



MTH F-3 POWERED B-UNIT OPERATING INSTRUCTIONS



Thank you for purchasing the MTH Electric Trains F-3 B-Unit locomotive. This 1/4" scale reproduction of the famous F-3 B-Unit locomotive measures over 13 1/2" in length and weighs over 3.5 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 8 for a complete list of compatible transformers and wiring instructions) and is completely compatible with past MTH F-3 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.

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QUICK START - BASIC OPERATION

The MTH F-3 B Unit contains state-of-the art electronics with several built-in automatic features for incredibly realistic operation. The F-3 B-Unit is easy to operate with your existing MTH F-3 AA or ABA units using any compatible standard AC transformer (see the compatibility chart on page 8). The F-3 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 F-3 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.

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.

Because the ProtoSound® system or DCRU® reverse unit found in your powered MTH F-3 A unit is not directly connected to the DCRU® unit in your powered F-3 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

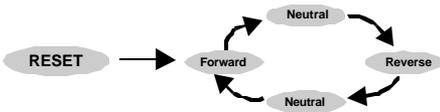


Figure 2: DCRU™ Cycle Phases

unit should come up in RESET. If you choose to operate your existing F-3 A units in a “locked-out” state, a lockout switch on the powered F-3 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 F-3 B-UNIT WITH PFA/FYS EQUIPPED MTH F3 AA OR ABA

You can utilize the PFA/FYS that came equip on previous MTH Premier F3 AA or ABA by reading the following instructions. Refer to your Premier F3 AA or ABA for operation instruction of PFA/FYS. Your MTH Premier Powered F3 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 F-3 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. 3 below.



Figure 3: 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 four Phillips screws. The screws are located on each end of the chassis as seen in Fig. 5 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. 5). Once the motor mount screw has been removed, pull the motor away from

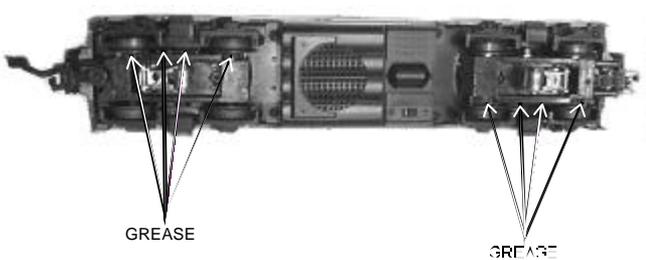


Figure 4: Greasing The Chassis Trucks

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. 4 above 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 truck sides from the truck block from the chassis in order to slip the new tire over the grooved drive wheel. The truck

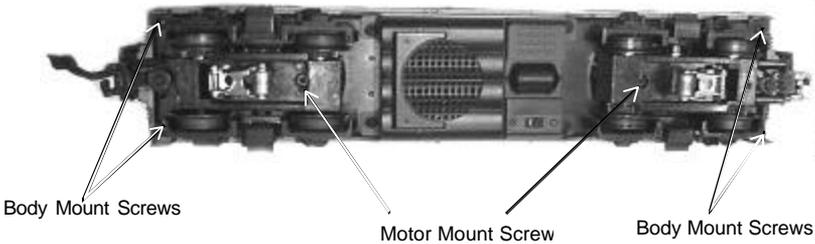


Figure 5: Removing The body From The Chassis

sides can be removed from the truck block by turning the engine upside down and unscrewing the two phillips head screws.

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 F-3 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 derailling when being pulled or pushed by the MTH F-3 through O-31 switches. Should this occur, we suggest adding weight to the cars making them heavier and less likely to derail.

TRANSFORMER WIRING CHART

ProtoSounds® is designed to work with any standard AC transformer that uses a "Pure Sine-Wave" format. The chart below lists the many Lionel® compatible transformers, such as the Lionel KW or ZW models. In addition, the chart details how the terminals on these compatible transformers should be attached to your layout. The Trainmaster system from Lionel® (marked with an asterisk below) will not function correctly with ProtoSounds without disrupting the sound effects. Therefore, whenever ProtoSounds senses that the Trainmaster system is being used, it automatically disables ProtoSound's sound effects. The operator retains control over the engine, but no sound effects will play.

