



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-4497; Project Identifier 2016-SW-011-AD; Amendment 39-21450; AD 2021-05-07]

RIN 2120-AA64

Airworthiness Directives; Airbus Helicopters Deutschland GmbH (Type Certificate Previously Held by Eurocopter Deutschland GmbH) Helicopters

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for Airbus Helicopters Deutschland GmbH (Airbus Helicopters) Model BO-105A, BO-105C, BO-105S, MBB-BK 117 A-1, MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, MBB-BK 117 B-2, and MBB-BK 117 C-1 helicopters. This AD was prompted by a report of a loss of electrical ground between the starter-generator and the generator voltage regulator (regulator). This AD requires inspecting the starter-generator electrical ground connection, retrofitting the starter-generator wire harness, and depending on model, revising the existing Rotorcraft Flight Manual (RFM) for your helicopter. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For Eurocopter service information identified in this final rule, contact Airbus Helicopters, 2701 N. Forum Drive, Grand Prairie, TX 75052; telephone 972-641-0000 or 800-232-0323; fax 972-641-3775; or at <https://www.airbus.com/helicopters/services/technical-support.html>. You may view this service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177. For information on the availability of this material at the FAA, call 817-222-5110.

Examining the AD Docket

You may examine the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2015-4497; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The street address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Ronnea L Derby, Aerospace Engineer, Denver ACO Branch, FAA, 26805 East 68th Ave., Room 214, Denver, CO 80249; telephone 303-342-1093; email ronnea.l.derby@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA), which is the Technical Agent for the Member States of the European Union, has issued EASA AD 2015-0098, dated June 2, 2015 (EASA AD 2015-0098), and EASA AD 2015-0220, dated November 9, 2015 (EASA AD 2015-0220) (also referred to as the Mandatory Continuing Airworthiness Information, or the MCAI), to correct an unsafe condition for all Airbus Helicopters Model MBB-BK117 A-1, MBB-BK117 A-3,

MBB-BK117 A-4, MBB-BK117 B-1, MBB-BK117 B-2, and MBB-BK117 C-1 helicopters; and Airbus Helicopters Model BO105 A, BO105 C, BO105 D and BO105 S helicopters with certain part-numbered voltage regulators.

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Airbus Helicopters Model BO-105A, BO-105C, and BO-105S helicopters; and all Airbus Helicopters Model MBB-BK 117 A-1, MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, MBB-BK 117 B-2, and MBB-BK 117 C-1 helicopters. The NPRM published in the *Federal Register* on July 16, 2020 (85 FR 43153). The NPRM was prompted by a report of a loss of electrical ground between the starter-generator and the regulator. The NPRM proposed to require inspecting the starter-generator electrical ground connection, retrofitting the starter-generator wire harness, and depending on model, revising the existing RFM for your helicopter.

The FAA is issuing this AD to address the loss of electrical ground between the starter-generator and the regulator. This condition could result in an overvoltage of electrical power, damage to electronic equipment, and subsequent loss of control of the helicopter.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The FAA received no comments on the NPRM or on the determination of the cost to the public.

Conclusion

The FAA reviewed the relevant data and determined that air safety and the public interest require adopting this final rule as proposed, except for minor editorial changes.

The FAA has determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

Related Service Information under 1 CFR Part 51

Eurocopter (now Airbus Helicopters) issued Alert Service Bulletin ASB-MBB-BK117-90-118, Revision 2, dated May 4, 2009, for certain Model MBB-BK117 helicopters and Alert Service Bulletin ASB BO105-90-103, Revision 4, dated June 21, 2010, for certain Model BO105 helicopters. This service information specifies a visual inspection for damage, corrosion, and cracks and measuring the resistance of the left-hand and right-hand electrical ground connections between each starter-generator and the regulator. If there is damage or suspected damage, or if the resistance is out of tolerance, this service information specifies replacing the wire terminal. This service information also specifies performing the visual inspection and resistance measurement each time the starter generator is removed or the wiring is disconnected until a retrofit ground connection is installed. These documents are distinct since they apply to different models.

Eurocopter also issued Eurocopter Flight Manual BK117 A-3 Temporary Revision 9, Eurocopter Flight Manual BK117 A-4 Temporary Revision 5, Eurocopter Flight Manual BK117 B-1 Temporary Revision 6, Eurocopter Flight Manual BK 117 B-2 Temporary Revision 1, and Eurocopter Flight Manual BK 117 C-1 Temporary Revision 2, all dated September 22, 2006, to provide updated procedures in the event of a generator failure. These documents are distinct since they apply to different models.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Other Related Service Information

Eurocopter (now Airbus Helicopters) issued Service Bulletin SB BO105-90-104, Revision 1, dated June 21, 2010, for certain Model BO105 helicopters. This service information specifies procedures for installing a retrofit ground connection of the starter-generator.

