



# Notice of Proposed Amendment 2022-103

in accordance with Articles 6(2) and 6(3) of MB Decision No 01-2022

## Regular update of the Certification Specifications for Normal-Category Aeroplanes

### CS-23 Amendment 6 and AMC & GM to CS-23 Issue 4

RMT.0687

#### EXECUTIVE SUMMARY

The objective of this Notice of Proposed Amendment (NPA) is to provide for state-of-the-art means of compliance to the Certification Specifications for Normal-Category Aeroplanes (CS-23).

This NPA proposes to amend CS-23 and the Acceptable Means of Compliance and Guidance Material to CS-23 (AMC & GM to CS-23) to incorporate 6 new and 23 revised consensus standards that are issued by the American Society for Testing and Materials (ASTM) International as an acceptable means of compliance to CS-23. EASA reviewed those amendments to the referenced standards that introduce state-of-the-art means of compliance, supporting global standardisation and harmonisation. In some cases, EASA complemented the incorporated ASTM consensus standards by remarks, to identify differences or limitations due to EASA’s interpretation of these standards.

This NPA also proposes to introduce some additional changes to CS-23, as well as to the AMC & GM to CS-23.

<b>Action area:</b>	Design and production
<b>Affected rules:</b>	CS-23 and AMC & GM to CS-23
<b>Affected stakeholders:</b>	Normal-category aeroplane manufacturers, design approval holders (DAHs), and design organisations dealing with supplemental type certificates (STCs), repairs or changes to normal-category aeroplanes.
<b>Driver:</b>	Efficiency/proportionality
<b>Impact assessment:</b>	Yes
<b>Rulemaking group:</b>	No

#### EASA rulemaking procedure milestones

Start Terms of Reference	Advisory Body Consultation NPA 2022-103 (draft Decision)	Proposal to the Commission EASA Opinion	Adoption by the Commission Implementing/Delegated act	Decision Certification Specifications, Acceptable Means of Compliance, Guidance Material
9.8.2017	28.10.2022	n/a	n/a	2022/Q4



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## 1. About this NPA

### 1.1. How this NPA was developed

The European Union Aviation Safety Agency (EASA) developed this Notice of Proposed Amendment (NPA) in line with Regulation (EU) 2018/1139<sup>1</sup> ('Basic Regulation') and the Rulemaking Procedure<sup>2</sup>.

This Rulemaking Task (RMT).0687 is included in Volume II of the European Plan for Aviation Safety (EPAS) [2022-2026](#). The scope and timescales of the task were defined in the related Terms of Reference (ToR)<sup>3</sup>. RMT.0687 is an open-ended task to introduce changes into CS-23 and the AMC & GM to CS-23 by addressing non-complex and non-controversial issues.

EASA initiated the proposed amendments to CS-23 Amendment 5, which had been largely harmonised with the Federal Aviation Administration (FAA) Part 23 Amendment 64, and coordinated them with the authorities that apply similar performance-based rules for normal-category aeroplanes (i.e. FAA, Transport Canada Civil Aviation (TCCA), Agência Nacional de Aviação Civil (ANAC)<sup>4</sup>). EASA drafted the proposed amendment to CS 23.2135(b) in coordination with the other authorities, and proposes to revert the text back to the original text of CS 23.153(c), as introduced by the Initial Issue of CS-23.

In respect of the AMC, EASA reviewed the new and revised consensus standards that stem from the American Society for Testing and Materials (ASTM) Technical Committee F44 on General Aviation Aircraft (hereinafter 'ASTM F44')<sup>5</sup> and its subcommittees. ASTM F44 applies a process for the development of consensus standards, which:

- is documented and publicly available<sup>6</sup>;
- is built on collaboration and consensus among those affected; today, over 400 ASTM F44 members from global industry, the users' community, and authorities (including an EASA representative) participate in the development of, and changes to, consensus standards;
- facilitates the inclusion of technological changes and innovation;
- assures a balance between competing interests by establishing a fifty-fifty voting right between industry and the other members; and

<sup>1</sup> Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139>).

<sup>2</sup> EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 01-2022 of 2 May 2022 on the procedure to be applied by EASA for the issuing of opinions, certification specifications and other detailed specifications, acceptable means of compliance and guidance material ('Rulemaking Procedure'), and repealing Management Board Decision No 18-2015 (<https://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-01-2022-rulemaking-procedure-repealing-mb>).

<sup>3</sup> <https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0687>

<sup>4</sup> The National Civil Aviation Authority of Brazil.

<sup>5</sup> <https://www.astm.org/COMMITTEE/F44.htm>

<sup>6</sup> <https://www.astm.org/ABOUT/faqs.html>

- provides access to the views and objections of other participants, and includes a fair and impartial subprocess for reconciling diverging views.

The NPA shall be consulted only with the EASA Advisory Bodies (ABs) in accordance with Articles 6(2) and 6(3) of the Rulemaking Procedure. EASA decided to follow the procedure laid down in said Articles based on the transparency of the ASTM F44 consensus standard development process, the possibility for stakeholders to participate and comment, as well as the support received by EASA from stakeholders for the proposed amendments to CS-23.

## 1.2. How to comment on this NPA

Please submit your comments via email to [IAConsultation@easa.europa.eu](mailto:IAConsultation@easa.europa.eu).

The deadline for the submission of comments is **18 November 2022**.

## 1.3. The next steps

EASA will consider the comments received from the ABs and issue a decision to amend CS-23 and the AMC & GM to CS-23.



## 2. In summary — why and what

### 2.1 Why we need to amend the rules — issue/rationale

The principal objective of Article 1 of the Basic Regulation is ‘to establish and maintain a high uniform level of civil aviation safety’ in Europe. EASA shall, pursuant to Article 76(3) of the Basic Regulation, ‘issue certification specifications and other detailed specifications, acceptable means of compliance and guidance material for the application of this Regulation and of the delegated and implementing acts adopted on the basis thereof.

Pursuant to Article 4(1) of the Basic Regulation, EASA ‘[...] shall reflect the state of the art and best practices in the field of aviation, and take into account worldwide aviation experience and scientific and technical progress in the respective fields [...]’.

To maintain a high uniform level of civil aviation safety in Europe, the intent of CS 23.2135(b) required clarification to avoid potential misunderstandings. The objective of CS 23.2135(b) is that the aeroplane is safely controllable during landing, using the approved procedures for the steepest approved approach gradient. Contrary to the current wording of said specification, it is not intended that such a procedure may result in aircraft damage and/or occupant injury. If this were the case, the specification would provide for a lower level of safety than the previous CS-23 Amendment 4. This would contravene the objective of maintaining the existing level of safety.

To better serve the certification process with up-to-date information and to promote innovation, EASA considered the latest revisions of as well as new ASTM International consensus standards that are proposed as AMC to CS-23 specifications and, if those standards were found acceptable, proposed them as AMC in AMC1 to CS-23.

In addition, to quickly address a safety recommendation (see [accident report](#)), EASA proposed to introduce a limitation remark into AMC1, AMC2, and AMC3 to CS 23.2525.

### 2.2 What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of the Basic Regulation. This proposal will contribute to achieving the overall objectives by addressing the issues described in Section 2.1.

The specific objective of this NPA is to provide for state-of-the-art technology and methods for showing compliance to the CS-23 requirements, based on the ATSM International consensus standards.

The objective of the proposed amendment that stems from the safety recommendation is to provide for a quicker in-flight means to reset an electric circuit that is essential to flight safety instead of the more time-consuming replacement of a glass fuse.

### 2.3 How we want to achieve it — overview of the proposed amendments

#### 2.3.1 CS-23 Amendment 6

The wording of CS 23.2135(b) ‘Controlability’ is proposed to be amended to clarify its intent and prevent misinterpretation: ‘without causing substantial damage or serious injury’ is proposed to be removed and ‘make a safe [landing]’ resinserted. A similar wording was last used in CS 23.153(c) ‘Control during landings’ in CS-23 Amendment 4. The current text could be misinterpreted that it

would be acceptable to allow some aircraft damage and/or occupant injury in the approved approach and landing procedure for the steepest approved approach gradient.

An editorial correction is proposed to be made to CS 23.2430: an erroneous reference to CS 23.2445(a)(7) is proposed to be replaced by the correct reference to CS 23.2445(g).

The text of CS 23.2515 is proposed to be harmonised with the text of CS 23.2520 by removing the word ‘significantly’ when describing the possible effects of lightning on aeroplane systems and the need for those systems to recover.

### **2.3.2 AMC & GM to CS-23 Issue 4**

To provide up-to-date information and to promote innovation, EASA proposes to incorporate 23 revised and 6 new consensus standards into AMC & GM to CS-23 Issue 4. The proposed amendments follow the changes to the ASTM International consensus standards that are used by reference in the AMC to CS-23. ASTM F3264-21 ‘Standard Specification for Normal Category Aeroplanes Certification’ (changed from F3264-18b to F3264-21) contains a list of the current ASTM F44 consensus standards that have been determined by consensus by ASTM International, to demonstrate compliance with the requirements for normal-category aeroplanes (which includes aeroplanes that are within the scope of CS-23). The proposed amendments to the AMC & GM to CS-23 reflect whether and how the revised or new consensus standards, as listed in ASTM F3264-21, have been accepted and incorporated as AMC to CS-23.

GM1 23.2010 and GM2 23.2010 are proposed to be amended to reflect the proposed amendments to CS-23 and the AMC & GM to CS-23. The example that was provided in GM2 23.2010 is no longer applicable since the referenced ASTM consensus standard has in the meantime been updated; GM2 23.2010 is therefore proposed to be updated to include the missing information.

A new GM3 23.2010 is proposed to be introduced including a list of all the ASTM F44 consensus standards and their revision levels as incorporated into the two most recent issues of the AMC & GM to CS-23 (Issues 3 and 4), to provide a better overview of the changes to those standards.

The following Section 2.3.3 provides the content changes to the ASTM F44 consensus standards, as well as EASA’s position on those changes, in the numerical order of the referenced standards.

### **2.3.3 Revision from F3264-18b to F3264-21 — Summary of changes**

#### **F2490-05 (changed to F2490-20) — Standard Guide for Aircraft Electrical Load and Power Source Capacity**

F2490 was reviewed and reissued with some editorial corrections. It was incorrectly referenced at specification level in F3264-18a and should have been shown as a standard referred to from F3231/F3231M and F3316/F3316M. This is corrected in F3264-21.

EASA accepted that change and incorporated it into the AMC to CS-23.

#### **F3061/F3061M-17 to F3061/F3061M-20 Standard Specification for Systems and Equipment in Small Aircraft**

F3061 is an overarching standard that refers to specific revised/removed standards of various systems.

New referenced standards:

- F3173/F3173M Standard Specification for Aircraft Handling Characteristics;
- F3179/F3179M Standard Specification for Performance of Aircraft;
- F3309/F3309M Standard Practice for Simplified Safety Assessment of Systems and Equipment in Small Aircraft;
- F3316/F3316M Standard Specification for Electrical Systems for Aircraft with Electric or Hybrid-Electric Propulsion; and
- F3367 Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft.

Removed referenced standards:

F3082/F3082M Standard Specification for Weights and Centers of Gravity of Aircraft

The intent was that F3082 would be an overarching standard for the various flight documents. This approach is no longer used within the flight subcommittee, making the standard F3082/F3082M references incorrect. References to F3082 were replaced by references to the 'lower-level' flight documents that contain the intended referential information, as follows:

- in Section 3.2.2, F3082 was replaced by a reference to F3173;
- in Section 13.9.3, F3082 was replaced by a reference to F3179;
- in Section 13.9.5, F3082 was replaced by a reference to F3179; and
- in F3082, Table 12 in the note was replaced by a reference to F3179.

EASA accepted those changes and incorporated them into the AMC to CS-23. In AMC1 to CS-23, the following amendments are proposed to be introduced regarding the links and/or references to the F3061 Standard:

- AMC1 23.2225 Component loading conditions.  
A new link from F3061 to F3232 was introduced (for details, see [F3232](#) described below).
- AMC1 23.2240 Structural durability  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2245 Aeroelasticity  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2250 Design and construction principles  
A new link from F3061 to F3232 was introduced (for details, see [F3232](#) described below).
- AMC1 23.2255 Protection of structure  
A new link from F3061 to F3232 was introduced (for details, see [F3232](#) described below).
- AMC1 23.2265 Special factors of safety  
References were changed because of the revision to F3061 (no technical change).

- AMC1 23.2270 Emergency conditions  
A new link from F3061 to F3232 was introduced (for details, see [F3232](#) described below).
- AMC1 23.2300 Flight control systems  
A new link from F3061 to F3232 was introduced (for details, see [F3232](#) described below).
- AMC1 23.2305 Landing gear systems  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2310 Buoyancy for seaplanes and amphibians  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2315 Means of egress and emergency exits  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2320 Occupant physical environment  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2325 Fire protection  
A new link from F3061 to F3231 was introduced (for details, see [F3231](#) described below).
- AMC1 23.2330 Fire protection in designated fire zones  
A new link from F3061 to F3231 was introduced (for details, see [F3231](#) described below).
- AMC1 23.2335 Lightning protection  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2410 Powerplant installation hazard assessment  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2440 Powerplant installation fire protection  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2500 General requirements on systems and equipment function  
The link from F3061 to F3231 was revised (for details, see [F3231](#) described below).
- AMC1 23.2505 General requirements on equipment installation  
The link from F3061 to F3231 was revised (for details, see [F3231](#) described below).
- AMC1 23.2510 Equipment, systems, and installations  
The link from F3061 to F3230 was revised (for details, see [F3230](#) described below).
- AMC1 23.2515 Electrical and electronic system lightning protection  
References were changed because of the revision to F3061. However, the referenced F3367 ‘Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft’ in F3061 was not accepted. In addition, a remark was added to amend paragraphs 17.3.1 to 17.3.4.



