5

Service Calibrations

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.

When Required	Calibrations To Be Done								
	C01	**C02**	**C03**	**C05**	**C06**	**C07**	**C08**	**C09**	**C10**
Electronics Module is replaced	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Carriage is disassembled or replaced	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No	No
Refill Assembly is disassembled or replaced	No	**Yes**	No	**Yes**	No	**Yes**	No	No	No
X-axis Assembly is disassembled or replaced	No	No	No	No	No	No	**Yes**	No	No
Drive Roller is disassembled or replaced	No	No	No	No	No	No	**Yes**	No	No
Banding Problem	No	No	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Edge Detect Problem	No	No	**Yes**	No	No	No	No	No	No
Misalignment between Colors	No	No	**Yes**	**Yes**	**Yes**	No	**Yes**	No	No
Color Accuracy Problem	No	No	**Yes**	No	No	**Yes**	No	No	No
Nozzles Out or Misdirected	No	No	No	No	**Yes**	No	No	No	No

HP DesignJet CP Series Printers

Service Calibrations

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 5-5.

WARNING

ALL THE COVER SENSORS ARE DISABLED WHEN IN THE CALIBRATIONS MENU. IF THE CARRIAGE IS MOVING IT WILL NOT STOP IF THE WINDOW IS OPENED, SO BE VERY CAREFUL NOT TO PUT YOUR HANDS INSIDE.

1 Carriage ◗ page 5-6

The purpose of this calibration is to calibrate the temperature from which the printhead has to be warmed.

2 Refill ◗ page 5-8

The purpose of this calibration is to ensure the correct position of the carriage assembly in respect to the refill assembly.

3 Line Sensor ◗ page 5-9

The purpose of this 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.

4 Service Station ◗ page 5-11

This Calibration is no longer required and should never be performed.

5 Printheads Alignment ◗ page 5-12

The purpose of this calibration is to test and if necessary correct the misalignment between the printheads. This Calibration is necessary to avoid color misalignments and print quality defects like banding.

6 Printheads Check ◗ page 5-13

The purpose of this calibration is to check that the Nozzles of the Printheads are functioning correctly.

7 Color Calib. ◗ page 5-15 **(Only available in the HP DesignJet 2500CP/3500CP printer)**

The purpose of this calibration is to determine a correction function to be applied in PostScript in order to match the color reproduction of a nominal Printer. This Calibration is necessary to improve color consistency between different prints and different Printers. This calibration is also independent of color accuracy or matching color from a monitor to the Printer.

8 Service Accuracy ◗ page 5-16

The purpose of this 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.

9 Maintenance ◗ page 5-18

The purpose of this calibration is to read and, if necessary, adjust the preventive maintenance counter, which counts the number of swaths.

10 Font Type Set ◗ page 5-19 **(Only available in the HP DesignJet 2500CP/3500CP printer)**

The purpose of this calibration is to check and, if necessary, select a Font type (only possible when the printer detects that a new Hard Disk has been installed or when installing a new Electronics Module).

Entering the Service Calibrations Menu System

1 Make sure the printer is switched OFF from the power switch on the back of the printer and **not** from the standby button on the front of the printer.

2 Hold the UP and ENTER keys down and switch the printer **O**N. Wait until the message "Status/Initializing" is displayed on the front-panel before releasing the UP and ENTER keys.

The reason for entering the Service Tests by powering ON is because various tests are performed during the initialization of the printer and also certain System Errors will cause an abnormal start up and will never reach the "Status/Ready" message on the front-panel.

3 Once the message "Status/Ready" is displayed on the front-panel, press the **Enter** key.

4 Use the **Arrow** keys to scroll to the "Utilities" menu display and press the **Enter** button. Make sure that you are in the Full menu mode because otherwise you will not be able to access the "Service Tests" submenu.

