DETAILS

Aircraft interiors expert **DENNIS WOLTER** offers several time- and cost-saving minor modifications which should be done as part of an interior renovation project.

Ask any handyperson who enjoys working on their house, car, boat, or airplane if they encounter issues that seem to present unwanted difficulty. The answer will undoubtedly be yes. Some issues that immediately come to mind in an airplane are a component installed in an inaccessible place; and the use of a flimsy fastener when a simple screw or bolt would improve maintainability.

This month's article is going to cover a list of detail projects which an aircraft owner can do to eliminate problems while making it much easier to maintain the airplane. *(Some of these projects will require a sign-off by your A&P or A&P/IA, so be sure to check with them first. - Ed.)* These little improvements are the result of my experience resolving frequently encountered problems over 47 years of renovating aging aluminum airframes.

Relocating dimmer transistors

Topping my list of dumb component locations is where Cessna mounted the very difficult-to-reach instrument lighting dimmer transistors above the glovebox. The slightest short will blow the dimmer transistor. Replacing a delicate transistor is a very frustrating experience.

The fix is to relocate the transistor rack to behind the co-pilot's forward kick panel. The existing wiring harness is long enough. Simply mount the transistor heatsink rack to the airframe skin with four #8 stainless steel aircraft machine screws and nyloc nuts.

Be sure to clean the skin of any of those corrosion-causing lead panels and install some anti-chafe material where the wiring harness lays over the bulkhead at the base of the instrument panel. It's important to not locate any insulation material up against the heatsink transistor base.

Heating system

Have you ever noticed how difficult it is to remove the front seats because the lower outer tracking foot hits and damages the aluminum heat outlet trim cover? The fix is to modify both the lower kick panel and heat outlet in order to reinstall the outlet 2 inches further forward on the side panel. The pictures on Page 22 show it all. Both you and your maintenance tech will love this mod.

While on the subject of heat outlets, let's talk about the topic of corrosive cotton aeroduct black CAT hoses that Cessna originally installed in heating and ventilation systems.

This often-deteriorated cotton hose retains moisture, allowing the steel wire to rust. The combination of moisture and acid from the rusty wire creates corrosion over time wherever this stuff touches aluminum.

Definitely replace all of this CAT-type tubing in the airframe with long-lasting SCAT-type, orange-colored, rust-preventing, non-moisture-retaining silicon rubber, impregnated-fiberglass-covered duct hose.

Cabin heat outlet moved 2 inches forward to allow for easier and less damaging removal and reinstallation of pilot and co-pilot seats.

Instrument light dimmer transistors relocated to a more accessible location behind the co-pilot forward side panel.

The orange duct hose is the non-corrosion-causing, more durable hose.

Image of heat outlet plenum showing where to cut it with a bandsaw.

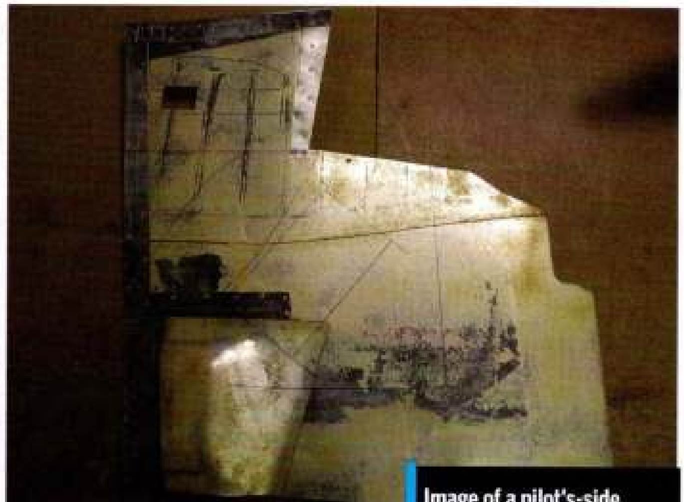


Image of a pilot's-side side panel with the heat outlet bump out relocated 2 inches forward to accommodate the new location of the heat outlets.

Doors and latches

We should now talk about Cessna doors and latches. Cessna finally got the design and engineering right in their current single-engine door designs. That said, pre-1980 Cessna doors have a few design flaws that need to be corrected.

Topping the list is the way Cessna used thin tempered wire clips to secure the door handles to the splined latch actuating shafts. The push-on retaining clips allow for a loose fit between the steel shaft and the soft metal splines in the door handle. The splines eventually strip out, the retaining clip lets go, and the handle easily pulls off.

