Firewall Grommets

This article is adapted from a process described by Tony Bingelis in a Sport Aviation article many moons ago and was downloaded from:

http://www.ch601.org/tools/firewall/firewall_grommets.htm
22 September 2009

The Procedure

You won't need much in the way of equipment or materials.

1. The material to use is thin (.015") stainless steel . . . a few scrap pieces will do. Stainless steel is very ductile and easily formed. Do not use aluminum . . . its melting point is far lower than that of steel - something in the range of 850-1200 degrees F.

2. You will also need a large socket wrench socket, and a short piece of steel tubing that fits loosely over the end of the socket.

3. A small scrap piece of soft pine about 3/4" x 2" x 4" to be used as a back-up block.

4. A large bench vise.

5. A pair of large metal tin snips.

With these five pieces of material and equipment at hand, you are ready to start manufacturing your own custom made firewall grommet shields.

The basic idea is to use both the socket and the short tubing length as dies, and your bench vise as an arbor press. You merely center the thin piece of stainless steel piece between the socket and the tubing, slip the assembly into the vise and squeeze. That's about it.

Now for the details

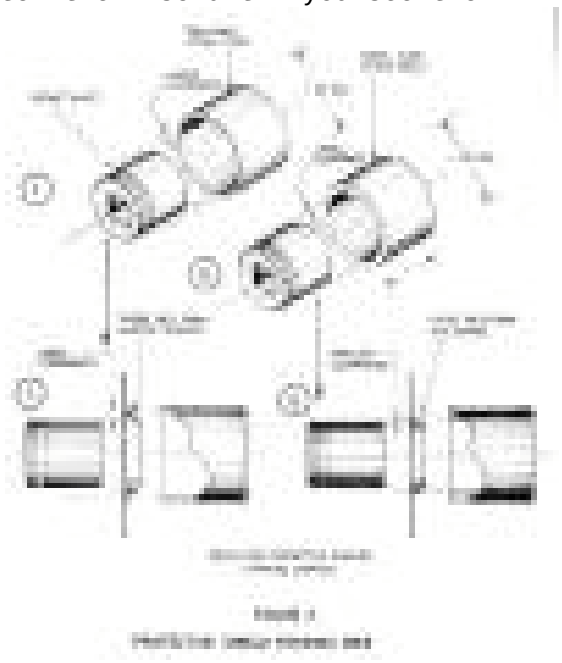
This picture shows the basic shape and dimensions typical of firewall shields. You can make yours larger or smaller to suit your needs. The only change would be to substitute a smaller size socket and a proportionately smaller piece of tubing as dies. The forming procedure would remain the same.

As you can see in the thumbnail on the left, the amount of clearance between the two "dies" determines the external shape (style) of the formed shield.

You probably have already examined the photo sequence and studied the drawings so

you should be familiar with the general procedure.

1. Begin by taking a scrap of stainless and holding the socket against it on one side, and the back-up block of soft wood on the other. Insert this assembly in your vise and tighten the vise until you see the socket actually sink about 1/16" into the stainless piece. That soft wood backing block crushes easily and allows this to happen.



2. Remove the assembly from the vise and you will see a definite circular indentation in the stainless piece. This indentation is necessary as it will allow you to accurately center the short piece of large diameter tubing over that embossed ring.

3. Place the socket back in its original position and, again, insert the whole assembly in the vise - this time with the large tube taking the place of the wood backing block. Squeeze the assembly until the socket is deeply imbedded into the stainless . . . approximately 1/8".

4. Then, without removing the now distorted piece of stainless, start to straighten the distorted metal edges any way you can. Tapping the stainless steel part with a small hammer - using a flat metal back-up block (bucking bar) held behind - is a good way to start. Tap away until the surplus metal edges are fairly free of large ripples and waves.

5. Remove the formed stainless part from the vise and cut away most of the excess metal with a pair of sharp sheet metal tin snips.

6. Complete straightening the edges of the formed stainless piece.

7. Use a thin strip of metal as a straight edge and mark the centers for the installation and attachment holes. Drill the screw holes with, say, a No. 19 drill bit, or punch them out with a Whitney punch. As for the center hole through which the wires, cables or engine controls will be routed, drill it to the size opening you will need.

8. Trim and smooth the edges and round the ends of the shield on a disc sander fitted with carburundum sandpaper. This edge trimming can also be done on a bench grinder with a fine wheel. Remember, the material you are working with is tough stainless and it can be very difficult to drill, trim and shape.

After you get the hang of it, you should be able to make one grommet shield in 10 minutes - and it will be every bit as good as a factory made one.

Go ahead and try making a few - it's quite satisfying. You could always give them to a builder/friend if you don't need them for yourself.

Inspecting Firewall Shielding Effectiveness
Remember, these firewall shields are to be used with rubber grommets and, sometimes, an asbestos washer behind them. The purpose of the grommet is to closely hug the wires, cables or controls passing through the firewall and protect them from being chafed or cut by the sharp edges of the firewall opening and the shield as well.

To evaluate the effectiveness of your firewall shield installations, you'll need help. Have someone stand outside the aircraft with a bright drop light or flashlight that he can shine on each shielded firewall opening.

With you in the cockpit, you should not see any sign of light shining through any of the firewall openings. If light can shine through, carbon monoxide and even flames can also get through.

Editor’s Notes:

Many shielded grommet installations of yesteryear have been observed to address the “light-tight, gas-tight, flame-tight” design goal by packing a cone of “fire putty” around the wire as it enters the grommet. Any well stocked hardware store or builder’s supply offers products for this purpose. Ask for “fire caulk”, “firestop putty, or fire-barrier”. These will come in tubes or caulking gun cartridges and are relatively inexpensive. B . . .

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