

## Rig tensioning using the Loos&Co Rig Tension gauge

from

*Salty John*

The Loos&Co range of rig tension gauges provides a convenient and accurate means of setting shroud and stay tension on a racing or cruising sail boat. The range of gauges comprises the Standard range and the Pro-range. The Pro-range offers repeatable accuracy of 3% whilst the more modestly priced Standard gauge offers an accuracy of 5%. The Pro range gauges can be left on the wire while the tension is adjusted, the Standard range gauges must be removed while tension is adjusted. Loos&Co produces tension gauges for wire up to the very large diameters used on super yachts, but here we will confine ourselves to the following gauges and the wire sizes they suit:

Type A; Standard; Reference 91M: Wire diameters 2.5mm, 3.0mm and 4.0mm

Type B; Standard; Reference 90M: Wire diameters 5.0mm, 6.0mm and 7.0mm

Pro PT1M: Wire diameters 2.5mm, 3.0mm and 4.0mm

Pro PT2M: Wire diameters 5.0mm, 6.0mm and 7.0mm



*Standard Type B Gauge*



*Pro Series, PT2M Gauge*

### Operation of the gauge:

Hook the gauge onto the stay or shroud, pull the lanyard until the pointer is positioned at the black calibration mark and read the value at the point where the centre of the wire meets the scale.

Use the scale mark as a reference, or convert the scale reading into actual tension in kilograms by reference to the conversion table on the gauge.

### How much tension? :

The following table gives recommended initial tension settings for 1 x 19 wire rope. It should be noted that optimal rig tension will be a function of the boat design, the rig and the cut of the sails.

Wire diameter	Breaking strain	Forestay tension	Shroud tension
2.5mm	550 kg	80 kg	55 kg
3.0mm	950 kg	145 kg	110 kg
4.0mm	1500 kg	230 kg	160 kg
5.0mm	2000kg	340 kg	230 kg
5.5mm	2800 kg	450 kg	320 kg
6.0mm	3700 kg	590 kg	390 kg
7.0mm	4500 kg	680 kg	450 kg

Leading sail-makers provide rig tension information for certain boats and sails and these should be followed where applicable. If no specific information is available use the above table and the following comments to establish a basis for tuning your rig.

Forestay tension – masthead rig: It is almost always advantageous to set the forestay tension as high as possible within the limits of structural strength. Generally, it is possible to use 15% of the breaking strain of the wire as the forestay tension. The backstay should be adjusted to maintain a straight mast with the desired forestay tension. The backstay tension will be less than the forestay tension because the backstay makes a greater angle to the mast than does the forestay.

Note that rollerfurling jib tension can only be set by adjusting backstay tension.

Forestay tension – fractional rig: Because the forestay tension cannot be directly balanced by the backstay tension some mast bend is accepted and the sails are cut to accommodate it. Forestay tension of at least 15% of the wire strength is desirable but, if this should result in excessive mast bend, it may be necessary to back off the tension.

Upper and lower shroud tension – masthead rig: The initial rig tension should be high enough that the leeward shrouds do not go slack when sailing close-hauled in a brisk breeze. The proper tension for your boat can be found by a few test runs under sail and then the Tension Gauge can be used to record and maintain this value.

For many boats a shroud tension of 10% to 12% of the wire strength is adequate. In some rigs it may be advantageous to carry a bit more tension in the uppers than the lowers.

Upper and lower shroud tension – fractional rig: In most cases the same comments apply as for masthead rigs. However, there is one exception. Where the upper and lower shrouds on a fractional rig lead to chainplates located aft of the mast – swept back spreaders – most of the forestay tension is balanced by the upper shrouds. A shroud tension as high as 20% of the wire strength may be required to achieve the desired forestay tension. Never exceed 25% of the wire breaking strength.

The Loos Tension Gauge is designed for use on 302 and 304 grade stainless steel 1 x 19 wire rope. If used on other wire types the readings will be repeatable, but the actual tension values in pounds or kilograms will differ from those given on the table on the gauge.