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LIONEL

TRAINmaster[®]
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SC-1
Switch and Accessory Guide

Introduction

This booklet helps you connect Lionel switches and animated accessories to SC-1, the Lionel TrainMaster Command switch and accessory activation component. It is necessary to have at least one CAB-1 remote-control unit and a Command Base (each available separately) properly connected to your railroad in order for SC-1 to function. Because of SC-1's design, it is *extremely important* that you make the proper connections.

SC-1 listens for and responds to your CAB-1 switch, route, and accessory

commands. Press SW, RTE, or ACC and the corresponding ID#, and the SC-1 controlling that switch or accessory will activate the selected item(s).

Unlike traditional Lionel wiring philosophy that switches accessory power on or off, SC-1 controls the ground (or "common") pathway. An incorrect connection will trip SC-1's breaker and prevent proper operations. Follow these instructions and you'll be enjoying walkaround control over your Lionel switches and animated accessories.

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Installing SC-1 on your railroad

SC-1 basics

Each SC-1 controls four switches and two accessories. SC-1s feature adhesive numeric labels which you apply to identify SC-1 switch and accessory terminals.

SC-1 will accommodate switches and accessories drawing up to a MAXIMUM of 1-amp load per switch or accessory.

There are two vertical “columns” of terminals for connecting SC-1 to Lionel accessories. Top-row SC-1 accessory terminals are for push-and-hold functions like loaders and motors, controlled by AUX1. Bottom-row terminals are for on/off functions like light towers, controlled by CAB-1’s AUX2 button. The middle row is for transformer “common” (U terminal) voltage.

WARNING: *Switches and accessories must be externally powered; do not power them with track voltage. Command control applies full voltage to the track at all times. By using an external power transformer or a PowerHouse and PowerMaster, you can control the voltage to the switches and accessories. In some accessories, original*

light bulbs should be changed to 18-volt rated bulbs.

Note!

SC-1 will operate all Lionel switches. For operation of other switches, see pages 5 and 6.

If your SC-1 serves only as an accessory activator (no switches are connected), you must power it with a 12-volt Lionel wallpack (part no. 610-2860-020). When powered, SC-1’s green light will illuminate.

To connect a switch or accessory to SC-1, establish a wire between the indicated binding post and SC-1 terminal. Use a screwdriver to loosen the terminal, connect the stripped wire end, then retighten the screw.

Connect the SC-1 common lead (center row) to the U terminal on your accessory power source. Next, connect the power lead from the accessory to the A (power) output on the transformer.

Note!

DO NOT connect UCS or RCS remote-control sections to SC-1. They can damage SC-1.

Installing SC-1 on your railroad

Connecting Lionel switches to SC-1

Power all Lionel switches through their fixed voltage terminals. Use the adhesive number labels included with SC-1 to mark switch connection terminals. Number your switches sequentially: 1, 2, 3, 4, and so on.

Connect switch wires to the three SC-1 terminals. Begin with the ground (common) for each switch; listed below are ground terminal locations for some popular Lionel switches. *Connect the ground to the center row of screws on SC-1:*

- on contemporary O gauge switches (nos. 3010 and 3011), *ground is terminal number 2;*
- on postwar O22 and MPC/early LTI O gauge switches (nos. 5132 and 5133), *ground is the center binding post;*
- on many O-27 switches—including O-42 and O-27 versions sold in the 1950s as model nos. 1122 and 1122e—*ground is closest to the switch motor;*
- on Super O switches (where two posts are together and one post is positioned on the side), *ground is the side post.*
- on modern-era switches with no fixed voltage terminals—such as nos. 5121 and 5122—an instruction sheet on how to connect them to SC-1 is available from Lionel Service (see page 16).

Because SC-1's ground/common terminals are connected internally, you only need to connect one ground wire between any of the four switches and SC-1.

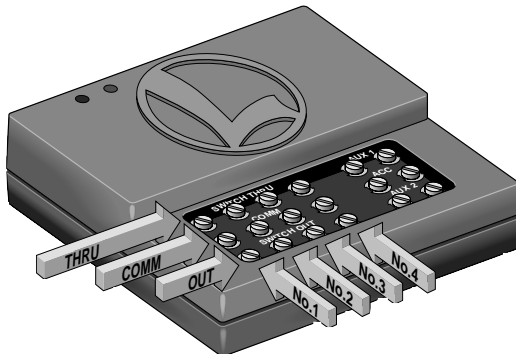
Hint

FINDING THE RIGHT POST. If you're in doubt about which binding post connects to the outside (ground) rail, check it with a meter or continuity tester, available from electronics supply stores.

