Service Calibrations 5

Service Calibrations

The Printer has several calibration procedures that must be performed under certain conditions. Refer to the table below to determine when calibrations are required.

REMEMBER THAT CERTAIN CALIBRATIONS ARE REQUIRED EVEN IF AN ASSEMBLY HAS BEEN DISASSEMBLED TO GAIN ACCESS TO ANOTHER ASSEMBLY OR COMPONENT.

	Which Calibrations Need To Be Done								
When Required	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**♦**
Carriage is disassembled or replaced	**No**	**Yes**	**Yes**	**Yes**	No	**Yes**	No	**Yes**	**Yes**
Electronics Module or Main PCA is replaced	No	No	No	No	No	No	**Yes**	**Yes**	No
Paper-Axis is disassembled or replaced	**Yes**	No	No	No	No	**Yes**	No	No	No
Platen Assembly is disassembled or replaced	No	No	**Yes**	No	No	**Yes**	No	No	**Yes**
Service Station is disassembled or replaced	No	No	**Yes**	No	No	**Yes**	No	No	No
Drive Roller is disassembled or replaced	**Yes**	No	No	No	No	**Yes**	No	No	No
Tubes System (SRK) is disassembled or replaced	No	No	No	No	No	No	**Yes**	**Yes**	No
Banding Problem	**Yes**	**Yes**	No	No	No	No	No	**Yes**	No
Misalignment between Colors	No	**Yes**	No	No	No	**Yes**	No	**Yes**	No
Color Accuracy Problem	No	No	No	No	No	No	No	No	No
Edge Detect Problems	No	**Yes**	No	No	No	No	No	No	No

Refer to the following page for the relevant Calibration.

Service Calibrations

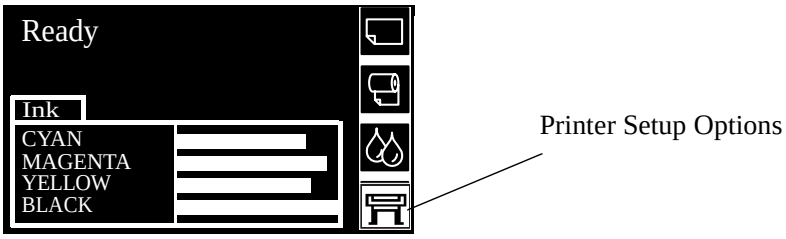
The following is a list of all internal service calibrations available in the Printers. Instructions for entering the service calibrations menu are given on Page *5-4*.

1. Accuracy Calibration ⇒ Page *5-6*
   The purpose of this Service Calibration is to calibrate the nominal advance of the media. This calibration is necessary to control the exact movement of the media in order to avoid print quality problems like banding.
2. Line Sensor ⇒ Page *5-9*
   The purpose of this Service Calibration is to calibrate the intensity of the line sensor in the Carriage PCA. An incorrect calibration can result in edge-detection failures during media loading and incorrect reading of prints that are used for alignment or calibration.
3. Service Station ⇒ Page *5-11*
   The purpose of this Service Calibration is to calibrate the Service Station in relation to the Carriage Assembly.
4. Roller Mark Position ⇒ Page *5-13*
   The purpose of this Service Calibration is to calibrate the Mark Encoder which is located on the Drive Roller.
5. Pen to Paper Spacing ⇒ Page *5-15*
   THIS CALIBRATION IS NO LONGER REQUIRED.
6. Color to Color Calibration ⇒ Page *5-16*
   The purpose of this Service Calibration is to correct the alignment between the Printheads and the rest of the Printer. This calibration is necessary in order to prevent color misalignment.
7. Calibrations Backup ⇒ Page *5-19*
   The purpose of this Service Calibration is to allow the EEROM contents to be saved when the Electronics Module/Main PCA or the Tubes System is replaced.
8. Pen Alignment ⇒ Page *5-22*
   The purpose of this Service Calibration is to correct the alignment between the Printheads. This calibration is necessary in order to prevent color misalignment and print quality defects like banding.

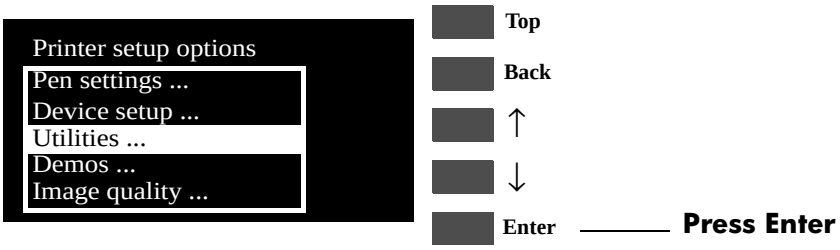
- Carriage Height Calibration ⇒ Page *5-24*
  The purpose of this Service Calibration is to adjust the distance between the Carriage and the Center Platen. This calibration is necessary in order to prevent problems like Printhead crashes.

Entering the Service Calibrations Menu

1 Once the message "Ready" is displayed on the front-panel, scroll to the "Printer Setup Options" icon and press the **Enter** key.

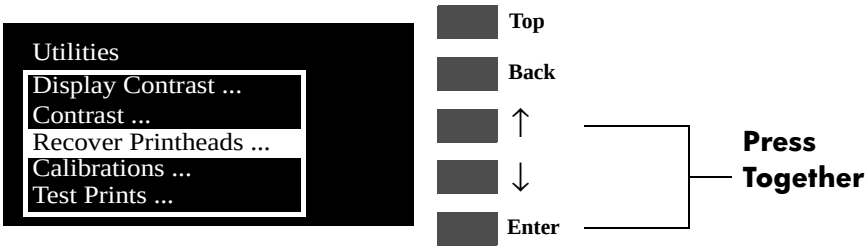


2 Once inside the "Printer Setup Options" menu, use the **Arrow** keys to scroll to the "Utilities" menu display and press the **Enter** key.

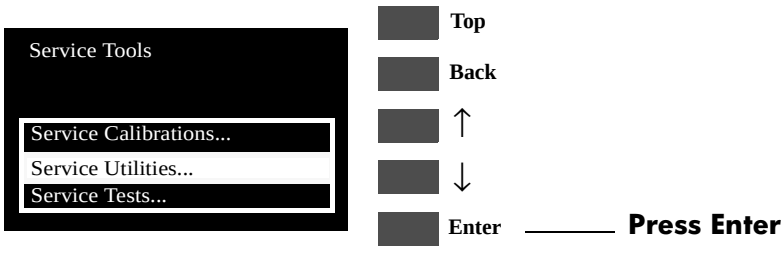


Make sure that you are in the Full menu mode because otherwise you will not be able to access the "Service Tools" submenu.

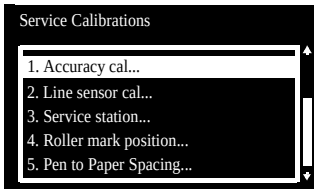
3 Once inside the "Utilities" menu, press the **UP** and **Enter** keys together. You are now in the **Service Tools** Menu.



4 Use the **Arrow** keys to scroll to the "Service Calibrations" menu and press the **Enter** key.



5 Use the **Arrow** keys to scroll through the "Service Calibrations" selections.



6 Press the **Enter** key to begin a specific calibration when the required Service Calibration is highlighted.

If the printer is not used for 3 minutes, the printer exits out of the Service Calibrations Menu and you must repeat the above steps to enter Service Calibrations again.

In some cases a quick press of a button may not be recognized by the Printer. When pressing a button, be sure to press it deliberately and all the way to the bottom of its travel.

If the Printer hangs up during an operation, switch the Printer OFF and restart from step 1.

1. Accuracy Calibration

The purpose of this Service Calibration is to calibrate the nominal advance of the media. This calibration is necessary to control the exact movement of the media in order to avoid print quality problems like banding.

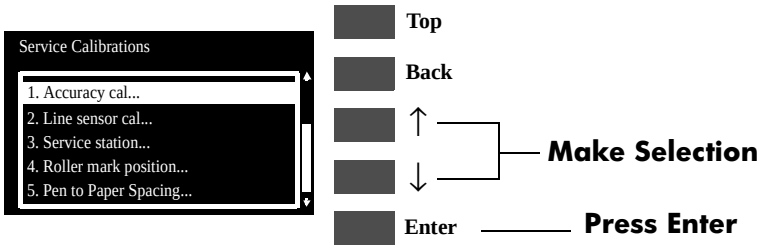
Perform the Service Accuracy Calibration whenever:

- Banding is detected in prints.
- Drive Roller is disassembled or replaced.
- Paper-axis Assembly is disassembled or replaced.

