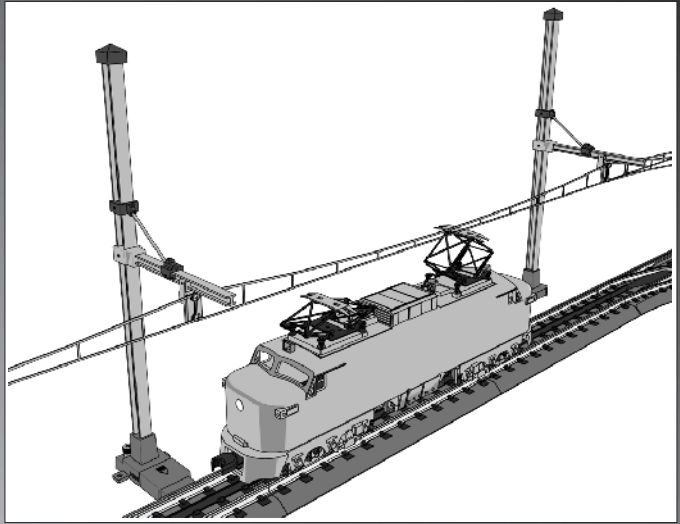




**M.T.H.**  
ELECTRIC TRAINS®

7020 Columbia Gateway Drive  
Columbia, MD 21046-1532

[www.mth-railking.com](http://www.mth-railking.com)



The RealTrax® Catenary System is designed to enhance the realism of electric locomotives. Your M.T.H. GG-1, Cascade, or other electrics will look far more realistic when its pantographs are contacting the overhead wire. For even more authenticity, you can power the catenary and run your engines via the overhead wires rather than the center rail.

The enclosed instructions and guidelines will tell you how to connect and power the catenary and give suggestions how you can make it fit your own layout for the best effect.

# 4 - Piece Catenary System

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

**Not recommended for children under 10 years of age. M.T.H.<sup>®</sup> recommends adult supervision with children ages 10 - 16. As with all electric products, precautions should be observed during handling and use to reduce the risk of electric shock.**

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

Read this manual thoroughly before using this device.

M.T.H.<sup>®</sup> recommends that all users and persons supervising use examine the catenary and its wiring periodically for conditions that may result in the risk of fire, electric shock, or injury to persons. In the event such conditions exist, the catenary should not be used until properly repaired.

This catenary system is intended for indoor use. Do not use if water is present. Serious injury or fatality may result.

Do not use this system for other than its intended purpose.

**As with all electrical appliances, the catenary system should not be left turned on when unattended.**

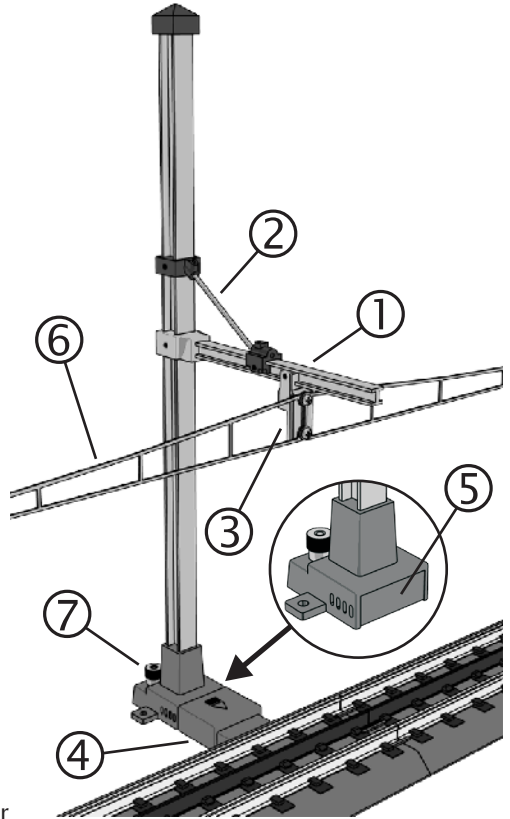
## Included in this Set

- 1 Power Pole with Removable Lock-on
- 1 Power Pole Lock-on Cover
- 3 Non-Power Poles
- 4 20" Messenger Wires
- 1 Messenger Adjustable Expander Plate with Screws, Star Lock-Washers, and Nuts
- 1 Messenger Extension Plate with Screws, Star Lock-Washers, and Nuts
- 8 Pole Base Mounting Screws

