

Renovating the ABS/ASF A36

Part Six: Glareshield

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Sometimes, obvious things can be hidden in plain sight. As we fly, we spend hours looking at a component, not realizing that those little cracks and deformations are an indication that a time-consuming repair project is staring you right in the face. I'm referring to the big, black, fragile glareshield that covers the instrument panel from the base of the windshield to about four inches beyond the face of the instrument panel. The one-piece glareshields installed in Bonanzas and Barons from the late 1960s through the early '80s were predisposed to failure.

Issue one is that Beech vacuum formed these large glareshields using less heat sensitive but more rigid acrylic plastic. It's only a matter of time until the entire glareshield becomes quite brittle and is prone to developing cracks.

The second issue is that in order to remove and reinstall this big one-piece glareshield, one must bend it to get the permanently attached defroster plenum to clear the radio stack, while at the same time force the outer corners of the aft end of the glareshield inward to clear the windshield trim. When new and somewhat flexible, these glareshields can be removed and reinstalled (carefully) with less risk of damage. Forty-plus years of aging has made this plastic very inflexible, and almost all of them are now so rigid that they are full of cracks.

The third issue is that these glareshields live right under the big plexiglass windshield where they are exposed to lots of ultraviolet light and the hot sun.

And finally, these glareshields were covered with heat-absorbing black vinyl that very efficiently absorbs the ultraviolet light and heat that degrades the acrylic plastic substrate.

Sounds like the perfect storm to me.

The glareshield in the 1981 model ABS Air Safety Foundation A36 had the usual amount of damage we find in 30-plus

year old Bonanzas. Cracks in the aft formed lip (**figure 1**) are definitely previews of coming attractions. Once the cover material and the light rack are removed, the true extent of the damage to the plastic substrate is revealed (**figure 2**). The first step in the repair process is to re-form and repair the damaged lip with Polyfix adhesive and model makers' fiberglass as described in the window frame repair article in the December issue of this magazine. The next step is to reinforce the repaired lip with a .040" aluminum riveted-in-place contoured doubler secured with 1/8" hardware store pop rivets (**figure 3**).

Cracks can also be found in the main body of the glareshield. The fix for this is

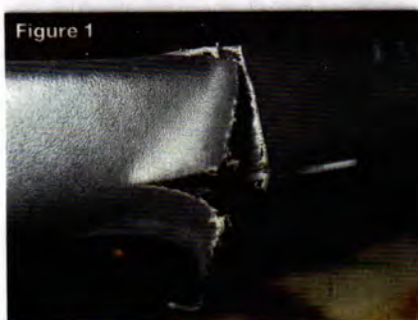


Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

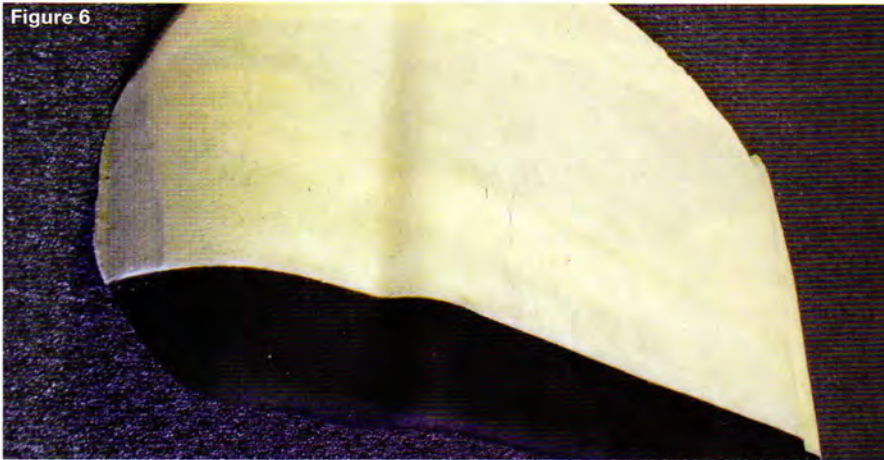


Figure 6



Figure 7



Figure 8

to cut a 0.020" aluminum doubler, which is then bonded to the back surface of the damaged areas with contact cement and secured to the edges of the doubler with $\frac{1}{8}$ " hardware store pop rivets (**figure 4**).

