

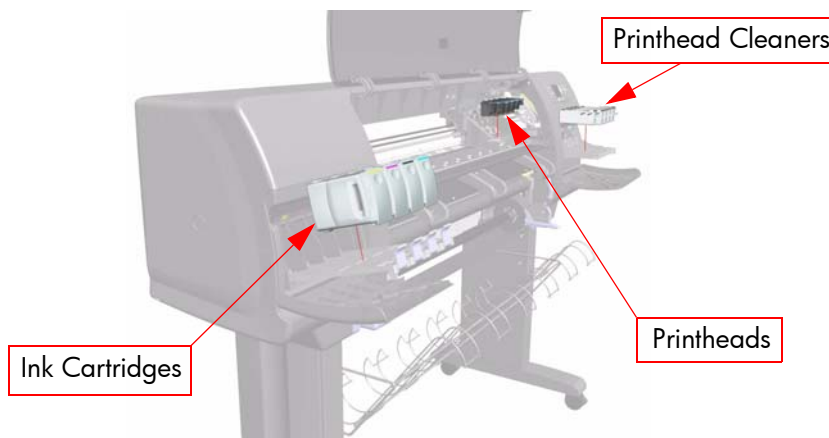
# Ink Supplies Troubleshooting

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## What are Ink Supplies?

For each of the four ink colors used in the printer, there are three separate components. The Printhead and the Printhead Cleaner are supplied together, and the Ink Cartridge is supplied separately. All of these components are called Ink Supplies.



## Ink Cartridges

The printer's four Ink Cartridges provide yellow, magenta, black, and cyan ink to the Printheads. The color Ink Cartridges supplied with the printer have a capacity of 225 cm<sup>3</sup>, and the black cartridge has a capacity of 400 cm<sup>3</sup>. It is also possible to buy and use color cartridges with a capacity of 400 cm<sup>3</sup>.

**All these Ink cartridges are physically the same size, only the internal capacity varies.**



The Ink Cartridges for the hp designjet 4000 series printers require no maintenance or cleaning. As long as each Ink Cartridge is inserted correctly into its slot, the ink will flow to the Printheads. Because the Printheads control the amount of ink transferred to the page, you will continue to see high-quality printing results even when the ink levels are getting low.

The front panel displays the status of the Ink Cartridge. Using the front panel, detailed information can be checked on the Ink Cartridges.

## Printheads

In order to increase printing speed, two Printheads are connected to each Ink Cartridge, giving eight printheads in total.



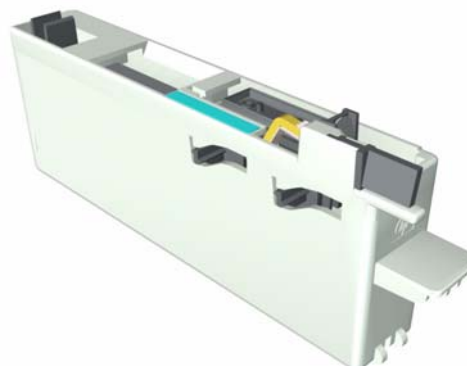
The Printheads are extremely durable and do not need to be replaced every time an Ink Cartridge is replaced. They are independent of the Ink Cartridges and will continue giving excellent image quality results even if the Ink Cartridges are low on ink.

If you notice a decline in print quality such as lines or dots missing from text/graphics, go to Page 6-13, *Troubleshooting Print Quality Problems*.

**Whenever a new Printhead is bought, it will come with a new Printhead Cleaner. When a Printhead is replaced, the Printhead Cleaner should be replaced at the same time. Leaving the old Printhead Cleaner in the Printer will shorten the new Printhead's life and possibly damage the Printer.**

## Printhead Cleaners

Each printhead has its own printhead cleaner, so there are eight printhead cleaners in the printer. Printhead cleaners are used to clean and maintain the printheads, to ensure the best possible print quality, and to seal the printheads when they are not in use to prevent them from drying out.



## General Information About the Ink Supplies

**For optimum results from the printer and modular ink delivery system always follow these guidelines when handling the ink supplies:**

- Always install the Ink Cartridges, Printheads and Printhead Cleaners before the expiration date, which is on the packaging.
- Install a new Printhead Cleaner every time you change a Printhead.
- Allow the Printer and Printhead Cleaners to automatically clean the Printheads.
- Install Ink Cartridges, Printheads and Printhead Cleaners in their color-coded slots.
- Follow the instructions on the front panel of the Printer during installation.
- Avoid unnecessary removal of the Ink Cartridges and Printheads.
- When turning off the Printer always use the power Off button on the front panel. The Printheads are then stored correctly which prevents them from drying out.
- The Ink Cartridges should never be removed while the printer is printing. They should only be removed when the printer is ready for you to replace them. The front panel will guide you through the removal and installation procedure.