- AMC1 23.2520 High-intensity radiated fields (HIRF) protection  
References were changed because of the revision to F3061. However, the referenced F3367 ‘Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft’ in F3061 was not accepted. In addition, a remark was added to amend paragraphs 17.3.1 to 17.3.4.
- AMC1 23.2525 System power generation, storage, and distribution  
The link from F3061 to F3231 was revised (for details, see [F3231](#) described below).
- AMC1 23.2530 External and cockpit lighting  
The link from F3061 to F3233 was revised (for details, see [F3233](#) described below).
- AMC1 23.2535 Safety equipment  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2540 Flight in icing conditions  
The link from F3061 to F3233 was revised (for details, see [F3233](#) described below).
- AMC1 23.2545 Pressurised systems elements  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2555 Installation of recorders (e.g. cockpit voice recorders and flight data recorders)  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2600 Flight crew compartment  
The link from F3061 to F3232 was revised (for details, see [F3232](#) described below).
- AMC1 23.2605 Installation and operation information  
The links from F3061 to F3227, F3231, F3232 and F3233 were revised (for details, see [F3227](#), [F3231](#), [F3232](#), and [F3233](#) described below).
- AMC1 23.2610 Instrument markings, control markings and placards  
References were changed because of the revision to F3061 (no technical change).
- AMC1 23.2615 Flight, navigation, and powerplant instruments  
References were changed because of the revision to F3061 (no technical change).

#### F3062/F3062M-18 (changed to F3062/F3062M-20) Standard Specification for Aircraft Powerplant Installation

Section 4.1 and Appendix X1 were changed to clarify the applicability of engine specifications.

Section 5.2.5 was added to provide alternative requirements for the override means for the alternate induction air door.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3063/F3063M-18a (changed to F3063/F3063M-20) Standard Specification for Aircraft Fuel Storage and Delivery

The word 'energy' was removed from the title since this standard only addresses fuel storage, but, for instance, not battery systems.

EASA accepted that change and incorporated it into the AMC to CS-23.

### F3064/F3064M-18a (changed to F3064/F3064M-21) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

Redundant information that is already captured in F3117 was removed from Sections 4.2.1.2, 6.2.1.1, and 6.2.1.2. In addition, new references to F3233 'Standard Specification for Flight and Navigation Instruments in Aircraft' and F3432 'Standard Practice for Powerplant Instruments' were introduced (for details, see [F3232](#) and [F3432](#) described below).

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3065/F3065M-18 (changed to F3065/F3065M-21a) Standard Specification for Aircraft Propeller System Installation

For propellers, the content of Section 4.3 was replaced by references to the applicable requirements in CS-P or CS-22, Subpart J.

A new Annex A1 was introduced to provide the correlation between this Standard and the relevant certification specifications (CSs) in CS-23.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3066/F3066M-18 (unchanged) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

This Standard was not revised; however, the reference to this Standard was introduced into AMC1 23.2240 'Structural durability'.

### F3083/F3083M-16 (changed to F3083/F3083M-20a) Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

References to F3061 and F3179 were introduced into this Standard.

The 15.0 g forward requirement for engines that are installed behind and above the seating compartment, as well as the 18.0 g forward requirement for engines that are installed inside the fuselage aft of the cabin, fall within the wider scope of powerplant as well as of energy storage system (ESS) and motor(s) installed in such a configuration.

The scope of aeroplanes to which the crashworthiness requirements for aircraft with a weight below 2 722 kg (6 000 lb) that do not meet the climb requirement of CS 23.67(a)(1) apply was replaced by the scope of Level 1 and Level 2 aeroplanes, and by referring to the F3179/F3179M Standard 'Specification for Performance of Aircraft'.

In Section 4.2.6, an additional seat/restraint system design option is introduced for Level 1 or Level 2 aeroplanes with a stalling speed of not more than 113 km/h (61 kt) in the landing configuration.

A new reference to this Standard is introduced into AMC1 23.2535 ‘Safety equipment’.

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3093/F3093M-15 (changed to F3093/F3093M-21) Standard Specification for Aeroelasticity Requirements

In Section 2, the titles and numbering of the referenced documents F3065/F3065M and F3115/F315M were corrected, and a reference to F3120/F3120M ‘Standard Specification for Ice Protection for General Aviation Aircraft’ was introduced.

Section 4.10.3 was corrected to address ice protection requirements including flutter and to refer to the applicable Standard F3120/F3120M.

A new Annex A1 was introduced to provide the correlation between this Standard and the relevant CSs in CS-23.

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3114-15 (changed to F3114-21) Standard Specification for Structures

The requirements in Section 4.5. ‘Vibration and Buffeting’ were removed since they were duplicated in Standard F3173/F3173M; the missing ‘Mass Balance’ requirement was also introduced.

Section 4.7.7 was added to this Standard to introduce the missing requirements of CS 23.775(e) that the windshield and side windows forward of the pilot’s back, when the pilot is seated in the normal flight position, must have a luminous transmittance value of not less than 70 %. A new reference to this Standard is introduced into AMC1 23.2600 ‘Flight crew compartment’, and the related remark in said AMC, which served to fill the gap of the missing provision, was deleted.

The details on the material strength properties in Section 6.3 were removed from this Standard since they are covered by F3380-19 ‘Standard Practice for Structural Compliance of Very Light Aeroplanes’.

EASA accepted those changes and incorporated them into the AMC to CS-23.

In addition, a new reference to F3380-19 ‘Standard Practice for Structural Compliance of Very Light Aeroplanes’, as a lower level to F3114-21, was introduced into the following AMC:

- AMC1 23.2240 Structural durability;
- AMC1 23.2250 Design and construction principles;
- AMC1 23.2255 Protection of structure;
- AMC1 23.2260 Materials and processes; and
- AMC1 23.2265 Special factors of safety.

#### F3115/F3115M-15 (changed to F3115/F3115M-20) Standard Specification for Structural Durability for Small Aeroplanes

This Standard was extensively rewritten to incorporate all tiering and performance-based requirements.

The references to the following Standards were introduced into this Standard:

- F3066/F3066M Standard Specification for Aircraft Powerplant Installation Hazard Mitigation;
- F3116/F3116M Standard Specification for Design Loads and Conditions;
- F3174/F3174M Standard Specification for Establishing Operating Limitations and Information for Aeroplanes; and
- F3380 Practice for Structural Compliance of Very Light Aeroplanes.

### Section 3 ‘Definitions’

Definitions are now more appropriate for both metallic and composite components. A specific definition for catastrophic loss or catastrophic failure was introduced to support the addition of limiting criteria for structural criticality, which are now also used in this Standard.

A new ‘life (or load) enhancement factor’ was introduced to serve as an additional explanation of the criteria for safe life determination of composite components.

### Section 4 ‘Evaluation for Aircraft Structure’

A new Section was introduced to address which structural components require a durability assessment. That information was previously located in various sections. The information on the evaluation of metallic structure was moved to Section 6.

The intent of CS 23.627, which was found to be missing, was introduced into F3115 as AMC1 23.2240 ‘Structural durability’, as text listing the structural components that require a durability analysis based on the material and criticality, which was previously located in various sections. Criteria for the use of service experience for both metallic and composite material were introduced, while the criteria in the previous revision were only applicable to unpressurised metallic structure. The new applicability to composite material was defined, which includes the use of process similarity.

### Section 5 ‘Load Considerations’

A new Section was created to address fatigue load considerations. The information in that Section was previously located in Section 4. The information that was previously located in Section 5 was moved to Section 7. The original fatigue load criteria were only applicable to metallic structure. The criteria are now applicable to both metallic and composite materials. Text on loading effects due to configuration changes was introduced. Dynamic loading events (buffet and vibration) were also clarified.

### Section 6 ‘Metallic Structure Evaluations’

A new Section was created to identify the evaluation options for all metallic structures, and provide a single set of criteria to address both pressurised and non-pressurised metallic structure.

The wording used for fatigue strength evaluation was clarified to state that a safe life value must be established. Criteria for the use of an equivalent cyclic load spectrum were introduced. The use of F3380 Standard Practice for Structural Compliance of Very Light Aeroplanes in lieu of a cyclic test was also introduced as an option.

The fail-safe strength evaluation was revised. The application of fail-safe strength evaluation to a principal structural element was removed, and instead, catastrophic failure criteria are used when performing the evaluation. Requirements were introduced to identify the mode and extent of the

damage. An ‘obvious’ partial failure was clarified, as well as what additional procedures are considered acceptable to prevent loss of the fail-safe capability. The fail-safe load requirements were reduced to be consistent with the fail-safe loads that were previously applicable in 14 Code of Federal Regulations (CFR) Part 23 Amendment 63.

Manufacturing defects were also introduced into the list of probable damage causes to be considered in the damage tolerance evaluation.

#### Section 7 ‘Composite Structure Evaluations’

The term ‘corrosion’ was replaced with ‘environmental effects’ in the damage tolerance evaluation, and additional residual-strength load criteria for structure demonstrating slow or arrested damage growth were introduced.

#### Section 8 ‘Residual Strength Loads’

This new Section was introduced. The information in this Section was originally located in Sections 4 and 5.

#### Section 9 ‘Substantiation of Bonded Structure’

The information in this Section was originally located in Section 6. The applicability of the criteria was clarified to apply to bonds in both metallic and composite structure. The applicability was changed to all aircraft levels (Level 1 through 4). The criteria for demonstrating residual strength capability were changed to remove the term ‘analysis-only’. Further, a new option was introduced for assessing the strength of critical structure, using F3380 ‘Standard Practice for Structural Compliance of Very Light Aeroplanes’.

#### Section 10 ‘Inspections and Other Procedures’

Some of the information in this Section was originally located in Section 7. The reference to the Instructions for Continued Airworthiness (ICA) was updated. In addition, criteria were introduced to update the ICA for severe usage.

A new Annex A1 was introduced to provide the correlation between this Standard and the relevant CSs in CS-23.

The new reference to F3380-19 ‘Standard Practice for Structural Compliance of Very Light Aeroplanes’, as a lower level to F3115-20, was introduced into AMC1 23.2240 ‘Structural durability’.

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3116/F3116M-18 (changed to F3116/F3116M-18e2) Standard Specification for Design Loads and Conditions

The Standard was revised to correct editorial errors; the technical content is unchanged.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3117/F3117M-18b (changed to F3117/F3117M-20) Standard Specification for Crew Interface in Aircraft

Section 5.6 was changed to clarify the switch requirements that are associated with master switches and protected switches. Sections 13.3.7 and 13.3.8 changed from ‘tape’ to ‘display’ to be less prescriptive; Section 13.9.6 was also made less prescriptive.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3120/F3120M-15 (changed to F3120/F3120M-20) Standard Specification for Ice Protection for General Aviation Aircraft

A new Section 4.2 ‘Similarity’ was introduced to address how similarity may be an acceptable means of compliance for any system or component, not only for air data systems.

Section 6 was revised to clarify the requirements for substantiating ice shedding compliance, including break-up allowances in accordance with the current advisory material and industry practices.

In Section 8.1.1.3, the text was revised to be consistent with that used in Section 8.4.2, which was updated to correct the definition of high speed.

In Section 8.4.1, an angle of attack/stall warning heat activation requirement was introduced for when the de-ice capability is not demonstrated.

In Section 8.4.2, the 250-knots calibrated airspeed (KCAS) threshold was deleted to ensure that only high-performance aeroplanes are subject to mixed-phase and ice crystal pitot requirements. Angle of Attack (AOA) vane type sensors require faceplate ice protection to ensure that the base of the vane does not freeze up in ice crystal conditions.

In Section 8.5, text was introduced to clarify the acceptable requirements and reduce the need for certification review items (CRIs) (issue papers) when applying this Standard.

In Section 8.5, text was introduced to correct the turbine engine certification requirements in continuous maximum and intermittent maximum conditions and to clarify when supercooled large droplets (SLD) conditions are required.

In Sections 9.1.9 through 9.1.10, and in the new Annex A4, the guidance material was changed, affecting designs and providing alleviation in some areas of testing.

Annex A1 was amended to remove ambiguity from the requirements and provide for alleviation in some areas that can lead to a reduction in the test requirements. Changes have been incorporated into the current guidance material and current industry practices.

The previous releases of this Standard did not include in Table A1.1 the engine-out take-off climb gradient requirements for high-speed aeroplanes and all Level 4 aeroplanes, as required prior to Part 23 Amendment 64, thus incorrectly requiring Level 1 and 2 aeroplanes to address discontinued approach climb gradients. This revision of the Standard now reflects the same level of safety that existed prior to Amendment 64.

