



適航指令發布單

Airworthiness Directive Issuance Form

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|--|---|---------------------|-----------|
| 民航局AD編號 AD Number | CAA-2015-06-006 | 發布日期 Date issued | 2015/6/22 |
| 適用之航空產品 Applied to (models, serial numbers or part numbers, as applicable) | This AD applies to all Honeywell International Inc. TPE331-1, -2, -2UA, -3U, -3UW, -5, -5A, -5AB, -5B, -6, -6A, -10, -10AV, -10GP, -10GT, -10P, -10R, -10T, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, -11U, -12JR, -12UA, -12UAR, and -12UHR turboprop engines. | | |
| 主旨摘要 | Engine Fuel and Control - Fuel Control Unit - Inspection | | |
| 民航局 CAA <input type="checkbox"/> 本國產品 Native products <input type="checkbox"/> 其他個案 Other | 設計國民航主關機構 Original Authorities <input checked="" type="checkbox"/> FAA <input type="checkbox"/> EASA <input type="checkbox"/> Brazil <input type="checkbox"/> Transport Canada Civil Aviation <input type="checkbox"/> DGAC <input type="checkbox"/> Germany LBA <input type="checkbox"/> CAA-NL <input type="checkbox"/> UK CAA <input type="checkbox"/> Japan CAB <input type="checkbox"/> CAA of Israel <input type="checkbox"/> Other _____ | | |
| | 設計國AD編號 Original AD number | 2015-12-04 | |
| | 1. 直接採用原AD之內容?(Is the original AD directly adopted?) <input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) ____ a. 生效日期另訂為(Re-specify the effective date as) : _____ b. 執行時限另訂為(Re-specify the compliance time or period as) : _____ 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?) <input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No) | | |
| 備註 Note | This AD replaces AD 2006-15-08 (CAA-2006-07-022). | | |
| 註： 1. AD內容後附。 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。 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)2349-6331~3, Fax：(02)2545-8464, e-mail：adcaa@mail.caa.gov.tw Note： 1. The AD text is enclosed. 2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval. 3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail：adcaa@mail.caa.gov.tw | | | |

[Federal Register Volume 80, Number 116 (Wednesday, June 17, 2015)]
[Rules and Regulations]
[Pages 34534-34538]
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2006-23706; Directorate Identifier 2006-NE-03-AD; Amendment 39-18177;
AD 2015-12-04]

RIN 2120-AA64

Airworthiness Directives; Honeywell International Inc. Turboprop Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding airworthiness directive (AD) 2006-15-08 for all Honeywell International Inc. TPE331-1, -2, -2UA, -3U, -3UW, -5, -5A, -5AB, -5B, -6, -6A, -10, -10AV, -10GP, -10GT, -10P, -10R, -10T, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, -11U, -12JR, -12UA, -12UAR, and -12UHR turboprop engines with certain Honeywell part numbers (P/Ns) of Woodward fuel control unit (FCU) assemblies, installed. AD 2006-15-08 required initial and repetitive dimensional inspections of the fuel control drives for wear, and replacement of the FCU and fuel pump. This new AD requires initial and repetitive dimensional inspections of the affected fuel control drives and insertion of certain airplane operating procedures into the applicable flight manuals. This AD was prompted by reports of loss of the fuel control drive, leading to engine overspeed, overtorque, overtemperature, uncontained rotor failure, and asymmetric thrust in multi-engine airplanes. We are issuing this AD to prevent failure of the fuel control drive that could result in damage to the engine and airplane.

DATES: This AD is effective July 22, 2015.

ADDRESSES: For service information identified in this AD, contact Honeywell International Inc., 111 S 34th Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Internet: <https://myaerospace.honeywell.com/wps/portal/!ut/>. You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2006-23706; or in person at the Docket Management Facility between

9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, 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: Joseph Costa, Aerospace Engineer, Los Angeles Aircraft Certification Office, FAA, Transport Airplane Directorate, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2006-15-08, Amendment 39-14688 (71 FR 41121, July 20, 2006), ("AD 2006-15-08"). AD 2006-15-08 applied to all Honeywell International Inc. TPE331-1, -2, -2UA, -3U, -3UW, -5, -5A, -5AB, -5B, -6, -6A, -10, -10AV, -10GP, -10GT, -10P, -10R, -10T, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, -11U, -12JR, -12UA, -12UAR, and -12UHR turboprop engines with certain Honeywell part numbers (P/Ns) of Woodward FCU assemblies, installed. The NPRM published in the Federal Register on March 19, 2014 (79 FR 15261). The NPRM was prompted by reports of loss of the fuel control drive, leading to engine overspeed, overtorque, overtemperature, uncontained rotor failure, and asymmetric thrust in multi-engine airplanes. The NPRM proposed to continue to require initial and repetitive dimensional inspections of the affected fuel control drives but would no longer require the installation of a modified FCU. The NPRM also proposed to require insertion of certain airplane operating procedures into the applicable flight manuals. We are issuing this AD to prevent failure of the fuel control drive that could result in damage to the engine and airplane.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM (79 FR 15261, March 19, 2014) and the FAA's response to each comment.

