

SERVICE EDGE

The Laser Printer Tech Quarterly
WINTER 2010

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DON'T TOUCH THAT!

Eight disasters that
printer techs should avoid.

EDITORIAL

Kentucky Fried Printer Parts

Yes, there is a secret recipe to the success of LPT. A mixture of things as simple as quality and as complex as putting love in every box. Quality is of first and foremost importance of course, the Number One ingredient if you will.



Why is quality so important? Because **you can't be the best in this field selling junk.** A service company can not sell quality and deliver junk, it will never work.

The cheapest guy in town always goes out of business and always will. The best always win. This is the quality mindset required in this "Industry of Value Creation".

An opportunity for you

Inflation may touch our industry as oil prices, which drive plastic and rubber prices, go up, and the dollar drops. You have the opportunity to raise prices in advance. Yes, Opportunity plus Quality equals Success.

May your success exceed your dreams!

David K. Reinke

David Reinke is president and chief executive officer of Liberty Parts Team Inc.

COMPANY NEWS

LPT Grows in 2010

In 2010, Liberty Parts Team gross sales grew 5%. The laser printer parts wholesaler has grown every year since it started on Jan. 18, 2005.

LPT Total Revenue by Year

2005 (11.5 months)	\$7 million
2006	\$14.5 million
2007	\$21 million
2008	\$24.5 million
2009	\$24.9 million
2010	\$26 million (estimated)

In addition, LPT had growth in customers sold (9%), and packages shipped (6%). LPT employs 68 at its Madison, Wis., headquarters, having hired and retained 14 new employees in 2010.



Every fuser is individually tested and inspected.



With LPT packaging, shipping damage is extremely rare.



The \$10 million inventory in Madison, Wis.

TECH

DON'T TOUCH THAT!

A Printer Tech's *NOT* To Do List

Do you know the difference between education and experience? Education is when you read the fine print; experience is what you get when you don't.
—Pete Seeger, folk singer

Many mechanically inclined people prefer to find things out for themselves, priding themselves on never consulting instructions. However, experience is a cruel teacher when it comes to learning the pitfalls of printer maintenance: hours lost in disassembly, printer identities confused and broken parts are examples of what awaits the uninformed. This *Service Edge* article describes eight situations you don't want to stumble into.

Don't Remove the MP Separation Pad Arm IN THE P3005, 24x0

When replacing the MP separation pad in the HP LJ P3005 and 2400 series, there is opportunity for a serious misstep. Making matters worse, there are no instructions in the service manual.

To remove the separation pad, pry it off of the plastic arm to which it is mounted (see Fig. A), and snap on the new pad. Attachment and detachment from the arm is awkward because there is little clearance, and the temptation is to remove the arm. Do not do this! Because of the compression spring under the arm, it is extremely difficult to re-install the arm correctly, and you may end up removing the entire pickup roller shaft – a long and difficult process.



CLJ 4700/30: Don't Troubleshoot with New Belt or Fuser

HP Color LaserJet 4700 and 4730 printers reset fuser and transfer maintenance counts automatically after detecting and blowing a fuse in the new fuser or transfer belt. Once the fuse has been blown, that fuser or transfer belt has lost the ability to reset the count.

This means that you should never use a new fuser or transfer belt just for troubleshooting. As soon as you power up the test printer with the new part in it, the fuse will blow, and reset the maintenance count in the printer. That has two undesirable effects: (1) There is no way to set the printer's maintenance count back to what it should be; (2) That fuser or transfer belt has lost the ability to reset the count in any other printer that you might install it into.

So do not install a new fuser or transfer belt in a 4700 or 4730 printer unless you intend to leave it in that printer.





