Lionel 671 S-2
Steam Turbine Locomotive
Owner's Manual

featuring **TRAINmaster** COMMAND *and* *Railsounds*

Congratulations!

You own one of the most sophisticated model trains ever built—the Lionel TrainMaster® Command equipped Century Club S-2 steam turbine. From the crisp die-cast detail and the gold Century Club indicia outside to the advanced technology and brute power within the boiler, your S-2 is ready for duty on your model railroad. Experience the superiority of today's Lionel.

- **Powerful Pullmor® motor**

- **Liontech Command™ LCRU2 reverse unit for use with the Lionel TrainMaster® Command™ model railroad control system**

- **Railsounds™ steam sound system—digital samples from a real steam loco-motive**

- **Smoke generator that produces clean, safe, and realistic smoke**

- **Die-cast Electrocoupler™ (rear of tender)**

- **Brilliant headlight**

- **CrewTalk™ and TowerCom™ (in command mode)**

Table of contents

Transformer operations

Running your S-2 with a Lionel transformer

1 | Place your S-2 on Lionel or Lionel-compatible 0 gauge track.

- **With track power OFF,** connect the locomotive tether between the engine and tender. The six-pin tender plug connects with the six-pin receptacle on the locomotive. Connect the drawbar between locomotive and tender.
- **Note!** • The engine tether receptical is "keyed" to allow the harness to be plugged in only one way.
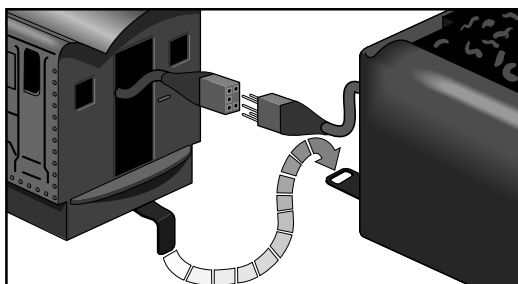
2 | Power up your S-2 with your transformer.

- **Your S-2 is designed to operate on 8-18 volts alternating current.** Virtually all Lionel and Lionel-compatible alternating-current transformers are suitable; we recommend the TrainMaster Command model railroad control system.
- **Note!** • **DO NOT POWER YOUR S-2 WITH DIRECT CURRENT** (DC). Damage to sensitive electronic components may occur.
- **When you first power up your track, the S-2 will wait between 3 and 8 seconds** as it "listens" for digital language from the TrainMaster Command Base (available separately). When it's determined that it's on a conventional (nonCommand) railroad, the S-2's headlight will illuminate and Railsounds will fire up. At this point, the S-2 is in neutral. (This occurs when placing the S-2 on your railroad for the first time. Thereafter, it starts in forward after every three-second power interrupt.)

3 | Move 'em out!

- **Get your S-2 moving.** Press the DIR button on your CAB-1 remote or Lionel transformer. This sequences the Liontech Command reverse unit (LCRU2) to the next operating state.
- **Adjust track voltage** until your S-2 moves at your desired speed.
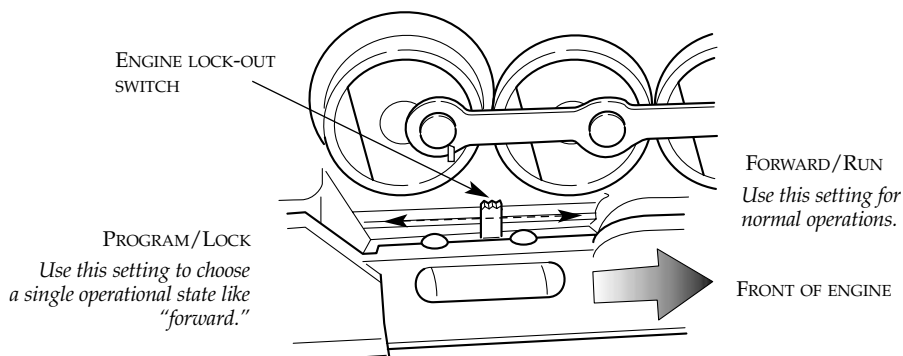
3

Transformer operations

Locking your S-2 into a single operational state

*T*o select a single operational state for your Lionel S-2 (example: forward only), you can deactivate the LCRU2's sequencing function with the reverse unit control switch, located underneath the cab of the S-2

Get your locomotive moving in the desired direction, then *slow it down* *without stopping.* Set the reverse unit control switch to PROGRAM/LOCK. The S-2 is now "locked" into your chosen direction.

