

AEROSPACE INFORMATION REPORT

SAE AIR1174

REV.
B

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Superseding AIR1174A

Index of Starting System Specifications and Standards

1. SCOPE:

This report lists military and industry specifications and standards which are used in aerospace engine starting and auxiliary power systems. Listings are provided as follows:

- Section 2. Topic Listing
- Section 3. Numerical Listing
- Section 4. Alphabetical Listing

Only those hardware standards which have been specifically designed for engine starting systems are listed. Revisions and amendments which are current for these specifications and standards are not listed.

1.1 Listing Documents:

The following documents which list specifications and standards

are used as a basis for this report. Basic document numbers are listed without revision letter. Many Military specifications are officially canceled and will no longer be kept up to date but they are available for general use.

- 1.1.1 Military Specifications and Standards: Department of Defense, Index of Specifications and Standards. This document is published annually with bi-monthly supplements.
- 1.1.2 Society of Automatic Engineers, Inc. Documents: Index of Aerospace Standards, Recommended Practices and Information Reports. This document is published annually by SAE, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

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Documents

Document Sharing Hub

1.2 Availability of Documents:

SAE Publications (SAE, AS, ARP, AIR) are available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Military and U.S. Government Publications (DOD, MS, SD, ARDCM, AN, AND, MIL, MS) are available from DODSSP, Subscription Service Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2. TOPIC LISTING:

Documents are organized under technical topics and source.

2.1 Engine Starting Characteristics:

2.1.1 Military Specifications:

Engines, Aircraft, Turbojet and Turbofan, General Specification for	MIL-E-5007
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Engines, Aircraft, Turboshaft and Turboprop, General Specification for	MIL-E-8593
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2.1.2 Society of Automotive Engineers Documents:

Guide for Determining Engine Starter Drive Torque Requirements	AIR781
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Guide for Determining, Presenting and Substantiating Turbine Engine Starting and Monitoring Characteristics	AIR713
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Power Sources, Auxiliary, for Aerospace Applications	AIR744
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Engines, Aircraft, Reciprocating, General Specification for	AS25109
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2.2 Engine Starting System:

2.2.1 Military Specifications:

Joint Service Specification Guide: Air Vehicle Subsystems	JSSG-2009
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Auxiliary Power Systems, Airborne (inactive for new design -- see JSSG-2009)	MIL-A-87229
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2.2.2 Society of Automotive Engineers Documents:

Aircraft Accessory Drag Torque During Engine Starts	AIR1087
A Means of Testing Turbojet Starter Performance	ARP715
Gasket Type XI, Engine Accessory Drive	AS3492
Gasket - Type XII, XIV A and XIV B Engine Accessory Drive	AS3493
Gasket - Type XVI Engine Accessory Drive	AS3496
Gasket – Engine Accessory Drive	AS3498
Glossary, Aircraft Engine Starting Systems	ARP906
Guide for Determining Engine Starter Drive Torque Requirements	ARP781
Turbine Engine Starting System Design Requirements	ARP949
Turbine Engine Starting and Motoring Characteristics Guide for Determining, Presenting and Substantiating	AIR713

2.2.3 Military Standards:

Drive Pad-Accessory, 10.000 BC Round, Design Standard for	MS3329
Flange Accessory, 5.000 BC Square, Design Standard for	MS3331
Flange Accessory, 10.000 BC Round, Design Standard for	MS3334
Adapter Installation - Type XII or XVI Drive Starter Jaw	MS33509
Drive Pad-Accessory, 5.000 BC Round, Design Standard for	MS3327 (AS)
Drive Pad-Accessory 8.000 BC Round, Design Standard for	MS3328 (AS)
Drive Pad-Accessory 5.000 BC Square, Design Standard for	MS3326 (AS)
Flange Accessory, 5.000 BC Round, Design Standard for	MS3332 (AS)
Flange Accessory, 8.000 BC Round, Design Standard for	MS3333 (AS)

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2.2.4 Society of Automotive Engineers Standards:

