



Airworthiness Directive

AD No.: 2018-0112

Issued: 22 May 2018

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:

LEONARDO S.p.A.

Type/Model designation(s):

AB139 and AW139 helicopters

Effective Date: 05 June 2018

TCDS Number(s): EASA.R.006

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2017-0160 dated 28 August 2017.

ATA 62 – Main Rotor – Main Rotor Damper – Inspection / Replacement

Manufacturer(s):

Leonardo S.p.A. Helicopters (formerly Finmeccanica S.p.A., Helicopter Division (FHD), AgustaWestland S.p.A., Agusta S.p.A.), AgustaWestland Philadelphia Corporation (formerly Agusta Aerospace Corporation)

Applicability:

AB139 and AW139 helicopters, all serial numbers (s/n), except s/n 31004, s/n 31007 and s/n 41237.

Definitions:

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

Affected MR damper: Main Rotor (MR) dampers, P/N 3G6220V01351; P/N 3G6220V01352; and P/N 3G6220V01353.

Groups: Group 1 helicopters are those that have an affected MR damper. Group 2 helicopters are those that do not have an affected MR damper installed.

ALF inspection: After the last flight (ALF) of the day.

Reason:

In-service failures were reported of affected MR dampers on AW139 helicopters. In some cases, these failures occurred at the eye end and body lugs with disconnection of the damper in flight. The



results of preliminary investigations determined that a combination of several factors could lead to disconnection of an MR damper.

This condition, if not detected and corrected, could lead to loss of the lead-lag damping function of an MR blade, possibly resulting in damage to adjacent critical MR components and consequent reduced control of the helicopter.

To initially address this potential unsafe condition, AgustaWestland published Mandatory Bollettino Tecnico (BT) 139-410 and later FHD published BT 139-446, providing interim inspection instructions. Further investigations highlighted the need for a one-time non-destructive inspection (NDI) followed by repetitive detailed visual inspections to detect cracks on the MR damper rod end and body end. Consequently, FHD issued Mandatory BT 139-450, incorporating the inspections contained in the previous two BTs and, in addition, providing instructions for a one-time dye penetrant inspection for cracks of limited areas of the MR damper (rod end and body end) and repetitive detailed visual inspections for cracks in the same areas. Consequently, EASA issued AD 2016-0087 requiring various one-time and repetitive inspections of the MR damper and a torque check and, depending on findings, accomplishment of applicable corrective action(s).

After that AD was issued, additional cases of in-service MR damper body end disconnections were reported. New analyses prompted FHD to issue BT 139-450 Revision A, with reduced compliance times, and BT 139-452 with additional actions. Consequently, EASA issued AD 2016-0140, retaining the requirements of EASA AD 2016-0087, which was superseded, to require accomplishment of additional actions as specified in BT 139-452 and in revised BT 139-450. That AD also introduced an eddy current inspection as an alternative action to the dye penetrant inspection and detailed visual inspection.

After that AD was issued, a new MR Damper, P/N 3G6220V01353, was certified and introduced into service. As a precautionary measure, pending completion of additional tests, it was determined that this new MR damper also needed to be inspected. Consequently, EASA issued AD 2017-0160, retaining the requirements of EASA AD 2016-0140, which was superseded, and extended the Applicability to helicopters equipped with MR Damper P/N 3G6220V01353.

Since that AD was issued, the results of additional tests performed on MR damper P/N 3G6220V01353 determined that this MR damper P/N does not need to be subject to the dye-penetrant inspection and detailed visual inspections for cracks required by EASA AD 2017-160, provided it is removed from service before exceeding its safe retirement life, which is now published in Chapter 4 Airworthiness Limitation Section (ALS) Issue 9. This revised ALS will be subject to a new EASA AD. It was also determined all affected MR dampers P/N 3G6220V01351 and P/N 3G6220V01352 must be replaced with MR dampers P/N 3G6220V01353.

For the reasons described above, this AD partially retains the requirements of EASA AD 2017-0160, which is superseded, removes the MR damper P/N 3G6220V01353 from the inspection requirements and requires modification of Group 1 helicopters by replacement of each affected MR damper P/N 3G6220V01351 and P/N 3G6220V01352 with an MR damper P/N 3G6220V01353, which is terminating action for the repetitive inspections as required by this AD.



Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously:

Inspection(s) / Torque Check:**Part A: For Group 1 helicopters:**

- (1) Within the compliance time specified in Table 1 of this AD, as applicable, reduce the installation torque of the bolts fixing each affected MR damper to the MR hub in accordance with the instructions of Part I of FHD BT 139-452.

