



## END OF TRAIN (EOT) DEVICE

### INSTRUCTION MANUAL

Thank you for purchasing this End of Train Device by Ring Engineering. We take pride in detail, accuracy, and reliability of the products that we produce and hope you find this EOT device to be a great addition to your model train.

Please read all warnings and instructions before installation and use. For the latest information from Ring Engineering, please visit us on the web at [www.RingEngineering.com](http://www.RingEngineering.com).

*INSTALLATION INSTRUCTIONS CAN BE FOUND ON THE REVERSE SIDE OF THIS SHEET.*

### 1.0 WARNINGS

» This product contains small parts and is not recommended for persons under the age of FOURTEEN (14).

» Maximum Voltage: 24 Volts - Operates with most HO Scale digital (DCC) and analog systems.

» If insulation on wires or circuit board is damaged, or wires are broken, discontinue use and return to Ring Engineering, Inc. for repair.

» This product contains a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm).

### 2.0 Description

The "real world" end of train device was originally produced to relay brake pipe pressure from the rear end of a train to the locomotive cab by means of RF (radio frequency) communication. The RF was transmitted through the antenna on top of the EOT device. Train operations personnel located in the caboose of the train used to do this by watching a pressure gauge and relaying the information to the locomotive engineer by means of a hand held radio.

During normal charging of the air brake system, it can take up to 1 hour plus to charge a 100 car train to full operating pressure. The pressure at the front end of the train can vary greatly from the back end of the train, particularly during charging of the air brake system. The EOT device allows the locomotive engineer to receive this very important air brake system status information in the locomotive cab. The EOT device has therefore made the need for the caboose a thing of the past.

This EOT device product has been developed to replicate one of the actual devices used in real world railroad service. From its looks and scale accuracy right down to the accurate flash duration and flash rate of the red light, this HO scale device is as prototypically correct as they get.

### 3.0 Operation

#### 3.1 ANALOG OPERATION

When operating the EOT device on an analog powered track, the unit will flash only when the voltage on the track is high enough to activate the electronic circuit. This activation voltage is quite low and will normally activate the EOT device before a locomotive will begin to roll. The EOT device "WILL NOT" continue to flash when the analog voltage is turned "OFF", as when stopping your train.

#### 3.2 DIGITAL (DCC) OPERATION

When operating the EOT device on a digital (DCC) powered track, the unit will flash continuously, as long as the DCC track has power.

#### 3.3 RECOMMENDED PRACTICE

It is recommended that any power supply used to power our End of Train Device be plugged into a surge suppressor. Surge suppressors can keep voltage spikes from the power line from damaging the End of Train Device. A surge suppressor may prevent voltage spikes from damaging many other electronic devices used on your model railroad layout also.

#### 4.0 Maintenance

The wheels on the EOT truck will need to be cleaned about as often as you would clean the wheels on your locomotive(s) to ensure good performance. Use a cotton swab with wheel cleaner to clean the wheels for best results. Make sure any remaining cotton swab "fuzz" is removed from the wheels and axles before returning to operation.

After every 100 hours of operation or twice per year, a small amount of 30W motor oil should be applied to each of the four bushings on the truck. A toothpick or similar device can be dipped in the oil and used to apply the oil to each axle bushing. Before applying oil, remove all debris such as carpet fibers, hair, or anything else that may have wound around the axles from normal use. **The axles have been factory assembled and should not be taken apart. Damage to the device can result.**

*Note: The unit comes pre-oiled from the factory and will not need to be oiled for 100 continuous hours of operation.*

Clean track is important to reliable operation of any model train. It is also important to the reliable operation of this EOT device. If the EOT device operates intermittently, cleaning of the track may be required.

#### 5.0 Troubleshooting and Installation Check List

» VERIFY ALL FOUR (4) WHEELS OF THE EOT TRUCK ARE CONTACTING THE TRACK. If the truck does not rest squarely on the track, poor electrical contact and poor performance will result.

» Make sure truck rotates freely. If the truck does not rotate freely, loosen the mounting screw that attaches the truck to the car body.

» Verify that all wheels on the car are the same size as those on the EOT truck. If all wheel sizes are not the same, poor contact with the track may result. For example, if you are using the EOT with 36-inch scale wheels be sure the front truck also has 36-inch scale wheels.

» If the car body or bottom of the car is metal (electrically conductive), make sure that the tops of the wheels do not touch the bottom of the car. This will result in a short circuit and prevent the EOT from flashing and locomotives from running.

» Check to see that the wheels of the EOT truck are free from contacting the under frame of the car when going through the tightest turn on your layout. Under frame contact will typically cause poor operation in curves.

» Remember, if operating the EOT device on an analog powered track, the EOT will not flash until the throttle is approximately 25% or greater.

#### 6.0 Limited One Year Warranty

Ring Engineering, Inc. (Ring Engineering) warrants that for a period of one year from the date of purchase, this product will be free from defects in material and workmanship. Ring Engineering, at its option, will repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with new or remanufactured product or component. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty.

