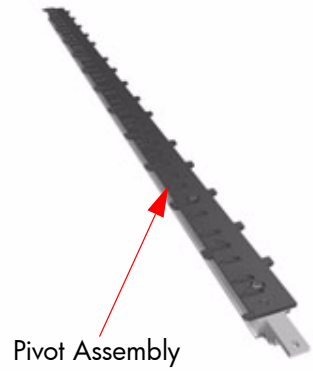
PRS Adjustment

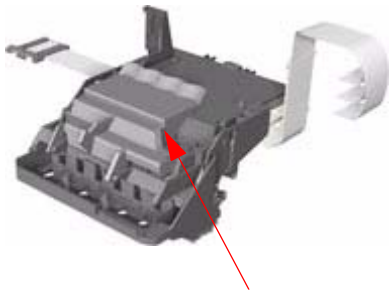
PRS Adjustment

When Required

It is very important that you perform the PRS Adjustment whenever:

- The Pivot Assembly is removed **or** replaced.
- The Feed Roller Assembly is removed **or** replaced
- The Carriage Assembly is replaced (it is not necessary to perform the PRS Adjustment if the carriage is reseated).





There are 2 different ways to perform the PRS adjustment:

- Automatic PRS Adjustment - This is done in repair centers using the PRS Tool and the Control Application ⇒ Page *5-3*.
- Manual PRS Adjustment - This is used during on-site repairs or when an automatic PRS adjustment is not possible ⇒ Page *5-20*.

Automatic PRS Adjustment

Introduction

The PRS Adjustment Tool is a measurement tool which is used to measure the pen to rib space (PRS) within the printer. It is critical that the pen to rib space is correct and within the given specifications, otherwise the printer will print with image quality problems.

The PRS Adjustment Tool consists of two separate tools:

- PRS Pen.
- Line Calibration Stand.

PRS Pen

Line Calibration Stand

In addition, the following equipment is also necessary to perform the PRS Adjustment:

- Lucas-Shaevitz MP1000 Display.
- Agilent DC Power Supply Unit (Part Number E3640A).
- Parallel to Serial Adapter.
- PC with 3 serial ports (a PCI Card with 2 serial ports needs to be installed).

Lucas-Shaevitz MP1000 Display

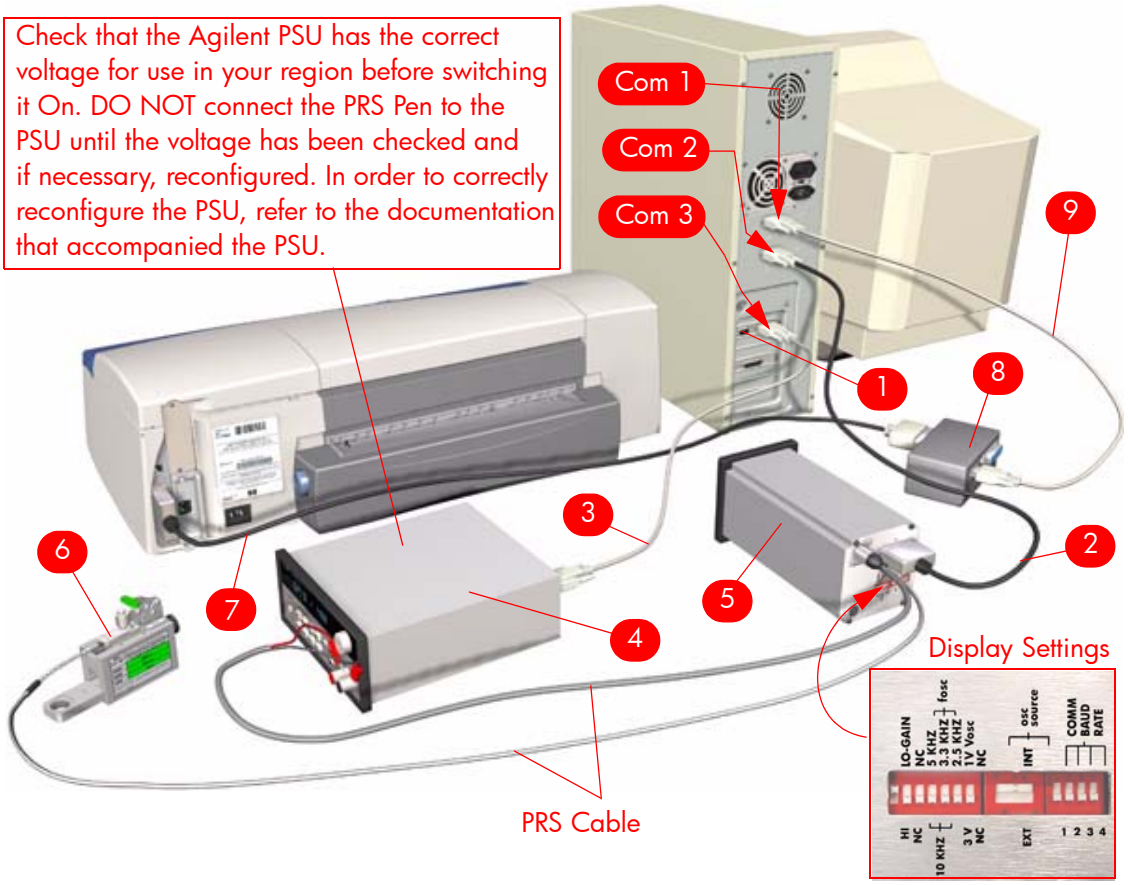
Agilent Power Supply Unit

Parallel to Serial Adapter

Automatic PRS Adjustment Tool Set-up Connections

The equipment for the PRS Adjustment Tool needs to be set-up as follows:

Check that the Agilent PSU has the correct voltage for use in your region before switching it On. DO NOT connect the PRS Pen to the PSU until the voltage has been checked and if necessary, reconfigured. In order to correctly reconfigure the PSU, refer to the documentation that accompanied the PSU.



1. PCS Card 2 Serial Ports.
2. PC-Display Communication Cable.
3. Serial Cable (9 pin female-female connection).
4. Agilent Power Supply Unit (Part Number E3640A).
5. Lucas-Shaevitz MP1000 Display.
6. PRS Pen.
7. Centronics (parallel) Cable (female-male connection).
8. Parallel-Serial Adapter.
9. Serial Cable (standard 9 pin female-male connection).

Power Supply Unit Configuration
Communication Mode - RS-232
Baud Rate - 9600 bps
Parity and Data Bits - None 8 bits

In order to correctly configure the PSU, refer to the accompanying documentation.