Table 1 – Torque Reduction

MR Damper P/N	Compliance Time
3G6220V01351 and 3G6220V01352	Within 10 flight hours (FH), or during the next ALF inspection, whichever occurs later after 28 July 2016 [the effective date of EASA AD 2016-0140]
3G6220V01353	Within 10 FH after 11 September 2017 [the effective date of EASA AD 2017-0160]

Part B: For Group 1 helicopters, except affected MR dampers P/N 3G6220V01353:

- (2) Within the compliance times defined in Table 2 of this AD, as applicable, depending on the FH accumulated by each affected MR damper, accomplish a one-time dye penetrant inspection of the rod end and body end of each affected MR damper in accordance with the instructions of Part I of FHD BT 139-450.

Table 2 – Group 1 helicopters – MR Dampers One-time Inspection

FH accumulated (see Note 1 of this AD)	Compliance Time
Less than 300	Before exceeding 300 FH, or within 30 FH after 10 May 2016 [the effective date of EASA AD 2016-0087], whichever occurs later
300 or more	Within 30 FH after 10 May 2016 [the effective date of EASA AD 2016-0087], or at the first MR damper removal, whichever occurs first

Note 1: Unless specified otherwise, the number of FH specified in this AD are those accumulated by each affected MR damper (or rod end or body end, as applicable) since new (first installation on a helicopter), or since overhaul.

- (3) Following the inspection as required by paragraph (2) of this AD, each time a replacement MR damper rod end is installed, P/N M006-01H004-041, or P/N M006-01H004-045, or P/N M006-01H004-053, which is not marked as per FHD BT 139-450, within 300 FH after installation of that rod end, accomplish a one-time dye penetrant inspection of that rod end in accordance with the instructions of Part II of FHD BT 139-450.



Part B (continued)

- (4) Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140], for rod ends that have accumulated 300 FH or more (see Note 1 of this AD) and, thereafter, during each ALF inspection, or before the first flight of each day, accomplish a detailed visual inspection (DVI) of the rod end of each affected MR damper in accordance with the instructions of Part III of FHD BT 139-450.
- (5) Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140], for body ends that have accumulated 300 FH or more, but not more than 1 200 FH (see Note 1 of this AD), accomplish a DVI of the body end of each affected MR damper in accordance with the instructions of Part III of FHD BT 139-450.
- (6) An eddy current inspection (ECI) of an affected MR damper in accordance with the instructions of Annex B of FHD BT 139-450 is an acceptable alternative method to an inspection as required by paragraph (2) or (3) of this AD, as applicable, for that affected MR damper. An ECI of the rod end or body end of an affected MR damper in accordance with the instructions of Annex B of BT 139-450, or Annex A of BT 139-452, as applicable, is an acceptable alternative method to an inspection as required by paragraph (4) or (5) of this AD, as applicable, for that affected MR damper.
- (7) Within the compliance times (threshold and intervals) as defined in Table 3 and Table 4 of this AD, as applicable, depending on the FH accumulated by each affected MR damper rod end or each affected MR damper body end (see Note 1 of this AD), inspect the rod end and/or body end bearings of each affected MR damper to detect rotation, in accordance with the instructions of Part IV of FHD BT 139-450.

Table 3 – Rod End Bearing Repetitive Inspections

FH accumulated by rod end	Threshold	Interval
Less than 300	Within 30 FH after 10 May 2016 [the effective date of EASA AD 2016-0087]	Not to exceed 10 FH
300 or more	Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140]	During each ALF inspection, or before the first flight of each day

Table 4 – Body End Bearing Repetitive Inspections

FH accumulated by body end	Threshold	Interval
Less than 300	Within 30 FH after 10 May 2016 [the effective date of AD 2016-0087]	Not to exceed 10 FH
From 300 up to 1 200	Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140]	During each ALF inspection, or before the first flight of each day



Part B (continued)