The previous releases of this Standard also omitted in Sections A1.1.1.3 and A1.1.1.5 to address the take-off speeds and take-off flight path requirements of F3179/F3179M for icing conditions for Level 1 and 2 high-speed multi-engined aeroplanes, which is now corrected.

Text that was introduced into Section A1.1.4.2 and Annex A3 clarifies the acceptable requirements and reduces the need for CRIs (issue papers) when applying the ASTM consensus standard. It also provides a practical means of compliance to CS 23.2540(b), which allows modifiers of aeroplanes that were certified for icing based on Part 23 Amendment 43 or previous, who may not have the original equipment manufacturer (OEM) data, to add a critical, safety-enhancing feature.

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3173/F3173M-17 (changed to F3173/F3173M-21) Standard Specification for Aircraft Handling Characteristics

Certification project experience has revealed the need for additional clarity to:

- ensure consistent interpretation of the intended and appropriate use of power changes during the test; and
- provide a clear description of an end point for the test.

Text that clarifies the test procedure was introduced, which more specifically addresses the intended use of power changes during the test and defines an end point for the test: ‘Power must not be reduced during the level acceleration unless a flap speed exceedance ( $V_{FE}$  of the initial position) is imminent. The manoeuvre is completed when the flaps have reached the selected position and the airspeed is not less than  $1.3 V_{S1}$ .’

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3174/F3174M-18 (changed to F3174/F3174M-19) Standard Specification for Establishing Operating Limitations and Information for Aeroplanes

Section 4.2.3 was amended to remove the power-plant-specific discriminator ‘turbine aeroplane’ and to clarify that  $V_D/M_D$  is established based on a minimum speed margin between  $V_C/M_C$  and  $V_D/M_D$  under F3116.

EASA accepted those changes and incorporated them into the AMC to CS-23.

#### F3179/F3179M-18 (changed to F3179/F3179M-20) Standard Specification for Performance of Aircraft

Section 4.2.3 was amended to remove the power-plant-specific discriminator and clarify its intent.

The erroneously removed accelerate-stop distance in Section 4.7 of Part 23 Amendment 62, was reinserted.

Sections 6.2.1 and 6.2.3 were changed to better include the original intent of the Certification Specifications for Very light Aeroplanes (CS-VLA) that does not differentiate between low speed and high speed, and is only applicable to single-engined aeroplanes.

Section 10.1.2 was changed to restore the original intent of Part 23 Amendment 62.

In general, the term ‘cowl flaps’ was replaced with the more generic ‘any means for controlling the cooling of the engine’.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3180/F3180M-18 (changed to F3180/F3180M-21) Standard Specification for Low-Speed Flight Characteristics of Aircraft

Several section titles were introduced for clarity and editorial errors were corrected. In Section 4.4.2.3, subparagraph (3) was removed.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3227/F3227M-17 (changed to F3227/F3227M-21) Standard Specification for Environmental Systems in Aircraft

The applicability table previously showed an exemption from the requirements for harmful or hazardous concentrations of gases and vapours as well as for smoke evacuation for low-altitude aircraft. That exemption was removed.

Section 5.1.8 was changed to remove the specific altitude requirement, to explain what constitutes a high-altitude airfield, and to clarify when to cease high-altitude operations.

Section 7 was added based on CS 23.773(b) to address the potential for fog or frost obscuring the pilot's view. Consequently, the previously entered remark in AMC1 23.2600 was removed.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3228-17 (unchanged) Standard Specification for Flight Data and Voice Recording in Small Aircraft

### F3229/F3229M-17 (unchanged) Standard Practice for Static Pressure System Tests in Small Aircraft

### F3230-17 (changed to F3230-20a) Standard Practice for Safety Assessment of Systems and Equipment in Small Aircraft

Section 2 was corrected to reflect the following previously included referenced standards:

- ETSO-C26d Aircraft Wheels and Wheel-Brake Assemblies (CS-23, CS-27, and CS-29 aircraft);
- MIL-PRF-87257 Hydraulic Fluid, Fire Resistant, Low Temperature Synthetic Hydrocarbon Base, Aircraft and Missile;
- DO-160 Environmental Conditions and Test Procedures for Airborne Equipment;
- SAE ARP4761 Guidelines and Methods for Conducting the Safety Assessment Process on Civil Airborne Systems and Equipment; and
- SAE AS5714 Minimum Performance Standard for Parts 23, 27, and 29 Aircraft Wheels, Brakes, and Wheel and Brake Assemblies.

Editorial changes were made to Sections 3 and 4 (e.g. capital letters removed from 'hazardous failure condition'). In addition, the term 'Airworthiness level' was replaced by 'Aeroplane Certification Level' to be consistent with the definitions in CS-23.

Except for Section 4.2.4.1, EASA accepted those changes and incorporated them into the AMC to CS-23.



### F3231/F3231M-17 (changed to F3231/F3231M-21) Standard Specification for Electrical Systems for Aircraft with Combustion Engine Electrical Power Generation

A new reference to F3316/F3316M that covers electrical systems of aircraft with electrical propulsion was introduced.

Sections 4.3.6 and 4.3.7 were revised, and Sections 4.3.6.1, 4.3.6.2, and 4.3.6.3 were introduced to provide for a clearer correlation of this Standard as means of compliance to CS 23.2525(c) between 14 CFR Part 23 Amendment 64 and EASA CS-23 Amendment 5.

Section 4.5.2 was revised to cover two different means of power disconnection. Section 4.5.2.1 retained the original wording of Section 4.5.2, and Section 4.5.2.2 was introduced to allow to remotely disconnect power feeders as long as they have fault detection that automatically de-energises the source if a fault is detected.

Section 4.2.15 was revised to separate the requirements for external power connections between those for the aeroplane and those for the ground personnel.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3232/F3232M-17 (changed to F3232/F3232M-20) Standard Specification for Flight Controls in Small Aircraft

The term ‘aeroplane certification level’ was harmonised with CS-23.

A new Section 5.4 was introduced to capture the link to the new F3180.

A new Section 4.4.6 was introduced to maintain the level of safety for failures in primary flight controls from CS 23.677(b)(1)/Federal Aviation Regulation (FAR) 23.677(b)(1), and CS-VLA.

A new Section 4.4.10 was introduced to incorporate an accepted standard for powered trim system runaways based on CS 23.677(d)/FAR 23.677(d), using updated system safety terminology.

Section 4.13 was amended to clarify that four options are available to address unsafe wing flap asymmetry, and that any of the four options may be used. These options are specified in Sections 4.13.1, 4.13.2, 4.13.3, and 4.13.4.

EASA accepted those changes and incorporated them into the AMC to CS-23.

### F3233/F3233M-17 (changed to F3233/F3233M-21) Standard Specification for Instrumentation in Small Aircraft

Table 1, and Sections 4.2.7, 4.4.5, 4.4.10, 4.6.2, and 4.6.3 were changed to add a missing exclusion circle for Certification Level 1 aircraft to the existing exclusions for low stall speed and day meteorological conditions. Table 1, and Sections 4.5.1.2, 4.5.1.3, 4.5.1.4, and 4.5.1.5 were also changed to correct a typographical error and add a missing exclusion mark for Certification Level 1 aircraft to the existing exclusions.

The incorrect reference to F3082/F3082M in Section 4.1.6 was corrected to read F3174/F3174M.

Other sections were amended to better reflect that the standards are a means of showing compliance to a requirement.

EASA accepted those changes and incorporated them into the AMC to CS-23.

F3234/F3234M-17 (unchanged) Standard Specification for Exterior Lighting in Small AircraftF3235-17a (unchanged) Standard Specification for Aircraft Storage Batteries

Based on experience from recent certification projects, a remark was added to explain that the F3235-17a Standards alone are not complete and must be complemented by additional means of compliance.

F3236-17 (unchanged) Standard Specification for High Intensity Radiated Field (HIRF) Protection in Small AircraftF3239-19 (new) Standard Specification for Aircraft Electric Propulsion Systems

This new ASTM F44 Standard addresses airworthiness requirements for the design and installation of electric propulsion systems for aeroplanes. Hybrid-electric propulsion systems are addressed implicitly, unless explicitly stated otherwise. This Standard was developed focusing on electric propulsion systems with conventional system layout, propulsion characteristics, and operation.

F3239-19 was not introduced as an AMC to CS-23 since at the time of its publication, there was insufficient experience with the related designs. It is therefore only included as a note to several requirements in CS-23, Subpart E, to highlight that it may be used for developing an AMC within specific certification projects.

F3254-19 (new) Standard Specification for Aircraft Interaction of Systems and Structures

This new ASTM F44 Standard addresses airworthiness requirements for aeroplanes that are equipped with systems:

- where the intended function of those systems is to alter an aeroplane's structural design envelope; or
- whose failure or malfunction would adversely affect the structural performance of the aeroplane.

Such systems include, but are not limited to, active flight control systems, stability augmentation systems, load alleviation systems, flutter control systems, flight envelope protection systems, control-surface-limiting systems, rudder bias systems, autopilot systems, and fuel management systems.

This new Standard addresses the direct structural consequences of the system responses and the performance of such systems.

EASA accepted those changes and incorporated them into the AMC to CS-23.

F3309/F3309M-18 (changed to F3309/F3309M-20) Standard Practice for Simplified Safety Assessment of Systems and Equipment in Small Aircraft

Below Table 1, a note was added to explain that the phrases under each failure condition classification are descriptions of the likely consequences of a given failure condition and not necessarily absolute criteria for classifying that failure condition.

In Section 3, the term ‘on the order of’ is introduced to recognise that for various reasons, predictions about component failure rates are often not precise enough to accurately predict an absolute probability of occurrence. The text was amended to apply that term more consistently when an applicant uses F3309/F3309M as a means of compliance.

A new Section 4.5.3.3 was introduced to address single points of failure that result in hazardous failure conditions.

EASA did not accept those changes and added appropriate remarks in the AMC to CS-23.

#### F3316/F3316M-19 (new) Standard Specification for Electrical Systems for Aircraft with Electric or Hybrid-Electric Propulsion

F3316-19 was not introduced as an AMC to CS-23 since at the time of its publication, there was insufficient experience with the related designs. It is therefore only included as a note to several requirements in CS-23, Subpart E, to highlight that it may be used for developing an AMC within specific certification projects.

#### F3331-18 (unchanged) Standard Practice for Aircraft Water Loads

#### F3367-21 (new) Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft

The FAA developed an HIRF and Lightning policy paper for lower-end Part 23 aircraft systems that perform catastrophic functions. That paper was used as the starting point and was further developed for hazardous functions; the rationale behind this development was to make proportionate or tiered requirements: where criticality is higher, the requirements are higher, while lower-criticality systems have lower requirements.

EASA did not accept this new Standard and did not incorporate it into the AMC to CS-23.

#### F3380-19 (new) Standard Practice for Structural Compliance of Very Light Aeroplanes

This new Standard provides simplified methods for satisfying structural requirements of very light aeroplanes. The material was developed through open consensus of international experts in General Aviation (GA), focusing on single-engined, non-aerobatic aeroplanes with maximum two people on board, a maximum take-off mass (MTOM) of not more than 750 kg, a stalling speed of not more than 83 km/h (45 kt) calibrated airspeed (CAS) in the landing configuration, and an unpressurised fuselage.

EASA accepted this new Standard and incorporated it into the AMC to CS-23.

#### F3396/F3396M-20 (new) Standard Practice for Aircraft Simplified Loads Criteria

This new Standard provides an acceptable means of meeting the airworthiness requirements for the flight design loads and conditions of small normal-category Level 1 and 2 aeroplanes. The material was developed through open consensus of international experts in GA.

This Standard provides means of compliance to CS 23.2200, CS 23.2210, CS 23.2215, and CS 23.2225, and addresses the following topics:

- simplified design load criteria;

- acceptable methods for control surface loads calculations;
- acceptable methods for primary control system loads calculations; and
- control surface loading (Level 1 aeroplanes)

EASA accepted this new Standard and incorporated it into the AMC to CS-23.

#### F3408/F3408M-21 (new) Standard Specification for Aircraft Emergency Parachute Recovery Systems

This new Standard covers the minimum requirements for the design of emergency parachute recovery systems for aircraft. Airframe emergency parachute systems that are addressed in this Standard refer to parachute systems that are designed, manufactured, and installed to recover the airframe and its occupants at a survivable rate of descent. This Standard is not applicable to deep-stall parachutes, spin recovery parachutes, drogue parachutes, or other airframe emergency aerodynamic decelerators that are not specifically intended for safely lowering the airframe and its occupants into the ground. The Standard is applicable only to such types of parachutes that are an integral part of an airframe emergency parachute system that is designed to recover the airframe and its occupants at a survivable rate of descent. The material was developed through open consensus of international experts in GA.

This Standard covers the following topics:

- strength requirements,
- parachute test method,
- activation system,
- deployment system,
- parachute attachment to the airframe,
- occupant protection, and
- system verification.

An Annex to this Standard provides detailed references that identify to which CS-23 requirements the sections of this Standard provide a means of compliance.

EASA accepted this new Standard and incorporated it into the AMC to CS-23.

