Renovating an Interior Part Five: CABIN CLEANUP

Interior restoration expert DENNIS WOLTER highlights areas of Cessna cabins prone to corrosion, how to remove the corrosion and how to prevent it from coming back.

IT is finally time to roll up our sleeves and get to work! In order to ensure a good outcome with your corrosion cleanup efforts, it's important to begin by identifying where you should be looking for corrosion in your airplane. As mentioned last month, we will concentrate our efforts on what we've learned here at Air Mod, focusing on typical corrosion-prone cabin areas.

To help implement a thorough inspection, cleanup and treatment plan, I have created a cabin corrosion diagram that identifies the most likely areas in a Cessna cabin where one should look for corrosion. It's a good idea to share this diagram with your maintenance technician.

Corrosion can occur anywhere, so keep your eyes open and be tenacious in your efforts to find this stuff.

Sealing windows

The first step in interior cabin cleanup is to cover all the inside surfaces of the cabin windows and windshield. Be careful to neatly mask all edges of your windows; protecting the solvent-sensitive acrylic plastic and providing a neat finish-out when the zinc chromate is applied.

With the cabin windows masked, check the windshield and all windows for leaks. The best way to do this is to have a person inside blowing compressed air around the perimeter of the window, while a second person brushes soapy water at the edge of the window from outside. If you observe bubbles, they mean leaks.

To seal the windows without having to remove them involves neatly masking one-eighth of an inch into the plexiglass window and one-eighth of an inch out onto the metal.

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Thoroughly clean the quarter-inch wide surface between the masking tape and lightly scuff the surface with red Scotch-Brite. Then, apply a thin coat of LP Aero Plastics Inc. aluminum-compatible SP-R732C clear RTV sealant, available from LP Aero. *(See link in Resources. —Ed.)* Be sure to remove the masking tape before the sealant begins to cure.

Keeping water out of the cabin is very important in the control of cabin corrosion.

Cabin cleanup

The actual interior cleanup process in all Cessnas begins with removing every one of those dreadful, corrosion-causing black lead vinyl skin damping panels.

Due to the development of corrosion between the back surfaces of the lead vinyl panel and the surface of the aluminum, some of these panels will practically fall off. Others will require the use of heat, plastic scrapers, and Scotch-Brite or Roloc wheels to remove all the old glue and corrosion.

Be careful not to overheat the skins while using a heat gun to get the bonded lead vinyl panels to release. It's easy to discolor the paint on the outer skin panels if too much heat is used inside.

You can pick up a heat gun at your local discount tool store for about $40. Never use a heat gun or electric vacuum cleaner if there are any flammable solvents or fuel present!