*If you need additional equipment, we also supply an 8-piece Catenary System with 1 power pole, 7 non-power poles, 8 messenger Wires, 1 messenger extension plate (Item No. 40-1035) and a Catenary Hardware Pack with 4 adjustable messenger expander plates and 4 messenger extension plates (Item No. 40-1039) to help you custom-fit your layout.*

## Diagram of Parts

- 1. Messenger Arm
- 2. Messenger Arm Support
- 3. Messenger Brace
- 4. Removable Lock-on
- 5. Power Pole Lock-on Cover
- 6. Messenger Wire
- 7. Thumbscrews



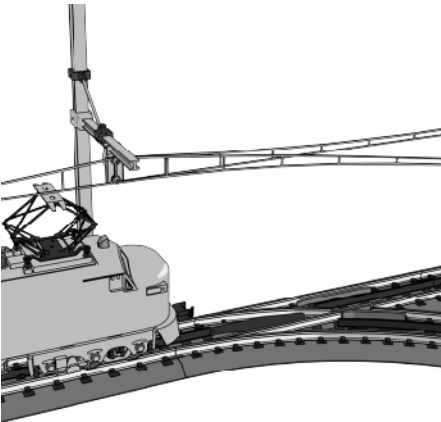
## Tools Needed

- 3/32" or 2.4mm Flat Blade Screwdriver
- #0 #4 and #1 Phillips Screwdriver
- wire strippers
- tape measure / ruler
- pencil if needed for layout of catenary support poles

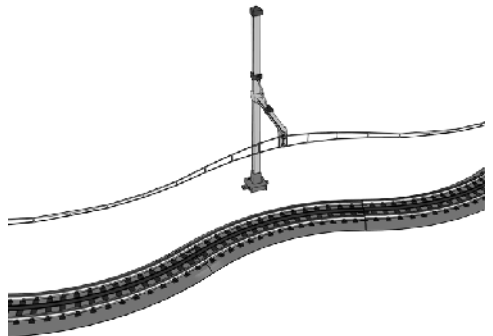
## Guidelines for Fitting to a Layout

While the catenary system is easy to assemble and adjust, you will need to determine for yourself how it will best fit your layout and engines. **Because there are so many variations in layouts and engines, it is impossible for us to give detailed plan measurements**, but we do have some rules of thumb that will make outfitting your layout with the catenary system much easier. Below are some guidelines to consider before you begin to install the system.

- **PLAN, PLAN, PLAN.** Draw, measure, and plan the installation carefully before you do any of the actual work. You do not want to get partway through the installation and realize you mis-measured and something won't work.
- Test small sections with an engine as you install the system, to be sure the pantograph maintains contact to the messenger wires around the layout. It is easier to make adjustments as you go rather than to fix them later. Different electric locomotives, with different lengths and pantograph heights, will fit the system differently. Be sure to test and adjust using the engine(s) that will get the most use on the loop of track you are fitting with the catenary. **Patience at this stage in the work will pay off.**
- Because switches are the trickiest parts of the layout to fit with the catenary system, it is best to start installing the system from your layout's switches. You should locate a pole at the base of a switch, so that the two messenger wires diverge a few inches prior to the switch points. (Because switches of different curvature radii will cause pantographs to track under messenger wires differently, you will have to fine-tune the exact location of the catenary pole and messenger brace that supports the diverging messenger wires above a track switch). Bend the messenger wire into whatever shape necessary to follow the curve of the track.

