

§ 29.1519

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variation with forward speed must be established, together with any other pertinent information, such as the kind of landing surface.

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§ 29.1519 Weight and center of gravity.

The weight and center of gravity limitations determined under §§ 29.25 and 29.27, respectively, must be established as operating limitations.

§ 29.1521 Powerplant limitations.

(a) *General.* The powerplant limitations prescribed in this section must be established so that they do not exceed the corresponding limits for which the engines are type certificated.

(b) *Takeoff operation.* The powerplant takeoff operation must be limited by—

- (1) The maximum rotational speed, which may not be greater than—

- (i) The maximum value determined by the rotor design; or
 - (ii) The maximum value shown during the type tests;

- (2) The maximum allowable manifold pressure (for reciprocating engines);

- (3) The maximum allowable turbine inlet or turbine outlet gas temperature (for turbine engines);

- (4) The maximum allowable power or torque for each engine, considering the power input limitations of the transmission with all engines operating;

- (5) The maximum allowable power or torque for each engine considering the power input limitations of the transmission with one engine inoperative;

- (6) The time limit for the use of the power corresponding to the limitations established in paragraphs (b)(1) through (5) of this section; and

- (7) If the time limit established in paragraph (b)(6) of this section exceeds 2 minutes—

- (i) The maximum allowable cylinder head or coolant outlet temperature (for reciprocating engines); and

- (ii) The maximum allowable engine and transmission oil temperatures.

- (c) *Continuous operation.* The continuous operation must be limited by—

- (1) The maximum rotational speed, which may not be greater than—

- (i) The maximum value determined by the rotor design; or

- (ii) The maximum value shown during the type tests;

- (2) The minimum rotational speed shown under the rotor speed requirements in § 29.1509(c).

- (3) The maximum allowable manifold pressure (for reciprocating engines);

- (4) The maximum allowable turbine inlet or turbine outlet gas temperature (for turbine engines);

- (5) The maximum allowable power or torque for each engine, considering the power input limitations of the transmission with all engines operating;

- (6) The maximum allowable power or torque for each engine, considering the power input limitations of the transmission with one engine inoperative; and

- (7) The maximum allowable temperatures for—

- (i) The cylinder head or coolant outlet (for reciprocating engines);

- (ii) The engine oil; and

- (iii) The transmission oil.

- (d) *Fuel grade or designation.* The minimum fuel grade (for reciprocating engines) or fuel designation (for turbine engines) must be established so that it is not less than that required for the operation of the engines within the limitations in paragraphs (b) and (c) of this section.

- (e) *Ambient temperature.* Ambient temperature limitations (including limitations for winterization installations if applicable) must be established as the maximum ambient atmospheric temperature at which compliance with the cooling provisions of §§ 29.1041 through 29.1049 is shown.

- (f) *Two and one-half minute OEI power operation.* Unless otherwise authorized, the use of 2½-minute OEI power must be limited to engine failure operation of multiengine, turbine-powered rotorcraft for not longer than 2½ minutes for any period in which that power is used. The use of 2½-minute OEI power must also be limited by—

- (1) The maximum rotational speed, which may not be greater than—

- (i) The maximum value determined by the rotor design; or

- (ii) The maximum value shown during the type tests;

- (2) The maximum allowable gas temperature;

- (3) The maximum allowable torque; and