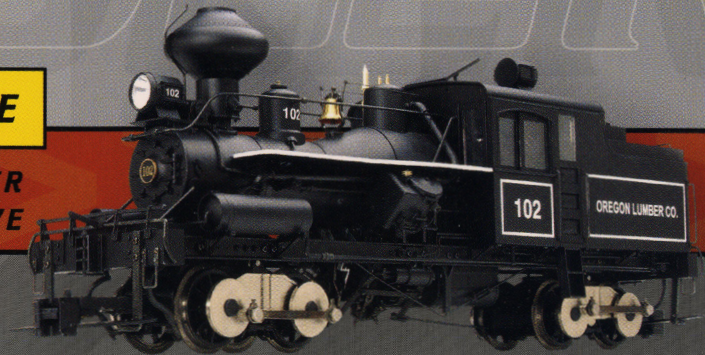


OWNER'S MANUAL

1:20.3 LARGE SCALE

**NARROW GAUGE TWO-TRUCK HEISLER
STEAM LOCOMOTIVE**



Spectrum[®]



Thank you for purchasing Bachmann's *Spectrum*® 1:20.3 Large Scale Narrow Gauge Two-Truck Heisler Steam Locomotive

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

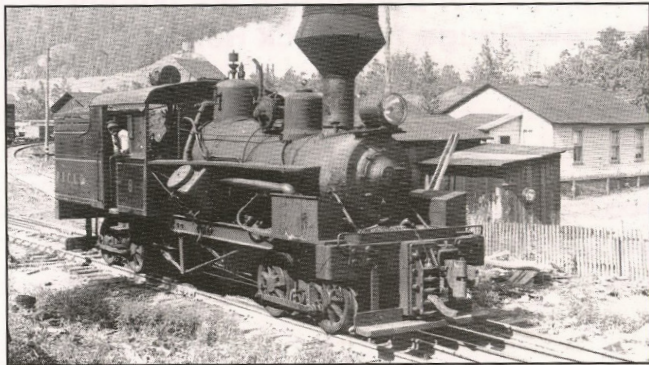
Your Bachmann *Spectrum*® locomotive has been designed to provide a lifetime of model railroading pleasure. However, like all precision instruments, it must be properly maintained. Please read this manual and watch the enclosed DVD before operating your locomotive.

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.

HEISLER LOCOMOTIVE HISTORY

The Heisler geared locomotive came from the fertile mind of Charles L. Heisler. During his lifetime, Heisler received over 60 patents for everything from a vegetable cutter to designs for special devices meant to combine sound with motion picture projectors thus creating talking motion pictures. However, it is the Heisler locomotive that has made his name so well known today.



In 1891, while working for Edward Nichols, president of both the Brooks Locomotive Works and the Dunkirk Engineering Company in New York State, Charles Heisler first conceived a geared locomotive to compete with the Shay and Climax locomotive designs. Many of his ideas were based on improvements to weak

points on the Gilbert and Dunkirk locomotives being built at that time. The Dunkirk Engineering Company built the first Heisler locomotive in 1891 for F.A. Addington of North Carolina.

Like the geared locomotives produced by its competitors, the Heisler had a central drive shaft running the length of the locomotive to transfer power from the cylinders to the drive wheels via bevel gears. Where the Climax, Dunkirk and Gilbert locomotives used bevel gears mounted on both axles of the trucks to power all four wheels, the Heisler used bevel gears on only the front axle of the lead truck and the rear axle of the rear truck. Power was transmitted to the second set of wheels on each truck via connecting side rods.

Another important difference was that Heisler enclosed his gears in a metal housing. This protected the gears from the elements and allowed them to sit in an oil bath. The center driveshaft was fitted with flexible couplings that allowed it to stay in line with the trucks as they swiveled and negotiated rough track work. Power was supplied to the drive shaft by two steam cylinders mounted in a "V" configuration in front of the locomotive cab.

