



71-4198-250
6/08

Lionel

CW-80 Transformer

Owner's Manual

CAUTION—ELECTRIC TOY

NOT RECOMMENDED FOR CHILDREN UNDER EIGHT YEARS OF AGE. AS WITH ALL ELECTRIC PRODUCTS, PRECAUTIONS SHOULD BE OBSERVED DURING HANDLING AND USE TO PREVENT ELECTRIC SHOCK.

TRANSFORMER RATINGS—INPUT: 120 VAC; 60 HZ ONLY.

AC OUTPUT: 18 V; 80 VA

Congratulations!

Congratulations on your purchase of the Lionel CW-80 Transformer! This device combines a high output control unit and an internal power supply, providing your railroad with 80 watts and five amps of alternating current. With a variable accessory voltage, the CW-80 Transformer features the precision control you demand!

Read this manual thoroughly before using your Transformer. It has important information on the setup and operation of this product. If you have any questions after reviewing these instructions, contact Lionel Customer Service at 586-949-4100.

FCC Statement

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

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Notes: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is not guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to trip to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Lionel®, *TrainMaster®*, *Odyssey®*, *RailSounds®*, *CrewTalk™*, *TowerCom™*, *DynaChuff™*, *StationSounds™*, *Pullmor®*, *ElectroCoupler™*, *Magne-Traction®*, *CAB-1® Remote Controller*, *PowerMaster®*, *Lionel ZW®*, *ZW®*, *PowerHouse®*, *TMCC®*, *Lionelville™*, *Lockon®*, *Wireless Tether™*, *LionMaster®*, *FatBoy™*, *American Flyer®*, *TrainSounds™*, *PowerMax™*, *LEGACY™*, *PowerMax™ Plus*

The name FasTrack® is used with permission from Pitsco, Inc.

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Operating your CW-80 Transformer safely

Your Lionel CW-80 Transformer is listed by Underwriter's Laboratory Inc. and has been carefully designed to ensure peak performance. When using electrical products, basic safety precautions should be maintained.

Be sure to observe the following guidelines:

- Read the manual thoroughly before using this device.
- This device is not recommended for children under eight years of age.
- Parents should periodically inspect this product for potential hazards and, if necessary, have them repaired by an authorized Lionel Service Center. In the event that such a condition exists, the transformer should not be used until it has been properly repaired.
- The CW-80 Transformer is intended to be used indoors. Do not use this device if water is present. Serious or fatal injuries may result.
- Use the CW-80 Transformer only for its intended purpose.
- The CW-80 Transformer was designed to operate on 120-volt, 60-Hertz power. Do not connect this product to any other power supply.
- Do not operate the CW-80 Transformer with a damaged cord, plug, or case.
- To avoid the risk of electrical shock, do not disassemble the unit. There are no user serviceable parts inside. If damaged, take this product to an authorized Lionel Service Center. A list of authorized Service Centers is packed with this unit.
- Do not operate the CW-80 Transformer on your layout unattended. Obstructed accessories or stalled trains may overheat, resulting in damage to your layout.
- Always unplug the CW-80 Transformer from the power source when not in use.
- Never insert objects into the ventilation slots on this product. Damage to sensitive electronic components can result.

Wiring your CW-80 Transformer

For best performance on large layouts, it is recommended that you use 16-gauge wire to connect your CW-80 Transformer to the track. Use the stripped ends of the wires, or spade-shaped connectors on all CW-80 Transformer connections, with no more than two wires on each terminal. Terminal strips (available at your local electronics supply store) allow you to connect multiple wires to evenly distribute power to your layout.

Make sure that all connections are secure. Loose connections can produce extremely high temperatures. For this reason, do not touch the terminals or track connections during use. Also, do not locate scenery materials such as lichen or ground foam near the terminals.

Caution! To prevent the excessive build up of heat, be sure to select the proper wire gauge for your layout. Follow these guidelines:

- Track connections (or Lockon connections) must be made with 18-gauge wire or heavier. Larger layouts require a minimum of 16-gauge wire.
- Use 24-gauge wire only when connecting single accessories that require lower current.
- When wiring multiple accessories (two or more) or accessories that require higher current, be sure to use 18- to 16-gauge wire.