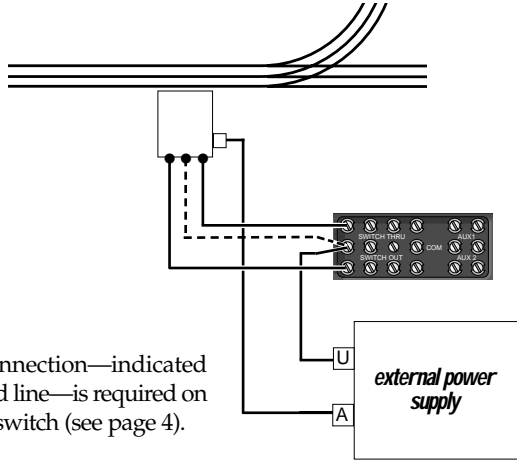
When connecting upper and lower terminal wires, make sure the wire throwing the switch "out" (curved) connects to SC-1's "switch out" terminal and the wire throwing "through" (straight) connects to SC-1's "switch thru" terminal. Check by touching each wire to its ground terminal to activate the switch throw. SC-1's green light illuminates when switches are powered.

Note!

It is important to note that the SC-1 switches the ground leg connection of the switch and the accessory.



Wiring schematic for connecting Lionel switches to SC-1



Note!

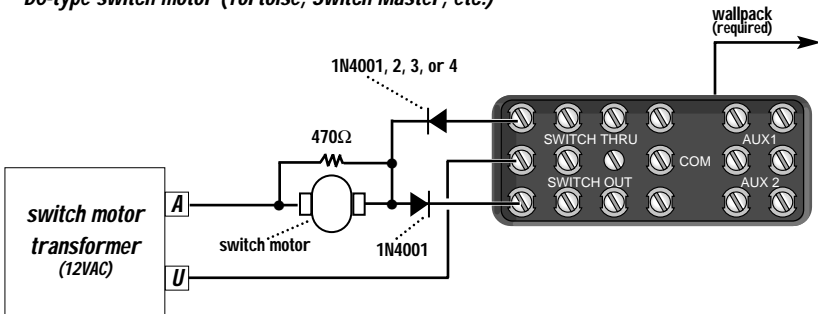
Ground connection—indicated by the dotted line—is required on at least one switch (see page 4).

Connecting hi-rail switch motors to SC-1

SC-1 can control up to four hi-rail switch motors. Depending on which hi-rail switch motor you use, you must



wire a 12VAC 2-amp relay or resistor between the switch motor and SC-1. The following diagrams show you how.

DC-type switch motor (Tortoise, Switch Master, etc.)



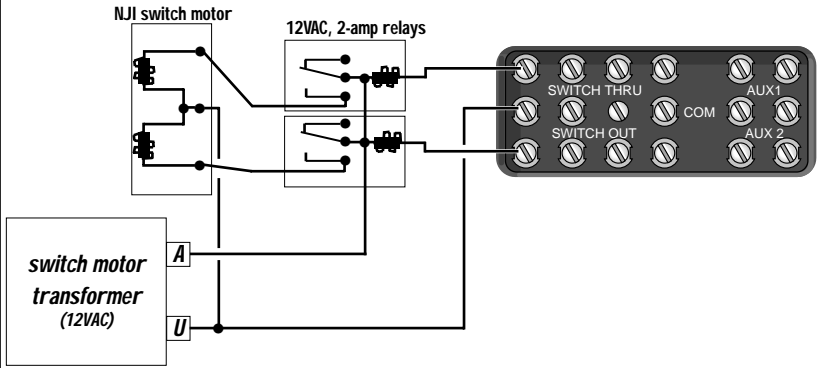
Parts needed for each DC-type switch motor:
 2-1N4001, 1N4002, 1N4003, or 1N4004 diodes
 1-470Ω 2-watt resistor
 Available from Newark Electronics or Radio Shack.

Note!

You must hold down the  and  buttons until the switch has fully thrown.

Installing SC-1 on your railroad

High-current solenoid switch motors (NJ International) greater than 1 amp



Parts needed for each high-current solenoid switch motor :
2-12VAC 2-amp relays
(e.g., Aromat #JAIc-TM-AC12V or Aromat #HC1-H-AC12V)
Available from Newark Electronics.

