§ 23.1459 Flight data recorders.

(a) Each flight recorder required by the operating rules of this chapter must be installed so that:

(1) It is supplied with airspeed, altitude, and directional data obtained from sources that meet the accuracy requirements of §§23.1323, 23.1325, and 23.1327, as appropriate;

(2) The vertical acceleration sensor is rigidly attached, and located longitudinally either within the approved center of gravity limits of the airplane, or at a distance forward or aft of these limits that does not exceed 25 percent of the airplane’s mean aerodynamic chord;

(3) (i) It receives its electrical power from the bus that provides the maximum reliability for operation of the flight data recorder without jeopardizing service to essential or emergency loads.

(ii) It remains powered for as long as possible without jeopardizing emergency operation of the airplane.

(4) There is an aural or visual means for preflight checking of the recorder for proper recording of data in the storage medium;

(5) Except for recorders powered solely by the engine-driven electrical generator system, there is an automatic means to simultaneously stop a recorder that has a data erasure feature and prevent each erasure feature from functioning, within 10 minutes after crash impact;

(6) Any single electrical failure external to the recorder does not disable both the cockpit voice recorder and the flight data recorder; and

(7) It is in a separate container from the cockpit voice recorder when both are required. If used to comply with only the flight data recorder requirements, a combination unit may be installed. If a combination unit is installed as a cockpit voice recorder to comply with §23.1457(e)(2), a combination unit must be used to comply with this flight data recorder requirement.

(b) Each nonejectable record container must be located and mounted so as to minimize the probability of container rupture resulting from crash impact and subsequent damage to the record from fire. In meeting this requirement the record container must be located as far aft as practicable, but need not be aft of the pressurized compartment, and may not be where aft-mounted engines may crush the container upon impact.

(c) A correlation must be established between the flight recorder readings of airspeed, altitude, and heading and the corresponding readings (taking into account correction factors) of the first pilot’s instruments. The correlation must cover the airspeed range over which the airplane is to be operated, the range of altitude to which the airplane is limited, and 360 degrees of heading. Correlation may be established on the ground as appropriate.

(d) Each recorder container must:

(1) Be either bright orange or bright yellow;

(2) Have reflective tape affixed to its external surface to facilitate its location under water; and

(3) Have an underwater locating device, when required by the operating rules of this chapter, on or adjacent to the container which is secured in such a manner that they are not likely to be separated during crash impact.

§ 23.1507 Airspeed limitations.
(a) The never-exceed speed \( V_{NE} \) must be established so that it is—
(1) Not less than 0.9 times the minimum value of \( V_D \) allowed under § 23.335; and
(2) Not more than the lesser of—
   (i) 0.9 \( V_D \) established under § 23.335; or
   (ii) 0.9 times the maximum speed shown under § 23.251.
(b) The maximum structural cruising speed \( V_{NO} \) must be established so that it is—
   (1) Not less than the minimum value of \( V_C \) allowed under § 23.335; and
   (2) Not more than the lesser of—
      (i) \( V_C \) established under § 23.335; or
      (ii) 0.89 \( V_{NE} \) established under paragraph (a) of this section.
(c) Paragraphs (a) and (b) of this section do not apply to turbine airplanes or to airplanes for which a design diving speed \( V_D/MD \) is established under § 23.335(b)(4). For those airplanes, a maximum operating limit speed (\( V_{MO}/MMO \)-airspeed or Mach number, whichever is critical at a particular altitude) must be established as a speed that may not be deliberately exceeded in any regime of flight (climb, cruise, or descent) unless a higher speed is authorized for flight test or pilot training operations. \( V_{MO}/MMO \) must be established so that it is not greater than the design cruising speed \( V_C/MC \) and so that it is sufficiently below \( V_D/MD \) and the maximum speed shown under § 23.251 to make it highly improbable that the latter speeds will be inadvertently exceeded in operations. The speed margin between \( V_{MO}/MMO \) and \( V_D/MD \) or the maximum speed shown under § 23.251 may not be less than the speed margin established between \( V_C/MC \) and \( V_D/MD \) under § 23.335(b), or the speed margin found necessary in the flight test conducted under § 23.253.