1. Attach a Lionel Lockon to your track.

As illustrated in Figure 1, slide the bottom edge of the outside rail into the metal lip on the Lockon. Press the clip at the end of the Lockon over the bottom edge of the inside rail.

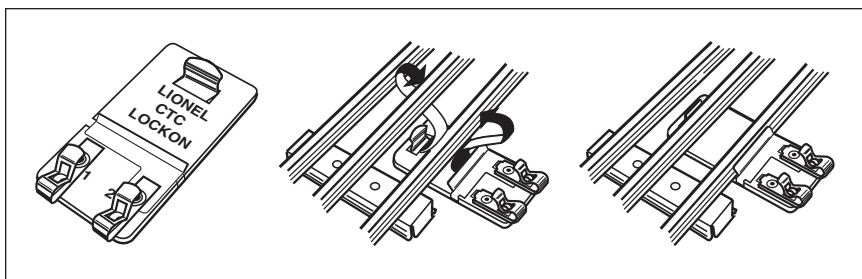


Figure 1. Lockon attachment

Wiring your CW-80 Transformer (continued)

2. **Attach one wire to the Lockon spring clip terminal labeled “1” and connect it to the power terminal labeled “A”. All Controller connections are illustrated in Figure 2.**

To attach the wire to the Lockon, press down on the top of the terminal clip so that a metal loop is formed. Slide the bare end of the wire into the exposed loop. Release pressure on the terminal clip, allowing the crimped metal to pinch the end of the wire in the metal loop. Give a little tug on the wire to check if the hold is secure.

To attach the wire to the Transformer terminal, loosen the thumbscrew to expose the hole in the terminal shaft, then insert the bare end of the wire into the hole. Tighten the thumbscrew, making sure that the bare wire is in contact with the terminal shaft.

3. **Attach a second wire to the Lockon spring clip terminal labeled “2” and connect it to the power terminal labeled “U”.**
4. **Attach a third wire to the Transformer terminal labeled “B” and connect it to your accessories.**
5. **Attach a final wire from your accessories to the Transformer terminal labeled “U”.**
6. **Plug the CW-80 Transformer into your wall outlet (120 volts).**

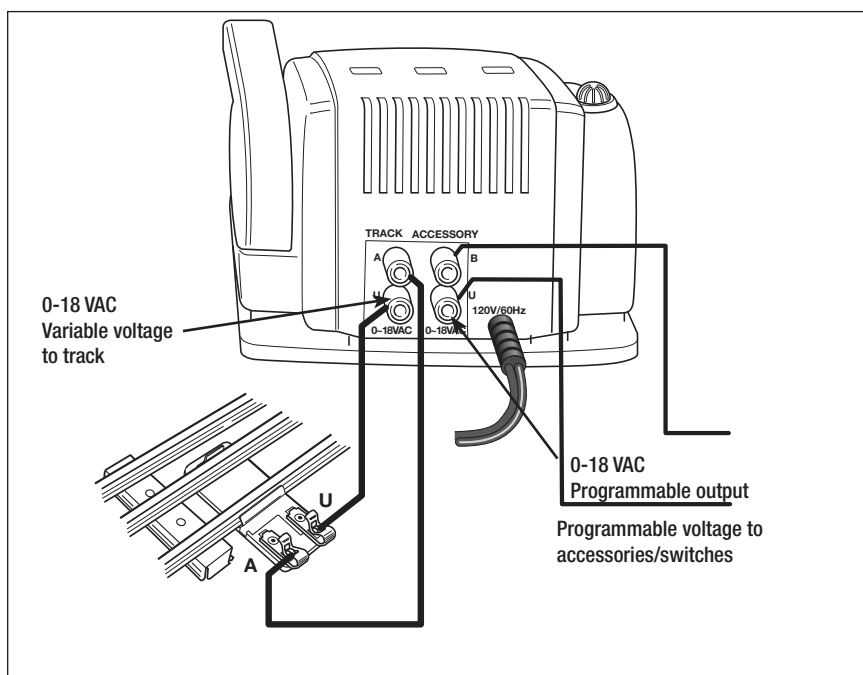


Figure 2. Controller connections

Connecting the FasTrack terminal section

If you are using the Lionel FasTrack track system, you will find that the terminal section easily connects to the transformer's TRACK posts. Two wires are attached to the underside of the FasTrack terminal section (available separately, 6-12016). Attach the spade-shaped connectors at the ends of these wires to the CW-80 Transformer. Be sure that the connections are secure. Follow these steps and refer to Figure 3.

