

Spectrum[®]



1:20.3 Large Scale
2-8-0 Narrow Gauge Outside Frame Consolidation
Owners Manual

Thank you for purchasing Bachmann's *Spectrum*[®] 1:20.3 Large Scale Narrow Gauge, Outside Frame Consolidation

This locomotive continues Bachmann's tradition of producing the finest state-of-the-art, award-winning large scale locomotives ever made.

Your Bachmann *Spectrum*[®] locomotive has been designed to provide a lifetime of model railroading pleasure. However, like all precision instruments, it must be properly maintained. Please read this manual and watch the enclosed video before operating your locomotive.

CAUTION

IT IS IMPORTANT THAT YOU FOLLOW THE RECOMMENDED PROCEDURES FOR LUBRICATING YOUR LOCOMOTIVE BEFORE RUNNING IT FOR THE FIRST TIME.

FAILURE TO DO SO COULD CAUSE SERIOUS MECHANICAL PROBLEMS.

NOTE: KEEP YOUR ORIGINAL PACKAGING IN CASE YOU NEED TO RETURN YOUR LOCOMOTIVE TO BACHMANN FOR SERVICE.

2-8-0 CONSOLIDATION HISTORY

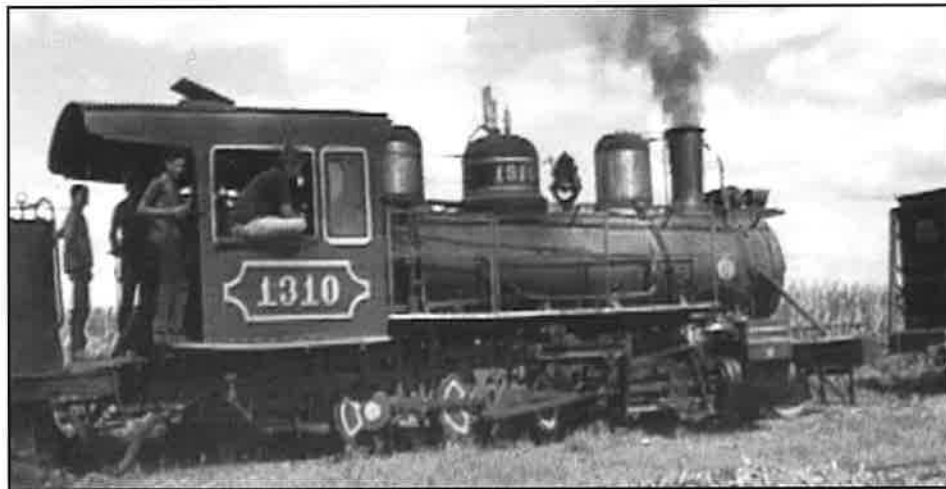
In the 1830's and 40's, the fledgling railroads in the United States began to build westward from the East Coast to tap the vast resources of the American frontier. These early efforts at expansion soon ran up against the slopes and river valleys of the Appalachian mountain range. The steep track grades and twisting roadbeds necessary to cross this formidable barrier severely taxed the railroads' small motive power. To meet the need for more tractive effort, the locomotive builders of the day began to design and construct larger and heavier "iron horses." By using lead trucks and adding more driving wheels, the new, weightier locomotives easily managed the lightly built rights of way. Lightweight 4-2-0 and 0-4-0 locomotives were quickly replaced by 4-4-0, 2-6-0, and 0-8-0 engines.



