§ 25.623

<table>
<thead>
<tr>
<th>Casting factor</th>
<th>Inspection</th>
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</thead>
<tbody>
<tr>
<td>Less than 2.0 but more than 1.5.</td>
<td>100 percent visual, and magnetic particle or penetrant or equivalent nondestructive inspection methods.</td>
</tr>
<tr>
<td>1.25 through 1.50</td>
<td>100 percent visual, magnetic particle or penetrant, and radiographic, or approved equivalent nondestructive inspection methods.</td>
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</table>

(2) The percentage of castings inspected by nonvisual methods may be reduced below that specified in paragraph (d)(1) of this section when an approved quality control procedure is established.

(3) For castings procured to a specification that guarantees the mechanical properties of the material in the casting and provides for demonstration of these properties by test of coupons cut from the castings on a sampling basis—

(i) A casting factor of 1.0 may be used; and

(ii) The castings must be inspected as provided in paragraph (d)(1) of this section for casting factors of “1.25 through 1.50” and tested under paragraph (c)(2) of this section.

§ 25.625 Fitting factors.

For each fitting (a part or terminal used to join one structural member to another), the following apply:

(a) Except as provided in paragraph (b) of this section, each part that has clearance (free fit), and that is subject to pounding or vibration, must have a bearing factor large enough to provide for the effects of normal relative motion.

(b) No bearing factor need be used for a part for which any larger special factor is prescribed.

§ 25.629 Aeroelastic stability requirements.

(a) General. The aeroelastic stability evaluations required under this section include flutter, divergence, control reversal and any undue loss of stability and control as a result of structural deformation. The aeroelastic evaluation must include whirl modes associated with any propeller or rotating device that contributes significant dynamic forces. Compliance with this section must be shown by analyses, wind tunnel tests, ground vibration tests, flight tests, or other means found necessary by the Administrator.

(b) Aeroelastic stability envelopes. The airplane must be designed to be free from aeroelastic instability for all configurations and design conditions within the aeroelastic stability envelopes as follows:

(1) For normal conditions without failures, malfunctions, or adverse conditions, all combinations of altitudes and speeds encompassed by the $V_D/M_D$ versus altitude envelope enlarged at all points by an increase of 15 percent in equivalent airspeed at both constant Mach number and constant altitude. In addition, a proper margin of stability must exist at all speeds up to $V_D/M_D$ and, there must be no large and rapid reduction in stability as $V_D/M_D$ is approached. The enlarged envelope may be limited to Mach 1.0 when $M_D$ is less than 1.0 at all design altitudes, and