


HOW TO USE RT SERIES TENSION GAUGES

 Print

HOW TO MEASURE

Figure 1



Model	Rod Diam
Model RT-10	Rod diam. .172, .198, .225, .250, .281
Model RT-10M	Rod diam .4mm, 5mm, 5.7mm, 6.3mm, 7.1mm
Model RT-11	Rod diam. .281, .330, .375
Model RT-11M	Rod diam., 7.1mm, 8.4mm, 9.5mm

Hold the gauge with the right hand and place the rod between the two nylon spools as shown in Figure 1. With the left hand pull the lanyard and extend the spring until the hook on the nylon slider can be hooked on the rod as shown in Figure 2.

Figure 2



Release the lanyard. Read the needle position on the scale. Refer to the calibration table to obtain correct tension in the rod. The gauge can be left on the wire for "hands free" adjustment of the rod.

To assure accurate readings make sure that the slider moves freely in the frame slot and does not bind. Lubricate the slider slot frequently with silicone lubricant.

HOW MUCH TENSION?

Table 1 recommends an initial tension setting, but there is no simple solution since the optimum rigging tension will be a function of the boat design, the rig (masthead or fractional, one or more spreaders, etc.), and even the cut of the sails. Many skippers use insufficient tension because of a fear of "breaking something." It should be noted that on America's Cup contenders, where electronic state of the art tension instrumentation is available, the standing rigging is set as tight as is structurally feasible.

Table 1						
Nitronic 50 Rod						
Diam., In.	Breaking Strength		Forestay*		Shrouds*	
	Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
.172	4700	2140	705	320	470	214
.198	6300	2860	950	430	630	290
.225	8200	3730	1230	560	820	380
.250	10300	4680	1550	700	1030	470
.281	12500	5680	1880	850	1250	570
.330	17500	7960	2630	1190	1750	800
.375	22500	10230	3380	1530	2250	1020

ONE DESIGN CLASS RACING SAILBOATS

It is suggested that you contact your sail maker for the recommended initial settings for the rod rigging on your boat. For larger boats it may be prudent to check with the designer of the boat.

When no specific requirements are provided by the sail maker, the following general comments will provide a basis for a rational procedure for tuning the rig.

FORESTAY TENSION

Masthead Rig On the masthead rig it's almost always advantageous to set the forestay tension as high as possible within the limits of structural strength. Generally, it's possible to use 15% of the breaking strength of the rod. Thus, a forestay tension of 1,550 lbs. is a reasonable and conservative place to start with a .250 diam. Nitronic rod.

Backstay tension would, of course, have to be adjusted to maintain a straight mast with the desired forestay tension. Since the backstay makes a greater angle to the mast, the backstay tension will be lower than the forestay tension.

NOTE ! ROLLER FURLING CAN ONLY BE SET BY BACK STAY TENSION.

Fractional Rig In a fractional rig the forestay does not go all the way to the masthead and forestay tension cannot be directly balanced by tension in the backstay. Therefore, some mast bend is generally accepted and the mainsail is cut to fit the bend. A forestay tension of at least 15% of the rod strength is desirable. However, if this results in excessive mast bend it will be necessary to back off a bit. On some fractional rigs, diamond shrouds are used to reduce mast bend.

UPPER AND LOWER SHROUD TENSION

Masthead Rig There is a simple criterion for shroud tension. The initial rigging tension should be high enough that the leeward shrouds do not go slack when sailing close-hauled in a reasonably brisk breeze. The proper value for your boat can be found by a few trial runs under sail. Once the correct tension is known, the gauge can be used to maintain the value.

For many boat designs a shroud tension of 10% to 12% of the breaking strength of the rod is adequate. Thus, for a .250 diam. Nitronic rod the upper and lower shrouds would be set to 1000 to 1200 LBS. tension. On some rigs it may be desirable to carry different tension in the uppers than lowers.

Fractional Rig For most fractional rigs the correct shroud tension is the same as that for a masthead rig, i.e., a tension setting that will keep the leeward shrouds from going slack. However, there is one exception. On certain fractional rigs, the upper and lower shrouds lead to chain plates that are aft of the mast. The spreader is swept back. For such a rig most of the forestay tension is balanced by the upper shrouds. A shroud tension of approximately 20 % of the rod strength may be required to achieve the desired forestay tension. Never exceed 25% of the rod breaking strength. (Refer to the breaking strength chart Table 1.)

GAUGE MAY NOT READ "0" WHEN AT REST, AS THEY ARE CALIBRATED AT MIDRANGE OF TENSION.

NOTE ! IF FLAT SPOTS APPEAR ON NYLON SPOOLS AFTER EXTENDED USE, ROTATE NYLON SPOOLS 45°.