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

ENGINE LOCK-OUT SWITCH

FORWARD/RUN
Use this setting for normal operations.

PROGRAM/LOCK
Use this setting to choose a single operational state like "forward."

FRONT OF ENGINE

Using your S-2 tender's Electrocoupler in the non-Command environment

*T*o use your S-2 tender's Electrocoupler in the non-Command environment, you must first couple a piece of rolling stock equipped with Lionel magnetic couplers directly to your S-2 tender's rear ElectroCoupler. 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.

Magnetic coupler on the rolling stock coupled to the rear of your S-2 tender

Remote-control track section
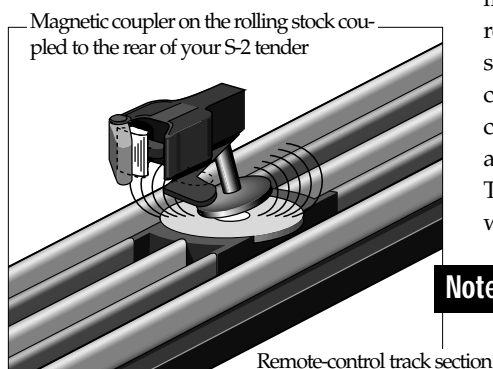
Note! *Your S-2 tender's Electrocoupler will NOT open manually or by using a remote-control track section*

*Y*our Lionel S-2 tender is equipped with a rear Electrocoupler that responds to the COUPLER R (rear) button on your CAB-1 remote when operated in the Trainmaster Command environment. Simply press R button on your CAB-1 remote, and the coupler opens.

Note!

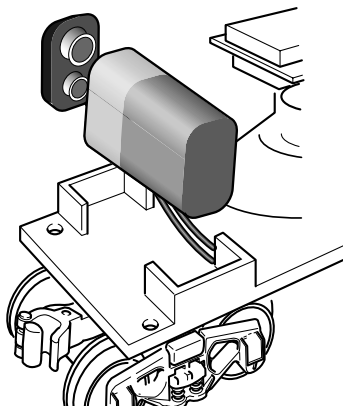*Your S-2 tender's Electrocoupler is NOT designed to be opened manually.*

Your S-2's Railsounds system—the basics

*L*ionel Railsounds is the most realistic model railroad sound system in the world. Your S-2 features digital samples from real-life steam locomotives for the *ultimate* in realism.

Begin by installing a 9-volt *alkaline* battery in the tender. This ensures interruption free

Installing a 9-volt alkaline battery in your S-2's tender.

operation of Railsounds. The battery is located within the tender and to access it you will need to remove the tender body from the frame. Begin by turning the tender over and remove one screw from each corner of the frame. Turn the tender over and remove the tender body from the frame assembly. Snap the battery clip on to the battery and place it into the rear of the tender where the built in retainer will hold it in place. Place the tender body back over the frame assembly mak-

ing sure that none of the wires are pinched between the frame and the body, turn the tender back over and secure together with the four previously removed screws.

When you first apply track power, the S-2's Railsounds system produces sounds of the locomotive at rest. As the S-2 moves, turbine "woosh" begins, increasing with the locomotive's speed. To silence the turbine "woosh" (whistle/bell are unaffected), slide the Railsounds switch, located on the bottom of the tender, to the OFF position *before powering up the locomotive*. The whistle is activated by using the lever or button on your transformer or CAB-1. The volume control knob to raise or lower the level of sound is located on the bottom of the tender.

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.

5

Transformer operations

Experiencing the range of your S-2's Railsounds system

*W*ith 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. And remember—inside your Lionel S-2 are the sounds of real-life steam engines. No other electric train can offer you authentic S-2 sounds. *That's* the power of Lionel.