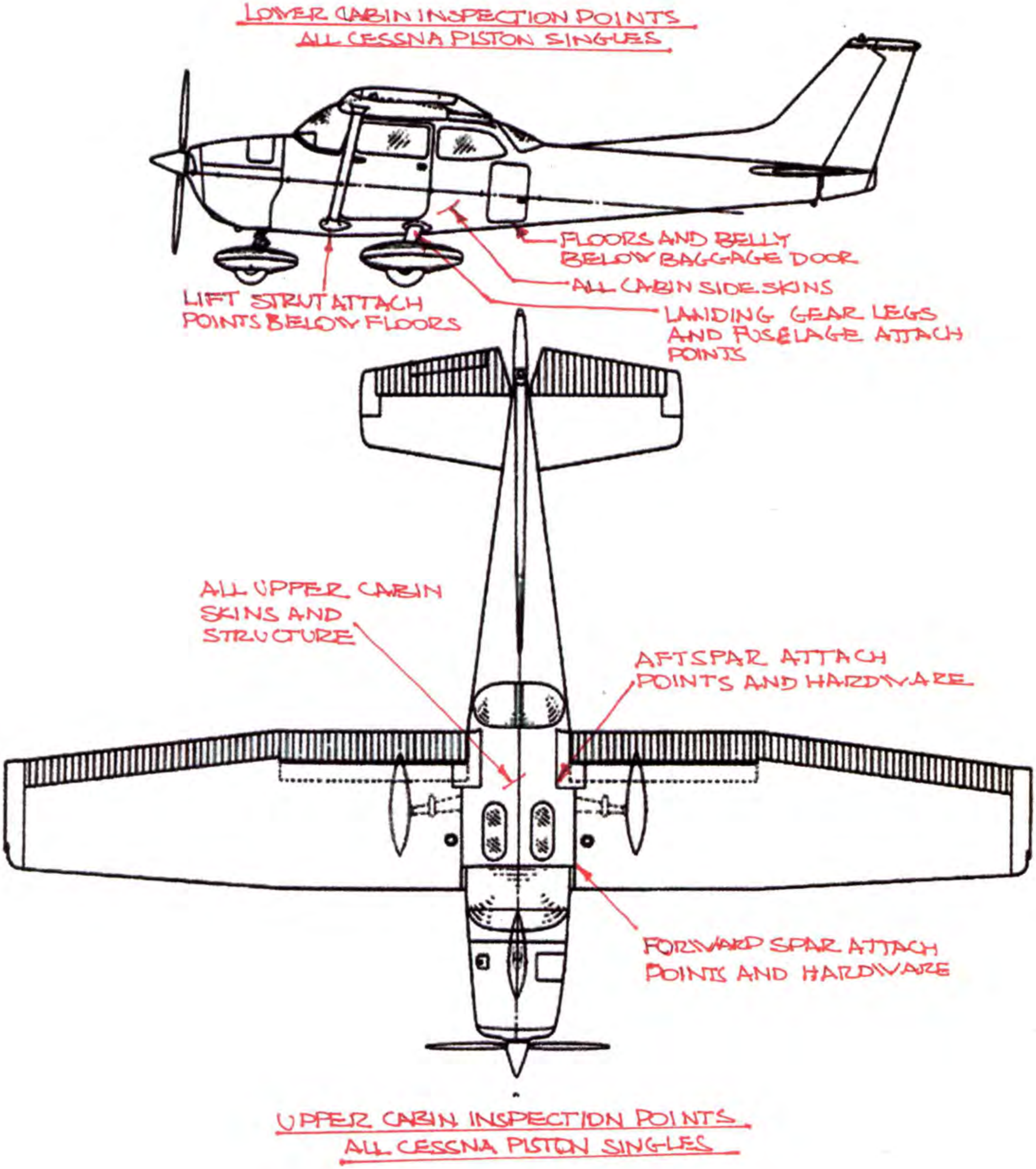
As stated before, Cessna airframes seem to present the most corrosion in the upper cabin due to the fact that moisture vapor tends to rise. Being high-wing airplanes, most of the critical wing structure, wing attach points, spar carry-throughs and related components are located in the upper cabin area. It's very important that the upper cabin be closely inspected and any corrosion be removed and treated.

With the headliner removed, the most obvious corrosion can easily be seen in the cabin top and wing root areas. The amount of corrosion seen in the photo (Page 26, bottom) is quite typical of what we find in a 1970s-era Cessna that has lived its life exposed to the humid environment of Midwest or Southeast summers.

The corrosion cleanup process begins with mass removal of the surface corrosion using a power drill and either Scotch-Brite wheels or 3M Roloc bristle discs. Since these abrasive discs cannot reach into tight corners, it is necessary to use red Scotch-Brite pads, stainless steel brushes and rifle barrel cleaning brushes to get in the tight spots. We also use the Scotch-Brite pads and stainless steel brushes to clean both the top and bottom surfaces of any stringers.

Don't forget the 10% rule. An accepted rule of thumb is that if the depth of the pitting in a structural component is more than 10% of the thickness of the metal, the component must be replaced, reinforced or repaired.

If heavy corrosion is encountered anywhere, definitely have your maintenance tech inspect that area and give you guidance as to how to deal with it.



Corrosion-prone spots in Cessna cabins.

Wing attach component cleanup

With the cabin skins and related components thoroughly cleaned and inspected, it's time to carefully inspect and clean the wing attach components. The fairly typical corrosion seen in the photo (Page 26, bottom left) can be difficult to clean.

The first issue to deal with is rusty bolts and nuts found in these structurally critical areas. They must be removed and inspected by a licensed technician.

Corrosion is a function of electrolysis and if a bolt head or nut is rusted, there is a good possibility that the shank of the bolt and the hole it is in is also corroded.

If corrosion is found in the bolt hole, the fix involves a call to Cessna engineering for guidance as to repairing the affected structure and the proper installation of new bolts.

The next wing attachment issue is to clean and chromate the attach points without damaging any of the structure. That involves the careful use of hand tools, Scotch-Brite and small brushes.

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We often use paint sticks that are cut into different shapes and covered with Scotch-Brite strips in order to clean way down inside the difficult-to-reach depths of the structural attach points.

Final detail cleanup is often done by carefully using dental picks and compressed air with a fine point nozzle to remove trapped dirt in tight places.

One final step in protecting these structurally critical components is, after the initial chromate application, we also spray just these wing attach areas with CorrosionX or ACF-50 to add an extra layer of corrosion protection.

The final wing attachment point to check on in strut-braced Cessnas is the lower lift strut attach points. Cessna has a note (Cessna SEB 95-19) that outlines the procedure that your maintenance technician must follow in completing this inspection. An owner, under the provisions of preventive maintenance, can clean and chromate lower lift strut components.

