

# **L-3 MOHAWK 3-RAIL OPERATING INSTRUCTIONS**

(Please Read Carefully Before Operating)

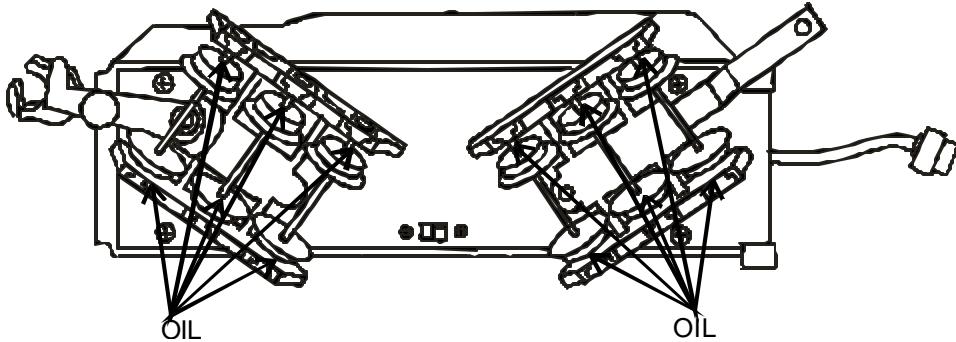


Congratulations on your purchase of the Die-Cast MTH Electric Trains L-3 Mohawk Steam Engine. The engine's die-cast body and chassis are traditionally sized for operation on any O-27 Gauge track.

Operating and maintenance instructions are included on the following pages. Should the engine need additional service, it should be sent back to the factory located at the address on the back page.

on your layout. The chassis\* linkage, pickup roller rivets and leading and trailing truck axles should be lubricated with household oil to prevent squeaks and enhance performance. A drop or two of oil on the linkage, axles and rivets should be sufficient (See Fig. 1 and 2). In addition, the tender truck axles should also be lubricated. Avoid over-lubricating as it can spill over onto the track surface and reduce locomotive traction.

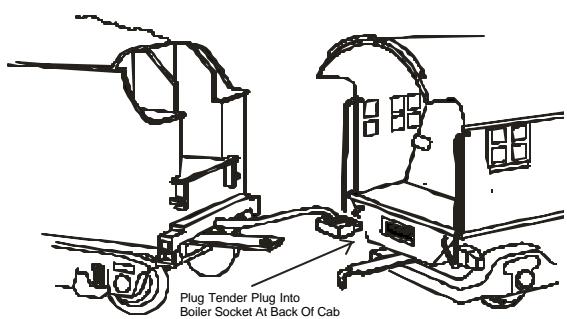
*Figure 1: Lubricating The Mohawk Locomotive Chassis*



*Figure 2: Lubricating The Mohawk Tender Chassis*

## REVERSE UNIT OPERATION

Each locomotive is powered by a precision DC can motor whose voltage is regulated by a QSI® DCRU™ electronic reverse unit. The reverse unit operates on a three-sequence loop: Forward-Neutral-Reverse. The next phase in the loop is entered each time the transformer throttle is turned off as the unit enters the next phase in the sequence. A "clicking" sound from inside the tender shell will be heard each time this is done. Because the engine always starts in neutral, the transformer throttle or directional button must be activated in order to get the engine to enter the forward phase. The reverse unit will reset to neutral after power has been shut down for three or more seconds allowing multiple Mohawk or other DCRU-equipped engines to be operated together. If the engines should become unsynchronized during operation simply



*Figure 3: Plugging In The Tender*

using the transformer throttle or directional button and then switching the ON/OFF switch located under the tender chassis (see Fig. 4) to the OFF position. To enter the normal phase again, simply turn the switch to the ON position. After an hour or more of non-use, the reverse unit will cycle into any of the three positions and the ON/OFF switch must be set to ON in order for the engine to operate correctly.

