

- (1) Stall speed safety margins;
- (2) Minimum control speeds; and
- (3) Climb gradients.

(b) For single engine airplanes and levels 1, 2, and 3 low-speed multiengine airplanes, takeoff performance includes the determination of ground roll and initial climb distance to 50 feet (15 meters) above the takeoff surface.

(c) For levels 1, 2, and 3 high-speed multiengine airplanes, and level 4 multiengine airplanes, takeoff performance includes a determination the following distances after a sudden critical loss of thrust—

- (1) An aborted takeoff at critical speed;
- (2) Ground roll and initial climb to 35 feet (11 meters) above the takeoff surface; and
- (3) Net takeoff flight path.

§ 23.2120 Climb requirements.

The design must comply with the following minimum climb performance out of ground effect:

(a) With all engines operating and in the initial climb configuration—

(1) For levels 1 and 2 low-speed airplanes, a climb gradient of 8.3 percent for landplanes and 6.7 percent for seaplanes and amphibians; and

(2) For levels 1 and 2 high-speed airplanes, all level 3 airplanes, and level 4 single-engines a climb gradient after takeoff of 4 percent.

(b) After a critical loss of thrust on multiengine airplanes—

(1) For levels 1 and 2 low-speed airplanes that do not meet single-engine crashworthiness requirements, a climb gradient of 1.5 percent at a pressure altitude of 5,000 feet (1,524 meters) in the cruise configuration(s);

(2) For levels 1 and 2 high-speed airplanes, and level 3 low-speed airplanes, a 1 percent climb gradient at 400 feet (122 meters) above the takeoff surface with the landing gear retracted and flaps in the takeoff configuration(s); and

(3) For level 3 high-speed airplanes and all level 4 airplanes, a 2 percent climb gradient at 400 feet (122 meters) above the takeoff surface with the landing gear retracted and flaps in the approach configuration(s).

(c) For a balked landing, a climb gradient of 3 percent without creating

undue pilot workload with the landing gear extended and flaps in the landing configuration(s).

§ 23.2125 Climb information.

(a) The applicant must determine climb performance at each weight, altitude, and ambient temperature within the operating limitations—

(1) For all single-engine airplanes;

(2) For levels 1 and 2 high-speed multiengine airplanes and level 3 multiengine airplanes, following a critical loss of thrust on takeoff in the initial climb configuration; and

(3) For all multiengine airplanes, during the enroute phase of flight with all engines operating and after a critical loss of thrust in the cruise configuration.

(b) The applicant must determine the glide performance for single-engine airplanes after a complete loss of thrust.

§ 23.2130 Landing.

The applicant must determine the following, for standard temperatures at critical combinations of weight and altitude within the operational limits:

(a) The distance, starting from a height of 50 feet (15 meters) above the landing surface, required to land and come to a stop.

(b) The approach and landing speeds, configurations, and procedures, which allow a pilot of average skill to land within the published landing distance consistently and without causing damage or injury, and which allow for a safe transition to the balked landing conditions of this part accounting for:

- (1) Stall speed safety margin; and
- (2) Minimum control speeds.

FLIGHT CHARACTERISTICS

§ 23.2135 Controllability.

(a) The airplane must be controllable and maneuverable, without requiring exceptional piloting skill, alertness, or strength, within the operating envelope—

(1) At all loading conditions for which certification is requested;

(2) During all phases of flight;

(3) With likely reversible flight control or propulsion system failure; and

(4) During configuration changes.