

Installation Instructions for the Lionel AD20B Oscillating Ditch Light Board

Instructions provided by

Train America Studios

Introduction

The Lionel AD20B Oscillating Ditch Light Circuit Board is designed for use in the command control environment. When use in the command mode every time you blow the horn, the ditch lights will oscillate back and forth. Once you release the horn button both ditch lights will stay on at full brightness. When used in the conventional mode, the ditch lights will simply illuminate, but not flash.

Installation

NOTE: There are 2 types of installations. The first type is written for the Lionel locomotives that use the newer style plug-in boards. The second set of instructions is written for the Lionel locomotives that use the older style boards; such as the LCRU and Railsounds 2.5 and older. You can easily identify which style you have once the shell is removed. If you do not see 3 plug in style cards that stand vertically, then you have the older style boards.

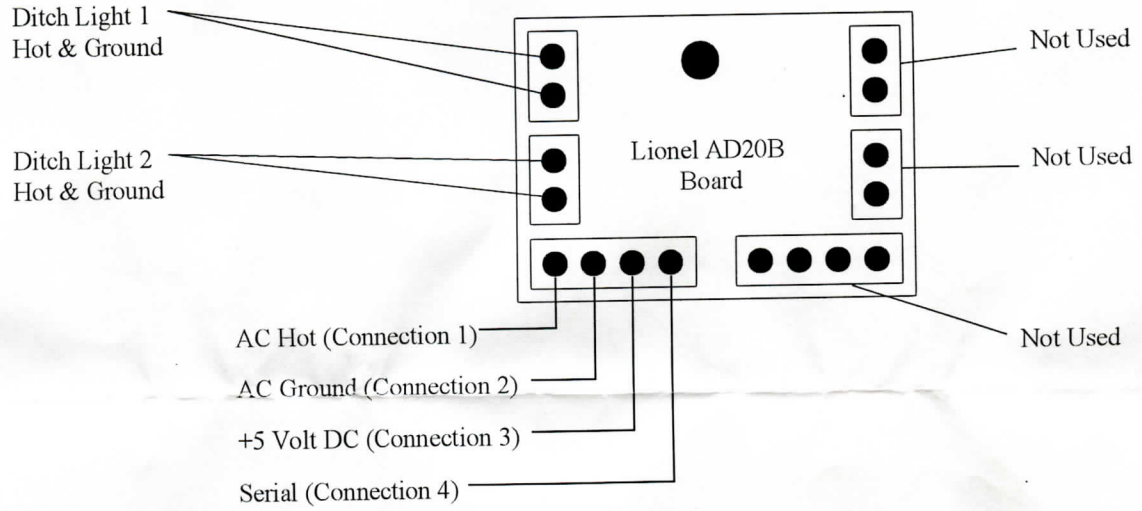
Installation is a bit tricky and will require soldering skills. If you are not comfortable using a soldering iron ask your local dealer if they can install this kit for you. Or contact Train America Studios for professional installation. We can be reached at (330)533-7181 Mon-Fri 10a-6p EST.

Newer Style Lionel Plug-In Boards

The newer style Lionel command and Railsounds boards consist of 3 separate boards. The first being the R2LC or Command Receiver (Lionel part # 6-22960). The other 2 boards make up Railsounds 4.0. They are the Railsounds Audio Board and the Railsounds Power Board. Each board is identifiably different, by the components mounted to each board.

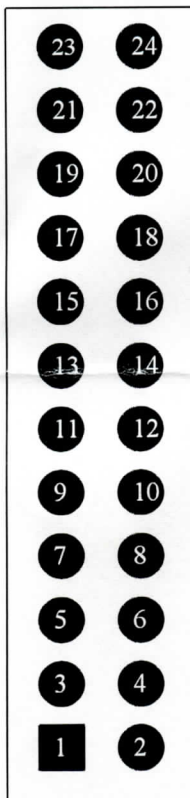
As mentioned above, you will be required to make 4 solder connections to 2 of these 3 boards. The diagram on the next page illustrates the connections that will be used on the AD20B board. As you can see (on the diagram on the next page) there are 4 main connections; AC Hot, AC Ground, +5VDC, Serial. These connections are labeled 1,2,3 and 4 respectively. Each of these connections will run from the AD20B board to their respective position on the Lionel plug-in boards. You will be responsible for routing the wires so they do not interfere with the Flywheel or any other moving parts in the locomotive.

Connector Orientation



The connections you will be required to make will be on the back side of each Lionel plug-in card. On the back side of these cards you will notice there are 24 pin legs. The orientation of these pin legs is shown on the next page.

