

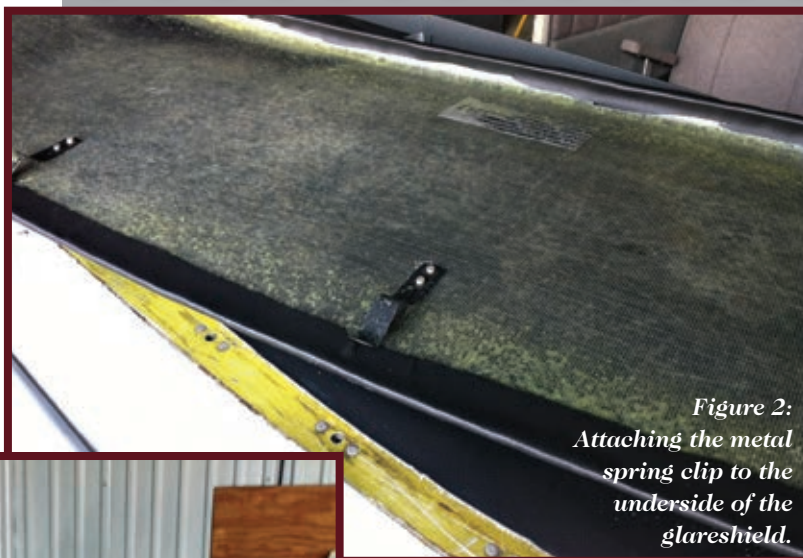
Two-piece Glareshield Installation in a Comanche

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*Figure 1:
Filling in the
handholds.*

When I installed a new one-piece windshield in my Twin Comanche recently, I thought it would be an ideal time to replace the 46-year-old glareshield. In its original configuration, the two-piece glareshield from Piper was not a bad design, and it definitely made it easier to access instruments in the top part of the panel. It consists of a fixed thin aluminum surface that extends as a continuation of the fuselage behind the windshield bezel and runs back to the lip of the instrument panel. Thus, it is and will remain a part of the aircraft's structure and is not something



*Figure 2:
Attaching the metal
spring clip to the
underside of the
glareshield.*



*Figure 3:
Laying out the
fabric on the fixed
glareshield.*

There is an approximate oval-shaped hole cut in this fixed portion of the glareshield which is covered and slightly overlapped by a removable piece of ABS plastic. This removable section has lowered slats cut in it for instrument cooling. To attach these two parts together, the plastic part has three spring-clips riveted on its bottom surface to fit under the forward edge of the opening in the fixed glareshield. The plastic is further secured to the permanent surface with several sheet metal screws.

The Piper glareshield is lacking in one vital area – it does not overhang the instrument panel. That is to say that when you are flying at night, you get an unwanted heads up display or inverted reflection of your lighted instrument panel showing up on the inside surface of the windshield. Every aftermarket glareshield that I have seen addresses that shortcoming by extending two or more inches aft from the top of the instrument panel.



*Figure 4:
Trimming
the fabric.*

you can remove or modify to any extent. When new, the entire fixed portion was covered by black imitation leather, which was glued in place. There are two elongated pyramidal-shaped metal defroster vents screwed to the fixed glareshield just inside the back surface of the windshield. They are painted flat black.



*Figure 5:
The finished
two-piece
glareshield.*

I had heard a number of Comanche owners describe the difficulty of inserting and removing their after-market glareshields – problems with scratching their windshield, and various modifications they found necessary to make including cutting the glareshield in two in order to avoid the problems I have outlined. I toyed with the notion of making my own glareshield from scratch either out of aluminum that I would form to the desired shape or even making a mold and fabricating a fiberglass model. I truly did not want to reinvent the wheel, and after doing some research I found that the Dennis Ashby glareshield, which is distributed by Aircraft Spruce, looked like it would best suit my needs as a starting point. It is made of molded fiberglass and has a flat black coating on top with a textured appearance. It is somewhat oversized when compared to the area to be covered. Furthermore, it is not precisely the contour of the original fixed panel. However,

I was told when I inquired that you could safely alter the shape of the fiberglass by heating it with a hair dryer.

