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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2023-2227; Project Identifier AD-2022-00113-T; Amendment 39-22813; AD 2024-16-07]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 787-8, 787-9, and 787-10 airplanes. This AD was prompted by incidents related to erroneous autothrottle (A/T) behavior during a balked landing with the A/T engaged, potential erroneous readings from the low range radio altimeter (LRRA), and possible deficiencies in low airspeed protections and crew alerting systems. This AD requires updating the thrust management (TM) and displays and crew alerting (DCA) operational program software (OPS). The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective October 23, 2024.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of October 23, 2024.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2023-2227; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

Material Incorporated by Reference:

- For Boeing material identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.
- You may view this material at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at *regulations.gov* under Docket No. FAA-2023-2227.

FOR FURTHER INFORMATION CONTACT:

Doug Tsuji, Aviation Safety Engineer, FAA, 2200 South 216th St., Des Moines, WA 98198; telephone: 206-231-3548; email: Douglas.Tsuji@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend [14 CFR part 39](#) by adding an AD that would apply to certain The Boeing Company Model 787-8, 787-9, and 787-10 airplanes. The NPRM published in the **Federal Register** on November 24, 2023 ([88 FR 82279](#)).

The NPRM was prompted by incidents related to erroneous A/T behavior during a balked landing with the A/T engaged, potential erroneous readings from the LRRA, and possible deficiencies in low airspeed protections and crew alerting systems.

In the NPRM, the FAA proposed to require updating the TM and DCA OPS. The FAA is issuing this AD to address problems with the TM and DCA OPS, which could result in possible runway overrun or controlled flight into terrain.

Discussion of Final Airworthiness Directive

Comments

The FAA received a comment from an individual who supported the NPRM without change.

The FAA also received comments from four commenters, including Air Canada, American Airlines, Boeing, and Qatar Airways. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Allow Use of Additional Service Information

Air Canada and Qatar Airways requested that paragraph (g)(1) of the proposed AD be revised to also allow compliance using Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 001,

dated August 3, 2020, for aircraft on which installation of the DCA software update has already been done using Boeing Alert RB B787-81205-SB310018-00 RB, Issue 001, dated August 3, 2020.

The FAA agrees with the commenters. There are no technical differences between Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021, and Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 001, dated August 3, 2020. The FAA has changed paragraph (g)(1) to include Boeing Alert RB B787-81205-SB310018-00 RB, Issue 001, dated August 3, 2020, as acceptable for use before the effective date of this AD.

American Airlines and Qatar Airways requested that the proposed AD be revised to ensure that subsequent approved versions of DCA OPS and TM OPS software will still be compliant with the proposed AD. American Airlines requested that paragraph (g) of the proposed AD be revised to read as follows:

For airplanes identified in paragraph (g) of this AD: Within 6 months after the effective date of this AD, install DCA OPS P/N COL47-0014-0031 or later-approved software version and TM OPS P/N HNP55-AL12-5008 or later-approved software version at the locations specified in the Service Bulletins. Both the installation and the check must be done in accordance with a method approved by the Manager, AIR-520, Continuous Operation Safety Branch, FAA. Later approved software versions are those Boeing software versions that are approved as a replacement for the DCA OPS P/N COL47-0014-0031 and TM OPS P/N HNP55-AL12-5008 and are approved as part of the type design by the FAA or by The Boeing Company Organization Designation Authorization (ODA).

The FAA infers this request is to reduce the need for alternative methods of compliance (AMOCs) for subsequent (newer) approved versions of DCA OPS and TM OPS software.

The FAA partially agrees with the commenters. The FAA agrees that without the usage of the terminology “or later approved software” or some variation of the wording that allows the use of later-approved software, historically ADs related to software changes that did not have this wording have resulted in multiple AMOCs for software updates. The FAA disagrees with the need to add “or later approved software” language to paragraph (g) of this AD because this provision is found in Boeing Requirements Bulletins B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021, and Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022, which are required by paragraphs (g)(1) and (2) of this AD, respectively. The FAA has not changed this AD in regard to this comment.