## General Precautions When Handling Ink Supplies



**Do not touch, wipe or attempt to clean the printhead nozzles. This can damage the printhead.**

- Handle the ink supplies with care. In particular the Printhead, which is a high precision device and must be handled carefully.
- Do not touch the Printhead nozzles.
- Do not put the Printhead down on the nozzles.
- Do not be rough when handling the Printheads. Always set them down gently.
- Do not drop the Printheads.
- Proper handling will assure optimum performance throughout the Printhead life.
- The Printhead Cleaner should always be handled and stored upright to avoid a potential spillage of ink.
- Do not touch the end of the Ink Cartridge which is inserted into the printer as there may be a small amount of ink on the connection.
- Avoid storing partially used Ink Cartridges on their ends.

## Priming the Ink System

When the customer first receives the printer, it is supplied with a set of four Setup Printheads pre-installed in the Carriage Assembly. These Setup Printheads are used for the priming of the tubes in the modular ink delivery system. The customer must not remove the Setup Printheads from the Carriage without following the procedures in the *Setup Guide*.

When the Printer is powered ON for the first time, the Printer will automatically perform the priming process. Without the priming process, the customer will NOT be able to use the Printer.

Why does the Printer require priming:

- The Tubes System is empty when the customer receives the Printer.
- The Tubes System has to be pressurized and filled with ink, ejecting any air bubbles.



**If the Printing Printheads are installed in the carriage during the priming process, they will be rejected and the front panel will show a warning message.**

## When Should You Replace the Ink Supplies?

When to change the ink supplies is mostly determined by you with guidance from the front panel. In conjunction with the messages displayed in the front panel and the message explanations in this chapter, you will be able to choose for yourself when is the right time to change the ink supplies.

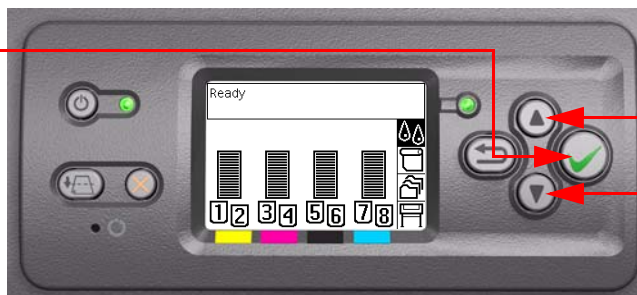
The Printer will also display the ink level and will tell you when the ink supply is low on ink. This means you have constantly updated information about the ink supplies.

Printhead life is anticipated to be 1000ml or twelve months in the printer, whichever occurs first, provided that the printhead is used under normal operating conditions (using HP Ink Cartridges only) and its "install before date" has not lapsed. However results vary depending on the print quality setting being used.

## Obtaining Ink Cartridge Information

- 1 Scroll to the Ink Menu icon and press **Enter**.

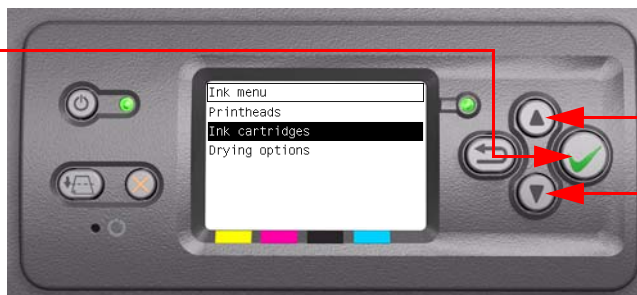
Press Enter to confirm selection



Use UP and DOWN keys to select

- 2 In the Ink Menu submenu, scroll to "Ink cartridges" and press **Enter**.

Press Enter to confirm selection



Use UP and DOWN keys to select

- 3 In the Ink Cartridges submenu, scroll to "Ink cartridge information" and press **Enter**.

