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AMERICAN FLYER®

2-8-2 Mikado Steam Locomotive and Tender Owner's Manual

featuring TRAINmaster COMMAND and RailSounds® 5.0

Congratulations!

Congratulations on your purchase of the American Flyer 2-8-2 Mikado steam locomotive and tender! On the outside, this locomotive features numerous prototypical details and expert decoration in your favorite livery. Inside the body, this locomotive is equipped with some of the most advanced sounds and controls in model railroading. This powerful locomotive is ready for duty on your layout.

Features of this locomotive

- **TrainMaster Command Control equipped—able to run in Command Control Mode or in Conventional Transformer Control Mode with most American Flyer and Lionel transformers**
- **RailSounds 5.0 sound system with new intelligible CrewTalk dialog and more TowerCom announcements, each with different scenarios depending on whether the locomotive is in motion or stopped**
- **Powerful maintenance-free motor with momentum flywheel**
- **Wireless Tether connection between locomotive and tender**
- **Directional lighting including operating headlight and back-up light on rear of tender**
- **Illuminated classification lights on front of locomotive**
- **Traction tires**
- **Operating smoke unit**
- **Illuminated cab interior**
- **Operating coupler on rear of tender**

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Quick Start

Transformer operations

1. **Place your locomotive on American Flyer or S gauge two-rail track.**

Note! The curves must have a minimum radius of at least 20".

2. **Power your locomotive at 8-18 volts with your alternating-current (AC) transformer.**

Caution! Do not power your locomotive with a direct-current (DC) transformer. Damage to sensitive electronic components may occur.

3. **Wait three to eight seconds as your locomotive determines whether it is in a conventional environment or a TrainMaster Command Control environment.**
4. **Move 'em out! Press the DIRECTION button on your transformer, then throttle up.**

TrainMaster Command Control operations

To operate your locomotive in the Command Control environment, you need a Command Base (available separately, 6-12911) and a CAB-1 Remote Controller (available separately, 6-12868). Both products are offered together in the TrainMaster Command Set (6-12969).

1. **Turn off track power and plug-in the Command Base.**
2. **Place your locomotive on American Flyer or S gauge two-rail track.**

Note! The curves must have a minimum radius of at least 20".

3. **Increase track voltage to full power (no more than 19 volts AC).**

Caution! Do not power your locomotive with a direct-current (DC) transformer. Damage to sensitive electronic components may occur.

4. **Press ENG and 1 to address your locomotive with your CAB-1 Remote Controller.**
5. **Throttle up and move 'em out.**

Conventional transformer operations

Conventional transformer operations

Your locomotive is capable of operating in the conventional environment, controlled by nothing more than a standard alternating-current (AC) transformer.

In the conventional environment, your locomotive cycles through a repeating pattern of operations: forward, neutral, reverse, neutral, and so on. To advance to the next operation, press the **DIRECTION** button on your transformer. Alternately, you could use the throttle to briefly turn off track power so that the locomotive advances to the next operation when power is restored.

Once you cycle the locomotive into forward or reverse, you control your locomotive's speed by varying track voltage with the transformer's throttle. To increase the speed of the locomotive, you increase track voltage. To decrease the speed, you decrease track voltage. To stop the locomotive and to change directions (or to enter neutral), track voltage is turned off or interrupted.

Use the **WHISTLE** and **BELL** buttons on your transformer (or separate buttons if your transformer is not equipped with these controls) to activate these features.

To experience all of your locomotive's features, we recommend operating in the TrainMaster Command Control environment. With a simple one-wire connection, you can use the CAB-1 Remote Controller to access all of the functions of your locomotive. Refer to pages 17-23 to see how to operate your locomotive in the TrainMaster Command Control environment.

Conventional transformer operations

Operating your locomotive in the conventional environment

1. **With your transformer turned off, place your locomotive on American Flyer or S gauge two-rail track.**

Note! The curves must have a minimum radius of at least 20".

2. **Connect the drawbar between the locomotive and tender as illustrated in Figure 1.**

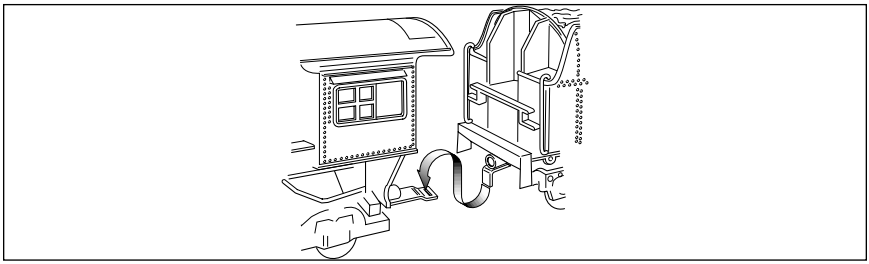


Figure 1. Drawbar connection

3. **Power your locomotive at 8-18 volts with your alternating-current transformer.**

Caution! Power your locomotive with an alternating-current (AC) transformer only. Powering your locomotive with a direct-current (DC) transformer may result in damage to sensitive electronic components.

4. **Wait three to eight seconds as your locomotive determines whether it is in a conventional environment or a TrainMaster Command Control environment.** The headlight flickers as the locomotive searches for a signal from the Command Base. When the locomotive has determined that a Command Base is not connected to the track, the flickering will stop and the headlight will remain illuminated. You are ready for operation in the conventional environment.
5. **Move 'em out!** Press the **DIRECTION** button on your transformer to sequence your locomotive through the repeating pattern of operations: forward, neutral, reverse, neutral, and so on. You may also briefly turn off track power to advance the locomotive to the next operating state. Adjust the throttle until your locomotive moves at your desired speed.

Note! When placing your locomotive on your layout for the first time, it will start out in neutral. Thereafter, it will start in forward after every power interruption lasting five seconds or longer.

