



## 適航指令發布單

### Airworthiness Directive Issuance Form

|  |  |                     |           |
|--|--|---------------------|-----------|
| 民航局 AD 編號<br>AD number   | CAA-2022-08-009  | 發布日期<br>Date issued | 2022/8/18 |
| 適用之航空產品<br>Applied to (models, serial numbers or part numbers, as applicable)  | This AD applies to The Boeing Company Model 747-400 series airplanes, certificated in any category, having a three air data computer configuration, except for airplanes on which the Production Revision Record 85655 has been incorporated.  |                     |           |
| 主旨摘要<br>Subject  | This AD requires revising the existing airplane flight manual to incorporate procedures to be applied during P/S probe heater failure conditions.  |                     |           |
| 民航局<br>CAA<br><input type="checkbox"/> 本國產品<br>Native product<br><input type="checkbox"/> 其他個案<br>Other  | 設計國民航主管機構<br>Original Authority<br><div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <input checked="" type="checkbox"/> FAA<br/> <input type="checkbox"/> EASA<br/> <input type="checkbox"/> Brazil<br/> <input type="checkbox"/> Transport Canada Civil Aviation<br/> <input type="checkbox"/> DGAC             </div> <div style="width: 48%;"> <input type="checkbox"/> Germany LBA<br/> <input type="checkbox"/> CAA-NL<br/> <input type="checkbox"/> UK CAA<br/> <input type="checkbox"/> Japan CAB<br/> <input type="checkbox"/> CAA of Israel<br/> <input type="checkbox"/> Other _____             </div> </div> |                     |           |
|  | 設計國 AD 編號<br>Original AD number  | 2022-15-07          |           |
|  | 1. 直接採用原 AD 之內容?(Is the original AD directly adopted?)<br><input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) _<br>a. 生效日期另訂為(Re-specify the effective date as) : _____<br>b. 執行時限另訂為(Re-specify the compliance time or period as) : _____<br>2. 使用人是否需要將 AD 執行結果向民航局提出報告?(Do Users need to report the status of compliance to the CAA?)<br><input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No)  |                     |           |
| 備註<br>Note   | None   |                     |           |
| 註： 1. AD 內容後附。<br>2. 航空器產品使用人得向民航局提出豁免、替代符合方法、執行時限之展延之申請。<br>3. 如有任何問題，請聯絡交通部民用航空局初始適航科。Tel：(02)2349-6330 / 6332, Fax：(02)2545-8464, e-mail：<br><a href="mailto:adcaa@mail.caa.gov.tw">adcaa@mail.caa.gov.tw</a><br>Note： 1. The AD text is enclosed.<br>2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval.<br>3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6330 / 6332, Fax：<br>(02)2545-8464, e-mail： <a href="mailto:adcaa@mail.caa.gov.tw">adcaa@mail.caa.gov.tw</a> |  |                     |           |

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-1005; Project Identifier AD-2021-00842-T; Amendment 39-22127; AD 2022-15-07]**

**RIN 2120-AA64**

### **Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 747-400 series airplanes. This AD was prompted by a report that after a certain circuit breaker tripped, power to the two pitot-static (P/S) probe heaters on the right-hand side was lost, and the flightcrew discovered conflicting procedures in the flightcrew operations manual/quick reference handbook (FCOM/QRH). This AD requires revising the existing airplane flight manual (AFM) to incorporate procedures to be applied during P/S probe heater failure conditions. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective September 15, 2022.

### **ADDRESSES:**

#### **Examining the AD Docket**

You may examine the AD docket at [www.regulations.gov](http://www.regulations.gov) by searching for and locating Docket No. FAA-2021-1005; 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.

