



HO TRAINS THAT DO MORE

**READY-TO-RUN** *sets*

THE COMPLETE SOLUTION

Easy to Setup, Easy to Use, Easy to Expand

## **F-3 Freight Set**

### **DCC Ready**

Congratulations! You've just purchased the most technically advanced HO diesel locomotive ever produced! This highly detailed model includes a broader range of features than you'll find on any other HO scale diesel, including smooth performance from a 12-Volt 5-Pole Precision Flywheel Equipped Skew-wound motor; and a DCC-Ready plug-in receptacle for any DCC receiver. If you're looking for modern motive power that's accurately detailed, smooth running, and a great deal of fun to operate, it doesn't get any better than this.

PLEASE READ THE MANUAL BEFORE USE AND SAVE  
[WWW.MTHHOTRAINS.COM](http://WWW.MTHHOTRAINS.COM)

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## **CAUTION: ELECTRICALLY OPERATED PRODUCT:**

Recommended for Ages 14 and up. Not recommended for children under 14 years of age without adult supervision. As with all electric products, precautions should be observed during handling and use to prevent electric shock.

**WARNING:** When using electrical products, basic safety precautions should be observed, including the following:  
Read this manual thoroughly before using this device.

- M.T.H. recommends that all users and persons supervising use examine the hobby transformer and other electronic equipment periodically for conditions that may result in the risk of fire, electric shock, or injury to persons, such as damage to the primary cord, plug blades, housing, output jacks or other parts. In the event such conditions exist, the train set should not be used until properly repaired.
- Do not operate your layout unattended. Obstructed accessories or stalled trains may overheat, resulting in damage to your layout. This train set is intended for indoor use. Do not use if water is present. Serious injury or fatality may result.
- Do not operate the hobby transformer with damaged cord, plug, switches, buttons or case.

This product may be protected by one or more of the following patents: 6,019,289; 6,280,278; 6,281,606; 6,291,263; 6,457,681; 6,491,263; 6,604,641; 6,619,594; 6,624,537; 6,655,640.

# Set Up Checklist

- Assemble RealTrax®
- Connect the transformer
- Lubricate the engine
- Place the engine and cars on the track and couple them together
- Apply power to run as described in the Basic Operation section of these instructions.

## Set Includes

Diesel Engine  
3 Freight Cars



HO RealTrax 9"  
Straight (81-1001)



HO RealTrax  
9" Straight Rerailer  
(81-1015)



12-Pieces HO RealTrax  
18" Radius Curve (81-1022)



Power Supply



Controller

## Tools Needed



Pliers



Scissors



Philips Screwdriver



Cotton Swab or Rag



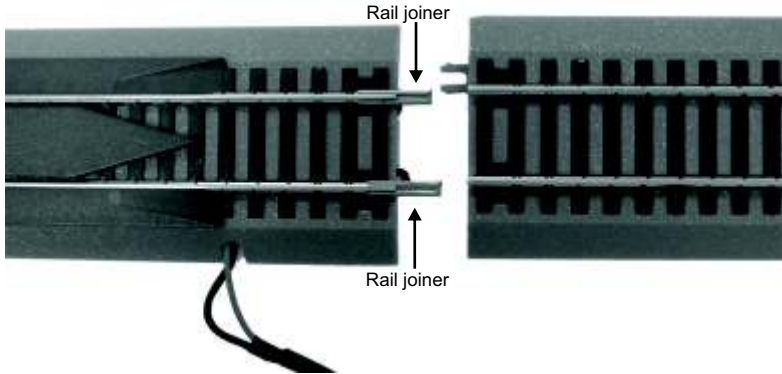
M.T.H. Maintenance Kit (30-50051)

**You can obtain replacement parts and replacement instructions from the M.T.H. Parts Department** (Order online: [www.mth-railking.com](http://www.mth-railking.com), e-mail: [parts@mth-railking.com](mailto:parts@mth-railking.com), Fax: 410-423-0009, Phone: 410-381-2580, Mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532, ).

# Assembling HO RealTrax

1. Begin by placing two pieces of HO RealTrax on any flat surface. (If you intend for your layouts final assembly to be on a non-flat surface, such as carpet, it is recommended that you first assemble your track in sections on a tile or hardwood surface)

2. Using your fingertips, maneuver each rail so that it can be easily inserted into the piece of adjoining track-as shown in the diagram below. Disregard the locking mechanism at this point; concentrate only on connecting the rail joiners.



