

10.2 Understanding Paint Defects



Before starting to correct and / or refine your paintwork by hand or machine, it's a good idea to identify each problem and what you can realistically expect to achieve. Whilst many imperfections will polish out with the correct tools and techniques, others will not. This section is designed to define the different types of paintwork problems and give an idea as to what can be done to correct them.

Oxidation – over time, harmful Ultraviolet (UV) rays make paintwork look dull and chalky – blacks appear grey, reds appear pink, etc. Oxidation was a particular problem for older paints – modern paint colour pigments are becoming increasingly sophisticated and new technologies mean clear coats have been engineered to better protect pigments.

Oxidation can be removed using an abrasive polish working by hand or with a machine polisher. By hand will of course, take longer!

Swirl marks – usually incurred during the washing and drying process, or picked up whilst driving. Swirls present as a 'cobwebbing' pattern across the paintwork. The more cobwebs present, the more light is scattered. Swirl marks play a significant role in the loss of gloss from paintwork. Swirl marks can, dependant on the severity, usually be removed by hand with a suitable abrasive polish, however working with a machine polisher will give better results much faster.

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Fine scratches - present in the upper most layer of the clear coat, fine scratches are usually a result of dirt and grit being rubbed over the surface mainly during the washing and drying process, but can also be caused by dirt and dust whipped up by high winds. They're usually defined as 'fine' if you cannot catch your fingernail in them.

Fine scratches will normally polish out. If there are only a couple of fine scratches using a proprietary scratch remover will work well. However, if the scratches are more prevalent then a machine polisher is a more able method of removing them.

Random Deep Scratches (RDS) – these deeper grooves cut through the clear coat and paint colour, down to the primer or sometimes, even to the bare metal. RDS can be spotted easily and running a fingernail along will cause the nail to catch in the groove.

These types of defect cannot normally be machine polished out completely, however their appearance can be significantly reduced by rounding off the edges of the groove, thereby affecting the way they reflect light, minimising their visual impact.

Holograms – also known as buffer trails, are caused by poor machine polishing techniques, even on brand new cars! These leave a blurry swirling effect on paintwork causing it to look dull and greasy.

Holograms are usually fairly easy to remove using the correct combination of machine polisher, pad and compound. Attempts to remove buffer trails through hand polishing is unlikely to work.

Stone chips – pitting in paintwork as a result of a high velocity collision of a hard stone with the bodywork. These present as fairly rounded spots and they usually look greyish white in colour – this is the primer showing through.

Stone chips go deep to the primer and actually are the result of several layers of clear coat and paint having been dug out of the bodywork. These will not machine polish out. Specialist products are required to fill in stone chips to reduce their appearance.

Bird dropping etching - birds usually do their business on top of fairly flat surfaces presented most directly to the sun. As paintwork is heated, it expands around the bird droppings and as it cools it contracts. This combined with the acidity of the droppings causes severe etching on the surface of the clear coat.

Acid rain etching – acid rain is caused by sulphur dioxide and nitrogen oxide, produced as a result of fossil fuel combustion, volcanic eruptions or even lightning strikes - combining with water to produce acid rain. Carbon dioxide in the atmosphere combines with water to form carbonic acid. These all wash out of the atmosphere with rain and react with clear coats to leave irregularly shaped patches, visible most clearly in direct sunlight and on darker coloured vehicles.

There are varying intensities of acid rain etching and whilst some will polish out with the right tools, if the rain has a particularly strong acidic composition or has been combined with some other factor, such as volcanic ash, there are occasions when this type of blemish will not polish out fully. The best way to guard against this type of damage is to ensure your vehicle has been protected with a last step product (LSP) such as a natural carnauba wax or a nanotechnology based glass coat sealant.

Water spot marks – PCC (precipitated calcium carbonate) from rain, or impurities in rinse water leave deposits on the paintwork if the vehicle is not properly dried. As with bird droppings, as paintwork expands and contracts around the water marks, the edges become etched into the clear coat and usually require machine polishing to remove.