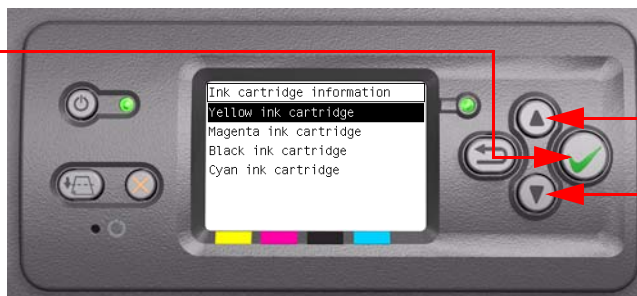
Press Enter to confirm selection



Use UP and DOWN keys to select

- 4 In the Ink Cartridge Information submenu, scroll to the Ink Cartridge that you want information on and press **Enter**.

Press Enter to confirm selection



Use UP and DOWN keys to select

- 5 The front panel displays information on the selected Ink Cartridge.

```

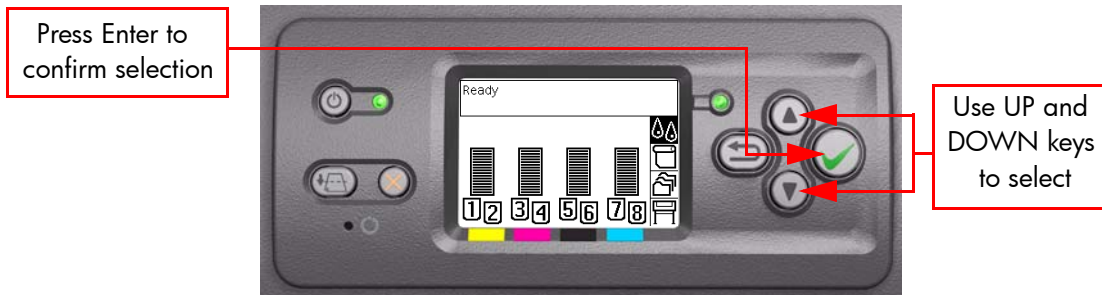
Yellow ink cartridge
Product name: HP No 90
Product number: C5065A
Serial number: 1116688-29-8
Status: OK
Ink level: 379 ml
Capacity: 400 ml
Manufacturer: HP
Warranty status: In warranty
  
```

The information supplied is:

- The make of the Ink Cartridge (hp no.90 is recommended).
- The product number of the Ink Cartridge.
- The serial number of the Ink Cartridge.
- The current status of the Ink Cartridge.
- The current ink level of the ink cartridge in milliliters.
- Original capacity of the ink cartridge in milliliters.
- The manufacturer of the Ink Cartridge (hp is recommended).
- The current warranty status of the Ink Cartridge.

## Obtaining Printhead Information

- 1 Scroll to the Ink Menu icon and press **Enter**.

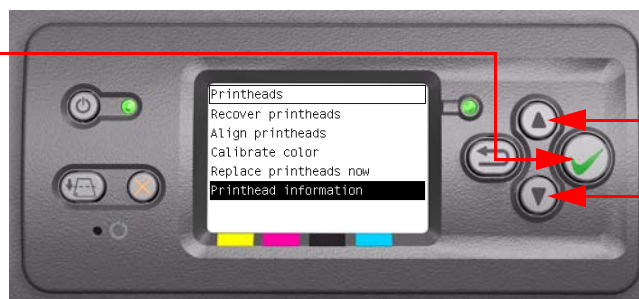


- 2 In the Ink Menu submenu, scroll to "Printheads" and press **Enter**.



- 3** In the Printheads submenu, scroll to "Printhead information" and press **Enter**.

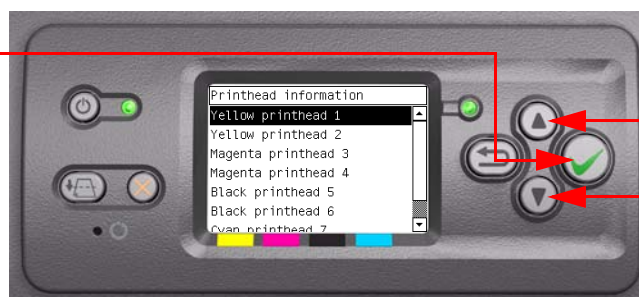
Press Enter to confirm selection



Use UP and DOWN keys to select

- 4** In the Printhead Information submenu, scroll to the Printhead that you want information on and press **Enter**.

Press Enter to confirm selection



Use UP and DOWN keys to select

- 5** The front panel displays information on the selected printhead.