#### F3432-20a (new) Standard Practice for Powerplant Instruments

This Standard provides the minimum required powerplant instruments and describes how that information is provided to the flight crew or pilot of Normal Category Level 1, 2, 3, or 4 aeroplanes. It provides a list of acceptable power plant instruments and a method for supplying the power plant information to the crew based on the type of the power plant installation.

This Standard also provides the following:

- criteria for mitigating the need for rate of change;
- direction of change; and
- proximity-to-limits information for some power plant instruments that are required to be provided.

This Standard applies to reciprocating and turbine-engined power plant requirements and provides a method of compliance to Section 6 of Standard F3064/F3064M.

EASA accepted this new Standard and incorporated it into the AMC to CS-23.

#### **2.4 What are the expected benefits and drawbacks of the proposed amendments**

The proposed CS-23 Amendment 6 clarifies the intent of CS 23.2135(b) to provide for a common understanding of this requirement.

This revision to the AMC & GM to CS-23 introduces changes into the referenced ASTM consensus standards in AMC1 to CS-23, which were made between Revisions 18b and 21 of F3264 ‘Standard Specification for Normal Category Aeroplanes Certification’. Between Revision 18b (published in December 2018) and Revision 21 (published in September 2021), 23 standards were changed, and 6 new standards were introduced. This shows the ability of the consensus standards development process to follow changes and innovation. Where the initial revisions of the referenced standards were primarily a mere incorporation of the existing detailed regulatory material into standards, changes and improvements are now being introduced.

As explained in Section 1.1, the consensus standards development process allows to quickly follow technological changes and innovation. Regular and quicker updates to consensus standards help to develop up-to-date means of compliance, therefore allowing for safety improvements as well as new technologies and methods for showing compliance.

On the other hand, a user-friendly application of the flexible building-block system requires additional tools and more detailed information, to support the AMC implementation as well as the creation of a certification plan and a compliance checklist. Therefore, the information on the correlation between the CSs and AMC is gradually being introduced into the annexes to various standards.

In parallel with CS-23 Amendment 6, other aviation authorities that use a similar performance-based regulatory system for normal-category aeroplanes are in the process of accepting ASTM F44 standards that are reflected in F3264-21 as AMC. This is expected to provide for global harmonisation of standards and reduced regulatory effort when validating type certificates (TCs) or changes to them.

To summarise, this amendment to CS-23 and the AMC & GM to CS-23 will provide a set of up-to-date CSs, AMC, and GM that appropriately reflects the current technology that is utilised for the design of normal-category aeroplanes as well as the current best design practices that are used by industry to ensure a safe and airworthy product. This amendment will also improve harmonisation with other certification authorities. This will result in reducing the need for CRIs and possible special conditions as well as validation activities, thus ultimately improving the efficiency of the certification process.

### 3. Proposed amendments

#### 3.1 Draft certification specifications, acceptable means of compliance, and guidance material (draft EASA decision) — CS-23 Amendment 6 and AMC & GM to CS-23 Issue 4

Please refer to:

- Appendix 1 to NPA 2022-103 (draft Decision); and
- Appendix 2 to NPA 2022-103 (draft Change information).



#### 4. Impact assessment (IA)

A detailed impact assessment (IA) is not applicable to this regular update RMT since it does not change the certification process for CS-23 aeroplanes. As explained in detail in Section 2.4, the proposed amendments will provide for an improved, up-to-date set of technical requirements for the certification of aeroplanes. They are also expected to improve harmonisation since a synchronised acceptance of the ASTM consensus standards is being pursued by the leading aviation authorities worldwide.



## 5. Monitoring and evaluation

EASA will monitor the agility of the process for developing up-to-date consensus standards by considering the level of amendments to standards, as well as new standards, under the regular update RMT for the AMC & GM to CS-23.

EASA will evaluate the effective use of the ASTM consensus standards for the establishment of the certification programmes and for demonstrating compliance when those standards are applied to certification projects. This is expected to confirm the anticipated benefits of using those standards.





## 6. Proposed actions to support implementation

There are no specific actions planned to support the implementation of the proposed amendments to CS-23 and the AMC & GM to CS-23.



## 7. References

### 7.1 Affected EU regulations

n/a

### 7.2 Affected EASA decisions

- Decision No. 2003/14/RM of the Executive Director of the Agency of 14 November 2003 on certification specifications, including airworthiness codes and acceptable means of compliance for normal, utility, aerobatic and commuter category aeroplanes ('CS-23')
- Executive Director Decision 2017/025/R of 20 December 2017 issuing Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Certification Specifications for Normal-Category Aeroplanes (CS-23) 'AMC/GM to CS-23 — Issue 1'

### 7.3 Other references

n/a



## 8. Appendices

- Appendix 1 to NPA 2022-103 (draft Decision)
- Appendix 2 to NPA 2022-103 (draft Change information)



## Executive Director Decision

**2022/XXX/R**

**of [date]**

**issuing the following:**

**Amendment 6 to the Certification specifications for Normal-Category Aeroplanes (CS-23)**

**'CS-23 — Amendment 6'**

**Issue 4 of the Acceptable Means of Compliance and Guidance Material to the Certification Specifications for Normal-Category Aeroplanes (AMC & GM to CS-23)**

**'AMC & GM to CS-23 — Issue 4'**

**'Regular update of CS-23'**

THE EXECUTIVE DIRECTOR OF THE EUROPEAN UNION AVIATION SAFETY AGENCY (EASA),

Having regard to Regulation (EU) 2018/1139<sup>1</sup>, and in particular Articles 76(3) and 104(3)(a) thereof,

Whereas:

- (1) Certification specifications are non-binding technical standards issued by EASA, which indicate the means to demonstrate compliance with Regulation (EU) 2018/1139 and with the delegated and implementing acts adopted on the basis thereof, and which are used by persons and organisations for the purpose of certification.
- (2) Acceptable means of compliance are non-binding standards issued by EASA, which are used by persons and organisations to demonstrate compliance with Regulation (EU) 2018/1139 and with the delegated and implementing acts adopted on the basis thereof, or with the certification specifications.
- (3) With Decision No. 2003/14/RM of 14 November 2003, the Executive Director issued Certification Specifications for Normal, Utility, Aerobatic and Commuter Category aeroplanes ('CS-23 — Initial Issue').

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<sup>1</sup> Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1) (<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1535612134845&uri=CELEX:32018R1139>).

- (4) With Decision 2017/025/R of 20 December 2017, the Executive Director issued Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Certification Specifications for Normal-Category Aeroplanes (CS-23) ('AMC/GM to CS-23 — Issue 1').
- (5) EASA shall, pursuant to Article 4(1)(a) of Regulation (EU) 2018/1139, reflect the state of the art and the best practices in the field of aviation and update its Decisions, taking into account worldwide aviation experience and scientific and technical progress in the respective fields.
- In coordination with other authorities that use similar regulations for normal-category aeroplanes, EASA identified the need to clarify some text in CS-23 that, subject to interpretation, might result in a lower level of safety.
- In addition, EASA identified the need to enhance and modernise the AMC & GM to CS-23, considering recent revisions to referenced American Society for Testing and Materials (ASTM) International consensus standards that provide for technological innovations and more cost-efficient means of showing compliance with CS-23.
- (6) EASA, pursuant to Article 115(1)(c) of Regulation (EU) 2018/1139 and Articles 6(2) and (3) of the EASA Rulemaking Procedure<sup>2</sup>, consulted its Advisory Bodies (ABs) on the content of this Decision and considered the comments received,

HAS DECIDED:

### ***Article 1***

The Annex to this Decision is issued as Amendment 6 to the Certification Specifications for Normal-Category Aeroplanes (CS-23) and Issue 4 of the Acceptable Means of Compliance and Guidance Material to the Certification Specifications for Normal-Category Aeroplanes (AMC & GM to CS-23).

### ***Article 2***

This Decision shall enter into force on the day following that of its publication in the Official Publication of EASA.

Cologne, [date]

*For the European Union Aviation Safety Agency*

*The Executive Director*

Patrick KY

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<sup>2</sup> EASA is bound to follow a structured rulemaking process as required by Article 115(1) of Regulation (EU) 2018/1139. Such a process has been adopted by the EASA Management Board (MB) and is referred to as the 'Rulemaking Procedure'. See MB Decision No 01-2022 of 2 May 2022 on the procedure to be applied by EASA for the issuing of opinions, certification specifications and other detailed specifications, acceptable means of compliance and guidance material ('Rulemaking Procedure'), and repealing Management Board Decision No 18-2015 (<https://www.easa.europa.eu/the-agency/management-board/decisions/easa-mb-decision-01-2022-rulemaking-procedure-repealing-mb>).



# CERTIFICATION SPECIFICATIONS AND ACCEPTABLE MEANS OF COMPLIANCE FOR NORMAL-CATEGORY AEROPLANES

## ‘CS-23 AMENDMENT 6’ AND ‘AMC & GM TO CS-23 ISSUE 4’

### CHANGE INFORMATION

The European Union Aviation Safety Agency (EASA) issues amendments to certification specifications (CSs) and publishes issues of acceptable means of compliance (AMC) and guidance material (GM) as consolidated documents. These documents are used for establishing the certification basis for applications submitted after the date of entry into force of the applicable amendment/issue.

Consequently, except for a note ‘[Amdt 6/Issue 4]’ under the amended rule, the consolidated text of CS-23 / AMC & GM to CS-23 does not allow readers to see the detailed amendments that have been introduced compared to the previous amendment/issue. To allow readers to see them, this ‘Change information’ document was created, using the following format (same as for the publication of notices of proposed amendments (NPAs):

- deleted text is ~~struck through~~;
- new or amended text is highlighted in blue;
- an ellipsis ‘[...]’ indicates that the rest of the text is unchanged.

#### **Note to the reader**

*In the proposed amendments, and in particular in existing (that is, unchanged) text, the term ‘Agency’ is used interchangeably with ‘EASA’. The interchangeable use of these two terms is more apparent in the consolidated versions. Therefore, please note that both terms refer to the ‘European Union Aviation Safety Agency (EASA)’.*

## SUBPART A — GENERAL

[...]

### GM1 23.2010 Accepted means of compliance

For compliance demonstration, applicants will use the issue of the AMC & GM which is current on the date of application, as reflected in the certification programme for the certification basis determined by EASA.

This current issue, however, does not automatically invalidate the previous **and later** issues of the AMC & GM to CS-23 Amendment 5 Issue 3, unless this is specifically identified as such in the AMC/GM. Applicants can, therefore, agree with EASA in the certification programme to use such previous issues of the AMC & GM to demonstrate compliance with the certification basis.

Whenever an earlier AMC is no longer considered to be acceptable for the demonstration of compliance, the restrictions on its use will be stated in **the** remarks column **of** the specific line **for** that CS and the related AMC. In particular, AMC2&3 to CS-23/CS-VLA Subpart B to Subpart G (which reflect respectively CS-23 Amendment 4 and CS-VLA Amendment 1) will not be updated to cover new technologies or methods. However, they are still accepted as means of compliance. EASA will restrict their use in the AMC only when they no longer appropriately address new safety concerns or the associated safety levels.

### GM2 23.2010 Accepted means of compliance

The AMC to certification specifications (CS) for Normal-Category Aeroplanes (CS-23 Amendment 5 and later) illustrate means, but not the only means, by which a requirement contained in CS-23 can be met. Satisfactory demonstration of compliance using the AMC shall provide for presumption of compliance with the related requirement. The AMC are a way to facilitate certification tasks for the applicant and the competent authority. Due to changes in technology or application of technology in a way that has not been considered or not (yet) included in the AMC, the appropriate application of this AMC in the certification of a design requires a review by the authority.

CS-23 Amendment 5 **and later** maintains the existing level of safety of CS-23 Amendment 4 and CS-VLA Amendment 1, except for areas addressing loss of control and icing, for which the safety level was increased. Achieving this level of safety through compliance with CS-23 Amendment 5 **and later** for a given certification project may require the use of additional means of compliance beyond those provided in this AMC, depending on the details of the specific design.

~~For example, the ASTM standard accepted by this AMC does not contain provisions that address powered trim system runaways. Therefore, in order to maintain the level of safety that was in CS-23 Amendment 4, applicants proposing the use of F3264-18b as a means of complying with CS-23.2300 for an aeroplane with a powered trim system would need to supplement the standards of F3264-18b with additional means of compliance to demonstrate safe controllability after a probable trim system runaway. To do this, applicants could use CS-23.677(d) from Amendment 4, or other means accepted under CS-23.2010 of Amendment 5.~~

Similarly, applicants may propose designs with novel or unusual features for which neither AMC1 nor the EASA Certification Specifications (CS-23 Amendment 4 and CS-VLA Amendment 1) contains appropriate AMC for showing compliance with CS-23 Amendment 5 and later. Therefore, applicants proposing the use of this AMC to CS-23 as a means of complying with CS-23 Amendment 5 and later for aeroplanes with novel or unusual design features may need to gain acceptance of additional means of compliance under CS 23.2010.

AMC1 CS-23 Subpart B through Subpart G contains means of compliance that consist of a listing of consensus standards at their specific revisions that have been reviewed by EASA and accepted as AMC to CS-23. ~~The table<sup>1</sup> provided in Sections B through G identifies which consensus standard contains an accepted demonstration of compliance with the requirement.~~ The scope and content of the referenced consensus standard can, however, differ from the overall scope of CS-23 or the objectives of the requirement. Therefore, using such a referenced consensus standard requires the applicant to identify what is applicable within that consensus standard and to seek agreement with the authority for agreement of the selected consensus standard and applied paragraphs. This is the so-called building-block flexibility that is built into the CS-23.

