SERVICE ADJUSTMENT TOOL FOR PRINT HEAD TO BELT SPACING

HP INC

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Recommended Citation
INC, HP, "SERVICE ADJUSTMENT TOOL FOR PRINT HEAD TO BELT SPACING", Technical Disclosure Commons, (July 20, 2018)
https://www.tdcommons.org/dpubs_series/1352
Service adjustment tool for Print Head to Belt Spacing

Large-Format Printers usually have a special adjustment process in the factory to ensure the correct spacing between the Print Head and the Belt. This distance (also known as PBS "Print Head to Belt Spacing") is very important as the Printer's algorithms uses it to calculate when the ink drop needs to be fired from the Print Head to place it on top of the media. This parabola is calculated assuming the PBS is 2.3mm with a tolerance of 0.5mm. By ensuring this PBS distance is within specs, printer's Image Quality is also ensured.

Because of the long tolerances chain on the printer, it is not possible to ensure so tighten specs by design, so it needs to be adjusted during Printer's manufacturing process.

Special and dedicated station is adjusting and checking 100% of printer's PBS by getting the Print Head to Belt Spacing along the whole Print Zone and telling the Operator the needed shims to place on the three posts to get the correct space.

This process can only be performed on the manufacturing line, meaning that there is no available tool in the field in order to perform this verification or adjustment in the field as the manufacturing tool is so complex and so expensive.

Current invention consists on a compact tool which will allow the Service Engineer to easily check the PBS status of the Printer enabling the adjustment of the printer in customer side.

Current invention allows Service Engineer to verify and adjust Printer's PBS at customer side after replacing any part that could affect the PBS distance or readjust the PBS distance because the customer is having Image Quality issues due to a PBS misadjustment that could occurred due to transportation issue or a big crash.

No prior solutions exist nowadays supporting Service to repair or adjust the Pen Belt Spacing in case of need.

Print Head to Belt Spacing Service tool consists on a compact equipment that allows the Service Engineer check and adjust the PBS distance if needed. Tool housing is a replica of a Printer's Print Head, thus allows insert the tool into the Carriage Pen Pocket, placing the tool in the defined datuming system.

Inside the tool there are two Encoder Sensors that read the Encoder Strips that moves up and down as they are attached directly to two skis that contact the belt.
When the verification/adjustment needs to be done, Service Engineer will install the tool into the Carriage Pen Pocket. Carriage will travel along the Scan Axis and at the same time, the skis coming out from the tool contacting the belt will draw the profile of the belt retrieving the information from the Encoder Sensor with a precision of 40microns.

Electronics embeded into the tool will convert the Encoder units signal to a distance and will be communicated to the PC via Bluetooth.
INC: SERVICE ADJUSTMENT TOOL FOR PRINT HEAD TO BELT SPACING
Electronics embeded into the tool are containing a small battery which allows the Service Engineer to connect via USB to a PC to charge it. This battery can also be feeded with the Printer's Print Head electronics when this is installed into the Printer (while running the measurement).

PBS tool may have an acumen (see picture below) contacting the Print Head electronics that let know the printer that the Print Head to Belt Spacing tool is installed into the Printer, limiting the Carriage movements along the Scan Axis to avoid possible damages.
Tool's case (where it is stored) contains also the correct datuming and a known surface to calibrate it. Below right image is also showing a cross section of the tool case references used to calibrate the tool.

Process flow for the Service Engineer is:

1. Switch on the Print Head to Belt Spacing tool
2. Insert the Print Head to Belt Spacing tool into the tool's case and get the measurement to calibrate the tool.
3. Insert the Print Head to Belt Spacing tool into the Carriage's Pen Pocket.
4. Carriage will move along the Scan Axis while the tool is getting the Z distance (Pen to Belt Space) for each Carriage position. All the processed data will be sent directly to the PC via Bluetooth.
5. PC program will plot and calculate the shape of the distance along the Belt telling the Service Engineer the Printer's profile, and if the PBS distance is OK or needs to be adjusted. Further calculations can tell the Service Engineer which number of shims needs to be added or removed to properly adjust the Printer.

Disclosed By:

Marc Clotet, Nestor Luid and Jose Antonio Marco, HP Inc.