Corroded & Rusted Up?

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(8 Bit ASCII Graphics use code page 437 or 850)

PRECAUTIONS
To stop things rusting/corroding up in the winter, e.g. Nuts & Bolts, PL259s, rotators, padlocks, generators etc. read on.

You need to protect metal surfaces, from each other & water ingress. Dissimilar metals on the atomic element table (far apart e.g. Copper & Steel/Ally) produce a small voltage between them & any electrolyte like water will make a shorted out battery, which rapidly corrodes one of the metals.

With unprotected metal there is even battery action of a single water droplet due to the different amount of Oxygen dissolved at the edge of the drop!

BARRIERS
Paint is the normal approach, it adheres to most surface fairly well, but not always to make a water tight barrier. Some paint are OSMOTIC & allow water molecules to penetrate under the paint!

Aluminium is one metal that is difficult, as it's important tough Oxide protecting layer also stops paint sticking well, & special etching paints are best.

For moving metal parts there is nothing like plenty of grease, all greases are water replant, some are better lubricants than others & the heavier ones are less likely to be washed away, but also can dry out. For best electrical insulation use a vaseline, e.g. "N"type & PL259 plugs etc. For padlocks warm up until quite hot & allow grease to run in. Be aware of some rubber & nylon gears components may perish/swell with oils or grease, check with the makers for compatible grease types.

Painting inside thin walled steel aerial poles from each end can be done before erection with "blown in" spray paint inside the pole while rotating the pole.

The moving air in the pole will thinly deposit the paint several metres inside the pole & stop rusting. The outside still needs painting of course! With steel a Zinc primer is best.

Oil spays work for a short time (eg. mower/generator in shed for winter) & can get to inaccessible parts as the oil "wets" the surface. Painted on old engine oil also works if you don't mind getting dirty.
Exposed nut & bolt threads can be greased bolted tight & then cleaned on the outside & painted. This seals in the grease between the working surfaces stopping water entry & corrosion where it matters. Many years later it can easily be undone.

WATER TIGHT

Hermetic seals, these attempt to stop water entering a unit (lock, Preamp etc.) but usually fail, mainly due to changing air pressure & heat cycles allowing water to ingress past O ring seals. Then it is too late, you end up with a damp micro climate inside the unit, causing continuous condensation on all components.

The open box approach solves this, with no pressure difference the seals stand a much better chance of keeping the water out. Insect gauze traps & long tube breath hole stops most ran & moisture entering.

A rotator normally left on its side unless the mast is up for instance, will let water inside as the seals are made to only work upright.

Drilling a small hole at the lowest point will let more water out than in.

Similar things happen with seals connector joints, a slight ingress of water into a clean new PL259 plugs & barrel all tapped up will corrode solid under the tape.

Amalgamating Waterproof Tape

Waterproof Tape

Filling the space with Vaseline where water could go is the answer here.

TOO LATE

If it is already too late, there are approaches other than a hack saw or angle grinder that may recover the situation.

Penetrating oil (eg.WD40) & heat, often works if given time. Work the component too & throw if there is any movement, not putting too much pressure on it to shear it off.
Rusted steel can be partly recovered with painted on Phosphoric acid treatments that convert the flaky rust brown Iron Oxide surface layer to a harder purple Iron Phosphate. Some rust treatment products are also rubber emulsion paints that seal the metal from future water at the same time.

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73 De John, G8MNY @ GB7CIP