**FOR FURTHER INFORMATION CONTACT:** Huey Ton, Aerospace Engineer, Systems and Equipment Section, FAA, Los Angeles ACO Branch, 3960 Paramount Boulevard, Lakewood, CA 90712-4137; phone: 562-627-5320; email: [huey.ton@faa.gov](mailto:huey.ton@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 747-400 series airplanes. The NPRM published in the Federal Register on December 28, 2021 (86 FR 73694). The NPRM was prompted by a report that after a certain circuit breaker tripped, power to the two P/S probe heaters on the right-hand side was lost, and the flightcrew discovered conflicting procedures in the FCOM/QRH. In the NPRM, the FAA proposed to require revising the existing AFM to incorporate procedures to be applied during P/S probe heater failure conditions. The FAA is issuing this AD to address the conflicting procedures, which could result in the transmission of potentially inaccurate pitot static pressure data to the air data computer (ADC), resulting in erroneous or misleading air data being displayed, which, in combination with a stall, overspeed, overrun, or short/hard landing condition, could result in reduced ability of the flightcrew to maintain continued safe flight and landing of the airplane.

### **Discussion of Final Airworthiness Directive**

#### **Comments**

The FAA received a comment from the Air Line Pilots Association, International (ALPA) who supported the NPRM without change.

The FAA received additional comments from a commenter, Cathay Pacific Airways Ltd. (Cathay Pacific). The following presents the comments received on the NPRM and the FAA's response to each comment.

#### **Request To Clarify Requirements of Paragraph (g) of the Proposed AD**

Cathay Pacific requested that the FAA clarify the requirements of paragraph (g) of the proposed AD to allow removing a copy of the AD from the AFM. Cathay Pacific commented that inserting a copy of the AD into the AFM is not a routine procedure, and that it also appears that once the AFM is revised to include the information provided in the AD, there is no provision within paragraph (g) of the proposed AD to remove the copy of the AD from the AFM. Cathay Pacific suggested revising the proposed AD to add a provision to permit the AD copy to be removed from the AFM.

The FAA agrees to clarify the requirements but disagrees with the suggestion to revise this AD. Paragraph (g) of this AD requires revising the AFM to include the changes specified in paragraphs (g)(1) through (4) of this AD, and allows for inserting a copy of the AD as one means of complying with the requirement to revise the AFM. Inserting a copy of the AD is an option that has been allowed in other ADs. There is no need to specify removing the copy of the AD when an operator subsequently uses another method to comply with the AD. After an operator uses another method to revise the AFM to include the changes to the AFM text specified in paragraphs (g)(1) through (4) of this AD, an operator may remove the copy of the AD. The FAA has not changed the AD in this regard.

#### **Request To Clarify Method for Complying With Requirements of Paragraph (g) of the Proposed AD**

Cathay Pacific requested that the FAA clarify if a temporary revision to the AFM is acceptable to comply with paragraph (g) of the proposed AD. Cathay Pacific remarked that the manufacturer might issue a temporary revision to the AFM which includes the information and asked if using a temporary revision would be considered a means of compliance with paragraph (g) of the proposed AD. Cathay

Pacific further asked that if a temporary revision is an acceptable means of compliance, could the FAA revise paragraph (g) of the proposed AD to also specify temporary revisions as a means of compliance.

The FAA agrees to clarify but does not agree to revise the AD. A temporary revision to the AFM, provided it has the specified changes required by paragraph (g) of this AD, is a means of revising the AFM. The language in paragraph (g) of this AD is designed to allow revising the AFM to incorporate the required changes through various methods, so long as the language in the revised AFM is identical to the changes specified in paragraphs (g)(1) through (4) of this AD. The FAA has not changed the AD in this regard.

## Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. 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.

## Costs of Compliance

The FAA estimates that this AD affects 114 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 |
| AFM Revision    | 1 work-hour × \$85 per hour = \$85 | None       | \$85             | \$9,690                |

## 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:



## **AIRWORTHINESS DIRECTIVE**

[www.faa.gov/aircraft/safety/alerts/](http://www.faa.gov/aircraft/safety/alerts/)  
[www.gpoaccess.gov/fr/advanced.html](http://www.gpoaccess.gov/fr/advanced.html)

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**2022-15-07 The Boeing Company:** Amendment 39-22127; Docket No. FAA-2021-1005; Project Identifier AD-2021-00842-T.

**(a) Effective Date**

This airworthiness directive (AD) is effective September 15, 2022.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to The Boeing Company Model 747-400 series airplanes, certificated in any category, having a three air data computer (ADC) configuration, except for airplanes on which the Production Revision Record (PRR) 85655 has been incorporated.

