

is the lesser speed except that it need not be less than $1.4 V_{s1}$, and the stick force shall not exceed 50 pounds with:

(1) Wing flaps retracted;

(2) The most critical weight between maximum landing weight and maximum takeoff weight;

(3) 75 percent of maximum continuous power for reciprocating engines; maximum cruising power selected by the applicant as an operating limitation (see § 4b.718) for turbine engines, except that the power need not exceed that required at V_{MO}/M_{MO} ; and

(4) The airplane trimmed for level flight with the power required in subparagraph (3) of this paragraph.

(b) *Landing gear retracted; low speed.* The stick force curve and, if required by § 4b.151(a), the elevator angle curve shall have stable slopes at all speeds from a speed equal to

$$V_{FC} - \left(\frac{V_{FC} - 1.4 V_{s1}}{2} \right)$$

to $1.4 V_{s1}$ and the stick force shall not exceed 50 pounds with the wing flaps and weight as specified in paragraph (a) of this section and with:

(1) Power required for level flight at a speed equal to $V_{FC} - \left(\frac{V_{FC} - 1.4 V_{s1}}{2} \right)$;

and

(2) The airplane trimmed for level flight with the power required in subparagraph (1) of this paragraph.

NOTE: At altitudes where Mach number is critical, the calibrated airspeed corresponding with M_{FC} may be used to calculate the speed $V_{FC} - \left(\frac{V_{FC} - 1.4 V_{s1}}{2} \right)$.

(c) *Landing gear extended.* The stick force curve and, if required by § 4b.151(a), the elevator angle curve shall have stable slopes at all speeds between $1.4 V_{s1}$ and V_{LE} and the stick force shall not exceed 50 pounds with the wing flaps and the weight as specified in paragraph (a) of this section and with:

(1) Power required for level flight at V_{LE} ; and

(2) The airplane trimmed for level flight with the power required in subparagraph (1) of this paragraph.

§ 4b.155-1 [Deletion]

19. By deleting § 4b.155-1.

§ 4b.156 [Amendment]

20. By amending § 4b.156 by inserting between the words "airplane" and "shall" the parenthetical expression "(e.g., V_{FE} , V_{LE} , or V_{FC}/M_{FC})".

§ 4b.157 [Amendment]

21. By amending § 4b.157 by deleting from paragraphs (a) and (b)(1) the words "the operating limit speed" and inserting in lieu thereof the words " V_{FE} , V_{LE} , or V_{FC}/M_{FC} , whichever is appropriate to the airplane configuration".

§ 4b.157-1 [Amendment]

22. By amending § 4b.157-1 by deleting paragraphs (e)(3), (e)(4), and (f)(2).

§ 4b.158 [Amendment]

23. By amending § 4b.158 by inserting between the words "airplane" and

"shall" the parenthetical expression "(e.g., V_{FE} , V_{LE} , or V_{FC}/M_{FC})".

24. By amending § 4b.160(c)(1) by deleting the phrase "With trim controls adjusted for straight flight at a speed of $1.4 V_{s1}$ " and inserting in lieu thereof "With the airplane trimmed for straight flight at the speed prescribed in § 4b.112(c)(1)".

25. By amending § 4b.160(e) to read as follows:

§ 4b.160 Stalling; symmetrical power.

(e) Straight flight stalls shall be entered with wings level. The roll occurring between the stall and the completion of the recovery shall not exceed approximately 20 degrees.

26. By adding a new § 4b.191 to read as follows:

§ 4b.191 High-speed characteristics.

(a) *Speed increase and recovery characteristics.* (1) Operating conditions or characteristics likely to cause inadvertent speed increases, including upsets in pitch and roll, shall be simulated with the airplane trimmed at any likely cruise speed up to V_{MO}/M_{MO} . Allowance for pilot reaction time after effective inherent or artificial speed warning occurs (see § 4b.603(k)), it shall be demonstrated that the airplane can be recovered to a normal attitude and its speed reduced to V_{MO}/M_{MO} without requiring exceptional strength or skill on the part of the pilot, without exceeding V_D/M_D , V_{DF}/M_{DF} , or the structural limitations, and without producing buffeting which would cause structural damage.

