

# The Lazy Guide to Rust Removal



**Well, the story starts with a motorbike – a 1930's Sunbeam – located in Germany. The owner had asked me about removing some rust from the inside of the petrol tank.**

The Sunbeam has a lovely glossy black tank with gold lettering – too good to risk! Having mulled it over I came up with the possibility of electrolysis, which usually involves submerging the work piece in a tub of suitable electrolyte and passing a current between it and some metal rods, effectively shifting the rust from the item to the rods. However, not easy when the rust is inside the tank and we didn't want to risk the paint finish.

That's when the 'lightbulb' moment occurred – why not use the petrol tank as the tub, fill it with the electrolyte, lower the rods into the tank and let electricity do the work.

The exercise had me looking up how to use electrolysis to remove rust and there are plenty of YouTube items to be found – mainly using buckets, clothes pegs, bits of wood, coat hangers, wire and reinforcing bar.

## **Surely there's an easier way?**

A plastic bucket usually holds the electrolyte and the steel rods have to be arranged around the workpiece and each one has its own wire connection, all hanging down into the electrolyte. Why not adopt the fuel tank idea and use a metal container instead of the plastic

bucket, which can then perform both the work of the bucket and the reinforcing rods, and only require a single wire?



## **What would I use it for anyway?**

It would certainly work for removal of rust from car parts, but as I live in Ireland, land of lashing rain and mist, my tools suffer terribly from rusting, and despite being put away, they still end up corroding. It's only going to cost pennies, it's lock-down, so worth a go!

The description below uses parts that I had available, but can be easily adapted to whatever you can find in your workshop. A larger can, longer wires – you choose!

## **Parts needed**

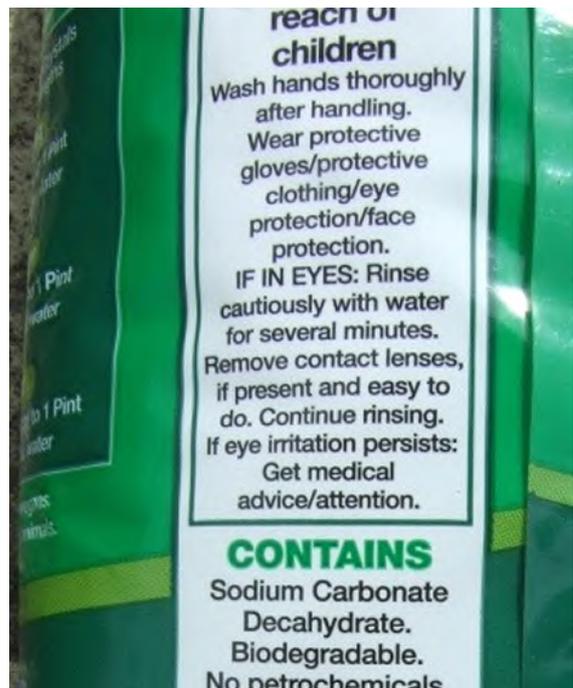
A metal container (not stainless) – I used a thinners tin. Food tins have a lacquer coat inside and therefore not suitable, but an oil/paint can would be. Having removed the top with a tin opener the 'lid' was dropped into the bottom to act as a muck collector. Nothing wasted.

- Two short lengths of cable – 5 amp or more – ideally red & black.
- Two small crocodile clips if you don't want to solder connections.
- Means to attach two cables to a 12v battery or battery charger.
- One in line fuse.
- One length of metal rod to bridge across top of can.
- Two short lengths of rubber hose/heat shrink to act as insulators for the rod above.
- Bare wire to hold the work piece to the bridging bar.
- One pack of washing soda – NOT caustic soda – NOT baking soda.



Power-wise a 12volt supply is fine, and I used a disabled buggy battery, but an 'old' 12v car battery would be fine. You can also use a battery charger – I tried my 'intelligent' charger and it came up with 'Error' when connected, as it expected to see some sort of voltage so didn't work. However, an 'old-fashioned' one did.

