Setting Up Mast Rake On A Dart16

What is mast rake? A mast is said to be raked forward or back from the perpendicular. Therefore if you have your mast set such that it inclines backwards then your mast is raked back. Obviously if the mast is forward of the perpendicular it is deemed to be raked forward. Does that make sense? I do hope so! So why is mast rake important. Simply put, it controls the sail shape whilst critically setting where the centre of effort is. This alongside other controls sets the boat up to sail to its optimum. I would suggest you read some sailing books and perhaps search the Internet for articles on the subject to gain an in depth knowledge. This article is to help you set the mast rake on the Dart 16. Questions on how much rake, whether to rake the mast forward or back hopefully will be answered by searching the internet or reading one of the hundreds of books on sailing. Once you begin to understand what raking the mast does you will need to know how to go about it on your Dart 16.

The three controls that you will be using are the shrouds (the two thicker wires, one each side of the boat that stop the mast from falling sideways. The other is the forestay which is a thinner wire and stops the mast from falling forward or backwards. Finally, you will be using the trapeze wires to help measure the amount of rake.

Before we start on the process, many sailors discuss their mast rake in terms of the number of holes up or down the Shroud Adusters (see Figure 4) the shrouds are attached to. i.e Bill's shrouds are attached 3 holes down and mine are 4 holes down. This is the wrong way in deciding mast rake setting. One cannot work out the rake in this manner because shrouds are likely to be of varying lengths. Hard to believe but a fact. The only way is to undertake the following method which eventually will give a mark on the hull which you can then compare with others. ie. This time instead of saying 2 holes up you would say 5 inches from the bridle chainplate.

To start, pick a day when the wind is very light and try and ensure the boat is level. The only tools you will require in this exercise is a piece of string no more than half a metre in length, a permanent marker pen, tape measure and pen and paper. You ought to ideally have another person around to help when it comes to changing things. Ensure the mast is centred – go to the back of the boat and check that the mast groove that the mainsail goes up and down in is pointing directly at the mid point on the rear beam (see Figure 1). You would not be able to achieve this if the wind was strong because the mast would be continually rotating in the wind. Now take hold of the starboard trapeze ring and ensure it is not snagged by looking up towards where it is secured to the mast. Remove the shockcord that is attached to the trapeze ring and tie that piece of spare rope to it. Make sure that the knot does not slip under tension. Walk back towards the rear beam making sure all the while that the trapeze wire is not snagged and that the mast has not rotated away from the centre of the rear beam.

Figure:1

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Figure: 2

Now pull on the string and get it to touch the starboard top rudder pintle bracket (see Figure 2). It is important that you ensure the string touches the furtherest part of the fitting. Hold the rope with your fingers at this point. i.e your fingers now mark the point of the rope that touches the fitting. Walk to the front starboard hull whilst holding the rope and the point it touched the fitting and ensure the mast has not rotated off centre and the trapeze wire is not snagged. Bring the rope down onto the top of the hull and place a mark where the rope that you are holding touches the hull using the permanent marker pen. Using the tape measure write down the distance from the bridle chainplate on the hull to the mark (Figure 3). Now do the whole thing again for the port side. Once complete you have a record of your existing set up which is useful if you need to revert back to how things were. Are both marks in roughly the same place? If not, either the shrouds are of unequal length or you've fitted the shroud to a different hole in the shroud adjuster (Figure 4) to the other side! The result would be that you would have been sailing better on one tack to the other. This is exactly what I found on my boat. The port shroud was longer than the starboard one!

Figure: 3

Should you find that the shrouds are uneven then you need to resolve this before you decide whether to change the mast rake. Decide whether you will need to move the shroud further down or up on the shroud adjuster and then with the other person's help, loosen the forestay rope sufficiently to allow the shrouds to go fairly loose, the other person now takes hold of the trapeze handle and uses their weight to take the place of the shroud that is to be altered. Take out the metal ring that holds the pin (clevis pin) which goes through the shroud adjuster and the shroud eye. Move the shroud up or down on the shroud adjuster and secure it again with the clevis pin and its ring. Now repeat checking the rake all over again until you are satisfied that both hulls now have their marks roughly equal. Once this is confirmed you can decide whether you wish to alter the rake. I would suggest that if you had found that the rake was different and you've ensured both sides are about equal then do not make any further changes but get on the water and see how the boat performs. After several sails and perhaps comparing against other Dart 16s you will be in a position to know whether you wish to experiment having different mast rake setting.

Figure: 4

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To rake the mast forward simply move the shrouds up a hole or two or down if you wish to rake backwards. Now pull on the forestay rope and tie off ensuring that the mast can freely rotate 90% left and right. Never tighten the forestay to the point where the mast does not freely rotate. Neither should you have it so loose that the mast wobbles from side to side too much because in choppy conditions the mast could pop off its ball support and fall down! Take a measurement again, not forgetting to record it and see whether each trapeze wire lines up about the same distance. Again, go out have several sails in different wind and wave conditions.

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