

[Federal Register Volume 86, Number 36 (Thursday, February 25, 2021)]

[Rules and Regulations]

[Pages 11404-11407]

From the Federal Register Online via the Government Publishing Office [www.gpo.gov]

[FR Doc No: 2021-03658]

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2020-0503; Product Identifier 2018-SW-006-AD; Amendment 39-21386; AD 2021-02-03]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Leonardo S.p.a. Helicopters**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for certain Leonardo S.p.a. (Leonardo) Model AW189 helicopters. This AD requires various repetitive inspections of the main rotor (MR) damper. This AD was prompted by reports of in-service MR damper failures and the development of an improved MR damper. This condition, if not corrected, could lead to loss of the lead-lag damping function of the MR blade, possibly resulting in damage to adjacent critical rotor components and subsequent loss control of the helicopter. The actions of this AD are intended to address the unsafe condition on these products.

**DATES:** This AD is effective April 1, 2021.

The Director of the Federal Register approved the incorporation by reference of certain documents listed in this AD as of April 1, 2021.

**ADDRESSES:** For service information identified in this final rule contact Leonardo S.p.A. Helicopters, Emanuele Bufano, Head of Airworthiness, Viale G.Agusta 520, 21017 C.Costa di Samarate (Va) Italy; telephone +39-0331-225074; fax +39-0331-229046; or at <https://www.leonardocompany.com/en/home>. You may view the referenced service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177. It is also available on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0503.

#### **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-2020-0503; 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 AD, the

European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA) AD, any service information that is incorporated by reference, 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:** Matt Fuller, AD Program Manager, Operational Safety Branch, Airworthiness Products Section, General Aviation & Rotorcraft Unit, FAA, 10101 Hillwood Pkwy., Fort Worth, TX 76177; telephone 817-222-5110; email matthew.fuller@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to Leonardo Model AW189 helicopters with MR damper part number (P/N) 4F6220V00251 installed. The NPRM published in the Federal Register on May 20, 2020 (85 FR 30664). The NPRM proposed to require reducing the installation torque of the nuts on the bolts attaching the MR damper to the MR hub. The NPRM also proposed to require, at specified intervals, replacing the affected MR damper; dye penetrant or eddy current inspecting the rod end and body end of each MR damper for a crack, visually inspecting the rod end and body end of each MR damper for a crack, and replacing any cracked MR damper. For certain helicopters, the NPRM also proposed to require inspecting each rod end and body end bearing for rotation, and replacing the rod end or MR damper as applicable if there is any rotation; inspecting the lag damper broached ring nut for damage, correct engagement, and alignment and removing the rod end and broached ring nut from service if any of those conditions exist. For all helicopters, the NPRM proposed to require, at specified intervals, inspecting the bearing friction torque of each MR damper body end and rod end, and replacing the MR damper if the torque value exceeds 30.0 Nm (265.5 lb in); inspecting the MR damper anti-rotation block for wear and replacing the anti-rotation block if there is wear beyond acceptable limits; and replacing each special washer P/N 3G6220A05051 with special washer P/N 3G6220A05052. For certain MR dampers, the NPRM proposed to require inspecting the broached ring for damage and alignment, removing the broached ring from service if there is damage, and replacing the broached ring if the rod end and broached ring cannot be aligned. Finally, the NPRM proposed to require inspecting certain serial-numbered MR dampers for correct torque of the broached ring prior to installation on any helicopter. The proposed requirements were intended to detect a crack in an MR damper, which if not detected and corrected, could lead to loss of the lead-lag damping function of the MR blade, resulting in damage of the MR damper, detachment of the MR damper in-flight, and subsequent loss of control of the helicopter.

The NRPM was prompted by EASA AD No. 2016-0145R1, dated January 17, 2018 (EASA AD 2016-0145R1), issued by EASA, which is the Technical Agent for the Member States of the European Union, to correct an unsafe condition for Leonardo Model AW189 helicopters with MR damper P/N 4F6220V00251 installed. EASA advises that a MR damper failed, which resulted in complete seizure of the body end lug and an in-flight disconnection of the damper. EASA states that a combination of factors may have contributed to the MR damper disconnection, and that this condition could result in loss of the lead-lag damping function of the MR blade, damage to adjacent critical rotor components, and subsequent reduced control of the helicopter. The contributing factors include cracks, slippage marks, damaged broach ring teeth, and loss of torque.