Automatic PRS Adjustment Instructions

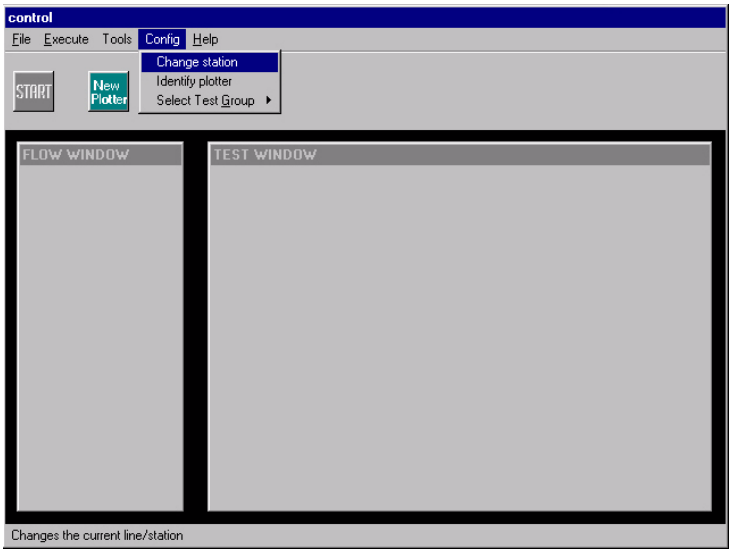
The PRS Adjustment is split into 2 different processes:

- Calibrating the PRS Pen using the Line Calibration Stand.
- Checking and, if necessary, adjusting the Pen to Rib space to within specifications.

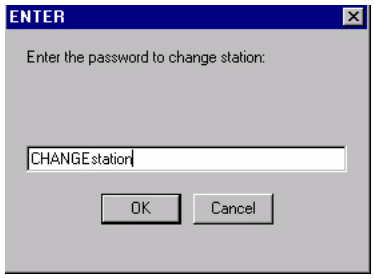
Calibrating the PRS Pen

Calibrate the PRS Pen using the Line Calibration Stand as follows:

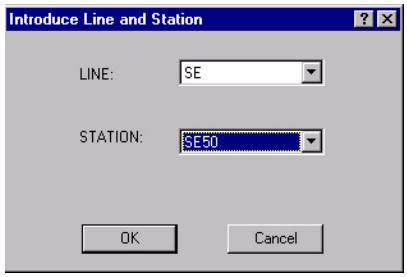
1. Double-click on the controller icon to start the Control Application (Version 1).
2. Click on **Config** and select **Change station** or click directly on the **New Plotter** box.



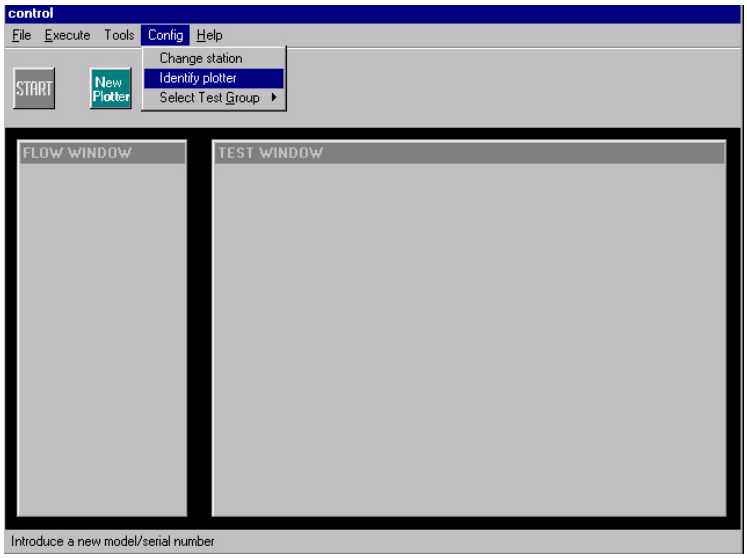
3. A "Enter the password to change station" message will appear. You must enter the following text and then press OK: CHANGEstation.



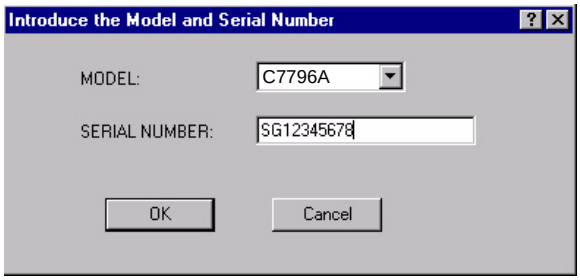
4 A box will appear prompting you to select the Line and Station. For the Line, select **SE** and for the Station, select **SE50**. Click **OK**.



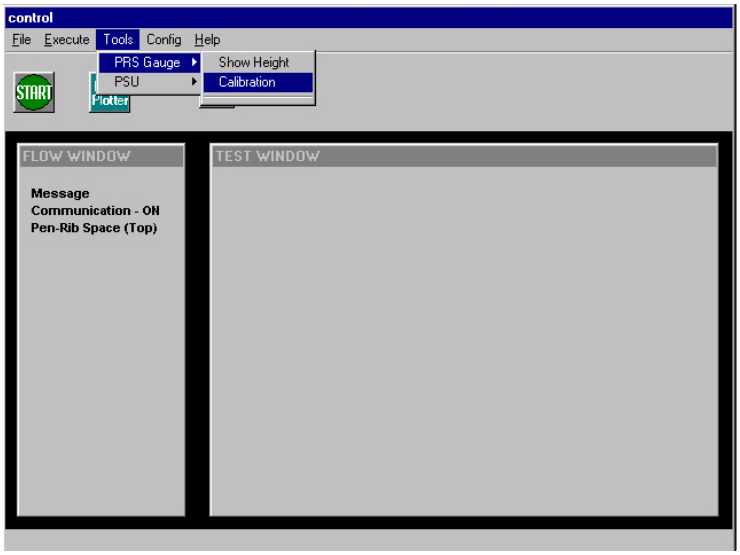
5 Click on **Config** and select **Identify plotter.**



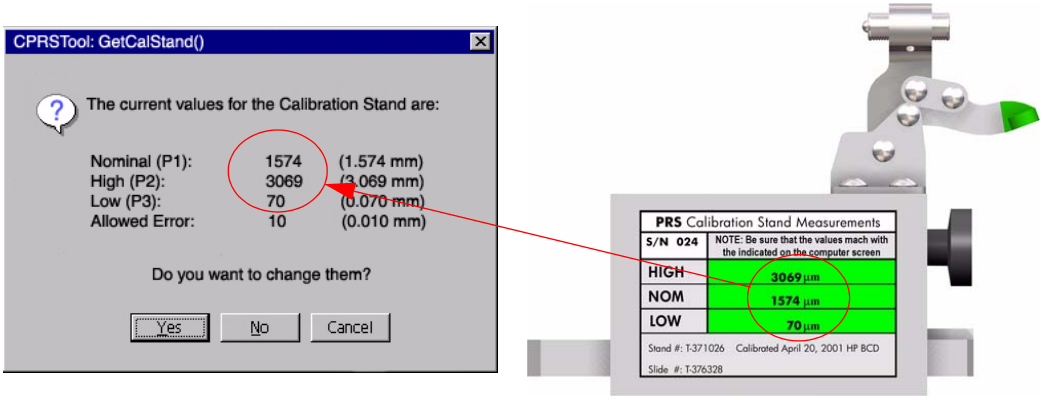
6 Select the Printer Model and type in the Printer Serial Number. Click **OK**.



