

SWITCH TENDER®

Micro-Mark® 340 SNYDER AVENUE, BERKELEY HEIGHTS, NJ 07922

This product contains lead, a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

The Switch Tender is a stall-motor switch machine. That means that the motor runs until it throws the track switch; then, it simply stalls, holding the points tightly against the stock rails. A resistor (provided), installed in either one of the motor lead wires, prevents the motor from overheating in the stalled position, even though the electrical power to the motor remains on. To throw the points in the other direction, simply reverse the polarity of the motor connections using an electrical toggle switch (not included...we recommend the Micro-Mark #83257 3PDT Toggle Switch, which will also route power of the proper polarity to the frog of the track switch). Installation of the Switch Tender requires ordinary hand tools, such as a flat tip screwdriver, needle-nose plier, small file, wire nipper and wire stripper; an electric drill with 1/8" and 1/16" diameter bits will make things easy. After you gain a little experience with installation, you should be able to install a Switch Tender in about 5 minutes (It takes longer to read the detailed instructions below than to install the Switch Tender).

Note: Dimensions given in the instructions are intended for HO gauge switches. Adjust them accordingly for your track gauge.

The Switch Tender can be mounted either before (quite simple) or after (a little more work) installation of your track switch. Instructions for both situations follow...

Figure 1 shows the contents of your Switch Tender kit:

- | | |
|--|--------------|
| 1 premium quality motor with integral slow-motion gearhead | 1 brass tube |
| 1 mounting bracket with clamping screw | 1 steel wire |
| 1 mounting screw | 1 brass wire |
| 1 resistor (150 ohm, 1 watt) | 3 wire nuts |

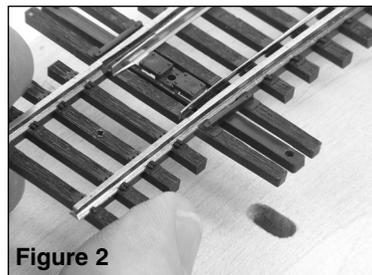
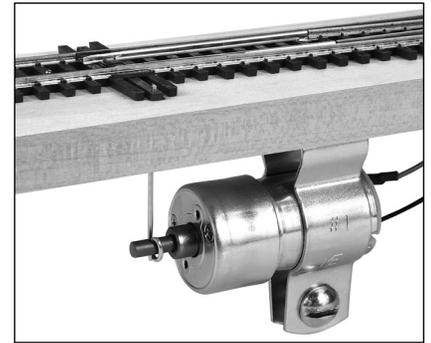


Figure 2

If your track switch has not yet been installed, follow these instructions:

As shown in **Figure 2**, create a slot through the roadbed and/or track support board under the hole in the throwbar of the track switch. Do this by drilling two 1/8" diameter holes about 3/16" apart (for HO gauge track), then cut and file out the space between them. Be careful to leave the hole smooth and splinter-free. Note: For scales larger than HO, make the slot correspondingly longer.

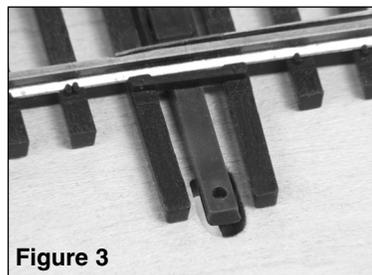


Figure 3

Figure 3 shows the track switch installed with the hole in the throwbar positioned above the slot. Be sure the slot is wide enough to clear the throwbar hole when the track switch is completely thrown in either direction.

On the underside of the track support board, drill a 1/8" diameter x 1/2" deep hole at a distance 1-1/2" to 1-3/4" from the slot. Remove the mounting bracket clamping screw and install the mounting bracket with the mounting screw provided in the kit as shown in **Figure 4**.

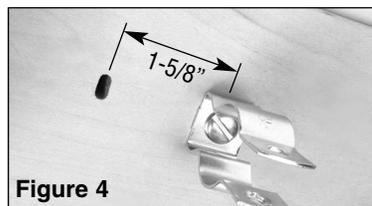


Figure 4

Install the brass wire through the hole in the motor shaft as shown in **Figure 5**. Place the end of the wire through the hole, then tightly wrap it around the motor shaft as shown. It will stay in an upright position with just a small amount of wobble (which is just what we would like to have) and act as the throw rod for the track switch.