Printer Identity Crisis: Swapping used formatters or DC controllers can downgrade your printers

Newer LJs: Avoid Troubleshooting with Formatters, DC Controllers

On many of the newer HP LaserJets, the same formatter and/or DC controller board is used for multiple printer models. The identity of the printer (which model it is, whether or not it has network capability, whether or not it has duplex capability, etc.) is written into NVRAM memory on both boards. When you replace either of these boards, it automatically copies that information (along with menu settings, page counts, etc.) from the other board. This works well as long as the board being installed is a brand new OEM board (never been installed in a printer) with a blank NVRAM.

If the board being installed has been taken from another printer and has data in the NVRAM, the printer doesn't know which direction to copy, and the results are unpredictable – the identity of the printer may be changed, and there is no easy way to change it back. There are procedures (usually involving an NVRAM initialization and/or a 5-minute waiting period on first power-up with the new board) that can minimize the chance of a downgrade, but if the two boards have different identities, one of them will change in any event.

On the printers that copy information between formatter and DC controller, HP warns against replacing both boards at the same time – because all the information (page counts, menu settings, etc.) will be lost. Even if both boards are bad and need to be replaced, it is best to do one at a time and perform the appropriate procedures separately for each board.

The moral of all this is: do not swap formatters and DC controllers between machines for troubleshooting purposes unless you must, and then be aware that it may cause identity problems. And do not remove both boards at the same time.

*LJ 4240/50, 4350, 2410/20/30/40, P3004/5, M3027, M3035, P4014/15 and 4515, and other printers released in the past 5-8 years. The 9050 and 9050MFP service manual warns not to remove the DC controller and formatter simultaneously, but whether there are potential identity issues with these models is not yet confirmed. Call LPT Tech Support if you have a question about a specific model not mentioned.

P3015: Careful with the Fuser



With most fusers, we take out a couple of screws and yank out the assembly. In the P3015, it is more complicated.

To make jams easier to remove, there is a mechanism that opens a gap between the fuser rollers when the toner door or the back door opens. However, if you try to remove or install the fuser when the mechanism is engaged, both parts can break.

As the manual indicates, make sure the toner door is closed when removing or installing the fuser. The white arm that is normally attached to the rear door should be all the way into the printer body; it is indicated by an arrow in the figure.



P3005 & 2400 series: Telling Gears Apart in Kits

Both the LaserJet 2400 series and the P3005 have problems with gear noise in the fuser/output area. Usually the problems can be alleviated by replacing the fuser (or just the gear on the fuser) and the drive gears in the printer. For both models, kits are available that contain the drive gears (three gears for the 2400 series, four gears for the P3005). No two gears in the kit are identical – they each have a specific location and function in the printer – but many have identical center holes. Once you remove them, it is not obvious which goes where. Either replace the gears one at a time, or observe them before you remove them and make a diagram to guide you in installing the new gears.

Screwing-up with Screws

Instead of checking the appropriate service manual, we can be tempted to guess at which screws to take out when removing printer assemblies, or simply remove every screw in sight. It's a bad habit and it can backfire.

A case in point is the HP LaserJet 4000/4050 engine controller board. Take off one of the wrong screws and a grounding tab falls off, and if this is not replaced, poor printing results. Moreover, if that tab falls inside the printer, it could cause a short circuit.

Another example in the same printer is the registration assembly: removing the wrong screw causes it to fall apart.

Let's not forget the main drive assembly for the Color LaserJet 3000/3600/3800/CP3505 series. If you remove the wrong screws, you may ruin the MDA (see related article, page 6).

If you have trouble working with instructions or opening a service manual (they are free on our website), you will learn by experience. Good luck to you!

Really! Don't Touch That!!!

Many of the parts inside a printer are delicate – laser/scanner optics, charge and transfer rollers, the toner cartridge drum, fuser rollers, and even rubber paper-moving rollers. Their surfaces can be damaged by harsh solvents, and sometimes even by skin oils. If you need to clean any of these items, use the gentlest method available. The first thing to try is a toner vacuum, or low-pressure condensed air. If you need to actually wipe the surface, a dry, non-abrasive cloth is best. If you need something stronger than that, use a cloth lightly dampened with water (ideally, distilled water). If that still isn't enough, it's usually best to just replace the part, rather than using alcohol or other harsh solvents.

