



# Printhead Adjustment

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## Printhead Adjustment

### Introduction

The mechanical adjustment of a Printhead must be done every time a Printhead is removed or replaced. If the adjustment of the Printheads is not done, you could get Print Quality problems like banding. The Printhead Adjustment should be done in the following order:

- 1 Calibrate the Printhead Adjustment Jig.
- 2 Install the Printhead Adjustment Jigs in to the Carriage.
- 3 Set Printhead Voltage.
- 4 Print the Printhead Adjustment pattern.
- 5 Perform Printhead Position correction.
- 6 Print the Check Printhead pattern.
- 7 Mechanically adjust the Printhead.

### Tools Required

The Tools required to perform the Printhead Adjustment procedure are shown below. Without these tools, the Printhead Adjustment procedure cannot be completed correctly.



Printhead Adjustment Jig 1



Printhead Adjustment Reference Plate



Printhead Positioning Pins



Small Flat-Head Screwdriver



Cross-Head Screwdriver



Printhead Adjustment Jig 2



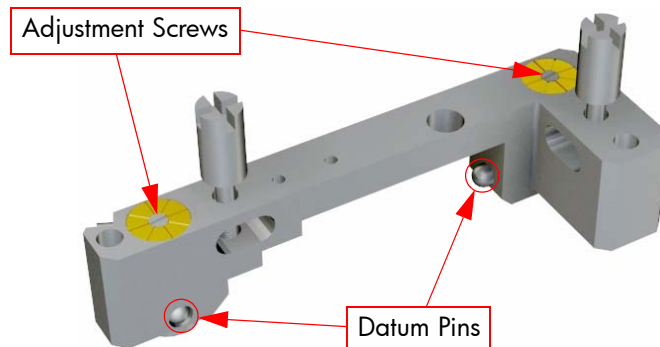
Measuring Loupe

## Calibrate the Printhead Adjustment Jig

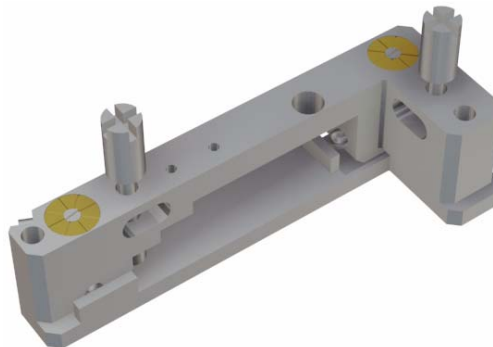
**To speed up the Printhead Adjustment, you can follow the tip on Page 3-19. If the tip is followed, then it is not necessary to calibrate the Printhead Adjustment Jig.**

Before installing the Printhead Adjustment Jig 1 in to the Carriage, it needs to be calibrated as follows:

- 1 Retract the datum pins located in the Printhead Adjustment Jig 1 by turning the Adjustment Screws counterclockwise using a small Flat-Head Screwdriver.



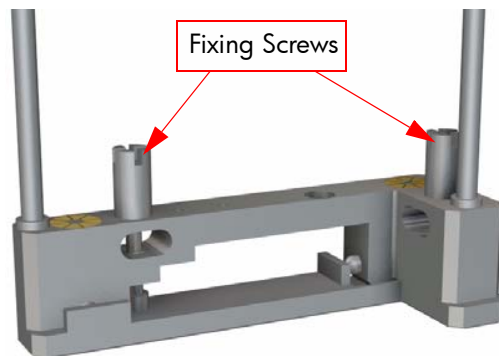
- 2 Place the Printhead Adjustment Jig 1 on top of the Printhead Adjustment Reference Plate as shown:



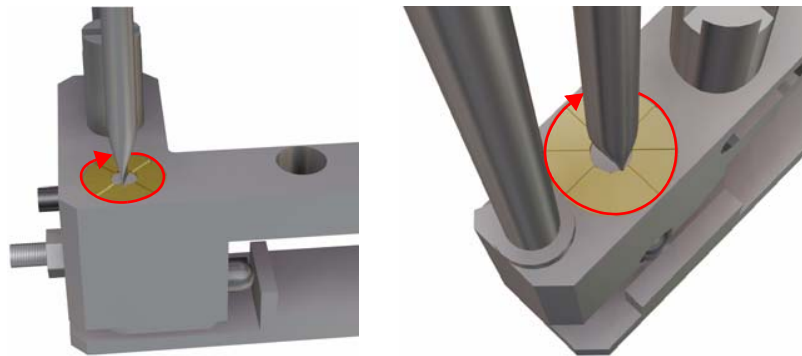
- 3 Insert the two Printhead Positioning Pins in to the Printhead Adjustment Jig 1.



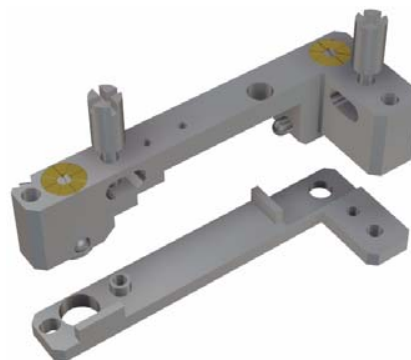
- 4 Tighten the two fixing screws so that the Printhead Adjustment Jig 1 is securely attached to the Printhead Adjustment Reference Plate.



- 5 Place the Printhead Adjustment Jig on a flat surface and without holding it, gently turn the Adjustment Screws clockwise until the Printhead Adjustment Jig begins to move. Check that the Datum Pins touch the walls of the Printhead Adjustment Reference Plate. Do **NOT** force the Adjustment Screws too much as this could damage the Datum Pins.



- 6 Once the Printhead Adjustment Jig 1 has been calibrated, you can loosen the fixing screws, remove the Printhead Positioning Pins and remove the Printhead Adjustment Reference Plate.

