

Not too long ago I noticed a chunk of wood in the driveway where the roadster had been parked so I crawled under the car and found that the wood had come from the fillet piece of the wooden door frame on the right side. I inspected all the frame wood along both sides and found some deterioration along the bottom of the door rockers but none in the door risers. In my car, the door risers seem to have been made a different and more durable wood than the rest. The door hinge post and the wind screen pillars were intact and very sturdy. The fillet pieces had been cut with the grain oriented vertically so had apparently been wicking road moisture up into the wood, resulting in extremely rotten fillet pieces. The figures below show the front left door frame from the underside of the car and a paper cutout of the fillet to show where it fits in the car. There were also some issues toward the rear of each rocker, primarily cracks and voids that required some attention as well. My goal was to stabilize the wood frame components and replace the deteriorated fillets.

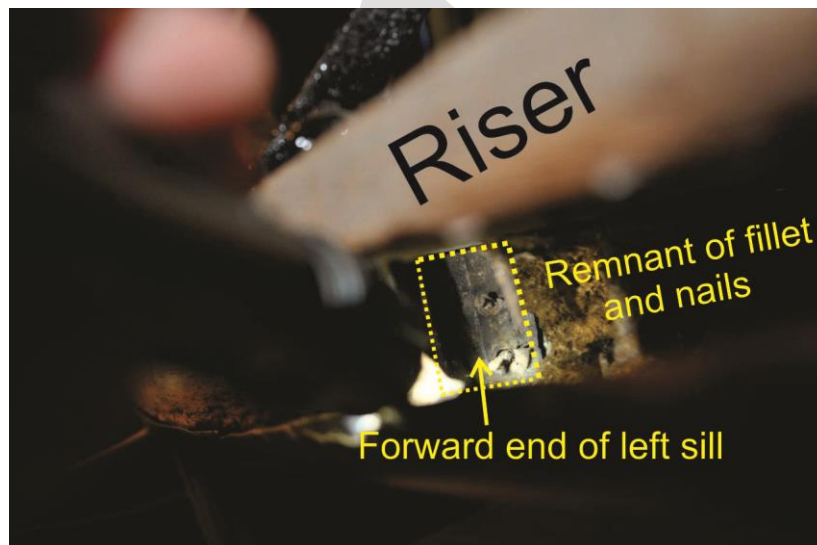


I obtained a set of drawings of the wood door frame from Keith Gulliford with the intention of replacing the fillet pieces. However, after looking over the instructions, it would have required that the aluminum body be peeled away from the wood frame, followed by substantial body work and a respray which would have been very expensive. This car had belonged to my father and the paint finish on it is very important to me. After consulting with Keith as well as Ron Cromar and some other club members, I decided to try to restore the wood using a product similar to one I used in the 1970s to restore a deteriorated fife rail on an old square rigged sailing ship when I worked for the San Francisco Maritime Museum. The product I had used was no longer available but something called Clear Penetrating Epoxy Sealer (CPES) marketed on the web (www.rotdoctor.com) appeared to be very similar. It is essentially a very thin epoxy resin that can penetrate wood in rotted areas very efficiently and is used mostly in marine applications. Once in the wood, CPES hardens and bonds with the wood, strengthening it and killing any microbes that cause rot. Once hardened, it makes the wood waterproof. The key is to have very dry wood to maximize penetration. It will not fill in completely rotted wood, so I spent a few hours

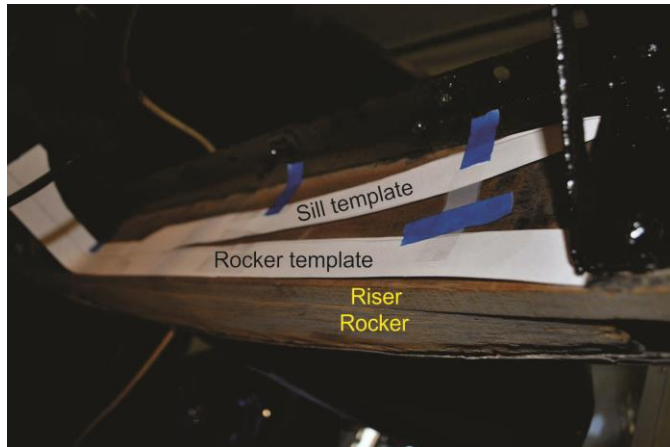
with a screwdriver and other tools removing the two rotten fillet pieces as completely as possible. I ended up with an impressive pile of wood chips and sawdust.



CPES is easy to apply if you have direct access to the wood, but of course it is never that simple with a roadster. If I looked into the space where the fillet pieces had been I could just see the forward end of the door sill as well as the nails that used to connect it to the fillet. The forward ends of the sills were amazingly intact where they had contacted the fillet and seemed fine.



While I had the car up on stands with the floor removed I stripped the metal frame of the car with a pneumatic needle scaler to remove grease, rust and old paint and repainted it with POR 15 paint. I cleaned and sanded the wooden riser and rocker on the exposed sides so they could better absorb CPES. From Keith's drawings, I traced paper cutouts of the sill and rocker for each side. I then taped the cutouts to the door riser to visualize where they were located.



I drilled a series of $\frac{1}{4}$ inch holes angled slightly downward through the riser so they would penetrate to the center of the rocker behind the riser. I decided not to try to drill holes into the sill through the riser as the sills appeared intact even where they contacted the rotten fillet. I spaced the holes into the riser and rocker about 5 or 6 inches apart. Toward the rear I had to drill through a part of the metal frame to get into the rocker. The purpose of the holes was to have a way of getting the CPES into the interior of the rocker as recommended by the CPES supplier. I also drilled some vertical holes down into the riser to allow CPES entry into the interior of the riser. I supported the car on four wooden blocks placed under the brake drums so the frame would be in its natural position instead of on stands that support the frame.