In January 1892, Edward Nichols, Charles Heisler's sponsor at the Brooks Locomotive Works and Dunkirk Engineering, died. Neither company showed any interest in manufacturing the Heisler locomotive, renouncing any and all rights to the patents. Free to seek another builder for his locomotive, Charles Heisler moved to Philadelphia and made the acquaintance of George Burnham of the Baldwin Locomotive Company. Burnham also owned a large share of the Stearns Manufacturing Company in Erie, Pennsylvania. Stearns made sawmill machinery, and was in close contact with lumbermen throughout the region. In 1894, Charles Heisler entered into an agreement with Stearns that allowed the company to build Heisler locomotives at their Erie plant. Charles Heisler worked with Stearns to develop numerous locomotive sizes to meet the demands of the lumber industry, making several changes to correct weaknesses in his original designs. These included two new frame designs, a wagon top boiler, and an all-weather vestibule cab to replace the open cab design. The cabs were also moved farther back on the boiler to give them more interior room.

From 1894 to 1904 Stearns designed and sold approximately 84 Heisler locomotives ranging in size from 14 tons to 60 tons. In 1904, for reasons still not completely known, the Stearns Manufacturing Company inexplicably closed its doors for good. The locomotive and machinery business, including Heisler's patents, were sold to a group of Erie businessmen. After resuming locomotive production for several years, the company was restructured, creating a boiler, engine, and sawmill machinery division and a separate locomotive division. In 1907, this reorganization gave birth to the Heisler Locomotive Works in Erie, Pennsylvania.

The Heisler's flexibility and faster operating speeds made it attractive to logging lines, strip mines, short line railroads, contractors, and industrial plants. From the very beginning, Heisler Locomotive Works was successful,



selling locomotives as fast as they could be built and making changes and improvements to designs along the way to meet the challenges and trends in the industry. Each request for a quote generated an extensive questionnaire designed to focus on the customer's requirements and expectations. Design alterations, when feasible, were made accordingly, leading to a better balanced and more efficient locomotive. Customers saw and appreciated these developments, and by 1930, Heislers outsold Lima's Shay and had driven Climax out of business.

George Swabb, who began his career as an assistant to Charles Heisler at the Stearns Manufacturing Company, oversaw these changes. While he was not the inventor of the Heisler locomotive, Swabb became Secretary of the new Heisler Locomotive Company and the driving force behind its perfection. Over the years, improvements included new and larger locomotive sizes, alterations to boiler sizes and configurations, alternate frame designs determined by locomotive weight, and a new swivel truck that provided increased flexibility for rough track.

In the 1920s, the lumber industry in the United States started to decline. The 1929 market collapse and the Great Depression that followed almost put Heisler out of business as locomotive sales, already in decline, dried up completely. Recognizing this, Heisler shifted its focus to diesel electric and fireless steam motive power with mixed results. The fireless locomotive product line was somewhat successful, but it was not enough to offset the commercial failure of the Heisler diesel electric. Unable to overcome the dual pressures of the Depression and fast-paced advancement of transportation technology, the Heisler management team decided to shut down the company and liquidate its assets. As of April 1941, the Heisler Locomotive Works was no more.

Heisler locomotives were primarily sold in the United States, but some did find their way to Mexico, Central America, New Zealand, and the Far East. Although the Heisler was a relative latecomer to the geared locomotive field, the innovative spirit of the Heisler Locomotive Works and unique designs that spirit generated have earned the Heisler a special place in the trinity of geared locomotives alongside the Shay and Climax.

NARROW GAUGE TWO-TRUCK HEISLER FEATURES

The *Spectrum*® 1:20.3 Scale Narrow Gauge Two-Truck Heisler is a precision-made model with many of the features that have made Bachmann's award-winning Large Scale steam locomotives so popular and successful. The new *Spectrum*® Heisler is a model of a 36 ton three-foot gauge locomotive with 33-inch drivers built in the mid 1920's.

Its classification is 36-8-33.



Mechanical

- DCC-ready
- two die-cast power trucks with precision can motors
- all-wheel drive and electrical pickup
- die-cast gear boxes and sideframes
- NMRA/NEM polarity switch with center "off" position

Exterior Detail

- die-cast I beam frame with frame supports
- nine-spoke Heisler wheels with connecting side rods (outside-frame disc counterweights per prototype)
- V-shaped cylinder assembly with operating Stephenson valve gear
- single-post truss rods
- oil or coal fuel bunker per roadname
- tapered, diamond, or onion stack (per prototype)
- operating smoke unit
- numerous additional detail parts, including smokebox cleanout plugs, air pump, generator, sand lines, piping, blackened metal hand rails and stanchions, machined brass bell, pop valves and whistle.