Use the **WHISTLE** and **BELL** buttons on your transformer to activate those features. Refer to page 12 if your transformer is not equipped with those buttons.

Conventional transformer operations

Locking your locomotive into a single direction

When the Command reverse unit switch is in the RUN position, your locomotive sequences through a repeating pattern of operations: forward, neutral, reverse, neutral, and so on.

To "lock" your locomotive into a single direction (for example, to operate in forward only), you can deactivate the Command reverse unit's sequencing function. Refer to Figure 2 for the location of the Command reverse unit switch inside the cab.

1. Use your transformer's **DIRECTION** button or interruptions in track power to get your locomotive moving in the desired direction.
2. Slow the locomotive down without stopping (reduce the throttle without turning off track power).
3. Slide the Command reverse unit switch to the PROG position. At this point, the locomotive is "locked" into your chosen direction. To restore the forward-neutral-reverse sequence, just slide the Command reverse unit switch back to the RUN position.

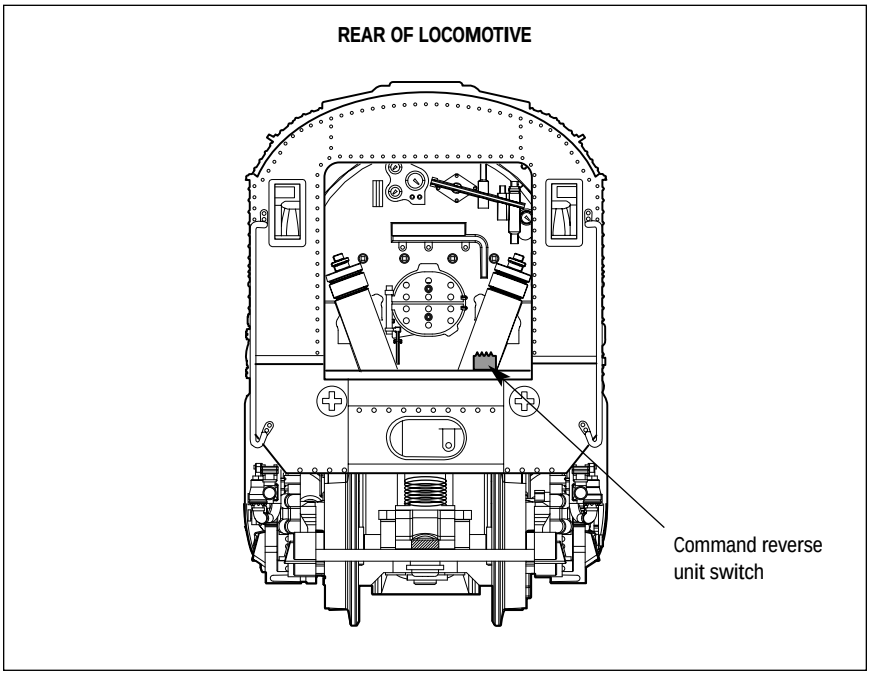


Figure 2. Locomotive switch locations

Conventional transformer operations

Coupling your tender

Your tender is equipped with an operating coupler. To open the coupler, push up on the uncoupling weight. Refer to Figure 3. To couple two cars together, place them on the track with at least one of the couplers open, then slide them together. The couplers will close automatically.

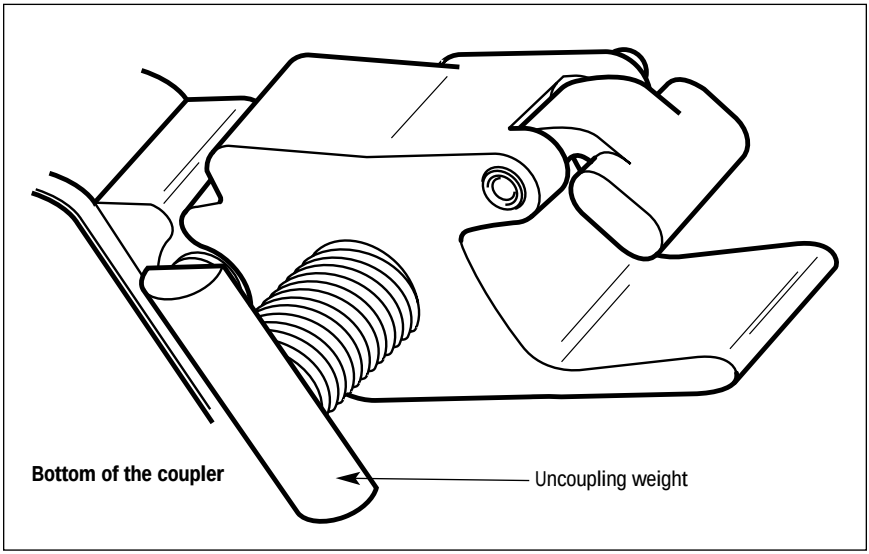


Figure 3. Coupler operation

RailSounds 5.0 sound system operations

RailSounds 5.0 sound system operations

Your locomotive is equipped with the Lionel RailSounds 5.0 sound system, the most realistic model railroad sound system in the world. The RailSounds 5.0 sound system brings the sounds of the railroad to your layout through high quality digital samples of real locomotives.

When you operate your locomotive in the conventional environment, you get realistic chuffing sounds, which automatically increase through 15 levels as the speed of the locomotive increases. You can sound the locomotive's whistle or activate the ringing of the bell. When you are through with operations and power down the track, your locomotive's RailSounds 5.0 sound system starts a realistic steam shutdown sequence (a nine-volt battery is required for the operation of the RailSounds 5.0 sound system when the track is powered down).