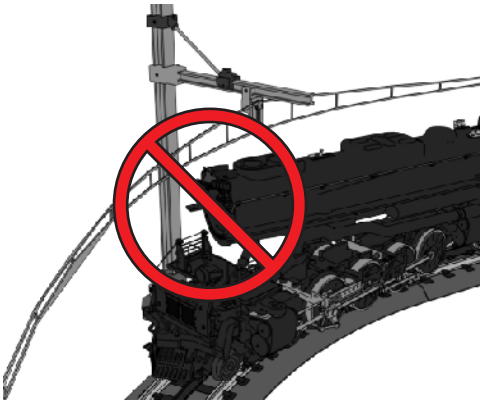


*Pole at the base of the switch*

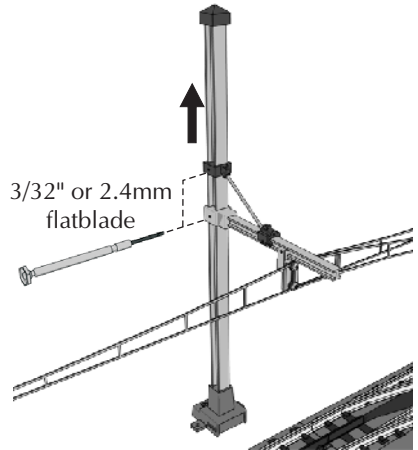


*Bent messenger wires to follow the track*

- Be sure to connect the power pole to a straight section of track to avoid potential overhang problems as a large engine or car rounds a curve. If you plan to continue to run via track power exclusively, you can remove the lock-on and treat that pole like all the non-power poles. If there is no favorable location for straight track connection to your RealTrax layout, remove the lock-on section from the catenary pole and apply power via thumbscrews.



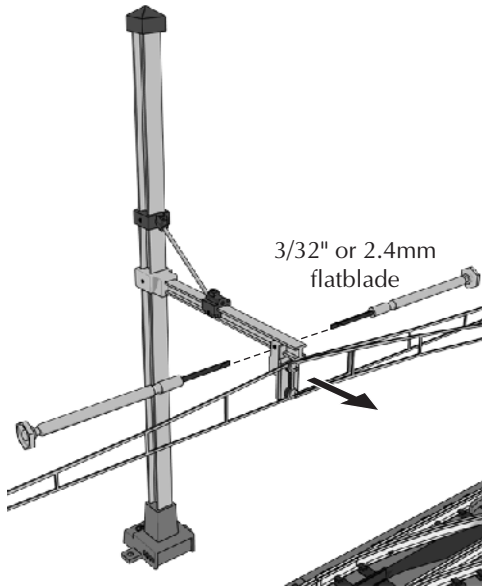
*Engines with large over hang cause problems with poles mounted on curves.*



*Adjust the messenger arm height by turning the screws shown with a 2.4mm screwdriver.*

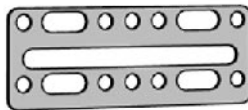
- As often as possible, place the poles on the inside of a curve, to lessen overhang problems. Before you screw the poles down, check for overhang clearance using the engine and cars with the greatest amount of overhang/undercut that will run on that loop of track.
- The messenger arm can be raised and lowered on the pole, according to the heights of the pantographs on the engines you run. When you begin installation, you might find it most effective to affix the poles to the table first, then adjust the messenger arm height with your engines on the track. Be sure that the messenger wire pushes down slightly on the pantograph to ensure a good, steady contact. If the messenger wire is too low; however, the increased tension in the pantograph springs may cause more rapid wear on the pantograph contact.

- The metal messenger wires should be bent to help them follow the curves of your layout, and the messenger brace can be adjusted on the messenger arm, from the end to the point where it meets the arm support, to help align the overhead wires with the track. Position your non-power poles far enough from the track to allow you to adjust the messenger brace in either direction as needed for smooth operation.



*Adjust the messenger brace by turning the screws shown with a 3/32" or 2.5mm flatblade screw driver.*

- Use the enclosed messenger extension plate to help extend the reach of a messenger wire slightly if you find yourself just short of reaching a span you need to cover.



