



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-2024-18

Effective Date:

12 June 2024

ATA:

67

Type Certificate:

H-92

Subject:

Rotors Flight Control – Cyclic Stick Tube Cracking

Applicability:

Bell Textron Canada Limited (Bell) model 407 helicopters, serial numbers 53000 through 53900, 53911 through 53999, 54000 through 54166, 54300 through 54800, 54805 through 54999, 56300 through 56305, and 56311 through 56315, installed with cyclic stick tube assembly part number (P/N) 206-001-342-101 or 206-001-342-101FM.

Compliance:

As indicated below, unless already accomplished.

Background:

Bell has received a report where a pilot cyclic stick tube P/N 206-001-342-101 fractured at the lower end of the tube near the upper slotted area where it is held in place in the pivot assembly. This finding occurred prior to engine start during the pilot Interior and Prestart Check of the freedom of movement of the controls and cyclic centering light operation. Examination of the fractured pilot cyclic stick and subsequent findings of other cracked pilot cyclic stick tubes revealed fatigue cracking. Investigation by Bell has determined that the root cause of the cyclic stick cracking was attributed to excessive force being applied to the cyclic stick during the freedom of movement of the controls and cyclic centering light operation check as part of the Interior and Prestart Check, which resulted in elevated stress at the slotted area, aggravated by the high stress concentration design feature of the upper slotted area.

This condition, if not detected and corrected, could lead to in-flight failure of the cyclic stick tube and consequent loss of control of the helicopter.

To mitigate this risk, Bell has issued a revision to the Normal Procedures for the Interior and Prestart Check of the applicable Bell 407 Rotorcraft Flight Manuals (RFMs) to limit the freedom of movement of the cyclic stick to approximately 1 inch (25.4 mm) when the CYCLIC CENTERING light is verified. Bell has also released Alert Service Bulletin (ASB) 407-23-130 to require a one-time detailed inspection and replacement or repair, as applicable, of the cyclic stick tube assembly.

This AD mandates the revised procedure for the Interior and Prestart Check of the applicable RFMs and the corrective actions of Bell ASB 407-23-130.

This AD is considered interim action and further AD action may follow.

Corrective Actions:

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

The Bell ASB: Bell ASB 407-23-130, Revision A, dated 27 March 2023, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Serviceable part: A serviceable part is a new cyclic stick tube assembly P/N 206-001-342-101 or superseding Bell P/N, or a cyclic stick tube assembly P/N 206-001-342-101 with no crack found during the detailed inspection of Part II Corrective Action A. of this AD, or a cyclic stick tube assembly, P/N 206-001-342-101FM, that has been repaired since less than 24 months in accordance with Part II Corrective Action C.2 of this AD.

Group 1 helicopters: Model 407 helicopters having serial numbers 53000 through 53900, 53911 through 53999, 54000 through 54166, 54300 through 54800, 54805 through 54999, 56300 through 56305, and 56311 through 56315.

Group 2 helicopters: Model 407 helicopters having serial numbers 53000 through 53900, 53911 through 53999, 54000 through 54166, 54300 through 54800, 54805 through 54954, 54956 through 54997, 54999, 56300 through 56304, and 56311 through 56315.

Part I – RFM Revision – Applicable to Group 1 Helicopters

Within 100 hours air time or 90 days, whichever occurs first, from the effective date of this AD, accomplish the following:

- A. Amend the applicable Transport Canada (TC) approved RFM by incorporating the revision to Section 2 – Normal Procedures – INTERIOR AND PRESTART CHECK as listed in Table 1 below.

Table 1

Helicopter model	RFM Procedure	RFM Revision
Bell 407, serial numbers 53000 through 53900, 53911 through 53999, 54000 through 54166.	Normal Procedures – INTERIOR AND PRESTART CHECK, Section 2-4	BHT-407-FM-1, Revision 22, dated 22 September 2022, or later revisions of this procedure approved by Transport Canada
Bell 407, serial numbers 54300 through 54303, 54305 through 54566, 54568 through 54800 (Bell 407GX)	Normal Procedures – INTERIOR AND PRESTART CHECK, Section 2-4	BHT-407-FM-2, Revision 17, dated 22 September 2022, or later revisions of this procedure approved by Transport Canada
Bell 407, serial numbers 54304, 54567, 54805 through 54999, 56300 through 56305, and 56311 through 56315 (Bell 407GX _i)	Normal Procedures – INTERIOR AND PRESTART CHECK, Section 2-4	BHT-407-FM-3, Revision 9, dated 22 September 2022, or later revisions of this procedure approved by Transport Canada

- B. Advise all flight crews of the changes introduced by the RFM revisions listed above and thereafter operate the helicopter accordingly.

Part II – Inspection and Replacement or Repair of Cyclic Stick Tube Assembly – Applicable to Group 2 Helicopters

- A. Within 100 hours air time or 90 days, whichever occurs first, from the effective date of this AD, perform a detailed inspection of the cyclic stick tube assembly to detect cracks in accordance with Part I Paragraphs 1 and 2 of the Accomplishment Instructions of the Bell ASB.

Note: Special detailed inspection of the cyclic stick tube assembly in accordance with Part I Paragraphs 2.b and 2.c. of the Accomplishment Instructions of the Bell ASB is only required if a crack is found and the option to repair the crack is selected.

- B. If no cracks are found, before further flight, perform the actions of Part I Paragraphs 4, 5, 6 and 8 of the Accomplishment Instructions of the Bell ASB.
- C. If a crack is found and the option to repair the cyclic stick tube assembly is selected, perform the following actions:

1. Before further flight, perform a special detailed inspection of the cyclic stick tube assembly in accordance with Part I Paragraphs 2.b and 2.c. of the Accomplishment Instructions of the Bell ASB to determine if the crack is within the allowable repair limits. Allowable repair limits are indicated in Part I Paragraph 2.d.i of the Accomplishment Instructions of the Bell ASB.
 2. If the crack is within the allowable repair limits, before further flight, repair the cyclic stick tube assembly in accordance with Part II of the Accomplishment Instructions of the Bell ASB, and thereafter, at intervals not to exceed 300 hours air time or 6 months, whichever occurs first, perform a detailed inspection of the repaired cyclic stick tube assembly, P/N 206-001-342-101FM, in accordance with Part III of the Accomplishment Instructions of the Bell ASB. If the crack is not within the allowable repair limits, before further flight, perform the actions of Part II Corrective Action D. of this AD.
 3. No later than 24 months after the accomplishment of the repair of the cyclic stick tube assembly in accordance with Corrective Action C. of this AD, replace the repaired cyclic stick tube assembly, P/N 206-001-342-101FM, with a serviceable part other than P/N 206-001-342-101FM, in accordance with Part IV of the Accomplishment Instructions of the Bell ASB.
- D. If a crack is found not to be within the allowable repair limits or if the option to replace a cracked cyclic stick tube assembly is selected, before further flight, replace the cyclic stick tube assembly with a serviceable part in accordance with Part I of the Accomplishment Instructions of the Bell ASB. After installation on a helicopter of a repaired cyclic stick tube assembly, P/N 206-001-342-101FM, the repetitive inspection requirements of Part II Corrective Action C.2 and replacement requirements of Part II Correction Action C.3 of this AD applies to the repaired cyclic stick tube assembly.

Accomplishment of Part II of this AD in accordance with Bell ASB 407-23-130, Basic Issue, dated 27 February 2023, prior to the effective date of this AD, also meet the intent of this AD.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jenny Young
Chief, Continuing Airworthiness
Issued on 29 May 2024

Contact:

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