Requests To Clarify Terms in the NPRM

Boeing requested that “throttle malfunction” be replaced with “erroneous autothrottle (A/T) behavior” in the Summary and Background of the NPRM, and paragraph (e) in the proposed AD, because the description incorrectly describes what occurred.

The FAA agrees that erroneous A/T behavior is a more accurate description of the occurrence. The full Background section is not restated in this final rule. The FAA has changed the Summary of the NPRM and paragraph (e) of this AD accordingly.

Boeing also requested that in the Background section, third paragraph, “flight management function (FMF)” be replaced with “Flight Management Function (FMF)/Thrust Management Function (TMF)

Block Point (BP) 4.0” because the behavior was due to the design changes included in the thrust management operation software and flight management BP 4.0.

The FAA agrees that FMF/TMF BP 4.0 more accurately describes the associated change; however, the full text of the NPRM Background section is not repeated in the final rule, so no further change is necessary to this final rule.

Boeing further requested that the Background section, sixth paragraph, be revised to read “Airplanes with version TMF software BP 4 installed, the A/T system is engaged during a manual go-around or missed approach . . .” because the behavior seen during a balked landing was introduced with TMF BP 4.0.

The FAA agrees that the issue of erroneous A/T behavior was introduced by FMF/TMF BP 4; however, the full text of the NPRM Background section is not repeated in the final rule, so no further change is necessary to this final rule.

Request To Delete Terms

Boeing requested that the FAA revise the NPRM to delete any reference related to “possible deficiencies in low airspeed protections and crew alerting systems,” “crew alerting systems,” “displays and crew alerting (DCA),” “crew alerting (DCA) operational software (OPS),” “install and check DCA software,” and “The FAA reviewed Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021. This service information specifies procedures for installing updated DCA OPS software and doing a software configuration check” because the design change included in TMF 4.1 (TMF BP 4.1) to address 20-PAD-0048 (Erroneous A/T Behavior During Balked Landing) and 20-AD-0054 (Erroneous Low Range Radio Altimeter Readings) is not dependent on a DCA OPS update.

Boeing also requested that the FAA revise the NPRM to delete the following statements:

The FAA has reviewed a report of the investigation of an accident that revealed deficiencies in low airspeed protections and crew alerting systems on Model 777 and 787.

Further, airplanes with versions of FMF software prior to BP 4 are susceptible to situations where the flightcrew may believe the airplane systems will prevent the airplane from having too low an airspeed for its flight condition, when in fact the systems do not offer that protection. This can also result in a CFIT event.

Boeing requested these deletions because the autothrottle low airspeed enhancements were implemented in FMF/TMF BP 4.0.

The FAA acknowledges that the changes associated with TMF BP 4.1 needed to address the issue of erroneous A/T behavior and erroneous LRRRA readings are not dependent upon a DCA OPS update, but the FAA disagrees with removing any reference to the “deficiencies in low airspeed protections and crew alerting systems” or “crew alerting (DCA) OPS.” Some changes associated with TMF BP 4.1 are to fix an unsafe condition (A/T issue) introduced by the previous TMF update BP 4. The FAA had intended to mandate TMF BP 4 (in combination with a DCA OPS update) to address the unsafe condition of insufficient low airspeed protections and crew alerting systems but had to postpone AD action until TMF BP 4.1 was available over three years later. While TMF BP 4.1 includes the TMF BP 4

updates addressing low airspeed protections, this is the first time the FAA has mandated requirements to address this unsafe condition. The FAA has not changed this AD in regard to this comment.

The “Related Service Information Under [1 CFR part 51](#)” section of the NPRM described the procedures specified in Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, and then added that the FAA “also” reviewed Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022, which specifies procedures for installing updated TM OPS software. Boeing requested that the word “also” be deleted because there is only one Boeing Alert Requirement Bulletin associated with Thrust Management BP 4.1.

The FAA disagrees with the request. The documents cited in this section of the NPRM (and this final rule) are required sources of service information for the requirements of this AD. The two documents include different actions (one for installing updated DCA OPS software and the other for installing updated TM OPS software), but both are necessary to address the unsafe conditions identified in this final rule. The FAA has not changed this final rule as a result of this comment.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Material Under [1 CFR Part 51](#)

The FAA reviewed Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021. This material specifies procedures for installing updated DCA OPS software and doing a software configuration check.

