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| <p>.562</p> | <p>(2) The attachment between the seat/restraint system and the test fixture must remain intact, although the seat structure may have deformed.</p> <p>(3) Each shoulder harness strap must remain on the ATD's shoulder during the impact.</p> <p>(4) The safety belt must remain on the ATD's pelvis during the impact.</p> <p>(5) The results of the dynamic tests must show that the occupant is protected from serious head injury.</p> <p>(i) When contact with adjacent seats, structure, or other items in the cabin can occur, protection must be provided so that the head impact does not exceed a head injury criteria (HIC) of 1,000.</p> <p>(ii) The value of HIC is defined as--</p> $HIC = \left\{ \left(t_2 - t_1 \right) \left[\frac{1}{(t_2 - t_1)} \int_{t_1}^{t_2} a(t) dt \right]^{2.5} \right\}_{Max}$ <p>Where-- t_1 is the initial integration time, expressed in seconds, t_2 is the final integration time, expressed in seconds, and $a(t)$ is the total acceleration vs. time curve for the head strike expressed as a multiple of g (units of gravity).</p> <p>(iii) Compliance with the HIC limit must be demonstrated by measuring the head impact during dynamic testing as prescribed in paragraphs (b)(1) and (b)(2) of this section or by a separate showing of compliance with the head injury criteria using test or analysis procedures.</p> <p>(6) Loads in individual shoulder harness straps may not exceed 1,750 pounds. If dual straps are used for retaining the upper torso, the total strap loads may not exceed 2,000 pounds.</p> <p>(7) The compression load measured between the pelvis and the lumbar spine of the ATD may not exceed 1,500 pounds.</p> <p>(d) For all single-engine airplanes with a V_{SO} of more than 61 knots at maximum weight, and those multiengine airplanes of 6,000 pounds or less maximum weight with a V_{SO} of more than 61 knots at maximum weight that do not comply with Sec. 23.67(a)(1):</p> <p>The ultimate load factors of Sec. 23.561(b) must be increased by multiplying the load factors by the square of the ratio of the increased stall speed to 61 knots. The increased ultimate load factors need not exceed the values reached at a V_{SO} of 79 knots. The upward ultimate load factor for acrobatic category airplanes need not exceed 5.0 g.</p> <p>(2) The seat/restraint system test required by paragraph (b)(1) of this section must be conducted in accordance with the following criteria:</p> <p>(i) The change in velocity may not be less than 31 feet per second.</p> <p>(ii) (A) The peak deceleration ($\geq 19g$ and $15g$ must be increased and multiplied by the square of the ratio of the increased stall speed to 61 knots:</p> $g_p = 19.0 \left(V_{SO} / 61 \right)^2 \text{ or } g_p = 15.0 \left(V_{SO} / 61 \right)^2$ <p>(B) The peak deceleration need not exceed the value reached at a V_{SO} of 79 knots.</p> <p>(iii) The peak deceleration must occur in not more than time (t_r), which must be computed as follows:</p> $t_r = \frac{31}{32.2 (g_p)} = \frac{96}{g_p}$ <p>where-- g_p = The peak deceleration calculated in accordance with paragraph (d)(2)(ii) of this section; and t_r = The rise time (in seconds) to the peak deceleration.</p> <p>(e) An alternate approach that achieves an equivalent, or greater, level of occupant protection to that required by this section may be used if substantiated on a rational basis.</p> | <p>dynamische Notlandung</p> <p>0</p> |
| <p>.571</p> | <p>(a) Metallic pressurized cabin structures. For normal, utility, and acrobatic category airplanes, the strength, detail design, and fabrication of the metallic structure of the pressure cabin must be evaluated under one of the following:</p> <p>A fatigue strength investigation in which the structure is shown by tests, or by analysis supported by test evidence, to be able to withstand the repeated loads of variable magnitude expected in service; or</p> <p>(b) A fail safe strength investigation, in which it is shown by analysis, tests, or both that catastrophic failure of the structure is not probable after fatigue failure, or obvious partial failure, of a principal structural element, and that the remaining structures are able to withstand a static ultimate load factor of 75 percent of the limit load factor at V_C, considering the combined effects of normal operating pressures, expected external aerodynamic pressures, and flight loads. These loads must be multiplied by a factor of 1.15 unless the dynamic effect of failure under static load are otherwise considered.</p> <p>(c) The damage tolerance evaluation of Sec. 23.573(b).</p> <p>(d) If certification for operation above 41,000 feet is requested, a damage tolerance evaluation of the fuselage pressure boundary per Sec. 23.573(b) must be conducted.</p> | |
| <p>.573</p> | <p>Damage tolerance and fatigue evaluation of structure.</p> <p>Composite airframe structure. Composite airframe structure must be evaluated under this paragraph instead of Secs. 23.571 and 23.572. The applicant must evaluate the composite airframe structure, the failure of which would result in catastrophic loss of the airplane, in each wing (including canards, tandem wings, and winglets), empennage, their carrythrough and attaching structure, moveable control surfaces and their attaching structure, fuselage, and pressure cabin using the damage-tolerance criteria prescribed in paragraphs (a)(1) through (a)(4) of this section unless shown to be impractical. If the applicant establishes that damage-tolerance criteria is impractical for a particular structure, the structure must be evaluated in accordance with paragraphs (a)(1) and (a)(6) of this section. Where bonded joints are used, the structure must also be evaluated in accordance with paragraph (a)(5) of this section. The effects of material variability and environmental conditions on the strength and durability properties of the composite materials must be accounted for in the evaluations required by this section.</p> <p>(1) It must be demonstrated by tests, or by analysis supported by tests, that the structure is capable of carrying ultimate load with damage up to the threshold of detectability considering the inspection procedures employed.</p> <p>(2) The growth rate or no-growth of damage that may occur from fatigue, corrosion, manufacturing flaws or impact damage, under repeated loads expected in service, must be established by tests or analysis supported by tests.</p> <p>(3) The structure must be shown by residual strength tests, or analysis supported by residual strength tests, to be able to withstand critical limit flight loads, considered as ultimate loads, with the extent of detectable damage consistent with the results of the damage tolerance evaluations. For pressurized cabins, the following loads must be withstood:</p> <p>(i) Critical limit flight loads with the combined effects of normal operating pressure and expected external aerodynamic pressures.</p> <p>(ii) The expected external aerodynamic pressures in 1g flight combined with a cabin differential pressure equal to 1.1 times the normal operating differential pressure without any other load.</p> <p>(4) The damage growth, between initial detectability and the value selected for residual strength demonstrations, factored to obtain inspection intervals, must allow development of an inspection program suitable for application by operation and maintenance personnel.</p> <p>(5) For any bonded joint, the failure of which would result in catastrophic loss of the airplane, the limit load capacity must be substantiated by one of the following methods--</p> <p>(i) The maximum disbands of each bonded joint consistent with the capability to withstand the loads in paragraph (a)(3) of this section must be determined by analysis, tests, or both. Disbands of each bonded joint greater than this must be prevented by design features; or</p> | <p>4,5,6</p> |