3. After making sure each piece is inserted properly into the opposite rail joiners, press the two pieces together until the ends of the roadbeds are touching one another. To insure that the two pieces of track are accurately locked, run your finger gently over the track and make sure the areas of connection are smooth, if not try reconnecting the pieces.



Wire harness is already attached to the rerailer track section. (See above)

# Lubricating the Engine

Lubricate the axles before operating using light machine or household oil, (available with M.T.H.'s Maintenance Kit (#30-50010) , sold separately) apply a very small amount to all axle points as shown.



# Coupling the Engine and Cars

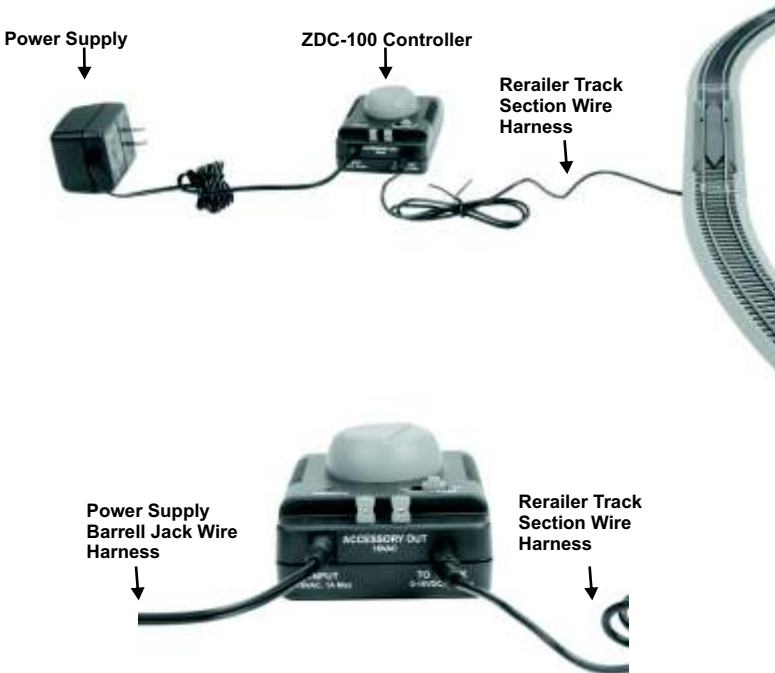
Our couplers are designed for realistic operation. Place the engine and cars on the track and couple them together.

## Connecting the Power Supply & Controller

Your set comes with M.T.H.'s Z DC-100 Controller and a UL approved Power Supply to provide an easy-to-use, safe power source for your new train set. To install the controller and power supply, please use the following instructions:

1. Ensure the Power Supply is unplugged.
2. Plug the Power Supply barrel jack into the port labeled “Input” on the controller. Plug the wire harness from the rerailer track section to the “To Track” port on the controller.
3. Make sure that the engine and cars are properly assembled and coupled on the track and then plug the Power Supply into any 110 volt AC wall outlet. You will know that you have power to the controller when the red power light is illuminated on top of the ZDC-100 Controller.

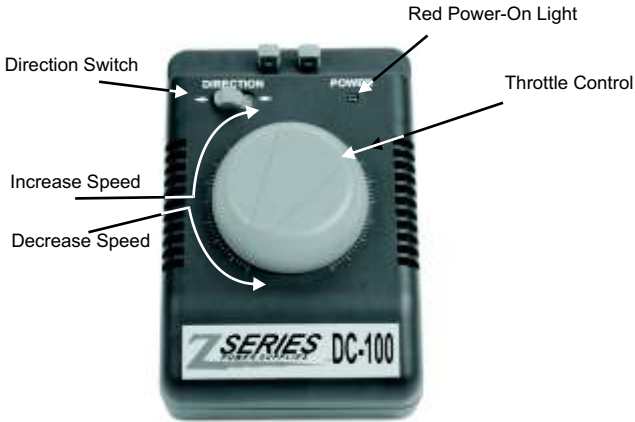
See Illustrations Below



# Basic Operation

## Running the Train

After making sure everything is properly assembled apply power to your train by turning the throttle control on the ZDC-100 Controller clockwise. You may want to turn the control slow at first and check to make sure your train is moving in the direction you want. If not, reduce the power by turning the control counter-clockwise until the train stops moving. Flip the direction switch on top of the controller and then increase the power again. To increase and decrease speed of train turn the throttle control clockwise to increase speed, and counter-clockwise to decrease speed.



