



AEROSPACE RECOMMENDED PRACTICE

ARP6943™

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Component Traceability Requirements for Life-Limited Parts

RATIONALE

Civil aircraft components such as landing gears which are removed from aircraft for overhaul or exchange onto other aircraft must be traced - the aircraft, consumed life, maintenance, repair, and incident history must be maintained to provide correct evidence of the usage history of the component. While all companies agree that back-to-birth (BtB) traceability is required, there is not an international agreement on the recommended practice for providing and maintaining this data.

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Documents

Document Sharing Hub

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1. SCOPE

This document contains the recommended practices for the traceability of civil aircraft life-limited parts (LLPs) applicable to landing gears. A unified means of tracking flight cycles, flight hours, and calendar time is provided, which will ease the interchange of parts between companies and through the component's life cycle. A harmonized means of defining "back-to-birth" (BtB) traceability is provided to ensure airworthiness of service LLPs.

1.1 Purpose

ARP6943 provides an explicit practice for proper reporting of critical information, in-depth guidance to interpretation of BtB traceability completeness, and finally, the authorized transfer of documentation, including the acceptance of secure e-signature. This document will serve to ease the transaction times and allow parties to properly define acceptable documentation. This document takes into account the regulatory requirements or guidelines and considerations for the different stakeholders involved in aircraft asset management, operation, and maintenance. Such a common recommended practice will increase the efficiency of asset transfers, provide additional transparency for proof of LLPs, reuse of serviceable parts, and will also reduce the risk for involved parties.

1.2 Background

During accident investigations, airworthiness regulatory agencies found LLPs installed on aircraft that exceeded their maximum life limit. The United States (U.S.) Congress passed a law regarding the proper removal and disposition of LLPs. Further, rules were written by the Federal Aviation Administration (FAA) to clarify the reasons and process of proper record keeping. (Refer to 49 U.S.C. § 44725.) Both the European Union Aviation Safety Agency (EASA) and the FAA require substantial evidence of life limit accumulation on LLPs through a means of historical record keeping and provide rules for proper disposition of LLPs that have exceeded their limit. (Refer to 14 CFR Parts 43 and 45. Refer to 37 FR 15983.)

The records are meant to substantiate the total utilization of flight cycle, flight hour, and calendar time by every owner/operator at each installation, operational period, and removal of the parts, including all maintenance history, statements of non-incident, and origin of manufacture. This collection of records is referred to in whole as "back-to-birth traceability" by the civil aviation industry. However, this term ("back-to-birth") has never been properly defined by any agency or organization. Attempts and drafts by individual companies, operators, and organizations have published partial definitions, but none have been widely accepted in the industry.

In an attempt to comply with the law, rules, and recommendations, civil aviation entities adopted the policy of keeping historical records where each entity adheres to an internal process. While the collective effort provided a means to uphold "back-to-birth" record keeping policy, the lack of reporting standardization and unclear regulatory guidance contributed to the creation of company-specific processes based on non-cohesive interpretations and ad-hoc reporting. As a result, BtB record keeping/reporting and interpretation lacks harmonization as a whole and puts a strain on the reuse of service LLPs due to "insufficient/inaccurate" records and is left up to interpretation of individuals to determine compliance. Additionally, regulations only require that each party store or save this information for a limited period of time; thus, recovering historical documents is often difficult. This difference in interpretation of complete BtB records lengthens the transaction process and causes confusion in the market.

This issue is most prevalent in the landing gear market due to the fact that operators are often exchanging assets and components. The term is also commonly used within aircraft lease agreements without a well-defined meaning. In order to retain residual value of a landing gear asset, or avoid penalties upon lease return, operators are now requiring additional documents not previously required and potentially unavailable. The technical representatives from Maintenance, Repair, and Overhaul (MROs) organizations, operator maintenance groups, or parts suppliers do not have visibility into the future requirements of purchasers or lease return conditions and, therefore, are requiring information that may not help to improve the safety of the product and only lengthen or complicate the transaction.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 EASA Publications

Available from European Union Aviation Safety Agency, Konrad-Adenauer-Ufer 3, D-50668 Cologne, Germany, Tel: +49 221 8999 000, www.easa.europa.eu.