Checking for leaks with compressed air and soap.

Caulking and sealing with LP Aero clear RTV sealant.

A common find in 40-year-old Cessnas: corrosion under lead vinyl panels.

Severe corrosion at an aft spar attachment.

Typical upper cabin corrosion found on older Cessnas.

Green Roloc and red Scotch-Brite wheels.

More corrosion removal tools: plastic scrapers, stainless steel brushes and a pick.

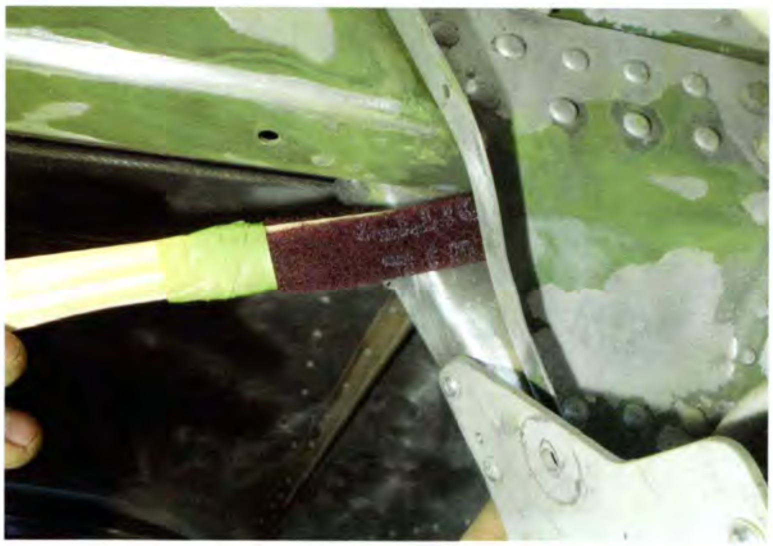
Removal of large areas of corrosion and glue, using a Roloc or Scotch-Brite wheel and a drill.

Use red Scotch-Brite pad and mineral spirits to thoroughly clean skins, bulkheads and stringers.

Use a stainless steel wire brush to clean hard-to-reach places.

Use a stainless steel rifle-cleaning brush to get into tight places around bulkheads and stringers.

Mineral spirits, compressed air and toothpicks can be used to remove trapped dirt from places where structural components are riveted to skins.



Cleaning deep into a spar attachment with red Scotch-Brite glued to a paint stick.

Rusted bolt heads often mean rusted bolt shanks and holes.

The best procedure would be to thoroughly clean this area, then have your maintenance technician perform the inspection before chromate is applied. This critical area will also be additionally protected when the belly is fogged with ACF-50 or CorrosionX after the lower strut attach structure is sprayed with chromate.

Cleaning under the floors

With all the floor inspection panels removed, it's time to clean up what will likely be years of dirt, oil and possible corrosion on the belly skins. Make every attempt to remove as many of the lead vinyl panels as possible.

Prior to using flammable solvents, scrape, brush and remove as much of the dirt as you can. We use 3M Roloc wheels on an extension to reach deep into the belly. Then, it's on to mineral spirits, compressed air and Scotch-Brite to finish the job before spraying with chromate.

> *...if a bolt head or nut is rusted, there is a good possibility that the shank of the bolt and the hole it is in is also corroded.*

It is usually impossible to remove all of the lead vinyl panels below the floors. That's why, once all the chromate and painting is completed in the cabin, we fog the belly below the floors with ACF-50 or CorrosionX.

The last cleaning task is a final wipe-down with a pre-painting cleaner. We use either a product sold under the brand name Prep-All from Klean Strip, or high-quality mineral spirits.

Pour a generous amount of whatever solvent you're using into a pan and use clean cotton rags, picks and compressed air to thoroughly remove the last vestiges of dirt, especially in tight corners.

Allow the entire solvent-soaked cabin to thoroughly dry out prior to applying zinc chromate.

Chromating the cabin

With the entire cabin antiseptically clean, it's time to mask all of the wiring, cables, fuel lines, autopilot servos, etc. We use a lot of aluminum foil for this job. It goes on easily, covers well, conforms to any shape and doesn't pull wires loose when being removed the way masking tape will do. And don't forget to unhook the battery.

Now for the fun part—applying the zinc chromate. We buy real zinc chromate from Aircraft Spruce in 18-ounce spray cans.

Zinc chromate is nasty stuff, but it really protects aluminum from surface corrosion. Follow the warnings on the can. We like 18-ounce spray cans because they are small and light and allow you to get the chromate into difficult places.

When a spray can is full, you can spray up and under the bottom surfaces of structural components such as bulkheads, cabin tops and stringers, so spray those surfaces first. When the can quits spraying, start a new one for the hard-to-spray areas.

