



MTH PA POWERED B-UNIT OPERATING INSTRUCTIONS



Thank you for purchasing the MTH Electric Trains PA B-Unit locomotive. This $\frac{1}{4}$ " scale reproduction of the famous PA B-Unit locomotive measures over $16\frac{1}{2}$ " in length and weighs over 4.5 pounds. Despite its scale size, the locomotive is capable of operating on O-31 3-rail track with any compatible AC transformer (see the chart on page 10 for a complete list of compatible transformers and wiring instructions) and is completely compatible with past MTH PA AA and ABA diesel sets.

The locomotive is equipped with several deluxe features that are simple and fun to operate. Each feature is described among the following pages which should be read before the engine is operated. For those of you who can't wait to get started, the ***Quick Start Basic Operating Instructions*** found on Pages 3 and 4 should be read so that you understand the basics of the operating system.

Notice: This PA B Unit should only be run with engines equipped with original Proto-Sound from QSI. It will not work with engines equipped with Proto-Sound 2.0

Table Of Contents

QUICK START - BASIC OPERATION	3
DCRU® Reverse Unit Operation	3
USING YOUR POWERED PA B UNIT WITH PFA/FYS EQUIPPED PA AA OR ABA	4
OIL & LUBRICATION INSTRUCTIONS	5
TRACTION TIRE REPLACEMENT INSTRUCTIONS	6
O-31 OPERATION	7
SMOKE UNIT OPERATION	8
TRANSFORMER WIRING CHART	10
SERVICE AND WARRANTY INFORMATION	11
HOW TO GET SERVICE	11
LIMITED ONE YEAR WARRANTY	11

Quick Start - Basic Operation

The MTH PA B Unit contains state-of-the art electronics with several built-in automatic features for incredibly realistic operation. The PA B-Unit is easy to operate with your existing MTH PA AA or ABA units using any compatible standard AC transformer (see the compatibility chart on page 8). The PA powered B-Unit is controlled by a DCRU® electronic reverse unit which unit operates in the same manner that all reverse units function by using forward, neutral and reverse states that are entered each time the throttle is turned on and off or by using the transformer direction switch (if so equipped). Simply plug the B-Unit wire harness into the existing sockets of the PA AA or ABA set to allow Proto-Coupler® equipped engines and directional lighting systems to function. Once connected, advance the transformer throttle to cycle all AA and B units together from RESET to Forward as explained in the DCRU section below.

Prime the operating smoke unit with smoke fluid before operating. Add 15-20 drops of smoke fluid through the smokestack (see Fig. 5 on pg. 8), then gently blow into the stack to eliminate any air bubbles in the fluid.

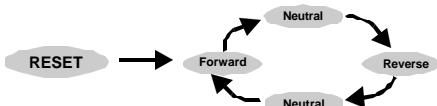
If you choose not to prime the unit with fluid, turn the smoke unit switch located under the engine to the OFF position (see Fig. 6 on pg. 8). **Running the engine without a primed smoke unit may cause damage.** See the “ProtoSmoke Unit Operation” section of this book for more information on smoke unit maintenance.

DCRU® Reverse Unit

As mentioned in the Basic Operating section, the engine is controlled by a DCRU® reverse unit that contains the standard forward-neutral-reverse states found on most reverse units. However, when power is first applied to the track, the reverse unit begins in RESET or what seems like a neutral state.

Power must be interrupted again to get the locomotive to enter the forward state. The system will enter RESET whenever power to the track is off for three or more seconds. NEUTRAL should be referred to as the state between Forward and Reverse.

Figure 1: DCRU™ Cycle Phases



Because the ProtoSound® system or DCRU® reverse unit found in your powered MTH PA A unit is not directly connected to the DCRU® unit in your powered PA B-Unit, you must cycle the power on and off slowly to maintain proper synchronization between each powered unit's reverse unit. If the units should become unsynchronized, simply shut down power for three or more seconds. Upon repowering, each unit should come up in RESET. If you choose to operate your existing PA A units in a "locked-out" state, a lockout switch on the powered PA B-Unit has been provided so that you can manually "lock-out" the B-Unit in the same direction the powered A Units are configured.

Using The Powered PA B-Unit With PFA/FYS Equipped MTH PA AA OR ABA

You can utilize the PFA/FYS that came equip on previous MTH Premier PA AA or ABA by reading the following instructions. Refer to your Premier PA AA or ABA for operation instruction of PFA/FYS. Your MTH Premier Powered PA B-unit has a DCRU installed in it, which is not directly connected to the ProtoSound of your powered A unit. Because the Powered B-unit is not directly connected to the ProtoSound, the Powered B-unit will cycle its directional states while the ProtoSound A unit is playing the PFA/FYS events. To operate the Powered PA B-unit with your ProtoSound A unit, the only thing to remember is not to set the voltage on the transformer too high, not above 8-10 volts. If the voltage is set to high, the Powered B-unit will begin vibrating on the track, as its motors will be turning. Since the directional cycles of the DCRU are insink with the number of events played during the PFA/FYS, the Powered B-unit will start in the same direction as the ProtoSound A unit after the PFA/FYS has finished playing.

