Revisions and Errata List
AISC Steel Design Guide 9, 2nd Printing (Printed Copy)
August 20, 2020

The following list represents corrections to the second printing of AISC Design Guide 9, *Torsional Analysis of Structural Steel Members.*

Page(s)	Item
4	In Figure 2.3, in the upper right hand diagram, $\dfrac{w_u e}{2H}$ should be replaced with $\dfrac{w_u e}{H}$.
4	In Figure 2.3, in the lower right hand diagram, $\dfrac{w_u e}{2H}$ should be replaced with $\dfrac{w_u e}{H}$.

21   In the left column, beginning with the 5th line from the bottom, replace the existing text as follows:

From Example 5.1,

$$T_u = \frac{-90\,\text{kip-in.}}{2} = -45\,\text{kip-in.}$$

$$\tau_t = \frac{T_u}{2tA_o} \qquad\qquad (4.4)$$

$$= \frac{-45\,\text{kip-in.}}{2(\tfrac{1}{2}\,\text{in.})(9.5\,\text{in.}\times 5.5\,\text{in.})}$$

$$= -0.861\ \text{ksi}$$

In the right column, replace the first four lines with the following:

Calculate Combined Stress

$$f_{uv} = \tau_b + \tau_t \qquad\qquad (4.10)$$

$$= \pm 0.75\ \text{ksi} - 0.861\,\text{ksi}$$

$$= -1.61\ \text{ksi}$$

22   In the table at the top of the first column, the value of f_{uv} for the TS10x6x½ should be changed from 2.47 ksi to 1.61 ksi.

26   In Example 5.4 under the heading, *Calculate Maximum Rotation*, the calculations should be replaced with:

From Appendix B, Case 3 with $\alpha = 0.3$, it is estimated that the maximum rotation will occur at 12.75 ft from the left end of the beam (Point A). At this location, $z/l = 0.51$ for T_B and $z/l = 1 - 0.51 = 0.49$ for T_D. The service-load torques are

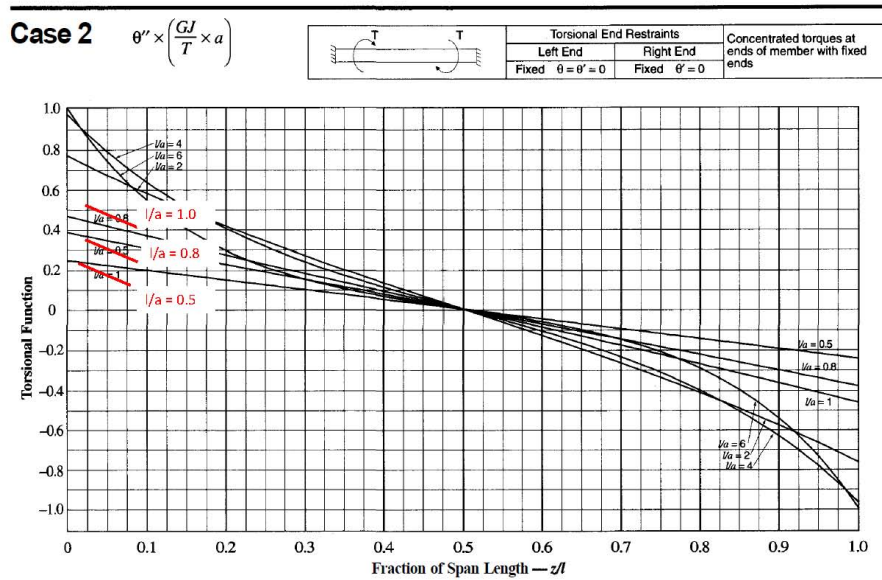$$T_B = (210\ \text{kips})(3\ \text{in.}) = 630\ \text{kip-in.}$$

$T_D = (285 \text{ kips})(3 \text{ in.}) = 855 \text{ kip-in.}$

The maximum rotation is

$$\theta = 0.064\left(\frac{T_B l}{GJ}\right) + 0.065\left(\frac{T_D l}{GJ}\right)$$

$$= 0.064\frac{(630 \text{ kip-in.})(300 \text{ in.})}{(11,200 \text{ ksi})(107 \text{ in.}^4)} + 0.065\frac{(855 \text{ kip-in.})(300 \text{ in.})}{(11,200 \text{ ksi})(107 \text{ in.}^4)}$$

$$= 0.024 \text{ rad}$$

57   Replace the Case 2 graph with:

58   In the upper table, for the Torsional End Restraint for the Left End and Right End, replace "Fixed" with "Pinned." To the right of that, "Concentrated torques at ends of member with fixed ends" should be replaced with "Concentrated torque at $\alpha = 0.1$ on member with pinned ends."

