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Lionel HO Scale Berkshire Passenger Set Owner's Manual

CAUTION—ELECTRIC TOY

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

TRANSFORMER RATINGS—INPUT: 100-240 V , 50/60 Hz.
OUTPUT: 12 VDC

Thank You!

Thank you for your purchase of the Lionel HO Berkshire Passenger Set! This set is designed to operate on any HO track system with a minimum curve radius of 20 inches. You can power your train with the included wall-pack power supply, a conventional DC transformer, or a DCC system up to 14 Volts. The LionChief remote control included will work with or without a DCC signal on the rails.

FCC Statement

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Contains

FCC ID: 2AH7AKW2541A

IC: 21416-KW2541A"

LionChief™ Remote control

The LionChief remote control is used to operate the locomotive. Easy to use, and with many enhanced features including a wider range of realistic sounds, such as chuff sounds and three buttons on the control to activate user-controllable announcements and engine sounds. Long-distance control and multi-engine operation on one layout are in your grasp with the LionChief remote control system.

LionChief® Bluetooth®

Incorporating Bluetooth technology into Lionel model trains opens a new world, integrating the tradition of model railroading with the latest smart-device technology. With Lionel's new LionChief app, you can control full operation and sounds directly from your Bluetooth-enabled smart phone or tablet and operate multiple locomotives from the same device. LionChief is available to smartphone users and is compatible with all new 2017 LionChief, LionChief Plus, S-Gauge, and HO Trains.

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Lionel®, LionChief™, MagneLock™

Table of Contents

Operating your wall-pack power supply safely

Your Lionel wall-pack power supply 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 fourteen years of age.
- Parents should periodically inspect this product for potential hazards and, if necessary, have them repaired by a Factory Trained Authorized Lionel Service Station. In the event that such a condition exists, the transformer should not be used until it has been properly repaired.
- The wall-pack power supply is intended to be used indoors. Do not use this device if water is present. Serious or fatal injuries may result.
- Use the wall-pack power supply only for its intended purpose.
- The wall-pack power supply was designed to operate on 100-240 volt AC, 50/60-Hertz power. Do not connect this product to any other power supply.
- Do not operate the wall-pack power supply 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 a Factory Trained Authorized Lionel Service Station. Visit www.lionel.com for a list of authorized Service Centers.
- Do not operate the wall-pack power supply on your layout unattended. Obstructed accessories or stalled trains may overheat, resulting in damage to your layout.
- Always unplug the wall-pack power supply 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.

Joining the MagneLock track sections

Lionel's MagneLock Track allows you to assemble your track in seconds! Just hold the pieces near each other and magnets will align and hold the sections together. Metal rail joiners are not necessary between the sections as the connectors in the roadbed will transfer power. If you would like to add these connectors for extra alignment and conductivity, or if you would like to join MagneLock Track to other HO tracks, simply break away the alignment tabs on the ends of the rails and insert the rail joiners. Lionel HO MagneLock Track is compatible with HO code 83 rail track from other manufacturers.

While not necessary, if you would like to fasten your track permanently to a platform, small holes are provided in the roadbed for nails. Metal tabs on the underside of the roadbed can be used to solder additional feeder wires if desired.

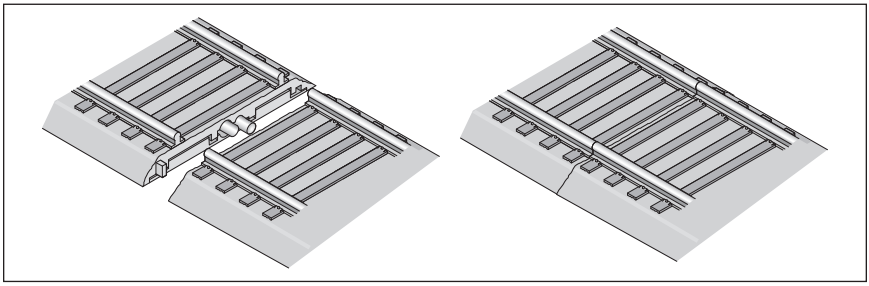


Figure 1. Joining the track sections

Connecting your wall-pack power supply

Your trains are powered by a DC wall-pack power supply. To power the track, simply plug the wall-pack into an outlet and plug the jack into the terminal section as shown in Figure 2.

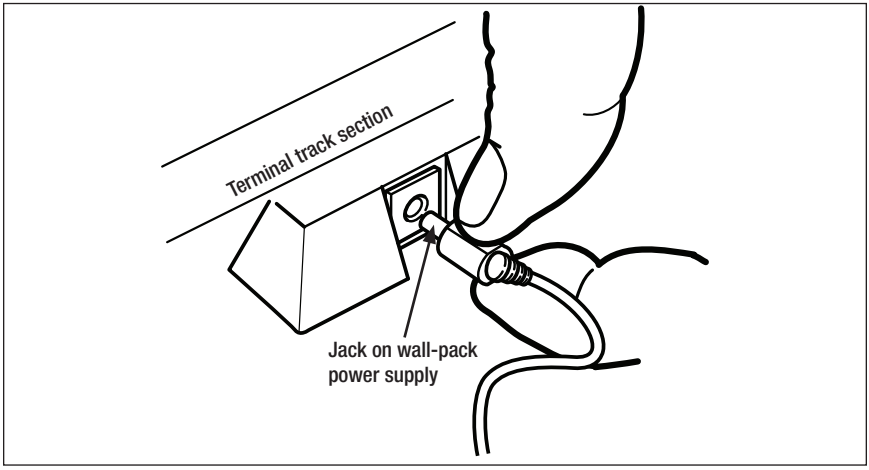


Figure 2. Wall-pack power supply connection

Locomotive control switches

There are two important control switches on the underside of the tender.

REMOTE / TRACK switch: Controls whether the locomotive will respond to track power (DC or DCC) or your LionChief Remote or another Bluetooth® device (either the Lionel Universal Remote or a smart device with the Lionel LionChief app.)

Sound OFF / ON switch: Mutes the chuff and background sounds. Whistle, bell and announcements can still be activated by pressing the buttons on your remote. We recommend leaving the sound switch on during set up so that you'll know the train and remote have successfully paired. The "tweeting" or beeping sound plays when in remote mode regardless of sound switch position.

Note! Engine power must be cycled (turned off and on) before any switch settings become effective.