**ProtoSounds needs over 14 volts of power to work properly. Overloading or using in-line accessories with this transformer may lower the peak voltage below ProtoSound's requirements.*

Transformer Model	Center Rail	Outside Rail	Min/Max. Voltage	Power Rating	Transformer Type
Lionel 1032	U	A	5-16v*	90-Watt	Standard
Lionel 1032M	U	A	5-16v*	90-Watt	Standard
Lionel 1033	U	A	5-16v*	90-Watt	Standard
Lionel 1043	U	A	5-16v*	90-Watt	Standard
Lionel 1043M	U	A	5-16v*	90-Watt	Standard
Lionel 1044	U	A	5-16v*	90-Watt	Standard
Lionel 1053	U	A	8-17v	60-Watt	Standard
Lionel 1063	U	A	8-17v	60-Watt	Standard
All-Trol	Left Terminal	Right Terminal	0-24v	300-Watt	Electronic
Cab-1/Powermaster	A	U	0-18v	135V.A.	Electronic
Dallee Hostler	Left Terminal	Right Terminal			
Lionel LW	A	U	8-18v	75-Watt	Standard
Lionel KW	A or B	U	6-20v	190-Watt	Standard
MRC Tech II	Left Terminal	2 nd From Left	0-15v*	40V.A.	Electronic
Lionel MW (not recommended)	Outside Track Terminal	Inside Track Terminal	5-16v*	50V.A.	Electronic
R.O.W.	Red Terminal	Black Terminal	0-24v	384-Watt	Standard
Lionel RS-1	Red Terminal	Black Terminal	0-18v	50V.A.	Electronic
Lionel RW	U	A	9-19v	110-Watt	Standard
Lionel SW	U	A	Unknown	130-Watt	Standard
Lionel TW	U	A	8-18v	175-Watt	Standard
Lionel ZW	A or D	U	8-20v	275-Watt	Standard
MTH Z4000	Red	Black	5-21v	390-Watt	Electronic

