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the conditions specified in paragraph (e) of this section. In addition, reasonable design precautions must be taken to minimize the probability of parts becoming detached and injuring occupants while in their seats.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-54, 45 FR 60172, Sept. 11, 1980; Amdt. 25-71, 55 FR 13477, Apr. 10, 1990; Amdt. 25-72, 55 FR 29776, July 20, 1990; Amdt. 25-87, 61 FR 28695, June 5, 1996]

§25.367 Unsymmetrical loads due to engine failure.

(a) The airplane must be designed for the unsymmetrical loads resulting from the failure of the critical engine. Turbopropeller airplanes must be designed for the following conditions in combination with a single malfunction of the propeller drag limiting system, considering the probable pilot corrective action on the flight controls:

(1) At speeds between V_{MC} and V_D , the loads resulting from power failure because of fuel flow interruption are considered to be limit loads.

(2) At speeds between V_{MC} and V_C the loads resulting from the disconnection of the engine compressor from the turbine or from loss of the turbine blades are considered to be ultimate loads.

(3) The time history of the thrust decay and drag build-up occurring as a result of the prescribed engine failures must be substantiated by test or other data applicable to the particular engine-propeller combination.

(4) The timing and magnitude of the probable pilot corrective action must be conservatively estimated, considering the characteristics of the particular engine-propeller-airplane combination.

(b) Pilot corrective action may be assumed to be initiated at the time maximum yawing velocity is reached, but not earlier than two seconds after the engine failure. The magnitude of the corrective action may be based on the control forces specified in §25.397(b) except that lower forces may be assumed where it is shown by anaylsis or test that these forces can control the yaw and roll resulting from the prescribed engine failure conditions.

§25.371 Gyroscopic loads.

The structure supporting any engine or auxiliary power unit must be designed for the loads, including gyroscopic loads, arising from the conditions specified in §§25.331, 25.341, 25.349, 25.351, 25.473, 25.479, and 25.481, with the engine or auxiliary power unit at the maximum rotating speed appropriate to the condition. For the purposes of compliance with this paragraph, the pitch maneuver in §25.331(c)(1) must be carried out until the positive limit maneuvering load factor (point A_2 in §25.333(b)) is reached.

[Amdt. 25-141, 79 FR 73468, Dec. 11, 2014]

§25.373 Speed control devices.

If speed control devices (such as spoilers and drag flaps) are installed for use in en route conditions—

(a) The airplane must be designed for the symmetrical maneuvers prescribed in \$25.333 and 25.337, the yawing maneuvers in \$25.351, and the vertical and lateral gust and turbulence conditions prescribed in \$25.341(a) and (b) at each setting and the maximum speed associated with that setting; and

(b) If the device has automatic operating or load limiting features, the airplane must be designed for the maneuver and gust conditions prescribed in paragraph (a) of this section, at the speeds and corresponding device positions that the mechanism allows.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25–72, 55 FR 29776, July 20, 1990; Amdt. 25–86, 61 FR 5222, Feb. 9, 1996; Amdt. 25–141, 79 FR 73468, Dec. 11, 2014]

CONTROL SURFACE AND SYSTEM LOADS

§25.391 Control surface loads: General.

The control surfaces must be designed for the limit loads resulting from the flight conditions in §§ 25.331, 25.341(a) and (b), 25.349, and 25.351, considering the requirements for—

(a) Loads parallel to hinge line, in §25.393;

- (b) Pilot effort effects, in §25.397;
- (c) Trim tab effects, in §25.407;
- (d) Unsymmetrical loads, in §25.427; and

§25.391