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|  AIRWORTHINESS DIRECTIVE No F-2005-014 | Distribution: | Issue date: | Page : |
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| Direction générale de l'aviation civile France GSAC publication | This Airworthiness Directive is published by the DGAC on behalf of EASA, Airworthiness Authority of the State of Design for the affected product, part or appliance. | | <i>Translation of « Consigne de Navigabilité » of same number. In case of difficulty, reference should be made to the French issue.</i> |
| | No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive, unless otherwise agreed with the Authority of the State of Registry. | | |
| Corresponding foreign Airworthiness Directive(s): Not applicable | | Airworthiness Directive(s) replaced: 2001-527 cancelled by its Revision 3 | |
| Person in charge of airworthiness: AIRBUS SAS | | Type(s): A330 aircraft | |
| Type certificate(s) No. A.004 TCDS No A.004 | | | |
| ATA chapter: 27 | Subject: Flight controls - Trimmable horizontal stabilizer actuator (THSA) - Operational life limit | | |

1. EFFECTIVITY:

AIRBUS A330 aircraft, all certified models, all serial numbers.

2. REASONS:

The life limits of the aircraft flight controls actuators and in particular of the THSA given in the Revision 8 of AMM Chapter 05-11-00 Configuration 1 (dated September 15, 1999) are not addressed by the definition of the structural life limits of Safe Life items as defined in Section 9.1 (Life limits/Monitored parts) of the Airworthiness Limitations Section (located in the MPD Section 9) which replaces the aircraft AMM Chapter 05-11.

As a result these life limits are removed from the above documents and integrated into this Airworthiness Directive (AD).


2.1. The previous AD 2001-527 R2 was addressing the life limits for these THSA taking into account the reminded following history:

The operational life limits of the THSA Part Number (PN) 47147-200 to 47147-350 are originally due to an excessive chrome wear on the screw which would have led to long term fatigue cracks if not corrected.

During the overhaul of these THSA a higher than anticipated No-Back Aluminum thrust bearing cage wear has been discovered which may have led to an aircraft critical situation if not corrected.

The aim of the AD 2001-527 was to require the modification of the THSA when they have reached their operational life limit, by AIRBUS Service Bulletin (SB) A330-27-3052. This SB consists in modifying the THSA by the supplier GOODRICH, in particular to replace the Aluminum No-Back thrust bearings cages by bronze ones.

In addition, this AD 2001-527 gave the temporary life limits of the last certified PN.

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The reason for Revision 1 of the AD 2001-527 was to clarify the life limits applicable to THSA PN 47147-400, 47147-500 and 47172-300, depending on whether the THSA was installed as a new equipment, or through retrofit of an older standard.

The aim of the Revision 2 of the AD 2001-527 was to extend the life limits of the THSA PN 47172 and 47172-300 according to endurance test result and to specify a calendar time for the modification of THSA PN 47147-200 up to 47147-350, already mentioned in the CN 2002-414 R1.

2.2. The aim of this new AD is to take into account the last test results by:

- Increasing the life limit for PN 47147-500 previously limited to 4,000 Flight Cycles (FC)/6,000 Flight Hours (FH),
- Increasing the life limit for PN 47172-300 which was previously limited to 20,000 Flight Cycles (FC)/30,000 Flight Hours (FH).

3. MANDATORY ACTIONS AND COMPLIANCE TIMES:

The demonstrated life limits applicable to the last certified PN's are given in the here below table, pending a revision of this AD further to additional tests. A follow-up of the times accumulated (FH/FC) by these THSA on aircraft since their origin and/or since their retrofit is necessary. These equipments have to be removed from aircraft if the life limit is reached before an extended demonstrated life is available.

| THSA PN | LIFE LIMITS ON A330 |
|---|--|
| 47147-500** (for equipment originally manufactured as PN 47147-400) | A330-200: Not applicable A330-300: 24, 000 FC or 36, 000 FH, accumulated since first installation on aircraft, whichever occurs first. |
| 47147-500** (for equipment retrofitted into PN 47147-400 by SB A330-27-3052) | A330-200: Not applicable A330-300: 24, 000 FC or 36, 000 FH, since retrofit into PN 47147-400 through SB A330-27-3052, whichever occurs first. |
| 47172-300 *** (equipment installed new or retrofitted by SB A330-27-3085) | TEMPORARY* LIFE LIMITS ON A330 A330-200: 30, 000 FC or 45, 000 FH accumulated since first installation on aircraft, whichever occurs first. A330-300: 38, 400 FC or 57, 600 FH accumulated since first installation on aircraft, whichever occurs first. |

* temporary pending completion of tests.

** PN 47147-500 has been rendered mandatory by AD 2002-414 R1/SB A330-27-3093 with a compliance time of 31 July 2004, consequently all PN 47147-XXX have been retrofitted into PN 47147-500. Previously, the AD 2001-527 was changing all PN47147-XXX into PN 47147-400 according to the following wording:

For the THSA PN 47147-200, -210, -213, -300, -303, -350, the operational life limit is 6,000 FC or 21,000 FH. Before the first of these 2 limits is reached or before July 31, 2004, whichever occurs first, apply SB A330-27-3052 (evolution to PN 47147-400).

*** PN 47172-300 had been rendered mandatory by AD 2002-414 R1/SB A330-27-3085 with a compliance time of 31 Dec 2003. Consequently, all PN 47172-XXX have been retrofitted into PN 47172-300.



Note 1: For parts that have been used in several aircraft models or type configurations having different life limit values, calculate the remaining life potential in the present configuration (i) using the following formula:

where:

$$Tr_i = \left[1 - \sum \left(\frac{Ca_j}{Cp_j} \right) \right] \times Cp_i$$

Tr_i = remaining time (FC/FH) for configuration i (present configuration).

Ca_j = time (FC/FH) accumulated on previous configuration(s) j.

Cp_j = life limitation (FC/FH) in previous configuration(s) j.

Cp_i = life limitation (FC/FH) in present configuration i.

Calculated total life potential = $(\sum Ca_j + Tr_i)$

When using the above formula Tr_i , Ca_j , Cp_j , Cp_i are expressed in the same unit (FC or FH): units can not be mixed in the same calculation.

After this calculation, if the life accumulated by the part in FC or in FH exceeds the calculated total life potential in FC or in FH, remove the part.

If the life accumulated by the part both in FC and in FH does not exceed the calculated total life potential in FC and in FH, plan to remove the part in order to comply with both calculated total life potentials in FC and in FH.

These calculations are required every time a part is moved from an installation to another having different limit values.

Note 2: Life limits applicable to A340 are indicated in AD F-2005-015.

4. REFERENCE PUBLICATIONS:

AIRBUS Service Bulletin A330-27-3052

AIRBUS Service Bulletin A330-27-3085

AIRBUS Service Bulletin A330-27-3093

Airworthiness Directive 2002-414 R1

(Any further approved revision of these documents is acceptable).

5. EFFECTIVE DATE:

January 29, 2005.

6. REMARK:

For questions concerning the technical contents of this AD's requirements, contact:

AIRBUS SAS – Airworthiness office - EAL - Fax : 33 5 61 93 45 80.

7. APPROVAL:

This AD is approved under EASA reference No 2005-497 dated January 12, 2005.