Yellow printhead 1
Product name: HP No 90
Product number: C5057A
Serial number: 16455695-33-8
Printhead status: OK
Ink fired: 3 ml
Warranty status: In warranty
Cleaner status: OK

The information supplied is:

- The make of the printhead (hp no.90 is recommended).
- The product number of the Printhead.
- The serial number of the Printhead.
- The current status of the printhead.
- How much ink has been fired (consumed) by the printhead. **Note:** It is possible for a printhead to consume more than one Ink Cartridge.
- The current warranty status of the Printhead.
- The current status of the Printhead Cleaner.



## Ink Cartridge Status Messages

### Status Bars

The front panel displays four horizontal bars. These bars represent how much ink is remaining in the Ink Cartridges: as ink is used up the bars get shorter in length. To see how much ink is remaining, go to the "Ink Cartridge Information" submenu. See Page 3-6, *Obtaining Ink Cartridge Information*

## Ink Cartridge Status While Printing

### OK

The Ink Cartridge is operating correctly and no action is required.

### Low

The **Low** message is an early warning sign and it is advisable that new supplies should be obtained of that particular color. The amount of ink remaining in the Ink Cartridge depends on its capacity, but there is approximately 14% of ink available for the user.

### Very Low

When the **Very Low** message is displayed, overnight printing should not be attempted. Changing the Ink Cartridge is strongly recommended to prevent the printer from stopping halfway through a print. There is approximately 8% of ink available for the user.

### Empty

The printer will stop and will not be able to continue printing until a new Ink Cartridge has been installed. If this occurs halfway through printing an image, you should check the quality of this image, as stopping mid-plot can affect the print. It would be recommended to reprint the image once a new Ink Cartridge has been installed.

## Ink Cartridge Status While Replacing

The printer can report the following status messages while the Ink Cartridge is being replaced:

### Missing

The Ink Cartridge has not been installed or is installed incorrectly. The Printer will not print until ALL Ink Cartridges have been installed correctly.

### Reseat

The Ink Cartridge is having continuity problems. Try removing the Ink Cartridge from the Printer and inserting it in again.

### Replace

The Ink Cartridge is faulty and needs to be replaced before the printer can continue printing.

### Unknown

The Ink Cartridge installed is not approved **but** the user has confirmed that he is using refilled or non-hp Ink Cartridges. Refer to the User's Guide for further information regarding using refilled or non-hp approved Ink Cartridges.

### The main actions for all 4 status messages is as follows:

- 1 Reseat the Ink Cartridge.
- 2 If reseating does not resolve the status message, replace the Ink Cartridge.
- 3 If the Status messages continue to appear, even after replacing the Ink Cartridge, replace the Ink Supply Tubes and Trailing Cable ⇒ Page 8-33.

## Printhead Status Messages While Printing

Detailed below are the printhead status messages that may be displayed while printing.

### OK

The printhead is operating correctly and will provide an acceptable level of print quality. To find more information on the printheads, refer to Page 3-7, *Obtaining Printhead Information*.

### Replace

The Printhead is faulty and needs to be replaced before the printer can continue printing.

If this message continues to appear (for example after installing new Printheads), try the following:

- 1 Reseat the Printheads and check if the message disappears.
- 2 Remove the Drop Detector and make sure that there are no obstacles inside which are blocking the sensor.
- 3 Print the Diagnostic Print ⇒ Page 6-6. Check that the Printhead nozzles are firing correctly.
- 4 Perform the Service Station Calibration ⇒ Page 5-8.
- 5 Replace ALL the Printheads.

## Printhead Status Messages While Replacing

The following are the Printhead status messages that may be displayed while replacing the Printheads.

### Reseat

In this situation, select the Printhead replacement option through the Front Panel but do NOT remove the Printheads. If this status message continues to appear then remove the Printheads and install them again.

### Remove

The Printhead is not a suitable type for use in printing (for example, a Setup Printhead).

### Missing

No Printhead has been detected in that Carriage stall. If a Printhead is installed in the Carriage stall when this status message is shown:

- 1 Reseat the Printhead, making sure it is installed correctly.
- 2 Clean the Carriage and Printhead flex circuits using the Carriage Interconnect Wiper ⇒ Page 3-14.
- 3 Replace the Printhead.
- 4 Perform the Electronic Systems Test ⇒ Page 4-17.