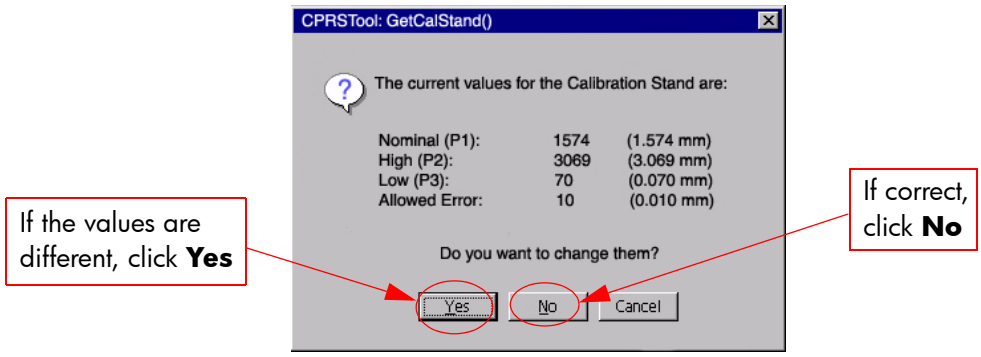
7 Click on **Tools**, then click on **PRS Gauge** and then click on **Calibration**.



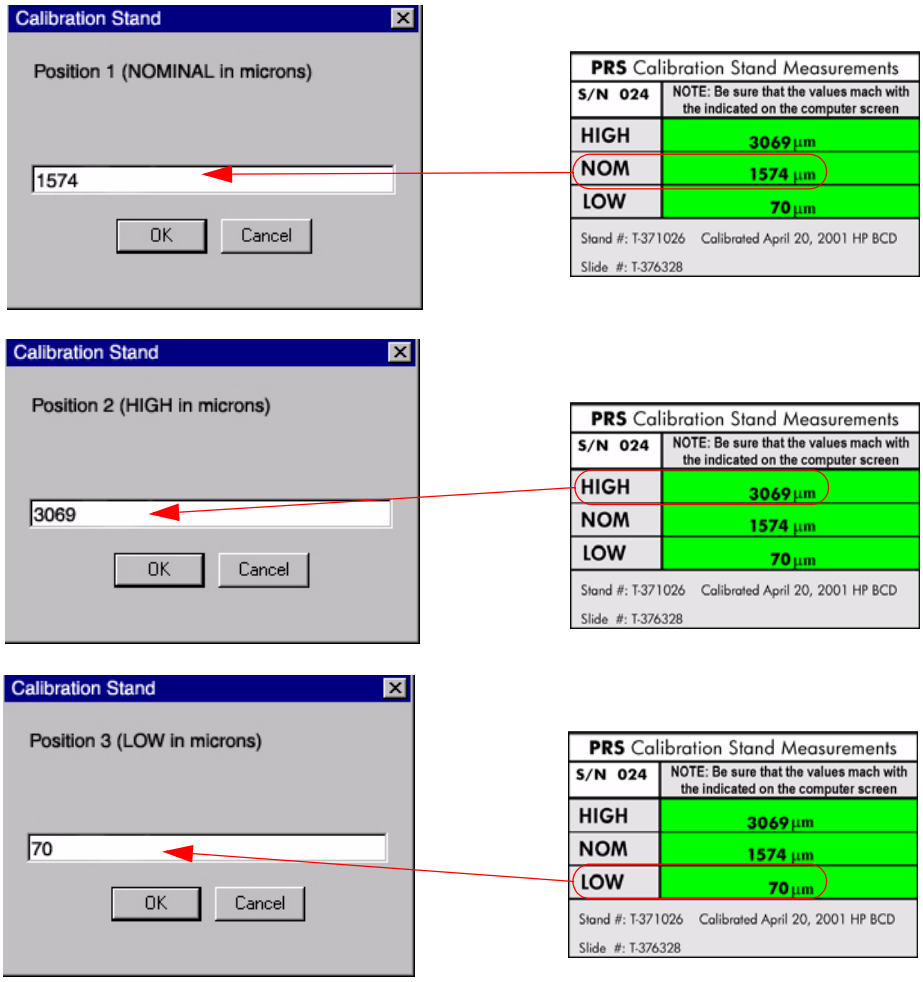
8 A message appears on the computer screen with the default values that are used for the calibration. Check these values against the values on the green label on the calibration Stand.



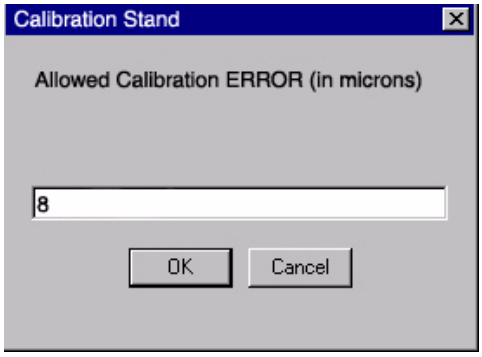
9 If the current values displayed on the computer screen are different from the values on the green label, then you will need to change the values by selecting **Yes** on the computer screen. If the values are correct, then select **No** and proceed to **step 13**.



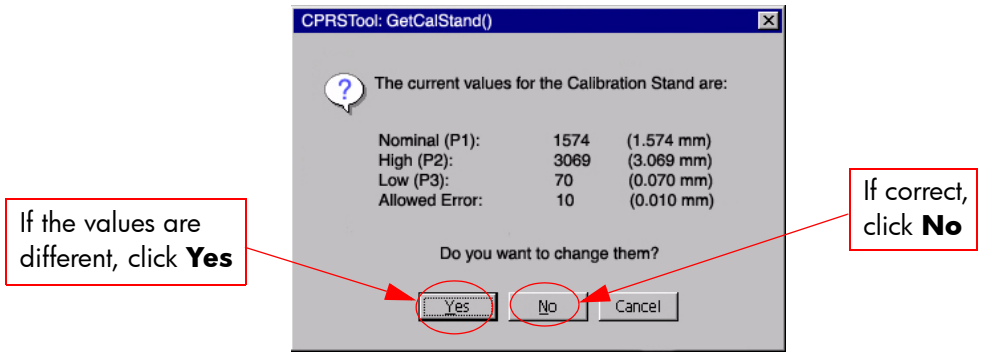
10 If you selected **Yes** (to change the values), a series of messages will appear requesting you to introduce the values for each of the 3 positions. Follow the messages on the computer screen to introduce the values that appear on the green label.



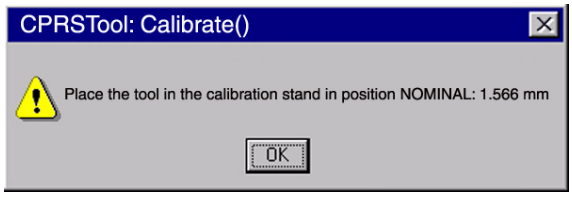
11 After you have entered the values for the Calibration stand, you will be requested to enter the allowed calibration error, which should be **8 microns**.