According to EASA, the AW189 MR damper is a similar design to the MR dampers installed on Model AW139 helicopters, where multiple MR damper failures have been reported involving the body end lug, the eye end lug, and the rod end. To correct this condition, EASA issued a series of superseded and revised ADs to require repetitive inspections of certain MR dampers, and similar corrective actions as those for Model AW139 helicopters. EASA AD 2016-0145R1 requires various one-time and repetitive inspections of the MR damper, a torque check of the body end, and replacing

any MR damper with a crack or that fails the torque check. EASA AD 2016-0145R1 also allows installation of a new MR damper, P/N 8G6220V00151, as an optional terminating action for the repetitive inspections.

## **Comments**

The FAA gave the public the opportunity to participate in developing this final rule, but the FAA did not receive any comments on the NPRM or on the determination of the cost to the public.

## **FAA's Determination**

These helicopters have been approved by EASA and are approved for operation in the United States. Pursuant to the FAA's bilateral agreement with the European Union, EASA has notified the FAA of the unsafe condition described in its AD. The FAA is issuing this AD after evaluating all of the information provided by EASA and determining the unsafe condition exists and is likely to exist or develop on other helicopters of the same type design and that air safety and the public interest require adopting these AD requirements as proposed.

## **Differences Between This AD and the EASA AD**

The EASA AD requires contacting the manufacturer under certain conditions, while this AD does not.

## **Related Service Information Under 1 CFR Part 51**

The FAA reviewed Finmeccanica Bollettino Tecnico No. 189-080, Revision A, dated July 15, 2016, which contains procedures for visual and dye penetrant inspections of the MR damper for cracks and for verifying the torque of the damper body ends.

The FAA also reviewed Leonardo Helicopters Alert Service Bulletin No. 189-102, Revision A, dated December 21, 2017, which contains procedures for installing an MR damper with reduced torque values and specifies replacing MR damper P/N 4F6220V00251 with new MR damper P/N 8G6220V00151.

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**

The FAA reviewed Finmeccanica Bollettino Tecnico No. 189-069, dated February 12, 2016, which contains procedures for installing a special washer on the MR damper rod end, modifying the installation torque of the MR damper, and inspecting the rod end bearings.

## **Costs of Compliance**

The FAA estimates that this AD affects 3 helicopters of U.S. Registry. The FAA estimates that operators may incur the following costs in order to comply with this AD. Labor costs are estimated at \$85 per work-hour.

Adjusting the tightening torque takes about 10 work-hours, for an estimated cost of \$850 per helicopter and \$2,550 for the U.S. fleet.

Replacing an MR damper takes about 2 work-hours, and parts cost about \$18,000, for an estimated cost of \$18,170 per MR damper.

Performing a dye penetrant or eddy current inspection of the MR damper takes about 8 work-hours, for an estimated cost of \$680 per helicopter and \$2,040 for the U.S. fleet.

Visually inspecting the rod ends and body ends takes about 0.5 hour, for an estimated cost of \$43 per helicopter and \$129 for the U.S. fleet, per inspection cycle.

Inspecting the rod ends and body ends for bearing rotation takes about 0.5 hour, for an estimated cost of \$43 per helicopter and \$129 for the U.S. fleet, per inspection cycle.

Inspecting the broached ring nut takes about 0.5 hour, for an estimated cost of \$43 per helicopter and \$129 for the U.S. fleet, per inspection cycle.

Inspecting for bearing friction takes about 2 hours, for an estimated cost of \$170 per helicopter and \$510 for the U.S fleet, per inspection cycle.

Inspecting the broached ring teeth for proper alignment and applying torque takes about 8 work-hours, for an estimated cost of \$680 per helicopter and \$2,040 for the U.S fleet.

Replacing a rod end takes about 3 work-hours and parts cost about \$500, for an estimated cost of \$755 per rod end.

Replacing a broached ring takes about 3 work-hours and parts cost about \$100, for an estimated cost of \$355 per broached ring.

Replacing a broached ring nut takes about 3 work-hours and parts cost about \$125, for an estimated cost of \$380 per broached ring nut.

Replacing an anti-rotation block takes about 3 work-hours and parts cost about \$50, for an estimated cost of \$305 per anti-rotation block.

### **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 helicopters 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:



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**2021-02-03 Leonardo S.p.a:** Amendment 39-21386; Docket No. FAA-2020-0503; Product Identifier 2018-SW-006-AD.

**(a) Applicability**

This airworthiness directive (AD) applies to Leonardo S.p.a. Model AW189 helicopters, certificated in any category, with a main rotor (MR) damper part number (P/N) 4F6220V00251 installed.

