

## Polishing Stainless Steel and Aluminum

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This paper describes the process for restoring stainless steel and aluminum parts. While it is particularly aimed at car hobbyists, the process is applicable in the home as well. Towards the end I will include some household uses. After ten years or so, and a mishap in my garage, I have added another tip to this for seriously damaged pieces.

One of the advantages of Corvairs and many cars of the 50's and 60's is that the shiny trim is made of Stainless Steel and Aluminum rather than Chrome and Plastic. But the fact that these cars are 40 to 60 years old has subjected them to dents, weather and scratches.



Of course, there are some pieces that cannot be repaired, or some that it is easier to replace than fix, but even the replacement pieces may have scratches, especially since they will probably be used rather NOS. The process for stainless steel varies slightly from that of Aluminum.

Here is the same car after a little work



### Stainless Steel Trim

The first step in restoring stainless trim is to recognize that it is solid stainless steel. Except for dents, you can sand away everything you don't like. And with dents you don't have to get them perfectly smooth. As long as the remaining marks are within what you will sand, they will go away. Dents such as these are actually easy to get out.



The first step is to find two materials that are firm, but not hard. This avoids stretching the metal. I had a scrap of thick leather left from my BBQ apron, so it became my base surface. I then took a small scrap of wood that I could easily form or shape on the grinder to match the surface of each piece. I placed the trim piece on the leather, the shaped stick above, and hit the stick with a hammer. I thought it would be easy to damage, but it turned out easy. A few hits, inspection, more hits, more inspection.



As it approached “straight” I used a piece of sandpaper on a block of wood to sand or “block” across the spot, identifying high and low spots.

Once the dents were out, it was time to sand. There are some air sanders that might be better at this, but I did not have any and decided to sand by hand after trying a mini-grinder with sandpaper discs. It made too many swirls. Hand sanding is really not that hard.

Here is a close-up of part of the upper windshield trim before I started.



I first tried 150 grit paper, and quickly found that while it took damage off quickly, it left big scratches that were hard to get out. Jumping up to 320 was taking too long to get the deep pitting out, so I settled on a first pass with 220 grit. It might have been better to use water, but I did not have any waterproof gloves. I do recommend gloves, and used the ones you see. These saved a few knuckles on the grinder.

On areas where there had been dents, sanding with a little piece of wood behind the sandpaper took out the high points. Then it was just straight sanding, sometimes concentrating on deeper areas.

Several people told me just to polish, nothing more. I originally tried that and this is what I found after polishing my gas filler trim without sanding first. This had obviously been hit by many gas pump nozzles over the years.



I did not want polished scratches, so I decided to try sandpaper and developed the rest of the technique.



Once I thought I had gotten rid of the big pitting and scratches, I moved to 360 or 400 grit paper. If I discovered any deeper scratches, sometimes I went back to 220 for a few minutes.

When I had a smooth, uniform surface, I moved up to 500 and then 600 grit paper. At this point the pieces started looking pretty new, and at first, I started polishing from here, but then I decided to try 1000 grit paper before using the polishing wheel, and this saved a lot of time and mess on the polisher.

I recommend safety glasses to keep the polishing compound and cotton threads out of your eyes. The gloves also helped keep a good grip on the parts.



This is a small Craftsman grinder with a polishing wheel. I tried different polishing pastes and compounds, finally realizing that the white polishing stick was the best at taking it to a good shine without caking, followed by a red polishing stick for the mirror finish.

This is the finished gas filler trim that is shown at the beginning where first I tried polishing without sanding.





Here is the final polished upper windshield trim piece we started with in the first close-up.



The vertical trim around the roof and windows had a lot less scratches, but the weather had taken its toll. Here is a comparison of two pieces from the roof trim, one before and one after polishing. There were only a few spots on these that required the 220 grit paper. For the most part I started with 360. The reflection is of my jeans and belt buckle.



Once all pieces were sanded and polished, I added a little wax and put the pieces aside until the body was repaired and painted. Here is the finished set of belt trim.



Here is the finished set of roof and windshield trim.



### Sharp dents

As I progressed and became more comfortable with the process, I found that those dents that would not come out with the wood and hammer could be removed with a wide, flat screwdriver and the hammer. It helps to grind both edges/ends of the screwdriver blade so that there is no deep dent where your hammer stroke ends.

Here we have part of my replacement rear piece before doing anything with it.