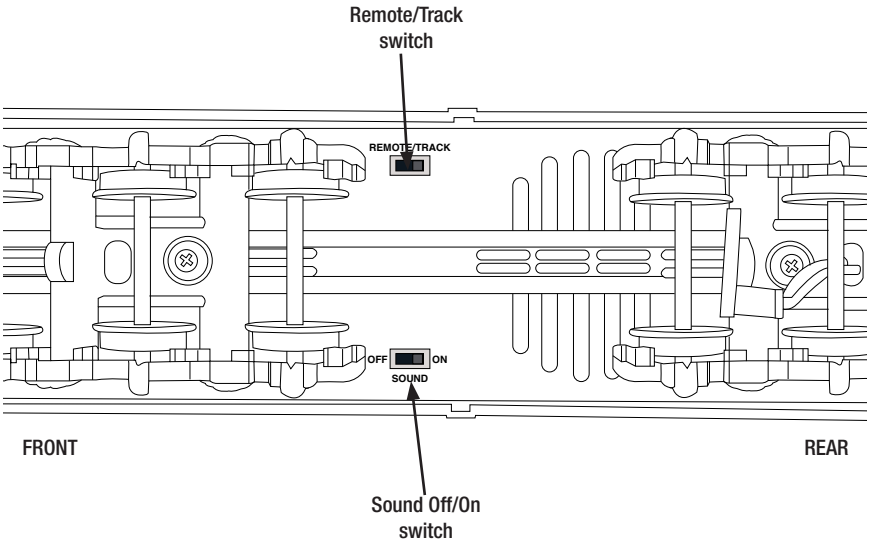


Figure 3. Switches under tender

Using the LionChief remote control

1

The LionChief Remote requires three AAA batteries (not included). For safety purposes, you must use a Phillips screwdriver to access the battery compartment. Use a Phillips screwdriver to remove the screw that secures the battery compartment hatch and lift the hatch to access the battery compartment (as shown in Figure 4). Insert three AAA alkaline batteries orienting the +/- as shown in the bottom of the battery compartment. Replace the battery door and tighten the Phillips head screw. Be careful to avoid over-tightening the screw.

Important! Use only Alkaline AAA batteries. Use only new batteries. Never mix new and used batteries or use different types together.

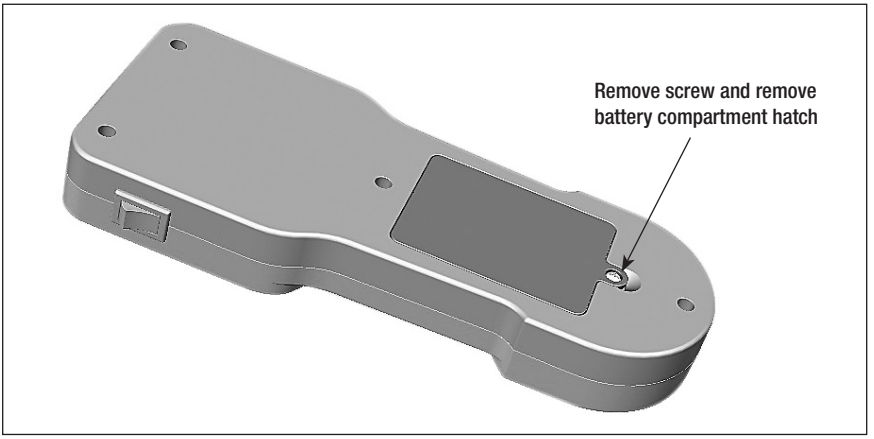


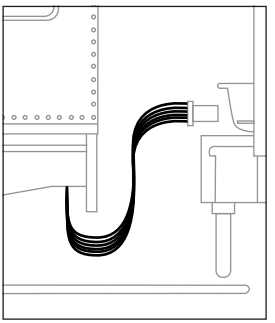
Figure 4. Opening and closing the battery compartment

Important! **REMOVE ALL BATTERIES WHEN THE TRAIN WILL NOT BE USED FOR AN EXTENDED PERIOD OF TIME. LIONEL'S LIMITED WARRANTY DOES NOT COVER DAMAGE TO YOUR REMOTE CAUSED FROM LEAKING BATTERIES.**

Important! **When you are not operating the train, flip the On/Off switch to the Off position to conserve the batteries.**

2

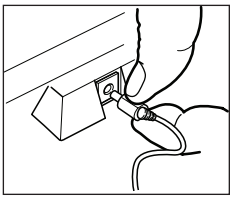
Connect the locomotive and tender. Plug the six-pin connector into the bottom of the locomotive. Connect the tender drawbar using the hole of your choice. We recommend using the shortened drawbar position only for larger radius curves.



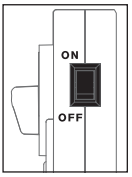
3 Locate the Remote / Track switch on the bottom of the tender and place it in the Remote position. Place the sound switch in the ON position. See figure 3 on page 6.

4 Place your train set on the track ensuring all wheels are on the rails.

5 Power up your layout. Plug in your wall-pack power supply and connect it to the track. If you are using a conventional DC power supply, turn the power up to around 14 Volts. You will hear a chime sound from the locomotive indicating that it is looking for a signal from a remote or Bluetooth® device.



6 Turn on the LionChief Remote using the toggle switch on the side of the remote.



7 The remote will automatically pair with the locomotive. Once acquired, the chime sounds will stop and you will hear the locomotive sounds.

Note! The locomotive can only pair with one device at a time. If you have already paired the locomotive with another Bluetooth® device (the Lionel Universal Remote or a phone or tablet using the LionChief app) then your locomotive will not pair with the set remote until released from the other device.

8 Your train is ready to run!

Coupling

When coupling your cars, at least one of the mating couplers must be open as shown at the left in Figure 5. Push the cars toward each other until they lock together.

Note! Keep in mind that it's easier to couple cars on a straight section of track.

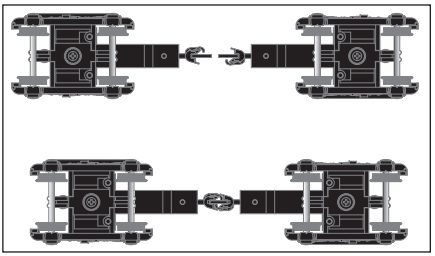


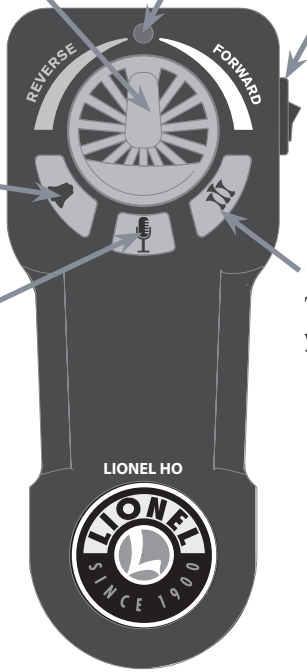
Figure 5. Coupler operation

Remote control features

THROTTLE
Control speed and direction with the knob. Turn the knob to the right to move forward, left for reverse and back to center (top) for stop. The LED indicator light will flash to indicate that speed signals are being sent to the locomotive.

SPEED INDICATOR LIGHT
The red light will remain on during normal operation. The light will begin to flash when the locomotive is in motion, and the flashing will vary with the locomotive's speed.

ON/OFF SWITCH
Turn remote control on and off. We recommend turning off the remote when not in use to conserve battery life. Remove the batteries for storage.