• **Turbine "Woosh".** Your S-2 's track speed determines the speed of the **"Woosh"**.
• **MultiWhistle**™**.** Different whistles *every* time—a Railsounds exclusive.
• **Authentic bell.** Press BELL on your CAB-1 or transformer to begin the effect, again to discontinue. Even the final "hit" is muted like the real thing.
• **Reverse unit reset sound.** Power down your track, wait for 3.5 seconds, and listen for the air-release sound—that's the S-2 telling you its Liontech 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 S-2 . If you're done with operations, Railsounds will commence with an authentic S-2 shutdown sequence about two seconds after the air-release reset occurs.

Note! A steam *turbine* locomotive, unlike a conventional steam engine, makes a continuous "whoosh" sound when it's operating, rather than a rythmic chuffing.

Notes on Railsounds

• Use the volume control dial, located on the bottom of the tender, to adjust sound output (see page 5).
• Listen for incidental engine sounds during Railsounds operation. They're automatic and, of course, authentic.
• The 9-volt alkaline battery you installed ensures *continuous* sounds, even during short track-power interrupts.

• Longer track-power interruptions (including locomotive derailments) cause Railsounds to shut down after about 7 seconds.
• For even *more* authentic Railsounds effects, operate your S-2 in the TrainMaster Command environment. See page 8 for details.

Installing the Lionel sound activation button

*T*o operate the bell and whistle sounds when operating your S-2 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.

CUSTOMER'S WIRE
BLACK WIRE
TO YOUR TRANSFORMER
RED WIRE
ATTACH TO GROUND TERMINAL
ATTACH TO POWER TERMINAL

Lionel no. 610-5906-001 sound activation button for activating the bell

Note! All track power must feed through "Sound Activation Button" Do not bypass button

For AC transformers with a horn/whistle button

RED WIRE
BLACK WIRE
RED WIRE
ATTACH TO GROUND TERMINAL
TO YOUR TRANSFORMER
ATTACH TO POWER TERMINAL

Lionel no. 610-5906-001 sound activation button for whistle

Lionel no. 610-5906-001 sound activation button for bell

For AC transformers lacking a horn/whistle button

Note! The no. 610-5906-001 button works with any Lionel AC transformer *except no. 6-4690 Type MW.* Transformers made by other manufacturers may not be compatible with Railsounds.

7

TrainMaster Command operations

Your S-2 in the TrainMaster Command environment

Lionel TrainMaster Command is the fun and sophisticated model railroad control system from Lionel. Your S-2 features the Liontech Command reverse unit, which acts as both a conventional reverse unit as well as the key to unlocking many extra features when you operate in Command mode.

TrainMaster Command gives you the power to operate multiple Command-equipped locomotives *on the same track, at the same time.* It's the most fun you can have with electric trains, and it's incredibly easy too! Just follow the directions below and you'll be on your way.

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 S-2 on Lionel or Lionel-compatible O gauge track.

- **Make sure track power is OFF before placing it on 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 S-2 with 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 own ID number.
- 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-equipped Lionels come factory-programmed with an ID# of "1."** To change your S-2's ID#, see page 12.

---

3 | ## Move 'em out!

- Throttle up or press any command button on CAB-1. Your S-2 will respond to your *every* command. Read on. The fun is just beginning!

Running your S-2 in the TrainMaster Command environment

Example *address Locomotive #1*

PowerMasters set to CMD or traditional power supplies ON FULL

ENG
Press ENG

1
Press 1 (the ID#)

Throttle up/press any command button

Your Command-equipped S-2 comes factory-programmed with an ID# of "1." To get your S-2 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; Railsounds starts up. Your S-2 is ready for Command operations.

CAB-1 commands for your S-2

S-2 RAILSOUNDS EFFECTS IN BOLD ITALIC

COUPLER R Rear coupler releases. *COUPLER RELEASE SOUNDS.*

AUX 2 Press AUX2 to turn your S-2's headlight on and off.

