

# The Bartels Reefing Furler – D. Barker, Sep. 2008

## Genoa Furling and Reefing

Many Wayfarer sailors have recognized the potential advantages of jib/genoa furling systems, and some have taken the further step of investing in *reefing* furler systems. (The principal difference between the two is a reefing spar fitted at the luff (leading edge) of the sail.)

Typically a purely furling system enables the sail to be used either fully unfurled or fully furled ('on' or 'off'). By contrast the reefing system allows any fraction of the sail (or all of it) to be furled away (continuously variable). This means that within seconds a single sail can be reduced in area from a full genoa to the equivalent of a jib, or even a storm jib, or nothing at all, and anything in between. For owners without a full set of cruising sails this could represent a significant financial saving compared to the cost of buying separate genoa, jib etc., partially offsetting the initial cost of the reefing system.

## The Bartels system

One particular reefing system is that made by the German firm of Bartels ([www.bartelsgmbh.de](http://www.bartelsgmbh.de)), which a number of Wayfarer sailors (including me) have now purchased. There have been sufficient enquiries made to existing owners about this to suggest that a short article about the Bartels system might be of interest and would perhaps answer some of the questions that prospective new owners might have. I make no apology for straying occasionally from analysis to opinion, as this article has been written based on my experience over the past two seasons as an owner.

Let us first examine the various components of the system:-

- The Furling Drum

This is a high quality component, made entirely from stainless steel. It is almost completely enclosed, so there is no risk of loose turns from the furling line dropping out and becoming tangled.



*Furling drum (with spar removed)*

(Arguably riding turns could be hidden within the drum and therefore be more difficult to untangle than with some of the cage-type drums; in practice I have never known this to happen.) The bearings seem to be of high quality, and the variant supplied for Wayfarers has a “collapse load” of 20kN or about 2 tonnes. Apparently Bartels feel that the bearings run more smoothly under loading, but they seem fine even without.

It may be worth mentioning that this furling drum could be used in a non-reefing furling system, perhaps with a view to upgrading to full reefing in future (when your sails eventually need to be replaced, for example.)

The drum is attached to the bow fitting by a clevis pin. The exact arrangement depends upon the type of bow fitting. Mine is the two-part channel type; I have added a (modified) shroud adjuster (see photo above) to extend the range of possible attachment points for the furling drum as well as the painter. There is an additional component available from the manufacturer which raises the drum above the bow fitting (see right), but on advice I decided to dispense with this, as the tack of the sail needs to be kept as low as possible. In my experience, without the extra part there is just enough room between the sides of the bow fitting to allow the drum to be attached, and just enough clearance above the deck to allow the drum to tilt to the correct angle, but not enough clearance for the mast to be lowered with the spar *in situ*.



*Extra component for attaching drum to bow fitting*

- **The Spar/foil**



*2-part section*



*Front section of spar*



*Rear section of spar*

The luff spar/foil is actually a two-part aluminium 'aerofoil' section. The front part is just 16mm across at its widest point and is hollow in the centre to house the supplied forestay, which is enclosed in a plastic sleeve, thus isolating it from the spar (see photo, right), avoiding galvanic corrosion, and maintaining a tight fit, which also contributes to the overall stiffness of the spar.

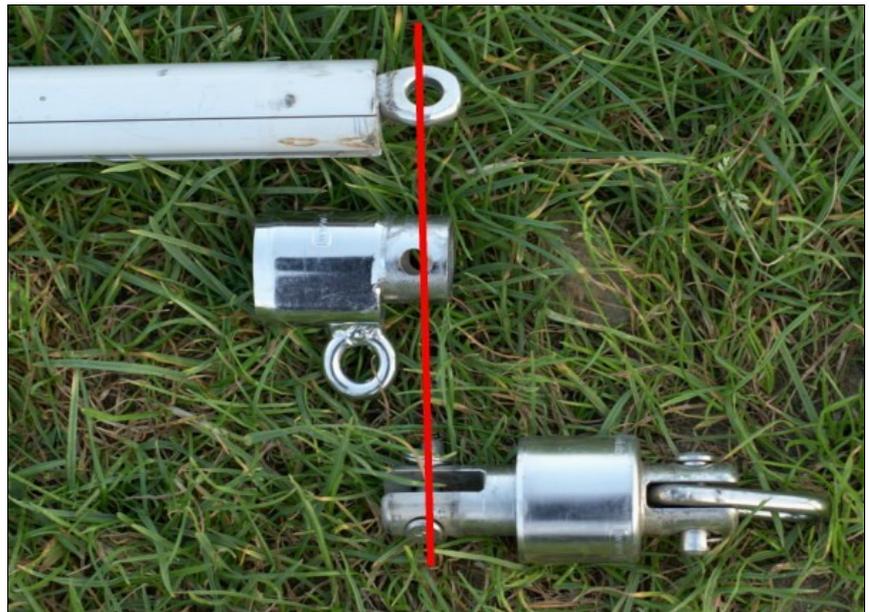


*Forestay in spar, showing plastic sleeve*

The rear part of the spar slides into the front part and has a concave slot at the back to hold the leading edge of the sail. When fully assembled the two sections of the spar together measure 23.5mm from front to back. The slim nature of the spar and its aerofoil section should help to minimise any loss of performance compared with a conventional sail.



