ONE YEAR LIMITED WARRANTY

This item is warranted for one year from the date of purchase against defects in material and workmanship. We will repair or replace at our option, the defective part without charge for parts or labor, if it is received within one year from the date of purchase. This warranty does not cover items that have been abused or damaged by careless handling. Transportation cost, if any, incurred by you are not covered by this warranty.

1. Should service be required during the warranty period, return the defective item POST PAID to:

US Mail:	**UPS or FEDEX:**
K-LINE Customer Service	K-LINE Customer Service
PO Box 2831	6909 Dodsons Crossroads
Chapel Hill, NC 27515	Hillsborough, NC 27278

   Be sure to include a copy of your sales receipt or other form of proof of purchase to verify that the engine qualifies for complete service at no charge.

2. *CAUTION*: Make sure the item is well packed to prevent. We recommend that the package be insured.

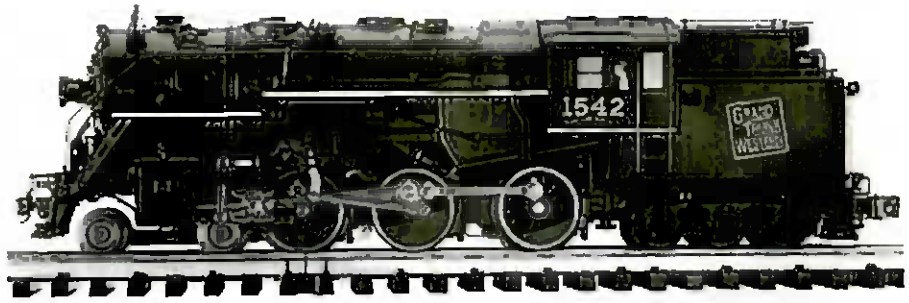
3. Please make sure that all instructions were followed carefully before returning any merchandise for service.

For questions, call **919-942-1116** or go to our Web Site: **www.k-linetrains.com**

K · L I N E

PO Box 2831 Chapel Hill, NC 27515
919-942-1116
FAX: 919-929-4050
service@klinetrains.com
www.k-linetrains.com

Scale 4-6-6T Tank Engine Owner's Manual



Please note this manual is for a variety of 4-6-6T Tank Engine configurations that may include different features. Contact Customer Service for the latest information about your engine. Most **K-LINE** steam engines now feature a Lionel Trainmaster Command Control (TMCC) unit and RailSounds sound system, some feature a conventional reverse unit with K-Sounds. Please check the information on the outside of the box to determine which system you have.

Read this instruction manual thoroughly for important tips on operating and maintaining your locomotive. When properly cared for, it will last a lifetime.

K-LINE Scale 4-6-6T Tank Engine

Scale 4-6-6T Tank Engine standard features:

- 1:48 Scale
- All New Tooling
- Die Cast Boiler
- Die Cast Metal Chassis
- Flywheel Equipped Motor
- Cruise Control™
- Metal Wheels and Axles
- Lighted Cab Interior
- Opening Cab Roof Hatches
- Operating Fire Box Glow
- Separately Applied Metal Handrails
- Solid Brass Builder's Plates
- Engineer and Fireman Figures
- Decorative Gold Plated Bell and Whistle
- Convienient Switch Panel on Top Of Locomotive Under Coal Load.
- Operates on O-31 curves
- 18" Long

The Conventional version has the following additional features:

- K-Sounds including whistle, bell, engine sounds and crew sounds.
- Smoke

The TMCC version has the following additional features:

- TrainMaster Command Control
- Lionel RailSounds including CrewTalk™ and TowerCom™
- Directional Lighting including Operating Headlight, Classification Lights and Rear Back-up Light
- Puffing Smoke Synchronized to Sounds and Wheels
- Electrocoupler on Rear of Engine