Power Take-Off Pad Requirements, Gas Turbine Engine	ARP748
Flange - Accessory, 2.653 BC Square, Design Standard for	AS960
Splines Involute; Wear Definition of	ARP1200
Drives and Flange Standards, Aircraft Engine and Accessory	AIR1160
Breech Drive Pad, OAD Assembly	AS1259
Coupling Clamp, Groove V-Band 6.400, 9.400, 11.400 Flange OD	AS976
Disconnect Systems, Accessory Drive Shaft	AIR853
Drive Tachometer Type I	AS54
Drive Studded, Accessory, 10.000 BC Round, Design Standard for	AS967
Drive Studded, Accessory, 2.653 BC Square, Design Standard for	AS959
Drive Studded, Accessory, 5.000 BC Square, Design Standard for	AS961
Drive Accessory, 10.000 BC Round, QAD, Design Standard for	AS971
Flange Accessory, 10.000 BC Round, Design Standard for	AS968
Gasket Copper, Tube Connection, Plain	AS3332
Flange Accessory, 5.000 BC Square, Design Standard for	AS962
Drive Accessory, 5.000 BC Round, QAD, Design Standard for	AS969
Drive Accessory, 8.000 BC Round, QAD, Design Standard for	AS970
Drive Studded, Accessory, 5.000 BC Round, Design Standard for	AS963
Drive Studded, Accessory, 8.000 BC Round, Design Standard for	AS965
Flange Accessory, 5.000 BC Round, Design Standard for	AS964
Flange Accessory, 8.000 BC Round, Design Standard for	AS966
Spline Details, Accessory Drives and Flanges	AS972

2.3 Cartridge/Pneumatic Starting System:

2.3.1 Society of Automotive Engineers Documents:

2.3.2 System Components:

2.3.2.1 Starter:

2.3.2.1.1 Military Specifications:

Starter, Engine, Cartridge/Pneumatic, Shaft Drive General Specification for	MIL-S-27266
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2.3.2.2 Energy Control:

2.3.2.2.1 Military Specifications:

Valve, Starter Control, Pneumatic, Aircraft Engine General Specifications for	MIL-V-38398
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Valve, Starter Control, Aircraft Engine, General Specification for	MIL-V-81995
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2.3.2.3 Mechanical Connections:

2.3.2.3.1 Ducting:

2.3.2.3.1.1 Military Specifications:

Bleed Air Systems, General Specification for	MIL-B-81365
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Coupling Half, Quick Disconnect, Pneumatic Starter, External, Low Pressure	MIL-DTL-25531
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Duct, Pneumatic Start, Flexible	MIL-DTL-22706
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Pneumatic Power Systems, High Pressure (inactive for new design – see JSSG 2009)	MIL-P-87210
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2.3.2.3.1.2 Society of Automotive Engineers Documents:

High Temperature Pneumatic Duct Systems for Aircraft	ARP699
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2.3.2.3.1.3 Military Standards:

Fitting, Pneumatic Starter Duct-Flanged (Male)	MS17833
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Fitting, Pneumatic Starter Duct-Flanged (Female)	MS17835
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Connector, Pneumatic Starter Duct, Double Ended	MS17836
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Adapter, Pneumatic Starter, Duct Nipple and (Male)	MS17834
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Nipple, Pneumatic Starting, 3 inch I.D. Outline Dimensions of	MS33740
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2.3.2.3.2 Electrical:

2.3.2.3.2.1 Military Specifications:

Connectors, Electrical Circular, Threaded AN type, General Specification for	MIL-C-5015
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Connectors, Electric, (Circular, Environment Resisting), Receptacles and Plugs, General Specification for	MIL-C-83723
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2.3.2.3.2.1 (Continued):

Slash Sheets for Series III Threaded Coupling	MIL-C-83723/82 thru MIL-C-83723/85 MIL-C-83723/88 thru MIL-C-83723/90 MIL-C-83723/95 thru MIL-C-83723/98
Connectors, Electrical, Circular, Miniature High Density, Quick Disconnect, Threaded Coupling, Series III	MIL-C-38999
Connectors, Series III, Slash Sheets	MIL-C-38999/20 thru MIL-C-38999/27
Contracts, Electrical Connector, General Specification for	MIL-C-39029
Connector, Accessories, Electrical, General Specification for	MIL-C-85049
Installing and Removal Tools, Connector Electrical Contact, General Specification for	MIL-I-81969
Crimping Tools, Terminal, Hand or Power Actuated, Wire Termination, and Tool Kits, General Specification for	MIL-DTL-22520

