



Civil Aviation Authority
**SAFETY AND OPERATIONAL
DIRECTIVE**
Number: SD-2021/001



Issued: 27 January 2021

**Boeing 737-8 “MAX” and Boeing 737-9 “MAX”
Return to Service Requirements**

This Safety and Operational Directive contains mandatory action that is required to restore an acceptable level of safety. It is issued in accordance with Article 248 of the Air Navigation Order 2016 and Article 70 of Regulation (EU) No. 2018/1139

Applicability:	
Aerodromes:	Not primarily affected
Air Traffic:	Not primarily affected
Airspace:	Not primarily affected
Airworthiness:	All Continued Airworthiness Management and Maintenance Organisations
Flight Operations:	All Operators of Boeing 737-8 MAX or 737-9 MAX Aeroplanes
Licensed Personnel:	All Pilots of Boeing 737-8 MAX or 737-9 MAX Aeroplanes

1 Introduction

- 1.1 This Safety and Operational Directive (SD) contains mandatory action that is required to establish an acceptable level of safety. It is issued under article 248, and in accordance with article 17(1), of the Air Navigation Order 2016 and subject to, and in accordance with, Article 70 of Regulation (EU) No. 2018/1139. Recipients must ensure that this Directive is copied to all members of their staff who need to take appropriate action or who may have an interest in the information, including any “in-house” or contracted maintenance organisation and relevant outside contractors.
- 1.2 SD-2020/002, and previously SD-2019/001, had been issued in the interests of safety following the fatal accidents to Ethiopian Airlines Boeing Model 737-8 MAX ET-AVJ on 10 March 2019 and the similar accident to Lion Mentari Airlines Boeing 737-8 (MAX), PK-LQP on 29 October 2018. The investigation into the causes of the accidents and subsequent activity by Boeing, the European Union Aviation Safety Agency (EASA) and the Federal Aviation Authority (FAA) is now at a stage where consideration may be made for the resumption of operations.
- 1.3 This Safety and Operational Directive supersedes and revokes SD-2020/002 and contains measures to enable the affected aeroplanes to return to service (RTS) subject to certain conditions specified in Section 4.

2 Background

- 2.1 Prompted by two fatal accidents with Boeing 737-8 aeroplanes, on 12 March 2019, EASA issued Emergency Airworthiness Directive AD 2019-0051-E to suspend all flight operations of the two affected models, except for some necessary ferry flights. On 13 March 2019, the FAA issued

an Emergency Grounding Order prohibiting the operation of Boeing 737-8/9 MAX aeroplanes within the US and by US certificated operators anywhere.

- 2.2 The results of safety investigations, as well as EASA's own safety review, have confirmed that, with affected Flight Control Computer (FCC) Operational Program Software (OPS) P12.1.1. or earlier FCC OPS, and MAX Display System (MDS) Display Processing Computer (DPC) OPS, Block-point (BP) 15, or earlier MDS DPC OPS, installed, a single erroneous high angle-of-attack (AOA) sensor input to the FCC on an affected aeroplane during manual flight with flaps up may prompt the Manoeuvring Characteristics Augmentation System (MCAS) to input incremental nose down trim. In this scenario, the flight crew may be unable to respond appropriately by applying opposing nose-up stabilizer trim, returning the aeroplane to a trimmed state, and by actuating the stab trim cut-out switches.
- 2.3 This condition, if not corrected, could lead to a stabilizer position that cannot be fully countered with elevator input, possibly resulting in loss of control of the aeroplane.
- 2.4 As a result of those findings, Boeing developed new OPS for FCC and MDS DPC and issued the associated Service Bulletins to provide instructions for OPS in-service installation. Boeing also updated the applicable flight crew training programme(s), introducing new training to ensure pilot understanding of the MCAS functions, the consequences of introducing the new OPS, and the new 'Airspeed unreliable' procedure.
- 2.5 EASA conducted a comprehensive review of the measures proposed by Boeing, including flight testing, and considers that these measures adequately address the above described unsafe condition. EASA issued preliminary Airworthiness and Safety Directives in November 2020 for consultation and the CAA has remained in close contact during the development of the new EASA and CAA directives to maintain alignment.
- 2.6 EASA also gathered factual evidence that, upon single failure of an AoA sensor during a "Required Navigation Performance - Authorization Required" (RNP-AR) approach, all flight guidance that allows the pilot to guide the aeroplane along the intended flight path is lost, and therefore the crew is left with no means to ensure that the trajectory of the aeroplane can be maintained within the tolerated lateral deviation. This condition, if not corrected, may constitute an unsafe condition when the RNP-AR approach has been implemented because of terrain or obstacle constraints in the vicinity of the airfield. This issue remains to be resolved to meet EASA AMC 20-26 compliance.
- 2.7 For the reasons described above, and after the actions required by this SD and the appropriate Airworthiness Directives have been accomplished, the affected Boeing 737-8 and 737-9 aeroplanes may be used to perform flights within the United Kingdom, and by UK operators anywhere, with the limitation not to perform RNP-AR approach operations. EASA has also issued its [Safety Directive No. 2021-01](#) in respect of third country operators (TCO).
- 2.8 In order to ensure safe operation of the affected Boeing 737-8 and 737-9 aeroplanes upon return to service, the Safety and Airworthiness Directives require pilots to perform specific return to service (RTS) training, including ground and flight training in a suitable full flight simulator (FFS), prior to operating the affected aeroplanes.

