

reasonably expected operating condition or when rebound occurs during landing or takeoff. In addition—

(1) Wheel brakes must operate smoothly and may not cause any undue tendency to nose over; and

(2) If a tail-wheel landing gear is used, it must be possible, during the takeoff ground run on concrete, to maintain any attitude up to thrust line level, at 75 percent of  $V_{SR1}$ .

(b) For seaplanes and amphibians, the most adverse water conditions safe for takeoff, taxiing, and landing, must be established.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-108, 67 FR 70828, Nov. 26, 2002]

#### § 25.233 Directional stability and control.

(a) There may be no uncontrollable ground-looping tendency in 90° cross winds, up to a wind velocity of 20 knots or 0.2  $V_{SR0}$ , whichever is greater, except that the wind velocity need not exceed 25 knots at any speed at which the airplane may be expected to be operated on the ground. This may be shown while establishing the 90° cross component of wind velocity required by § 25.237.

(b) Landplanes must be satisfactorily controllable, without exceptional piloting skill or alertness, in power-off landings at normal landing speed, without using brakes or engine power to maintain a straight path. This may be shown during power-off landings made in conjunction with other tests.

(c) The airplane must have adequate directional control during taxiing. This may be shown during taxiing prior to takeoffs made in conjunction with other tests.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-23, 35 FR 5671, Apr. 8, 1970; Amdt. 25-42, 43 FR 2322, Jan. 16, 1978; Amdt. 25-94, 63 FR 8848, Feb. 23, 1998; Amdt. 25-108, 67 FR 70828, Nov. 26, 2002]

#### § 25.235 Taxiing condition.

The shock absorbing mechanism may not damage the structure of the airplane when the airplane is taxied on the roughest ground that may reasonably be expected in normal operation.

#### § 25.237 Wind velocities.

(a) For land planes and amphibians, the following applies:

(1) A 90-degree cross component of wind velocity, demonstrated to be safe for takeoff and landing, must be established for dry runways and must be at least 20 knots or 0.2  $V_{SR0}$ , whichever is greater, except that it need not exceed 25 knots.

(2) The crosswind component for takeoff established without ice accretions is valid in icing conditions.

(3) The landing crosswind component must be established for:

(i) Non-icing conditions, and

(ii) Icing conditions with the most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with § 25.21(g).

(b) For seaplanes and amphibians, the following applies:

(1) A 90-degree cross component of wind velocity, up to which takeoff and landing is safe under all water conditions that may reasonably be expected in normal operation, must be established and must be at least 20 knots or 0.2  $V_{SR0}$ , whichever is greater, except that it need not exceed 25 knots.

(2) A wind velocity, for which taxiing is safe in any direction under all water conditions that may reasonably be expected in normal operation, must be established and must be at least 20 knots or 0.2  $V_{SR0}$ , whichever is greater, except that it need not exceed 25 knots.

[Amdt. 25-42, 43 FR 2322, Jan. 16, 1978, as amended by Amdt. 25-108, 67 FR 70827, Nov. 26, 2002; Amdt. 25-121, 72 FR 44668, Aug. 8, 2007; Amdt. 25-140, 79 FR 65525, Nov. 4, 2014]

#### § 25.239 Spray characteristics, control, and stability on water.

(a) For seaplanes and amphibians, during takeoff, taxiing, and landing, and in the conditions set forth in paragraph (b) of this section, there may be no—

(1) Spray characteristics that would impair the pilot's view, cause damage, or result in the taking in of an undue quantity of water;

(2) Dangerously uncontrollable porpoising, bounding, or swinging tendency; or

(3) Immersion of auxiliary floats or sponsons, wing tips, propeller blades,