

Installing Air Conditioning on C320, #64

Introduction

We are two C320s: 1994 #64 (mine) and 1999 #___ belonging to Bruce and Norma Stumpp. We undertook to simultaneously install air conditioning, conferred frequently, learned from each other, took a lot of time making decisions, and had a successful install that met our objectives. Some of our decisions are different because of the difference in boat age and changes by Catalina. Here, I present the installation on #64.

Major Objectives

1. Minimize the need for ducting.
2. Minimize the loss of space in the port cockpit locker
3. Minimize loss of space in the galley breadbox that projects into the port cockpit locker

We achieved the first by deducting into the galley over the bread box; the second with the selection of a compact unit that fit nicely forward in the port cockpit locker in space that was already underutilized; the third by only reducing the height of the breadbox by 2". We are pleased with a successful installation.

Unit to be installed

Selection of the A/C unit to install is of paramount importance. There are many from which to choose. We selected the CruiseAir Turbo 12K unit by Dometic. The dealer asked if we were selling the boat or intending to keep it. We said "keep" and he said there are other less expensive units, even from Dometic, but the CruiseAir Turbo is the better unit. This unit claims a true 12K output in a very compact form.

Here is a picture of the finished installation in the locker. The enclosure does not extend into the storage area and isolates the unit from other stuff. The vertical wall of the cover is secured with 4 screws for easy removal. The top is in two pieces split to fit around the supply duct providing easy removal of the aft half for easy access to the unit.



Location

Any installation other than the port locker with supply to the galley and return via the aft cabin will require additional ducting. There is not any good provision on the 320 for running ducts, so we decided to use the port locker with a short supply duct into the galley over the breadbox and return via the aft cabin. If you want to be able to close the aft cabin door, install a louvered grill in the door. From here, the run to the electric panel is easy, and runs to the pump and thru-hull as well under the aft cabin. We found the air flow more than adequate to quickly cool the salon and aft cabin. With the V-berth door open this space too will be cooled. We can remove the side panels in the bulkhead for better air flow into the V-berth; or, without the panels, a small fan will assist the circulation

Placement

We placed the unit as far forward as possible against the galley bulkhead. The floor of the locker is a tad uneven so we used a poly-plastic cutting board, 15" x 20", as a mounting board. It was necessary to make several adjustments to this board before the final position was achieved, after numerous dry-fits of the unit and bread box. Our buddies, Bruce and Norma Stumpp, decided to skip the board and secure the unit directly to the floor of the locker. I'm not sure it makes a bit of difference how you do it.

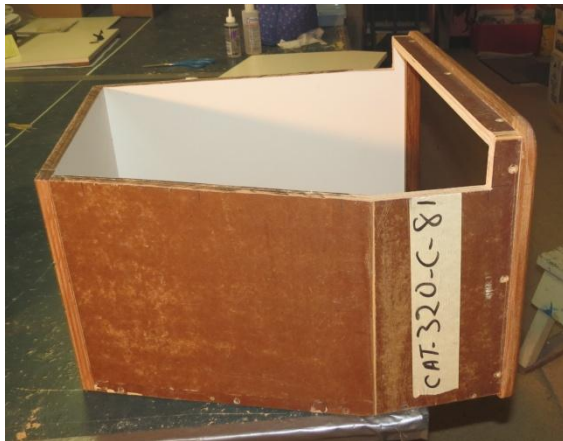
This picture shows our unit on the mounting board. The unit is secured to the board with the supplied shock-absorbing mounts, and the board will be attached to the locker deck with lag bolts. (Note: make sure the lag bolts go no further than the thickness of the deck. There are conduits below the deck.) The dealer recommended we place a 2x4 block under the blower unit as further support.



Since the port locker is not originally part of the space intended to be cooled, it is necessary to enclose the unit to prevent incursion of outside air. Failing to do so will allow unconditioned air and humidity to be drawn into the return air flow. This will greatly impact the efficiency of the unit. The design and construction of the cover will be discussed later.

Modifying the Bread Box

The unit in the locker was too tall to allow the bread box to exist in the space previously occupied so it was necessary to reduce the height of it by two inches. This was enough to allow a cover to be placed over the unit and under the bread box to enclose the unit and isolate it from the outside, untreated, air. We wanted to leave enough of the original bottom of the where the box rests in the galley bulkhead so as not to lose the support it provided. Therefore, we started the cut about 1-1/2" in from the finished molding of the box.



well to fill the open space with a few modifications.