Cab Detail and Lighting

- all-weather vestibule cab with arched windows and working three-panel doors
- glowing firebox
- detailed boiler backhead with gauges, valve handles, and controls such as the throttle, Johnson bar, brake handle, and crew seats
- operating headlight and cab-mounted backup light

Support Material

- comprehensive DVD video on Heisler history and model maintenance
- owners and maintenance manual

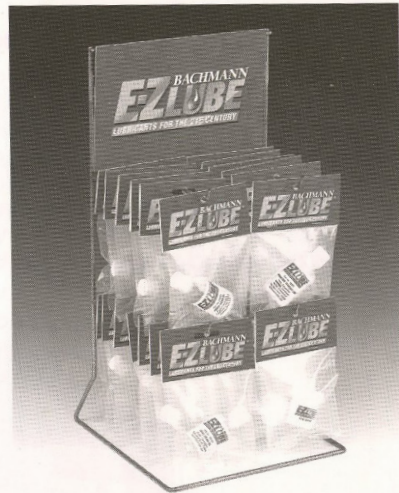
LUBRICATION PREPARATION

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

You will need:

- a thick towel or the top foam insert from your *Spectrum*[®] packaging to act as a cushion
- a toothpick or a thin wooden dowel
- the necessary lubricants

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

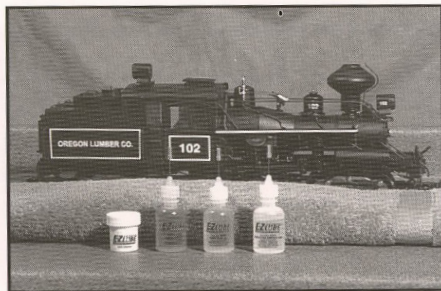


BACHMANN
E-Z LUBE

LUBRICATION PROCEDURES

The Spectrum® Narrow Gauge Two-Truck Heisler is designed to be easily maintained and lubricated. With your towel or foam insert on the work surface, put the locomotive on its side or, if using the foam insert, upside down. Parts that require lubrication are the power trucks, including truck siderods; mating and telescoping surfaces along the center drive shaft; valve gear; axle and motor bearings; and bearing points on the truck side frame, siderods, and counter weights (when applicable). Conductive lubricant will also be applied to the driving wheel treads.

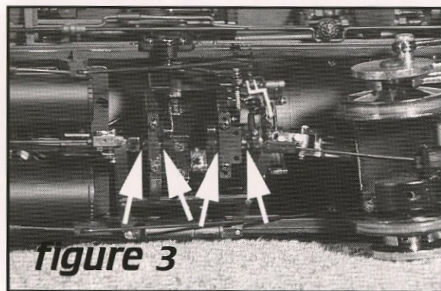
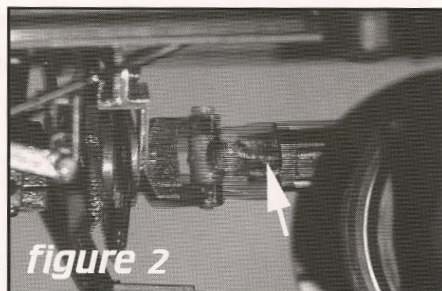
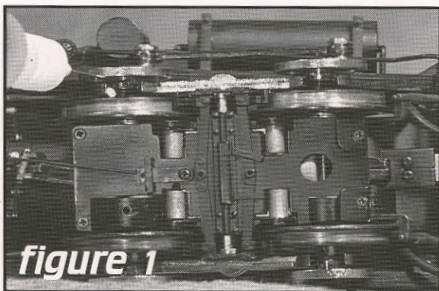
Before you start, it's important to know that over-lubrication is more damaging to any locomotive than no lubrication at all. Therefore, use a light touch when applying lubricants.