3 Ferry Flights

- 3.1 CAA SD-2020/002 provided a means for operators to conduct managed ferry flights into, out of, or through UK airspace for the purposes of essential maintenance or modification. This provision is partially retained in this SD to allow operators of Boeing 737-8/9 MAX aeroplanes to conduct such ferry flights subject to prior permission from the CAA.
- 3.2 For the purposes of this SD/OD, a ferry flight is defined as:

"Ferry flight" means a non-commercial flight of a Boeing 737-8/9 MAX aeroplane with minimum crew members and no passengers or cargo when it is moved to or from a specified maintenance base and the aeroplane is operated under permit-to-fly conditions.

- 3.3 Applications for such flights by operators of aeroplanes not registered in the UK will be considered on a flight by flight basis by the CAA who will wish to establish various factors before granting any permission for the flight to be conducted within UK airspace.
- 3.4 Full details and compliance requirements will be issued by the CAA to the applicant as necessary and permission, if granted, will be provided in writing.
- 3.5 Operators will need to ensure that they also comply with any specific requirements of other States when conducting a ferry flight within their airspace.

4 Operational Directive

- 4.1 The Civil Aviation Authority (CAA), in exercise of its powers under article 248, and in accordance with article 17(1), of the Air Navigation Order 2016, and subject to, and in accordance with, Article 70 of Regulation (EU) No. 2018/1139, directs Operators and pilots in command of any Boeing 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane which is:
 - a) registered in the UK; or
 - b) registered other than in the UK and intending to conduct flights within UK airspace, to comply with the requirements set out in paragraph 4.2 and subject to the conditions in paragraph 4.3.
- 4.2 Operators and pilots in command must not conduct any flight with Boeing 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane, unless:
 - a) all elements contained in the appropriate Airworthiness Directive, mandated by the State of Registry and which must be equivalent to either [CAA AD G-2021-0001](#), [EASA AD 2021-0039](#) or FAA [AD 2020-24-02](#), have been fully complied with;
 - b) all pilots operating flights have undergone the RTS training contained in FAA [Flight Standardization Board \(FSB\) Report for Boeing 737](#), Revision 17, Appendix 7 (Boeing 737 MAX Special Training for Flight Crews) and RTS training outlined in Appendix 3 to Boeing 737 document D626A014, Operational Suitability Data – Flight Crew (OSD-FC), and in Boeing 737 document D626A014-1, Operator Difference Requirement Tables, both Revision NEW (see Note 1);
 - c) the Full Flight Simulators (FFS) used to deliver RTS training to the pilots are capable of supporting the required RTS training elements contained in FAA FSB Report for Boeing 737, Revision 17, Appendix 7 (Boeing 737 MAX Special Training for Flight Crews) and RTS training outlined in Appendix 3 to Boeing 737 document D626A014, Operational Suitability Data – Flight Crew (OSD-FC), and in Boeing 737 document D626A014-1, Operator Difference Requirement Tables, both Revision NEW (see Note 1); and
 - d) the Operator of any such aeroplane registered other than in the UK has made a Declaration of full compliance with 4.2 a), b) and c) to the CAA and been acknowledged by the CAA.

Note 1: The content of Appendix 7 of FAA FSB Report for Boeing 737, Revision 17 is equivalent to the RTS training specified in CAA AD G-2021-0001 and EASA AD 2021-0039.

- 4.3 Operators and pilots in command of:
 - a) any such Boeing 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane registered in the UK must not conduct any RNP-AR approach operations during flights; and
 - b) any such Boeing 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane registered other than in the UK must not conduct any RNP-AR approach operations during flights in UK airspace.
- 4.4 Notwithstanding 4.1 b), Operators and pilots in command of:
 - a) any such Boeing 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane registered other than in the UK may conduct a ferry flight operation into, out of or through UK airspace, subject

to the express Permission of the CAA and subject to such requirements and conditions as the Permission contains.

- 4.5 To be granted a Permission at 4.4 for any ferry flight, the Operator must apply to the CAA and comply with such requirements and conditions as the CAA thinks fit and provided to the Operator in writing.