5 Use the **Arrow** keys to scroll to the "Service Tests" menu display and press the **Enter** button.

6 Use the **Arrow** keys to scroll to the "Service Calibrations" menu display and press the **Enter** button.

7 Use the **Arrow** buttons to scroll through the calibration selections.

8 Press the **Enter** button to begin a specific calibration when the required calibration is displayed.

If the printer is not used for 5 minutes, the printer exits out of the Service Mode and you must repeat the above steps to enter the service mode again.

In some cases a quick press of a button may not be recognized by the processor. 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 a calibration, switch the Printer OFF and restart from step 2.

If you have media loaded you will be forced to remove it when you exit the Diagnostics menu.

Once you are inside the Service Calibrations submenu, the front-panel keys can be used in the following way:

- **Up Arrow** - Go to the next calibration.
- **Down Arrow** - Go to the previous calibration.
- **Previous** - Exit the current calibration.
- **Enter** - Perform the current calibration.

C01. Carriage

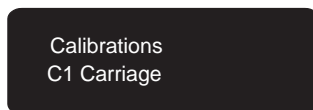The purpose of this calibration is to calibrate the temperature from which the printhead has to be warmed.

THIS CALIBRATION MUST BE DONE WITH THE PRINTHEADS INSTALLED.

Perform the Carriage calibration whenever the:

- Carriage is disassembled or replaced.
- Electronics Module is replaced.

Perform the Carriage Calibration as follows:

1 In the Calibrations submenu, scroll to "C1 Carriage" and press **Enter**.

```
Calibrations
C1 Carriage
```

2 The message "Remove Printheads / Press Enter" will be displayed on the front-panel. Remove the Printheads and press **Enter** when you have removed them.

3 While the Calibration is being performed, a row of "***" will be displayed on the front-panel.

4 If the calibration is performed correctly, the "C0100 OK" message is displayed on the front-panel.

5 Press **Previous** and the "Reinstall Printheads" message is displayed on the front-panel. Reinstall the Printheads into the correct stalls in the carriage.

6 If the calibration fails, one of the following messages will be displayed on the front-panel:

- "C0101 Fail" - The Cyan Printhead has failed.
- "C0102 Fail" - The Magenta Printhead has failed.
- "C0103 Fail" - The Cyan and Magenta Printheads have failed.
- "C0104 Fail" - The Yellow Printhead has failed.
- "C0105 Fail" - The Cyan and Yellow Printheads have failed.
- "C0106 Fail" - The Magenta and Yellow Printheads have failed
- "C0107 Fail" - The Cyan, Magenta and Yellow Printheads have failed
- "C0108 Fail" - The Black Printhead has failed.

The calibration is continued on the next page.

- "C0109 Fail" - The Cyan and Black Printheads have failed.
- "C0110 Fail" - The Magenta and Black Printheads have failed.
- "C0111 Fail" - The Cyan, Magenta and Black Printheads have failed.
- "C0112 Fail" - The Yellow and Black Printheads have failed.
- "C0113 Fail" - The Cyan, Yellow and Black Printheads have failed.
- "C0114 Fail" - The Magenta, Yellow and Black Printheads have failed.
- "C0115 Fail" - The Cyan, Magenta, Yellow and Black Printheads have failed.

In these cases, Perform the Electronics test ▶ *page 4-6.*

C02. Refill

The purpose of this calibration is to ensure the correct position of the carriage assembly in respect to the refill assembly.

Perform the Refill calibration whenever the:

- Carriage is disassembled or replaced
- Refill Assembly is disassembled or replaced.
- System Error 020006 appears on the front-panel display.
- Electronics Module is replaced.

When the Carriage Assembly, Refill Assembly or the Electronics Assembly is ordered, a Refill Calibration Tool, a special Carriage height gauge and an Instructions flyer will be included. You must follow the instructions in the flyer in order to correctly calibrate the Refill Assembly and to make sure that the Carriage is at the correct height.

C03. Line Sensor

The purpose of this 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.