In 1867, the first locomotive with a 2-8-0 wheel arrangement was built by the Baldwin Locomotive Company for the Lehigh Valley Railroad. It was named "Consolidation" in honor of the recent merger, or consolidation, of several railroads to form the Lehigh Valley Railroad. The design quickly proved to be very successful and was soon copied by other railroads across the country. In fact, the 2-8-0 Consolidation became one of the most popular locomotive designs of all time. Over a 70 year period, thousands of them were constructed by almost every builder of locomotives. The 2-8-0 design was built in a variety of shapes, sizes and track gauges. They were used in all types of service, including freight, switching, industrial hauling, and even on passenger trains. An outside frame design was utilized on many early 20th Century narrow gauge locomotives to help spread a heavier weight over a wider loading gauge. This allowed for a lower center of gravity and more stability on narrow gauge track. Consolidations were the go-anywhere, do-anything workhorses of the railroad industry: they ran worldwide on standard gauge, narrow gauge and even broad gauge railways.

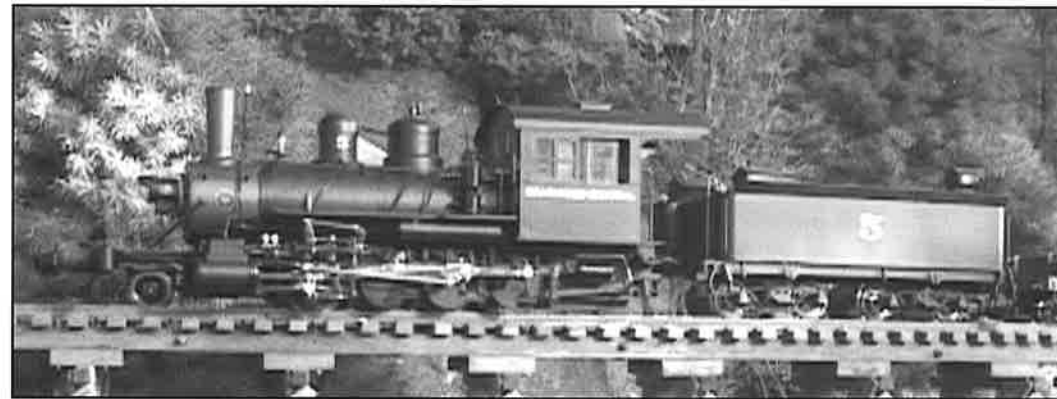


Bachmann's *Spectrum*® 2-8-0 is a model of a Baldwin Locomotive Works stock design built in the early 1920's. Baldwin sold these outside frame 2-8-0's around the world. Over the years, Baldwin and other builders exported hundreds of 2-8-0's to Mexico, Central America, South America, the Philippines, India, China and other countries. In fact, many of these engines still operate today in Cuba and several other Latin American locations.



2-8-0 CONSOLIDATION FEATURES

Your Bachmann 2-8-0 Consolidation is a precision 1 to 20.3 scale model with many features and details found on the prototype (see next page).



Mechanical

- fully operational Baker valve gear with Johnson bar and linkage
- die cast gear box
- DCC ready
- metal frame
- wheel counterweights
- precision can motor
- smoke generator with on-off switch
- NMRA polarity switch

Exterior Detail

- brass bell with metal clapper
- brass whistle
- machined brass pop valves
- separate sanding lines
- metal handrails and piping
- wood-grain detail on planking
- end beams with nut, bolt and washer detail
- chemically blackened, machined metal wheels
- fully detailed tender trucks with brake beams, hangers and shoes

Cab Detail and Lighting

- LED headlight
- load-synchronized LED's in firebox and ashpan for realistic fire glow
- complete backhead detail including steam gauge with piping, throttle, sight glass fittings, and operating firebox door
- sliding cab windows

Support Material

- comprehensive video on 2-8-0 history and model maintenance
- owners and maintenance manual

Note: For best performance and prototypical accuracy, this locomotive should be operated on railroads with medium to wide radius curves.



E-Z LUBE BACHMANN
LUBRICANTS FOR THE 21ST CENTURY

LUBRICATION PREPARATION

Gather all the items you'll need to perform the lubrication procedure. Then find a large, sturdy work surface to hold your locomotive. Your kitchen table or a workbench will do very well.

