



Civil Aviation Authority

AIRWORTHINESS DIRECTIVE

Number: **G-2021-0008**

Issue date: 08 September 2021



Note: In this Airworthiness Directive, references to EU regulations are to those regulations as retained and amended in UK domestic law under the European Union (Withdrawal) Act 2018 and are referenced as "UK Regulation (EU) year/number or UK Regulation (EU) No. number/year".

This Airworthiness Directive (AD) is issued by the UK CAA in accordance with UK Regulation (EU) No. 748/2012 Part 21.A.3B, acting as the Authority of the State of Design for the affected product(s), under Article 34 of the Air Navigation Order 2016 (ANO) and UK Regulation (EU) 2018/1139.

In accordance with UK Regulation (EU) No. 1321/2014 Annex I (Part-M), M.A.301 / Annex VB (Part-ML), ML.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 or agreed by the CAA [Part-M, M.A.303 / Part-ML, ML.A.303].

Type Approval Holder's Name:

BAE SYSTEMS (OPERATIONS) Ltd

Type/Model Designation(s):

BAe 146 and AVRO 146-RJ Aeroplanes

Effective Date:	22 September 2021
TCDS:	(UK) EASA.A.182, issue 03 dated 15 January 2015
Foreign AD (if applicable):	Not applicable
Superseding AD:	EASA AD 2013-0207 dated 9 September 2013

ATA 53 – Fuselage – Rear Fuselage Skin and Frames – Inspection

Manufacturer(s):

BAE Systems (Operations) Ltd, British Aerospace plc, British Aerospace (Commercial Aircraft) Ltd, British Aerospace (Operations) Ltd, British Aerospace Regional Aircraft Ltd, British Aerospace Regional Aircraft trading as Avro International Aerospace

Applicability:

BAe 146 and AVRO 146-RJ aeroplanes, all models, all serial numbers:

Definitions:

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

The ISB: BAE Systems (Operations) Ltd Inspection Service Bulletin (ISB) 53-239 Revision 5.

Reason:

In 2012, a pressurisation problem occurred on an AVRO 146-RJ100 aircraft during climb-out. Subsequent investigation results identified a 42.87 inch (1 089 mm) long crack in the skin of the rear fuselage drum, near the rear passenger door. The skin crack had initiated in the step of the skin land adjacent to a lap joint. Cracks were also found in Frames 41X and 42.

This condition, if not detected and corrected, could lead to degradation of the structural integrity of the aircraft.

Prompted by this finding, BAE Systems (Operations) Ltd issued ISB 53-239, providing instructions to inspect the internal area of the rear fuselage drum for cracks, corrosion and any other defects, and EASA issued AD 2012-0178 to require accomplishment of a one-time low frequency eddy current (LFEC) inspection of the affected fuselage area at stringer 30, left-hand (LH) and right-hand (RH), and, depending on findings, repair of cracked structural items. Note: EASA issued AMOC 10041592, after the publication of the initial issue of the ISB to allow the use of external low frequency eddy current inspections in lieu of the internal eddy current inspection. This AMOC was superseded by EASA AD 2013-0207.

After that AD was issued, additional damage was found on the aeroplane that had the pressurisation problem and further review concluded that the compliance time for the one-time inspection had to be reduced in order to mitigate the risk of cracking on other aeroplanes. Consequently, EASA issued AD 2012-0184, retaining the requirements of EASA AD 2012-0178, which was superseded, reducing the compliance time accordingly.

After that AD was issued, similar design features in other areas of the rear fuselage drum were assessed, and it was determined that stringer 2 RH and stringers 11 and 18, LH and RH, could also be affected. Consequently, BAE Systems (Operations) Ltd issued ISB 53-239 Rev. 1 and Rev. 2 and EASA issued AD 2013-0207, retaining the requirements of EASA AD 2012-0184, which was superseded, to additionally require repetitive inspections of all affected areas and, depending on findings, repair of cracked structural items. Subsequently, ISB 53-239 Rev. 3 clarified the inspection requirements for aircraft with a large freight door, and ISB 53-239 Rev. 4 introduced a revised low frequency eddy current (LFEC) inspection technique for inspection of skin lands with adjacent repair plates and associated compliance requirements for aircraft with repair plates. (EASA issued AMOC Approval 10058964 for ISB 53-239 Rev. 4 providing alternative inspection procedures. These related to the use of a revised LFEC procedure, now defined in ISB Rev 5 Appendix 3, as well as inspection requirements accounting for the presence of repair plates, now defined in ISB Rev. 5 Table 1 of para 1.D. The AMOC is therefore superseded by this AD).

Since EASA AD 2013-0207 was issued, errors were identified in the inspection instructions of ISB 53-239 Rev. 4, which resulted, for certain stringer 11 areas, in the calculation of an incorrect inspection interval. That ISB also referenced an inspection method that physically could not be used to inspect repaired structure. Consequently, BAE Systems (Operations) Ltd published ISB 53-239 Rev. 5.