BELL
Press the BELL button to begin the bell sounds; press the button again to turn off the bell.

ANNOUNCEMENTS
Press the center button for a variety of announcements.

WHISTLE
The WHISTLE button will activate your locomotive's whistle.

To adjust the sound volume, press and hold the announcement button  and turn the throttle – right for more volume, left for less. The engine has to be stopped to adjust the volume (throttle at center). After adjusting the volume, the throttle must be turned back to the center position before being able to control engine speed.

Resetting the locomotive to factory settings

With the remote OFF, hold BELL, DIALOG, HORN button down; then while holding the buttons, power up the remote. Let go of the 3 buttons. Once the engine connects, it will reset and blow the whistle at full volume. If the whistle does not blow; redo the sequence.

Using another Bluetooth® device

Your locomotive can also be controlled by another Bluetooth® device. Only one control device can be paired with the locomotive at a time. If switching to another device, turn off the LionChief Remote included with the locomotive. Make sure the TRACK / REMOTE switch on the tender floor is set for REMOTE. See figure 3 on page 6 for the location of the switch.

This locomotive will also operate with the Lionel Universal Remote (6-83071) available from your Lionel dealer. This remote can control up to three LionChief locomotives at the same time.

You can also operate the locomotive from any Bluetooth® equipped smart device with the LionChief app. To download the app go to www.lionel.com.

Follow the start up instructions for the LionChief remote to pair either of these devices. All will pair with the locomotive the same way. Remember to turn off the remote after each use to conserve battery life.

Note! Available for both Apple and Android small hand-held smart devices.

Download on the App Store

GET IT ON Google Play

Connecting to your LionChief, LionChief Plus, or FlyerChief locomotive on Apple Devices

Once you have downloaded the free LionChief app and your locomotive is powered up on the track, tap the LionChief icon on your Apple or Android smart device.

This screen will be present and within a few seconds it will automatically connect with your locomotive. Once it has connected, your Bluetooth enabled locomotive will show up in the locomotive box. You are now ready to operate your locomotive.

Note! Your locomotive will make a chirping sound until the connection process is complete.

Figure 6a. App screen when trying to connect to a locomotive

Figure 6b. App screen when a locomotive is connected

What if my Bluetooth enabled engine didn't automatically connect?

Tap on the locomotive box. Your locomotive will show up at top, click the link button and you're all set to begin running your locomotive.

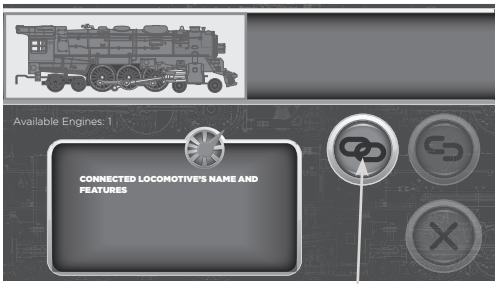


Figure 7. App screen to select a locomotive

Connecting to your LionChief, LionChief Plus, or FlyerChief locomotive on Android Devices

To locate your Bluetooth enabled locomotives on Android devices, tap on the number. This will take you to the engine selection menu. Tab the looking glass icon and the app will begin searching for compatible locomotives. Once the locomotive you want to run shows up on the selection bar, select it and then tap the link icon.

Note! Your locomotive will make a chirping sound until the connection process is complete.

Figure 8a. App screen when opening the app

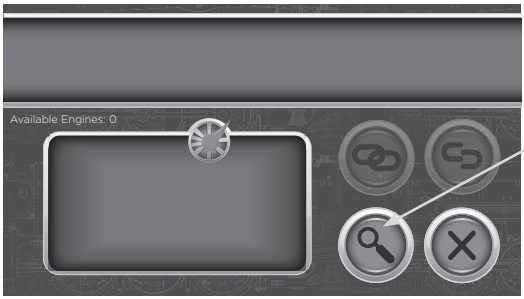


Figure 8b. App screen when searching for a locomotive

Figure 8c. App screen when a locomotive is connected

Running your locomotive

This is your main control panel.

Note! Grayed out icons means this feature is not available on your locomotive.

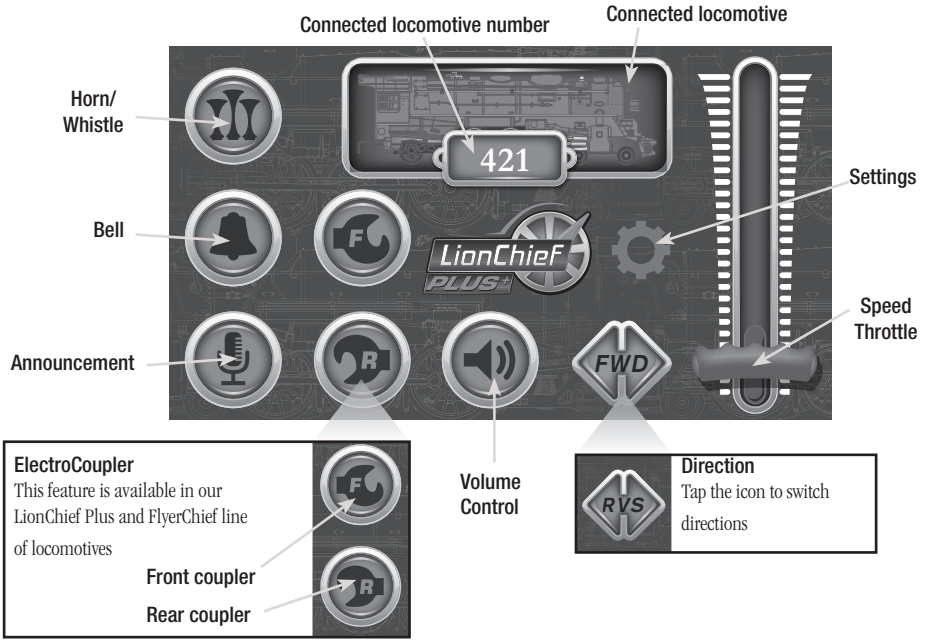


Figure 9. Controlling your locomotive with the app

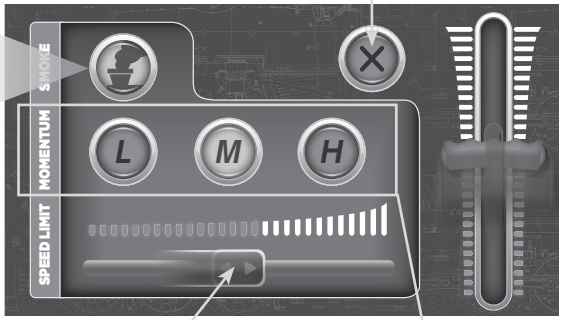
Settings

On the setting screen, you will be able to establish key elements of how your locomotive will run including smoke, momentum and speed limit. These settings will reset once you are done running the locomotive and close out of your LionChief app.