RT10 & RT-10M TENSION GAUGE - FRONT LABEL

RT-10 POUNDS (LBS.)	RT-10M KILOGRAMS (MM)



PROFESSIONAL
TENSION GAUGE

MODEL RT-10

LBS. TENSION
% BREAK STRENGTH

SCALE **.172** ROD DIAM.

5	600				
	13%				
9	700				
	15%	.198			
13	800	650			
	17%	10%			
20	1000	850			
	21%	13%	.225		
23	1100	950	700		
	23%	15%	9%		
25	1200	1050	800		
	26%	17%	10%		
27	1270	1100	880		
	27%	18%	11%	.250	
30	1450	1250	950	750	
	31%	20%	12%	7%	
33	1650	1350	1080	850	
	35%	21%	14%	8%	
36	1830	1500	1200	950	
	39%	24%	15%	9%	.281
40		1780	1350	1100	750
		28%	17%	11%	6%
44		2100	1550	1250	870
		33%	19%	12%	7%
48			1750	1400	1000
			21%	14%	8%
52			2000	1600	1160
			24%	16%	9%
55			2150	1750	1300
			26%	17%	10%
57			2300	1900	1400
			28%	18%	11%
60			2600	2100	1550
			32%	20%	13%
63				2300	1700
				22%	14%
65				2500	1800
				24%	15%
68				2800	2000
				27%	16%
76					2650
					21%

U.S. PAT. NO. 5,461,929



PROFESSIONAL
TENSION GAUGE

MODEL RT-10M

KG TENSION
% BREAK STRENGTH

SCALE **4.4mm** ROD DIAM.
.172

5	272				
	13%				
9	317				
	15%	5.0mm			
		.198			
13	363	300			
	17%	10%			
20	454	385			
	21%	13%	5.7mm		
			.225		
23	500	430	317		
	23%	15%	9%		
25	544	476	362		
	26%	17%	10%		
27	580	508	400		
	27%	18%	11%	6.3mm	
				.250	
30	660	567	430	340	
	31%	20%	12%	7%	
33	750	612	490	390	
	35%	21%	14%	8%	
36	830	680	540	430	
	39%	24%	15%	9%	7.1mm
				.281	
40		794	610	500	340
		28%	17%	11%	6%
44		950	700	570	390
		33%	19%	12%	7%
48			800	640	450
			21%	14%	8%
52			910	730	530
			24%	16%	9%
55			980	800	590
			26%	17%	10%
57			1040	860	630
			28%	18%	11%
60			1200	950	700
			32%	20%	13%
63				1040	770
				22%	14%
65				1100	820
				24%	15%
68				1300	910
				27%	16%
76					1200
					21%

U.S. PAT. NO. 5,461,929

RT-11 & RT-11M TENSION GAUGE FRONT LABELS

RT-11

RT-11 METRIC

POUNDS (LBS.)

KILOGRAMS (MM)

LOOS & CO.
PROFESSIONAL
TENSION GAUGE
MODEL RT-11
LBS. TENSION
% BREAK STRENGTH

LOOS & CO.
PROFESSIONAL
TENSION GAUGE
MODEL RT-11M
KG TENSION
% BREAK STRENGTH

SCALE	ROD DIAM.	
7	.281	
	800	
	6%	
15	1200	
	10%	
17	1400	
	11%	
		.330
20	1600	800
	13%	5%
23	1900	1000
	15%	6%
25	2100	1200
	17%	7%
30	2800	1500
	22%	9%
33	3200	1800
	26%	10%
35	3700	2000
	30%	11%
37		2200
		13%
		.375
40		2500
		14%
		5%
43		3000
		17%
		7%
45		3400
		19%
		8%
47		3700
		21%
		9%
50		4400
		25%
		10%
54		2800
		12%
58		3500
		16%
60		4000
		18%
62		4400
		20%
65		5200
		23%
68		6500
		29%

SCALE	ROD DIAM.	
	7.1mm	
	.281	
7	360	
	6%	
15	540	
	10%	
17	635	
	11%	
		8.4mm
		.330
20	730	360
	13%	5%
23	860	450
	15%	6%
25	950	540
	17%	7%
30	1270	680
	22%	9%
33	1450	820
	26%	10%
35	1680	910
	30%	11%
37		1000
		13%
		9.5mm
		.375
40		1130
		14%
		5%
43		1360
		17%
		7%
45		1540
		19%
		8%
47		1680
		21%
		9%
50		2000
		25%
		10%
54		1270
		12%
58		1590
		16%
60		1810
		18%
62		2000
		20%
65		2360
		23%
68		2950
		29%

U.S. PAT. NO. 5,461,929

U.S. PAT. NO. 5,461,929

[Back to Tension Gauges How Tos \(/how-tos/tension-gauges\)](#)