

Fmin equations for the imperial & metric systems

(by Allen Face – Jan 2014)

Imperial Units (L: wheel or axle separation in inches; s: measurement point spacing in inches)

For 12" ≤ L ≤ 240":

$$d_{max} = \frac{1,3\sqrt{L+2,7}-1,9}{Fmin}; [inch]$$

For 12" ≤ L < 55":

$$e_{max} = \frac{-0,4L^2+43,9L+2773,3}{1000Fmin}; \left[\frac{inch}{ft}\right]$$

For 55" ≤ L ≤ 240"

$$e_{max} = \frac{3,9778}{Fmin}; \left[\frac{inch}{ft}\right]$$

For 0" < s ≤ 12"

$$f_{max} = \frac{s(0,015s+0,09)}{Fmin}; \left[\frac{inch}{s^2}\right]$$

Metric Units (L: wheel or axle separation in mm; s: measurement point spacing in mm)

For 300mm ≤ L ≤ 6100mm:

$$d_{max} = \frac{6,55\sqrt{L+68,58}-48,26}{Fmin}; [mm]$$

For 300mm ≤ L < 1400mm:

$$e_{max} = \frac{-0,01575L^2+43,9L+70441,82}{1016Fmin}; \left[\frac{mm}{300mm}\right]$$

For 1400 mm ≤ L ≤ 6100 mm

$$e_{max} = \frac{99,445}{Fmin}; \left[\frac{mm}{300mm}\right]$$

For 0 mm < s ≤ 300 mm

$$f_{max} = \frac{s(0,00059s+0,09)}{Fmin}; \left[\frac{mm}{s^2}\right]$$