Smoke On/Off
LionChief Steam, LionChief Plus and FlyerChief steam locomotives come equipped with a smoke unit. This button allows you to turn on/off your smoke unit.

Smoke On

Smoke Off



Speed Limit
This setting allows you to control the max speed the locomotive can go while you are running your set on the app.

Momentum
The setting simulates the gradual acceleration and stopping of a real train.

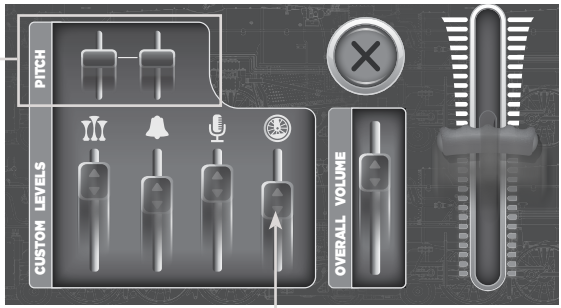
Figure 10. Adjusting locomotive speed and smoke settings

Volume Control

Our LionChief ,LionChief Plus and FlyerChief locomotives come equipped with a very impressive RailSounds sound system. This section of the app will allow you to establish the volume for individual sound elements or the overall sound level.

Note! Once these are established here, the characteristics will continue both on the app or with your remote until you choose to change them again.

Pitch
You are able to adjust the quality of sound "higher" or "lower" for both the horn/whistle and bell.



Train Sounds
Diesel revving or steam chuffing

Figure 11. Adjusting locomotive individual and overall volume levels

Switching Connection Between Multiple Bluetooth® Locomotives

Your LionChief app will display all "available" locomotives in the engine selection carousel. If you have three or more available engines, touch and scroll right to view them. Switching between available locomotives is easy, press the un-link icon to release the currently connected engine. Alternately, you can highlight the engine you would like to run and press the Link icon to connect. In both cases, if the previously selected locomotive was in motion, it will stop when disconnected.

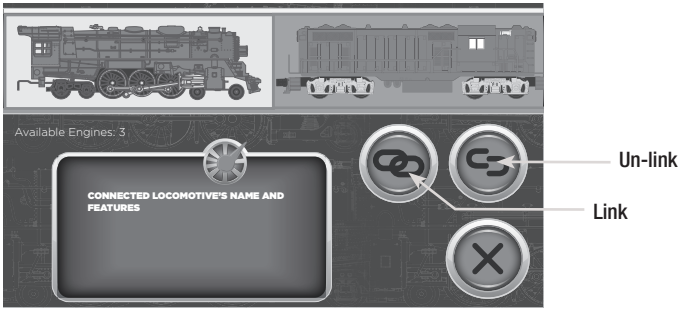


Figure 12. Switching between three locomotives

Troubleshooting

- If the locomotive does not appear in the app's "engine selection carousel," try turning the track power off, wait 5 seconds and turn it back on.

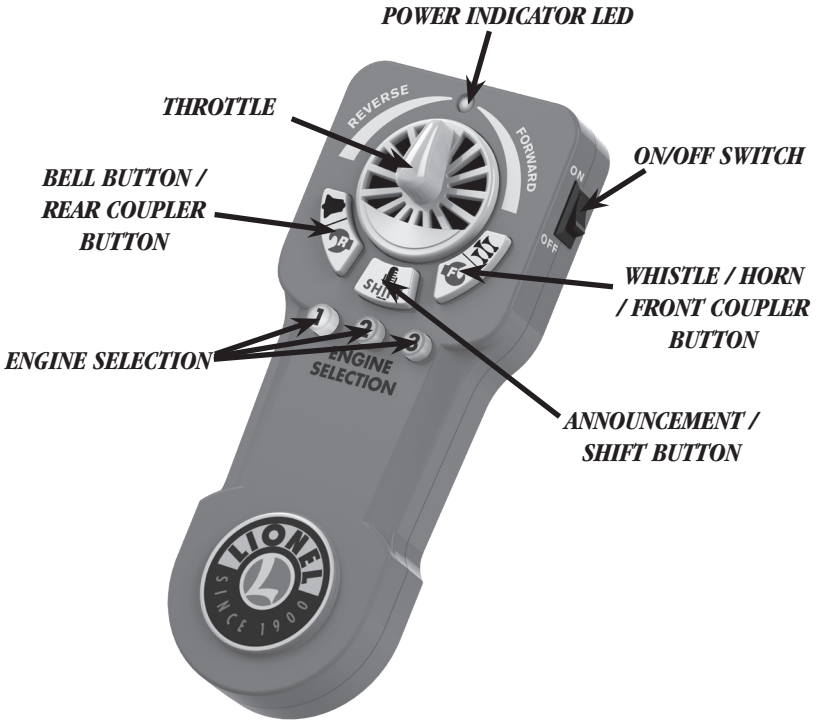
- If the locomotive powers up and starts playing its background sound instead of chirping, there is another remote connecting to the locomotive. Since the locomotive can only be controlled by one remote at a time, locate and turn off the other remote that is connecting to the engine.

- If a universal remote is present and powered on, make sure one of its 3 channels is not connecting to your locomotive before the app is able to connect.

- Verify that the locomotive works as expected with its provided remote or with the Lionel Universal remote.

The LionChief Universal Remote (6-83071)

Note! *Please refer to your LionChief Universal Remote manual for in-depth details of operation.*



POWER INDICATOR LED

When solidly illuminated, this red LED indicates the remote is turned on. When the remote pairs with a locomotive it will visually reflect the speed on the locomotive; solidly illuminated for idle, slow to fast blink, based on the speed of the locomotive. If the LED does not illuminate when the remote is switched on, the batteries need to be replaced.

ANNOUNCEMENT / SHIFT BUTTON

Press and release the announcement button to activate the locomotive's announcements. Press and hold the Announcement button for it to function as a "shift key".

ON/OFF SWITCH

Use this switch to turn the Universal Remote on and off. We recommend you turn the remote off when not in use to conserve battery life.

WHISTLE / HORN / FRONT COUPLER BUTTON

Press the Whistle / Horn button to activate the horn / whistle. To activate the front coil coupler on the locomotive press and hold the Announcement button down and, using another finger, press and release the Whistle/Horn button to activate the front coupler. Then release the Announcement/Shift button.

BELL BUTTON / REAR COUPLER BUTTON

To turn the bell on, press the bell button one time. To turn the bell off press the button again. To activate the rear coil coupler on the locomotive press and hold the Announcement button and, using another finger, press and release the Bell button to activate the rear coupler. Then release the Announcement/Shift button.

ENGINE SELECTION

1, 2, 3

Each Engine Selection button represents a channel for controlling one LionChief, LionChief Plus, or Legacy Bluetooth locomotive. Each of these buttons may be "paired" with a different locomotive. Once paired, you can control multiple locomotives from one remote by pressing an Engine Selection button, then using the throttle, horn, bell, etc..