Disagreement With the Elimination of Requirement To Install a Modified FCU

Honeywell International Inc. (Honeywell) and an individual commenter indicated that the NPRM should mandate the installation of the FCU because of the benefits it provides. In addition, both commenters disagreed with the FAA that the modified FCU contributed to the rate of in-flight shutdowns (IFSDs) and that the inherent risk of repetitive inspections does not support the elimination of the overspeed governor (OSG) modification requirement of AD 2006-15-08.

We disagree. We eliminated the mandatory installation of recently certified, modified FCUs due to the numerous reports of unscheduled removals and the IFSDs caused by the recent design changes incorporated in the modified FCU. We did not change this AD.

Request Change to Costs of Compliance

Honeywell indicated that the cost for repetitive inspections is not accurate. Honeywell estimates that, without a change in design, a limitless number of inspections would be needed over the life of the engine.

We agree. Numerous fuel control drive inspections could be needed over the life of the engine. The Costs of Compliance paragraph was changed to reflect an annual cost of compliance which was based on the fleet costs as reflected in the NPRM.

Request To Change the Applicability

Honeywell requested that engines in Group #4 reflect the engines associated with FCU assembly P/Ns being added to the Applicability paragraph for added clarity.

We agree. We changed Table 1 to paragraph (c) of this AD to clarify the Group #4 engine models as follows: "Group #4 TPE331-3U, -3UW, -5, -5B, -6, -6A, and -10T".

Request To Change the Applicability

Honeywell requested that clarification be provided for FCU P/Ns of Woodward fuel control units. The Applicability paragraph refers to P/Ns as Woodward P/Ns when the listed P/Ns are Honeywell P/Ns for Woodward FCUs.

We agree. We changed paragraph (c) of this AD to read, ". . . turboprop engines with Honeywell part numbers (P/Ns) for Woodward fuel control unit (FCU) assemblies listed in Table 1 to paragraph (c) of this AD, installed."

Request Redundant Term Be Removed From the Compliance

Honeywell requested that "spline" be removed from the fuel control drive inspection as stated in the Compliance paragraph. This change is consistent with the Compliance and the Definitions paragraphs in AD 2006-15-08.

We agree. We changed paragraphs (e)(1)(i) and (e)(2)(ii) to read: "Inspect the fuel control drive for wear."

Request To Change Related Information

Honeywell requested that the publications listed in Related Information, paragraph (i)(2), be referred to as airplane publications and not as obtainable from Honeywell International. The reason for this request is that the Airplane Flight Manual (AFM), the Pilot Operating Handbook (POH), and the Manufacturer's Operating Manual (MOM) are airplane publications and cannot be obtained from Honeywell.

We agree that the AFM, POH, and the MOM are airplane manuals. As a result of reviewing this comment, we decided that mentioning all applicable owners of airplane manuals is unnecessary in the related information section of this AD.

Request To Change Airplane Operating Procedures

Honeywell requested that reference to the "Loss of Fuel Control Drive" be changed to "Loss of the drive between the engine driven fuel pump and the fuel control governor." This change would eliminate confusion between the loss of the accessory drive gearing to the fuel pump with the loss of the fuel control drive.

We agree that the term "fuel control drive" is not a term used in airplane operating procedures. We removed the term "fuel control drive" from the Airplane Operating Procedures in this AD and made other changes to simplify and clarify Figure 1 to paragraph (e) of this AD.

Request To Change Airplane Operating Procedures

One commenter requested a revision of the Operating Procedure "Warnings" in the NPRM to clearly address overspeed during start and immediately after start before the propeller has been removed from the start locks. This change would provide clarification and enhance safety.

We disagree. The Loss of Fuel Control Drive causing rapid, uncommanded acceleration during engine start is as unsafe as the Loss of Fuel Control Drive immediately after start when the engine is stable before the propeller is removed from the start locks. However, since the observed effects for these two conditions are the same, we combined both instances as "Rapid, Uncommanded Acceleration During Engine Start".

