



FAA
Aviation Safety

EMERGENCY

AIRWORTHINESS DIRECTIVE

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DATE: September 1, 2010

AD #: 2010-19-51

This Emergency Airworthiness Directive (AD) is prompted by a main rotor hydraulic servo actuator (servo actuator) malfunction and a subsequent investigation that revealed the output piston rod assembly (piston rod) had fractured at the threaded end because of stress corrosion cracking. Also, during the investigation of that servo actuator malfunction, a nonconforming grind relief was discovered on a separate piston rod. The actions specified by this AD are intended to detect corrosion or a nonconforming piston rod that, if not detected and corrected, could result in failure of the piston rod, failure of the servo actuator, and subsequent loss of control of the helicopter.

We have reviewed Bell Alert Service Bulletin (ASB) No. 222-10-109 for the Model 222 and 222B helicopters, ASB No. 222U-10-80 for the Model 222U helicopters, ASB No. 230-10-41 for the Model 230 helicopters, and ASB No. 430-10-44 for the Model 430 helicopters. Each ASB is dated August 18, 2010, and specifies a one-time inspection of all affected servo actuators to verify the condition of the piston rod. We have also reviewed Woodward HRT ASB No. 141600-67-02, dated August 18, 2010, attached to each Bell ASB, which specifies inspecting the piston rod for corrosion and nonconforming grind relief. It also contains instructions for reworking and reassembling the unit for operation.

Transport Canada, the airworthiness authority for Canada, notified us that an unsafe condition may exist on these helicopter models. Transport Canada advises that it has been determined that the piston rods of the servo actuators “may be corroded and, consequently, prone for corrosion cracking.” Also, in one case, an unapproved repair was found on the piston rod. This situation, if not corrected, could result in loss of control of the helicopter. Transport Canada classified the ASBs as mandatory and issued AD No. CF-2010-29, dated August 26, 2010, to ensure the continued airworthiness of these helicopters.

These helicopters have been approved by the aviation authority of Canada and are approved for operation in the United States. Pursuant to our bilateral agreement with Canada, they have notified us of the unsafe condition described in the Transport Canada AD.

We are issuing this AD because we evaluated all information provided by Transport Canada and determined the unsafe condition exists and is likely to exist or develop on other helicopters of these same type designs. Therefore, this AD requires, before further flight:

- Disassembling the actuator to gain access to the piston rod.
- Cleaning the entire piston rod and nut using Acetone and a nylon bristle brush removing all contaminants to allow for inspection.
- Inspecting the grind relief configuration for the piston rod and nut. If the grind relief is unacceptable, replacing the piston rod and the nut with airworthy parts.

- Using a 10x or higher magnifying glass, visually inspecting the nut for corrosion or damage to the threads. If you find any corrosion or damage to the threads, replacing the nut with an airworthy nut.
- Using a 10x or higher magnifying glass, visually inspecting the piston rod for any corrosion, visible lack of cadmium plate (gold or grey color), or damage to the piston rod. If you find any corrosion, visible lack of cadmium plate (gold or grey color), or damage to the piston rod in the “Critical Areas,” replacing the piston rod with an airworthy piston rod.
- If you find any corrosion or visible lack of cadmium plate on the piston rod in areas that are not considered “Critical Areas,” reworking the piston rod by removing any surface corrosion that has not penetrated into the base material by lightly buffing with scotch-brite. Cleaning the part using Acetone and a nylon bristle brush to remove any residue.
- If you find any corrosion that is red or orange in color, magnetic particle inspecting the piston rod for a crack. If you find a crack, replacing the piston rod with an airworthy piston rod.
- Inspecting the portion of the piston rod for any bare base metal that is not coated with cadmium plate. If you find any bare base metal on the piston rod in this area, reworking the piston rod by applying brush cadmium plating to all bare and reworked areas.
- Reassembling the servo actuator.
- After reassembling the servo actuator, marking it with the letter “B” following the serial number on the name plate using a scribe or vibrating stylus.
- Performing a hydraulic system check.

These actions must be accomplished by following specified portions of the ASBs described previously.

This AD differs from the Transport Canada AD in that we require the initial inspection before further flight rather than no later than 5 hours air time upon receiving the AD. Also, this AD requires replacing unairworthy parts with airworthy parts if certain conditions are found and this AD does not add a life limit to the servo actuator. Also, this AD does not require a one time rectification and a complete overhaul of the servo actuator after the initial inspection. This AD is an interim action; we may supersede this AD to require reducing the life limit and overhaul of the affected servo actuators.

This rule is issued under 49 U.S.C. Section 44701 pursuant to the authority delegated to me by the Administrator, and is effective immediately upon receipt of this emergency AD.

2010-19-51 BELL HELICOPTER TEXTRON CANADA: Directorate Identifier 2010-SW-079-AD.

