RS800 CAP SHROUDS – FOR DISCUSSION AT RS800 AGM 2020

Purchase

Rules say 4:1. This was introduced in the very early years and I can't find much record. It's been reported that the bottlescrew was flawed due to the time it took to apply and release tension as described in reference 2. The system supplied by RS is now 5:1 (figure 1). The 5:1 can be seen implemented not long after moving to 4:1 as evidenced by Figure 4 and 5 which were taken in 2003-2005. At least the rules should reflect the 5:1 purchase currently supplied (RS are happy to endorse 5:1 in the rules but not more).

The majority are racing with a 5:1. The committee proposed a rule change wording (no purchase limit) back in February. However, this was vetoed by RS over fears of caps being over tensioned (ref 3).

The 4:1 rule is in 'conditions when racing'. There is nothing stopping additional purchases being used to apply tension before racing so long as they are removed for the race. Most are using the mainsheet, downhaul and kicker to apply extra tension. The RS rigging guide suggests pulling backwards on the main halyard (Ref 2).

All these methods are by their nature less controllable than just using an appropriate purchase system on the mast. However, they make the caps a bit of a 'dark art' as it's not obvious how much caps to pull on, and it's hard to measure a 'base' number once the main is hoisted.

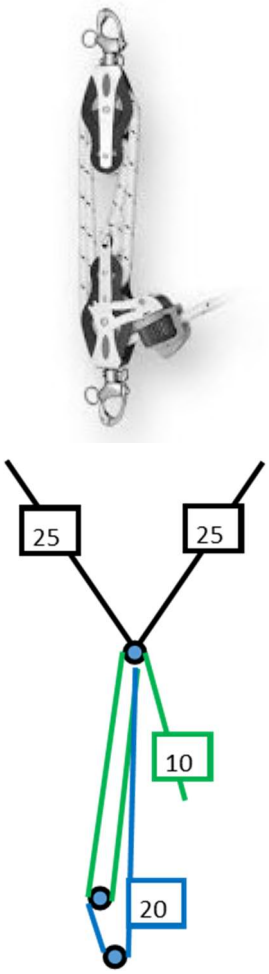

Figure 1 – original style 4:1 purchase (top image) and currently supplied 5:1 purchase (bottom image)

Chafe

The cap shrouds cleat chafes on the front of the mast and pulls the chafe plates off when it catches on the edge of the plate, which is too small for the amount of sideways movement. The edges of the plate also chafe the rope tackle. Selden have recently tried to improve this by doubling the size of the plate in both dimensions, but only a handful of masts have this larger plate. There is also chafe on the lacquered mast from the cap shrouds themselves which means the mast must be re-varnished more often. Lastly there is wear at the spreaders where the caps move back and forth each tack and gybe. This has required several steps of remedial action to address the chafe but not source of the chafe over the years (stainless chafe plate, brass roller inserts).

The lateral movement occurs due to the length of the 'tensioning system' between the fixed point on the mast and where the caps join at the eye. See figure 2.

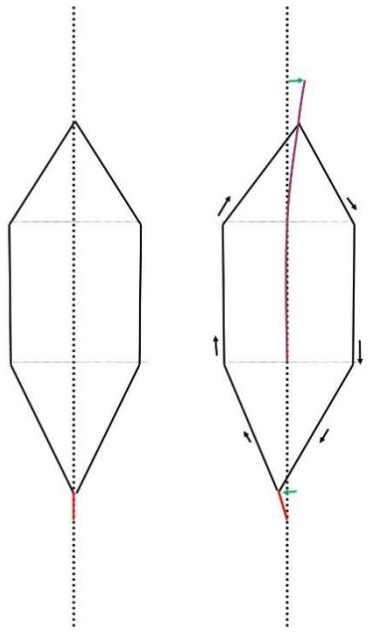

Figure 2 – reason why cleat moves sideways, chafing mast and lower spreader tips

The move from a 4:1 block and tackle, to a 5:1 cascade also required the cap shrouds to join further away from the mast fitting (to accommodate the greater range needed for the cascade purchase). This is corroborated by reports from class members at the time and can be seen in Figure 5 (initial 4:1) and Figure 6 (cascade 5:1). This increased the length of red section (figure 2) and increased movement from the bottlescrew or 4:1 simple tackle set ups. In 2007-2008 a cheek block was added to the mast, which further increased the distance between the caps eye and the fixed point on the mast (ref 1). It was also on the first iteration of the fixed spreader that chafe on the spreader terminals became an issue. This was an unintended consequence of the longer tensioning system. The spreaders had to be redesigned to include a brass sheave to accommodate the movement and increasingly large stainless chafe plates. Selden reference this cost as one of the reasons for the high spreader cost in the EGM.

To remove the chafe, you could reduce the length of the purchase system, or split the caps so each side is direct to the fixed point on the mast (figure 3).