58   In the lower table, for the Torsional End Restraint for the Left End and Right End, replace "Fixed" with "Pinned." To the right of that, "Concentrated torques at ends of member with fixed ends" should be replaced with "Concentrated torque at $\alpha = 0.1$ on member with pinned ends."

59   In the upper table, for the Torsional End Restraint for the Left End and Right End, replace "Fixed" with "Pinned." To the right of that, "Concentrated torques at ends of member with fixed ends" should be replaced with "Concentrated torque at $\alpha = 0.1$ on member with pinned ends."

59   In the lower table, for the Torsional End Restraint for the Left End and Right End, replace "Fixed" with "Pinned." To the right of that, "Concentrated torques at ends of member with fixed ends" should be replaced with "Concentrated torque at $\alpha = 0.1$ on member with pinned ends."

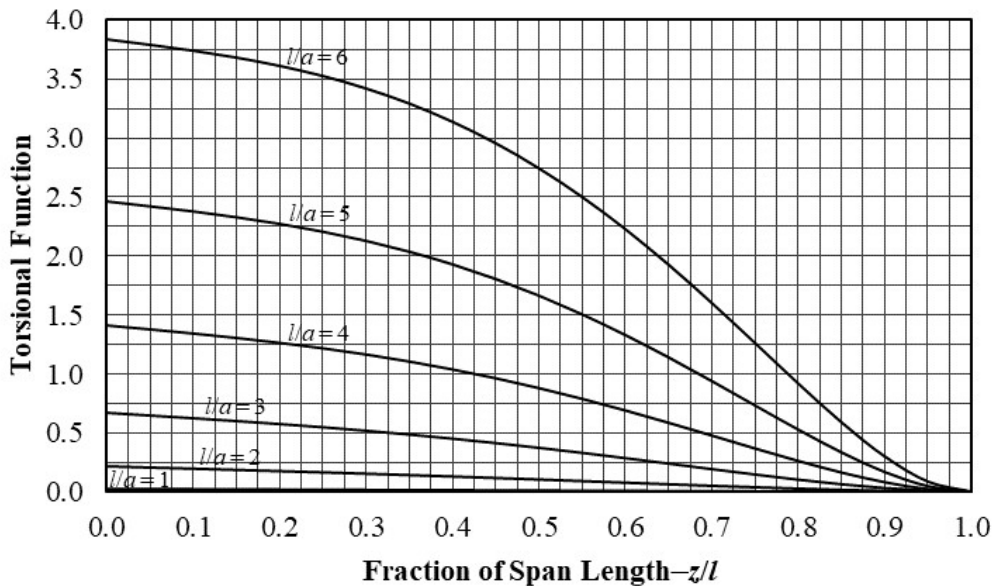|	
60	In the top graph, the y-axis values "1.5, 1.25, 1.0, 0.75, 0.5, 0.25," should be replaced with "0.15, 0.125, 0.1, 0.075, 0.05, 0.025."

