

71-8587-250

Rev. 3.1

5/00

LIONEL



Lionel C-420 Diesel Locomotive Owner's Manual

featuring **TRAINmaster** and *Railsounds*
C-O-M-M-A-N-D

Congratulations!

You purchased a tough, durable locomotive—the C-420 diesel locomotive built by Lionel. From the crisp detail and expert decoration on the outside to the brute

power under the hood, the Lionel C-420 is ready for duty on your model railroad. Experience the superiority of today's Lionel.

- Two powerful flywheel equipped can motors
- Digital TrainMaster Command™ controlled
- Railsounds™ digital — sound system
- Tire-Traction
- Die-cast ElectroCouplers
- Illuminated headlights/rear light/interior light
- CrewTalk (in command)
- TowerCom (in command)
- Diesel smoke generator
- Directional lighting

Table of contents

Transformer operations

Running your C-420 with a Lionel transformer	3
Locking your C-420 into a single operational state	4
Using your C-420 Electrocoupler in the non-command environment	4
Installing the Lionel no. 610-5906-001 sound activation button	5

Maintaining and servicing your C-420

Lubricating your C-420	6
Adding fluid to your Locomotive's smoke generator	7
Replacing your C-420's L.E.D.	7

TrainMaster® Command operations

Your C-420's Railsounds™ system—the basics	8
Experiencing the range of your C-420's Railsounds™ system	9
The Command™ control environment	10
Running your C-420 in the TrainMaster® Command environment	11
CAB-1 numeric keypad commands for your C-420	12
Tuning your C-420's performance	13
Assigning your C-420 a new ID#	14
Reprogramming R2LC circuit boards to restore or change features	15
Lionel Service	16

Transformer operations

Running your Lionel C-420 with a Lionel transformer

1

Place your C-420 locomotives on Lionel or Lionel-compatible 0 gauge track.

2

Power up your C-420 with your transformer.

- **Your C-420 is designed to operate on 8-18 volts alternating current.**

Virtually all Lionel and Lionel-compatible alternating-current transformers are suitable.

- **Do not power your C-420 with direct current (DC).** Damage to sensitive electronic components may occur.

Note!

- **When you first power up your track, your C-420's headlights will illuminate.** At this point, the locomotive is in neutral. This occurs when placing the C-420 on your railroad for the first time. When your train is first powered up, the default state will be neutral and the default direction is forward. This means whenever you power up your engine the engine will remain in neutral, and when the power is removed and again applied, the train will move forward. This condition holds true if the engine is being powered up for the first time or if the engine has been powered down longer than five seconds.

3

Move 'em out!

- **Get your C-420 moving.** Press the DIR button on your CAB-1 remote or Lionel transformer. This sequences the Lionel reverse unit to the next operating state.
- **Adjust track voltage** until your C-420 moves at your desired speed. To increase speed, increase track voltage. To decrease speed, reduce voltage. To stop the locomotive, cut track power.
- **See page 4 for information on locking your C-420 in a single operating state**

Transformer operations

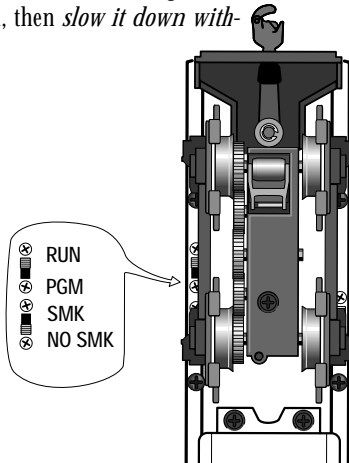
Locking your C-420 into a single operational state

To select a single operational state for your Lionel C-420 (example: forward only), you can deactivate the R2LC's sequencing function with the reverse unit control switch.

Get your locomotive moving in the desired direction, then *slow it down with-*

out stopping. Set the reverse unit control switch to PROGRAM. The C-420 is now "locked" into your chosen direction.

When you no longer want single-direction operation, just slide the reverse unit control switch back to RUN.

