ROVERPHILES

Rust Found Between “Rover” and “Scrap”

From Ian Potts’ *Motoring Encyclopedia*

Every vintage motor car has a considerable amount of iron-based metal, most of which can corrode and rust if not protected and cared for on a frequent basis. Some iron alloys, such as stainless steel do not corrode, but even after the war years stainless was considered too expensive for use in volume vehicle manufacture.

Unfortunately, it is not only iron which rusts. Aluminum can form a white coating of oxide if left unprotected in the rain. The main difference between this and iron rust is that the aluminum oxide coating stays firmly fixed to the surface, preventing any further corrosion, rather than flaking off and laying new metal bare to attack.

Even cars made with glassfibre are not immune to rust as they usually have a steel chassis to support the body. One of the drawbacks with glassfibre is that the metal parts tend to be forgotten, being hidden under a still-shiny and new-looking body. Although the chassis is painted when new, it is susceptible to rust soon after that coating has been chipped and scraped by flying stones and other debris.

No matter what the metal, rusting only occurs where the metal surface is exposed to the elements, particularly rain, which contains many corrosive elements and compounds. Water reacts with the iron or aluminum to form an oxide or hydroxide, which creates the characteristic brown or white coating.

In the case of iron, once water finds a hole in a protective coating, such as paint, it will not create corrosion in that spot alone. The rust will quickly spread under the edges of the surrounding paint, which may chip and may eventually fall off in flakes. The same problem does not arise with aluminum because the corrosion does not creep more than a millimetre or so under the paint edges.

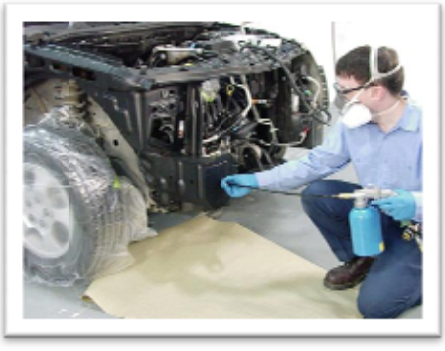
Where two dissimilar metals are joined together, there is a strong tendency for rust to set in which is caused by an electrochemical reaction between the two metals, one of which is more electro-negative than the other. In this instance, the corrosion will not necessarily be due to the formation of oxide or hydroxide; it may comprise a compound of the two metals. The most common site of this type of reaction is where bright-metal strips are affixed to the steel of a car body by metal clips. The preventative treatment is to fit plastic collars between the clips and the bodywork.

The easiest way to manage rust is always to put large obstacles in its way in order to prevent it happening. In other words, if the metal parts are given a thick and, more important, a complete coat of paint, then, as long as the paint is not chipped and scratched when assembling the components, rust is prevented from beginning its destructive process.

The most important part of any car to be concerned about rust is the underside, since this is the area which is examined least often and is exposed to the worst wear and tear. Many cars are undersealed when new - given a thick underbody coating of sealing compound. However, too much faith is placed in this substance, as it can never form a continuous layer unless applied before assembly of the parts. For instance, even the most powerful spray will not force the sealant to coat the top of an inaccessible chassis or subframe member. The main function of underseal, then, is to form a protective shield over the paintwork of the underside, in order to prevent flying stones from creating damage.

This function is particularly important in the wheel arches where the tires are continually throwing up stones and other assorted debris.

In order to enable the paint and the underbody coating to limit corrosion, it is advisable to clean the underside of a car frequently, especially in the winter, when the roads may have been coated with salt which is highly corrosive. Great care should be taken to avoid car washing services that use recycled water run-off collected from previous car washes. Most cars also have mud traps unwittingly built into them somewhere in the wheel arches. If wet mud is allowed to stay in these niches, it will make short work of a slightly imperfect paint finish. A hose and brush or soft scraper should be capable of removing the offending material.



Unfortunately, the rust-proofing methods used by most of the car manufacturers are not very efficient. Although a vague effort is made, in that a rust inhibiting primer is used, it would

not pay most of the builders to make cars last too long. After all, the bodies could be built of stainless steel if prolonged life, albeit at high cost, were required.

Despite this lack of enthusiasm on the part of manufacturers, it is possible to have a new car, or even a used one which is not rusty, effectively rust-proofed. There are new U.S., Canada, UK and other country companies specializing in treating the whole of a car body with one or more compounds calculated to prevent or stop rust.