Also, when handling any of these parts, it is best to wear thin rubber gloves, or if the part comes with protective paper wrapping (transfer rollers and charge rollers usually have this), leave the protective wrapping on until after the part is



P3005 Gear Kit



2410/20/30/40 Gear Kit



installed, so that your skin doesn't directly contact the roller surface. In this case, you can take the title of the article literally – don't touch that!

3000/3600/3800 MDA removal: Read the Instructions!!!!

To avoid a bad result when replacing the cartridge locks (which requires MDA removal), read the instructions. Our procedure is on pages 6-10.



CARTRIDGE LOCK LEVER REPLACEMENT

CLJ 3000, 3600, 3800



HP's instructions for the removal of the main drive assembly have been available on the internet for several years, yet techs continue to struggle with the procedure. They reassemble the printer only to get the same 10.92 error that prompted them to try and replace the cartridge locks. Sometimes they get new errors.

To learn why this was causing the confusion, the writer, a non-tech, tried the procedure and successfully performed it on the first try. Many are getting caught because they failed to align certain gears *exactly*.

It is hoped that these instructions will reduce frustration and prevent mistakes that can turn a simple procedure into an ordeal. For added convenience, instructions for cover removal are included.

—R. Reinke

The cartridge lock levers tend to break, resulting in a 10.92.XX error. Replacing them involves the removal and reinstallation of the main drive assembly, a task not described in the manual.

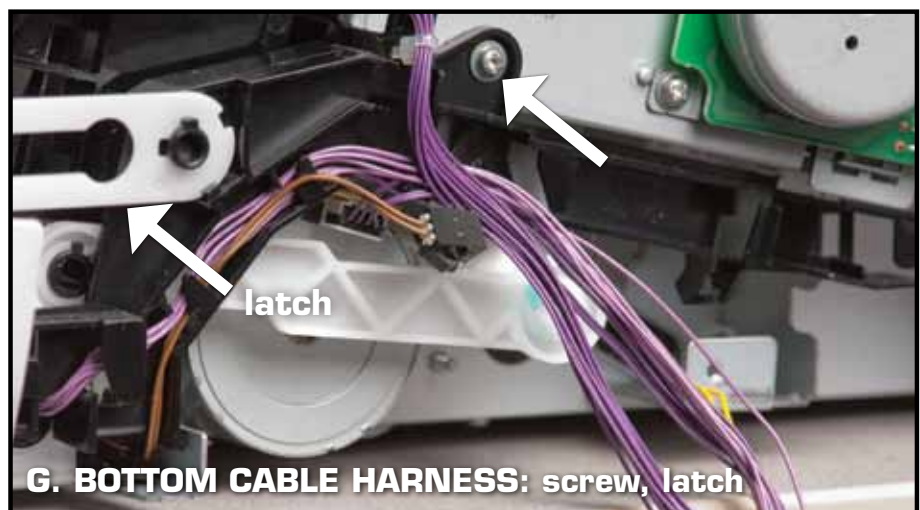
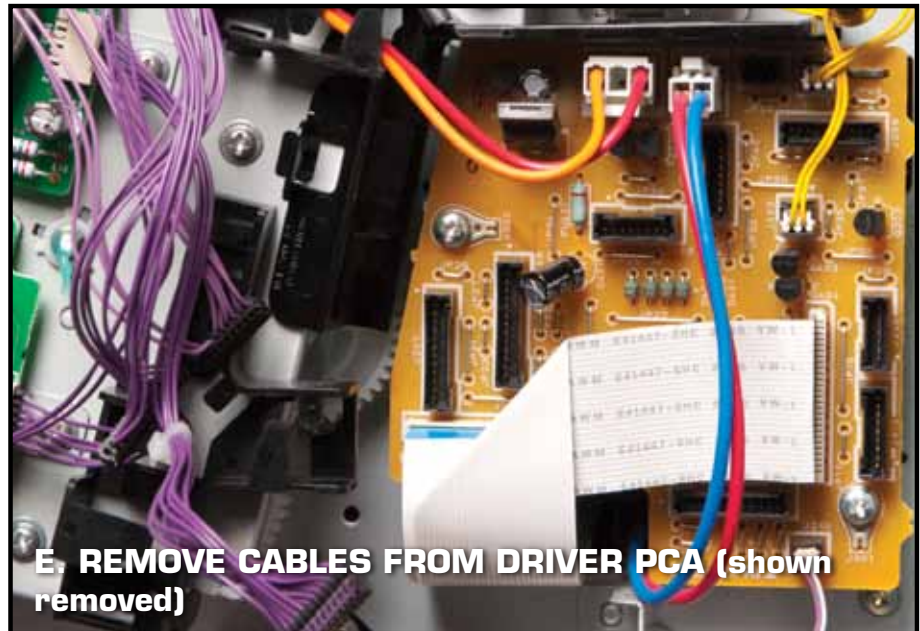
TOOLS NEEDED: Phillips screwdriver, flat-bladed screwdriver, slender needle-nose pliers.

