

# PS2 Steam Chuffing in Neutral

We have found that some models exhibit chuffing in neutral. To eliminate this problem place a 10K ohm resistor in line with the orange wire going to the tach reader. This applies to 5 volt Ps2 equipped models only. The 3 volt Ps2 Board has the 10K ohm resistor on the board.

## PS2 Steam Light Flickering

We have completed analysis and testing of a fix for the MUX board problems in the scale Challengers exhibiting the light flickering problem. Unfortunately, this is a compound problem and the solution is as follows. For steam engines equipped with PS2 and MUX boards such as the Scale Challenger, here is what must be done to eliminate the light flickering.

1. Swap the ground wires between the MUX transmit and DCS board in the tender. This is the previous mod that has been fully explained as a potential fix for other engines. (Royal blue wire swap.)
2. Remove C200 and C215 on the DCS processor board. Change R6 to 470 ohms 5% 603 package on the MUX transmit board.
3. On the boiler side, add an 18 gauge wire from pin #3 of the 10 pin connector to the ground lead of C4 on the MUX receive board. Disconnect the serial/Mux signal wire from the 10 pin connector pin 1, pull it out of the harnesses, and twist it around the new 18 gauge ground wire, then re-connect to pin 1. You may find it easier to simply wrap the 18 ga wire around the MUX signal wire. Please see the attached pictures for clarification of this step.
4. In the engine, change R12 from 3.32K ohms to 4.7K ohm 5% 603 package on the Receive Mux board.

All four of the steps above may be necessary to completely eliminate the problem. You may be able to correct some engines with only steps #1 and #2. Since steps #1 and #2 are both on the tender side and relatively simple, the process should be to implement these fixes and test the engine. If the condition still exists, implement step #3 and #4. Step #3 is the most invasive and is particularly difficult in the scale Challenger because of how the MUX receive board is mounted in the boiler and the wire routing.

- Step #1 should be taken for ANY engine exhibiting the problem as a matter of course in. On smaller engines with lower current draws and shorter ground wires, this step often solves the problem in of itself.

- Step #2 should be implemented for ANY engine where step #1 does not solve the problem in service.

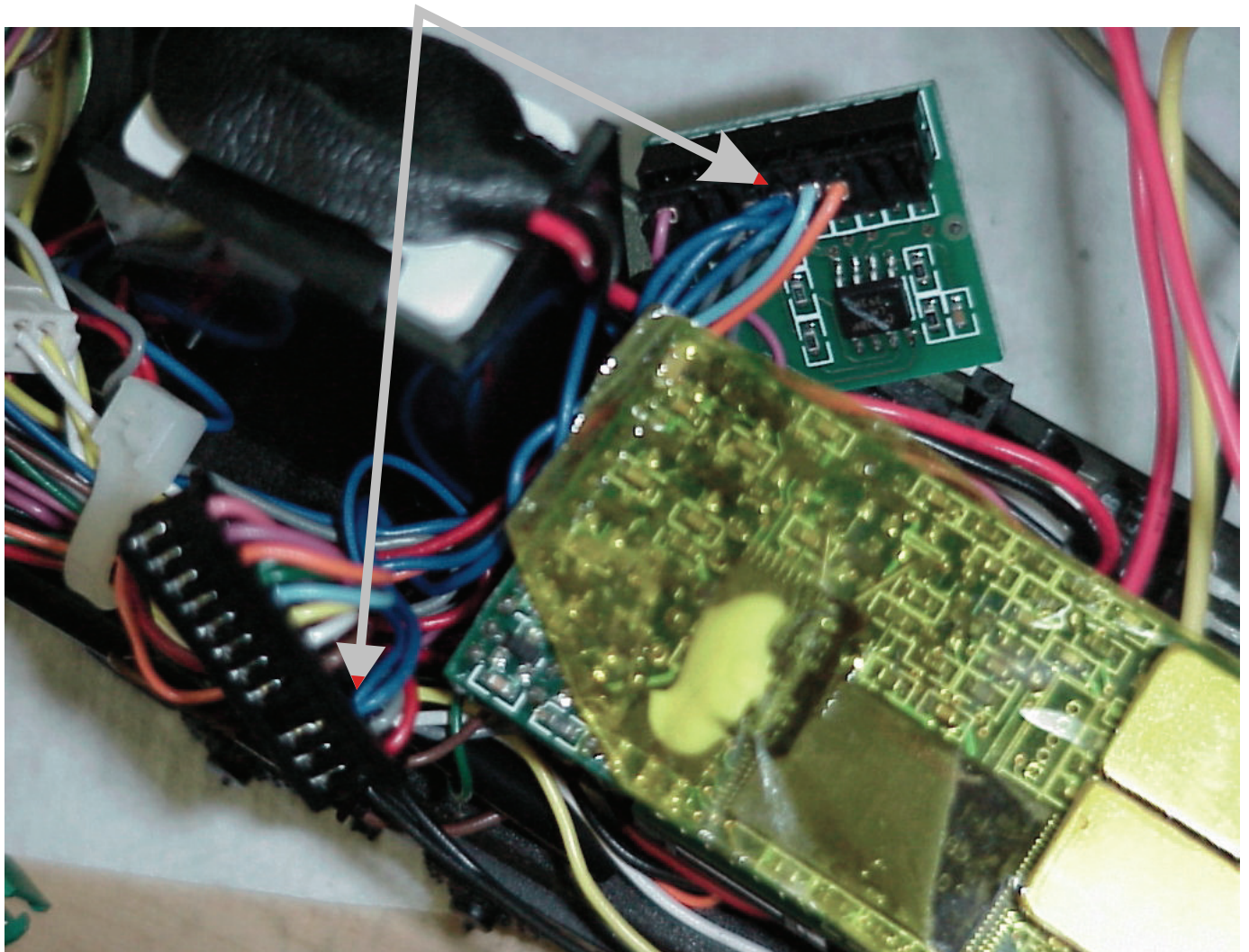
- Step #3 should only be taken if steps #1 & #2 do not resolve the problem. This is a more invasive mod and the level of difficulty varies depending upon how the engine is built. For example, implementing this step in the Texas engine is not nearly as difficult as the scale Challenger because the MUX receive board is mounted vertically and the ground wire can be soldered directly to the back of the board. Also, the wires are routed on the chassis and are much easier to deal with.