- (8) For helicopters equipped with an affected MR damper, having an s/n specified in Part V of FHD BT 139-450: Within 30 FH after 10 May 2016 [the effective date of EASA AD 2016-0087] and, thereafter, at intervals not to exceed 20 FH, visually inspect the rod end broached ring nut of each affected MR damper, in accordance with the instructions of Part V of FHD BT 139-450. These repetitive inspections can be terminated when an affected MR damper accumulates 600 FH since first installation on a helicopter.
- (9) Within 50 FH after 10 May 2016 [the effective date of EASA AD 2016-0087], or within 100 FH after the latest inspection in accordance with the instructions of FHD BT 139-446 Part I accomplished before 10 May 2016 [the effective date of EASA AD 2016-0087], as applicable, and, thereafter, at intervals not to exceed 100 FH, accomplish a bearing friction inspection of the body end and rod end bearings of each affected MR damper, and a detailed inspection of the anti-rotation block of each affected MR damper, in accordance with the instructions of Part VI of FHD BT 139-450.
- (10) For helicopters equipped with an affected MR damper, having an s/n specified in Part VII of FHD BT 139-450: Within 50 FH after 10 May 2016 [the effective date of EASA AD 2016-0087], accomplish a visual inspection of each affected MR damper rod end installation and a torque check of the MR damper broached ring nut, in accordance with the instructions of Part VII of FHD BT 139-450.

Corrective Action(s):

- (11) If, during the inspection as required by paragraph (10) of this AD, any special washer P/N 3G6220A05051 is found installed, before next flight, replace that special washer P/N 3G6220A05051 with a new washer P/N 3G6220A05052 in accordance with the instructions of Part VII of FHD BT 139-450.
- (12) If, during any inspection as required by paragraph (2), (3), (4), (5) or (8) of this AD, or as specified in paragraph (6) of this AD, as applicable, any crack or other damage is detected, before next flight, contact Leonardo in accordance with the instructions of FHD BT 139-450 and BT 139-452, as applicable, and, if the discrepancy is confirmed, replace the affected MR damper with a serviceable part.
- (13) If, during any inspection or torque check as required by paragraph (7), (9) or (10) of this AD, as applicable, any discrepancy is detected as defined in FHD BT 139-450 or FHD BT 139-452, as applicable, before next flight, accomplish the applicable corrective action(s) as specified in, and in accordance with, the instructions of FHD BT 139-450 or FHD BT 139-452, as applicable.

Replacement:

- (14) Before exceeding 1 200 FH accumulated by an MR damper body end P/N M006-01H002-041 or P/N M006-01H002-047 since new (see Note 1 of this AD), or within 30 FH after the effective date of this AD, whichever occurs later, replace the affected MR damper with an MR damper P/N 3G6220V01353 in accordance with the instructions of Part II of Leonardo SB 139-452 Revision B.



Part B (continued)**Terminating Action:**

- (15) Accomplishment of corrective action(s) on a helicopter, as required by paragraph (11), (12) or (13) of this AD, as applicable, does not constitute terminating action for any repetitive action as required by this AD for that helicopter.
- (16) Modification of a helicopter by replacement of each affected MR damper P/N 3G6220V01351 or P/N 3G6220V01352 with a MR damper P/N 3G6220V01353 in accordance with the instructions of Part II of Leonardo SB 139-452 Revision B, constitutes terminating actions for all repetitive actions required by this AD for that helicopter.

Part C: For Group 1 and Group 2 helicopters:**Parts installation:**

- (17) Do not install an affected MR damper P/N 3G6220V01351 or P/N 3G6220V01352 on any helicopter, as required by paragraph (17.1) or (17.2) of this AD, as applicable.
- (17.1) For Group 1 helicopters: After modification of a helicopter, as specified in paragraph (16) of this AD.
- (17.2) For Group 2 helicopters: From the effective date of this AD.
- (18) From the effective date of this AD, installation of an affected MR damper P/N 3G6220V01353 on a helicopter is allowed, provided that it is installed on the MR hub of the helicopter using the correct torque values, as specified in Leonardo SB 139-452 (any revision).

Ref. Publications:

FHD BT 139-410 Revision A dated 12 February 2016.

FHD BT 139-446 original issue dated 12 February 2016.

FHD BT 139-450 original issue dated 20 April 2016, or Revision A dated 27 June 2016, or Revision B dated 25 November 2016, or Leonardo SB 139-450 Revision C dated 10 April 2018.

FHD BT 139-452 original issue dated 27 June 2016, or Revision A dated 05 December 2016, or Leonardo SB 139-452 Revision B dated 10 April 2018.

The use of later approved revisions of the above-mentioned documents is acceptable for compliance with the requirements of this AD.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication.



3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. For any question concerning the technical content of the requirements in this AD, please contact: Leonardo S.p.A. Helicopters, E-mail: CSE.AW139.AW@leonardocompany.com.

