TECHNICAL DOCUMENT

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Common Problems and Issues Concerning the Brother HL-1240 (TN-460, DR-400) Engine

DOC-0322

OVERVIEW

This article covers the TN-430, TN-460, TN-6300, TN-660, and DR-400 cartridges. The information contained here can also be applied to the TN-530, TN-560 and DR-500 cartridges. They use different supplies, but operate the same way, and have the same issues. This is not a full "step by step" type instruction, it covers cartridge theory and common problems associated with these cartridges.

We will cover some of the theory of how these cartridges work, the method that must be followed when remanufacturing them, as well as some cartridge troubleshooting. Now before your eyes glaze over, the theory really should be read. This cartridge system works differently from any other we have seen. Most of the problems people experience when doing these cartridges stems from not understanding how they work. A few minutes now can save a lot of time (and money) later. If you haven't done these cartridges yet, this is a must read before you start. If you are doing them and having problems, hopefully this will help.

This cartridge system is unique in a number of ways; the waste toner from the drum cartridge is recycled back into the toner supply chamber, the drum cartridge uses a cleaning felt (or brush) instead of a wiper blade or roller, and it also has both a Primary Corona Wire and a Transfer Roller. This is the first cartridge we have seen with both a wire and a roller for charging/ transferring. The Primary Corona wire has a built in cleaner that should be on the left side of the cartridge when not in use.

This engine is also unique in the sense that the developer roller in the toner cartridge actually touches the drum. There is not an air gap as in other cartridges. In other words, this engine does not use what is commonly known as "jumping technology" to transfer the image from the developer roller to the drum. This unusual fact doesn't change how the cartridge is recycled, but can lead to some interesting problems if BOTH the Toner and OPC cartridges are not cleaned properly. If you are to do these cartridges successfully, throw out any pre-conceived notions you may have based on other cartridges, and read the following carefully. Figure 1 will also help show how these cartridges work.

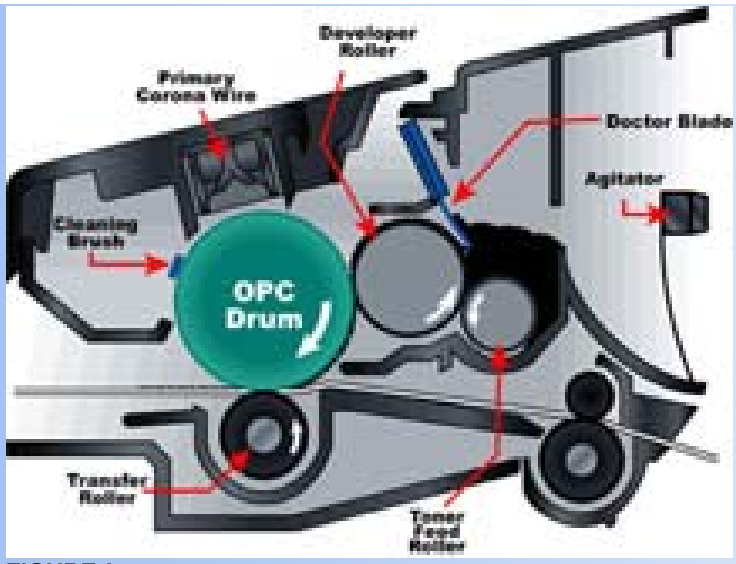

FIGURE 1

When an “empty” cartridge is returned for remanufacturing, the remaining toner (80g or so!) MUST be completely removed from the supply chamber before adding new toner. Failure to do this will cause back-grounding. In addition to contaminating the toner cartridge, this will also contaminate the cleaning section of the drum cartridge, which in turn will contaminate the toner cartridge again, (A vicious cycle!) The remaining 80g of toner is actually the waste toner, and a small amount of new toner combined. There is not enough new toner to work or “charge up” left. Not cleaning this toner completely out is the largest cause of cartridge failure!

The cleaning section of the drum cartridge consists of a "cleaning brush" and a recovery blade. The cleaning brush has two opposite charges placed on it during the print cycle. The first attracts any remaining toner off the drum. The second repels the toner off the brush back onto the drum where it then transfers back into the toner cartridge. This is all done in a timing sequence that does not interfere with the printing process. If the cleaning brush becomes contaminated with bad toner that will not accept the proper charge, the brush will not be able to clean itself, and back grounding will occur. It seems to be the nature of contaminated toner that it will accept most of the charge to be cleaned off the drum, but it will not accept the charge that would allow the brush to clean itself off at all. A properly working cleaning brush will at any given time have only a small amount of toner on it. Once contaminated, toner will accumulate, which will only cause the problems to get worse. The drum cartridge does not have a waste chamber; all the waste toner is recycled back into the toner cartridge.