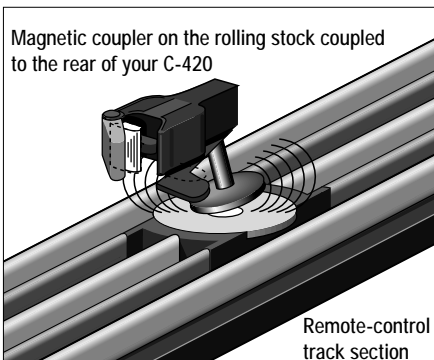


Smoke Unit
(see page 7 for details)

Using your C-420 Electrocoupler in the non-Command environment

To use your C-420 Electrocoupler in the non-Command environment, you must first couple a piece of rolling stock equipped with Lionel magnetic couplers directly to

your C-420's electrocouplers. The magnetic coupler on the rolling stock will then react to the magnetic field generated by a Lionel remote-control track section (available separately). Place your rolling stock's coupler "trigger disc" over the central coil of a remote-control track section and press uncouple on the controller. The magnetic field pulls the disc downward, and the coupler opens.



Note!

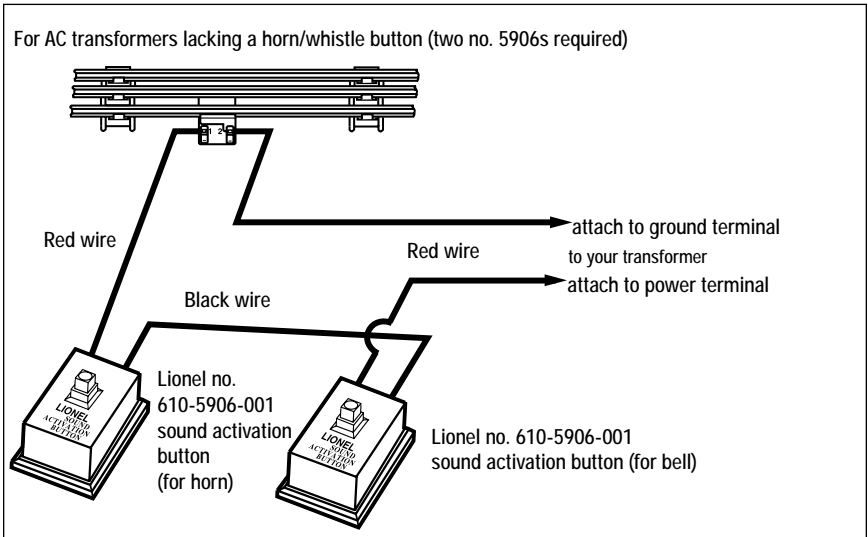
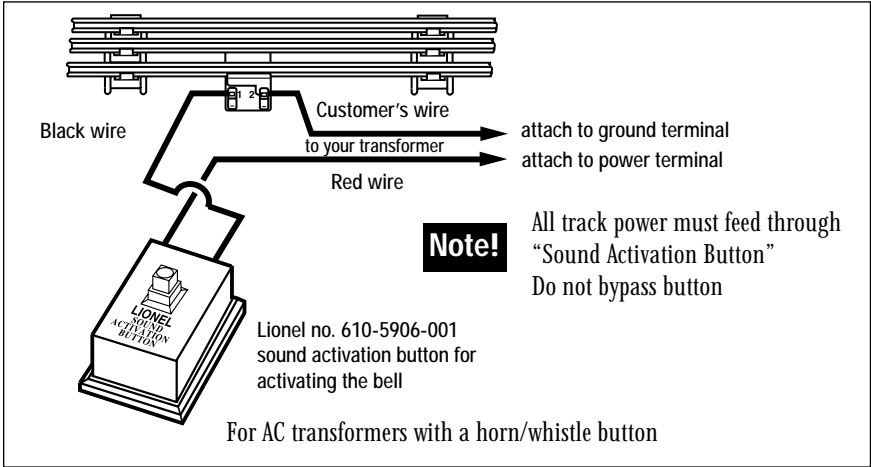
Your C-420 electrocouplers will NOT open manually or by using a remote-control track section

Transformer operations

Installing the Lionel no. 610-5906-001 sound activation button

To operate the bell and horn sounds when operating your C-420 with conventional transformers, you'll need to install the Lionel

no. 610-5906-001 sound activation button (available separately). Connect the button(s) as shown below.



