

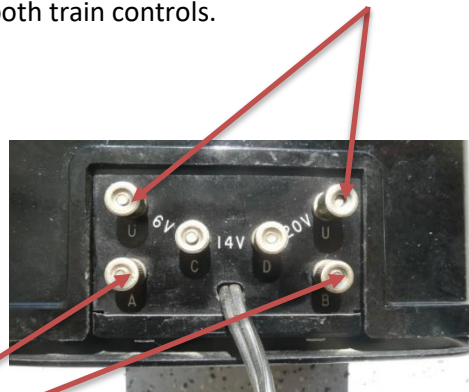
## KW TRANSFORMER



This poor transformer has received more criticism than any other transformer Lionel ever made.

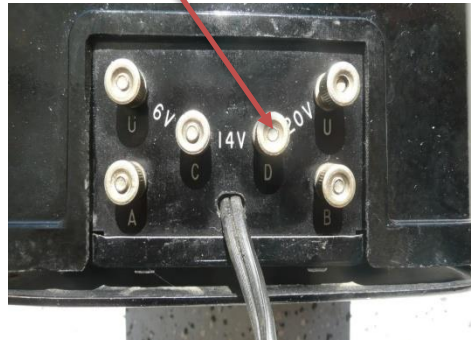
It really is not a bad transformer, its just the design engineers in my opinion got a little too cute, and the owner's manual frankly sucks. So a picture is worth.....So let's try to take the mystery out of this poor neglected step child.

First, these two terminals are shorted together inside the transformer and need to be hooked to the outside rails of your tracks, for both train controls.



These two terminals are used to run the trains and should be hooked up to the center rail for 2 separate trains.

This terminal should be wired for accessory power to for example switches, uncoupler tracks etc. It will give you a constant 19 volts or so no matter where your speed control is set.



These next two 14V have to be used together because they do not share anything with the outside rails. They are useful for village lights etc. but you need to remember you will have to run 2 wires to each light.

In other words for your lights one side of the bulb goes to the c terminal the other to the d terminal .

Lastly the C terminal that is supposed to be wired like c and d (which gives you 14 volts) here you can use the outside rail power tap (u) and C to get 6 volts. For what have no idea, would have been a lot better if it would give 14 volts between C and U but no luck. Other than that it really is not too bad.

So a summary:

U terminals go to the outside rails, no matter which one. they are both shorted together  
A terminal is to run a train controlled from the A control lever and needs to be hooked to the center rail of your "A" train.

B terminal is to run another train and needs to be connected to the center rail for that train, again is controlled by the B lever.

D can be used to operate all your switches, remote control uncouple/unloader tracks etc.

C and D hook to light bulbs

Why the 3 wire cable? These transformers were originally designed early last century. There were no rules or regulations regarding grounding or safety concerns. The wires that plug into the wall go directly to the primary windings of the internal transformer, which is mounted on a metal plate which is screwed into the bottom plate. While very rare it is possible that a short could develop between a winding on the transformer and

the metal mounting plates, which then could charge the bottom metal plate of the ZW (or KW) transformer. This then could potentially cause a shock hazard.

For a few years we have been using 3 prong plugs solely for the purpose of phasing all our transformers the same. (More on this later) The light bulb came on when we were taking one of the transformers apart, and the idea struck us why not change the whole cord ( which we were doing anyway for most all the transformers we recondition) with a 3 wire cord, with a top quality molded 3 prong computer style cord. By doing this we then take the 3<sup>rd</sup> ground cable, and screw it into the internal plates and the bottom plate, which will still take care of the phasing issue and provide the safety of grounding the bottom plate, and the internal transformer mounting plates.

If you are using this transformer with another, it is very important that they be phased together. If you are using it with another ZW or KW from us, we have already wired them so they will be in phase. If you are using with another transformer, here is a method to make sure your transformers are all in phase.

Plug in both transformers Take a wire and attach it to one of the "u" terminals on your new ZW. Plug in whatever transformer you want to use with the ZW on the same layout. Turn off all adjustable controls on both transformers. Touch the other end of the wire to the common terminal (wherever you would connect to the outside rails). No spark, you are good to go. If you get a spark, reverse the plug that goes into the wall plug on your old transformer. If you have more than one transformer, follow the same procedure for each transformer. That should take care of it.

Any questions or concerns, let us know. You can always reach us via email: @tinman3railcom. Or we always enjoy chatting with you guys....262-914-0057, your transformer has a one year warranty, so don't hesitate.