**(b) Unsafe Condition**

This AD defines the unsafe condition as a crack in an MR damper, which if not detected and corrected, could lead to loss of the lead-lag damping function of the MR blade, resulting in damage of the MR damper, detachment of the MR damper in-flight, and subsequent loss of control of the helicopter.

**(c) Effective Date**

This AD becomes effective April 1, 2021.

**(d) Compliance**

You are responsible for performing each action required by this AD within the specified compliance time unless it has already been accomplished prior to that time.

**(e) Required Actions**

(1) Within 10 hours time-in-service (TIS), reduce the torque of the nut on the bolt attaching each MR damper to the MR hub by following paragraphs 4 through 7 of the Accomplishment Instructions, Part I, of Leonardo Helicopters Alert Service Bulletin No. 189-102, Revision A, dated December 21, 2017 (ASB 189-102).

(2) Within 30 hours TIS or before the MR damper body end (body end) accumulates 500 hours TIS, whichever occurs later, and thereafter at intervals not to exceed 500 hours TIS, replace the MR damper.

(3) Within 30 hours TIS, before the MR damper accumulates 300 hours TIS, or within 300 hours TIS since the last overhaul, whichever occurs later, dye penetrant inspect using a 5X power magnifying glass or eddy current inspect each MR damper rod end (rod end) and body end for a crack in the areas depicted in Figure 2 of Finmeccanica Bollettino Tecnico No. 189-080, Revision A, dated July 15, 2016 (BT 189-080).

(i) If there is a crack on the body end, before further flight, replace the MR damper.

(ii) If there is a crack on the rod end, before further flight, replace the rod end and, within 300 hours TIS, dye penetrant or eddy current inspect the rod end for a crack as described in paragraph (e)(3) of this AD.

(iii) If there are no cracks, before further flight, mark the rod end and body end with a dot of black polyurethane paint as shown in Figure 13 of BT 189-080.

(iv) Thereafter, before the first flight of each day, using a mirror and a magnifying glass visually inspect each rod end and body end for a crack in the areas shown in Figure 14 of BT 189-080. If there is a crack in the rod end, before further flight, replace the rod end. If there is a crack on the body end, before further flight, replace the MR damper.

(4) Within the compliance times listed in paragraphs (e)(4)(i) and (ii) of this AD, inspect each rod end bearing and body end for bearing rotation in the damper seat. An example of rotation (misaligned slippage marks) is shown in Figure 4 of BT 189-080. If there is any bearing rotation in the rod end, before further flight, replace the rod end. If there is any bearing rotation in the body end, before further flight, replace the MR damper.

(i) For MR dampers that have accumulated less than 300 hours TIS since new or since the last overhaul, within 30 hours TIS and thereafter at intervals not to exceed 10 hours TIS.

(ii) For MR dampers that have accumulated 300 or more hours TIS since new or since the last overhaul, within 5 hours TIS and thereafter before the first flight of each day.

(5) For helicopters with an MR damper with a serial number (S/N) MCR0001 through MCR0154 and MCR0174 through MCR0195, within 30 hours TIS and thereafter at intervals not to exceed 20 hours TIS until the MR damper has accumulated 600 hours TIS, visually inspect each MR damper broached ring nut for broken teeth, proper engagement, and alignment as depicted in Figure 5 and shown in Figures 6, 7, and 8 of BT 189-080. If there is a broken tooth, improper engagement, or misalignment of the broached ring nut, before further flight, remove from service the rod end and broached ring nut.

(6) Within 50 hours TIS and thereafter at intervals not to exceed 100 hours TIS:

(i) Rotate the body end around the damper axis to put it near the middle position and determine the bearing friction torque value of the body end, using as a reference Figure 11 of BT 189-080.

Note 1 to Paragraph (e)(6)(i): Applying too much force while rotating the body end around the damper axis may cause damage.

(A) If the torque value of the body end is more than 30.0 Nm (265.5 in lb), before further flight, replace the MR damper.

(B) If the torque value of the body end is 30.0 Nm (265.5 in lb) or less, determine the bearing friction torque value of each rod end, using as a reference Figure 11 of BT 189-080. If the torque value of the rod end is more than 30.0 Nm (265.5 in lb), before further flight, replace the rod end.

(ii) Inspect each MR damper anti-rotation block for wear by following paragraphs 4.3 through 4.3.6 of the Compliance Instructions, Part VI, of BT 189-080. If there is wear, before further flight, replace the MR damper anti-rotation block.