Request To Change Airplane Operating Procedures

The commenter requested changing the operating procedures for when the propeller is off the start locks to address the rapid uncommanded, uncontrolled increase in revolutions-per-minute (RPM). The commenter believes that if the fuel control drive fails when the propeller is off the start locks the engine's propeller governor will control and stabilize the engine RPM.

We disagree with the commenter's justification because test data has shown that the engine propeller governor will not control and stabilize the engine RPM if the fuel control drive fails when the propeller is off the start locks. A rapid, uncommanded, uncontrolled increase in RPM is most evident during partial or full reverse. We simplified the operating procedure by removing the statement "Power—Move power lever to or toward flight idle as required to maintain engine limits" with the propeller off the start locks as proposed in the NPRM. We changed Figure 1 to paragraph (e) of this AD by adding the following: "Engine shut down—Move condition lever to EMERGENCY STOP".

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Costs of Compliance

We estimate that this AD will affect 2,250 engines installed on airplanes of U.S. registry. We estimate that it will take 8 hours per engine to perform an FCU inspection. The average labor rate is \$85 per hour. Due to the more frequent inspections proposed by this AD, we estimate 10% of affected engines will require FCU assembly stub shaft replacement, and fuel pump or fuel control repair. We also estimate that repairs will not exceed \$10,000 per engine. Based on these figures, we estimate the cost of this AD on U.S. operators to be \$525,587 per year.

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.

We are 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

We have determined that 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) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) 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.

Adoption of 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 removing airworthiness directive (AD) 2006-15-08, Amendment 39-14688 (71 FR 41121, July 20, 2006), and adding the following new AD:



CORRECTED: The AD number in the preamble was incorrectly stated as 2014-12-04. This copy has been corrected.

2015-12-04 Honeywell International Inc.: Amendment 39-18177454851; Docket No. FAA-2006-23706; Directorate Identifier 2006-NE-03-AD.

(a) Effective Date

This AD is effective July 22, 2015.

(b) Affected ADs

This AD replaces AD 2006-15-08, Amendment 39-14688 (71 FR 41121, July 20, 2006).

(c) Applicability

This AD applies to all Honeywell International Inc. TPE331-1, -2, -2UA, -3U, -3UW, -5, -5A, -5AB, -5B, -6, -6A, -10, -10AV, -10GP, -10GT, -10P, -10R, -10T, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, -11U, -12JR, -12UA, -12UAR, and -12UHR turboprop engines with Honeywell part numbers (P/Ns) for Woodward fuel control unit (FCU) assemblies listed in Table 1 to paragraph (c) of this AD, installed.

Table 1 to Paragraph (c)–Affected FCU Assembly P/Ns

| Group No. | Engine | FCU assembly P/Ns |
|------------------|---|--|
| 1 | TPE331-1, -2, and -2UA | P/N 869199-13, -20, -21, -22, -23, -24, -25, -26, -27, -28, -29, -31, -32, -33, -34, and -35. |
| 2 * | TPE331-1, -2, and -2UA | P/N 869199-9, -10, -11, -12, -14, -16, -17, and -18. |
| 3 | TPE331-3U, -3UW, -5, -5A, -5AB, -5B, -6, -6A, -10AV, -10GP, -10GT, -10P, and -10T | P/N 893561-7, -8, -9, -10, -11, -14, -15, -16, -20, -26, -27, and -29; or P/N 897770-1, -3, -7, -9, -10, -11, -12, -14, -15, -16, -25, -26, and -28. |
| 4 * | TPE331-3U, -3UW, -5, -5B, -6, -6A, and -10T | P/N 893561-4, -5, -12, and -13 or P/N 897770-5, -8, and -13. |
| 5 | TPE331-10, -10R, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, -11U, -12JR, -12UA, -12UAR, and -12UHR | P/N 897375-2, -3, -4, -5, -8, -9, -10, -11, -12, -13, -14, -15, -16, -17, -19, -21, -24, -25, -26, and -27; or P/N 897780-1, -2, -3, -4, -5, -6, -7, -8, -9, -10, -11, -14, -15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26, -27, -30, -32, -34, -36, -37, and -38; or P/N 893561-17, -18, and -19. |

* New/added FCU assembly P/Ns

(d) Unsafe Condition

We are issuing this AD to prevent failure of the fuel control drive that could result in damage to the engine and airplane.

