



AEROSPACE INFORMATION REPORT

AIR4250™**REV. C**Issued 1992-01
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Superseding AIR4250B

(R) Electronic Engine Control Specifications and Standards

RATIONALE

This document is being revised to reflect a number of specifications and standards that have been updated or are no longer current.

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Documents
Document Sharing Hub

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1. SCOPE

This report lists documents that aid and govern the design, development, certification, and utilization of aerospace electronic engine control systems. The report lists the military and industry specifications and standards that are commonly used in electronic engine control system design. Also included are Airworthiness Authority documents and requirements associated with certification. However, these lists are not necessarily complete.

The specifications and standards section has been divided into two parts: a master list, and a categorized list that provides a functional breakdown and cross-reference of these documents.

For specifications and standards, the issue available during the latest revision to this document is listed. Details of current revisions for many documents are available in the Department of Defense Index of Specifications and Standards (DODISS).

It should be noted that not all of these documents are referenced or even recognized by all certification authorities. In addition, not all revisions of these documents are recognized by all authorities. The user should confirm before assuming that a document, or its process, will be accepted for approval.

Additionally, the list contains, when available, the date of the latest revision of the document reviewed, together with comments from the SAE E-36 committee members who reviewed the document, the intention being to aid the reader to determine the likely relevance or usefulness of the document subject matter.

1.1 Availability of Documents

The following information pertains to the source and availability of specifications and standards.

1.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

1.1.2 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

1.1.3 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401-7435, Tel: 410-266-4000, www.arinc.com.

1.1.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

1.1.5 EIA Publications

EIA Standards are available from Electronic Components Industry Association (ECIA), 310 Maxwell Road, STE 200, Alpharetta, GA 30009, Tel: 678-393-9990. Copies of these documents are available online at <https://www.ecianow.org>.

1.1.6 EUROCAE Publications

Available from EUROCAE Secretariat, 102 rue Etienne Dolet, 92240 Malakoff, France, Tel: +33 1 40 92 79 30, www.eurocae.net.

1.1.7 IEC Publications

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

1.1.8 IEEE Publications

Available from IEEE Operations Center, 445 and 501 Hoes Lane, Piscataway, NJ 08854-4141, Tel: 732-981-0060, www.ieee.org.

1.1.9 Military Documents

Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

The Department of Defense Index of Specifications and Standards, prepared by Naval Publications and Forms Center (NPFC 103), is published annually with bi-monthly cumulative supplements available from Document Automation and Production Services (DAPS), Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <https://assist.daps.dla.mil/quicksearch/>.

1.1.10 National Bureau of Standards (NBS) Publications

United States Department of Commerce, Washington, DC 20234.

1.1.11 RTCA Publications

Available from RTCA, Inc., 1150 18th Street, NW, Suite 910, Washington, DC 20036, Tel: 202-833-9339, www.rtca.org.

1.2 Availability of Airworthiness Authority Documents

1.2.1 Federal Aviation Administration Code of Federal Regulations (CFRs)

www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgFAR.nsf/MainFrame?OpenFrameSet.

1.2.2 Federal Aviation Administration Advisory Circulars

www.faa.gov/regulations_policies/advisory_circulars/.

1.2.3 Federal Aviation Administration Policy Letters

www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/Frameset?OpenPage.

1.2.4 European Aviation Safety Agency (EASA) Certification Specifications

<https://www.easa.europa.eu/document-library/certification-specifications>.

1.2.5 European Aviation Safety Agency (EASA) Certification Memoranda (CM)

<https://www.easa.europa.eu/document-library/public-consultations/certification-memoranda>.

2. MASTER LIST OF DOCUMENTS

The following sections contain four tables that group the documents into four categories: SAE Publications, Other Documents, Federal and Military Documents, and Airworthiness Authority Documents.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

Further information about each SAE document listed below, including the identity of the SAE Issuing Committee, can be found by searching for the document at <https://saemobilus.sae.org>.