Note!

The no. 610-5906-001 sound activation button (available separately) works with any Lionel AC transformer except no. 6-4690 Type MW. Transformers made by other manufacturers may not be compatible with Railsounds.

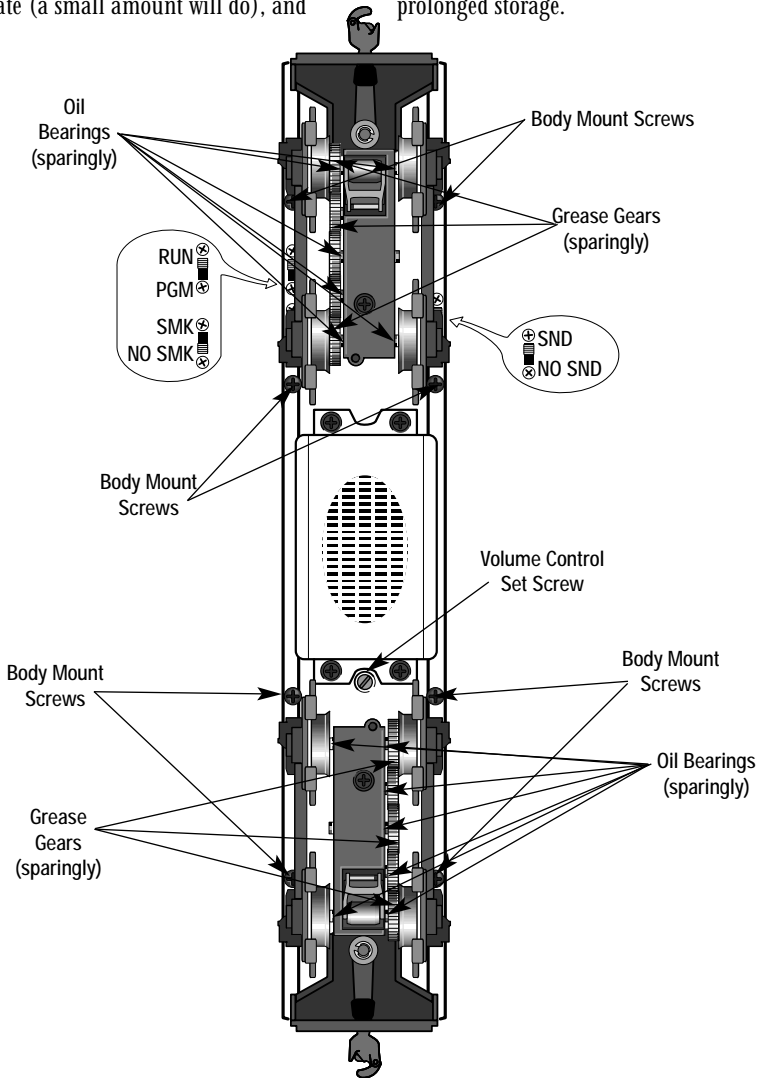
Maintaining and servicing your C-420

Lubricating your C-420

Help your Lionel C-420 lead a long and productive life on your railroad by maintaining it properly.

We recommend you purchase a Lionel Lubrication and Maintenance Kit (no. 6-62927), available from your Lionel dealer. Two basic rules to keep in mind: *never* over-lubricate (a small amount will do), and

avoid getting grease or oil on the C-420's wheels *or* your track. You'll know your C-420 requires lubrication when visual inspection reveals dryness on the parts indicated in the illustration. Remove accumulated dirt and dust before lubricating, and always lubricate any locomotive emerging from prolonged storage.



