



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-2021-05R3

Effective Date:

2 April 2021

ATA:

67

Type Certificate:

H-112

Subject:

Rotors Flight Control – Collective Controls – Failure of Pilot Collective Stick and Grip Assembly

Revision:

Supersedes AD CF-2021-05R2, issued 4 March 2021.

Applicability:

Bell Textron Canada Limited (Bell) model 505 helicopters, serial numbers 65011 through 65347.

Compliance:

As indicated below, unless already accomplished.

Background:

Bell has received a report where a pilot collective stick and grip assembly (hereafter called pilot collective stick) fractured above the cabin floor at the junction with the collective jackshaft. This finding occurred prior to engine start during the pilot pre-flight check of flight controls for travel. Examination of the fractured pilot collective stick and another cracked pilot collective stick by Bell revealed fatigue cracking.

Based on Bell's findings, it was determined that the one-time visual inspection introduced in Bell Alert Service Bulletin (ASB) 505-21-20 and mandated by AD CF-2021-05 is not adequate. As a result, Bell published ASB 505-21-20, Revision A to require a repetitive fluorescent penetrant inspection (FPI) that is capable of detecting smaller cracks. The ASB also includes the requirement to repeat the FPI at intervals of 25 hours air time. AD CF-2021-05R1 was issued to mandate an initial and repetitive FPI of the pilot collective stick in accordance with ASB 505-21-20, Revision A.

Subsequent to the issuance of AD CF-2021-05R1, additional FPI findings showed that cracking of the pilot collective stick could occur at very low flight hours. As a result, Bell published ASB 505-21-20, Revision B to introduce Temporary Revisions (TRs) to the Rotorcraft Flight Manuals (RFMs) to prohibit single pilot operations from the right crew seat.

Since cracking may lead to failure of the pilot collective stick and consequent loss of control of the helicopter, Transport Canada (TC) issued AD revision CF-2021-05R2 to prohibit single pilot operations from the right crew seat, in accordance with ASB 505-21-20 Revision B, and RFM TRs BHT-505-FM-1 (TR-6) and BHT-505-FM-2 (TR-1). AD CF-2021-05R2 was considered an interim action.

Since AD CF-2021-05R2 was issued, the pilot collective stick has been redesigned to address the root cause of the cracking. This AD revision, CF-2021-05R3, mandates incorporation of this redesign as terminating action to the requirements of AD CF-2021-05R2, and limits its applicability to helicopters that have not incorporated this redesign in production, in accordance with ASB 505-21-20 Revision C.

It is also noted that the ferry flight provision of Part IV of this AD is more restrictive and differs from those stated in the Bell ASB 505-21-20.

Corrective Actions:**Part I – Operational Restrictions**

- A. Before further flight, amend the applicable TC approved RFM by incorporating the flight crew limitations as detailed in the TRs listed in Table 1 below, or superseding revisions of the TRs or revisions to the RFM approved by TC.

Table 1

Helicopter Serial Number	RFM Number	RFM TR Number
65011 through 65169, 65171 through 65300	BHT-505-FM-1	TR-6
65170, 65301 through 65347	BHT-505-FM-2	TR-1

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

Part II – Initial Inspection

- A. Before further flight, carry out an initial FPI of the pilot collective stick to detect cracking, in accordance with Part I of the Accomplishment Instructions of Bell ASB 505-21-20, Revision C, dated 11 March 2021.

FPI of the pilot collective stick accomplished in accordance with the Accomplishment Instructions of Bell ASB 505-21-20, Revision A, dated 26 February 2021, or Revision B, dated 3 March 2021, also meets the intent of this paragraph.

- B. If the pilot collective stick is found to be unserviceable, replace the pilot collective stick with a serviceable part before further flight. For the purpose of this AD, a serviceable pilot collective stick is a new pilot collective stick or a pilot collective stick with no crack found during the FPI of Part II Corrective Action A. above.

Part III – Repetitive Inspection

- A. For helicopters not operated exclusively with only a single pilot in command from the left crew seat, repeat the FPI of Part II, Corrective Action A. above at intervals not exceeding 25 hours air time since the last FPI.
- B. If the pilot collective stick is found to be unserviceable, replace the pilot collective stick with a serviceable part before further flight.

Part IV – Ferry Flight Provision

Operators of helicopters equipped with dual flight controls are permitted to carry out ferry flights required to bring the helicopter to a maintenance base to carry out the FPI, provided that the helicopter is operated in accordance with the flight crew limitations of the applicable TR listed in Part I, Corrective Action A above.

Part V – Replacement of pilot collective stick tube

- A. No later than 12 months from the effective date of this AD, accomplish the following:
1. Replace the pilot collective stick tube with a redesigned pilot collective stick tube part number (P/N) M207-20M301-043 in accordance with Part II of the Accomplishment Instructions of Bell ASB 505-21-20, Revision C, dated 11 March 2021. Installation of a pilot collective stick and grip assembly P/N M207-20M478-053 meets the intent of this paragraph;
 2. Amend the applicable TC approved RFM by removing the flight crew limitations as detailed in the RFM TRs listed in Table 1 of Part I of this AD, and advise all flight crews of the changes introduced.
- B. Replace the pilot collective stick tube P/N M207-20M301-043 at or before reaching its Life Limit as defined in Table 1 of the Maintenance Planning Information (MPI) Chapter 4 Airworthiness Limitations Schedule (ALS), BHT-505-MPI Chapter 4 Issue 09, dated 12 March 2021, or later revisions of the ALS approved by Transport Canada.

Accomplishment of Part V of this AD constitutes a terminating action to the requirements of Part I through IV of this AD.

Later revisions of Bell ASB 505-21-20 approved by the Chief, Continuing Airworthiness, Transport Canada, are acceptable for compliance with the requirements of this AD.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Rémy Knoerr
Chief, Continuing Airworthiness
Issued on 19 March 2021

Contact:

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