EASA Maintenance List of Documents

2.1.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

FAA List of Documents

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

2.1.3 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800 Place Victoria, P.O. Box 113, Montreal, Quebec H4Z 1M1, Canada, Tel: 1-514-874-0202, www.iata.org.

International Air Transport Association (IATA) Recommendation

2.1.4 ASA Publications

Available from Aviation Suppliers Association, 2233 Wisconsin Avenue, NW, Suite 503, Washington, DC 20007, Tel: 202-347-6899, www.aviationsuppliers.org.

ASA-100 BtB Guidelines

2.1.5 Other Publications

Life Limited Part Log Card Template

Movement Traceability (MTS)

Non-Incident Statement (NIS)

Maintenance Delivery Report Section Outline

Storage Statement

2.2 Related Publications

The following documents are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 United States Code Publications

Available from Office of the Law Revision Counsel, U.S. House of Representatives, H2-308 Ford House Office Building, Washington, DC 20515, Tel: 202-226-2411, <https://uscode.gov>.

49 U.S.C. § 44725 Life-limited aircraft parts

2.2.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

Federal Aviation Regulation (FAR) Federal Aviation Administration (FAA), Department of Transportation Doc. No. 10658, 37 FR 15983, Aug. 9, 1972, as amended by Amdt. 121-251, 60 FR 65933, December 20, 1995; Amdt. 121-321, 71 FR 536, Jan. 4, 2006

FAR Part 43 - Maintenance, Preventive Maintenance, Rebuilding, and Alteration: Section 43.9 and 43.10 Disposition of life limited aircraft parts (c) (1)

FAR Part 91 - Section 91.417 Maintenance Records and Section 91.419 Transfer of Maintenance Records

FAR Part 121 - Section 121.380 Maintenance Recording Requirements and Section 121.380a Transfer of Maintenance Records

FAA, Department of Transportation Part III, 14 CFR Parts 43 and 45 Safe Disposition of Life-Limited Aircraft Parts; Final Rule

FAA Airworthiness Circular (AC) No: 20-154 2005.12.12 Guide for Developing a Receiving Inspection System for Aircraft Parts and Material. Sect 5, 11 (k)

NOTE: An audit trail tracing an LLP back to its origin would only be required when the operator's records are not complete enough for an accurate determination of the elapsed time on the part to be established. A request for such an audit trace would probably be the exception (Federal Aviation Decisions, Interpretation Letter 1992-35).

2.2.3 EASA Publications

Available from European Union Aviation Safety Agency, Konrad-Adenauer-Ufer 3, D-50668 Cologne, Germany, Tel: +49 221 8999 000, www.easa.europa.eu.

2.2.3.1 CONTINUING AIRWORTHINESS REQUIREMENTS - PART M: Consolidated version of Part M of the Commission Regulation EC No. 2042/2003, and related EASA Decisions (Acceptable Means of Compliance), as amended Issue: December 2009

2.2.3.1.1 Section M.A.30 Aircraft continuing airworthiness record system

2.2.3.1.2 Section M.A.503 Service life limited components

2.2.3.1.3 Section M.A.504 Control of unserviceable components

2.2.3.2 Maintenance Organization Approvals-Part-145 Consolidated version of Part-145 (Annex II) of the Commission Regulation EC No. 2042/2003, and related EASA Decisions (Acceptable Means of Compliance and Guidance Material)

2.2.3.2.1 Section Acceptance of Components 145.A.42

2.2.3.2.2 Section Certification of Maintenance 145.A.50

2.2.4 Other Publications

Boeing Service Letter LANDING GEAR LIFE LIMITED PART RECORDKEEPING REQUIREMENTS 737-SL-32-144-A, 757-SL-32-094-A, 747-SL-32-118-A, 767-SL-32-101-A, 777-SL-32-054-A, ATA: 3200-00, 19th February 2008 & 737NG-FTD-32-10004

3. TERMINOLOGY

The use of “shall,” “should,” “will,” and “may” within this SAE Aerospace Recommended Practice observes the following rules:

- The word “shall” in the text denotes a mandatory requirement. Departure from such a requirement is not permissible without formal agreement.
- The word “should” in the text denotes a recommendation or advice on implementing such a requirement of the document.
- The word “will” in the text denotes a provision or service or an intention in connection with a requirement of the specification.
- The word “may” in the text denotes a permissible practice or action. It does not express a requirement of the specification.