Maintaining and servicing your C-420

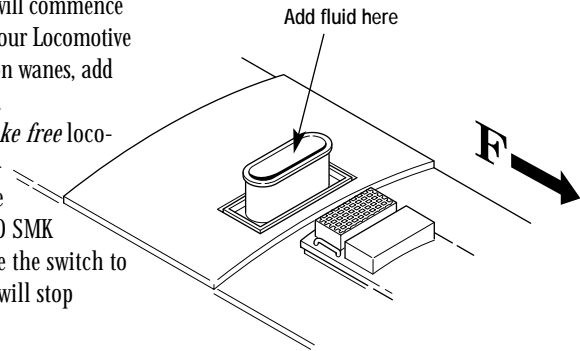
Adding fluid to your Locomotive's smoke generator

Your Locomotive is equipped with a smoke generator that produces safe, clean white smoke during operation.

The smoke generator requires the periodic addition of Lionel smoke fluid in order to function. Pierce the tube end with a pin, then add 35-40 drops of fluid into the Locomotive's stack. See diagram for location of smoke generator duct. Smoke production will commence momentarily, faster if you run your Locomotive at speed. When smoke production wanes, add more fluid (four to eight drops).

If you prefer to have a *smoke free* locomotive, there is a switch located on the bottom of the engine under the cab marked SMK/NO SMK (see page 5 for location). Move the switch to NO SMK and your locomotive will stop smoking.

When the smoke unit is on *Always* keep a small amount of smoke fluid in the Locomotive's smoke generator; the generator's element can become damaged if operated without fluid. Smoke production is greater at higher voltages and when the Locomotive is pulling a heavy load or long consist.



Replacing your C-420's L.E.D.

Your C-420 is illuminated by two L.E.D. Circuit Boards. During the course of normal operation, they may require replacement.

Begin by removing the C-420's shell; see page 6 for screw location. After removing the eight screws, carefully lift the shell away from the frame.

The rear L.E.D. assembly can be replaced with Lionel Part No. 610-8587-019. The front L.E.D. assembly can be replaced with Lionel Part No. 610-8587-020.

We recommend that you have the L.E.D. replacement done at a Lionel Service Station. See Lionel Service section on page 16 for more information. Reinstall the shell.

Note!

If you have upgraded your powered locomotive to Command Control, make sure the headlight was not turned off by pressing AUX2 before replacing L.E.D.

Maintaining and servicing your C-420

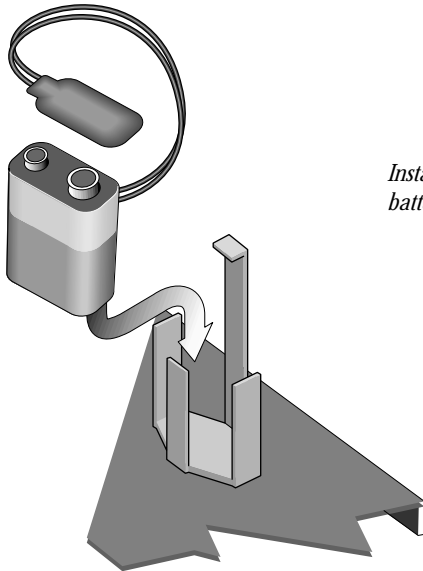
Your C-420 Railsounds system—the basics

Lionel Railsounds is the most realistic model railroad sound system in the world. Your C-420 features digital samples from real-life diesel locomotives for the *ultimate* in realism.

You may choose to install a 9-volt *alkaline* battery in your C-420. This ensures interruption free operation of Railsounds. The battery clip is located under the body toward the front of the engine. Remove the engine body, refer to the diagram on page 6 for location of mounting screws

When you first apply track power, the C-420's Railsounds system produces sounds of the locomotive at rest. As the C-420 moves, R.P.M.s begin increasing with the locomotive's speed.