Eurocopter issued Alert Service Bulletin ASB-BO 105-80-118, Revision 1, dated November 29, 1995, and Service Bulletin SB-BO105-80-119, dated November 7, 1994, both for certain Model BO105 helicopters. This service information specifies retrofitting certain helicopters with voltage regulators that incorporate overvoltage protection by modifying the main relay box, modifying the overhead panel, and performing a functional test.

Eurocopter issued Information Notice 2370-I-24, Revision 0, dated November 15, 2011, for certain Model BO105 helicopters to provide notice that a modified starter-generator may only be installed on helicopters that have also been modified. This service information states that combining modified with non-modified can cause overvoltage in the electrical system during the first ground run following engine replacement and subsequent damage to electronic equipment. This service information also recommends retrofitting all helicopters approved to only fly under visual flight rules.

Differences between this AD and the EASA ADs

The EASA ADs require visually inspecting the wire terminals for damage, corrosion, and cracks. This AD requires visually inspecting for a crack, a kink, fraying, looseness, missing material, and corrosion.

The EASA ADs require repeating the visual inspection and resistance measurement each time a starter-generator is removed or the wiring is disconnected from a starter-generator. This AD does not because such a compliance time would be difficult to enforce.

EASA AD 2015-0220 requires additional actions for Model BO-105 helicopters with a serial number up to 0160 than for helicopters with a serial number 0161 and larger. This AD requires the same actions for all Model BO-105 helicopters regardless of serial number.

EASA AD 2015-0220 allows credit for complying with Eurocopter Alert Service Bulletin ASB BO105-90-103, Revision 2 or Revision 3, whereas this AD does not.

Costs of Compliance

The FAA estimates that this AD affects 40 Model BO-105 helicopters and 44 Model MBB-BK 117 helicopters of U.S. Registry. The FAA estimates that operators may incur the following costs in order to comply with this AD using an estimated labor cost of \$85 per work-hour.

Performing a visual inspection and resistance measurement of the electrical ground connection takes about 2 work-hours for an estimated cost of \$170 per helicopter and \$14,280 for the U.S. fleet per inspection and measurement.

Performing the retrofit of the wiring harness takes about 10 work-hours. Required parts for a Model BO-105 helicopter cost \$2,509 for an estimated replacement cost of \$3,359 per helicopter and \$134,360 for the U.S. fleet. Required parts for a Model MBB-BK 117 helicopter cost \$1,730 for an estimated replacement cost of \$2,580 per helicopter and \$113,520 for the U.S. fleet. Revising the existing RFM for Model MBB-BK 117 helicopters takes about 0.5 work-hour, for an estimated cost of \$43 per helicopter and \$1,892 for the U.S. fleet.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2021-05-07 Airbus Helicopters Deutschland GmbH (Type Certificate Previously Held by Eurocopter Deutschland GmbH): Amendment 39-21450; Docket No. FAA-2015-4497; Project Identifier 2016-SW-011-AD.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to the following Airbus Helicopters Deutschland GmbH (Type Certificate previously held by Eurocopter Deutschland GmbH) helicopters, certificated in any category:

(1) Model BO-105A, BO-105C, and BO-105S helicopters with a voltage regulator part number (P/N) 51565-000, 51565-000R, or 51509-002R installed; and

(2) Model MBB-BK 117 A-1, MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, MBB-BK 117 B-2, and MBB-BK 117 C-1 helicopters.

(d) Subject

Joint Aircraft Service Component (JASC) Code: 2497, Electrical Power System Wiring.

(e) Unsafe Condition

This AD was prompted by a report of a loss of electrical ground between the starter-generator and the generator voltage regulator (regulator). The FAA is issuing this AD to address loss of electrical ground between the starter-generator and the regulator. This condition could result in an overvoltage of electrical power, damage to electronic

equipment, and subsequent loss of control of the helicopter.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) Within 50 hours time-in-service (TIS):

(i) Visually inspect the wire terminal of wire P55F16N/P56F16N for Model BO-105A, BO-105C, and BO-105S helicopters and wire 1PA53B20/2PA53B20 for Model MBB-BK 117 A-1, MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, MBB-BK 117 B-2, and MBB-BK 117 C-1 helicopters on Terminal E of each starter-generator for a crack, a kink, fraying, looseness, missing material, and corrosion. If there is a crack, a kink, fraying, looseness, missing material, or any corrosion, before further flight, replace the wire terminal.