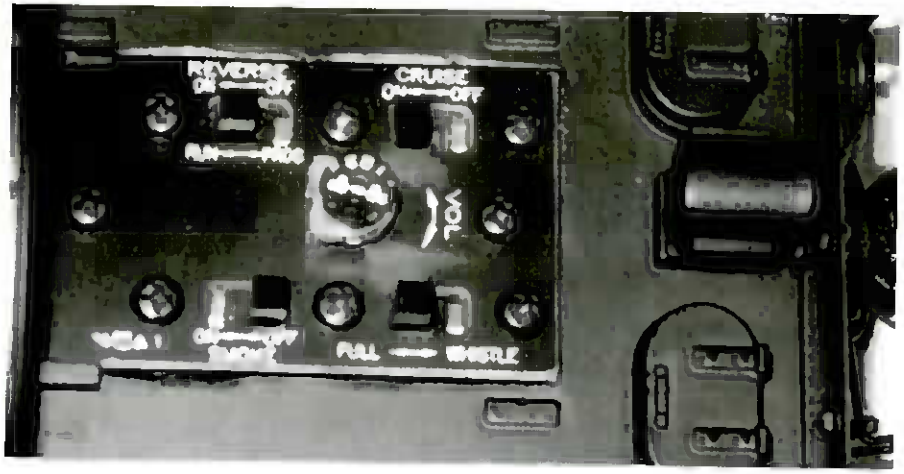
The 2-rail version has the following additional features:

- DC Version

Switch Panel

The switch panel is a special feature on the Conventional and Train Master Command Control versions of the 4-6-6T Tank Engine. It is a convenient panel located on the top of the locomotive that contains all of the switches and other controls for the locomotive. The switch panel is located under the coal load behind the cab of the locomotive. The coal load cover is held in place by a pair of small magnets located under the panel. This provides a secure holding mechanism for the coal load cover that requires no tools to gain access to the switches. The coal load cover is also "keyed" so that it only fits when oriented in the correct direction. The following switches/controls are located on the switch panel:

- REVERSE ON/OFF
- RUN/ PROG
- SMOKE ON/OFF
- CRUISE ON/OFF
- Volume Control
- FULL/WHISTLE



Switch Panel

Conventional Engine

Operation

Your 4-6-6T Tank Engine features a solid-state, electronic reversing unit (E-unit), utilizing a state of the art, integrated circuit design. The E-unit operates as follows: Each time the power to the locomotive is interrupted, the E-unit changes states. This can be done by moving the transformer control to the off position, or pushing the direction button on your transformer (if it is equipped with a direction button). The sequence of operation is forward-neutral-reverse-neutral-forward.

The engine can also be locked into any mode of operation by moving the Reverse On-Off Switch to the off position. This switch is located on the control panel. When the switch is moved to off, the locomotive will "lock" into the current mode of operation. For instance, if the engine is moving forward, track power is stopped and the switch is moved to off, the engine will remain in forward when power is reapplied. The engine can be locked in forward, neutral or reverse.

In addition, the Reversing Unit has a forward-reset feature. Should the engine sit without power from the track for a brief time, operation will resume in the forward direction upon being re-energized.

Whistle/Bell

The conventional 4-6-6T Tank Engine is equipped with K-Sounds. K-Sounds includes a digital whistle and bell that operate at the push of the whistle/horn or bell button on most. If you transformer is not equipped with a bell button, use a K-0952 controller.

No battery is required for K-Sounds on the conventional version.

Chuffing sound is synchronized to the wheels and occurs at 2 chuffs/revolution.

The whistle/full sounds works the same as RailSounds.

K-Sounds also provides crew sounds. Talking occurs when the whistle is blown while stopped. If the engine has just stopped one of several random arrival messages will play. After 15 seconds, one of several departure messages will play. Also, while stopped on the track, with power on, one of several random maintenance messages will play at varying intervals.

Smoke

Smoke Output in Conventional mode is continuous and its volume is dependent on transformer voltage. When running the engine alone, it will run at lower voltage and the smoke output will be low. To increase the smoke output, add more cars to the train, thereby increasing the voltage needed to run the train. See the **Engine Maintenance** section for further information on smoke unit operation.

Cruise Control™

This engine is equipped with **K-LINE** Cruise Control™, an innovative feature that continually measures the speed of the engine and adjusts the motor power to compensate for changes in grade. With the Cruise Control™ active, the engine will maintain a nearly constant speed up and down hills, through switches and around curves.

