.3 and align the marks on the torque shaft/housing.
- 4.2.6 Reconnect all supply pressure.
- 4.2.7 Replace lock cover assembly (60) and lock into place.

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\* Signatures on file Bettis Actuator & Controls, Waller, Texas