SUPERNOVA CLASS ASSOCIATION

Raked Rudder Blade Position

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For a while now many of us have been changing the position of the rudder blade so that the leading edge of the rudder is slightly raked forwards.

Why do we rake the rudder blade forwards?

Well, if you have ever sailed with your rudder not fully down you will know how the rudder pulls when you are sailing, this is because the centre of effort on the rudder blade is further away from the pivot point, the rudder pintles. So, the lever is longer and so you must pull harder on the rudder to overcome the increased force. By putting the rudder fully down or in our case more than fully down by raking it slightly forwards to reduce the force it takes to hold it when steering a relatively straight course. It does not improve performance, but it makes the steering feel lighter and allows you to have more feel.

A bit more detail on why…

As we have progressed towards a more raked mast setup this has moved the sails centre of effort further aft relative to the centreboard, this makes the boat want to head/turn up into the wind more (this is greatly exaggerated if you let the boat heel and don't sail it flat), which increase the pull on the rudder required to sail a straight course, this is what we call "weather helm". Basically, it's the pulling load that you feel whilst holding the tiller extension to keep the boat from turning up into the wind which is normally felt when beating. So as the rig is raked back the sails centre of effort moves back, the boat wants to naturally turn up into the wind more and the pull on the rudder "weather helm" increases.

So, to reduce the pulling force you can rake the rudder blade forwards a little to get a more neutral feel. This does not remove the weather helm but positions the rudder, so you don't feel it as much which improves your overall feel of the boat when you don't have to pull hard on the rudder.

Within normal mast rake positions (6100mm to 6000mm, mast tip to top rudder fitting measurement) this set up works well. Its also why you don't generally rake the mast back much further, if you do you increase the weather helm even more which then starts to lose the gains as you have to use more rudder to keep a straight line upwind which results in more drag which slows the boat, this is the main reason why we end up sailing with a mast rake of approx. 6100mm to 6000mm, with this range of rake you are able to point high without excessive weather helm.

Ok, enough of the technical chit chat, how do I set up the rudder?

Alright, so that's the long explanation as to why we do it and a little information about what causes weather helm. The following pages show you how to set up the rake and the length of the rudder blade so that you are still able to comply with the class rules (As per V7 of the rules).

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Setting the rake of the Rudder blade:
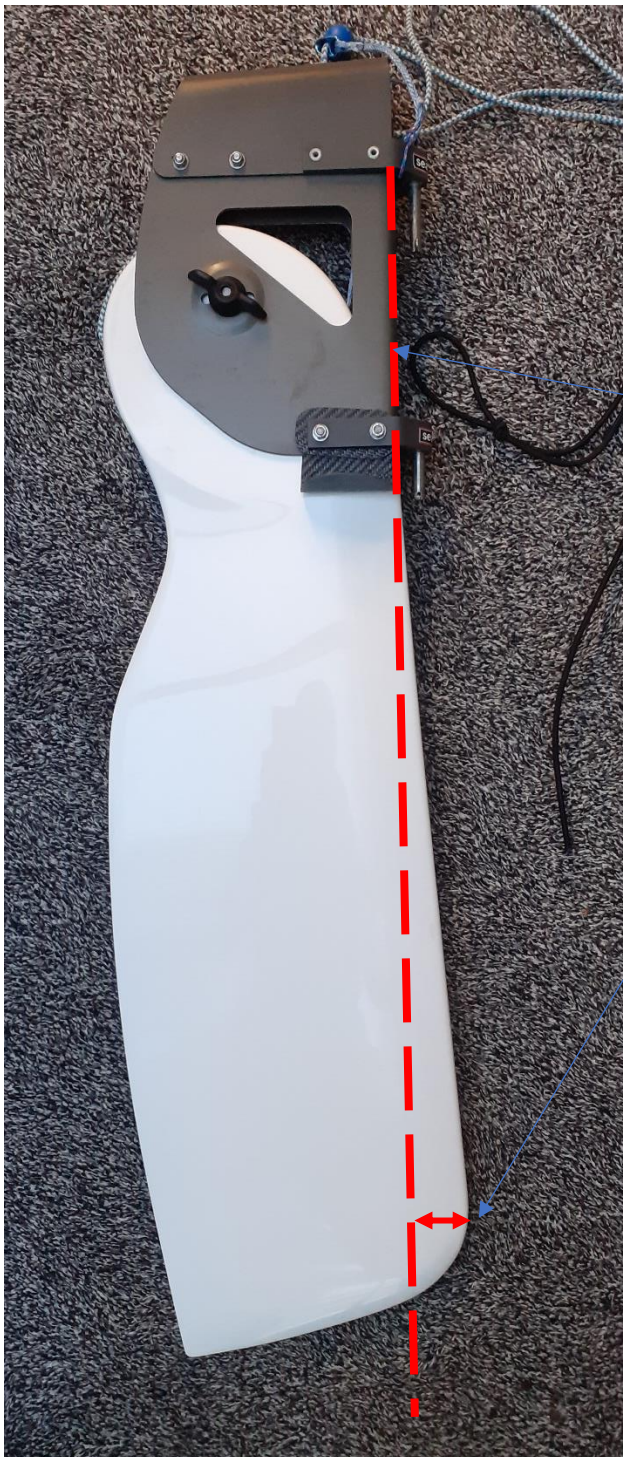
Taking a straight line down the front of the rudder stock and project it down the rudder blade.

