[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2023-1050; Project Identifier AD-2022-00602-E]

RIN 2120-AA64

Airworthiness Directives; Honeywell International Inc. Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for all Honeywell International Inc. Model AS907-1-1A and AS907-2-1G engines. This proposed AD was prompted by reports of compressor surge, including a dual engine compressor surge, during takeoff climb out through a steep temperature inversion, causing a loss of engine thrust control. This proposed AD would require either the replacement of a certain electronic control unit (ECU) software version installed on AS907-1-1A engines with updated software or the replacement of certain ECUs installed on AS907-1-1A engines with ECUs eligible for installation. This proposed AD would also require the replacement of certain ECUs installed on AS907-2-1G engines with ECUs eligible for installation. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

• Federal eRulemaking Portal: Go to regulations.gov. Follow the instructions for submitting comments.

• Fax: (202) 493-2251.

• Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

• Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at regulations.gov by searching for and locating Docket No. FAA-2023-1050; 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 NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Joseph Costa, Aviation Safety Engineer, West Certification Branch, FAA, 3960 Paramount Boulevard, Lakewood, CA 90712; phone: (562) 627-5246; email: joseph.costa@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include "Docket No. FAA-2023-1050; Project Identifier AD-2022-00602-E" at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is

important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Joseph Costa, Aviation Safety Engineer, West Certification Branch, FAA, 3960 Paramount Boulevard, Lakewood, CA 90712. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA was notified of several reports that Honeywell International Inc. (Honeywell) Model AS907-1-1A and AS907-2-1G engines experienced compressor surge, including an AS907-1-1A dual engine compressor surge, during takeoff climb out through a steep temperature inversion, which resulted in loss of engine thrust control. The FAA determined that the installed ECU software version logic locked the engine inlet total temperature (Tt2) at 60 knots on a takeoff roll and that reference Tt2 remained locked until the aircraft reached 400 feet above ground level (AGL) or the pilot moved the throttle before reaching 400 AGL. The locked Tt2 is mathematically adjusted by the ECU software for altitude and Mach number changes as the takeoff progresses. During the climb to 400 feet AGL with a thermal inversion, the actual engine Tt2 can increase above the Tt2 that is being calculated by the ECU, which causes the compressor guide vanes' (CGVs) position to be off-schedule for the actual ambient conditions. Significant off-scheduling of the CGVs can lead to a compressor surge event. The compressor surge margin is decreased when scheduling is based on a colder Tt2 temperature than what the engine is actually running. Engine deterioration impacts compressor surge margin and can increase the likelihood of a dual engine compressor surge as the AS907-1-1A and AS907-2-1G engine fleets age. Dual engine power loss due to a temperature inversion occurring within 75 feet AGL during takeoff climb out may cause the loss of thrust control of an airplane. This condition, if not addressed, could result in reduced controllability of the airplane, loss of control of the airplane, reduced ability of the flight crew to maintain the safe flight and landing of the airplane, and loss of the airplane.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Proposed AD Requirements in this NPRM

This proposed AD would require either the replacement of a certain ECU software version installed on AS907-1-1A engines with a software version eligible for installation or the replacement of certain ECUs installed on AS907-1-1A engines with ECUs eligible for installation. This proposed AD would also require the replacement of certain ECUs installed on AS907-2-1G engines with ECUs eligible for installation. ECUs with P/N 2119576-3001 or P/N 2119576-3002 installed in AS907-2-1G engines would be eligible for reinstallation on the AS907-2-1G engines until exceeding the compliance time specified in Table 2 to paragraph (g)(2) of this AD.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 853 engines installed on airplanes of U.S. registry. The FAA estimates that 175 engines installed on AS907-2-1G engines will require replacing two ECUs.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Replace AS907-2-1G ECUs (2 per engine)	5 work-hours x $85 per hour = $425	$109,044	$109,469	$19,157,075

For either replacement of the AS907-1-1A ECU software or replacement of the AS907-1-1A ECUs, depending on the option selected by the operator to comply with this AD, the FAA estimates the following costs:

Action	Labor Cost	Parts Cost	Cost per product
Replace AS907-1-1A ECU software (2 per engine)	5 work-hours x $85 per hour = $425	$0	$425

Replace AS907-1-1A ECU (per ECU, per engine)	2 work-hours x $85 per hour = $170	$61,162	$61,332

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this proposed 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

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 this proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Would not affect intrastate aviation in Alaska, and

(3) Would 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 Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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: **Honeywell International Inc.**: Docket No. FAA-2023-1050; Project Identifier AD-2022-00602-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Honeywell International Inc. (Honeywell) Model AS907-1-1A and AS907-2-1G engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7300, Engine Fuel and Control.

