

Life Limited Parts

AMP Reference: IAL/330/T Revision 00 Initial

Life limited Parts / Safe Life Items

This section of the Maintenance Programme consists of 'Life-Limited Parts' (LLP) or 'Safe Life Items' SLI and the 'Time Controlled Components'.

As per (Regulation (EU) No 1321/2014), M.A 305, term 'life-limited part' embraces any component/part for which the maintenance schedule of the aircraft maintenance programme requires the permanent removal from service when, or before, the specified mandatory life limitation in accordance with Commission Regulation (EU) No 748/2012 if any of the applicable parameters is reached.

Engines

Engine Limitations of life-limited parts are controlled by the engine manufacturers and are published in the Rolls Royce ATA 05 of the Time Limits Manual for Rb211 Trent 700 Series Engines Installed in The Airbus Industrie A330 Aircraft (T-TRENT-7RR) 05-10-01 Date 08/OCT/2021

Table Terminology Used:

Part numbers - The part numbers given in this section are those which can be seen in the Illustrated Parts Catalogue (IPC) for the Critical part or Critical Group A part or assembly. They are identified by part description, Chapter/Section/Subject and by Fig/item number in the SUBTASK titles. The IPCs supplied to airlines are customized or are for some engine marks only. They will not always contain all the part numbers given in this section.

Life limits - Unless specified differently the life limits given in this section are total lives which must be counted continuously for each part from the start of its first operation. This must also be done if a Service Bulletin or related Repair is done during the life of a part, if the work done extends the total life of the part or not. The life completed before the Service Bulletin or Repair must be subtracted from the total declared life to give the life remaining.

Part numbers with a prefix of one or more letters, for example BCFW12345, shows that a Service Bulletin or Repair was done during the life of the part. The prefix is only to show an interchangeability effect with related parts. The declared life will be the same as that for the basic part number (FW12345). The prefix letters are not given in this section.

Category

- Critical Group A parts are divided into three Categories:
- Category 1 - Disks.
- Category 2 - This category is not used for the Trent 500.
- Category 3 - Shafts

The Category of each part is listed against each part number. Airworthiness Authority approval to use Extended Lives will be for specified categories of parts. The extended life limit must only be used for the Category of part that is specified.

Auxiliary Power Unit

APU Limitations of life-limited parts are controlled by the engine manufacturers and are published in the APU GTCP331-200 Component Maintenance Manual, ATA NO. 49-22-13, revised December 13, 2013, Revision No. 21 Dated January 15, 2015

Landing Gear

The following documents contain a complete listing of Landing Gear and Support Structure safe life parts together with System Equipment Maintenance Requirements:

ALS Part 1 Safe Life Airworthiness Limitation Items (SL-ALI)

ALS Part 4 System Equipment Maintenance Requirements (SEMR)

ALS Part 1 SLI are covered in the LLP Tasks spreadsheet Landing Gear Tab.

1 LIFE LIMITS (LL)

ALS Part 1 manual contains, in SECTION 4, components having a life limit due to failure during fatigue tests. Their Part Numbers (PNR) are labelled “LL” in the table.

2 DEMONSTRATED FATIGUE LIVES (DF)

ALS Part 1 manual contains, in SECTION 4, components having a demonstrated fatigue life without failure. Their PNR are labelled “DF” in the table.

For these components, the life limitation provided (in usage parameters, e.g.: Flight Hours, Landings, etc. as applicable) may evolve depending on fatigue tests result. If the component fails, its Part Number (PNR) will be at last labelled “LL” in the table.

3 BASIC RULES

3.1 CLOCK STARTING POINT FOR SAFE LIFE ALI

The starting point is the date at which the component accomplishes the first flight for which it will undertake its intended function, unless otherwise stated.

The life limitation for a PNR is to be counted from the first flight of the component, unless otherwise stated.

Note: The clock is not reset for in-service PNR evolution, unless otherwise stated.

3.2 TRACEABILITY

Safe Life Airworthiness Limitation Items (SL-ALI) have to be considered as “service life limited components” or “life-limited parts” and therefore it is necessary to assure

traceability and monitoring of these components as per EASA Part M.A.305 - Aircraft continuing airworthiness record system.

Where the complete life history of a component/item is not known, Operators are requested to refer to the In-Service Information ISI 00.05.00003 for guidance. It provides the means to manage such components/items. It has been issued in agreement with the European Aviation Safety Agency (EASA).