**(d) Subject**

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

**(e) Unsafe Condition**

This AD was prompted by a report that after a certain circuit breaker tripped, power to the two pitot-static (P/S) probe heaters on the right-hand side was lost, and the flightcrew discovered conflicting procedures in the flightcrew operations manual/quick reference handbook (FCOM/QRH). The FAA is issuing this AD to address the conflicting procedures, which could result in the transmission of potentially inaccurate pitot static pressure data to the ADC, resulting in erroneous or misleading air data being displayed, which, in combination with a stall, overspeed, overrun, or short/hard landing condition, could result in reduced ability of the flightcrew to maintain continued safe flight and landing of the airplane.

**(f) Compliance**

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

**(g) Airplane Flight Manual (AFM) Revisions**

Within 90 days after the effective date of this AD, revise the Non-Normal Procedures Section of the existing AFM to include the changes specified in paragraphs (g)(1) through (4) of this AD. Revising the existing AFM to include the changes specified in paragraphs (g)(1) through (4) of this AD, may be done by inserting a copy of figure 1 to paragraph (g)(1) through figure 4 to paragraph (g)(4) of this AD into the existing AFM.

(1) In Section 2, Non-Normal Procedures, add the “HEAT P/S CAPT” paragraph to include the information in figure 1 to paragraph (g)(1) of this AD.

**Figure 1 to paragraph (g)(1) – AFM Revision: Heat P/S Captain**

**PITOT-STATIC PROBE HEAT**

**(Required by AD 2022-15-07)**

**HEAT P/S CAPT**

The HEAT P/S CAPT message indicates that captain’s pitot static probe heat is failed. This procedure objective is to determine whether more than one probe heat is failed, and to select air data sources to minimize or to prevent erroneous flight instrument indications.

Disengage the autopilot.

If EICAS message HEAT P/S CAPT is displayed and HEAT P/S L AUX is blank, place the captain’s air data source selector to R and the first officer’s air data source selector to C. Engage the R autopilot, if needed. L and C autopilots are unreliable in icing conditions, end of procedure.

[Disengage the autopilot.]

If EICAS messages HEAT P/S CAPT and HEAT P/S L AUX are both displayed, place the captain’s air data source selector to C. Engage any autopilot, if needed. Avoid icing conditions. Flight in icing conditions can result in unreliable standby flight instrument indications.

**Note Inoperative Items:**

- Both pitot probe heaters on the left side of the airplane inoperative – Avoid Icing Conditions.
- Autothrottle inoperative, Reference EPR is blank - Use manual throttle.
- LNAV and VNAV inoperative – Use HDG SEL or HDG HOLD and FLCH, V/S or ALT HOLD.

Do not accomplish the HEAT P/S L AUX non-normal procedure, end of procedure.

(2) In Section 2, Non-Normal Procedures, add the “HEAT P/S F/O” paragraph to include the information in figure 2 to paragraph (g)(2) of this AD.

**Figure 2 to paragraph (g)(2) – AFM Revision: Heat P/S First Officer**

**PITOT-STATIC PROBE HEAT (CONTINUED) (Required by AD 2022-15-07)**

**HEAT P/S F/O**

The HEAT P/S F/O message indicates that First Officer's pitot static probe heat is failed. This procedure objective is to determine whether more than one probe heat is failed, and to select air data sources to minimize or to prevent erroneous flight instrument indications.

Disengage the autopilot.

If EICAS message HEAT P/S F/O is displayed and HEAT P/S R AUX is blank, place the captain's air data source selector to C and the first officer's air data source selector to L. Engage the L or C autopilot, if needed. R autopilot is unreliable in icing conditions, end of procedure.

[Disengage the autopilot.]

If EICAS messages HEAT P/S F/O and HEAT P/S R AUX are both displayed, engage the L or C autopilot, if needed. R autopilot is unreliable in icing conditions. Avoid icing conditions. Flight in icing conditions can result in unreliable first officer's flight instrument indications.

**Note Inoperative Items:**

- Both pitot probe heaters on the right side of the airplane inoperative – Avoid Icing Conditions.
- Autothrottle inoperative, Reference EPR is blank - Use manual throttle.
- LNAV and VNAV inoperative – Use HDG SEL or HDG HOLD and FLCH, V/S or ALT HOLD.