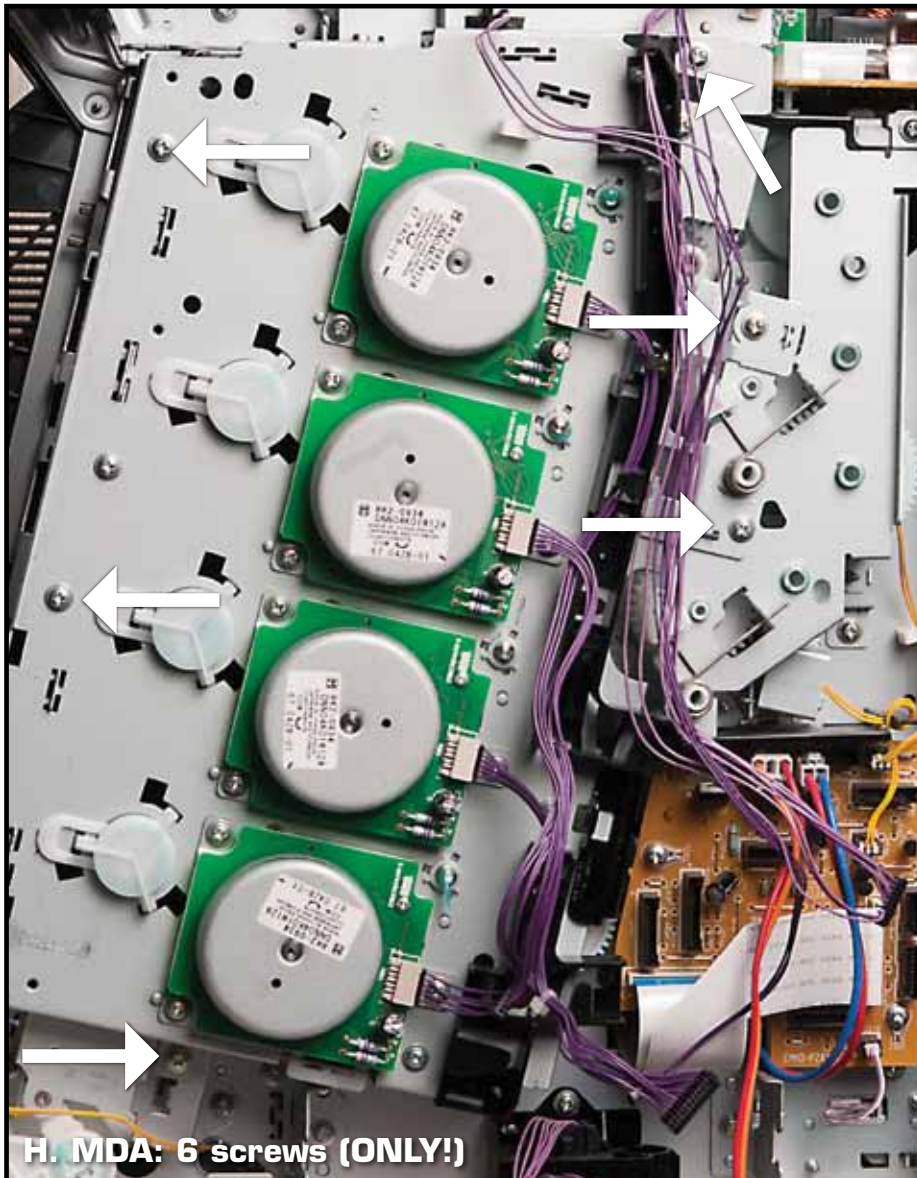
GENERAL ADVICE: If you are in the habit of spinning gears for no particular reason, restrain yourself. The only gears you need to touch are described in step 17 and 18, which are critical steps.

