75-8018-250
9/16

Lionel HO Scale Berkshire Locomotive & Tender Owner's Manual

Congratulations!

Congratulations on your purchase of the Lionel HO Berkshire locomotive and tender! This locomotive is designed to operate on any HO track system with a minimum curve radius of 18 inches. You can power your train with 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.

Table of Contents

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.

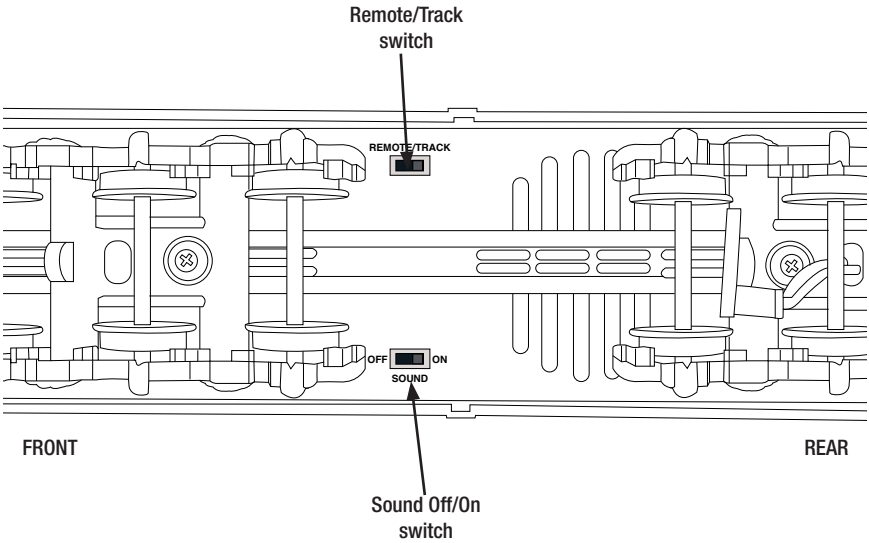


Figure 1. Switches under tender

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 2). 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.

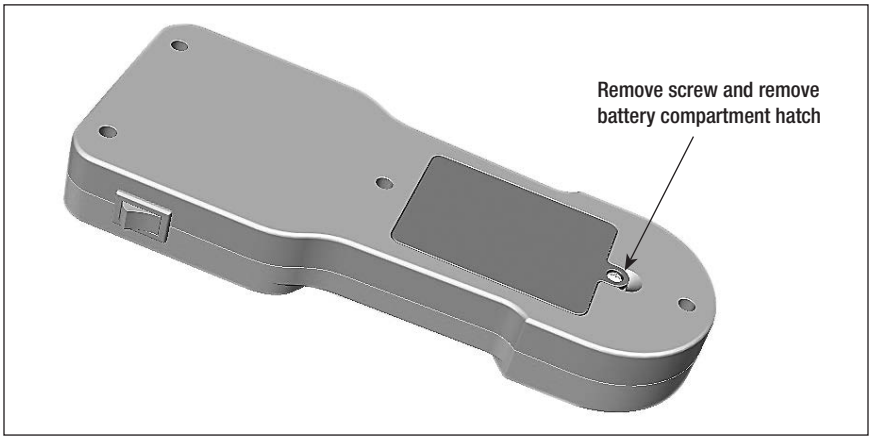


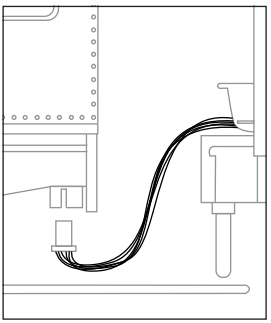
Figure 2. Opening and closing the battery compartment

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.



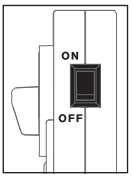
Using the LionChief remote control continued

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 1 on page 4.

4 Place the locomotive and tender on the track ensuring all wheels are on the rails.

5 Power up your layout. 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 locomotive is ready to run!

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.