Note! NJI switch motors must be operated in the low-duty cycle or damage to the SC-1 will result.

Programming SC-1 switch numbers

Example

*program switch numbers
1, 2, 3, and 4*

Command Base ON

Switch/turnout power ON or
wallpack plugged in

SC-1's green light ON

Slide SC-1 PROG/RUN switch to PROG



Press SW



Press 1



Press SET

SC-1's red light illuminates for
two seconds

You have assigned a number—1—to
the first switch connected to SC-1.
The next switch numbers—2, 3, and 4
—are automatically assigned

Slide your SC-1 PROG/RUN switch to
RUN; repeat these steps for other
SC-1s installed on your railroad

Note!

The next SC-1 program-
ming will be Switch #5 or
higher

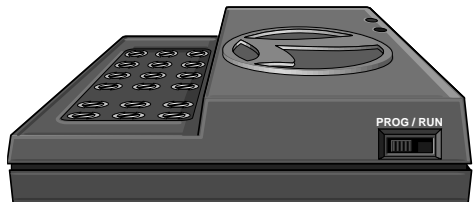
Every switch needs an ID#. Now that you've labeled SC-1 switch terminals and connected the wires between switches and SC-1s, you're ready to program switch ID#s.

SC-1 switch numbers are consecutive. Only program *one* switch number per SC-1—the turnout connected to the first vertical "column" of SC-1 switch terminals. The next switch ID#s are programmed automatically and sequentially by SC-1.

Here's how it works: If you program the first switch connected to your SC-1 as Switch #1, the switch numbers on that SC-1 become 1, 2, 3, and 4. If you program the first switch connected to your SC-1 as Switch #9, the numbers become 9, 10, 11, and 12.

Note!

Choose switch numbers between 0 and 99 (100 switches total).



A side view of SC-1. Note the location of the PROGRAM/RUN switch; use this when you assign ID#s for your switches and accessories.

Installing SC-1 on your railroad

Controlling switches with CAB-1

Example *throw Switch #1 "out"*



Press SW



Press 1



Press OUT

Switch #1 is now curved or "out"

Example *throw Switch #12 "through"*



Press SW



Press 12



Press THROUGH

Switch #12 is now straight or "through"

Now that you've programmed switch numbers, you can throw any SC-1-controlled switch using CAB-1.

Hint

SWITCH SHORTHAND. To operate a second or third switch, you can just enter the ID# and OUT or THROUGH. This "short-hand" continues to work until you press another top-row address button (ENG, TR, ACC, RTE).

Programming SC-1 accessory ID#s

Example

program accessory numbers 1 and 2

Command Base ON

Switch/turnout power ON or wallpack plugged in

SC-1's green light ON

Slide SC-1 PROG/RUN switch to PROG



Press ACC



Press 1



Press SET

SC-1's red light illuminates for two seconds

You have assigned a number—1—to the first accessory connected to SC-1. The next accessory number—2—is automatically assigned

Slide your SC-1 PROG/RUN switch to RUN; repeat these steps for other SC-1s installed on your railroad

Note!

The next SC-1 programming will be Accessory #3 or higher

Just like switches, accessories need ID#s assigned. To do this, follow the example at the left.

Accessory ID#s on SC-1s are automatically consecutive. Because of SC-1's design, when you program the first of the two accessories, you also program the second.

Choose accessory ID#s between 0 and 99 (100 accessories total).

Installing SC-1 on your railroad

Controlling accessories with CAB-1

Example

*turn on Accessory #1
(floodlight tower)*



Press ACC



Press 1



Press AUX2

Accessory #1's lights illuminate; press AUX2 again to extinguish the lights

Example

*activate Accessory #3
(diesel fueling station)*



Press ACC



Press 3



Press and hold AUX1 until action is accomplished, then release AUX1



Press AUX2 to illuminate the fuel office



Press AUX2 again to extinguish the light

Note!

Do not connect UCS/ RCS remote-control sections to SC-1; use ONLY original-equipment controllers to activate them

Now that you've programmed accessory ID#s, you can activate any SC-1-controlled accessory using CAB-1.

Note!

1-AMP MAXIMUM. SC-1 will accommodate switches and accessories drawing up to a MAXIMUM of 1-amp load per switch or accessory.

Note!

ACCESSORY INCOMPATIBILITY. Certain multi-function Lionel accessories (like the magnet and intermodal cranes) cannot be controlled by SC-1 because they are internally wired to track ground. Use original-equipment controllers to activate them.

