



## BWS-LB1 Bowser Numberboard Upgrade Kit

In the bag:

- 1 replacement lightboard
- 1 auxiliary wire for the new numberboard function

Things you will need:

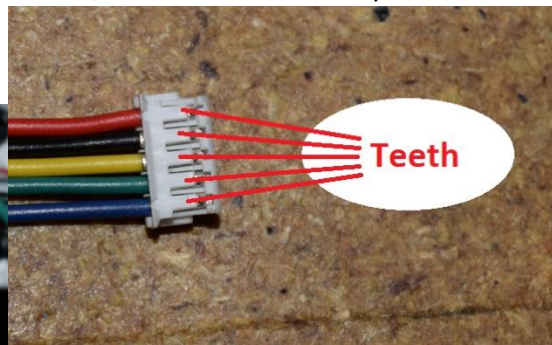
- Phillips head screwdriver
- Soldering iron
- Knife or wire stripping tool

**WARRANTY:** Milepost 93 Models guarantees this product to be free from defects for a period of 5 years. Milepost 93 will repair or replace our product found to be defective through normal use with the intended model. We will not be held responsible for any damages resulting from misuse, abuse, poor workmanship, installation or use in applications other than the intended role, Acts of God, other modifications to the model, or alien invasions.

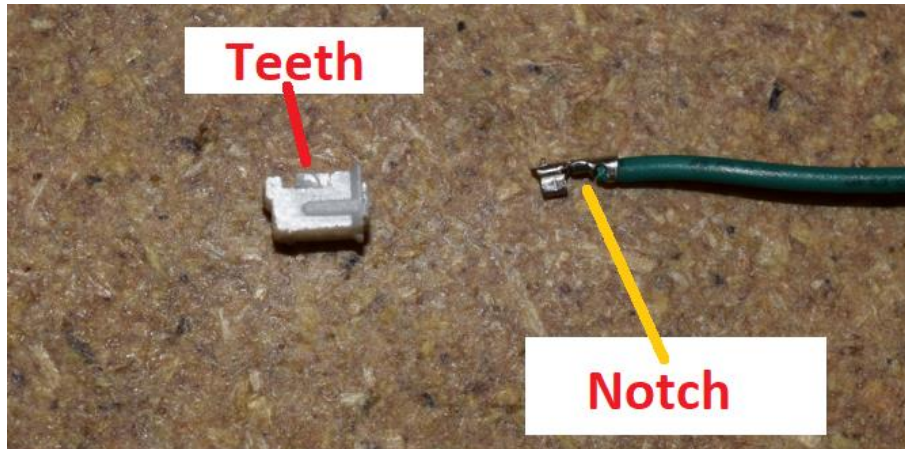
Please visit our website at [www.milepost93.com](http://www.milepost93.com) for warranty assistance.

### Installing the new light board:

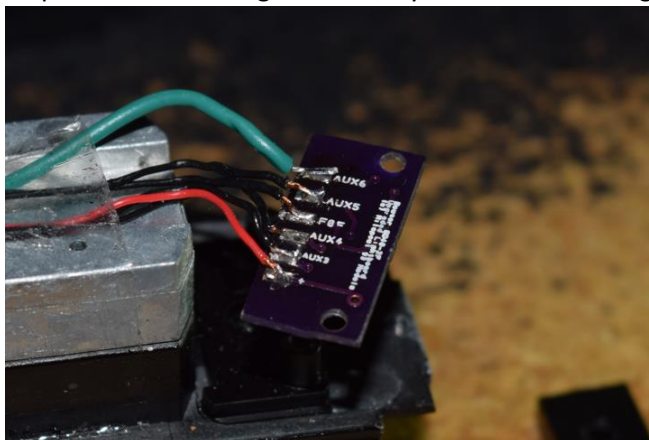
1. Place the SD40-2F upside down in a foam cradle
2. Remove both coupler pockets by unscrewing the retaining screws and slipping them out the end. Be careful not to lose any parts. Set these aside for later.
3. Turn the locomotive over on to its wheels and carefully remove the shell. It should slide off freely. There is a pair of wires that connect from the frame to the shell for the ditch lights, so ensure you do not break these
4. Carefully disconnect the ditch light wires and set the shell aside. Do not pull on the wires themselves, they are very fragile
5. Disconnect the 4-pin connector at the front of the circuit board. Note the orientation of the teeth on the white connector. In the example below, the new wire is already installed.



