

JIB TACK UNDERDECK SUPPORT DESIGN

Bob DeRoeck

May 7, 2005

This upgrade applies to Chrysler Mutts and Bucs built before 1979 which have been converted to a wire-luff jib system and Chrysler post-1979 and TMI Mutts and Bucs which were manufactured with wire-luff jib systems.

The objective of this upgrade is to properly support the load on the jib tack that is applied by the entire rig, which can exceed 500 lbs instantaneous load. I'll also provide information for cutting a hole in the deck for current or future installation of a spinnaker snout and for a simple hatch cover for this hole to use until the snout is installed.

Photographs for this work are at the end of this document.

Underdeck Support Requirements

The rig puts a large load on the base of the forestay at the jib furling drum and this force must be transferred to the hull and not applied to the deck. Otherwise, there is a risk that the deck/hull joint at the gunwale will fail. The original Chrysler design had the forestay penetrate the foredeck and go to a pulley that was attached to the hull at the back end of the cutwater. From this pulley the forestay continued back to a Hyfield lever located under the deck close to the mast base. The concept behind this design was fine. In reality there were two problems. The first was that the attachment of the pulley to the hull was weak and has failed in numerous boats. The second is that the forestay between the deck and the cutwater pulley interfered with installation of a large spinnaker snout. When a snout was retrofitted the jib was usually converted to a wire-luff jib with a brand-name furling system and a new jib tensioning system (usually a Magic Box located on the mast). This retrofit created the problem of how to properly support the load from the jib tack since the deck was not strong enough to take this load.

A similar problem occurred with the design of the 1979 and later Chrysler boats and TMI boats which were all produced with enclosed cuddys, wire-luff jibs, and brand-name furling systems as original equipment. These boats as originally designed and constructed did not have adequate support of the foredeck at the jib tack.

The purpose of this project is to provide adequate underforedeck support for the jib tack for pre-1979 boats that have been or are being retrofitted with wire-luff jib and brand-name furling system and 1979 and later Chrysler boats and TMI boats which had inadequate foredeck support in their original design.

Access

Owners of pre-1979 boats have access to the underforedeck area via the open cuddy cut in the main bulkhead at the mast location. However, the upgrade project detailed in these

instructions requires fiberglass work under the deck. I strongly recommend not doing fiberglass work in an enclosed space (such as under the foredeck) unless you have breathing apparatus. Since most owners do not have access to BA, I recommend that all owners cut a hole in the foredeck between the bow and the jib tack to allow you to do the fiberglass work from outside the hull. I also recommend you cut this hole of size and shape to allow the future installation of a spinnaker snout. The pattern for this hole is shown on the last page of these instructions. The “cut” line is the red line in the pattern. Later, I’ll explain how to make a simple hatch cover for this hole, if you decide not to install a spinnaker snout at this time.

Instructions

1. Cut the hole in the foredeck for the spinnaker snout, if one does not already exist. Use the pattern shown on the last page of these instructions. Locate the aft end of the hole 2” in front of the location of the old forestay deck penetration point or the center of the fitting for the jib furler drum. Make the hole using a jig saw. Wear a good quality dust mask when cutting fiberglass.

2. The old Chrysler boats had a thin, but solid, fiberglass foredeck. For these boats no further work is required to the hole aside from rounding over and sanding smooth the edges.

The post 1979 boats had a sandwich fiberglass deck with a corrugated cardboard core. On these boats the “end-grain” of the cardboard needs to be sealed. Otherwise, water will eventually find its way into the core and cause it to rot. If the cardboard core extends under the jib tack, cut the core out in a 3” x 3” square directly beneath the jib tack. Cut a piece of pressure-treated wood to fit this 3 x 3 section. Use epoxy resin with colloidal silica filler to cover all the cardboard endgrain in this area, then while this resin mix is still “wet”, epoxy the PT block into place. Next, cut the cardboard back about ¼-3/8” all around the rest of the snout hole. Fill this cut-back area with epoxy resin with colloidal silica filler. This should provide a solid, water-proof seal for all the cardboard core endgrain around the snout hole.

3. Cut a support bulkhead out of ½” thick exterior grade plywood. There is no need to use very expensive marine plywood. You will get an idea of the shape of this bulkhead from the photo. But, you will have to develop the pattern to fit your boat. I suggest making a pattern out of cardboard first, before cutting the plywood. The fit does not have to be perfect, since the fiberglass will bond the plywood to the hull and deck. Gaps up to 1/8” should present no problem. Note, the large hole in the bottom of the bulkhead serves two functions. First, it will accommodate the back end of a spinnaker snout. Second it provides access for you to fiberglass the rear of the bulkhead from outside the boat, working with your arms through the snout hole in the foredeck.