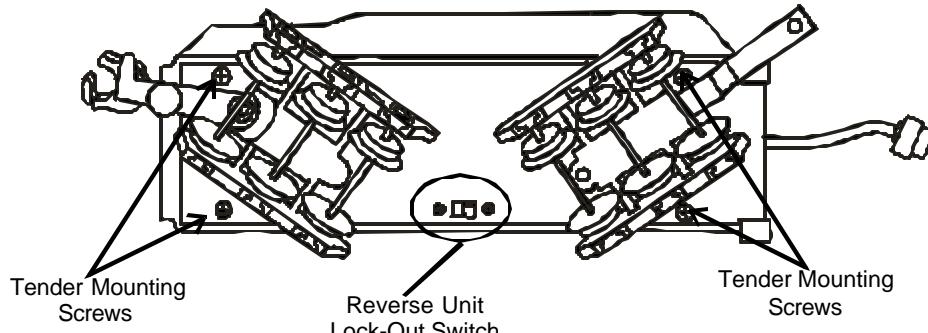


Figure 4: Reverse Unit Lockout Switch Location

## WHISTLE OPERATION

The locomotive comes equipped with an electronic whistle located inside the tender body. The whistle is activated by operating the whistle controller on your transformer whenever power to the track is on. If the whistle fails to operate, it may be necessary to reverse the leads from your transformer to the track. If more realistic sounds are desired, the electronic whistle can be removed and a ProtoSound™ Digital Sound and Train Control module can be plugged into the reverse unit. This procedure is described in more detail on the following pages.

## SMOKE UNIT OPERATION

The locomotive is also equipped with an operating smoke unit. The smoke output is regulated by the track voltage and the speed of the engine using an integrated piston drive system. The piston system blows the smoke out of the smoke stack in a puffing action. The faster the engine travels, the more rapid and intense the smoke output becomes. To add smoke fluid, clip the end of the SuperSmoke fluid tube that comes included with your engine with a pair of scissors and pour 6 - 12 drops of fluid into the smoke unit stack. Smoke output may not be strong immediately until the smoke unit wick soaks up the fluid. Do not oversaturate the wick as it will result in poor smoke output.

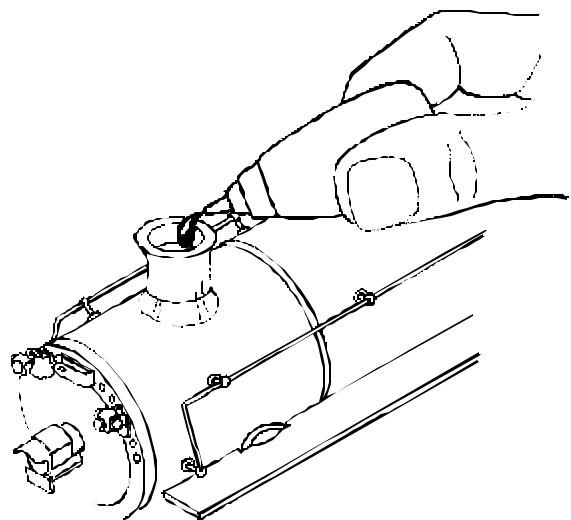


Figure 5: Filling The Smoke Stack

If you operate the engine without smoke fluid for long periods of time, the wick may become hard and unabsorbant. When this occurs, it may be difficult for the wick to soak up the heavy SuperSmoke smoke fluid resulting in poor smoke output. If that occurs, we recommend using a lighter weight smoke fluid, such as LGB Smoke Fluid. Once the engine is run with the lighter fluid, the wick regains some of its absorbancy and SuperSmoke smoke fluid can be used again. You can inspect the wick to see if it needs replacement by removing the smoke unit inspection cover as seen in Fig. 6 . After removing the screws lift the inspection plate away and inspect the wick. If the wick is darkly discolored and hard, it should be replaced.