Note: Traceability and monitoring of "life-limited" components which are listed in SECTION 4 are not required for consumable components (for which replacement is controlled at assembly/aircraft level).

3.3 REPLACEMENT REQUIREMENTS

In order to maintain aircraft airworthiness, Operators shall replace components listed at or prior to whichever of the life limitations occurs first, after any necessary adjustment of the stated life limitations in accordance with the instructions of this Section.

TRANSFER OF PARTS BETWEEN AIRCRAFT APPLICATIONS/AIRCRAFT CONFIGURATION CHANGE

The airworthiness limitation(s) for a component fitted to an aircraft may be different when:

- The component is transferred to another application (aircraft type, aircraft model, weight variant, etc.),
- The aircraft configuration is changed as a result of MOD/SB embodiment (weight variant, landing gear standard, etc.).

In these cases, the component's remaining life must be calculated using the following formula:

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

With:

- Tr_i = components remaining life for operation on current application i.
- Ca_j = components accumulated life on previous application j.
- Cp_j = components airworthiness limitation in previous application j.
- Cp_i = components airworthiness limitation in current application i.

Note 1: When using the above formula, Tr_i , Ca_j , Cp_j , Cp_i are expressed in the same usage parameter (e.g. FH or FC or LDG): Usage parameters cannot be mixed in the same calculation.

Note 2: The remaining life calculation must be reassessed every time the component's airworthiness limitation(s) change(s) for current and/or previous aircraft application(s) to which the component is/was fitted.

5.5 DISPOSAL/QUARANTINE ACTION

When the components reach the life limitations, disposal/quarantine action shall be taken, as per EASA Part M.A.504 - Control of unserviceable components, which asks for a status of

service life limited components and a service life limited components log card.

Disposal/quarantine action depends on the following categories:

- For “life-limited” components labelled “LL” and listed in the SECTION 4: They shall be mutilated beyond repair limits to prevent rework to appear to be airworthy.

Note: Supplier shall be kept informed.

- For components, whose fatigue lives have been demonstrated, labelled “DF” and listed in the SECTION 4: Appropriate means shall be implemented to deter their installation on aircraft pending possible extension of their life limitations. Examples of means are:

- Record keeping system,
- Non-permanent markings,
- Segregation (components stored separately from those currently eligible for installation).

The ultimate solution is the mutilation beyond repair limits to prevent rework to appear to be airworthy, as per AMC M.A.504 – Control of unserviceable components.

Note: When consumable components are removed, they must be mutilated beyond repair limits to prevent rework to appear to be airworthy.

5.6 ASSOCIATED TECHNICAL DOCUMENTATION

PNR provided by SECTION 4 relates to detail components. They may not all be listed in Illustrated Parts Catalogue (IPC) issued by Airbus.

For wing structure and landing gear components manufactured by Airbus, detail PNR are listed in the relevant Airbus engineering drawings/Component Maintenance Manual manufacturer (CMM) issued by Airbus.

For landing gears, detail PNR are listed in the relevant Illustrated Parts List (IPL)/Component Maintenance Manual (CMM) issued by vendors.

To help operators complying with the ALS Part 1, Airbus has compiled in a supporting document named “Information File” the Next Higher Assembly and procurable PNR associated to each components listed in the ALS Part 1. The Information File can be found at the same location than the ALS Part 1 itself.

6 INTENTIONALLY LEFT BLANK

7 PRODUCTION/ CONCESSIONS, REPAIR SOLUTIONS, ALS VARIATIONS, AIRWORTHINESS DIRECTIVES AND ALTERNATIVE METHODS OF COMPLIANCE

Limitations of the ALS Part 1 may be superseded by instructions and/or airworthiness limitations given in either a production concession, a Repair Design Approval Sheet (RDAS) or a Repair Design Approval Form (RDAF), an ALS Variation, an Alternative Method Of Compliance (AMOC), an Airworthiness Directive (AD) or exemptions provided by National Aviation Authorities (e.g. exemption supported by ASAC – Airbus Statement of Airworthiness Compliance).

When limitations change in a Revision of the ALS Part 1 subsequent to the issuance date of the production concession/repair solution/AD/AMOC, Operators are requested to contact Airbus for guidance to establish impact on the production concession/repair solution/AD/AMOC.