When you operate your locomotive in the TrainMaster Command Control environment, you get full control of the RailSounds 5.0 sound system, including the whistle, air horn, and bell sounds. The locomotive's chuffing sounds automatically increase, but you can also set a particular chuff intensity level using your CAB-1 Remote Controller. Use the **BRAKE** button, and listen for the sound of squealing metal. You can also trigger CrewTalk dialog and TowerCom announcements, which simulate the interaction between the locomotive crew and the dispatcher. Whenever you choose to shutdown your locomotive, the realistic shutdown sequence commences (a nine-volt battery is required for the operation of the RailSounds 5.0 sound system when the track is powered down).

RailSounds 5.0 sound system operations

Installing the battery

While the RailSounds 5.0 sound system is powered through the track, we recommend that you install a nine-volt alkaline battery in the tender to prevent the sound system from shutting down during track power interruptions (for example, at a switch or a dirty section of track). Follow these steps and refer to Figure 4 as you install the battery.

Note! If the RailSounds sound system turns off during interruptions in track power, you may need to replace the battery.

1. Remove the body screws from the underside of the tender. Refer to Figure 4 for the location of the screws.
2. Lift the body off the frame. Be careful to avoid pulling on the wires that connect the body to the frame.
3. Remove the protective cover from the battery harness.
4. Snap the battery harness onto the nine-volt alkaline battery's terminals.
5. Slide the battery into the battery holder. Be sure that the wires from the battery harness are routed below the battery in the holder.
6. Replace the body on the frame and secure it with the body mounting screws. Be careful to avoid pinching wires between the body and the frame.

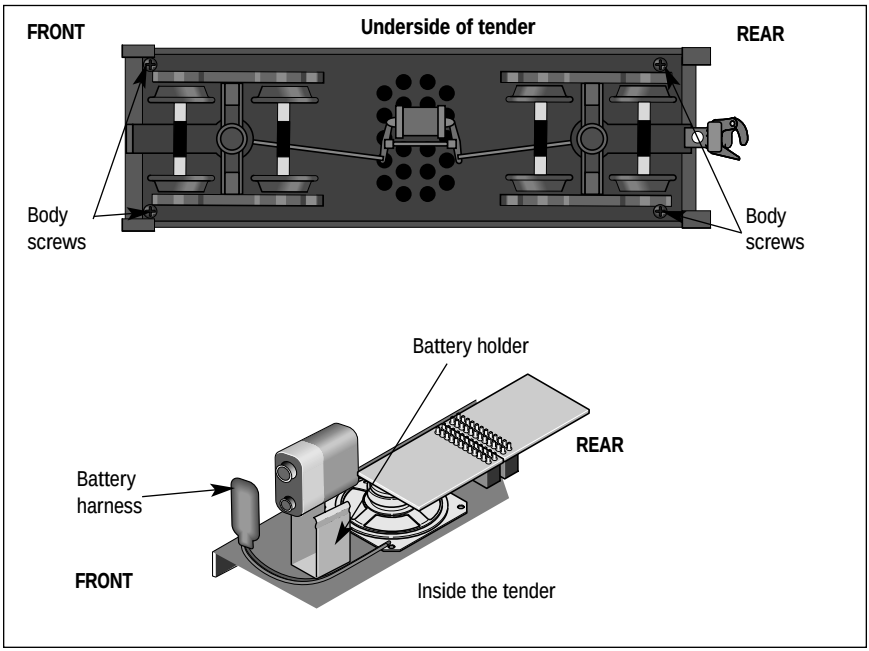


Figure 4. Battery installation

RailSounds 5.0 sound system operations

Using the RailSounds 5.0 sound system in the conventional environment

When you first power up your locomotive, you will hear the sounds of the locomotive at rest. As the locomotive moves, the chuffing sounds automatically increase with the locomotive's speed. In the conventional environment, the whistle and bell sounds are activated by your transformer controls.

To silence the chuffing sounds, slide the RailSounds 5.0 sound system switch located under the hatches on top of the tender to the SIGNALSOUNDS position before you power up the locomotive or after the locomotive has been powered down for a minimum of ten seconds. The whistle and bell sounds will still be active. To adjust the volume, use the volume control knob located under the hatch on top of the tender.

Note! For proper operation of the RailSounds 5.0 sound system during track power interruptions and for the locomotive shutdown sequence, you must install a nine-volt alkaline battery. See page 10.

In the conventional environment, you will experience several features of the RailSounds 5.0 sound system.

- **DynaChuff.** Your locomotive's speed automatically determines the level of chuffing sounds. At low speeds, the chuffing intensity is relaxed. When you highball down the mainline, the chuffing intensity is labored.
- **MultiWhistle.** A different whistle sound at different speeds—a RailSounds 5.0 sound system exclusive.
- **Authentic bell.** Press **BELL** on your transformer to begin the effect, then press **BELL** a second time to discontinue the effect.
- **CrewTalk dialog and TowerCom announcements.** These brief conversations between the train crew and the tower are triggered by short whistle blasts.
- **Reverse unit reset sound.** Power down your track, wait three seconds, and listen for the air-release sound—that's the locomotive telling you that its Lionel Command reverse unit has reset to forward.
- **Shutdown sequence.** When you turn off track power, you have two seconds to power up again after you hear the reverse unit reset sound. If you do not restore power, you will hear the realistic shutdown sequence. Because track power is off, a battery is required for this sequence to function.

RailSounds 5.0 sound system operations

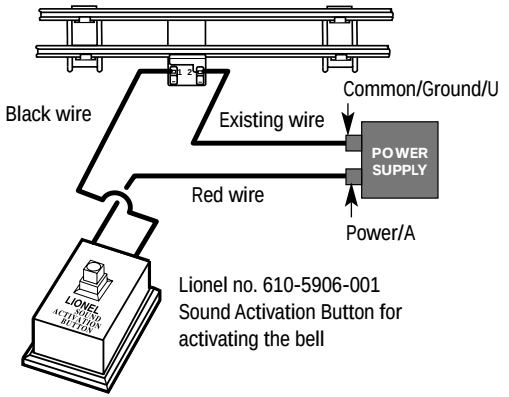
Installing a Lionel Sound Activation Button for conventional operation

If your transformer lacks **WHISTLE** and **BELL** buttons, you will need to install Lionel no. 610-5906-001 Sound Activation Buttons (available separately) to activate the locomotive's whistle and bell sounds.

