

In A Cruising Catamaran

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Six Things To Look For

Early catamaran designs were heavy by today's standards. The multihulls were designed with a narrow beam, high freeboard, and inefficient underwater design. They were prone to hobby-horsing and pitching. Today, with the technological advancements of lighter, stronger composite materials, catamarans' performance have greatly improved.



Above: The 2005 38-ft. Lagoon is much bigger in volume and has a much higher bridge deck clearance than the 1992 Prout 39.

In the last 20 years or so, boat builders have painstakingly studied and resolved the issues affecting catamarans, effectively increasing their seaworthiness by leaps and bounds. Constant reform and transformation of even the basic tenets of catamaran design continue today as is evident in the radical catamaran designs in the 2013 America's Cup Challenge. Multihulls like foiling Gunboat G4 and Neel Trimaran designs spring to mind. In fact, many of the problems of the older multihull designs have been eliminated altogether.



The new generation of cruising catamarans offer exciting sailing vessels with great livability, space, comfort, and safety. This was made possible, in no small part, by the

early multihull pioneers like Woody Brown and James Wharram. Thanks to these trailblazing pioneers and advances in modern technology, catamarans and yes, even trimarans, are available to the cruising sailor at a reasonable cost today.

Catamaran Weight & Carrying Ability

Unlike the monohull design that can carry weight without much loss of performance, an overloaded catamaran rapidly loses performance and, eventually, safety. In order to counter this, multihull manufacturers are continually looking for ways to reduce construction weight to increase the potential payload capacity while retaining optimal performance.

Below: Constructing a resin infusion catamaran makes it about 20% lighter and stronger.



To select a light catamaran, look for hulls with cored construction and interiors built with lightweight materials. Unlike monohulls that rely on a heavy lead keel to keep them upright, a catamaran relies on the beam of the boat and the buoyancy of the hulls. Lighter construction makes catamarans able to carry more weight and perform faster, so this characteristic is very important when selecting a cruiser.

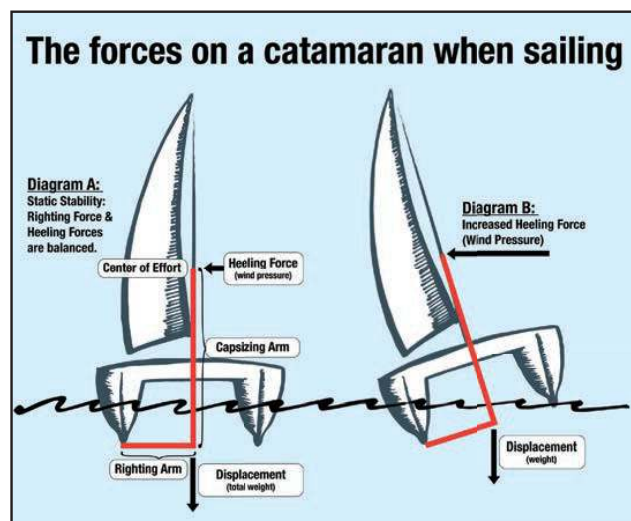
Structural Integrity and Seaworthiness

Monohulls can heel and spill wind when the sails are overpowered. But a catamaran's only available response to pressure of a wind gust is to accelerate. So the boat has to be very strong to hold together. Cored construction makes the catamaran strong and very stiff. Stiffness gives a catamaran good performance.



Consider that the catamaran's hulls are actually two boats joined together by a bridge deck. These "boats" are constantly fighting each other and trying to go in their own direction. The boat structure must be strong enough to counter this and, at the same time, deal with the down force of the mast in the center of the bridge deck. The catamaran performs an amazing feat contending with all the opposing forces inherent in the multihull design. For that reason, it is critical to ensure the design and manufacturer are reputable with a track record to demonstrate structural integrity.

Image on right: For a catamaran to be stable, the righting moment has to be bigger than the capsizing moment (Diagram A). If the capsizing moment becomes bigger (increase in wind) than the righting moment, the vessel will capsize (Diagram B). So, to balance the catamaran, the weight x righting arm has to be equal to wind pressure x capsizing arm. Inspiration: James Wharram, king of "self-build" catamarans.



