

condition must be available at any speed up to  $V_{DF}/M_{DF}$ .

(5) With the airplane trimmed at  $V_{MO}/M_{MO}$ , extension of the speedbrakes over the available range of movements of the pilot's control, at all speeds above  $V_{MO}/M_{MO}$ , but not so high that  $V_{DF}/M_{DF}$  would be exceeded during the maneuver, must not result in:

(i) An excessive positive load factor when the pilot does not take action to counteract the effects of extension;

(ii) Buffeting that would impair the pilot's ability to read the instruments or control the airplane for recovery; or

(iii) A nose down pitching moment, unless it is small.

(b) *Maximum speed for stability characteristics,  $V_{FC}/M_{FC}$ .*  $V_{FC}/M_{FC}$  is the maximum speed at which the requirements of §§ 25.143(g), 25.147(f), 25.175(b)(1), 25.177(a) through (c), and 25.181 must be met with flaps and landing gear retracted. Except as noted in § 25.253(c),  $V_{FC}/M_{FC}$  may not be less than a speed midway between  $V_{MO}/M_{MO}$  and  $V_{DF}/M_{DF}$ , except that, for altitudes where Mach number is the limiting factor,  $M_{FC}$  need not exceed the Mach number at which effective speed warning occurs.

(c) *Maximum speed for stability characteristics in icing conditions.* The maximum speed for stability characteristics with the most critical of the ice accretions defined in Appendices C and O of this part, as applicable, in accordance with § 25.21(g), at which the requirements of §§ 25.143(g), 25.147(f), 25.175(b)(1), 25.177(a) through (c), and 25.181 must be met, is the lower of:

(1) 300 knots CAS;

(2)  $V_{FC}$ ; or

(3) A speed at which it is demonstrated that the airframe will be free of ice accretion due to the effects of increased dynamic pressure.

[Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-23, 35 FR 5671, Apr. 8, 1970; Amdt. 25-54, 45 FR 60172, Sept. 11, 1980; Amdt. 25-72, 55 FR 29775, July 20, 1990; Amdt. 25-84, 60 FR 30750, June 9, 1995; Amdt. 25-121, 72 FR 44668, Aug. 8, 2007; Amdt. 25-135, 76 FR 74654, Dec. 1, 2011; Amdt. 25-140, 79 FR 65525, Nov. 4, 2014]

#### § 25.255 Out-of-trim characteristics.

(a) From an initial condition with the airplane trimmed at cruise speeds up to  $V_{MO}/M_{MO}$ , the airplane must have satisfactory maneuvering stability and

controllability with the degree of out-of-trim in both the airplane nose-up and nose-down directions, which results from the greater of—

(1) A three-second movement of the longitudinal trim system at its normal rate for the particular flight condition with no aerodynamic load (or an equivalent degree of trim for airplanes that do not have a power-operated trim system), except as limited by stops in the trim system, including those required by § 25.655(b) for adjustable stabilizers; or

(2) The maximum mistrim that can be sustained by the autopilot while maintaining level flight in the high speed cruising condition.

(b) In the out-of-trim condition specified in paragraph (a) of this section, when the normal acceleration is varied from + 1 g to the positive and negative values specified in paragraph (c) of this section—

(1) The stick force vs. g curve must have a positive slope at any speed up to and including  $V_{FC}/M_{FC}$ ; and

(2) At speeds between  $V_{FC}/M_{FC}$  and  $V_{DF}/M_{DF}$  the direction of the primary longitudinal control force may not reverse.

(c) Except as provided in paragraphs (d) and (e) of this section, compliance with the provisions of paragraph (a) of this section must be demonstrated in flight over the acceleration range—

(1) – 1 g to + 2.5 g; or

(2) 0 g to 2.0 g, and extrapolating by an acceptable method to – 1 g and + 2.5 g.

(d) If the procedure set forth in paragraph (c)(2) of this section is used to demonstrate compliance and marginal conditions exist during flight test with regard to reversal of primary longitudinal control force, flight tests must be accomplished from the normal acceleration at which a marginal condition is found to exist to the applicable limit specified in paragraph (b)(1) of this section.

(e) During flight tests required by paragraph (a) of this section, the limit maneuvering load factors prescribed in §§ 25.333(b) and 25.337, and the maneuvering load factors associated with probable inadvertent excursions beyond the boundaries of the buffet onset envelopes determined under § 25.251(e),