§ 25.365 Pressurized compartment loads.

For airplanes with one or more pressurized compartments the following apply:

(a) The airplane structure must be strong enough to withstand the flight loads combined with pressure differential loads from zero up to the maximum relief valve setting.

(b) The external pressure distribution in flight, and stress concentrations and fatigue effects must be accounted for.

(c) If landings may be made with the compartment pressurized, landing loads must be combined with pressure differential loads from zero up to the maximum allowed during landing.

(d) The airplane structure must be designed to be able to withstand the pressure differential loads corresponding to the maximum relief valve setting multiplied by a factor of 1.33 for airplanes to be approved for operation to 45,000 feet or by a factor of 1.67 for airplanes to be approved for operation above 45,000 feet, omitting other loads.

(e) Any structure, component or part, inside or outside a pressurized compartment, the failure of which could interfere with continued safe flight and landing, must be designed to withstand the effects of a sudden release of pressure through an opening in any compartment at any operating altitude resulting from each of the following conditions:

(1) The penetration of the compartment by a portion of an engine following an engine disintegration;

(2) Any opening in any pressurized compartment up to the size \( H_o \) in square feet; however, small compartments may be combined with an adjacent pressurized compartment and both considered as a single compartment for openings that cannot reasonably be expected to be confined to the small compartment. The size \( H_o \) must be computed by the following formula:

\[
H_o = P A_s
\]

where,

\( P = (A_s/6240) + .024 \)

\( A_s = \) Maximum cross-sectional area of the pressurized shell normal to the longitudinal axis, in square feet; and

\( \)
§ 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.

(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 analysis 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 the gyroscopic loads arising from the conditions specified in §§25.331, 25.341(a), 25.349, 25.351, 25.473, 25.479, and 25.481, with the engine or auxiliary power unit at the maximum rpm appropriate to the condition. For the purposes of compliance with this section, the pitch maneuver in §25.331(c)(1) must be carried out until the positive limit maneuvering load factor (point A in §25.333(b)) is reached.

§ 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 prescribed in §25.351, and the vertical and lateral gust conditions prescribed in §25.341(a), 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