

(1) By a load on each main wheel tire) to be compared to the static rating approved for such tires) equal to the corresponding static ground reaction under the design maximum weight and critical center of gravity; and

(2) By a load on nose wheel tires (to be compared with the dynamic rating approved for such tires) equal to the reaction obtained at the nose wheel, assuming the mass of the airplane to be concentrated at the most critical center of gravity and exerting a force of 1.0 W downward and 0.31 W forward (where W is the design maximum weight), with the reactions distributed to the nose and main wheels by the principles of statics and with the drag reaction at the ground applied only at wheels with brakes.

(b) If specially constructed tires are used, the wheels must be plainly and conspicuously marked to that effect. The markings must include the make, size, number of plies, and identification marking of the proper tire.

(c) Each tire installed on a retractable landing gear system must, at the maximum size of the tire type expected in service, have a clearance to surrounding structure and systems that is adequate to prevent contact between the tire and any part of the structure of systems.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13092, Aug. 13, 1969; Amdt. 23-17, 41 FR 55464, Dec. 20, 1976; Amdt. 23-45, 58 FR 42165, Aug. 6, 1993]

§ 23.735 Brakes.

(a) Brakes must be provided. The landing brake kinetic energy capacity rating of each main wheel brake assembly must not be less than the kinetic energy absorption requirements determined under either of the following methods:

(1) The brake kinetic energy absorption requirements must be based on a conservative rational analysis of the sequence of events expected during landing at the design landing weight.

(2) Instead of a rational analysis, the kinetic energy absorption requirements for each main wheel brake assembly may be derived from the following formula:

$$KE=0.0443 WV^2/N$$

where—

KE=Kinetic energy per wheel (ft.-lb.);

W=Design landing weight (lb.);

V=Airplane speed in knots. V must be not less than V_{S1} , the poweroff stalling speed of the airplane at sea level, at the design landing weight, and in the landing configuration; and

N=Number of main wheels with brakes.

(b) Brakes must be able to prevent the wheels from rolling on a paved runway with takeoff power on the critical engine, but need not prevent movement of the airplane with wheels locked.

(c) During the landing distance determination required by § 23.75, the pressure on the wheel braking system must not exceed the pressure specified by the brake manufacturer.

(d) If antiskid devices are installed, the devices and associated systems must be designed so that no single probable malfunction or failure will result in a hazardous loss of braking ability or directional control of the airplane.

(e) In addition, for commuter category airplanes, the rejected takeoff brake kinetic energy capacity rating of each main wheel brake assembly must not be less than the kinetic energy absorption requirements determined under either of the following methods—

(1) The brake kinetic energy absorption requirements must be based on a conservative rational analysis of the sequence of events expected during a rejected takeoff at the design takeoff weight.

(2) Instead of a rational analysis, the kinetic energy absorption requirements for each main wheel brake assembly may be derived from the following formula—

$$KE=0.0443 WV^2N$$

where,

KE=Kinetic energy per wheel (ft.-lbs.);

W=Design takeoff weight (lbs.);

V=Ground speed, in knots, associated with the maximum value of V_1 selected in accordance with § 23.51(c)(1);

N=Number of main wheels with brakes.

[Amdt. 23-7, 34 FR 13092, Aug. 13, 1969, as amended by Amdt. 23-24, 44 FR 68742, Nov. 29, 1979; Amdt. 23-42, 56 FR 354, Jan. 3, 1991; Amdt. 23-49, 61 FR 5166, Feb. 9, 1996]