

## Lubricating the Pickup Rollers (Figure 1, #5)

Apply a small drop of oil at the axles of the pickup rollers. Wipe away excess oil with a cotton swab. The rolling surface should be free from oil.

## LUBRICATING THE TENDER

### Every 5 Hours

1. Add a single drop of motor oil to all twelve wheels, at the axle.
2. Apply a small drop of oil at the axles of the pickup rollers. Wipe away excess oil with a cotton swab. The rolling surface should remain free of oil.

## 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 MTH Electric Trains 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 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.



## 400E LOCOMOTIVE TRADITIONAL VERSION OPERATING INSTRUCTIONS



The MTH 400E is a replica of the 400E standard gauge locomotive. This locomotive runs on standard gauge three rail track and runs on 14 to 20 volts (AC) Alternating Current.

### OPERATING VOLTAGE

The 400E locomotive runs on 14 to 20 volts (AC) alternating current. The mechanical whistle requires a minimum of 14 volts for proper operation.

### MECHANICAL REVERSING UNIT

The locomotive is stopped, started and reversed by means of the reversing 'E-Unit' located inside the locomotive. The E-Unit is a three position sequence relay which cycles whenever current to the

locomotive is interrupted. This can be done by operating the 'direction' control on the transformer, or by moving the transformer voltage control to the OFF position. The sequence of its operation is Forward, Neutral, Reverse, Neutral, etc. In other words, if the locomotive is in forward motion, operate the 'Direction' control once to stop it, and twice to reverse it.

If you want to operate the train in one direction only, which is necessary if you have automatic stations or Insulated blocks in your layout, you must 'lock-out' the E-Unit. Make sure the locomotive is moving in the desired direction then stop it. Now, move the E-Unit lever to its OFF position or toward the left side of the locomotive. To access the reversing lever (Figure 1, #8) remove the locomotive from the track (holding the locomotive in your hand), then move the E-Unit lever to OFF. If the E-Unit is 'locked out' while it is in the Neutral position, the locomotive will not run at all. Also, because the E-Unit works partially by gravity, it will not operate properly if the locomotive is held on its side or upside down.

## LUBRICATING THE LOCOMOTIVE

Use motor oil (10W-40 or 10W-30) for lubrication. Apply oil sparingly using a toothpick or similar applicator. Before beginning please be sure to have several toothpicks and cotton swabs to apply oil and clean up excess spills. Familiarize yourself with the location of the oiling points before beginning (See Figure 1). Apply oil before operating the locomotive and after every 7 hours of operation.

### Lubricating the Wheel Gears (Figure 1, #1)

Slowly turn the drive wheels by hand and apply oil to the wheel gears until all teeth on all four gears are moist. Wipe away excess oil using a cotton swab.

### Lubricating the Intermediate Gears (Figure 1, #2)

Slowly turn the drive wheels by hand and oil the six intermediate gears until all gear teeth are moist. Note: Four gears are double gears: both sets of teeth should be oiled. Wipe away excess oil with a cotton swab.

### Lubricating the Ends of the Armature Shafts (Figure 1, #3)

On the geared end of the armature shafts place a single drop of oil at the point where the shafts just protrude through the bearings.

On the other end of the shafts place a single drop of oil where the shafts extend through the insulating plate between the brass brush holders. Do not put oil on the brush holders. Wipe away any excess oil with a cotton swab.

### Lubricating the Drive Axles (Figure 1, #4)

Position one end of the locomotive downward so that you can see one of the drive axles on each motor. Using a toothpick or length of wire, carefully apply two drops of oil to the axles at all four bronze bearings.

Now turn the locomotive around with the other end downward so that you can see the other two axles. Carefully apply two drops of oil on the axles at the bronze bearings.

### Lubricating the Side Rods (Figure 1, #5)

Apply a drop of oil at each of the screws which attach the side rods to the drive wheels. Wipe away excess oil with a cotton swab.

### Lubricating The Leading and Trailing Trucks (Figure 1, #6)

Apply a drop of oil to the axle holes and to each of the side axle bushings in the leading and trailing trucks. Wipe away excess oil with a cotton swab.

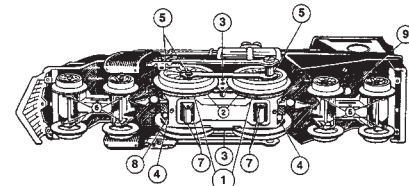


Figure 1: Lubricating The 400E