PART ONE: REMOVAL

- 1. REMOVE TONER AND ETB.**
- 2. REMOVE UPPER COVER**
 - a. Remove the output bin, which is on the top rear of printer, and the fuser, under the upper cover. The fuser may be hot.
 - b. Remove four screws from the upper cover (Fig. A).
 - c. As you lift off the upper cover, there is one cable to disconnect.
- 3. REMOVE FORMATTER.**
- 4. REMOVE RIGHT COVER.**
 - a. Remove a screw at the bottom, inside the handgrip (Fig. B).
 - b. Press three tabs with a flat screwdriver blade (Fig. B).
 - c. Pull out the metal power-switch arm from the white lever in the top rear of the cover (Fig. C.)
 - d. Press two rear tabs (Fig. D.)
- 5. UNPLUG MDA CABLES FROM DRIVER PCA.**
 - a. Unplug and remove eight MDA cables from harnesses. (duplex machines will have 10 cables). Fig. E shows the PCA with this cabling removed.
 - b. Reinstallation: only duplex units use slot J209 in the upper right and J406. Also, since there are two 9-pin and two 12-pin cables, judge which goes where by their cable lengths.
- 6. REMOVE INTERLOCK SWITCH ASM (Fig. F).**
 - a. Remove one screw and remove.

