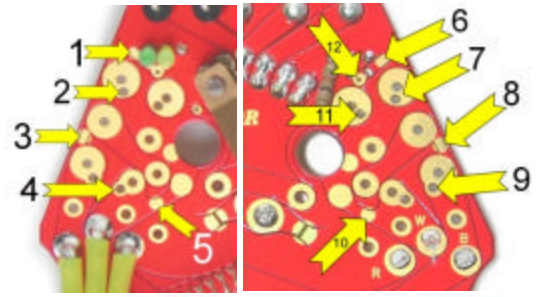




PROFESSOR MOTOR CONTROLLERS



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, #1 Philips screwdriver, 1/4" nut driver, hobby knife, 0.073" drill bit (or use 1/16" and enlarge a bit with hobby knife)

Important notes - It is critical that the solder flux residue is removed with a cotton swab and lighter fluid to prevent possible 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 a Dremel cutoff disc or small grinding stone in a Dremel, cut the circuit board traces in positions #3, #5, #8 and #10. It is important that the entire copper trace (area between the black lines) is removed, so it is necessary to cut slightly beyond the areas shown by the gold circles on the circuit board. Proper cuts are shown in the third picture above. If the power pilot lights are used the circuit board traces in positions #1 and #6 must also be cut (a small diameter grinding stone would be preferred for this.)

Step 2 - Using the 2 stranded plain copper jumper wires supplied, insert these wires in a crossing pattern from positions #2 to #4 and, on opposite side, from positions #9 to #11. To do this - start with an arch in the wire to get the ends started, then pull the ends through with pliers. For both of these wires form an "S" bend as shown in the picture below to avoid contact with the center switch terminals (gold circular contacts). Solder the wires in position (on the same side that they were inserted into the board) at both ends using a minimal amount of solder so as to not block the center holes where the switch will mount. Cut off excess wire on the opposite sides for each of these wires (opposite where it was soldered).

Step 3 - If using the power pilot light system, solder in a small gage solid copper wire from position #12 to #7. The wire can be very small since the current used to power the lights is minute.

Step 4 - 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 5 - Insert the switch in the front side of the circuit board until fully flush and solder all six connections on the back using only a modest amount of solder.

Step 6 - Remove the trigger wiper arm (1 screw) and trim the bottom (kinked) leg and also the brake (left) side tab (as shown in the pictures) with a Dremel. Remove the plastic trigger. Using a hobby knife chamfer the sharp edge of the molded trigger plastic on the bottom (brake) side where the new brake contact will mount such that this contact will mount as snug to the trigger as possible.

Step 7 - Using a hobby knife, twist the knife to form a small pilot hole in the center of the trigger plastic boss to center the drill bit when this is drilled. Drill the new brake tab mounting hole through the center of the trigger plastic boss (use a drill press for this if available) with a #49 (0.073") drill if available (a 1/16" can be used & then opened up slightly with an hobby knife). Mount the brake tab with the screw provided on the back side of the trigger (open the hole in the brake tab if necessary to get it to line up with the screw hole (check the picture for proper mounting). Install the wiper arm back to the trigger and insert the trigger mounting screw through the photo etched brass tab (see picture). Reinstall the trigger assembly and tighten the nut with care to insure the brass tab under the screw points forward.

Step 8 - Solder on the jumper wire (provided) connecting the new brake tab to the tab that mounts under the trigger mounting screw. The loop in this wire can be fairly tight if routed as shown in the pictures since the loop will open up as the trigger moves.

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. Test with the switch in both positions.