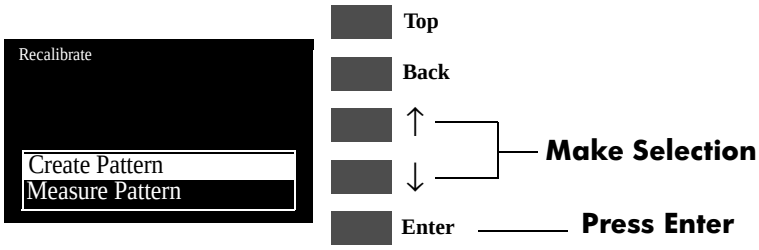
Perform the Accuracy Calibration as follows:

Make sure you load HP High Gloss Photo Paper in to the Printer before performing this calibration. Do NOT use any other type of media apart from HP High Gloss Photo Paper.

1 In the Service Calibrations submenu, scroll to "1. Accuracy cal" and press **Enter**.



2 When the following message appears on the front panel, select "Create Pattern" and press **Enter**.



3 If media is not loaded, the following message appears on the front panel and you must load media into the Printer.

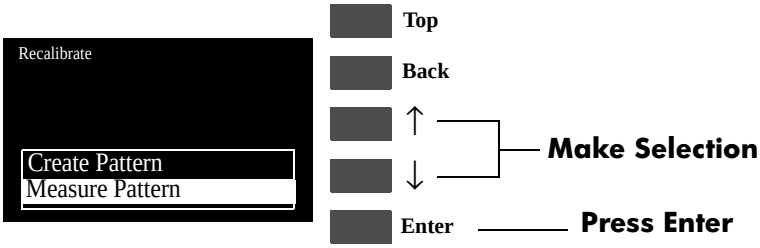
Do NOT use any other type of media apart from HP High Gloss Photo Paper.

4 The Printer will start to print the Accuracy Calibration Pattern and the following message will be displayed on the front panel:

5 Once the Accuracy Calibration Pattern is completed, remove the pattern from the printer and leave it to dry for a few minutes.

If there is a multi-roll feeder installed, you MUST perform the instructions on Page *5-8* before continuing with the following steps.

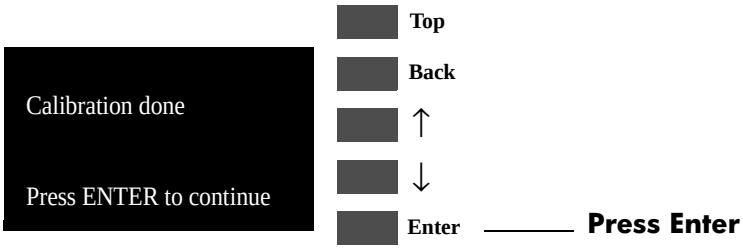
6 Select "Measure Pattern" and press **Enter**.



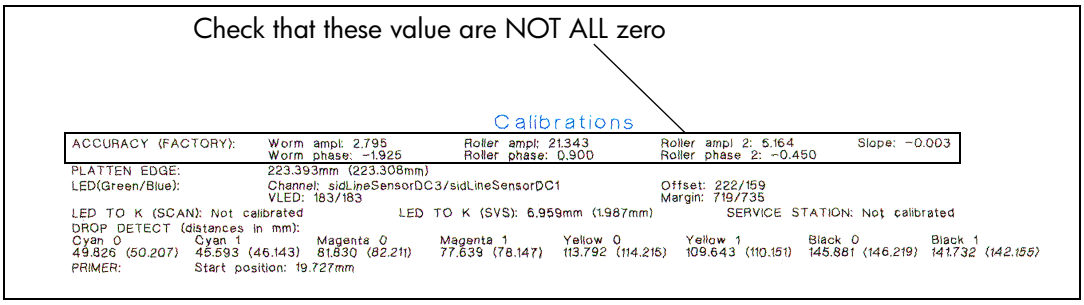
7 Rotate the printed sheet 90° counterclockwise and reload it printed-side up, so that the black arrows go into the printer first.

8 The Printer will load the pattern and then measure the alignment marks using the line sensor on the Carriage Assembly. The following message will be displayed while the Printer measures the pattern:

9 Once the calibration is completed, the following message will be displayed:



10 To check if the Calibration was completed correctly, print the Service Configuration Print (see Page *1-17*) and check that the values given for the Accuracy Calibration are NOT ALL zero.



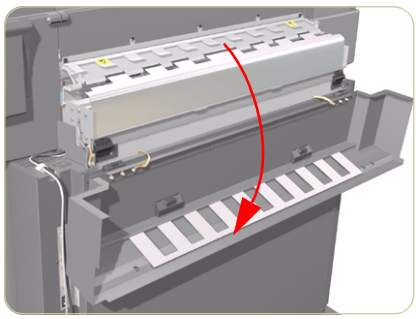
11 If the calibration fails *Perform the Electronic Systems Test* ⇒ *Page 4-5*.

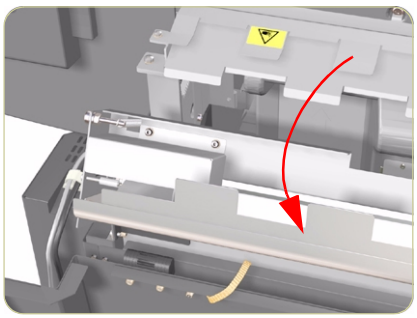
Instructions if Multi-Roll Feeder is Installed

If the multi-roll feeder is installed, you first need to de-activate it through the front panel by selecting Device setup ⇒ Multiroll ⇒ NO. Once the multi-roll feeder has been de-activated, you must reboot the printer.

When the printer displays the Ready status do the following:

1 Go to the rear of the multi-roll feeder, open the Rear Top-Cover and the Motion Control Unit.





2 Re-enter into the Accuracy Calibration and then continue from step 6 on the previous page.

While the printer is measuring the pattern, go to the back of the printer and support the sheet as it is fed out of the back, so that it does not get scratched or damaged.

When the printer has finished measuring the pattern and has ejected the sheet, the calibration is finished. Lift the Motion Control Unit back into place and close the Rear Top-Cover of the multi-roll feeder.

After performing the Accuracy Calibration, make sure you re-active the multi-roll feeder through the front panel and reload the media roll. You must close the Rear Top-Cover fully to assure successful loading of the media.

2. Line Sensor

The purpose of this Service Calibration is to calibrate the intensity of the line sensor in the Carriage PCA. An incorrect calibration can result in edge-detection failures during media loading and incorrect reading of prints that are used for alignment or calibration.

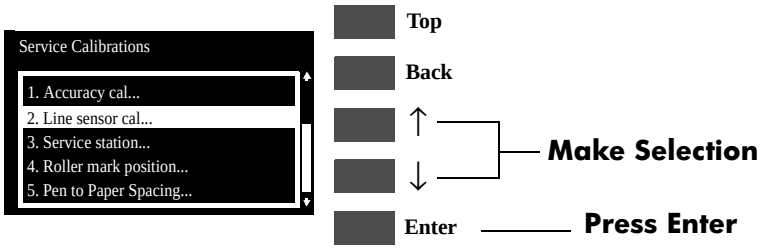
Perform the Line Sensor Calibration whenever:

- Edge detect procedure fails during media loading.
- Carriage is disassembled or replaced.
- Banding is detected in prints.
- Misalignment between colors is detected.

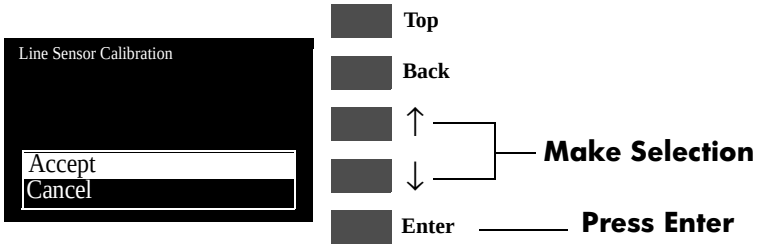
Perform the Line Sensor Calibration as follows:

Make sure you load HP Coated media in to the Printer before performing this calibration.

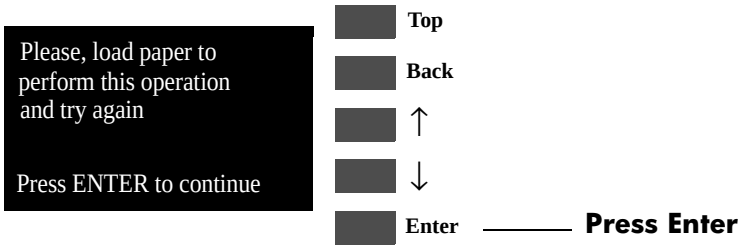
1 In the Service Calibrations submenu, scroll to "2. Line Sensor cal" and press **Enter**.



