

Revisions and Errata List
AISC Steel Design Guide 9, 2nd Printing (Printed Copy)
February 16, 2023

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, $\frac{w_u e}{2H}$ should be replaced with $\frac{w_u e}{H}$.
4	In Figure 2.3, in the lower right hand diagram, $\frac{w_u e}{2H}$ should be replaced with $\frac{w_u e}{H}$.
21	In the left column, beginning with the 5 th line from the bottom, replace the existing text as follows:

From Example 5.1,

$$\begin{aligned}
 T_u &= \frac{-90 \text{ kip-in.}}{2} = -45 \text{ kip-in.} \\
 \tau_t &= \frac{T_u}{2tA_o} && (4.4) \\
 &= \frac{-45 \text{ kip-in.}}{2(\frac{1}{2} \text{ in.})(9.5 \text{ in.} \times 5.5 \text{ in.})} \\
 &= -0.861 \text{ ksi}
 \end{aligned}$$

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

Calculate Combined Stress

$$\begin{aligned}
 f_{uv} &= \tau_b + \tau_t && (4.10) \\
 &= \pm 0.75 \text{ ksi} - 0.861 \text{ ksi} \\
 &= -1.61 \text{ ksi}
 \end{aligned}$$

22	In the table at the top of the first column, the value of f_{uv} for the TS10x6x $\frac{1}{2}$ should be changed from 2.47 ksi to 1.61 ksi.
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26	In Example 5.4 under the heading, <i>Calculate Maximum Rotation</i> , the calculations should be replaced with:
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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

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

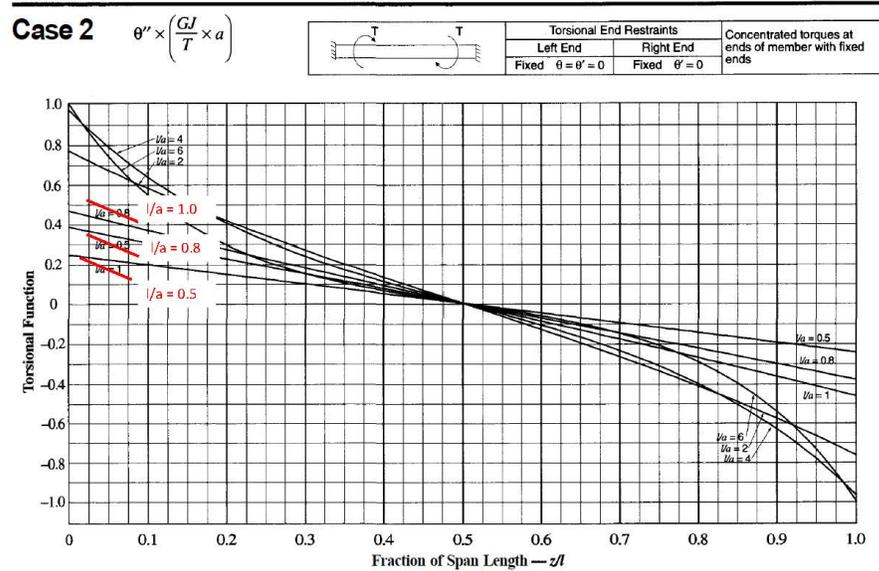
$$T_D = (285 \text{ kips})(3 \text{ in.}) = 855 \text{ kip-in.}$$

The maximum rotation is

$$\begin{aligned} \theta &= 0.064 \left(\frac{T_B l}{GJ} \right) + 0.065 \left(\frac{T_D l}{GJ} \right) \\ &= 0.064 \frac{(630 \text{ kip-in.})(300 \text{ in.})}{(11,200 \text{ ksi})(107 \text{ in.}^4)} + 0.065 \frac{(855 \text{ kip-in.})(300 \text{ in.})}{(11,200 \text{ ksi})(107 \text{ in.}^4)} \\ &= 0.024 \text{ rad} \end{aligned}$$

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 $\theta = \theta' = 0$ ” with “Pinned $\theta = \theta'' = 0$.” 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 $\theta = \theta' = 0$ ” with “Pinned $\theta = \theta'' = 0$.” 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 $\theta = \theta' = 0$ ” with “Pinned $\theta = \theta'' = 0$.” 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

