(c) The prescribed reduction in climb gradient may be applied as an equivalent reduction in acceleration along that part of the takeoff flight path at which the airplane is accelerated in level flight.


§ 25.117 Climb: general.

Compliance with the requirements of §§25.119 and 25.121 must be shown at each weight, altitude, and ambient temperature within the operational limits established for the airplane and with the most unfavorable center of gravity for each configuration.

§ 25.119 Landing climb: All-engines-operating.

In the landing configuration, the steady gradient of climb may not be less than 3.2 percent, with the engines at the power or thrust that is available 8 seconds after initiation of movement of the power or thrust controls from the minimum flight idle to the go-around power or thrust setting—

(a) In non-icing conditions, with a climb speed of \(V_{REF}\) determined in accordance with §25.125(b)(2)(i); and

(b) In icing conditions with the landing ice accretion defined in appendix C, and with a climb speed of \(V_{REF}\) determined in accordance with §25.125(b)(2)(ii).

[Amdt. 25–121, 72 FR 44666; Aug. 8, 2007]

§ 25.121 Climb: One-engine-inoperative.

(a) Takeoff; landing gear extended. In the critical takeoff configuration existing along the flight path (between the points at which the airplane reaches \(V_{LOF}\) and at which the landing gear is fully retracted) and in the configuration used in §25.111 but without ground effect, the steady gradient of climb must be positive for two-engine airplanes, and not less than 0.3 percent for three-engine airplanes or 0.5 percent for four-engine airplanes, at \(V_{LOF}\) and with—

(1) The critical engine inoperative and the remaining engines at the power or thrust available when retraction of the landing gear is begun.

with §25.111 unless there is a more critical power operating condition existing later along the flight path but before the point at which the landing gear is fully retracted; and

(2) The weight equal to the weight existing when retraction of the landing gear is begun, determined under §25.111.

(b) Takeoff; landing gear retracted. In the takeoff configuration existing at the point of the flight path at which the landing gear is fully retracted, and in the configuration used in §25.111 but without ground effect:

(1) The steady gradient of climb may not be less than 2.4 percent for two-engine airplanes, 2.7 percent for three-engine airplanes, and 3.0 percent for four-engine airplanes, at \(V_{2}\) with:

(i) The critical engine inoperative, the remaining engines at the takeoff power or thrust available at the time the landing gear is fully retracted, determined under §25.111, unless there is a more critical power operating condition existing later along the flight path but before the point where the airplane reaches a height of 400 feet above the takeoff surface; and

(ii) The weight equal to the weight existing when the airplane’s landing gear is fully retracted, determined under §25.111.

(2) The requirements of paragraph (b)(1) of this section must be met:

(i) In non-icing conditions; and

(ii) In icing conditions with the takeoff ice accretion defined in appendix C, if in the configuration of §25.121(b) with the takeoff ice accretion:

(A) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of \(V_{SR}\); or

(B) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b).

(c) Final takeoff. In the en route configuration at the end of the takeoff path determined in accordance with §25.111:
§ 25.123 En route flight paths.

(a) For the en route configuration, the flight paths prescribed in paragraph (b) and (c) of this section must be determined at each weight, altitude, and ambient temperature, within the operating limits established for the airplane. The variation of weight along the flight path, accounting for the progressive consumption of fuel and oil by the operating engines, may be included in the computation. The flight paths must be determined at a speed not less than \( V_{FTO} \), with—

(1) The most unfavorable center of gravity;
(2) The critical engines inoperative;
(3) The remaining engines at the available maximum continuous power or thrust; and
(4) The means for controlling the engine-cooling air supply in the position that provides adequate cooling in the hot-day condition.

(b) The one-engine-inoperative net flight path data must represent the actual climb performance diminished by a gradient of climb of 1.1 percent for two-engine airplanes, 1.4 percent for three-engine airplanes, and 1.6 percent for four-engine airplanes—

(1) In non-icing conditions; and
(2) In icing conditions with the en route ice accretion defined in appendix C, if:
   (i) A speed of 1.18 \( V_{SR} \) with the en route ice accretion exceeds the en route speed selected for non-icing conditions by more than the greater of 3 knots CAS or 3 percent of \( V_{SR} \); or
   (ii) The degradation of the gradient of climb is greater than one-half of the applicable actual-to-net flight path gradient reduction defined in paragraph (b) of this section.

(c) For three- or four-engine airplanes, the two-engine-inoperative net flight path data must represent the actual climb performance diminished by