4. Insert the bulkhead through the snout hole. Wedge it into place. Next, fiberglass it into place using polyester resin and fiberglass tape and mat. I recommend using two

layers, the first of mat and the second of fiberglass tape. Cut strips of mat about 2" wide. The mat layer should extend about 1" beyond the joint to the deck and hull and 1" beyond the joint to the plywood all around the hull and the underside of the deck. Use 3" wide fiberglass tape for the second layer so that it extends 1.5" on either side of the joint. Do the front side of the bulkhead first. Apply the mat layer and then the fiberglass tape layer while the mat layer is still wet. After the resin sets, remove the wedges. Then apply the two layers to the rear side of the bulkhead working through the bulkhead hole. This is not easy, but it is doable. Protect your arms by wrapping each arm with a trash bag liner held in place with masking tape and wear disposable vinyl gloves. Since working on the back side of the bulkhead is difficult, you may want to do this in 3 sections, port side, then starboard side, then the top side where the bulkhead meets the deck.

5. After the bulkhead glass work is done, you need to provide a means to transfer the load from the jib furler directly to the bulkhead. Otherwise all of the force will be localized on the fiberglass tape just below the jib tack and this is likely to cause this tape to fail. There are number of ways to transfer this load. The simple one I recommend is to cut two pieces of PT wood each 1.5" x 1.5" x 3". Use epoxy resin with colloidal silica filler to glue one piece at the deck/bulkhead joint in front of the bulkhead and one piece behind the bulkhead. After the epoxy sets, install two 1/4" diameter SS bolt and nuts through both PT pieces and the bulkhead. Locate each bolt 3/4" in from each end of the PT pieces. This will allow you to bolt the deck fitting for the furling drum in the center of the PT pieces with two SS 1/4" diameter bolts, one in front of the bulkhead and one behind the bulkhead. Note, before you do any fiberglassing, check to see if you can drill the horizontal 1/4"holes for the bolts through the PT wood pieces and the bulkhead from in front with the drill held down within the snout hole. If there is not enough space to do this, then drill the holes in the PT wood pieces and the bulkhead prior to installing the bulkhead.

6. Install the furling drum deck fitting and you're done with the deck reinforcement.

7. If you are installing a spinnaker snout, install it now. You have two choices of how to attach it to the deck. The first is to use SS self-tapping screws. There is relatively little force on the snout so short screws going through just the top sandwich of fiberglass in a sandwich-construction deck are adequate. However, water is likely to get into these holes and rot the core. So, apply a good quality caulk to the holes before installing the screws. Do not use 3M 5200 or you may not be able to remove the snout in the future without destroying it. A better option if you have a sandwich-construction deck is to permanently seal the drill holes for the fasteners. Drill the fastener holes with a 3/8" diameter bit. Put a piece of masking tape over the holes under the deck. Then, fill the holes with the epoxy resin mixed with colloidal silica filler. After the epoxy sets, drill smaller holes for #10 machine screws through the center of the 3/8" epoxy plugs you've made in the deck. This design will prevent water from entering the core where the fasteners are located. Next, coat the machine screws with oil. Install the machine screws using regular SS nuts (not Nylok nuts) and with no washers and without the snout in place. Make sure the oil is only on the screws, not on the nuts. Use epoxy resin and

colloidal silica filler to cover the nuts and screw threads for a total of about $\frac{3}{4}$ " diameter and about $\frac{1}{4}$ " thick. Wait until the epoxy partially sets to the point that the epoxy will no longer take a dent when you press a screwdriver tip into it. Then, loosen the machine screws and remove them. Each screw will "crack" free with a loud crack. If the nut also cracks free, you will have to redo that nut. This system provides "captive" nuts which makes removing and reinstalling the spinnaker snout or hatch cover simple and quick. One of the photos shows these captive nuts. Once the epoxy has completely set, you can install the snout.

I recommend installing it without any caulking to make removal and installation easier. The fiberglass flange of the snout is relatively flexible so that you will get a pretty good seal of the flange to the deck without any caulk. However, if you can see gaps between the flange of the snout and the deck, then install a low strength caulk such as silicon caulk (it doesn't need to be "marine" grade) or 3M 101 sealant.

8. If you are not installing a spinnaker snout, make a simple hatch cover out of formica. The formica is relatively strong, yet sufficiently flexible to provide a fairly watertight seal without using any caulking. One of the photo shows my formica hatch cover. Provide a $\frac{3}{4}$ " overlap of the formica to the snout hole on all sides.

9. Stand back, open a cool one and admire your work.



Plywood bulkhead



Captive nuts



Snout hole



Snout hole



Cover

CUTOUT PATTERN FOR HOLE IN FOREDECK FOR SPINNAKER SNOOT
(DRAWING NOT TOO SCALE)