*Messenger extension plate.*

# Set-Up

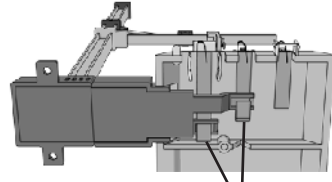
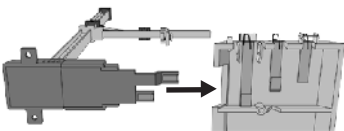
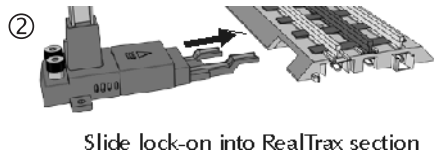
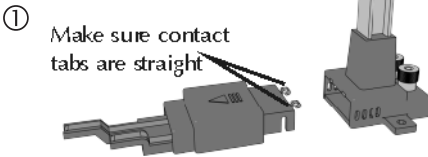
Once you have carefully planned the location of the power and non-power poles, you can begin installation.

## Powering the layout:

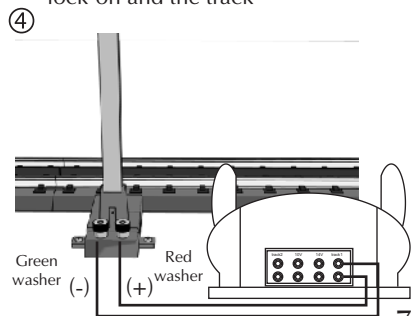
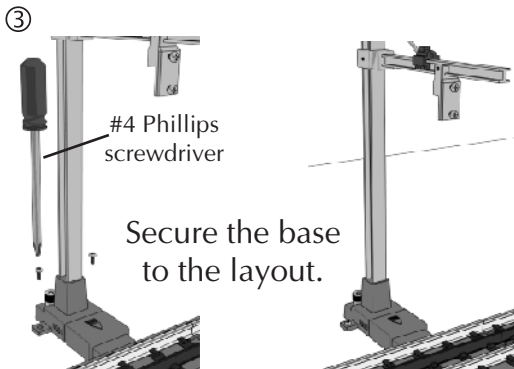
There are three ways you can use the power pole to power engines via the catenary system.

1. To use the power pole and its lock-on connection to power RealTrax as well as the catenary:

- Check the lock-on portion of the base to make sure the small metal hooks in the back are seated at the top of the lock-on (not bent down), then slide the back of the lock-on into the pole base. Push it in firmly for good contact.
- Slide the lock-on (attached to the base) firmly into a knock-out on the RealTrax track section (straight section recommended), ensuring it is making good electrical contact with the track.
- Screw the base into place on your layout.
- Connect the red wire from the transformer (+) terminal to the post under the thumbscrew with the red washer and the black wire from the transformer (-) terminal to the post under the thumbscrew with the green washer. Tighten the thumbscrews to hold the wires in place.



Ensure good contact between the lock-on and the track



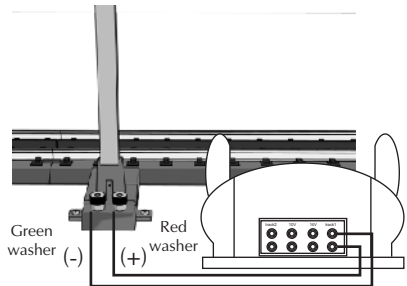
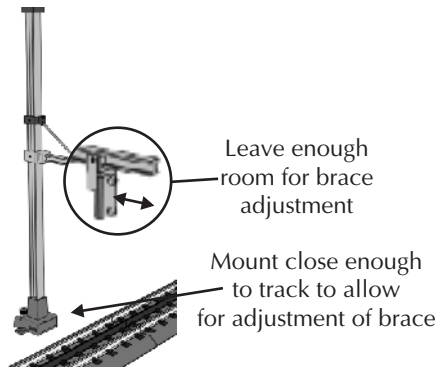
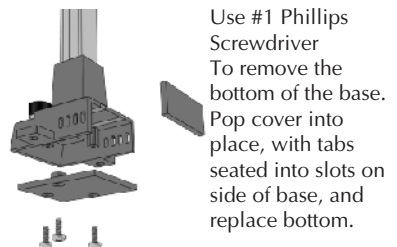
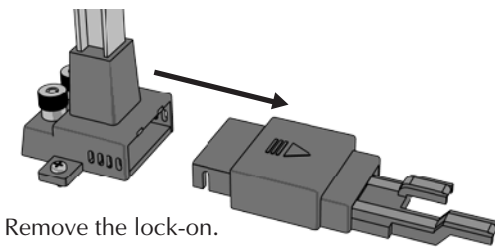
2. To allow the catenary to share existing RealTrax track power from an existing RealTrax lock-on:

