



Standard Specification for Design of Weight-Shift-Control Aircraft¹

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1. Scope

1.1 This specification covers the minimum airworthiness standards a manufacturer shall meet in the designing, testing, and labeling of weight-shift-control aircraft.

1.2 This specification covers only weight-shift-control aircraft in which flight control systems do not use hinged surfaces controlled by the pilot.

NOTE 1—This section is intended to preclude hinged surfaces such as typically found on conventional airplanes such as rudders and elevators. Flexible sail surfaces typically found on weight-shift aircraft are not considered hinged surfaces for the purposes of this specification.

1.3 Weight-shift-control aircraft means a powered aircraft with a framed pivoting wing and a fuselage (trike carriage) controllable only in pitch and roll by the pilot's ability to change the aircraft's center of gravity with respect to the wing. Flight control of the aircraft depends on the wing's ability to flexibly deform rather than the use of control surfaces.

1.4 This specification is organized and numbered in accordance with the bylaws established for Committee F37. The main sections are:

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1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

¹ This specification is under the jurisdiction of ASTM Committee F37 on Light Sport Aircraft and is the direct responsibility of Subcommittee F37.40 on Weight Shift.

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1.6 *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 and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

F2339 Practice for Design and Manufacture of Reciprocating Spark Ignition Engines for Light Sport Aircraft

F2506 Specification for Design and Testing of Light Sport Aircraft Propellers

2.2 Federal Aviation Regulations:³

FAR-33 Airworthiness Standards: Aircraft Engines

FAR-35 Airworthiness Standards: Propellers

2.3 Joint Aviation Requirements:⁴

JAR-E Engines

JAR-P Propellers

JAR-22 Sailplanes and Powered Sailplanes

3. Terminology

3.1 Definitions—Aircraft Weight:

3.1.1 *design maximum aircraft weight, n*—aircraft design maximum weight W_{MAX} shall be the sum of $W_{WING} + W_{SUSP}$.

3.1.2 *design maximum trike carriage weight, n*—design maximum trike carriage weight, W_{susp} , shall be established so that it is: (1) highest trike carriage weight at which compliance with each applicable structural loading condition and each applicable flight requirement is shown, and (2) not less than the empty trike carriage weight, W_{tkmt} , plus a weight of occupant(s) of 86.0 kg [189.6 lb] for a single-seat aircraft or 150 kg [330.8 lb] for a two-seat aircraft, plus the lesser of full usable fuel or fuel weight equal to 1-h burn at economical cruise at maximum gross weight.

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 Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591.

⁴ Available from Global Engineering Documents, 15 Inverness Way, East Englewood, CO 80112-5704