Oil & Lubrication Instructions

In order for the engine to perform correctly and quietly, it is important that the chassis be lubricated before operation. Lubrication should include all truck block bushings and pickup rollers to prevent them from squeaking. Use light household oil and follow the lubrication points marked "L" in Fig. 2 below.

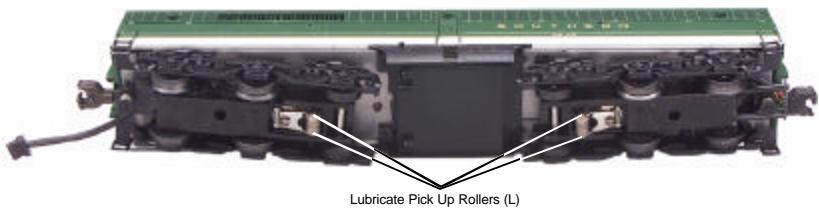


Figure 2: Lubricating The Chassis

The locomotive's internal gearing in both power trucks has been greased at the factory and shouldn't need additional grease until after 50 hours of operation or one year whichever comes first. Grease cannot be added to the internal gearing until the body is removed from the chassis which is held in place by six Phillips screws. The screws are located on each end of the chassis as seen in Fig. 4 on the following page. After removing the screws, lift the body away from the chassis and lay the body next to the chassis.

Next, remove the truck blocks from the chassis by unscrewing the large Phillips motor mount screw on the bottom of each truck block (See Fig. 4). Once the motor mount screw has been removed, pull the motor away from

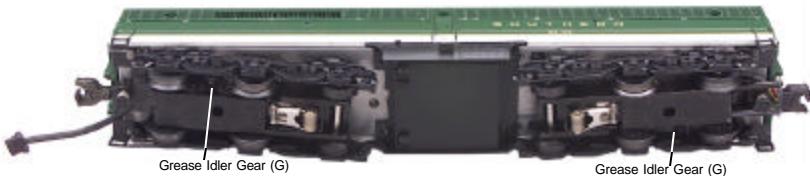


Figure 3: Greasing The Chassis Trucks

the truck block and lightly coat the motor worm gear and bronze drive gear (in the truck block) with grease. Reassemble the truck and motor, being careful not to pinch the pickup and ground wires between the truck block and motor mount. Repeat the procedure for the other motor and truck and then reassemble the chassis to the body. When reassembling the chassis and body, be very careful that the lighting wire harnesses are not caught between the body and chassis as this can lead to a short which may damage the electronic circuit boards beyond repair.

In addition to the truck block internal gearing, it is a good idea to lubricate the outside truck block "idler" and "drive" gears with grease. Use the diagram shown in Fig. 3 on pg. 5 as a guide and add grease to the points marked with a "G".

Periodically, check the locomotive wheels and pickups for dirt buildup as this can significantly affect the engine's ability to perform properly. Dirty track and dirty wheels can cause both poor electrical contact as well as poor traction, especially on elevated track sections. Finally, dirt and oil build up can prematurely wear out the neoprene traction tires.

Traction Tire Replacement Instructions

Your locomotive is equipped with two neoprene rubber traction tires on each power truck. While these tires are extremely durable and long-lasting there may arise a time where they will need to be replaced. Should this occur, you will need to remove the trucks and truck sides on the truck block from the chassis in order to slip the new tire over the grooved drive wheel. We suggest you follow the disassembly instructions found in the Lubrication section on the preceding pages to disassemble the chassis and truck blocks from the body.

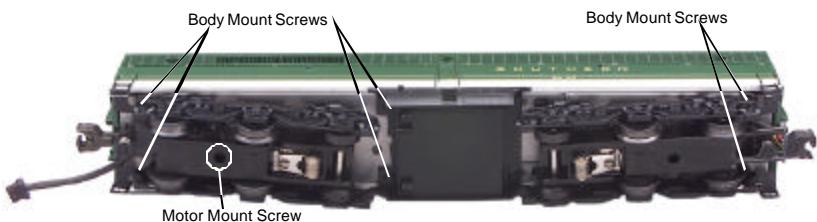


Figure 4: Removing The body From The Cahssis

Before the new tire can be installed, you must make sure the old tire has been completely removed from the groove in the drive wheel. Use a razor blade or small flatblade screwdriver pry away any remains left from the old tire that may still be in the drive wheel groove. Once the old tire has been completely removed, slip the new tire onto the wheel. You may find it useful to use two small flatblade screwdrivers to assist you in stretching the tire over the wheel. Be careful to avoid twisting the tire when stretching it over the wheel. If a twist occurs, the tire will have to be removed and reinstalled or a noticeable wobble in your engine will occur when operating the locomotive. In addition, it is important to make sure that the tire is fully seated inside the groove. Any portion of the tire extending out of the groove can cause the engine to wobble. A razor blade can be used to trim away any excess tire that doesn't seat itself inside the groove properly.

Once the new tire(s) are in place, reassemble the truck sides to the truck blocks and then reassemble the chassis to the body. Replacement tires are available directly from MTH Electric Trains.