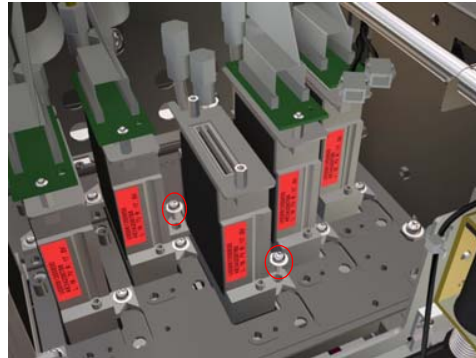


## Install the Printhead Adjustment Jigs in the Carriage

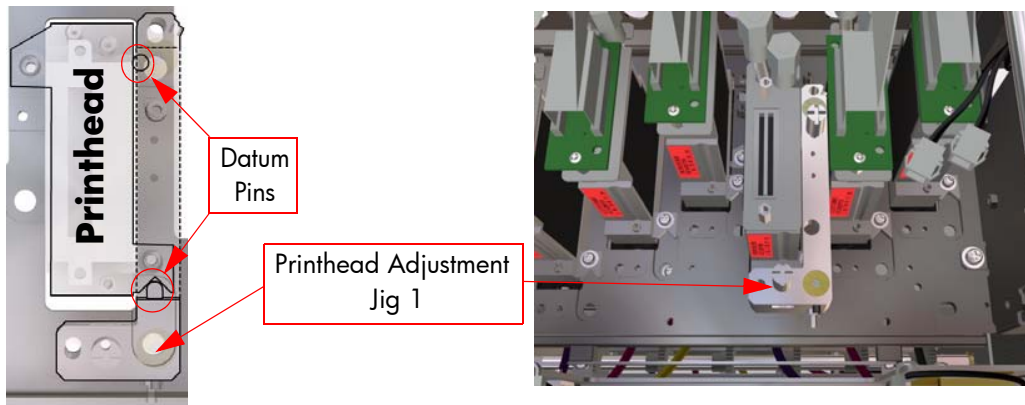
The next procedure will be to install the Printhead in to the Carriage and install the Printhead Adjustment Jigs as follows:

**Never touch the Printhead nozzles. They can be easily damaged or clogged. For Printhead removal information, refer to Page 8-86.**

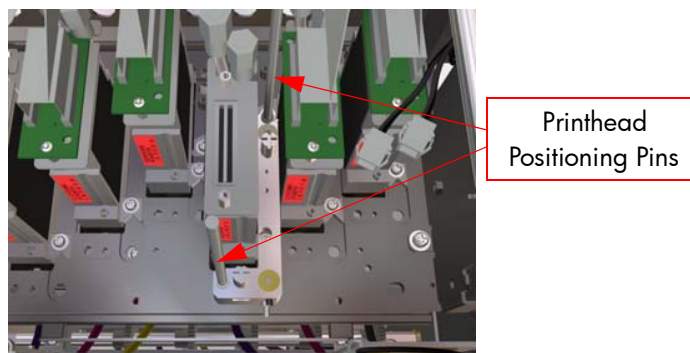
- 1 Install the new Printhead in to the Carriage and secure it with two screws. The screws should not be tightened too much, just enough so that the Printhead does not move loosely.



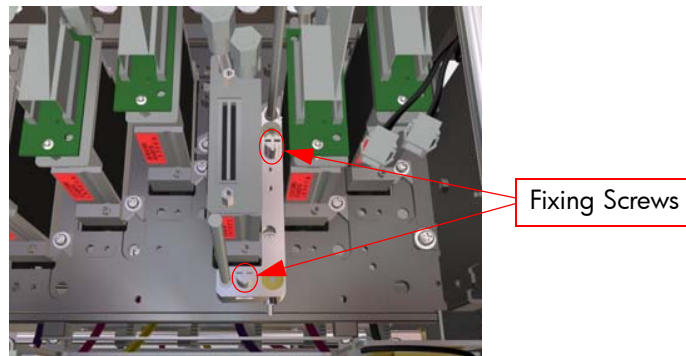
- 2 Install the Printhead Adjustment Jig 1 in to position against the Carriage Base Plate. Make sure that the 2 datum pins touch the Printhead as shown.



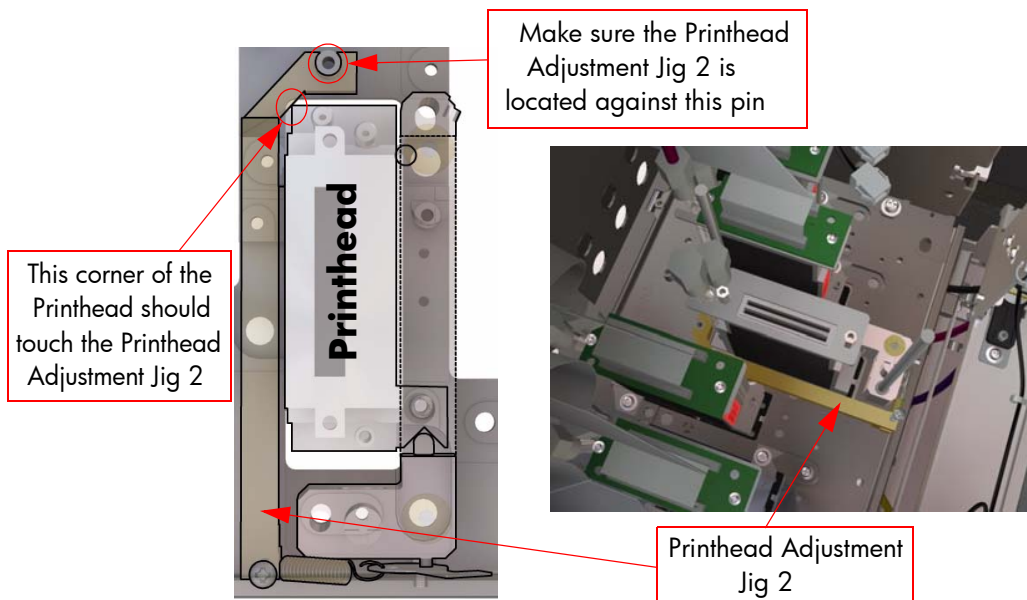
- 3 Insert the two Printhead Positioning Pins into the Printhead Adjustment Jig 1.