Turn the THROTTLE to the right to accelerate, left to decelerate. *SPEED-DEPENDENT TURBINE "WOOSH"*

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

Press WSTL/HRN to activate the S-2's whistle, release to discontinue. *MULTI-WHISTLE STEAM WHISTLE SOUND.* **WSTL / HRN**

Press BELL once to activate the bell, again to discontinue. *TRADITIONAL BELL SOUND.* **BELL**

Press DIR—the locomotive decelerates to a complete stop; turn the throttle up, and the locomotive moves in the opposite direction. *THERE IS NO NEUTRAL. STEAM AIR-RELEASE SOUND.* **DIR**

Press and hold BOOST for extra power. Release BOOST and return to the S-2's previous speed. **BOOST**

Press and hold BRAKE to slow down or stop. Release BRAKE and return to the previous speed. *SQUEALING BRAKE SOUNDS.* **BRAKE**

9

TrainMaster Command operations

Railsounds in the Command environment

Your S-2's Railsounds system gives you even *more* in the TrainMaster Command environment.

• **Bonus sounds** like squealing brakes with the CAB-1 BRAKE command.

• **Incidental sounds** *you* control with CAB-1 numeric keypad commands, like steam letoff and steam release effects.

CAB-1 numeric keypad commands for your S-2

When you press AUX1 on CAB-1, you turn the numeric keypad into 10 command buttons. The keypad "stays open" and gives you access to extra command features until you press any top-row button

AUX1
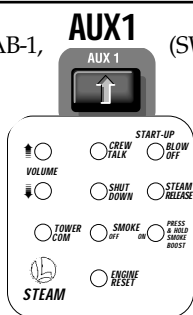
(SW, ACC, RTE, TR, or ENG). The CAB-1 keypad overlay included with your S-2 is designed to help you learn the auxiliary features specific to this classic locomotive.

S-2 RAILSOUNDS EFFECTS IN BOLD ITALIC.

0 Stops and resets the S-2 to FORWARD. *WHISTLE BLOWS. HEADLIGHT FLICKERS.*

1 Raises the volume of Railsounds. *SOUND VOLUME INCREASES.*

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

3 Starts up Railsounds. *STARTUP SEQUENCE COMMENCES. STEAM BLOWOFF SOUND.*

4 Lowers the volume of Rail- sounds. *SOUND VOLUME DECREASES.*

5 Activates the Railsounds steam shutdown sequence. Just like the real thing, *your S-2 must be idle for shutdown to occur. STEAM SHUTDOWN COMMENCES.* Remember, the whistle and bell will not sound until you *restart* Railsounds.

6 *STEAM RELEASE SOUND.*

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 Turns off the smoke generator.

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 S-2.

Note! <u>Always</u> keep smoke fluid in your S-2's smoke generator. Using Smoke Boost with depleted fluid can damage the generator's element.

Tuning your S-2's performance

MOMENTUM

Simulate the labored performance of a locomotive pulling a heavy load with momentum. Press L, M, or H (located under CAB-1's removable panel) for light, medium, or heavy momentum. The LCRU2 remembers the setting until you change it. For delayed response, use H. For quick response, choose L.

BOOSTING AND BRAKING

Use the BOOST and BRAKE command buttons for incremental control of speed *and* a superior method for handling grades, stops-and-starts, and more. Plus, using BRAKE in the Command environment gives you a bonus Railsounds effect—the ultrarealistic sound of squealing brakes.

STALL

Make your S-2 feel more responsive by setting a "stall" voltage. Get your locomotive moving, then press SET; the S-2 will stop. The headlight will flash, indicating it's in the SET mode. Turn the throttle clockwise to get the engine moving, then decrease speed until the locomotive just stops.

Then press SET again; the LCRU2 remembers the stall setting until you change it. To clear stall, press SET twice, holding it for one second each time.

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.

SOUND QUALITY

To achieve your preferred Railsounds master volume level, use the volume control dial located on the bottom of the tender. Turn the dial left or right to adjust the volume to your liking.

For quick remote-control of volume *below* the master setting—like muting—use the CAB-1 numeric keypad's volume control. Pressing AUX1 and then 4 on the numeric keypad lowers overall Railsounds output.

Note! These settings will be lost when you assign new engine ID#s.