**AC Power Accessory Terminals** - Can be used to power any AC-powered train accessories.



# Maintenance

## Cleaning The Wheels, Tires, and Track

Periodically check the locomotive wheels and pickups for dirt and buildup, which can cause poor electrical contact and traction and prematurely wear out the neoprene traction tires. Wheels and tires can be cleaned using denatured (not rubbing) alcohol applied with a cotton swab.



To clean the track, use RailKing Track Cleaning Fluid found in Maintenance Kit (30-50051) or denatured (not rubbing) alcohol and a clean rag. Unplug the transformer and wipe the rails of the track, turning the rag frequently to ensure that you are using clean cloth on the rails. Thereafter, keep an eye on the track and clean it when it gets dirty to ensure good electrical contact and to lengthen the life of the tires.



Track Cleaning Block (40-1099)

Clean any type of track with this heavy-duty track cleaning block (40-1099). Durable constructed from ABS plastic, the block includes a built-in cleaning pad. For really stubborn track, you can insert sandpaper into the block in just a few quick steps.



Maintenance Kit (30-50051)

## Lights

As you read on, you'll notice there are no instructions for replacing light bulbs in your diesel. That's because there aren't any. We use specially designed and controlled LEDs to create realistic lighting effects that occur automatically. Again, **NO PROGRAMMING!!** Just come to a stop and watch as the headlight dims automatically in accordance with rule 17. Of course, as you pull away, the headlight returns to it's fully bright, yet warm, glow. We even included a light in the cab so the engineers can see to do their jobs!



# Lubricating the Engine

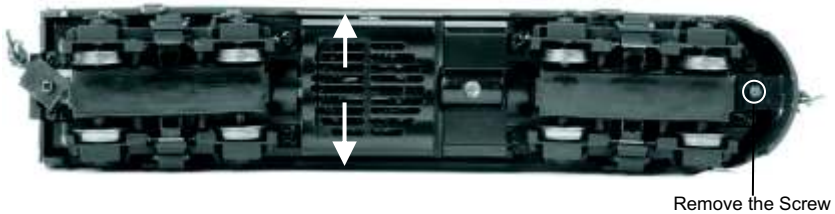
Lubricate the axles before operating using light machine or household oil, (available with M.T.H.'s Maintenance Kit (#30-50010) , sold separately) apply a very small amount to all axle points as shown.

Your gearbox is properly greased at the factory and probably never needs service however, if you run excessive hours pulling heavy loads, it's a good idea to re-grease the gearbox using M.T.H. gear grease or equivalent. You can remove the gear box cover by releasing one of the end locking tabs using a small flatblade screwdriver.



# Removing the Body

- You must first remove the front locomotive coupler in order to pull the body off of the chassis.
- Remove the screw shown below
- Then slightly pull the body outward of engine in order to slide the body off.



# Learn More About Your M.T.H. HO Locomotive

## Features and Operation

### Conventional Operation Jumpers

Your MTH DCC Ready engine has pre-installed jumpers that allow for out-of-the-box operation. However, you can remove these jumpers to change the lighting to your liking. You can shut off the Number Board Lights by removing the jumper on the engine's circuit board. Please refer to Removing Jumpers in the DCC Operation section of this manual.

It is important to note that there two sets of jumpers that route track power to your engine's motor. These must be installed when operating in Conventional DC mode.

Your MTH DCC Ready engine already has the jumpers installed at the factory so all you have to do is set it on the rails, apply DC power and away you go.

## Modes of Operation

### Analog DC

This is when there is nothing connected to the rails except a conventional DC power pack. These power packs generally have at least one variable output controlled by a throttle of some sort and a means of reversing DC polarity on the track to change the direction of your engine.

### DCC

The user connects their DCC decoder of choice to the MTH DCC Ready board's 8-pin header following the DCC decoder's manufacturer's instructions.

### Analog DC

Not much explanation is required here, and that's exactly why you run your trains this way! Here's the good news, even if you like to keep it simple, your MTH HO engine is outfitted with lights, features, that you're going to love.