This warranty is valid for the original retail purchaser from the date of initial retail purchase and is not transferable. Ring Engineering dealers, distributors, or retail stores selling Ring Engineering products do not have the right to alter, modify, or any way change the terms and conditions of this warranty.

The warranty does not cover normal wear of parts or damage resulting from negligent misuse of the product. Further, the warranty does not cover Acts of God, such as fire, flood, hurricanes, and tornadoes.

Ring Engineering shall not be liable for any incidental or consequential damages caused by the breach of any express or implied warranty or condition. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose is limited in duration to the duration of the above warranty. Ring Engineering disclaims all other warranties or conditions, express or implied statutory or otherwise. Some states or jurisdictions do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

#### How to Obtain Warranty Service

Send the product with a copy of the original sales receipt included by UPS or Parcel Post with insurance prepaid to:

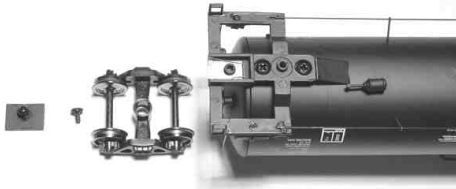
Ring Engineering, Inc.  
228 W. Lincoln Hwy. #167  
Scherverville, IN 46375

Make certain that your End of Train Device is properly packed to avoid damage in transit to the factory. Please allow four to six weeks for service. Please also make sure to include return and contact information (Your name, address, phone number and e-mail address if you have one).

If your End of Train Device is not covered by warranty, or has been damaged, an estimate of repair costs or replacement costs will be provided to you for approval prior to servicing or replacement.

# Installation Instructions

## Step 1



Remove a truck and coupler.

**Note:** Keep the coupler centering spring plate to use with the End of Train Device.

## Step 3



The circuit board can now be flipped out of the way to expose the mounting screw hole.

## Step 6

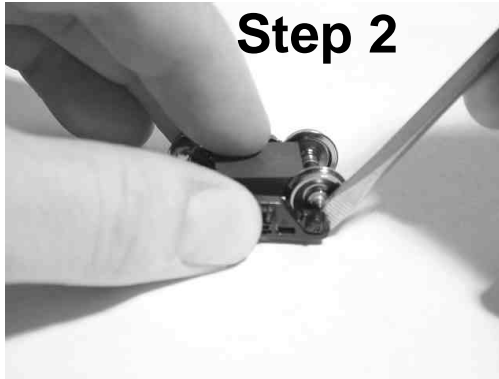


Swing circuit board into position.

**Tip!** If the wire length needs to be shorter, add a few twists to the wire. Untwist wire to lengthen.

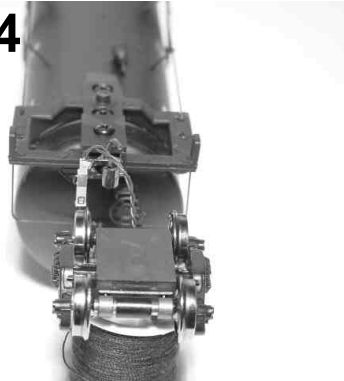
**IMPORTANT:** When finished, be sure wire is not rubbing on the axle and the wire does not drag when going over turnouts!

## Step 2



Use 1/8 inch Flat Blade Screw Driver and free axle farthest from EOT. **Important:** See next picture. Gently, pry each side frame out just far enough to free the axle from the side frame pocket.

## Step 4



Support Truck assembly and install coupler to train car.

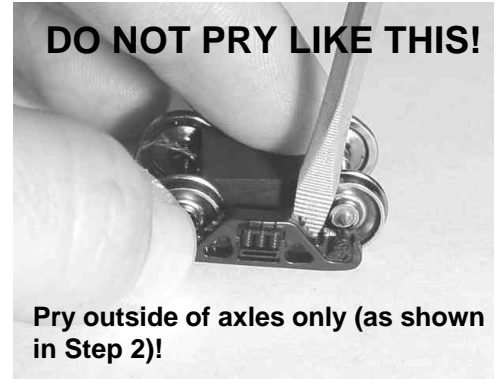
**Note:** We used a spool of thread to support the Truck (any object about the size of a spool of thread will do).

## Step 7



Use 1/8 inch Flat Blade Screw Driver and gently pry each side frame out just far enough to re-insert the axle into the side frame pockets. See caution from Step 2.

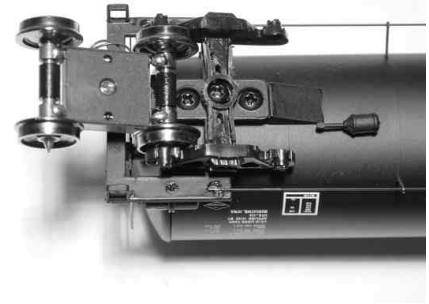
**DO NOT PRY LIKE THIS!**



Pry outside of axles only (as shown in Step 2)!

**CAUTION:** The axles are attached to the circuit board by a light gauge wire that can be damaged if care is not taken during this step and step 7. Physical damage will be considered abuse and will not be covered under the limited warranty!

## Step 5



Attach Truck to Train Car with Screw.

## Step 8



Position wire as shown.



**Ready To Roll!**