



A Textron Company

ALERT SERVICE BULLETIN

230-11-43

9 December 2011

Revision A, 22 June 2012

Revision B, 4 November 2021

Revision C, 24 February 2022

MODEL AFFECTED: 230

SUBJECT: UPGRADE OR OVERHAUL OF HYDRAULIC SERVO ACTUATOR P/N 222-382-001-107 AND INTRODUCTION OF SERVO ACTUATOR P/N 222-382-001-111 AND/OR -111FM

HELICOPTERS AFFECTED: Serial numbers 23001 through 23038 and all P/N 222-382-001-107 spare actuators.

COMPLIANCE: Upon release of this bulletin for all affected actuators.

DESCRIPTION:

Bell Helicopter released ASB 230-10-41 on August 18, 2010 requesting operators to perform a one-time inspection of all P/N 222-382-001-107 servo actuators to verify the condition of the piston rod in accordance with the procedure listed in Woodward Alert Service Bulletin 141600-67-02. Subsequently, ASB 230-10-41 Revision A dated August 30, 2011 was released requiring operators, whose actuators were within the one year or 1200 hours category, to perform another inspection of affected actuators to verify the condition of the piston rod.

The original bulletin 230-11-43 revised the inspection/overhaul requirements introduced by ASB 230-10-41 following actuator inspection by Woodward Alert Service Bulletin. During inspection/overhaul of P/N 222-382-001-107 servo actuators at WHRT, all actuators would be overhauled to a P/N 222-382-001-111 configuration with the incorporation of a new piston rod made from improved corrosion resistant steel material. In addition, that bulletin introduced a new overhaul interval of 10 years or 10,000 hours, whichever comes first, for hydraulic actuator P/N 222-382-001-111 or P/N 222-382-001-111FM.

Revision A of this bulletin introduces an alternate method to upgrade the P/N 222-382-001-107 actuators into P/N 222-382-001-111FM configuration by allowing the replacement of the existing actuator piston rod in accordance with the procedure listed in Woodward HRT Service Bulletin 141600-67-03.

In addition, in order to accommodate operational requirements, scheduling and parts acquisition to comply with the upgrade of the actuators, Revision A of this bulletin authorizes operators, whose actuators have reached the 1 year/1200 hours or 2 years/2400 hours, to perform another inspection of affected actuators P/N 222-382-001-107 to verify the condition of the piston rod. That inspection may be accomplished by the operator in accordance with the procedure listed in PART II of the accomplishment instructions in this bulletin.

Note that the inspection per PART II in Revision A of this bulletin does not apply to servo actuators which fall within the 4 years or 3000 hours category. The upgrade /overhaul of those actuators should be delayed for some time until the upgrade/overhaul of the 2 years or 2400 hours actuators is completed.

Revision B of this bulletin extends the 10-year overhaul requirement to 11 years for the 222-382-001-111 and 222-382-001-111FM servo actuators only. The new overhaul requirement for the 222-382-001-111 and 222-382-001-111FM is now 10,000 hours or 11 years; whichever comes first.

Revision C of this bulletin removes the calendar overhaul interval. Following review of field history and based on materials testing, it has been determined that the 11-year overhaul assigned to the actuators 222-382-001-111 and -111FM is not required. The new overhaul requirement for the 222-382-001-111 and 222-382-001-111FM is now 10,000 hours

APPROVAL:

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Bell Product Support Engineering
Tel: 1-450-437-2862 / 1-800-363-8023 / productsupport@bellflight.com

MANPOWER:

Approximately 4 man-hours are required to complete this bulletin. This estimate is based on hands-on time and may vary with personnel and facilities available.

SPECIAL PRICING POLICY:

Considering that the P/N 222-382-001-107 actuators overhaul program has been terminated, the special overhaul price of \$ 25,000.00 per actuator is hereby cancelled.

A special price of \$ 11,900.00 per kit has been assigned for the parts required to upgrade each actuator P/N 222-382-001-107.

WARRANTY:

There is no warranty for parts or labor associated with this bulletin.

MATERIAL:

Required Material:

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Supply Center.