The KROWN (U.S. and Canada) and Protectol (U.K.) methods are ones where two very different liquids are used, depending on the part of the car being treated. This British Protectol system is based on the Swedish ML method of corrosion protection, pioneered in 1952 by Sven Lauren. Thin liquid ML is applied by an airless spraying technique to all the cavities of the car body. These include the doors, the door sills, the tubular or pressed steel bonnet and boot struts and the door posts. In addition to this, ML is used to protect parts where bright-metal trim is attached (this includes the badges). The nature of the ML liquid is such that it has high capillarity, enabling it to creep into welded seems and similar crevices. Holes are drilled in order to force the liquid into the 'sealed' cavities such as the doors and sills; these are plugged after the operation has been carried out. KROWN uses a similar system in the U.S. and Canada.

The underbody is treated with a thick compound, which is sprayed under extremely high pressure on to all body and chassis parts. Both this and the wax-based ML form a flexible and self-healing layer, which will protect the metal for a considerable period.

It would be almost impossible for a mass-production car manufacturer to incorporate this type of treatment into each new car, as it would bring the production line to a snail's pace, but it is a very effective way of protecting a complete new car.

Once a piece of iron or steel begins to rust, it very difficult to halt the process altogether; the only sure way is to remove all traces of corrosion by using abrasive material. There is no point whatsoever in painting over the top of a rusty patch on a car body, as the corrosive action will continue under the new paint, which will soon flake off.

There are several special rust-treatment 'paints' sold in motor-accessory shops such as POR-15, but it is still necessary to remove at least the flakes of rust before applying one of these curatives. If the metal has rusted extensively, the surface will be badly pitted, so that treating it with a rust curer will leave it too rough for a smooth final paint finish. The answer here is to rub-down the damaged area, using wet-or-dry paper if it is a small patch or a rotary sanding disc on an electric drill if it is large. The surrounding paint must be sanded until shiny metal is showing and the paint edges 'feathered' so that the repair will not be obvious when finished.

Once the rust has been removed, primer must be applied to the bare metal to provide a key for the finishing coat, which should be sprayed on after the primer has been sanded smooth.

Of course, not only does rust spread if it is left untreated, it will penetrate deeper and deeper, as the flakes drop off, until a hole forms. In the motor car, most of the holes which are seen in the bodywork have been caused by rust starting, unnoticed on the back of a particular panel, such as a wing or a door.

The first sign of this is when the paint begins to bubble for no apparent reason; a gentle prod at this stage with a sharp instrument such as a key or screwdriver will prompt the immediate formation of a hole.

The treatment of a rust hole requires a different technique from that needed for a simple rusty patch. The metal surrounding the hole must be cut back, using a tool such as a pair of tin-snips, until all the rusty parts have been removed. If the hole is still only small, then body filler can be applied after gently hammering the edges of the hole inwards to form a dent onto which the filler can key. However, if the hole is large, then it will be necessary to place some support material behind the hole to prevent the filler falling in.

If the hole is a blind one, such as in a door or its sill, then the best material with which to provide support is chicken wire. This can be screwed up, forced into the hole and then allowed to expand against the edges. If the back of the hole is accessible, then a piece of perforated zinc sheet should be used; the edges of the hole should still be knocked inwards, but this time, the back should be cleaned and the zinc stuck to those edges using body filler.

Whichever the case, once the support has been placed, body filler should be applied to it until the surface is level with the rest of the panel. When hard, this should be sanded down, using wet-or-dry paper on a block, until it is smooth. If necessary, further filler should be applied and the process repeated until there are no bumps or dips, and the filler edges are tapered onto the metal. Priming and painting should then be carried out as before.

Rust on a chassis member, or on any other important load-bearing structure, may necessitate the welding-on of a strengthening plate in order for the vehicle to pass the compulsory MOT test. Sometimes, such items as spring

shackles and damper mountings are damaged by rust, and have to be replaced.

Different makes of car have their own most commonly affected rust spots, but in general it is the door edges, the sills, the wings and the floors which rust first -all places which come regularly into contact with water.

Accident damage, even though repaired, can give rust a useful opening; it is easy for a repair shop to make the exterior surface perfect, without remembering that the inside may well have lost its paint.

It is a good idea to check any body repairs and, if possible, to apply a solid coating of underseal to any repaired or replaced panels. Welded seams are the most important areas of all, because any rust which starts here will soon penetrate to the other side of the seam, which may well be on the outside of the car.

Finally, if chrome-plated parts begin to rust, there is little that can be done, short of stripping off the plating, making the metal good and starting again with a new chrome surface. This may be worthwhile for an obsolete care whose spares are not available, but it would also pensive, so that for a current model replacement part, be it a bumper or a hub cap, would be cheaper and certainly be far more convenient in “keeping up appearances”.

(Article submitted October 2004 by Ian Potts of the RCCC and published in the *Rover View* while Eric Russell was editor.)