The FAA also reviewed Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022. This material specifies procedures for installing updated TM OPS software and doing a software configuration check.

This material is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the **ADDRESSES** section.

Costs of Compliance

The FAA estimates that this AD affects 125 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
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Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Install and check DCA software	3 work-hours × \$85 per hour = \$255	* \$0	\$255	\$31,875
Install and check TM software	4 work-hours × \$85 per hour = \$340	* 0	340	42,500

* Boeing has confirmed that there is no charge for the software.

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some or all of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected operators.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under [Executive Order 13132](#). This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under [Executive Order 12866](#),
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in [14 CFR Part 39](#)

- Air transportation
- Aircraft
- Aviation safety
- Incorporation by reference

- Safety

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends [14 CFR part 39](#) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: [49 U.S.C. 106\(g\)](#), [40113](#), [44701](#).

[§ 39.13](#) [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2024-16-07 The Boeing Company: Amendment 39-22813; Docket No. FAA-2023-2227; Project Identifier AD-2022-00113-T.

(a) Effective Date

This airworthiness directive (AD) is effective October 23, 2024.

(b) Affected Ads

None.

(c) Applicability

This AD applies to The Boeing Company Model 787-8, 787-9, and 787-10 airplanes, certificated in any category, as identified in Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022.

(d) Subject

Air Transport Association (ATA) of America Code 31, Instruments; 34, Navigation.

(e) Unsafe Condition

This AD was prompted by incidents related to erroneous auto-throttle (A/T) behavior during a balked landing with the A/T engaged, potential erroneous readings from the low range radio altimeter (LRR), and possible deficiencies in low airspeed protections and crew alerting systems. The FAA is issuing this AD to address problems with thrust management (TM) and displays and crew alerting (DCA) operational program software. The unsafe conditions, if not addressed, could result in possible runway overrun or controlled flight into terrain.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For airplanes identified in Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021: Within 6 months after the effective date of this AD, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021; or Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 001, dated August 3, 2020. After the effective date of this AD, only Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021, may be used.

Note 1 to paragraph (g)(1):

Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin B787-81205-SB310018-00, Issue 002, dated July 15, 2021, which is referred to in Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021.

Note 2 to paragraph (g)(1):

Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin B787-81205-SB310018-00, Issue 001, dated August 3, 2020, which is referred to in Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 001, dated August 3, 2020.

(2) For airplanes identified in Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022: Within 6 months after the effective date of this AD, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022.

Note 3 to paragraph (g)(2):

Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin B787-81205-SB340053-00, Issue 001, dated November 16, 2022, which is referred to in Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022.

(h) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in [14 CFR 39.19](#). In accordance with [14 CFR 39.19](#), send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (j)(1) of this AD. Information may be emailed to: AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, AIR-520 Continued Operational Safety Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(i) Related Information

(1) For more information about this AD, contact Doug Tsuji, Aviation Safety Engineer, FAA, 2200 South 216th St., Des Moines, WA 98198; telephone: 206-231-3548; email: Douglas.Tsuji@faa.gov.

(2) Material identified in this AD that is not incorporated by reference is available at the address specified in paragraph (j)(3) this AD.

(j) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the material listed in this paragraph under [5 U.S.C. 552\(a\)](#) and [1 CFR part 51](#).

(2) You must use this material as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Requirements Bulletin B787-81205-SB310018-00 RB, Issue 002, dated July 15, 2021.

(ii) Boeing Alert Requirements Bulletin B787-81205-SB340053-00 RB, Issue 001, dated November 16, 2022.

(3) For material identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

(4) You may view this material at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit www.archives.gov/federal-register/cfr/ibr-locations or email fr.inspection@nara.gov.

Issued on August 1, 2024.

Peter A. White,

Deputy Director, Integrated Certificate Management Division, Aircraft Certification Service.

[[FR Doc. 2024-21144](#) Filed 9-17-24; 8:45 am]

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