Table 1 - SAE publications

Document	Issue/RA Date When Reviewed	Subject	SAE E-36 Member Comments
AE4L-81-2	1981-02	Test Waveforms and Techniques for Assessing the Effects of Lightning Induced Transients	Original test definitions.
AE4L-87-3	1987-03	Recommended Draft Advisory Circular Protection of Aircraft Electrical/Electronic Systems Against the Indirect Effects of Lightning	Original basis for FAA advisory circular.
AIR64B	1992-09	Electrical and Electronic Equipment Cooling in Commercial Transports	Guidelines for system cooling.
AIR1209	1998-12	Construction and Calibration of Parallel Plate Transmission Line for Electromagnetic Interference Susceptibility Testing	Relevant, detailed design level.
AIR1255	1991-12	Spectrum Analyzers for Electromagnetic Interference Measurements	Useful guidelines on use of spectrum analysers.
AIR1263	1991-05	Tin Plated Solderless Terminal Lugs and Splices on Nickel Coated High Temperature Wire	In use.
AIR1277B	2005-02	Cooling of Military Avionic Equipment	Useful for information only at the early stage of EEC mechanical design.
AIR1329C	2014-08	Electrical Connectors and Wiring, Compatibility of	OK, but detailed, design level.
AIR1336B	2013-03	Ground Support Equipment Electrical Systems	Good primer on automotive type system considerations. Applicability to engine controls is remote.
AIR1394A	1998-12	Cabling Guidelines for Electromagnetic Compatibility	In use.
AIR1404	1998-12	DC Resistivity vs. RF Impedance of EMI Gaskets	Still applicable.
AIR1423	1977-08	Electromagnetic Compatibility on Gas Turbine Engines for Aircraft Propulsion	Basic principles still relevant. References are a bit old. MIL-STD-461F.
AIR1425A	1998-12	Methods of Achieving Electromagnetic Compatibility of Gas Turbine Engine Accessories, for Self-Propelled Vehicles	General guidelines/system considerations.
AIR1662A	1998-09	Minimization of Electrostatic Hazards in Aircraft Fuel Systems	Good background material.
AIR4250C	2018-12	Electronic Engine Control Specifications and Standards	This document.
AIR5060A	2011-11	Electronic Engine Control Design Guide for Electromagnetic Environmental Effects	Detailed information and guidelines. Some references, e.g., HIRF levels, are outdated.
AIR5924A	2013-01	Guidelines for the Integration of Electronic Engine Control Systems for Transport Category (Part 25) and General Aviation (Part 23) Aircraft	Good background material.
AIR6181	2011-08	Electronic Propulsion Control System/Aircraft Interface Control Documents	Guidelines to document functional and physical interface requirements.
AMS2422F	2014-02	Plating, Gold	Replaced MIL-G-45204.
AMS-C-8837A	2015-10	Coating, Cadmium (Vacuum Deposited)	Replaced MIL-C-8837.
AMS-DTL-23053/15A	2012-10	Insulation Sleeving, Electrical, Heat Shrinkable, Polyolefin, Heavy-Wall, Coated, Flexible, Outer Wall Crosslinked	Replaced MIL-I-23053.