When operating with conventional transformer control, the locomotive will speed up as the track voltage is increased, but not all the track power is sent directly to the motors. A portion is reserved and used only when more power is needed, as when climbing a hill. Simply set the transformer throttle so the train is moving at the desired speed, and the Cruise Control™ will maintain that speed. You will notice that the engine will require more voltage to start moving. This is normal.

When running a Cruise Control™ equipped engine in a consist with other engines, it may be desirable to turn off the Cruise Control™ feature. In conventional transformer control, the Cruise Control™ feature can be disabled by moving the "CRUISE ON/OFF" switch, located on the control panel under the coal load, to the off position. The feature can be turned back on by placing the switch in the "ON" position. The switch should only be moved when track power is off.

2-Rail Engine

The 2-Rail version of the 4-6-6T Tank Engine is a DC powered engine. It must **not** be used with an AC power supply/transformer. The 2-Rail version has no sounds or smoke.

Command Engine with RailSounds

Transformer Operation (Non-command)

Place your engine on the track. This engine is designed to operate on 7-18 volts alternating current. Virtually all alternating current transformers are suitable, as well as the Lionel TrainMaster Command model railroad control system. ***NOTE:*** Do not power your locomotive with direct current (DC). Damage to electronic components may occur.

When you first power up your track, the engine will wait 3 to 8 seconds as it listens for the digital language from the TrainMaster Command Base (sold separately). When it's determined that it's on a conventional (nonCommand) railroad, the headlights will illuminate and RailSounds will fire up. At this point the engine is in neutral. (This occurs when placing the locomotive on your railroad for the first time. Thereafter, it starts in forward after every three second power interrupt).

Start your locomotive moving. Press the DIR button on your transformer. This sequences the Lionel Command reverse unit to the next operating state. The reverse unit alternates between three states: forward, neutral and reverse.

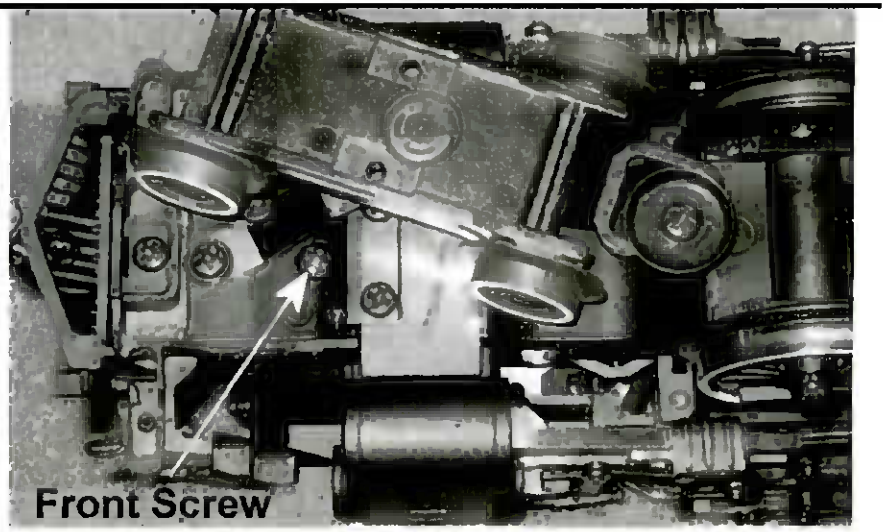
Adjust track voltage until your locomotive moves at a desired speed. Increase track voltage to increase speed. Reduce track voltage to decrease speed. Cut track power to stop the locomotive.

To select a single operating state (example forward only), you can deactivate the reverse unit's sequencing function. Get your locomotive moving in the desired direction and turn off track power. Slide the Reverse on/off switch on the switch panel to off. This will lock the engine in that that direction. Should the engine sit without power from the track for a brief time, operation will resume in the forward direction upon being re-energized.