(ii) Measure the resistance between each starter-generator and its regulator in accordance with the Accomplishment Instructions, paragraph 2.A.2.3. of Eurocopter Alert Service Bulletin ASB BO105-90-103, Revision 4, dated June 21, 2010, or paragraphs 2.A.2.3. and 2.A.2.5. of Eurocopter Alert Service Bulletin ASB-MBB-BK117-90-118, Revision 2, dated May 4, 2009, as applicable to your model helicopter. If the resistance is more than 500 milliohms, before further flight, replace the wire terminal.

(2) Within 150 hours TIS:

(i) Install a wire harness from each generator voltage regulator as follows.

(A) For Model BO-105A, BO-105C, and BO-105S helicopters: wire harness P/N 105-90081.

(B) For Model MBB-BK 117 A-1, MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, and MBB-BK 117 B-2 helicopters: wire harness P/N 117-901941.

(C) For Model MBB-BK 117 C-1 helicopters: wire harness P/N 117-901961.

(ii) For Model MBB-BK 117 A-3, MBB-BK 117 A-4, MBB-BK 117 B-1, MBB-BK 117 B-2, and MBB-BK 117 C-1 helicopters, revise the existing Rotorcraft Flight Manual (RFM) for your helicopter to include the information in Section 3 Emergency and Malfunction Procedures of the following temporary revisions, as applicable to your helicopter: Eurocopter Flight Manual BK117 A-3 Temporary Revision 9, Eurocopter Flight Manual BK117 A-4 Temporary Revision 5, Eurocopter Flight Manual BK117 B-1 Temporary Revision 6, Eurocopter Flight Manual BK 117 B-2 Temporary Revision 1, or Eurocopter Flight Manual BK 117 C-1 Temporary Revision 2, all dated September 22, 2006. Using a later RFM revision with information identical to that contained in the temporary revision specified for your helicopter is acceptable for compliance with the requirement of this paragraph.

(iii) For Model MBB-BK 117 A-1 helicopters, revise Section 3 Emergency and Malfunction Procedures of the existing RFM for your helicopter to include the information in Figures 1 through 3 to paragraph (g)(2)(iii) of this AD.

CAUTION LIGHT INDICATIONS

GEN I

or

GEN

Conditions/Indications

Affected generator has failed or is disconnected from the power distribution system.

Procedure

1. BUS-TIE switch position – Check

If BUS-TIE in position OFF:

2. Electrical short circuit procedure – Perform (refer to para 3.6.1)

If voltage is out of normal range (> 30 V):

2. Generator overvoltage procedure – Perform (refer to para 3.6.1.a)

If BUS-TIE in position NORM:

2. Affected GENERATOR switch – RESET, then ON

GEN caution light remains on

3. Relevant GENERATOR sw – OFF

4. GEN TRIP switch (to trip generator) – Relevant position (I or II), then release

5. AMM SEL switch – Select normal generator

6. Ammeter and voltmeter – Monitor

NOTE One generator alone will provide sufficient power for normal services.

Figure 1 to Paragraph (g)(2)(iii)

CAUTION LIGHT INDICATIONS

GEN I

and

GEN

Conditions/Indications

Both generators have failed or are disconnected from the power distribution system.

Procedure

1. GENERATOR 1 switch – RESET, then ON
2. Ammeter and voltmeter – Check
3. GENERATOR 1 switch – OFF
4. GENERATOR 2 switch – RESET, then ON
5. Ammeter and voltmeter – Check
6. GENERATOR 2 switch – OFF

If voltage is out of normal range (> 30 V):

7. Generator overvoltage procedure – Perform (refer to para 3.6.1.a)

If voltage is in normal range:

8. Both GENERATOR switches – RESET, then ON

If one GEN caution light remains on:

9. Respective GENERATOR switch – OFF
10. GEN TRIP switch – Respective position (I or II), then release

If both GEN caution light remain on:

11. GEN TRIP switch – Position I and II, then release
12. PWR SELECT switch – OFF

Battery supplies **both flight essential busses**.

NOTE If, in addition, both main busses are necessary, both BUS-TIE switches can be set to NORM and PWR SELECT switch to BAT. Then the battery supplies **both flight essential busses and also both main busses**. In this case battery will be discharged at a high rate.

13. AMM SEL switch – BAT

Figure 2 to Paragraph (g)(2)(iii)

14. Ammeter and voltmeter – Monitor

15. LAND AS SOON AS PRACTICABLE

Residual Battery Endurance					
Continuous load [A]	15	20	25	30	40
Time [min]	60	45	35	30	22
NOTE Calculations are based on an assumed minimum battery capacity of 15 Ah. Times include 10 minutes landing light operation and 10 minutes radio transmission.					
WARNING TOTAL ELECTRICAL FAILURE WILL LIMIT FUEL AVAILABLE TO QUANTITY CONTAINED IN SUPPLY TANKS AT TIME OF FAILURE AND THUS RESIDUAL FLIGHT TIME.					