For the reasons described above, this AD retains the requirements of EASA AD 2013-0207, which is superseded, and changes the inspection method for stringer 11 left and 11 right, if no repair is embodied. Where no repair is embodied at stringer 11 left and 11 right (up to 6.0 inches forward of the door frame) and the last inspection was accomplished using the instructions of ISB 53-239 Rev. 4, the interval before the next inspection of stringer 11 left and right (up to 6.0 inches forward of the door frame) is reduced. Where repairs are embodied at stringer 11 left and right (up to 6.0 inches forward of the door frame), the inspection method has changed but the interval before the next inspection has not changed.

EASA published PAD No 20-182 dated 18 November 2020 to address ISB 53-239 Rev. 5. No comments were received. From 1 January 2021, the UK CAA became the national airworthiness authority responsible under ICAO State of Design requirements, for the aircraft identified within this AD. Following review of ISB 53-152 Rev. 5 dated 2 March 2017 it was identified that additional clarifications needed to be added to the required actions and compliance times, previously identified within EASA PAD 20-182 dated 18 November 2020.

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

Required as indicated, unless accomplished previously:

Inspection(s):

- (1) Before exceeding the applicable threshold(s) as specified in Table 1 of the ISB and thereafter at intervals not exceeding the applicable values as specified in Table 1 of the ISB accomplish Low Frequency Eddy Current (LFEC) inspections in accordance with the instructions of the ISB. The requirements of Table 1 to be read in conjunction with all notes included within paragraph D Compliance of the ISB.

Note 1: ISB 53-239 Rev. 5 introduces a one-off reduced repeat interval for certain aircraft. Table 1 states that; "For aircraft that have inspected stringer 11 (up to 6.0 inches forward of the door frame) as shown in views A and B in Drawing 3, with no repair, in accordance with Rev. 4 of this ISB using Appendix 3 inspection method, next inspection will be at 2400 FC for RJ Delta P aircraft and 4300 FC for all other aircraft using Appendix 2 inspection method. Thereafter the repeat will be as per Table 1."

For aircraft that have exceeded or are close to these requirements and have not had inspections performed in accordance with ISB 53-239 Rev. 5 inspection methods (Appendix 2). A grace period is applicable. At the effective date of the AD, aircraft that have exceeded 1775 FC (RJ Delta P aircraft) or 3675 FC (146 and RJ non-Delta P aircraft) since last inspection then accomplish the inspection within 625 FC from the effective date of the AD but do not exceed either; 4000 FC (RJ Delta aircraft) or 7500 FC (146 and RJ non-Delta P aircraft). Aircraft that have accomplished the inspection of stringer 11 (up to 6.0 inches forward of the door frame) with no repairs in accordance with ISB 53-239 at Rev. 5 do not require any retrospective action.

Note 2: ISB 53-239 Rev. 4 introduced new LFEC inspection instructions applicable to aircraft with various external repairs present, the presence of these repairs prevented inspections being performed in accordance with earlier revisions of the ISB. Due to the variability of chamfers made to external repairs and the chamfer assumed present within the LFEC inspection tooling, a miss-match may be present that prevents the defined LFEC inspection being applicable. As a point of clarification: under these circumstances; BAE Systems (Operations) Ltd should be contacted to establish revised LFEC inspection requirements.

Note 3: If repairs extend across the lap joint, then contact to BAE Systems (Operations) Ltd for inspection requirements. This requirement supersedes the third note within paragraph D Compliance within the ISB.

Corrective Action(s):

- (1) If, during any inspection as required by paragraph (1) of this AD, discrepancies are detected, before next flight, contact BAE Systems (Operations) Ltd for approved corrective action instructions and accomplish those instructions accordingly.

Terminating Action:

None

Reference Publications:

BAE Systems (Operations) Ltd ISB 53-239 Revision 5 dated 4 March 2017.

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

Remarks:

- (1) This AD was posted on 27 July 2021 as PAD 1982 for consultation until 24 August 2021. The Comment Response Document (CRD) has been published at the same time as the AD, on our website page [List of UK Airworthiness Directives \(caa.co.uk\)](https://www.caa.co.uk/airworthiness-directives). Once the AD is incorporated into the [CAP 747: Mandatory Requirements for Airworthiness \(caa.co.uk\)](https://www.caa.co.uk/cap747), the CRD can be requested via email Continued.Airworthiness@caa.co.uk
- (2) If requested and appropriately substantiated, CAA can approve Alternative Methods of Compliance for this AD.
- (3) Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the CAA aviation safety reporting system. This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.
- (4) Enquiries regarding this Airworthiness Directive should be referred to: Continued.Airworthiness@caa.co.uk
- (5) For any questions concerning the technical content of the requirements in this AD, please contact BAE Systems (Operations) Ltd, Customer Information Department, Prestwick International Airport, Ayrshire, KA9 2RW, Scotland, The United Kingdom. Telephone: +44 1292 675207, Facsimile +44 1292 675704; E-mail: RApublications@baesystems.com