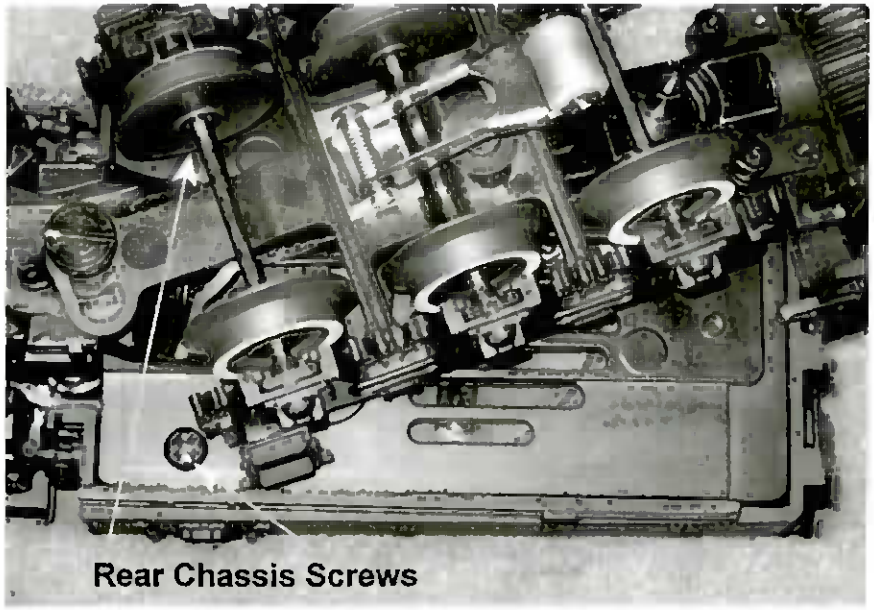
Lionel RailSounds

Lionel RailSounds is the most realistic model railroad sound system in the world. This locomotive features digitally stored sounds from authentic steam engines for the ultimate in realism.

Begin by installing a 9-volt alkaline battery, if desired. This requires the entire locomotive chassis to be removed. Do this by removing the three Chassis Screws on the bottom of the locomotive and carefully remove the shell.

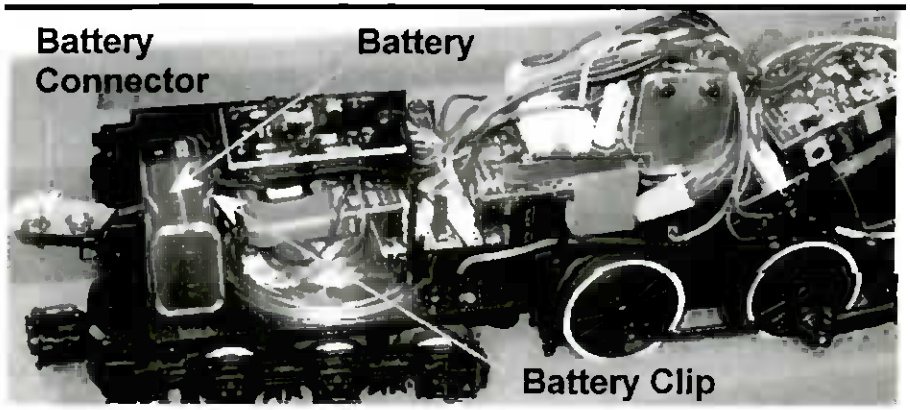


Front Chassis Screw Location



Rear Chassis Screws

Connect the 9-volt battery to the battery connector and place the battery in the clip.



Battery Location and Connection

Carefully replace Chassis on the Frame. Check to make sure that no wires are caught between the Chassis and Frame. Pay careful attention to the switch panel. Wires are easily caught on the panel and can be cut by the panel when the chassis screws are tightened.

Reinsert the Chassis Screws.

NOTE: Although track voltage powers RailSounds, the battery is required for uninterrupted operation while changing direction and shutdown sequences. Use only alkaline batteries; do not use heavy duty batteries. The following brands are recommended: Duracell, Radio Shack or Energizer Alkaline. **DO NOT USE** Ray-o-vac or Duracell Ultra.

