

galling, bearing wear, and variations in material properties).

[Amdt. 35-5, 45 FR 60182, Sept. 11, 1980]

#### § 35.39 Endurance test.

(a) *Fixed-pitch wood propellers.* Fixed-pitch wood propellers must be subjected to one of the following tests:

(1) A 10-hour endurance block test on an engine with a propeller of the greatest pitch and diameter for which certification is sought at the rated rotational speed.

(2) A 50-hour flight test in level flight or in climb. At least five hours of this flight test must be with the propeller operated at the rated rotational speed, and the remainder of the 50 hours must be with the propeller operated at not less than 90 percent of the rated rotational speed. This test must be conducted on a propeller of the greatest diameter for which certification is requested.

(3) A 50-hour endurance block test on an engine at the power and propeller rotational speed for which certification is sought. This test must be conducted on a propeller of the greatest diameter for which certification is requested.

(b) *Fixed-pitch metal propellers and ground adjustable-pitch propellers.* Each fixed-pitch metal propeller or ground adjustable-pitch propeller must be subjected to the test prescribed in either paragraph (a)(2) or (a)(3) of this section.

(c) *Variable-pitch propellers.* Compliance with this paragraph must be shown for a propeller of the greatest diameter for which certification is requested. Each variable-pitch propeller (a propeller the pitch setting of which can be changed by the flight crew or by automatic means while the propeller is rotating) must be subjected to one of the following tests:

(1) A 100-hour test on a representative engine with the same or higher power and rotational speed and the same or more severe vibration characteristics as the engine with which the propeller is to be used. Each test must be made at the maximum continuous rotational speed and power rating of the propeller. If a takeoff rating greater than the maximum continuous rating is to be established, and additional 10-hour block test must be made at the

maximum power and rotational speed for the takeoff rating.

(2) Operation of the propeller throughout the engine endurance tests prescribed in Part 33 of this subchapter.

[Doc. No. 2095, 29 FR 7458, June 10, 1964, as amended by Amdt. 35-2, 32 FR 3737, Mar. 4, 1967; Amdt. 35-3, 41 FR 55475, Dec. 20, 1976]

#### § 35.41 Functional test.

(a) Each variable-pitch propeller must be subjected to the applicable functional tests of this section. The same propeller used in the endurance test must be used in the functional tests and must be driven by an engine on a test stand or on an aircraft.

(b) *Manually controllable propellers.* 500 complete cycles of control must be made throughout the pitch and rotational speed ranges.

(c) *Automatically controllable propellers.* 1,500 complete cycles of control must be made throughout the pitch and rotational speed ranges.

(d) *Feathering propellers.* 50 cycles of feathering operation must be made.

(e) *Reversible-pitch propellers.* Two hundred complete cycles of control must be made from lowest normal pitch to maximum reverse pitch, and, while in maximum reverse pitch, during each cycle, the propeller must be run for 30 seconds at the maximum power and rotational speed selected by the applicant for maximum reverse pitch.

[Doc. No. 2095, 29 FR 7458, June 10, 1964, as amended by Amdt. 35-3, 41 FR 55475, Dec. 20, 1976]

#### § 35.42 Blade pitch control system component test.

The following durability requirements apply to propeller blade pitch control system components:

(a) Except as provided in paragraph (b) of this section, each propeller blade pitch control system component, including governors, pitch change assemblies, pitch locks, mechanical stops, and feathering system components, must be subjected in tests to cyclic loadings that simulate the frequency and amplitude those to which the component would be subjected during 1,000 hours of propeller operation.