This calibration also identifies which type of Line Sensor has been installed and stores this information in the EEROM.

Perform the line sensor calibration whenever the:

- Edge detect procedure fails during media loading.
- Carriage is disassembled or replaced.
- Electronics Module is replaced.
- Banding is detected in prints.
- Misalignment between colors is detected.
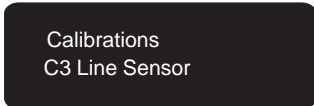- There is a color consistency problem between prints.

Load white media before performing this calibration.

Perform the Line Sensor Calibration as follows:

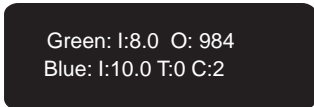### MAKE SURE THAT THE WINDOW IS CLOSED BEFORE YOU PERFORM THIS CALIBRATION.

REPLACE THE LENS COVER BEFORE YOU PERFORM THIS CALIBRATION IN ORDER TO PREVENT ANY AEROSOL PROBLEMS.

1 In the Calibrations submenu, scroll to "C3 Line Sensor" and press **Enter**.

```
Calibrations
C3 Line Sensor
```

2 If media is not loaded the calibration will stop and the message "Load Media" will be displayed on the front-panel. Load media in order to continue the calibration.

3 While the Calibration is being performed, a row of "***" will be displayed on the front-panel.

4 Once the Calibration is completed, a message similar to the following is displayed on the front-panel.

```
Green: I:8.0  O: 984
Blue: I:10.0 T:0 C:2
```

Refer to the following table in order to know the limits for values **I** (Saturated Input Voltage) and **O** (Output Voltage in mV) for the Green and Blue LEDs**:**

LED	I		O	
	Minimum	**Maximum**	**Minimum**	**Maximum**
Green	7	10.5	980	1500
Blue	7	12	-	-

*If **I** Value is below the Minimum, then the printer has too much light. Make sure the Top Cover is closed.*

*If **I** Value is above the Maximum, then the printer has not enough light. Make sure you are using white paper. If you you are using white paper, then there might be an Aerosol problem in which case replace the lens cover before performing this calibration.*

5 Press **Enter** and the "C0300 Done" message is displayed on the front-panel.

C04. Service Station

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

C05. Printheads Alignment

The purpose of this calibration is to test and if necessary correct the misalignment between the printheads. This Calibration is necessary to avoid color misalignments and print quality defects like banding.

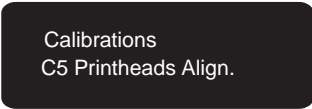Perform the Printheads Alignment calibration whenever:

- Carriage is disassembled or replaced.
- Banding is detected in prints.
- Misalignment between colors is detected.
- Refill Assembly is disassembled or replaced.
- Electronics Module is replaced.

Load media before performing this test.

Perform the Printheads Alignment Calibration as follows:

MAKE SURE THAT THE WINDOW IS CLOSED BEFORE YOU PERFORM THIS CALIBRATION.

1 In the Calibrations submenu, scroll to "C5 Printheads Align." and press **Enter**.

> Calibrations
> C5 Printheads Align.

2 If media is not loaded the calibration will stop and the message "Load Media" will be displayed on the front-panel. Load media in order to continue the calibration.

3 While the Calibration is being performed, the message "Aligning Printheads" will be displayed on the front-panel.

4 If the calibration is performed correctly, the "C0500 Done" message is displayed on the front-panel.

5 If the calibration fails, the "C0501 Fail" message is displayed on the front-panel.

If the calibrations fails, to resolve the problem, try one of 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 complete Ink Delivery System of the color that is bad.

  2 *Perform the Electronics Test ▶ page 4-6.*

  3 *Perform the Line Sensor Test ▶ page 4-9.*

C06. Printheads Check

The purpose of this calibration is to check that the Nozzles of the Printheads are functioning correctly.

