

§ 23.69

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of the takeoff surface must be measurably positive for two-engine airplanes, not less than 0.3 percent for three-engine airplanes, or 0.5 percent for four-engine airplanes with—

- (i) The critical engine inoperative and its propeller in the position it rapidly and automatically assumes;
- (ii) The remaining engine(s) at take-off power;
- (iii) The landing gear extended, and all landing gear doors open;
- (iv) The wing flaps in the takeoff position(s);
- (v) The wing level; and
- (vi) A climb speed equal to  $V_2$ .

(2) *Takeoff; landing gear retracted.* The steady gradient of climb at an altitude of 400 feet above the takeoff surface must be not less than 2.0 percent of two-engine airplanes, 2.3 percent for three-engine airplanes, and 2.6 percent for four-engine airplanes with—

- (i) The critical engine inoperative and its propeller in the position it rapidly and automatically assumes;
- (ii) The remaining engine(s) at take-off power;
- (iii) The landing gear retracted;
- (iv) The wing flaps in the takeoff position(s);
- (v) A climb speed equal to  $V_2$ .

(3) *Enroute.* The steady gradient of climb at an altitude of 1,500 feet above the takeoff or landing surface, as appropriate, must be not less than 1.2 percent for two-engine airplanes, 1.5 percent for three-engine airplanes, and 1.7 percent for four-engine airplanes with—

- (i) The critical engine inoperative and its propeller in the minimum drag position;
- (ii) The remaining engine(s) at not more than maximum continuous power;
- (iii) The landing gear retracted;
- (iv) The wing flaps retracted; and
- (v) A climb speed not less than  $1.2 V_{S1}$ .

(4) *Discontinued approach.* The steady gradient of climb at an altitude of 400 feet above the landing surface must be not less than 2.1 percent for two-engine airplanes, 2.4 percent for three-engine airplanes, and 2.7 percent for four-engine airplanes, with—

(i) The critical engine inoperative and its propeller in the minimum drag position;

(ii) The remaining engine(s) at take-off power;

(iii) Landing gear retracted;

(iv) Wing flaps in the approach position(s) in which  $V_{S1}$  for these position(s) does not exceed 110 percent of the  $V_{S1}$  for the related all-engines-operated landing position(s); and

(v) A climb speed established in connection with normal landing procedures but not exceeding  $1.5 V_{S1}$ .

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§ 23.69 Enroute climb/descent.

(a) *All engines operating.* The steady gradient and rate of climb must be determined at each weight, altitude, and ambient temperature within the operational limits established by the applicant with—

- (1) Not more than maximum continuous power on each engine;
- (2) The landing gear retracted;
- (3) The wing flaps retracted; and
- (4) A climb speed not less than  $1.3 V_{S1}$ .

(b) *One engine inoperative.* The steady gradient and rate of climb/descent must be determined at each weight, altitude, and ambient temperature within the operational limits established by the applicant with—

- (1) The critical engine inoperative and its propeller in the minimum drag position;
- (2) The remaining engine(s) at not more than maximum continuous power;
- (3) The landing gear retracted;
- (4) The wing flaps retracted; and
- (5) A climb speed not less than  $1.2 V_{S1}$ .

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§ 23.71 Glide: Single-engine airplanes.

The maximum horizontal distance traveled in still air, in nautical miles, per 1,000 feet of altitude lost in a glide, and the speed necessary to achieve this must be determined with the engine inoperative, its propeller in the minimum drag position, and landing gear and wing flaps in the most favorable available position.

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