2 The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Line Sensor Calibration, or select **CANCEL** if you want to cancel the it. Press **Enter** once the selection has been made.

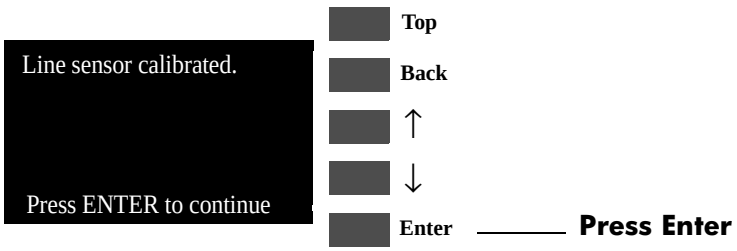


3 If you selected to continue, then the following message appears on the front panel if media is not loaded. You must load Media in to the Printer to continue.

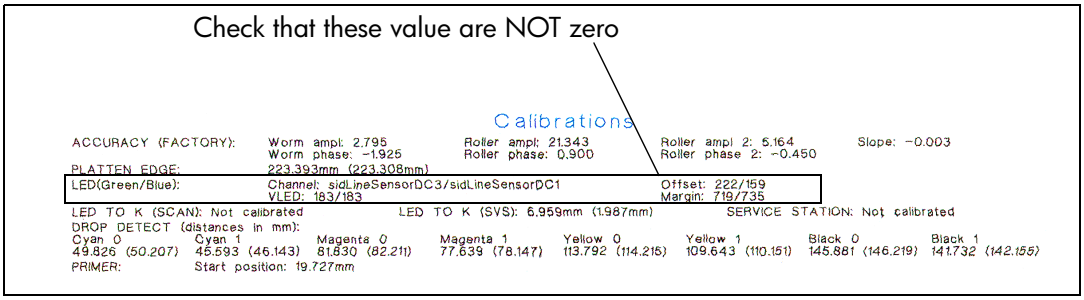


4 The Printer will start to print the Line Sensor Pattern and the following message will be displayed on the front panel:

5 Once the line sensor calibration is completed, the following message will be displayed on the front panel:



6 To check if the Calibration was completed correctly, print the Service Configuration Print (see Page *1-17*) and check that the values given for the LED (Green/Blue) are NOT zero.



7 If the calibration fails *Perform the Electronic Systems Test* ⇒ *Page 4-5*.

3. Service Station

The purpose of this Service Calibration is to calibrate the Service Station in relation to the Carriage Assembly.

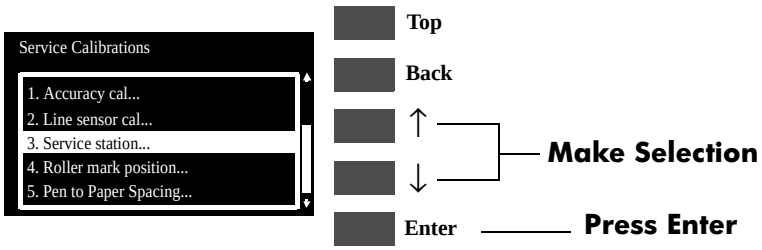
Perform the Service Station Calibration whenever:

- Carriage Assembly is disassembled or replaced.
- Platen Assembly is disassembled or replaced.
- Service Station is disassembled or replaced.

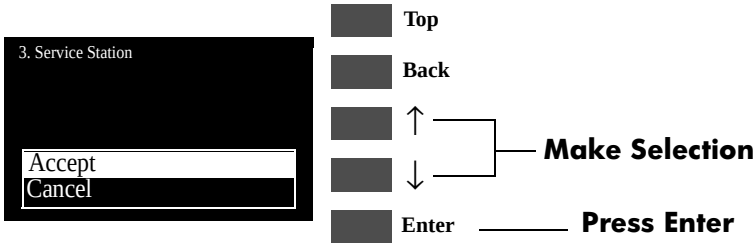
Perform the Service Station Calibration as follows:

Make sure you load media bigger than A4 in to the Printer before performing this calibration. Do NOT use any other type of media apart from HP Coated or HP High Gloss Photo Paper.

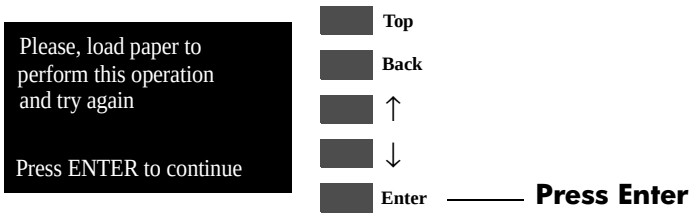
1 In the Service Calibrations submenu, scroll to "3. Service Station" and press **Enter**.



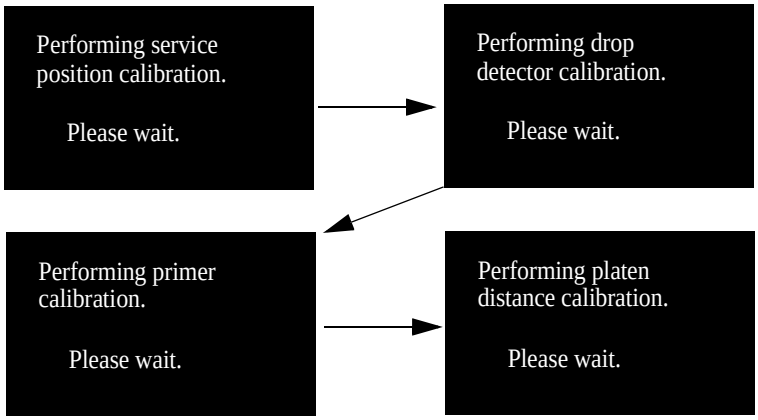
2 The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Service Station Calibration, or select **CANCEL** if you want to cancel the it. Press **Enter** once the selection has been made.



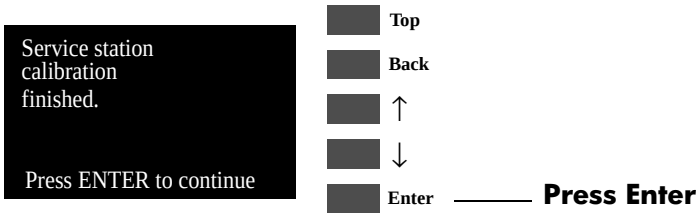
3 If you selected to continue, then the following message appears on the front panel if media is not loaded. You must load Media in to the Printer to continue.



4 The Printer will start to print the calibration pattern and the following messages will be displayed on the front panel:



5 Once the service station calibration is completed, the following message will be displayed on the front panel:



6 To check if the Calibration was completed correctly, print the Service Configuration Print (see Page *1-17*) and check that the calibrations are done and are within the stated limits.

Check that the Calibrations are done and within the limits

Calibrations

ACCURACY (FACTORY): Worm ampl: 2.795 Worm phase: −1.925 Roller ampl: 21.343 Roller phase: 0.900 Roller ampl 2: 5.164 Roller phase 2: −0.450 Slope: −0.003

PLATTEN EDGE: 223.393mm (223.308mm)

LED(Green/Blue): Channel: sidLineSensorDC3/sidLineSensorDC1 VLED: 183/183 Offset: 222/159 Margin: 719/735

LED TO K (SCAN): Not calibrated LED TO K (SVS): 6.959mm (1.987mm) SERVICE STATION: Not calibrated

DROP DETECT (distances in mm):

Cyan 0	Cyan 1	Magenta 0	Magenta 1	Yellow 0	Yellow 1	Black 0	Black 1
49.826 (50.207)	45.593 (46.143)	81.830 (82.211)	77.639 (78.147)	113.792 (114.215)	109.643 (110.151)	145.881 (146.219)	141.732 (142.155)

PRIMER: Start position: 19.727mm

4. Roller Mark Position

The purpose of this Service Calibration is to calibrate the Mark Encoder which is located on the Drive Roller.

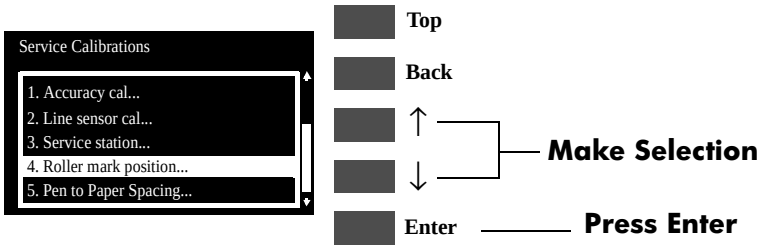
Perform the Roller Mark Position Calibration whenever:

- Carriage is disassembled or replaced.