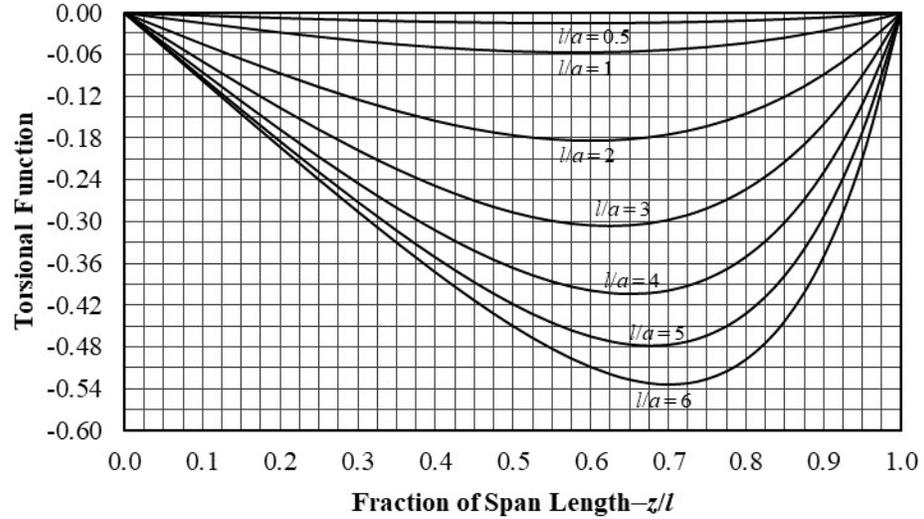
In the lower table, for the Torsional End Restraint for the Left End and Right End, replace “Fixed $\theta = \theta' = 0$ ” with “Pinned $\theta = \theta'' = 0$.” To the right of that, “Concentrated torques at ends of member with fixed ends” should be replaced with “Concentrated torque at $\alpha = 0.1$ 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 $\theta'' \times \left(\frac{GJ}{t} \right)$ with:



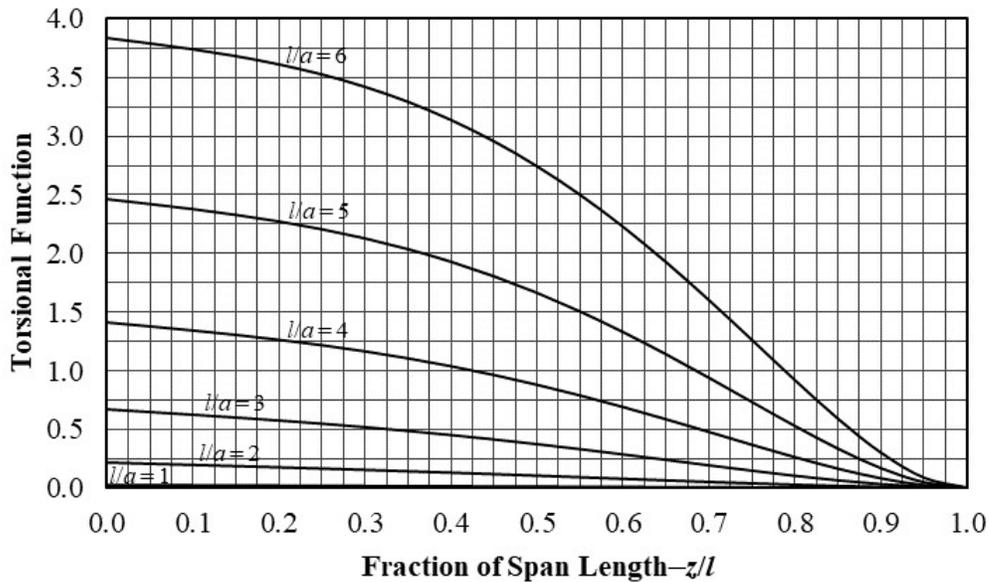
77

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

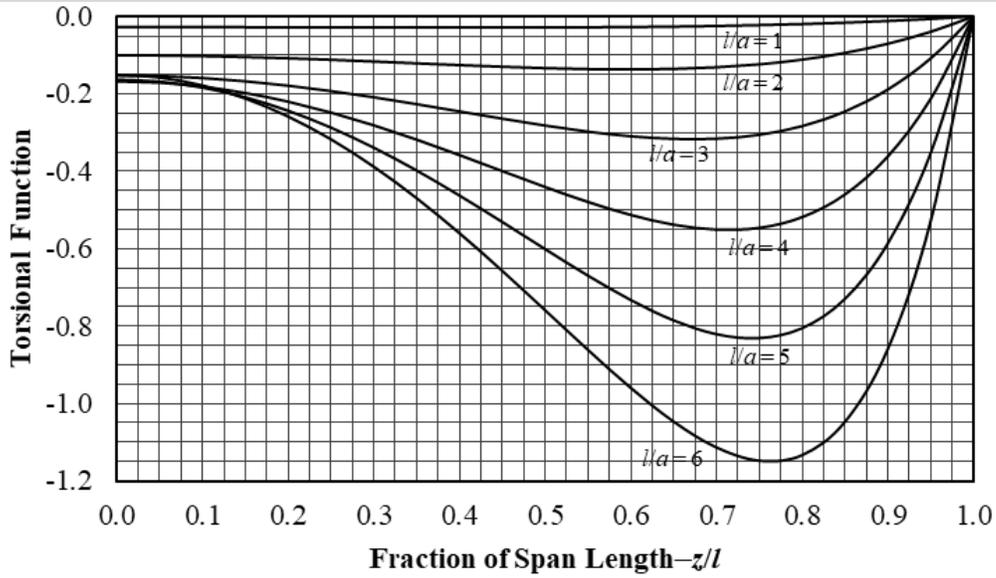
$$\theta''' \times \left(\frac{GJ}{t} \times \frac{10a^2}{l} \right)$$