- Step #4 should be implemented any time #3 is performed.

# PS2 Steam Light Flickering

## Mux Fix

**Step #1** Extract the pins from these two locations and swap them. These are the PCB grounds for both the MUX board and the engine board.

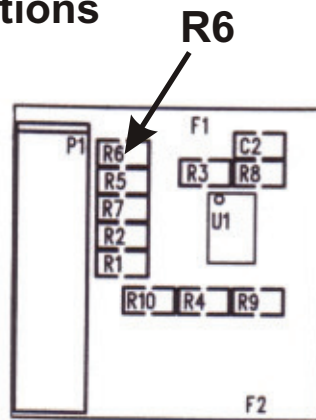


## Ps2 Board Modification



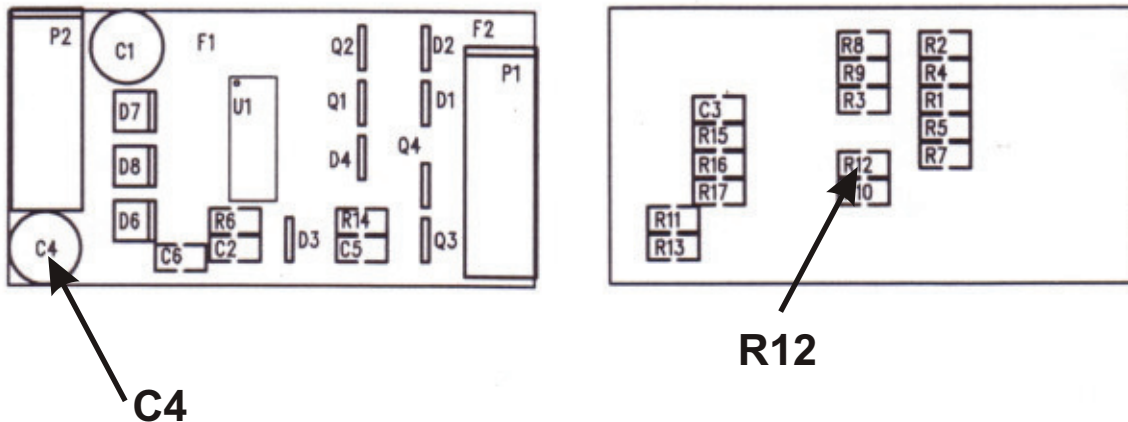
# Ps2 Steam Light Flickering

## MUX Board Modifications



Tender MUX board (transmit)

Step #2: Replace R6 with 470 ohm 5% surface mount resistor.