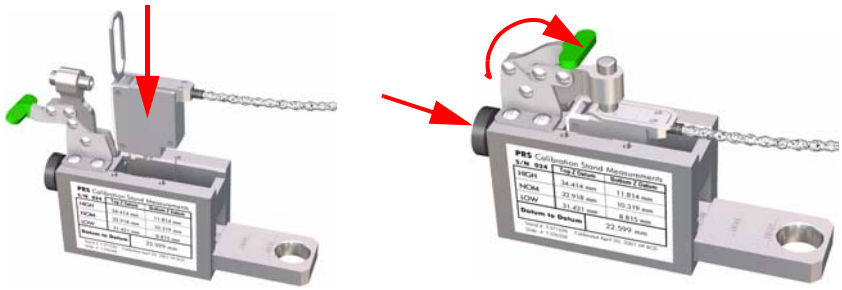
12 Once all the values have been entered, a message will appear on the computer screen with the values that you have just entered. Check these values against the values on the green label on the Calibration Stand to make sure they are correct and then select **No** (or select **Yes** and re-enter the values).



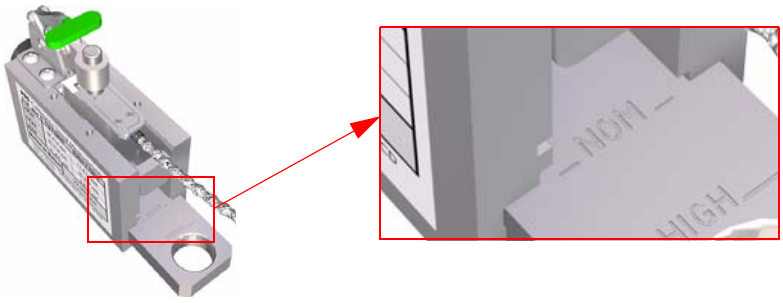
13 If you select **No** (meaning the values are correct), a message will appear on the computer screen requesting you to insert the PRS Tool into the Line Calibration Stand.



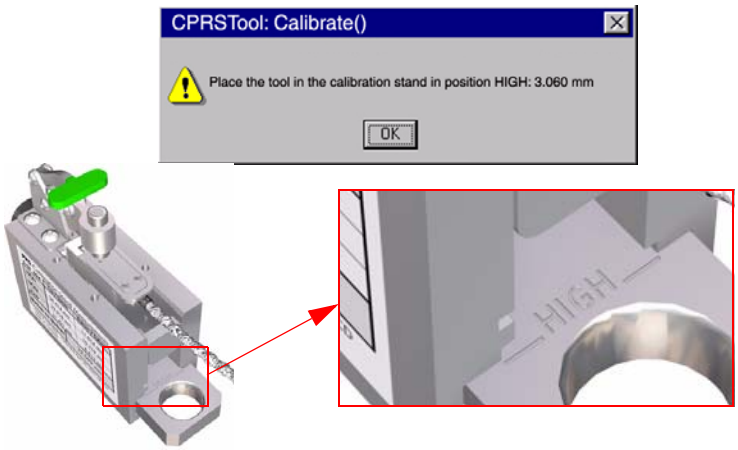
14 Install the PRS Pen inside the Line Calibration Stand. Release the plunger and lower the clamp into position



15 Place the Line Calibration Stand in the NOM position and click on **OK**.

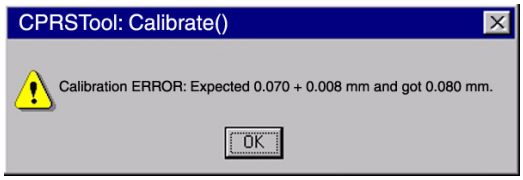


16 A message will appear on the computer screen requesting you to place the Line Calibration Stand in the HIGH position. Place the Line Calibration Stand in the HIGH position and click on **OK**.



17 A message will appear on the computer screen requesting you to place the Line Calibration Stand in the LOW position. Place the Line Calibration Stand in the LOW position and click on **OK**.

18 If the Calibration fails with an error, the following message will appear and you must repeat the calibration again.



19 If the Calibration finished correctly, the following message will appear. Click **OK**.

Adjusting the Pen to Rib Space

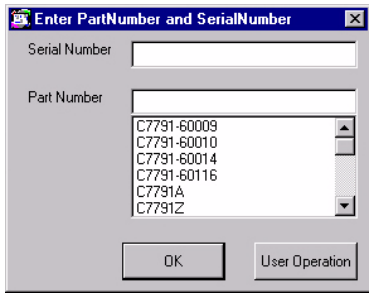
Do NOT insert the PRS Pen into the Carriage until you are requested or else you may damage both the PRS Pen and the printer.

Do NOT manually move the Carriage along the print platen while the PRS Pen is installed or else you may damage the PRS Pen.

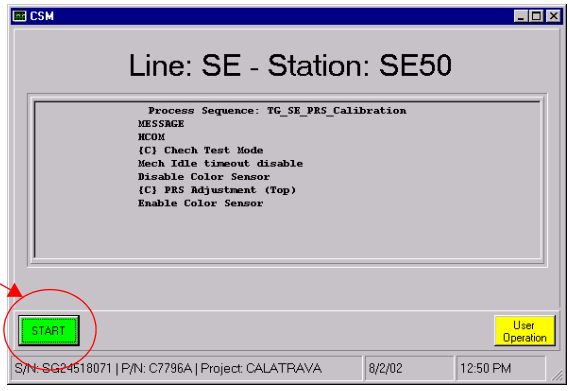
Check that the Pen to Rib space is within specifications and, if necessary, adjust it as follows:

1. Open the Top Cover and the Printhead Access Door and block the Door Sensor with a piece of paper.

2. Double-click on the **Caltrava topLine CSM** icon to start the application.
3. Select the Printer Model and type in the Printer Serial Number. Click **OK**.

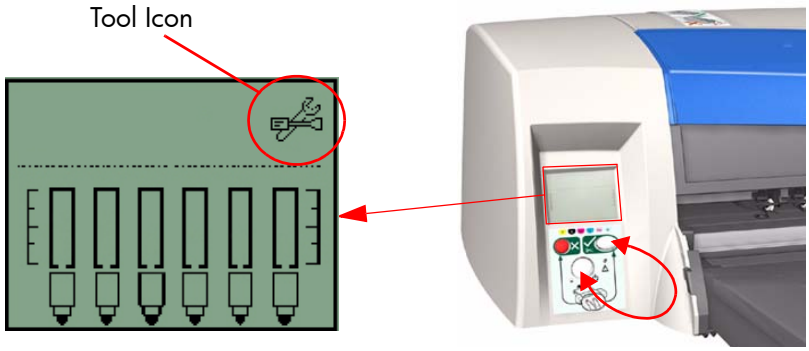


4. In the Control Application, click on the START button (make sure first that you are in Test Station SE50).

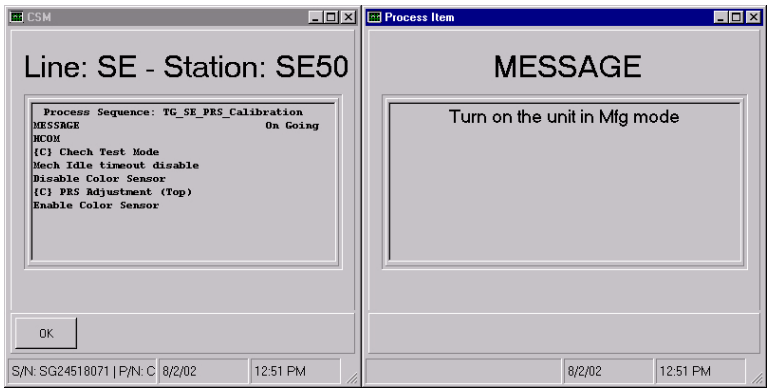


Click here

5 A message appears that asks you to put the printer in **MFG mode**. To do this, while the printer is switched OFF, press both the **resume** and **power** buttons together until the Tool icon appears on the front panel.



