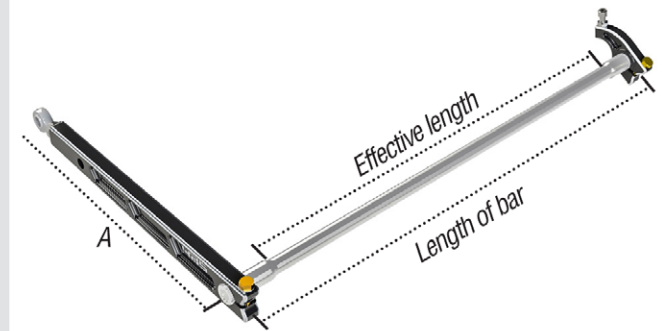


Torsion Bar Spring Rates

$$\text{Spring Rate} \left(\frac{\text{lbs}}{\text{in}} \right) = \pi \left(\frac{\text{OD}^4}{2} \right) \cdot \left(\frac{\text{Arcsin} \left(\frac{1}{A} \right) \cdot 11,290,000}{A \cdot B} \right)$$

Notes: The effective length of the bar is the length of the turned down part of the torsion bar. For 26" bars, we use 21", because it matches our real-world spring rate tests. For 23" bars use 18.5". The length of the arm is the distance from center of torsion bar to center of rod end.

Based on our real-world comparisons, we have found that the formula seems to be slightly softer than what the real rate of the bar is. But this is a good way to get a close number. The exact type of material and the hardening process the manufacturer uses will affect the actual spring rate of the bar.



Spring Rates (lbs./in.) for 7/8" x 26" Effective Length 21" (B)

		Length of Arm (A)														
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
Bar Size (OD)	0.475	42.1	37.3	33.2	29.8	26.9	24.4	22.2	20.3	18.7	17.2	15.9	14.8	13.7	12.8	12.0
	0.500	51.7	45.8	40.8	36.6	33.0	30.0	27.3	25.0	22.9	21.1	19.5	18.1	16.8	15.7	14.7
	0.550	75.7	67.0	59.8	53.6	48.4	43.9	40.0	36.6	33.6	30.9	28.6	26.5	24.7	23.0	21.5
	0.575	90.4	80.0	71.4	64.0	57.8	52.4	47.7	43.7	40.1	37.0	34.2	31.7	29.5	27.5	25.7
	0.600	107.2	94.9	84.6	75.9	68.5	62.1	56.6	51.8	47.6	43.8	40.5	37.6	34.9	32.6	30.4
	0.625	126.2	111.7	99.6	89.4	80.7	73.2	66.7	61.0	56.0	51.6	47.7	44.2	41.1	38.3	35.8
	0.650	147.6	130.7	116.6	104.6	94.4	85.6	78.0	71.3	65.5	60.4	55.8	51.7	48.1	44.8	41.9
	0.675	171.7	152.0	135.6	121.6	109.8	99.5	90.7	83.0	76.2	70.2	64.9	60.2	56.0	52.2	48.7
	0.700	198.5	175.8	156.8	140.7	126.9	115.1	104.9	95.9	88.1	81.2	75.1	69.6	64.7	60.3	56.4
	0.712	212.5	188.2	167.8	150.6	135.9	123.2	112.3	102.7	94.3	86.9	80.3	74.5	69.3	64.6	60.3
	0.725	228.4	202.3	180.4	161.9	146.1	132.5	120.7	110.4	101.4	93.4	86.4	80.1	74.5	69.4	64.9
	0.737	244.0	216.0	192.6	172.9	156.0	141.5	128.9	117.9	108.3	99.8	92.2	85.5	79.5	74.1	69.3
	0.750	261.6	231.7	206.6	185.4	167.3	151.7	138.2	126.4	116.1	107.0	98.9	91.7	85.3	79.5	74.3
	0.775	298.3	264.1	235.6	211.4	190.7	173.0	157.6	144.2	132.4	122.0	112.8	104.6	97.2	90.6	84.7
	0.800	338.7	299.9	267.5	240.0	216.6	196.4	178.9	163.7	150.3	138.5	128.0	118.7	110.4	102.9	96.2
0.825	383.0	339.2	302.5	271.4	244.9	222.1	202.4	185.1	170.0	156.7	144.8	134.3	124.9	116.4	108.8	
0.850	431.6	382.2	340.8	305.8	276.0	250.3	228.0	208.6	191.6	176.5	163.2	151.3	140.7	131.1	122.5	

Spring Rates (lbs./in.) for 7/8" x 14" Bars Effective Length 10.5" (B)

		Length of Arm														
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
Bar Size	0.550	151.3	134.0	119.5	107.2	96.8	87.7	79.9	73.1	67.2	61.9	57.2	53.1	49.3	46.0	43.0
	0.575	180.8	160.1	142.8	128.1	115.6	104.8	95.5	87.4	80.2	73.9	68.3	63.4	58.9	54.9	51.3
	0.600	214.3	189.8	169.2	151.9	137.0	124.3	113.2	103.6	95.1	87.7	81.0	75.1	69.9	65.1	60.8

Spring Rates (lbs./in.) for 3/4" x 23" Bars Effective Length 18.5" (B)

		Length of Arm														
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
Bar Size (OD)	0.600	121.6	107.7	96.1	86.2	77.8	70.5	64.3	58.8	54.0	49.7	46.0	42.6	39.6	37.0	34.5
	0.630	147.9	130.9	116.8	104.8	94.5	85.7	78.1	71.5	65.6	60.5	55.9	51.8	48.2	44.9	42.0
	0.670	189.1	167.5	149.4	134.0	120.9	109.7	99.9	91.4	83.9	77.4	71.5	66.3	61.7	57.5	53.7
	0.690	212.8	188.4	168.0	150.8	136.0	123.4	112.4	102.8	94.4	87.0	80.4	74.6	69.3	64.6	60.4
	0.700	225.4	199.6	178.0	159.7	144.1	130.7	119.0	108.9	100.0	92.2	85.2	79.0	73.5	68.5	64.0
	0.710	238.5	211.2	188.4	169.0	152.5	138.3	126.0	115.3	105.9	97.5	90.2	83.6	77.7	72.5	67.7
	0.720	252.2	223.4	199.2	178.7	161.3	146.3	133.2	121.9	111.9	103.2	95.4	88.4	82.2	76.6	71.6
	0.730	266.5	236.0	210.5	188.9	170.4	154.6	140.8	128.8	118.3	109.0	100.8	93.4	86.9	81.0	75.7
	0.740	281.5	249.2	222.3	199.4	180.0	163.2	148.7	136.0	124.9	115.1	106.4	98.7	91.7	85.5	79.9
	0.750	297.0	263.0	234.5	210.4	189.9	172.2	156.9	143.5	131.8	121.5	112.3	104.1	96.8	90.2	84.3
0.775	338.6	299.8	267.4	239.9	216.5	196.3	178.9	163.6	150.3	138.5	128.0	118.7	110.4	102.9	96.1	