O-31 Operation

While the MTH PA B-Unit is more than capable of operating on O-31 curves and switches, you may find that certain light freight cars are prone to derailing when being pulled or pushed by the MTH PA through O-31 switches. Should this occur, we suggest adding weight to the cars making them heavier and less likely to derail.

ProtoSmoke® Unit Operation

This Premier diesel locomotive contains a self-powered smoke unit that outputs smoke through the smokestack on the roof of the engine. The smoke unit is essentially a small heating element and wick that soaks up and then heats a mineral oil-based fluid that emits a harmless smoke. The smoke is then forced out of the stack by a small electric fan. Smoke volume is controlled by the Proto-Sound 2.0 system.

With a few easy maintenance steps, you should enjoy trouble-free smoke unit operation for years.

When preparing to run this engine, add 15-20 drops of smoke fluid through the smokestack (see Fig. 5). We recommend M.T.H. ProtoSmoke, Seuthe, LGB, or LVTS fluids. Do not overfill the unit or the fluid may leak out and coat the interior engine components.

If you choose not to add the fluid (or have already added the fluid but choose to run smoke-free), turn off the smoke unit switch located under the engine (see Fig. 6). **Failure either to add fluid to the unit or to turn it off may damage the smoke unit heating element and/or wicking material.**

When the smoke output while running the engine begins to diminish, add another 10-15 drops of smoke fluid or turn the smoke unit off.

When storing the unit for long periods of time, you may want to add about 15 drops of fluid to prevent the wick from drying out.

After removing the engine from storage, add another 25 drops of fluid, letting the wick soak up the fluid for 15 minutes prior to operation.



Figure 5. Add Smoke Fluid

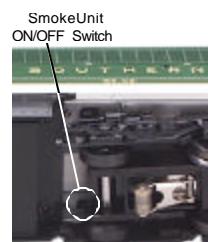


Figure 6. Smoke Switch

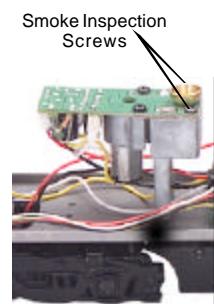


Figure 7. Smoke Unit Inspection Cover

If you experience poor or no smoke output when the smoke unit is on and has fluid, check the wick to see if it has become hard, blackened, and unabsorbent around the heating element. Remove the smoke unit inspection cover from the smoke unit's body (see Fig. 7 on pg. 8). After removing the chassis and inspection cover screws, lift the inspection plate away and inspect the wick. If it is darkly discolored and hard, it should be replaced.

Replacement parts and wick replacement instructions are available directly from the M.T.H. Parts Department (phone: 410-381-2580; e-mail: parts@mth-railking.com; mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532).

Transformer Wiring Chart

Service & Warranty Information

How to Get Service Under the Terms of the Limited One-Year Warranty

For warranty repair, do not return your product to the place of purchase. Instead, follow the instructions below to obtain warranty service as our dealer network is not prepared to service the product under the terms of this warranty.

1. First, write, call or FAX M.T.H. Electric Trains, 7020 Columbia Gateway Drive, Columbia, MD 21046, (Tel 410-381-2580; FAX No.: 410-423-0009; e-mail: service@mth-Railking.com), stating when it was purchased and what seems to be the problem. You will be given a return authorization number to assure that your merchandise will be properly handled upon its receipt.
2. CAUTION: Make sure the product is packed in its original factory packaging including its foam and plastic wrapping material so as to prevent damage to the merchandise. The shipment must be prepaid and we recommend that it be insured. A cover letter including your name, address, daytime phone number, e-mail address (if available), Return Authorization number, a copy of your sales receipt and a full description of the problem must be included to facilitate the repairs. Please include the description regardless of whether you discussed the problem with one of our service technicians when contacting M.T.H. for your Return Authorization number.
3. Please make sure you have followed the instructions carefully before returning any merchandise for service.

Limited One-Year Warranty

All M.T.H. products purchased from an Authorized M.T.H. Train Merchant are covered by this warranty.

See our website at www.mth-railking.com or call 1-888-640-3700 to identify an Authorized M.T.H. Train Merchant near you.

M.T.H. products are warrantied for one year from the date of purchase against defects in material or workmanship, excluding light bulbs and traction tires. We will repair or replace (at our option) the defective part without charge for the parts or labor, if the item is returned to M.T.H. Electric Trains within one year of the original date of purchase. This warranty does not cover damages caused by improper care, handling, or use. Transportation costs incurred by the customer are not covered under this warranty.

Items sent for repair must be accompanied by a return authorization number, a description of the problem, and a copy of the original sales receipt from an Authorized M.T.H. Train Merchant, which gives the date of purchase. Call 410-381-2580, fax 410-423-0009, or e-mail the Service Department at Service@mth-railking.com to obtain a return authorization number.

This warranty gives you specific legal rights, and you may have other rights that vary from state to state.

Service Department
M.T.H. Electric Trains
7020 Columbia Gateway Drive
Columbia MD 21046-1532