The listing in AMC1 Subpart B through Subpart G is consistent with the administrative ASTM standard F3264 at the revision as specified ~~in the header of the table<sup>2</sup>~~. The AMC1 is therefore basically a copy of ASTM F3264, except when it is considered necessary to include or exclude specific standards. ~~If applicable, this is identified explained in by the remarks column of the table<sup>2</sup>.~~

When EASA has established that there is the need to deviate from some of the content of a specific referenced consensus standard in order to meet the level of safety of CS-23 Amendment 5, this is also stated in ~~the remark column<sup>3</sup>~~ in this AMC to CS-23.

AMC2 CS-23 Subpart B through Subpart G contains means of compliance that refer to the previous Amendment 4 of CS-23. These AMC are included for the (administrative) convenience of both the applicant and EASA when using an existing certification basis. ~~A table<sup>2</sup> is provided AMC2 in Sections B through G that identifies which CS-23 Amendment 4 requirements contain an accepted demonstration of compliance with the requirement.~~ This AMC2 CS-23 Subpart B through Subpart G is applicable for fixed wing aeroplanes with a passenger-seating configuration of 19 or less and a maximum certificated take-off mass of 8 618 kg (19 000 pounds) or less.

Before the entry into force of Amendment 5 of CS-23, CS-23 was included in the certification basis that often required complementing special conditions (refer to point 21.A.16B of Part 21<sup>3</sup>) when the certification specification did not contain adequate or appropriate safety standards for the product. These special conditions can be applied to complement AMC2 when required.

~~<sup>1</sup> eRules CS 23 AMC editorial note: In contrary to what is explained in the AMC1 to CS 23.2010 above, the eRules representation is not presenting the AMC in a table format. The remarks from the AMC tables are provided directly following their relevant AMC.~~

~~<sup>2</sup> eRules CS 23 AMC editorial note: In contrary to what is explained in the AMC1 to CS 23.2010 above, the eRules representation is not presenting the AMC in a table format. The remarks from the AMC tables are provided directly following their relevant AMC.~~

<sup>3</sup> Regulation (EU) No 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (OJ L 224, 21.8.2012, p. 1). (<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1473415871666&uri=CELEX:32012R0748>).



AMC3 CS-23 Subpart B through Subpart G contains means of compliance that refer to the previous Amendment 1 of CS-VLA. These AMC are included for the (administrative) convenience of both the applicant and EASA when using an existing certification basis. A table<sup>42</sup> AMC3 that are<sup>is</sup> provided in Sections B through G that identify<sup>ies</sup> which CS-VLA Amendment 1 requirement<sup>s</sup> contain an accepted demonstration of compliance with the requirement. This AMC3 CS-23 Subpart B through Subpart G is applicable to aeroplanes with a single engine (spark- or compression-ignition) having not more than two seats, with a maximum certificated take-off weight of not more than 750 kg and a stalling speed in the landing configuration of not more than 83 km/h (45 knots)(CAS), to be approved for day VFR only. This AMC3 is applicable for non-aerobatic operations including:

- any manoeuvre incident to normal flying;
- stalls (except whip stalls); and
- lazy eights, chandelles, and steep turns, in which the angle of bank is not more than 60°.

Before the entry into force of Amendment 5 of CS-23, CS-VLA was included in the certification basis that often required complementing special conditions (refer to point 21.A.16B in Part 21) when the certification specification did not contain adequate or appropriate safety standards for the product. These special conditions can be applied to complement AMC3 when required.

#### Availability of referenced consensus standards

The referenced consensus standard documents are available from their issuing standards body:

- ASTM documents may be purchased from:

ASTM International  
100 Barr Harbor Drive, PO Box C700  
West Conshohocken, Pennsylvania  
19428-2959, USA  
(Website: [www.astm.org](http://www.astm.org))

## GM3 23.2010 Accepted means of compliance

The following table provides an overview of the ASTM International Technical Committee F44 (hereinafter ‘ASTM F44’) consensus standards that are included in AMC1 as an acceptable means of compliance to CS-23. It also gives the revision number of the ASTM consensus standards as changed between Issue 3 and Issue 4 of the AMC1 to CS-23.

	AMC & GM to CS-23 Issue 4 (ED Decision 2022/XXX/R)	AMC & GM to CS-23 Issue 3 (ED Decision 2020/006/R)
<b>ASTM consensus standard number and title</b>	<b>ASTM consensus standard revision</b>	<b>ASTM consensus standard revision</b>
F2490 Standard Guide for Aircraft Electrical Load and Power Source Capacity	20	05
F3061/F3061M Standard Specification for Systems and Equipment in Small Aircraft	20	17
F3062/F3062M Standard Specification for Aircraft Powerplant Installation	20	18
F3063/F3063M Standard Specification for Aircraft Fuel Storage and Delivery	20	18a
F3064/F3064M Standard Specification for Aircraft Powerplant Control, Operation, and Indication	21	18a
F3065/F3065M Standard Specification for Aircraft Propeller System Installation	21a	18
F3066/F3066M Standard Specification for Aircraft Powerplant Installation Hazard Mitigation	18	18
F3082/F3082M Standard Specification for Weights and Centers of Gravity of Aircraft	17	17
F3083/F3083M Standard Specification for Emergency Conditions, Occupant Safety and Accommodations	20a	16
F3093/F3093M Standard Specification for Aeroelasticity Requirements	21	15
F3114 Standard Specification for Structures	21	15
F3115/F3115M Standard Specification for Structural Durability for Small Aeroplanes	20	15

	AMC & GM to CS-23 Issue 4 (ED Decision 2022/XXX/R)	AMC & GM to CS-23 Issue 3 (ED Decision 2020/006/R)
<b>ASTM consensus standard number and title</b>	<b>ASTM consensus standard revision</b>	<b>ASTM consensus standard revision</b>
F3116/F3116M Standard Specification for Design Loads and Conditions	18e2	18
F3117/F3117M Standard Specification for Crew Interface in Aircraft	20	18b
F3120/F3120M Standard Specification for Ice Protection for General Aviation Aircraft	20	15
F3173/F3173M Standard Specification for Aircraft Handling Characteristics	21	17
F3174/F3174M Standard Specification for Establishing Operating Limitations and Information for Aeroplanes	19	18
F3179/F3179M Standard Specification for Performance of Aircraft	20	18
F3180/F3180M Standard Specification for Low-Speed Flight Characteristics of Aircraft	21	18
F3227/F3227M Standard Specification for Environmental Systems in Aircraft	21	17
F3228 Standard Specification for Flight Data and Voice Recording in Small Aircraft	17	17
F3229/F3229M Standard Practice for Static Pressure System Tests in Small Aircraft	17	17
F3230 Standard Practice for Safety Assessment of Systems and Equipment in Small Aircraft	20a	17
F3231/F3231M Standard Specification for Electrical Systems for Aircraft with Combustion Engine Electrical Power Generation	21	17
F3232/F3232M Standard Specification for Flight Controls in Small Aircraft	20	17
F3233/F3233M Standard Specification for Instrumentation in Small Aircraft	21	17
F3234/F3234M Standard Specification for Exterior Lighting in Small Aircraft	17	17
F3235 Standard Specification for Aircraft Storage Batteries	17a	17a

	AMC & GM to CS-23 Issue 4 (ED Decision 2022/XXX/R)	AMC & GM to CS-23 Issue 3 (ED Decision 2020/006/R)
<b>ASTM consensus standard number and title</b>	<b>ASTM consensus standard revision</b>	<b>ASTM consensus standard revision</b>
F3236 Standard Specification for High Intensity Radiated Field (HIRF) Protection in Small Aircraft	17	17
F3254 Standard Specification for Aircraft Interaction of Systems and Structures	19	N/a
F3309/F3309M Standard Practice for Simplified Safety Assessment of Systems and Equipment in Small Aircraft	21	18
F3331 Standard Practice for Aircraft Water Loads	18	18
F3380 Standard Practice for Structural Compliance of Very Light Aeroplanes	19	N/a
F3396/F3396M Standard Practice for Aircraft Simplified Loads Criteria	20	N/a
F3408/F3408M Standard Specification for Aircraft Emergency Parachute Recovery Systems	21	N/a
F3432 Standard Practice for Powerplant Instruments	20a	N/a

## SUBPART B — FLIGHT

[...]

### AMC1 23.2100 Mass and centre of gravity

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.1 *Weight/Mass and Centre of Gravity:*

5.1.1 ~~F3082/F3082M-17~~ Standard Specification for Weights and Centers of Gravity of Aircraft

5.1.2 ~~F3114-15~~ F3114-21 Standard Specification for Structures

[...]

### AMC1 23.2105 Performance data

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.2 *Performance Data:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

#### Remarks

F3179 revised from -16 to -18

[...]

### AMC1 23.2110 Stall speed

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.3 *Stall Speed:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

#### Remarks

F3179 revised from -16 to -18

[...]

### AMC1 23.2115 Take-off performance

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.4 *Take-off Performance:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

#### Remarks

F3179 revised from -16 to -18

[...]

## AMC1 23.2120 Climb requirements

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.5 *Climb Requirements:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

### Remarks

F3179 revised from -16 to -18

[...]

## AMC3 23.2120 Climb requirements

CS-VLA Amdt 1

~~CS-VLA-65~~ 'Climbs': All engines operating

### Remarks

To demonstrate compliance with CS 23.2120, the climb gradient should be determined, using F3179M-20 'Standard Specification for Performance of Aircraft'.

[...]

## AMC1 23.2125 Climb information

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.6 *Climb Information:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

### Remarks

F3179 revised from -16 to -18

[...]

## AMC1 23.2130 Landing

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

5.7 *Landing:*

~~F3179/F3179M-18~~ F3179/F3179M-20 Standard Specification for Performance of Aircraft

### Remarks

F3179 revised from -16 to -18

[...]

## CS 23.2135 Controllability

- (a) The aeroplane must be controllable and manoeuvrable, without requiring exceptional piloting skills, alertness, or strength, within the operating envelope:
- (1) at all loading conditions for which certification is requested;
  - (2) during all phases of flight;
  - (3) with likely reversible flight control or propulsion system failure; and
  - (4) during configuration changes.
- (b) The aeroplane must be able to ~~complete a~~ **make a safe** landing, ~~without causing substantial damage or serious injury~~ using the steepest approved approach gradient procedures and providing a reasonable safe margin below  $V_{REF}$  or above **the** approach angle of attack.
- (c)  $V_{MC}$  is the calibrated airspeed at which, following the sudden critical loss of thrust, it is possible to maintain control of the aeroplane. For multi-engine aeroplanes, the applicant must determine  $V_{MC}$ , if applicable, for the most critical configurations used in take-off and landing operations.
- (d) If the applicant requests certification of an aeroplane for aerobatics, the applicant must demonstrate those aerobatic manoeuvres for which certification is requested and determine entry speeds.

## AMC1 23.2135 Controllability

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.8 *Controllability:*

~~F3173/F3173M-17~~ **F3173/F3173M-21** Standard Specification for Aircraft Handling Characteristics

### Remarks

~~F3173 revised from -15 to -17~~

[...]

## AMC1 23.2140 Trim

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.9 *Trim:*

~~F3173/F3173M-17~~ **F3173/F3173M-21** Standard Specification for Aircraft Handling Characteristics

### Remarks

~~F3173 revised from -15 to -17~~

[...]

## AMC1 23.2145 Stability

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.10 *Stability*:

~~F3173/F3173M-17~~ **F3173/F3173M-21** Standard Specification for Aircraft Handling Characteristics

### Remarks

~~F3173 revised from -15 to -17~~

[...]

## AMC1 23.2150 Stall characteristics, stall warning, and spins

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.11 *Stall Characteristics, Stall Warning, and Spins*:

~~F3180/F3180M-18~~ **F3180/F3180M-21** Standard Specification for Low-Speed Flight Characteristics of Aircraft

### Remarks

~~F3180 revised from -16 to -18~~ **F3180-21 should be applied instead of F3180-19 that is referenced in F3264-21.**

[...]

## AMC2 23.2150 Stall characteristics, stall warning, and spins

CS-23 Amdt 4

23.201 Wings level stall

23.203 Turning Flight and accelerated turning stalls

23.207 Stall Warning

23.221 Spinning

### Remarks

CS 23.2150(b) and (c) are not covered by **this** AMC2. Applicants may use the provision in ASTM F3180-~~18~~ **21** to show compliance with CS 23.2150.

[...]

## AMC1 23.2155 Ground- and water-handling characteristics

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.12 *Ground and Water Handling Characteristics*:

~~F3173/F3173M-17~~ **F3173/F3173M-21** Standard Specification for Aircraft Handling Characteristics



**Remarks**

~~F3173~~ revised from ~~-15~~ to ~~-17~~

[...]