Along with the CPES, I had ordered a hand spray bottle, a large syringe with thick needles and some paint brushes. I also purchased a respirator with charcoal filters for protection from the fumes and some tubing to attach to the syringe. I used double examination gloves when handling the CPES. I placed a small electric heater below the car and left it running for several days to ensure the wood was as dry as possible to allow the best penetration by the CPES. I masked the car paint that might be exposed to the CPES with some transparent packing tape as recommended by the CPES supplier. My plan to apply the CPES was as follows:

1. Spray CPES into the void left by the fillet in order to saturate the end of the sill as well as to saturate any remnants of the fillet and to saturate the end and top of the rocker and sill as far as the spray would reach.
2. Use the syringe with a needle to pour CPES into all the holes I drilled through the riser.
3. Use the syringe with tubing to saturate the top of the rocker and sill with CPES as far back as the door hinge post.

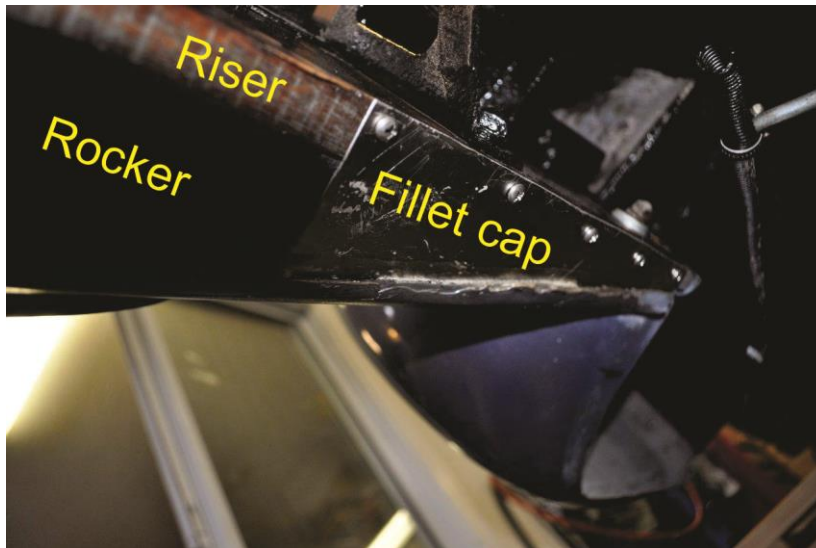
4. Use the syringe with a needle to inject CPES into any voids or cracks in the exposed rocker, especially toward the rear near the door hinge posts.
5. Use the paint brush to saturate the reachable sides of the riser and rocker.

The best way to do this is to apply the CPES repeatedly to maximize the amount that can soak into the wood. I worked the left side of the car, then switched to the right side, and back and forth until the CPES set. This took several hours, used several liters of CPES and was very messy. My shirt sleeves and much of the garage floor were soaked by the CPES. I probably applied CPES at least ten times to each part of the frame in that time period. It soaked into the wood very quickly. Of course I was essentially wallowing in the CPES when I was under the car as excess constantly dripped down. I had the garage door open and several fans blowing air out of the garage, but still the respirator was essential. After a few days I mixed up some epoxy filler from the same company to patch over the holes I had drilled and to fill in some cracks and voids toward the rear of the sill. Ordinarily, applying epoxy filler to wood does more damage than good, but since the wood had been treated with the CPES, I think the filler will work well as it is designed to bond to CPES treated wood. The filled holes in the riser can be seen in the photo below. You can also see how the CPES leaves a plastic-like sheen, almost like a varnish, except that it soaks into the wood and doesn't just coat the surface.



The next issue was how to fill the void where the fillet had been on either side. After a lot of thought, web research and consultation with others, I decided to use epoxy semi-rigid automotive foam sold by 3M. This is very different from the expanding foam used to insulate window frames in houses. It is strong, but unlike rigid foams, it can be removed at some point in the future. Because it is epoxy based, it solidifies completely over time. My understanding is that window frame foams do not always cure completely in thick applications. Pillar foam is used to add strength and sound deadening to hollow structural pillars in modern cars. It requires a special applicator that is kind of like a caulk gun and uses

special 3M pillar foam cartridges. I made an aluminum bottom cap for each side of the car flush with the bottom of the sill so the foam would stay in the fillet void. I attached a mixing tip to the applicator and a foot of tubing to the mixing tip. Then I applied the foam into the void through a gap on the front side along the metal frame. The foam expands and I used an entire tube for each side. The process only took a few minutes and appeared to fill the entire void. A few days later I trimmed off some excess foam that had extruded out of several gaps, and then sealed the cut edges with some thick epoxy resin. This should prevent road water from wicking up into the foam cells that were cut.



If I was doing a complete restoration of the car and it didn't already have such a beautiful paint finish, I would have certainly replaced the wood. So the main question that remains is how long do I expect this repair to last? The spongy bottom of the rocker is now very hard and makes a sharp noise when tapped, so I think the CPES did its job. I think I was thorough in getting the CPES into as much of the wood structure as I could. I have no way of thoroughly inspecting the pillar foam since it is sealed away, but it seemed to have cured properly where I could get to it. I have thought that the worst thing that could happen would be that somehow the pillar foam could prevent water from draining out of the door frame area and if somehow the CPES didn't penetrate very well, the rot problem could continue. Being an optimist and considering all the hard work that was put into it, I think the most likely outcome is that I have successfully stabilized the wood door frame in my roadster and I won't have to worry about it again!