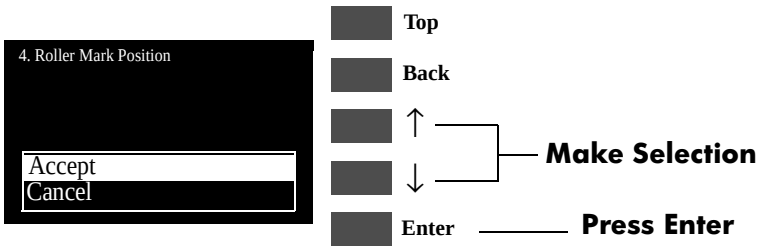
Perform the Roller Mark Position Calibration as follows:

Make sure that you unload the media from the Printer before performing this calibration.

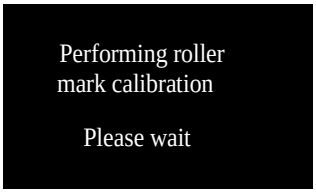
1 In the Service Calibrations submenu, scroll to "4. Roller mark position" and press **Enter**.



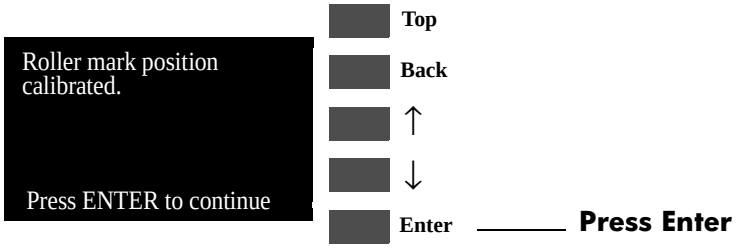
2 The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Roller Mark Position Calibration, or select **CANCEL** if you want to cancel the it. Press **Enter** once the selection has been made.



3 If you selected to continue, the calibration will start and the following message will appear on the front panel:



4 Once the roller mark position calibration is completed, the following message will be displayed on the front panel:



5. Pen to Paper Spacing

THIS CALIBRATION IS NO LONGER REQUIRED AND SHOULD NEVER BE PERFORMED.

6. Color to Color calibration

The purpose of this Service Calibration is to correct the alignment between the Printheads and the rest of the Printer. This calibration is necessary in order to prevent color misalignment.

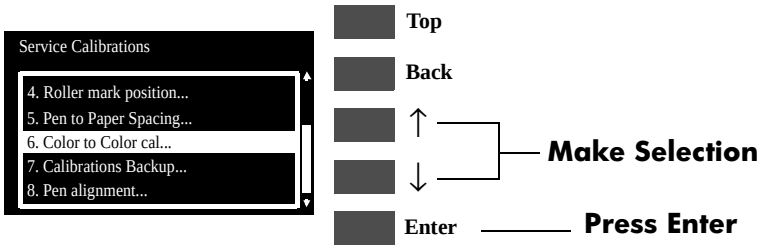
Perform the Color to Color Calibration whenever:

- Carriage is disassembled or replaced.
- Drive Roller is disassembled or replaced.
- Problems with color misalignment.
- Paper-Axis is disassembled or replaced.
- Platen Assembly is disassembled or replaced.
- Service Station is disassembled or replaced.

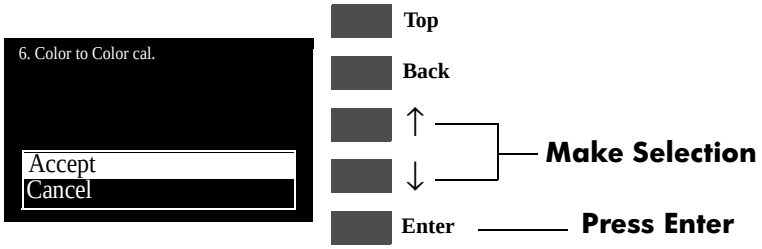
Perform the Color to Color Calibration as follows:

Make sure that you load E/A0 size HP High Gloss Photo Paper or HP Coated media before performing this calibration. Do NOT use any other type of media apart from HP Coated or HP High Gloss Photo Paper.

1 In the Service Calibrations submenu, scroll to "6. Color to Color cal" and press **Enter**.

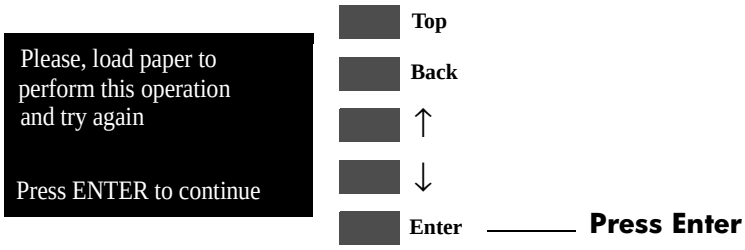


2 The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Calibration, or select **CANCEL** if you want to cancel the it. Press **Enter** once the selection has been made.

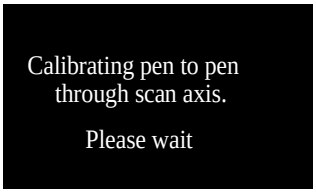


3 If you selected to continue, then the following message appears on the front panel if media is not loaded.

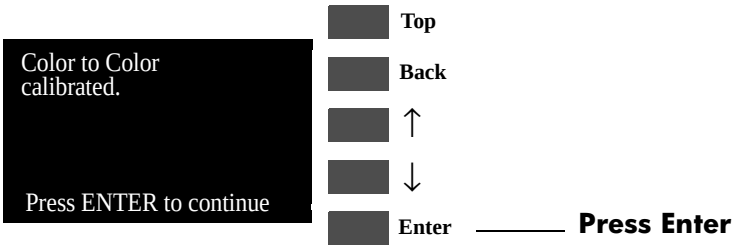
Make sure that you load E/A0 size HP High Gloss Photo Paper or HP Coated media. Do NOT use any other type of media apart from HP Coated or HP High Gloss Photo Paper.



4 The Printer will start to print the calibration pattern and the following message will be displayed on the front panel:

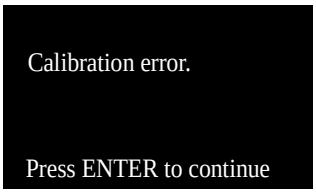


5 Once the pen to paper spacing calibration is completed, the following message will be displayed on the front panel:



Make sure that you press Form Feed and Cut when you have finished the calibration to trim the calibration pattern from the media roll.

If the calibration fails, then the following message will appear on the front panel:



In this case, to resolve the problem, try the following:

1 *If the calibration pattern is bad:*

- Try recovering the Printheads using the front-panel menu and try the calibration again.
- If the calibration pattern is bad again, then replace the Printhead of the color that is bad.

2 *Perform the Electronics System test* ⇒ Page 4-5.

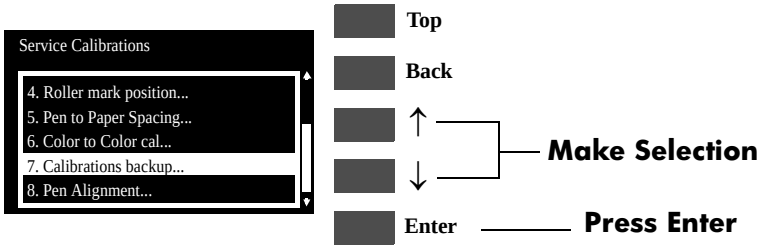
7. Calibrations Backup

The purpose of this Service Calibration is to allow the EEROM contents to be saved when the Electronics Module/Main PCA or the Tubes System has been replaced.

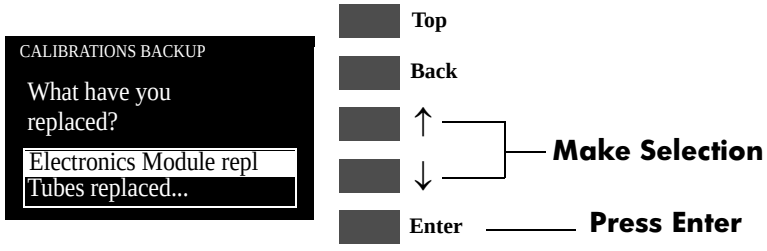
ALWAYS PERFORM THE CALIBRATIONS BACKUP AFTER REPLACING THE ELECTRONICS MODULE/MAIN PCA OR THE TUBES SYSTEM.

