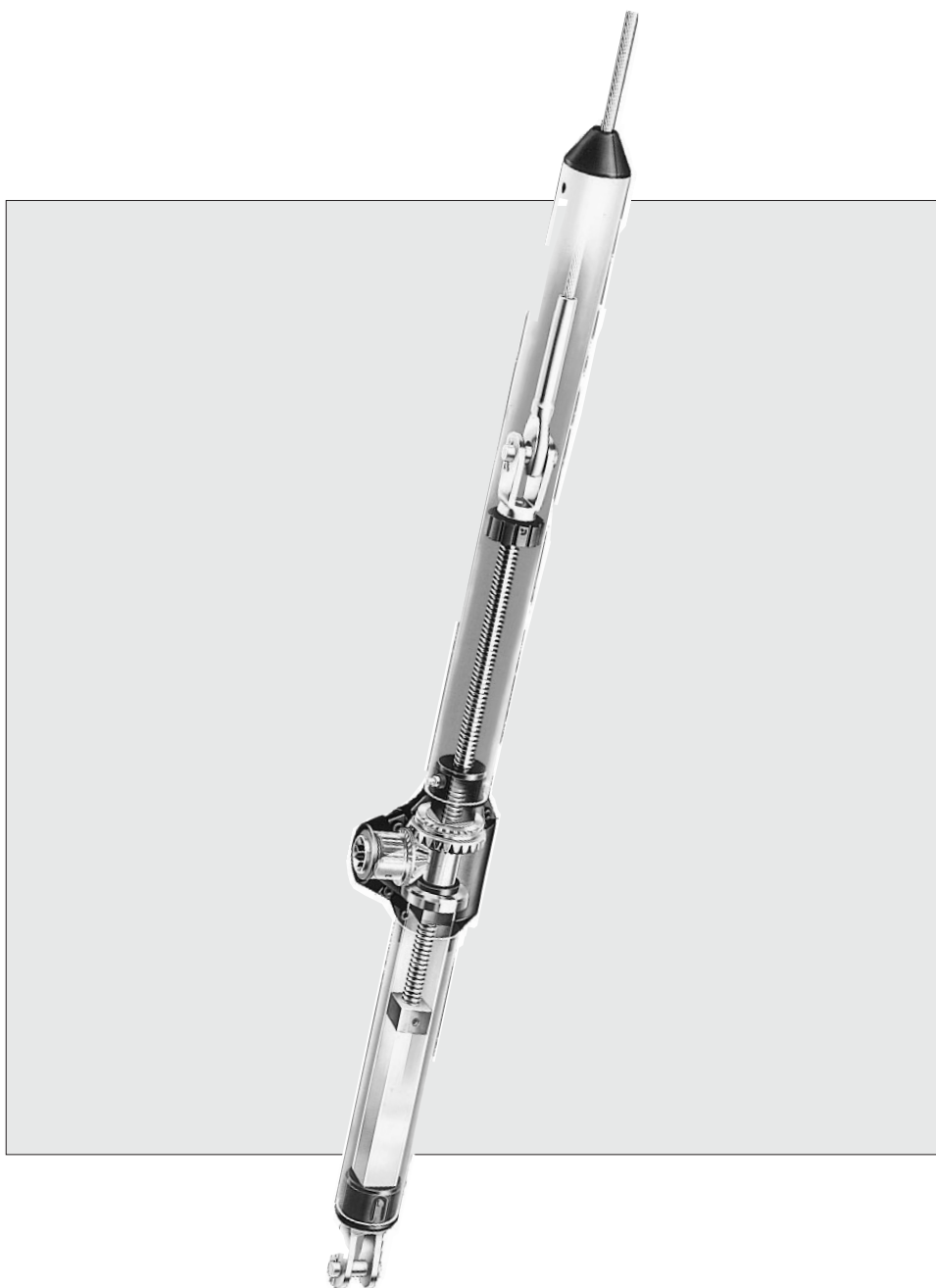


## Backstay tensioner



# Product description

This backstay tensioner can be used for stays with a diameter of 6–8 mm (10 mm if certain conditions are met). It is a mechanical tensioner, which contains a winch handle operated bevel gear. The driven gear acts as a nut on a threaded pull-rod, which is connected directly to the backstay.