- Check the lock-on portion of the base to make sure the small metal hooks in the back are seated at the top of the lock-on (not bent down), then slide the back of the lock-on into the pole base. Push it in firmly for good contact.
- Slide the lock-on (attached to the base) firmly into a knock-out on the RealTrax track section (straight section recommended), ensuring it is making good electrical contact with the track.
- Screw the base into place on the table, but do not wire the thumbscrews.

Refer to Diagrams 1-3 on the previous page.

3. To power the catenary without locking into the track:

- Remove the lock-on from the power base.
- Install the power pole lock-on cover to protect contacts inside the base.
- Make sure you place the pole not so far away from the track that you lose the ability to adjust the messenger brace in either direction, align the pole parallel with the track edge and screw it firmly into place through the brackets on both sides of the base.
- Connect the red wire from the transformer (+) terminal to the post under the thumbscrew with the red washer and the black wire from the transformer (-) terminal to the post under the thumbscrew with the green washer. Tighten the thumbscrews to hold the wires in place. *Note: if track and catenary are both powered, be sure you power them both from the same transformer output.*



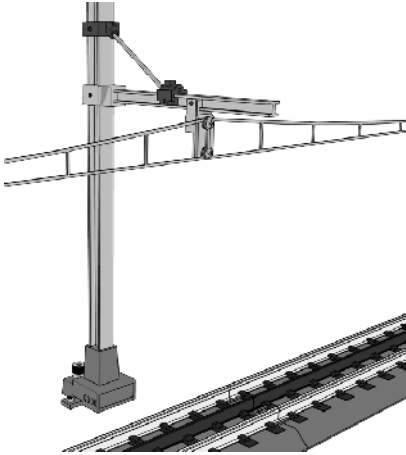


## To affix a non-power pole to your layout:

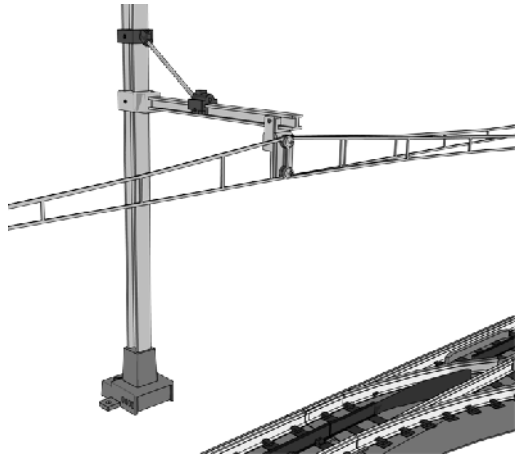
Mount the non-power pole far enough from track to adjust messenger brace in either direction (as shown on the previous page) over track as needed (see "To adjust messenger brace" section below).

You can use the power pole as a non-power pole if you choose. Simply replace the lock-on with the lock-on cover provided and screw the base into the table.

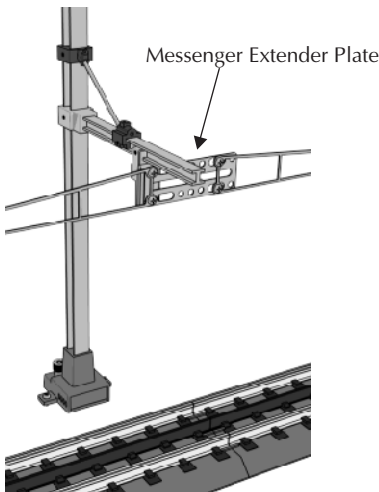
## To attach messenger wire to pole:



