



AIRWORTHINESS DIRECTIVE

This Airworthiness Directive (AD) is issued pursuant to Canadian Aviation Regulation (CAR) 521.427. No person shall conduct a take-off or permit a take-off to be conducted in an aircraft that is in their legal custody and control, unless the requirements of CAR 605.84 pertaining to ADs are met. Standard 625 - Aircraft Equipment and Maintenance Standards Appendix H provides information concerning alternative means of compliance (AMOC) with ADs.

Number:

CF-2021-26

Effective Date:

9 August 2021

ATA:

62

Type Certificate:

H-88

Subject:

Main Rotor – Pitch Link Assembly Clevis Fracture

Applicability:

Bell Textron Canada Limited (Bell) model 430 helicopters, serial numbers 49001 through 49129.

Compliance:

As indicated below, unless already accomplished.

Background:

In January 2021, a model 430 helicopter experienced an in-flight failure of a main rotor pitch link clevis resulting in loss of control of the helicopter and fatal injury to the five occupants on-board. The main rotor pitch link clevis part number (P/N) 430-010-432-101 fractured at the exposed thread area above the nut and the fracture was consistent with fatigue damage. A similar accident previously occurred in September 2016 on a model 430 helicopter where the main rotor pitch link clevis was found to have fractured at the neck area via fatigue damage that originated at a corrosion pit.

Inspection of the failed part from the 2021 accident determined that the universal bearing P/N 212-010-412-001 of the main rotor pitch link assembly was found with excessive wear and had increased resistance to rotation. Restriction in freedom of movement of the universal bearing can cause increased loads on the main rotor pitch link assembly and subsequent fatigue failure of the clevis prior to its life limit. The accident investigation is still ongoing.

This condition, if not corrected, could lead to crack initiation at the main rotor pitch link clevis neck or threaded area and consequent failure of the main rotor pitch link, resulting in loss of control of the helicopter.

To address this unsafe condition, this AD requires an initial special detailed inspection (SDI) of the main rotor pitch link clevises and detailed visual inspection (DVI) of the universal bearings, and rectification, as required. This AD also mandates a repetitive DVI of the main rotor pitch link clevises and universal bearings, and rectification, as required. Bell issued Alert Service Bulletin (ASB) 430-21-60 to provide instructions for inspection and replacement of the affected parts.

This AD is considered an interim corrective action and further AD action could follow.

Corrective Actions:

For the purpose of this AD, the following definitions apply:

The ASB: Bell ASB 430-21-60, Basic Issue, dated 13 July 2021, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Serviceable part: A serviceable main rotor pitch link clevis is a new main rotor pitch link clevis or a main rotor pitch link clevis that has been inspected in accordance with the requirements of this AD and found acceptable. A serviceable universal bearing is a new universal bearing or a universal bearing that has

been inspected in accordance with the requirements of this AD and found acceptable.

Part I – Initial Inspection and Rectification

Within 25 hours air time or 30 days, whichever occurs first, from the effective date of this AD, accomplish the following, in accordance with the Accomplishment Instructions of Part I of the ASB:

- A. Perform a DVI of the main rotor pitch link clevises and rod ends for wear and damage, and rectify any defect as required.
- B. Perform a DVI of the universal bearings for signs of binding or stiffness, wear, damage, looseness, excess axial and radial play, and rectify any defect as follows:
 - i. For each main rotor pitch link assembly P/N 430-010-411-105/-107 that has accumulated 5000 hours air time or less and has an associated universal bearing P/N 212-010-412-001 that is found to be unserviceable: replace the universal bearing with a serviceable part.
 - ii. For each main rotor pitch link assembly P/N 430-010-411-105/-107 that has accumulated more than 5000 hours air time and has an associated universal bearing P/N 212-010-412-001 with signs of binding or stiffness: replace both the universal bearing and the main rotor pitch link clevis with serviceable parts.
 - iii. For each main rotor pitch link assembly P/N 430-010-411-105/-107 that has accumulated more than 5000 hours air time and has an associated universal bearing P/N 212-010-412-001 that is found to be unserviceable but with no signs of binding or stiffness: replace the universal bearing with a serviceable part. For a main rotor pitch link assembly that has accumulated more than 5000 hours air time, the associated main rotor pitch link clevis can remain in service until the current life limit of the main rotor pitch link assembly is reached provided the associated universal bearing is found serviceable with no signs of binding or stiffness.
 - iv. Purge grease the bearings of each universal bearing ensuring all four grease fittings allow for grease purging.
- C. Perform a magnetic particle inspection (MPI) of the main rotor pitch link clevises to detect cracks, and replace clevises that have signs of cracking.
- D. If the main rotor pitch link clevis is found serviceable following the MPI, replace missing cadmium plating by carrying out selective brush cadmium plating and apply chromate conversion coating.

Part II – Repetitive Inspection and Rectification

Following completion of Part I of this AD, accomplish the following:

- A. At intervals not to exceed 50 hours air time, perform a DVI of the main rotor pitch link clevises for corrosion and mechanical damage, and rectify any defect as required, in accordance with the Accomplishment Instructions of Part II of the ASB. If any suspected defects are found as a result of the DVI, perform a MPI of the affected main rotor pitch link clevises in accordance with Corrective Action Part I.C and I.D of this AD.
- B. At intervals not to exceed 150 hours air time, perform a DVI of the universal bearings for signs of binding or stiffness, wear, damage, looseness, excess axial and radial play, and rectify any defect, in accordance with the Accomplishment Instructions of Part III of the ASB and Corrective Action Part I.B of this AD.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jean Grenier
Acting Chief, Continuing Airworthiness
Issued on 26 July 2021

Contact:

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