

MARCH TECH TIP

Common Repairs for the ZW Transformer

Part 1

By Jim Weatherford



The most popular transformer built by Lionel, by far, is the 275 watt ZW. It provides a combination of power, flexibility, whistle control, multiple train operation, direction control, and (this is very important) the user has an inherent understanding of how to control the trains. The ZW is ambidextrous, it can control either a right or left handed train. A used ZW usually reveals the favored hand of the previous owner by the relative wear of the "A" or "D" carbon roller. Righties use the "A" handle and lefties use the "D" handle. Another trivial tidbit: lefties usually run their trains clockwise while righties run theirs counterclockwise. That's why you'll find most right marker lights bent or broken on steam locomotives since the engine will derail and tumble over on the right side when traveling counterclockwise at the speed of sound. Some digressions are interesting, aren't they?

Back to the subject at hand; the celebrated ZW Multi-Control Transformer. First built in 1948, the VW/ZW gained immediate acceptance in the model train world because of the dual whistle and reversing controls and the ability to operate four different trains independently by one transformer. It's difficult to determine exactly when production of the ZW ceased, the 1966/67 catalogue still offered them but they were probably supplied from warehouse inventory. Sales were reaching an all time low during the late 1960's, just prior to the purchase of Lionel by General Mills. It's doubtful the ZW's were still in production. By the way, the VW has all the same functions of the ZW but is only rated at 150 watts.

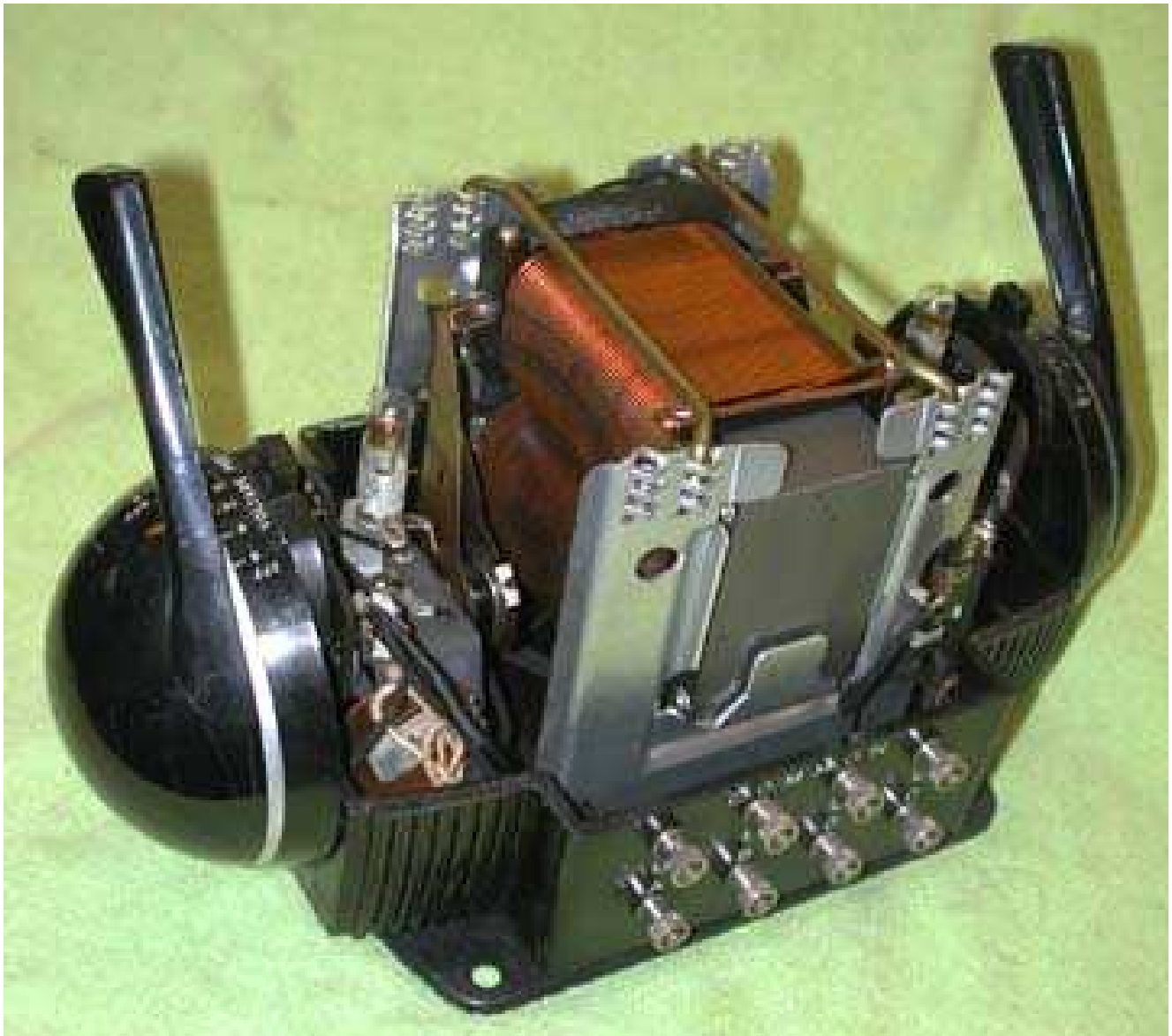
The four most common maintenance problems with this transformer are bad power cords, worn out carbon rollers, loose binding posts, and defective whistle rectifiers. We will address each of these problems over the next three issues of the Mainline.