You will need:

- a thick towel or the top foam insert from the locomotive's packaging to act as a cushion
- a toothpick or a thin wooden dowel
- and the necessary lubricants.

We recommend Bachmann's line of *E-Z Lube*[®] plastic-compatible lubricants. *E-Z Lube*[®] products are available at your local hobby retailer.

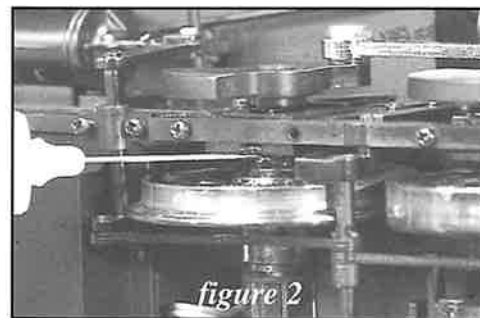
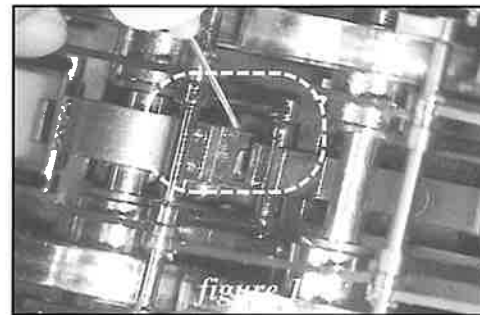
LUBRICATION PROCEDURES

We will be lubricating these areas: the gear box area; the driving wheel axles; the lead truck; outside counter weights; and Baker valve gear on both sides of the boiler. We will also lubricate the tender trucks, and apply conductive lubricant on each driving wheel and tender wheel axle to enhance electrical contact.

Before you start, it's important to know that over-lubrication is more damaging to any locomotive than no lubrication at all. Therefore, use a light touch when applying lubricants.

We recommend using Bachmann *E-Z Lube*® plastic-compatible lubricants, available at your local hobby retailer, but other plastic compatible lubricants can be used as well.

All of the 2-8-0 Consolidation's parts and lubrication points can be seen in the exploded view diagrams included with this locomotive.

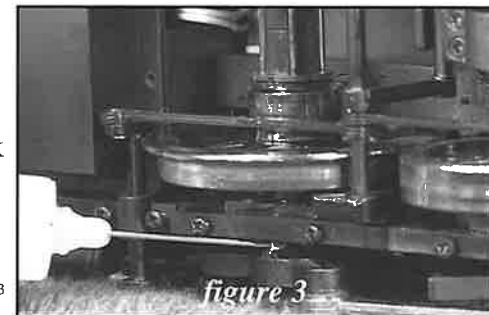


LUBRICATION PROCEDURES

With your towel or foam on the work surface, gently lay the locomotive and tender on its side, or, if using the foam packaging insert, upside down.

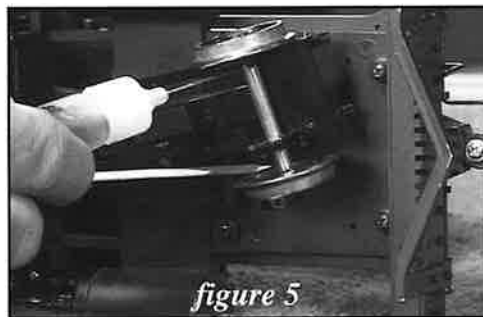
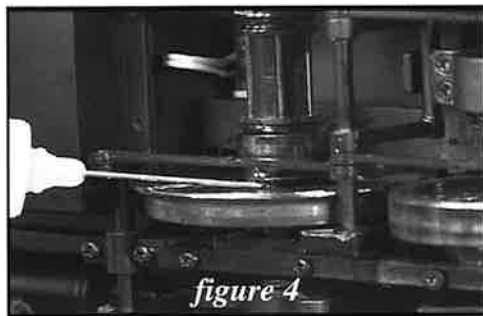
To begin, put a drop or two of heavy-duty plastic compatible gear oil into the access port just above, and to the front, of the gear box cover on the next to last drive wheel axle.¹

