04.722 Maximum airspeed. The flight tests shall include steady flight in relatively smooth air at the design gliding speed (V_g) for which compliance with the structural loading requirements (§ 04.21) has been proved, except that they need not involve speeds in excess of 1.33 V_L (§ 04.111), provided that the operation limits are correspondingly fixed (see § 04.743). When high-lift devices having nonautomatic operation are employed, the tests shall also include steady flight at the design flap speed V_f (§ 04.114), except that they need not involve speeds in excess of 2 V_{sf} (see § 04.113). In cases where the high-lift devices are automatically operated, the tests shall cover the range of speeds within which the devices are operative.

04.111 Design level speed, V_L. The indicated airspeed chosen for use in determining the pertinent structural loading conditions. This value will be incorporated in the aircraft certificate as a maximum operational limitation in level and climbing flight. (See § 04.743.)

04.113 Design stalling speed, V_s. The computed indicated airspeed in unaccelerated flight based on the maximum lift coefficient of the wing and the design gross weight. The effects of slipstreams and nacelles shall be neglected in computing V_s. When high-lift devices are in operation the corresponding stalling speed will be denoted by V_{sf}.

04.114 Design flap speed, V_f. The indicated airspeed at which maximum operation of high-lift devices is assumed. (See §§ 04.211 and 04.743.)

04.21 Flight loads.

04.210 General. The airworthiness rating of an airplane with respect to its strength under flight loads will be based on the airspeeds and accelerations (from maneuvering or gusts) which can safely be developed in combination. For certain classes of airplanes the acceleration factors and gust velocities are arbitrarily specified hereinafter and shall be used for those classes. The airspeeds which can safely be developed in combination with the specified acceleration factors and gusts shall be determined in accordance with the procedure hereinafter specified and shall serve as a basis for restricting the operation of the airplane in flight. (See § 04.743.)

04.211 Airspeeds. (See §§ 04.109 to 04.116 for definitions.) The design airspeeds shall be determined as follows:

V_L (See § 04.111)

V_g shall not be less than $V_L + K_g(V_m - V_L)$, except that it need not be greater than either $V_L + 100$ miles per hour or 1.5 V_L, whichever is lower. K_g is specified on Fig. 04-1. V_m is defined in § 04.115. A special ruling may be obtained from the Administrator if the design gliding speed thus determined is greater than 1.33 V_L and appears to be unnecessarily high for the type of airplane involved.

V_f shall not be less than $2V_{sf}$. V_{sf} is defined in § 04.113.

V_p shall not be less than $V_{sf} + K_p(V_L - V_{sf})$, except that it need not be greater than V_L. K_p is specified in Fig. 04-2. (See §§ 04.2220, 04.2223 and 04.2230 for exceptions for multi-engine airplanes.)

04.212 Load factors. The flight load factors specified hereinafter shall represent *wing* load factors. The *net* load factor, or acceleration factor, shall be obtained by proper consideration of balancing loads acting on the airplane in the specific flight conditions.

04.2120 Maneuvering load factors. The limit maneuvering load factors specified hereinafter (see Fig. 04-3) are derived largely from experience with conventional types of airplanes and shall be considered as minimum values unless it can be proved, to the satisfaction of the Administrator, that the airplane embodies features of design which make it impossible to develop such values in flight, in which case lower values may be used subject to the approval of the Administrator

04.2121 Gust load factor. The gust load factors shall be computed on the basis of a gust of the magnitude specified, acting normal to the flight path, and proper allowance shall be made for the effects of aspect ratio on the slope of the lift curve. The gust velocities specified