



Torsion Bar Facts	Hollow and Solid Torsion Bars	Maintenance
<p>Torsion bars provide the vital suspension link between the surface of a race track and a car's chassis. Torsion bars have as much to do with the car's response as do its tires, so their quality and consistency are essential to a good performing car. The quality of material, workmanship, heat treatment and finish all have an effect on the performance of the torsion bar. Maxim uses only aircraft quality high alloy steel to achieve the finest bar possible, and machines their torsion bars with state of the art CNC equipment. Only Maxim torsion bars are machined in one continuous pass from end to end in order to prevent irregularities. Then they are polished, heat treated to exact specifications, then polished again to assure no surface imperfections exist which could cause a stress point or crack to originate. The bars are then coated with a protective film and shipped in plastic screw-lock tubes for protection and easy identification.</p>	<p>There are significant differences between gun drilled, and solid torsion bars other than their weight. The hole in the center of gun drilled torsion bars creates two surfaces instead of one, allowing the bar to react differently than a solid bar to deflection. Gun drilled torsion bars have a faster spring rate than a solid torsion bar, which means they rebound, or spring back, quicker. Track conditions and chassis characteristics determine which type of bar is the best choice for your particular application.</p>	<p>"How long should a torsion bar last?". The answer lies in how close to the material's yield point the bar is used. The closer the stress exerted on the bar is to the yield point of the material, the shorter the life of the bar. Consistently take a bar past its yield point and the life starts to go out of the bar. A high quality bar will not lose it's spring rate, it simply will not be as responsive as it is designed to be. An analogy would be to compare torsion bars to valve springs that test OK but the engine will not perform at its peak. All Maxim torsion bars are manufactured of the finest materials and to the closest tolerances to insure unsurpassed durability and reliability under racing conditions. Torsion Bars should be inspected and lubricated after each event. Consider replacing a bar after any incident which may have abruptly twisted the bar in a severe fashion. Once a new bar has been used in a particular corner of the race car it should continuously be used in that same corner or the corner of the car which is diagonally across from it. This ensures that the bar will always be twisted in the same direction as it was originally.</p>

Hollow Torsion Bar Spring Rate Formula

1129000 multiplied by the outside diameter of the bar to the 4th, minus the inside diameter to the 4th, divided by the arm length squared, multiplied by the effective length of the bar.

Example: $1129000 \times (OD^4 - ID^4) \div AL^2 \times EL = \text{Spring Rate}$