**If all 8 Printheads are installed but have the Status message "Missing", it is possible that the Carriage Assembly is faulty.**

## Printhead Cleaner Status Messages While Printing

Detailed below are the Printhead Cleaner status messages that may be displayed while printing.

### OK

The Printhead Cleaner is operating correctly and no action is required.

### End of Life

The Printhead Cleaner has reached the end of its life and should be replaced.

## Printhead Cleaner Status Messages While Replacing

The following are the Printhead Cleaner status messages that may be displayed while replacing the Printheads.

### Reseat Cleaner

In this situation, remove the Printhead Cleaner and install it again.

### Wrong Stall

The Printhead Cleaner has been installed in the incorrect place. Remove the Printhead Cleaner and check that it is installed in the correct stall of the Service Station.

### Missing

The Printhead Cleaner has not been installed or is installed incorrectly. The Printer will not print until ALL Printhead Cleaners have been installed correctly.

### Not replaced with Printhead

A new Printhead has been installed without installing a new Printhead Cleaner that came with it. Make sure a new Printhead Cleaner is installed everytime you replace a Printhead.

If a Printhead Cleaner needs to be removed or reseated, you must first start the Printhead Replacement process. Open the window when prompted to do so by the front panel. If the front panel shows the Printheads with **no** Printhead blinking, you do not need to touch the Printheads. Just close the window again, and the Printer will proceed to Printhead Cleaner replacement.

## Summary of Solving Ink Supplies Problems

Most of the problems that you could encounter when working with the ink supplies are solved with guidance from the front panel. A full list of front panel messages are supplied in the User's Guide.

### Problems reseating the printhead

If you have inserted the printhead into the printhead carriage assembly and the printer does not "BEEP" try the following steps.

**Check that during the priming process, the Setup Printheads are installed in the Carriage. If the printing Printheads are installed in the carriage during the priming process, they will be rejected and the front panel will show a warning message.**

- Check that the protective tape has been removed from the printhead.
- Insert the Printhead into the Carriage Assembly but this time correctly close the cover using the latch.
- Clean the electrical contacts on both the printheads and the printhead Carriage Assembly using the carriage interconnect wiper ⇒ Page 3-14.
- Replace the Printhead with a new one.

### You Cannot Insert the Ink Cartridge Into the Printer

- 1 Ensure that you have the correct hp no.90 Ink Cartridge.
- 2 Ensure that the Ink Cartridge is the correct color for that slot.
- 3 Ensure that the Ink Cartridge is the correct orientation, with the color coded label at the top.

**Never clean inside the Ink Cartridge slots as this can cause damage to the Printer.**

### You Cannot Insert the Printhead Into the Printer

- 1 Ensure that you have the correct hp no.90 Printhead.
- 2 Ensure that the printhead is the correct color for that slot.
- 3 Ensure that the printhead is in the correct orientation.
- 4 Ensure that the protective cap is removed from the Printhead.

### You Cannot Insert the Printhead Cleaner Into the Printer

- 1 Ensure that you have the correct hp no.90 printhead cleaner.
- 2 Ensure that the printhead cleaner is the correct color for that slot.
- 3 Ensure that the printhead cleaner is in the correct orientation.

## Troubleshooting Printhead Error Codes

The Printhead Error Codes can be found on the Service Information Print (Setup Menu/Information Menu/Internal Prints/Print Service Information/Current Information). The actual error code is a decimal number and it has to be converted to a binary number before it can be used.

Date:	Dec 15, 2006	Product Name:	HP DesignJet 4000	Serial Number:	144528004										
Program version:	HP J.L.1.1.4	Product version:	02776	Service ID:	14500										
Current Printer Configuration															
Language:	Eng (en)	Memory:	256 MB	Stor. capacity:	40.0 GB										
Current Temperature:	25.3°C (77°F)	Current Humidity:	40% RH												
Paper Loaded Information															
Active Paper Path:	Roll	Paper Loaded Status:	not available	Media Type Selected:	Best Paper										
Media width:	1847 mm / 42.41 inches	Paper Loaded Length:													
Current Printhead Kit Info															
1 - Yellow		2 - Yellow		3 - Magenta		4 - Magenta		5 - Black		6 - Black		7 - Cyan		8 - Cyan	
In warranty:	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Printhead Status:	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
Printhead Model:	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0
Error ID Code:															
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Current Ink Cartridge Info															
Yellow		Magenta		Black		Cyan		Yellow		Magenta		Black		Cyan	
Status:	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working
Product Name:	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90
Product Number:	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A
Serial Number:	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0
Expiration Date:	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615
Used with non-HP Ink:	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ink Level:	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%
Warranty Level:	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Usage Time:	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Maximum Recovery Level:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scan Area Shutdown:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Current Ink Cartridge Info															
Yellow		Magenta		Black		Cyan		Yellow		Magenta		Black		Cyan	
Status:	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working	Working
Product Name:	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90	HP No. 90
Product Number:	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A	C8463A
Serial Number:	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0	144528004-01-0
Expiration Date:	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615	20060615
Used with non-HP Ink:	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Ink Level:	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%	1.4%	3.4%
Usage Time:	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%
Maximum Recovery Level:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scan Area Shutdown:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Error ID Code: 0 0 0 0 0 0 0 0

