§ 4b.308 Flutter, deformation. and vibration. Compliance with the following provisions shall be shown by such calculations, resonance tests, or other tests as are found necessary by the Administrator.

(a) Flutter prevention. The airplane shall be designed to be free from flutter of wing and tail units, including all control and trim surfaces, and from divergence (i.e. unstable structural distortion due to aerodynamic loading), at all speeds up to 1.2 VD. A smaller margin above VD shall be acceptable if the characteristics of the airplane (including the effects of compressibility) render a speed of 1.2 VD unlikely to be achieved, and if it is shown that a proper margin of damping exists at speed VD. In the absence of more accurate data, the terminal velocity in a dive of 30 degrees to the horizontal shall be acceptable as the maximum speed likely to be achieved. If concentrated balance weights are used on control surfaces, their effectiveness and strength, including supporting structure, shall be substantiated.

(b) Loss of control due to structural deformation. The airplane shall be designed to be free from control reversal and from undue loss of longitudinal, lateral, and directional stability and control as a result of structural deformation, including that of the control surface covering, at all speeds up to the speed prescribed in paragraph (a) of this section for flutter prevention.

(c) Vibration and buffeting. The airplane shall be designed to withstand all vibration and buffeting which might occur in any likely operating conditions.