PART I

<u>Part Number</u>	<u>Nomenclature</u>	<u>Qty</u>
KM141600101-67-03	Kit	1 per unit

PART II

<u>Part Number</u>	<u>Nomenclature</u>	<u>Qty</u>	<u>Reference *</u>
141517-101	Nut	A/R	Note 4
250, 1.00 wide	Tape, high adhesion	A/R	Note 3
Acetone Gallon	Acetone (Note 1)	A/R	C-316
AMS-S-8802 6OZ	Sealant	A/R	C-308

* C-XXX numbers refer to the consumables list in BHT-ALL-SPM Standard Practices Manual

NOTES:

1. As alternate, Toluene (C-306), MEK (C-309) or Solvent (C-304) may be used. However, use of Alcohol is prohibited.
2. Materials listed here are either equivalent or alternate to those listed in Woodward HRT bulletin.
3. Available from any 3M supply store under No. 250, Flatback, high adhesion
4. Nuts P/N 141517-101 are not available from Bell Helicopter. They must be procured from WHRT. Refer to Service Bulletin 141600-67-03 for contact details.

SPECIAL TOOLS:

Work-Aids can be manufactured locally or purchased directly from vendor. Refer to Woodward Alert Service Bulletins for details

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

BHT-230-MM-2 and MM-4 Maintenance Manual
BHT-230-CR&O Component Repair and Overhaul Manual
Woodward Service Bulletin 141600-67-02
Woodward Service Bulletin 141600-67-03
ASB 230-10-41
ASB 230-11-43

PUBLICATIONS AFFECTED:

BHT-230-MM-2 and MM-4 Maintenance Manual
BHT-230-CR&O Component Repair and Overhaul Manual

ACCOMPLISHMENT INSTRUCTIONS:

PART I: Upgrade or overhaul of 222-382-001-107 actuators

-NOTE-

The calendar/hourly intervals for the overhaul or upgrade of the actuators listed in step 1 below start from the date of the inspection of the actuator piston rod accomplished per ASB 230-10-41 or ASB-230-10-41 Revision A.

1. Following compliance with Woodward Alert Service Bulletin 141600-67-2, all hydraulic servo actuators P/N 222-382-001-107 will require a complete overhaul/upgrade per following steps:
 - a. Actuators piston rods had no corrosion, damage, or visible lack of cadmium plating and were coated with primer before reassembly. Those actuators must be upgraded to P/N 222-382-001-111 configuration per Revision A of this bulletin or returned to WHRT for overhaul upon reaching four (4) calendar years or 3,000 hours, whichever comes first.

- b. Actuators piston rods had red/orange corrosion or surface corrosion with no pitting or penetration to base metal. Lack of cadmium plating was limited to a total area less than 1.0 in² or no single areas greater than 0.25-inch width. Following corrosion clean-up, piston rod was magnetic particle inspected and had brush cadmium applied. Piston rods were coated with primer before reassembly. Those actuators must be upgraded to P/N 222-382-001-111 configuration per Revision A of this bulletin or returned to WHRT for overhaul upon reaching two (2) calendar years or 2,400 hours, whichever comes first.
- c. Actuators piston rods had red/orange corrosion or surface corrosion with no pitting or penetration to base metal. Lack of cadmium plating was limited to a total area less than 1.0 in² or no single areas greater than 0.25-inch width. Following corrosion clean-up, piston rods were coated with primer before reassembly. Those actuators must be upgraded to P/N 222-382-001-111 configuration per Revision A of this bulletin or returned to WHRT for overhaul upon reaching one (1) calendar year or 1,200 hours, whichever comes first.

NOTE

All servo actuators must be upgraded or overhauled within the period listed in step 1 above. Otherwise, they must be inspected per PART II of this bulletin.

- 2. Remove servo actuator(s) P/N 222-382-001-107 from the aircraft. Refer to BHT-230-MM-4, Chapter 29.

NOTE

Servo actuators may still be shipped to WHRT for repair or complete overhaul. However, prior to shipping actuators, it is recommended to contact WHRT personnel to discuss repair or overhaul price as well as turn-around time. Please refer to Woodward Service Bulletin 141600-67-03 for contact details.

- 3. Modify/upgrade affected servo actuators per Woodward HRT Service Bulletin 141600-67-03.
- 4. Install overhauled or new or upgraded actuator(s) P/N 222-382-001-111 and/or P/N 222-382-001-111FM on the helicopter. Refer to BHT-230-MM-4, Chapter 29.
- 5. Perform Hydraulic System operational check. Refer to BHT-230-MM-4, Chapter 29.