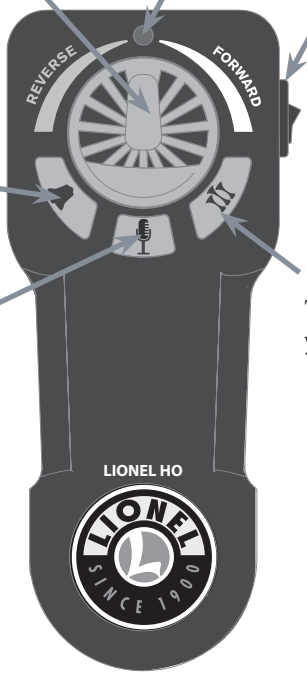
SPEED INDICATOR LIGHT
The red light will remain on during normal operation. The light will begin to flash when the locomotive is in motion, and the flashing will vary with the locomotive's speed.

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 1 on page 4 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.

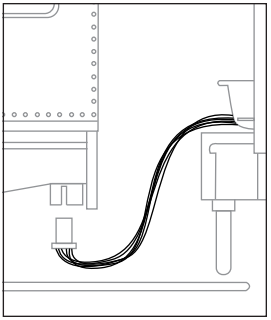
Using a conventional transformer

You can control your locomotive 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 7 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 1 on page 4 for the location of the switch.

3 Place the locomotive and tender on the track ensuring all wheels are on the rails.

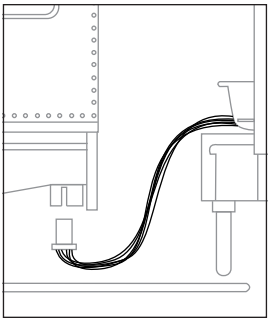
4 Power up your layout. Use your transformer speed dial and direction switch to control your locomotive.

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

Controlling your locomotive with DCC

Your locomotive 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 1 on page 4 for the location of the switch.

3 Place the locomotive and tender 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.

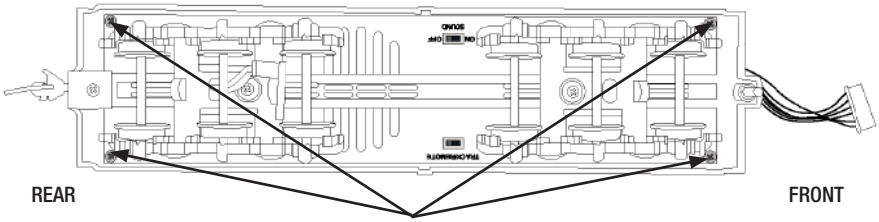


Figure 3. Tender body screw locations

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

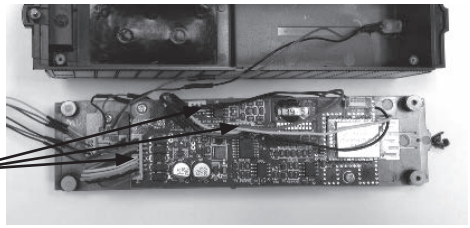


Figure 4. Main board inside tender

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

4 Insert 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 5 and 6 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.