NOTE: If RailSounds drops out during track power interrupts, replace the battery.

Apply track power and RailSounds system delivers an authentic start-up sequence, followed by the sounds of the locomotive at rest. As the engine speed increases, chuffing begins, increasing with speed of the engine. Sounds return to idle only after the locomotive has come to a complete halt. To silence the chuffing (whistle and bell remain unaffected), slide the FULL/WHISTLE switch on the switch panel to WHISTLE before powering up the locomotive. To re-activate the steam chuffing, return the switch to the FULL position.

NOTE: Discontinue locomotive power for 10 seconds after changing the RailSounds FULL/WHISTLE switch.

Experiencing the range of RailSounds

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.

Variable chuff rate: Your engine speed determines the steam chuff rate.

MultiWhistle: Press WSTL/HRN on your transformer to activate the different whistle every time; release it to discontinue.

Authentic bell: Press BELL on your transformer to begin the sound; press 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 locomotive 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 2 seconds to restart the locomotive. If you're done with operations, RailSounds will commence with an authentic shutdown sequence about 2 seconds after the air-release reset occurs.

NOTE: Battery must be installed for shutdown sequence.

Notes on RailSounds

Insert a screwdriver into the volume control knob on the switch panel and turn slowly to adjust sound output. Do NOT force.

Listen for incidental locomotive sounds during RailSounds operation. They're automatic and authentic. The 9-volt alkaline battery you installed ensures continuous engine sounds, even during short track-power interrupts.

Longer track-power interruptions (including derailments) cause RailSounds to shut down after 7 seconds. For even more authentic RailSounds effects, operate in TrainMaster Command Control environment.

TrainMaster Command Control Operations

The Command Control Environment

Lionel TrainMaster Command Control is the model railroad control system from Lionel. TrainMaster Command Control gives you the power to operate multiple Command-equipped locomotives on the same track, at

the same time. To operate in Command mode, you need a Command Base and a CAB-1 remote. These can be purchased from your retailer.

Place your engine on the track. Make sure track power is OFF before placing the engine on the track. Make sure your Lionel Command Base is ON and its communications wire is connected to the COMMON post on your transformer or directly to the outer rail. Once positioned on the track, increase track voltage to FULL.

Address your engine using the CAB-1:

Press **ENG**, *then* **1** *on the numeric keypad of your CAB-1 remote.*

This command is sent by the CAB-1 to the Command Base, which then translates it into digital code. That code is sent around your railroad's outside rails to the train. All Command-equipped engines 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 TMCC, not track power, controls the actions of Command equipped engines.

All Command-equipped engines come factory-programmed with ID# 1. See section on **Assigning Your Locomotive a New ID#** for information on changing this ID#.

Throttle up or press any command button on the CAB-1. Your engine will respond to every command.

Press AUX1 to activate numeric keys

Press AUX2 to turn headlight on and off.

Press Coupler F to release the front coupler if equipped.

Press Coupler R to release the rearcoupler.

Press HALT to shut down all PowerMaster electrical outlets on your railroad. Stops all Command equipped engines.

Turn the THROTTLE to the right to accelerate, left to decelerate. Speed-dependent variable chuffing is heard.

Press WSTL/HRN to activate whistle, release to discontinue.

Press BELL once to activate the bell, again to discontinue.

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. Steam Air-Release Sound is heard.

Press and hold BOOST for extra power. Release BOOST and return to the engine's previous speed. Labored Chuff is heard.

Press and hold BRAKE to slow down or stop. Relase BRAKE and return to previous speed.

CAB-1 Commands

CAB-1 Numeric Keypad Commands

When you press the **AUX1** button 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).

0 Stops and resets the engine. The direction is reset to FORWARD.

1 Raises the volume of RailSounds.

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

3 Starts up RailSounds. Startup sequence commences. Steam Blowoff is heard if RailSounds is already on.

4 Lowers the volume of RailSounds.

5 Activates the RailSounds shutdown sequence. Your locomotive must be idle for shutdown to occur. Press 5 to initiate the shutdown sequence. Steam shutdown commences. Remember, the horn and bell will not sound until you restart RailSounds.

