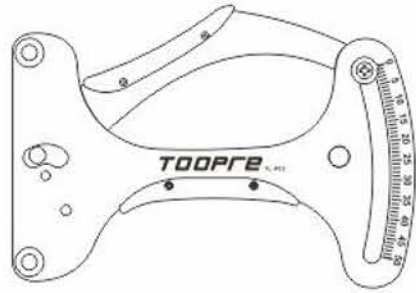


TL-P03 SPOKE TENSION METER

The spoke tension meter can be used to accurately and reliably measure the tension of each spoke in a wheel, the average tension of all the spokes in a wheel, and the relative tension between all the spokes in the wheel. It works on nearly any bicycle spoke, no matter what the diameter, material, or shape.



SPOKE TENSION

Wheels that are strong, reliable and long-lasting have spokes that are properly tensioned. Tension is the amount of force pulling on a wheel's spokes. Spokes that have low tension will continue to loosen as the bike is ridden, resulting in shortened spoke life and a wheel that requires continuous re-truing. Spokes that have too much tension can result in deforming and/or cracks near the nipple holes of the rim, around the flange of the hub, and at the wrench flats of the spoke nipple.

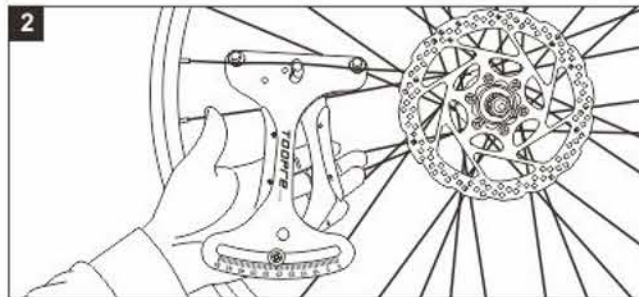
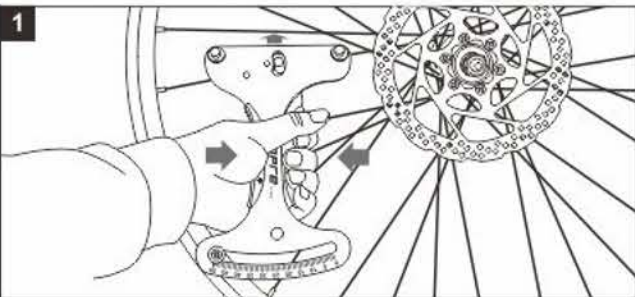
In addition to achieving proper spoke tension, it is also important for all the spokes in the wheel to have approximately the same relative tension. Relatively great differences in tension between each of the spokes will result in a wheel that is not laterally stable and that will come out of true more easily and more frequently.

The recommended tension for spokes in bicycle wheels can be as low as 80 kilograms force (kgf) and as high as 130 kilograms force. As a rule of thumb, it is best to set tension as high as the weakest link in the system will allow, which for a bicycle wheel is usually the rim. Therefore, to obtain a spoke tension recommendation for a specific wheel, it is best to contact the rim manufacturer.

MEASURING TENSION OF A SPOKE

1. Hold the spoke tension meter horizontally. Squeeze the spoke tension meter at the handle grips as in Picture 1. Place the spoke between the two fixed posts and the moveable post as in Picture 2. Gently release handles.
2. With the spoke tension meter engaged on the spoke, the pointer will be pointing to a number on the tool's graduated scale. This number is a deflection reading that is used in conjunction with the the spoke tension meter's conversion table to determine the actual tension of the spoke.
3. Using the conversion table, find the column corresponding to the material and diameter of the spoke being measured. Follow the column down to the row corresponding to the spoke's deflection reading (as determined in step 3). The number at this intersection is the actual tension of the spoke in kilograms force (kgf).

*Other units of force sometimes used are Newtons and pounds force. One kilogram force is approximately equal to 9.8 Newtons or 2.2 pounds force.



CONVENTIBLE TABLE [kgf] 1kgf=9.8Nm=2.2lb

Round Spokes(mm)	
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Spoke Size		2.3	2.0	1.8	1.7	1.6	1.5
Measured Reading	0-8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						46
	16					45	51
	17				46	50	57
	18				50	55	63
	19			48	55	60	69
	20			53	60	65	76
	21			59	68	73	85
	22		49	65	79	83	95
	23		56	75	90	94	108
	24		63	85	102	105	122
	25		70	96	114	119	136
	26		80	110	131	138	156
	27	42	90	125	150	157	
	28	50	100	141	169		
	29	57	120	160			
	30	64	140				
	31	77	160				
	32	95					
	33	110					
34	134						
35	157						
36-50							

CONVENTIBLE TABLE [kgf] 1kgf=9.8Nm=2.2lb

Blade Spokes(mm)	
1	10
2	10
3	10
4	10
5	10
6	10
7	10
8	10
9	10
10	10
11	10
12	10
13	10
14	10
15	10
16	10
17	10
18	10
19	10
20	10
21	10
22	10
23	10
24	10
25	10
26	10
27	10
28	10
29	10
30	10
31	10
32	10
33	10
34	10
35	10
36	10
37	10
38	10
39	10
40	10
41	10
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43	10
44	10
45	10
46	10
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80	10
81	10
82	10
83	10
84	10
85	10
86	10
87	10
88	10
89	10
90	10
91	10
92	10
93	10
94	10
95	10
96	10
97	10
98	10
99	10
100	10

[illegible]