At the lower end of the spar there is a cut-out (above, left) to allow the sail to be fed into the luff groove, and at each end a sort of cap fits over the end of the spar (above, right). The sail is attached at the head and the tack by a small ring welded to each of these end caps. This is illustrated in the photo below (left), which shows the top of the spar, the end cap (with black rope attaching the sail to the ring) and the top swivel. A robust clevis pin passes through the end cap, forestay terminal and top swivel. The photo below (right) shows all three components, separated for clarity, with the red line showing where the clevis pin fits.



The supplied length of the spar (over 4500mm) is more than adequate for a Wayfarer genoa, but there is still plenty of room between the genoa halyard mast sheave and the top of the spar (see photo, right). This is the gap that would be spanned by a safety wire, if fitted.



*Clearance between top of spar and mast*

Incidentally, the aluminium profile only comes in lengths up to 2m, so obviously the spar has to be supplied in several lengths. They are pre-cut to the exact total length required to match the supplied forestay, and cannot be shortened without replacing the forestay.

- **The Top Swivel**



Again this is a high quality component, with smooth running bearings (even without load in my experience) and a 'collapse load' equivalent to the drum, i.e. 20kN. The swivel fits between the top of the spar and the end of the genoa halyard, and has a generous-sized oval ring to which the halyard can be attached with a shackle etc. in the usual way. (The swivel allows the sail to be furled or unfurled without introducing twists into the halyard.)

A good quality swivel is important in any furling or reefing system, but some of the cheaper versions are not really up to the job and tend not to work properly under load. This one is engineered to work well under load, and does so.

As with the drum, the swivel supplied in this system could be used as part of a non-reefing furling system with a view to a subsequent upgrade.

- **The Forestay**



*Top of forestay, showing plastic sleeving (slid back for photo)*

Arguably one of the biggest advantages of this sort of system is the fact that the forestay is enclosed by the luff spar (as discussed previously). This removes a significant potential cause of frustration, namely the tendency for the foresail to become wrapped around the (separate) forestay when furling the sail. A number of well-publicised techniques have been developed down the years to minimise this risk, but surely none is more effective than completely enclosing the stay.

Seasoned cruisers will already have spotted the possible flaw in this argument, namely the absence of a separate forestay should anything unfortunate happen to the drum, the enclosed stay, swivel, shackle or halyard. However I should mention at this point that the wire used for the forestay is 4mm in diameter rather than the 3mm kind normally used as Wayfarer genoa luff wire, so the cross-sectional area is almost double that of the usual stay wire. This, and the high specification of the drum and swivel, significantly reduces the chance of failure, so it could be argued that there is no need for a separate stay.

The halyard, however, is more vulnerable, and not just to the possibility of breakage; there is also the potential for it to be released accidentally or absent-mindedly, so a 'safety wire' between (say) the forestay attachment point on the mast and the oval ring on the top swivel has been proposed as a sensible precaution. If the spinnaker halyard is not required while sailing this could take the place of the safety wire, and has the advantage that it can be adjusted or even released without taking the mast down. Better still a dedicated halyard would have the same advantages and would leave the spinnaker halyard free for the spinnaker, whilst afloat, and for hoisting a genoa UV cover when not afloat.

Some may feel that there is no need to worry about a backup of any sort; after all we rely on just one shroud on each side of the boat, with no backup. This is the sort of decision that has to be made individually by each owner, taking into account the sort of sailing undertaken and the possible consequences of gear failure.

[The remaining components are not supplied by Bartels, but for our purposes need to be considered as part of the same system:-]

- **The Sail**



*Genoa bolt rope and tape loop*

As mentioned, the genoa fits onto the spar by means of a concave groove in the back of the aluminium section. The sail needs to have a luff rope (bolt rope) of suitable diameter sewn into the leading edge rather than the usual luff wire. The groove has a maximum diameter of 5mm within the extrusion, which dictates the bolt rope diameter, (not forgetting to allow for the thickness of the sailcloth around it).

A good sailmaker will be able to convert an existing sail, although this may not furl as neatly as one designed for the purpose; this is because the standard sail is likely to be cut too 'full' to roll neatly around the spar, free from creases. A purpose-made sail can be cut flatter than usual, and can have the other modifications to the head and tack, such as the addition of tape loops (as shown) or cringles for sail attachment 'designed in' from the start.

I originally requested cringles for attaching the sail to the spar, but the sailmaker ([Mike McNamara](#)) was very reluctant to use this method, preferring to use tape loops (mainly because they are flexible, I think). Because I leave the sail on the spar virtually all the time, this works well. The lower tape loop is tied closely to the lower end cap ring, with strong 2-3mm line. The upper loop (at the head of the sail) is attached to the upper end cap ring, and pulled just tight enough to take the slack out of the sail's luff without introducing any vertical creases, before being tied off. If I wanted to adjust the luff tension regularly, it would be necessary to shorten the upper tie a little to leave room for this adjustment at the lower luff. (It is important to remember that luff tension and rig tension are entirely separate parameters.)