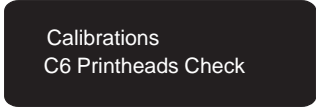Perform the Printheads Check calibration whenever:

- Carriage is disassembled or replaced.
- Banding is detected in prints.
- Nozzles Out or Misdirected.
- Misalignment between colors is detected.
- Electronics Module is replaced.

Load media before performing this test.

Perform the Printheads Check Calibration as follows:

MAKE SURE THAT THE WINDOW IS CLOSED BEFORE YOU PERFORM THIS CALIBRATION.

1 In the Calibrations submenu, scroll to "C6 Printheads Check" and press **Enter**.

> Calibrations
> C6 Printheads Check

2 If media is not loaded the calibration will stop and the message "Load Media to Check Printheads" will be displayed on the front-panel. Load media in order to continue the calibration.

3 While the Calibration is being performed, the message "Checking Printheads" will be displayed on the front-panel.

4 If the calibration is performed correctly, the "C0600 Done" message is displayed on the front-panel.

5 If the calibration fails, one of the following messages will be displayed on the front-panel:

- "C0601 Fail" - The Cyan Printhead has failed.
- "C0602 Fail" - The Magenta Printhead has failed.
- "C0603 Fail" - The Cyan and Magenta Printheads have failed.
- "C0604 Fail" - The Yellow Printhead has failed.
- "C0605 Fail" - The Cyan and Yellow Printheads have failed.

The calibration is continued on the next page.

- "C0606 Fail" - The Magenta and Yellow Printheads have failed
- "C0607 Fail" - The Cyan, Magenta and Yellow Printheads have failed
- "C0608 Fail" - The Black Printhead has failed.
- "C0609 Fail" - The Cyan and Black Printheads have failed.
- "C0610 Fail" - The Magenta and Black Printheads have failed.
- "C0611 Fail" - The Cyan, Magenta and Black Printheads have failed.
- "C0612 Fail" - The Yellow and Black Printheads have failed.
- "C0613 Fail" - The Cyan, Yellow and Black Printheads have failed.
- "C0614 Fail" - The Magenta, Yellow and Black Printheads have failed.
- "C0615 Fail" - The Cyan, Magenta, Yellow and Black Printheads have failed.

If the calibrations fails, to resolve the problem, try one of 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 complete Ink Delivery System of the color that is bad.

2 *If the calibration pattern is **good**:*
   - Replace the Carriage Assembly ▶ *page 8-42.*

3 *Perform the Electronics Test ▶ page 4-6.*

4 *Perform the Line Sensor Test ▶ page 4-9.*

C07. Color Calib. (Only available in DesignJet 2500CP/3500CP printer)

The purpose of this calibration is to determine a correction function to be applied in PostScript in order to match the color reproduction of a nominal Printer. This Calibration is necessary to improve color consistency between different prints and different Printers. This calibration is also independent of color accuracy or matching color from a monitor to the Printer.

Perform the Color calibration whenever:

- Carriage is disassembled or replaced.
- There is a color consistency problem between prints.
- Refill Assembly is disassembled or replaced.
- Electronics Module is replaced.

Load media before performing this test.

Perform the Color Calibration as follows:

MAKE SURE THAT THE WINDOW IS CLOSED BEFORE YOU PERFORM THIS CALIBRATION.

1 In the Calibrations submenu, scroll to "C7 Color Calib." and press **Enter**.

> Calibrations
> C7 Color Calib.

2 If media is not loaded the calibration will stop and the message "Load Media" will be displayed on the front-panel. Load media in order to continue the calibration.

3 While the Calibration is being performed, the message "Calibrating Color" will be displayed on the front-panel.

4 If the calibration is performed correctly, the "C0700 Done" message is displayed on the front-panel.

5 If the calibration fails, the "C0701 Fail" message is displayed on the front-panel.

If the calibrations fails, to resolve the problem, try one of 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 complete Ink Delivery System of the color that is bad.