Note! Your remote will remember all locomotive pairings when you turn everything back on for your next operating session.

THROTTLE

Turn the throttle clockwise slowly to increase speed in the forward direction. Returning the throttle to the top dead center position will bring the locomotive to a stop. Moving the throttle counterclockwise will increase the speed of the locomotive in reverse. The Throttle also functions as the volume control for LionChief Plus locomotives. Refer to "Adjusting the locomotive volume" section in this manual for more detailed information.

Adjusting the locomotive volume with the Universal Remote

To adjust the overall volume of the locomotive's sound system begin by placing the throttle in the top dead center position (so the red LED is solidly illuminated and the locomotive is stopped). Press and hold the Announcement button then turn the throttle to the left and / or right, this will increase and decrease the overall locomotive volume. Continue holding the Announcement button when turning the throttle, you can stay in this mode until the volume is at the level you desire. Once the volume level is set to the level you want release the Announcement button and return the locomotive throttle to the top dead center position again. (The new volume level will remain until you change it in the future, even after power has been cycled.) If, after running the locomotive, you decide to change the volume, simply follow the steps above to do so.

Note! If the throttle is not in the top dead center position before or after the volume adjustment process undesired operation will occur. Always start and finish the volume adjustment process with the throttle in the top dead center position!

Pairing locomotives to the Universal Remote

Your Universal Remote can connect or "pair" to one, two or three different locomotives at a time. Each "target" locomotive will be associated with one Engine Selection Button. Once you've paired with a locomotive, you can run it.

However, only "available" locomotives can be paired with the Universal Remote. "Available" means "not currently controlled by any other remote." An available locomotive will be powered up and beeping or chirping (older LionChief locomotives will play locomotive background sounds when available).

To Pair a Locomotive to Engine Selection button #1

1. Turn on power to your Universal Remote
2. Press and hold Engine Selection button #1 until it blinks rapidly. This will clear any previously stored pairing information so you can connect to the new target locomotive.
3. Release the button. It should flash slowly, indicating it is not connected to a locomotive.
4. Place the target locomotive on the track and apply track power.
5. Tap and release Engine Selection button #1. The remote will now seek and connect to the first available locomotive it finds.
6. Engine Selection button #1 should now be on (no flashing) and if the locomotive was beeping or chirping, it should now be playing engine background sounds.
7. Run the locomotive!

This locomotive pairing is now stored in your Universal Remote. The next time this engine and remote are powered on, the connection will be automatically re-established.

To Pair a Locomotive to Engine Selection buttons 2 or 3, simply follow the same steps with the other two Engine Selection Buttons.

Note! Legacy locomotives cannot be operated by the Universal Remote if they are already under the control of the App or another Universal Remote.

Operating locomotives with the Universal Remote

Now that you have paired locomotives with the Universal Remote its time to run trains! Operation with the Universal Remote is very similar to using the basic remote included with your locomotive. Switch between the locomotives you want to control by pressing different Engine Selection buttons.

Using the Throttle with multiple locomotives

Familiarize yourself with the Universal Remote by putting just one locomotive in motion at a time. Once you are comfortable as to which button is paired to what locomotive, try putting multiple locomotives in motion using the Universal Remote.

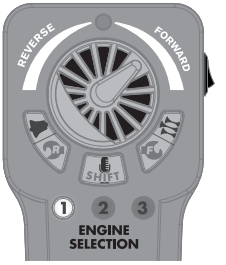
As soon as you press a different Engine Selection button, you can command the newly selected engine to blow its whistle, ring the bell or trigger dialog. However, throttle control does not automatically switch!

To take throttle-control of the selected engine, you have two choices: You can make the locomotive match the remote's current throttle position—or—you can change your remote's throttle position to match the engine's current speed and direction.

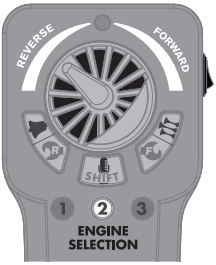
To immediately force the engine to match the throttle, just press that Engine Selection button a second time. The locomotive will immediately honor the current position of your throttle. This may result in an abrupt change in speed and/or direction.

Option two will avoid the possibility of an abrupt speed change. After pressing the Engine Selection button once, manually turn your throttle knob until it matches the locomotive's current speed and direction. Once you've matched the knob position, the main red LED will begin flashing at a rate proportional to the engine's speed. From this point on, further throttle rotation will change the engine's speed and/or direction.

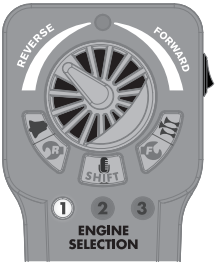
Here's an example showing the "throttle matching" option in action.



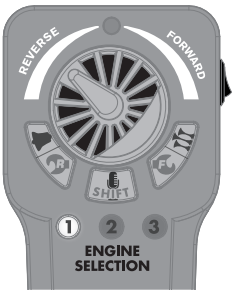
Engine #1 (above) is a diesel with throttle set for forward direction, medium speed.

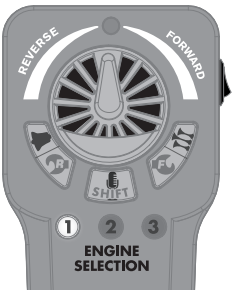


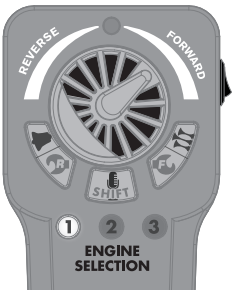
Engine 2 (above) is a steamer at stop. Press Engine Selection button #2 and turn the throttle counter-clockwise through the 12 o'clock (stop) position and continue to put this loco in reverse at slow speed. Meanwhile, notice that engine #1 is still moving forward as before.



Now, switch back to engine #1, the diesel. Note that even though the throttle is in the reverse/slow speed position, the diesel continues moving forward at medium speed.







Match!

To regain speed and direction control over diesel locomotive #1, you must match the throttle position to the engine's current speed and direction. Turn the throttle clockwise. Once you've matched the throttle position, additional throttle adjustments will again cause speed and direction changes of the currently selected engine.

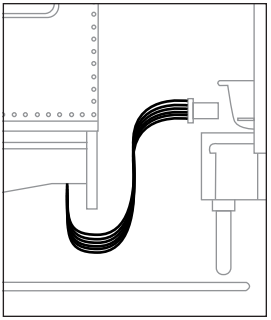
Using a conventional transformer

You can control your set with a conventional DC power supply directly without the use of the LionChief Remote.

Note! Due to the power demands of the sound system, you will not have sounds when running with your transformer. Your locomotive will also not start moving until you have applied approximately 7 to 8 volts to the track and will have a different speed range than non-sound equipped locomotives. To get the full sound features from the locomotive, power up your transformer to full power and use the LionChief Remote to control the locomotive's speed, direction and sound features. See page 9 for complete remote operating instructions.