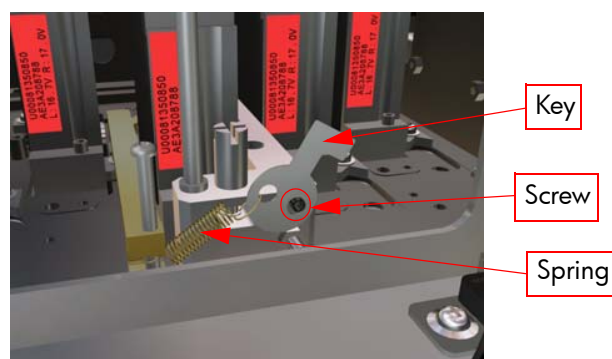
- 4 Tighten the two fixing screws so that the Printhead Adjustment Jig 1 is securely attached to the Carriage Base Plate.



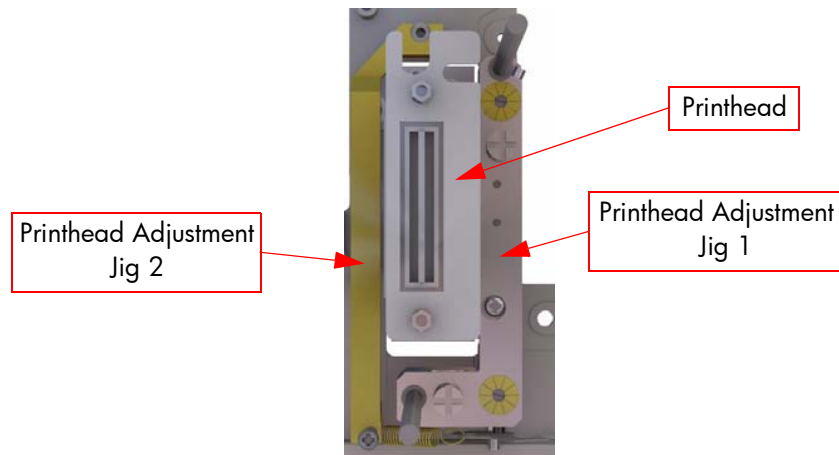
- 5 Install the Printhead Adjustment Jig 2 in to position against the Carriage Base Plate.



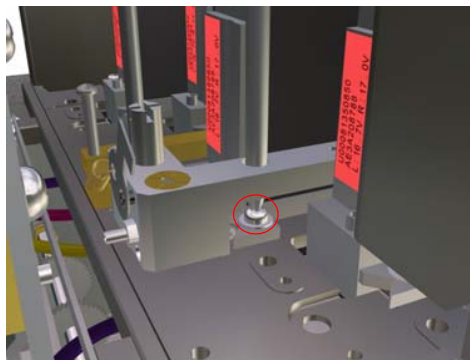
- 6 Stretch the spring and hook the key over the top screw of the Printhead Adjustment Jig 1 as shown.



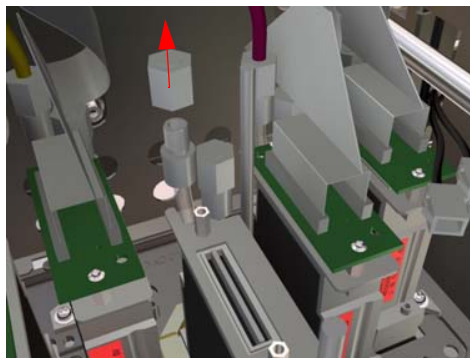
- 7** The following drawing shows the overall position of the Printhead Adjustment Jigs in relation to the Printhead (the tubes have been removed for clarity).



- 8** Once the Printhead Adjustment Jigs are in place, tighten the front screw that secures the Printhead to the Carriage Base Plate.

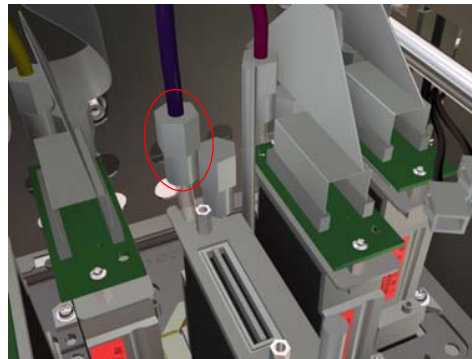


- 9** Remove the tube cap from the Printhead.

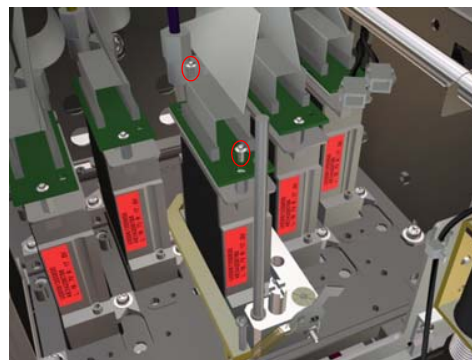




- 10** Attach the Ink Tube to the Printhead and secure it tightly.



- 11** Attach the Printhead Connector Assembly to the Printhead and secure it with 2 screws.



- 12** Before moving to the next stage of the Printhead Adjustment procedure, make sure that the Printhead Connector cables are safely secured with tape so that they don't hit other parts of the Printer.



Secure with  
tape

- 13** Enter into the Ink System Options submenu and select "Wash Printheads" in order to charge the replaced Printhead with ink.
- 14** Print a Nozzle Check pattern in order to verify that ink has been charged correctly into the Printhead. If any of the nozzles are not firing correctly, then perform a Normal Printhead Recovery and then retry the nozzle Check pattern.