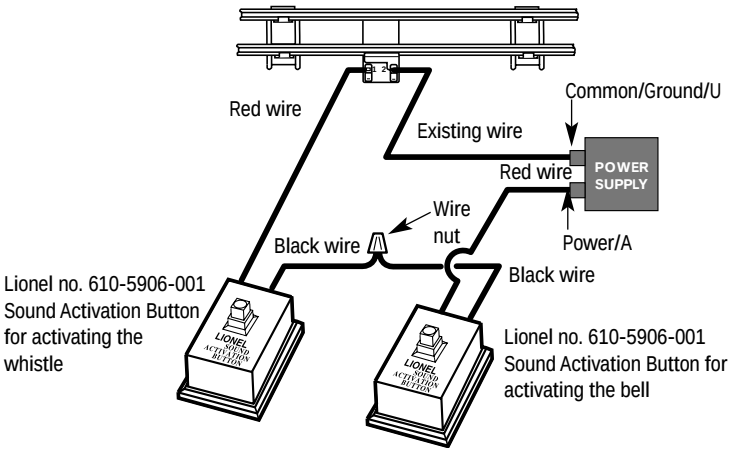
You may find that the **WHISTLE** and **BELL** buttons control the opposite features. To remedy this situation, you may swap the track power wires or run the locomotive in the opposite direction.

Connect the buttons as shown below. Be sure that all track power passes through the Sound Activation Button(s). Do not bypass the buttons.

For AC transformers lacking a bell button



For AC transformers lacking bell and horn/whistle buttons



Activating the CrewTalk dialog and TowerCom announcements in the conventional environment

In the conventional environment, CrewTalk dialog and TowerCom announcements are triggered by short whistle blasts and vary with the state of the locomotive.

- If the locomotive has been stopped for less than 30 seconds, a short whistle blast triggers a "please standby" dialog.
- If the locomotive has been stopped for longer than 30 seconds, a short whistle blast triggers a "cleared outbound" dialog.
- If the locomotive is moving, a short whistle blast triggers an "all clear ahead" dialog.
- If the locomotive is moving with the bell activated, a short whistle blast triggers a "slow to caution" dialog.

RailSounds 5.0 sound system operations

Using the RailSounds 5.0 sound system in the TrainMaster Command Control environment

To access all of the features of the RailSounds 5.0 sound system, you must operate your locomotive in the TrainMaster Command Control environment. The CAB-1 Remote Controller is required to activate features such as TowerCom announcements, CrewTalk dialog, and coupler release sounds. Refer to pages 17-21 to learn how the RailSounds 5.0 sound system is integrated into TrainMaster Command Control operations.

Note! For proper operation of the RailSounds 5.0 sound system during track power interruptions and for the locomotive shutdown sequence, you must install a nine-volt alkaline battery. See page 10.

In the TrainMaster Command Control environment, you will experience all of the features of the RailSounds 5.0 sound system.

- **DynaChuff.** Your locomotive's speed automatically determines the level of chuffing sounds. At low speeds, the chuffing is relaxed. When you highball down the mainline, the chuffing intensity is labored. You may also manually set the chuff sounds to a particular level using your CAB-1 Remote Controller.
- **MultiWhistle.** A different whistle sound at different speeds—a RailSounds 5.0 sound system exclusive.
- **Authentic bell.** Press **BELL** on your transformer to begin the effect, then press **BELL** a second time to discontinue the effect.
- **Squealing brakes.** Press the **BRAKE** button and listen for the squealing of the locomotive's brakes as the locomotive slows down.
- **Coupler release sounds.** Use your CAB-1 Remote Controller to release the ElectroCoupler, and you get the sounds of the coupler opening.
- **TowerCom announcements.** TowerCom announcements are a dispatcher-initiated radio conversation with the engineer. Depending on the movement of the locomotive, the dialog will change. The RailSounds 5.0 sound system will often use different words and phrases when composing the conversation. See pages 15-16 for additional information.
- **CrewTalk dialog.** CrewTalk dialog is an engineer-initiated radio conversation with the dispatcher. Depending on the movement of the locomotive, the dialog will change. The RailSounds 5.0 sound system will often use different words and phrases when composing the conversation. See pages 15-16 for additional information.

RailSounds sound system operations

Using the RailSounds 5.0 sound system in the TrainMaster Command Control environment (continued)

- **Shutdown sequence.** When you turn off track power or press **AUX1**, **5**, you have two seconds to power up again after you hear the reverse unit reset sound. If you do not restore power, you will hear the realistic shutdown sequence. Because track power is off, a battery is required for this sequence to function.

Activating the CrewTalk dialog and TowerCom announcements in the Command Control environment

With the RailSounds 5.0 sound system, CrewTalk dialog and TowerCom announcements feature a variety of brief radio conversations between the engineer and dispatcher. All dialog is intelligible, and each comment is followed by at least one automatic response.

CrewTalk dialog is an engineer-initiated radio conversation with the dispatcher. TowerCom announcements are a dispatcher-initiated radio conversation with the engineer. Be sure to listen for the different combinations of words and phrases that comprise these exchanges.

Refer to Table 1 for the dialog commands.

