



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-2020-15

Effective Date:

27 May 2020

ATA:

65

Type Certificate:

H-92

Subject:

Tail Rotor Drive – Failure of Tail Rotor Drive Shaft Coupling Bolted Connections

Replacement:

Supersedes AD CF-2019-34, issued 25 September 2019

Applicability:

Bell Textron Canada Limited (Bell) model 206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1, 206L-3 and 206L-4 helicopters, all serial numbers.

Compliance:

As indicated below, unless already accomplished.

Background:

Bell and Transport Canada Civil Aviation (TCCA) have received reports of cracked or missing part number (P/N) MS21042-series nuts. Conditions that can lead to cracked or missing P/N MS21042 nuts include improper installation torque, loss of self-locking characteristics and hydrogen embrittlement. Several of these occurrences involved the bolted connections at the tail rotor drive shaft (TRDS) disc pack (Thomas) couplings. Failure of any one of these bolted connections will result in loss of tail rotor drive and probable loss of control of the helicopter.

To reduce the probability of nuts at the TRDS Thomas couplings failing to perform their function, Bell has published Alert Service Bulletins (ASBs) 206-19-136 and 206L-19-181. The first ASB is applicable to the 206/206A/206B family of helicopters. The second ASB is applicable to the 206L/206L-1/206L-3/206L-4 family of helicopters. These ASBs provide instructions to replace the P/N MS21042-series nuts with P/N NAS9926-series nuts. The P/N NAS9926 nuts are much less vulnerable to failure from hydrogen embrittlement than P/N MS21042 nuts.

P/N NAS9926-series nuts are a relatively new design. For that reason they are not widely available from distributors of aerospace hardware and are not kept in stock at many maintenance organizations. This AD does not permit de-modification of a helicopter once that helicopter has been modified by installing P/N NAS9926 nuts. For that reason, it is suggested that operators and maintenance organizations that support helicopters affected by this AD, take steps to acquire sufficient inventory of the P/N NAS9926 nuts to satisfy the demand that will arise during ongoing maintenance of the helicopters.

After AD CF-2019-34 was issued, TCCA was made aware that, for helicopters modified in accordance with Federal Aviation Administration (FAA) Supplemental Type Certificate (STC) SH2750NM or TCCA STC SH99-202 (the STCs), it is not possible to completely meet the intent of the AD. This is because on model 206, 206A, 206A-1, 206B, 206B-1 and 206L helicopters and some 206L-1, 206L-3 helicopters, at one Thomas coupling location the P/N NAS9926 nuts cannot be installed because the STC installs a pulley at this location causing insufficient clearance.

On other 206L-1, 206L-3 and all 206L-4 helicopters, the STCs introduce a different problem: there is one

coupling location where the pre-STC configuration uses P/N EWSN26M-5 nuts. These nuts are not vulnerable to the hazard affecting P/N MS21042 nuts; for that reason this coupling location was not identified for nut replacement in Bell ASB 206L-19-181. At this location, the STCs install a pulley and replace the P/N EWSN26M-5 nuts with P/N MS21042L5 nuts. The P/N MS21042L5 nuts must be replaced with an alternate part that is less vulnerable to failure.

The holder of the STCs, Air Comm Corporation (Air Comm), has developed Service Bulletin (SB) 206-092619 in response to these issues. SB 206-092619 provides instructions to replace P/N MS21042L4 nuts at the forward short TRDS coupling location with P/N 90-132L4 nuts on helicopters with model 206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1, and 206L-3 pulley configuration. SB 206-092619 also provides instructions to replace P/N MS21042L5 nuts installed at the forward short TRDS location with P/N 90-132L5 on helicopters with model 206L-4 pulley configuration.

For helicopters with the STCs installed, it is important to note that special tooling ('crow's foot' adapter) and modified fastener torqueing procedures are required because of the space limitations around the fasteners at the forward short TRDS coupling location. The special torqueing procedures are those for Torque Wrench Nonconcentric Type Attachments in Chapter 2 – Torque of the Bell Standard Practices Manual BHT-ALL-SPM.

