

MiniWorld visited Surface Processing Ltd to see how their unique acid dipping service can be a Mini restoration lifesaver...

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Photos: Stephen Colbran and SPL

Chemical cleaning

Truly rust-free Minis are very difficult to find. Even if the exterior bodywork appears immaculate, it's in the out-of-site cavities and box sections where water can become trapped and the rust can lurk. Given the damp climate in which most European Minis live, if you plan to use your car as was intended, it will no doubt need a restoration at some point.

Welding up a Mini and replacing rusty panels is not, despite what some bodyshops may tell you, any more difficult than with any other classic car. Most panels are still available, removing trim can be straightforward and moving the car is easy thanks to the Mini's size. The problems arise when attempting to weld new panels to surrounding metal that's also become thin or rotten. Add this to the mess of seam sealant, sound deadening, protective paints, waxes and various other coatings that have been slapped on the metalwork over the years, and welding can be frustratingly slow and messy. Burning sealants can also cause toxic fumes.

"Rust, filler, paint and sealers are all removed"

metal, re-paint and protect. It may sound like overkill, but if you're prepared to spend hundreds, if not thousands, on a fresh paintjob then why not ensure your cash isn't wasted. It makes sense to safeguard yourself from the risk of rust returning soon after.

There are a few methods to strip the bare shell of nasties: good old manual labour, sand blasting or acid dipping. Working manually can take months of spare time and the danger is that surface rust will appear in the meantime where any metal is left bare. Sandblasting is an effective method of paint and rust removal but should only really be applied to the edges of panels, or those out of sight, due to the risk of rippling the metal. Plus, the leftover grit can become trapped in box sections for years. It's also impossible to get right inside vulnerable areas of a Mini such as the sills.

So that leaves acid cleaning. For £745 Surface Processing Ltd of Dudley will immerse your entire bodyshell into a bath of special chemicals, taking it right back to bare metal, so you'll know exactly what lies ahead. Rust, filler, paint and sealers are all removed. Welding repairs are therefore simplified and there will be absolutely no rusty surprises lurking under the grime. Once all the holes are welded and panels are replaced, you can re-visit SPL for a final clean, ready for primer or special coating. Repairing a shell can still work out cheaper than the British Motor Heritage re-shell option, and is the only choice for early or rare shells where replacements are not available. Here's the process explained...

How long?

Turn-around time is between 5-10 days. You'll need to strip the car to a bare shell and transport it to and from SPL.

How hard?



HOW MUCH?

Full bodyshell clean: £745. Other parts: POA. Clean and EN coating: £2,500. Contact: Surface Processing Ltd, Dudley, West Midlands, DY3 2AF. www.surfaceprocessing.co.uk. +44 (0)1384 242010.



01 SPL didn't plan to save so many classics when they opened in 1994. Their business was to strip back industrial components like car-carrying hooks from production lines or batches of parts sent out with paint defects. 2,000 cars on, their yard has a fascinating carpark filled with rusty bare shells queuing up to be dipped. Minis sit alongside VWs, Porches, MGs, Escorts and more. There's not much left to identify this Mk3-onwards shell.



04 The interior is a sorry sight, but acid dipping will reach all areas once the shell is fully submerged in the chemical tanks. Luckily, this appears to be surface rust, or else the owner will have little left of their Mini on removal. SPL has been accused of swapping customers' classics for another vehicle after the dip, as the rotten metal has all disappeared, leaving huge holes! Shell bracing is recommended if you suspect the worst. Some shells will be beyond economical repair so choose wisely.



07 The first chemical bath contains a secret alkaline hydrocarbon solution, heated to 85-degrees C, to break down any remaining 'heavy organic contaminants'. When the shell is fully submerged in this special chemical solution for a few hours, any filler, sealants, waxes and grime are broken down and removed. Paint will also be stripped back, leaving a completely bare-metal shell from the inside out.



02 Every panel is red rusty from being stripped and left to the elements and it's plagued with holes. You'd be forgiven for thinking this is scrap, but with the value of solid Mini bodysells increasing, a shell like this is still worthy of repair.

03 The wings and many of the front panels have already been removed. If you can see that panels will definitely need to be replaced you may as well remove them prior to dipping, as long as it doesn't affect the structural integrity of the shell. All of the glass, interior, running gear and electrics will need to be removed.



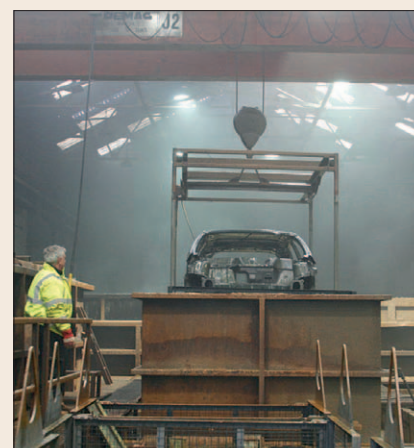
05 Inside SPL's cleaning plant. Here are the multiple tanks that will be used for the four-part cleaning process. Shells and components are placed in cradles, hoisted around the factory by the overhead lift and dipped into the tanks.