Premier Powered B Unit

Parts

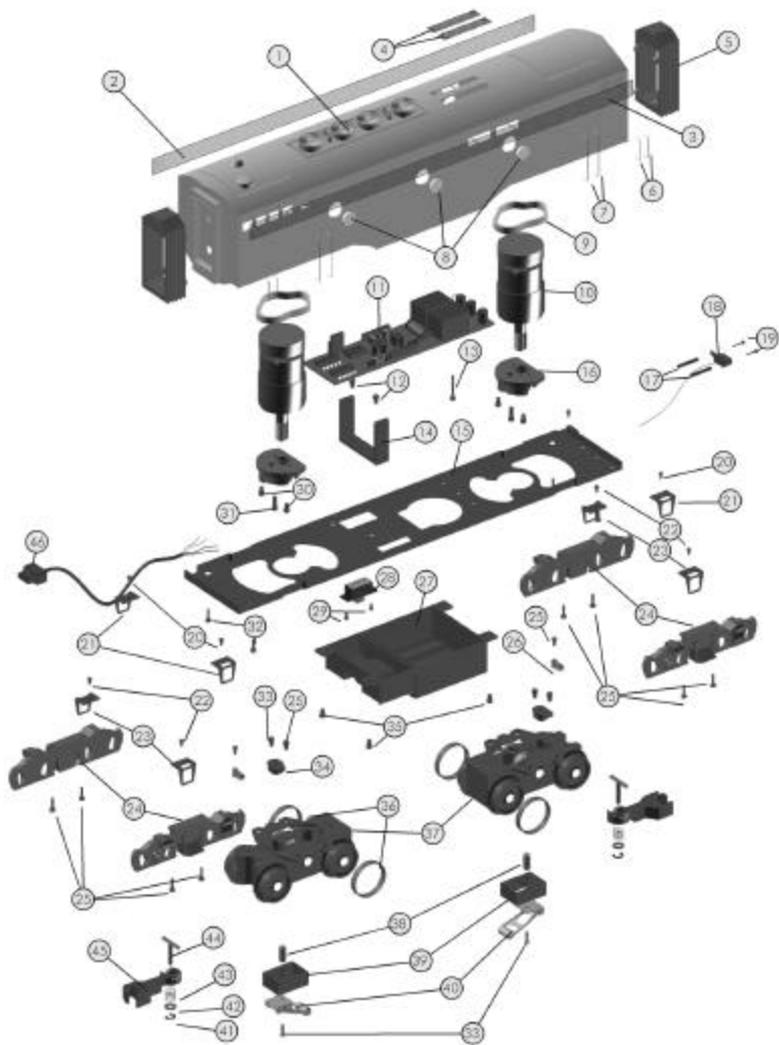
Name and Number	Part#
1.) Shell (AT & SF)	FC-2100094
1.) Shell (C & O #8506)	FC-2100095
1.) Shell (B & M)	FC-2100096
1.) Shell (L & N #701)	FC-2100097
1.) Shell (Rl)	FC-2100098
1.) Shell (ARR #1503)	FC-2100099
2.) Vent (right)(AT&SF)(silver)	FC-2110012
2.) Vent (right)(C&O)(blue)	FC-2110013
2.) Vent (right)(B&M)(maroon)	FC-2110014
2.) Vent (right)(L&N)(blue)	FC-2110015
2.) Vent (right)(Rl)(black)	FC-2110016
2.) Vent (right)(ARR)(blue/yellow)	FC-2110017
3.) Vent (left)(AT&SF)(silver)	FC-2120012
3.) Vent (left)(C&O)(blue)	FC-2120013
3.) Vent (left)(B&M)(maroon)	FC-2120014
3.) Vent (left)(L&N)(blue)	FC-2120015
3.) Vent (left)(Rl)(black)	FC-2120016
3.) Vent (left)(ARR)(blue/yellow)	FC-2120017
4.) Vent (top)(AT&SF)(silver)	FC-2100100
4.) Vent (top)(L&N)(blue)	FC-2100101
4.) Vent (top)(ARR)(blue)	FC-2100102
4.) Vent (top) (Rl,B&M,C&O)(black)	FC-2100103
5.) Diaphragm	FI-0000017
6.) Handrail (18.5mm long)	FC-2100104
7.) Handrail (31.5mm long)	FC-2100105
8.) Lens (portal)(11.0mm)	FA-0000001
9.) Rubber band	BI-4500004
10.) Motor	BE-0000022
11.) DCRU board	AC-0000001
12.) Screw	IA-0000055
13.) Screw	IA-0000094
14.) Bracket	IH-0000039
15.) Chassis	DH-2100006
16.) Motor mount	BI-0000009
17.) Spacer (2.0X4.5X14.5mm)	ID-0000050
18.) PCB board (w/wire harness)	BB-0000014
19.) Screw	IA-0000095
20.) Screw	IA-0000044
21.) Ladder (chassis)(silver)	FC-2100106
21.) Ladder (chassis)(black)	FC-2100107
22.) Screw	IA-0000037
23.) Ladder (truckside)(silver)	FC-2100108
23.) Ladder (truckside)(black)	FC-2100109
24.) Truckside (silver)	DB-2100005
24.) Truckside (black)	DB-2100006
25.) Screw	IA-0000003
26.) Wire strap	IH-0000012
27.) Fuel tank (silver)	FC-2100110
27.) Fuel tank (black)	FC-2100111
28.) Switch (small)	BB-0000009
29.) Screw	IA-0000076
30.) Screw	IA-0000001
31.) Screw	IA-0000012
32.) Screw	IA-0000041
33.) Screw	IA-0000015
34.) Insulator (top)(square)	BD-0000015
35.) Screw	IA-0000016
36.) Traction tires	DE-0000018
37.) Truck block (2axle)	DA-2000002

Parts

Name and Number	Part#
38.) Nut	IC-0000005
39.) Insulator (bottom)(rect.)	BD-0000039
40.) Pick-up	BD-0000025
41.) E-clip	IF-0000002
42.) Washer	ID-0000026
43.) Spring	IE-0000007
44.) T-bar	IG-0000001
45.) Coupler (non-operating)	DD-4000005
46.) Wire harness	BC-0000011

* Requires Exchange





WARNING:

When using electrical products, basic safety precautions should be followed including the following:

-- Read this and all related manuals (transformer/power supply, locomotive, etc.) thoroughly before using this device.

-- This device is not recommended for children under eight years of age without adult supervision.

-- MTH recommends parents examine the toy transformer used to power this device periodically for conditions that may result in the risk of fire, electric shock, or injury to persons, such as damage to the primary or output cord, plug blades, housing or other parts (including proper functioning of the circuit breaker), and that, in an event such conditions exist, the transformer should not be used until properly repaired.

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 unless it was purchased from Mike's Train House in Columbia, MD. 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 MTH Electric Trains, 7020 Columbia Gateway Drive, Columbia, MD 21046, 410-381-2580 (FAX No. 410-381-6122), 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, 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 MTH 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

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 costs 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.