Perform the Calibrations Backup as follows:

1 In the Service Utilities submenu, scroll to "7. Calibrations Backup" and press **Enter**.

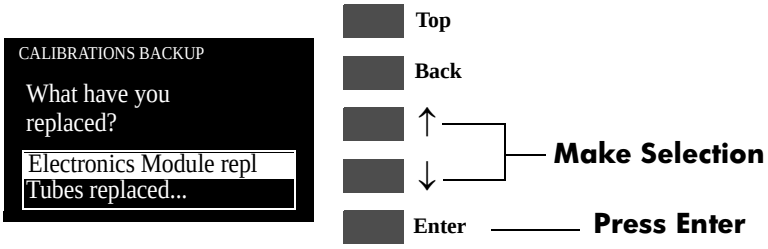


2 When the following message appears on the front panel, you must select which component you have replaced. Select either the Electronics Module or Tubes System and press **Enter**.

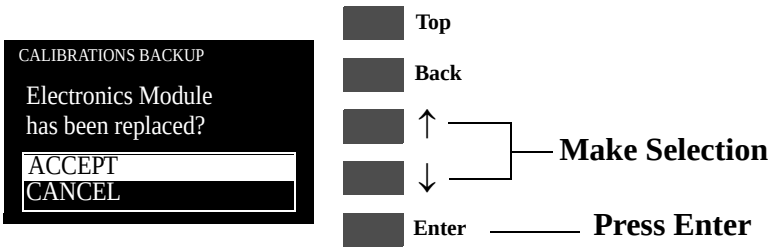


If the Electronics Module/Main PCA was replaced

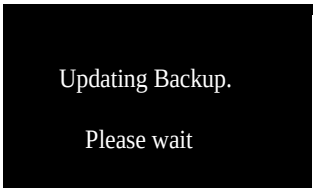
a If the Electronics Module **or** Main PCA was replaced, then select Electronics Module and press **Enter**.



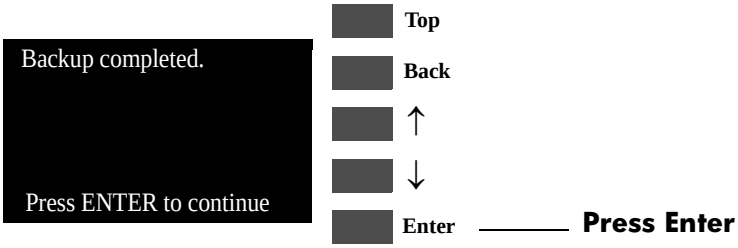
b The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Calibrations Backup, or select **CANCEL** if you want to cancel the Calibrations Backup. Press **Enter** once the selection has been made.



c If you selected to continue, the Calibrations Backup will start to update the calibrations and the following message will be displayed on the front panel:



d Once the Calibrations Backup has been completed the following message will appear on the front panel:

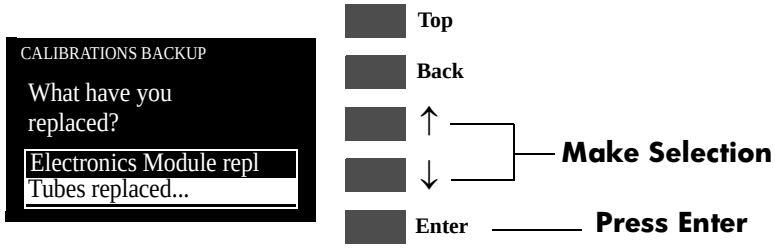


Make sure you reboot the Printer after completing the Calibrations Backup. This is to ensure that the data is correctly restored.

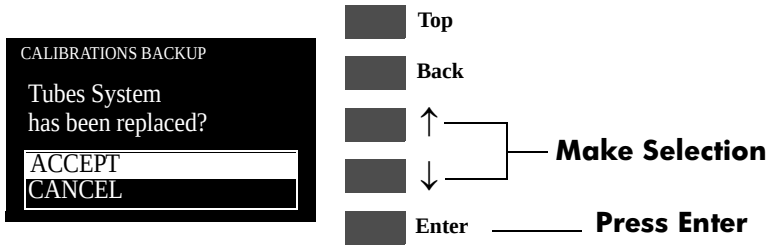
The Calibrations Backup WILL NOT automatically re-activate any accessories installed on the printer. After performing the Calibrations Backup, make sure you re-active ALL accessories that the customer may have installed by using the front panel.

If the Tubes System was replaced

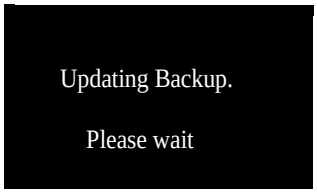
a If the Tubes System was replaced, then select Tubes System and press **Enter**.



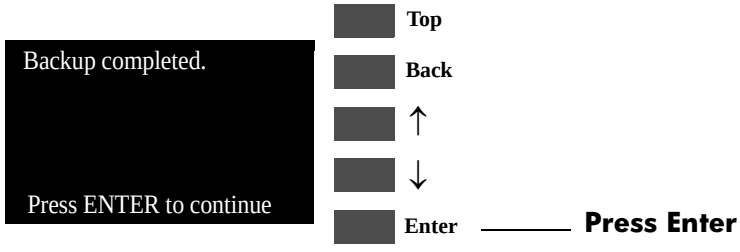
b The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Calibrations Backup, or select **CANCEL** if you want to cancel the Calibrations Backup. Press **Enter** once the selection has been made.



c If you selected to continue, the Calibrations Backup will start to update the calibrations and the following message will be displayed on the front panel:



d Once the Calibrations Backup has been completed the following message will appear on the front panel:



Make sure you reboot the Printer after completing the Calibrations Backup. This is to ensure that the data is correctly restored.

The Calibrations Backup WILL NOT automatically re-activate any accessories installed on the printer. After performing the Calibrations Backup, make sure you re-active ALL accessories that the customer may have installed by using the front panel.

8. Pen Alignment

The purpose of this Service Calibration is to correct the alignment between the Printheads. This calibration is necessary in order to prevent color misalignment and print quality defects like banding.

Perform the Printhead Alignment Calibration whenever:

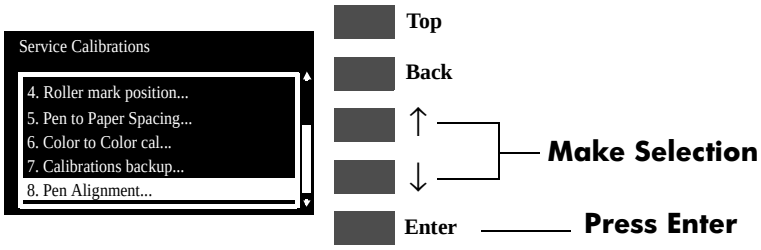
- Carriage is disassembled or replaced.
- Tubes System is disassembled or replaced.
- Banding is detected in prints.
- Misalignment between colors is detected
- Electronics Module **or** Main PCA is replaced.

Perform the Pen Alignment Calibration as follows:

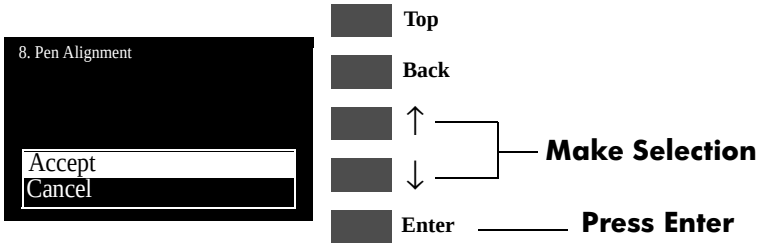
Make sure you load media before performing this calibration.

Do NOT use Clear Film, Vellum or Natural Tracing Paper.

1 In the Service Calibrations submenu, scroll to "8. Pen Alignment" and press **Enter**.

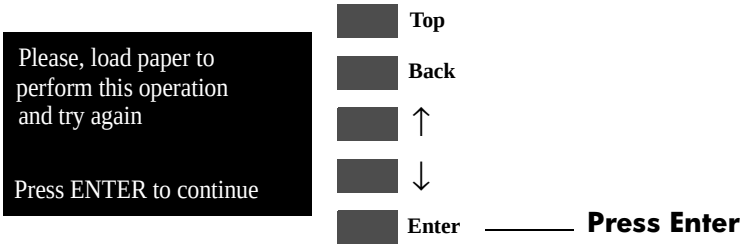


2 The following message will appear asking you to confirm the operation. Select **ACCEPT** if you want to continue the Calibration, or select **CANCEL** if you want to cancel the it. Press **Enter** once the selection has been made.