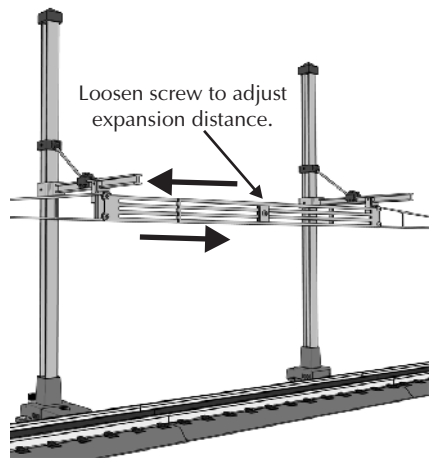
Attach both wires to the brace, then tighten screws.



Attach three wires to the brace to wire a switch.



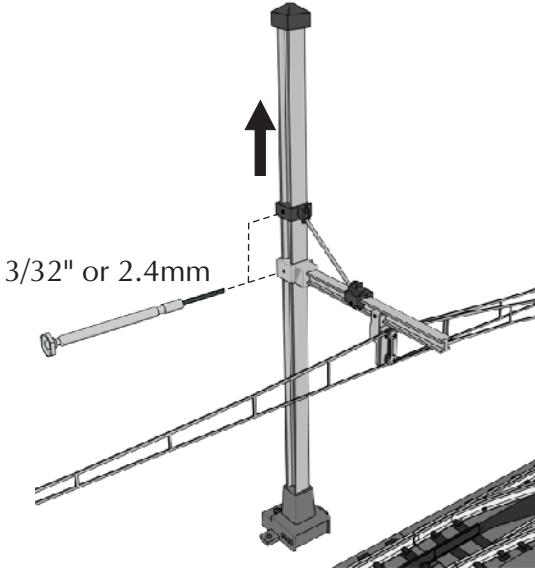
To extend the reach of one of your messenger wires, add a messenger extension plate. Attach one end of the plate to the brace and screw the wire to the appropriate holes in the other end of the plate.



Slide the pieces of the expander plate to make the length fit the span you need to cover, and screw the end holes to the messenger brace.

### To adjust messenger arm height:

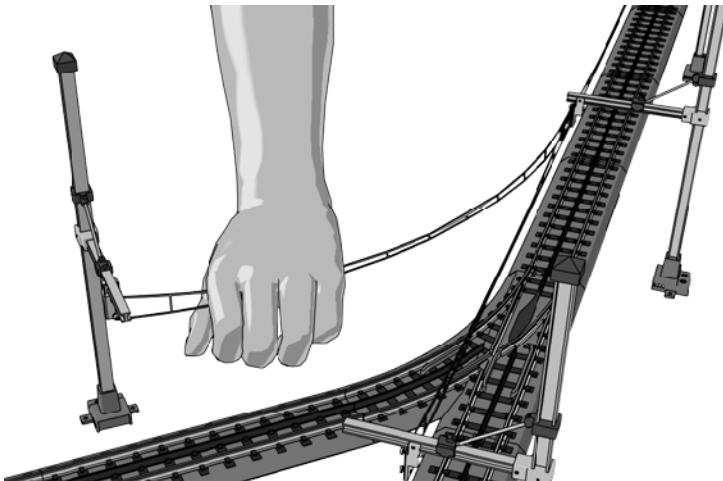
With the pole and wire installed and the engine(s) you will most often run on the track, fix the optimal height of the messenger arm by tightening messenger arm set screw. **Make sure the wires will push down slightly on the pantographs to ensure steady contact.**



*Adjust the messenger arm by turning the screws shown with a 2.4mm screw driver.*

