

Tip: 39021 Bad 1Vh 1002 Improve LED Light Output

Date: 09-04-2020, New 16-01-2024

Hi All,

A little History

I first mentioned how to do this upgrade on the [marklin-users.net forum](http://marklin-users.net) in May 2016 and since I have started to run this locomotive on my layout I have finally improved the LED light output to a better level so the lights can now be seen in a well light room which is a great improvement.



This is a combined photo to show the before and after LED light output. The photo on the left is the original light output and the photo on the right is the new improved LED light output.

Warning: - You undertake the following modifications at your own risk as fine de-soldering/soldering skills are required.

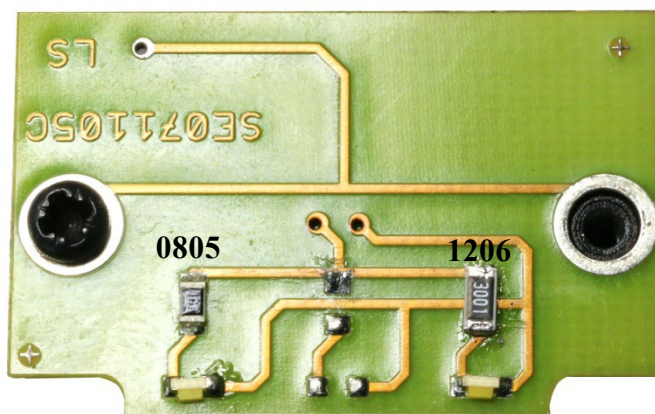
Tender Lights

I first started with the lights in the tender.

With the tender body shell removed I unscrewed the PCB and flipped it over and held it in position with one screw. I removed one 10 k (0805 size) and replaced it with a 3k (1206 size)

I would only recommend using a 0805 size resistors for this upgrade.

Soldering a larger component to a small pad footprint is difficult to solder.

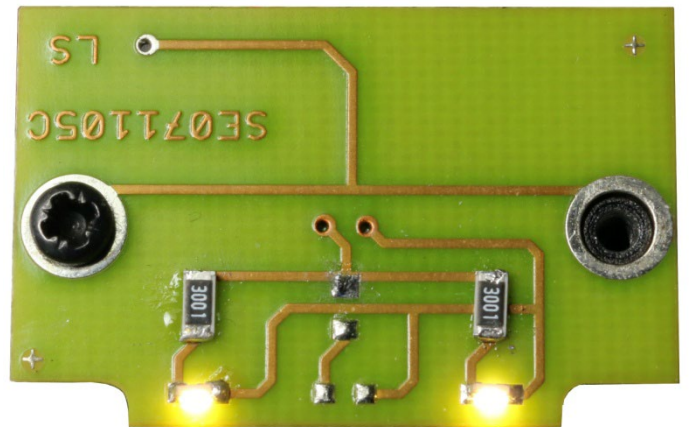
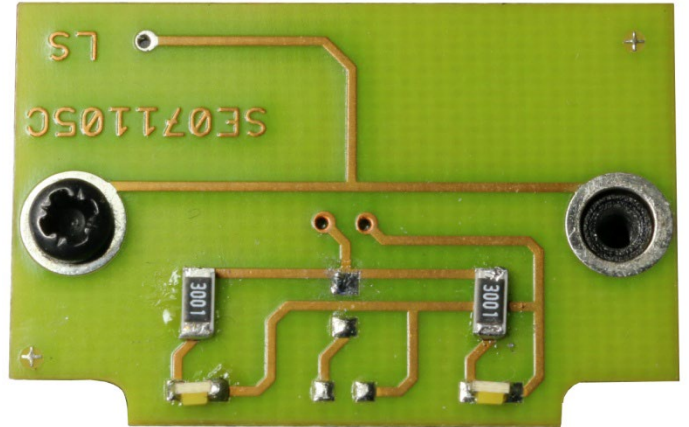


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The result of changing the 10k resistor to a 3k value resistor can be seen in the left lamp as shown.



With the changes complete I tested the LEDs were working then flipped the PCB over for the correct orientation and reassembled the tender body shell.

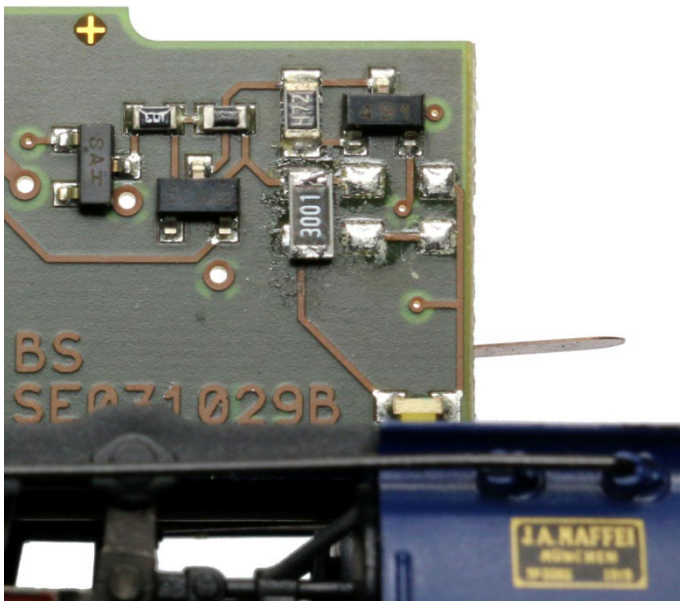
The results show improved light output.



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Locomotive Lights



Soldering the 3k 1206 resistor in a confined area isn't recommended, use the correct size **0805**. Make sure you don't create any short circuits with you soldering.



Test the LED functions before fitting the body shell on.

The results are well worth the effort for a small amount of time to improve the LED light output.

For this locomotive I have had to do a few fine tuning improvements to get it to negotiate my layout. You can find the details in the link below.

[Strange Bits Log part 2 page 3](#)

As always enjoy your model trains.