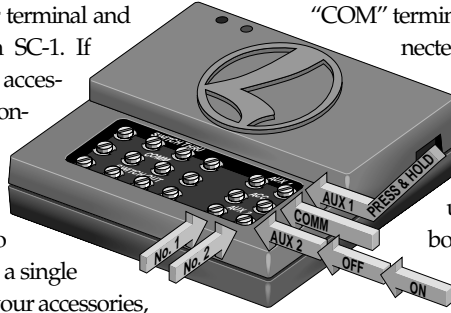
Note!

SC-1 MEMORY. SC-1 remembers the on/off status of accessories after layout power has been turned off.

Accessory connections

Notes on accessory connections

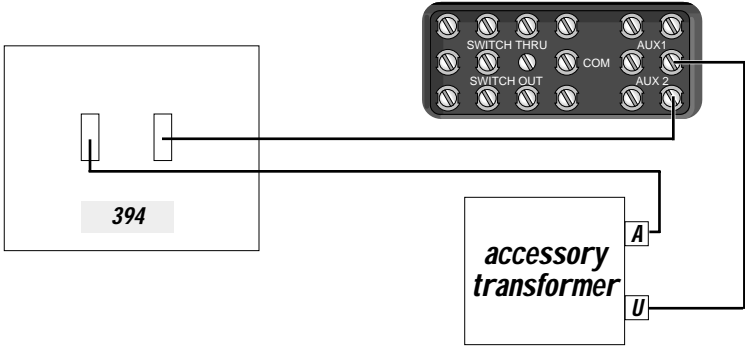
The following illustrations show common/ground connections between the "U" transformer terminal and "COM" terminal on SC-1. If you connect two accessories to an SC-1, connect ONE common lead ONLY. In fact, if you've connected switches to your SC-1 that share a single power source with your accessories,



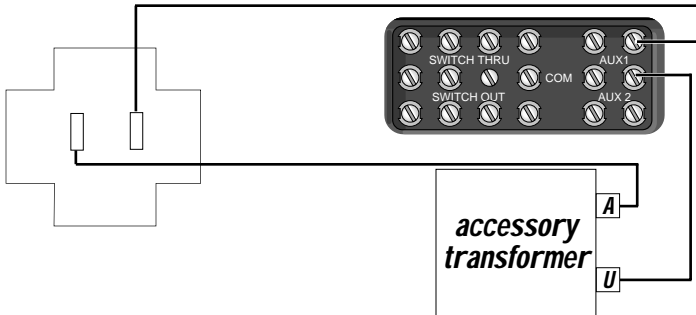
you won't even need to connect a common lead for your accessories; SC-1's "COM" terminals are internally connected.

And though these illustrations depict connections to the "Accessory 2" column of terminals, use both when connecting two accessories to SC-1.

Rotary beacon (394/494/6-12831)

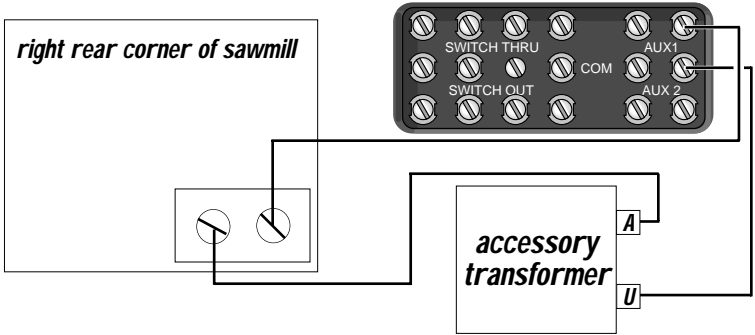


Water tower (30/138)

