W = design water takeoff weight in pounds.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25–23, 35 FR 5673, Apr. 8, 1970]

§ 25.533 Hull and main float bottom pressures.

(a) *General.* The hull and main float structure, including frames and bulkheads, stringers, and bottom plating, must be designed under this section.

(b) *Local pressures.* For the design of the bottom plating and stringers and their attachments to the supporting structure, the following pressure distributions must be applied:

(1) For an unflared bottom, the pressure at the chine is 0.75 times the pressure at the keel, and the pressures between the keel and chine vary linearly, in accordance with figure 3 of appendix B. The pressure at the keel (psi) is computed as follows:

$$P_k = C_2 \times \frac{K_2 V_{S1}^2}{\tan \beta_k}$$

where—

P_k = pressure (p.s.i.) at the keel;
C_2 = 0.00213;
K_2 = hull station weighing factor, in accordance with figure 2 of appendix B;
V_{S1} = seaplane stalling speed (Knots) at the design water takeoff weight with flaps extended in the appropriate takeoff position; and
β_K = angle of dead rise at keel, in accordance with figure 1 of appendix B.

(2) For a flared bottom, the pressure at the beginning of the flare is the same as that for an unflared bottom, and the pressure between the chine and the beginning of the flare varies linearly, in accordance with figure 3 of appendix B. The pressure distribution is the same as that prescribed in paragraph (b)(1) of this section for an unflared bottom except that the pressure at the chine is computed as follows:

$$P_{ch} = C_3 \times \frac{K_2 V_{S1}^2}{\tan \beta}$$

where—

P_{ch} = pressure (p.s.i.) at the chine;
C_3 = 0.0016;
K_2 = hull station weighing factor, in accordance with figure 2 of appendix B;
V_{S1} = seaplane stalling speed at the design water takeoff weight with flaps extended in the appropriate takeoff position; and
β = angle of dead rise at appropriate station.

The area over which these pressures are applied must simulate pressures occurring during high localized impacts on the hull or float, but need not extend over an area that would induce critical stresses in the frames or in the overall structure.

(c) *Distributed pressures.* For the design of the frames, keel, and chine structure, the following pressure distributions apply:

(1) Symmetrical pressures are computed as follows:

$$P = C_4 \times \frac{K_2 V_{S0}^2}{\tan \beta}$$

where—

P = pressure (p.s.i.);
C_4 = 0.078 C_1 (with C_1 computed under § 25.527);
K_2 = hull station weighing factor, determined in accordance with figure 2 of appendix B;
V_{S0} = seaplane stalling speed (Knots) with landing flaps extended in the appropriate position and with no slipstream effect; and
V_{S0} = seaplane stalling speed with landing flaps extended in the appropriate position and with no slipstream effect; and β = angle of dead rise at appropriate station.

(2) The unsymmetrical pressure distribution consists of the pressures prescribed in paragraph (c)(1) of this section on one side of the hull or main float centerline and one-half of that pressure on the other side of the hull or main float centerline, in accordance with figure 3 of appendix B.

These pressures are uniform and must be applied simultaneously over the entire hull or main float bottom. The loads obtained must be carried into the sidewall structure of the hull proper, but need not be transmitted in a fore and aft direction as shear and bending loads.

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§ 25.535 Auxiliary float loads.

(a) *General.* Auxiliary floats and their attachments and supporting structures