5 Declarations

- 5.1 Declarations of compliance with the requirements of 4.2 a), b) and c) in accordance with 4.2 d) shall be made in writing by the Operator to the CAA Airline Licensing Consumer and Markets Group at foreigncarrierpermits@caa.co.uk.
- 5.2 The required details and the Declaration form are at Annex A.

6 Permission Application

- 6.1 Application for the grant of a Permission under 4.5 for each ferry flight will entail a charge by the CAA and should be made to CAA Applications at apply@caa.co.uk furnishing the following initial information:
- a) Operator details and contact information.
 - b) Aeroplane type and registration.
 - c) Planned date of flight and routing details.
 - d) Reason for flight.
- 6.2 On receipt of each application, the CAA will process the request and contact the operator with any additional information that may be required for the application to be fully considered.

7 Queries

- 7.1 Operators wishing to make any inquiry or requests for further guidance as a result of this communication, should contact their assigned FOI if a UK operator, or in all other cases the CAA Flight Operations Department commsflightops@caa.co.uk.

8. References

- 8.1 References to EU regulations in this document are to those regulations as retained and amended in UK domestic law under the European Union (Withdrawal) Act 2018

9 Cancellation

- 9.1 This Directive will remain in force until further notice.

Signed: **Rob Bishton**
for the Civil Aviation Authority

Date: 27 January 2021

Annex:

- A. Declaration of Compliance with requirements of UK Civil Aviation Authority Safety and Operational Directive SD-2021/001 dated 27 January 2021

Annex A**Boeing 737-8 “MAX” and Boeing 737-9 “MAX”****Return to Service Requirements****Declaration of Compliance with requirements of UK Civil Aviation Authority Safety and Operational Directive SD-2021/001 dated 27 January 2021**

1. In accordance of Safety and Operational Directive SD-2021/001 dated 27 January 2021 and issued by the United Kingdom Civil Aviation Authority (CAA) under article 248, and in accordance with article 17(1), of the Air Navigation Order 2016 and subject to, and in accordance with, Article 70 of Regulation (EU) No. 2018/1139 (as retained in UK law), the Operator of any Boeing 737-8 “MAX” or Boeing 737-9 “MAX” aeroplane registered other than in the UK shall, before conducting any flights within UK airspace, comply with the requirements set out in paragraph 4.2, and subject to the conditions in paragraph 4.3, of SD-2021/001 and declare compliance to the CAA.
2. Operators mentioned in paragraph 1 must provide the information at Attachment 1 and make the associated Declaration of compliance in accordance with paragraphs 4.2 d) and 5 of the SD.

UK Civil Aviation Authority

Date: 27 January 2021

Attachment:

1. Details of Operations and Declaration of Compliance by Operator in accordance with UK CAA Safety and Operational Directive SD-2021/001 Boeing 737-8 “MAX” and Boeing 737-9 “MAX” Return to Service Requirements

Attachment 1**Details of Operations and Declaration of Compliance by Operator in accordance with UK CAA Safety and Operational Directive SD-2021/001 Boeing 737-8 "MAX" and Boeing 737-9 "MAX" Return to Service Requirements**

Details of Operations

a.	Operator name and AOC number	
b.	Aircraft type and registration	
c.	Details of Airworthiness Directive used to meet compliance	
d.	Details of intended operations in UK airspace	

This Declaration will be considered in respect of the Company Name as registered under the Company number provided below.

Registered Company Name (in full):

Registered Company Number:

Country of Company Registration:

Registered Office Address:

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Country: Postcode:

Telephone: Fax:

E-mail:

Air Operator Certificate Number:

Trading Name: (if applicable)

Trading Address (primary site):

Country Postcode:

Website address:

Authorised Representative of Company

This Declaration is to be signed by either a Director or Company Secretary or a person authorised by the Board to act on behalf of the Company

Title: Forename: Surname:

Position in Company:

Telephone No: E-mail:

Declaration

The Operator declares compliance, and will continue to comply, with the requirements of UK CAA Safety and Operational Directive SD-2021/001 before conducting any flights with 737-8 "MAX" or Boeing 737-9 "MAX" aeroplane within UK airspace.

The Operator will notify the UK CAA of any changes in circumstances affecting its compliance with SD-2021/001.

The Operator confirms that all information included in this Declaration is complete and correct.

Signature of Authorised Representative:

Date:

FALSE REPRESENTATION STATEMENT

It is an offence under the UK Air Navigation Order 2016 to make, with intent to deceive, any false representation for the purpose of procuring the grant, issue, renewal or variation of any certificate, licence, approval, permission or other document. This offence is punishable on summary conviction by a fine, and on conviction on indictment with an unlimited fine or up to two years imprisonment or both.