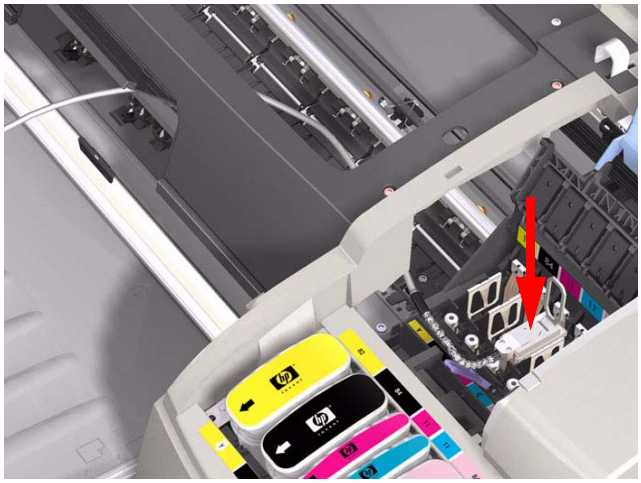
6 Click on **OK** once the printer is in **MFG mode**.



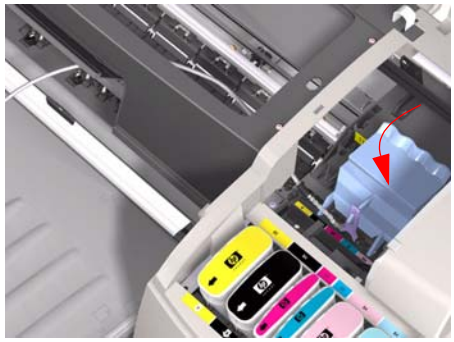
7 After a few seconds the Carriage moves to the left and then to the right several times and then finally comes to a stop above the Service Station and the following message appears.

8 Open the Access Panel in the Center Cover and pass the PRS Tool through it.

9 Open the Carriage Cover and install the PRS Pen into the Magenta Stall. Make sure that there is enough PRS Pen cable to allow the Carriage to move along the Scan-Axis of the Printer.

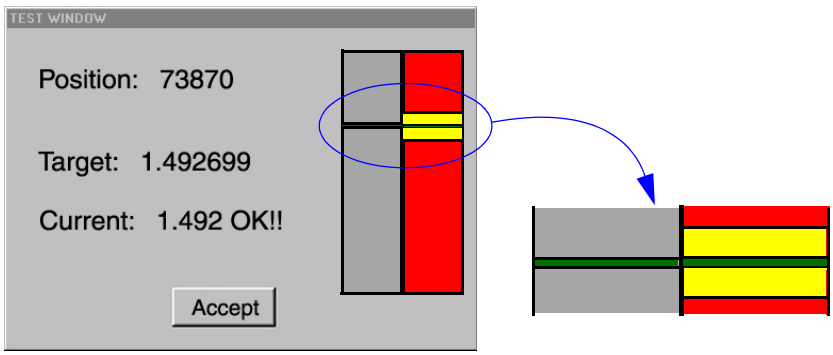


10 Close the Carriage Cover and once you are ready, click **OK**.

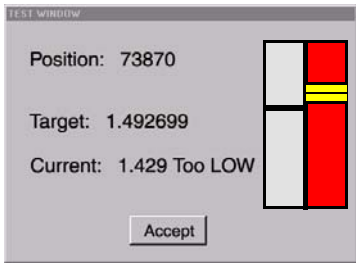


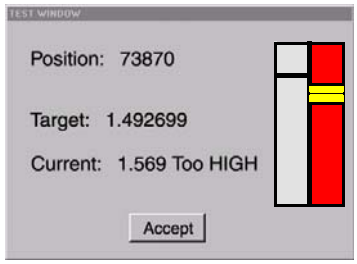
11 The PRS Pen measures the Pen to Rib Space along the Print Platen. Once it has taken all the measurements, the PRS Pen stops on the left hand side of the Print Platen and the PRS measurement is displayed on the computer screen.

12 Check the two blocks (one gray and one red) on the computer screen. If the green bar on the left block is aligned with the green bar on the right block then the measurement is within specification. Click **Accept** and the PRS Pen moves to the right hand side of the Print Platen. Again, check the two blocks on the computer screen. If the two green bars are aligned then the measurement is within specification. Click **Accept** to continue.



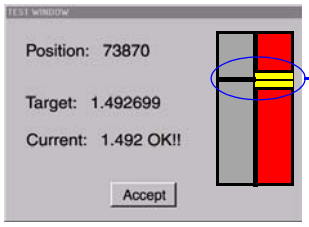
13 If the green bar on the left block is below or above the green bar on the right block, then the measurement is out of specification and the Pen to Rib Space needs to be adjusted.



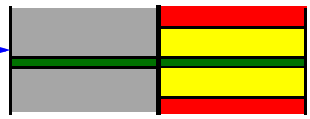


14 Adjust the Pen to Rib Space as follows:

a Using a very long torx screwdriver (T-8) either tighten or loosen the Pivot Assembly screw. Tightening or loosening the screw will adjust the Pen to Rib Space until the green bar on the left block is aligned with the green bar on the right block. If the current position is LOW, then tighten the screw slightly, if the current position is HIGH, then loosen the screw slightly.