When the difficult areas are covered, spray the vertical surfaces with the partially empty cans. They will still perform quite well when held upright as you spray the vertical sides of the cabin, spars, etc.

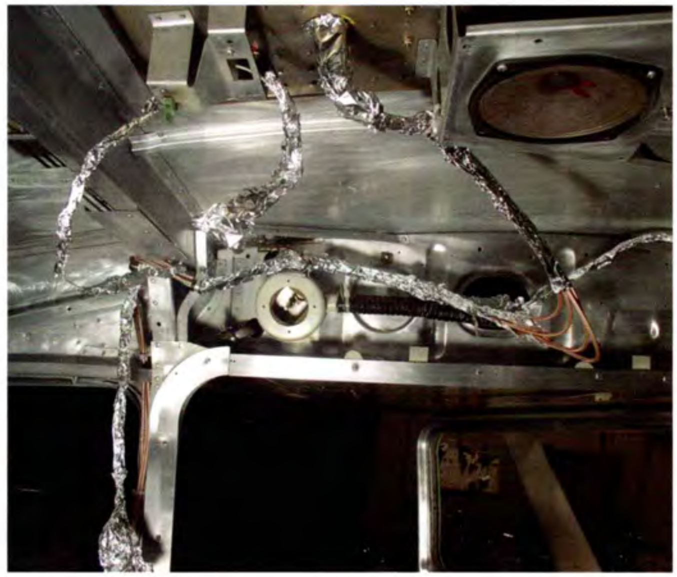
Allow the chromate to cure overnight before removing all the masking. Cover the nicely chromated floors with old blankets or carpet to protect the

Using a dental pick to carefully clean contaminates trapped in between spar attach components.

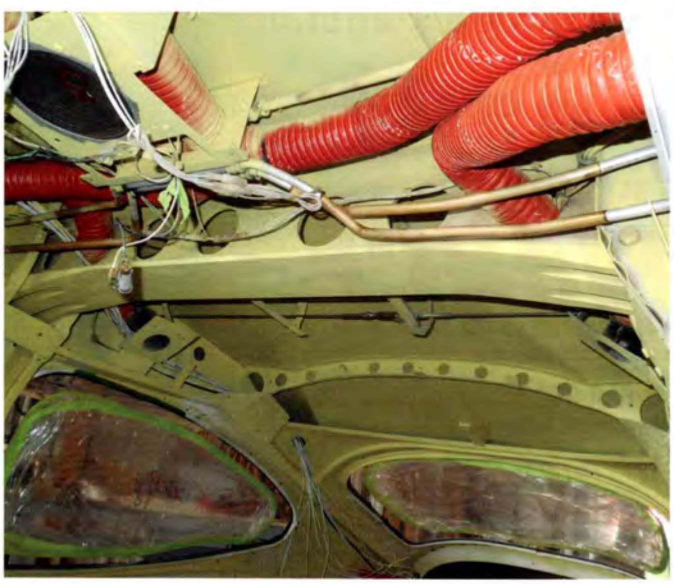
Carefully spraying ACF-50 into a chromated spar attachment.

Rusted steel lower lift strut doubler, prior to being cleaned and chromated.

Using an extension shaft and a small Roloc wheel to remove corrosion below the floors.



A Cessna 182 cabin cleaned and masked with aluminum foil; finally ready for application of chromate.



A Cessna 177 Cardinal cabin cleaned, chromated and ready for new insulation to be installed.

Very serious corrosion found under the foam pad glued directly to an unchromated spar carry-through by the factory. Inspect every Cessna 177 and Cessna 210 spar carry-through ASAP.

chromate during the rest of the interior renovation process.

It's safe to say at this point in the project that the worst part of interior renovation is behind you. There's a lot more to do but, in my opinion, none of what is left is as messy and tedious as corrosion removal and cabin cleanup.

On that positive note, we'll sign off for now. Next time, it's on to prepping and painting cabin doors, door jambs, seat frames and cabin trim components. Oh yes, that means repairing that lovely Cessna plastic. Until then, fly safe! CF

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.

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 Air Mod in 1973 in order 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

CLEANING AND SEALING PRODUCTS

Klean Strip (Prep-All)
kleanstrip.com/product/prep-all

LP Aero Plastics Inc. (SP-R732C silicone sealant)
lpaerodirect.com/index.php?p=product&id=1182

CORROSION INHIBITORS

Corrosion Technologies (CorrosionX)
corrosionx.com

Lear Chemical (ACF-50)
learchem.com/products/acf-50.html

FURTHER READING

Cessna SEB 95-19
CessnaFlyer.org/forum under "Magazine Extras"