Additional terms and glossary found in Appendix A.

4. PERFORMANCE RECOMMENDATIONS

4.1 Regulatory Harmonization

The FAA, EASA, and Airworthiness Limitation Sections (ALS) provide written rules and/or continuing airworthiness records requirements. These entities agree on the information that should be reported and transferred to each owner/operator/MRO as part of regulatory record keeping. Table 1 contains a matrix of the required information for LLP record keeping referencing the published document number along with the industry-utilized documents on which the information is currently found. See Table 1.

Table 1 - Required information for LLPs

Required Information	EASA Requirement	ALS Requirement	FAA Requirement	Industry Utilized Document Reporting					
	Document Ref. M.A.305, 503, 504, 613	Document Ref. ALS Part 1	Document Ref. 91.417, 91.419, 43.10	LLP Log Card	MTS	NIS/NRS	Storage Statement	Maintenance Delivery Report	Birth Delivery Document
Airworthiness Directive (AD)/Service Bulletin (SB) Compliance	x	x	x	□	□	□	□	x	□
Aircraft Cycles Since New (CSN) Total Accumulated	x	x	x	x	x	x	x	x	x
Aircraft Registration	x	x	□	x	x	x	x	x	x
Aircraft Serial Number	x	x	x	x	x	x	x	x	x
Aircraft Time Since New (TSN) (Total Accumulated)	x	x	x	x	x	x	x	x	x
Aircraft TSN and CSN at LLP Removal/Install	x	x	x	x	x	x	x	x	x
Aircraft Type	x	x	□	x	x	x	x	x	x
Airworthiness Form	x	x	□	□	□	□	□	x	□
Date	x	x	□	x	x	x	x	x	x
First Flight	□	x	□	x	x	□	□	□	x
List of Deferred Maintenance	x	x	□	x	x	x	□	x	□
LLP Calendar Days (Total Accumulated)	x	x	x	x	□	□	□	□	□
LLP - Cycles Remaining (CREM)	x	x	x	x	□	□	□	x	□
LLP Cycles Since New (CSN) (Total Accumulated)	x	x	x	x	x	x	x	x	□
LLP Cycles Since Overhaul (CSO) (Total Accumulated)	x	x	x	x	x	x	x	x	□
LLP - Description	x	x	□	x	x	x	x	x	x
LLP History	x	x	□	x	x	x	□	x	□
LLP Installation Reference	x	x	x	x	x	x	□	□	□
LLP Life Limitation	x	x	x	x	x	x	□	x	□
LLP - Part Number (PN)	x	x	x	x	x	x	x	x	x
LLP Removal Reference	x	x	x	x	x	□	x	x	□
LLP Serial Number (SN)	x	x	x	x	x	x	x	x	x
LLP Total Hours/Cycles/Calendar Time Remaining	x	x	x	x	x	x	x	x	□
LLP TSN Hours and Cycles (Total Accumulated)	x	x	x	x	x	x	x	x	□
LLP Time Since Overhaul (TSO) (Total Accumulated)	x	x	x	x	x	□	x	x	□
Maintenance Reports	x	□	x	□	□	□	□	x	□
Mass & Balance Report - Weight Variant	x	x	□	x	x	x	□	x	□
Non-Incident Status	x	x	□	□	□	x	□	x	□
Original Equipment Manufacturer (OEM), Component Maintenance Manual (CMM), Maintenance Planning Data (MPD) REV & DATE	x	x	□	□	□	□	□	x	□
Overhaul Cycle (OHC) Delivery Report	□	□	x	x	x	□	□	□	□
On/Off Date	x	x	x	x	x	x	□	□	□
REPAIR/MODIFICATION WORK	x	x	□	x	x	□	□	x	□
Replacement Parts	x	x	□	□	□	□	x	x	□
Storage Life Limits	x	x	□	□	□	□	x	□	□
Transfer of Records	x	x	x	□	□	□	□	□	□
Operated on runways that meet the standard international runway conditions and only Operated on runways that are paved, level, smooth and dry.	x	x	x	x	x			x	
LLP Hours Remaining (for applicable assets)	x	x	x	x	x			x	