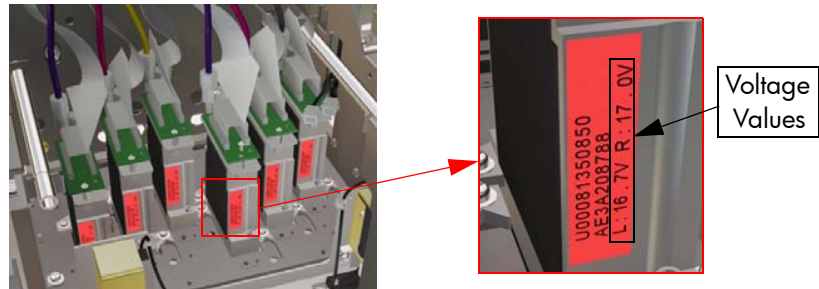


## Set Printhead Voltage

Before the Printhead can be used to print correctly, you must set the Printhead Voltage as follows:

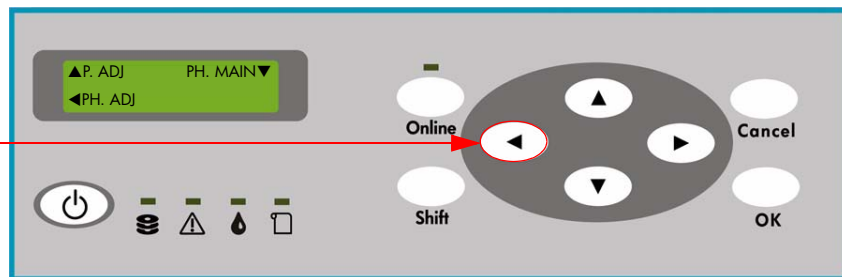
**Remember to set BOTH the left and right Printhead Voltage values for each Printhead correctly.**

You can find the Printhead Voltage values on each Printhead as shown:



- 1 Power On the Printer and enter in to the Maintenance Mode ⇒ Page 4-7.
- 2 Press the ◀ key to enter in to the Printhead Adjustment menu.

Press the Left Arrow  
Key to select



- 3 In the Printhead Adjustment submenu, scroll to "PH Voltage" and press the ▶ key.

```
# PH VOLTAGE
# Lm (L)
```

- 4 In the PH Voltage submenu, select the color of the Printhead (either left or right) for which you would like to set the Printhead Voltage and press the **OK** key. If you would like to exit the PH Voltage submenu, press the ◀ key.

```
# PH VOLTAGE
> Lm (L) >16.0 V
```

- 5 Use the ▲ and ▼ keys to change the digits and use the ◀ and ▶ keys to select the digits. The value can be changed in a range of 12.0 to 20.0 V (in increments of 0.1 V). Press the **OK** key once you have entered the new value.

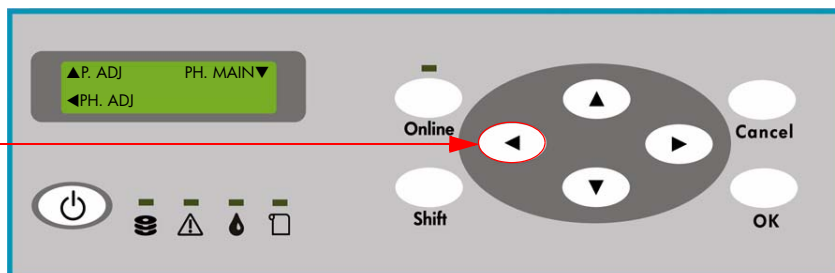
```
# PH VOLTAGE
> Lm (L) >17.6 V
```

## Print the Printhead Adjustment Pattern

In order to correct the Printhead position, you must first print the Printhead Adjustment pattern as follows:

- 1 Enter in to the Maintenance Mode ⇒ Page 4-7.
- 2 Press the ◀ key to enter in to the Printhead Adjustment menu.

Press the Left Arrow  
Key to select



- 1 In the Printhead Adjustment submenu, scroll to "PH Adj Print" and press the **OK** key.

```
# PH ADJ PRINTS
> NOZZLE CHECK
```

- 2 In the Printhead Adjustment Prints submenu, scroll to "Printhead Adj" and press the **OK** key.

```
# PH ADJ PRINTS
* PRINthead ADJ
```

- 3 You will need to confirm that you want to print the Printhead Adjustment pattern by pressing the **OK** key.

```
# PH ADJ PRINTS
* PRINthead ADJ  OK?
```

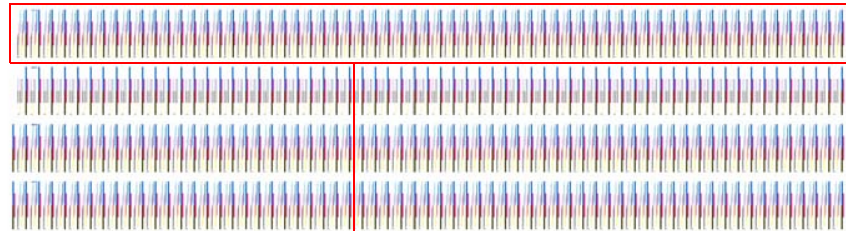
- 4 The Printer will start printing the Printhead Adjustment pattern and the following message will appear on the Front Panel.

```
# PH ADJ PRINTS
* EXECUTING
```

## Perform Printhead Position Correction

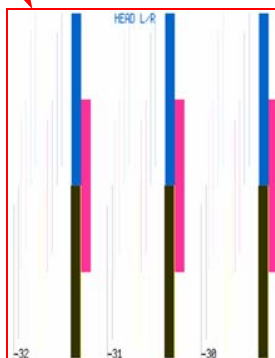
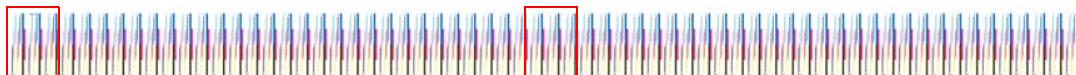
Once you have printed the Printhead Adjustment pattern, you can use it to correct the position of the Printhead as follows:

- 1 Locate the Printhead Row pattern in the Printhead Adjustment pattern.

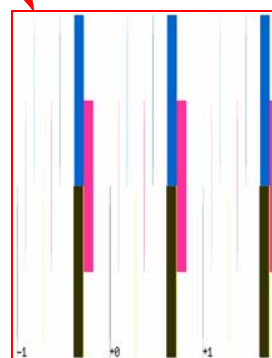


Printhead Row Pattern

- 2 Select the pattern that looks the best aligned and note down the value (either a - value or a + value).