Figure 2 to Paragraph (g)(2)(iii) (continued)

3.6. SYSTEM EMERGENCY/MALFUNCTION CONDITIONS

3.6.1. Electrical Short Circuit - Generator System I Cutoff

Conditions/Indications

- Short circuit on main bus No. I or on feeder line between generator No. I and main bus No. I or between main bus No. I and battery relay
- Power supply is interrupted to main bus No. I and battery
- Power supply is guaranteed to main bus No. II, flight essential bus No. II and to non-essential bus by generator No. II and to flight – essential bus No. I by battery.
 - **GEN I** caution light on
 - **BAT DISCH** warning light
 - **BUS-TIE** switch OFF
 - Failure of equipment powered by affected busses

Procedure

1. GENERATOR I switch – OFF
2. GEN TRIP switch – Position I, then release
3. AMM SEL switch – BAT
4. Electrical consumption on No. I FLT ESS BUS – Reduce
5. Ammeter and voltmeter – Monitor
6. LAND AS SOON AS PRACTICABLE

NOTE One generator alone will provide sufficient power for normal services.

3.6.1.a Generator overvoltage

Conditions/Indications

- Voltmeter indication > 30 V
- **GEN I** or **GEN II** caution light on

Procedure

1. Generator with high voltage – OFF (not to be used again)
2. Other generator – RESET, then ON
3. Ammeter and voltmeter – Monitor
4. GEN TRIP switch – Position (I or II), then release
5. AMM SEL switch – Select normal generator
6. LAND AS SOON AS PRACTICABLE

NOTE One generator alone will provide sufficient power for normal services

Figure 3 to Paragraph (g)(2)(iii)

(h) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Strategic Policy Rotorcraft Section, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (i)(1) of this AD. Information may be emailed to: 9-Denver-Aircraft-Cert@faa.gov or ronnea.l.derby.@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(i) Related Information

(1) For more information about this AD, contact Ronnea L Derby, Aerospace Engineer, Denver ACO Branch, FAA, 26805 East 68th Ave., Room 214, Denver, CO 80249; telephone 303-342-1093; email ronnea.l.derby.@faa.gov.

(2) The subject of this AD is addressed in European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA) AD 2015-0098, dated June 2, 2015, and EASA AD 2015-0220, dated November 9, 2015. You may view the EASA ADs on the Internet at <https://www.regulations.gov> in Docket No. FAA-2015-4497.

(3) The following documents, which are not incorporated by reference, contain additional information about the subject of this AD: Eurocopter Alert Service Bulletin ASB-BO 105-80-118, Revision 1, dated November 29, 1995; Eurocopter Information Notice 2370-I-24, Revision 0, dated November 15, 2011; Eurocopter Service Bulletin SB-BO105-80-119, dated November 7, 1994; and Eurocopter Service Bulletin SB BO105-90-104, Revision 1, dated June 21, 2010.

(4) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (j)(3) and (4) of this AD.

(j) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(i) Eurocopter Alert Service Bulletin ASB-MBB-BK117-90-118, Revision 2, dated May 4, 2009.

(ii) Eurocopter Alert Service Bulletin ASB BO105-90-103, Revision 4, dated June 21, 2010.

(iii) Eurocopter Flight Manual BK117 A-3 Temporary Revision 9, dated September 22, 2006.

(iv) Eurocopter Flight Manual BK117 A-4 Temporary Revision 5, dated September 22, 2006.

(v) Eurocopter Flight Manual BK117 B-1 Temporary Revision 6, dated September 22, 2006.

(vi) Eurocopter Flight Manual BK 117 B-2 Temporary Revision 1, dated September 22, 2006.

(vii) Eurocopter Flight Manual BK 117 C-1 Temporary Revision 2, dated September 22, 2006.

(3) For Eurocopter service information identified in this AD, contact Airbus Helicopters, 2701 N. Forum Drive, Grand Prairie, TX 75052; telephone 972-641-0000 or 800-232-0323; fax 972-641-3775; or at <https://www.airbus.com/helicopters/services/technical-support.html>.

(4) You may view this service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177. For information on the availability of this material at the FAA, call 817-222-5110.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fedreg.legal@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on February 19, 2021.

Lance T. Gant,
Director, Compliance & Airworthiness Division, Aircraft Certification Service.
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