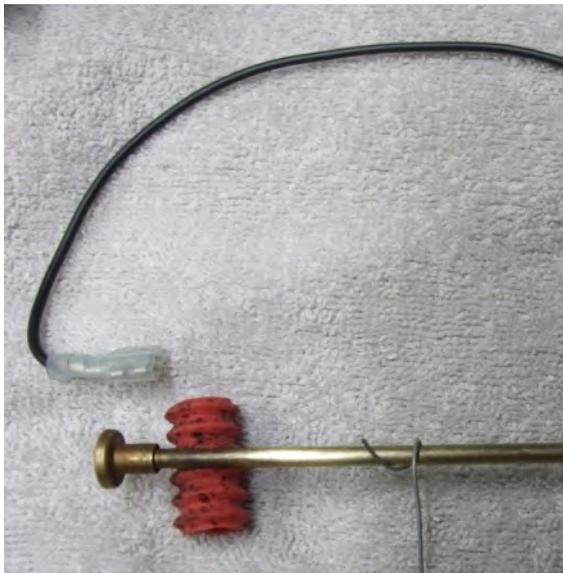
I also have a large leisure battery that would certainly last for days.



The inner face of the metal can act as the anode and is connected to the **+, positive**, side of the battery. This **red wire** can be soldered to the outer surface of the can or attached to the rim with a crocodile clip. Soldering does mean you don't have to think about polarity.

The work piece/bridging bar is connected to the -, **negative**, side of the battery. This **black lead** can be soldered to the bar or attached to the bar with a crocodile clip.

The silicone rubber insulators used here is from a 'worm' that is used to stop you burning yourself on the kitchen oven bars – salvaged –! The brass bar is from an old lawn mower carburettor - I knew it would one day be useful.

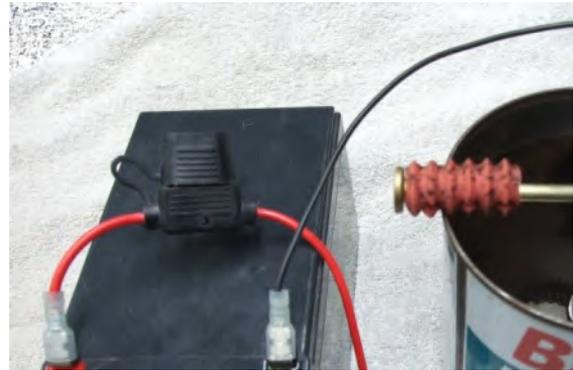


Once the parts are assembled pour some washing soda crystals into the can – I added around 1cm depth (no idea of concentration – it worked fine!).

Then added cold water and stirred until crystals had dissolved.

Wired the work piece to the cross-bar and suspended it in the solution, making sure that it didn't contact the inside or rim of the can. If it does the fuse will blow. With longer pieces it is possible to dip one half in, de-rust and then do the other half – you won't see the join! You can also put more than one item on the bar and it

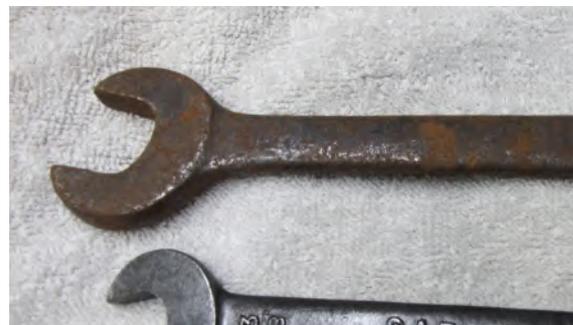
doesn't matter if the parts touch one another.



With long items make sure that they don't contact the bottom of the tin – if concerned then put a rubber or plastic lid in the bottom to act as an insulator/debris collector. De-grease oily items & strip painted parts if needed. The solution has no effect on bare metal or paint, just the rust.

Power on and immediately bubbles begin to rise and after a while the solution warms up, along with a brown froth.

A one hour treatment worked well on my tools and, after electrolysis, a rub with a metal scourer and drying off revealed rust-free tools.



After a few goes there's a build-up of all of the crud that has come off – an amazing amount – and this will be on the inside face of the tin and also in suspension.