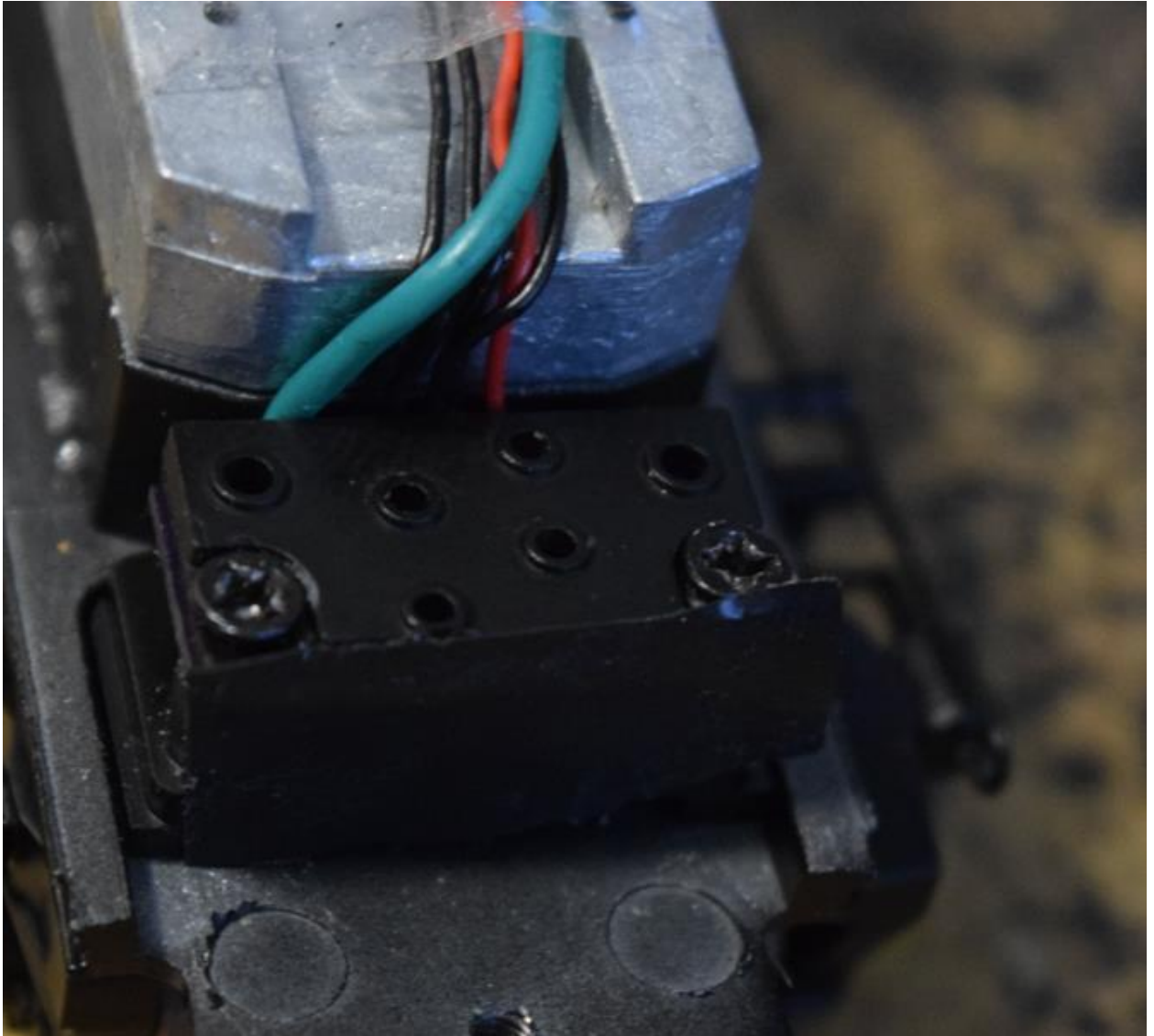
- Use the included wire and carefully insert the crimped end into the **second-rightmost slot (second from the engineer's side)** of the connector (Right next to the red wire). The notch in the crimp should face away from the teeth in the connector. Once the wire is fully inserted, it will lock into place. A light pull on it will confirm this (do not break the wire). In our example, both on the previous page and below, the new wire is green, but the one included in your bag may be a different colour.



- Strip about 2mm of insulation from the other end of the wire.
- Solder the other end of the wire to the AUX6 pad on the bottom of the NEW light board. Wire should be oriented to the closest edge (see picture below)
- Reconnect the 4-pin connector to the circuit board.
- Remove the two screws holding the existing front light board assembly down.
- Remove the light shield and set aside
- Turn the existing lightboard over.
- Desolder the wires from the back of the old board and resolder them to the pads labelled the same on the new board (FOF to FOF, AUX3 to AUX3, etc.). Make sure the wires are oriented so that they head off the nearest long edge of the board. Do not allow too much exposed wire off the edge of the board, as it may short on the frame. Be VERY CAREFUL to not bridge any of the pads, and to solder the "+" (Function positive) wire to the appropriate pad. We will not be held responsible for damages caused by incorrect soldering.



14. Once all 5 existing wires are soldered to the new board, turn the board over so that the wires are on the bottom, and position over the screw holes on the locomotive frame (the drill holes on the circuit board should be towards the front).
15. Replace the light shield and the screws. Be careful of the light shield orientation. If it's backwards or upside down, you may damage the LEDs.
16. We also recommend placing a short strip of electrical tape on the front face of the board/light shield to eliminate bleed through. See below for the fully installed assembly



17. Reconnect the ditch light lead to the shell
18. Carefully place the shell back on the body and reinstall the couplers and coupler pockets. Make sure you don't strain or pinch the ditch light wires
19. You're done! On to programming the decoder...

## Programming the decoder:

These instructions assume that you are using a LokSound decoder, such as the one that shipped with the sound-enabled Browsers. They will enable AUX6 and turn on the numberboards whenever either the headlight or the backup light is on (Similar to the original Bowser SD40-2s). Please note that exact instructions for programming in DCC vary by DCC system vendor. Consult your DCC system manual for help in programming configuration variables. Numberboards will not work until these steps are complete.

- A. Configure AUX6 options (for light effects)
  - 1. Set CV 31 to 16
  - 2. Set CV 32 to 0
  - 3. Set CV 315 to 2 (Dimmable light, fade in/out. If you don't want the fade in/out effect, set to 1)
  - 4. Set CV 316 to 0
  - 5. Set CV 317 to 0
  - 6. Set CV 318 to 31 (Note: If the numberboards are too bright, reduce this setting. 31 is the maximum. Just make sure you set CV 31 and 32 above BEFORE changing CV318)
  - 7. Set CV 319 to 128
- B. Configure the numberboards to come on when F0 (front or rear) is on
  - 1. Set CV 31 to 16
  - 2. Set CV 32 to 8
  - 3. Set CV 257 to 129
  - 4. Set CV 273 to 130

If you wish to program another function key to turn on just the numberboards, this is the time to do it!

Go ahead and test things out. Apart from the new independent numberboards, everything should work the same as it did before.