

# Instructions

## Art-Nr: 3002 Red backlights 2-axle up to 16 volt

1. These parts are not suitable for small children. There is a danger of swallowing.
2. The product can be seen in figure 1. These instructions are part of the product. Please retain them well.
3. The product is suited for direct and alternating current from 6 – 16 volt. The current consumption depends on the brightness of the LED, usually a couple of milliampere.



figure 1: Red backlights in a flat car

4. Since the built in electronics do not weigh much, the metal weight has been left in the wagon, so that the complete weight of the model has only increased a little bit.
5. The installed backlights are ready to use, so you just can put the car on the tracks and start running it. The lights will start working as soon as they are connected to a current of the above mentioned strength, no extra charging time is necessary. The built-in electronics are able to bridge voltage gaps up to a few seconds that are normal to occur when working with model trains and due to the light weight of the car. This has the effect that the backlights always shine with a continuous intensity when the car is moving.



figure 2: A closer look at the backlights

6. Under normal circumstances the backlights are also working when the wagon is standing, e.g. if in a digital system the tracks are always provided with current or when using our controller for analog systems. But this cannot be guaranteed, since it is due to physical reasons that the current input is not continuous, but always interrupted for short intervals. If the wagon comes to a halt where the contact of the current to the current collectors is interrupted, it is logical that the lights turn off after a short afterglow. But as soon as the car starts to move again, the current collectors have contact to the current again and the LEDs will be shining again continuously as described above.
7. The LEDs are affixed to the sidewalls of the wagon very firmly. Nevertheless it is advisable to avoid mechanical impact, contact with screwdrivers or other tools, or getting stuck with your fingernails. If the LED is broken off, this very often also damages the small wires.
8. The LEDs are protected against light scatter by black color. Touching them too often or contact with detergents and solvents can cause abrasion or flaking of the color, so avoid unnecessary contact with your fingers and any liquids.
9. Unlike the wheels moving along without current, these wheels are picking up a lot of dirt. We know this problem from the locomotives. For working properly, they need to be cleaned from time to time. For doing this, dismantle the wheels carefully using some tweezers. Avoid contact with the current collectors by picking them up on the side opposite to the current collectors.
10. Ultrasonic treatment and using a damp cloth are the best methods to clean the wheels, especially the contact surfaces and the axle. According to our experience it is best to use ultrasonic treatment and/or polish everything with a damp cloth. The contact surfaces should not be matt afterwards, but shining like the ones of a new wheel. The cleaning process does not influence the abrasion of the nickel layer. The abrasion of the nickel layer usually has a different reason, e.g. the different speed of the wheels on each side when going through curves. But the nickel layer can also be damaged unnecessarily when using a wire brush or fiber glass pen, so we strongly advise to use the method described above for cleaning your wheels.
11. The best liquids for cleaning the wheels are benzine, alcohol, purified alcohol, surgical spirit, or simply spirit, all of them mild cleaning liquids for metal. Just soak a cloth and wipe off the dirt. The wheels should not be soaked and remain in these or other detergents for any length of time. Also do not use any solvents or thinners that are used when working with paint. These are likely to damage the plastic foam insulation on one side of the wheel and make it soft. As a consequence, the wheel starts to flatter.

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12. For reassembling the wheels, use the tweezers again. The model has to lie securely and backwards on the locomotive repairing fixture. Put the axle on the spot where it is usually held by the clamp, figure 3. Watch for the correct polarity! Figure 6 and 7. Now use your tweezers to bend open the clamp at the side away from the current collector by imposing pressure on the axle and push in the wheels, figure 4. Finished – all done, figure 5.

13. For running your trains properly, the right polarity is very important. Axles built in the wrong way cause short circuits with high currents that can destroy the fine current collector springs. An axle of a 2-axle car is always built in correctly when the uninsulated side of the wheel – the side that shows pure metal – is on the side where the current collector spring is pointing at. Figure 6 and 7. Please keep this in mind very well since it is very important in order to prevent damages.

14. The current collectors are our own design and something very special. A compromise had to be found between the elasticity of the metal and the contact pressure of the spring. Of course a high contact pressure guarantees a good current collection. This is no problem with powered locomotives, the engine easily surmounts this frictional resistance. With wagons pulled by a locomotive things are a bit more difficult. Concerning our current collector, we have given preference to the elasticity of the metal, and so to a low contact pressure. The very thin and flexible material has the ability to abut with a strong bending, but with low pressure, evenly and securely on the axle. This is why the spring is strongly bent forward, see figure 8. It can happen that this bend disappears in the course of time. So always check the spring when cleaning the wheels and if necessary bend the spring again as shown in figure 8. Don't be afraid, the material is suitable for this and due to the low contact pressure the wagon, in spite of its light weight, won't be lifted by the spring.

15. High Tech Modellbahnen manufactures its products with the greatest possible care. We issue a guarantee and warranty according to legal regulation. Should you find any new product you just bought defective, please contact your local dealer.

16. If one of our products has been damaged or breaks, please contact us your local dealer as well. He often might be able to save it, while own attempts to repair it might lead to a total economic loss.

Now enjoy your new car with backlights.

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97456 Hambach  
[www.z-hightech.de](http://www.z-hightech.de)



figure 3: The axle ready to be built in, lying on top of the clamp



figure 4: Pushing the axle into the clamp with the help of some tweezers.

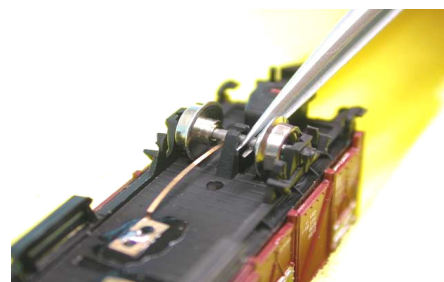


figure 5: The axle has been pushed underneath the clamp holding it in its place.



figure 6: The insulated side of the wheel, turned to the opposite direction of the current collector

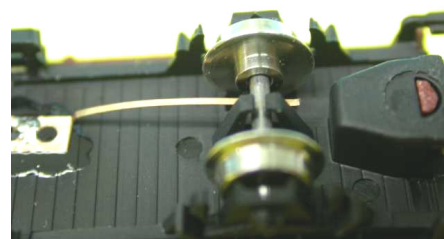


figure 7: The uninsulated side—always on the side where the current collector is located. Very important!



figure 8: The correct position of the current collector without the axle