*Figure 6: Inspecting The Smoke Unit Wick*

**Note:** Replacement bottles of SuperSmoke are available at most hobby shops. Replacement smoke unit wicks and SuperSmoke can be purchased directly from MTH Electric Trains. The engine has been designed so that an optional On/Off smoke unit switch can be added to the frame. The switch location is noted in Figure 7. It is available directly from MTH Electric Trains.

## MAINTENANCE INSTRUCTIONS

The locomotive is designed so that very little maintenance is required from the owner. It is recommended that all moving parts (idler gears, pickup rollers and axles) be oiled after every 25 hours of operation. Bearing grease or a similar lubricant should be applied to the motor worm gear and the bronze drive gear inside the locomotive chassis after 50 hours of operation.

To add grease, remove the cab from the chassis by unscrewing its four mounting screws (See Fig. 7). After removing the shell from the chassis, remove the white plastic grease cover over the drive wheels to expose the locomotive gearing. Lightly coat each gear with grease

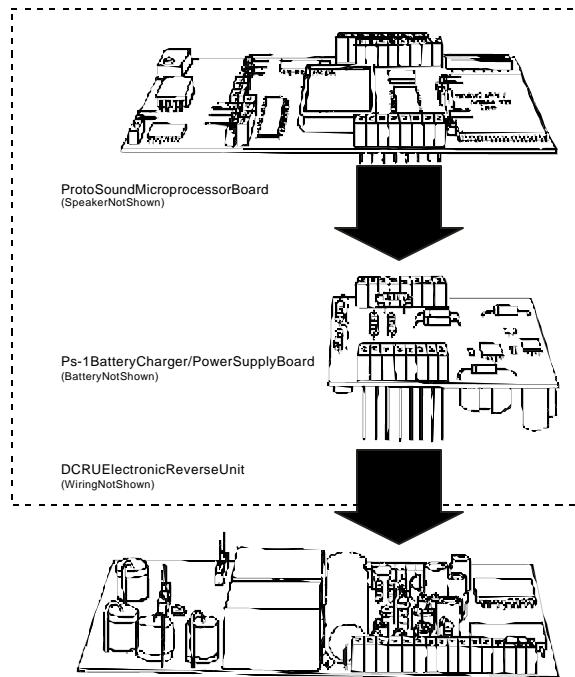
*Figure 7: Removing The Chassis From The Boiler*

*Figure 8: Adding Grease To The Locomotive Gearing*

*Figure 9: Lubricating The Leading & Trailing Truck Swivel Points*

## **TRACTION TIRE REPLACEMENT**

If it becomes necessary to replace the rubber traction tires on the drive wheels, the following steps should be followed. First, remove the cab from the chassis as indicated in Figure 7. Next, unscrew the main side rods connecting the eight drive wheels together using a 5mm nut driver or a pair of pliers. Cut or pry off the old traction tire (if it hasn't already broken) from the grooved channel in the drive wheel and stretch the replacement tire over



*Figure 10: The ProtoSound Digital Sound & Train Control System*

## You Will Need The Following Tools

Flat Blade Screwdriver, Phillips Screw Driver, Needle Nose Pliers, Sissors, Pliable Adhesive Glue or Hot Glue Gun

- 1) Remove the steam engine tender body from its chassis by removing the four mounting screws located in each corner of the chassis as seen in Figure 4.
- 2). Remove the electronic whistle circuit by cutting the plastic tie attaching the circuit to the DCRU and lift the circuit out of the DCRU strip socket holes as seen in Fig. 11 .

simply pulling them out of the sockets and remove the switch by unscrewing it from the tender floor. You will not need a lock-out switch since ProtoSound can lock your engine out by remote control.