2 *Perform the Electronics Test* ◗ *page 4-6.*

3 *Perform the Line Sensor Test* ◗ *page 4-9.*

C08. Service Accuracy

The purpose of this 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.
- Carriage is disassembled or replaced.
- X-axis Assembly is disassembled or replaced.
- Drive Roller is disassembled or replaced.
- Misalignment between colors is detected.
- Electronics Module is replaced.

Remove any media already loaded into the Printer before performing the calibration.

Perform the Service Accuracy Calibration as follows:

MAKE SURE THAT THE WINDOW IS CLOSED BEFORE YOU PERFORM THIS CALIBRATION.

1 In the Calibrations submenu, scroll to "C8 Service Accuracy" and press **Enter**.

> Calibrations
> C8 Service Accuracy

2 The "Create pattern / Measure pattern" message is displayed.

3 Press the **Up Arrow** key to select "*Create pattern*".

4 The "*Status / Calibrating*" message is displayed while the Printer is calibrating.

5 When the Printer has finished calibrating, the "*Load media for calibration*" message is displayed.
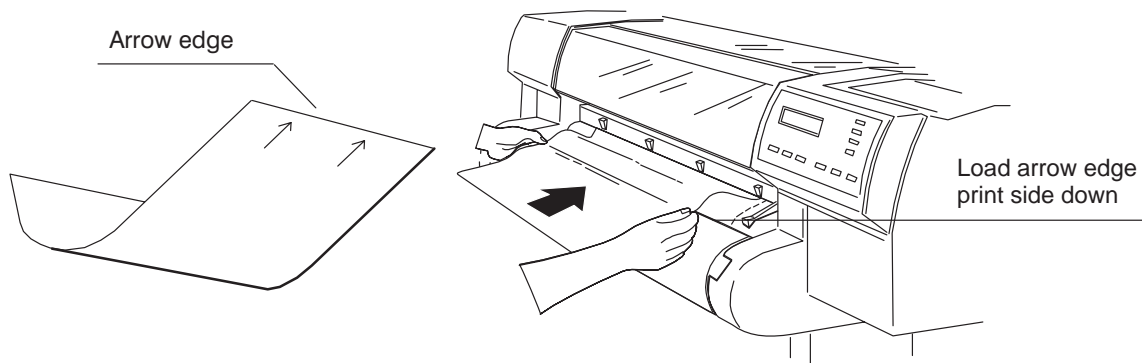
You must use HP Matte film to perform this calibration even if it is not supported. You can select it as any media in the front-panel.

6 Load the media. If using D-size media, load the short edge as the leading edge in D-size Printers and the long edge as the leading edge in E-size Printers.

The calibration is continued on the next page.

7 When the media is loaded, the Printer will automatically begin to plot the pattern.

8 A "*Status / Printing*" message is displayed while plotting.

9 Remove the media when the Printer has finished plotting.

10 The "*Create pattern / Measure pattern*" message is displayed.

11 Press the **Down Arrow** key to select "*Measure pattern*".

12 Rotate the plot so that the edge with the arrows points to the leading edge, then reload the plot with the arrow edge print side down.

Arrow edge

Load arrow edge print side down

13 The Printer will load the plot and then measure the alignment marks using the line sensor on the carriage assembly.

14 If the calibration passes, the "C0800 Done" message is displayed on the front-panel.

15 If the calibration fails, the "C0801 Fail"message is displayed on the front-panel.

If the calibrations fails, to resolve the problem, try one of 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 complete Ink Delivery System of the Black color.

2 *If the calibration pattern is **good**:*

- Replace the Carriage Assembly ◗ *page 8-42*.

3 *Perform the Electronics Test ◗ page 4-6.*

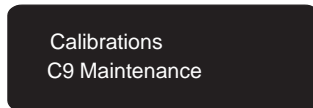**4** *Perform the Line Sensor Test ◗ page 4-9.*

C09. Maintenance

The purpose of this calibration is to read and, if necessary, adjust the preventive maintenance counter, which counts the number of swaths.