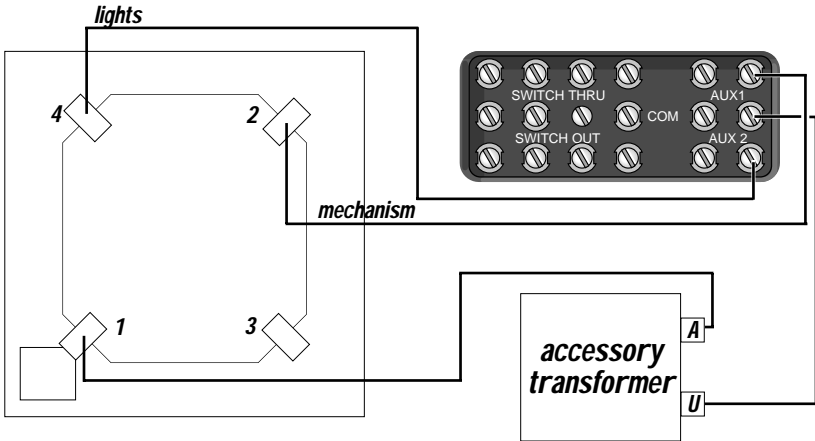


Accessory connections

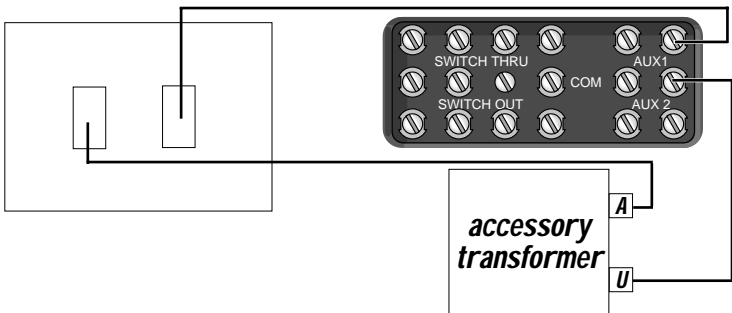
Lumber mill/sawmill (464/6-12873)



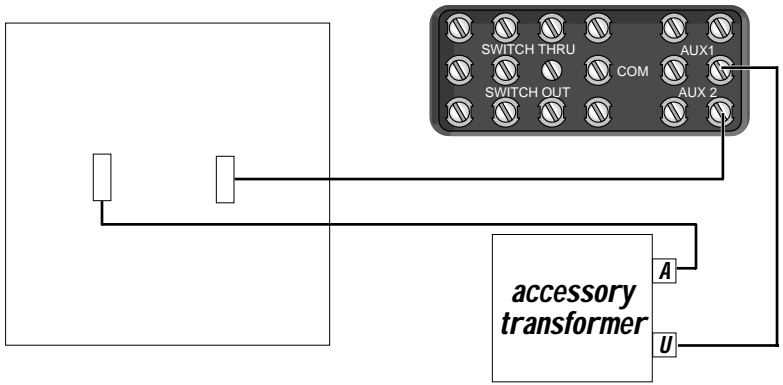
Switch tower (445)



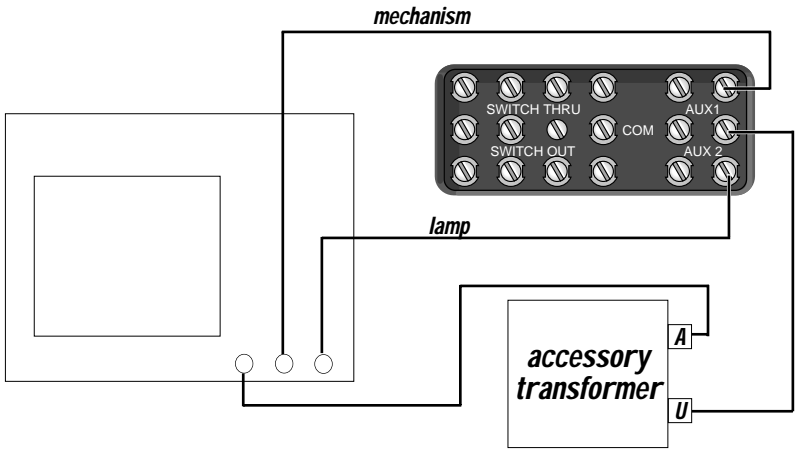
Icing station (352/6-12847)



Control tower (192/6-12878)

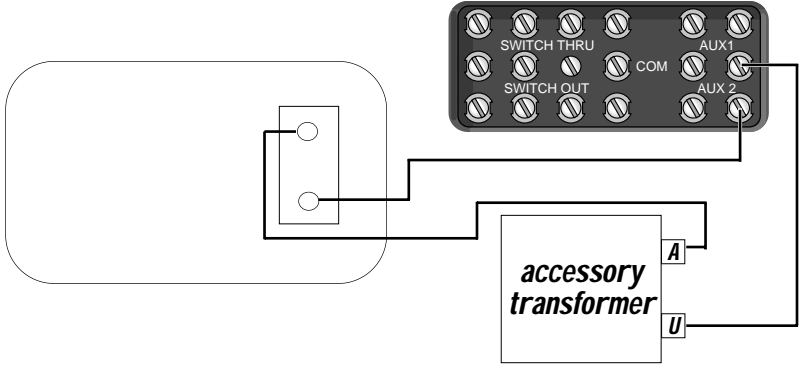


Diesel fueling station (415/6-12877)