Lines **not** well aligned



Lines well aligned

- 3 In the Printhead Adjustment submenu, scroll to "PH Row Val" and press the ► key.

```
# PH ROW VAL
# Lm
```

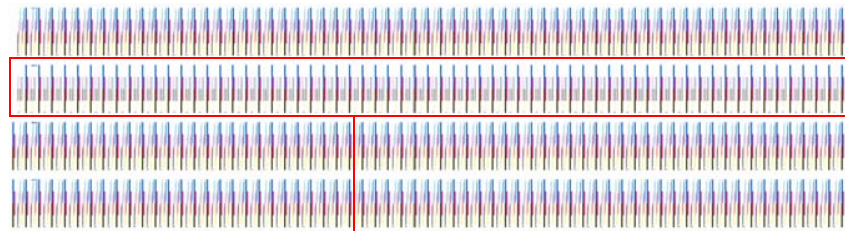
- 4 In the PH Row Val submenu, select the color of the Printhead that you would like to adjust and press the **OK** key. If you would like to exit the PH Row Val submenu, press the ◀ key.

```
# PH ROW VAL
> Lm >+00
```

- Use the ▲ and ▼ keys to change the digits and use the ◀ and ▶ keys to select the digits. Enter the value that you noted down in step 2.

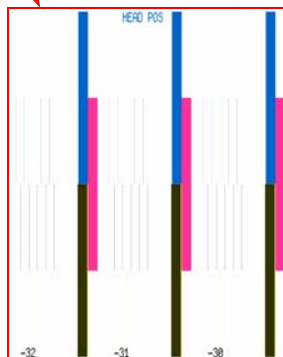
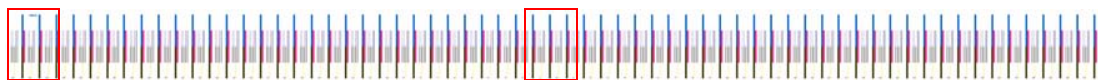
```
# PH ROW VAL
> Lm >+01
```

- Press the **OK** key once you have entered the new value.
- Locate the Printhead to Printhead pattern in the Printhead Adjustment pattern.

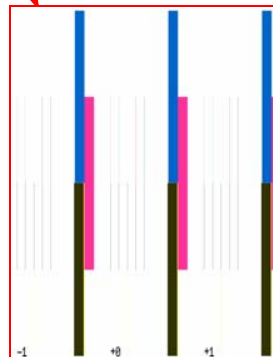


Printhead to Printhead Pattern

- Select the pattern that looks the best aligned and note down the value (either a - value or a + value).



Lines **not** well aligned



Lines well aligned

- In the Printhead Adjustment submenu, scroll to "PH to PH Val" and press the ▶ key.

```
# PH TO PH VAL
# Lm
```

- 10** In the PH to PH Val submenu, select the color of the Printhead that you would like to adjust and press the **OK** key. If you would like to exit the PH to PH Val submenu, press the **◀** key.

```
# PH TO PH VAL  
> Lm >+00
```

- 11** Use the **▲** and **▼** keys to change the digits and use the **◀** and **▶** keys to select the digits. Enter the value that you noted down in step 8.

```
# PH TO PH VAL  
> Lm >+01
```

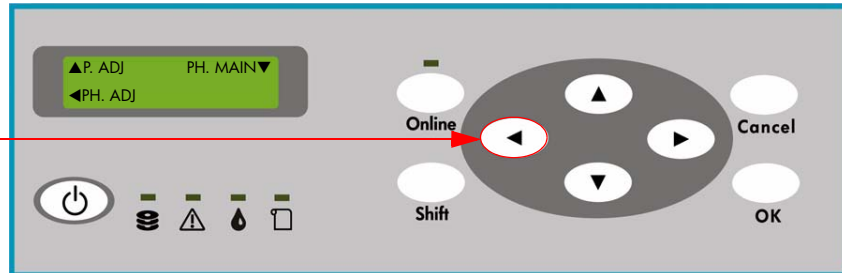
- 12** Press the **OK** key once you have entered the new value.

## Print the Check Printhead Pattern

In order to adjust the Printhead, you must first print the Check Printhead pattern as follows:

- 1 Enter in to the Maintenance Mode ⇒ Page 4-7.
- 2 Press the ◀ key to enter in to the Printhead Adjustment menu.

Press the Left Arrow  
Key to select



- 1 In the Printhead Adjustment submenu, scroll to "PH Adj Prints" and press the **OK** key.

```
# PH ADJ PRINTS
> NOZZLE CHECK
```

- 2 In the Printhead Adjustment Prints submenu, scroll to "Check Printhead" and press the **OK** key.

```
# PH ADJ PRINTS
* CHECK PRINthead
```

- 3 You will need to confirm that you want to print the Check Printhead pattern by pressing the **OK** key.

```
# PH ADJ PRINTS
* CHECK PRINthead OK?
```

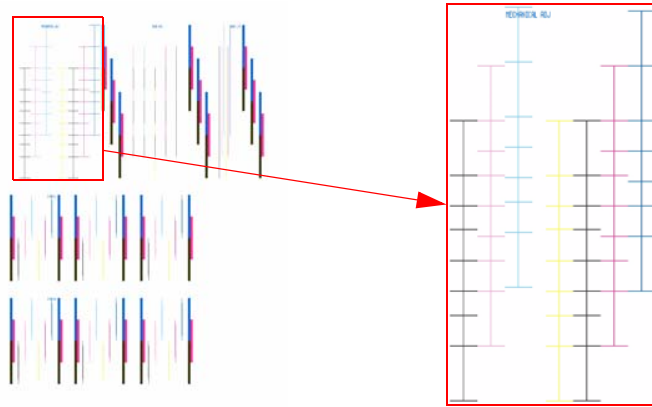
- 4 The Printer will start printing the Check Printhead pattern and the following message will appear on the Front Panel.

```
# PH ADJ PRINTS
* EXECUTING
```