Note! We recommend a 20 Watt transformer or larger for best operation. Using a less powerful transformer will not provide optimal performance. Do not exceed 16 Volts or damage to the electronics may occur.

1 Connect the locomotive and tender. Plug the six-pin connector into the bottom of the locomotive. Connect the tender drawbar using the hole of your choice. We recommend using the shortened drawbar position only for larger radius curves.



2 Locate the Remote / Track switch on the bottom of the tender and place it in the TRACK position. See figure 3 on page 6 for the location of the switch.

3 Place the set on the track ensuring all wheels are on the rails.

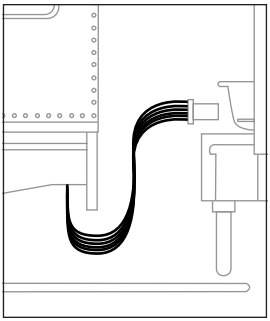
4 Power up your layout. Use your transformer speed dial and direction switch to control your locomotive.

Note! The locomotive must be brought to a stop before changing direction.

Controlling your set with DCC

Your set can also be controlled by a DCC system. Refer to your system user manual for set up of your DCC power.

1 Connect the locomotive and tender. Plug the six-pin connector into the bottom of the locomotive. Connect the tender drawbar using the hole of your choice. We recommend using the shortened drawbar position only for larger radius curves.



2 Locate the Remote / Track switch on the bottom of the tender and place it in the TRACK position. See figure 3 on page 6 for the location of the switch.

3 Place the set on the track ensuring all wheels are on the rails.

4 Power up your layout. The locomotive is preset to address 3 from the factory. Program your locomotive address and operate it per your system's instructions.

Sound Keys

Use the following short keys to access the locomotive features:

F0: Headlight
F1: Bell
F2: Whistle
F3: Turns on sounds
F5: Announcements
F8: Turns off sounds

Changing decoders

Your locomotive is already equipped with a DCC decoder. If you wish to replace the Lionel decoder with a decoder from another manufacturer, you can access all of the electronics inside the tender. The Lionel electronics are plugged into a standard JST 9-pin connector.

1 Remove the tender body by removing the four screws in the corners of the tender floor.

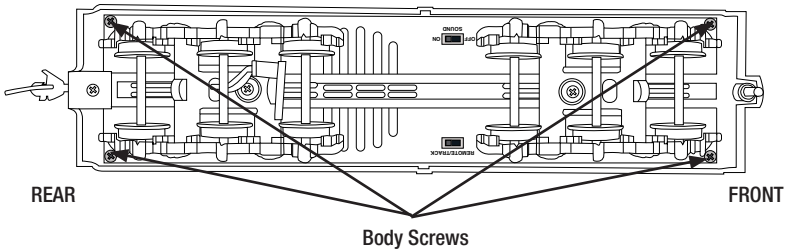


Figure 13. Tender body screw locations

2 Unplug the 9-pin, 6-pin, and 3-pin connectors from the main board.

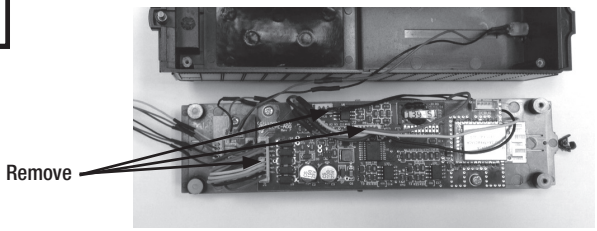


Figure 14. Main board inside tender

3 Remove the two screws holding the main board in place to remove it.

4 Insert the 9-pin plug into your new decoder.

5 If your new decoder supports sounds, follow the instructions with your decoder to connect the speaker wires to the proper connections.

Note! If your decoder does not already include resistors to protect the LED headlight and back up light, we recommend installing a 300Ω resistor in line with each LED to prevent burn out.

Note! Lionel is not responsible for damages caused by after-market decoders.

6 Replace the tender body and replace the screws.

Currently the following CV's are supported:

1. CV 1, Short Address
2. CV 3, Acceleration Rate
3. CV 4, Deceleration Rate
4. CV 7, Code Version
5. CV 8, Manufacturer ID (73) [write to 08 => full decoder reset]
6. CV 17 & 18, Long Address
7. CV 19, Consist Address
8. CV 29, Operating Modes, see DCC spec.
9. CV 50, Consist Position (1 = Lead, 2 = Mid, 3= End)
10. CV 51, BEMF Enable (default = ON)
11. CV 54, Brake Sounds Enable (future release)
12. CV 58, Control and Consist Filter Setting* (default = 2)
13. CV 59, Speed Step 128 Filter Setting* (default = 4)
14. CV 60, Speed Step 28 &14 Filter Setting* (default = 4)
15. CV 61, Function Groups Filter Setting* (default = 2)
16. CV 62, Config Variables Filter Setting* (default = 3)
17. CV 67 to 94, Speed Table 28 (active for 14 and 28 step mode only)

* Filter valid settings are 1 to 8. The filter settings are used to help prevent dirty track from affecting loco operation by rejecting commands that do not repeat for the selected count within a short period of time. For example, if the loco is on speed step 20 and the user sets speed step 30, the default filter setting of 2 requires 2 speed step 30 commands to change to speed step 30. Normally commands are repeated often enough in DCC controllers to pass the default filter settings selected. For example: If your loco stops occasionally, increase the filter setting for CV59 and CV60; if the loco does not respond to all speed commands, decrease the filter setting for CV59 and CV60.

Advanced DCC programming continued

Writing the CV's works as expected. All 4 methods of CV programming are supported: Ops (mainline), Page, Direct, and Physical mode.

A Lionel feature is CV50, "Consist Position". When creating a Consist on a DCC controller, the process only enters the default "direction" of travel. Once the Consist is created tedious lighting tweaks are the norm. On the Lionel DCC implementation, simply select each loco ID in the Consist (not consist ID!) and enter CV 50 per the following selections and all lighting, sound masking, and general operations are configured perfectly.

CV50: set 1 for "lead" loco, 2 for "mid" loco(s), and 3 for "end" loco.

Compatibility & limitations

The Lionel DCC implementation has been checked out with the Digitrax DCS50 and DCS51 DCC systems; the NCE Power Cab DCC system, and the MRC Prodigy 2.

The NCE system will need a bit of configuration for optimal performance:

Under the "Setup Command Station" menu

1. Number of Stop Packets: set to 8 (default)
2. Number of Horn Stop Packets: set to 8 from default of 2
3. Number of Program Packets: set to 8 from default of 4
4. Momentum Multiplier: set to 1 from default of 8

The CV's can be difficult to read, especially with the higher power draw on advanced feature locomotives. The NCE Power Cab system works well when reading the CV's. For other DCC systems, we recommend the DCC Specialties "Power Pax"™ booster for your programming track to improve CV read back.

