

## HP LaserJet 24xx Series: Gear Noise Solution

*This article shares a procedure omitted by the service manual for curing a gear noise problem in the HP LaserJet 2400 series. It will also help the printer tech avoid unnecessary fuser warranty claims.*

As laser printers continue to evolve, performance improves, and sometimes lower-level printers will “catch up” to the performance of higher-level models from just a few years earlier. A good example is the HP LaserJet 24xx series, where the most advanced model in this series, the 2430 (released in late 2004), has performance specs comparable to those of the higher-level 4200, released only two years earlier!

But as printer speed increases, so does the risk of mechanical difficulties, and the 24xx series also shares one of the common problems of the 4200 series: a tendency for the fuser drive section of the printer to become noisy as gears begin to wear. In the 4200 series, the solution is simple: replace the fuser (or just the main fuser gear) and the swing plate gear that drives it. In the 24xx series, it is a bit more complicated: the fuser is initially driven by the printer’s main motor and drive train (as in the 4200 series), but then a special fuser motor, with a separate group of gears, takes over and drives the fuser from above. These parts are also responsible for driving the output rollers and initiating duplex operations.

All of the relevant gears are mounted to a plate called the Fixing Drive Side Plate Assembly (RM1-1500), though some are not included with it. The gear that initially drives the fuser is part of this assembly. The gears above the fuser that mount to the plate are not: the 21-tooth gear (RU5-0377) the 20-tooth gear (RU5-0378), and the 19-tooth gear (RU5-0379). These three gears are available as a kit (part number KIT-2400-GR-NN).

The rest of this article will focus on how to remove and replace the various gears. The three “loose gears” are more likely to be worn, and are also much easier to replace, so we will start with those.

To get to the three loose gears and view the other gears, we need to remove the fuser. Since this procedure is fully covered in the service manual, we will not go into detail here. Briefly, you will need to remove the paper tray and toner cartridge (put it in a dark place or cover it), and then remove the back cover, I/O cover, fuser cable cover, and duplex inlet guide. Then disconnect three cables, remove four screws, and pull the fuser out. Looking into the fuser cavity, you should be able to see five gears. The three removable gears are indicated in Fig. 1. For each gear, release the small plastic retaining tab and slide the gear off the shaft. Note the relative positions of the three gears, since each one is unique and needs to go in a specific location.

This would be a good time to inspect the condition of those three gears, as well as the main gear on the fuser and the large gear on the bottom of the cavity, and replace them as needed (If you have already replaced the fuser, see note at end of article!). All except the large bottom gear can be easily replaced at this point. If the bottom gear

looks good, you may want to just replace the others and re-assemble the printer. If the bottom gear is visibly worn, or if you want to replace them all just to be sure, you will have to replace the fixing drive side plate assembly, which requires a significant amount of further work. If you decide to replace this assembly, set the fuser and the three removable gears aside – they will be re-installed after the assembly has been replaced.

In order to remove the fixing drive side plate assembly, you will first have to remove the main drive assembly. Both drive assemblies are on the right side of the printer, so you will have to remove the formatter and ECU boards to get to them. Again, we will not give details, since the full procedure is covered in the service manual. However, we will note a few things:

1. The manual does not even mention the switch link. This is a black plastic arm or lever in the right rear of the printer; as its name implies, it links the external power switch with the internal switch on the ECU board. The upper end of the arm attaches to the ECU switch; the lower end slides into a plastic “link switch holder” that mounts into the right rear metal frame of the printer. You will want to carefully observe the orientation and alignment of the switch link while removing the ECU board, so that you can recreate it when re-assembling the printer. After removing the ECU board and switch link, also remove the switch link holder from the chassis (this will require releasing two retaining tabs, accessed from the bottom of the printer – see Fig. 4). There are several ways to re-assemble it, but we recommend starting with the switch link connected to

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FIG. 1

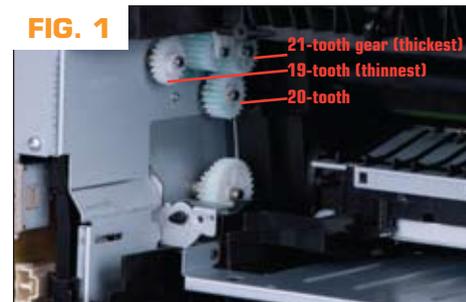


FIG. 2



FIG. 3



FIG. 4

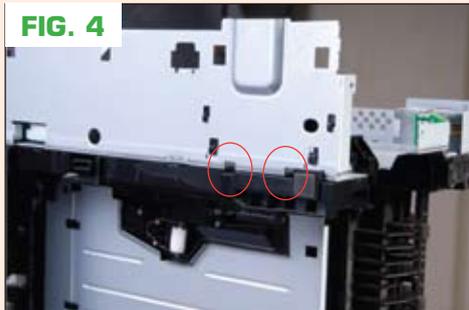
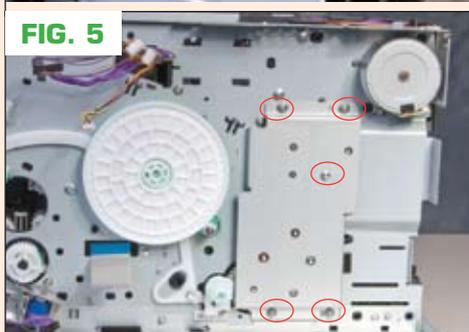


FIG. 5



CONTINUED FROM THE REVERSE  
the ECU, and the switch link holder installed in the printer chassis. Guide the link into the holder while installing the board. This will require some patience, but it seems to work better than the alternatives. Figs. 2 and 3 may help – Fig. 2 shows the link attached to the ECU board; Fig. 3 shows it installed in the link holder without the board.

2. After removing the main drive assembly, note that the large gear on the side of the printer is loose, and is at risk of falling off (it is normally held in place by the large spring on the main drive assembly). Since re-installing this gear is tricky if it comes off, you may want to secure it with tape until you are ready to re-install the main drive assembly.

Once the main drive assembly has been removed, it is a simple task to remove the fixing drive side plate assembly: remove the five screws shown in Fig. 5, and pull the assembly straight out. It will not come out if the three removable gears are still attached, so remove them first if you have not already done so. Once you have installed the new assembly, reverse the previous steps to re-assemble

the printer. Remember to install the three removable gears in their correct locations.

This procedure should alleviate the vast majority of noise problems in the 2400 series printers. Note that replacing the fuser alone usually will not cure the problem – it may even make it worse, since the fresh gears on the new fuser may not “get along” with the worn gears in the printer as well as the worn gears on the old fuser did. But this does not mean you got a bad fuser – it most likely just means that you need the fuser drive gear kit. Replacing those gears is the real key to solving noise problems in the 2400 series.

—Dennis Kosterman

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