



Frame care

For 118 years, Reynolds has stood for quality and innovation. With 27 Tour de France wins and millions of bicycles produced. The ride of Reynolds frames has become renowned the world over. Whether you are purchasing your frame brand new or buying second hand. With the correct care and maintenance, there is no reason why the joys of a Reynolds steel frame can't be enjoyed for the next 10, 20, 30 years and beyond...

So what is rust and why is it so damaging to steel frames?

Given the right conditions. Carbon steels such as those in the Reynolds range (531, 525, 631, 725 and 853) can and will corrode. This corrosion, more commonly referred to as rust. Is a natural process and the product of an electro chemical reaction between iron (in steel) and oxygen in the presence of water.

When water droplets gather on an iron/steel surface, several reactions take place. Firstly, the iron in the steel oxidises, giving rise to positively charged iron ions and free electrons. These electrons then proceed to move towards the edges of the water droplet. Where there is a plentiful supply of dissolved oxygen to react with. Here they react with both oxygen and water molecules to produce negatively charged hydroxide ions. Further reactions between these hydroxide ions, water and iron go on to produce hydrated iron oxide that we commonly refer to as rust. Not only is this rust unsightly, it is damaging. As layers of iron are removed from the steels surface. The integrity of the frame can be greatly affected.

Fortunately, there are several steps that can be taken to prevent rust from forming and extend the life of your frame set.



Caring for your carbon steel frame

The first port of call to preventing rust from occurring should always be cleaning your bike properly. Sweat and road salt both make better electrolytes than pure water and speed up the corrosion process so removal of these should be your main priority after a ride.

To wash your bike, liquid dish washing detergent or car shampoo can both be used. Though it is important that ingredients lists are checked beforehand as some contain salts, which if not properly rinsed, can actually speed up the rate of corrosion. Once rinsed thoroughly, frames should be left to air dry or wiped down with a clean cloth.



Removing rust from Carbon steel frames

The outside of most carbon steel frames are protected from corrosion by a tough layer of paint. Over time however, scratches and dents can start to appear that allow corrosion to occur. If the scratches are small enough they can be covered using a clear nail varnish or touched up using paint. If the area affected is larger or rust has been allowed to progress further, refinishing of the frame may be required.

Reynolds would always recommend handing a frame over to a professional for stripping and renovation. Should one choose to undertake it themselves. There are a couple of ways rust can be removed before the frame is repainted.

Superficial rust can be removed using a fine grit sand paper (#320 grit or finer). This will remove surface rust and make identifying areas where rusting may have progressed (pitted) easier. Phosphoric acid can then be applied to the bare metal to dissolve larger rust spots. This can be applied to the frame directly with a brush or via a diluted solution on a soaked cloth depending on the position and severity of the rusting (zip ties work well for this). Particular care should be taken on frames brazed with brass as the phosphoric acid will slowly attack it, weakening the joint. After treatment, the phosphoric acid should be washed off with soap and water. No orange or brown rust spots should be visible. **WARNING: Phosphoric acid is an irritant.** Protective eye wear should be worn. The use of protective gloves is also advised, though short term skin contact should not cause any issues. If rusting has not progressed too far, moderately pitted areas can then be filled before painting.

Protecting the inside of frames

Despite the outside of the frame being constantly exposed to rain, surface spray and mud. It is the inside of the frame is where corrosion damage can cause the biggest issues. Out of sight and somewhat out of mind. Water that has entered the frame through gaps at the seat collar, BB seals and headset can pool and allow rust to form and make significant inroads into the frame. Sometimes only being picked up once a failure of the frame occurs.

It is for this reason Reynolds recommends that frames are periodically treated with a rust inhibitor such as Weigles frame saver or T9 to seal the inside of frames. Other oils such as boiled linseed oil have been rumoured to be effective, though Reynolds is unable to comment on their suitability first hand. These should be applied periodically - once a season though more if conditions are particularly harsh. It is important when treating to focus on each tube individually. Rolling the frame after each application so that the inner surface of the tube is completely coated. Once all tubes have been coated, the frame can be left to air out until the oil dries to a gel like consistency. It is important that any holes in the frame are not blocked, so that air can circulate freely and water is prevented from pooling inside the frame.