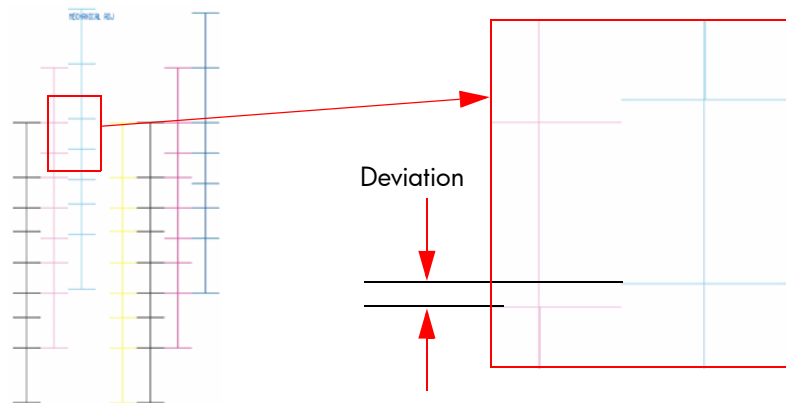
## Adjust the Printhead

Once you have printed the Check Printhead pattern, you can use it to adjust the Printhead as follows:

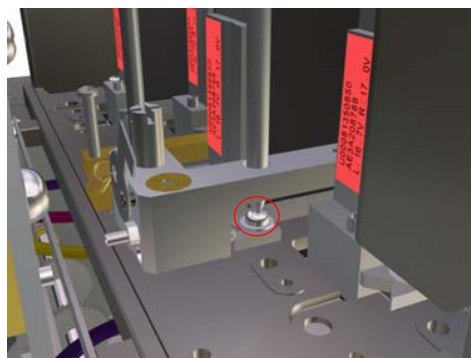
- 1 Locate the mechanical adjustment pattern in the Check Printhead pattern.



- 2 Using a Measuring Loupe, you must first measure the deviation of the Printhead in the vertical position.

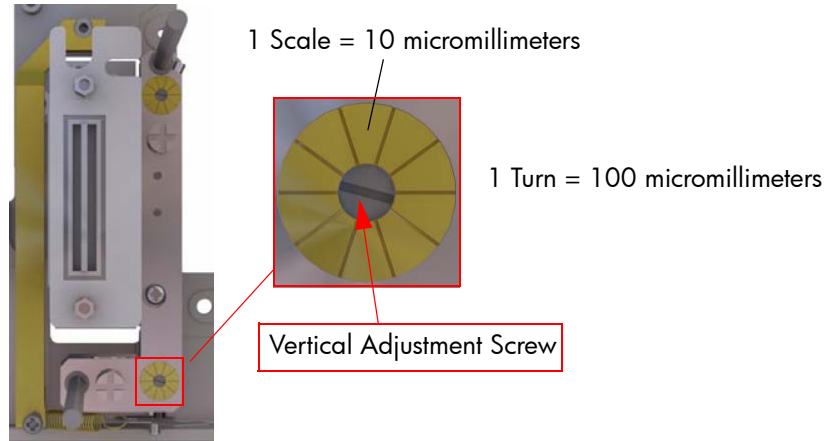


- 3 Loosen the front screw that secures the Printhead to the Carriage Base Plate.





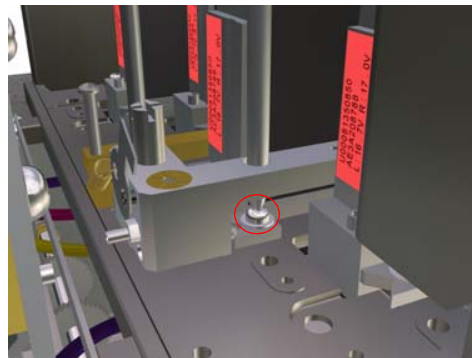
- 4 Using the measurement obtained in step 2, calculate how many scales you will need to turn the Vertical Adjustment Screw to adjust the vertical position of the Printhead.



- 5 If for example, the deviation measured in step 2 was 240 micro-millimeters, you would turn the Vertical Adjustment Screw 2 full turns and 4 scales.

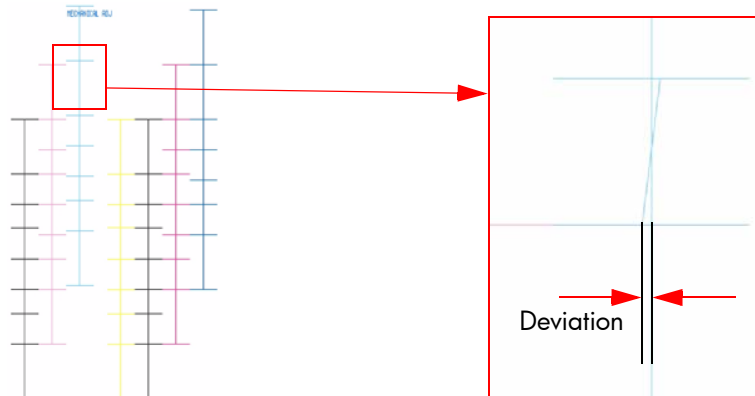


- 6 Tighten the front screw that secures the Printhead to the Carriage Base Plate.

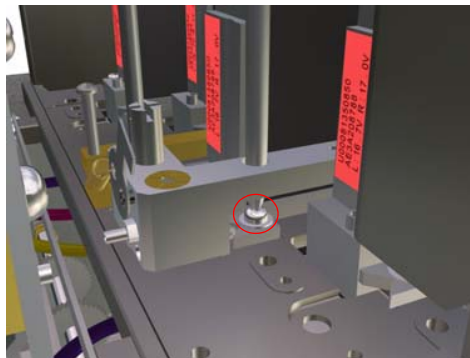


- 7 Reprint the Check Printhead pattern and measure again the deviation of the Printhead in the vertical position. If there is still deviation, repeat the instructions from step 3.