06 The shell is firstly subjected to a high-pressure clean with up to 2,500psi of pressure. This blasts off the first of any 'heavy organic contaminants' such as filler, paint and sealants. The water-diluted solution begins to break down all of these organic contaminants before the first submersion.

08 Separate panels such as doors, bonnets and boots can also be dipped using the same technique, although these are handled in separate containers. Alloy and composite components can be dipped too, but it is a slightly different process. Speak to SPL for further advice.



09 Because this cleaning dip will remove all underseal and factory-applied sound deadening, the process has become very popular with race car builders. Here is a brand new Ford Focus shell that's destined to be a touring car where the extra few lbs of weight saving will make all the difference. It's a similar story if you plan to race your Mini; this is a far easier and more effective option than chiselling away at the factory sound deadening.



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10 The shell and parts need to be pressure washed once again to remove the green residue which remains after the first submersion.



11 The pressure jet contains a preservative. Water alone is avoided in the plant so that any surrounding bare metal parts do not rust. Particular attention is paid to the seams and crevices, especially on a Mini.



14 If you are concerned about your Mini's steel being eroded away by the chemicals used in this process, check out this Clubman front wing. The chemicals are so gentle on the metalwork that these scuffs caused by pre-paint preparation at the factory are still present on the panel.



15 The same cannot be said of rusty bits. The owner of this Volvo P1800 may be surprised by the end result. At least the true extent of the damage is now visible. Otherwise, the rust may have been ineffectively patched-up or gone unnoticed and continued to corrode its way through the shell with potentially dangerous or expensive consequences.



18 Repairs complete, return the shell and parts to SPL to repeat the final stages of the cleaning process to remove any additional grease and unwanted contaminants. After having the shell acid dipped and cleaned, Derek's Mini Centre has done a fantastic job on the restoration of this Mk2 shell and it has now returned for the final clean.



19 EN plating or electrophoretic-coating (e-coating) is the next best step to long-term rust prevention. This particular shell has been e-coated after having the full acid dip treatment. Because of the full-emersion technique of the EN-plating and e-coating procedure, shells will be treated inside the box sections too. E-coat is the finish you'll recognise from most aftermarket Mini panels.



12 Removing all of the organic contaminants may reveal past repair work that you didn't even realise existed, such as this rear arch repair which would have been hidden with a skim of filler under the paint. Thankfully, this is a good quality repair on this shell. On others you may find all manner of bodes.



13 Once cleaned off, the shell or parts are lifted back up and into the next tank for an overnight stay. This contains inhibited hydrochloric acid – the acid dip. The acid eats away through any rust, completely removing it from the good steel. The solution is not purely acidic though, with only 5% being hydrochloric acid. Extra inhibitors in this solution stop the acid from eating non-rusty steel so that the shell does not dissolve completely. Only the rust dissolves. On removal, the shell gets another blast with the pressure washer solution and the true extent of the car's rust will be revealed.




16 The shell or parts are dipped for a final time in a neutralisation process to remove any leftover acidic traces from the previous dip. The highly-alkaline solution of the final dip reaches inside all nooks and crannies to ensure a thorough neutralisation of the steel, even in the bits you can't see or reach. The pressure jet is used again to clean up the components. A chemical reaction between the steel and the solution leaves a shiny metallic finish.



17 In the unlikely case that the shell is completely free from holes, it is now in a bare metal state. It can now either be primed or electroless nickel (EN) plated as an undercoat, or a fine spray of oil can be applied so it is ready to take away for any welding repairs. Although the steel is neutralised, surface rust will still set in if left to the elements, so you must be quick with the repairs and store the shell somewhere dry. You wouldn't have the shell EN plated before welding repairs, as it's expensive to do twice.

20 SPL plan to introduce the EN coating for full shells as the older e-coating service (shown in step 19) has been discontinued, excluding smaller components like doors and individual panels which can have either coating. The shells leave the SPL plant to visit a local specialist and have the nickel plating applied. Although not cheap at £2,500 including the acid dip, SPL reckon the procedure will offer the best possible protection against further corrosion as it penetrates every part of the shell, as can be seen on this cross-sectioned Clubman Estate. It will come with a three-year anti-perforation warranty.



21 To prove the versatility of EN-plated steel, the cross-sectioned shell has been welded back together. Obviously, it would need to be coated again to protect the weld, so any welding must be carried out beforehand. Have your fully-repaired shell EN-plated, re-apply the seam sealants and underbody seal and it's ready for primer and paint. A coat of Dinitrol or Waxoyl in the rust-prone areas and your Mini should have a much better chance against the elements than the first time around. It's ideal piece of mind for your daily drive Mini, plus it will be worth considerably more. 



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