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PRINT HEAD CONNECTOR PROTECTION TOOL

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Print head connector protection tool

Some 3D printing technology has its working basis on applying a binder to a layer of metal powder and then with a source of energy cure the binder to build the parts to be sintered in an oven. During the printing process, some metal powder is disturbed, and some particles can get attached to the print head nozzle surroundings. An analogous process happens when print agents used to print the parts splashes from the powder bed.

While printing, there are some mechanisms to keep the print head nozzles clean to prevent nozzle blockage, but some mixture of metal powder and print agent can be accumulated in the print head boundaries and can damage the print head electronics when replacing the print head.

If the electronic connector gets dirty while extracting the print head, the user needs to clean it. These processes are typically either tedious and inconvenient for the user. If the cleaning process is not properly done, the risk of damaging the connectors increases.

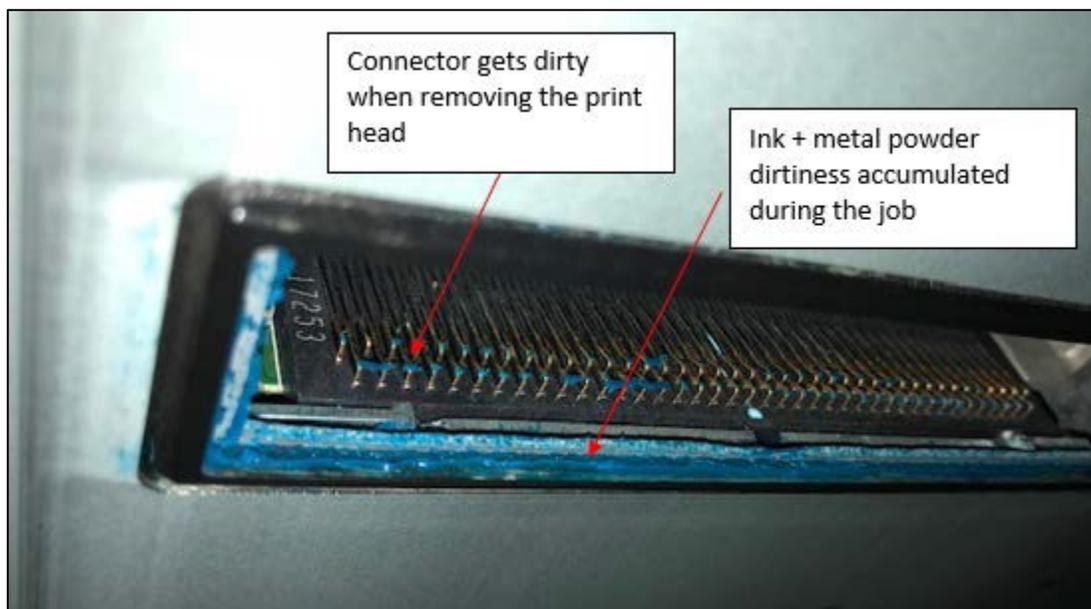


Figure 1 – Electronic connector dirty after a replacement of a printhead

Prior solutions were addressed to make a tool to clean the piano connectors after the connector get dirty but due to the thin connectors and the high adhesiveness of some print agents, the process could be improved but not solved as the piano connectors were in risk of being bended if the tool was not properly inserted.

A mechanical solution has been developed which consists on a tool that prevents the piano connector from getting dirty by protecting the connection while the print head is removed. This tool not only prevents the piano connector to get dirty, but it also increases the robustness and productivity of the system as it prevents the user to have to clean a delicate connection in a tinny space. The concept of the solution is as follow