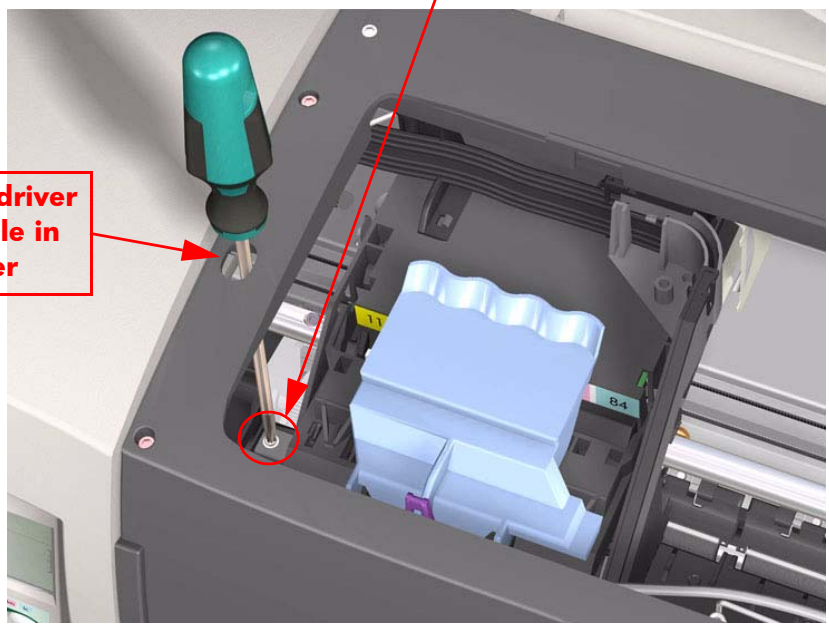


LOW = Tighten Screw
HIGH = Loosen Screw



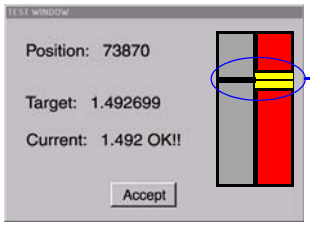
Tighten or Loosen the screw using a Torx screwdriver until the two green bars are aligned

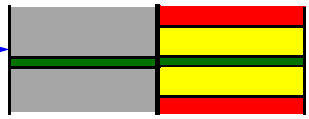
Pass the Screwdriver through this hole in the Center Cover



b Once the two green bars are aligned, click **Accept** and the PRS Pen will move to the right hand side of the printer.

c Using a very long torx screwdriver (T-8) either tighten or loosen the Pivot Assembly screw. Tightening or loosening the screw will adjust the Pen to Rib Space until the green bar on the left block is aligned with the green bar on the right block. If the current position is LOW, then tighten the screw slightly, if the current position is HIGH, then loosen the screw slightly.

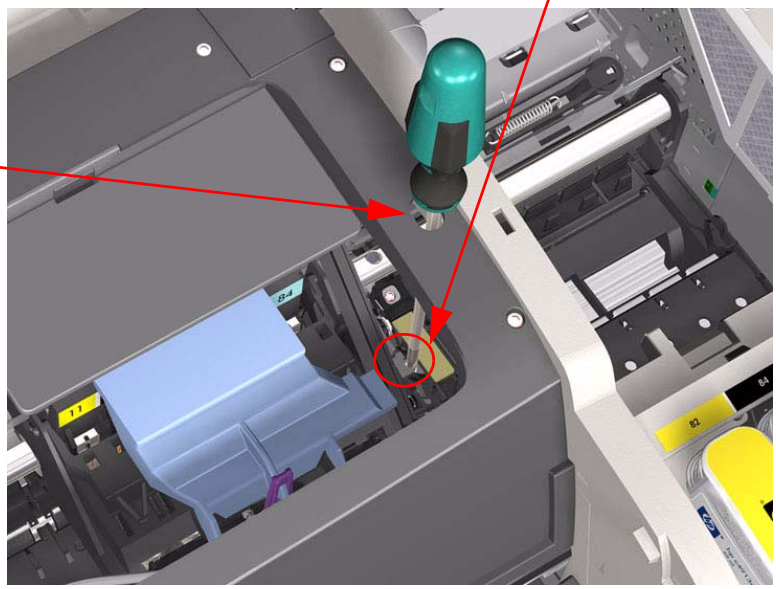




LOW = Tighten Screw
HIGH = Loosen Screw

Tighten or Loosen the screw using a Torx screwdriver until the two green bars are aligned

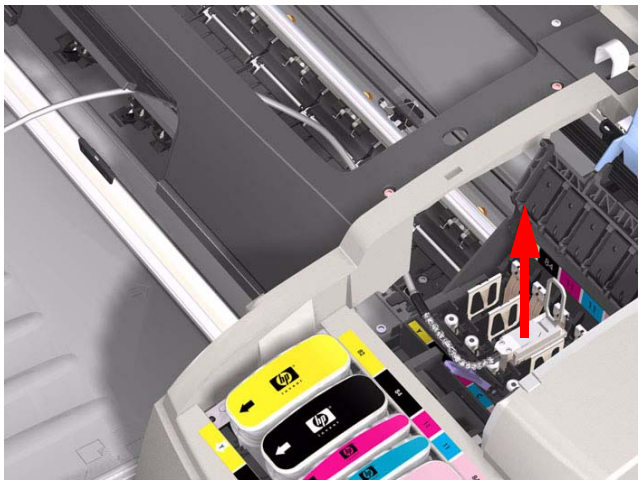
Pass the Screwdriver through this hole in the Center Cover



d Once the two green bars are aligned, click **Accept**.

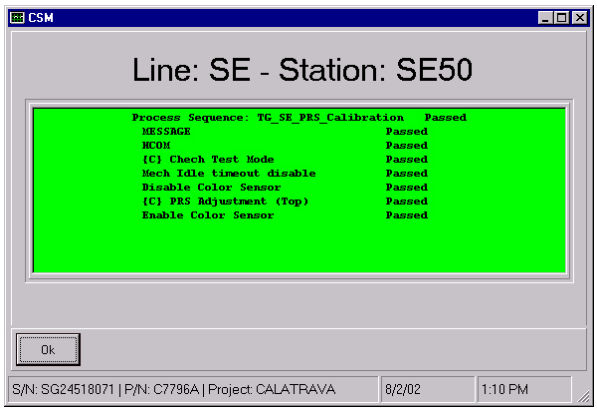
15 The PRS Pen measures the Pen to Rib Space along the Print Platen again. Once it has taken all the measurements, the PRS Pen moves to the Service Station and the following message is displayed on the computer screen.

16 Open the Carriage Cover and remove the PRS Pen from the Magenta Stall.

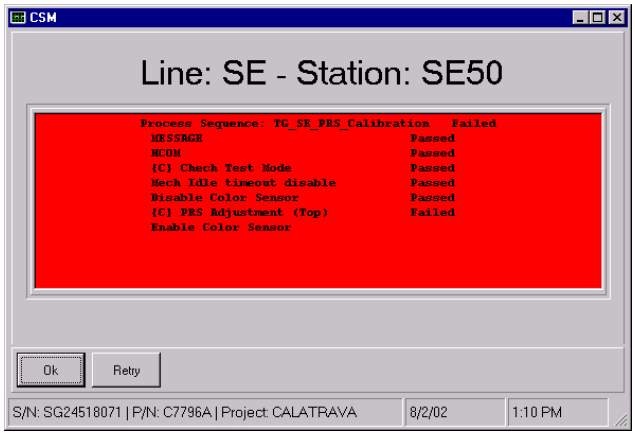


17 Close the Carriage Cover and then click **OK**.

18 If the calibration was performed correctly and the Pen to Rib Space is within specification, then the following message is displayed on the computer screen.



19 If the calibration was performed incorrectly or the Pen to Rib Space is out of specification, then the following message is displayed on the computer screen. Click on **Retry** if you want to retry the Calibration.