Orientation of Pins on Lionel Plug-In boards



These pins are on the backside
of the Plug-In boards

The square pad is the number 1 position. EVERY Lionel plug in card will have a square pad. Use this pad as a reference for the orientation of the pins.

When making your solder connections please be careful. The stripped end of the wire to be soldered to the pins should be cut to length BEFORE soldering it to the pin legs. Once you have the wire soldered in place make sure the wire is not touching any surrounding pins or surface mount components.

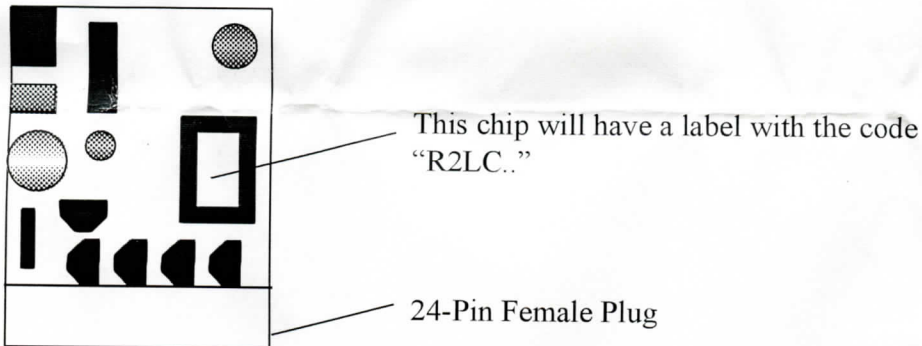
Connection 1 is AC Hot. This connection is made to pins 1 and 2 on the R2LC.

Connection 2 is AC Ground. This connection is made to pins 3 and 4 on the R2LC.

Connection 3 is +5 DC. This connection is made to pins 5 and 6 on the RS Power Board.

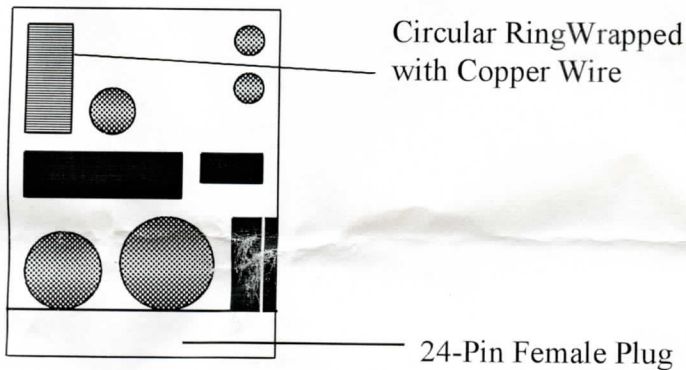
Connection 4 is Serial. This connection is made to pin 24 on the R2LC.

Front side of R2LC



If you are unsure of which plug in board is the R2LC, simply unplug the boards one by one and look for the word "Radio" printed under the 24 pin male connector.

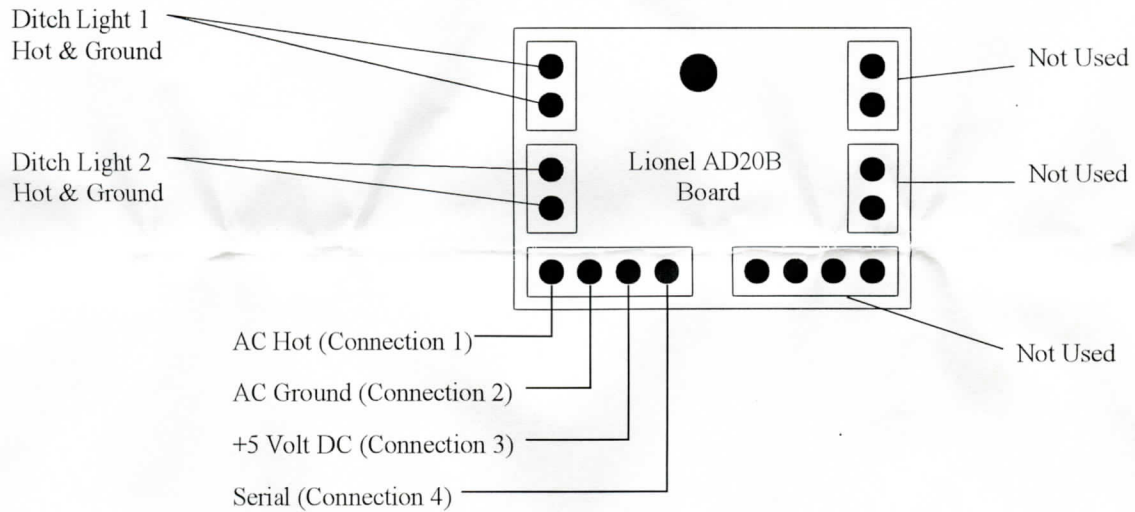
Front Side of Railsounds 4.0 Power Board



Once your connections have been made, refer to "Connecting the Ditch Lights" on page 6.