To silence the diesel roar (horn and bell remain unaffected), slide the Railsounds switch on the underside of the locomotive to NO SND (see page 6), *before powering up the locomotive.*



Installing a 9-volt alkaline battery in your C-420.

Note! Please remove protective cover from battery clip

Note! Although Railsounds is powered by track voltage, *the battery is required* for uninterrupted operation and shutdown sequences. Use only alkaline batteries.

Note! Discontinue locomotive power *for 10 seconds* before changing the Railsounds ON/OFF switch position.

Note! If Railsounds “drops out” during track power interrupts (direction change), replace the battery.

Maintaining and servicing your C-420

Experiencing the range of your C-420's Railsounds system

With Railsounds, you experience the sounds of real railroading like never before. Simply put, it's the most sophisticated, authentic model railroad sound system in the world.

- **Four diesel-roar levels.** Your C-420's speed determines the level of diesel RPM roar—*automatically, if you prefer*: idle, half throttle, three quarters or full-speed output.
- **MultiHorn™.** A different horn sound at different speeds—a Railsounds exclusive.
- **Mechanical bell.** Press BELL on your CAB-1 or transformer to begin the effect, again to discontinue.
- **Reverse unit reset sound.** Power down your track, wait for 3-5 seconds, and listen for the air-release sound—that's the C-420 telling you its Lionel Command reverse unit has just *reset to forward operation*.
- **Shutdown sequence.** No other model railroad sound system shuts down like Railsounds. Turn off track power, and after the air-release reset sound, you have two seconds to restart your C-420. If you're done with operations, Railsounds will commence with a realistic diesel shutdown sequence about two seconds after the air-release reset occurs.

Notes on Railsounds

- Turn the volume knob clockwise or counter clockwise in the location shown on page 6 to adjust sound output.
- Listen for incidental locomotive sounds during Railsounds operation. They're automatic and, of course, authentic.
- The 9-volt alkaline battery you installed ensures *continuous* C-420 diesel roar.
- Longer track-power interruptions (including locomotive derailments) cause Railsounds to shut down after about 7 seconds.
- For even *more* authentic Railsounds effects, operate in the TrainMaster Command environment.

TrainMaster Command operations

The Command control environment

Lionel TrainMaster Command is the advanced model railroad control system from Lionel. Your upgraded C-420 is equipped with a Liontech Command reverse unit.

TrainMaster Command gives you the power to operate multiple Command-

equipped locomotives *on the same track, at the same time.*

TO OPERATE IN COMMAND, YOU NEED A COMMAND BASE AND A CAB-1 REMOTE. Find them both at your authorized Lionel retailer.

1

Place your C-420 on Lionel or Lionel-compatible 0 gauge track.

- **Make sure track power is OFF before placing on the track.**
- **Make sure your Lionel Command Base is ON** and its communications wire is connected to the COMMON post on your Lionel transformer *or* the U on any of your installed PowerMasters.
- Once positioned on the track, **increase track voltage to FULL** (on PowerMaster, slide the CMD/CONV switch to CMD).

2

Address your C-420 using CAB-1.

- **Press ENG and 1** on the numeric keypad of your CAB-1 remote. This command is sent by CAB-1 to the Command Base, which then translates your command into digital code. That code is sent around your railroad's outside rails in the form of a digital "halo." All Command-equipped Lionels listen to this digital communication, but they do not respond until they hear their individual ID number—in this case, "1."
- **The digital language of TrainMaster Command—and not track power—controls the actions of Command-equipped Lionels.** Track power is simply like gasoline in the tank of your car—it gives you the power to go places, but it doesn't tell you where to go or how fast to get there.
- **All Command upgrades come factory-programmed with an ID# of "1."** To change the ID# of your C-420, see page 15.

3

Move 'em out!

- Throttle up or press any command button on CAB-1. Your C-420 will respond to your every command. Read on.