Locomotive	Commands	Feature	Dialog
Stopped	AUX1, 2 AUX1, 7	CrewTalk dialog TowerCom announcements	"Please stand by for clearance"
	2 7	CrewTalk dialog TowerCom announcements	"Cleared for departure"
	AUX1, 5		"Signing off," shutdown sequence
Moving	AUX1, 2 AUX1, 7	CrewTalk dialog TowerCom announcements	"Clear inbound"
	2 7	CrewTalk dialog TowerCom announcements	"All clear ahead"
	AUX1, 5 5		"Emergeny stop," shutdown sequence "Slow to caution"

Table 1. CAB-1 Remote Controller dialog commands

Activating the CrewTalk dialog and TowerCom announcements in the Command Control environment (continued)

Refer to Figure 5 for a sample dialog script for the locomotive's round trip.

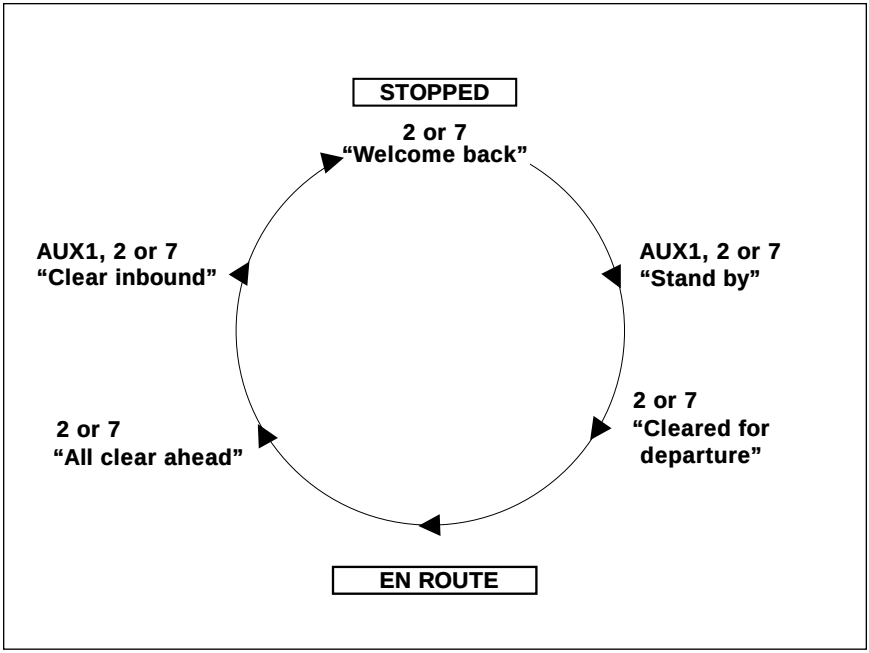


Figure 5. RailSounds 5.0 sound system dialog on a round trip

You may also activate an arrival dialog. To cue the arrival dialog, press **AUX1**, **2** or **AUX1**, **7** within 30 seconds of stopping, then press **2** or **7** after the locomotive stops.

TrainMaster Command Control operations

TrainMaster Command Control operations

TrainMaster Command Control is the advanced model railroad control system from Lionel. To operate your locomotive in the Command Control environment, you need a Command Base (available separately, 6-12911) and a CAB-1 Remote Controller (available separately, 6-12868).

Your commands are sent by the CAB-1 Remote Controller to the Command Base, which then translates the command into digital code. That code is sent through the outside rails to your locomotive, which will not respond until it recognizes its unique ID#. TrainMaster Command Control gives you the power to operate multiple Command-equipped locomotives on the same track at the same time.

Keep in mind that track power is like gasoline in the tank of a car—it gives you the power to go places, but it doesn't tell you where to go or how fast to get there.

Operating your locomotive in the Command Control environment

1. **Turn off track power and plug-in the Command Base.** Be sure that the TRACK U terminal on the Command Base is connected to the BASE (or common) terminal on your TRACK U terminal on the track power supply.
2. **Place your locomotive on American Flyer or S gauge two-rail track.**
3. **Increase track voltage to full power (no more than 19 volts AC).** If you are operating with a PowerMaster, slide the CMD/CONV switch to CMD. Program any Track Power Controllers to Command Control operation.
4. **Press ENG and enter the ID# to address your locomotive with your CAB-1 Remote Controller.** All Lionel locomotives come factory-programmed as ID# 1. To change the ID#, see page 22.
5. **Throttle up and move 'em out!** Your locomotive will respond to every command from your CAB-1 Remote Controller.

TrainMaster Command Control operations

CAB-1 Remote Controller commands

The CAB-1 Remote Controller commands are detailed below. ***The corresponding RailSounds sound system effects are in bold italic type.***

Coupler release sound.

Coupler release sound.

Activates the numeric keypad. ***Short steam release sound.***

Toggles the headlight on and off.

Accelerates the locomotive with a clockwise rotation. Decelerates the locomotive with a counter-clockwise rotation. ***Speed-dependent chuffing sounds. DynaChuff dynamic chuffing effect.***

Activates the locomotive's whistle. Release the button to discontinue the sound. ***MultiWhistle steam whistle sound.***

Toggles the bell sound on and off. ***Bell sound.***

Changes the locomotive's direction. The locomotive decelerates to a stop and continues in the opposite direction when you increase the throttle. ***Air release sound.***

Note! We recommend that you wait a few moments before adjusting the throttle after a direction change.

See page 21 for the momentum settings.

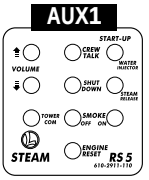
Increases the locomotive's speed while the button is pressed. Release the button to return to the initial speed. ***Labored chuff.***

Decreases the locomotive's speed while the button is pressed. ***Squealing brake sounds.***

Shuts down all PowerMasters on your railroad. Stops all TrainMaster Command Control-equipped locomotives in operation. Use **HALT** only in emergency situations.