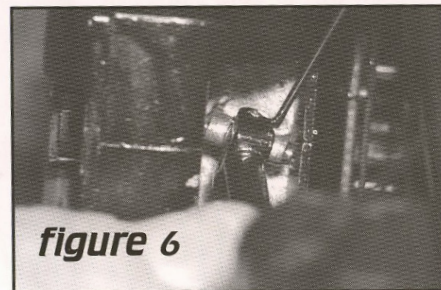
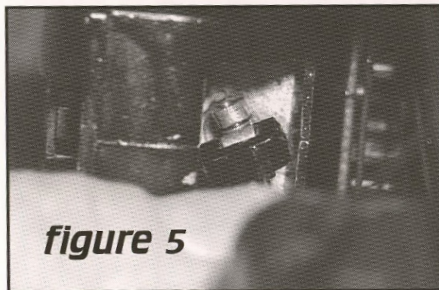
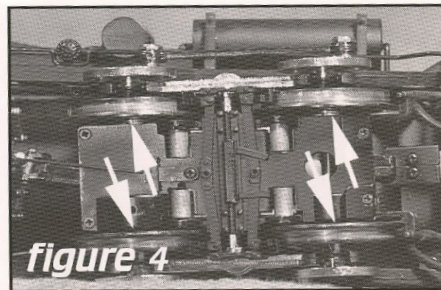
LUBRICATION REQUIRED BEFORE INITIAL OPERATION

As it comes from the factory, your Heisler's internal gears and bearings have been lubricated sufficiently for its initial break-in period. Although no internal lubrication is required at this point, you will need to do some external oiling. Remember to perform the following procedures on each power truck.

First, apply *E-Z Lube*® Light Gear Oil to the truck siderods where they are attached to the driving wheels. If you have a model with the outside-frame disc trucks, be sure to apply oil on the side rod connection to the discs as well as where the discs connect to the truck sideframe (figure 1). A single drop or two will do. Light gear oil should also be used to lubricate the valve gear at the bottom of the V 2 cylinders and all of the mating and telescoping surfaces along the center drive shaft (figures 2 & 3). Again, a single drop or two at each joint will suffice. Be sure to lubricate all of the bearing surfaces.



Next, put a small drop of light gear oil on each axle where it exits the power truck, making sure to lubricate both sides of each truck (figure 4). A drop of oil should also be applied to the universal joint, where the drive shafts connect to the motor (figures 5 & 6). This is in the large opening on the top of each power truck at the end closest to the cab. Just pull it down slightly for easier access.



While working near the frame, put a drop of light gear oil on the roller bearings, where the trucks connect to the frame (figure 7). These rollers help distribute the locomotive's weight more evenly onto the trucks as they negotiate the curves and grades on your layout.

Once the initial lubrication is complete, your Heisler is ready to go for its first run. After running your locomotive for 25 hours, or if you notice some squeaking or gear noise, it's time perform more comprehensive lubrication.

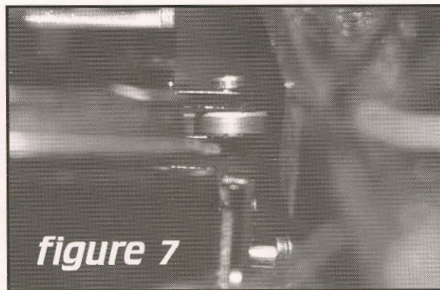
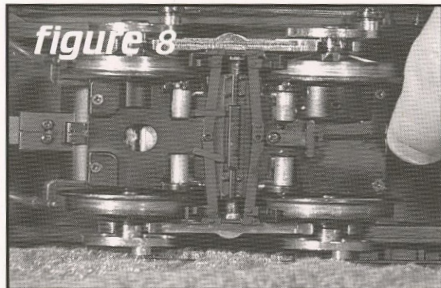