The wood can take out the big dents like the one in the upper piece in this picture (left rear fender).



In this picture you can see how the wood was effective on that upper piece.



But the ones in the creases need more direct impact, so the screwdriver and hammer on the leather strip take them out. This just takes a little patience and practice.



The next step is sanding fairly aggressively with 220 grit paper wrapped around the wooden stick. The object here is to eliminate any high points and discover any low points that remain. If you discover any, just go back to the hammer.



Once it is sanded flat, or following the contour, and no high or low spots remain, it is time for the 360 grit sandpaper. I used this first with the stick to make sure I had everything straight and then finished up with finer paper.



Here you can see how it looks after sanding with 500 grit paper. It is straight and smooth, although not shiny.



The next step is to sand with the 1000 grit paper and polish as before with the polisher and white compound, then red compound for a finer shine.

Here is the same piece, polished and installed on the back of the car.





Thirteen years after restoring all of this, a house painter got careless and slammed two corners of my Corvair with a ladder. This is how he left that corner.



Since this was a very hard hit, and located on the curve, where just hammering might straighten it lengthwise or not be able to get the right depth, I cut a groove in a piece of wood to the depth and approximate shape of the piece.



With this groove I was able to use the wooden stick, ground to different angles, and my slightly rounded screwdriver (just take the corners back a couple of mm), to return the piece to its proper form, sand it, and polish it, as you can see in the next picture.



## **Aluminum**

Although aluminum is also pure metal and can be sanded, there are two problems with its restoration:

1. The anodized coating that comes from the factory and protected it during its first years. This is very hard and resists polishing.
2. Aluminum is soft. This makes corrosion deeper. Additionally, the aluminum sill plates are located where they get kicked and stay wet, often with salt or other compounds. Finally, sill plates are the most neglected since they are not seen.

Because it is soft, I was originally afraid to sand the aluminum parts. I started with the headlight bezels, and soon found that it was very time consuming to get through the anodizing.

Here is my first attempt at polishing without removing the anodizing.



Looking on the internet I found a recommendation to use caustic soda (drain cleaner) to remove the anodizing. This starts bubbling and I used a brush to keep fresh solution where it was needed. It takes between 1 and 2 tablespoons per gallon of water, with only about 10 to 15 minutes soaking.

Once I had the anodizing off, I tried the sandpaper and found it best to start on the bezels with 600 grit paper. This quickly took off the dull finish and began to put a shine on it.



I found that polishing directly from the 600 grit paper left a lot of clogging of the polishing wheel, so I followed up the 600 paper with 1000 grit paper before polishing.



The bezels have small grooves that required the use of a little ice cream spoon on the sandpaper to get into the grooves, followed up by the white polishing stick and a polishing wheel on my mini-grinder.



The bezels have a lot of curves, so I combined the polishing wheel on the grinder for the outside and one on my drill for the inside, clamping the bezels to the table.



Then I coated the finished bezels with a clear thermo-plastic spray paint to replace the original anodizing and protect the finish.



Putting these together with the stainless headlight rims that I straightened and polished, as well as the headlight housings that I sandblasted, patched, and painted, the headlights are ready for assembly on the car.

I also used my wood and leather to straighten the galvanized bowls for the headlights, then sanded the rust and plastic coated them. If it had been available I would have used a zinc spray on the galvanized parts.



## Aluminum Sill Plates

The sill plates presented another problem. Heavy sanding of the corrosion would have taken out the stamped design, so I had to compromise how far I would sand certain areas.

Here are a couple of them in their original condition.



