

Simple Method To Protect Loco Wiring If Switch Is Not Aligned Correctly

If your locomotive (diesel or steam) runs up against a turnout that is thrown in the wrong direction, a short circuit will occur between the loco's front wheels, touching the frog, and the rear wheels. If this happens, booster current will flow from the frog, through the locomotive wiring and out the rear wheels.

If your booster is set for maximum output current, the short circuit current flowing through the loco's internal wiring can cause the wires to become very hot and might possibly melt the insulation. ZoneMaster boosters can source up to 8A of current. The small wire usually limits the total amount of current to something LESS THAN the short circuit setting on the booster. The booster doesn't know the difference between a 7A short and a 7A motor load. The booster will happily pump out 7A until the short circuit is resolved or one of the wires melts.

To protect delicate locomotive internal wiring against this type of failure, use the old fashion but highly effective trick of installing an automotive light bulb between the frog and the power feeds. An inexpensive 1156 automotive light bulb will reduce short circuit current to about 2 amps. The 1156 bulb can be purchased from Amazon and sell for about one dollar.

Under normal conditions, the bulb is dark and the loco running current flows through the bulb unimpeded. But should there be a short circuit between the frog and the opposite polarity track, the bulb will start to glow and reduces the amount of the short circuit current.

Bulb Mounting: A pair of wire pigtails can be soldered directly to the bulb. The bulb is installed between the frog and the spare contacts for frog polarity. Bulb sockets can also be purchased. Match the bulb base description to the socket; they must match or the bulb won't fit. The 1156 has a bayonet base.

Bulb Selection: For the simple frog protection shown below, the bulb rating should be about the same rating as the locomotive that goes through the turnout.

More Information: This link takes you to a well written section regarding light bulbs and their ratings. An extensive "theory" of operation can also be found here.

<https://sites.google.com/site/markgurries/home/technical-discussions/dcc-circuit-breakers/light-bulbs>