DCC Specialties contact information:

DCC Specialties
57 River Rd, Suite 1023
Essex Junction, VT 05452

800-671-0641

email: info@DCCSpecialties.com

Compatibility & limitations continued

Operating Features

The Function Keys are similar to the Legacy Touch Pad. There are many Function keys on the DCC controllers, mapped to 10 physical buttons – F0 to F9. Some DCC controllers have additional Function keys above F9.

The arrangements on the Function Keys differ from controller to controller, however for the most compatibility with the Lionel Legacy System the Function Keys are based on Legacy features of the Touch Pad where possible.

DCC Predefined Mapping

F0 *(0 key)* is the Headlight On/Off

F1 *(1 key)* is the Bell On / Off

F2 *(2 key)* is the Horn / Whistle Key

DCC Lionel Unique Mapping

F3 *(3 key)* is Startup

F4 *(4 key)* is Master Volume up

F7 *(7 key)* is Master Volume down

F5 *(5 key)* is Dialog Activation

F6 *(6 key)* is Momentum Up

F9 *(9 key)* is Momentum down

F8 *(8 key)* is Shutdown

Operating Requirements

Track voltage cannot exceed 16VDC (or 16VDCC).

Current typically 0.5A, 2.0A peak

Note! Pulsed DC not supported.

Compatibility & limitations continued

CV29 supports the following (default is 18 decimal, 12 hex)

Bit 0 = Locomotive Direction: **"0" = normal, "1" = reversed.** This bit controls the locomotive's forward and backward direction in DCC mode only.

Bit 1 = FL location: set to **"0" in bit 4** to allow Speed and Direction instructions control the FL, **"1" = bit 4** in function group one instruction controls FL. The recommended setting is"1".

Bit 2 = Power Source Conversion: **Set to"0" = DCC Capable Only**

Bit 3 = Bi-Directional Communications: **Set to "0" = single direction communication**.

Bit 4 = Speed Table: **"0"** allows speed table set by configuration variables #2,#5, and #6, **"1"** = Speed Table set by configuration variables #66-#95. Must set to "1", and is only active in Speed Step 14 and 28 modes. The speed step profile in 128 speed step mode is internally controlled.

Bit 5 = **"0"** = one byte addressing, **"1"** = two byte addressing (also known as extended addressing). Both modes are supported.

Bit 6 = Reserved for future use

Bit 7 = Accessory Decoder: **"0"** = Multifunction Decoder, **"1"** = Accessory Decoder, this bit is set to "0".

Lubricating your locomotive

Help your Lionel locomotive lead a long and productive life on your railroad by maintaining it properly. To keep your locomotive lubricated, we recommend that you purchase a Lionel Lubrication and Maintenance Kit (6-62927), available from your authorized Lionel dealer.

When you find that the lubrication points illustrated in Figures 15 and 16 appear dry, lubricate your locomotive after you have removed any accumulated dirt and dust. There are two basic rules to keep in mind when you are lubricating your locomotive: use only a small amount of lubrication and avoid getting grease or oil on your locomotive's wheels or the track.

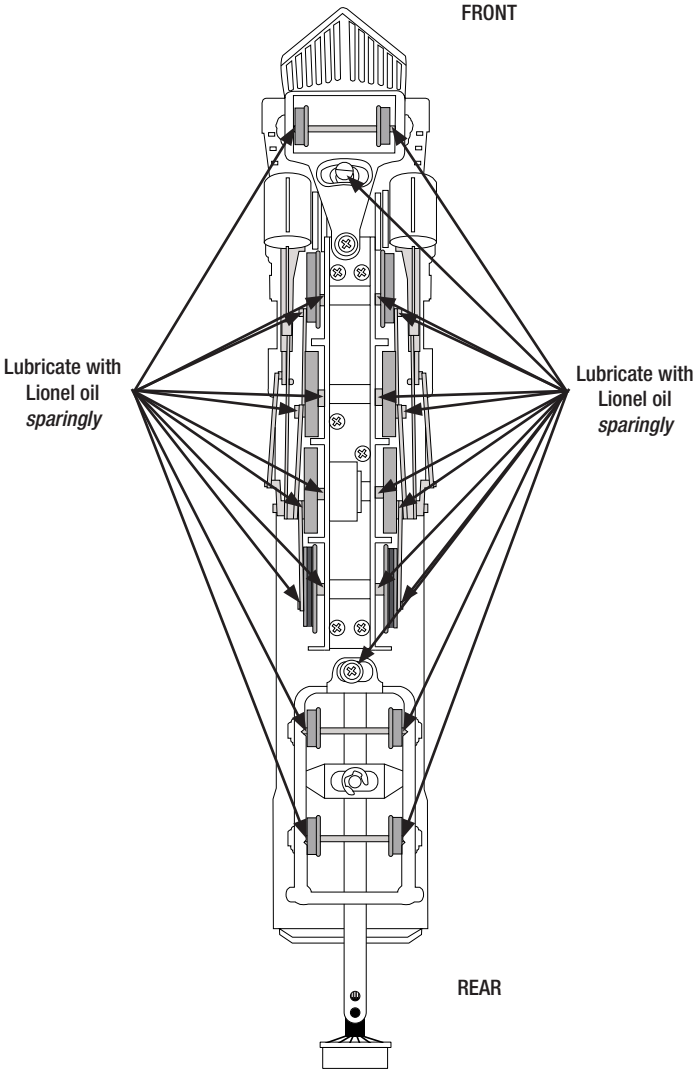


Figure 15. Locomotive lubrication points

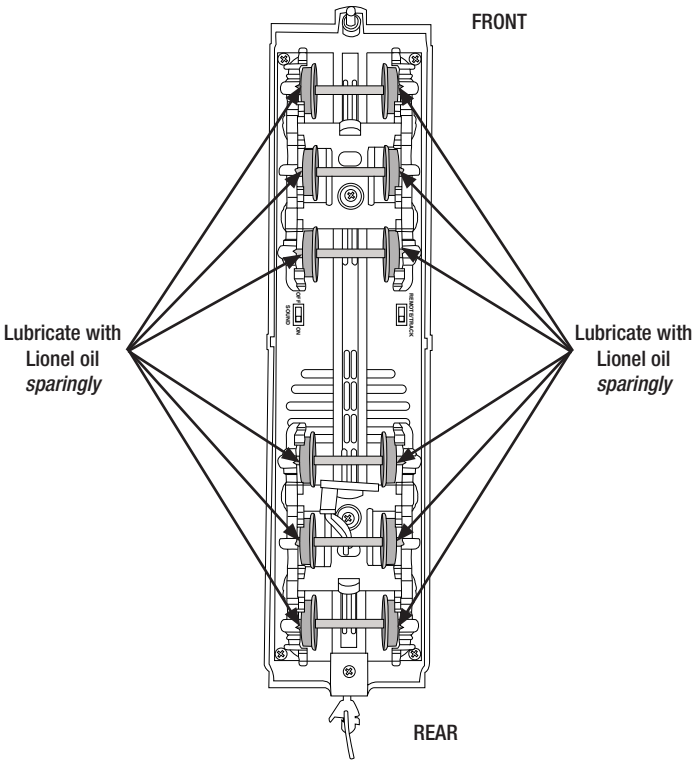


Figure 16. Tender lubrication points

Cleaning

To maintain proper electrical pick up, it is important to clean the wheels of your set from time to time. Erratic operation and flickering lights are the first signs that track and or wheels are getting dirty.