Since the developer roller actually contacts the drum, the waste toner is transferred back into the supply of the toner cartridge. As stated above, once you print with a bad toner cartridge the drum unit will become contaminated. Even when you change out the toner with a good properly recycled or new OEM cartridge, the drum unit will transfer some of the bad toner back into the good toner cartridge, which will again cause back grounding. Both cartridges will be contaminated again. Basically, once you have back-grounding, both cartridges need to be cleaned out.

The remaining 80g or so of "toner" in the toner cartridge is just below the bare minimum that can maintain the proper charge level. When the change toner light comes on, the toner will not charge up to the proper level and will cause the back grounding. As the toner cartridge reaches the end of its useful life, the printer senses the low charge level in the toner supply and will try to keep the charge level up. This constant charging keeps an almost "empty" cartridge from back grounding. Once the printer cannot get the remaining toner up to the minimum charge, the change toner light comes on. The cartridge at this point will still be printing properly. If you were to take that same cartridge out of the machine for a few days, and then put it back in the printer with out doing anything to it, the cartridge will background. This will happen because the charge level that the printer was trying so hard to keep up has dissipated out and the materials left can no longer accept a proper charge.

WHAT DOES THIS ALL MEAN?

1. Make sure that your cartridge techs thoroughly clean out the supply chamber of the toner cartridge. Clean dry compressed air is the best method.

2. In the event that they forget, and you have a back-grounding cartridge. The toner must be completely cleaned out again. (Do not use the toner over!!) and NEW fresh toner MUST be installed. At this point, the drum unit has to be taken apart and cleaned out with emphasis on the cleaning brush area. This is a very simple process but very necessary once contaminated.

3. Last but certainly not least, no chemicals of any sort should ever be used when cleaning the toner cartridge. If the developer roller has a buildup that cannot be removed with a clean lint free DRY cloth, don’t use the roller. All cleaning chemicals have a tendency to leave a small amount of residue which will react with the toner and cause problems. When rebuilding the drum unit, alcohol can be used to clean the drum, but no other chemicals any where else. This is especially true of the cleaning brush. This brush has a conductive coating on it that will be removed if any solvents get on it. Once the conductive coating is gone, the cartridge is useless.

CARTRIDGE TROUBLESHOOTING

Back-grounding: Toner cartridge and Drum cartridge; By far the most common problem with these cartridges, there are three common causes.

1) The first is contaminated toner. If the old toner in the toner cartridge was not fully cleaned out, a shaded background will result usually over the entire page. This can also be caused by a contaminated cleaning brush in the drum cartridge, which is directly related to a bad toner cartridge.

2) If the developer roller in the toner cartridge is worn, it will tend to pull too much toner, and back-grounding will result. This normally happens only on cartridges that have been recycled a few times. A normal roller will have a somewhat mottled look, and the texture should be smooth. If the roller has lines, small cracks, or just doesn't look right, don't use it.

3) Another back-grounding issue can result from the toner being used. Not all aftermarket toners will work together. This is because there is always a small amount of toner left on the drum cartridge cleaning brush. Most aftermarket toners will work over the OEM, but not all will work over another aftermarket toner. If your cartridges work in house but background out in the field, it can be that the drum unit has failed, or that another aftermarket toner was used previous to yours. Check with your vendor to make sure that your toner will work on top of another (all) aftermarket brand(s).

Clicking: Toner Cartridge; On the left side of the cartridge there is a series of gears with very fine teeth. If any toner gets on these teeth during the cleaning process, and is not cleaned off, the toner can cause a tooth to break, and clicking will result. We have found it easy to keep one hand over the gear train when blowing the cartridge out and when filling it, that way the gears stay clean. If they do get toner on them, clean the gears and the shafts with alcohol, and lubricate with fine grease. Both the shafts and teeth need to be lubricated.

Clicking gears can also result from toner not specifically designed for the TN-460 being used. If the toner particles are not uniform, the toner will not flow easily, and the mixing auger inside the toner cartridge can bind, causing a tooth to break.