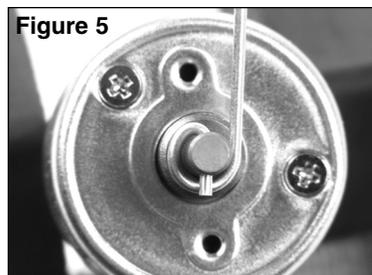


Figure 5

Spread the gap in the mounting bracket, then snap the motor into place in the bracket as shown in **Figure 6**. At the same time, guide the throw rod wire up through the hole in the track switch throw bar as shown in **Figure 7**. Reinstall the clamping screw and adjust the motor position so that the throw rod wire clears all edges of the slot. Trim off excess throw rod wire as shown in **Figure 8** (be careful to leave a little extra so it doesn't slip out of the hole when the switch is thrown).

Skip the next part of the instructions and proceed to: Electrical Hook-Up and Final Adjustment

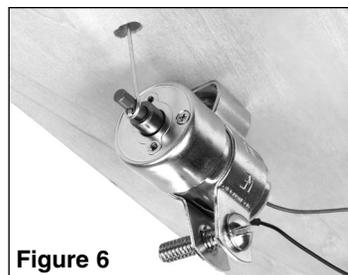


Figure 6

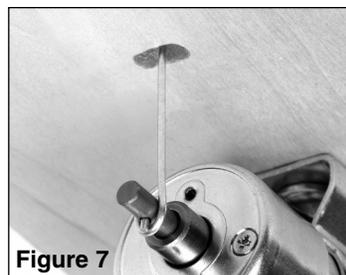


Figure 7

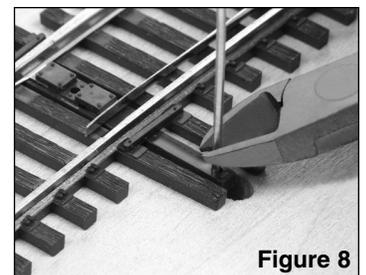


Figure 8

If your track switch has already been installed, follow these instructions:

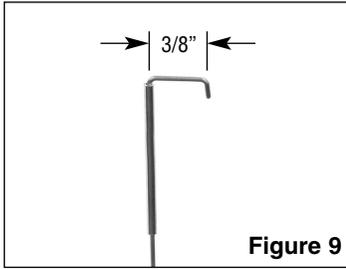


Figure 9

Bend a square hook in the end of the steel wire as shown in **Figure 9**. Slide the long end of the wire through the brass tube.

Drill a 1/16" diameter hole through the track roadbed and base board adjacent to the throw bar hole as shown in **Figure 10**. Space the drilled hole from the throw bar so that the tip of the hook will engage the hole in the throw bar. Install the brass tube in the hole and engage the hook in the throw bar hole. If the hook drags on the roadbed, adjust the height of the brass tube and/or trim the wire before going any further.

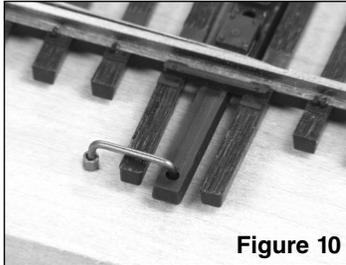


Figure 10

On the lower end of the brass tube, make a right angle bend in the steel wire as shown in **Figure 11** in the direction of the motor. This steel wire will now act as the throw rod crank.

Drill a 1/8" diameter x 1/2" deep hole at a distance 2" from the brass tube in line with the bent steel wire. Remove the mounting bracket clamping screw. Install the mounting bracket with the screw provided as shown in **Figure 12**.

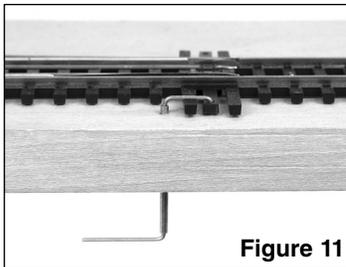


Figure 11

Install the brass wire through the hole in the motor shaft as shown in **Figure 13**. Place the end of the wire through the hole, then wrap it tightly around the motor shaft as shown. It will stay in an upright position with a small amount of wobble.

Make an additional bend in the brass wire so it will engage the steel wire throw rod crank as shown in **Figures 14** and **15**. Install the motor by snapping it into the bracket while engaging the throw bar linkage, and reinstall the clamping screw to hold everything in position. Trim the ends of the throw rod wires as necessary for clear travel.