Split caps

I trialled a split cap system from December 19 to August 20 (figure 4). I was hoping to show this at class events to get a feeling on the change. There were no events!

Pros:

- Completely removes chafe on mast front (figure 3).
- Drastically reduces chafe at spreaders.
- Much easier to apply tension physically.
- Completely retrofittable.
- Cheap (one cleat and one block, plus cost of splitting old caps, total around £50).

Cons:

- You need to measure both caps to ensure equal tension. (do this first time, then mark rope)
- Unless purchase is reduced to 2:1 each side, the total advantage over the pair of shrouds is greater than 5:1 as you can pull on each side individually.
- Performance gain (or perception of?) due to reduced sideways movement of topmast.

Longer caps

I put longer caps on not long before the nationals, so I have less experience with these. They are a bit of a half-way house. There is still movement, but you can't make them much longer as you run out of range with a cascade purchase (reason they were made shorter back in 2000's). My caps now join at the bottom of the chafe plate shown in figure 4 (about 5-10 cm different).

Pros

- Reduces chafe on mast
- Reduces chafe on spreaders
- Single tensioning system
- Cheap and easy to retrofit, just need longer caps made

Cons

- Doesn't eliminate movement entirely.
- Limit to space for cascade range
- Performance gain (or perception of?) although less than for split caps.

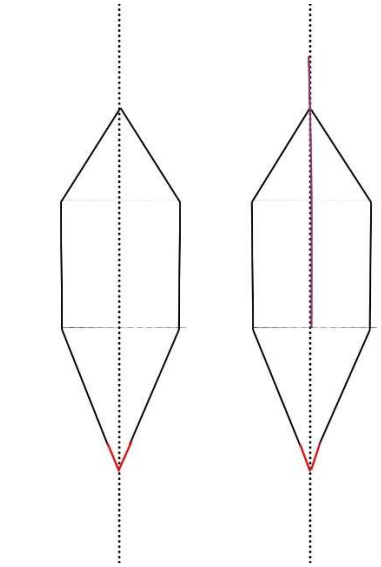

Figure 3: split caps, no movement

Figure 4: split caps purchase system

Figure 5: 27.7% of lowers height from jib track (old caps were longer)

Figure 6: 43.5% of lowers height from jib track (newer caps shorter)

Are they legal? Should they be legal?

Equipment must be replaced from the LIC / licensed manufacturer unless authorised elsewhere (C.6.1).

Repairs must retain essential shape, characteristic and function of the original (C.6.2).

Modifications, replacements, and alterations where equipment may be from another supplier is limited by the restrictions in their specific rules. Inferring requirement to match original equipment exactly poses many practical issues in our class rules where they only state the limitations and there is no way of knowing the other dimensions.

Cap shrouds are specifically allowed to be replaced from any supplier with the only restriction for replacement / modification of cap shroud that the wire is 2.5mm 1x19 (C.9.1 4). Length is not restricted, however making them longer does arguably change the shape of the diamonds, hence there is need for interpretation of the rules.

Historically there have been changes in supplied cap shroud length which have not required changes to the class rules (see figure 5 and figure 6). There is still a great deal of variance of cap shroud length in the class.

Potentially, split cap shrouds could be legal as well, as again, they still use 2.5mm 1x19 wire. My interpretation is that they don't comply C.9.2 5 which says the caps shrouds (plural) may be tensioned by 'a' (singular) rope purchase. RS agree.

The class must ask if variance in cap shroud length is allowed, do we want to change the rules to limit it? What are the implications of limiting it on the range of lengths seen on existing boats?

Less chafe is a positive of longer cap shrouds. However, there could be small performance gain from less movement at the top of the rig. However, this might not be the case as having the rig deflect off may be preferable. The class have had different length cap shrouds in the past and there has not been any significant performance change reported.

There could be a perceived performance split in the fleet. Whether real or not, this may erode confidence in one design. However, the cost is low, and I don't believe it is out of the budget of any team and will typically cost less than a new set of kite sheets and a lot less than clear coating the mast or replacing chafe plates a few of times.

Options for the class:

1) Specifically limit changes in length and ban splitting of caps in rule C.9 by inserting a restriction on these dimensions.
2) Leave rules as they are and publish an interpretation to clarify that people can make changes to lengthen caps if they wish, i.e. it is not considered a change of shape or characteristic. RS prefer this option.
3) Specifically allow split caps as an alteration / modification.

Ref 1: https://www.rs800.org/documents/p1aiiie4quef21javiae1do52qc3.pdf

Ref 2: https://www.rssailing.com/wp-content/uploads/guides/RS800_Rigging_Guide.pdf

Ref 3: https://www.rs800.org/documents/p1e4o2jn701g5p7cas3ud8g1npb3.pdf