Federal Aviation Regulation

Sec. 25.735

Part 25 AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES	
Subpart D--Design and Construction	Landing Gear

Sec. 25.735

Brakes.

(a) Each brake must be approved.
(b) The brake system must be designed and constructed so that, if any connecting or transmitting element (excluding the operating pedal or handle) fails, or if any single source of hydraulic or other brake operating energy supply is lost, it is possible to bring the airplane to rest under conditions specified in Sec. 25.75, with a mean deceleration during the landing roll of at least 50 percent of that obtained in determining the landing distance as prescribed in that section. Unless the leakage of hydraulic fluid resulting from failure of the sealing, elements in hydraulic brakes, the brake drum, shoes, and actuators, (or their equivalents) does not reduce the braking effectiveness below that required by this paragraph, these units are considered to be connecting or transmitting elements.
(c) Brake controls may not require excessive control force in their operation.
(d) The airplane must have a parking control that, when set by the pilot, will without further attention, prevent the airplane from rolling on a paved, level runway with takeoff power on the critical engine.
(e) If antiskid devices are installed, the devices and associated systems must be designed so that no single probable malfunction will result in a hazardous loss of braking ability or directional control of the airplane. Antiskid devices meeting the airworthiness portions of Military Specification MIL-B-8075 (ASG) and any amendments thereto, are acceptable.
(f) The brake kinetic energy capacity rating of each main wheel-brake assembly may 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 rational analysis of the sequence of events expected during operational landings at maximum landing weight. This analysis must include conservative values of airplane speed at which the brakes are applied, braking coefficient of friction between tires and runway, aerodynamic drag,

propeller drag or powerplant forward thrust, and (if more critical) the most adverse single engine or propeller malfunction.
(2) Instead of a rational analysis, the kinetic energy absorption requirements for each main wheel brake assembly may be derived from the following formula, which assumes an equal distribution of braking between main wheels:

$$KE = \frac{0.0444 W V_{S_0}^{\ 2}}{N}$$

where--
KE = kinetic energy per wheel (ft. lb.);
W = design landing weight (lb.);
V_{S_0} = power-off stalling speed of the airplane at sea level, at the design landing weight, and in
the landing configuration; and
N = number of main wheels.

The formula must be modified in cases of unequal braking distribution.
(g) The minimum stalling speed rating of each main wheel-brake assembly (that is, the initial speed used in the dynamometer tests) may not be more than the V_{S_0} used in the determination of kinetic energy in accordance with paragraph (f) of this section, assuming that the test procedures for wheel-brake assemblies involve a specified rate of deceleration, and, therefore, for the same amount of kinetic energy, the rate of energy absorption (the power absorbing ability of the brake) varies inversely with the initial speed.

Comments

Document History

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