The easiest way to clean the locomotive and tender wheels is with track cleaning solution. Dampen a paper towel with the solution and place it across the track. With the locomotive and tender connected and all other wheels on the track, place the locomotive's driving wheels on top of the towel. Hold onto the locomotive and apply power, spinning the drive wheels on the towel.

Non-powered wheels on the locomotive and tender, as well as passenger cars, can be cleaned by gently pushing them back and forth over the towel.

In addition to cleaning the wheels of the locomotive and passenger cars, clean track is essential for proper operation. Follow the recommendations of the manufacturer of your track and clean your rails regularly.

Servicing your locomotive's LEDs

Your locomotive and tender are illuminated by LEDs that are expected to last for the life of the locomotive. The LED's are not user serviceable. If service is required, we recommend that you have your locomotive serviced at a Lionel Factory Trained Authorized Service Station or Lionel Service.

Note! If you replace the Lionel decoder and receiver board with an another brand of decoder, we recommend installing 300Ω resistors in line with the LEDs.

Note! Lionel is not responsible for damage caused to LEDs by another manufacturer's decoder.

Note! The headlight is always on regardless of the locomotive's direction. The rear light only works when the locomotive is moving in reverse.

Servicing your passenger car LEDs

Your passenger cars are equipped with LEDs for longer life and are not user serviceable. Please contact your nearest Lionel Service Center or Lionel Service if they need replacing.

Storing your set

If you are putting your set away for extended storage, we recommend the following:

- Remove batteries from the remote control.
- Clean the wheels before packing.
- Store your set in the original packaging.
- Store your set in a normal upright position, not on its side or upside down.
- Store your trains in a cool place with low humidity.
- When unpacking, check for lubrication. A break-in period is normal after any extended storage time.

Wall-pack power supply

CAUTION-ELECTRIC TOY

Not recommended for children under 14 years of age. As with all electric products,precautions should be observed during handling and use to prevent electric shock.

MODEL: SW1202000-W04
INPUT: 100-240V, 50/60Hz
OUTPUT: 12V

Keep these instrutions for futher reference. They contain important information.

OPERATION:

1. Plug the transformer into standard wall oulet
2. Connect the transformer to the appliance
3. Turn off the appliance and unplug the transformer from the wall outlet when not in use.

SPECIAL NOTE TO ADULTS:

- This transformer is age-graded for ages 14 and over, the transformer should not be operated in the presence of children under 14 without adult supervision. Adult supervision is recommend.

- It is recommended that the toy transformer be periodically examined for conditions that may result in the risk of fire, electric shock, or injury to persons (such as damage to the output cord, blades, housing or other parts) and that, in an event of such conditions, the transformer should not be used until properly repaired.

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.

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 no 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 equipement off and on, the user is encouraged to try 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.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Lionel Limited Warranty Policy & Service

This Lionel product, including all mechanical and electrical components, moving parts, motors and structural components, with the exception of **LIGHT BULBS, LED's & TRACTION TIRES** are warranted to the original owner-purchaser for a period of **one year from the original date of purchase** against original defects in materials or workmanship when purchased through a **Lionel Authorized Retailer***.

This warranty does **NOT** cover the following:

- Normal wear and tear
- Light bulbs or LED's
- Defects appearing in the course of commercial use
- Damage resulting from abuse/misuse of the product

Transfer of this product by the original owner-purchaser to another person voids this warranty in its entirety. Modification of this product in any way, visually, mechanically or electronically, voids the warranty in its entirety.

Any warranted product which is defective in original materials or workmanship and is delivered by the **original owner-purchaser** (this warranty is non-transferrable) to Lionel LLC or any Lionel Authorized Service Station **MUST** be accompanied by the original receipt for purchase (or copy) from an **Authorized Lionel Retailer***, will at the discretion of Lionel LLC, be repaired or replaced, without charge for parts or labor. In the event the defective product cannot be repaired, and a suitable replacement is not available, Lionel will offer to replace the product with a comparable model (**determined by Lionel LLC**), if available. In the event a comparable model is not available the customer will be refunded the original purchase price (requires proof of purchase from the **Authorized Lionel Retailer*** it was originally purchased). Any products on which warranty service is sought must be sent freight or postage prepaid (Lionel will refuse any package when postage is due). **Transportation and shipping charges are not covered as part of this warranty.**

NOTE: Products that require service that do not have a receipt from an LIONEL AUTHORIZED RETAILER* will be required to pay for all parts required to repair the product (labor will not incur a charge) providing the product is not older than 3 years from date of manufacture and is within 1 year from date of purchase. A copy of the original sales receipt is required.

In no event shall Lionel LLC be held 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 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 LLC product is required; bring the item, along with your DATED sales receipt and completed warranty information (at the bottom of this page) to the nearest Lionel Authorized Service Station. Your nearest Lionel Service Station can be found by calling 1-800-4-LIONEL or by accessing the website at www.lionel.com.

If you prefer to send your Lionel product directly to Lionel, for repair you must FIRST call 1-800-4LIONEL (1-800-454-6635) or write to Lionel Customer Service, 6000 Victory Lane, Concord, NC 28027. Please have the 6-digit Lionel product number, the date of original purchase, the dealer where the item was purchased and what seems to be the problem. You will receive a return authorization (RA) number to ensure your merchandise will be properly tracked and handled upon receipt at Lionel LLC.

Once you have your Return Authorization (RA) number, make sure the item is packed in its original Styrofoam inner container which is placed inside the original outer display box (this will help prevent damage during shipping and handling). This shipment MUST be prepaid and we recommend that it be insured with the carrier of your choice.

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 Lionel LLC's Authorized Service Stations after its warranty has expired. A reasonable service fee should be expected once the product warranty has expired.

Warranty Information

Please complete the information below and keep it, along with your **DATED ORIGINAL SALES RECEIPT**. You **MUST** present this form **AND** your **DATED SALES RECEIPT** when requesting warranty service.

*A complete listing of Lionel Authorized retailers can be found by calling 1-800-4-LIONEL or by visiting our website at www.lionel.com.

Products that are more than 3 years old, from date of manufacture, are not applicable for warranty coverage, even if they have never been sold prior to this date. (Under no circumstance shall any components or labor be provided free of charge.)

Name _____

Address _____

Place of Purchase _____

Date of Purchase _____

Product Number _____

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