The threaded pull-rod is made of acid-resistant stainless steel and the driven gear is made of bronze, preventing seizing under high load and guaranteeing a long service life.

The driving gear is made of acid-resistant stainless steel and has a socket for an international-standard winch handle. Due to the low friction, the worm gear has a safety device that locks the tensioner after adjustment. This safety device can be detected as an irregularity in the gear when rotating the handle, and occurs every 3/4 of a turn.

The pull-rod is prevented from rotating by a square bronze block at its end that runs in a square tube.

The gear housing and the outer protective tubes are made of anodized, salt-water resistant aluminium alloys.

# Technical data

Maximum working load: 30 000 N. Breaking load: 65 000 N

Part No.: 174-601-01 (60005). Stroke 250 mm.

Part No.: 174-601-02 (60006). Stroke 400 mm.

This backstay tensioner may be used on 10 mm diameter backstays providing that the following conditions are met:

1. The fore- and backstay are of 10 mm, 19-strand acid-resistant wire or other stay material with a breaking strength of 88 kN or less.
2. The backstay-to-mast angle must be at least 40 % greater than the forestay-to-mast angle.

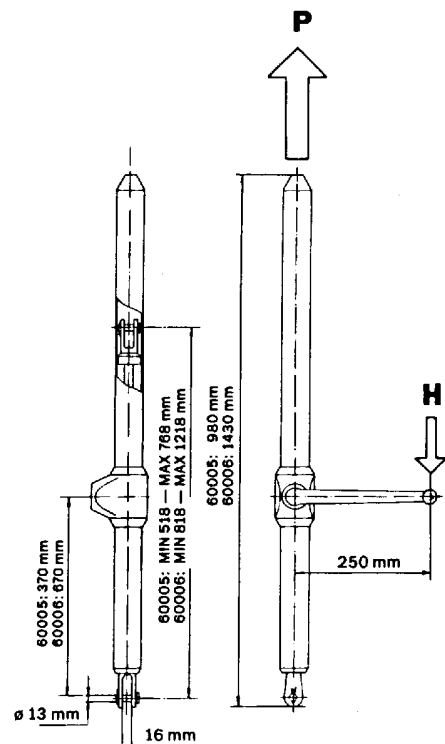
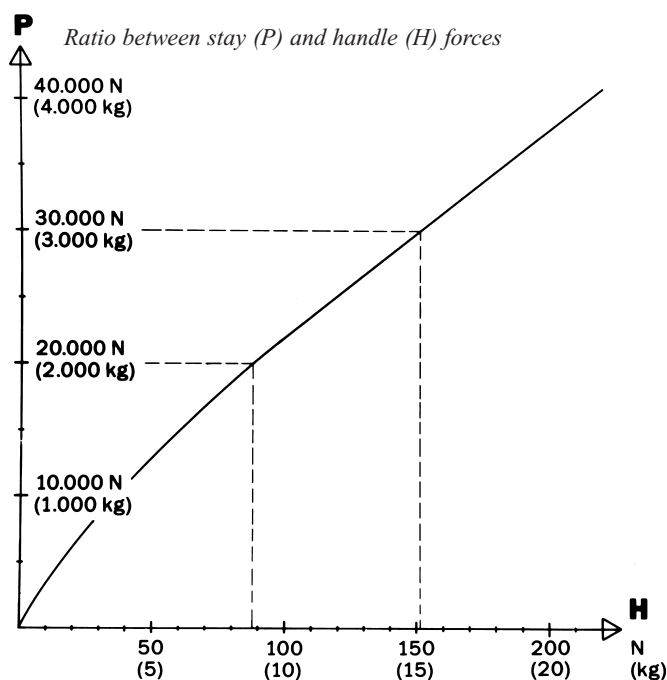