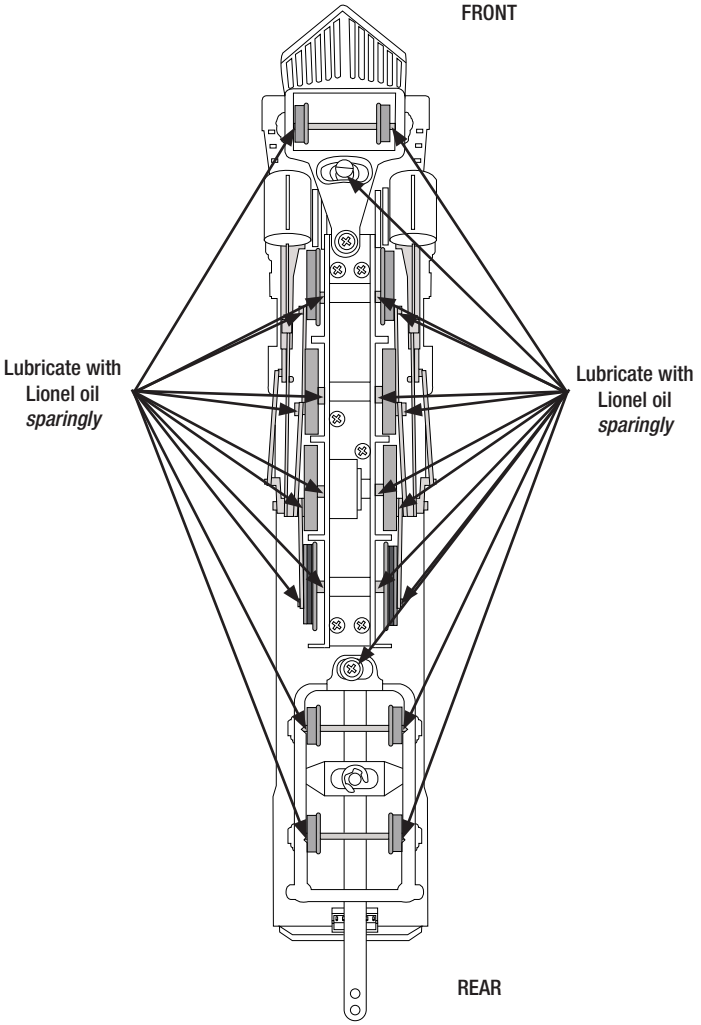


Figure 5. Locomotive lubrication points

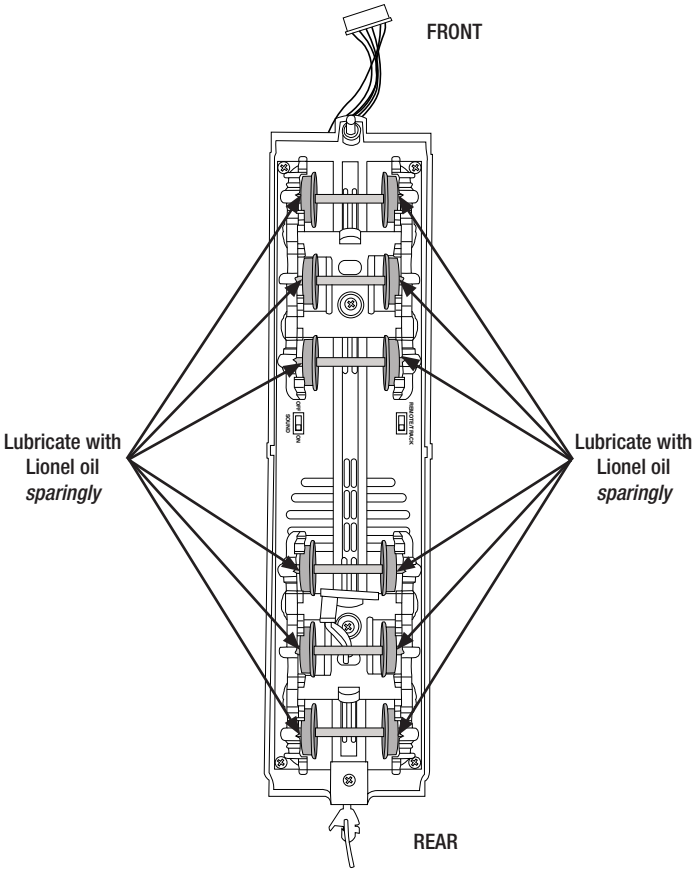


Figure 6. Tender lubrication points

Cleaning

To maintain proper electrical pick up, it is important to clean the wheels of your locomotive 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 wheels is with 90% Isopropyl Alcohol. Dampen a paper towel with the alcohol 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 locomotive wheels, 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.

Storing your locomotive

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

- Remove batteries from the remote control.
- Clean locomotive wheels before packing.
- Store your locomotive in the original packaging.
- Store your locomotive 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.

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 586-949-4100 extension 2 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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