**AMC1 23.2160 Vibration, buffeting, and high-speed characteristics**

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.13 *Vibration, Buffeting, and High-Speed Characteristics:*

~~F3173/F3173M-17~~ **F3173/F3173M-21** Standard Specification for Aircraft Handling Characteristics

**Remarks**

~~F3173~~ revised from ~~-15~~ to ~~-17~~

[...]

**AMC1 23.2165 Performance and flight characteristics requirements for flight in icing conditions**

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.14 *Performance and Flight Characteristics Requirements for Flight in Icing Conditions:*

~~F3120/F3120M-15~~ **F3120/F3120M-20** Standard Specification for Ice Protection for General Aviation Aircraft

**AMC2 23.2165 Performance and flight characteristics requirements for flight in icing conditions**

CS-23 Amdt 4

23.1419 Ice Protection

Following the cancellation of Federal Aviation Administration (FAA) Advisory Circular (AC)-1419-2D, applicants should now use AMC1 23.2165.

[...]

**AMC1 23.2170 Operating limitations**

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

5.15 *Operating Limitations:*

~~F3174/F3174M-18~~ **F3174/F3174M-19** Standard Specification for Establishing Operating Limitations and Information for Aeroplanes

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

**Remarks**

F3174 revised from -15 to -18

[...]

DRAFT

## SUBPART C — STRUCTURES

[...]

### AMC1 23.2200 Structural design envelope

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

6.1 *Structural Design Envelope:*

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[F3396/F3396M-20](#) Standard Practice for Aircraft Simplified Loads Criteria

#### **Remarks**

F3116 revised from -15 to -18

[...]

### AMC1 23.2205 Interaction of systems and structures

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

6.2 *Interaction of Systems and Structure*

[F3254-19](#) Standard Specification for Aircraft Interaction of Systems and Structures ~~TBD~~

#### **Remarks**

Consensus standard in development

[...]

### AMC1 23.2210 Structural-design loads

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

6.3 *Structural Design Loads:*

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[F3396/F3396M-20](#) Standard Practice for Aircraft Simplified Loads Criteria

[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

#### **Remarks**

F3116 revised from -15 to -18

[...]

## AMC1 23.2215 Flight load conditions

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.4 *Flight Load Conditions*:

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[F3396/F3396M-20](#) Standard Practice for Aircraft Simplified Loads Criteria

### Remarks

~~F3116 revised from -15 to -18~~

[...]

## AMC1 23.2220 Ground and water load conditions

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.5 *Ground and Water Load Conditions*:

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[F3331-18](#) Standard Practice for Aircraft Water Loads

### Remarks

~~F3116 revised from -15 to -18~~

~~F3331-New~~

[...]

## AMC1 23.2225 Component loading conditions

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.6 *Component Loading Conditions*:

~~[F3061/F3061M-17](#)~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~[F3232/F3232M-17](#)~~ [F3232/F3232M-20](#) Standard Specification for Flight Controls in Small Aircraft

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[F3396/F3396M-20](#) Standard Practice for Aircraft Simplified Loads Criteria

### Remarks

~~F3116 revised from -15 to -18~~

[...]

## AMC1 23.2230 Limit and ultimate loads

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

6.7 *Limit and Ultimate Loads*:

~~F3114-15~~ [F3114-21](#) Standard Specification for Structures

[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

[...]

## AMC1 23.2235 Structural strength

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

6.8 *Structural Strength*:

~~F3114-15~~ [F3114-21](#) Standard Specification for Structures

[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

[...]

## AMC1 23.2240 Structural durability

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

6.9 *Structural Durability* & 9.11 *Equipment Containing High-Energy Rotors*:

~~F3115/F3115M-15~~ Standard Specification for Structural Durability for Small Aeroplanes

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

[F3066/F3066M-18](#) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

[F3115/F3115M-20](#) Standard Specification for Structural Durability for Small Aeroplanes

[F3380-19](#) Standard Practice for Structural Compliance of Very Light Aeroplanes

[F3116/F3116M-18e2](#) Standard Specification for Design Loads and Conditions

[...]

## AMC1 23.2245 Aeroelasticity

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

6.10 *Aeroelasticity*:

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~F3093/F3093M-15~~ [F3093/F3093M-21](#) Standard Specification for Aeroelasticity Requirements

[...]

## AMC1 23.2250 Design and construction principles

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.11 *Design and Construction Principles:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3114-15~~ **F3114-21** Standard Specification for Structures

**F3380-19** Standard Practice for Structural Compliance of Very Light Aeroplanes

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

[...]

## AMC1 23.2255 Protection of structure

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.12 *Protection of Structure:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3114-15~~ **F3114-21** Standard Specification for Structures

**F3380-19** Standard Practice for Structural Compliance of Very Light Aeroplanes

**F3066/F3066M-18** Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

### **Remarks**

~~F3066 revised from -15 to -18~~

[...]

## AMC1 23.2260 Materials and processes

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.13 *Materials and Processes:*

~~F3114-15~~ **F3114-21** Standard Specification for Structures

**F3380-19** Standard Practice for Structural Compliance of Very Light Aeroplanes

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

[...]

## AMC1 23.2265 Special factors of safety

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.14 *Special Factors of Safety:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3114-15~~ **F3114-21** Standard Specification for Structures

**F3380-19** Standard Practice for Structural Compliance of Very Light Aeroplanes

[...]

## AMC1 23.2270 Emergency Conditions

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

6.15 *Emergency Conditions:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3083/F3083M-16~~ **F3083/F3083M-20a** Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

[...]

## SUBPART D — DESIGN AND CONSTRUCTION

[...]

### AMC1 23.2300 Flight control systems

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.1 *Flight Control Systems:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

**F3066/F3066M-18** Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

**F3117/F3117M-20** Standard Specification for Crew Interface in Aircraft

#### Remarks

Except as follows:

For Level 1 single-engine airplanes with a stall speed in the landing configuration ( $V_{S0}$ ) of more than 45 knots, ASTM ~~F3264-18b~~ **F3264-21**, paragraph 7.1 does not include means for showing that the airplane is protected from loss of control when any one connecting or transmitting element in the primary flight control system fails. If applying for certification of a Level 1 single-engine airplane with a  $V_{S0}$  greater than 45 knots, applicants may use the requirements of CS 23.677(b)(1) at Amendment 4 as a means of complying with this aspect of CS 23.2300, or may propose a different means of compliance in accordance with CS 23.2010.

For powered trim, applicants may use the provisions of CS 23.677(d) at Amendment 4 as a means of complying with CS 23.2010.

~~F3066 revised from -15 to -18~~

[...]

### AMC1 23.2305 Landing gear systems

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.2 *Landing Gear Systems:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

[...]



## AMC1 23.2310 Buoyancy for seaplanes and amphibians

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.3 *Buoyancy for Seaplanes and Amphibians:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

[...]

## AMC1 23.2315 Means of egress and emergency exits

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.4 *Means of Egress and Emergency Exits:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3083/F3083M-16~~ **F3083/F3083M-20a** Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

[...]

## AMC1 23.2320 Occupant physical environment

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.5 *Occupant Physical Environment:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3227/F3227M-17~~ **F3227/F3227M-21** Standard Specification for Environmental Systems in ~~Small~~ Aircraft

~~F3083/F3083M-16~~ **F3083/F3083M-20a** Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

~~F3114-15~~ **F3114-21** Standard Specification for Structures

~~F3117-18b~~ **F3117/F3117M-20** Standard Specification for Crew Interface in Aircraft

### **Remarks**

~~F3117-15~~ revised from ~~-15~~ to ~~-18b~~

[...]

## AMC1 23.2325 Fire protection

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.6 *Fire Protection:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3231/F3231M-17~~ **F3231/F3231M-21** Standard Specification for Electrical Systems ~~for in Small~~ Aircraft with Combustion Engine Electrical Power Generation

~~F3234/F3234M-17~~ Standard Specification for Exterior Lighting in Small Aircraft

~~F3066/F3066M-18~~ Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3083/F3083M-16~~ **F3083/F3083M-20a** Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

### Remarks

~~F3066 revised from -15 to -18~~

ASTM F44 published standards for showing compliance for electrical systems that are installed on aeroplanes with electric or hybrid-electric propulsion systems. EASA has not yet accepted ~~F3316-19~~; however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

## AMC1 23.2330 Fire protection in designated fire zones

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.7 *Fire Protection in Designated Fire Zones and Adjacent Areas:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3231/F3231M-17~~ **F3231/F3231M-21** Standard Specification for Electrical Systems ~~for in Small~~ Aircraft Aircraft with Combustion Engine Electrical Power Generation

~~F3114-15 Standard Specification for Structures~~

~~F3066/F3066M-18~~ Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3114-15~~ **F3114-21** Standard Specification for Structures

~~F3083/F3083M-16 Standard Specification for Emergency Conditions, Occupant Safety and Accommodations~~

### Remarks

~~F3066 revised from -15 to -18~~

~~Different from ASTM F3264-18b paragraph 7.7, ASTM F3083-16 has been added as means of complying with CS-23.2325.~~

[...]

## AMC1 23.2335 Lightning protection

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.8 *Lightning Protection:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

[...]

## AMC1 23.2340 Design and construction information

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

7.9 *Design and Construction Information*

**F3117/F3117M-20** Standard Specification for Crew Interface in Aircraft

*None*

### Remarks

~~No AMC expected~~

[...]

## SUBPART E — POWERPLANT INSTALLATION

[...]

### AMC1 23.2400 Powerplant installation

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

8.1 *Powerplant Installation:*

~~F3062/F3062M-18~~ [F3062/F3062M-20](#) Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ [F3063/F3063M-20](#) Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3064/F3064M-18a~~ [F3064/F3064M-21](#) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

~~F3065/F3065M-18~~ [F3065/F3065M-21a](#) Standard Specification for Aircraft Propeller System Installation

[F3066/F3066M-18](#) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

#### Remarks

~~F3062 revised from -16 to -18~~

~~F3063 revised from -16a to -18a~~

~~F3064 revised from -15 to -18a~~

~~F3065 revised from -15 to -18~~

~~F3066 revised from -15 to -18~~

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

### AMC1 23.2405 Power or thrust control systems

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

8.2 *Power or Thrust Control Systems* & 8.5 *Reversing Systems:*

~~F3062/F3062M-18~~ [F3062/F3062M-20](#) Standard Specification for Aircraft Powerplant Installation

~~F3064/F3064M-18a~~ [F3064/F3064M-21](#) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

~~F3065/F3065M-18~~ [F3065/F3065M-21a](#) Standard Specification for Aircraft Propeller System Installation

[F3117/F3117M-20](#) Standard Specification for Crew Interface in Aircraft

**Remarks**

F3062 revised from -16 to -18

F3064 revised from -15 to -18a

F3065 revised from -15 to -18

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

**AMC1 23.2410 Powerplant installation hazard assessment**

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

8.3 *Powerplant Installation Hazard Assessment:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~F3062/F3062M-18~~ [F3062/F3062M-20](#) Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ [F3063/F3063M-20](#) Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3064/F3064M-18a~~ [F3064/F3064M-21](#) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

~~F3065/F3065M-18~~ [F3065/F3065M-21a](#) Standard Specification for Aircraft Propeller System Installation

[F3066/F3066M-18](#) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3117-18b~~ [F3117-20](#) Standard Specification for Crew Interface in Aircraft

**Remarks**

F3062 revised from -16 to -18

F3063 revised from -16a to -18a

F3064 revised from -15 to -18a

F3065 revised from -15 to -18

F3066-15 revised from -15 to -18

F3117 revised from -15 to -18b

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

## AMC1 23.2415 Powerplant installation ice protection

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

8.4 *Powerplant Installation Ice Protection:*

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ **F3063/F3063M-20** Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

**F3066/F3066M-18** Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

### Remarks

~~Different from ASTM F3264-18b paragraph 8.4, ASTM F3063-18a has been added as a means of complying with CS 23.2415.~~

~~F3062 revised from 16 to 18~~

~~F3063 revised from 16a to 18a~~

~~F3066 revised from 15 to 18~~

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted **F3239-19**; however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

## AMC2 23.2415 Powerplant installation ice protection

CS-23 Amdt 4

23.929 Engine installation ice protection

23.1093 Induction system icing protection

23.975 Fuel tank vents and carburettor vapour vents

23.997 Fuel strainer or filter

23.1105 Induction system screens

### Remarks

Following the cancellation of FAA AC-1419-2D, applicants should now use the icing conditions that are outlined in AMC1 23.2165.

[...]

## AMC1 23.2425 Powerplant operational characteristics

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

8.6 *Powerplant Operational Characteristics:*

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3064/F3064M-18a~~ [F3064/F3064M-21](#) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

~~F3065/F3065M-18~~ [F3065/F3065M-21a](#) Standard Specification for Aircraft Propeller System Installation

[F3066/F3066M-18](#) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3117-18b~~ [F3117-20](#) Standard Specification for Crew Interface in Aircraft

#### **Remarks**

~~F3062 revised from -16 to -18~~

~~F3064 revised from -15 to -18a~~

~~F3065 revised from -15 to -18~~

~~F3066 revised from -15 to -18~~

~~F3117 revised from -15 to -18b~~

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

## **CS 23.2430 Powerplant installation, energy storage and distribution systems**

- (a) Each system must:
- (1) Be designed to provide independence between multiple energy storage and supply systems so that a failure of any one component in one system will not result in the loss of energy storage or supply of another system.
  - (2) Be designed to prevent catastrophic events due to lightning strikes taking into account direct and indirect effects for aeroplanes where the exposure to lightning is likely.
  - (3) Provide energy to the powerplant installation with adequate margins to ensure safe functioning under all permitted and likely operating conditions, and accounting for likely component failures.
  - (4) Provide the information established in CS 23.2445 ~~(a)(7)~~ [\(g\)](#) to the flight crew and provide uninterrupted supply of that energy when the system is correctly operated, accounting for likely energy fluctuations.
  - (5) Provide a means to safely remove or isolate the energy stored within the system.
  - (6) Be designed to retain the energy under all likely operating conditions and minimise hazards to the occupants during any survivable emergency landing. For Level-4 aeroplanes, failure due to overload of the landing system must be taken into account.
  - (7) Prevent hazardous contamination of the energy supplied to each powerplant installation.

