

Renovating the ABS/ASF Bonanza

Part II: Making Progress

By Dennis and Cynthia Wolter

Last month we began this series on the work Air Mod has done on the ABS Air Safety Foundation A36, which gave us a first look at what was underneath the interior of this typical 36-year-old Bonanza. This month, Air Mod gets to work on the repairs.—ed.

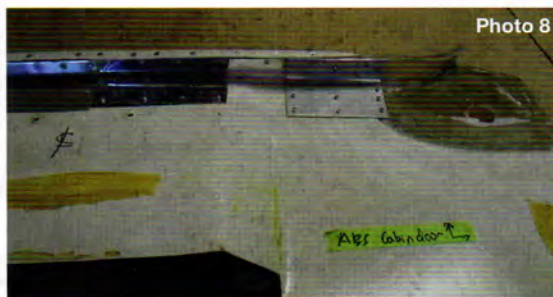
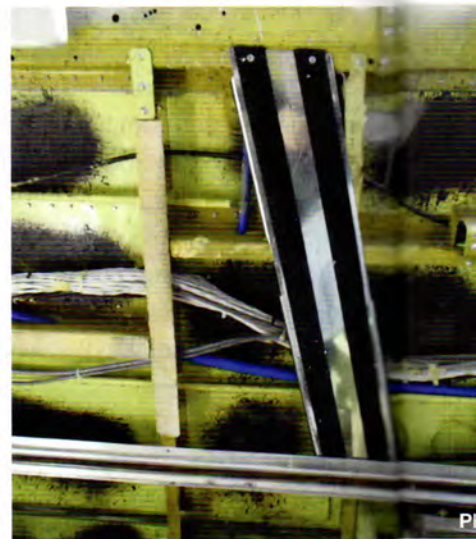
With the tear-down and inspection process complete, it was time to start repairing, modifying, and upholstering interior components. Due to the complexity and differing technical challenges these components present, at Air Mod we organize this process into seven categories: seats, side

panels, headliner, upper plastic trim components, spar covers, glareshield, and miscellaneous. As we move through the renovation, I will describe repair procedures as well as the many ways we modify the interior to facilitate easier removal and installation. This saves time and helps prevent damage to the interior

components during later inspections, modifications, and maintenance.

We begin with side panel repair and modification. To save weight and money, Beech fabricated the cabin side panels using very lightweight, delicate, and easily damaged honeycomb material. They then fabricated a one-piece left side panel that is just over 13 feet long. Removing and reinstalling this piece requires a great deal of care. Guess what happens: These panels are almost always damaged (**Photo 1**).

N3819M was no different. The fix is to splice on a new section of honeycomb



trimmed to fit to precisely meet the contour of the instrument panel and the fresh air outlet. To eliminate future damage to the delicate forward edge of the repaired panel, we bond 0.020" aircraft aluminum to the back surface of the side panel, greatly enhancing the durability of the panel (Photo 2). The second step is to cut the long side panel into three manageably sized pieces. One cut is made at an angle, at a location that hides the splice behind the back of the pilot's seat, at which point we install a Velcro-lined support brace (Photo 3). The second cut is made at the aft end of the panel at the leading edge of the cargo compartment step-up (Photo 4). These modifications make it easier to remove and reinstall the left side panel when accessing wiring, oxygen, and pitot static lines. This ensures when you get your airplane back after an avionics installation or a maintenance event, your interior will not be damaged.

Another common side panel issue is with the vacuum-formed plastic upper pilot side panel and cabin door side panel. These panels are often badly sun damaged at the upper corners, and this Bonanza is no exception (Photo 5). The fix is to mold new, more durable, flameproof fiberglass corner pieces and splice them on to replace the degraded corners (Photo 6).

The next area of concern is the usually damaged plastic-formed upper lip of the side panel (Photo 7). We first repair the damaged plastic using a cyanoacrylate adhesive product called



Photo 4



Photo 5



Photo 3



Photo 9



Photo 10

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Photo 11



Photo 12

polyfix, a composite repair kit available from Aircraft Spruce. This stuff can fix almost any type of plastic. Using a heat gun, we heat the damaged plastic until it becomes soft enough to re-form it back to its designed shape. We then use fine Hobbico medium 208 model makers' fiberglass cloth (available at hobby shops) and polyfix to repair any cracks. Finally, we form a reinforcement out of 0.020" aircraft aluminum that we rivet in place using countersunk 1/8" pop rivets (**Photo 8**). We now have a thermally stable and strong repair that will not warp or crack in the future.

The last side panel issue common to this generation of Barons and Bonanzas is the often bent and torn lower kick panels. These metal-backed, carpet-covered panels are held in place by an

aluminum upper divider rail. The base of these panels is secured by being tucked between the outer edges of the wood floorboards and the outer floor support. The only way to remove and reinstall these panels is to bend them to nudge them out of the upper divider rail and the lower edges of the floorboard. This almost always results in damage to the metal kick panels (**Photo 9**). Bonanza 19M definitely had its share of this problem. The first challenge is to repair or replace the damaged panels by reforming the deformed and stretched edges (**Photo 10**). A metal shrinker is the ideal tool to use to eliminate any waviness once the edges of the metal have been tapped flat. Traditional riveted-in-place repairs will take care of torn edges. If the panel is damaged beyond economical repair, use it as a pattern to fabricate a new one using 0.025" 2024T-3 aircraft aluminum (**Photo 11**).

To prevent future damage and save maintenance costs, we modify the mounting system for these kick panels by altering how they fit between the wood floorboards and the outer support structure, thus eliminating the aforementioned bending during removal and installation. Step one is to trim the lower edge of the kick panel by approximately 1/4". Step two is to extend the height of the outer floor support by 2" using a riveted-in-place 0.032" 2024T-3 aluminum extension with a 1/4" formed lip at the upper edge (**Photo 12**). This modification allows the panels to be secured at the base using upholstery screws, located so as not to interfere with wiring and other critical components. We draw arrows on the floorboards with a magic marker indicating the location of lower mounting screws. With this change, all one needs to do to remove the kick panel is remove a couple of upholstery screws along the bottom edge and drop the panel out without having to remove the floorboards and, more importantly, without bending the kick panels. Saves time, prevents damage, what's not to like?

That's pretty much a wrap on side panels. Next month it's on to headliner issues. Yes, there are problems there, too, which are not unusual for an '80s vintage Bonanza.

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Dennis and Cynthia Wolter own Air Mod, a premier interior shop near Cincinnati, Ohio. Air Mod offered to update the ABS/ASF A36 at a substantial discount to show its support for ABS and the ABS Air Safety Foundation.