Easily the most common problem is the cracked and brittle power cord. The insulation was made out of rubber and, with age, dries out and deteriorates to the point where bare wires are exposed. Naturally this is a severe safety concern and resolution of the problem is not for everyone. If your ZW

has been in the basement or attic for the past 40 years and you want to set up the family train, you should check the power cord to ensure it's pliable and safe to plug into a wall outlet. Inspect the cord especially near the case for cracks or brittleness. Bend the cord double to make sure the insulation is flexible and doesn't split. Check the power plug to see if it's still part of the original molded cord. If the cord is suspect, do **NOT** attempt to apply power. Replace the power cord before going any further.

Warning!! If you are unfamiliar or uncomfortable working around 120 volt AC electrical components, take the transformer to a qualified Lionel service repairman. Do not attempt to make this repair yourself.

STEP 1: Make sure the old cord is not plugged into a wall outlet. Remove the case top (four Phillips head screws) and also remove the bottom mounting plate by unscrewing the four hex-head screws. Set the plate aside.





STEP 2: Cut the old power cord off where it enters the bottom case. Set the transformer on its bottom and warm up your soldering iron.

STEP 3: Use wire cutters and cut off the cord about an inch from the terminal so each wire is separate. Remove the rest of the old cord from the bottom of the case. Remove the two coil support straps and the rear core support bracket. Prop up the core with a small block of wood about 2 inches. (This exposes the power cord terminals so you can get to them easily.)

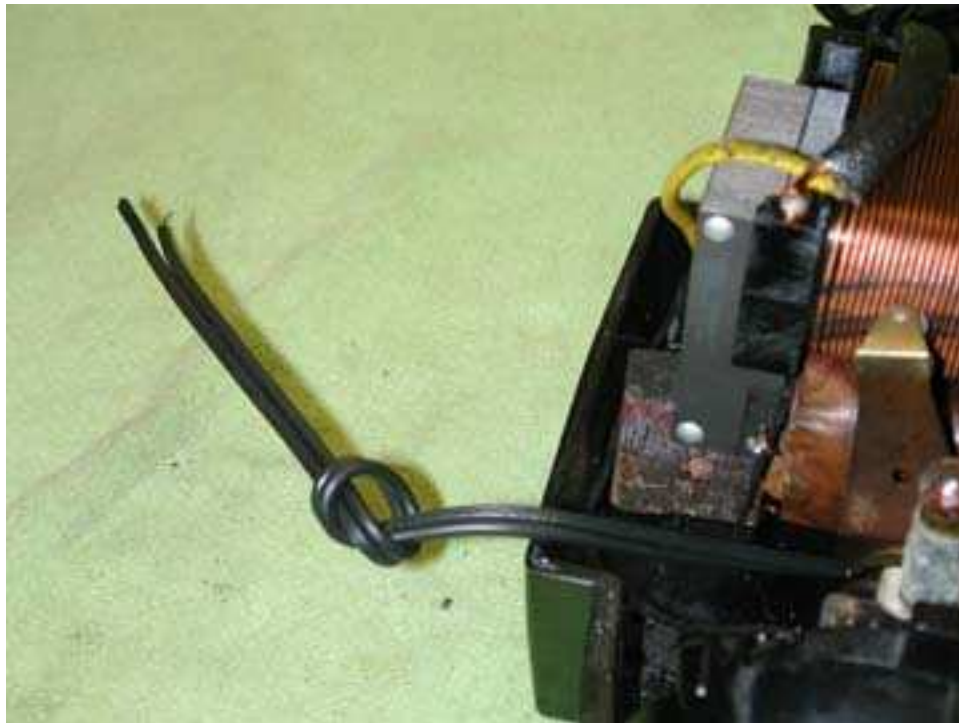




STEP 4: Heat up the top terminal with the soldering iron and use needle-nosed pliers to gently pull the wire free of the eyelet when the solder joint is fluid. Do the same with the bottom terminal taking care not to pull or bend the small, solid conductor primary core wires. The new power cord should be two-conductor and the same size as the old one.

STEP 5: Feed the new cord end without the plug through the hole in the bottom of the case from the outside. Pull enough through so you can tie a knot in the cord about six inches (approximately) from the end to prevent stress on the terminals in case someone pulls on the cord from the outside.





STEP 6: Separate the ends of the cord for two inches or so and cut one inch off one of the ends. Strip one half inch of insulation off each end, twist the ends tightly, then tin them with solder.



STEP 7: Take the short wire, holding it near the tinned end with long, needle-nosed pliers, heat the lower primary terminal with the soldering iron, and push the end through the back of the eyelet all the way to the insulation. Bend the end down on the inside using the soldering iron and add solder to ensure a solid electrical connection. Solder the other wire to the top terminal eyelet and make sure the cord is pushed to the bottom of the case, out of the way of the contact arm roller assemblies.



STEP 8: Next pull the cord from the outside until the knot is against the hole. Remove the wooden block, install the core support bracket, and ensure the core is centered. Install the bottom mounting plate with the four screws. Make sure the brackets are securely tightened. (If the screw slips in the bracket, bend the aluminum female holders together slightly and then tighten the screws.) Install the core support straps and the case top. Now you're ready to test your handiwork.