Applicability: Model 222, 222B, 222U, 230, and 430 helicopters, with an installed main rotor hydraulic servo actuator, part number 222-382-001-107 (servo actuator), manufactured by Woodward HRT, certificated in any category.

Compliance: Before further flight, unless accomplished previously.

To detect corrosion or a nonconforming grind relief on the output piston rod assembly (piston rod), to prevent failure of the piston rod, failure of the servo actuator, and subsequent loss of control of the helicopter, do the following:

(a) Disassemble the actuator to gain access to the piston rod as shown in Figures 1 through 5 and by following the Accomplishment Instructions, paragraph 3.A., Part I., of Woodward HRT Alert Service Bulletin No. 141600-67-02, dated August 18, 2010 (Woodward ASB).

Note 1: Bell Helicopter Textron Canada (Bell) Alert Service Bulletin (ASB) No. 222-10-109 for the Models 222 and 222B, ASB No. 222U-10-80 for the Model 222U, ASB No. 230-10-41 for the Model 230, and ASB No. 430-10-44 for the Model 430 helicopters, all ASBs dated August 18, 2010, contain guidance pertaining to this AD.

(b) Clean the entire piston rod and nut using Acetone and a nylon bristle brush removing all contaminants to allow for inspection. Inspect the grind relief configuration for the piston rod and nut as shown in Figure 6 of the Woodward ASB. If the grind relief is unacceptable as shown in Figure 6, replace the piston rod and the nut with airworthy parts.

(c) Using a 10x or higher magnifying glass, visually inspect the nut for any corrosion or any damage to the threads. If you find any corrosion or any damage to the threads, replace the nut with an airworthy nut.

(d) Using a 10x or higher magnifying glass, visually inspect the piston rod as shown in Figure 7 of the Woodward ASB for any corrosion, visible lack of cadmium plate (gold or grey color), or damage to the piston rod.

Note 2: For the purposes of this AD, damage to the piston rod is defined as pitting, a visible scratch, a crack, or a visible abrasion.

(1) If you find any corrosion or visible lack of cadmium plate or any damage to the piston rod in the "Critical Areas," replace the piston rod with an airworthy piston rod.

(2) If you find any corrosion or visible lack of cadmium plate on the piston rod in areas that are not considered "Critical Areas," rework the piston rod by removing any surface corrosion that has not penetrated into the base material by lightly buffing with scotch-brite. Clean the part using Acetone and a nylon bristle brush to remove any residue.

(3) If you find any corrosion that is red or orange in color, magnetic particle inspect the piston rod for a crack. If you find a crack, replace the piston rod with an airworthy piston rod.

(e) Inspect the portion of the piston rod for any bare base metal, as shown in Figure 7 of the Woodward ASB, which is coated with cadmium plate. If you find any bare base metal on the piston rod in this area, rework the piston rod by applying brush cadmium plating to all bare and reworked areas by following the Accomplishment Instructions, paragraph B., Part II, 4.5. and paragraph C., Part III, C.1.1.1. through C.1.1.3., of the Woodward ASB.

(f) Reassemble the servo actuator by following the Accomplishment Instructions, paragraph C, Part III, 1.1.4. through 3.3.4. of the Woodward ASB.

(g) After reassembling the servo actuator, mark it with the letter "B" following the serial number on the name plate using a scribe or vibrating stylus.

(h) Perform a hydraulic system check.

(i) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Contact the Manager, Safety Management Group, FAA, ATTN: J. R. Holton, Jr., Aviation Safety Engineer, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, Texas 76137, telephone (817) 222-4964, fax (817) 222-5961, for information about previously approved alternative methods of compliance.

(j) The Joint Aircraft System/Component (JASC) Code is 6730: Rotorcraft Servo System.

(k) Copies of the applicable service information may be obtained from Bell Helicopter Textron Canada, 12,800 Rue de l'Avenir, Mirabel, Quebec J7J1R4, telephone (450) 437-2862 or (800) 363-8023, fax (450) 433-0272, or at <http://www.bellcustomer.com/files/>.

(l) Emergency AD 2010-19-51, issued August 31, 2010, becomes effective upon receipt.

Note 3: The subject of this AD is addressed in Transport Canada AD No. CF-2010-29, dated August 26, 2010.

FOR FURTHER INFORMATION CONTACT: J. R. Holton, Jr., Aviation Safety Engineer, FAA, Rotorcraft Directorate, Safety Management Group, 2601 Meacham Blvd., Fort Worth, Texas 76137, telephone (817) 222-4964, fax (817) 222-5961.

Issued in Fort Worth, Texas, on August 31, 2010.

Mark R. Schilling,
Acting Manager, Rotorcraft Directorate,
Aircraft Certification Service.