Drain off the gloop and dispose – the soda I used was biodegradable so ended up in the septic tank.

The 'rust', now on the inside of the tin, is a crumbly paste and a quick scrub with a metal scourer and a rinse out makes it ready for use again. You can re-use the original solution, but when you see the colour, and given the minimal cost of making up fresh, it's hardly worth it.



You can also clean the can the lazy way – hang a piece of clean scrap steel into the solution and reverse the battery connections. The muck on the can will migrate from the can to your scrap steel.

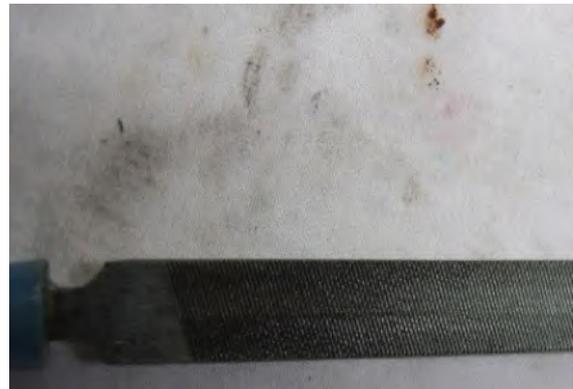


When finished, all of the parts pack away into the tin until next time.

#### **Any surprises?**

Firstly, how simple and effective it is and secondly how it 'restored' some of my fine

files which had become clogged and ineffective. The embedded rust/debris was removed and they were again fit for use, with a proper bite to them.



I'm looking at a big tub of drill bits next.....!

#### **How to keep those tools and bare metal car parts shiny**

One of the best ways is to coat them with ACF50, which forms a very long-lasting anti-corrosive film. It is available as an aerosol or in a larger bottle with a free mini-sprayer.

It appears expensive but a tiny amount – two drops – will coat a spanner and keep it looking good. Easy to apply small quantities with a pipe cleaner. I used to use it on motorcycle wheel spokes & rims and there's nothing out there to beat it. It

is also great on aluminium, stopping the 'frosting' that can occur, especially if the roads have been salted.



Great on bare steel – lathes, hand planes etc., but keep it away from brake surfaces as it is also a lubricant. Over time it will gather dust, but still stops any corrosion – just an annual wipe off and a fresh coat keeps things looking good. Alternatively dry the parts thoroughly & prime and top-coat them as soon as possible after the electrolysis treatment.

### **Now a motorcycle tank**

Well, that's the way to clean up parts and tools but now the more challenging task of de-rusting the inside of a fuel tank.

In order to use the same process for removal of rust from the inside of a motorcycle tank, the tank needs to be drained and removed from the frame and flushed out with soapy water. Any taps need to be removed and replaced with simple threaded plugs or even corks - the loosened rusty debris will clog any taps and filters.

Make up sufficient Washing Soda solution to nearly fill the tank, using a funnel, and sit the tank securely on a padded surface in order not to damage the paintwork - a full tank is pretty heavy!

Make up one or two 'insulated' electrodes that can be introduced into the filler hole - they must be made so that they do not come into electrical contact with the metal body of the tank, or the essential supply fuse will blow.



Do not connect any electrical supply to the tank or the insulated electrodes until the tank has been filled with the Soda solution - petrol vapour is highly explosive and no attempt should be made to use this process if there is any residual petrol or vapour in the tank. Use simple steel tube for the internal electrodes and domestic pipe insulation can be secured to the pipe with tie wraps. Ideally rivet or screw the supply lead(s) securely to the pipes(s) - the leads need to be long enough to allow easy connection to the power source.

Once all is in place take the negative lead that has been attached to the fuel tank, followed by the positive lead(s) that have been attached the insulated electrode(s) and connect these to the respective battery terminals. The process will start. After an hour or more remove the leads from the power supply and extract the

electrodes for cleaning. Repeat the process, along with further flushing out of the tank and renewing the Washing Soda solution. Use the traditional 'rattling around some chain or nuts and bolts' between treatments and continue the process until the rust has been removed. Thoroughly flush out the tank at the end of the treatment and allow it to dry at room temperature.