TrainMaster Command Control operations

CAB-1 Remote Controller numeric keypad commands



When you press the **AUX1** button on your CAB-1 Remote Controller, you turn the numeric keypad into ten command buttons. These commands are specific to your locomotive, and an overlay is included to help you learn these functions. After you press the **AUX1** button, you will be able to press any numbered button until you address a different product. ***The corresponding RailSounds sound system effects are in bold italic type.***

0 Stops and resets the locomotive. Resets the locomotive's direction to forward. Resets the RailSounds 5.0 sound system to Automatic Chuff Mode. ***Air release sound.***

1 Raises the volume of the chuffing and boiler sounds. ***Sound volume increases.*** The whistle, bell, CrewTalk dialog, and TowerCom announcements will play at full volume. Use the volume control knob located under the hatch on top of the tender to adjust the volume.

2 CrewTalk dialog is an engineer-initiated radio conversation with the dispatcher. Depending on the movement of the locomotive, the meaning of this dialog will change. The RailSounds 5.0 sound system will often use different words and phrases when composing the conversation. See page 15-16 for additional information. ***CrewTalk dialog commences.***

3 Starts the RailSounds 5.0 sound system if the locomotive was previously shutdown. Triggers the water pump sounds. Activates Manual Chuff Mode (see page 20) to set the chuff intensity manually. ***Water injector sounds.***

4 Lowers the volume of the background effects. ***Sound volume decreases.*** The whistle, bell, CrewTalk dialog, TowerCom announcements, and other user-controlled effects will play at full volume. Use the volume control knob located under the hatch on top of the tender to adjust the maximum volume of all effects.

5 Activates the steam locomotive shutdown sequence. If the locomotive is in motion, an "emergency stop" dialog will play. If the locomotive is at rest, the engineer will sign-off. ***Dialog and shutdown sequence.***

6 Activates Manual Chuff Mode (see page 20) to set the chuff intensity manually. ***Steam release sound.***

7 TowerCom announcements are a dispatcher-initiated radio conversation with the engineer. Depending on the movement of the locomotive, the dialog will change. The RailSounds 5.0 sound system will often use different words and phrases when composing the conversation. See pages 15-16 for additional information. ***TowerCom announcement.***

8 Turns off the smoke unit. ***Let-off sound.***

9 Turns on the smoke unit if the smoke unit switch is in the ON position. Be sure to add smoke fluid before turning on the smoke unit to prevent damage to your locomotive. ***Let-off sound.***

Note! **AUX1**, **8** and **9** function only if the locomotive's smoke unit switch is in the ON position.

TrainMaster Command Control operations

Tuning your locomotive's performance

TrainMaster Command Control allows you to fine-tune the performance of your locomotive. Use your CAB-1 Remote Controller to make these adjustments.

Note! These settings will be lost if you assign a new ID#.

Chuff intensity

Your locomotive is equipped with DynaChuff, the realistic steam chuffing sounds produced by the RailSounds 5.0 sound system. Your locomotive's chuff rate is always synchronized with the drive wheels and the speed of the locomotive. The chuff intensity is also capable of varying automatically with the speed of the locomotive in automatic chuff mode. You may also choose to set a constant, or fixed, chuff intensity in manual chuff mode. There are 15 chuff intensity levels.

Automatic chuff mode

When you first throttle up, the intensity of the chuff sounds will vary with adjustments to the throttle. When you stop the locomotive for two seconds or more, the sounds will return to their initial intensity.

The initial chuff intensity simulates the sounds of the locomotive pulling a heavy string of cars. Keep in mind that you may choose to reduce the initial intensity of the chuff sounds to simulate a lighter load on the locomotive by pressing the **BRAKE** button while your locomotive is at rest. This will reduce the initial chuff intensity to the lowest level.

Manual chuff mode

Manual chuff mode allows you to set a constant chuff intensity for your locomotive. The intensity of the chuff sounds does not vary with the throttle settings or the speed of the locomotive.

To set a constant chuff intensity, get your locomotive moving, then press **AUX1**, **3** or **AUX1**, **6** to enter manual chuff mode. The locomotive will be locked at the current chuff intensity. To adjust this chuff intensity, press **3** to increase the intensity of the chuffing or press **6** to decrease the intensity of the chuffing. The locomotive will save this intensity level.

If you press **AUX1**, **3** while the locomotive is at rest, the chuffing will be set to the maximum intensity. If you press **AUX1**, **6** while the locomotive is at rest, the chuffing will be set to the lowest intensity. Once the locomotive is in motion, you may use the **3** and **6** buttons to increase and decrease the intensity of the chuff sounds.

When you press **AUX1**, **3** or **AUX1**, **6**, you have a ten-second "window" to adjust the chuff intensity. During this time, the water injector (**3**) and the steam blow-down (**6**) sound will not be triggered by the **3** and **6** buttons. After ten seconds, the **3** and **6** buttons will be reassigned to activate the sounds. To adjust the chuff intensity after the ten seconds have elapsed, simply press **AUX1**, **3** or **AUX1**, **6** again.

To exit manual chuff mode, turn off track power and allow the locomotive to reset, enter the shutdown sequence (**AUX1**, **5**) or reset the locomotive (**AUX1**, **0**).

Note! The water injector sounds (**3**) and the blow-down sounds (**6**) are inactive during the first ten seconds of entering manual chuff mode. These sounds are restored after the ten seconds have elapsed. If you wish to adjust the chuff intensity again, press **AUX1**, **3** and **AUX1**, **6** to open another ten-second programming "window".

Tuning your locomotive's performance (continued)

Volume

The RailSounds 5.0 sound system gives you greater control over the volume of your locomotive's sounds. Pressing **AUX1**, **1** raises the volume of the chuffing and boiler sounds, and **AUX1**, **4** lowers the volume. There are nine volume levels.

Note! The volume level you set will be saved and restored upon power-up. Press **AUX1**, **1** and **4** to adjust the volume.

The whistle, bell, CrewTalk dialog, and TowerCom announcement sounds play at full volume, regardless of the settings entered with the CAB-1 Remote Controller. To adjust these sound levels, use the volume control knob found under the hatch on the tender.