Continued on Next Page



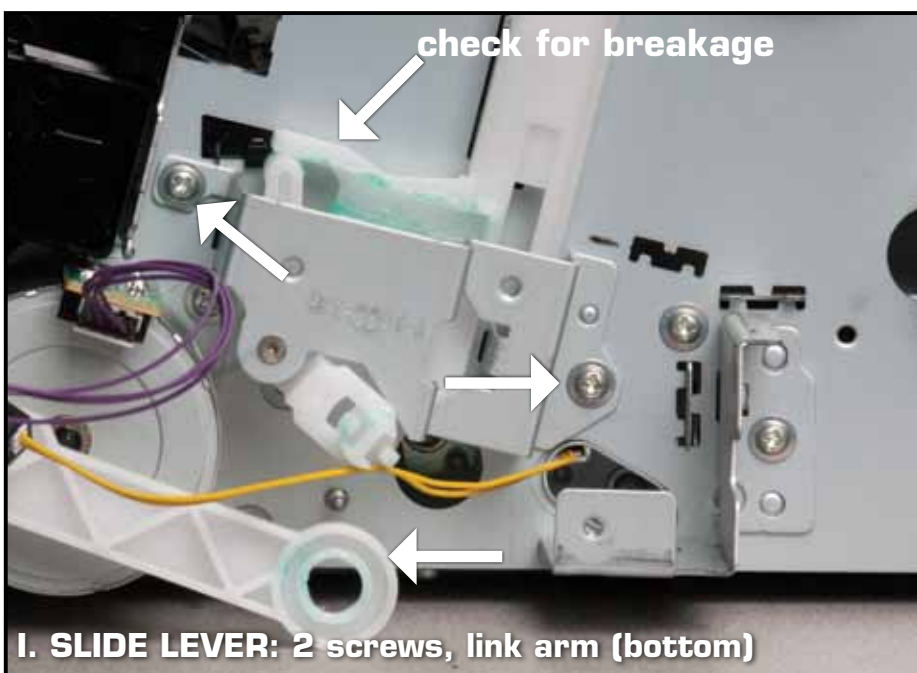


7. REMOVE BOTTOM CABLE HARNESS (Fig. G).

- a. Remove one screw and disengage the harness from the chassis. When reinstalling, seat the rear locking tab in the sheet-metal chassis. It may be necessary to disconnect the white door latch from the front door.

8. REMOVE MDA

- a. Remove the six screws indicated in Fig. H. Removing the wrong screws may ruin the MDA.
- b. Gently pull off the MDA. Two gears may fall off and will in any case need to be removed from the MDA. Their reattachment will be described later.



9. REMOVE METAL CASE

- a. Remove two screws (Fig. I).

10. UNFASTEN WHITE LINK ARM. (Fig. I).**11. CHECK THEN REMOVE SLIDE LEVER.**

- a. Compare with Fig. I, which shows an intact slide lever; breakage can occur near where the arrow points.
- b. Push down on the white slide lever as far as it will go. The two metal tabs should be aligned with openings in the lever. (Fig. J.) Flex the arm and pull off the arm from the tab. Keep track of the four springs that connect this lever to the cartridge locks.

12. REMOVE CARTR. LOCK.

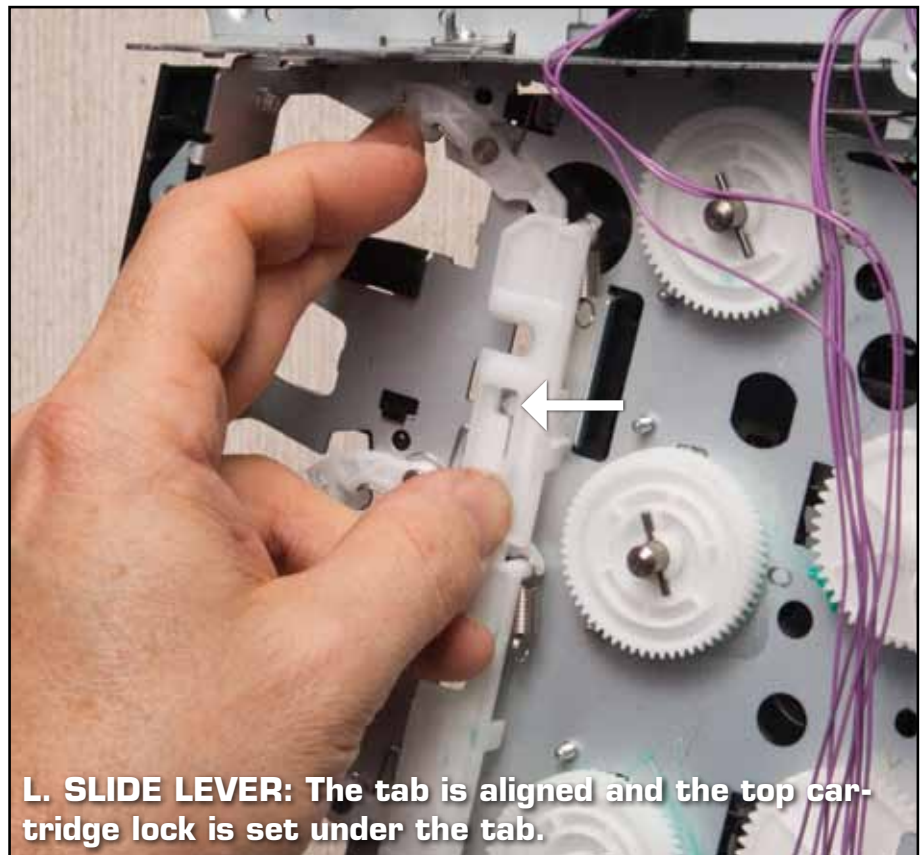
- a. Pull out the broken cartridge locks. To reinstall, first hook the wire on the metal tab (Fig. K)

PART TWO: REASSEMBLY.**13. REATTACH SPRINGS.**

- a. Make sure the ETB guides are in the up position.
- b. Hang the four springs on the white slide lever. They will be reattached to the cartridge locks in step 14.