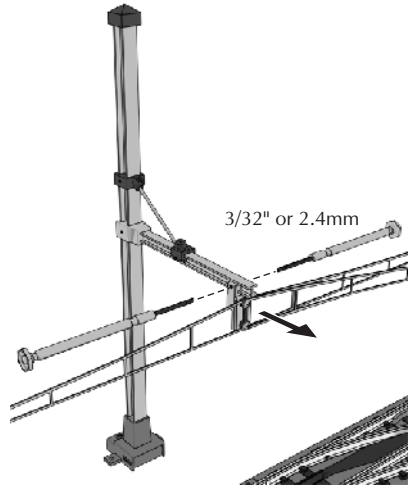
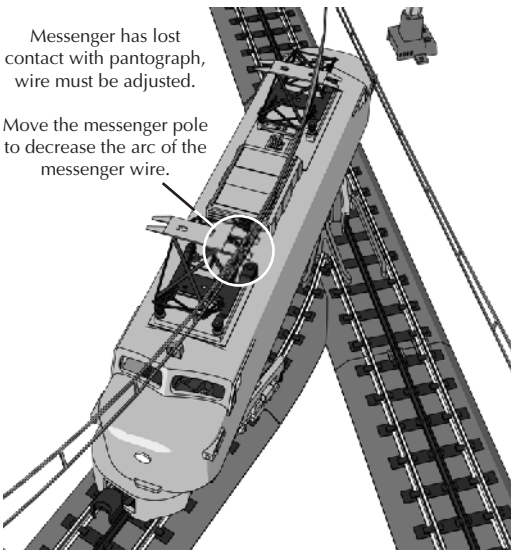
### To shape the messenger wire:

Gently bend the wires to conform to the shape of the track.



## To adjust messenger brace:

- Moving the engine slowly along the track, check to see where the pantograph loses contact with the messenger wire. Be ready to turn the power off quickly if the engine gets hung on a wire.
- In places where the pantograph loses contact with the wire, determine whether the wire is already curved enough to follow your track plan.
- If so, determine which direction and distance the wire needs to move to maintain smooth contact with the engine's pantograph.
- Adjust brace position as shown
- Re-test and repeat as necessary.



Check to make sure messenger wire always has contact with the engine's pantograph's.

Adjust the messenger brace by turning the screws shown with a 2.4mm screw driver.

## Powering the Engine Through the Catenary

If you are using the power lock-on, the catenary system is powered and ready to run your engines. Your engines, however, may need adjustment to prepare them to accept power via their pantographs.

### To connect the pantograph to the positive power circuit of an M.T.H.<sup>®</sup> engine:\*

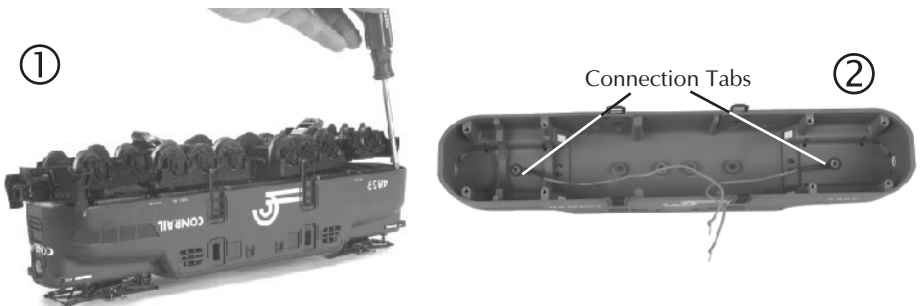
1. Remove the body shell.
2. Locate pantograph connection tabs on inside roof of the shell.
3. Locate wire nut containing leads from pickup rollers to the PCB board.
4. Install wire lead from connection tab at top of shell to wire bundle containing leads from pickup rollers and PCB board. Insulate wired ends from pick-up rollers to prevent a short. You may have to remove the wire nut and trace the wires to the pick-up rollers to be sure you connect the pantograph to the right wires. Re-install wire nut. A wire nut or electrical tape over the exposed wire are ways to do this.
5. Make sure interior wires are not pinched between the shell and chassis. Then re-install the body shell.

There is no need to remove the pick-up rollers.