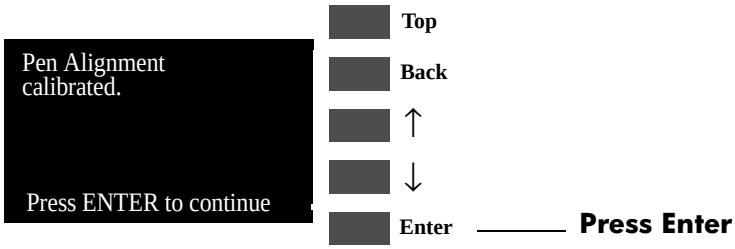
3 If you selected to continue, then the following message appears on the front panel if media is not loaded. You must load Media in to the Printer to continue.

Do NOT use Clear Film, Vellum or Natural Tracing Paper.



4 The Printer will start to print the Alignment Pattern and the following message will be displayed on the front panel:

5 Once the Pen Alignment calibration is completed, the following message will be displayed on the front panel:



6 If the calibration fails *Perform the Electronic Systems Test* ⇒ *Page 4-5*.

Carriage Height Calibration

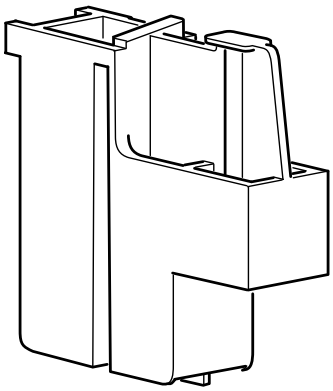
The purpose of this Service Calibration is to adjust the distance between the Carriage Assembly and the Center Platen. This calibration is necessary in order to prevent problems like Printhead crashes.

Perform the Carriage Height Calibration whenever:

- Carriage is disassembled or replaced.
- Center Platen is disassembled or replaced.
- Continuous Printhead Crashes.

Perform the Carriage Height Calibration as follows:

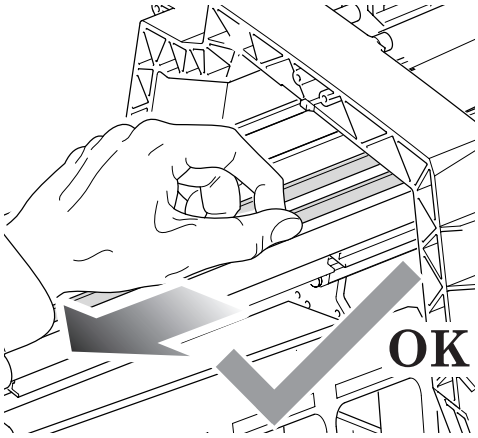
The procedure should be carried out using the Carriage Height Tool (See Figure 1 below) that came with the new Carriage Assembly or Center Platen Assembly.



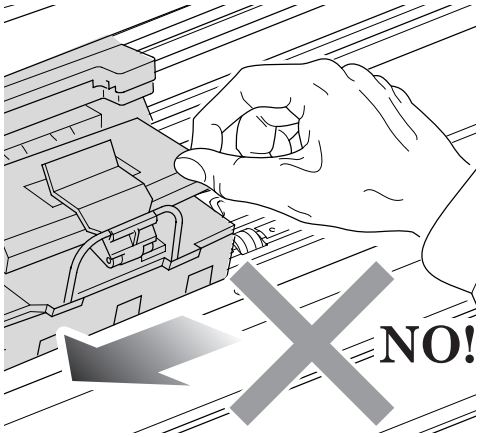
Carriage Height Tool

Figure 1

During the Carriage Height Calibration procedure the Carriage Assembly has to be moved along the length of the printer for correct calibration. Make sure that the Carriage Assembly is only ever moved by pulling the belt and never by direct contact with the carriage itself (See Figure 2 below).



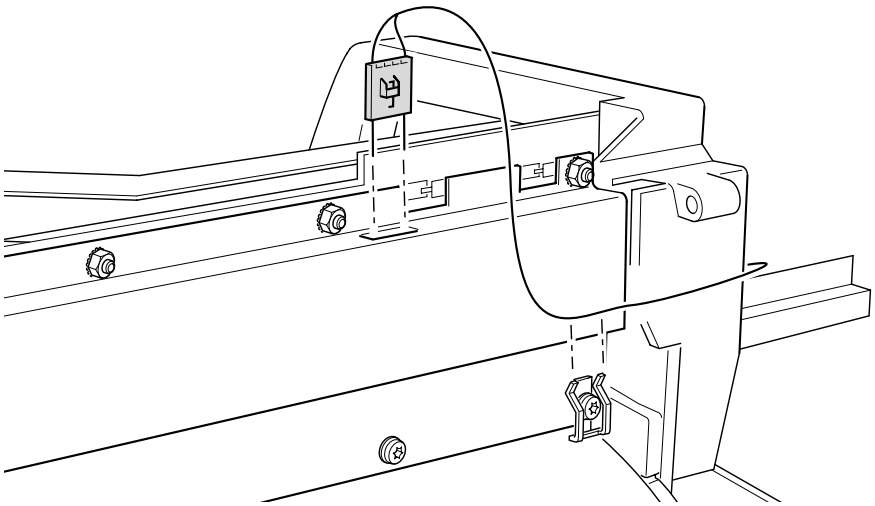
Correct: move using the belt.



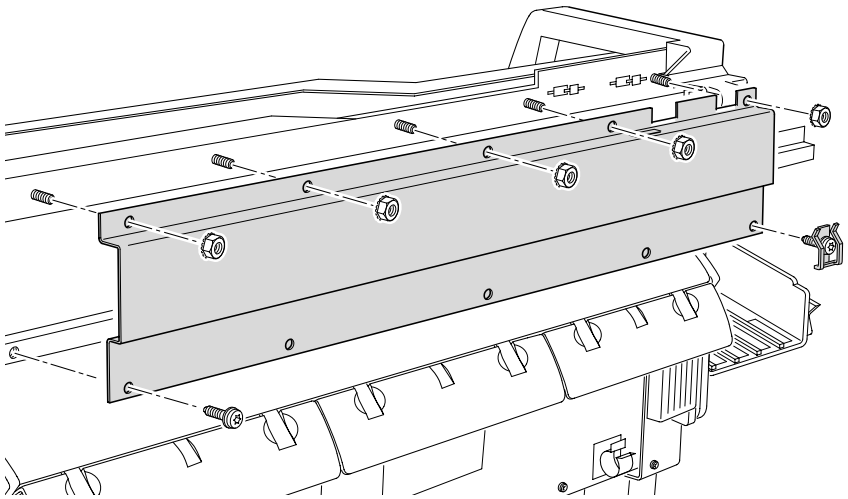
Incorrect: never move using Carriage Assembly.

Figure 2

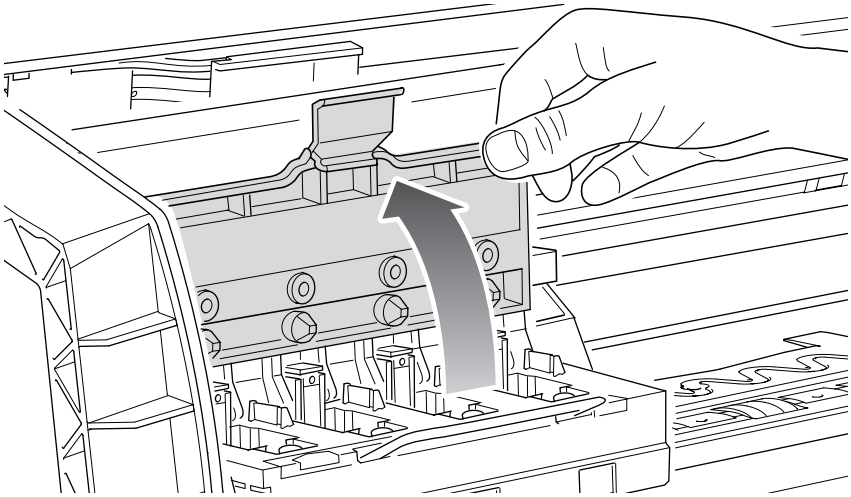
1 Disconnect the Ink Leak Detector Cable Connector from the back of the printer.