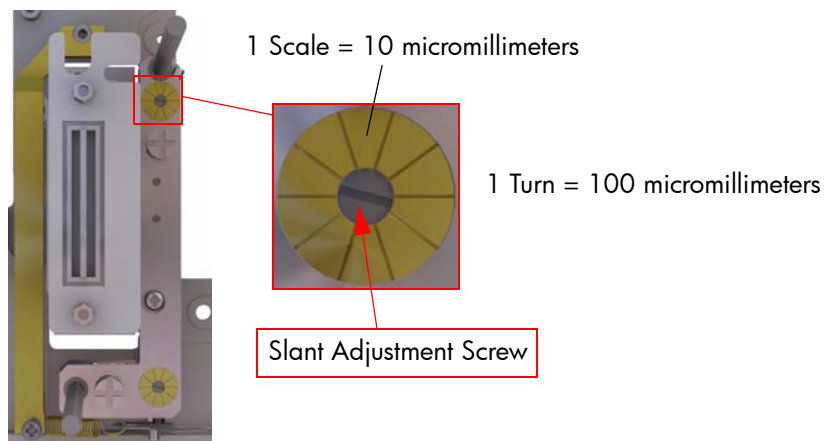
- 8** If the deviation measured is 0, you will now measure the deviation of the Printhead in the slant position.



- 9** Loosen the front screw that secures the Printhead to the Carriage Base Plate.



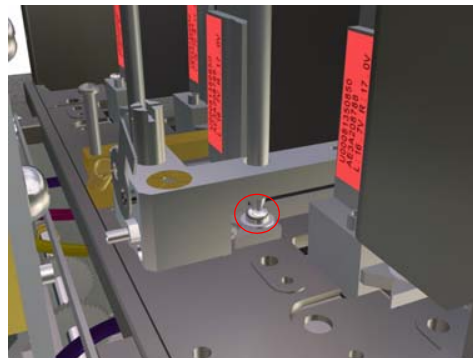
- 10** Using the measurement obtained in step 8, calculate how many scales you will need to turn the Slant Adjustment Screw to adjust the slant position of the Printhead.



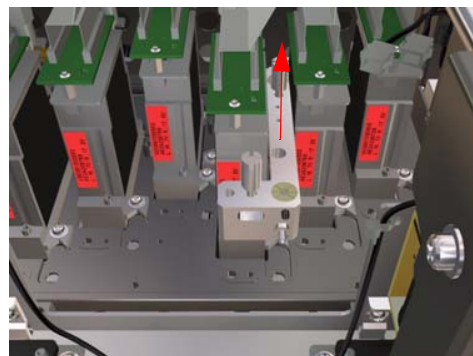
- 11** If for example, the deviation measured in step 8 was 120 micro-millimeters, you would turn the Slant Adjustment Screw 1 full turn and 2 scales.



- 12** Tighten the front screw that secures the Printhead to the Carriage Base Plate.



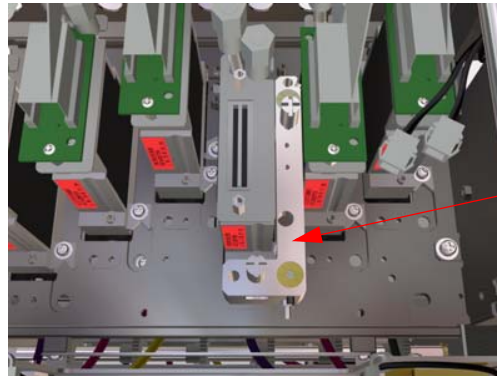
- 13** Reprint the Check Printhead pattern and measure again the deviation of the Printhead in the slant position. If there is still deviation, repeat the instructions from step 9.
- 14** If the deviation measured is 0, you can remove the Printhead Adjustment Jigs from the Carriage.



## Tip to Speed-Up the Printhead Adjustment

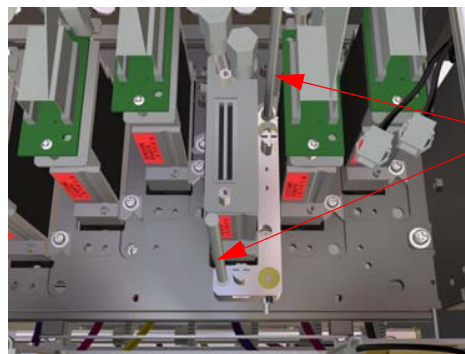
An alternative and faster way to adjust a new Printhead is as follows:

- 1** Before removing the **old** Printhead, install the Printhead Adjustment Jig 1 in to position against the Carriage Base Plate.



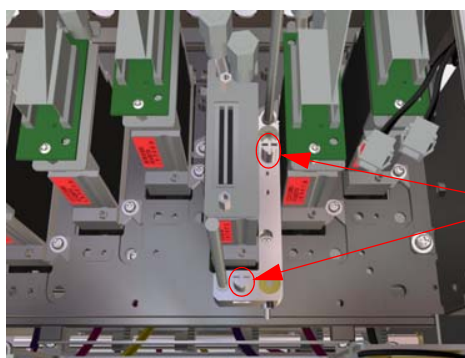
Printhead Adjustment Jig 1

- 2** Insert the two Printhead Positioning Pins into the Printhead Adjustment Jig 1.



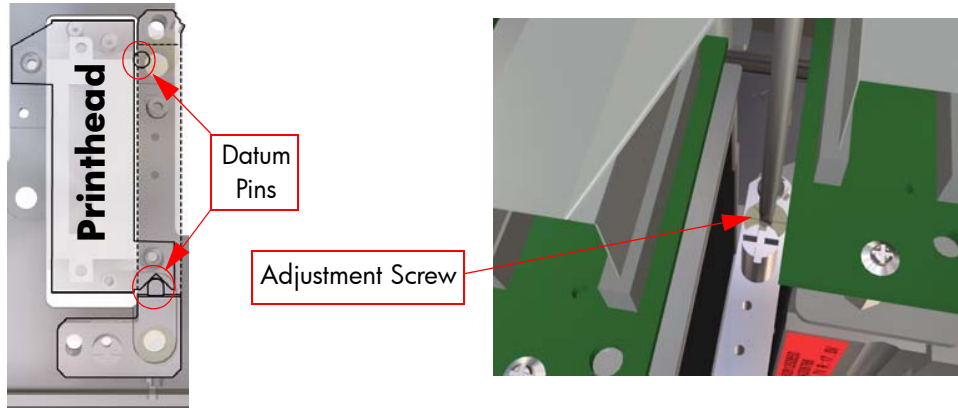
Printhead Positioning Pins

- 3** Tighten the two fixing screws so that the Printhead Adjustment Jig 1 is securely attached to the Carriage Base Plate.