(e) Unsafe Condition

This AD was prompted by reports of compressor surge, including a dual engine compressor surge, during takeoff climb out through a steep temperature inversion, which caused a loss of engine thrust control. The FAA is issuing this AD to prevent loss of engine thrust control. The unsafe condition, if not addressed, could result in reduced controllability of the airplane, loss of control of the airplane, reduced ability of the flight crew to maintain the safe flight and landing of the airplane, and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) For AS907-1-1A engines with an ECU having part number (P/N) 2119576-1011 and software version AS907_1011 installed, before exceeding the applicable compliance time in Table 1 to paragraph (g)(1) of this AD, either replace software version AS907_1001 with a software version eligible for installation; or replace the ECU with an ECU eligible for installation. Either the software or ECU must be replaced for all four ECUs installed in both airplane engines at the same time.

Note 1 to paragraph (g)(1): Guidance for removing and replacing the ECU software or removing and replacing the ECU may be found in Honeywell Service Bulletin (SB) AS907-76-9031, Revision 2, dated May 15, 2022.

Table 1 to Paragraph (g)(1) – Model AS907-1-1A Engines

Engine Operating Time Since New (TSN)	Compliance Time
Greater than 5,000 hours TSN	Within 12 months or before exceeding 400 hours time-in-service (TIS), whichever occurs first after the effective date of this AD.
3,000 to 5,000 hours TSN	Within 18 months or before exceeding 600 hours TIS, whichever occurs first after the effective date of this AD.
Fewer than 3,000 hours TSN	Within 24 months or before exceeding 800 hours TIS, whichever occurs first after the effective date of this AD.

(2) For AS907-2-1G engines with serial numbers (S/N) P130101 through P130240 that have not incorporated Honeywell SB AS907-72-9063, and for AS907-2-1G engines with S/Ns P130241 through P130336, and S/Ns P130101 through P130240 that have incorporated Honeywell SB AS907-72-9063, before exceeding the applicable compliance time in Table 2 to paragraph (g)(2) of this AD, replace any installed ECU having P/N 2119576-3001 or P/N 2119576-3002 with an ECU eligible for installation. All four ECUs installed in both airplane engines must be replaced at the same time.

Note 2 to paragraph (g)(2): Guidance for removing and replacing the ECU may be found in Honeywell SB AS907-76-9014, Revision 6, dated October 10, 2022.

Note 3 to paragraph (g)(2): Guidance for converting a standard flow compressor to a high flow compressor for improving surge margin may be found in Honeywell SB AS907-72-9063, Revision 1, dated July 31, 2019.

Table 2 to Paragraph (g)(2) – Model AS907-2-1G Engines

Engine Type	Compliance Time
Standard Flow Compressor AS907-2-1G engines (engine S/Ns P130101 through P130240 that have not incorporated Honeywell SB AS907-72-9063)	Within 2 years or before exceeding 800 hours TIS, whichever occurs first after the effective date of this AD.
High Flow Compressor AS907-2-1G engines (engine S/Ns P130241 through P130336 and engines that have incorporated Honeywell SB AS907-72-9063)	Within 7 years or before exceeding 2,800 hours TIS, whichever occurs first after the effective date of this AD.

(h) Installation Prohibition

(1) After the effective date of this AD, do not install an ECU having P/N 2119576-1011 and software version AS907_1001 in any AS907-1-1A engine.

(2) Do not install an ECU having P/N 2119576-3001 or P/N 2119576-3002 in any AS907-2-1G engine if the ECU has exceeded the compliance time specified in Table 2 to paragraph (g)(2) of this AD.

(i) Definitions

(1) For the purpose of this AD, for the AS907-1-1A engine, a "software version eligible for installation" is a software version that is not software version AS907_1001.

(2) For the purpose of this AD, for the AS907-1-1A engine, an "ECU eligible for installation" is an ECU that does not have P/N 2119576-1011.

(3) For the purpose of this AD, for the AS907-2-1G engine, an "ECU eligible for installation" is an ECU that does not have P/N 2119576-3001 or P/N 2119576-3002.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, West Certification 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 local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification branch, send it to the attention of the person identified in paragraph (k)(1) of this AD and email to: 9-ANM-LAACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

(1) For more information about this AD, contact Joseph Costa, Aviation Safety Engineer, West Certification Branch, FAA, 3960 Paramount Boulevard, Lakewood, CA 90712; phone: (562) 627-5246; email: joseph.costa@faa.gov.

(2) For service information identified in this AD that is not incorporated by reference, contact Honeywell International Inc., 111 South 34th Street, Phoenix, AZ 85034; phone: (800) 601-3099; website: myaerospace.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(l) Material Incorporated by Reference

None.

Issued on May 16, 2023.

Michael Linegang, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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