Stainless steel care

Stainless steels such as Reynolds 953, 931 and 921 can be defined as iron alloys that contain a minimum of 10.5% chromium. It is the chromium within these alloys that reacts preferentially with oxygen to produce a passive film that protects the metal from corrosive attack. The important thing to remember is that stainless steels can still stain and corrode. They are stain – less not stain impossible. Corrosion can occur if the surface of the material becomes contaminated through abrasion with a non-stainless material or the protective film is disturbed through use of incorrect cleaning methods or products.

Caring for your stainless frame.

Similar products to those used on normal carbon steel frames can be used to wash stainless frames. Liquid dish washing detergent or car shampoo can both be used through care must be taken to ensure products do not leave a coating on the tubes surface. Surface coatings can not only affect the appearance but can disturb the metals own protective film. Leaving it vulnerable to corrosive attack. Some detergents also contain chlorides that can particularly aggressive on stainless steels. That is why detergents with neutral PH's should be favoured and all detergents rinsed off thoroughly after use.

Note: Some stainless steel cleaners can also contain chlorides and acids. It should not be assumed that because a product identifies itself as a stainless steel cleaner it is safe to use. The ingredients list should always be checked and products tested on a low visibility spot before being used to clean larger areas.

Removing rust from stainless frames

Should your stainless frame show signs of corrosion it should be treated immediately. Superficial rust can be removed using a fine grit sand paper (#320 grit or finer). Tubes should be sanded wet to minimise the chances of contaminants or rust from being sanded back into the frame. As corrosion affects not only the surface layer of the material but the layer directly below it (depleting it of chromium). The affected areas should continue to be sanded once rust is no longer visible to ensure that the chromium depleted layer is also removed. Tubes can then be treated with an application of phosphoric acid, applied either directly with a brush or on a soaked rag (zip ties work well for this). After treatment, the phosphoric acid should be washed off with soap and water. **WARNING: Phosphoric acid is an irritant.** Protective eye wear should be worn. The use of protective gloves is also advised, though short term skin contact should not cause any issues. If rusting has not progressed too far, moderately pitted areas can then be filled with a suitable silver filler before painting.



Seized seat posts

If left for long periods of time without maintenance. Seat posts can seize inside frames. This is especially true of aluminium posts in steel frames where galvanic corrosion causes the two materials to effectively bond together. In terms of dealing with seized seat posts, prevention is very much better than cure. Bonding can be prevented by applying a liberal layer of grease to the post before insertion into the frame. Seat posts should be removed, cleaned and re-greased regularly to prevent seizing from occurring.

Should a seat post become seized. There are couple of options available should one choose to remove it. The second of which will result in destruction of the seat post. It should be noted that Reynolds recommends that all maintenance and repair work be carried out by a qualified cycle mechanic. Reynolds will not be held responsible for any damage, injury or loss caused by following the guidelines below.

Weak acids such as lemon juice can be applied to help weaken the bond between frame and seat post which is typically an alkaline base. Penetrating oils and lubricants can also be used if available. Once left to soak, attempts can be made to twist the saddle until loose. In the event that no progress is made. More leverage can be sought by removing the wheels from the bike and mounting upside down with the seat post in the jaws of a vice.

If the post is still stuck, it may be possible to cut it out of the frame. Firstly, the post should be cut through approximately 1 inch from the seat collar. Then, being careful not to cut into the frame itself. 4 slots should be made at 90 degrees to each other down the centre of the post. Once cut, the post can be hit with a hammer until it collapses. Care should be taken when removing the seat post as any fragments may have sharp edges. **NOTE: Do not attempt to remove a carbon post by cutting it out!** Once the post has been removed, the inside of the frame may require re honing to remove any remnants of corrosion left inside. A new seat post can then be inserted after being properly greased and prepared.

As stated at the beginning of this section. The instructions for seat post removal should be used as guide only and are carried out at the individuals own risk. Reynolds would always recommend taking a bike to a professional cycle mechanic or frame builder over individuals completing such a repair themselves. Reynolds will not be held responsible for any damage or injury to frame or person caused by following these guidelines. Neither will they be held responsible for any damage or injury sustained as a result of either improper use, repair or maintenance or neglect of a Reynolds tubed frame.

TC/RTL/2017