## Lighting

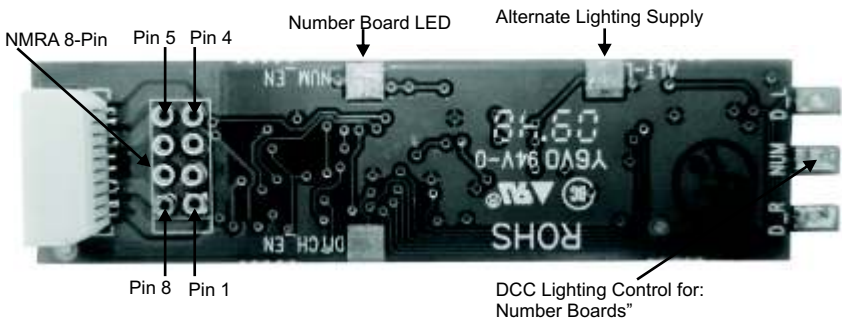
Your model is equipped with a headlight, operating ditch lights, and number board lights. In analog DC mode, lighting operation is fully automatic.

### Alternate Lighting Supply Jumper

This exists on your MTH board in case you have a DCC decoder that doesn't have an appropriate lighting supply line. Most all current DCC decoders have a lighting supply line so in most cases you won't need this jumper installed. If you have programmed your DCC decoder correctly and you still have no lights then you will need to install this jumper. Again, this is why it is recommended that you operate the model with the body off after installation of any DCC decoder.

### DCC Lighting Control Tabs

These tabs provide wiring locations for DCC Decoders that have extra F functions available. The tabs are labeled on the board - NUM = Number Board.



## To install your DCC decoder:

**Step 1:** Remove the engine's body. (See page 9)

**Step 2:** Remove the Alternate Lighting Supply jumper removal reference

- Number Board
- Alternate Lighting Supply
- NMRA Header (both jumpers)

**Step 3:** Connect your DCC decoder to the 8-pin NMRA header on your MTH engine board. Follow your DCC decoder's manufacturer's instructions carefully

***NOTE – If your DCC decoder has the extra F – Functions (and wires) available you can connect the DCC decoder board to the 3 tabs at the end of the board to control Ditch lights and Number Board lights***

If your DCC decoder has only a headlight and a taillight available and you want to keep your number board lights active, leave the pad jumpers installed for Number Board on your MTH board. The tabs on the end of the MTH board are available for you to wire your DCC Decoder's function control lines to them to allow control of the Number Board lights. For example, if you want your DCC Decoder to control the Number Board lights and you have the function control line to do so, remove the Number Board pad jumper then wire the control line from your DCC Decoder to the NUM pad on the MTH board.

To mount your DCC Decoder to the MTH board it is recommended that you use double-sided tape and ensure your DCC decoder board doesn't touch your MTH board (keep the two boards insulated from one another). There is quite a bit of room available inside your model so for most DCC decoders you will find it easy to mount them

**Step 4:** If you are connecting the extra lighting function wires from the note above then simply slide the plastic wire clip off the tab on the MTH board and insert the wire then slide the clip back on. This provides a secure, yet, quick and easy way to connect the added function wires from your DCC decoder using the existing LED's on your MTH engine.

If you are adding a 28mm speaker and want to utilize one or more of the existing cut-outs in your MTH engine's fuel tank you will most likely need to desolder the wires from the speaker in order to get them fished down through the model. To continue please go to Step 5:

**Step 5:** On each side of the fuel tank are clips. Gently slip an X-acto blade on the clip and gently pry it up. Repeat on the other end of the tank. The fuel tank details will come apart in two halves

**Step 6:** Pick up one of both of the speaker surrounds and remove the backing. You will notice that there is a cut-out for the speaker wire to go through as well as each speaker enclosure has a key to ensure you install it back into the correct orientation

**Step 7:** Slide the wires for the speaker down past the motor and ensure they do not come into contact with the motor shaft or flywheel

**Step 8:** Run the wires through the opening in the back plate of the speaker enclosure and solder them back onto the speaker

**Step 9:** Set the speaker enclosure back in place and re-install the fuel tank detail halves. They snap together very easily

**Step 10:** Place the engine back on the track with the engine's body still removed

**Step 11:** Apply DCC power to the rails and follow your DCC decoder's manufacturer's instruction for operation. You want to ensure you have the wiring correct and not shorting to anything on the chassis or the MTH board. This is particularly true if you have wired in a speaker and ran the speaker wires from the fuel tank up past the motor

If you have successful operation of your DCC decoder then you can proceed to the next step:

**Step 12:** Re-install the engine's body and ensure that it is clipped fully onto the chassis. You should be able to pick up your model by the body if it's been installed properly