6 Generates Steam Release Sound.

7 TowerCom™ is an audible announcement from the tower.

8 Turns off the smoke unit.

9 Turns on the smoke unit. Hold down to momentarily increase smoke.

Tuning your locomotive's performance

Braking and Boosting

There's more to starting and stopping than just turning the CAB-1 throttle. Press and hold the **BOOST** or **BRAKE** command buttons - they give you a temporary change of speed and are the superior way to handle grades, momentary stops-and-starts and more. Plus, using **BRAKE** in the Command environment gives you a bonus RailSounds effect - the realistic sound of squealing brakes. When the button is released, the locomotive will return to its previous speed. Before the locomotive returns to its previous speed, any movement of the throttle will cause the engine to remain at its current speed.

Sound Quality

To achieve your preferred RailSounds master volume level, we recommend you use your volume control screw knob located on the switch panel. Turn the knob left or right to adjust the volume to your liking. 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** several times on the numeric keypad to lower overall RailSounds output. Press **1** to increase volume. The remote set volume will return to max each time the locomotive is powered up.

Cruise Control ™

This engine is equipped with **K-LINE** Cruise Control™, an innovative new feature that continually measures the speed of the engine and adjusts the motor power to compensate for changes in grade. With the Cruise Control™ active, the engine will maintain a nearly constant speed up and down hills, through switches and around curves. The Cruise Control™ feature works when operating in Command Control operation.

When operating with Trainmaster Command Control, set the desired speed using the CAB-1 remote. The locomotive will maintain that speed. For best results, the track voltage should be set to around 18 volts.

Setting Speed Steps

To adjust the speed steps on your throttle enter one of the following command sequences that corresponds to the number of steps per full revolution of the throttle knob.

32 Steps: **DIR, BELL, AUX1, 1** (factory setting)

128 Steps: **DIR, BELL, AUX1, 2**

256 Steps: **DIR, BELL, AUX1, 3**

The 32 setting is best for normal operation. The other settings are used for ultra precise speed setting. Note that when rotated slowly, each revolution of the CAB-1 throttle is equivalent to 32 speed steps, so changing the speed step setting will change the number of times the throttle has to be rotated to get to full speed.

NOTE for DCS handheld users: The DCS handheld only outputs 31 Steps. To setup for 32 steps enter the following commands: **DIR, BELL, VOL+**

Adjusting Chuff Settings

The chuff rate can be set to 1, 2, or 4 chuffs per revolution. To change the chuff rate, enter the following command sequence:

DIR, WSTL, AUX1, #.

is the numeric key 1, 2, or 4 for the number of chuffs per revolution. The factory default setting is 2 chuffs per revolution.

The smoke unit is synchronized to the sound system so that a puff of smoke is generated for each chuff sound.

Operating Consists

When running a Cruise Control™ equipped engine in a consist with other engines, it may be desirable to turn the Cruise Control™ feature off. The Cruise Control™ feature can be disabled by moving the "Cruise ON/OFF" switch, located on the switch panel, to the "OFF" position. The feature can be turned back on by placing the switch in the "ON" position. The switch should only be moved when track power is off.

In the TMCC mode, while the Cruise Control™ feature is disabled, the "stall speed" can be set by getting the engine moving, slowing the engine until it just stops, then pressing **F, AUX1, F, AUX1**. To remove the stall setting, press DIR, then press **F, AUX1, F, AUX1**. Setting the stall speed of all engines in a consist will make them all start at the same time. Cruise Control™ equipped engines cannot be programmed from the CAB-1 to run reversed in a consist.