In my further assessment of the fiberglass cover, I realized that it would be difficult to re-position the defroster vents onto its compound curved surface. And even with shaping it to better conform to the fixed glareshield below, I surmised that it was going to be very difficult to insert and remove it if I attempted to make a one-piece glareshield that would cover the entire area forward of the top lip of the instrument panel, even with removing the ABS trim from the windshield side posts. It was at this point that I took a page from Piper's book and decided to make a two-piece glareshield similar in concept to theirs. In the process, I opted to sidestep the minor engineering dilemma and leave the defroster vents in their original location after I installed some new leatherette fabric covering on the fixed surface.

When I was removing the old leatherette, I also noted the two badly cracked ABS plastic handholds in the top of the fixed shield. I had no reason to keep these, so I planned to remove them and fabricate some aluminum plates to rivet into place to fill in the openings (see Figure 1).

My first step was to decide the size of the fiberglass shield. My goal was to make it small enough to easily remove and install and yet appreciably larger than the old removable glareshield, covering as much of the area as possible. The Ashby shield has a curled front edge which overhangs the upper panel rim. There is no way to trim much from the lateral border of the shield without exposing the top edge of the instrument panel; ergo this defines the lateral edge of the removable shield. In a very small space, three structures all come close together: the outermost extent of the top edge of the instrument panel, the inside surface of the windshield, and the lateral reach of the new glareshield. I wanted the removable shield to cover the exposed top edge of the instrument panel completely but yet not rub against the windshield, especially as it comes forward. To accomplish this, I had to make some careful measurements in that area and start trimming it forward and then medially in order to keep it from hitting against the Plexiglas. I did not need a French Curve template; given the short distance, it was easy to freehand a visually pleasing curve blending to a

straight line that would represent the leading edge of the shield. In doing so, I needed to completely cover the opening in the fixed shield and bring the edge forward nearly to the back edges of the defroster vents. I used an electric nibbler and a sabre saw to trim the fiberglass after marking it with a Sharpie.

My next step was to drill out the rivets on the spring clips on the old ABS glareshield and attach them to the underside of the new fiberglass shield much in the same position they had formerly occupied on the old shield (see Figure 2). I then took the glareshield to an upholstery shop and had them glue some one-half-inch thick medium density upholstery foam to the top of the structure. Following that, they covered it with a black matte finish textured leatherette material. In addition, I asked the upholsterer to sell me a piece of matching leatherette, 17 inches by 53 inches, to cover the fixed part of the glareshield to match the removable part.

I peeled off all the old Naugahyde fabric from the fixed glareshield and made a butcher paper template of the area I wanted to cover. Then I cut the new material somewhat over-sized so that I could trim it more accurately once it was glued in place. I then recovered the entire fixed shield area with the new material, gluing it in place with quick-drying 3M Super 77 Multipurpose Adhesive (see Figure 3). After the glue was dry, I screwed the black inner windshield bezel in place to better determine how much more to trim the leatherette using an Exacto knife with a #15 blade (see Figure 4). Next I cut the holes for the defroster vents in the leatherette and located the screw holes to affix them. My vents and their attachment screws were showing the ravages of time, so I repainted them a flat black.

In addition to the metal spring clips, to further attach the removable shield to the fixed one, I used some Velcro strips glued to both surfaces just to the sides of the opening in the fixed glareshield. At best, this does not provide much of a seal and will allow heat to escape from the instruments below. Nowadays my radios all receive forced air from an avionics-cooling fan, so ventilation of the new glareshield is not as much of an issue as when the panel was originally designed.

Can the method I have employed be accomplished with the windshield still in

place? The answer is, for the most part, yes – but with slightly more difficulty. However, it would be nearly impossible to remove the ABS handholds because the screws that hold them in place are very close to the inside of the sloping windshield. These screws were put in place at the factory before the windshield was installed.

Covering the fiberglass shield with foam padding and fabric not only adds a

bit more of an upscale appearance than the original finish, but it also decreases the chances of marring the Plexiglas when manipulating the shield. Because my new instrument panel is well lit, I saw no reason to purchase the internally lighted version of the Ashby glareshield. The end result came out pretty well and is much easier to insert and remove than if I had tried to fill the entire area on top of the panel with just a one-piece cover (see Figure 5). 