> *This Calibration must be used to reset the Maintenance counter to ZERO after the Preventive Maintenance Kit has been installed in order to disable the "Maintenance Advised" message on the front-panel. This calibration must also be used to set the correct value when replacing a new Electronics Module.*

Perform the Maintenance Calibration as follows:

1 In the Calibrations submenu, scroll to "C9 Maintenance" and press **Enter**.

> Calibrations
> C9 Maintenance

2 The "Swaths: #### / Set New Number" message is displayed.

If you are about to replace the Electronics Module, you MUST note down the Swaths Counter (####).

3 If you need to adjust the swaths counter, press the **Down Arrow** key.

You should adjust the counter to the number that you noted before replacing the Electronics Module.

4 The "New Swath Counter / ########" message will be displayed on the front-panel. Use the following keys to adjust the swaths counter.

- **Up Arrow** - Increase the Counter Digit.
- **Down Arrow** - Decrease the Counter Digit.
- **Enter** - Select the Next digit.

5 When the last digit is entered, the "0900 Done" message is displayed on the front-panel. The new number will then be fixed and saved in the EEROM.

C10. Font Type Set (Only available in DesignJet 2500CP/3500CP printer)

YOU SHOULD ONLY NEED TO SET THE FORNT TYPE IF YOU REQUIRE ASIAN FONTS, OTHERWISE IT SHOULD NEVER BE USED.

The purpose of this calibration is to check and, if necessary, select a Font type.

NOTE FOR HP DESIGNJETS 2500CP WITH FIRMWARE VERSION LOWER THAN A.02.14:

IT IS HIGHLY RECOMMENDED THAT YOU UPGRADE THE FIRMWARE INSTEAD OF REPLACING BOTH THE HARD DISK DRIVE AND THE ELECTRONICS MODULE.

NOTE FOR HP DESIGNJET 2500CP WITH FIRMWARE VERSION A.02.14 OR HIGHER AND HP DESIGNJET 3500CP:

YOU MUST PERFORM THIS CALIBRATION WHEN YOU INSTALL A NEW ELECTRONICS MODULE IN ORDER TO SET THE CORRECT FONT TYPE.

IF YOU NEED TO DEFINE THE FONT TYPE BUT THIS CALIBRATION DOES NOT ALLOW YOU TO SELECT THE REQUIRED FONT TYPE, THEN YOU MUST PERFORM THE TEST "D17. RESET COUNTERS" ON PAGE ◗ 4-30 TO RESET THE COUNTERS TO ZERO AND THEN REDO THIS CALIBRATION.

Perform the Font Type Set Calibration as follows:

1 In the Calibrations submenu, scroll to "C10 Font Type Set" and press **Enter**.

> Calibrations
> C10 Font Type Set

2 If you **have not** installed a new Electronics Module, the current font type will be displayed on the front-panel.

3 If you **have** installed a new Electronics Module (counter plots = 0), the message "Character Set New" will be displayed on the front-panel. Press the **Up Arrow** key to set the new type font.

---

4 The message "Choose Character Set" will be displayed on the front-panel. Use the **Up and Down Arrow** keys to select the font type required and then press **Enter**. The font types available are:

- 24 (R) - Roman.
- 25 (J2) - Japanese (2 Moriswa Fonts).
- 27 (CS) - Chinese Simplified.
- 28 (CT) - Chinese Traditional.
- 29 (CB) - Both Chinese.
- 30 (K) - Korean.

5 The first time a PostScript print is sent to the printer, the other font types **will be** deleted **and cannot be recovered**.

IF YOU DO NOT SELECT ANY FONT SET, THE ROMAN FONT WILL BE SELECTED BY DEFAULT WHEN A POSTSCRIPT FILE IS SENT.