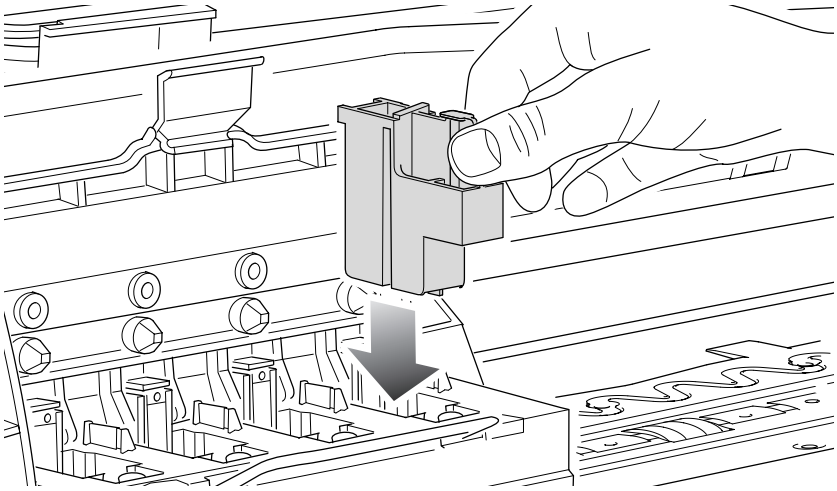
2 Remove the EMC Cover on the left hand side of the printing area.



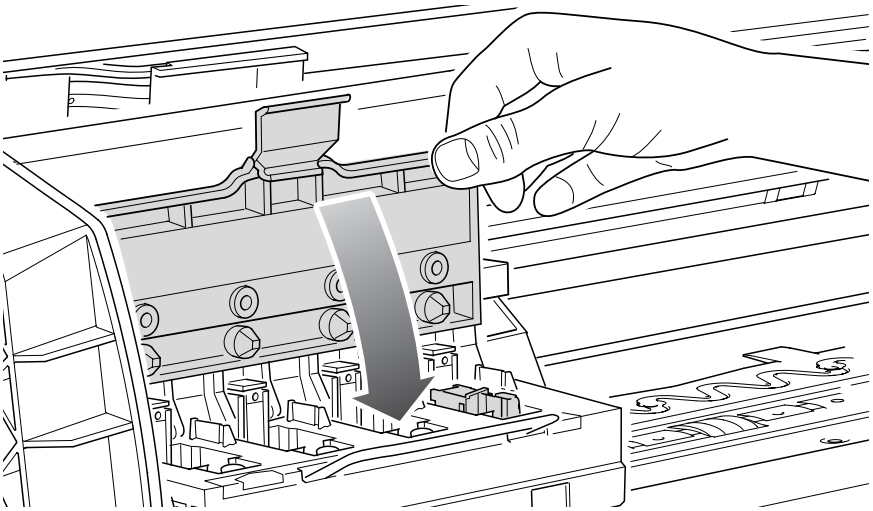
3 Open the Carriage Cover on the left hand side of the printing area.



4 Insert the Carriage Height Tool into the black cartridge slot.

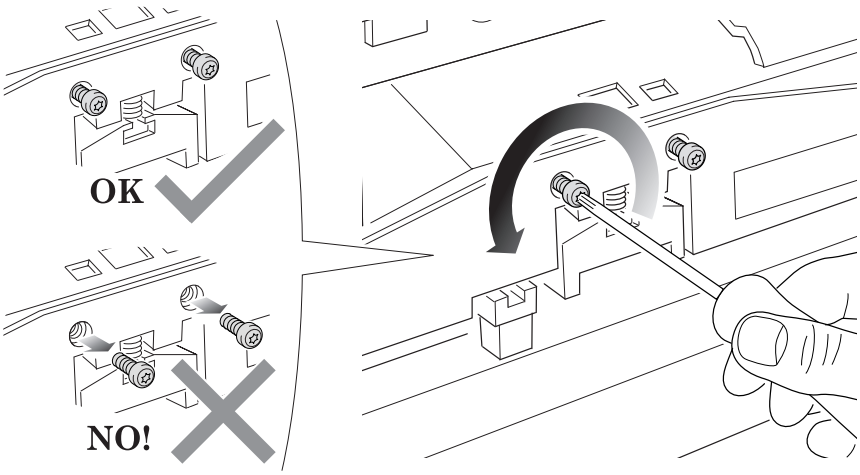


5 Close the Carriage Cover.

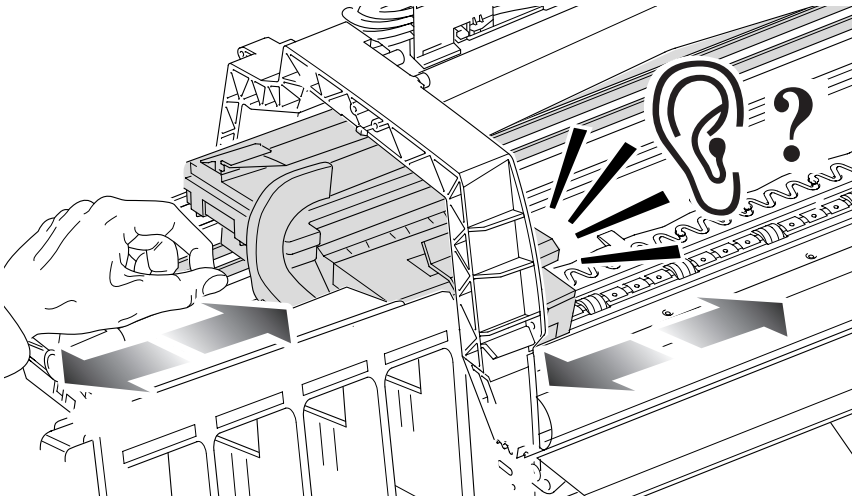


6 **Loosen** the two T10 screws at the back of the Carriage Assembly.

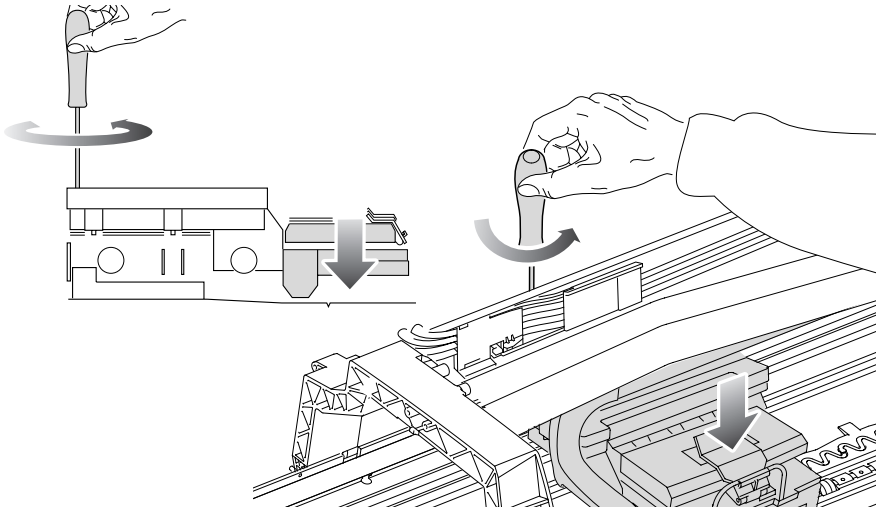
The screws should not be removed.



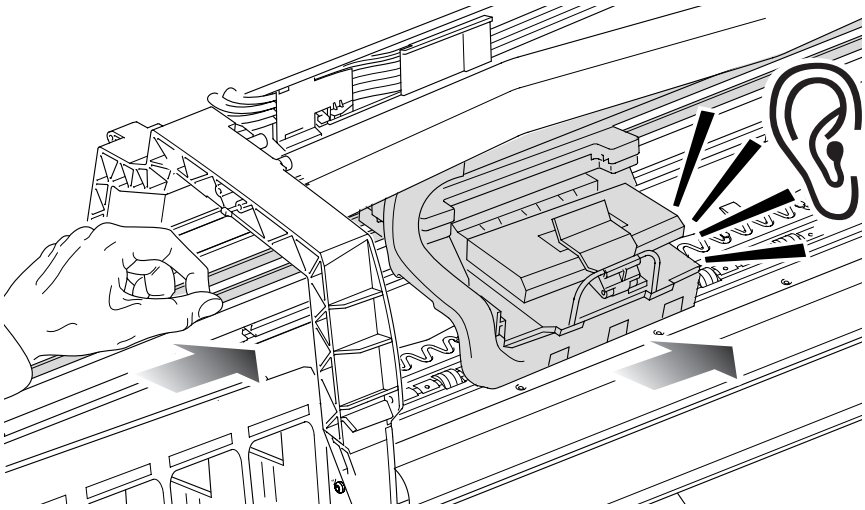
7 Using the belt, and beginning to the left hand side of the starting position (where the left hand edge of the paper is positioned when printing), move the Carriage Assembly back and forth along the length of the printer, **you are listening for a scraping sound**: if you hear a sound already you may proceed directly with step 9, if not you must lower the Carriage Assembly (step 8), and try again until a scraping sound is heard.



