

Federal Aviation Agency

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AIRCRAFT

EFFECTIVE :

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SUBJECT : QUALIFICATION OF TYPE CERTIFICATED ENGINES FOR AIRCRAFT INSTALLATIONS

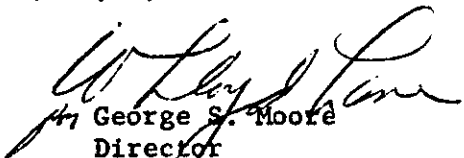
1. **PURPOSE.** This circular brings attention to the relationship between Civil Air Regulations, Part 13, Aircraft Engine Airworthiness, and the applicable aircraft and rotorcraft airworthiness parts.
2. **BACKGROUND.** Difficulties have been encountered in the certification of aircraft and rotorcraft because of certain design feature(s) of the engine which did not facilitate compliance with the applicable requirements of the airworthiness parts. Examples of such requirements are: CAR 3.449 requires that one fuel pump be engine driven; CAR 4b.444 requires a particular breather design to prevent freezing; and CAR 4b.467 requires that hot exhaust parts not be located in hazardous proximity to portions of any system carrying flammable fluids. In most cases, the problem of facilitating compliance with the installation requirements has been resolved by cooperation between the engine and aircraft manufacturers. Early recognition of possible problems of this nature would enable improved suitability of engine design for installation requirements and minimize the need for last minute modifications.
3. **INFORMATION.**
 - a. Civil Air Regulations, Part 13.13, Type Certificate, note 2, states:

"Prior to approval for use of a type certificated engine on a certificated aircraft, the engine will be required to comply with pertinent provisions of the applicable airworthiness parts of the regulations in this subchapter."

- b. Engine installation requirements are contained in Subpart E of CARS 3, 4b, 6, and 7. Each subpart, in the general section, states that "the powerplant installation shall be considered to include all components of the airplane which are necessary for its propulsion." The term "all components" is interpreted by CAMs 3.411-1, 4b.400-2, and 6.400-1 as follows:

"The term 'all components' includes engines and propellers and their parts, appurtenances, and accessories which are furnished by the engine or propeller manufacturer and all other components of the powerplant installation which are furnished by the airplane (rotorcraft) manufacturer. For example: fuel pumps, lines, valves, and other components of the fuel system which are integral parts of the type certificated engines are also components of the airplane (rotorcraft) powerplant installation."

- c. The above-quoted note and interpretation are intended to make clear that the requirements of the airframe airworthiness parts govern the installation of the engine in the airframe, and that the engine manufacturer should be aware of the various detailed requirements having an effect on the design and configuration of the engine.
- d. During the engine development and certification programs, due consideration of the installation requirements will materially minimize problems of noncompatibility during the aircraft or rotorcraft type certification. The final engine configuration should embody features which facilitate installation compatibility and compliance with the applicable standards of CARS 3, 4b, 6, and 7.


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