

Rust Removal, the Easy Way - Solar Powered Rust Removal

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Having completed the salvage of the beyond-repair TR6 Jim and I bought in June, it was not time to turn my attention to cleaning, preparing, and painting the many pieces I'd recovered. Normally, I'd use a physical abrading process with wire brushes and sanding disks, but that is awfully time consuming and messy. Moreover, in this heat, wearing the face shield and leather apron to protect against debris is cumbersome.

Most of all, my haul included both robust suspension bits, like upper and lower A-arms, but also a few that were quite complex surfaces, like the original tire changing kit. I did not think the more delicate components would fare well under the grinding wheel, and there were many areas impossible to reach with a wire wheel.

What I needed was a simple, easy, and thorough way to get at the rust in those tiny crevices. I also needed a system that would allow me to efficiently address larger items like the seat rails or the seat frames themselves.

In the past, I've used excellent products like "Evapo-Rust" to soak pieces in, and it has worked well. However, it is expensive. A 13 litre tub of the stuff is \$120.00 at Princess Auto! Sadly, I'd need several tubs in which to soak the larger pieces – a cost-prohibitive endeavour.



Enter Electrolysis

A few years ago, I'd read about electrolytic rust removal, a process used in naval systems and civil engineering. The process is simple, cheap, effective, and eco-friendly. Most important for me in this project, however, was the scalability. All I needed was a container large enough for the item to be salvaged. I could do small pieces like throttle linkages all the way up to the trunk or hood.

There are plenty of sites out there that describe the process in detail. The one I liked was at <https://www.instructables.com/Electrolytic-Rust-Removal-aka-Magic/>. It provides easy instructions and good photos. The only modification I made was to use a 40W solar panel I'd bought on clearance from Canadian Tire that provided a free source of 12 volt DC for me. That allowed me to set up my tubs in the back yard behind the shed, and not worry about proximity to outlets. Even on a cloudy day it produces sufficient electricity.

For solution, I have tried both Washing Soda and Citric Acid. Both work well, although the washing soda requires one wear protective gear as it is caustic. It is the preferred solution, and most importantly, it is cheap! A 1kg box costs \$8.50 at Canadian Tire. As one uses approx 60g / litre, this is sufficient to do any project.



Citric acid can be more expensive, as it is typically used in food preparation as “sour salt”. Prices vary, but Defalco's Beer and Winemaking sells 950g for \$15.00

Next was to secure a container. It must be plastic, for safety. I found a cheap child's wading pool at Canadian Tire for \$18.00. It is big enough to take a seat rail, or even the seat frame if dismantled. 36 inches in diameter by 7 inches deep. I suppose if I wanted to an even larger piece, I'd spring for an inflatable wading pool 8 1/2 by 6 ft, 20 inches deep. \$40, and big enough to treat a fender!



For smaller pieces, I acquired a number of cheap plastic containers in the 5 litre and smaller size at the Dollar Store, for \$3 - \$5 apiece.

Next - the power source. While the solar power is free, it will not work at night. I pondered whether or not I'd want to add a spare car battery to the arrangement but opted not to. I figured if it took two days to treat a piece, I was in no rush and that was fine. After all, I'd already bought it on Clearance some years ago, and needed to find other uses for it.

I checked and Canadian Tire actually has a NOMA 100W system on clearance - \$200.00. That is enough to charge a laptop, and more than adequate for this exercise.



Of course, for the “highlanders” in the club (i.e., Scotsmen, well known for their frugality), a 12V 500mA transformer can be purchased at a thrift store for a few dollars that will provide proper current. This will constrain you to operating near an outlet, but will permit you to do inside your workshop or garage and conduct the treatment overnight. Just make sure you correctly identify your Negative and Positive leads, or you risk ruining the piece you are recovering.

Finally, the sacrifice metal, or “anode”, which is connected to the positive lead of the power source. For this one must use iron or steel. Stainless and galvanized are not suitable, nor is copper or brass. Rebar or untreated flat steel works best.

Final thoughts: Electrolysis rust demonstrated itself to work exceptionally well, given sufficient time. There was still a requirement to prepare pieces for painting or finishing, but it is greatly reduced and the result significantly improved. The fact that it is a “fire and forget” process enabled me to dip the piece for removal and then carry on with other projects. It is eco-friendly, and disposal of the solution once done can be handled in the sink or drain.

The only limitation was that it cannot do bimetal pieces, such as the steering column cowl for the TR8, which consists of an iron tube and a zinc/aluminum cast housing for the ignition lock. For that I had to rely on the Evapo-Rust. I did not want to risk damaging the aluminum pieces to treat the iron ones.

Next is to clean some of my rusty garden tools, starting with a pair of hedge trimmers I left out in the rain for several days. Of course, this eliminates my excuse as to why I am not trimming my cedar hedges, so perhaps I’ll do something Lisa can then use.