Fig. 2:1

# Fitting instructions

## A. Cutting the backstay

1. Check the fore-and-aft rake of the mast and adjust if desirable.
2. Slacken off the backstay rigging screw until the fore- and backstays are slack.
3. Remove the upper tube of the tensioner by pressing in the locking pin at the bottom edge of the tube. Keep the loose components in a safe place.

4. Wind the tensioner out so that the threaded rod is visible to the maximum extent. This is equivalent to the entire stroke length of the tensioner. (250 mm or 400 mm).
5. Place the tensioner alongside the backstay, with the lower rigging pin at the same level as the hole in the shroud chain plate. Mark the position of the upper rigging pin on the wire. (The length of the backstay rigging screw can also be compared with the tensioner when both are unscrewed and the backstay wire shortened according to this measurement.)
- 6. Secure the mast aft by means of the main halyard.**
7. Take the backstay down from the mast and have a new swaged end terminal fitted in line with the marking. Alternatively, to avoid having to remove the stay, a swageless eye can be fitted (Sta-lok or Norseman type).
8. Refit the shortened backstay.

## B. Fitting the tensioner

1. Two alternative sets of clevis pins including bushings are enclosed to match the tensioner to smaller chain plate and wire dimensions. However, the largest possible combination of clevis pin/hole diameter should be used for the chain plate and end piece.

Wire dimension	Clevis pin set
ø 6 mm	Use min. ø 11 mm clevis pin + bushings
ø 7 mm	Use min. ø 13 mm clevis pin + bushings
ø 8 and 10 mm	Use min. ø 15.8 mm clevis pin (Fitted to tensioner when supplied)

2. Attach the tensioner to the chain plate.
3. Remove the black conical bushing halves from the upper covering tube (cf. Point A3). Thread the stay through the tube. (The end where the bushing halves were located must point upwards.) Connect the backstay to the tensioner.
4. Guide the tube down and attach it to the gear housing. Place the two bushing halves around the stay and press them down into the tube so that the snap-fastener on one half of the bushing engages in the hole in the tube.

## Checking the stay force

1. The forestay often forms a smaller angle to the mast (approx. 17°) than the backstay (approx. 24°). The forestay force is therefore 30-40% greater than the backstay force (Multiplication factor = sine for backstay angle divided by sine for forestay angle).

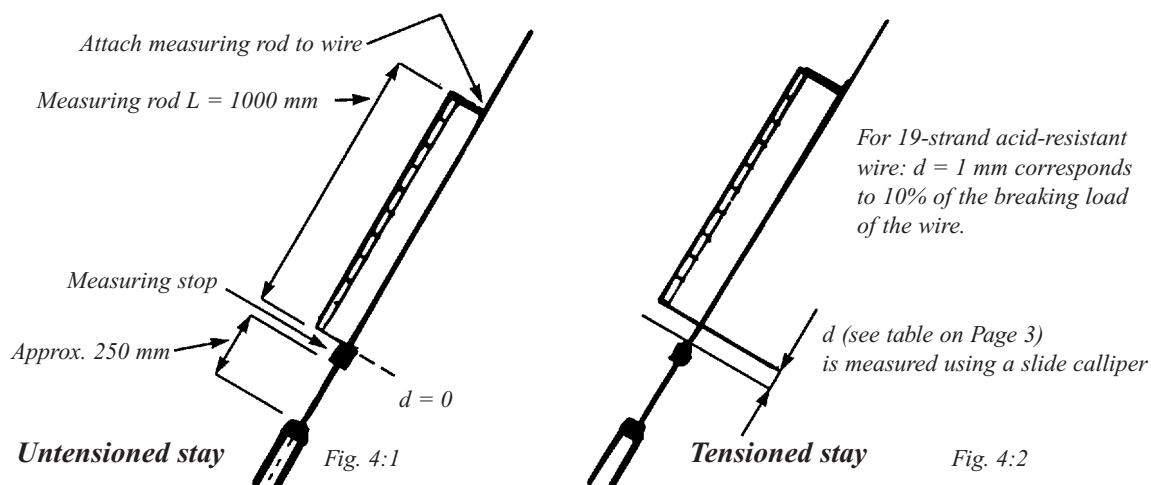
The tensile force in a stay wire should not exceed 20% of the wire's breaking load on **continuous static loading** (i.e. the tensioning force when the boat is not in use).