Engine Maintenance

Lubricating your locomotive

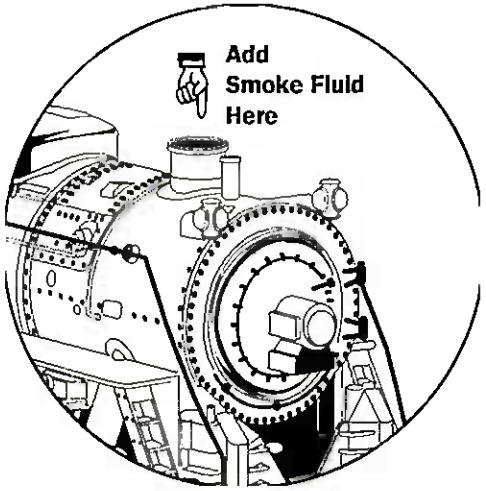
K-LINE steam engines are designed to provide years of quality operation with very little maintenance required. Using a small amount of light machine oil on the end of a toothpick, lubricate all points of linkage on the drive wheels and all drive rods. Do not over oil. The more often the engine is run, the more often the drivers need to be lubricated. Remove any excess oil or grease, especially if it has come in contact with the traction surfaces of the wheels.

Changing/Removing the Battery

The 4-6-6T Tank Engine is equipped with a battery for the RailSounds system. The battery should be removed when the engine will not be used

for a long period of time. It should also be replaced periodically to prevent leakage from corroding any adjacent surfaces. See the **Lionel RailSounds** section for instructions on battery installation.

Smoke Unit



For the first fill with smoke fluid, use between 10 to 15 drops of smoke fluid. Use about 5 drops in subsequent uses. Add directly to the smoke stack. Be sure the fluid goes down the chimney tube.

It is very important to keep the heater element wet with some fluid. If the aroma changes from smoke to a slight burning smell, this is a sign the smoke fluid is running low. This could cause failure of the heater element.

Conventional Mode: Turn the smoke unit on and off using the slide switch on the switch panel. Switch to the off position if the locomotive is run without Smoke Fluid. While in neutral, the motor in the smoke generator will pulse on and off. This is done to protect the heater element.

Smoke Output in Conventional mode is dependent on transformer voltage. When running the engine alone, it will run at lower voltage and the smoke output will be low. To increase the smoke output, add more cars to the train, thereby increasing the voltage needed to run the train.

Smoke output in Conventional mode is continuous and not puffing.

Command Mode: The smoke unit must be turned on using the slide switch on the switch panel for Command mode. When track power is applied, the smoke output is off until the engine is addressed. Any command sent to the engine turns on the smoke output. Smoke can be turned on and off using CAB-1 Commands: **AUX1**, **8** turns smoke Off and **AUX1**, **9** turns smoke On. Press **AUX1** and hold down **9** for a momentary boost of smoke output. Do not hold for more than 10 seconds.

Smoke output in Command mode is synchronized to the sound system so that a puff of smoke is generated for each chuff sound.

Assigning your locomotive a new ID#

As your fleet of Command-equipped engines grows, new engines require different ID#. Choose from any number between 2 and 99. Remember, all Command-equipped engines ship as ID# 1.

We recommend that you choose an easy to remember ID# for your engine such as part of the engine road number or 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 engine.

1. Turn the Command Base ON and set the engine on the track.
2. Slide the switch panel's RUN/PROGRAM switch to PROGRAM.
3. Turn track power on.
4. Press **ENG** and new ID#.
5. Press **SET** located under the removable cover at the bottom of CAB1.
6. The headlight flashes and the horn blows to signal that the ID# is set.
7. Turn track power off.
8. Set the RUN/ PROGRAM switch to RUN and turn track power on.

Your engine remembers its ID# until you change it again.

Reprogramming your locomotive to restore features

Due to inevitable derailments, static and the nature of electricity, it is possible that your engine could someday lose its setup program. The symptom of this condition is unresponsiveness in command mode. This can easily be remedied by "reprogramming" your engine.

1. Slide the panel's RUN/PROGRAM switch to PROGRAM.
2. Turn on Command Base.
3. Place locomotive on track, then turn on power to track.
4. Press **ENG** then input locomotive ID#. Press **SET**.
5. Press **AUX1**, **7**, **4** to return engine to factory program settings.
6. Turn off power to track, wait ten seconds.
7. Set the RUN/ PROGRAM switch to RUN.
8. Turn on power to track.
9. Press **ENG** and ID#, and then operate normally.