



AEROSPACE INFORMATION REPORT

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(R) A Guide to Landing Gear System Integration

RATIONALE

Revision A incorporates the latest information and state of the art in the landing gear industry, and conveys the information as a reference to assist in the creation of an integrated landing gear system specification for new designs. It is intended as information only, and should not be used as a mandatory requirement specification.

AIR5451A has been reaffirmed to comply with the SAE Five-Year Review policy.

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1. SCOPE

The landing gear system is a major and safety critical airframe system that needs to be integrated efficiently to meet the overall aircraft program goals of minimizing the penalties of weight, cost, dispatch reliability and maintenance. As the landing gear system business develops and large-scale teaming arrangements and acquisitions become increasingly common, it may be desirable in some instances to procure an Integrated Landing Gear System. This document provides guidelines and useful references for developing an integrated landing gear system for an aircraft. The document structure is divided into four sections:

- Landing Gear System Configuration Requirements (Section 3)
- Landing Gear System Functional Requirements (Section 4)
- Landing Gear System Integrity Requirements (Section 5)
- Landing Gear System Program Requirements (Section 6)

The landing gear system encompasses all landing gear structural and subsystem elements. Structural elements include shock struts, truck beams, torsion links, braces, fittings, pins, wheels, tires, and brakes. The subsystem elements include the retraction/extension system (both normal and alternate), the steering system, the braking system (both normal and alternate, manual and automatic), the indication and monitoring systems and control systems (mechanical, hydraulic, electrical and electronic).

1.1 Purpose

The purpose of this document is to provide an airframe manufacturer or procuring agency with a framework from which a specification for an Integrated Landing Gear System may be developed and to provide guidance in the development of an integrated landing gear system. This document is not intended to be an all-inclusive detail design document or to duplicate other existing SAE landing gear documents. Rather, the intent is to provide guidance in writing and managing the top-level integration requirements, remembering that the landing gear systems must also be integrated into the airframe. This document has information applicable to both commercial and military landing gear systems.

1.2 Field of Application

In the past, it has been common for airframe manufacturers to procure the landing gear and its associated systems as separate elements, and to integrate these elements into the overall aircraft design. Using this approach, the airframe manufacturers have written separate specifications for each element and have assembled the landing gear from components delivered separately by different suppliers. In some instances, the landing gear supplier simply performs the assembly work and delivers a "dressed gear" that has been built up from components procured by the airframer. In other instances, the airframe manufacturer subcontracts the design of the landing gear, including the specification and procurement of the associated systems, to an integrator. This document includes landing gear systems for large commercial aircraft certified under 14 CFR Part 25, EASA CS 25.

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.