The fix is to use a #20 drill bit to center-drill a mounting hole in the door handle and countersink the new hole from the finish side, then carefully use a #29 drill bit and center-drill and tap the splined latch shaft to receive an 8-32 chrome-plated countersunk screw.

If the splines in the soft metal door handle are completely stripped out, a new one will be needed. If the splines are only partly worn, tightly securing the handle to the shaft with a machine screw will hold a door handle with worn splines in place. It works great!

As modifying a door handle affects egress, this mod will require that a licensed airframe mechanic make a minor modification logbook entry describing this process.

These early door handles often present a pesky little problem on the outside. We often get Cessna singles in for renovation that have an outside door handle with a rusted return spring that has failed.

Installing a new return spring requires removing the entire latch assembly. Replacing the spring takes a lot of time, and you can damage your nice paint because the outside latch mounting screws must be removed.

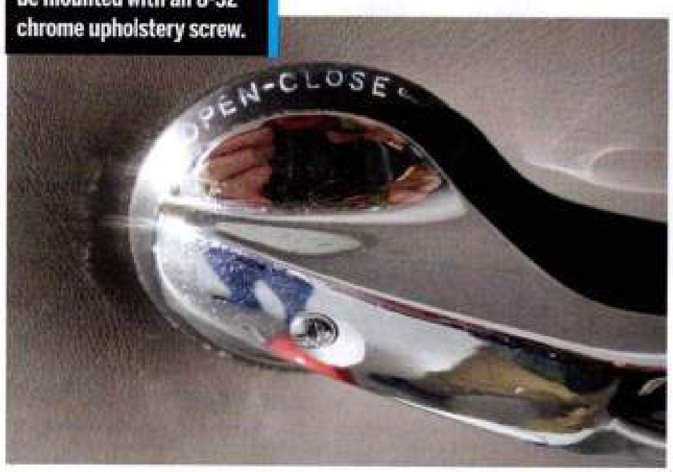
A simple and effective five-minute fix is to epoxy two nickel-sized refrigerator magnets; one bonded to the pull handle and one bonded to the door latch assembly itself. It works great and never fails.

Cessna single-engine cabin doors with internal doorstops are often weak or completely inoperative and can require a lot of time to repair. The best fix is to install a set of STC'd Mtn View Aviation gas cylinder Door Stewards. It's about a two-hour job and does not require the purchase of expensive Cessna parts.

The Door Stewards work great and are actually a much stronger door stop that will reduce the possibility of the wind blowing your large cabin door into the strut and bending the lower forward corner of your door or, even worse, completely tearing the door off, like can happen on a strutless Cessna 177 or 210.

The installation does require the completion of an FAA 337 major alteration form and an appropriate logbook entry by an A&P/IA.

A door handle modified to be mounted with an 8-32 chrome upholstery screw.



Center-drilling the splined door handle in preparation for tapping the hole to receive an 8-32 machine screw.

Nickel-size refrigerator magnets do a great job of holding the outer door handle closed on a 1973 Cessna 172 Skyhawk.

Seatbelt webbing retainers

Here's an easy-to-install time saver. Remove the original aluminum seat belt webbing retainers on single-place cabin seats and install leather or vinyl straps, secured at one end with an upholstery screw, and at the other end with a snap. This flexible webbing retainer is open at one end, allowing the seat to be removed without having to unbolt the seat belt end fittings on the floor.

Side panels

When installing a new interior, fabricate the new side panels in horizontally sectioned multiple pieces, mounted with aluminum extruded divider rails. These individual smaller panel sections can be installed with very few screws.

They are held in place by the fact that they are slightly oversized and tuck neatly into the rails for a secure fit. Removal and installation are quick and easy, and the aluminum rails add a great look to the side panels.

The forward cabin side panels located between the forward door post and the firewall have always been difficult to remove and reinstall and, you guessed it, they get damaged.

Before reupholstering these panels, consider retrimming the upper edges of the panels under the instrument panel. Cutting these panels down in this area makes them much easier to remove and reinstall. This eliminates potential damage without degrading

Quick-release seat belt strap that saves having to unbolt the lap belts.

how they look when installed in the airplane.

Inspection panel fasteners

Cessna secured the cabin floor inspection panels with small metal push buttons. Over time, the little buttons become weak and can break. We replace all of them with #8 PK sheet metal screws secured to field-modified folded Tinnerman nuts.