Your S-2's digital communication antenna

Your S-2 locomotive's handrail is more than scale detailing, it's the LCRU2's antenna for receiving Command Base digital communications.

If your S-2 is experiencing difficulty receiving base communications, check for foreign metal objects between the handrail and cab.

| **Example** | **Assign a new I D# to your Command-equipped locomotive** |

Command Base ON

Place the locomotive on track

PowerMasters set to CMD or traditional power supplies ON FULL

Set the locomotive reverse unit control switch to PROGRAM (see pg.4 for location)

Turn track power on (PowerMasters):

    ⬆️ **Press BOOST**

Program the locomotive with a new ID#:

    [ENG] **Press ENG**

    [?][?] **Press a number you choose (the ID#)**

    [SET] **Press SET**

Set reverse unit control switch to FORWARD/RUN (see pg.4 for location)

Your locomotive remembers its ID# forever; change it <u>any time</u> with these steps

*A*s your fleet of Command-equipped Lionels grows, give your S-2 locomotive its own ID#. Choose from any between 1 and 99. Turn the Command Base ON and place the locomotive on track. Power up, then slide the locomotive's reverse unit control switch to PROGRAM.

Using CAB-1, press ENG, the locomotive ID#, then press the SET button located under CAB-1's removable panel. See the locomotive's headlight flash; that's your signal that the programming has been accepted. Slide the control switch to RUN.

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.* If you like write the number on a small piece of tape and put this on the bottom of the frame to aid in remembering.

Reprogramming LCRU circuit boards to restore features

*D*ue to the inevitable derailments, static, and the nature of electricity, it is possible that your LCRU could someday lose its setup program. The symptoms of

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 **a number closest** to your locomotive type. (see list for engine types)

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

this condition would be unresponsiveness in command mode. This can be easily remedied by "reprogramming" your LCRU using the following steps

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.

PROGRAM CODE FOR OTHER ENGINES

0 = STEAM WITH SIGNAL SOUNDS
1 = DIESEL WITH SIGNAL SOUNDS
2 = DIESEL WITH CAB LIGHT AND SIGNAL SOUNDS
4 = STEAM WITH SMOKE   S2 Turbine
5 = DIESEL WITH STROBE LIGHT
6 = DIESEL WITH CAB LIGHT
36 = ALCO PA'S - NEW IN 1997
70 = J1E HUDSON & S.F. WARHORSE (BOTH LOCO&TENDER MUST BE ON TRACK)
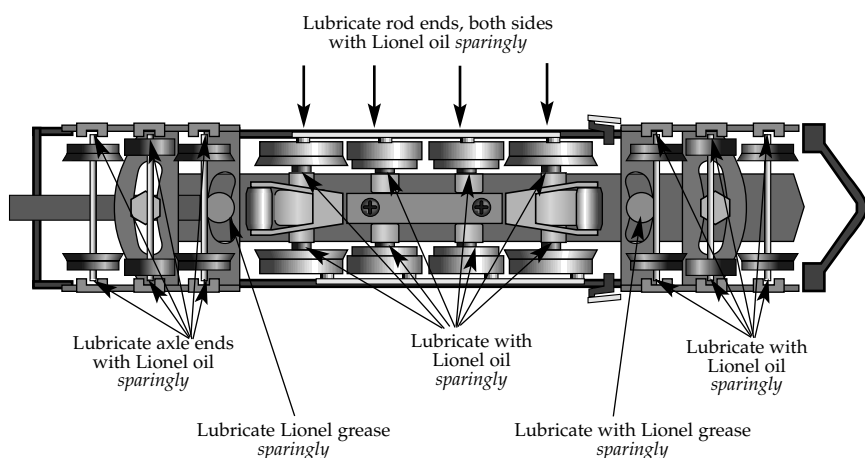75 = SOO LINE SD-60

Lubricating your S-2

*H*elp your Lionel S-2 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 S-2's wheels, contact rollers, *or* your track.

You'll know your S-2 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. Also, *lightly* lubricate the S-2's side rods after each 10 hours of operation.