NOTE: Examples of operating conditions or characteristics likely to cause speed increases are: gust upsets, inadvertent control movements, low stick force gradient in relation to control friction, passenger movement, leveling off from climb, and descent from Mach to airspeed limit altitudes.

(2) At all speeds up to V_{DF}/M_{DF} , there shall be no control reversal. Any reversal of elevator control force or tendency of the airplane to pitch, roll, or yaw, shall be mild and readily controllable using normal piloting technique.

(b) *Maximum speed for stability characteristics, V_{FC}/M_{FC} .* V_{FC}/M_{FC} shall be the maximum speed at which the requirements of §§ 4b.132(e), 4b.155(a), 4b.156, 4b.157(a), 4b.157(b), and 4b.158 are required to be met with flaps and landing gear retracted. It shall not be less than a speed halfway between V_{MO}/M_{MO} and V_{DF}/M_{DF} , except that in the altitude range where Mach number is the limiting factor, M_{FC} need not exceed the Mach number at which effective speed warning occurs.

27. By amending § 4b.210(b)(1) to read as follows:

§ 4b.210 General.

(b) *Design air speeds.* * * *

(1) *Design flap speeds, V_F .* The design flap speed for each flap position established in accordance with § 4b.323 (a) shall be sufficiently greater than the

operating speed recommended for the corresponding stage of flight (including balked landings) to allow for probable variations in control of airspeed and for transition from one flap position to another. V_F shall be not less than:

(i) $1.6 V_{s1}$ with flaps in takeoff position at maximum takeoff weight;

(ii) $1.8 V_{s1}$ with flaps in approach position at maximum landing weight; and

(iii) $1.8 V_{s0}$ with flaps in landing position at maximum landing weight.

Where an automatic flap positioning or load limiting device is employed, it shall be permissible to use the speeds and corresponding flap positions programmed or permitted by the device. (See § 4b.323(c).)

28. By amending § 4b.210(b)(4) by adding at the end thereof the parenthetical reference "(See § 4b.711.)"

29. By amending § 4b.210(b)(5) to read as follows:

(b) *Design air speeds.* * * *

(5) *Design dive speed, V_D .* The design dive speed chosen by the applicant shall be used in determining the maximum operating limit speed for the airplane in accordance with § 4b.711.

30. By amending § 4b.212(a) by deleting the introductory paragraph and inserting in lieu thereof the following: "When flaps are intended for use during takeoff, approach, or landing, the airplane shall be assumed to be subjected to symmetrical maneuvers and gusts within the range determined by the following conditions, at the design flap speeds established for these stages of flight in accordance with § 4b.210(b)(1) and with the flaps in the corresponding positions."

31. By amending § 4b.212(b) by deleting from the introductory paragraph the words " V_{FE} speed established in accordance with § 4b.714(c)" and inserting in lieu thereof "the flap design speed chosen for this condition."

32. By amending § 4b.212 by deleting paragraph (d) and amending paragraph (c) to read as follows:

§ 4b.212 Effect of high lift devices.

(c) The airplane shall be designed for the conditions prescribed in paragraph (a) of this section, except that the airplane load factor need not exceed 1.0, taking into account the following effects as separate conditions:

(1) Propeller slipstream corresponding with maximum continuous power at the design flap speeds V_F , and with takeoff power at not less than 1.4 times the stalling speed for the particular flap position and associated maximum weight; and

(2) A head-on gust of 25 feet per second velocity (EAS).

33. By amending § 4b.216 by amending paragraphs (c)(4) and (d) to read as follows:

§ 4b.216 Supplementary flight conditions.

(c) *Pressurized cabin loads.* * * *