Caution! If you are connecting the Transformer to your layout with any other type of wire, refer to the guidelines on page 4.

1. **Feed the wires through the notch in the FasTrack terminal section.** Refer to Figure 3.
2. **Loosen the red TRACK thumbscrew terminal, then slide the spade-shaped connector with the red insulation at the end of the black wire with white tracer into position.** The thumbscrew post should be positioned between the “blades” of the spade connector. Tighten the thumbscrew to secure the connection.
3. **Loosen the black TRACK thumbscrew terminal, then slide the spade-shaped connector with the black insulation at the end of the BLACK wire into position.** Tighten the thumbscrew to secure the connection.
4. **If you need to power an accessory, connect the accessory to the ACCESSORY thumbscrew terminals.**
5. **Plug the CW-80 Transformer into your wall outlet (120 volts).**

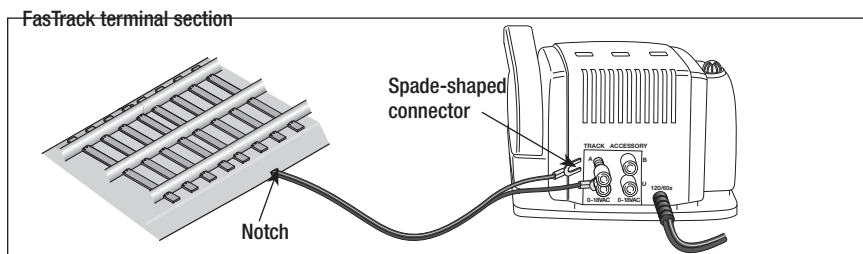


Figure 3. Transformer connections

Operating your trains with the CW-80 Transformer

You're clear for departure! Move the throttle control handle forward to increase power to the track. The farther forward you push the handle, the faster your train will go.

Note! Quickly shutting off or throwing the throttle all the way forward will not result in an instant change in track voltage.

When operating in the conventional (non-Command) environment, remember that the greater the load on the engine (adding more cars for the engine to pull, for example), the farther forward the handle must be pushed before it will operate the locomotive.

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Experiencing the features of the CW-80 Transformer

Refer to Figure 4 on page 8 for the location of the Transformer features listed in this section.

THROTTLE

Push the throttle forward to increase track power. The markings on the throttle approximate the percentage of full power. For more realism, push the throttle slowly to gradually increase or decrease the speed of the locomotive. Slowing or stopping the locomotive with the throttle instead of the DIRECTION button will allow you to continue in the same direction when you increase the throttle again. To achieve this effect, reduce the throttle to the point that the locomotive stops moving, don't completely turn off the throttle. That way, your train won't sequence into neutral.

POWER-ON INDICATOR

The green light will remain on during normal operation. The green light will begin to flash if you exceed the power limit of the Transformer. The unit will allow you to momentarily exceed the power limit, but power will be gradually reduced until the problem is corrected. This safety feature replaces the circuit breaker. The benefit is that the Transformer will not instantly turn off.

DIRECTION

The DIRECTION control button interrupts track power to activate the reverse unit in locomotives with forward-neutral-reverse operation. This button has no effect on locomotives not equipped with reverse units or on locomotives with the reverse unit in the OFF position.

Note! When the DIRECTION button is pressed, track power is interrupted instantaneously. Track power is restored gradually when the DIRECTION button is released.

WHISTLE/HORN

The WHISTLE/HORN button will activate Lionel sound-equipped locomotives, including those equipped with the RailSounds sound system. The sound will continue until the button is released. No external sound activation buttons are needed.

Experiencing the features of the CW-80 Transformer (continued)

BELL

The BELL button will activate all RailSounds bells. Press and hold the BELL button for two to three seconds to begin the sounds; press and hold the button again to turn off the ringing.

Note! Do not activate horns, whistles, or bells on RailSounds-equipped locomotives until track power has been turned on for a few moments, or a continuous horn/whistle or bell sound may occur. To correct this problem, simply turn off the CW-80 Transformer, then turn it back on.

