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LENTOTURVALLISUUSHALLINTO
FLIGHT SAFETY AUTHORITY**LENTOKELPOISUUSMÄÄRÄYS**
AIRWORTHINESS DIRECTIVE**M 2166/94****13.6.1994**

Lentokelpoisuusmääräyksen noudattaminen on ilma-aluksen jatkuvan lentokelpoisuuden edellytyksenä. Määräyksen mukaisen toimenpiteen saa tehdä ja kuitata, ellei määräyksessä toisin mainita se jolla ilmailumääräyksen AIR M2-1, AIR M4-1, AIR M5-3, AIR M5-10 tai AIR M6-3 mukaisesti on oikeus tehdä kyseisen ilma-aluksen tai -välineen määräaikaishuoltoja. Tehty toimenpide on merkittävä ilma-aluksen teknilliseen päiväkirjaan tai purjelentokoneen matkapäiväkirjaan. Lentokelpoisuusmääräys on annettu ilmailulain (595/64) 14§:n ja ilmailuasetuksen (525/68) 20§:n perusteella.

AlliedSignal Inc (Garret). TFE731-moottorin kunnon seuranta

Koskee: AlliedSignal Inc Model TFE731-2A, -3, -3A, -3R, -3AR, -3B ja 3BR-moottoreita, joiden ensimmäisen vyöhykkeen matalapaineturbiinin suuttimien osanumero on 3072842-1 tai 3072319-1:stä - 8:aan.

Viite: FAA AD 94-07-03

Voimaantulo: 30.6.1994

Voimassaoloaika: Tämä määräys on voimassa toistaiseksi.

Toimenpiteet:

- A. Revisoi ennen lentotoiminnan jatkamista lentokäsikirjan rajoitusosan moottorin kunnon ja lentoarvojen seurantaa koskeva liite tämän määräyksen liitteenä olevan AD 94-07-03 kohdan (a) mukaisesti.
- B. Valvo moottorin kuntoa AD 94-07-03 kohtien (b) ja (c) mukaisesti.
- C. Vaihda matalapaineturbiinin ensimmäisen vyöhykkeen suuttimen tiiviste A5 uuden malliseen AD 94-07-03 kohdan (d) mukaisesti 150 lentotunnin kuluessa, jos moottorin käyntiaika on yli 500 tuntia. Jos moottorin käyntiaika on alle 500 tuntia, vaihda tiiviste ennen kuin moottorin kokonaiskäyntiaika ylittää 650 tuntia. Kun tiiviste on vaihdettu, ei moottorin monitorointia tarvitse tehdä AD 94-07-03:n mukaisesti ja lentokäsikirjan liite voidaan poistaa.

Tämä määräys kumoaa muutosmääräyksen M1950/92.

LIITE AD 94-07-03 (4 sivua)

AIRWORTHINESS DIRECTIVE

FLIGHT STANDARDS SERVICE
REGULATORY SUPPORT DIVISION
P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125-0460



U.S. Department
of Transportation
**Federal Aviation
Administration**

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, Part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference FAR Subpart 39.3).

94-07-03 AlliedSignal, Inc.: Amendment 39-8861. Docket 93-ANE-49. Supersedes priority letter AD 92-12-09.

Applicability: AlliedSignal, Inc. Model TFE731-2A, -3, -3A, -3R, -3AR, -3B, and -3BR turbofan engines that have first stage low pressure (LP) turbine nozzles, Part Number (P/N) 3072842-1 or P/N's 3072319-1 through -8, installed. These engines are installed on but not limited to Avions Marcel Dassault Falcon 50, AiResearch Aviation Company 731 Jetstar, Lockheed 1329-25 (Jetstar II), Israel Aircraft Industries Ltd. 1124 series (Westwind) and 1125 Westwind Astra, British Aerospace DH/HS/BH 125 series, Learjet 55 series, Cessna 650 Citation III series, and Sabreliner NA265-65 (Sabreliner 65 and 65 series) aircraft.

Compliance: Required as indicated, unless accomplished previously.

To prevent uncontained failure of the first stage LP turbine disk, accomplish the following:

(a) Prior to further flight revise the Limitations Section of the FAA-approved Airplane Flight Manual (AFM) to include the following paragraphs (1) through (4) relating to engine and flight data monitoring. This may be accomplished by inserting a copy of this AD in the AFM.

"ENGINE AND FLIGHT DATA MONITORING"

(1) If any engine has more than 500 hours time in service since new (TSN), record the flight data set forth in paragraph (2) once every two flights while meeting the following conditions:

- a. matched low pressure rotor (N1) speed;
- b. turn engine anti-ice off (consistent with safe operation); and
- c. attain a stabilized cruise speed for five minutes or longer.

NOTE: If flight operations do not permit all of these conditions to be met, the engine to engine comparison data may be unreliable.

(2) When the conditions specified in paragraph (1) are met, record the following flight data and retain this data for six months:

- a. date of flight;
- b. aircraft altitude or flight level;
- c. outside static air temperature in degrees celsius (°C);
- d. Mach number;
- e. engine N1 speed for each engine;
- f. engine high pressure rotor (N2) speed for each engine;
- g. fuel flow for each engine; and
- h. interstage turbine temperature (ITT) for each engine.