Momentum

The TrainMaster Command Control momentum feature simulates the labored performance of a locomotive pulling a light, moderate, or heavy load. Press **L**, **M**, or **H (**located under the removable panel on the CAB-1 Remote Controller**)** to adjust the momentum setting. If you select the high momentum setting, you will find that the locomotive increases and decreases its speed slowly to simulate the weight of the train. For quicker response to your commands, press **L**, which is the factory default setting. You locomotive will keep this setting until it is changed.

Adjusting the speed

The **BRAKE** and **BOOST** buttons give you incremental control of you locomotive's speed while you press and hold these buttons, allowing you to make small, gradual adjustments around curves and over grades. The locomotive will resume its initial speed when the buttons are released. Listen for the squeal of your locomotive's brakes when you use the **BRAKE** button.

Setting the maximum speed (high voltage)

You may use your CAB-1 Remote Controller to set your locomotive's maximum speed. This will prevent the locomotive from derailing as a result of excessive speed.

1. With the Command reverse unit switch in the RUN position, address your locomotive by pressing **ENG** and entering the ID#.
2. Press **SET** on the CAB-1 Remote Controller. The headlight will flash.
3. Get your locomotive moving at your desired maximum speed.
4. Press **BOOST**.

The maximum speed has been set. To clear this setting, press **SET** and then **BOOST**, holding each button for one second.

Setting the minimum speed (stall voltage)

You may use your CAB-1 Remote Controller to set your locomotive's minimum, or stall, speed.

1. With the Command reverse unit switch in the RUN position, address your locomotive by pressing **ENG** and entering the ID#.
2. Press **SET** on the CAB-1 Remote Controller. The headlight will flash.
3. Get your locomotive moving at your desired minimum speed.
4. Press **SET** again. The locomotive will stop.

The next time you throttle up, your locomotive will start at the speed you set. To clear this setting, press **SET** twice, holding the button for one second each time.

Note! These settings will be lost when you assign a new locomotive ID#.

TrainMaster Command Control operations

Assigning your locomotive a new ID#

As your roster of TrainMaster Command Control-equipped locomotives grows, you will want to give each unit a unique ID#. The locomotive will respond to commands associated with its ID# while all other units will disregard these commands.

Note! To restore your locomotive's functions, see page 23.

1. Slide the Command reverse unit switch on your locomotive to the PROG position.
2. Place the locomotive on the track.
3. Connect the Command Base and plug it in.
4. Power up the track.
5. Press **ENG**.
6. Enter the unique ID#. Choose any number from 1 to 99 that has not been assigned to another locomotive **(ENG)**. We recommend using a part of your locomotive's cab number.
7. Press **SET**. The locomotive's whistle will sound, or the headlights will flash if the RailSounds sound system is off.
8. Slide the Command reverse unit switch back to the RUN position.

   The locomotive's ID# has been set. Be sure to record the new ID# for your reference.

TrainMaster Command Control operations

Reprogramming your locomotive to restore features

If your locomotive is unresponsive to your commands in the TrainMaster Command Control environment, we recommend that you follow this procedure to reset your locomotive. All factory default settings will be restored when you reprogram the locomotive.

1. Slide the Command reverse unit switch to the PROG position.
2. Plug in and connect your Command Base.
3. Place your locomotive on the track, then power up the track.
4. Press **ENG** and enter the locomotive's ID#.
5. Press **SET**.
6. Press **ENG** and enter the locomotive's ID# again.
7. Press **AUX1**.
8. Enter **74** for this particular locomotive.
9. Turn off track power and wait ten seconds.
10. Slide the Command reverse unit switch back to the RUN position.

At this point, your locomotive has been reset. Restore power to the track and operate the locomotive as usual. Be sure to use the ID# entered in Step 4.

Maintaining and servicing your locomotive

Adding fluid to your locomotive's smoke generator

Your locomotive is equipped with a smoke generator that produces a safe, clean, white smoke during operation. In order to function, the smoke generator requires the periodic addition of Lionel smoke fluid. A small bottle of smoke fluid is included with your locomotive.

To add smoke fluid, press down and unscrew the cap of the smoke fluid bottle, then add 10 to 15 drops of fluid into the stack of your locomotive. It is easier to add smoke fluid if your locomotive is powered down or the smoke unit is off. Power up your locomotive with the smoke unit switch in the ON position, and smoke production will start momentarily. When smoke production decreases, add four to eight additional drops of smoke fluid.

When the smoke unit switch is in the ON position, always keep a small amount of smoke fluid in the smoke unit. Operating your locomotive's smoke unit without smoke fluid will cause damage to the heating element.

If you prefer to operate your locomotive without smoke, locate the smoke unit switch and slide it to the OFF position. Refer to Figure 7 for the location of this switch.

In the TrainMaster Command Control environment, press **AUX1, 8** on your CAB-1 Remote Controller to turn off the smoke unit. To turn on the smoke unit, be sure that the smoke unit switch is in the ON position, then press **AUX1, 9**.

Caution! Always operate your locomotive's smoke unit with the addition of smoke fluid to prevent damage to the heating element.