The corresponding value on **maximum static loading** (i.e. maximum tensioning force) is 40%. The additional dynamic load caused by variations in the wind strength and sea state is roughly 25% maximum of the static load.

Wire ø mm	Wire- breaking load (N)	Forestay		Backstay (factor 1.4)		Equivalent handle force (Fig. 2:1)		Equivalent wire elongation "d" (Fig. 4:2)	
		contin. (N)	max. (N)	contin. (N)	max. (N)	contin. (N)	max. (N)	contin. mm	max. mm
6	32000	6400	12800	4600	9200	13	35	1.4	2.8
7	43000	8600	17200	6200	12400	18	50	1.4	2.8
8	56000	11200	22400	8100	16200	30	65	1.4	2.8
10	88000	17600	35200	12720	25400	47	102	1.4	2.8

*\* Measurements relate to 19-strand acid-resistant wire  
Conversion values (10N = 1kp / 1kg / 2,25lb)*

2. Tension the backstay to the maximum value and mark the wire (using paint or tape) at the level of the top edge of the black bushing. **You should never go past this mark.**  
If the forestay & backstay are tensioned continuously, the hull of the boat will become deformed over time, allowing the tension to decrease (this does not apply to steel or aluminium hulls). Initial adjustment can be repeated during the season if required. When the boat has not been under load for any length of time (e.g. following winter storage), the hull largely assumes its original shape. The marking should therefore be checked at the start of each season.
3. Determining the stay force by measuring the elongation.



## Maintenance

The backstay tensioner must be lubricated once a season.

1. Remove the lubricating screw in the side of the gear housing and press grease into the mechanism at the same time as rotating it. This enables grease to reach the axial bearing and gear rings.
2. Release the upper tube of the tensioner by pressing in the locking pin at the bottom edge of the tube. Slide it up to expose the threads of the pull-rod. Apply grease and rotate the mechanism so that the grease also enters the crank chamber. Lower and secure the upper tube.

## Adjusting the lower attachment

(e.g. when using the tensioner as a halyard tensioner)

The lower fork can be rotated 90° in relation to the upper fork.

1. Remove the lower tube, which is attached by two screws.
2. Dismantle the crank chamber, which is held together by six screws.
3. Withdraw the fork, rotate it 90° and refit it.
4. Reassemble the crank chamber and lower tube.



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**Sweden:** Seldén Mast AB, Tel +46 (0)31 69 69 00, e-mail [info@seldenmast.com](mailto:info@seldenmast.com) **UK:** Seldén Mast Ltd., Tel +44 (0)1489 48 40 00, e-mail [info@seldenmast.co.uk](mailto:info@seldenmast.co.uk) **USA:** Seldén Mast Inc. Tel +1 843-760-6278, e-mail [info@seldenus.com](mailto:info@seldenus.com) **Denmark:** Seldén Mast A/S, Tel +45 39 18 44 00, e-mail [info@seldenmast.dk](mailto:info@seldenmast.dk) **the Netherlands:** Seldén Mid Europe B.V. Tel +31 (0)111-698 120, e-mail [info@seldenmast.nl](mailto:info@seldenmast.nl)