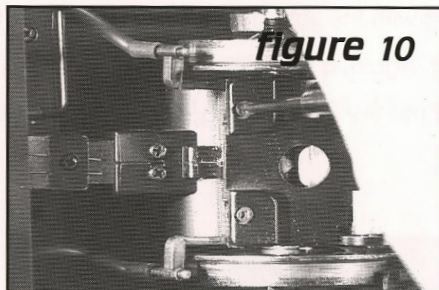
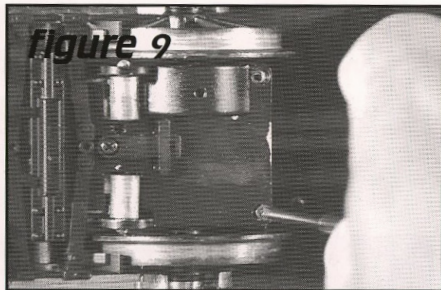
figure 7

PERIODIC COMPREHENSIVE LUBRICATION

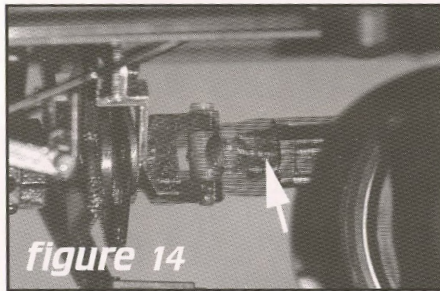
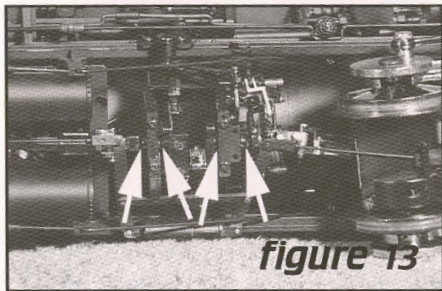
Again, turn your Heisler on its side on a towel or upside down in the upper half of the foam packing material. Gently pull the brake rods from their connecting slots on the power trucks (figure 8). Using a small Phillips head screwdriver, remove the four screws from the bottom cover plate on the power truck (figures 9 & 10). Remove the cover plate by pulling it straight out.

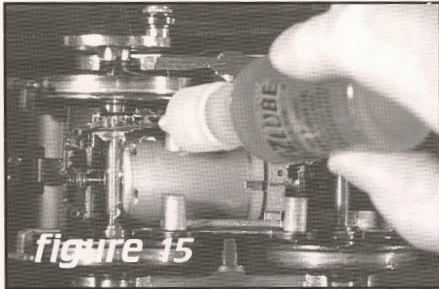


Now, using light gear oil, lubricate the crankpins that connect the side rods to the wheels (figure 11). Next, put a drop of light oil on each of the ball bearing races on each axle. Also, put a drop of light oil on the motor drive shaft, where the shaft exits the motor housing. There is one on each end of the motor (figure 12).



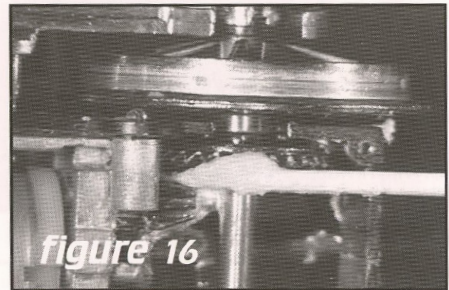
Continuing with the light gear oil, lubricate all of the mating and telescoping surfaces along the center drive shaft. Again, a single drop or two at each joint will suffice. And don't forget the valve gear at the bottom of the V 2 cylinders (figures 13 & 14). Be sure to lubricate all of the bearing surfaces.





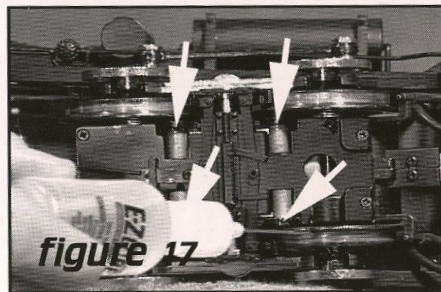
Next, take heavy gear oil and put a drop on all of the visible gears (figure 15).

Follow the heavy gear oil with a small dollop of gear grease on one of the gears (figure 16). The grease will be distributed to the other gears when you run your Heisler. Replace the bottom cover plate of the power truck and you are ready to roll for 25 more hours of service.



