

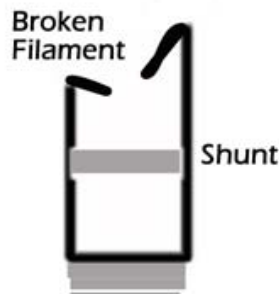
An Easy Way to Troubleshoot Lights

What Causes a Light Set to Fail?

A light set can fail for any of these reasons:

- Internal bulb failure
- Loose, broken, or missing bulb
- Bad connection between the bulb and bulb socket
- Blown fuse (**very rare**)
- Broken wire or plug
- Poor connection at the power source

But the most common cause by far is internal bulb failure. Modern light sets are designed to work even if one or more individual lights fail.



In this drawing, the filament in the bulb has burned out, interrupting the flow of electricity required for the light bulb to operate.

Miniature light sets are designed with a feature that allows current to bypass the burnt out filament. It's called a shunt – an aluminum wire wrapped around the two metal posts supporting the filament. If the filament is burned out, current will normally burn through an oxide coating, completing the circuit and illuminating the rest of the light set.

If the oxide fails to burn off, the shunt fails, the circuit cannot be completed, and the remaining lights go out. Just as a water pipe needs a clear path to have water flow it; a light set also requires a clear path to have electricity flow it.

The first thing you should do when lights are out is to inspect the light set to see if all the bulbs are present, are unbroken, are in tight, and plugged into an outlet that's working.

If this doesn't solve the problem, it may be due to a loose contact between one of the light bulbs and its husk (the plastic receptacle into which the light bulb fits). Next, you will need to check you light set for a loose bulb contact.

The quickest way to check for a loose contact is to:

1. Run your hand over the needles of the section where the lights are out.
2. Start at the base of the branch near the tree trunk, and brush your hand out toward the tip. By doing this you will be gently jostling the bulbs, and usually the bulb with a loose contact will cause the lights to flicker on.
3. If this is the case, locate the bulb that's creating the flicker and replace it with one of the spares provided. (You can find these in a clear plastic package attached to the base cords of each light set.)
4. Start with one branch, and go from branch to branch (left to right) using this method. Proceeding left to right is a good way to keep track of what you have checked, so you don't become frustrated looking randomly for bulbs.

If this technique of brushing and replacing doesn't solve the problem, it's probably due to one or more failed shunts. Resolving this problem can best be accomplished either by obtaining a **Light Keeper Pro** or by contacting NeumanTree for help.

A **Light Keeper Pro** is an inexpensive but very effective device that makes it easy to locate problems so you can get your lights to go back on. You can check out the Light Keeper Pro and find a retailer near you at: www.lightkeeperpro.com

