Civil Aviation Authority

PROPOSED AIRWORTHINESS DIRECTIVE

Number: 1991

Issue date: 22 December 2021

In accordance with the CAA Continuing Airworthiness Procedures, the issuance of an Airworthiness Directive (AD) is proposed which will be applicable to the aeronautical product(s) identified below.

All interested persons may send their comments, referencing the PAD Number above, to the e-mail address specified in the 'Remarks' section, prior to the consultation date indicated.

Type Approval Holder's Name:	**Type/Model Designation(s):**
BAE SYSTEMS (OPERATIONS) LTD	AVRO 146-RJ aeroplanes

Effective Date:	(TBD upon issue of final AD)
TCDS:	EASA.A.182,
Foreign AD (if applicable):	Not Applicable
Supersedure:	Not Applicable

ATA 34 - Navigation – Inertial Reference Units Magnetic Variation - Inspection

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Manufacturer(s):

BAE Systems (Operations) Ltd

Applicability:

AVRO 146-RJ aeroplanes, all models, all serial numbers (s/n), if equipped with Honeywell Inertial Reference Unit (IRU) Part Number (P/N) HG2001BC02, or P/N HG2001BC04

Definitions:

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

- **Affected IRU:** A Honeywell IRU having P/N HG2001BC02 using a magnetic variation (MagVar) lookup table from 1990, or P/N HG2001BC04 using a MagVar lookup table from 1995.
- **MagVar**: Magnetic Variation

Reason:

The navigation system for the AVRO 146-RJ has an Inertial Reference System (IRS) that uses true north to calculate magnetic heading and track. The IRS contains MagVar data tables that correct the heading/track for the effects of magnetic variation. Due to the change in the location of magnetic north over time, the level of IRS accuracy diminishes in certain geographical locations if MagVar lookup tables are not kept up to date. Consequently, certain aeroplanes may have navigation units with MagVar tables that are out of date and which can lead to inaccurate heading, course and bearing calculations. This could contribute to an unsafe condition if the following conditions are met;

- The flight is using compass navigation
- the IRUs contain out-of-date magnetic variation data tables
- the aircraft is operating in an area of significant magnetic variation
- the aircraft's TAWS and/or TCAS is inoperative

This condition, if not corrected, may result in an increased risk of controlled flight into terrain (CFIT), or collision with another aircraft, possibly resulting in damage to the aeroplane and injury to occupants.

To address this potential unsafe condition, BAE Systems (Operations) Ltd issued AOM 21-011V-1 to provide instructions for carrying out an assessment of magnetic variation, define actions if the change in MagVar exceeds 2 degrees and to raise awareness among flight crews on the issues surrounding magnetic variation.

For the reason described above, this AD is issued to require an assessment of the difference between current MagVar values and those contained in the IRS MagVar data tables, to define actions if the change in MagVar exceeds 2 degrees and also to raise awareness among flight crews on the issues surrounding magnetic variation.

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

Required as indicated, unless accomplished previously:

Operators of affected aircraft are required to comply with paragraph (1), (2), (3), (4) and (5) below;

(1) **Magnetic Variation Assessment:**

Within 3 months of the effective date of this AD, and, thereafter, at intervals not to exceed 5 calendar years, assess the accuracy of the aircraft's IRU MagVar data tables in accordance with the instructions of AOM 21-011V-1.

Note: Having assessed the accuracy of the installed MagVar data tables, if the difference identified between the installed MagVar data table and the present-day MagVar values is determined to be less than 2 degrees, for the routes that the aircraft may operate, then no further action is necessary.

(2) **Prohibition of Operation Without Serviceable TAWS and TCAS**

Within 3 months of the effective date of this AD, and, thereafter, at intervals not to exceed 5 calendar years, having assessed the accuracy of the installed MagVar data tables, if the difference identified between the installed MagVar data table and the present-day MagVar values is determined to be greater than 2 degrees for the routes that the aircraft may operate, then from the date of completing the magnetic variation assessment, do not operate the aeroplane in areas where the difference between the installed and the present day MagVar values exceeds the 2 degree tolerance, unless both TAWS and TCAS are installed and operative.

Note: Normal aircraft operation, (i.e. removing the need to prohibit dispatch without serviceable TAWS and TCAS), can be resumed if the MagVar data table of both IRUs are updated with the present-day values.

(3) **Amendment of MEL:**

Within 3 months of the effective date of this AD, and, thereafter, at intervals not to exceed 5 calendar years, having assessed the accuracy of the installed MagVar data tables, if the difference identified between the installed MagVar data table and the present-day MagVar values is determined to be greater than 2 degrees for the routes that the aircraft may operate, then, within 3 months of the effective date of this AD, Operators are required to remove from their MEL the ability to operate without functioning TAWS and TCAS.

Note: Restoration of MEL (i.e. removing the need to prohibit dispatch without serviceable TAWS and TCAS), can be accomplished if the MagVar data table of both IRUs are updated with the present-day values.

(4) **Information for Flight Crew**

Operators are required to provide flight crews with procedures for operating in areas with known or suspected significant magnetic variation. Information provided by operators to flight crews should include a list of locations known to be affected by significant magnetic variation and a means for flight crews to report other suspected affected locations. If heading abnormalities are noticed the flight crew should alert ATC. All procedures are required to be approved by the operators' National Aviation Authority.

Reference Publications:

BAE Systems (Operations) Ltd AOM 21-011V-1, Issue 1, dated 27 September 2021.

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

Remarks:

1. This PAD will be closed for consultation on 19 January 2022.

2. If requested and appropriately substantiated, CAA can approve Alternative Methods of Compliance (AMOC) 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 Occurrence reporting | UK Civil Aviation Authority (caa.co.uk). 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 PAD should be referred to: Continued.Airworthiness@caa.co.uk

5. For any question concerning the technical content of the requirements in this PAD, please contact: BAE Systems (Operations) Ltd Customer Technical Support Department, Prestwick International Airport, Ayrshire, KA9 2RW, Scotland, United Kingdom or E-mail: RaEngliaison@baesystems.com