2.3.2.3.2.2 Military Standards:

Connectors, Receptacle, Electrical,
Wall Mounting Rear Release,
Crimp Contact, AN Type MS3450

Connectors, Receptacle, Electrical,
Cable Connecting, Rear Release,
Crimp Contact, AN Type MS3451

Connectors, Receptacle, Electrical,
Box Mounting, Rear Release,
Crimp Contact, AN Type MS3452

Connectors, Receptacle, Electrical,
Jam Nut Mounting, Rear Release,
Crimp Contact, AN Type MS3454

Connectors, Plug, Electrical, Self-
locking Coupling Nut, Rear Release,
Crimp Contact, AN Type MS3459

2.3.3 Power Source:

2.3.3.1 Military Specifications:

Cartridge, Engine Starter MXU-4A/A MIL-C-27505

Power Units, Aircraft Auxiliary, Gas-Turbine-Type,
General Specification for MIL-P-8686

Auxiliary Power Systems, Airborne
(inactive for new design -- see JSSG-2009) MIL-A-87229

Power Unit, Aircraft, Auxiliary, Gas Turbine, General
Specification for MIL-P-85573

2.3.3.2 Society of Automotive Engineers Documents:

Pneumatic Power Supplies for Starting Aircraft AIR944

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2.4 Electric Starting System:

2.4.1 Military Specifications:

Electrical Power Systems, Aircraft MIL-E-87219

Selection and Installation of Aircraft Electric Equipment MIL-STD-7080

2.4.2 Society of Automotive Engineers Documents:

2.4.3 Military Standards:

Criteria, Jet Electrical Starting System, DC Aircraft MS17794

Electrical Power Characteristics MIL-STD-704

2.4.4 System Components:

2.4.4.1 Starter:

2.4.4.1.1 Military Specifications:

Starter, Electric, Constant Current DC MIL-S-7780

Starter-Generator, Engine, STU-6A MIL-S-26547

2.4.4.1.2 Society of Automotive Engineers Documents:

Generators/Starter-Generators, Engine Driven
DC, and Associated Voltage Regulators,
Minimum Performance Standards for AS8020

D-C Starter-Generator, Engine, General
Specification for ARP892

2.4.4.1.3 Military Standards:

Starter-Aircraft, Direct Cranking, 28V DC AN4116

2.4.4.2 Connections:

2.4.4.2.1 Electrical:

2.4.4.2.1.1 Military Specifications:

Cable Assemblies and Attachable
Plugs External Power, Aircraft

MIL-C-7974

2.4.5 Power Source:

2.4.5.1 Military Specifications:

Battery and Cell, Storage, Aircraft, General Specification for

MIL-B-8565

Battery, Storage, Aircraft, Type MA-2-1

MIL-B-26026

Batteries and Cells, Storage, Nickel-Cadmium, Aircraft,
General Specification for

MIL-PRF-81757

Batteries, Storage, Lead Acid, General Specification for

MIL-B-83769

2.4.5.2 Society of Automotive Engineers Documents:

Electromagnetic Compatibility (EMC) System Design Checklist

AIR1221

Electromagnetic Compatibility on Gas Engines for Aircraft Propulsion

AIR1423

Electromagnetic Interference (EMI) Measurement Impulse
Generators; Standard Calibration Requirements and Techniques

ARP1267

Methods of Achieving Electromagnetic Compatibility of
Gas Turbine Engine Accessories for Self-Propelled Vehicles

AIR1425

Nickel Cadmium Vented Rechargeable Aircraft Batteries
(non-sealed maintainable type)

AS8033

2.4.5.3 Military Standards:

2.5 Gas Turbine Starting System (Jet Fuel Starter):