TrainMaster Command operations

Running your C-420 in the TrainMaster Command environment

Example address Locomotive #1

PowerMasters set to CMD or traditional power supplies ON FULL



Press ENG



Press 1 (the ID#)

Throttle up/press any command button

Your Command-equipped C-420 comes factory-programmed with an ID# of “1.” To get your C-420 in action, set PowerMasters to CMD or set all power supplies on full. Press ENG and “1” on CAB-1. Turn the throttle or press any command button; your C-420 is ready for Command operations.

CAB-1 commands for your C-420



Front coupler releases. **Coupler release sounds.**



Rear coupler releases. **Coupler release sounds.**

AUX 1



Activates keypad.

AUX 2



Press AUX2 to turn your C-420's headlight on and off.



Turn the THROTTLE to the right to accelerate, left to decelerate.



Press HALT to shut down all Power-Master electrical output on your railroad. Stops all Command-equipped Lionels in operation.



Press WSTL/HRN to activate the C-420 horn. release it to discontinue. **MultiHorn diesel horn sound.**



Press BELL once to activate the bell, again to discontinue. **Diesel mechanical bell sound.**



Press DIR—the locomotive decelerates to a complete stop; turn the throttle up, and the locomotive will accelerate in the new, opposite direction. There is no neutral state. **Diesel air-release sound.**



Press and hold BOOST for extra power. Release BOOST and return to the C-420's previous speed.



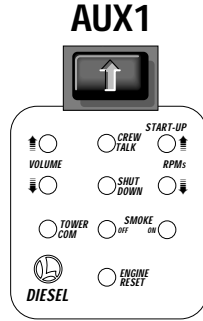
Press and hold BRAKE to slow down or stop. Release BRAKE and return to the previous speed. **Squealing brake sounds.**



TrainMaster Command operations

CAB-1 numeric keypad commands for your C-420

When you press AUX1 on CAB-1, you turn the numeric keypad into 10 command buttons. The keypad lets you control extra command features (until you press any top-



row button like SW, ACC, RTE, TR, or ENG). ***Railsounds sounds in bold italic.*** (Upgrade required for these).

0 Stops and resets the C-420's. Resets the C-420's direction to FORWARD. Resets Railsounds to automatic RPM operation. ***Horn blows. RPMs return to automatic.***

1 Raises the volume of Railsounds. ***Sound volume increases.***

2 CrewTalk™ is the sound of inaudible walkie-talkie communication.

3 Raises Railsounds RPM level. Starts up Railsounds. ***RPMs increase. Startup sequence commences.***

4 Lowers the volume of Railsounds. ***Sound volume decreases.***

5 Activates the Railsounds shutdown sequence. Just like the real thing, *your C-420's RPMs must be at idle for shutdown to occur.* Press 6 repeatedly to lower RPMs until they won't descend further. Your locomotive is now at idle. Press 5 to initiate the shutdown

sequence, following Crewtalk sound. ***Crewtalk sounds, Diesel shutdown commences.*** Remember, the horn, bell, and RPMs will not sound until you *restart* Railsounds.

6 Lowers Railsounds RPM level. ***RPMs decrease.***

7 TowerCom™ is an audible announcement that includes that engine's road number and/or name. *There is a Four second delay in this function.*

8 Smoke off ***Crewtalk sounds***

9 Turns on the smoke generator. Press and hold 9 (10 seconds maximum) to initiate Smoke Boost™ — it superheats the smoke generator and enhances smoke output when you start running your steam locomotive. See notes on filling or turning off the smoke generator on page 8. ***Crewtalk sounds***

Note! AUX1-9 only works if the smoke unit switch is in the on position.

Tuning your C-420's performance

MOMENTUM

TrainMaster Command's momentum feature simulates the labored performance of a locomotive pulling a heavy load. Press L, M, or H (located under CAB-1's removable panel) for light, medium, or heavy momentum. The C-420's R2LC remembers this setting until you change it. For quick locomotive response, choose L.

