

How to Un-Insulate Wheelsets

By Richard Kerr

Most model railway wheelsets made for 2-rail use have one or both wheels insulated from the axle by a cylindrical sleeve of insulating material between the axle and the wheel. The method presented here is a simple, quick, inobtrusive and fully reversible method to un-insulate these wheelsets. In the East Penn Traction Club, we use the grounding action of un-insulated wheelsets to provide detection for automatic control on our modular layouts. By un-insulating the wheelsets of trailers, freight cars and other rolling stock, we protect the cars from collisions.

The method involves drilling through this material, parallel to the axle for the width of the wheel, using a drill size equal to the thickness of the insulating sleeve. A short piece of brass wire the same diameter is then hand-pressed into this hole, so that its edges touch both the wheel and the axle, thus connecting them electrically. For O-scale Atlas O and Intermountain wheelsets, use a 1/32-inch diameter brass wire and a #68 (0.031 inch) drill bit. I have also modified Northwest Short Line wheelsets in this manner, using a thinner wire and smaller bit. The same basic approach should work in other scales. Simply match the diameter of the wire and the size of the drill bit to the thickness of the insulating material used in the wheelset.



1. To remove and replace wheels from the truck, twist the sideframes and carefully extract or insert the wheelsets without damaging the axle point or the surface it revolves in. Do it carefully and the truck springs will not pop out. (An Athearn O-scale archbar truck is shown. Its plastic wheels will be replaced with metal Intermountain wheelsets. With Atlas O trucks, you must unscrew the sideframes and bolsters.)



2. Start drilling at an angle towards the axle, until the bit starts into the insulating material. Then carefully straighten the drill, parallel with the axle, and drill through to a depth equal to the thickness of the wheel. You will hit a “shoulder” on the axle inside of the wheel, or see the drill bit come through on the inside of the wheel. The drilling should be easy, through plastic or nylon. Buy several bits – the tips can break!



3. Use needle-nose pliers to carefully insert the brass wire the full depth of the wheel thickness. Then bend the wire up and away from the axle end at about a 45-degree angle. This makes it easier to snip off close to the bend. I use Xuron flush-cut rail nippers. Leave enough wire so that you can bend it all the way over, flush to the wheel, and can grab it later (see below).



4. Use needle-nose pliers to bend the wire piece the rest of the way, squeezing it flat against the wheel's hub. I then use a screwdriver tip to rotate the wire slightly, so that the exposed portion lays flat on the axle, instead of pointing away from it. This hides it better behind the truck's journal box. Test the electrical continuity between the axle and the wheel with an ohmmeter. The reading does not have to be zero ohms, just a low number. Do the other wheelsets, then carefully twist

the trucks and insert the modified wheelsets. Make sure the wire does not hit the truck sideframe. If in the future you want the wheelsets to be insulated again, just disassemble the truck, grab and remove the brass wire pieces, and re-assemble! The small hole will not affect the integrity at all.