We re-form the Tinnerman to conform to the conformed angled edge of the inspection hole by carefully clamping the folded end of the Tinnerman nut in a vise and using a hammer to bend the nut to the desired angle. Now, all the inspection hole covers can be thoroughly secured in place.

Armrest attachment hardware

Here is an easy fix for another common problem. During the 1970s, Cessna installed molded rubber armrests with poorly designed mounting clips that made the armrests difficult to remove and reinstall. Too often, messed-up armrests and broken clips were the result.

The fix involves fabricating a 1/8-inch thick steel pointed clip as shown in the shop sketch at above right. Add this new clip and a couple of machine screws and nuts, and you'll have no more issues with loose-fitting and difficult-to-remove armrests.

Bending folded inspection panel Tinnerman nuts using a hammer and a vise.

An extruded aluminum divider rail that holds a cabin side panel with no screws; looks good and saves time.

Headliner retaining strips

Last, but certainly not least, is how Cessna secured the perimeter of stretched vinyl headliners using sharp-pointed retainer strips that can easily damage headliner material during removal and reinstallation.

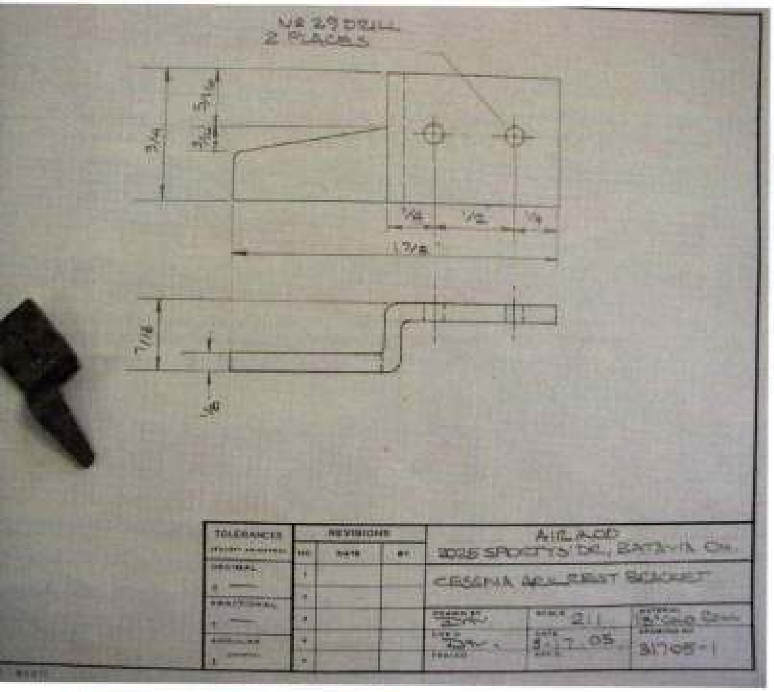
The image at right shows a field-fabricated retaining rail that relies on a snug fit between a 0.025-inch aircraft aluminum inner angle and the 0.032-inch aircraft aluminum base angle.

This retainer is an exact copy of the original without the sharp points. The two pieces of this assembly are riveted together using 1/8-inch diameter hardware pop rivets. This new retainer strip allows for the easy installation and removal of the headliner with the aid of a rounded putty knife. Problem solved.

In the next article, I want to discuss the all-important, serious topic of an inflight cabin fire, and how an interior renovation can present a great opportunity to reduce that risk. Until then, fly safe!

IMPORTANT: This article describes work that may need to be performed/supervised by a certificated aviation maintenance technician. Know your FAR/AIM and check with your mechanic before starting any work.

Typical broken original armrest mounting tab.



Shop sketch showing how to fabricate a steel armrest mounting tab that makes it easier to securely install or remove a 1970s-era Cessna door armrest.

Mounting the new steel armrest mounting tab using 6-32 machine screws and nuts.

End view of the field-fabricated pointless headliner retainer strips.

Industrial designer and aviation enthusiast **DENNIS WOLTER** is well-known for giving countless seminars and contributing his expertise about all phases of aircraft renovation in various publications. Wolter founded AirMod in 1973 to offer private aircraft owners the same professional, high-quality work then only offered to corporate jet operators. Send questions or comments to editor@cessnaflyer.org.

RESOURCES

Door Stewards
MTN. VIEW AVIATION
mtnviewaviation.com