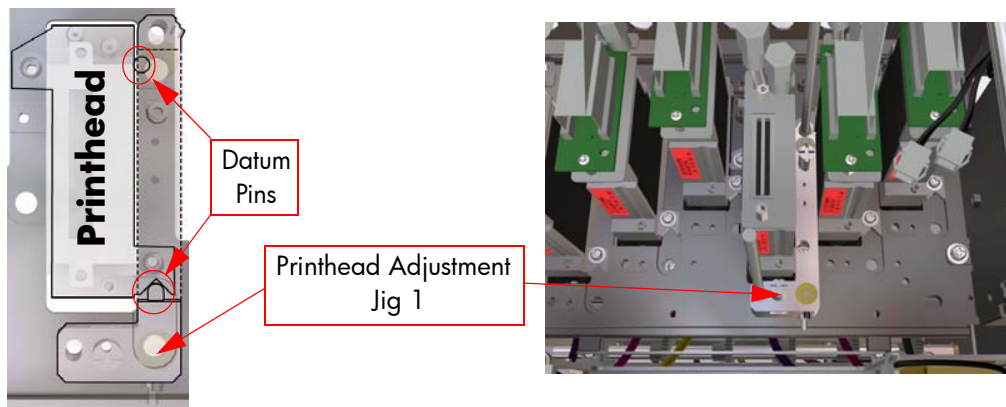


Fixing Screws

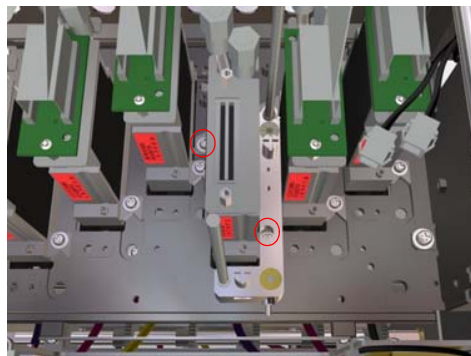
- 4 Turn both Adjustment Screws so that the 2 datum pins touch the Printhead as shown. You must **not** force the Adjustment Screws too much as this could damage the Datum Pins.



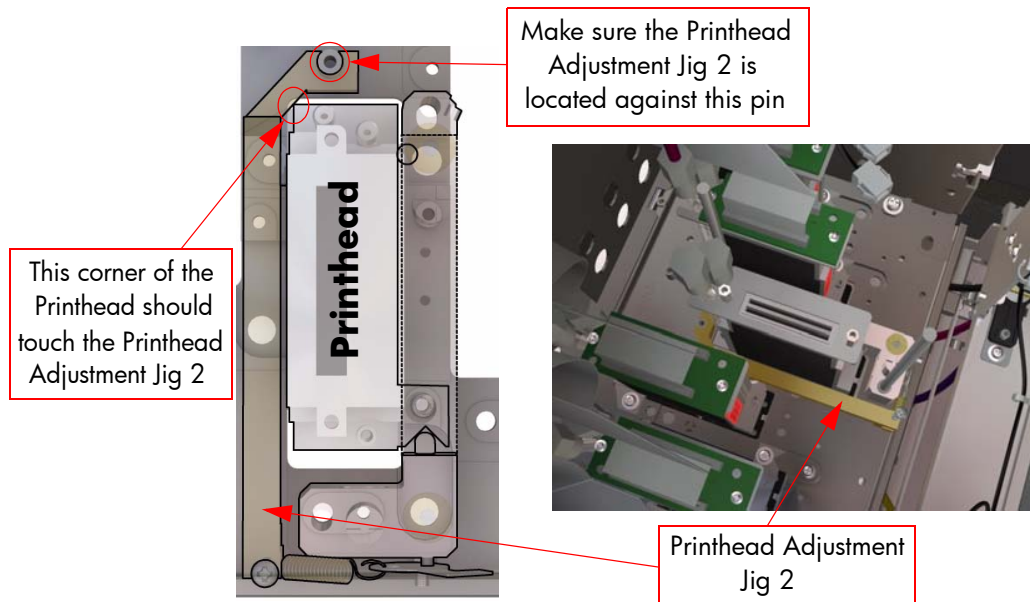
- 5 Now that the Printhead Adjustment Jig 1 is calibrated to the **old** Printhead, the Printhead can now be removed ⇒ Page 8-86.
- 6 Install a **new** Printhead in to the Carriage and position it against the Printhead Adjustment Jig 1 as shown. Make sure that the 2 datum pins touch the Printhead as shown.



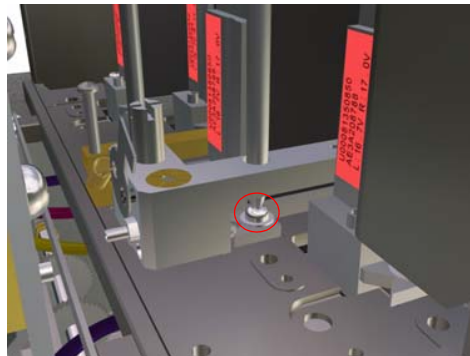
- 7 Install the two screws to secure the Printhead. The screws should **not** be tightened too much, just enough so that the Printhead does not move loosely.



- 8 Install the Printhead Adjustment Jig 2 in to position against the Carriage Base Plate.



- 9 Tighten the front screw that secures the Printhead to the Carriage Base Plate.



- 10 At this point the **new** Printhead should now be more or less in the same position as the **old** Printhead.
- 11 Before continuing, you should connect the Ink Tube and Printhead Connector Assembly to the Printhead.
- 12 You should now continue the Printhead Adjustment procedure from Page 3-9.