67   Replace the top graph for $\theta'' \times \left(\dfrac{GJ}{t} \right)$ with:
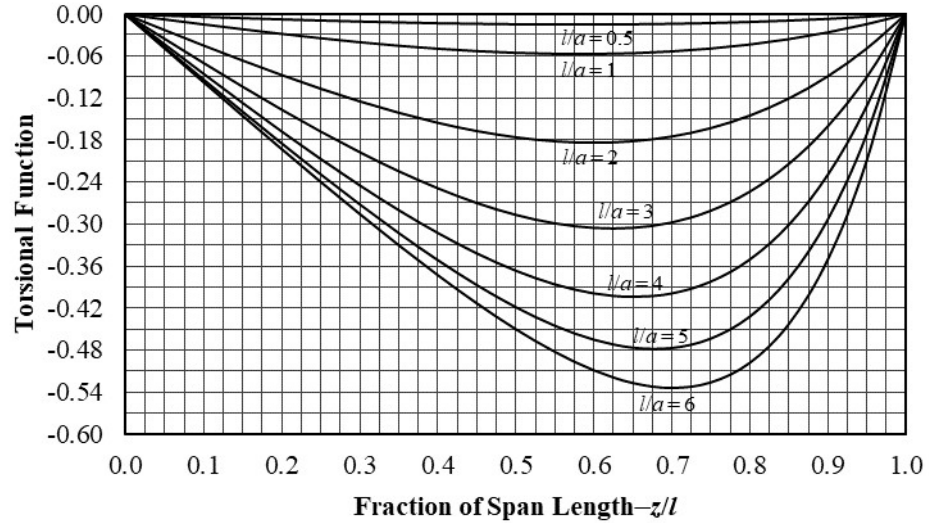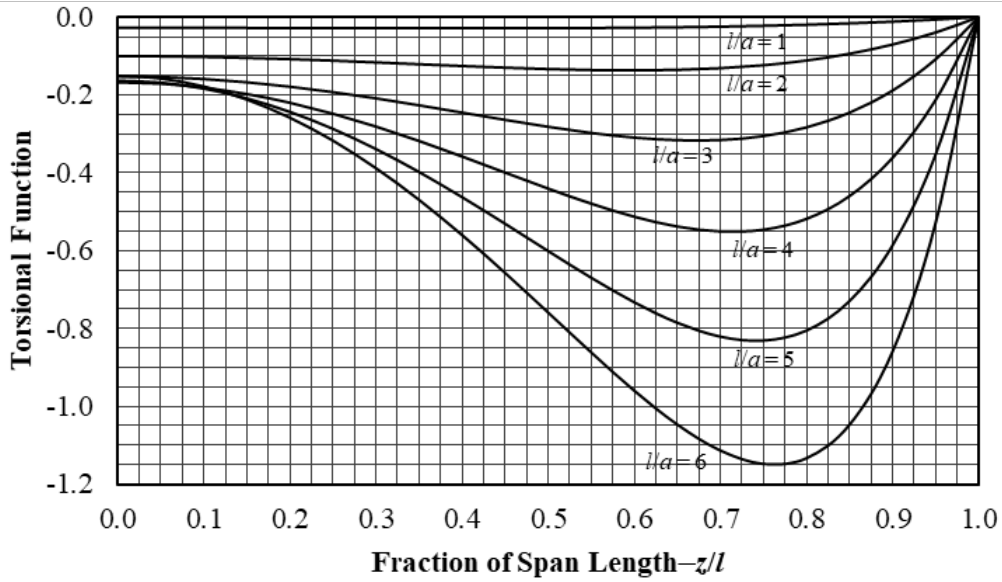