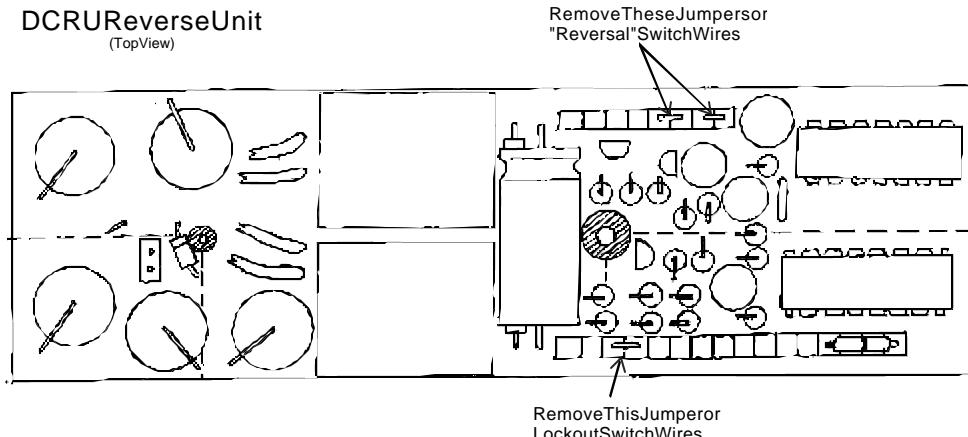


Figure 12: Prepping The DCRU Reverse Unit For ProtoSound Installation

- 4) Carefully align the pins from the combination ProtoSound and PS-1 board into the socket holes on the reverse unit. Be sure that the pins line up in the holes and are correctly centered in each socket as shown in Figure 14. Center the pins on one side of the board, hold in place and then align the pins on the other socket strip. Do not press the boards together yet.

Before you actually press the boards together, check to see that the transformer component on the PS-1 board (shown in Figure 15), will not interfere with the components on the DCRU reverse unit. If it does, gently push the components on the DCRU reverse unit to one side. Also, you need to be aware that the sockets on the reverse unit will be quite tight and it will take some gentle force to press the two boards together. The best way to insert the pins into the

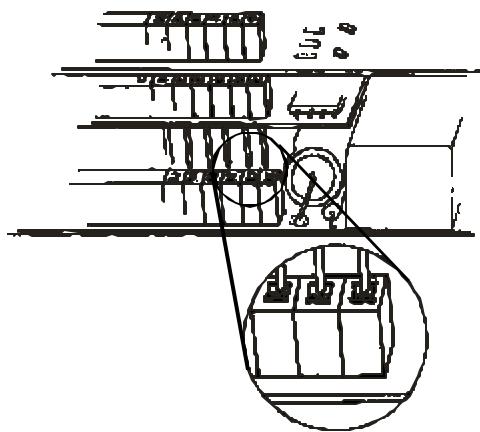


Figure 14: Lining Up The Pins Before Pressing The ProtoSound Boards Together

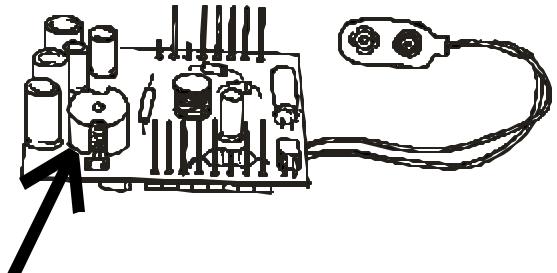


Figure 15: Transformer Component

with both hands, one hand on each side of the boards. You should hear a snap from each side as the two boards go together. The PS-1 board should sit just above the reverse unit as shown in Figure 10. If you are having difficulty, separate the PS-1 board from the ProtoSound board and press together as shown in Figure 16.