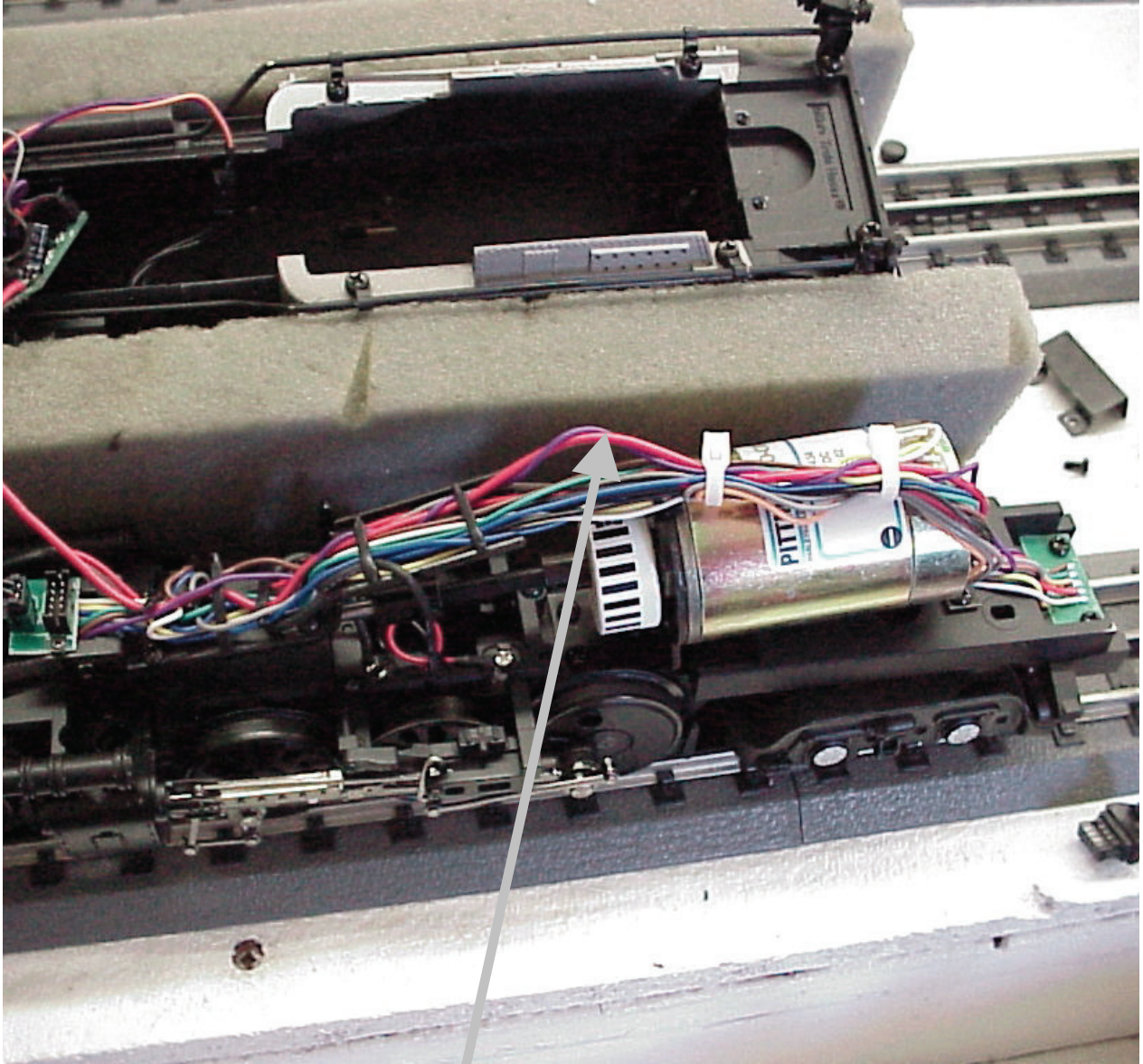


Engine MUX board (receive) –

- Step #3 add 18 gauge wire to ground lead on C4
- Step #4 Replace R12 with 4.7K ohm 5% surface mount resistor.