Put a drop of oil on each side of the sprung pillow block bearings, where each drive axle passes through the locomotive frame.^{2,3}

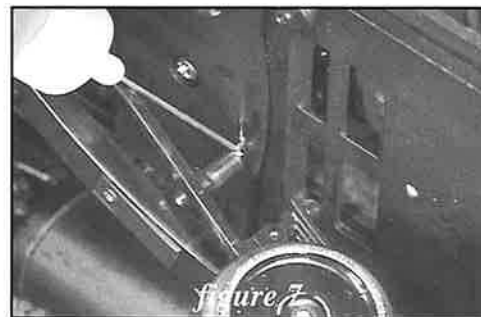
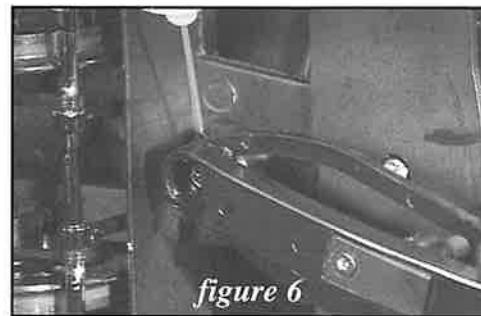


Also, put a drop of oil on either side of the ball bearing casing just behind each driver.⁴

Moving on to the lead truck, add a drop or two of oil to each bearing surface, where the wheel axle passes through the truck side frame.⁵



Lubrication

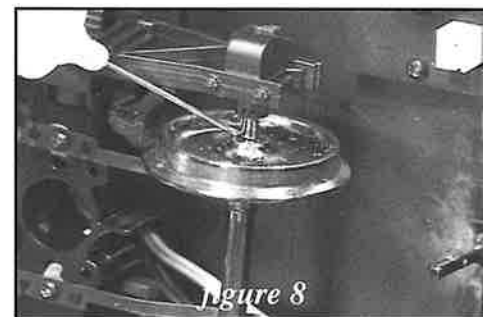


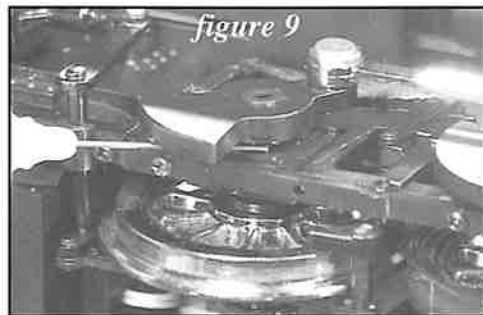
Lubrication

Be sure not to forget the lead truck pivot point, where it attaches to the locomotive frame just in front of the lead driver.⁶

Also, put a drop of oil on the plunger where it contacts the underframe. This will help the lead truck move easily in either direction.⁷

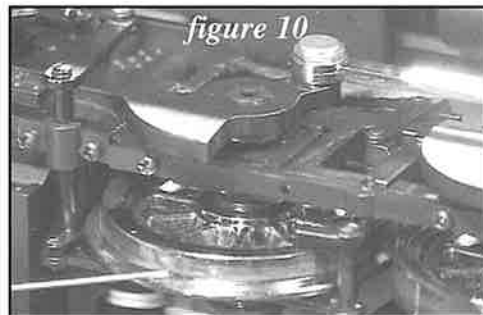
Finally, put a drop of oil on the end of each axle on the tender truck wheel sets.⁸





Double check that you have lubricated all of the required parts before going on to apply the conductive lubricant. Bachmann *E-Z Lube*® Conductive Contact Lubricant enhances electrical conductivity, and will decrease the amp draw of your locomotive.

