



Designation: F3491 – 21

Standard Practice for Enhanced Indication Methods in Aircraft¹

This standard is issued under the fixed designation F3491; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice provides methods for how Enhanced Indications are provided to the responsible crewmember when an applicant uses these indications in support of compliance with the requirements for Stall Characteristics, Stall Warning, and Spins applicable to Normal Category Aeroplanes, using Specification **F3180/F3180M**.

1.2 The specific types of enhanced indications identified in Specification **F3180/F3180M** are as follows:

Type	Description
Angle of Attack	Angle of attack indication
Angle of Attack	Angle of attack indication with trend marker
Pitch Limit	Pitch limit indication displayed on attitude indication
Dynamic Low-Speed Markings	Indicated airspeed markings that change with flight condition
Airspeed Trend	Indicated airspeed trend marker displayed on airspeed indication
Flight Path Marker	Flight path marker displayed on attitude indication
LOC Alert	Alert issued when loss of control likely within trend window

1.3 An applicant intending to propose this information as Means of Compliance for a design approval must seek guidance from their respective oversight authority (for example, published guidance from applicable civil aviation authority (CAA) concerning the acceptable use and application thereof. For information on which oversight authorities have accepted this practice (in whole or in part) as an acceptable Means of Compliance to their regulatory requirements (hereinafter “the Rules”), refer to the ASTM Committee F44 web page (www.astm.org/COMMITTEE/F44.htm).

1.4 *Units*—This document may present information in SI units, English Engineering units, or both. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

2.1.1 The following is a list of external standards referenced throughout this practice. In all cases, later document revisions are acceptable if shown to be equivalent to the listed revision, or if otherwise formally accepted by the governing CAA; earlier revisions are not acceptable.

F3060 Terminology for Aircraft

F3180/F3180M Specification for Low-Speed Flight Characteristics of Aircraft

F3117/F3117M Specification for Crew Interface in Aircraft

2.2 SAE Standard:³

ARP4102/7 Electronic Displays

3. Terminology

3.1 *Definitions*—Terminology specific to this practice is provided below. For general terminology, refer to Terminology **F3060**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *flight path marker, n*—flight path marker shows the aircraft’s predicted path based on horizontal and vertical speed, heading, wind, and possibly other contributing factors.

4. Significance and Use

4.1 The purpose of this practice is to discuss display or functional characteristics, or both, of enhanced indications for low-speed awareness.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

³ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, <http://www.sae.org>.

¹ This practice is under the jurisdiction of ASTM Committee **F44** on General Aviation Aircraft and is the direct responsibility of Subcommittee **F44.10** on General.

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