(3) Verify N1 rotation during engine start by allowing N2 to increase to approximately 12 to 15 percent and confirm N1 rotation prior to fuel initiation. If no N1 rotation is observed, discontinue further attempts at engine start.

(4) Check for rubbing noises and free rotation of the N1 spool following each engine shutdown. If any rubbing noises are detected, or if the N1 spool locks up, discontinue further flight."

(b) When engine and flight data monitoring is required by the AFM revision of paragraph (a) of this AD, accomplish the following:

(1) After each flight, calculate the difference (i.e., No. 1 minus No. 2, No. 1 minus No. 3, and No. 1 minus No. 4) between the engines' ITT, N2 speed, and fuel flow readings for each flight having recorded data. Compare these differences to the differences calculated from previous flights.

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(2) Discontinue further flight if a change of 20°C or more occurs in the ITT difference between two engines, (on three and four engine airplanes compare No. 2, No. 3 and No. 4 engine parameters to the No. 1 engine) with the last ten flights having recorded data. Flight operation can be continued when the cause of the ITT temperature shift has been determined and appropriate corrective action has been accomplished. Engine and flight data monitoring must be continued upon return to flight operations.

NOTE: A suspect engine may indicate an increase in ITT temperature and an increase in N2 speed greater than 1% and an increase in fuel flow to a lesser degree with respect to the other normal engine(s).

Additional guidance and information regarding flight data collection, trend monitoring, and corrective actions, may be obtained from Allied-Signal Aerospace Company, Garrett Engine Division, Operating Information Letter No. OI 731-13, Revision C, dated November 20, 1992.

(c) Discontinue further flight if no N1 rotation is observed during engine start, or if engine rubbing noises are detected or the N1 spool locks up after engine shutdown. Flight operation can be continued when the cause of the N1 rotor lockup or engine rubbing noises has been determined and appropriate corrective action has been accomplished. Engine and flight data monitoring must be continued upon return to flight operations.

(d) Replace the A5 seal assembled in affected first stage LP turbine nozzles and install a redesigned A5 seal in accordance with the Accomplishment Instructions of Allied-Signal Aerospace Company, Garrett Engine Division, Service Bulletin (SB) No. TFE731-72-3502, Revision 2, dated March 15, 1993, SB No. TFE731-72-3502, Revision 1, dated December 21, 1992, or SB No. TFE731-72-3502, Original, dated November 25, 1992; or SB No. TFE731-72-3503, Revision 1, dated December 21, 1992; or AlliedSignal, Inc. SB No. TFE731-72-3509, dated January 4, 1994, as applicable, as follows:

**Time in Service Since
New (TSN) on the Effective
Date of this AD**

Replacement Schedule

500 hours TSN or more

Within 150 hours time in service (TIS) after the effective date of this AD.

Less than 500 hours TSN

Prior to accumulating 650 hours TSN

Installation of the redesigned A5 seal constitutes terminating action to the engine and flight data monitoring and AFM revision required by this AD.

(e) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Los Angeles Aircraft Certification Office. The request should be forwarded through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Los Angeles Aircraft Certification Office.

NOTE: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Los Angeles Aircraft Certification Office.

(f) Special flight permits may be issued in accordance with 14 CFR 21.197 and 21.199 to operate the aircraft to a location where the requirements of this AD can be accomplished.

(g) The replacement of the A5 seal shall be done in accordance with the following service bulletins:

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| Document No. | Pages | Revision | Date |
|--|---|--|--|
| Allied-Signal Aerospace Company, Garrett Engine Division SB No. TFE731-72-3502 | 1-18 | 2 | March 15, 1993 |
| Total pages: 18. | | | |
| Allied-Signal Aerospace Company, Garrett Engine Division SB No. TFE731-72-3502 | 1-16 | 1 | December 21, 1992 |
| Total pages: 16. | | | |
| Allied-Signal Aerospace Company, Garrett Engine Division SB No. TFE731-72-3502 | 1-14 | Original | November 25, 1992 |
| Total pages: 14. | | | |
| Allied-Signal Aerospace Company, Garrett Engine Division SB No. TFE731-72-3503 | 1 2-3 4 5 6 7-9 10-16 | 1 Original 1 Original 1 Original 1 | December 21, 1992 December 9, 1992 December 21, 1992 December 9, 1992 December 21, 1992 December 9, 1992 December 21, 1992 |
| Total pages: 16. | | | |
| AlliedSignal, Inc. SB No. TFE731-72-3509 | 1-10 | Original | January 4, 1994 |
| Total pages: 10. | | | |

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from AlliedSignal Inc., Aviation Services Division, Data Distribution, Dept. 64-3/2102-1M, P.O. Box 29003, Phoenix, AZ 85038-9003. Copies may be inspected at the FAA, New England Region, Office of the Assistant Chief Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

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- (h) This amendment supersedes priority letter AD 92-12-09, issued June 8, 1992.
- (i) This amendment becomes effective on June 6, 1994.

FOR FURTHER INFORMATION CONTACT:

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