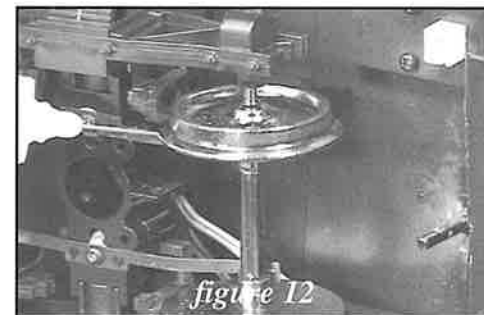
Just put one drop on each drive wheel axle,⁹ where it passes through the pillow block bearing, and on each driver wheel tread.¹⁰

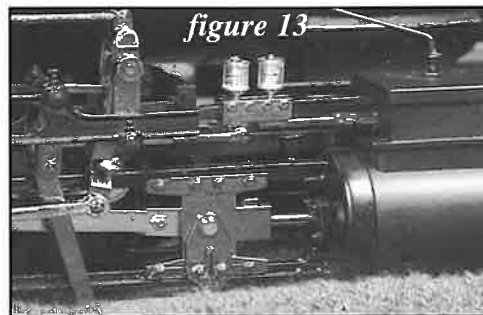


Don't forget the tender wheel sets. Put a small drop of conductive lubricant on each wheel tread¹¹ and on the wheel axles where they contact the electrical pick up wipers.¹²

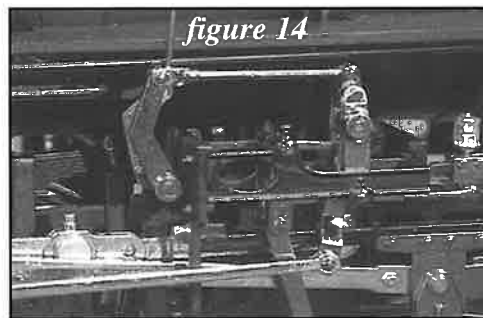
You should perform this electrical conductive maintenance every 5 to 6 hours of operation or as needed.

When operating outdoors, high temperatures and other environmental conditions can cause a lot of friction, wear and evaporation. Friction is metal's worst enemy. So be sure to follow a sensible lubrication schedule.

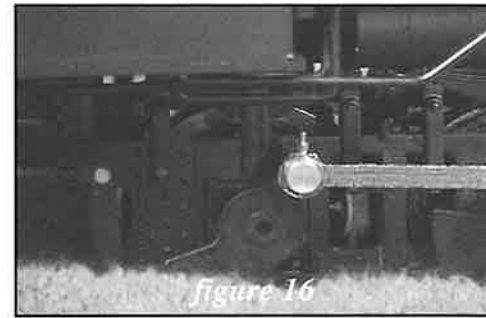
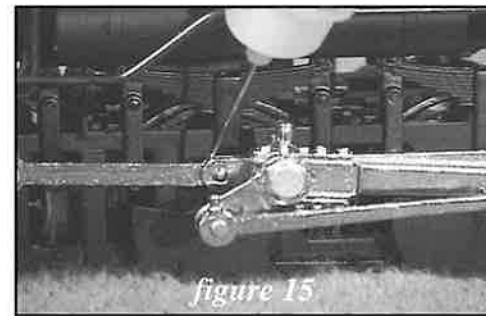


