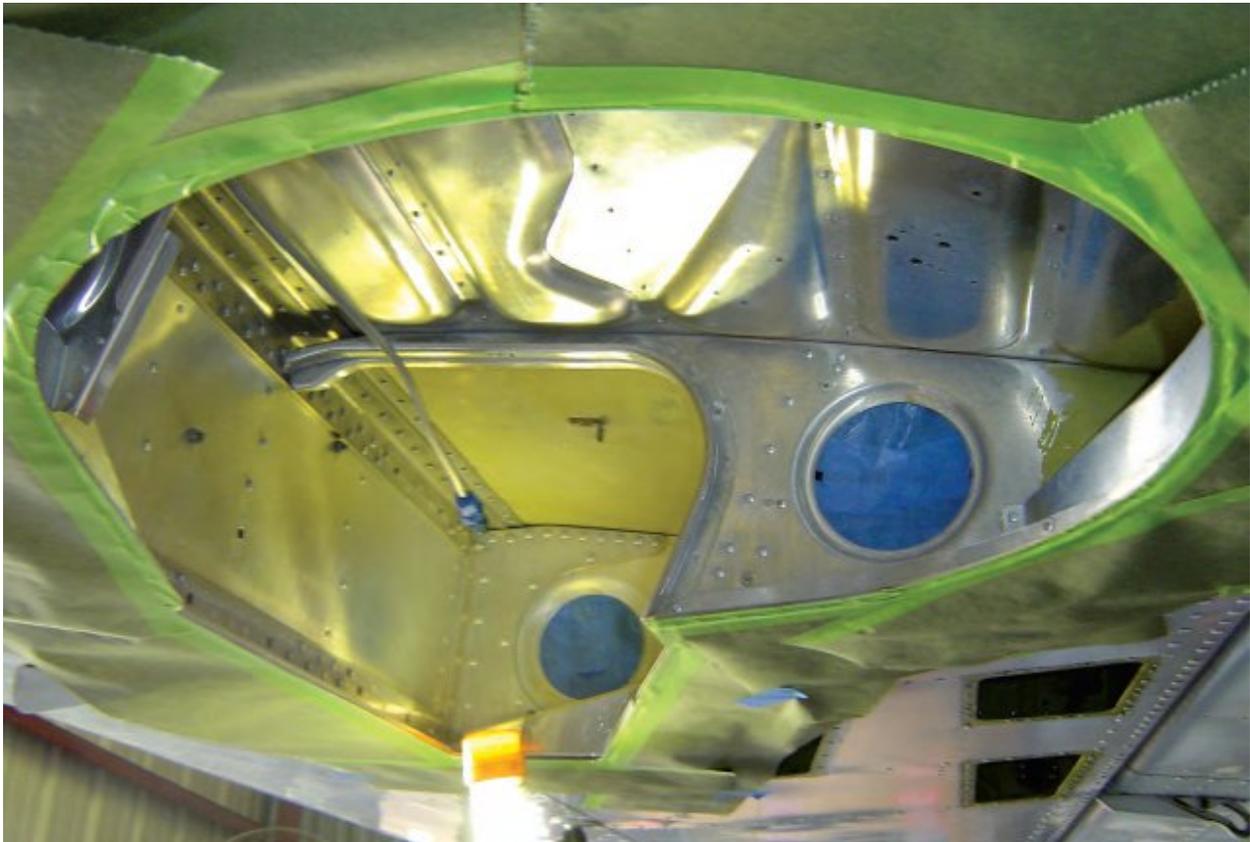


Just another Cheap Speed Mod, or Cabin Breeze-Reduction Too? (Feb 2011)

Matt Kurke, ICS #10288

Airflow creates high pressure under the wing and consequently in the wheel wells. There are three openings located in each wheel well to be blocked (see Figure 1 and 2). One is at the wingroot rib, a kidney-shaped cover; the other two are round covers. One is just outboard of the MLG strut; the other is behind the wheel-well splash shield. If you give some thought to this issue, you'll discover this approach is also a speed-mod. Remember Bernoulli's principle? The airflow through these openings entering through the wheel wells to exit points is a total waste of energy; except possibly to vent odor from mouse droppings.



*FIGURE 1: The objective is to make covers for the two holes pictured, in blue.
The photos in figures 1 and 2 were taken during the wheel well refinish project on my 400.*



FIGURE 2: Also make covers for the kidney-shaped opening in the root rib. These covers will benefit cabin-draft reduction.

The primary interest here will probably be cabin draft-reduction, although I prefer the speed-mod benefit. The kidney-shaped cover will be the most effective in this cabin-draft reduction approach. There is also a cover that is supposed to be in place where the main spar and conduit penetrate the fuselage. If they are missing, there will be a very large draft in the cabin (see Figure 3). Another point, although quite small, is the small area around the conduit entry/exit through the fuselage; plug those areas with some sealant (see figure 4). I use “duct seal”, a product of Gardner Bender – Google™ it – it costs about \$2 from various sources (sorry to say Home Depot no longer carries it). You could possibly purchase it at an air conditioning/heating establishment.

The Process

Use a piece of heavy poster paper/ board and cut to the approximate size, of the cover for the root rib, plus some margin. Measure the conduit diameter (7/8-inch?) and mark the hole location; use a circle template to draw the hole.

Slit from an edge of the pattern to the hole; then accurately cut the hole.

Position the rough-cut pattern over the conduit and using your fingers make an impression of the edge of the root-rib opening onto the poster paper/board. Now you almost have a pattern.

Using scissors, cut on the outline of the rib-opening impression, then lay this pattern onto another piece of poster paper/board and add a 3/8-inch margin.

You now have a new pattern. Test-fit the pattern and trim as necessary before making the final product.

The hole for the conduit should leave a bit of room to avoid contact, or make the hole larger (1-1/4 inch), like Figure 3, for a grommet AN931-14-20. Note: The wing root rib cut-out covers for the left side and right side are identical pieces, just mirror images.

There are two options: if you plan to install this cover with an installed conduit, use option 1; if you are using new conduits, use option 2.

Option 1 – make a two-piece cover split diametrically through the conduit hole; add ½-inch overlap at the split. Use pop rivets at the overlap to secure.

Option 2 – make this a one-piece cover as shown in Figure 2.

Use 2024-T3, 0.032-inch aluminium for all the fabricated covers. Use a hole saw for cutting the hole for the conduit opening in those covers. Install the covers using “3M Scotch-Mount double coated acrylic

foam tape". You can find it online, Google "3M Scotch-Mount", or try an automotive store like NAPA. It comes in ½-inch width which is too wide to apply neatly; cut to ¼-inch width. This stuff has an acrylic adhesive which is tenacious and thus works well on clean surfaces. Nix the silicone adhesive method here. Another hint – adhere some baffle material at the openings where the aileron cables enter/exit the fuselage; likewise flap cables (conduits on the 400) and flap step-lock cable.
©2010 Comanche Gear



FIGURE 3: This is the cover (blue outline) that should be found at this location. See discussion. Landing gear conduit (right side) shown at fuselage entry/exit point



FIGURE 4: Use "duct seal" here which will also reduce cabin draft somewhat and possibly keep wildlife from nesting inside the fuselage.