GSAC

# AIRWORTHINESS DIRECTIVE

**released by DIRECTION GENERALE DE L'AVIATION CIVILE**

*Inspection and/or modifications described below are mandatory. No person may operate a product to which this Airworthiness Directive applies except in accordance with the requirements of this Airworthiness Directive.*

**Translation of 'Consigne de Navigabilité' ref. : 2001-526(B) R2**
**In case of any difficulty, reference should be made to the French original issue.**



**AIRBUS**

**A340 aircraft**

THSA - Operational life limit (ATA 27)

## 1. APPLICABILITY:

AIRBUS A340 aircraft, models -211, -212, -213, -311, 312 and -313, all serial numbers.

## 2. REASONS:

The life limits of the aircraft flight controls actuators and in particular of the THSA given in the Revision 6 of AMM Chapter 05-11-00 Configuration 1 (dated August 27, 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).

The operational life limits of the THSA P/N 47147-100 to 47147-350 are originally due to an excessive chrome wear on the screw which would lead to long term fatigue cracks if not corrected.

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

The aim of this AD is to require the modification of the THSA when they have reached their operational life limit, by AIRBUS INDUSTRIE Service Bulletin (SB) A340-27-4059. This SB consists in modifying the THSA by the supplier TRW, in particular to replace the No-Back ball bearings.

In addition, this AD gives the temporary life limits of the last certified P/N.

The reason for Revision 1 of this AD was to clarify the life limits applicable to THSA P/N 47147-400, 47147-500 and 47172-300, depending on whether the THSA is installed as a new equipment, or through retrofit of an older standard. This differentiation has been introduced in paragraph 3.

The aim of this Revision 2 is to extend the life limits of the THSA P/N 47172-300 according to the result of an endurance test and to specify calendar time for the modification of THSA P/N 47147-200 up to 47147-350, already mentioned in the CN 2002-415(B) R1.

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**3. COMPLIANCE:**

The following actions are rendered mandatory from the effective date of this AD at original issue :

- For the THSA P/N 47147-200, -210, -213, -300, -303, -350 the operational life limit is 6,000 Flight Cycles (FC) or 27,000 Flight Hours (FH). Before the first of these 2 limits is reached or before July 31, 2004,
  whichever occurs first, apply SB A340-27-4059 (evolution to P/N 47147-400).

- The demonstrated life limits applicable to the last certified P/N'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 since their origin and/or since their retrofit is necessary.

| THSA P/N | TEMPORARY* LIFE LIMITS ON A340 |
|---|---|
| 47147-400 (equipment installed new) | 20,000 FC or 80,000 FH, whichever occurs first |
| 47147-400 (retrofitted equipment) | 20,000 FC or 80,000 FH, since retrofit through SB A340-27-4059, whichever occurs first |
| 47147-500** (equipment installed new) | 4,000 FC or 16,000 FH, whichever occurs first |
| 47147-500** (retrofitted equipment) | 4,000 FC/16,000 FH, since retrofit through SB A340-27-4099, or 20,000 FC/80,000 FH accumulated since first installation on aircraft, whichever occurs first. |
| 47172 | 20,000 FC or 80,000 FH, whichever occurs first |
| 47172-300 (equipment installed new) | 20,000 FC or 80,000 FH, whichever occurs first |
| 47172-300 (retrofitted equipment ) | 20,000 FC/80,000 FH, since retrofit through SB A340-27-4089, or accumulated since first installation on aircraft, whichever occurs first. |

* temporary pending completion of tests.
** P/N 47147-500 has been certified on June 27, 2002 and rendered mandatory by AD 2002-415(B) R1.

**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:

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

where:

$Tr_i$ = remaining time (flight cycles/flight hours) for configuration i (present configuration).
$Ca_j$ = time (flight cycles/flight hours) accumulated on previous configuration(s) j.
$Cp_j$ = life limitation (flight cycles/flight hours) in previous configuration(s) j.
$Cp_i$ = life limitation (flight cycles/flight hours) in present configuration i.



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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 (flight cycles or flight hours): units can not be mixed in the same calculation.

After this calculation, if the life accumulated by the part in flight cycles or in flight hours exceeds the calculated total life potential in flight cycles or in flight hours, remove the part. If the life accumulated by the part both in flight cycles and in flight hours does not exceed the calculated total life potential in flight cycles and in flight hours, plan to remove the part in order to comply with both calculated total life potentials in flight cycles and in flight hours.

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 THSA installed on A330 are indicated in AD 2001-527(B) at its latest revision.

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REF.: AIRBUS INDUSTRIE Service Bulletin A340-27-4059
AIRBUS INDUSTRIE Service Bulletin A340-27-4089
AIRBUS INDUSTRIE Service Bulletin A340-27-4099
(Any later approved revision is acceptable).

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This Revision 2 replaces AD 2001-526(B) R1 issued on January 23, 2002.

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**EFFECTIVE DATES :**

**Original issue : DECEMBER 08, 2001**
**Revision 1 : FEBRUARY 02, 2002**
**Revision 2 : OCTOBER 26, 2002**