# PS2 Steam Light Flickering

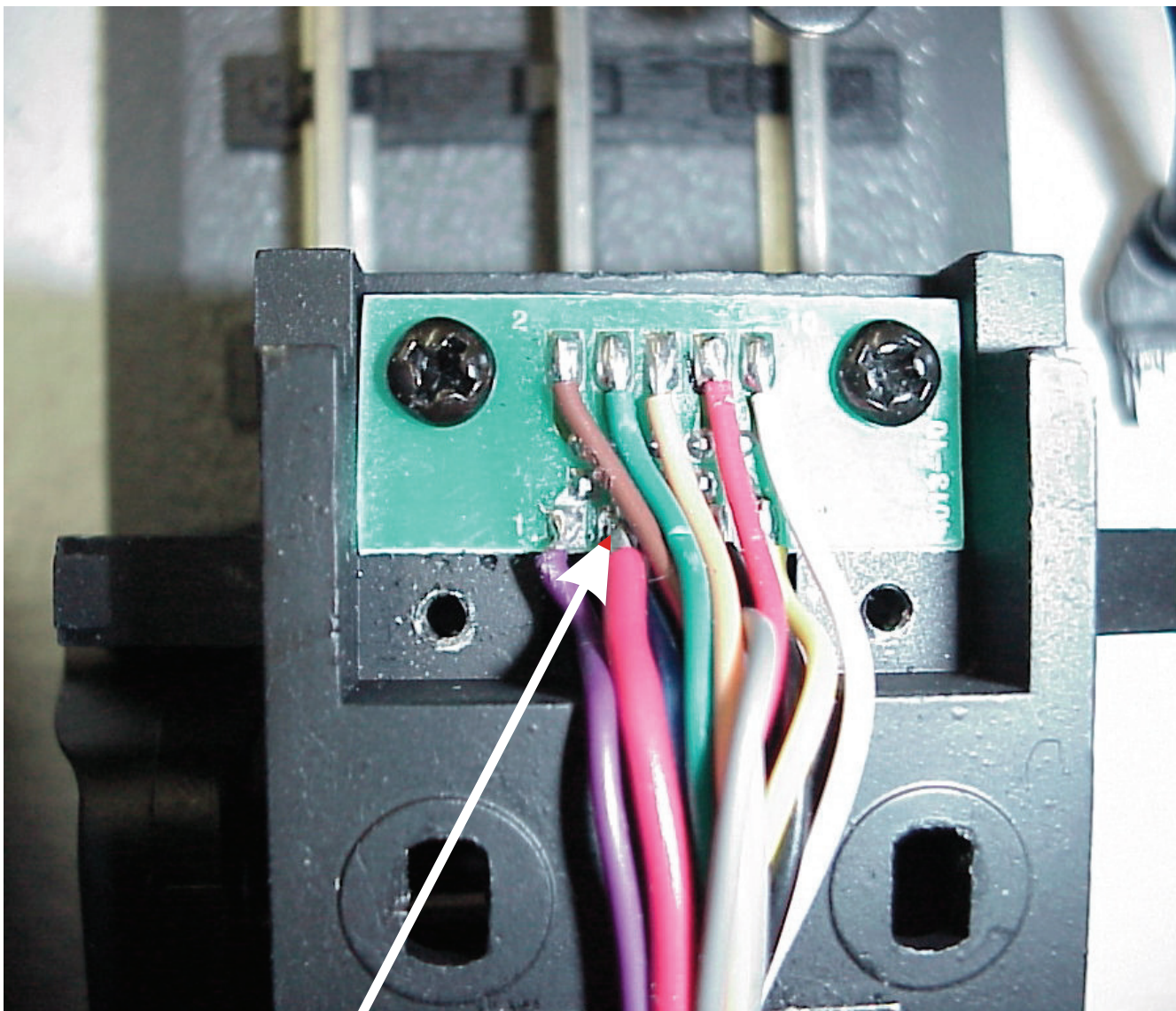
## MUX: Adding an 18 Gauge Wire



**Step #3** Prior to solder the additional ground wire down, wrap it around the purple wire (MUX serial) that connects to Pin 1 on the tender interconnect board (see page 28 for a clearer shot of where this purple wire goes).