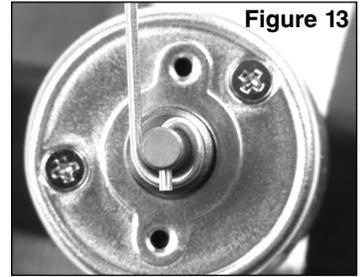


Figure 13

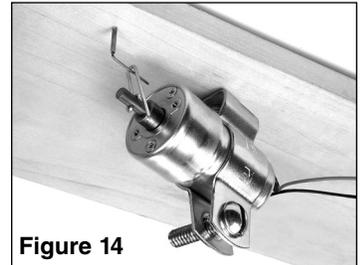


Figure 14

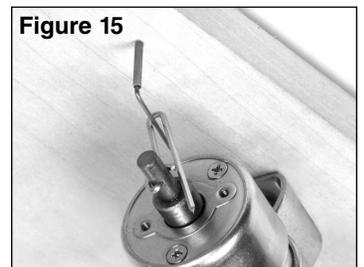


Figure 15

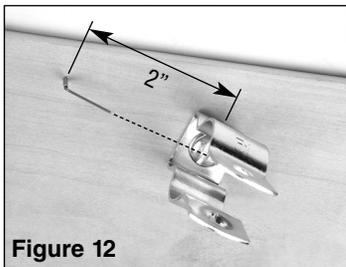


Figure 12

Electrical Hook-Up and Final Adjustment

Connect a resistor to either one of the motor leads using a wire nut as shown in **Figure 16**. Be sure the motor lead is stripped sufficiently long to form a tightly twisted pair with the resistor lead.

Use the remaining two wire nuts to temporarily connect the two wire ends (one from the resistor and one from the motor) to a 12 volt DC supply and adjust the motor position and wire linkage as necessary to obtain a good throw of the track switch points. Tip: If the steel wire throw rod crank (if used) slips out of the brass throw rod, move the motor closer to the crank. Reverse the motor leads, and check operation again. Then connect your final wiring.

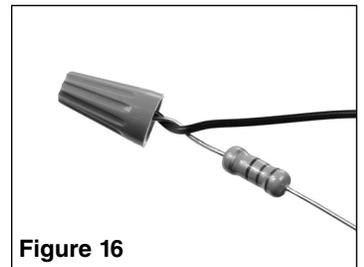
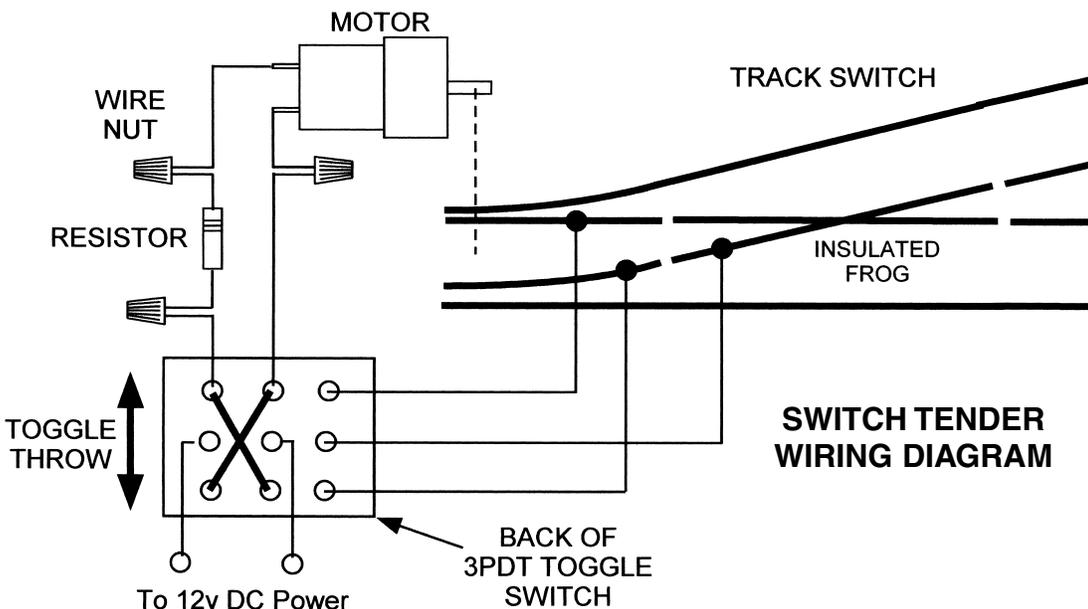


Figure 16



If your turnouts already route power to the frog through the points, do not use the extra contacts on the toggle switch to power the frog. If you have a very many Switch Tenders, use a power supply of sufficient power to handle the load: supply 1 amp for each 16 Switch Tenders.

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