1. Place the tool between the connector and the print head before removing the print head.

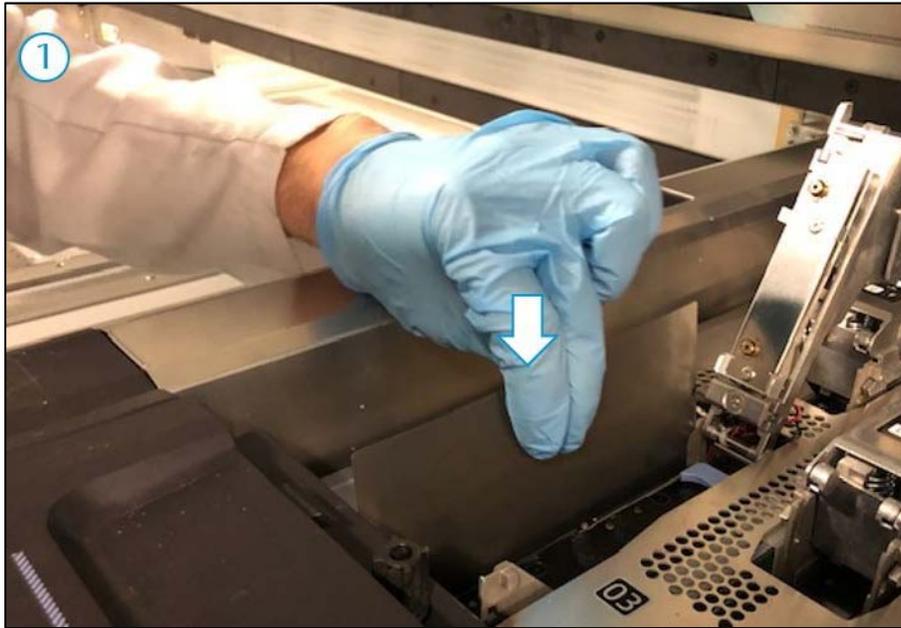


Figure 2 – Step 1 in the process of replacing the print head using the new tool

2. Remove the print head with the normal procedure while keeping the tool in place.



Figure 3 – Step 2 in the process of replacing the print head using the new tool

3. Remove the tool and clean it outside the printer for the next use

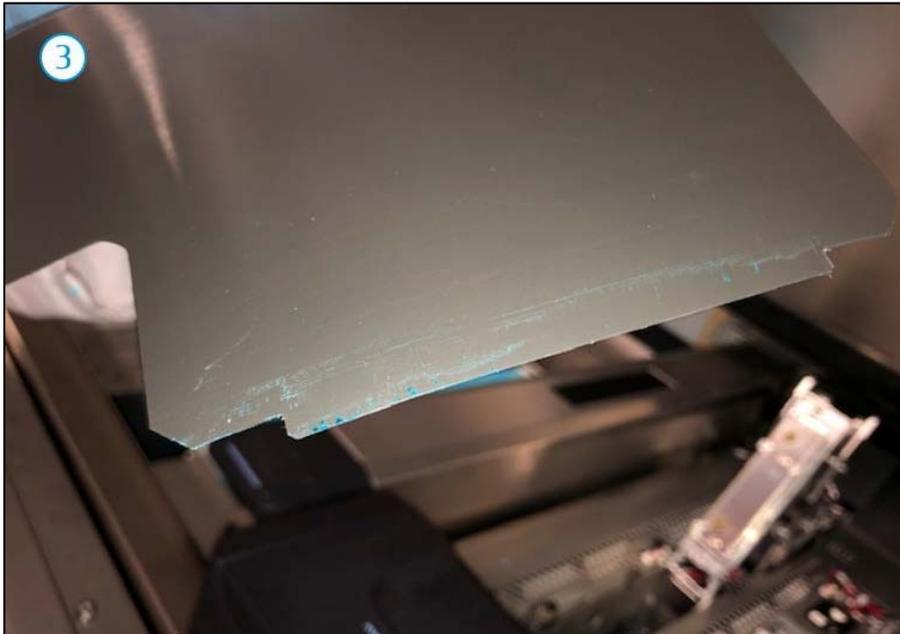


Figure 4 – Step 3 in the process of replacing the print head using the new tool

If the aforementioned process has not been followed, the dirtiness shown in the picture above would have been stuck to the print head electronics. Thus, by using this tool, the robustness of the connection is increased as the tedious action of cleaning the connection every time the print head is removed is no longer required. For this reason, the productivity of the printer is improved as the action of replacing the print head is faster due to the reasons explained above.

Disclosed by Emiliano Tolosa, Gemma Bolumar and Michael Monroe, HP Inc.