

Interior Restoration: My Tips and Recommended Supplies for the Project

Introduction. I have redone the interior of my Piper Warrior twice over its life and helped a friend redo the interior on his Piper Arrow IV. This guide provides the tips that I have learned from these jobs and suggested supplies and techniques that worked for me. Your mileage may vary.

Sound Insulation. I used the SoundEx soundproofing insulation (<http://www.soundexproducts.com/>) to replace the old fiberglass insulation in the Warrior. The dealer is always at Sun N Fun and has an effective product demo featuring a loud stereo speaker in a cooler with SoundEx attached all around the inside of the cooler. You will not hear the sound until the cooler lid is open. SoundEx sells the SoundEx pre-cut for your aircraft or sells the templates for you to cut your own pieces. You do not need either if you use your existing insulation to serve as a template. Existing insulation on mine had a layer of plastic attached to the inside of each piece. Just mark each piece with an up arrow so that you can remember how the new piece is supposed to go. Use an electric carving knife to cut the SoundEx. You can get a decent carving knife for about \$20 at K-Mart. You do not need adhesive; just press the new piece in. You can use 2" aluminum tape around the edges if you wish. You will need about three sheets SoundEx one-inch thick to do the side panels and door and more if you elect to replace the insulation under the headliner as well. Each sheet should be around \$110. I believe that the soundproofing did reduce the noise level but I did not have a good way to test. The biggest improvement was in insulation. The cabin seemed to better insulation in the winter and a little cooler in the summer.

Headliner. If your headliner is in good physical shape but discolored, you can use white shoe polish to cover it and remove the discoloration. I took a piece of cardboard with a paper towel attached and just pressed the shoe polish sponge on the top of the cardboard to load the shoe polish sponge and held the cardboard under the applicator to catch any drips. You have to do multiple coats. This worked great. Replacement headliners are available from Airtex. Other pilots also repainted the headliner with SEM Colorcoat vinyl paint but painting overhead will be messy and will require interior masking.

Seatbelt Re-webbing. It is a good time to consider re-webbing your seatbelts. I used Aviation Safety Products <http://aircraftseatbelts.com/>. They will inspect your seat belt buckles and other hardware and replace any defective parts.

Carpet. I purchased my carpet from Plane Plastics (<http://www.planeplastics.com/>) but Airtex (<http://www.airtexinteriors.com/index.php>) has good quality carpet as well. To install, you need to pull up existing carpet, remove old adhesive, and Scotch Brite (green and maroon) any corrosion you find. You can then put down some soundproofing from Airtex and then cover that with the carpet. I used 3M Super 77-aerosol adhesive to put the carpet down and 2" Industrial Velcro for the front mats to make them easy to remove for cleaning.

Removal and Replacement of Original Pink Underlayment Insulation. Underneath the carpet of the front seat area is some pink Styrofoam material that had cracked over the years. I removed that entirely, removed adhesive and any corrosion, and glued down Airtex soundproofing. The Airtex soundproofing has adhesive on one side with a peel off cover.

Snaps. My Warrior had a couple of places where the carpet needed to be snapped to the floor but the carpet from Plane Plastics did not have the snaps installed. I found some in stainless steel at the local West Marine store including an installer tool. Practice a few times on some scrap material to learn how to install the snaps into the carpet.

Seats. I got my seat covers from Airtex. I used vinyl on the panel walls (Barley and Tan) and leather seats (Barley). It will take a few weeks for Airtex to fill your order.

Headrests. Most of the Cherokee seat back frames are already pre-drilled for headrests. If you want to add headrests to your interior, you can get matching headrest covers and foam from Airtex (about \$60 for the headrest kit for two headrests). If your Cherokee did not have headrests, you have several options for making the headrest frame:

- You can pick up Piper headrests from a salvage dealer and recover,
- You can use a headrest frame from an automobile junk yard that has the same width and tube size,
- You can get two 36-inch stainless steel tube 3/8" and use a pipe bender to bend for the appropriate width to fit existing holes, or
- You can get four one foot stainless steel tubes 3/8" and a square foot of aluminum .064 inch for the headrest back.

I elected to use the fourth option. I bought the stainless steel tubes and the aluminum sheet from Aircraft Spruce. I cut the aluminum to two 3" x 7.5" plates using an air saw. I then used a grinder to round each of the corners so that plates would not cut the seat-rest covers. For the tubes, I used the grinder while rotating the tube to make one end of each tube to have a coned shape so that it would insert into the seat frame easier. I made two holes on the other end using a drill press at .5" and 2.5" from the top. I used a cobalt drill bit to drill the holes just large enough to accommodate #6 3/4" pan head machine screws. For drilling stainless steel, you want to lower your drill speed to the lowest setting and use pressure on the drill bit for best results. I used a Harbor Freight pilot hole bit first because the drill bits tended to bend a little with the risk of breaking the bit and not centering your holes. You need to deburr the holes you drilled on the SS tubes. Once you drill the tubes, you can place them in the seat frame, place the plate behind both tubes and center, and drill the plate through the tube holes. I used a washer and a lock nut on the back of each and it worked great. I then wrapped aluminum tape around the metal plate to minimize cuts to the inside of the headrest cover. I found that inserting the foam in the seat rest cover first and then inserting the frame into the foam worked best. The seat covers have Velcro on the bottom to hold the cover around the frame. You will need to consult with your A&P to see if a signoff is needed for the headrests.

Slings. If your seat slings are original, chances are that they need to be replaced. My front seats were original and seat backs had serious rips in the fabric. One seat had a rip over 10 inches and the other had a rip about 6 inches. You can inspect yours by removing the plastic back to the seat. The seat bottoms had a heavier plastic web fabric, which was in good shape but had about a 2-inch sag in the center of the seat. I considered reusing that fabric and tightening a bit but eventually decided to replace both seat backs and bottoms with new fabric. I bought the sling material from Airtex. The sling material was not listed on the Airtex website but available if you give them a call. For the adhesive, I elected to use Weldwood Contact Cement available at Lowe's hardware (http://www.lowes.com/pd_10106-68-25312_0). The Weldwood seemed to be the preferred adhesive of automobile upholsterers because of low cost, local availability, and ability to hold up well in high heat environments. If you order online, you will find the shipping cost to be a little expensive because of a hazardous item charges. I believe that it was around \$10 a quart. Do not get the environmental friendly version of this adhesive because that has a much longer drying time and will not hold as well. Keep the lid on the can when you are not using the adhesive. Weldwood can be used with a low cost paint gun (think Harbor Freight) and a compressor without thinning, but I elected to use four one-inch utility paintbrushes (about 75 cents each at Lowes) instead. To prep the seat frames for the new slings, I removed that old seat fabric, foam, and pulled off the old slings. The seat bottoms were a little tougher to remove because they had several hog-rings and staples in addition to the glue. I just used a razor blade cutting knife to cut it off. Once the sling material is removed, you

need to clean off the old adhesive with 3M Adhesive Remover (sold by the quart online or at a local automobile paint store) and MEK. I then repainted the frames with Satin Gloss Black from Eastwood (www.eastwood.com). Eastwood's paint seemed to be better quality with higher durability and a spray nozzle that sprayed in a finer mist than hardware store variety. Do not paint any part of the seat frame where you will be applying adhesive because the adhesive will dissolve the paint (that warning is on the glue label) and additional glue will have to be applied. You also need air temperature to 65 degrees or above for adhesive to dry properly. To get all the slings tight, I did one end and waited until it dried and then did the opposite end. After that, I did the sides. Harbor Freight 2-inch clips are helpful in keeping everything tight until the glue dries. Drying time is about 20 minutes for the adhesive. Consult with your A&P on procedures for a sign-off on the slings replacement. I found very good videos on replacing the seat slings at YouTube:

<https://www.youtube.com/watch?v=31ED61lxdEq>

<https://www.youtube.com/watch?v=IDu9dTncxLk>

<https://www.youtube.com/watch?v=h1XYKcp0O5E>

<https://www.youtube.com/watch?v=8K8RDrloqXE>

Foam and Seat Cover. To attach the foam to the sling, you can use either 3M Super 77 aerosol adhesive or 3M High Strength 90 aerosol adhesive. The new Airtex covers slip over the back seats and have Velcro to close the bottom of the seat back. The seat bottoms have the foam built into the seat and can be attached to the seat with hogrings (hog rings and hog ring pliers come with the Airtex kit). You no longer need the plastic seat backs with this new Airtex design.

Bench Seat Installation. The bench seat on my Warrior has a bracket that attaches the seat back to the airframe. There is also a small bushing (about 3/8") that goes between that bracket and the airframe. I used a Harbor Freight hollow hole punch (<http://www.harborfreight.com/6-piece-hollow-punch-set-67030.html>) and a power drill to make the hole in the side panel for that bushing.

Covering Front Seats. Before starting on the front seats, you need to clean and repaint the frame. Avoid painting any part of the seat where you will be using adhesives. Next, lubricate all the moving parts on the seat including the seat rollers. Inspect operation; we found that one seat had a missing tension pin and another tension pin was misaligned; this affected operation of the seat back release. If you have seats with adjustable height, make sure the lift cylinders still work properly, else replace or repair. The lift cylinders are one of two types: Some have a visible spring; those may be rebuilt. If yours does not have a visible spring, then order a replacement from McFarlane. It is easier if you remove the seat back from the seat bottom by removing the bolts on each side of the seat. For the seat back, it is easier to install if you fold the bottom part of the seat cover up like a pillow cover. Pull the top part of the seat cover over the seat back as far as you can. Make sure that you can feel the seat back through the top of the seat cover. Now is the time to make holes in the seat cover for the headrest. The easiest way to do this is to use a large pick and insert inside the seat cover on the backside of the seat back through the holes in the seat frame. Push up slightly but do not puncture the top of the seat cover. You should be able to see the indentation of the pick on the top of the seat cover. Now put a hollow hole punch for a 3/8 inch hole in your electric drill and center the hollow hole punch over the pick indentation. While holding the pick in place, start the drill. You should now have a perfectly round hole over the hole in the seat back. Now roll the rest of the seat cover down over the rest of the frame. Pull tight and fold over the Velcro to fasten. If it is tight, you should not see any of the Velcro from the back. To install the seat bottoms, I placed the seat bottom upside down on a table, sprayed some adhesive on the foam and some on top of the

seat sling, set the seat over the foam, and let that dry a little. Next, I trimmed about 2 to 3 inches of the foam around the bottom of the seat. This will give you more clearance for the hog rings, which seem to be a little shorter than they should be. I started on the back part of the seat, applied some adhesive to the back part, and used four hog rings to attach it to the seat. Some pilots that use the Airtex kit invest in better hog ring plyers. You have to press down hard on the hogging pliers to get it to through the fabric. Now do the same for the front of the seat. Then do the two sides.

Plastic Panel Overlays and Window Trim. To refinish the plastic overlays and trim, you need to first inspect all of the existing pieces and see if they need to be replaced. You can get these from Plane Plastics. The plastic pieces will likely need to be trimmed to fit. I used a Dremel tool with flat cutting disks and a small hand planer (Stanley 21-399 6-Inch Surform Pocket Plane) to trim down. I then removed each piece and painted with SEM Colorcoat Vinyl paint. I used 15453 Gloss White for the window trim and top of door and 15243 Satin Black for the front panel and flaps cover. You will need to get a set of new placards to cover over the front panel and flaps cover. For each piece, I removed part from the plane, washed with soap and water, cleaned with alcohol, and then primed with SEM 38373 Solvent Pre Cleaner. The SEM makes the plastic a little tacky and promotes paint adhesion. Avoid sanding if you can to protect surface texture. You can get SEM products from Plane Plastics or TCP Global (<http://www.tcpglobal.com/>). SEM will send you a color chart if you want to see other options. If your existing trim just needs minor repairs, consider getting a plastic repair kit from Plane Plastics. You get a quart of the repair paste (pulverized plastic mixed with acetone or MEK, I believe) for about \$10. If you have panel pieces with cracks all the way through, consider using fiberglass tape (available from the hardware store as a drywall crack repair) and JB Weld on the back to provide better structural support and then the plastic repair on the front.

Wall Panels. To install the Airtex wall panels, you need to remove all the seats and the old panels carefully bagging all the plastic parts you remove along with the screws that held them on. The new panels have markings on the back when holes should go but you need to use great care before you start cutting. First, place the new panels under the old panels to verify that the cutouts on the new panel closely match the holes in the old panel. On the front panels, see how the cutouts for the ribs match up with the rib. I like to start from the front and cut each hole (for vents, static drains, fuel tank selector valve) one at a time and a little smaller than the panel cutout and hang it on the clips for final adjustment. Remember that you can always trim your holes larger but you can't make them smaller. Once you have cut all the holes, you can begin reattaching the plastic pieces. To check-hole cutouts for the armrests, I used an awl and inserted it in the hole for the armrest screws. I used a hole finder (<http://www.aircraftspruce.com/catalog/topages/strapDuplicator.php>) to make the holes in the panel for the top screws. I used # 4- 3/4" ovalhead sheet metal screws and a #4 finishing washer for each hole. A bag of 50 each should be sufficient for the side panels. However, get a few #4- 1-inch oval head sheet metal screws because you will find a few places where the others will be too short. Avoid tightening these screws more than needed because the finishing washer will cut the panels over time. You can minimize this by using a #4 flat plastic washer under the finishing washer. I also sent my armrests to Airtex for recovering. They use the original plastic but remove the ashtrays, use thicker foam on the top, and cover the whole armrest with matching material.

Switch Covers. If your Piper switches are faded and hard to read, Arrow4Graphics sells Lexan covers for them that just adhere to the switch.

Restoration of Circuit Breaker Panel. Arrow 4 Graphics makes custom overlays for your circuit breakers and it includes new breaker overlays. Last time I checked, prices were reasonable. [Arrow Graphics - Interior Placard Kits your Piper Cherokee](#) Arrow4Graphics offers custom overlays for your circuit breaker. These are done in Lexan plastic. Additionally, you can

get replacement round knurled panel nuts to replace existing nuts around your circuit breakers. These are Switchcraft part T10711, a nickel-plated 15/32-32 nut that matches the original nuts pretty well. You can get 25 of those from Mousers for around \$14.

LED Bulb Replacements. I replaced all my GE53 panel lights and overhead light with LED lights from SuperbrightLEDs:

- Overhead White Floodlight is 67-W15 Natural White
- Panel and Engine Gauge lights are BA9S-W-120-12VAC-20PK

--Kent Shaw