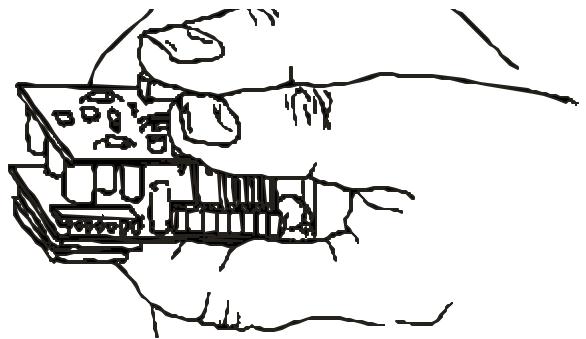


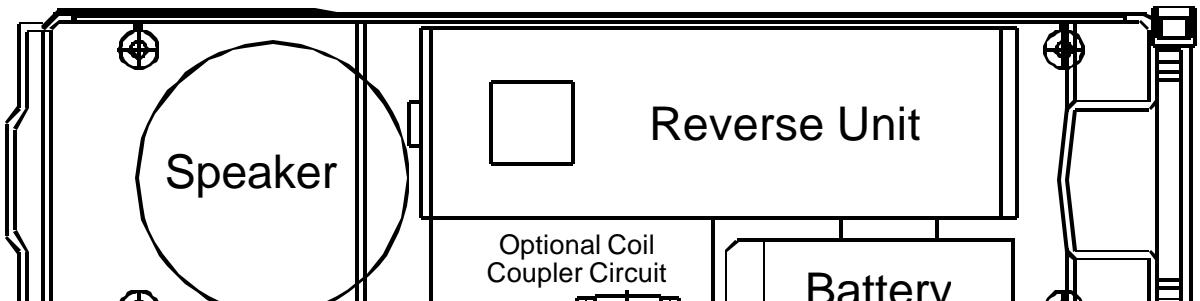
Figure 16: Pressing The Boards Together

- 5) If you separated the ProtoSound board from the PS-1 board, carefully press the ProtoSound top board into the socket pins on the PS-1. This should also be a snug fit, but a little easier to insert since the socket holes were already spread. Make sure that the ProtoSound board is correctly positioned since it can be inserted incorrectly in the socket in a backwards position (rotated 180°). The ProtoSound board is in the correct position if the ProtoSound board lines up with the DCRU reverse unit as shown in Figure 10. Also watch to see that all the connector pins are in their own socket; *you do not want the ProtoSound board to be offset by one or two pins since this would cause damage to the circuit board.*

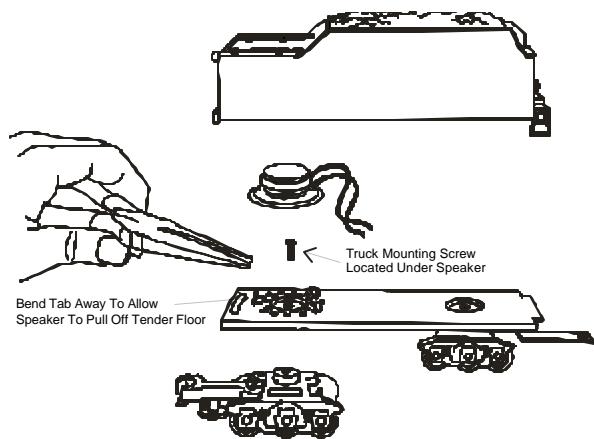
*Note: You may want to tie all three boards together using the cable-tie provided. This prevents the boards from becoming separated during handling or shipping. Run the cable-tie around all three boards, slip the pointed end into the hole on the other end and pull until snug, do not overtighten. Make sure you do not bend any electronic parts and that you do not cover the mounting hole on the reverse unit. Once the cable has been pulled tight, it cannot be loosened.*

- 6) Attach the battery with the double sticky foam tape provided. Mount the battery next to the reverse unit as shown in Figure 17.