Document	Issue/RA Date When Reviewed	Subject	SAE E-36 Member Comments
ARP826	1991-08	Electrical Computing Resolvers	Useful reference for resolver characteristics.
ARP926B	1997-06	Fault/Failure Analysis Procedure	Use ARP4761 for civil airborne systems.
ARP935B	2013-03	Control Plan/Technical Construction File	EMI control plan outline includes a sample plan based on MIL-STD-461F requirements.
ARP1172	1991-12	Filters, Conventional, Electromagnetic Interference Reduction, General Specification for	Still applicable where large EMI filters are used.
ARP1173A	2013-03	Test Procedures to Measure the RF Shielding Characteristics of EMI Gaskets	Still applicable.
ARP1308D	2014-11	Electrical Connectors for Aerospace, Shipboard, Ground Vehicles, and Associated Equipment	This ARP only pertains to AS connector standards. Refer to MIL-STD-1353 for U.S. Military specification connector information.
ARP1350A	2012-03	Procedure for Installation and Mounting of Single Hole Mount, Cylindrical, Electrical Connectors (for Pressure Differential Applications)	Still relevant. Somewhat detailed.
ARP1481A	1998-09	Corrosion Control and Electrical Conductivity in Enclosure Design	Still applicable, but has extensive references to Cadmium plating, which is increasingly forbidden.
ARP1705C	2017-02	Coaxial Test Procedure to Measure the RF Shielding Characteristics of EMI Gasket Materials	Still applicable.
ARP1892B	1997-12	Electrical Connectors for Use in Battery Powered Ground Support Equipment	Doesn't seem relevant to electronic controls.
ARP4714A	2012-09	External Software Loading of Electronic Engine Controls	Guidelines for development of the procedure.
ARP4754A	2010-12	Guidelines for Development of Civil Aircraft and Systems	Focuses on overall system safety assurance process and allocates objectives and activities to each side of the aircraft/engine interface for propulsion systems with electronic engine controls.
ARP4761	1996-12	Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment	Detailed information on safety assessment process and analysis methods.
ARP5107C	2018-09	Guidelines for Time-Limited-Dispatch (TLD) Analysis for Electronic Engine Control Systems	Industry standard for TLD analysis.
ARP5412B	2013-01	Aircraft Lightning Environment and Related Test Waveforms	Latest, current, industry definition. (Equivalent to ED-84.)
ARP5414A	2005-2	Aircraft Lightning Zoning	Useful for understanding lightning phenomena. (Equivalent to ED-91.)
ARP5415A	2002-04	User's Manual for Certification of Aircraft Electrical/Electronic Systems for the Indirect Effects of Lightning	Provides additional guidelines for the tests of ARP5413A and RTCA/DO-160.

Document	Issue/RA Date When Reviewed	Subject	SAE E-36 Member Comments
ARP5416A	2013-01	Aircraft Lightning Test Methods	This ARP is a significant refinement and expansion of the basic material from the SAE AE-4L Committee's "Blue" book issued in 1978 and titled "Lightning Test Waveforms and Techniques for Aerospace Vehicles and Hardware," providing a more thorough and updated description of the test techniques. (Equivalent to ED-105.)
ARP5583A	2010-06	Guide to Certification of Aircraft in a High-Intensity Radiated Field (HIRF) Environment	Latest HIRF User's Guide. (Equivalent to ED-107A.)
ARP5757A	2016-10	Guidelines for Engine Component Tests	Component certification guidelines supplementing AC 33.28-1.
ARP5890A	2011-2	Guidelines for Preparing Reliability Assessment Plans for Electronic Engine Controls	Describes processes that are intended for use in assessing the reliability of electronic engine controls, or subassemblies thereof.
ARP6109	2014-2	Electronic Engine Control Hardware Change Management	Details how to manage electrical HW change at engine and aircraft configuration management levels.
AS29	1996-11	Ignition Shielding, Aircraft	Non-current. Not recommended for new designs.
AS654	1994-06	Cable, Special Purpose, Electrical: Wire, Electrical (Ignition, High-Tension)	Standards for ignition cables of internal combustion engines.
AS9000	1997-05	Aerospace Basic Quality System Standard	Aerospace clone of QS9000 applicable to COTS supplier control.
AS8700	1999-08	Installation and Test of Electronic Equipment in Aircraft, General Specification for	Replaced MIL-I-8700.
AS50151C	2015-07	Connectors, Electrical, Circular Threaded, AN Type, General Specification for	Supersedes MIL-DTL-5015H Sup 1, which was cancelled.
AS50881F	2015-05	Wiring, Aerospace Vehicle	Replaced MIL-W-5088.