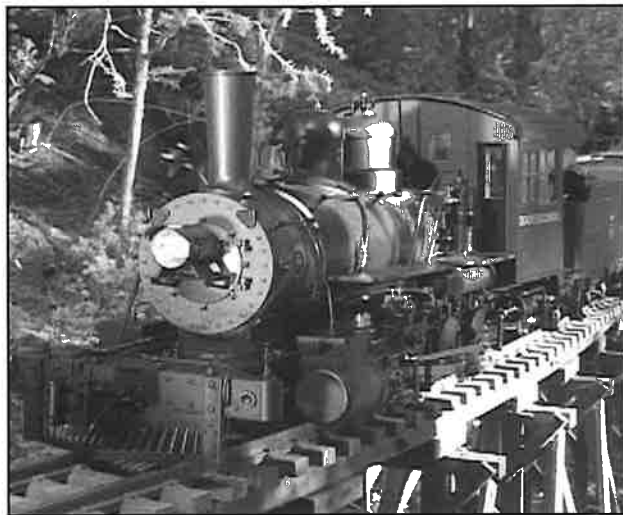


Now, bring the locomotive and tender to an upright position and, changing to light gear oil, lubricate the valve rod, piston rod,¹³ and valve guides.¹⁴



Also using light gear oil, lubricate the Baker valve gear¹⁵ and counterweight crank pins¹⁶ with a small drop of oil. There are many bearing surfaces in the complex Baker valve gear. Be sure to lubricate all of them. Don't forget to do both sides of the locomotive, and remember, DO NOT OVER LUBRICATE.





Now your *Spectrum*® locomotive is ready for track testing, and many years of pleasant enjoyment. We recommend that you break in your engine by running it with a light load at slow to medium speeds, checking to see that everything on the locomotive is operating properly. This is the way prototype locomotives were brought into service. Don't forget to fill out your warranty card and send it in as soon as possible. Remember, the key to maintaining your *Spectrum*® locomotive for long life is to keep all the parts well lubricated, but too much lubrication is just as bad as no lubrication at all.

ENJOY YOUR BACHMANN *SPECTRUM*® LOCOMOTIVE, and be sure to check out the entire line of Bachmann Large Scale trains at your local hobby retailer.

OPERATION OF VALVE GEAR LINKAGE

The locomotive is equipped with a Johnson bar (reversing lever) that adjusts the valve linkage and valve stroke. The adjustments are representational only, and do not affect the actual operation of the locomotive. To access and move the reversing lever, open the cab door on the engineer's side of the locomotive. Using your fingers inserted through the cab door and window (one each side), locate the Johnson bar. (See illustration with a cutaway view of the cab interior.)¹⁷ The Johnson bar can be adjusted by pulling up slightly and then moving it forward or backward as desired; the valve gear adjusts accordingly. (Moving the bar toward the smokestack represents forward motion of the locomotive. Moving it toward the coal bunker represents reverse motion.) For the longest piston strokes, move the Johnson bar either all the way forward or back.

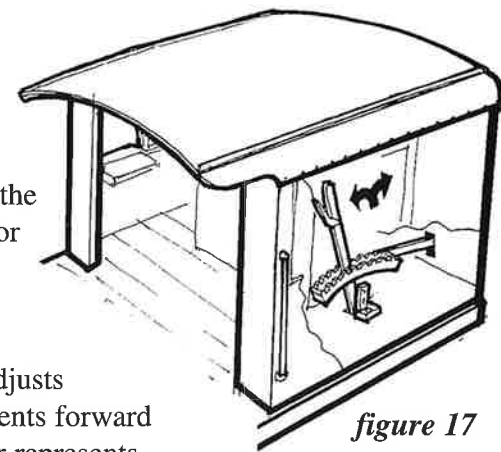


figure 17

POLARITY SWITCH

You will find a polarity switch under the smokebox door and above the smoke "on-off" switch.¹⁸ This switch is used to change the direction in which your locomotive travels according to two different standards. Move the switch to the left to make your locomotive travel forward according to the National Model Railroad Association (NMRA) standard (for two rail direct current locomotives operating with right hand rail positive "+," left hand rail negative "-"). Move the switch to the right to make your locomotive travel forward according to large scale model railroading practice (for two rail direct current locomotives operating with right hand rail negative "-," left hand rail positive "+"). Note: your locomotive will operate equally well in either polarity mode.