20 If during the PRS Calibration an error message appears, refer to the following table in order to troubleshoot it:

TG_SE_PRS_Calibration			
Test name	**Error Message**		**Troubleshooting**
HCOM	NONE	CIMation failed to communicate with the Printer.	Repeat the test after checking that ALL the cables are correctly connected.
Check User Mode	Unit booted in 0 mode while expected 1	Printer initialized in a different mode than the expected.	Initialize the Printer in the correct mode (MFG) and click on "Retry".
{C} PRS Adjustment (Top)	1. Target PRS values for adjustment are too small. **Potential Carriage Crash**.	Pivot might be assembled too high.	Check that the Pivot position is away from the PRS pen crash.
	2. Potential Carriage bushing missing.	Based on the calculation the possibility of the Carriage Bushing missing.	Check that the carriage busing is present and then click "OK" to proceed with adjustment. If bushing is NOT present, click "NO" to the failed test
	3. Error adjusting PRS at position.	3. Printer Out of Spec.	Repeat the entire test one more time.

PRS Adjustment Tool Maintenance

The maintenance schedule for the PRS Tool should include the actions listed below. As experience with the PRS Tool increases, the maintenance schedule should be adjusted according to the actual wear of the PRS Tool.

Daily Maintenance

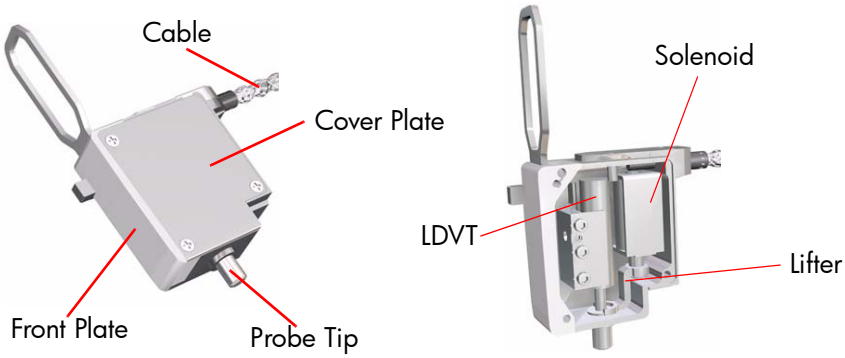
- Inspect the Calibration Stand for dirt or debris, and clean as necessary.
- Ensure that the probe tip moves freely when using the solenoid button.

Weekly Maintenance

- Inspect tools for worn, damaged or missing parts, and replace as necessary.
- Inspect the latches and springs on the Calibration Stand.
- Inspect the PRS Pen cable and verify that there are no exposed conductors on the cable assembly.

Automatic PRS Adjustment Troubleshooting

The following table contains a list of common problems you may encounter while using the PRS Adjustment Tool and the possible causes and solutions:



Problem	Possible Cause	Solution
Measurement numbers are out of specification.	PRS Pen cable is in a position that causes the Carriage to lift or is affecting the position of the PRS Pen.	Check that the PRS Pen cable is NOT pulling the PRS Pen out of position.
	Probe tip is not on a rib.	Position the Carriage so that the probe tip is sitting flat on a rib.
Probe tip will not raise.	Probe tip is stuck against a pivot rib.	Check that the probe tip is not stuck against the edge of a rib. Move the Carriage slightly in order to free the probe tip.
	The Solenoid is not plugged in.	Make sure that the solenoid is energized when the button is pressed.
	The lifter is binding inside the PRS Tool.	Make sure that there is adequate clearance around the wire lifter and that it is not hanging on any part of the PRS Pen.
Probe Tip will not lower.	The lifter might be binding inside the PRS Tool preventing the probe tip from full extension.	Make sure that there is adequate clearance around the wire lifter and that it is not hanging on any part of the PRS Pen.
Measurement values are too high when checking in a Calibration Stand.	The Calibration Stand may have debris or it may be preventing the PRS Pen from sitting correctly in it's datum.	Check that the PRS Pen cable is NOT pulling the Carriage out of position. There should be no gap between the Carriage and the rail.

Problem	Possible Cause	Solution
Communication error with the Computer.	The MP1000 Display rebooted.	Make sure that the MP1000 Display is ON and is in run mode, then restart the communications link.
	The MP1000 Display was calibrated while still connected to the computer.	Normally, if the MP1000 Display controls are used while attached to the computer, it will cause a break in the communication link. Try to re-establish the communication link after the MP1000 Display is setup and in run mode.
Numbers from the Calibration Stand are out of specification.	Probe Tip was not released onto the reference datum using the Solenoid switch.	Always use the Solenoid switch to raise and lower the Probe Tip. This will ensure that the Probe Tip drops straight down and will get stuck against the reference datum.
	Datum surfaces on the Calibration Stand are worn.	Check the Calibration using the Calibration-Master Stand. If the values are within specifications, then the Calibration Stand should be sent to the Metrology Lab to verify that the datum surfaces are correct.
	The Calibration Stand or the PRS Pen may have debris which is preventing the PRS Pen from either sitting correctly in it's datum or it might be affecting the reference surface.	Make sure that ALL datums on both the PRS Pen and the Calibration Stand are clean and free from debris. Also check that there is nothing else preventing the PRS Pen from sitting correctly on the Pen Datums in the Calibration Stand.
	The PRS Tools need to be recalibrated.	Check the Calibration using the Calibration-Master Stand. If the values NOT within the specifications, recalibrate the PRS Tool using the Calibration-Master Stand.
PRS Pen numbers are low.	Wires inside the PRS Pen body are preventing the probe tip to move.	Remove the cover plate of the PRS Pen and make sure that the wires are not preventing the probe tip to move.
	Probe tip is not locked tight onto the core.	Remove the cover plate of the PRS, remove the LVDT and inspect the probe tip and core. Use Locktite™ (preferably #242 which is removable) to secure the probe tip onto the core. This will help to ensure that the probe tip does not back itself out over a period of time.

Manual PRS Adjustment

The purpose of the Manual PRS Adjustment is to adjust the distance between the Carriage Assembly and the Pivot Assembly. This adjustment is necessary in order to prevent problems like Printhead crashes.

Perform the Manual PRS Adjustment as follows:

The Manual PRS Adjustment should be carried out using the Carriage Height Tool.

Carriage Height Tool

During the Manual PRS Adjustment procedure the Carriage Assembly has to be moved along the length of the printer. Make sure that the Carriage Assembly is only ever moved by pulling the belt and never by direct contact with the Carriage itself.