BRAKING AND BOOSTING

There's more to starting and stopping than just turning the CAB-1 throttle. Use the BOOST and BRAKE command buttons—they give you incremental control of speed *and* are the superior way to handle grades, gradual stops-and-starts, and more. Plus, using BRAKE in the Command environment gives you a bonus Railsounds effect—the ultra realistic sound of squealing brakes.

SOUND QUALITY

To achieve your preferred Railsounds master volume level, we recommend you adjust your C-420 volume control set screw (see page 6 for location). Turn the set screw left or right to reach the desired volume level.

For quick remote-control of volume *below* the master setting—for example, muting—use the CAB-1 numeric keypad's volume control. Press AUX1 and then 4 on the numeric keypad to lower overall Railsounds output.

HIGH VOLTAGE SETTING

Press SET, headlight will flash. Get your locomotive moving to the maximum speed you want it to run, press BOOST. Use this to keep your locomotive from excess-speed derailing. Turn off the high voltage setting by pressing SET, then BOOST, holding each for one second.

STALL

Make your C-420 feel more responsive by setting a “stall” voltage. Get your locomotive moving, then press SET; the C-420 will stop. Turn the throttle clockwise to get the locomotive moving, then decrease speed until the locomotive just stops. Then press SET again; the R2LC remembers the stall setting until you change it. To clear stall, press SET twice, holding it for one second each time.

Note! These settings will be lost when you assign a new engine ID number.

Assigning your C-420 a new ID#

Example

Assign a new ID# to your Command-equipped C-420

Command Base ON

Place the C-420 on track

PowerMasters set to CMD or traditional power supplies ON FULL

Set the C-420 reverse unit control switch to PROGRAM

Turn track power on (PowerMasters):



Press BOOST

Program the C-420 with a new ID#:



Press ENG



Press a number you choose (the ID#)



Press SET

Set the reverse unit control switch to FORWARD/RUN

Your C-420 set remembers its ID# forever; change it any time with these steps

As your fleet of Command-equipped Lionels grows, you'll want to give your C-420 a more individualized number. Choose from any between 1 and 99. To make things easy, use a portion of your C-420's cab number.

Turn the Command Base ON and place the C-420 on track. Power up, then set the C-420's reverse unit control switch to PGM (see the illustration on page 6). Using CAB-1, press ENG, the locomotive ID# (you select: ?), then press the SET button located under CAB-1's removable panel. Hear the horn blow (or see the headlight flash if Railsounds is off); that's the R2LC confirming the new ID#. Set the reverse unit control switch to RUN. Your C-420 is ready for operations with its all-new ID#.

We recommend that you choose an easy to remember ID# for your engine. Some possibilities are part of the engine road number; your age, any two digit number that is not used by another engine. Write the number on a small piece of tape and put this on the bottom of the fuel tank to aid in remembering.

Reprogramming R2LC circuit boards to restore features

Due to the inevitable derailments, static, and the *negative* nature of electricity, it is possible that your R2LC could someday lose its setup program. The symptoms of this

STEP 1: Move switch on locomotive from run to program.

STEP 2: Turn on Command Base.

STEP 3: Place locomotive on track, then turn on power to track.

STEP 4: Press “ENG” then input locomotive’s ID#. Press “SET”

STEP 5: Press “ENG”, then the ID#, “AUX1”, then press **8** for your locomotive.

condition would be unresponsiveness in command mode. This can be easily remedied by “reprogramming” your R2LC using the following steps.

STEP 6: Turn off power to track, wait ten seconds.

STEP 7: Remove locomotive from track, move switch from program to run.

STEP 8: Place locomotive back on track, turn power on to track.

STEP 9: Press “ENG” and ID#, then operate as normal.

Note!

To program your R2LC as a diesel locomotive with smoke, follow these steps. (These steps will also restore programming which is accidentally lost due to static, numerous derailments, etc.)

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 contacting our Website @ www.lionel.com

If you prefer to send it back to Lionel L.L.C. for factory repair, you must first call 810-949-4100 or FAX 810-949-5429 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 assure 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.

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 _____

