§ 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—

\[ KE = 0.0443 \times W \times V^2 N \]

where—

- \( KE \) = Kinetic energy per wheel (ft-lbs);
- \( W \) = Design landing weight (lb);
- \( V \) = Airplane speed in knots. \( V \) must be not less than \( V_{S\sqrt{}} \), 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) 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.

(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—

\[ KE = 0.0443 \times W_{1} \times V^2 N \]

where,

- \( KE \) = Kinetic energy per wheel (ft-lbs);
- \( W_{1} \) = 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.