§ 27.903 Engines.

(a) Engine type certification. Each engine must have an approved type certificate. Reciprocating engines for use in helicopters must be qualified in accordance with §33.49(d) of this chapter or be otherwise approved for the intended usage.

(b) Engine or drive system cooling fan blade protection. (1) If an engine or rotor drive system cooling fan is installed, there must be a means to protect the rotorcraft and allow a safe landing if a fan blade fails. This must be shown by showing that—

(i) The fan blades are contained in case of failure;

(ii) Each fan is located so that a failure will not jeopardize safety; or

(iii) Each fan blade can withstand an ultimate load of 1.5 times the centrifugal force resulting from operation limited by the following:

(A) For fans driven directly by the engine—

(1) The terminal engine r.p.m. under uncontrolled conditions; or

(2) An overspeed limiting device.

(B) For fans driven by the rotor drive system, the maximum rotor drive system rotational speed to be expected in service, including transients.

(2) Unless a fatigue evaluation under §27.571 is conducted, it must be shown that cooling fan blades are not operating at resonant conditions within the operating limits of the rotorcraft.

(c) Turbine engine installation. For turbine engine installations, the powerplant systems associated with engine assembly of components and equipment essential to safe operation of the rotorcraft, except where operation with the incorrect assembly can be shown to be extremely improbable.

(c) The installation must comply with—

(1) The installation instructions provided under §33.5 of this chapter; and

(2) The applicable provisions of this subpart.

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