Polarity Switch

SMOKE GENERATOR

To operate the smoke generator, put 3 or 4 drops of smoke fluid down the smokestack. The on-off switch for the smoke generator is behind the smoke box door. If you operate your locomotive without smoke fluid, be sure to turn off the smoke generator. Failure to do so will burn out the smoke unit.

Also, it is not recommended to run your locomotive above 16 volts with the smoke unit turned on. This may cause the smoke unit to burn out.

Smoke Generator

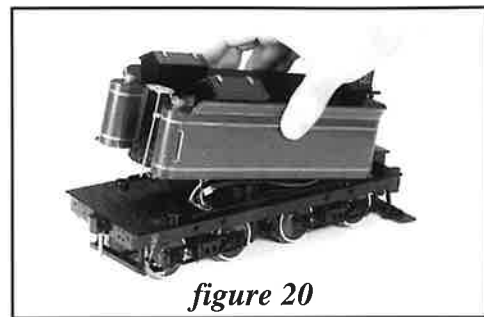
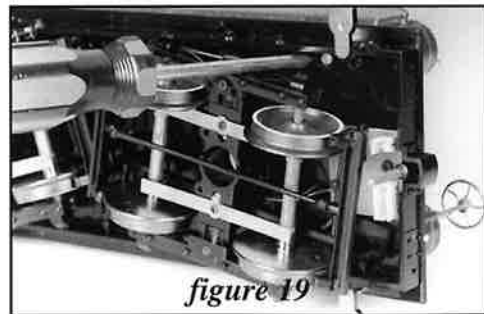
SOUND INSTALLATION

Your *Spectrum*® locomotive is pre-wired to make installation of after market sound systems easier. To access the sound PC Board under the tender shell, you need to:

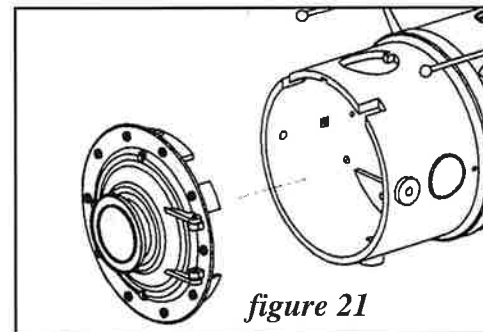
- Loosen the two Phillips head screws located near the front corners on the underside of the tender.¹⁹
- Tilt the tender shell towards the back and pull forward to release the assembly tabs on the rear.²⁰

For additional information, consult the manufacturer of your after market sound system.

Note: Tender shown is for illustration purposes only. Your locomotive's tender may vary in appearance.



Sound Installation



the smoke unit. (Note: you may need a small flashlight to locate the screws. A larger, fine point Phillips head screwdriver works best.) After removing the screws, use your fingers to pull the smoke unit and pc board straight out from the boiler.

- Install your decoder (Lenz LE230 or similar suitable product with heavy duty amp rating) according to the aftermarket manufacturer's instructions. Be sure to insulate the decoder wires (wrap with electrical tape) from the main PC board.

Note: Boiler shown in diagram is for illustration purposes only. Your locomotive's boiler may vary in appearance.

DCC Installation

DCC INSTALLATION

- Remove smokebox front by snapping out with your fingers²¹. Be sure to pull carefully to avoid damage to the wires attached to the rear of the smoke box and pc board.
- Next, gently pull the wires (with service loop) until taut to give yourself working room.
- Remove the two small Phillips head screws from under

GENERAL MAINTENANCE

Lubricate your locomotive regularly according to the schedules recommended in the lubrication section of this manual. However, remember that over lubricating can be worse than no lubrication at all. Set up a lubrication schedule and follow it just as you would for your automobile. Clean your locomotive with a soft, lint-free cloth. Or use a new cosmetics brush that would be used to apply blush. Do not use any liquids or solvents to clean this locomotive. Do not leave your locomotive outdoors overnight or in inclement weather.