Note! The CW-80 Transformer may cause random whistles in the Lionel Mighty Sounds of Steam™ tenders with a three-pin connector. We recommend that you purchase a RailSounds-equipped tender to solve this problem.

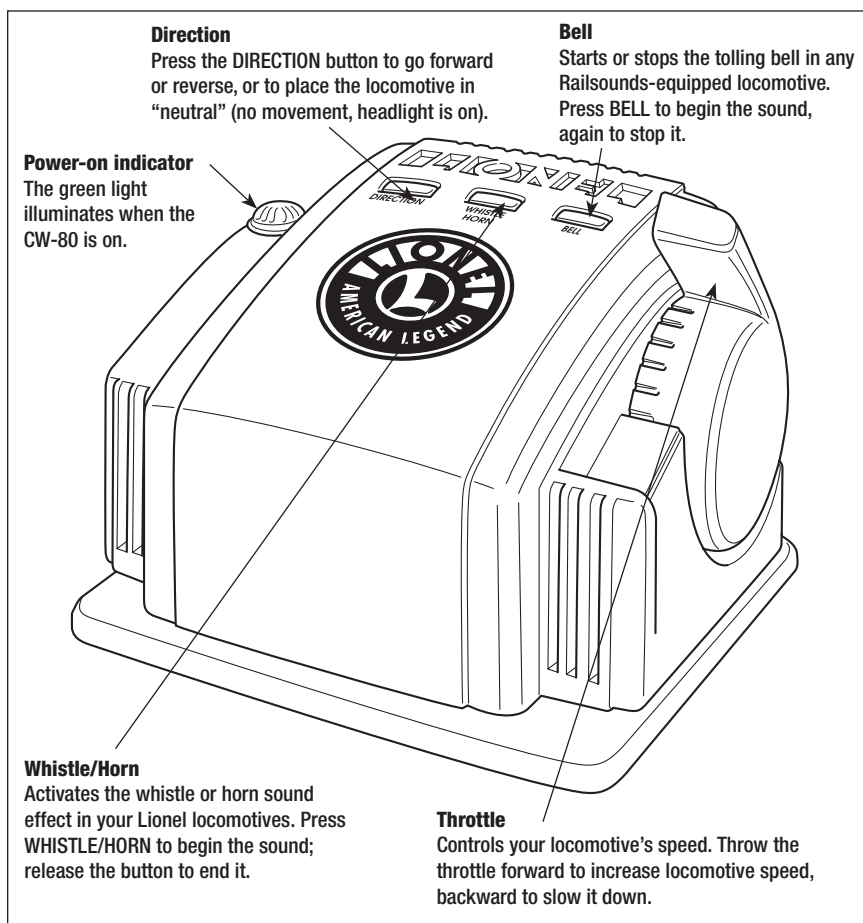


Figure 4. Transformer features

Setting the accessory output

Take control of your Lionel empire with your CW-80 Transformer! You choose how much power your accessories need. Your CW-80 Transformer features a programmable accessory output. The ability to control the voltage allows you to set the speed of your accessory motors and the intensity of your lights. Follow these steps to set the voltage.

Note! The accessory voltage was set to 12 volts at the factory.

- 1. Bring the throttle all the way back to turn off the power.**
- 2. Press and hold down the DIRECTION, WHISTLE/HORN, and BELL buttons on the Controller. Refer to Figure 4 for the location of these buttons.**
The green light on the Transformer will flash and track power will turn off.
- 3. With all three buttons held down, raise the throttle slowly until you reach your desired accessory voltage.**
- 4. Release the buttons once you have reached your desired voltage.**
The accessory turns off, and the solid green light indicates that you have set the accessory voltage.
- 5. Bring the throttle all the way back to turn off the power.**
The voltage will momentarily increase, briefly causing the lights to shine brighter or the motors to operate faster, before returning to the set level.
At this point, increasing the throttle again will control track power.

Powering your layout with the CW-80 Transformer

Your CW-80 Transformer provides a total output of five amps. The track outputs will deliver all of this power to the track when no accessories are connected to the Transformer. Keep in mind that connected accessories borrow some of this power. For example, if the accessories require two amps of the total five-amp capacity of the Transformer, you have three amps available for track power. This built-in flexibility will provide power for virtually any small- to medium-sized railroad. Also, available voltage depends on how much load is on the two outputs. Generally, track voltage and accessory voltage are 0-16 volts (AC) each.