Another common problem is heat deformation of the defroster hose flange. The fix for this is to rivet a three-inch length of aluminum tubing that is pushed into the deformed plastic flange and secured with those wonderfully useful, hardware store pop rivets (**figure 5**). This works *great!*

With the acrylic plastic glareshield substrate all repaired and reinforced, it's time to install two densities of foam padding. We bond $\frac{1}{4}$ " high-density black flame retardant foam that is wrapped and trimmed around the aft lip. This foam adds an extra measure of protection should someone come into contact with the glareshield; it also becomes a stable base for the new French-stitched cover. We then bond $\frac{1}{4}$ " flame retardant upholstery foam to the rest of the glareshield (**figure 6**).

The glareshield is now ready to be covered with French-stitched black flame retardant vinyl (**figure 7**). I do not recommend using any vinyl that is light in color. If you do, you will be able to log all of your flight time on sunny days as actual IFR, as the sunlight reflecting off the glareshield onto the windshield will restrict your vision. Also, do *not* cover a glareshield with leather. As we've seen when used on window frames, leather shrinks as it ages and will deform the glareshield over time (**figure 8**). That photo says it all!

I'm going to move away from this ABS project to touch upon two other fairly common problems that we did not find in the ABS/ASF A36. The first is clearance issues with the defroster plenum. Some new avionics installations in Bonanzas and Barons can interfere with the defroster plenum; we've seen it all too often. Improperly executed field modifications done to these defrosters, using duct tape, hot glue, etc., can fail, causing hot air to blow directly on those expensive, heat sensitive avionics...ouch! The fix is to cut out the defroster to allow for proper

component clearance, and then fabricate a formed 0.020" aluminum filler piece that is secured to the defroster with 1/8" pop rivets and sealed with high temperature silicone caulk (**figure 9**).

The second problem is that some avionics installations are so complex that they make it very difficult to get the defroster plenum past the avionics components during glareshield removal and installation. The only fix is to separate the defroster plenum from the glareshield (**figure 10**) and permanently mount it to two 1/2" by 1/2" aluminum angles that are secured to the base of the forward windshield supports with rivnuts and machine screws (**figure 11**). The aft end of the support angles are secured to the top flange of the fixed instrument panel with #8-32 machine screws and nylock nuts. Finally, the defroster plenum is secured to the support angles with #6 upholstery screws and folded Tinnerman nuts.

With the defroster plenum mounted, the last modification step in this process is to extend the now cut-out area of the glareshield about 1-1/2" to close the gap between the glareshield and the hard-mounted defroster plenum (**figure 12**). This modification creates an easily removed and installed, aesthetically pleasing glareshield.

As with all component repair projects, it's important to decide up front if it would be more cost effective to buy a new glareshield versus repairing an old one. Thankfully, Aircraft Spruce (www.aircraftspruce.com) sells a quality fiberglass version of the Beech glareshield (part number 05-03905). It does not have lights or a vinyl covering and comes in a pretty large box, so factor in shipping costs when deciding if this option makes sense for you.

I sometimes wonder what the cost difference and weight penalty would have been if Beech had initially fabricated these components using fiberglass or more recently available Kevlar. (As I said, just wondering.)

Next month, it's on to seat refurbishment. Till then, fly safe!



Figure 9



Figure 10

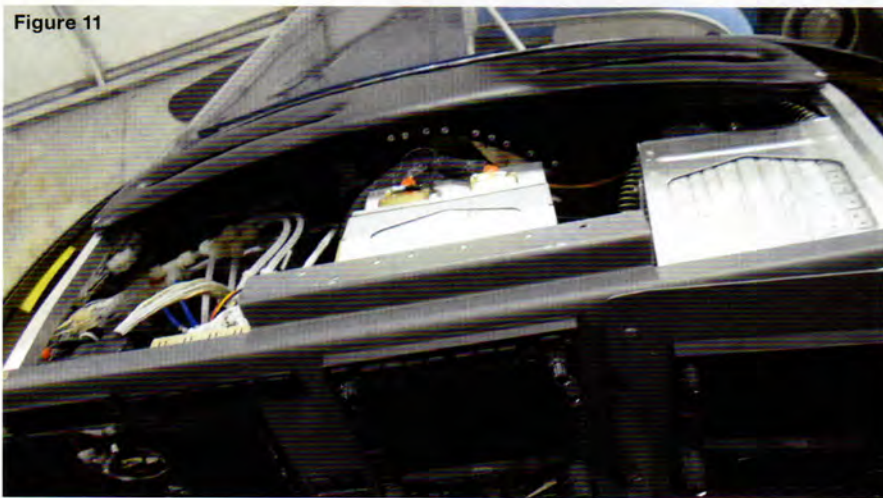


Figure 11



Figure 12