



# PROFESSOR MOTOR CONTROLLERS

## Rotary Brake Pot Installation for “Silver Series” – PMTR2039 / 2040 / 2041

Tools & supplies you will need - pencil type soldering iron with small tip, lighter fluid, Q-tips or similar cotton swabs, 60-40 rosin core solder, Dremel or equivalent rotary tool, 5/16" nut driver / socket, 1/16" Allen wrench, step type drill bit or single 1/4" drill bit, drill motor and small hobby knife or countersink tool (for deburring)

Important notes - It is important that any solder flux residue is removed after soldering with a cotton swab and lighter fluid to prevent corrosion of the circuit board and resulting damage from short circuits. For the same reason, acid core solder and acid flux should never be used on this or any other soldering operation on the circuit board. For best results follow these steps in the sequence that follows.

**Step 1** – With an abrasive cutoff disc in a Dremel (or equivalent), cut the circuit board traces in positions #1 and #2 as shown to the right on the back side of the circuit board. The entire copper trace (area between the black lines) should be removed, so it is necessary to cut slightly beyond the areas shown on the circuit board. Proper types of Dremel cuts are shown in the picture bottom right.

**Step 2** – Using a step drill or single 1/4" drill bit open up the mounting hole in #3 to a full 1/4" and debur the drilled hole to remove copper flash by using a small hobby knife or deburring tool

**Step 3** – Stand up the circuit breaker on the 2<sup>nd</sup> picture at right and repeat the 2 Dremel cuts on the front side of the board as shown in the same corresponding positions as the cuts made on the back side of the circuit board.

**Step 4** – After the cuts are made unsolder the top leg of the circuit breaker (use “Solder Wick” or slot car braid with liquid rosin flux, and reposition the top leg to the horizontal hole indicated as #4. Because the hole at #4 is very close to the adjacent copper trace on some circuit boards, it is recommended that the circuit breaker leg be soldered only on the backside of the board at #4.

**Step 5** – Bend the 2 outside terminals of the brake pot to flat or 90° from their original position. Cut off the right hand terminal close to the body of the pot and using a Dremel or diagonal cutter trim the left hand terminal to a point as shown.

**Step 6** – Insert the pot into the front side of the circuit board with the center terminal of the pot inserted through the hole as shown using one of the red fiber insulating washers on each side of the board, and add the lock washer & nut.

**Step 7** – Bend down the remaining pointed terminal so that it contacts the gold plated connecting hole at #5 as shown. Twist the pot slightly to line up the connection and trim the terminal if needed so that the pot will sit flat. Tighten the nut to secure the pot. Solder the center pot terminal on the backside of the circuit board and the pointed terminal on the front side of the board. When all of that is complete it should appear as shown.

**Step 8** – Using cotton swabs and lighter fluid, clean off all solder flux residue from soldering operations on both sides of the circuit board. As noted above, take your time and do this as thoroughly as possible.

**Step 9** – Re-assemble the controller handles and install the knob on the shaft using the Allen wrench. Suggested setup for easy reference – position the knob so that the white line is straight “up” when the brakes are “full” (fully clockwise position looking at the back side of the controller).

After all is complete, test the system carefully by installing the black and white leads first & then briefly touching the red lead to make sure that no sparks are generated.

For technical information or the latest catalog of available service parts and upgrades please visit us on the World Wide Web

[www.professormotor.com](http://www.professormotor.com)

