



## Airworthiness Directive

**AD No.:** 2017-0160

**Issued:** 28 August 2017

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:** 11 September 2017

**TCDS Number(s):** EASA.R.006

**Foreign AD:** Not applicable

**Supersedure:** This AD supersedes EASA AD 2016-0140 dated 14 July 2016.

## 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; if equipped with Main Rotor (MR) damper Part Number (P/N) 3G6220V01351, P/N 3G6220V01352, or P/N 3G6220V01353.

### Reason:

In-service failures were reported of MR dampers P/N 3G6220V01351 and P/N 3G6220V01352 on AW139 helicopters. In some cases, these failures occurred at the eye end and body lugs with disconnection in flight of the damper. The results of preliminary investigations determined that a combination of several factors could lead to disconnection of a MR damper.

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

To initially address this issue, AgustaWestland published Mandatory Bollettino Tecnico (BT) 139-410 and later FHD published BT 139-446, providing interim inspection instructions.



Since these BTs were issued, 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, superseding Mandatory BT 139-410 and Mandatory BT 139-446, incorporating the inspections contained in these two BTs and, in addition, providing instructions for a one-time dye penetrant inspection for cracks of a limited area of MR damper (rod end and body end) and repetitive detailed visual inspections for cracks in the same area. 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 revealed the need of introducing additional actions and FHD issued BT 139-450 Revision A, with reduced compliance times, and BT 139-452 with additional actions. Consequently, EASA issued AD 2016-0140 (which superseded EASA AD 2016-0087) to require accomplishment of additional actions as specified in BT 139-452 and revised BT 139-450. In addition, EASA AD 2016-0140 introduced an eddy current inspection as an alternative action to the dye penetrant inspection and DVI as previously required by AD 2016-0087. EASA AD 2016-140 also corrected typographical errors related to the P/Ns of the special washers, which were wrongly specified in EASA AD 2016-0087.

Since EASA AD 2016-0140 was issued, a new MR Damper P/N 3G6220V01353 was certified and introduced into service. It has been determined that this new MR damper also needs to be inspected.

For the reason described above, this AD retains the requirements of EASA AD 2016-0140, which is superseded, and extends the Applicability to helicopters equipped with MR Damper P/N 3G6220V01353.

This AD is still considered an interim action. If, as a result of the on-going investigation, a terminating action is later identified, further AD action may follow.

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

Required as indicated, unless accomplished previously:

Note 1: For the purpose of this AD, Group 1 MR dampers have P/N 3G6220V01351 or P/N 3G6220V01352. Group 2 MR dampers have P/N 3G6220V01353. Group 1 and Group 2 MR dampers are also collectively referred to as 'affected damper' in this AD.

#### **Inspection(s) / Torque Check:**

- (1) For Group 1 MR dampers (see Note 1 of this AD), within 10 flight hours (FH), or after the last flight of the day, whichever occurs later after 28 July 2016 [the effective date of EASA AD 2016-0140] or, for Group 2 MR dampers, within 10 FH after the effective date of this AD, as applicable, reduce the installation torque of the bolts fixing the MR damper to the MR hub in accordance with the instructions of Part I of FHD BT 139-452.



- (2) Within the compliance times defined in Table 1 or Table 2 of this AD, as applicable, depending on the FH accumulated by each affected MR damper, accomplish a one-time dye penetrant inspection (see Note 3 of this AD) of the rod end and body end of each MR damper in accordance with the instructions of Part I of FHD BT 139-450.

Table 1 – Group 1 MR Dampers One-time Inspection

<b>FH accumulated</b> (see Note 2 of this AD)	<b>Compliance Time</b>
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

Table 2 – Group 2 MR Dampers One-time Inspection

<b>FH accumulated</b> (see Note 2 of this AD)	<b>Compliance Time</b>
Less than 300	Before exceeding 300 FH, or within 30 FH after the effective date of this AD, whichever occurs later
300 or more	Within 30 FH after the effective date of this AD, or at the first MR damper removal, whichever occurs first

Note 2: Unless specified otherwise, the number of FH specified in this AD are those accumulated by the MR damper (or rod end or body end) since its first installation (new) or since its first installation after overhaul on a helicopter.

Note 3: As an alternative to a dye penetrant inspection as required by this AD, it is allowed to accomplish an eddy current inspection in accordance with the instructions of Annex B of FHD BT 139-450.

- (3) Following the inspection as required by paragraph (2) of this AD, each time a replacement MR damper rod end P/N M006-01H004-041 or P/N M006-01H004-045 or P/N M006-01H004-053 not marked as per BT139-450 is installed, within 300 FH after installation of that rod end, accomplish a one-time dye penetrant inspection (see Note 3 of this AD) of that rod end in accordance with the instructions of Part II of FHD BT 139-450.
- (4) Within the compliance times defined in Tables 3 and 4 of this AD, depending on the FH accumulated by each affected MR damper rod end or each affected MR damper body end, as applicable, accomplish a detailed visual inspection (DVI) of the rod end and body end of each affected MR damper in accordance with the instructions of Part III of FHD BT 139-450 and Part II of FHD BT 139-452.