8 MODIFICATIONS/REPAIRS NOT DEVELOPED BY AIRBUS DOA Certificate EASA.21J.031

If an aircraft/component has a modification or repair embodied, that has not been developed under the authority of Airbus Design Organization Approval (DOA) No EASA.21J.031, and affects the content of the ALS, the Design Approval Holder (e.g. Supplementary Type Certificate (STC) holder) is responsible to provide any necessary adaptations of the ALS Part 1 airworthiness limitations.

Spreadsheet Explanation

Explanation notes are located under the table		LL/DF	LIMITATIONS (Whichever occurs first)				A330-2xxF	A330-2xx				A330-3xx				A330-800	A330-900	
			FH	LDG	FC	Cal.	WV00x	WV02x	WV05x WV06x	WV058 WV062	WV08x	WV00x WV01x	WV02x	WV03x WV05x WV06x	WV08x	WV80x	WV90x WV91x	WV92x
NOMENCLATURE	PART NUMBER																	
ATA XX-XX-XX ATA NAME (FIG. XX)																		
ASSEMBLY NAME (FIG. XX)																		
SUB-ASSEMBLY NAME (FIG. XX)																		
(1) [Note 1]																		
(2) [Note 2]																		

NOTES

Explanation notes are located under the table. When several notes are provided in the same cell the logical "AND" applies between the different configurations/conditions.

REVISION CODE

This column provides nature of change compared to previous Revision. This information is provided at the level of the part number.

- (D): Deleted (part number no more life limited)
- (R): Revised (at least one change in one limitation of considered part number)
- (N): New (new life limited part number introduced)

NOMENCLATURE

This column provides the nomenclature of the part number given on the right hand side column.

(2) PART NUMBER

This column provides the part number impacted by the life limitations/demonstrated fatigue lives.

Note: SECTION 4 provides the applicable life limitations only when PNR installations have been authorized. These tables do not ensure that a PNR has been validated for a specific

individual aircraft MSN. PNR are authorized for installation on individual aircraft MSN by SB (and the associated modifications), which are published by Airbus.

(3) LL/DF

Components having a life limit (LL) due to failure during fatigue tests will be labelled “LL”.

Components having a demonstrated fatigue life (DF) without failure will be labelled “DF”.

(4) LIMITATIONS

Life limitations quoted in SECTION 4 are applicable to the undamaged detail components as listed, not to the assembly or the aircraft on which they are installed.

Life limitations are provided in usage parameters, e.g.:

- FH: Flight Hours
- FC: Flight Cycles
- LDG: Landings
- Cal.: Calendar time in years, months, etc.

For a given PNR, when more than one set of limitations (FH/FC/Cal) is published for the same application, it is under Operator/MRO's responsibility to select the appropriate set depending on the aircraft utilization. Combining the limitations from different sets is not permitted.

(5) LIMITATIONS APPLICABILITY

Applicability is allocated to aircraft affected with an “x”, according to:

- AIRCRAFT MODEL

Table headers indicate aircraft models. When ‘x’ is entered in the model number, it stands for any number within the limits of the list of models given in the SECTION 1, paragraph 2 APPLICABILITY, e.g.:

A330-30x

stands for:

A330-301, A330-302 and A330-303

Life limitation applicability is allocated according to the aircraft model affected, e.g.:

A330

stands for:

All A330 models defined by the applicability of the column.

-321

stands for:

A330-321 model only, defined by the applicability of the column.

-321/-341

stands for:

A330-321 and A330-341 models only, defined by the applicability of the column.

Excl. -341

stands for:

All A330 models defined by the applicability of the column, excluding the A330-341 model.

- WEIGHT VARIANT

Table headers indicate aircraft WV. When 'x' is entered in the WV number, it stands for any number within the limits of the list of WVs defined in the tables of SECTION 1, paragraph 2 APPLICABILITY.

- AIRCRAFT MANUFACTURER SERIAL NUMBER

Life limitation applicability may be allocated according to the aircraft MSN affected, e.g.:

XXXXX-YYYYY

stands for:

From aircraft MSN XXXXX to aircraft MSN YYYYY (for all aircraft defined by the applicability of the column)

XXXXX, YYYYY

stands for:

For aircraft MSN XXXXX and aircraft MSN YYYYY

XXXXX

stands for:

For aircraft MSN XXXXX only

Excl. XXXXX

stands for:

For all aircraft (defined by the applicability of the column), excluding MSN XXXXX