

Floating Fuser Lamps

Every toner-based printer (which includes most laser printers and LED printers) has to have some way of fusing the toner into the paper. Usually this is done with a combination of heat and pressure. The paper (with loose toner on it) is pressed between a hot roller and a pressure roller just before exiting the printer. These rollers are usually combined into one assembly, called the fuser or fixing assembly.

A variety of methods have been used to heat the hot roller, and today you might find a halogen lamp inside a metal roller, or a ceramic heating element inside a flexible film, or an induction coil inside a metal roller. Each method has its pros and cons, but the latter two are relatively new. In earlier times, all fusers used lamps. AC current passed through the lamp would heat it up, and eventually this would heat the metal roller (the inherent slowness of this method is the main reason for the invention of the other methods, which get the fuser up to temperature faster).

When designing a fuser with a heat lamp, there are two engineering problems to be solved with regard to mounting the lamp: (1) physically positioning the lamp in the center of the roller, so that the roller is evenly heated; (2) connecting AC power to the lamp. Again, there are several methods of doing each, but we will focus on a method (used by HP only in the very early CX engine – the LaserJet Series I – and by Lexmark in the entire Optra S and Optra T series) that solves both problems at once.

In this method, each end of the fuser lamp has a concave metal contact. On each end of the fuser is a plastic end cap with a stiff

metal strip that is bent so that the tip of it fits into the concave end piece of the lamp. These strips simultaneously suspend the lamp in the approximate center of the roller (but with some degree of “float” – the metal strips have some flexibility, so that the lamp isn’t held absolutely rigid), and provide an electrical connection to it. Figures 1 & 2 illustrate this method with a Lexmark T634 fuser.

The advantages of this method are simplicity and efficiency. But it also has a disadvantage: the lamp isn’t held as securely as with other methods, and can sometimes come loose during shipping and handling, so that the mechanical and electrical contact to the end of the lamp is lost. This can usually be remedied by simply removing the end cap (two screws) and re-positioning the lamp. Whenever we have to do this, we will also use needle-nose pliers to bend the metal strip more aggressively (at a 90-degree angle instead of the original 45 degrees or so) so that it holds the lamp tighter (this has been done to the strip in figure 2).

This problem (lamp coming loose) is not extremely common, but it’s common enough that it’s worth checking this whenever you have an error (usually 922) that would indicate an open lamp. If it actually is an open lamp, you would need to replace the fuser or the lamp. But sometimes you can fix it with the simple procedure described in the last paragraph, which can be done in just a minute or two.

—Dennis Kosterman

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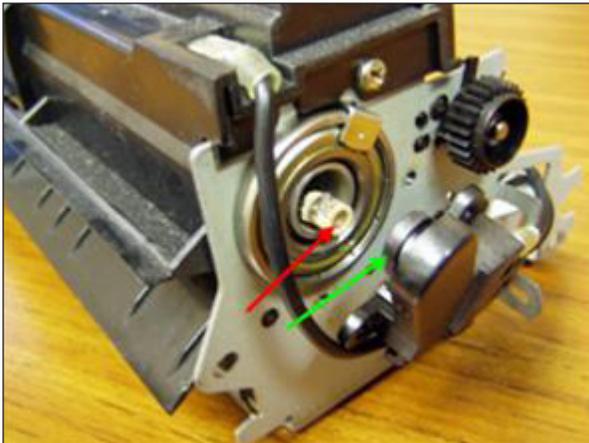


Figure 1: Lexmark T634 Fuser, showing lamp end (red arrow) and end cap (green arrow)



Figure 2: Inner side of end cap, showing metal contact strip (red arrow)