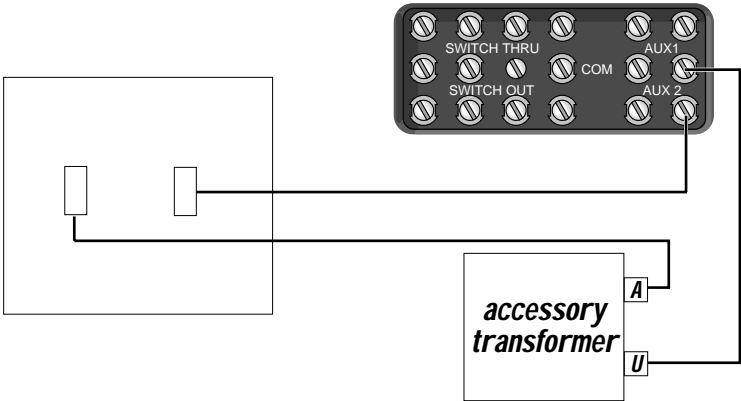


Accessory connections

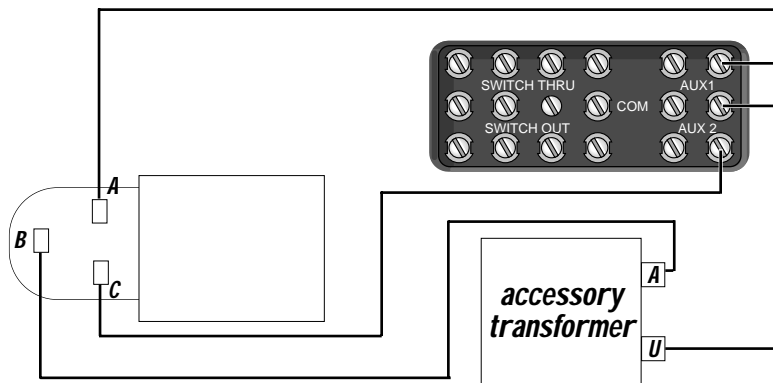
Oil derrick (445/6-12902)



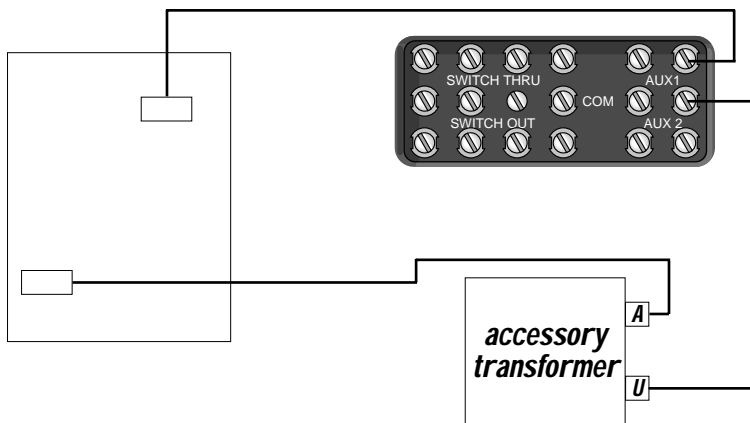
Floodlight tower (195/395/6-12759/6-12886)



Freight station (356)



Whistle shack (125/6-12737/6-12903 diesel horn variant)



Lionel Service

Your SC-1 is built with pride by Lionel and carries a warranty to support continued reliable operation. If service is required, bring it and its warranty card to your local authorized Lionel Service Center. To find the nearest dealer or Service Center, simply call 1-800-4-LIONEL.

If you prefer a Lionel factory repair, call 810-949-4100, fax 810-949-5429, or write Lionel Service, P.O. Box 748, New Baltimore, MI 48047-0748. State the problem and the product's purchase date. We'll send a return authorization

letter to assure proper handling while at Lionel. You may choose to have your product repaired by Lionel Service after its warranty has expired. A reasonable service fee will be charged.

CAUTION: Make sure your product is properly packed to prevent shipping damage. The shipment must be prepaid and we recommend it be insured. Please follow these instructions carefully. This warranty gives you specific legal rights. You may have other rights that vary from state to state.



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