

Wing Tips

By Dennis Wolter



Door and Window Seals

We're finally at the beginning of our last "Wing Tips" article on the exciting topic of installing and adjusting door and window seals. This final installment will cover sealing aft cargo doors on A36 and Baron 58 models, as well as center opening window seals on all 35 through 58 models.

It's important to be aware of a couple of things when dealing with aft cargo doors on 36 and 58 airplanes. Prior to the late 1990s, Beech used a marginally effective, hollow, black rubber P-shaped seal system in their effort to seal these doors. It didn't take long before the shortcomings of that system became apparent.

The most common problem is in maintaining a good seal where the upper edges of the two doors meet. Beech relied on a soft rubber plug for a watertight seal where the hollow vertical seal is tangent to the matching horizontal seal bonded to the upper door jamb. Even when new, this design was, shall we say, a pretty optimistic solution for the inherent problems in this location. A little misalignment, coupled with the natural hardening of seal material that occurs with time, and a water leak in this area is inevitable.

The real fix is to replace the seal with a new silicon rubber engineered seal, Beech kit #36-4015-1. More on this in a minute. First, we'll look at extending the life of the original seals, and the effort to actually get them to keep water out of the cabin.

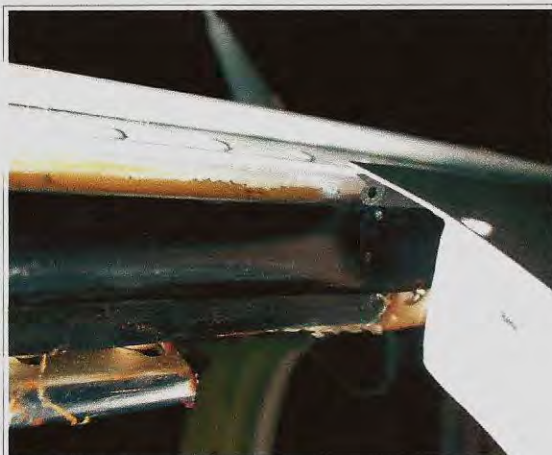
Here at Air Mod, we buy a hollow P-shaped soft rubber seal from Home Depot (I jokingly call this the Aircraft Supply department), sold under the MD brand, which we bond to the vertical and upper edges of the cargo doors. The photo shows

the orientation and approximate position of the P-seal. We're careful to locate this seal so that it facilitates a thorough closure against the original seal, paying very close attention to the upper corners and where the two cargo doors meet. After the new secondary seal is installed, close the door and insert a business card between the two seals. You should feel some resistance, indicating a snug fit. The final leak test is done with a garden hose. Be prepared to try this more than once. The Home Depot seals are inexpensive, so a second or third try is painless enough.

If your original seals are beyond help, here's the real fix. The #36-4015-1 kit is a durable and effective solution for leaky cargo doors. The kit places a seal on both the door itself and the door jamb. It comes with all components; adhesive; and well-written, illustrated installation instructions. The current cost of the kit is about \$750. Installation time, including the necessary repainting of doors and jamb, is approximately eight hours. Doors and jambs will often



30 years of time has caused the corner piece to shrink and separate.



Secondary P-seal installation on door.



New Beech silicon rubber seal system.

need surface filling and priming prior to painting, adding an hour or so of time.

The results speak for themselves: A door seal that looks good, works well, lasts a long time due to its being silicon, and has a clever little silicon flap that seals the formerly troublesome gap where the cargo doors meet. I love it!

So let's get down to the last sealing issue – center opening windows. During a tour of the Beech factory in 1973, I observed something I wouldn't have expected to see. A worker was using a hammer and a piece of wood to adjust the contour of the metal flange that holds the rubber seal for the opening windows. Re-forming these flanges is truly the best way to establish a good fit between the opening window and the airframe after new seals are installed. Be sure to open the window before employing the hammer technique, or a cracked window may be the result. This adjustment is often necessary after new center windows are installed.

Beech changed the design of this flange in the late '70s to accommodate a larger diameter seal, improving our ability to seal these opening windows. It may still be necessary to re-contour even these later style

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flanges. Use the business card test as you go, and the garden hose check at the end.

There is another adjustment that can be made toward achieving good closure for the center opening windows. I'm referring to an over-center latching rod that has an adjustable end. These rods are often over-lengthened in an attempt to get the window to seal better by pulling it tighter into the frame. This can result in some deformation of both the Plexiglas and the frame. I think properly re-contouring the window flanges may be a better way of establishing a good seal without risking stress to the window or closing linkage.

One additional thought regarding these opening windows. Make sure you're able to latch them without exerting a lot of force. If they are

difficult to close, have your maintenance tech check it out. Having one of these big guys pop open in-flight really gets everyone's attention.

That's about it for door and window seals. If you have any questions or suggestions, I'm all ears, so give me a call. In the next article, I'll move on to correcting what could be a serious safety issue with side-mounted circuit breaker panels in newer 33, 36, 55, and 58 models. Until then, fly safe!

Dennis Wolter is an A&P, IA and a 3,000-hour instrument pilot who started Air Mod in 1973 to bring innovative design and high-quality renovations to the general aviation market. Dennis has a degree in industrial design from the University of Cincinnati.



1.



The little rubber flap that works.



Leather-tipped wood drift and hammer re-forming the flange of the opening window.