8 Lower the Carriage Assembly slightly, by turning the T9 screw shown below anti-clockwise and then check for a scraping sound again as shown previously in step 7.



9 On moving the Carriage Assembly along the length of the printer you should now hear a scraping sound: this sound indicates that you need to raise the Carriage Assembly (if there is no sound repeat step 8).



10 Raise the Carriage Assembly slightly, by turning the T9 screw (shown below) clockwise.

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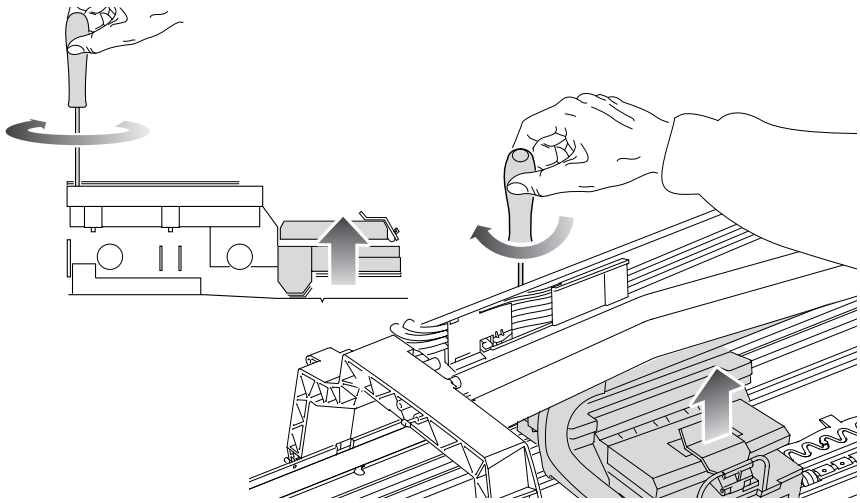
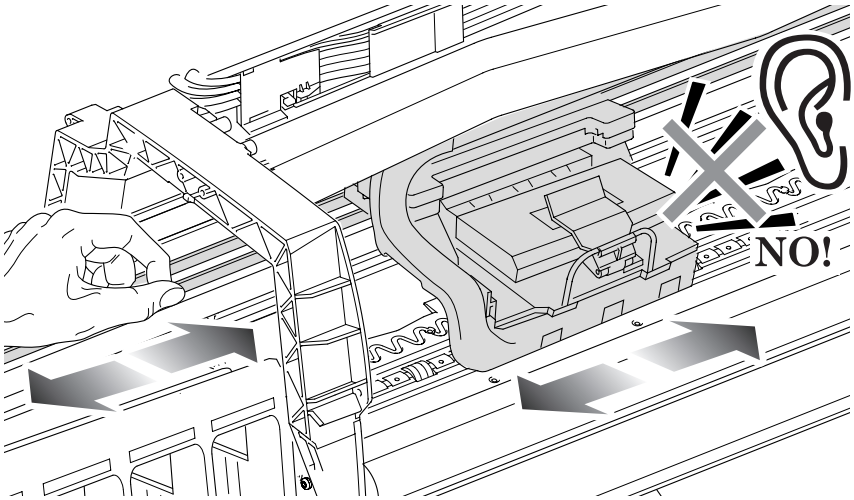
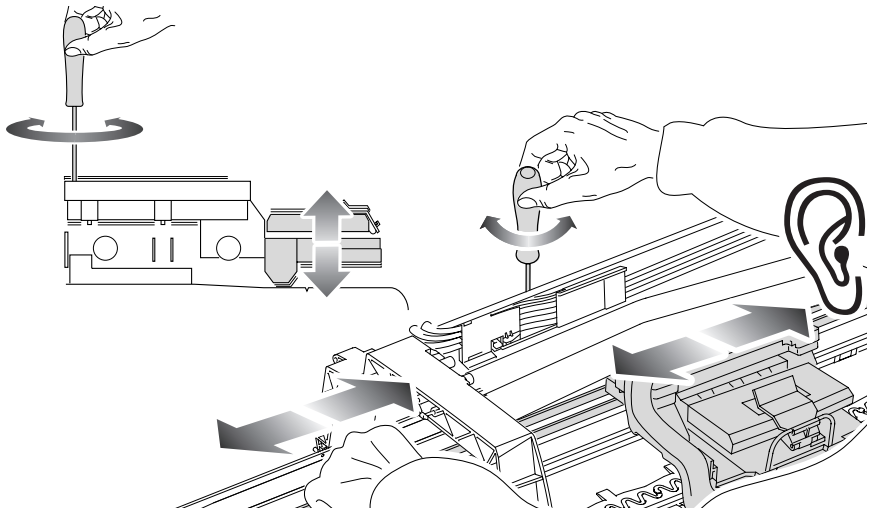


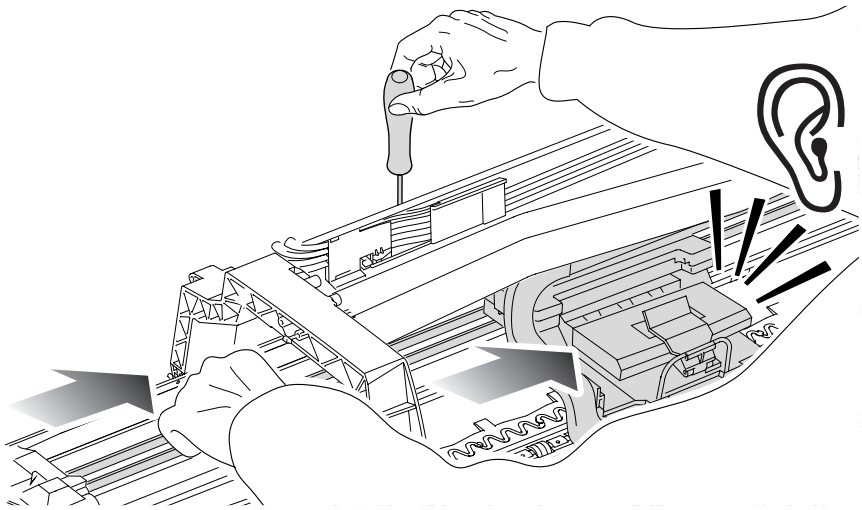
11 Check that there is no longer a scraping sound.



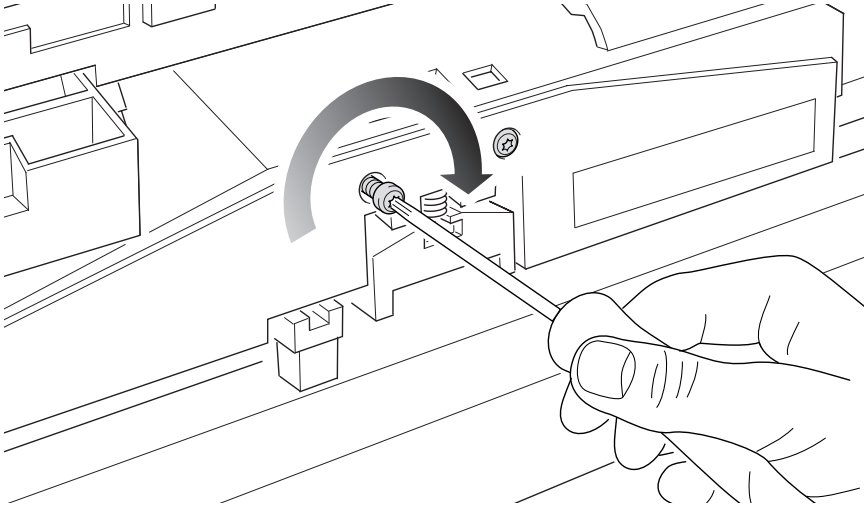
12 When the scraping has been eliminated it is important to leave the Carriage Assembly as close as possible to the Center Platen: move the Carriage Assembly back and forth across the area where the scraping sound was, gently lowering and raising the Carriage Assembly until you are sure that it is as close as it possibly can be to the Center Platen without touching.



13 Continue checking the full length of the printer until you arrive at the blue line used to load the cut sheet paper, repeating steps 10, 11 and 12 whenever a scraping sound is heard.



14 When the complete length of the printer is calibrated (clear of any scraping sound), tighten the two T10 screws at the back of the Carriage Assembly to secure the current position.



15 Remove the Carriage Height Tool.