77   The variable description for the bottom graph should be revised to:

$$\theta''' \times \left(\frac{GJ}{t} \times \frac{10a^2}{l} \right)$$

102   Replace the top graph for $\theta \times \left(\dfrac{GJ}{t} \times \dfrac{1}{a^2} \right)$ with:
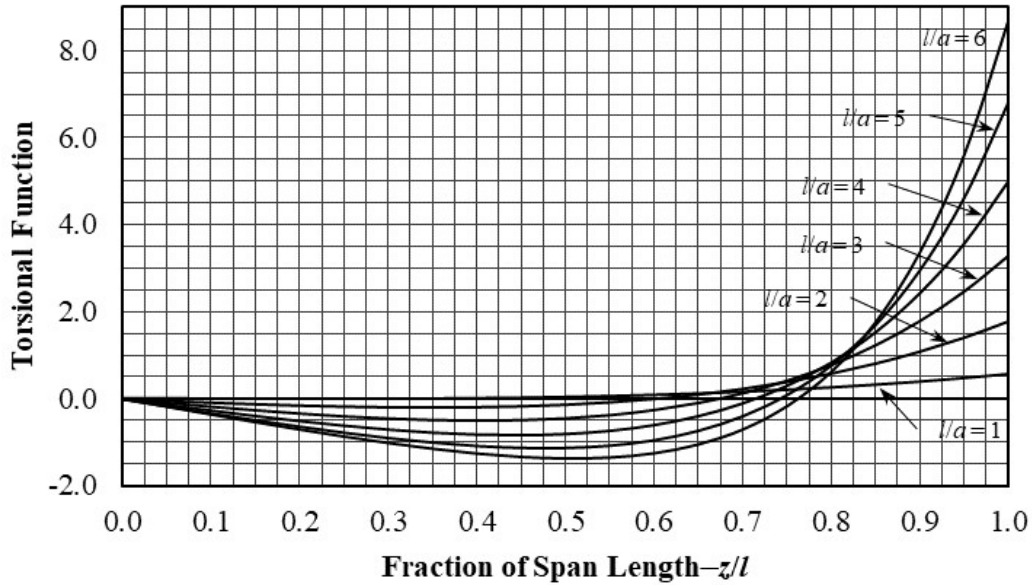
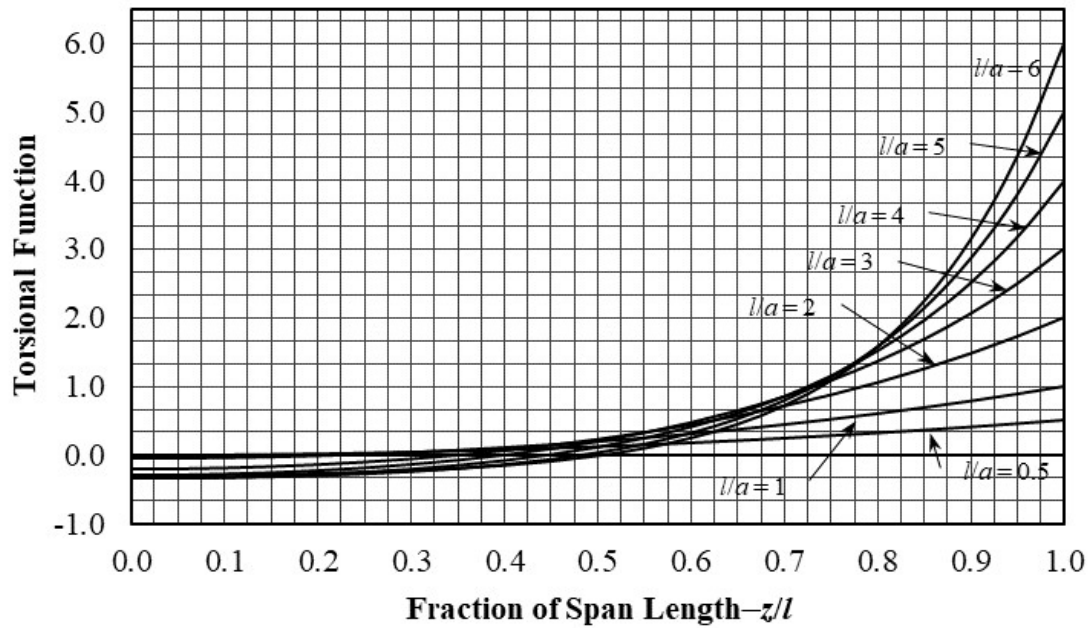Replace the bottom graph for $\theta' \times \left(\dfrac{GJ}{t} \times \dfrac{1}{a} \right)$ with:

Torsional Function (y-axis: 0.0, -0.2, -0.4, -0.6, -0.8, -1.0, -1.2)

Curves labeled: $l/a=1$, $l/a=2$, $l/a=3$, $l/a=4$, $l/a=5$, $l/a=6$

Fraction of Span Length—z/l (x-axis: 0.0 to 1.0)

103   Replace the top graph for $\theta'' \times \left(\dfrac{GJ}{t} \times 4 \right)$ with:

Torsional Function (y-axis: 8.0, 6.0, 4.0, 2.0, 0.0, -2.0)

Curves labeled: $l/a=6$, $l/a=5$, $l/a=4$, $l/a=3$, $l/a=2$, $l/a=1$

Fraction of Span Length—z/l (x-axis: 0.0 to 1.0)

Replace the bottom graph for $\theta''' \times \left(\dfrac{GJ}{t} \times 2a \right)$ with:

4

Torsional Function

$l/a = 6$

$l/a = 5$

$l/a = 4$

$l/a = 3$

$l/a = 2$

$l/a = 1$

$l/a = 0.5$

6.0 5.0 4.0 3.0 2.0 1.0 0.0 -1.0

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

Fraction of Span Length–z/l

107   Equation C.9 should be changed to:

$$\theta = A + Bz + C\cosh\frac{z}{a} + D\sinh\frac{z}{a} - \frac{tz^3}{6GJl}$$

108   In the right column, Equation C.17 should be changed to:

$$S_{ws} = \int_0^s W_{ns}t\ ds$$

112   For Case 11, the equation for θ should be changed to:

$$\theta = \frac{ta^2}{GJ}\left\{1 + \frac{l^2}{6a^2} - \left(\frac{a}{l} + \frac{l}{2a}\right)\tanh\frac{l}{a} - \frac{z}{l} + \left(\frac{a}{l} + \frac{l}{2a}\right)\frac{\sinh\frac{z}{a}}{\cosh\frac{l}{a}} - \frac{z^3}{6la^2}\right\}$$