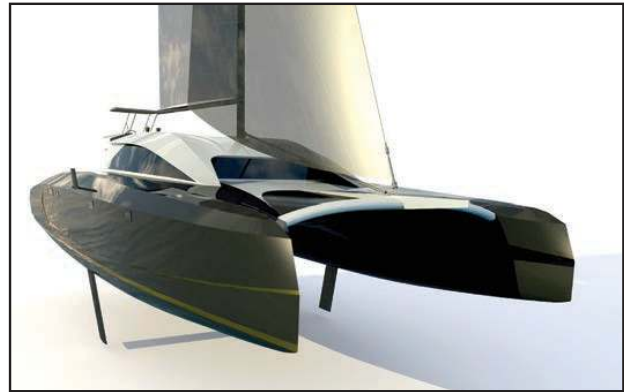
Catamaran Bridge Deck Clearance



Above: A higher clearance produces less slamming. My rule of thumb is: 4% of the overall length is low, 5% is acceptable, and 6% is good.

ALL catamarans slam (waves hitting under the bridge deck). The noisy and sometimes disconcerting slamming takes getting used to. The first catamaran I ever sailed an ocean passage on was a Shuttleworth 44. In the early '90s and even today, it is considered to be a good design. However, after a few hours of sailing in some sloppy seas off the eastern coast of Africa, the slamming noise had me convinced that the boat was going to break up and sink. Now that I have a full understanding of the nature of a catamaran, it turns out that there was no need to worry. I have come to accept that slamming is just part of sailing a catamaran. It is the degree of slamming that makes the difference between a comfortable ride and a terrifying experience.

Bridge deck clearance is a key factor in predicting the slamming level of a catamaran design. A higher clearance produces less slamming. My rule of thumb is: 4% of the



overall length is low, 5% is acceptable, and 6% is good. When it comes to slamming, another important factor is weight. If the boat is heavy due to construction or payload, it will tend to go into a wave. This slams the chest of the boat into the wave. A lighter boat with more buoyancy will rise on the wave reducing slamming substantially.

As you can see in the photo to the upper left, catamarans with dagger boards are able to point much better to the wind than catamarans with keels.

Windward Ability: Catamaran Keel vs. Daggerboard

The average cruising catamaran has keels while high performance cruising catamarans have dagger boards. Let's look at the two schools of thought on this subject. The general perception that catamarans cannot point as high into the wind as monohulls is not entirely true. I have seen modern catamarans pointing as high as most cruising monohulls, especially in stronger winds. The issue is not how high the boat points, but rather how much leeway it makes. A monohull with a large keel (lateral resistance) makes less leeway than a catamaran with shallow keels. So, even if both vessels are pointing at 45 degrees to the wind, the monohull will be making a better track to windward.

Catamarans with dagger boards are able to point much better than catamarans with keels. The claim is that a catamaran with dagger boards is safer because if the boards are up and the boat gets sideways on a wave, it will skid down the wave sideways. Dagger board proponents believe a keel trips the boat as it tries to navigate down the side of a wave causing capsize. I can only speak from personal experience. I was caught sideways on a 20-foot wave a few days out of Cape Town on a 40-foot catamaran with keels. The boat was hit successively by three waves before we could get it back on track. The boat skidded





down the waves and there was no capsize, but it took some nifty maneuvering at the helm. My personal belief is that both types are safe and acceptable provided they are operated correctly.

Catamaran Deck Surfaces

From a safety perspective, decks should be as wide and as flat as possible.

Cockpit to Mast

Older designs often have decks with two levels from the coach roof windows to the gunnels, which form a side deck with a trip hazard. Most modern catamaran deck designs are now one flat surface being wide enough to walk unhindered from the cockpit to the mast.

Saloon

The cockpit and the saloon should be on one level with no step down into the saloon, if possible. Modern designs have achieved this and it really makes a big difference for ease of movement and safety while at sea.

Stern

The steps on the stern should be wide and easy to climb with a reasonable angle. If the steps are too steep or narrow, they become a hazard and lose space for recreation. The stern should be easily accessible from the dinghy.

Ease of Handling: Catamaran Deck Layout

Deck layout is an important factor because most cruising catamarans are sailed short-handed. On catamarans with one helm, all lines should run back to the helm so there is a static position from where the entire

boat can be controlled. I recommend electric winches and single line reefing for at least the first reef, but also the second reef, if possible. All of these lines should come back to the static control station at the helm:



- Both jib sheets
- The sheet from the opposite side of the boat should be run through a turn block and across the coach roof through a clutch to the helm
- Main sheet
- Jib furling line
- Single line reefing lines
- Main halyard
- Outhaul
- Traveler control lines

Six Things To Look For



Visibility from the helm is also very important. All around visibility while underway, maneuvering, and docking is key to safety of your boat and others' property and life. When standing at the helm, you should be able to see both bows or, at the very least, the pulpits. The

center of the crossbeam from where the anchor is handled should be visible as well as both sterns for the times when you dock "stern to." If all these stations are not visible while standing at the helm where the engine controls are, you may encounter problems because of blind spots.