[...]

## AMC1 23.2430 Powerplant installation, energy storage and distribution systems

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

8.7 *Fuel and Energy Storage and Distribution Systems:*

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ **F3063/F3063M-20** Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3064/F3064M-18a~~ **F3064/F3064M-21** Standard Specification for Aircraft Powerplant Control, Operation, and Indication

**F3066/F3066M-18** Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3114-15~~ **F3114-21** Standard Specification for Structures

### Remarks

~~Different from ASTM F3264-18b paragraph 8.7, ASTM F3061-17 has been considered not relevant as a means of complying with CS 23.2430 and therefore not included.~~

~~F3062 revised from -16 to -18~~

~~F3063 revised from -16a to -18a~~

~~F3064 revised from -15 to -18a~~

~~F3066 revised from -15 to -18~~

~~F3114-15 New~~

**ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted **F3239-19**; however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.**

[...]

## AMC1 23.2435 Powerplant installation support systems

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

8.8 *Powerplant Induction, Exhaust, and Support Systems:*

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

### Remarks

~~Different from ASTM F3264-18b paragraph 8.8, ASTM F3066-18 has been considered not relevant as a means of complying with CS 23.2435 and therefore not included.~~

~~F3062 revised from -16 to -18~~



ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

## AMC1 23.2440 Powerplant installation fire protection

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

8.9 Powerplant Installation Fire Protection:

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~F3062/F3062M-18~~ [F3062/F3062M-20](#) Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18~~ [F3063/F3063M-20](#) Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3064/F3064M-18a~~ [F3064/F3064M-21](#) Standard Specification for Aircraft Powerplant Control, Operation, and Indication

[F3066/F3066M-18](#) Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

### Remarks

~~With reference to ASTM F3264-18b paragraph 8.9, ASTM F3063-18 has been added as a means of complying with CS-23.2440.~~

~~F3062 revised from -16 to -18~~

~~F3063 revised from -16a to -18~~

~~F3064 revised from -15 to -18a~~

~~F3066 revised from -15 to -18~~

ASTM F44 published standards for showing compliance for electric propulsion systems. EASA has not yet accepted [F3239-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

[...]

## AMC1 23.2445 Powerplant installation information

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

*None*

8.10 Powerplant Installation Information: *None*

[F3117/F3117M-20](#) Standard Specification for Crew Interface in Aircraft

**F3174/F3174M-19 Standard Specification for Establishing Operating Limitations and Information for Aeroplanes****Remarks**

No-AMC expected

[...]

DRAFT

## SUBPART F — SYSTEMS AND EQUIPMENT

[...]

### AMC1 23.2500 General requirements on systems and equipment function

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

9.1 *Systems and Equipment Function* ~~and Safety~~ Requirements:

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3230-17 Standard Practice for Safety Assessment of Systems and Equipment in Small Aircraft~~

~~F3231/F3231M-17~~ **F3231/F3231M-21** Standard Specification for Electrical Systems ~~for in Small~~ Aircraft with Combustion Engine Electrical Power Generation

**F3235-17a** Standard Specification for ~~Electrical Storage~~ **Aircraft Storage** Batteries ~~in Small Aircraft~~

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3233/F3233M-17~~ **F3233/F3233M-21** Standard Specification for **Flight and Navigation** Instrumentation in ~~Small~~ Aircraft

**F3229/F3229M-17** Standard Practice for Static Pressure System Tests in Small Aircraft

~~F3309/F3309M-18 Standard practice for Simplified Safety Assessment of Systems and Equipment in Small Aircraft~~

~~F3064/F3064M-18a~~ **F3064/F3064M-21** Standard Specification for Aircraft Powerplant Control, Operation, and Indication

**F3066/F3066M-18** Standard Specification for Aircraft Powerplant Installation Hazard Mitigation

~~F3117-18b~~ **F3117-20** Standard Specification for Crew Interface in Aircraft

~~F3120-15~~ **F3120/F3120M-20** Standard Specification for Ice Protection for General Aviation Aircraft

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

#### Remarks

~~F3309~~ New

~~F3064~~ revised from -15\* to -18a

\* ~~F3064-15 § 6.2.1 must be complemented. F3064-18 § 6.2.1.6 provides this AMC.~~

~~F3066~~ revised from -15 to -18

~~F3117~~ revised from -15 to -18b

~~F3120-15~~ added as AMC

ASTM F44 published standards for showing compliance for electrical systems that are installed on aeroplanes with electric or hybrid-electric propulsion systems. EASA has not yet accepted [F3316-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

EASA does not consider that [F3235-17a](#) alone provides a complete means of compliance for electrical storage batteries in small aircraft (e.g. paragraph 4.2.1). Therefore, additional and complementary means of compliance should be developed and agreed with EASA for the specific application.

[...]

## AMC1 23.2505 General requirements on equipment installation

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

9.2 *Equipment Function and Installation Requirements:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~F3230-17 Standard Practice for Safety Assessment of Systems and Equipment in Small Aircraft~~

~~F3231/F3231M-17~~ [F3231/F3231M-21](#) Standard Specification for Electrical Systems ~~for in Small Aircraft~~ with Combustion Engine Electrical Power Generation

[F3235-17a](#) Standard Specification for ~~Aircraft~~ ~~Electrical~~ Storage Batteries ~~in Small Aircraft~~

~~F3232/F3232M-17~~ [F3232/F3232M-20](#) Standard Specification for Flight Controls in Small Aircraft

~~F3233/F3233M-17~~ [F3233/F3233M-21](#) Standard Specification for ~~Flight and Navigation~~ Instrumentation in ~~Small Aircraft~~

~~F3117-18b Standard Specification for Crew Interface in Aircraft~~

[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

### Remarks

~~Different from ASTM F3264-18b paragraph 9.2, ASTM F3230-17 is included as a means of complying with CS-23.2505~~

~~F3117 revised from -15 to -18b~~

ASTM F44 published standards for showing compliance for electrical systems that are installed on aeroplanes with electric or hybrid-electric propulsion systems. EASA has not yet accepted [F3316-19](#); however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.

EASA does not consider that [F3235-17a](#) alone provides a complete means of compliance for electrical storage batteries in small aircraft (e.g. paragraph 4.2.1). Therefore, additional and complementary means of compliance should be developed and agreed with EASA for the specific application.

[...]

## AMC1 23.2510 Equipment, systems, and installations

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

### 9.3 *Equipment, Systems, and Installation:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3230-17~~ **F3230-20a** Standard Practice for Safety Assessment of Systems and Equipment in Small Aircraft

~~F3231/F3231M-17~~ *Standard Specification for Electrical Systems in Small Aircraft*

~~F3235-17a~~ *Standard Specification for Electrical Storage Batteries in Small Aircraft*

~~F3232/F3232M-17~~ *Standard Specification for Flight Controls in Small Aircraft*

~~F3233/F3233M-17~~ **F3233/F3233M-21** Standard Specification for **Flight and Navigation** Instrumentation in ~~Small~~ Aircraft

~~F3229/F3229M-17~~ *Standard Practice for Static Pressure System Tests in Small Aircraft*

~~F3227/F3227M-17~~ **F3227/F3227M-21** Standard Specification for Environmental Systems in ~~Small~~ Aircraft

**F3309/F3309M-21** Standard Practice for Simplified Safety Assessment of Systems and Equipment in Small Aircraft

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

### **Remarks**

At variance with **F3230-20a**, paragraph 4.2.4.1, the use of service history data is limited to the fleet of an aeroplane type/aeroplane types for which the applicant is the holder of one or more type certificates (TCs), the owner of the data, or, if accepted by EASA, has concluded with the owner of the data an agreement that permits its use by the applicant for that purpose.

At variance with the note under Table 1 of **F3309/F3309M-21**, that Table 1 provides the applicable criteria for classification of a failure condition based on the severity of the effects. For instance, if the crew is incapacitated, the failure condition classification is expected to be classified as 'catastrophic', as in the case of hull loss.

At variance with **F3309/F3309M-21**, paragraph 3.2.4, the term 'on the order of' means that for various reasons, the component failure rate data is not precise enough to allow accurate estimates of the probabilities of failure conditions. This inability to establish accurate estimates of the probabilities of failure conditions results in some degree of uncertainty and the expression 'on the order of' is included in the descriptions of the quantitative probability terms that are provided to reflect this uncertainty. When calculating the estimated probability of each failure condition, that uncertainty should be accounted for in a way that does not compromise safety. In this context, 'on the order of' does not mean that for instance, the quantitative assessment of a major failure condition can be exceeded by a certain percentage (e.g. 1.1E-5, 2E-5, etc.) to be 'on the order of' 1E-5. It means that there is

uncertainty when determining the component failure rate, and that uncertainty should be accounted for in a way that does not compromise safety.

At variance with Example 1 in paragraph 4.5.3.3 of [F3309/F3309M-21](#), the failure of simple mechanical system components is not always extremely remote. The design should have proper characteristics (i.e. margins, safety factors) between loads and static strength, and be free from fatigue-related failure modes. All those elements (i.e. proper margins and absence of fatigue-related failures) are to be proven before it is possible to come to the conclusion that is proposed in said Example 1.

At variance with Example 2 in paragraph 4.5.3.3 of [F3309/F3309M-21](#), the use of service history data is limited to the fleet of an aeroplane type/aeroplane types for which the applicant is the holder of the TC(s), the owner of the data, or, if accepted by EASA, has concluded with the owner of the data an agreement that permits its use by the applicant for that purpose.

~~Different from ASTM F3264-18b paragraph 9.3, ASTM F3231-17 and F3229-17 are included as a means of complying with CS-23.2510~~

[...]

## CS 23.2515 Electrical and electronic system lightning protection

For an aeroplane where the exposure to lightning is likely:

- (a) each electrical or electronic system that performs a function, the failure of which would prevent the continued safe flight and landing of the aeroplane, must be designed and installed such that:
  - (1) the function at the aeroplane level is not adversely affected during and after the time the aeroplane is exposed to lightning; and
  - (2) the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning unless the system's recovery conflicts with other operational or functional requirements of the system;
- (b) each electrical and electronic system that performs a function, the failure of which would ~~significantly~~ reduce the capability of the aeroplane or the ability of the flight crew to respond to an adverse operating condition, must be designed and installed such that the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning.

## AMC1 23.2515 Electrical and electronic system lightning protection

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

9.4 *Electrical and Electronic System Lightning Protection:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

### Remarks:

[F3367-21a](#) Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft, as referenced in [F3061/F3061M-20](#), paragraph 17.3.4, is not an EASA accepted practice.

At variance with [F3061-20](#):

(a) paragraph 17.3.1 should be replaced with the following:

each electrical or electronic system that performs a function, the failure of which would prevent the continued safe flight and landing of the aeroplane, must be designed and installed such that:

- (1) the function at the aeroplane level is not adversely affected during and after the time the aeroplane is exposed to lightning; and
- (2) the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning unless the system's recovery conflicts with other operational or functional requirements of the system;

(b) paragraph 17.3.2 should be replaced with the following:

each electrical and electronic system that performs a function, the failure of which would reduce the capability of the aeroplane or the ability of the flight crew to respond to an adverse operating condition, must be designed and installed such that the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning; and

(c) paragraphs 17.3.3 and 17.3.4 should be removed.

[...]

## AMC1 23.2520 High-intensity radiated fields (HIRF) protection

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

9.5 *High-Intensity Radiated Fields (HIRF) Protection:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

[F3236-17](#) Standard Specification for High Intensity Radiated Field (HIRF) Protection in Small Aircraft

### Remarks:

[F3367-21](#) Standard Practice for Simplified Methods for Addressing High-Intensity Radiated Fields (HIRF) and Indirect Effects of Lightning on Aircraft, as referenced in [F3061/F3061M-20](#), paragraph 17.3.4, is not an EASA accepted practice.

At variance with [F3061-20](#):

(a) paragraph 17.3.1 should be replaced with the following:

each electrical or electronic system that performs a function, the failure of which would prevent the continued safe flight and landing of the aeroplane, must be designed and installed such that:

- (1) the function at the aeroplane level is not adversely affected during and after the time the aeroplane is exposed to lightning; and
- (2) the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning unless the system's recovery conflicts with other operational or functional requirements of the system;

(b) paragraph 17.3.2 should be replaced with the following:

each electrical and electronic system that performs a function, the failure of which would reduce the capability of the aeroplane or the ability of the flight crew to respond to an adverse operating condition, must be designed and installed such that the system recovers normal operation of that function in a timely manner after the aeroplane is exposed to lightning; and

(c) paragraphs 17.3.3 and 17.3.4 should be removed.

