

§ 23.537

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K=0.8, except that lower values may be used if it is shown that the floats are incapable of submerging at a speed of 0.8 V_{so} in normal operations;

V_{so}=seaplane stalling speed (knots) with landing flaps extended in the appropriate position and with no slipstream effect; and g=acceleration due to gravity (ft/sec²).

(g) *Float bottom pressures.* The float bottom pressures must be established under § 23.533, except that the value of K₂ in the formulae may be taken as 1.0. The angle of dead rise to be used in determining the float bottom pressures is set forth in paragraph (b) of this section.

[Doc. No. 26269, 58 FR 42162, Aug. 6, 1993; 58 FR 51970, Oct. 5, 1993]

§ 23.537 Seawing loads.

Seawing design loads must be based on applicable test data.

[Doc. No. 26269, 58 FR 42163, Aug. 6, 1993]

EMERGENCY LANDING CONDITIONS

§ 23.561 General.

(a) The airplane, although it may be damaged in emergency landing conditions, must be designed as prescribed in this section to protect each occupant under those conditions.

(b) The structure must be designed to give each occupant every reasonable chance of escaping serious injury when—

(1) Proper use is made of the seats, safety belts, and shoulder harnesses provided for in the design;

(2) The occupant experiences the static inertia loads corresponding to the following ultimate load factors—

(i) Upward, 3.0g for normal, utility, and commuter category airplanes, or 4.5g for acrobatic category airplanes;

(ii) Forward, 9.0g;

(iii) Sideward, 1.5g; and

(iv) Downward, 6.0g when certification to the emergency exit provisions of § 23.807(d)(4) is requested; and

(3) The items of mass within the cabin, that could injure an occupant, experience the static inertia loads corresponding to the following ultimate load factors—

(i) Upward, 3.0g;

(ii) Forward, 18.0g; and

(iii) Sideward, 4.5g.

(c) Each airplane with retractable landing gear must be designed to protect each occupant in a landing—

(1) With the wheels retracted;

(2) With moderate descent velocity; and

(3) Assuming, in the absence of a more rational analysis—

(i) A downward ultimate inertia force of 3 g; and

(ii) A coefficient of friction of 0.5 at the ground.

(d) If it is not established that a turnover is unlikely during an emergency landing, the structure must be designed to protect the occupants in a complete turnover as follows:

(1) The likelihood of a turnover may be shown by an analysis assuming the following conditions—

(i) The most adverse combination of weight and center of gravity position;

(ii) Longitudinal load factor of 9.0g;

(iii) Vertical load factor of 1.0g; and

(iv) For airplanes with tricycle landing gear, the nose wheel strut failed with the nose contacting the ground.

(2) For determining the loads to be applied to the inverted airplane after a turnover, an upward ultimate inertia load factor of 3.0g and a coefficient of friction with the ground of 0.5 must be used.

(e) Except as provided in § 23.787(c), the supporting structure must be designed to restrain, under loads up to those specified in paragraph (b)(3) of this section, each item of mass that could injure an occupant if it came loose in a minor crash landing.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13090, Aug. 13, 1969; Amdt. 23-24, 52 FR 34745, Sept. 14, 1987; Amdt. 23-36, 53 FR 30812, Aug. 15, 1988; Amdt. 23-46, 59 FR 25772, May 17, 1994; Amdt. 23-48, 61 FR 5147, Feb. 9, 1996]

EFFECTIVE DATE NOTE: By Amdt. 23-62, 76 FR 75756, Dec. 2, 2011, § 23.561 was amended by adding new paragraph (e)(1), and adding and reserving paragraph (e)(2), effective Jan. 31, 2012. For the convenience of the user, the added text is set forth as follows:

§ 23.561 General.

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(e) * * *

(1) For engines mounted inside the fuselage, aft of the cabin, it must be shown by test or analysis that the engine and attached