(e) Compliance

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

(1) Inspection of Engines With FCU Assembly P/Ns in Groups 2 and 4

For FCU assembly P/Ns in Groups 2 and 4 listed in Table 1 to paragraph (c) of this AD:

(i) At the next scheduled inspection of the fuel control drive, or within 500 hours-in-service (HIS) after the effective date of this AD, whichever occurs first, inspect the fuel control drive for wear.

(ii) Thereafter, re-inspect the fuel control drive within every 1,000 HIS since-last-inspection (SLI).

(2) Inspection of Engines With FCU Assembly P/Ns in Groups 1, 3, and 5

For FCU assembly P/Ns in Groups 1, 3, or 5 listed in Table 1 to paragraph (c) of this AD:

(i) If on the effective date of this AD the FCU assembly has 950 or more HIS SLI, inspect the fuel control drive for wear within 50 HIS from the effective date of this AD.

(ii) If on the effective date of this AD the FCU assembly has fewer than 950 HIS SLI, inspect the fuel control drive for wear before reaching 1,000 HIS.

(iii) Thereafter, re-inspect the fuel control drive for wear within every 1,000 HIS SLI.

(3) Airplane Operating Procedures

Within 60 days after the effective date of this AD, insert the information in Figure 1 to paragraph (e) of this AD, into the Emergency Procedures Section of the Airplane Flight Manual (AFM), Pilot Operating Handbook (POH), and the Manufacturer's Operating Manual (MOM).

Figure 1 to Paragraph (e) – Airplane Operating Procedures

NOTE

Procedures in dotted line boxes are immediate action items to be performed by the pilot / flight crew.

**RAPID, UNCOMMANDED ACCELERATION DURING
ENGINE START (Propeller ON Start Locks)**

- Engine Start – Abort Immediately – Move condition lever to EMERGENCY STOP.

WARNING

Do not attempt to re-start engine. Report to maintenance.

ON GROUND or IN FLIGHT:

**RAPID, UNCOMMANDED INCREASE IN RPM, TORQUE,
FUEL FLOW AND/OR TURBINE TEMPERATURE
(Propeller OFF Start Locks)**

- Identify Malfunctioning Engine (multi-engine airplane) – Cross check for high torque, RPM, fuel flow, and turbine temperatures.
- Engine shut down - Move condition lever to EMERGENCY STOP.

WARNING

Never retard the power levers aft of flight idle in flight or on the ground.

WARNING

Do not attempt an engine re-start. Report to maintenance.

(f) Optional Terminating Action

Replacing the affected FCU assembly with an FAA-approved FCU assembly P/N not listed in this AD is terminating action for the initial and repetitive inspections required by this AD, and for inserting the information in Figure 1 to paragraph (e) of this AD into the AFM, POH, and MOM.

(g) Definitions

For the purposes of this AD:

- (1) The "fuel control drive" is a series of mating splines located between the fuel pump and fuel control governor.
- (2) The fuel control drive consists of four drive splines: The fuel pump internal spline, the fuel control external "quill shaft" spline, and the stub shaft internal and external splines.

(h) Alternative Methods of Compliance (AMOCs)

The Manager, Los Angeles Aircraft Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request.

(i) Related Information

(1) For more information about this AD, contact Joseph Costa, Aerospace Engineer, Los Angeles Aircraft Certification Office, FAA, Transport Airplane Directorate, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

(2) Information pertaining to operating recommendations for affected engines after a fuel control drive failure is contained in Honeywell International Inc., Operating Information Letter (OIL) OI331-12R6, dated May 26, 2009, for multi-engine airplanes; and in OIL OI331-18R4, dated May 26, 2009, for single-engine airplanes. Information on fuel control drive inspection can be found in Section 72-00-00 of the applicable TPE331 maintenance manuals. These Honeywell International Inc., OILs and the TPE331 maintenance manuals, which are not incorporated by reference in this AD, can be obtained from Honeywell International Inc., using the contact information in paragraph (i)(3) of this AD.

(3) For service information identified in this AD, contact Honeywell International Inc., 111 S. 34th Street, Phoenix, AZ 85034-2802; Internet: <https://myaerospace.honeywell.com/wps/portal/!ut>; phone: 800-601-3099.

(4) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(j) Material Incorporated by Reference

None.

Issued in Burlington, Massachusetts, on June 5, 2015.
Ann C. Mollica,
Acting Directorate Manager, Engine & Propeller Directorate,
Aircraft Certification Service.