

§ 23.1357

§ 23.1357 Circuit protective devices.

(a) Protective devices, such as fuses or circuit breakers, must be installed in all electrical circuits other than—

(1) Main circuits of starter motors used during starting only; and

(2) Circuits in which no hazard is presented by their omission.

(b) A protective device for a circuit essential to flight safety may not be used to protect any other circuit.

(c) Each resettable circuit protective device ("trip free" device in which the tripping mechanism cannot be overridden by the operating control) must be designed so that—

(1) A manual operation is required to restore service after tripping; and

(2) If an overload or circuit fault exists, the device will open the circuit regardless of the position of the operating control.

(d) If the ability to reset a circuit breaker or replace a fuse is essential to safety in flight, that circuit breaker or fuse must be so located and identified that it can be readily reset or replaced in flight.

(e) For fuses identified as replaceable in flight—

(1) There must be one spare of each rating or 50 percent spare fuses of each rating, whichever is greater; and

(2) The spare fuse(s) must be readily accessible to any required pilot.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964; 30 FR 258, Jan. 9, 1965, as amended by Amdt. 23-20, 42 FR 36969, July 18, 1977; Amdt. 23-43, 58 FR 18976, Apr. 9, 1993]

§ 23.1359 Electrical system fire protection.

(a) Each component of the electrical system must meet the applicable fire protection requirements of §§ 23.863 and 23.1182.

(b) Electrical cables, terminals, and equipment in designated fire zones that are used during emergency procedures must be fire-resistant.

(c) Insulation on electrical wire and electrical cable must be self-extinguishing when tested at an angle of 60 degrees in accordance with the applicable portions of appendix F of this part, or other approved equivalent methods. The average burn length must not exceed 3 inches (76 mm) and the average flame time after removal of the flame

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source must not exceed 30 seconds. Drippings from the test specimen must not continue to flame for more than an average of 3 seconds after falling.

[Doc. No. 27806, 61 FR 5169, Feb. 9, 1996]

§ 23.1361 Master switch arrangement.

(a) There must be a master switch arrangement to allow ready disconnection of each electric power source from power distribution systems, except as provided in paragraph (b) of this section. The point of disconnection must be adjacent to the sources controlled by the switch arrangement. If separate switches are incorporated into the master switch arrangement, a means must be provided for the switch arrangement to be operated by one hand with a single movement.

(b) Load circuits may be connected so that they remain energized when the master switch is open, if the circuits are isolated, or physically shielded, to prevent their igniting flammable fluids or vapors that might be liberated by the leakage or rupture of any flammable fluid system; and

(1) The circuits are required for continued operation of the engine; or

(2) The circuits are protected by circuit protective devices with a rating of five amperes or less adjacent to the electric power source.

(3) In addition, two or more circuits installed in accordance with the requirements of paragraph (b)(2) of this section must not be used to supply a load of more than five amperes.

(c) The master switch or its controls must be so installed that the switch is easily discernible and accessible to a crewmember.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964; 30 FR 258, Jan. 9, 1965, as amended by Amdt. 23-20, 42 FR 36969, July 18, 1977; Amdt. 23-43, 58 FR 18977, Apr. 9, 1993; Amdt. 23-49, 61 FR 5169, Feb. 9, 1996]

§ 23.1365 Electric cables and equipment.

(a) Each electric connecting cable must be of adequate capacity.

(b) Any equipment that is associated with any electrical cable installation and that would overheat in the event of circuit overload or fault must be flame