In order to convert the decimal error code to a binary error code, you can use a calculator. For example, if you had the error code 4099, you would enter 4099 as a decimal number and then select the binary option which would give you a binary number of 1000000000011.

The following table explains the meaning of the different bits (0 or 1). When the value of the error code is reported as 0, it means that the Printhead is working correctly:

Bit	Meaning	Bit	Meaning
1st	FAILS_LOGICAL_V	11th	BAD_ACUMEN_ACCESS
2nd	FAILS_CONTINUITY	12th	WRONG_MODEL
3rd	SHUTDOWN	13th	MISMATCH
4th	FAILS_VPP	14th	CSDATA_NOT_RESPONDING
5th	TEMP_EXTREMELY_HIGH	15th	CSDATA_TRANSMIT_ERROR
6th	TEMP_EXTREMELY_LOW	16th	FAILS_ENERGY_CALIBRATION
7th	TEMP_TOO_HIGH	17th	EMPTY_DUMMY
8th	TEMP_TOO_LOW	18th	FULL_DUMMY
9th	BAD_ACUMEN_INFO	19th	END_OF_LIFE
10th	NO_PEN	20th	OUT_OF_WARRANTY

The binary number needs to be read from right to left so that the 1st bit corresponds to the right one of the binary number. For example, the error code 4099 is converted to binary number 10000000000011. So using the table above, the error code means "FAILS\_LOGICAL\_V", "FAILS\_CONTINUITY" and "MISMATCH".

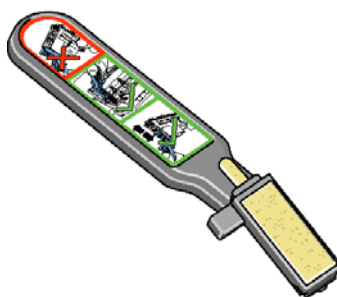
## Carriage Interconnect Wiper

**The Carriage Interconnect Wiper is part of the Maintenance Kit which can be ordered using Part Number Q1271-60420. All the instructions needed to use the Carriage Interconnect Wiper will be packaged with the kit.**

Whenever you replace the Printhead, check the empty slots to see if they need cleaning. In extreme circumstances, when a Printhead is inserted, it is possible that the Printer will not recognize it due to the build-up of ink on the electrical connection between the Printhead and the Carriage Assembly.

Included with the HP Designjet Printer, is a Carriage Interconnect Wiper. This tool is provided in a separate package. It also contains replacement sponges and an instruction sheet. This tool should be used for cleaning the electrical interconnects of both the Carriage Assembly and the Printhead.

If the front panel displays the message "Reseat" or "Replace" next to the offending printhead, try cleaning the flex circuits of the Carriage and the Printheads.



**Do not touch, wipe or attempt to clean the printhead nozzles. This can damage the printhead and reduce print quality.**

## Warranty Information for Ink Supplies

### Ink Cartridge

The warranty for the Ink Cartridges will end when one of the following occurs:

- 24 months from the date of manufacture

**or**

- When the advertised deliverable ink is reached (225ml/7.6 oz or 400ml/13.5 oz)

**or**

- When the user confirms that they have used non-hp ink in empty over-ride mode.

The actual end of warranty date is printed on the supply label.

## Warranty Information for Printheads

### Ink Cartridge

The warranty for the Printheads will end when one of the following occurs:

- 24 months from the date of manufacture that is printed on the Printhead

**or**

- When 1000ml/33.8 oz of HP original ink has been consumed by the Printhead

**or**

- When the user confirms that they have used non-hp ink in empty over-ride mode.