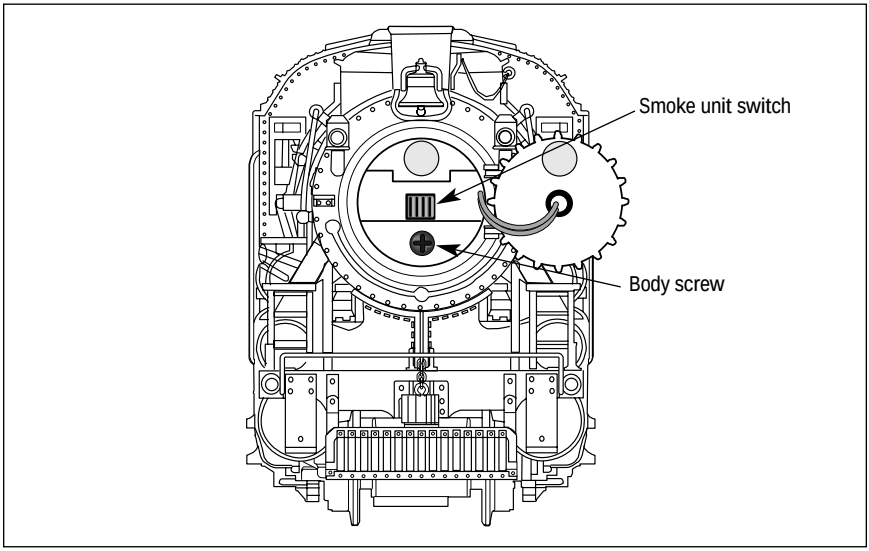


Figure 7. Smoke unit switch

Maintaining and servicing your locomotive

Lubricating your locomotive

Help your 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 Figure 8 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, roller pick-ups, or the track.

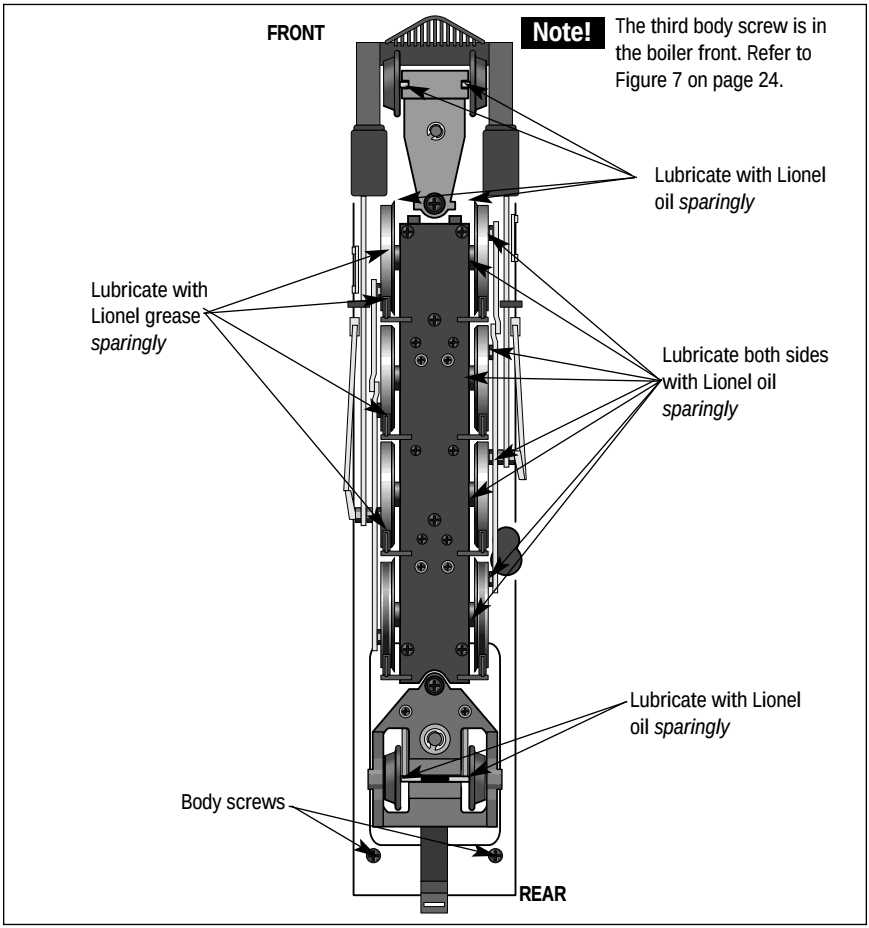


Figure 8. Lubrication points

Maintaining and servicing your locomotive

Maintaining your locomotive's handrail antenna

The handrails on your locomotive are the antennas that receive the digital communication from the Command Base. For optimum reception, the handrails have been insulated from the die-cast body. Please handle the locomotive carefully to avoid handrail damage. The handrails should not touch the locomotive's body.

If your locomotive appears to have problems receiving communications from the Command Base, be sure that the ends of the handrails are insulated from the body with either an insulating washer or handrail stanchion.

Servicing your locomotive's lamps

Note! Before changing the lamps in your locomotive, be sure to check that the **AUX2** command was not used to turn off the front headlight.

Your locomotive is illuminated by two lamps and one LED. One lamp is located in the headlight housing mounted on the boiler front and the other lamp illuminates the interior of the cab. During the course of normal operations, these may require replacement.

We recommend that you have the lamps serviced at your authorized Lionel Service Center.

Lamp Numbers:	
Headlight (1)	640-8036-300
Cab light (1)	640-8036-310

Note! The tender back-up light and classification lights are LEDs, which are expected to last for the life of the product. They can be replaced by your authorized Lionel Service Center if it is ever required.

Maintaining and servicing your locomotive

Replacing the traction tires

Two of the locomotive's drive wheel are equipped with rubber traction tires to increase the tractive effort of your locomotive, allowing it to pull more cars.

During the course of normal operations, the traction tires may become worn out. Replacement traction tires are included with your locomotive. Follow these steps to replace a worn traction tire.

1. Unscrew the drive rod nut from the wheel using a 3/16" nut driver.
2. Slip off the old traction tire and remove it from under the drive rod.
3. Stretch the traction tire around the wheel.
4. Reinstall and tighten the drive rod nut.

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 accessing our Website at www.lionel.com.

If you prefer to send your product back to Lionel L.L.C. for repair in Michigan, you must first call 586-949-4100 or FAX 586-949-5429, 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 ensure 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. 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 _____

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