14. INSTALL LEVER.

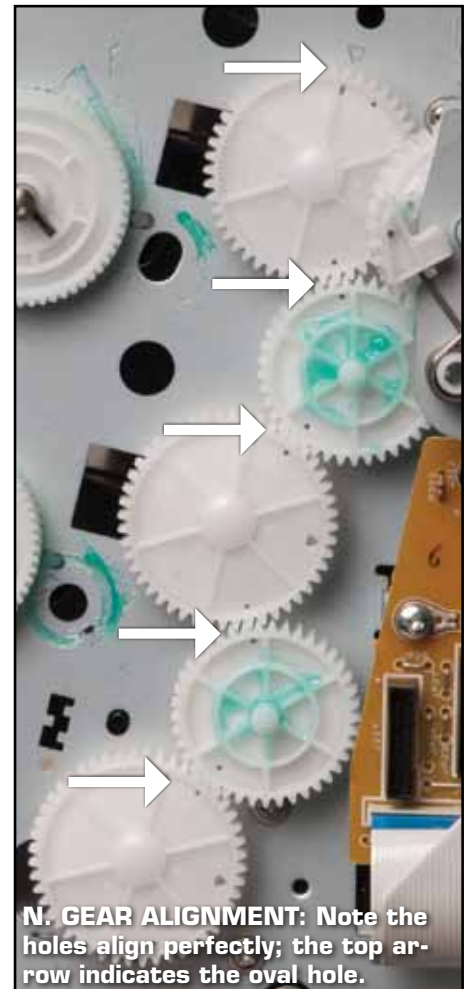
- a. Lift the lever and begin inserting the metal tabs into its slots. Before pushing the lever on the top tab, lift the top cartridge lock to position it beneath the plastic tab on the lever (Fig. L.) Position the other three cartridge locks as you snap the lever into place. Then slide the lever up. The result should look like Fig. M.



L. SLIDE LEVER: The tab is aligned and the top cartridge lock is set under the tab.



M. SLIDE LEVER POSITION



N. GEAR ALIGNMENT: Note the holes align perfectly; the top arrow indicates the oval hole.

Continued on Next Page

15. SECURE LEVER.

- a. Install the metal case, white plastic piece, and the white link arm.

16. CONNECT SPRINGS.

- a. Reconnect the four springs to the cartridge locks using a slender needle-nose pliers. If your hands are unsteady, be patient.

17. CHECK GEAR ALIGNMENT.

- a. The top two gears have oval holes that align with arrows in the metal frame. The two small gears, which may have fallen off or still be on the MDA, each have two holes which align with small holes in larger gears. See Fig. N. Make sure you align them up exactly. It is suspected that many "Do-overs" occur because these were not quite aligned.

18. CHECK MDA GEAR ALIGNMENT.

- a. As in Fig. O., the shafts should tilt all the way right and the holes in the large gears should be

visible. If the shafts are not to the right, move them there. If the holes are not visible, turn the gears at the upper right.