Vertical speckled toner pattern on the right side of the page: Toner Cartridge; This is a common problem. There is a small plastic clip that is on the right side of the developer roller that is held on only by double sided tape. It is very common for it to fall off. In fact we have seen as much as 35% of the cores come in with out these clips. The purpose of the clip is to keep the toner from building up on the edge of the developer roller. If it is missing, the toner will build up, and eventually start to fall off and cause a speckled vertical streak. The left side of the cartridge also has a clip, but it is permanent, and does not fall off. New clips are available. See Figure 2 and 3 for more information. (Figures on next page)

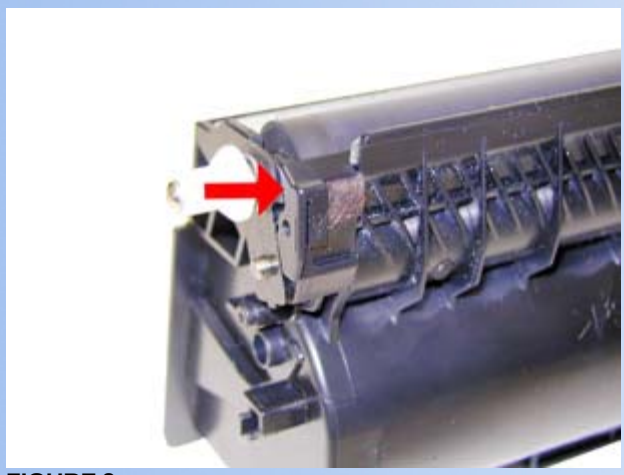

FIGURE 2

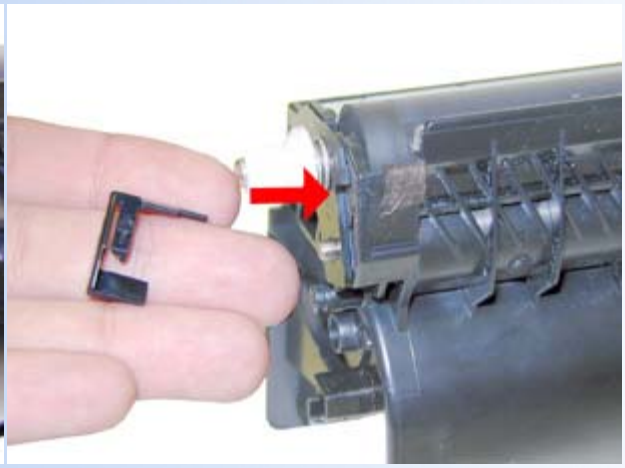

FIGURE 3

Dark Black Vertical Streaks: Drum cartridge; This is normally caused by either a dirty primary corona wire, or the blue corona wire cleaner is not in its "home" position on the left side of the cartridge.

Light Print: Drum cartridge; Can be caused by a dirty or worn Transfer Roller. These rollers are located inside the cartridge. In our tests, they should last at least 2-3 cycles.

Black or white horizontal Lines: Toner cartridge and Drum cartridge; Black lines normally appear when there is a build up of toner, White when there is a dead spot, or contamination of the roller. If the lines repeat every 94 mm

(approx. 3 3/4"), the drum is bad, or dirty. If they appear every 39mm (approx. 1 9/16"), the developer roller in the toner cartridge is bad or dirty.

Solid Black Pages: Drum cartridge; Bad drum ground contact, probably from the drum axle shaft to the contact gear inside the drum.

Perfectly straight thin black lines down the page: Drum cartridge; Scratched drum.

Black dots that repeat every 94mm (3 3/4"): Drum cartridge; Bad drum, or something is stuck to the drum surface.

DRUM CARTRIDGE RESET PROCEDURE

If the machine is saying to change the drum unit, do the following. If the drum unit was cleaned because of contamination, the reset is not necessary. Note that there are separate procedures for laser printers, and fax machines.

Fax Machines (DCP Machines also)

After replacing the drum unit, keep the front cover open and press “Clear”. The display will show “Replace Drum? 1.Yes 2.No” Press “1” the display will show “Accepted”, close the front cover. The counter is reset!

Laser Printers

Open the front cover. Locate the black button under the LED lights on the left side. Press and hold in the button until all the lights are lit. Release the button. The counter is reset!

RECOMMENDED SUPPLIES

Microsoft OLE DB Provider for ODBC Drivers error '80004005'

[Microsoft][ODBC Microsoft Access Driver]General error Unable to open registry key 'Temporary (volatile) Jet DSN for process 0x1c78 Thread 0x2dc8 DBC 0x21448ac Jet'.

/script/catSearch.asp, line 58