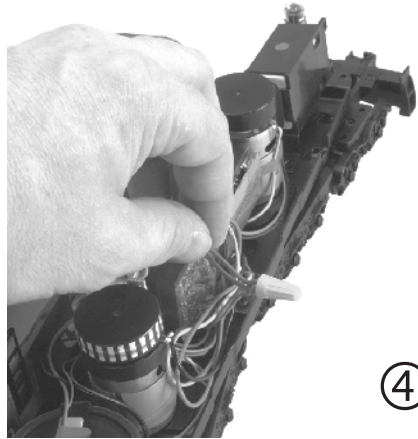
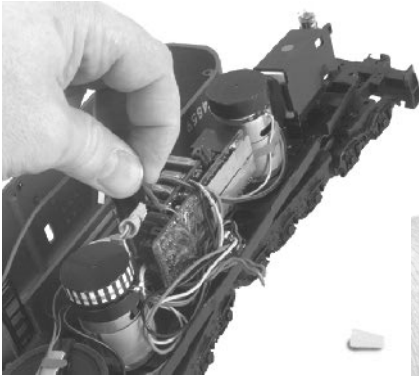
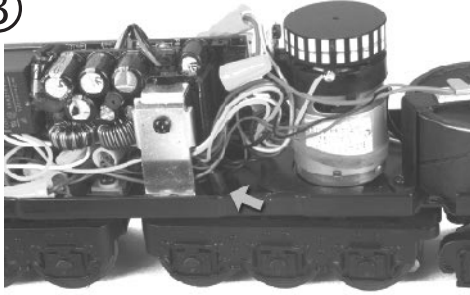
You may find that your engine will negotiate switches more smoothly if you bend the ends of the pantograph down slightly to prevent them from snagging on the converging wires.

Power systems in engines by other manufacturers may vary. Please see their operating instructions.

\*These directions are general. Individual engines may vary, so work carefully as you make this adjustment. If you are uncomfortable doing this job yourself, please contact an Authorized M.T.H. Service Center for assistance (see [www.mth-railking.com](http://www.mth-railking.com) for a list of service centers).



③



④



⑤

# Maintenance

## Cleaning the messenger wires:

With the transformer turned off, occasionally wipe the underside of the messenger wire with a rag and denatured alcohol.

## Troubleshooting

Although this catenary system has been designed and engineered for ease of use, you may have some questions during initial set-up and operation. The following table should answer most questions. If your problem cannot be resolved with this table, contact M.T.H.<sup>®</sup> Fo.r assistance (e-mail: [service@mth-railking.com](mailto:service@mth-railking.com); telephone: 410-381-2580; fax: 410-423-0009; mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532).

Problem	Remedy
There is a short in the system.	Make sure the positive (+) red wire from the transformer is connected properly.
I get intermittent operation.	Check to make sure that all of the screws are tight enough to make solid connections through the pole, out the arm, through the brace, and into the wire. Double check that the pantograph is making full contact with the messenger wire throughout the layout.



# 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. 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.

- First, e-mail, write, call or fax an Authorized M.T.H. Service Center in your area or M.T.H. Electric Trains to obtain Repair Authorization. You can find the list of Authorized Service Centers on the M.T.H. website, [www.mth-railking.com](http://www.mth-railking.com). Otherwise, contact M.T.H. (at e-mail: [service@mth-railking.com](mailto:service@mth-railking.com); 7020 Columbia Gateway Drive, Columbia, MD 21046; tel: 410-381-2580; fax: 410-423-0009), stating when the item was purchased and describing the problem. If you contact M.T.H., you will be given a return authorization number to assure that your merchandise will be properly handled upon its receipt.
- **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, e-mail address (if available), 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 a service technician when contacting the Service Center or M.T.H. for your Return Authorization.**
- Please make sure you have followed the instructions carefully before returning any merchandise for service.

## Limited One-Year Warranty

All M.T.H. ® products purchased from an Authorized M.T.H. Train Merchant are covered by this warranty.

See our web site at [www.mth-railking.com](http://www.mth-railking.com) or call 1.888.640.3700 to identify an Authorized M.T.H. Train Merchant near you.

M.T.H. products are warranted for one year from the date of purchase against defects in material or workmanship, excluding light bulbs and traction tires. We will repair or replace (at our option) the defective part without charge for the parts or labor, if the item is returned to an Authorized M.T.H. Service Center or M.T.H. Electric Trains 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 the item to M.T.H., call 410-381-2580, fax 410-423-0009, or e-mail the Service Department at to obtain a return authorization number. 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.