## PS2 Steam Light Flickering

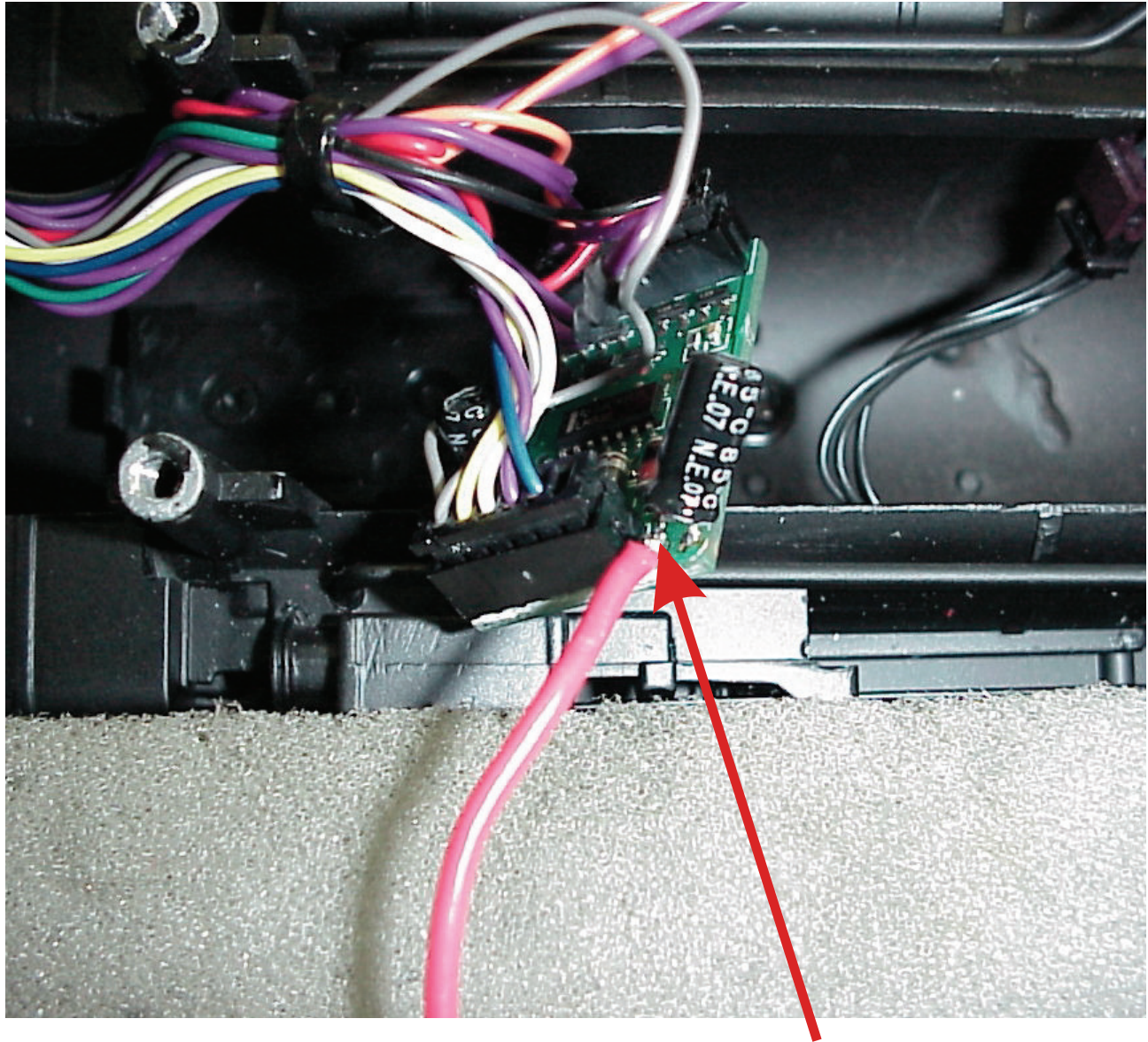
### MUX: Adding an 18 Gauge Wire



**Step #3** Add the 18 gauge wire from Pin 3 on the tender interconnect harness. Do NOT remove the blue wire that is already on that pin.

# PS2 Steam Light Flickering

## MUX: Adding an 18 Gauge Wire



### Step #3

Connect the other side of the ground wire to this capacitor on the MUX RX board. Note the wire goes to the negative side of the cap (pin 2). This wire is installed to add a parallel ground path. You'll need to solder it to the top of the PCB on the Scale Challenger otherwise the PCB won't fit back into it's holder