#### BOTTOM VIEW OF MOHAWK TENDER WITH PROTOSOUND, SPEAKER, BATTERY & COIL COUPLER LOCATIONS

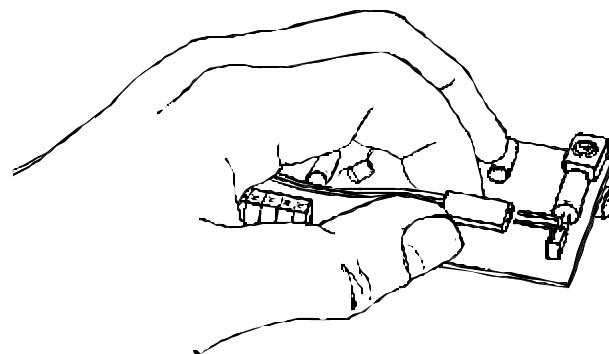


mounts vertically inside the tender shell. Normally, this would be above the speaker perforation holes where the current electronic whistle speaker sits. Because the electronic horn speaker is not compatible with ProtoSounds, it will have to be removed and the ProtoSound speaker installed in its place. To remove the electronic whistle speaker, take either a flat blade screwdriver or a pair of needle nose pliers and bend the tabs securing the speaker to the chassis away from the speaker frame. Once bent away from the speaker lift the speaker away from the chassis. Insert the new speaker and resonator cone over the speaker perforations and bend the tabs into the resonator cone to hold the speaker and cone in place. It may be necessary to further secure the new speaker with either pliable adhesive (like Walters® GOO™) or a hot glue gun.



*Figure 18: Removing The Old Speaker*

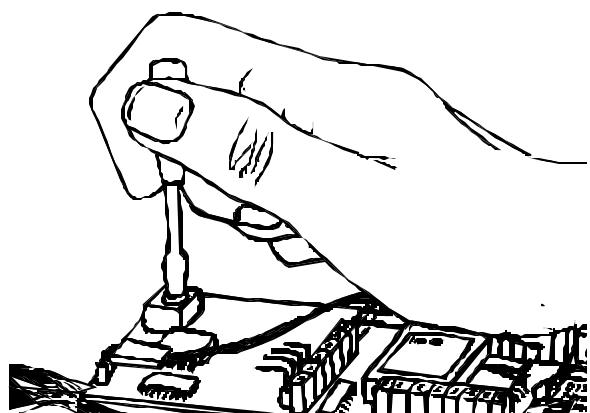
After you have installed the speaker, connect the speaker plug to the ProtoSound board as shown in Figure 19. It does not make any difference which way the plug goes. If you are installing the coil coupler, the circuit board should fit directly in front of the speaker resonator.



*Figure 19: Plugging The Speaker Harness Into The ProtoSound Board*

## Adjusting the Volume:

On the top ProtoSound board there is a small square component with a screw driver slot to adjust the volume. Turn the slot clockwise to reduce the volume or counter clockwise to increase the volume (see Figure 20). After the volume is adjusted, replace the shell but do not install the screws. The tender shell will tend to amplify the sound so it is good to test the unit to see if the setting is correct by placing the shell on



## **HOW TO GET SERVICE UNDER THE TERMS OF THE LIMITED WARRANTY**

Do not return your product to the place of purchase unless you bought the item directly from Mike's Train House in Columbia, MD as our dealer network is not prepared to service the product under the terms of this warranty.

1. First, write, call or FAX MTH Electric Trains at 9693-A Gerwig Lane, Columbia, MD 21046, 410-381-2580 (FAX 410-381-6122) to obtain a return authorization number. You will need to provide the date of purchase and a general description of 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 indicating the reason for the return and a brief description of the problem should be included to facilitate the repairs. Please don't forget to include your return name and address.
3. Please make sure that you have followed the instructions carefully before returning any merchandise for service.

## **LIMITED ONE YEAR WARRANTY**

This item is warranted for one year from the date of purchase against defects in material or workmanship. We will repair or replace (at our option) the defective part without charge for parts or labor, if the item is returned to the address below within one year of the original date of purchase. This warranty does not cover items that have been abused or damaged by careless handling. Transportation cost incurred by the customer are not covered under this warranty.

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

**MTH Electric Trains  
9693-A Gerwig Lane  
Columbia, MD 21046**