

(2) The takeoff distance must not exceed the length of the runway plus the length of any clearway except that the length of any clearway included must not be greater than one-half the length of the runway.

(3) The takeoff run must not be greater than the length of the runway.

(d) No person operating a turbine engine powered airplane may take off that airplane at a weight greater than that listed in the Airplane Flight Manual—

(1) In the case of an airplane certificated after August 26, 1957, but before October 1, 1958 (SR422), that allows a takeoff path that clears all obstacles either by at least  $(35+0.01D)$  feet vertically (D is the distance along the intended flight path from the end of the runway in feet), or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing the boundaries; or

(2) In the case of an airplane certificated after September 30, 1958 (SR 422A, 422B), that allows a net takeoff flight path that clears all obstacles either by a height of at least 35 feet vertically, or by at least 200 feet horizontally within the airport boundaries and by at least 300 feet horizontally after passing the boundaries.

(e) In determining maximum weights, minimum distances, and flight paths under paragraphs (a) through (d) of this section, correction must be made for the runway to be used, the elevation of the airport, the effective runway gradient, the ambient temperature and wind component at the time of takeoff, and, if operating limitations exist for the minimum distances required for takeoff from wet runways, the runway surface condition (dry or wet). Wet runway distances associated with grooved or porous friction course runways, if provided in the Airplane Flight Manual, may be used only for runways that are grooved or treated with a porous friction course (PFC) overlay, and that the operator determines are designed, constructed, and maintained in a manner acceptable to the Administrator.

(f) For the purposes of this section, it is assumed that the airplane is not banked before reaching a height of 50

feet, as shown by the takeoff path or net takeoff flight path data (as appropriate) in the Airplane Flight Manual, and thereafter that the maximum bank is not more than 15 degrees.

(g) For the purposes of this section the terms, *takeoff distance*, *takeoff run*, *net takeoff flight path* and *takeoff path* have the same meanings as set forth in the rules under which the airplane was certificated.

[Doc. No. 6258, 29 FR 19198, Dec. 31, 1964, as amended by Amdt. 121-268, 63 FR 8321, Feb. 18, 1998]

**§ 121.191 Airplanes: Turbine engine powered: En route limitations: One engine inoperative.**

(a) No person operating a turbine engine powered airplane may take off that airplane at a weight, allowing for normal consumption of fuel and oil, that is greater than that which (under the approved, one engine inoperative, en route net flight path data in the Airplane Flight Manual for that airplane) will allow compliance with paragraph (a) (1) or (2) of this section, based on the ambient temperatures expected en route:

(1) There is a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within five statute miles on each side of the intended track, and, in addition, if that airplane was certificated after August 29, 1959 (SR 422B) there is a positive slope at 1,500 feet above the airport where the airplane is assumed to land after an engine fails.

(2) The net flight path allows the airplane to continue flight from the cruising altitude to an airport where a landing can be made under § 121.197, clearing all terrain and obstructions within five statute miles of the intended track by at least 2,000 feet vertically and with a positive slope at 1,000 feet above the airport where the airplane lands after an engine fails, or, if that airplane was certificated after September 30, 1958 (SR 422A, 422B), with a positive slope at 1,500 feet above the airport where the airplane lands after an engine fails.

(b) For the purposes of paragraph (a)(2) of this section, it is assumed that—

(1) The engine fails at the most critical point en route;

(2) The airplane passes over the critical obstruction, after engine failure at a point that is no closer to the obstruction than the nearest approved radio navigation fix, unless the Administrator authorizes a different procedure based on adequate operational safeguards;

(3) An approved method is used to allow for adverse winds;

(4) Fuel jettisoning will be allowed if the certificate holder shows that the crew is properly instructed, that the training program is adequate, and that all other precautions are taken to insure a safe procedure;

(5) The alternate airport is specified in the dispatch or flight release and meets the prescribed weather minimums; and

(6) The consumption of fuel and oil after engine failure is the same as the consumption that is allowed for in the approved net flight path data in the Airplane Flight Manual.

[Doc. No. 6258, 29 FR 19198, Dec. 31, 1964; 30 FR 130, Jan. 7, 1965, as amended by Amdt. 121-143, 43 FR 22641, May 25, 1978]

**§ 121.193 Airplanes: Turbine engine powered: En route limitations: Two engines inoperative.**

(a) *Airplanes certificated after August 26, 1957, but before October 1, 1958* (SR 422). No person may operate a turbine engine powered airplane along an intended route unless he complies with either of the following:

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets the requirements of § 121.197.

(2) Its weight, according to the two-engine-inoperative, en route, net flight path data in the Airplane Flight Manual, allows the airplane to fly from the point where the two engines are assumed to fail simultaneously to an airport that meets the requirements of § 121.197, with a net flight path (considering the ambient temperature anticipated along the track) having a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within five miles on each side of

the intended track, or at an altitude of 5,000 feet, whichever is higher.

For the purposes of paragraph (a)(2) of this section, it is assumed that the two engines fail at the most critical point en route, that if fuel jettisoning is provided, the airplane's weight at the point where the engines fail includes enough fuel to continue to the airport and to arrive at an altitude of at least 1,000 feet directly over the airport, and that the fuel and oil consumption after engine failure is the same as the consumption allowed for in the net flight path data in the Airplane Flight Manual.

(b) *Aircraft certificated after September 30, 1958, but before August 30, 1959* (SR 422A). No person may operate a turbine engine powered airplane along an intended route unless he complies with either of the following:

(1) There is no place along the intended track that is more than 90 minutes (with all engines operating at cruising power) from an airport that meets the requirements of § 121.197.

(2) Its weight, according to the two-engine-inoperative, en route, net flight path data in the Airplane Flight Manual, allows the airplane to fly from the point where the two engines are assumed to fail simultaneously to an airport that meets the requirements of § 121.197, with a net flight path (considering the ambient temperatures anticipated along the track) having a positive slope at an altitude of at least 1,000 feet above all terrain and obstructions within 5 miles on each side of the intended track, or at an altitude of 2,000 feet, whichever is higher.

For the purposes of paragraph (b)(2) of this section, it is assumed that the two engines fail at the most critical point en route, that the airplane's weight at the point where the engines fail includes enough fuel to continue to the airport, to arrive at an altitude of at least 1,500 feet directly over the airport, and thereafter to fly for 15 minutes at cruise power or thrust, or both, and that the consumption of fuel and oil after engine failure is the same as the consumption allowed for in the net flight path data in the Airplane Flight Manual.

(c) *Aircraft certificated after August 29, 1959* (SR 422B). No person may operate