The modifications worked out exceptionally well. After removing the bottom (screws no glue,) we measured 2" and made the cuts on a table saw and finished with a hand saw to square the inside corners. Then the original unmodified bottom was installed and screwed into place. From the inside, the change was hardly noticeable except for the space between the old floor and new. One of the pieces removed in the cutting served very



Here is the finished box with the bottom raised. Perhaps it is not up to cabinet maker's standards; but, it works and allows us to store the same stuff that was there before.



Finally, here is a picture of the locker with A/C unit and bread box in-place. Also seen here is the electrical box for connections, and the supply and return air grills in-place. But, more on that later. What is missing yet are the hoses and electrical to the pump.

The Galley Grill

Once we were satisfied how the unit and bread box would exist together, it was time to deal with the supply air vent and the grill in the galley bulkhead.

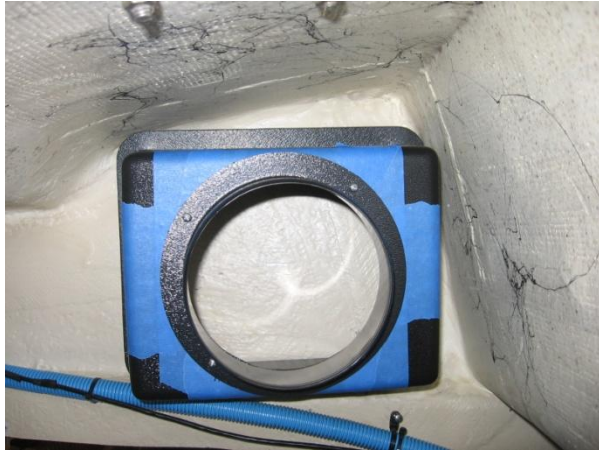
There wasn't much choice in where to place the opening in the galley as there is limited space and opportunity in the bulkhead for the hole. There is a transition box, a baffle, and a grille. The transition box goes on the aft side of the bulkhead and is how the supply hose attaches to the grill. The baffle directs the air flow toward the grille and reduces turbulence in the box. The reason for the baffle is, the box is larger than the grille. The grill nicely finished with teak trim and has movable blades to direct the outflow of the air. To match the finish on the rest of the teak trim in the galley we used Min-wax Wipe-on Poly finish. In the picture of the box you can see how it was necessary to trim the flange to fit reasonably flush against the aft side of the bulkhead.



The baffle was made from a scrap piece of plywood and varnished, then glued in-place to meet the edge of the grill.



Cutting the hole through the galley bulkhead was traumatic. First, was to position the transition box on the aft side of the bulkhead to see how that would fit. From this it was determined where to trim the flange so that the box would fit flush and be square to the counter in the galley.



Using a pencil, reach inside the box while in-place and scribe the corners. Using a straight edge, scribe a line diagonally from each corner so the lines cross in the middle. Then, where the lines cross, drill a hole through the bulkhead. This hole will help to locate the grill on the galley side.

Now, working from the galley side and using the pilot hole as a center, transfer the outline of the box onto the galley wall. Position the grill over the outline drawn and decide exactly how the grill should be positioned so that it will be inside the boundary of the box and level with the top of the refer. Scribe this

position on the bulkhead.

I found the best way to cut holes in this FRP (fiberglass reinforced plastic,) is to use an oscillating multifunction power tool with a metal cutting blade (you'll need several blades for this project.) I bought one from HarborFreight.com at a reasonable price. Drill pilot holes in two opposing corners with a drill larger in diameter than the blade of the saw. Insert the saw in a pilot hole and cut to the next corner. Dry fit the grill and use a sander tool to relieve any low spots. Dry fit the box and grill to be sure both fit. Mark the inside of the box where the upper edge of the grill lies. That is where the edge of the baffle should end.

I should mention that the transition box came with just a big hole for the supply duct. There is a collar to attach the hose that must be fastened to the box. Cover the box with tape, scribe the inside circumference of the collar on the back of the box, cut the hole in the box, and attach the collar with (silicone) glue and screws.

The transition box was attached with four corner screws and (silicone) glue.



The Return Air Grill

Fortunately, the return air grill was much simpler to install. As with the galley grill, start from the inside of the locker and place the grill on the wall separating the locker from the aft cabin. Scribe the outline and the center of the outline as with the galley grill. Drill a pilot hole in the center where the diagonal lines meet. Now, from the cabin side, transfer the outline of the grill to the wall with the pilot hole in the center. Position the grill over the outline and make any necessary adjustments to the drawn outline. Drill pilot holes in two corners as with the galley grill and cut the hole. Attach the grill to the wall with small screws in the frame.