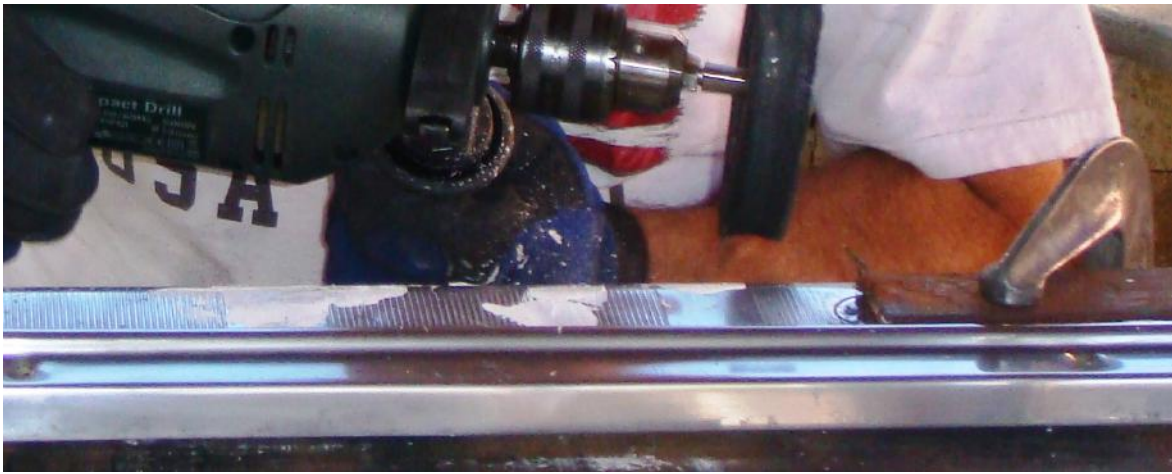
Here is a close-up that shows some of the deeper corrosion.



I did some sanding with an orbital sander, but in the end found that I had more control using my hands. There were a few areas where I used 150 grit, but for the most part I started with 220, then 360 or 400, then 500 and 600 before finishing with 1000.



Once everything was sanded and basically polished with 1000 grit paper, I started polishing with an abrasive polishing paste. Since these are long and flimsy, I found it easier to clamp them to the table and use the polishing wheel on my drill.



The polished sill looks like this before coating with clear plastic spray.



Here is the finished set of four along side the four steel sills that go underneath them. Those have been sandblasted, patched where rusted through, rust-proofed and painted.



Here is the can of clear plastic that I used to protect all of the aluminum parts after polishing. The stainless parts do not need it as they will maintain their shine as they are polished regularly with the rest of the car.

There are probably many similar products out there, but this was available and gave me a nice clear finish and dried quickly without allowing dust to set in. I don't remember the brand, but it had a Miami address.



These are the basics. When you have more tools or materials available there are probably some short cuts, but in reality it took me less than one day for the belt trim, another for the roof and windshield trim, one more (or maybe just an afternoon) for the headlights, and maybe two days for the sill plates.

In the process I bought out all of the 400, 500, 600, and 1000 grit sandpaper from at least four hardware and paint stores. Not that it was a lot of sandpaper, but the local stores here in Bolivia normally stock two or three sheets of each.

The rest of the process of my restoration of my Corvair is posted on my web site at [www.widman.biz/Corvair](http://www.widman.biz/Corvair)



Some aluminum products are not anodized. Those do not require the first step. Some do not normally have a flat finish to sand. Here are the manifolds of my Renault Dauphine. The intake manifold is cast aluminum with a cast finish, so all it took was buffing with a wire wheel, applying Meguiar's Mag and Aluminum Polish to the finished product to protect it from the elements. (The exhaust manifold is painted with Rustoleum Hi-Temp BBQ paint.)



Other parts are cast aluminum but should be smooth and shiny. Here are the rear grills of my Renault Dauphine. They required some straightening and welding, then removal of paint and casting marks. The makings from the mold (50 years ago) were severe on all of the bars.



This in this case, I used the wire wheel to remove most of the paint, then, since I was dealing with solid cast aluminum that was not anodized, I used 150 grit paper wrapped around a piece of wood that I ground to where it fit in the slots and rounded ends. Then, when the casting and welding marks were removed, I used 220 grit paper, then 360, 400, 500 and then 1000 grit before buffing with the cotton wheel and polishing compound.



I decided that I would treat these with the Meguiar's polish, as it is producing a very nice final finish and I can apply it easily as needed.

As I move on with the restoration of this Renault, I will be practicing my stainless restoration on these front and rear window trim pieces. They are all scratched and pitted.



Here is the restored piece of windshield trim shown above



## **Household tips**

My daughter has a nice set of stainless dinnerware, but most of the spoons had made their way into the dishwasher, probably with the help of the twin toddlers. So, one night while visiting, as we watched a movie, I decided to restore the damaged pieces. First, I used a steel nail file to eliminate the sharp or malformed edges, approximating the right shape for the spoon. Once that was done, I used her emery board to eliminate the remaining scratches, moving on to the finest to leave a nice shine. By the end of the movie the whole set was restored.

The documentation of each of my car restorations is posted here:

<https://www.widman.biz/cars/>

For more automotive maintenance tips, check with us at [www.widman.biz](http://www.widman.biz)