(7) Within 50 hours TIS:

(i) On each MR damper, replace special washer P/N 3G6220A05051 with special washer P/N 3G6220A05052.

(ii) For helicopters with an MR damper with a S/N MCR0001 through MCR0041, MCR0043, MCR0045 through MCR0151, MCR0153 through MCR0157, MCR0159 through MCR 0179, and MCR0185 through MCR0370; and for MR dampers with a rod end P/N M006-01H004-045 or P/N M006-01H004-053 installed, do the following:

(A) Inspect each broached ring for wear, bent teeth, missing teeth, and stripped threads. Pay particular attention to the four pins that engage the piston grooves. If there is any wear or damage to the broached ring, before further flight, remove from service the broached ring. An example of an acceptable broached ring is shown in Figure 4, Annex A, of BT 189-080.

(B) Align each rod end and broached ring by applying a torque of 60 Nm (531 in lb) to 80 Nm (708 in lb). If the rod end and broached ring cannot be aligned, before further flight, replace the broached ring.

(8) Except for MR dampers with a S/N MCR0042, MCR0044, MCR0152, MCR0158, and MCR0180 through MCR0184, do not install an MR damper P/N 4F6220V00251 on any helicopter unless the MR damper has passed the requirements in paragraph (e)(7)(ii) of this AD.

**(f) Credit For Previous Actions**

(1) Actions accomplished before the effective date of this AD in accordance with the Compliance Instructions, Part II, of Finmeccanica Bollettino Tecnico No. 189-069, dated February 12, 2016 (BT 189-069), are considered acceptable for compliance with the corresponding actions in paragraph (e)(7)(i) of this AD.

(2) Actions accomplished before the effective date of this AD in accordance with the Compliance Instructions, Part III, of BT 189-069, are considered acceptable for compliance with the corresponding actions in paragraph (e)(7)(ii) of this AD.

**(g) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Rotorcraft Standards Branch, FAA, may approve AMOCs for this AD. Send your proposal to: Matt Fuller, AD Program Manager, Operational Safety Branch, Airworthiness Products Section, General Aviation & Rotorcraft Unit, FAA, 10101 Hillwood Pkwy., Fort Worth, TX 76177; telephone 817-222-5110; email 9-ASW-FTW-AMOC-Requests@faa.gov.

(2) For operations conducted under a 14 CFR part 119 operating certificate or under 14 CFR part 91, subpart K, the FAA suggests that you notify your principal inspector, or lacking a principal inspector, the manager of the local flight standards district office or certificate holding district office before operating any aircraft complying with this AD through an AMOC.

**(h) Additional Information**

(1) Finmeccanica Bollettino Tecnico No. 189-069, dated February 12, 2016, which is not incorporated by reference, contains additional information about the subject of this AD. For service information identified in this AD, contact Leonardo S.p.A. Helicopters, Emanuele Bufano, Head of Airworthiness, Viale G. Agusta 520, 21017 C. Costa di Samarate (Va) Italy; telephone +39-0331-225074; fax +39-0331-229046; or at <https://www.leonardocompany.com/en/home>. You may view the referenced service information at the FAA, Office of the Regional Counsel, Southwest Region, 10101 Hillwood Pkwy., Room 6N-321, Fort Worth, TX 76177.

(2) The subject of this AD is addressed in European Aviation Safety Agency (now European Union Aviation Safety Agency) (EASA) No. 2016-0145R1, dated January 17, 2018. You may view the EASA AD on the internet at <https://www.regulations.gov> in Docket No. FAA-2020-0503.

**(i) Subject**

Joint Aircraft Service Component (JASC) Code: 6200, Main Rotor System.

**(j) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference 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 the AD specifies otherwise.

(i) Finmeccanica Bollettino Tecnico No. 189-080, Revision A, dated July 15, 2016.

(ii) Leonardo Helicopters Alert Service Bulletin No. 189-102, Revision A, dated December 21, 2017.

(3) For service information identified in this AD, contact Leonardo S.p.a. Helicopters, Emanuele Bufano, Head of Airworthiness, Viale G. Agusta 520, 21017 C. Costa di Samarate (Va) Italy; telephone +39-0331-225074; fax +39-0331-229046; or at <https://www.leonardocompany.com/en/home>.

(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](mailto:fedreg.legal@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on January 6, 2021.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2021-03658 Filed 2-24-21; 8:45 am]