Bell Service Instruction (SI) BHT-206-SI-2052, which is optional, provides procedures to upgrade the 206L-1 and 206L-3 airframe and systems to allow operations at an internal gross weight of 4450 pounds (2018.5 kg). This SI includes installation of the 206L-4 TRDSs. For that reason, model 206L-1 and 206L-3 helicopters that have incorporated SI BHT-206-SI-2052 and that have one of the STCs installed will have the model 206L-4 pulley configuration.

This AD retains all of the requirements of AD CF-2019-34. It contains a new requirement for helicopters with the STCs installed to comply with Air Comm SB 206-092619.

Corrective Actions:

Group 1 helicopters are models 206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1, 206L-3 and 206L-4 that have not been modified by installing STC SH2750NM or STC SH99-202.

Group 2 helicopters are models 206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1 and 206L-3 that have been modified by installing STC SH2750NM and have not been modified by accomplishing Bell SI BHT-206-SI-2052.

Group 3 helicopters are models 206L-1 and 206L-3 that have been modified by installing STC SH2750NM and have been modified by accomplishing Bell SI BHT-206-SI-2052.

Group 4 helicopters are models 206L-4 that have been modified by installing STC SH2750NM or STC SH99-202.

- A. This corrective action applies to Group 1 helicopters. Within 600 hours air time or 24 months, whichever occurs first, from 9 October 2019, the effective date of AD CF-2019-34, replace the P/N MS21042 nuts of the tail rotor drive (Thomas) couplings with NAS9926 nuts. Bell ASBs 206-19-136 and 206L-19-181, Basic Issue, both dated 27 August 2019, provide approved instructions for replacement of the nuts and related maintenance actions. For Group 1 helicopters that previously complied with Bell ASBs 206-19-136 or 206L-19-181 or AD CF-2019-34, no further action is required.
- B. This corrective action applies to Group 2 helicopters. Within 600 hours air time or 24 months, whichever occurs first, from 9 October 2019, the effective date of AD CF-2019-34:
 1. Replace the P/N MS21042 nuts of the tail rotor drive (Thomas) couplings, except those at the forward short TRDS coupling location, in accordance with Bell ASBs 206-19-136 or 206L-19-181, Basic Issue, both dated 27 August 2019, as applicable.
 2. Replace the P/N MS21042 nuts of the forward short TRDS coupling in accordance with the requirements of Air Comm SB 206-092619, Revision NC, dated 26 September 2019, that are specified for model 206, 206A, 206A-1, 206B, 206B-1, 206L, 206L-1 and 206L-3 helicopters.
 3. For Group 2 helicopters that previously complied with Bell ASBs 206-19-136 or 206L-19-181 or AD CF-2019-34, it is only necessary to accomplish Air Comm SB 206-092619.
- C. This corrective action applies to Group 3 and Group 4 helicopters. Within 600 hours air time or 24 months, whichever occurs first, from 9 October 2019, the effective date of AD CF-2019-34:
 1. Replace the P/N MS21042 nuts of the tail rotor drive (Thomas) couplings, except those at the forward short TRDS coupling location, in accordance with Bell ASB 206L-19-181, Basic Issue, dated 27 August 2019.
 2. Replace the P/N MS21042 nuts of the forward short TRDS coupling in accordance with the

requirements of Air Comm SB 206-092619, Revision NC, dated 26 September 2019, for model 206L-4 helicopters.

3. For Group 3 and 4 helicopters that previously complied with Bell ASB 206L-19-181 or AD CF-2019-34, it is only necessary to accomplish Air Comm SB 206-092619.
- D. From the date that ASB 206-19-136, ASB 206L-19-181 or SB 206-092619, as applicable, is implemented on a helicopter or within 24 months from the effective date of this AD, whichever occurs first, P/N MS21042-series nuts are not eligible for installation at the TRDS disc pack (Thomas) couplings.

Later revisions of the Bell ASBs 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 13 May 2020

Contact:

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