If your locomotive should need service contact our service department at:

Service Department

Bachmann Industries, Inc.

1400 East Erie Avenue

Philadelphia, Pennsylvania 19124

1-800-356-3910

Additional information may be found online at: www.bachmanntrains.com

LIFETIME LIMITED WARRANTY for BACHMANN LOCOMOTIVES PURCHASED IN THE UNITED STATES and CANADA

Bachmann warrants that the mechanical components of this locomotive will be free of any defect or malfunction under normal use for the lifetime of the ORIGINAL purchaser and will remedy any mechanical components which prove to be thus malfunctioning. This warranty does not extend to: (1) locomotives purchased outside the United States or Canada (2) any damage to the locomotive resulting from any improper or unreasonable use of the locomotive (including failure to provide proper lubrication), or from any use of the locomotive in any manner other than that for which it was intended, (3) any damage to the finish or casing of the locomotive, or (4) any other damage (except for damage resulting from a covered defect or malfunction) to the locomotive while in the possession of any consumer.

This warranty is given in lieu of all other express warranties. (All implied warranties, including but not limited to the implied warranties of merchantability and fitness for a particular purpose shall expire one year from date of original purchase. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.) UNDER NO CIRCUMSTANCES SHALL BACHMANN BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING IN REGARD TO ANY BACHMANN LOCOMOTIVE. Some jurisdictions do not allow limitations or exclusions of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from location to location.

In order to register the date of original purchase for all customers (and validate the warranty for US and Canadian purchases ONLY), the Owner Registration Card enclosed with your locomotive must be completed and mailed within ten (10) days after purchase of the locomotive to one of the addresses listed below according to the location of the locomotive's original purchase

If warranty service on the locomotive is required WITHIN one year from the date of original purchase by a US or CANADIAN resident, please send the locomotive, postage prepaid, to: Bachmann Industries, Inc.; Attention: Service Department; 1400 East Erie Avenue; Philadelphia, PA 19124 USA. Also, please write a letter explaining the nature of your difficulty and enclose it with the locomotive, and be sure to include your return address, DAYTIME PHONE NUMBER, and e-mail address (if available).

If warranty service is required AFTER one year from the date of original purchase by a US or CANADIAN resident, or ANYTIME BY ANY OTHER PERSON WORLDWIDE, please contact the respective service department to which you sent your Owner Registration Card to determine the postage and handling fee and applicable service charge in effect at the time the repair is required. Then send the locomotive, postage prepaid, with a check or money order in the amount specified to the appropriate service department. Also, please write a letter explaining the nature of your difficulty and enclose it with the locomotive, and be sure to include your return address, DAYTIME PHONE NUMBER, and e-mail address (if available).

NOTE: in the event that a specific locomotive cannot be repaired for any reason, and at the option of Bachmann, a locomotive may be replaced with a reconditioned model of equivalent quality. In the event that you have any questions concerning the use and/or care of this product, please contact the appropriate service department.

IF PURCHASED IN NORTH AMERICA or SOUTH AMERICA,

send Owner Registration Card and direct inquiries to:

Bachmann Industries, Inc.

Attention: Service Department

1400 East Erie Avenue

Philadelphia, PA 19124 USA

www.bachmanntrains.com

IF PURCHASED IN EUROPE or AFRICA,

send Owner Registration Card and direct inquiries to:

Bachmann Industries Europe Ltd.

Attention: Service Department

Moat Way, Barwell

Leicestershire LE9 8EY United Kingdom

www.bachmann.co.uk

IF PURCHASED IN ASIA (other than China) or AUSTRALIA,

send Owner Registration Card and direct inquiries to:

Bachmann Asia

Attention: Service Department

22 Kai Cheung Road

Kowloon Bay Hong Kong

www.bachmannchina.com

IF PURCHASED IN CHINA,

send Owner Registration Card and direct inquiries to:

Bachmann (China) Ltd.

Attention: Service Department

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