Table 3 – MR Damper Rod end Repetitive DVI

<b>FH accumulated by rod end</b> (See Note 2 of this AD)	<b>Threshold</b>	<b>Interval</b>
300 or more	Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140] (Group 1 MR Damper) or within 5 FH after the effective date of this AD (Group 2 MR Damper)	After the last flight of each day, or before the first flight of each day

Table 4 – MR Damper Body end Repetitive DVI

<b>FH accumulated by body end</b> (see Note 2 of this AD)	<b>Threshold</b>	<b>Interval</b>
From 300 up to 1 200	Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140] (Group 1 MR Damper) or within 5 FH after the effective date of this AD (Group 2 MR Damper)	After the last flight of each day, or before the first flight of each day
More than 1 200	Within 4 FH after 28 July 2016 [the effective date of EASA AD 2016-0140] (Group 1 MR Damper) or within 4 FH after the effective date of this AD (Group 2 MR damper)	Not to exceed 4 FH

Note 4: As an alternative to a DVI as required by paragraph (4) of this AD, it is allowed to accomplish an eddy current inspection in accordance with the instructions of Annex B of BT 139-450, or Annex A of BT 139-452, as applicable.

- (5) Within the compliance times defined in Table 5 and Table 6 of this AD, depending on the FH accumulated by each affected MR damper rod end or each affected MR damper body end, as applicable, inspect the rod end and/or body end bearings of each affected MR damper in accordance with the instructions of Part IV of FHD BT 139-450 and Part II of FHD BT 139-452.



Table 5 – Rod End Bearing Repetitive Inspection for Rotation

<b>FH accumulated by rod end</b> (See Note 2 of this AD)	<b>Threshold</b>	<b>Interval</b>
Less than 300	Within 30 FH after 10 May 2016 [the effective date of EASA AD 2016-0087] (Group 1 MR damper) or within 30 FH after the effective date of this AD (Group 2 MR damper)	Not to exceed 10 FH
300 or more	Within 5 FH after 28 July 2016 [the effective date of EASA AD 2016-0140] (Group 1 MR damper) or within 5 FH after the effective date of this AD (Group 2 MR damper)	After the last flight of each day or before the first flight of each day

Table 6 – Body End Bearing Repetitive Inspection for Rotation

<b>FH accumulated by body end</b> (see Note 2 of this AD)	<b>Threshold</b>	<b>Interval</b>
Less than 300	Within 30 FH after 10 May 2016 [the effective date of AD 2016-0087] (Group 1 MR damper) or within 30 FH after the effective date of this AD (Group 2 MR damper)	Not to exceed 10 FH
From 300 up to 1200	Within 5 FH 28 July 2016 [the effective date of EASA AD 2016-0140] (Group 1 MR damper) or within 5 FH after the effective date of this AD (Group 2 MR damper)	After the last flight of each day or before the first flight of each day
More than 1 200	Within 4 FH after having exceed 1 200 FH	Not to exceed 4 FH

- (6) For a helicopter equipped with a MR damper, having a 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.
- (7) For Group 1 MR dampers, within 50 FH after 10 May 2016 [the effective date of EASA AD 2016-0087] or, for Group 2 MR dampers, within 50 FH after the effective date of this AD, 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.

- (8) For a helicopter equipped with an affected MR damper, having a 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):**

- (9) If, during the inspection as required by paragraph (8) 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 (see Note 4 of this AD).
- (10) If, during any inspection as required by paragraph (2), (3), (4) or (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 part with a serviceable part.
- (11) If, during any inspection or torque check as required by paragraph (5), (7) or (8) of this AD, as applicable, any discrepancy as defined in FHD BT 139-450 or FHD BT 139-452, as applicable, is detected, 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.
- (12) Accomplishment of corrective action(s) on a helicopter, as required by paragraph (9), (10) or (11) of this AD, as applicable, does not constitute terminating action for any repetitive action as required by this AD for that helicopter.

**Conditions for installation of parts on a helicopter:**

- (13) From 28 July 2016 [the effective date of EASA AD 2016-0140], installation of a Group 1 MR Damper (see Note 1 of this AD) on a helicopter is allowed, provided that the part has not exceeded 300 FH since its first installation on a helicopter, unless it has passed an inspection in accordance with the instructions of Part I of FHD BT 139-450, and provided that, following installation, the part is inspected as required by, and within the compliance times as specified in, this AD.
- (14) From 28 July 2016 [the effective date of EASA AD 2016-0140], installation on a helicopter of an affected MR damper, having a s/n specified in Part VIII of FHD BT 139-450, is allowed, provided that, prior to installation, each broached ring nut of that MR damper has passed a torque check in accordance with the instructions of Part VIII of FHD BT 139-450.
- (15) From the effective date of this AD, installation of a Group 2 MR Damper (see Note 1 of this AD) on a helicopter is allowed, provided that the part has not exceeded 300 FH since its first installation on a helicopter, unless it has passed an inspection in accordance with the instructions of Part I of FHD BT 139-450, and provided that, following installation, the part is inspected as required by, and within the compliance times as specified in, this AD.



**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.

FHD BT 139-452 original issue dated 27 June 2016, or Revision A dated 05 December 2016.

The use of later approved revisions of these 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](mailto:ADs@easa.europa.eu).
4. For any question concerning the technical content of the requirements in this AD, please contact: Finmeccanica S.p.A., Helicopter Division. E-mail: [CSE.AW139.AW@finmeccanica.com](mailto:CSE.AW139.AW@finmeccanica.com).