Older Style Lionel Boards

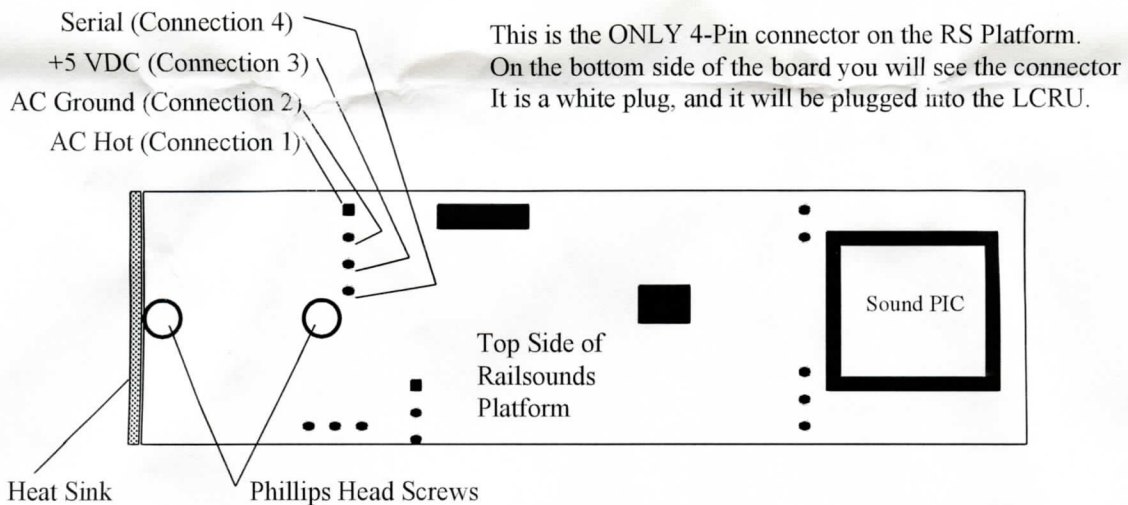
The older style Lionel boards are quite simple. They consist of an LCRU and a Railsounds platform. The connections you will be making will be located on the Railsounds platform. There are a total of 4 primary connections that will need to be made. they are shown on the diagram below;



These primary connections are AC Hot, AC Ground, +5VDC and Serial. All 4 connections will be made on the Railsounds platform.

You will be responsible for routing the wires so they do not interfere with the motors, or any other moving parts in the locomotive. Double sided tape is enclosed to mount the board, or you can use a screw through the hole in the board. If you decide to use the screw method, make sure you insulate the bottom of the board, so a short does not occur.

The solder points on the RS Platform are shown below;



Now that the wiring is complete, refer to "Connecting the Ditch Lights" below to complete the installation.

Connecting the Ditch Lights

If your locomotive already has ditch lights, such as the new scale diesels from Lionel, simply trace the wires back to their point of origin and cut them off. These wires will now be connected to the AD20B board. Simply solder the wires in place (each bulb has 2 wires, one wire connects to one hole, other wire to the other hole under either Ditch Light 1 or Ditch Light 2).

If your locomotive did not previously have ditch lights, then you will need to add them. If bulbs were not included in your kit, you need to use 2; 12 volt, 90 mA bulbs for the AD20B board to function properly. If you cannot locate these bulbs, give us a call at (330)533-7181 Mon-Fri 10a-6p EST.

Once you have the ditch lights wired up you will need to route the bulbs into the shell. Mounting these bulbs will be left to your discretion. We recommend using hot glue, in the event they ever have to be replaced down the road.

Symptoms	Troubleshooting Correction
Lights come on, but do not flash	Check the serial connection. Make sure you are in the command mode when pressing the horn button.
Lights don't come on	Check the AC hot and AC ground connections Make sure you haven't accidentally pressed AUX2. Make sure none of the wires are pinched.
Lights don't always come on when you hit the Direction button	When this occurs press AUX1 and zero on the Cab-1 If it persists, simply slow down when giving commands. If you have used this loco in a lash up, reprogram the ID #
Only one bulb illuminates connection	Check the light bulb leads on the board, ensure the is good. Check to ensure the board is not shorting out against the frame. Make sure the wires are not pinched.
Lights don't flash in conventional	Good, they are no supposed to. The AD20B board needs the serial data from the R2LC or LCRU to know when to flash. If you are operating the conventional mode, there is no serial data stream.