6. Create or annotate Historical Service Record (HSR) and helicopter records to reflect an overhaul requirement of 10,000 hours for hydraulic servo actuator(s) P/N 222-382-001-111 or -111FM. Delete the previous 11-year overhaul requirement.
7. Make an entry in helicopter historical service records indicating compliance with revision C PART I of this Alert Service Bulletin.

PART II: This inspection applies only to P/N 222-382-001-107 actuators which have reached the 1 year/1200 hours or 2 years/2400 hours but for various reasons cannot be upgraded to P/N 222-382-001-111/-111FM configuration.

NOTE

This inspection does not apply to servo actuators which fall within the 4 years or 3000 hours category. The upgrade or overhaul of those actuators should be delayed for some time until the upgrade/overhaul of the 2 years or 2400 hours actuators is completed.

NOTE

Disassembly/reassembly of actuators to perform this inspection will require replacement of the piston rod retaining nut P/N 141517-101. The nuts are not available from Bell Helicopter. New nuts must be procured from WHRT. Refer to Service Bulletin 141600-67-03 for contact details.

1. Remove applicable cowlings to gain access to the lateral, longitudinal and collective servo actuators. Refer to BHT-230-MM.
2. Locate the identification plate on each actuator to determine the part number and manufacturer of the component.
3. Review aircraft records to determine the time since the inspection of the actuator(s) per original bulletin requirement.
4. Remove all affected servo actuators from the aircraft. Refer to BHT-230-MM.

CAUTION

Actuator disassembly and reassembly should be accomplished in a clean room to prevent FOD and contamination.

5. Following instruction listed in Woodward Alert Service Bulletin 141600-67-2, perform disassembly of actuator per accomplishment Instruction, Section A, Part 1. Discard existing piston rod retaining nut.
6. Following instruction listed in Woodward Alert Service Bulletin 141600-67-2, clean and inspect Piston Rod Assembly of each actuator except as follows:
 - a. Clean entire piston rod per WHRT ASB, Accomplishment Instructions, Section B, PART II, step 1.
 - b. Without removing the primer and using a 10X or greater magnifying glass, inspect the piston rod assembly in the total area identified in Figure 7 of WHRT ASB for corrosion. Any corrosion or damage in this area is cause for rejection of the piston rod and the complete actuator must be upgraded or returned for overhaul per PART I of this bulletin.
 - c. Provided the primer is in excellent condition (no flaking, bubbling, missing areas, or any indication of lack of adhesion) on the entire area of the piston rod, disregard steps d) and e) and proceed with reassembly of the actuator per step f) below.
 - d. Provided no corrosion or damage exists, but the coating of primer is not in excellent condition, remove all the primer from the entire area of the piston rod using Scotch Brite (3M Scotch Brite), Clean and Finish Roll – White). Clean part using Acetone and nylon bristle brush to remove any residue.
 - e. Using a 10X or greater magnifying glass, inspect the piston rod assembly for the total area identified in Figure 7 of WHRT ASB for pitting in the base material. Any pitting is cause for rejection of the piston rod and the complete actuator must be upgraded or returned for overhaul per PART I of this bulletin.

NOTE

A new piston rod retaining nut P/N 141517-101 is required during reassembly of the actuators. The nuts are not available from Bell Helicopter. New nuts must be procured from WHRT. Refer to Service Bulletin 141600-67-03 for contact details.

- f. If the piston rod assembly meets the inspection criteria per sub-steps a through e above, proceed with assembly of dual servo actuator assembly In accordance with Woodward Alert Service Bulletin 141600-67-2 Accomplishment Instructions, Section C, PART III, steps 1 through 3 inclusively except a new piston rod retaining nut P/N 141517-101 is required.

-NOTE-

Following compliance with Revision A, PART II of this bulletin, all affected servo actuators will require an upgrade or complete overhaul per PART I of this bulletin at the next 6 months/ 600 hours, whichever comes first.

7. Annotate the historical card of each affected actuator indicating the date of accomplishment of the inspection per Revision A, PART II of this bulletin and indicate when the actuator must be removed for upgrade or overhaul.
8. Reinstall actuator(s) on the aircraft. Refer to BHT-230-MM.
9. Perform Hydraulic System operational check. Refer to BHT-230-MM-4, Chapter 29.
10. Make an entry in helicopter service records indicating compliance with Revision A PART II of this Alert Service Bulletin.