Do not accomplish the HEAT P/S R AUX non-normal procedure, end of procedure.

(3) In Section 2, Non-Normal Procedures, add the “HEAT P/S L AUX” paragraph to include the information in figure 3 to paragraph (g)(3) of this AD.



**Figure 3 to paragraph (g)(3) – AFM Revision: Heat P/S Left Auxiliary**

**PITOT-STATIC PROBE HEAT (CONTINUED) (Required by AD 2022-15-07)**

**HEAT P/S L AUX**

The HEAT P/S L AUX message indicates that left auxiliary pitot static probe heat is failed. This procedure objective is to determine whether more than one probe heat is failed, and to select air data sources to minimize or to prevent erroneous flight instrument indications.

Disengage the autopilot.

If EICAS message HEAT P/S L AUX is displayed and HEAT P/S CAPT is blank, place the captain's air data source selector to C and the first officer's air data source selector to L. Engage the L or C autopilot, if needed. Avoid Icing Conditions. Flight in icing conditions can result in unreliable standby flight instrument indications, end of procedure.

[Disengage the autopilot.]

If EICAS messages HEAT P/S L AUX and HEAT P/S CAPT are both displayed, place the captain's air data source selector to C. Engage any autopilot, if needed. Avoid icing conditions. Flight in icing conditions can result in unreliable standby flight instrument indications.

**Note Inoperative Items:**

- Both pitot probe heaters on the left side of the airplane are inoperative – Avoid Icing Conditions.
- Autothrottle inoperative, Reference EPR is blank - Use manual throttle.
- LNAV and VNAV inoperative – Use HDG SEL or HDG HOLD and FLCH, V/S or ALT HOLD.

Do not accomplish the HEAT P/S CAPT non-normal procedure, end of procedure.

(4) In Section 2, Non-Normal Procedures, add the “HEAT P/S R AUX” paragraph to include the information in figure 4 to paragraph (g)(4) of this AD.

**Figure 4 to paragraph (g)(4) – AFM Revision: Heat P/S Right Auxiliary**

**PITOT-STATIC PROBE HEAT (CONTINUED) (Required by AD 2022-15-07)**

**HEAT P/S R AUX**

The HEAT P/S R AUX message indicates that right auxiliary pitot static probe heat is failed. This procedure objective is to determine whether more than one probe heat is failed, and to select air data sources to minimize or to prevent erroneous flight instrument indications.

Disengage the autopilot.

If EICAS message HEAT P/S R AUX is displayed and HEAT P/S F/O is blank, place the captain's air data source selector to R and the first officer's air data source selector to C. Engage the R autopilot, if needed, end of procedure.

[Disengage the autopilot.]

If EICAS messages HEAT P/S R AUX and HEAT P/S F/O are both displayed, engage the L or C autopilot, if needed. R autopilot is unreliable in icing conditions. Avoid icing conditions. Flight in icing conditions can result in unreliable first officer's flight instrument indications.

**Note Inoperative Items:**

- Both pitot probe heaters on the right side of the airplane are inoperative – Avoid Icing Conditions.
- Autothrottle inoperative, Reference EPR is blank - Use manual throttle.
- LNAV and VNAV inoperative – Use HDG SEL or HDG HOLD and FLCH, V/S or ALT HOLD.

Do not accomplish the HEAT P/S F/O non-normal procedure, end of procedure.

**(h) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle ACO 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 (i)(2) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@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, Seattle ACO 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 Huey Ton, Aerospace Engineer, Systems and Equipment Section, FAA, Los Angeles ACO Branch, 3960 Paramount Boulevard, Lakewood, CA 90712-4137; phone: 562-627-5320; email: huey.ton@faa.gov.

(2) For information about AMOCs, contact Frank Carreras, Aerospace Engineer, Systems and Equipment Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3539; email: frank.carreras@faa.gov.

**(j) Material Incorporated by Reference**

None.

Issued on July 15, 2022.

Christina Underwood,  
Acting Director, Compliance & Airworthiness Division, Aircraft Certification Service.  
[FR Doc. 2022-16607 Filed 8-10-22; 8:45 am]