THE CONDUCTIVE LUBRICANT

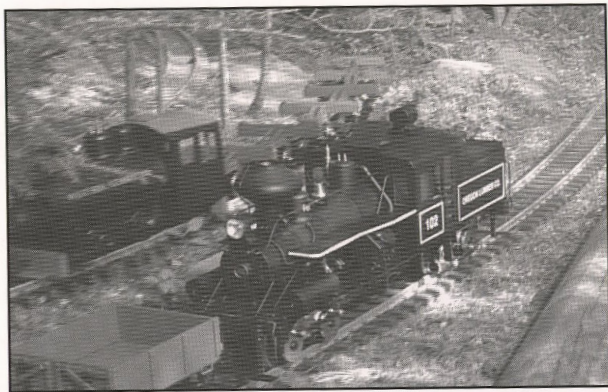
Now we are ready to apply the conductive lubricant. Bachmann *E-Z Lube*® Conductive Contact Lubricant enhances electrical conductivity and decreases the amp draw of your locomotive. The lubricant is highly concentrated. Just put 1 drop on each wheel tread and where the power pick up plunger contacts the back of each wheel (figure 17). As a side note, you should perform this electrical conductive maintenance every 5 to 6 hours of operation or as needed. (You may need to lubricate your locomotive more frequently when operating outdoors under high temperatures and other environmental conditions.)





OPERATION

Now your *Spectrum*[®] locomotive is ready for track testing and many years of pleasant enjoyment. To break in your locomotive, we recommend that you run 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 are brought into service.

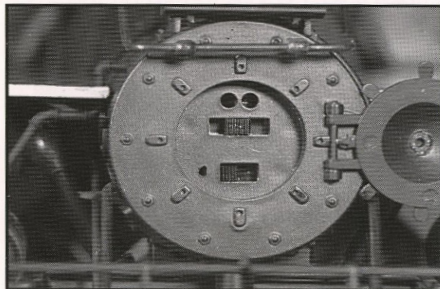


Don't forget to fill out your warranty card and send it in as soon as possible. And remember, the key to maintaining your *Spectrum*[®] locomotive for long life is to keep all the parts well lubricated.

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

CAB LIGHTING, POLARITY, AND SMOKE UNIT CONTROLS

A switch compartment is located behind the smokebox door, with controls for smoke unit operation and polarity (for NMRA or NEM conformance). The three-position polarity switch has a center "off" position that cuts track power to the locomotive, allowing it to remain on your layout while other trains run.



SMOKE GENERATOR OPERATION

To operate the smoke unit, put 3 or 4 drops of smoke fluid down the smokestack. The on-off switch for the smoke generator is also located in the switch compartment behind the smokebox door. Move the smoke generator switch to the "on" position and begin running your locomotive at moderate to fast speeds. Please be patient, as it may take a few minutes for the smoke unit to reach operating temperature. 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.*

DCC INSTALLATION

To access the DCC circuit board, simply lift the fuel load from directly behind the cab and gently pull upward from the bunker.

Install your decoder (Lenz LE4024 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.



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 do for your automobile.

Clean your locomotive with a soft, lint-free cloth or use a new cosmetics brush that is 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
www.bachmanntrains.com

LIFETIME LIMITED WARRANTY for BACHMANN LOCOMOTIVES purchased in the UNITED STATES and CANADA

effective January 1, 2003, this warranty supersedes all previous (and/or concurrent) warranties

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 accompanying Owner Registration Card must be completed and mailed within ten (10) days after purchase of the locomotive to the address listed below.

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: **Attention: Service Department; Bachmann Industries, Inc.; 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 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 service department 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, or complete credit card information (including credit card number, your name as it appears on the card, and the card expiration date) to the service department. (No C.O.D.s will be accepted.) 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 you have any other questions concerning the use and/or care of this product, please contact the service department.

Send Owner Registration Card and direct inquiries to:

Attention: Service Department

Bachmann Industries, Inc.

1400 East Erie Avenue

Philadelphia, PA 19124 USA

Telephone: 800-356-3910 (toll-free within the United States and Canada only)

Telephone: 215-533-1600 (for all countries)

E-mail: service@bachmantrains.com



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