(1) From 0.8 of the minimum value of V_1 to the maximum value of V_2, considering the approved ranges of altitude and weight; and

(2) With the flaps and power settings corresponding to the values determined in the establishment of the takeoff path under § 25.111 assuming that the critical engine fails at the minimum value of V_1.

(c) The airspeed error of the installation, excluding the airspeed indicator instrument calibration error, may not exceed three percent or five knots, whichever is greater, throughout the speed range, from—

(1) V_{MO} to 1.23 V_{SR1}, with flaps retracted; and

(2) 1.23 V_{SR0} to V_{FE} with flaps in the landing position.

(d) From 1.23 V_{SR} to the speed at which stall warning begins, the IAS must change perceptibly with CAS and in the same sense, and at speeds below stall warning speed the IAS must not change in an incorrect sense.

(e) From V_{MO} to V_{MO} + ⅔ (V_{DF} − V_{MO}), the IAS must change perceptibly with CAS and in the same sense, and at higher speeds up to V_{DF} the IAS must not change in an incorrect sense.

(f) There must be no indication of airspeed that would cause undue difficulty to the pilot during the takeoff between the initiation of rotation and the achievement of a steady climbing condition.

(g) The effects of airspeed indicating system lag may not introduce significant takeoff indicated airspeed bias, or significant errors in takeoff or accelerate-stop distances.

(h) Each system must be arranged, so far as practicable, to prevent malfunction or serious error due to the entry of moisture, dirt, or other substances.

(i) Each system must have a heated pitot tube or an equivalent means of preventing malfunction in the heavy rain conditions defined in Table 1 of this section; mixed phase and ice crystal conditions as defined in part 33, Appendix D, of this chapter; the icing conditions defined in Appendix C of this part; and the following icing conditions specified in Appendix O of this part:

(1) For airplanes certificated in accordance with § 25.1420(a)(1), the icing conditions that the airplane is certified to safely exit following detection.

(2) For airplanes certificated in accordance with § 25.1420(a)(2), the icing conditions that the airplane is certified to safely operate in and the icing conditions that the airplane is certified to safely exit following detection.

(3) For airplanes certificated in accordance with § 25.1420(a)(3) and for airplanes not subject to § 25.1420, all icing conditions.

TABLE 1—HEAVY RAIN CONDITIONS FOR AIRSPEED INDICATING SYSTEM TESTS

Altitude range		Liquid water content	Horizontal extent		Droplet MVD
(ft)	(m)	(g/m3)	(km)	(nmiles)	(μm)
0 to 10 000	0 to 3000	1	100	50	1000
		6	5	3	2000
		15	1	0.5	2000

(j) Where duplicate airspeed indicators are required, their respective pitot tubes must be far enough apart to avoid damage to both tubes in a collision with a bird.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25–57, 49 FR 6849, Feb. 23, 1984; Amdt. 25–108, 67 FR 70828, Nov. 26, 2002; Amdt. 25–109, 67 FR 76656, Dec. 12, 2002; Amdt. 25–140, 79 FR 65526, Nov. 4, 2014]

§ 25.1324 Angle of attack system.

Each angle of attack system sensor must be heated or have an equivalent means of preventing malfunction in the heavy rain conditions defined in Table 1 of § 25.1323, the mixed phase and ice crystal conditions as defined in part 33, Appendix D, of this chapter, the icing conditions defined in Appendix C of this part, and the following icing conditions specified in Appendix O of this part: