

I couldn't even wash my airplane!

Every time I tried to wash or wax my airplane, I was unable to clean anywhere near the wing root seals. A swipe of the brush or a rag always crumbled some of the black rubber off the surface of the seals, leaving ugly black streaks. So nobody knew it, but my airplane had never been properly cleaned or waxed at the wing roots.

Why? Just how old were they? I don't know. But the paint lines under the seals indicate they were not replaced when the airplane was last painted in 1988, 25 years ago (cheap paint job, don't tell anyone). There are no logbook entries for seal replacement before that, but the airplane was also repainted in 1975. If I assume they were replaced at that time, the seals that are on there now are at least 38 years old! Well, no wonder they were crumbling.



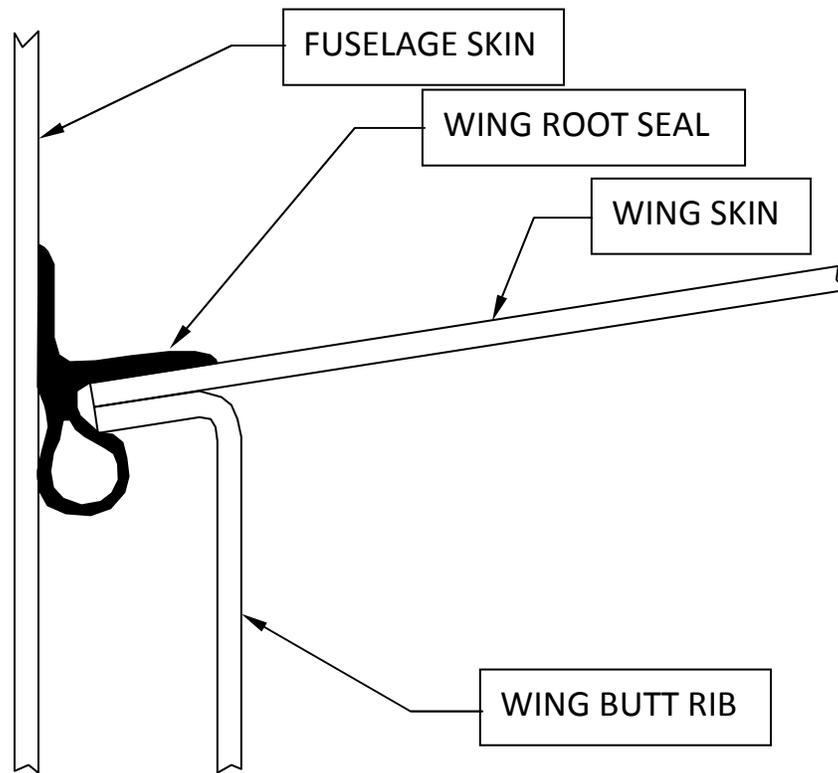
Paint line dates the seals to before the last paint job 25 years ago.

I bought new wing root seals from a popular supplier two years ago, before the 2012 West Coast Cherokee Fly In. They were the same brand that Michael bought when he agreed to replace his own seals at that event. I helped him. Much to my surprise, what I thought would be a simple job was really, REALLY tough! After two honest-full days of swearing, many broken putty knives, a half-gallon of Miracle Bubbles, and the help of the entire fly-in crowd, we got his airplane finished in time for him to fly it home...but the job was so tough, and such a bad experience, that I chickened out replacing my own...until I discovered the seals made and sold by Brown Aircraft Supply.

On the recommendation of several Cherokee owners, I bought the wing root seals from Brown Aircraft Supply in Jacksonville, FL. They cost about the same as the other seals, and had the same cross-section shape, but the material was of Neoprene rubber and MUCH softer and more-pliable than the other brand. So it was that I approached my airplane with new wing root seals in hand, prepared to do battle.



Cross-section of the new wing root seals before installation.



Approximate Cross-section of the new wing root seals after installation.

First Step: Remove the old seal. Those old seals did not come out easily. Every time I was able to grab the end with the pliers, the rubber just crumbled. I was also wary of another owner's experience where someone removing the old seal by pulling on it too hard managed to curl up edges of the wing skin in the process, damaging it. I ended up removing the old seal inch-by-inch, often having to dig out the bits of dried-out rubber with a pick-and-hook set. They were eventually removed...but it took more time and effort than I expected.



Removal of the old, crumbly wing root seal took more effort than expected.

Second Step: Wash the paint under the old seals. As you can imagine, there was at least 38 years of grime under them. Simple Green Aircraft and some red rags made this step quick and easy.



Washing at least 38 years of grime from under the old seals.

Third Step: Refinish any bare aluminum. Where paint had worn or bubbled off the edge of the aluminum wing skin, I scrubbed with scotch brite to remove loose paint flakes and clean the aluminum surface.

Fourth Step: Refinish any bare aluminum: Where paint had flaked off, I masked the area with blue painter's tape and refinished with a coat of zinc phosphate primer.



Refinishing some places where the paint had flaked off.

Fifth Step: Wax the paint under the seals. I had never been able to do that before! I used Seal-a-Plane from Aircraft Door Seals.

Sixth Step: Install the new seals. Both sides worked exactly the same. On an 85-degree day, I started on the top aft and worked my way forward. I left the new seal long until after it was all installed, then trimmed the excess as the final step. I used Miracle Bubbles soap, as the high-glycerin soap is harmless to the aluminum and has the consistency of really slick snot, a perfect lubricant to help the bulb of the rubber seal slide into the gap between the wing and the fuselage. Working an inch at a time, I used plastic putty knives to help force the bulb into the gap. Where the new seal crossed over the wing spar, on both the top and bottom, I trimmed the bulb so that the seal would lie flat and smooth on the outside. Besides the wing spar, there was only one location where trimming the bulb was necessary on my airplane, that is near the leading edge of the wing where the gap was too tight for the seal to fit. Elsewhere, the bulb fit into the gap with patience, lots of soap, and the plastic putty knives.



I trimmed the bulbs from the seals where they passed over or under the wing spar.



Working the bulb of the seal into the gap with a plastic putty knife. Tough, inch-by-inch work with plenty of Miracle Bubbles soap.



I was hoping to avoid the new seals pinching into the gap at the leading edge as shown here, but they just don't fit right any other way. The old seals were like that, too.

This is where the seals from Brown Aircraft Supply really shined. Compared side-by-side, the rubber of the other brand was much stiffer and harder than the Brown's seals. The harder rubber is much tougher to force into the gap. This is why we ran into such trouble on Michael's airplane. The softer rubber of the Brown's seals made this job much, MUCH easier than it was on Michael's.

Last Step: Trim off the excess seal. Once the seal was trimmed even at the aft edges, the job was done.



I left the new seals long until they were completely installed, then trimmed the excess (top and bottom).



New seals installed, looking' good, now I can finally wash and wax my wing roots normally.

From arriving to the airplane to leaving the airplane took me about 5 hours, which included working slow, waiting for paint to dry, taking photos, and taking breaks to play with the kids, and clean-up. There were times, particularly working over my head under the airplane, that my arms hurt and it tough to get that bulb to fit. Overall however, it was a far cry from the agony endured on Michael's airplane.

Conclusions: Provided you use seals that are soft and pliable, this is a job that is well within the reach of the average airplane owner, and falls under preventative maintenance per FAR Part 43. Simple tools are all that's required. I annotated my airplane logbook as the airplane owner and operator.

I recommend Brown Aircraft Supply's wing root seals. In addition to the Brown's seals being easier to install than another brand, their customer service is excellent. When they found out about the West Coast Cherokee Fly In, they also jumped at the chance to support us. Please check out their catalog, they sell a lot of products used on our airplanes, but I can say from experience that you will really be doing yourself a favor by using Brown Aircraft Supply's wing root seals on your Cherokee next time yours need replaced.

Supplies and Tools Used:

Description	Source	Price Each	Qty	Price Total
Things I had to buy for this project:				

Wing Root Seal, black, 12 feet, Part Number WR-693-B	Brown Aircraft Supply, http://www.brownaircraft.com/	\$52.30	2	\$104.60
Bottle of Miracle Bubbles	Fred Meyer Department Store	\$0.99	1	\$0.99
Things I already had in the toolbox:				
1-1/2 inch Plastic Putty Knives	Ace Hardware	\$0.99	2	\$1.98
3-pack Green Scotch-Brite pads	Ace Hardware	\$3.49	1	\$3.49
Aerosol can, Tempo Green zinc phosphate primer	Spencer Aircraft Supply, http://spenceraircraft.com/	\$10.75	1	\$10.75
32-oz Bottle of Simple Green Aircraft	Spencer Aircraft Supply, http://spenceraircraft.com/	\$15.95	1	\$15.95
Package of 25 red rags	Harbor Freight	\$7.49	1	\$7.49
4-piece pick and hook set	Harbor Freight	\$1.00	1	\$1.00
Needle Nose Pliers	Harbor Freight	\$2.19	1	\$2.19
Side Cutter Pliers	Harbor Freight	\$3.29	1	\$3.29
Hobby Knife	Harbor Freight	\$0.99	1	\$0.99
Screwdriver	Harbor Freight	\$1.99	1	\$1.99
Roll of Scotch 2 - inch blue masking tape	Harbor Freight	\$4.99	1	\$4.99
Total spent for just the items I didn't already have in the box:				\$104.59
Total if I had to buy all these items new:				\$159.70



Tools and Supplies Used (note I broke both of the putty knives I bought...oops).