

$$\text{-Application Torque (in/lbs)} = \frac{\text{Horsepower} \times 63,025}{\text{RPM}}$$

*Note: This is strictly the application torque, not considering a service factor*

$$\text{-B-10 Life Hours in Universal Joints} = \frac{1.5 \times 10^6}{\text{Operating Angle} \times \text{RPM}} \times \left[ \frac{\text{Life Torque}}{\text{Application Torque}} \right]^{\frac{10}{3}}$$

*Note: Life Torque is determined by Life Torque Capacity Rating of selected size UJ*

$$\text{-Shaft Stress (PSI)} = \frac{(5.1 \times \text{Torque}) \times \text{OD}}{(\text{OD}^4 - \text{ID}^4)} ; \text{ Where OD and ID are in inches}$$

$$\text{-Torsional Twist (Degrees)} = \frac{.0000507 \times \text{Torque} \times \text{Length}}{d^4}$$

*Note: The usual allowable twist is .08 degrees per foot*

For Shock Absorbers:

$$\text{-Kinetic Energy to be Absorbed (ft-lbs)} = E = \frac{wv^2}{231,840} ; \text{ where } w = \text{weight share per bumper}$$

and  $V = \text{velocity in FPM}$

$$\text{-Energy Adjusted to Design Velocity of Bumper } E_v = E \left[ .3 \left( \frac{V}{V_d} \right) + .7 \right] \text{ Note: } V_d \text{ is Design Velocity}$$

$$\text{-Maximum allowable shocks per hour} = 8 \times \left( \frac{E_v}{E} \right)$$