

## Safety Directive

**SD No.:** 2021-01

**Issued:** 27 January 2021

Note: This Safety Directive (SD) is issued by EASA, acting in accordance with Art. 76(6)(a) of Regulation (EU) 2018/1139, to address an urgent safety problem. This Safety Directive is mandatory for Third Country Organisations holding an EASA certificate.

**Subject:** Boeing 737-8 and 737-9 (MAX) Aeroplanes – Return to Service

**Effective Date:** 27 January 2021

**Supersedure:** This SD supersedes EASA SD 2019-01 dated 12 March 2019.

### Applicability:

Third country operators (TCO) authorised by EASA pursuant to Commission Regulation (EU) No 452/2014 to perform commercial air transport operations with Boeing model 737-8 or 737-9 (commercially known as 'MAX') aeroplanes into, within or out of the territory subject to the provisions of the Treaty on European Union and the Treaty on the Functioning of the European Union ('the EU treaties').

### Definitions:

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

**Affected FCC OPS:** Flight Control Computer (FCC) Operational Program Software (OPS) P.11.1 (for model 737-8) and P.10.0 (for model 737-9), or earlier FCC OPS.

**Affected MDS DPC OPS:** MAX Display System (MDS) Display Processing Computer (DPC) OPS, Block-point (BP) 1.5, or earlier MDS DPC OPS/BP.

### Reason:

Prompted by two fatal accidents with Boeing 737-8 aeroplanes, EASA issued SD 2019-01 which required TCO authorisation holders not to perform commercial air transport operations with Boeing 737-8 or Boeing 737-9 aeroplanes into, within or out of the territory subject to the provisions of the EU treaties.

The results of safety investigations conducted by the authorities of the States where these events occurred, as well as EASA's own safety review, have confirmed that, with affected FCC 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.

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.

Prompted by 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.

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.

In addition, EASA has 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 aeroplane's trajectory can be maintained within the tolerated lateral deviation. This condition, if not corrected, may constitute an unsafe condition in case the RNP-AR approach has been implemented because of terrain or obstacle constraints in the vicinity of the airfield.

For the reasons described above, after the actions required by this SD have been accomplished, the affected Boeing 737-8 and 737-9 aeroplanes can be used to perform flights under the TCO authorisation, with the limitation not to perform RNP-AR approach operations.

In order to ensure safe operation of the affected Boeing 737-8 and 737-9 aeroplanes upon return to service, this SD requires that pilots perform the return to service (RTS) training, including ground and flight training in a suitable full flight simulator (FFS), prior to operating the affected aeroplanes.

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

Before the first commercial air transport flight performed by Boeing 737-8 and 737-9 aeroplanes and conducted pursuant to the privileges and conditions established by the TCO authorisation, into, within or out of the territory subject to the provisions of the EU treaties, the operator shall:

- (1) Implement all elements contained in Federal Aviation Administration (FAA) [AD 2020-24-02](#), or in EASA AD 2021-0039 or, where applicable, in an AD issued by the State of Registry that contains the same elements as FAA AD 2020-24-02, or EASA AD 2021-0039.
- (2) Ensure all pilots operating flights conducted under the TCO authorisation have undergone the RTS training (see Note 1 of this SD) contained in FAA [Flight Standardization Board \(FSB\) Report for Boeing 737](#), Revision 17, Appendix 7 (Boeing 737 MAX Special Training for Flight Crews).

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



- (3) Ensure FFS used to deliver RTS training to pilots are capable to support 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).

**Limitations:**

The operator shall not conduct RNP-AR approach operations during flights performed under the TCO authorisation and shall disseminate appropriate information to crew and operations staff.

**Ref. Publications:**

EASA AD 2021-0039 dated 27 January 2021.

FAA [AD 2020-24-02](#) dated 18 November 2020, which is not adopted by EASA.

FAA [FSB Report for Boeing 737](#), Revision 17 dated 16 November 2020.

**Remarks:**

1. This SD was posted on 24 November 2020 as Preliminary SD 20-185 for consultation until 22 December 2020. The Comment Response Document can be found in the [EASA Safety Publications Tool](#), in the compressed (zipped) file attached to the record for this SD.
2. Enquiries regarding this SD should be referred to the EASA Safety Information Section, Certification Directorate, E-mail: [ADs@easa.europa.eu](mailto:ADs@easa.europa.eu).