**Step 13:** Re-install the handrails

# Engine Specifications

Electrical	Input Voltage	0 - 18 VDC
	Current Draw ( lights, sounds)	~100 – 300 mA unloaded)
	Lighting	LED - Rule 17
Operating Modes	Analog DC	Yes
	DCC - Digital Command Control (with user installed DCC Decoder)	Yes
	DCS - Digital Control System	No
Default Addresses	DCS	N/A
	DCC short	N/A
	DCC extended	N/A

## US PATENTS

US 6,457,681	Oct. 2, 2002
US 6,619,594	Sept. 16, 2003
US 6,655,640	Dec. 2, 2003

# HO Troubleshooting Guide

The following Guide will help you trouble shoot your M.T.H. HO engine.

## Analog DC

<b>Start Up</b>	<b>Solution</b>
When I apply power to the track my engine doesn't do anything. No lights, no movement, no nothing.	Check to see if that section of track has power. Use a voltmeter or a lit passenger car.
	Slide the engine a couple of feet in either direction, you may have a bad track section
	Have you got that section electrically isolated with a toggle switch or other device?

## DCC

<b>Lights</b>	<b>Solution</b>
The Number Board lights are not controllable from DCC	Check that you have removed the jumpers for the Number Board lights.
<b>Motion</b>	<b>Solution</b>
Motor spins at track voltage	Check that you have removed the NMRA header jumper (both jumpers)

<b>Lights</b>	<b>Solution</b>
No Number Board lights are on	Check that the appropriate jumpers are installed. Remember - the jumpers must be installed in Analog DC for the Number Board lights to be active
<b>Motion</b>	<b>Solution</b>
No movement of the engine when track power is applied	Check that the NMRA header jumpers are installed. You must jump pin 1 to pin 8 and also pin 4 to pin 5

# Service & Warranty Information

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

When you suspect an item is defective, please check the operator's manual for standard operation and troubleshooting techniques that may correct the problem. Additional information may be found on the M.T.H. Website. Should you still require service, follow the instructions below to obtain warranty service.

First, e-mail, write, call or fax a M.T.H. Authorized Service Center (ASC) in your area to obtain Repair Authorization. You can find the list of ASCs on the M.T.H. Website, [www.mth-railking.com](http://www.mth-railking.com). Authorized Service Centers are required to make warranty repairs on items sold *only* from that store; all other repairs may - or may not be done at the store's own discretion. If you did not purchase the item directly from the ASC, you will need to select a National Authorized Service Center (NASC). These centers are compensated by M.T.H. to perform warranty service for any customer whose repair qualifies for warranty service. A list of NASC retailers can be located on the M.T.H. Website or by calling 410-381-2580. Should the warranty no longer apply, you may choose either an ASC or NASC retailer to service your M.T.H. Product. A reasonable service fee will be charged.

**CAUTION:** Make sure the product is packed in its original factory packaging including its foam and plastic wrapping material to prevent damage to the merchandise. There is no need to return the entire set if *only one* of the components is in need of repair *unless otherwise instructed by the Service Center*. **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 (if required by the service center, 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 a service technician when contacting the Service Center for your Return Authorization.**

Please make sure you have followed the instructions carefully before returning any merchandise for service. Authorized M.T.H. Service Centers are independently owned and operated and are not agents or representatives of M.T.H. Electric Trains. M.T.H. assumes no responsibility, financial or otherwise, for material left in their possession, or work done, by privately owned M.T.H. Authorized Service Centers. If you need assistance at any time email MTH Service at [service@mth-railking.com](mailto:service@mth-railking.com), or call 410 381-2580.

## Limited One-Year Warranty

All M.T.H. products purchased from an Authorized M.T.H. Retailer are covered by this warranty. See our Website [www.mthtrains.com](http://www.mthtrains.com) to identify an M.T.H. Retailer near you.

M.T.H. products are warrantied for one year from the date of purchase against defects in material or workmanship, excluding wear items such as light bulbs, pick-up rollers, batteries, smoke unit wicks, and traction tires. We will repair, replace, or credit (at our option) the defective part without charge for the parts or labor, if the item is returned to an M.T.H. Authorized Service Center (ASC) or M.T.H. National Authorized Service Center (NASC) 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. If you are sending this product to an Authorized Service Center, contact that Center for their return authorization.

This warranty gives you specific legal rights, and you may have other rights that vary from state to state. Specific questions regarding the warranty may be forwarded to M.T.H. Directly.

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