An alternative method (which I would guess would work better with cringles than tape loops) would be to fix the lower luff (tack) and use a halyard passing through the upper end cap ring to raise the sail and maintain/adjust the luff tension. This would have the advantage of ease of adjustment, and would make it possible to remove the sail independently of the spar, even afloat if necessary, making the sail potentially available as a trysail, as described [elsewhere](#). (This kind of genoa is particularly suitable as a trysail because of it already has a luff/bolt rope, which can be slid into the mast groove.)

Other factors to discuss with your sailmaker include:-

1. Compensating for the unusually high tack position caused by the furling drum.

2. A shaped lightweight foam insert sewn behind the bolt rope to help take up the fullness from the middle of the sail when it is partly or fully furled. I decided to try such an insert and duly specified this when getting a new genoa made, but it has not been a total success, having taken on a permanent curve across its width (from being furled away in the same direction for so much of the time). This disrupts the airflow just behind the luff, particularly on port tack, and makes the tell-tales appear to lift more or less constantly. (It would be simple enough to remove the foam – it's held in place by a sort of 'blister' or patch of extra sailcloth [see photo], which could be unpicked and removed.) This problem seems to relate to certain types of foam, as others have reported no curvature, even after several years.



*Top end of foam insert*

- **The Sail Cover**



If you are likely to leave the genoa and spar rigged on the boat for more than a few days it is important to protect the exposed parts of the sail from UV and wind damage. I suppose it would be possible to have a sacrificial strip fitted to the leach as is often the case with yachts, but this fairly quickly starts to become tatty, and is still visible when sailing the boat.

A separate cover can be hoisted into position using the spinnaker halyard (as mentioned previously), and will ideally be made from a breathable material similar to some types of boat cover. The sail cover doesn't need to be much more than a long tube with either a full-length zip or velcro to enable it to be fitted around the furled sail *in situ*. If using a zip remember to have the zip closing downwards! My cover also has three webbing straps around its girth, one at each end and one in the middle. There needs to be a means of attaching the halyard at the top and a tie-down at the bottom. A good sailmaker should be able to make such a sail cover for a very reasonable price. I recommend dark blue as it doesn't show the dirt!

*Sail cover in position*

## **Transporting and hoisting the spar**

When not fitted to the boat the spar is slightly vulnerable to damage. Although it is much stronger than it looks it could fairly easily be distorted if subjected to careless or accidental force. I carry mine strapped tightly under the mast when trailing the boat.

I prefer to leave the genoa on the spar to minimise the number of times the sail is slid in and out of the luff groove. The disadvantage of this is the slight curl which the sail (and foam strip, as discussed) acquires over time.

I use the sail cover to protect the sail when trailing; if nothing else it helps to keep the sail clean. The furling drum can remain on the bow fitting, and it's then an easy job to re-fit the spar once the mast has been raised. (If using a safety wire to the mast's forestay attachment ring this needs to be rigged before raising the mast.)



*Luff showing foam insert*

Unfortunately I have no personal experience of bridge-shooting with a reefing spar, so I don't feel able to comment on possible solutions to this problem, other than to reiterate that the furling drum on *Cockle* has insufficient clearance below it to allow the mast to be lowered with the drum *in situ*.

## **Cost of the system**

The Bartels reefing system is well made, with high quality components, and in the opinion of several well-known cruising Wayfarers has key advantages over its rivals, notably the robust stainless steel drum and top swivel, quality bearings and slender (but stiff) luff spar. All this comes at a price, and this is by no means one of the cheaper systems on the market. (The actual cost is approximately equivalent to that of a good new mainsail.) For anyone who has already invested in a conventional set of sails (genoa, jib, storm jib) it may be difficult to justify spending this much on a reefing system, although as mentioned it is possible to modify a conventional genoa. I would certainly recommend that anyone who already has a conventional set of foresails and is contemplating installing a furling-only system should at least consider selecting components that can form the basis of a full reefing system.

If starting from scratch the economics are slightly different, as the reefing system in effect takes the place of a jib and a storm jib (3 sails for the price of 1), and avoids the need for potentially tricky sail changes at sea into the bargain. The counter argument to this is that there is no spare sail in case of accident or damage to the genoa. Again each person must assess his/her own circumstances and make a judgement – all part of seamanship.

## **Conclusion**

The Bartels system is a good quality reefing system that has worked well for me over the past two seasons. It is simple, robust, and well-designed, and allows total flexibility when setting a suitable sail plan. Because I needed new sails the cost was easier to justify, and I firmly believe that a dependable system like this positively contributes to the safety of the boat. I strongly recommend it.

## **Thanks**

My particular thanks are due to Ton Jaspers for his considerable assistance with this article.