Position the rudder blade so the leading edge is approximately 15 to 20mm in front of the projected line.

When installed on the boat the rudder leading edge will be raked such that it starts to tuck under the transom of the boat, but don't worry it will not foul on the hull.

Setting the length of the rudder blade:

The rudder length is set in combination with the raked position, you must get both set correctly before marking the drill position for the rudder pivot bolt. This should ensure that the final hole position complies with the class rules which states that "the centre of the pivot hole is not less than 50mm from any of the outer edges of the rudder mould (Ref V7 20th Sept 2019), whilst get pretty much the maximum rudder blade length, do check before you drill though that your marked hole position complies with the 500mm from edge class ruling.
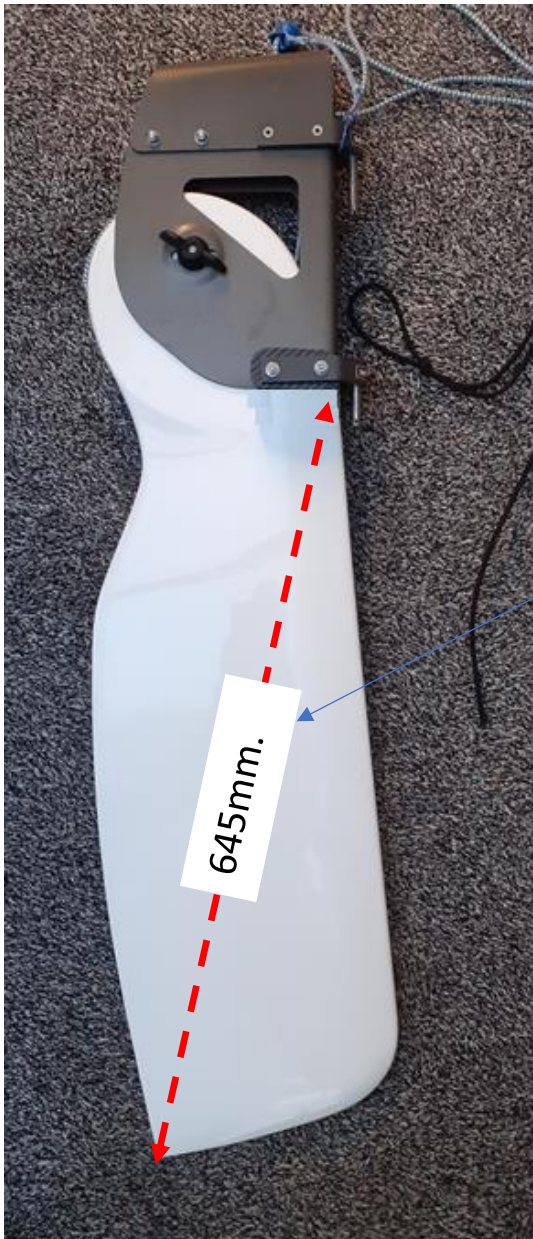
645mm.

To set the rudder blade length, the distance from the bottom front edge of the stock to the tip of the rudder trailing edge should be approx. 645mm.