

The HP LaserJet 5000 and 5100: Putting the ‘Next Generation’ in Perspective

Unfortunately, my son, a.k.a. “the next generation,” is beginning to look and act more like his father. I can only hope that he improves with age and manages to bypass the numerous hereditary pitfalls inherent in his DNA.

Fortunately, improving on the next generation of a printer in a R&D lab is a bit easier than reversing generations of DNA. Hewlett-Packard has proven this with the 5100, which is the next-generation version of its 5000 wide-format laser printer.

HP is clearly the market leader when it comes to introducing new printers, which I like to call “variations on the same theme” because quite often the printers share more similarities than differences. Manufacturers are under pressure to speed next-generation models to market. On

average, HP introduces a new monochrome every two to four years, based on the printer’s market segment. Color machines enter the market a bit faster, with an average gap of one to two years between models.

Rapidly spawning families of printers yield obvious advantages and disadvantages. End users reap most of these advantages; for example, the 5100 offers faster Ethernet speed, e-enabled access from anywhere and other features requested by today’s demanding office environments. For technicians, the advantage is the commonalities between printers. Often it will take less time for a seasoned technician — already fluent in troubleshooting the 5000 — to understand the 5100. The disadvantage is that the technician may encounter commonalities of failure, and have the same problems treating this new printer’s failures as he did with its predecessor’s. Complicating matters is the fact that HP often changes its error codes with each new family member, thereby requiring technicians to continually hone their memorization skills so they don’t have to rely on a heavily earmarked printer repair manual.

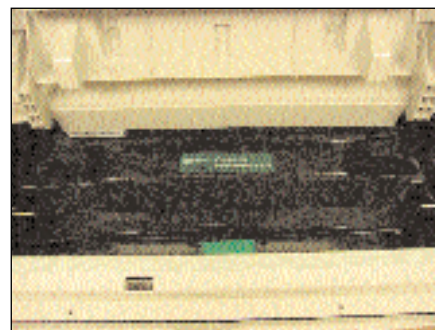


Figure 1. HP 5000 toner cartridge.

Let’s take a closer look at the HP LaserJet 5100 and its predecessor, the 5000. I say “close” look because the printers are nearly identical at first glance. See Figure 1 for the 5000’s toner cartridge, which is identical to that of the 5100. Remember to check each printer’s markings and identification number to avoid ordering incorrect replacement parts.

A Little History

The HP 5100 was first introduced in May 2002 as a replacement for the discontinued HP 5000. Both printers have wide-format capabilities, due to their wider paper path and fuser enhancements.

Both the 5000 and 5100 can produce output up to 11 by 17 inches, have a 13-second time to first printed page and deploy instant-on fuser technology. Both printers share similar feed components, e.g., pick-up tray and feed roller. They use a C4129 toner cartridge, which yields 10,000 pages.

Next-Generation Improvements

To end users, “next generation” often implies faster and better efficiency. The 5100 is no exception. Here are some factoids that technicians should know:



(Top) A side-by-side comparison of the HP 5000 and 5001. (Above left) The HP 5000. (Above right) The HP 5100.

Letter-Size Output

- 21 ppm (HP 5100)
- 16 ppm (HP 5000)

Processor Speed

- 300 MHz (HP 5100)
- 100 MHz (HP 5000)

Memory

- 4 MB expandable to 192 MB (HP 5100)
- 164 MB (HP 5000)

Common Failures

- 50.1 Fuser Error Message — low fuser temperature
- 50.3 Fuser Error Message — high fuser temperature

In both models, the fusing assemblies use ceramic heating elements, which provide the heat required to fuse the toner to the paper. However, ceramic has limits in terms of continuous run speed; the actual speed is less than stated when running multiple pages. Sometimes the fixing film does not maintain the constant temperature like an aluminum roller does (most fusers have an aluminum heat roller and a heat lamp).

The HP 5100's ceramic heating element is slightly different than the 5000's


due to increased speed. Look closely at the subtle changes affecting the entrance guide, fixing film (sleeve) and top cover. Unfortunately, these small changes mean that the fuser is not “backwards compatible.” Technicians can dismiss any plans of cannibalizing their defunct 5000 for 5100 fuser parts! Notice the slight differences in the two fusers in Figure 2, 3 and 4.

Despite these subtle differences, the 5000 and 5100 share commonalities of fuser failure. Does 50.1 (low fuser temperature) look familiar? Like the 5000, the 5100 unit is prone to premature failure of the ceramic heating element due to a flaw in the connector's design. This flaw often sparks “arcing,” or a discharge that occurs when electric current flows between two surfaces separated by a small gap and a high potential difference. See Figures 5, 6 and 7 for an example of an arced contact pad, a contact-to-element arcing and a damaged element. Error 50.1 generally means that the temperature wasn't high enough to fuse the toner to the paper and the printer will not function.

Does 50.3 (high fuser temperature) spark some unpleasant, smoky memo-

ries? This error code often means that the fuser's temperature is too high, which causes the entire printer to malfunction. Its inability to maintain a constant temperature can create a constant headache! Technicians should check their power supply for low or faulty voltage.

Assess Error Codes with Caution

I try not to believe everything my son says, especially when he claims that the PlayStation did not play a role in his missing homework. Avoid the temptation of taking error codes at face value. A flashing fuser error might tell you what the problem is, yet it's important to keep in mind that in addition to the power supply, you should re-examine the controller and formatter boards. These other components may have experienced intermittent failure, which sometimes causes a misdiagnosis. See “Whatdunit? Diagnosing Image Defects in the HP LaserJet 5000” (*Recharger Magazine*, April 2003) to avoid a misdiagnosis of fuser failure. 

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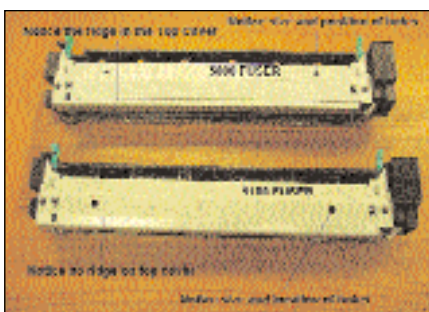


Figure 2



Figure 3

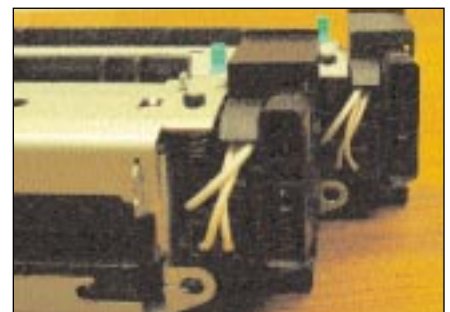


Figure 4

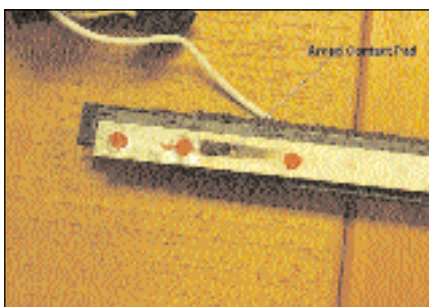


Figure 5

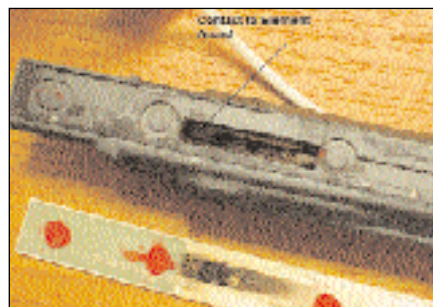


Figure 6



Figure 7