102

Replace the top graph for $\theta \times \left(\frac{GJ}{t} \times \frac{1}{a^2} \right)$ with:

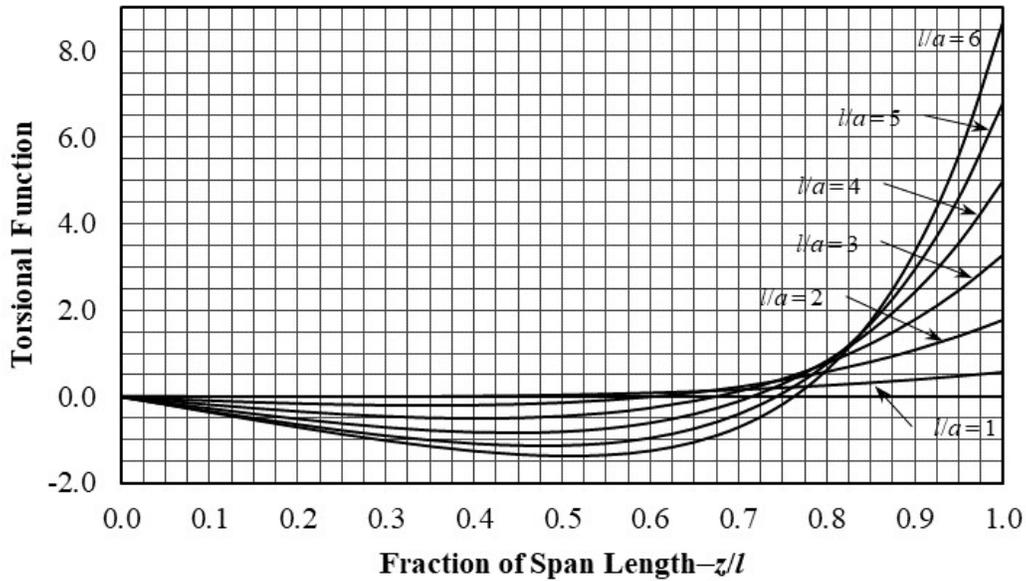


Replace the bottom graph for $\theta' \times \left(\frac{GJ}{t} \times \frac{1}{a} \right)$ with:

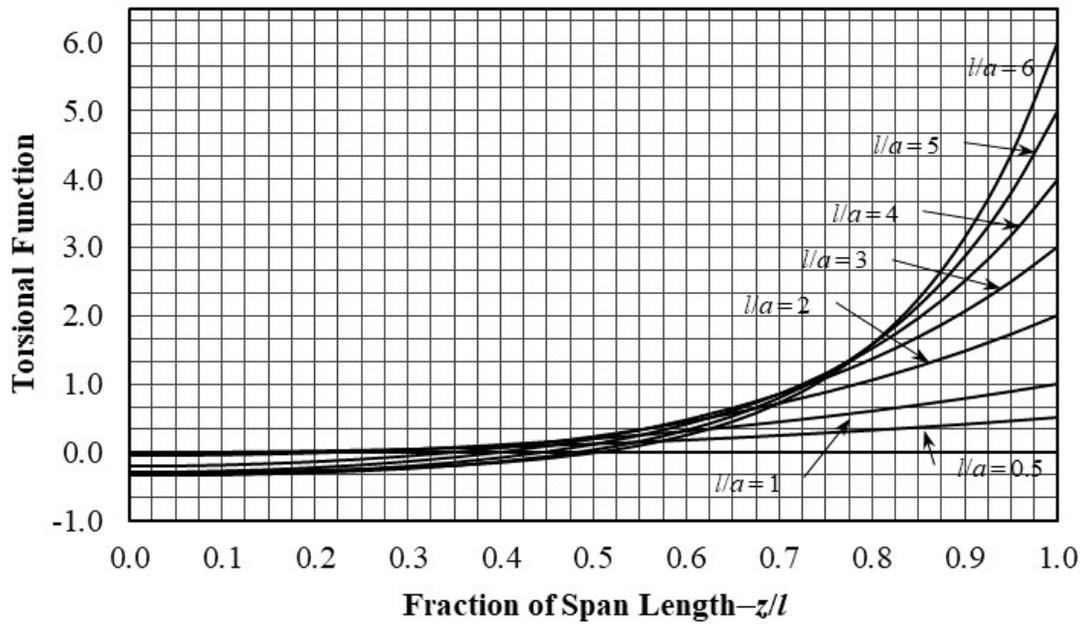


103

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



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



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:

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

109 In the right column, Equation C.30 should be changed to:

$$\alpha'_4 = -0.0908 + 0.262 \frac{t_w}{t_2} + 0.123 \frac{R}{t_2} - 0.0752 \frac{t_w R}{t_2^2} - 0.0945 \frac{t_w^2}{t_2^2}$$

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

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