Lubricate rod ends, both sides with Lionel oil *sparingly*

Lubricate axle ends with Lionel oil *sparingly*

Lubricate with Lionel oil *sparingly*

Lubricate with Lionel oil *sparingly*

Lubricate Lionel grease *sparingly*

Lubricate with Lionel grease *sparingly*

After 80 hours of operating time or after extended periods of storage, apply one drop of oil to the small hole in the die-cast motor casting, just below the field winding. After extended running, the brushes may require replacement. Sluggish or intermittent operation are signs that brush replacement is due. When removing the cab, take note of the location of the plastic spacers. These must be replaced in the proper location.

One drop of oil

Spacer
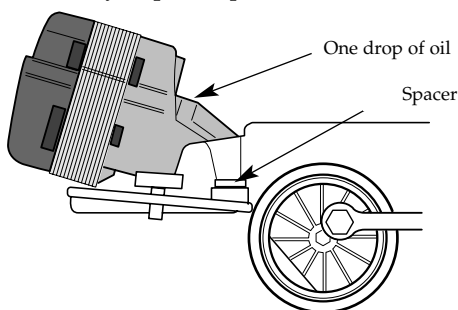
Maintaining and servicing your S-2

Adding fluid to your S-2's smoke generator

Your S-2 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 four to eight drops of fluid directly into the S-2's stack. Smoke production will commence momentarily, faster if you run your S-2 at speed. When smoke production wanes, add more fluid (four to eight drops).

An idle S-2 will not smoke; press AUX1 and 9 (press for a maximum of 10 seconds) to engage the smoke generator at idle/in neutral. *Always* keep a small amount of smoke fluid in the S-2's smoke generator; the generator's element can become damaged if operated without fluid. Smoke production is greater at higher voltages and when the S-2 is pulling a heavy load or long consist.

Replacing your S-2's front lamp

Your S-2 is illuminated by a lamp located directly behind the boiler-face. During the course of normal operation, the lamp may require replacement.

Carefully pull open the boilerface. Remove the connector from the light in the boiler front. Pull the bulb out of the lens and replace it with Lionel part no. 610-8049-300, available from your Authorized Lionel Service Center or Lionel Service.
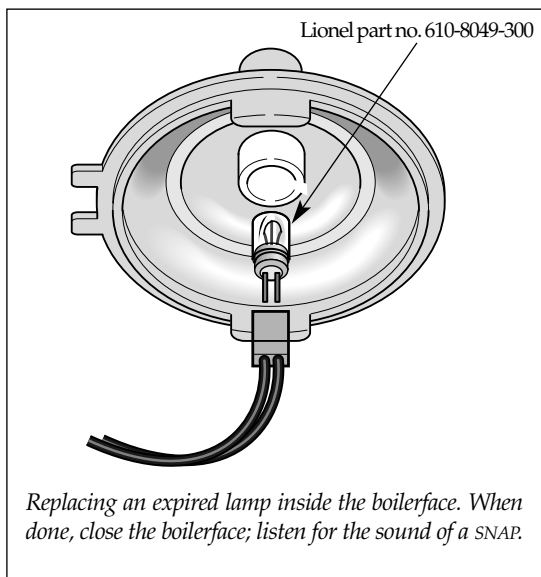
Place the bulb assembly back into its retaining bracket and close the boilerface; you'll hear a *SNAP* when it's properly closed.

Lionel part no. 610-8049-300

Replacing an expired lamp inside the boilerface. When done, close the boilerface; listen for the sound of a SNAP.

Note! Press Aux2 to make sure headlamp was not accidently turned off, before replacing bulb

Limited Warranty/Lionel Service

*T*his 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 5 years 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 products original packaging. This shipment must be prepaid and we recommend that it be insured.

Please make sure you have followed all of the above instructions carefully before returning any merchandise for service.

You may choose to have your product repaired by one of our Authorized Lionel Service Centers after its warranty has expired. A reasonable service fee will be charged.

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

NAME_____

ADDRESS_____

PLACE OF PURCHASE_____

DATE OF PURCHASE _____

PRODUCT NUMBER _____

PRODUCT DESCRIPTION

_____