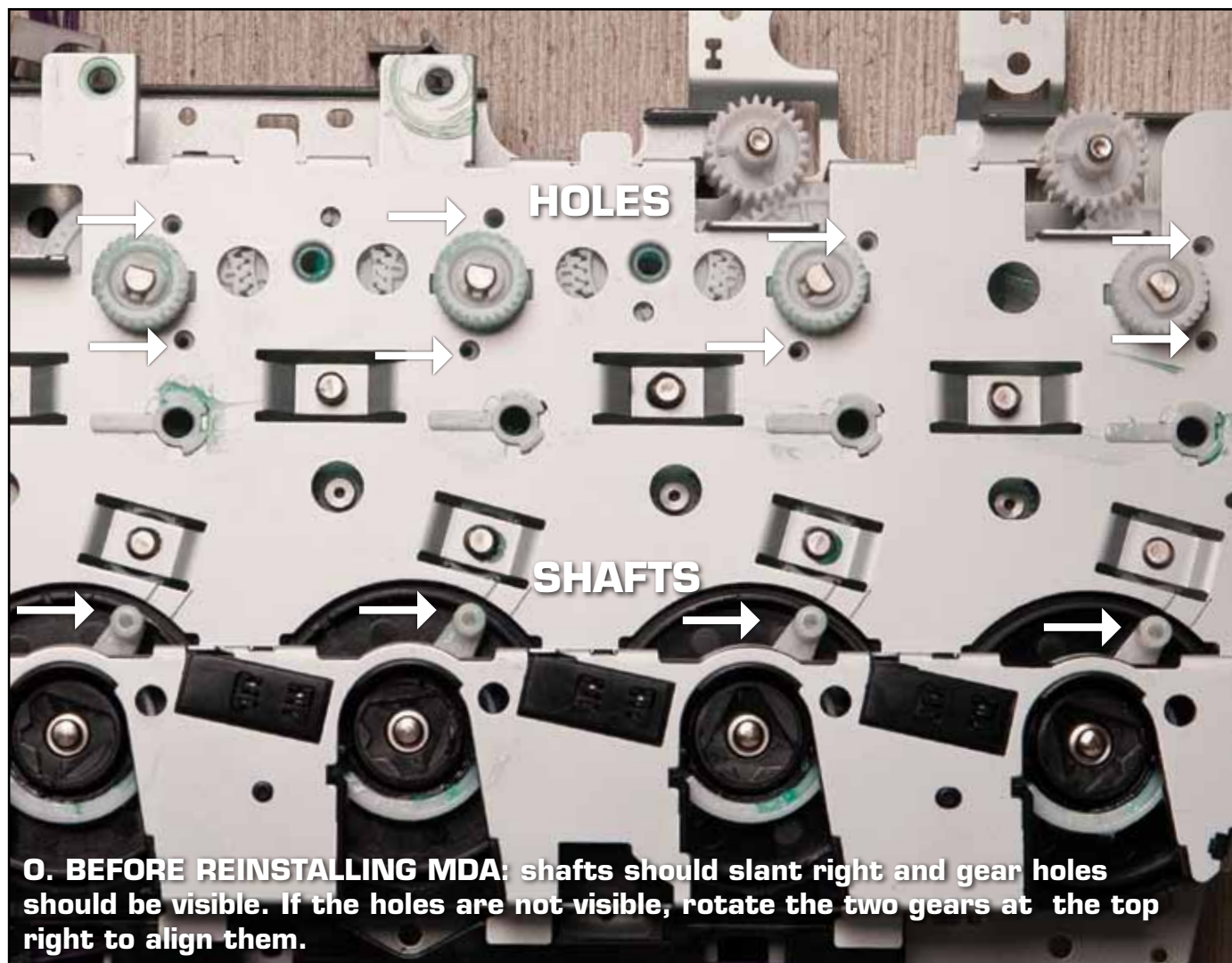
19. INSTALL THE MDA.

- a. Start with the left side, inserting it into the metal slots, then rotate it into place. The top left screw can be attached but not overly tightened to free your hands. Wiggle the MDA into place, make sure it is seated properly, and screw it on.

20. Return to steps 1-6 to reassemble the machine.

Robert Reinke is Creative Director at Liberty Parts Team. He has worked in the laser printer industry since 1989, both in marketing and in printer part-out and parts refurbishing. He ran his own printer parts refurbishing company before joining LPT in 2006.

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Parts Specials

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Prices subject to change without notice.



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