This Transformer is capable of operating trains up to and including dual-motored AC engines. To operate at this level of track power, it may be necessary to disconnect any accessories. You may also want to attempt to lower the accessory voltage settings. Refer to the “Setting the accessory output” section.

You may momentarily approach or exceed the five-amp limit of the CW-80 Transformer when pulling illuminated cars, fighting over grades with heavy loads, or operating accessories. When you reach five amps, the green light on the Controller will begin to flash. This indicates that the Transformer is in “fold-back mode.” In fold-back mode, the Transformer is automatically reducing, or folding back, power. This gradual reduction in power provides interruption-free power while bringing the amperage back down to a safe level.

Troubleshooting

No lights or operation

Be sure CW-80 Transformer is plugged in.

Train runs, but WHISTLE/HORN, BELL, and DIRECTION buttons do not work

Check track connections. The track must be connected to the “A” and “U” terminals on the Transformer.

No change when DIRECTION button is pressed

Be sure that your locomotive reverse unit switch is ON.

Accessory operation is intermittent or absent

Check for loose, shorted, or improper connections. The accessory output voltage may have been set too low for the accessory. Refer to page 9 and reset the voltage to a higher level.

Locomotive runs slowly or lights dim at the far end of the track

On larger layouts, additional track resistance may cause a voltage drop. Attach additional Lockons to the remote portion of your track.

Green light begins to flash

The power limit of the Transformer has been exceeded. The unit will gradually reduce power until the problem is corrected.

Bell button blows whistle

Switch the wire connections at the Lockon or Controller Terminals. Be sure that the U post is connected to the outside rail and the A post is connected to the inside rail.

Limited Warranty/Lionel Service

This Lionel product, including all mechanical and electrical components, moving parts, motors and structural components, except for light bulbs, is warranted to the original consumer-purchaser, for **one year** against original defects in materials or workmanship when purchased through an authorized Lionel merchant.

This warranty does NOT cover normal wear and tear, light bulbs, defects appearing in the course of commercial use, or damage resulting from abuse or misuse of the product by the purchaser. Transfer of this product by the original consumer-purchaser to another person voids this warranty. Modification of this product voids this warranty.

Any warranted product which is defective in original materials or workmanship and is delivered by the original consumer-purchaser to Lionel L.L.C. or an authorized Lionel L.L.C. Service Center, together with proof of original purchase will, at the option of Lionel L.L.C., be repaired or replaced, without charge for parts or labor. In the event the defective product cannot be repaired, and a replacement is not available, a refund of the original purchase price will be granted. Any products on which warranty service is sought must be sent freight or postage prepaid, as transportation and shipping charges are not covered by the warranty.

In no event shall Lionel L.L.C. be liable for incidental or consequential damages.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Instructions for Obtaining Service

If service for this Lionel L.L.C. product is required, bring the item, along with your dated sales receipt and completed warranty information to the nearest Authorized Lionel Service Center. Your nearest Lionel Service Center can be found by calling 1-800-4-Lionel, or by accessing our Website at www.lionel.com.

If you prefer to send your product back to Lionel L.L.C. for repair in Michigan, you must first call 586-949-4100 or FAX 586-949-5429, or write to Customer Service, P.O. Box 748, New Baltimore, MI 48047-0748, stating what the item is, when it was purchased and what seems to be the problem. You will be sent a return authorization letter and label to ensure your merchandise will be properly handled upon receipt.

Once you have received your return authorization and label, make sure that the item is packed to prevent damage during shipping and handling. We suggest that you use the product's original packaging. This shipment must be prepaid and we recommend that it be insured.

Please make sure you have followed all of the above instructions carefully before returning any merchandise for service. You may choose to have your product repaired by one of our Authorized Lionel Service Centers after its warranty has expired. A reasonable service fee will be charged.

Warranty Information

Please complete the information below and keep it, along with your dated sales receipt. You must present this and your dated sales receipt when requesting warranty service.

Name _____

Address _____

Place of Purchase _____

Date of Purchase _____

Product Number _____

Product Description _____



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