[...]

## AMC1 23.2525 System power generation, storage, and distribution

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

9.6 *System Power Generation, Storage, and Distribution:*

~~F2490-05 Standard Guide for Aircraft Electrical Load and Power Source Capacity~~

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3231/F3231M-17~~ **F3231/F3231M-21** Standard Specification for Electrical Systems ~~for in Small~~ Aircraft with Combustion Engine Electrical Power Generation

**F2490-20** Standard Guide for Aircraft Electrical Load and Power Source Capacity Analysis

~~F3235-17a Standard Specification for Electrical Storage Batteries in Small Aircraft~~

~~F3233/F3233M-17~~ **F3233/F3233M-21** Standard Specification for **Flight and Navigation** Instrumentation in ~~Small~~ Aircraft

~~F3117-18b~~ **F3117-20** Standard Specification for Crew Interface in Aircraft

~~F3120-15~~ **F3120/F3120M-20** Standard Specification for Ice Protection for General Aviation Aircraft

### Remarks

Different from ASTM F3264-18b paragraph 9.6, ASTM F3235-17a is included as a means of complying with CS-23.2525

F3120-15 added as AMC

At variance with **F3231/F3231M-21**, paragraph 4.4, EASA does not accept a protective device for a circuit essential to flight safety in design applications after the date of entry into force of the AMC & GM to CS-23 Issue 4; automatic fuses or circuit breakers should be used instead.

ASTM F44 published standards for showing compliance for electrical systems that are installed on aeroplanes with electric or hybrid-electric propulsion systems. EASA has not yet accepted **F3316-19**; however, EASA would take into consideration applications from applicants that use this standard as the basis for the development of their means of compliance subject to agreement with EASA.



## AMC2 23.2525 System power generation, storage, and distribution

### CS-23 Amdt 4

- 23.1303 Flight and navigation instruments
- 23.1331(b), (c) Instruments using a power source
- 23.1351(a), (b), (c) Electrical Systems — General
- 23.1353 Storage battery design and installation
- 23.1357 Circuit protective devices

### Remarks

At variance with CS 23.1357(b) and (d), EASA does not accept a protective device for a circuit essential to flight safety in designs applications after the date of entry into force of the AMC & GM to CS-23 Issue 4; automatic fuses or circuit breakers should be used instead.

## AMC3 23.2525 System power generation, storage, and distribution

### CS-VLA Amdt 1

- VLA-1303 Flight and navigation instruments
- VLA-1331 Instruments using a power supply
- VLA-1351 Electrical Systems — General
- VLA-1353 Storage battery design and installation
- VLA-1357 Circuit protective devices

### Remarks

At variance with CS-VLA 1357(b) and (d), EASA does not accept a protective device for a circuit essential to flight safety in designs applications after the date of entry into force of the AMC & GM to CS-23 Issue 4; automatic fuses or circuit breakers should be used instead.

[...]

## AMC1 23.2530 External and cockpit lighting

ASTM F44 ~~F3264-18b~~ F3264-21 Standard Specification for Normal Category Aeroplanes Certification

9.7 External and Cockpit Lighting:-

~~F3061/F3061M-17~~ F3061/F3061M-20 Standard Specification for Systems and Equipment in Small Aircraft

~~F3233/F3233M-17~~ F3233/F3233M-21 Standard Specification for Flight and Navigation Instrumentation in Small Aircraft

F3234/F3234M-17 Standard Specification for Exterior Lighting in Small Aircraft

~~F3117-18b~~ F3117-20 Standard Specification for Crew Interface in Aircraft

~~F3120-15~~ [F3120/F3120M-20](#) Standard Specification for Ice Protection for General Aviation Aircraft

**Remarks**

~~F3117 revised from -15 to -18b~~

~~F3120-15 added as AMC~~

[...]

## AMC1 23.2535 Safety equipment

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

9.8 *Safety Equipment:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

[F3083/F3083M-20a](#) Standard Specification for Emergency Conditions, Occupant Safety and Accommodations

[F3117/F3117M-20](#) Standard Specification for Crew Interface in Aircraft

[...]

## AMC1 23.2540 Flight in icing conditions

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

9.9 *Flight in Icing Conditions:*

~~F3061/F3061M-17~~ [F3061/F3061M-20](#) Standard Specification for Systems and Equipment in Small Aircraft

~~F3233/F3233M-17~~ [F3233/F3233M-21](#) Standard Specification for [Flight and Navigation Instrumentation](#) in ~~Small~~ Aircraft

~~F3120/F3120M-15~~ [F3120/F3120M-20](#) Standard Specification for Ice Protection for General Aviation Aircraft

## AMC2 23.2540 Flight in icing conditions

CS-23 Amdt 4

23.1323 Airspeed indicating system

23.1325(b), (g) Static pressure system

~~23.1419 Ice protection~~

23.775(f) Windshields and windows

**Remarks**

Following the cancellation of FAA AC-1419-2D, applicants should now use the icing conditions that are outlined in AMC1 23.2165.

[...]

**AMC1 23.2545 Pressurised systems elements**

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

9.10 *Pressurized System Elements:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3229/F3229M-17~~ Standard Practice for Static Pressure System Tests in Small Aircraft

**Remarks**

~~F3229-17 added as AMC~~

[...]

**AMC1 23.2555 Installation of recorders (e.g. cockpit voice recorders and flight data recorders)**

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

9.12 *Installation of Cockpit recorders:* & 9.13 *Installation of Flight Data Recorders*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3228-17~~ Standard Specification for Flight Data and Voice Recording in Small Aircraft

9.13 *Installation of Flight Data Recorders:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3228-17~~ Standard Specification for Flight Data and Voice Recording in Small Aircraft

[...]

## SUBPART G — FLIGHT CREW INTERFACE AND OTHER INFORMATION

[...]

### AMC1 23.2600 Flight crew compartment

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

10.1 Flight **C**rew Compartment Interface:

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ **F3063/F3063M-20** Standard Specification for Aircraft Fuel ~~and Energy Storage~~ and Delivery

~~F3064/F3064M-18a~~ **F3064/F3064M-21** Standard Specification for Aircraft Powerplant Control, Operation, and Indication

**F3114-21** Standard Specification for Structures

~~F3117-18b~~ **F3117-20** Standard Specification for Crew Interface in Aircraft

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

#### Remarks

~~F3062 revised from -16 to -18~~

~~F3063 revised from -16a to -18a~~

~~F3064 revised from -15 to -18a~~

~~F3117 revised from -15 to -18b~~

Except as follows:

~~ASTM F3264-17 does not contain standards for windshield luminous transmittance. Windshield luminous transmittance must be addressed in showing compliance with CS 23.2600(a). Applicants may use the provisions of CS 23.775(e) at amendment as a means of complying with CS 23.2600(a), or may propose a different means of compliance in accordance with CS 23.2010.~~

ASTM F3264-21 does not contain standards that ensure the required pilot compartment view is provided in conditions of fog or frost formation on the internal portion of the windshield and side windows. Pilot compartment view with formation of fog or frost must be addressed in showing compliance with CS 23.2600(a). Applicants may use the provisions of CS 23.773(b) at Amendment 4 as a means of complying with this aspect of CS 23.2600(a), or may propose a different means of compliance in accordance with CS 23.2010.

F3117/F3117M-20 does not contain Section 4.3 on Level 4 aeroplanes, which is included in the next revision (F3117/F3117M-21a).

[...]

## AMC1 23.2605 Installation and operation information

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

10.2 *Installation and Operation Information:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3232/F3232M-17~~ **F3232/F3232M-20** Standard Specification for Flight Controls in Small Aircraft

~~F3233/F3233M-17~~ **F3233/F3233M-21** Standard Specification for **Flight and Navigation** Instrumentation in ~~Small~~ Aircraft

~~F3231/F3231M-17~~ **F3231/F3231M-21** Standard Specification for Electrical Systems ~~for in Small~~ Aircraft with Combustion Engine Electrical Power Generation

~~F3227/F3227M-17~~ **F3227/F3227M-21** Standard Specification for Environmental Systems in ~~Small~~ Aircraft

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3063/F3063M-18a~~ **F3063/F3063M-20** Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3064/F3064M-18a~~ **F3064/F3064M-21** Standard Specification for Aircraft Powerplant Control, Operation, and Indication

~~F3117-18b~~ **F3117-20** Standard Specification for Crew Interface in Aircraft

~~F3120/F3120M-15~~ **F3120/F3120M-20** Standard Specification for Ice Protection for General Aviation Aircraft

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

### Remarks

~~F3062 revised from -16 to -18~~

~~F3063 revised from -16a to -18a~~

~~F3064 revised from -15\* to -18a~~

\*F3064-15 § 6.2.1 must be complemented. F3064-18a § 6.2.1.6 **and subsequent revisions** provides this AMC.

~~F3117 revised from -15 to -18b~~

[...]

## AMC1 23.2610 Instrument markings, control markings and placards

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

10.3 *Instrument Markings, Control Markings, and Placards:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3063/F3063M-18a~~ **F3063/F3063M-20** Standard Specification for Aircraft Fuel ~~and Energy~~ Storage and Delivery

~~F3117-18b~~ **F3117-20** Standard Specification for Crew Interface in Aircraft

~~F3120-15~~ **F3120/F3120M-20** Standard Specification for Ice Protection for General Aviation Aircraft

**F3408/F3408M-21** Standard Specification for Aircraft Emergency Parachute Recovery Systems

### Remarks

~~F3063 revised from -16a to -18a~~

~~F3117 revised from -15 to -18b~~

~~F3120-15 added as AMC~~

[...]

## AMC1 23.2615 Flight, navigation, and powerplant instruments

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

10.4 *Flight, Navigation, and Powerplant Instruments:*

~~F3061/F3061M-17~~ **F3061/F3061M-20** Standard Specification for Systems and Equipment in Small Aircraft

~~F3062/F3062M-18~~ **F3062/F3062M-20** Standard Specification for Aircraft Powerplant Installation

~~F3064/F3064M-18a~~ **F3064/F3064M-21** Standard Specification for Aircraft Powerplant Control, Operation, and Indication

**F3432-20a** Standard Practice for Powerplant Instruments

**F3117/F3117M-20** Standard Specification for Crew Interface in Aircraft

### Remarks

~~F3062 revised from -16 to -18~~

~~F3064 revised from -15\* to -18a~~

\*F3064-15 § 6.2.1 must be complemented. F3064-18 § 6.2.1.6 **and subsequent revisions** provides this AMC.

## AMC2 23.2615 Flight, navigation, and powerplant instruments

### CS-23 Amdt 4

- 23.1141(g) Powerplant controls: general
- 23.1142 Auxiliary power unit controls
- 23.1303 Flight and navigation instruments
- 23.1305 Powerplant instruments
- 23.1311 Electronic display instrument systems
- 23.1323 Airspeed indicating system
- 23.1325 Static pressure system
- 23.1327 Magnetic direction indicator
- 23.1337 Powerplant instruments installation

### Remarks

23.1305 must be complemented. F3064-18 § 6.2.1.6 **and subsequent revisions** provides this AMC.

## AMC3 23.2615 Flight, navigation, and powerplant instruments

### CS-VLA Amdt 1

- VLA-1141 Powerplant controls: general
- VLA-1303 Flight and navigation instruments
- VLA-1305 Powerplant instruments
- VLA-1323 Airspeed indicating system
- VLA-1325 Static pressure system
- VLA-1327 Magnetic direction indicator
- VLA-1337 Powerplant instruments

### Remarks

VLA-1305 must be complemented. F3064-18 § 6.2.1.6 **and subsequent revisions** provides this AMC.

[...]

## AMC1 23.2620 Aeroplane Flight Manual

ASTM F44 ~~F3264-18b~~ **F3264-21** Standard Specification for Normal Category Aeroplanes Certification

10.5 ~~Airplane~~ **Aeroplane** Flight Manual:-

~~F3117-18b~~ **F3117/F3117M-20** Standard Specification for Crew Interface in Aircraft

~~F3174/F3174M-18~~ **F3174/F3174M-19** Standard Specification for Establishing Operating Limitations and Information for Aeroplanes

~~F3120-15~~ [F3120/F3120M-20](#) Standard Specification for Ice Protection for General Aviation Aircraft  
[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

**Remarks**

~~F3117 revised from -15 to -18b~~

~~F3174 revised from -15 to -18~~

F3120-15 added as AMC

[...]

## AMC1 23.2625 Instructions for Continued Airworthiness

ASTM F44 ~~F3264-18b~~ [F3264-21](#) Standard Specification for Normal Category Aeroplanes Certification

10.6 *Instructions for Continued Airworthiness:*

~~F3120/F3120M-15~~ [F3120/F3120M-20](#) Standard Specification for Ice Protection for General Aviation Aircraft

~~F3117-18b~~ [F3117/F3117M-20](#) Standard Specification for Crew Interface in Aircraft

[F3408/F3408M-21](#) Standard Specification for Aircraft Emergency Parachute Recovery Systems

**Remarks**

~~F3117 revised from -15 to -18b~~

[...]