

Downwind Downer: Shackle on Spinnaker Block Bites the Dust

Apart from electrical components, stainless-steel failure is one of the most often reported problems we hear from readers. Often, this failure is due to poor installation or maintenance, but the material itself has some inherent problems. Even the highest-grade stainless steel has a finite working life in the marine environment, and when it goes, it can go suddenly and catastrophically. *PS* did an extensive study of the troubles with stainless steel in our February 2007 issue. A recent example of the fallibility of this material came from reader Sam Showalter, who sails a Corsair F-31 in Texas.

After approximately eight years in service, the Nicro snapshackle on a Ronstan Series 50 Orbit block sheared at the swivel pin. (See photos below right.) Showalter fixes the block to the aft quarter of his Corsair, using it as a turning block for the spinnaker sheet. According to Showalter, the swivel pin failed under a modest load, at 2 a.m. (of course) during the 2007 Harvest Moon Race. Prior to failure, the block had not seen a great deal of saltwater action, and it was always stored out of the weather when not in use.

The Ronstan block has a 500-kilogram working load and a 1,500-kilogram breaking strength (www.ronstan.com). The spinnaker measures 1,064 square feet, but the boat is light (3,500-4,000 pounds). In our view, Corsair should specify a beefier block for this duty.

Showalter said that this was the second such failure on his boat, and he worries that poor design is at fault. "The pin that keeps the parts from unscrewing takes away about 30 percent of the area, and also causes stress concentration and a place for corrosion to begin," he wrote in an e-mail to *PS*. "The pin is so close to the edge of the shackle that there are only about two threads engaged before the pin hole.

"This is a commonly used design, and I am certain that these are not the only ones like this that have failed. I would think that the weak link in a system like this should be the compressive strength of the balls, or the sheave, but certainly not the shackle itself," he concluded.

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A combination of time, corrosion, and off-axis, cyclical loading likely contributed to this Nicro shackle's failure. The side and top views of the failure point show where the shackle simply sheared.



Corsairs in the 30-foot range, like this Corsair 31RS and reader Sam Showalter's F-31, are better suited using blocks in the 55- to 70-millimeter range as leads for spinnaker sheets, according to block-maker Ronstan.



Ronstan 50 with Lewmar replacement shackle

After the incident, Showalter purchased several Lewmar shackles to replace the Nicro shackles on his blocks. (See photo at page center.) He expects that the swivel pin on the Lewmar will not fail before the block.

According to Ronstan's Scot West, the failure likely can be attributed to a combination of the following: nearly 10 years use in the marine environment, potential overloading, and bending/off-axis loading, which is a result of the block's inability to articulate in two directions and increases fatigue.

Ronstan suggests using a larger block and a soft attachment instead, generally a length of 6-millimeter Dyneema (www.dsm.com), to lash an appropriately sized block. For a review of several options, see "High Tech Rope Shackles," *PS* Jan. 15, 2003 (online at www.practical-sailor.com/marine/chafe-protection-for-marine-rope.html).

Not only does the Dyneema bend to better align with the spinnaker sheet loads, but it also won't corrode. However, it does chafe and deteriorate from UV exposure. These soft attachments require frequent inspection for wear, making them more practical for racing boats than most cruising boats. West also recommended using a beefier block such as Ronstan's 55-millimeter or 70-millimeter Orbit blocks.



Photos courtesy of Sam Showalter and Corsair