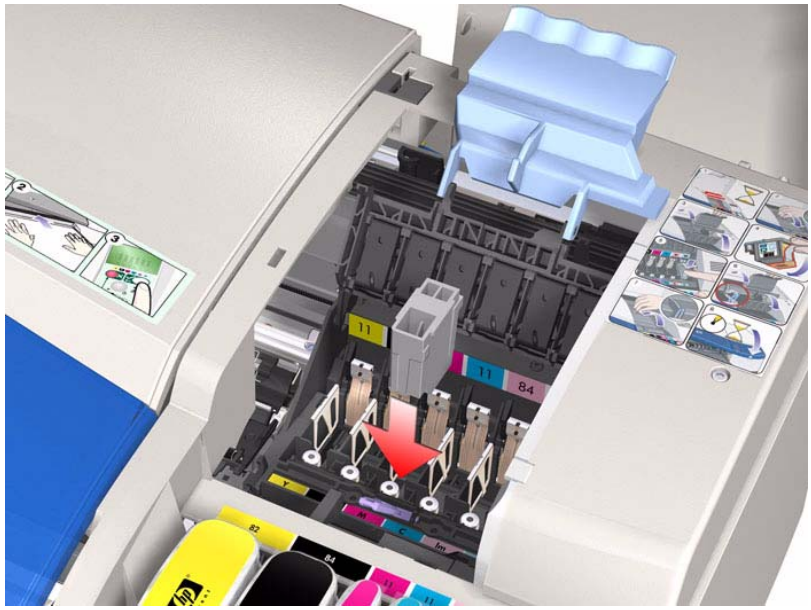
Correct: move using the belt.

Incorrect: never move using Carriage Assembly.

1 Turn On the Printer and open the Printhead Access Door.

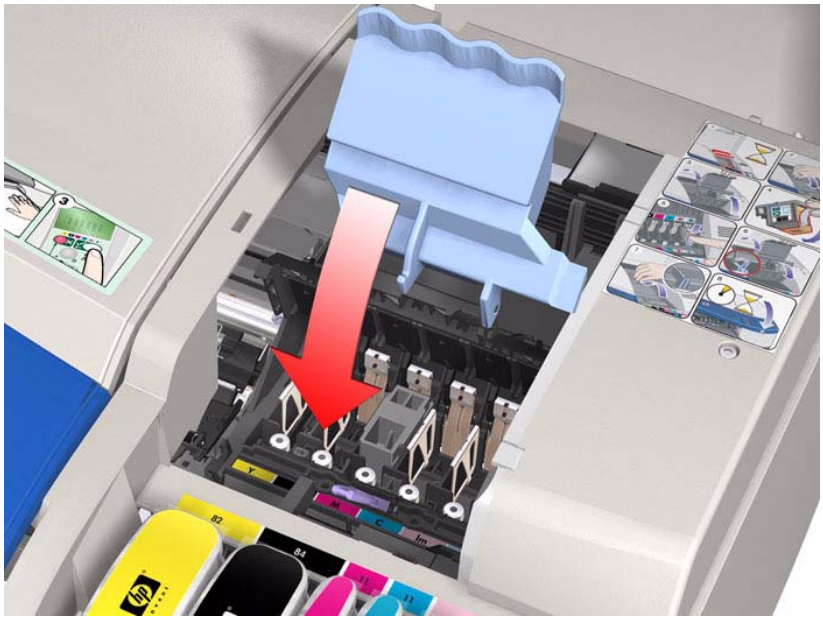
Make sure that you turn ON the Printer, otherwise you will NOT be able to open the Carriage Cover.

2 Open the Carriage Cover and install the Carriage Height Tool into the Magenta Stall - Make sure ALL the other printheads are already removed from the Carriage Assembly.

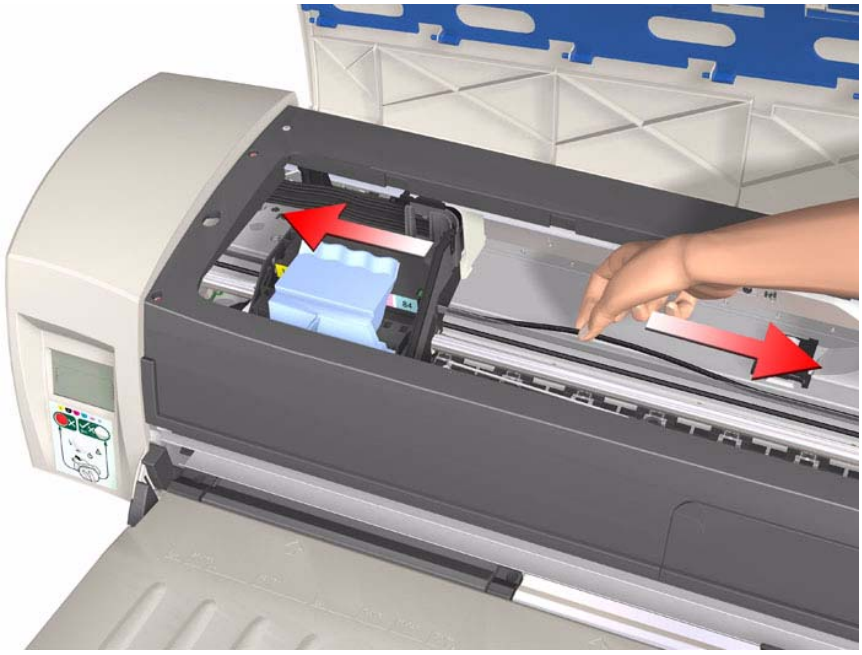


3 Close the Carriage Cover and switch OFF the Printer.

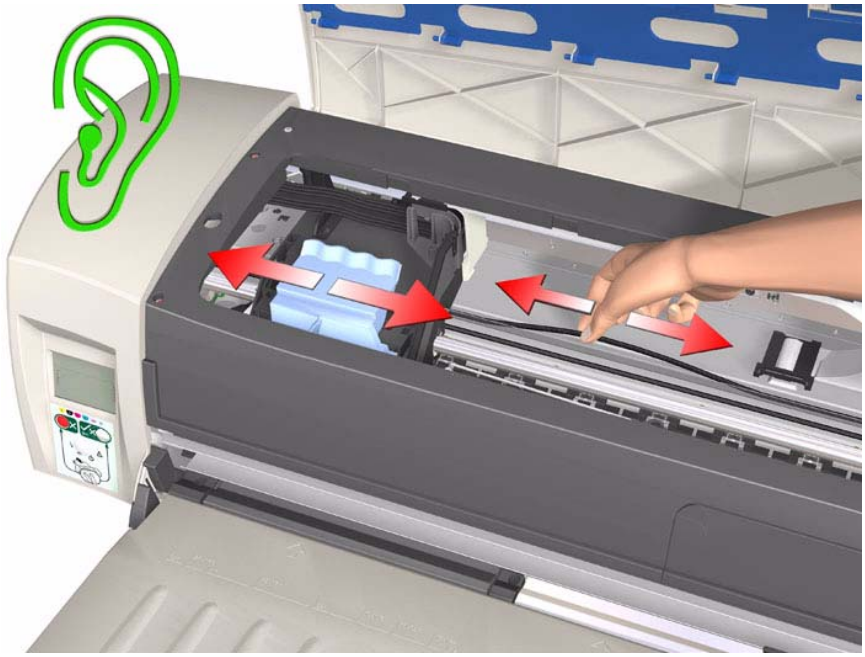
Make sure that you turn OFF the Printer, otherwise you will NOT be able to manually move the Carriage Assembly.



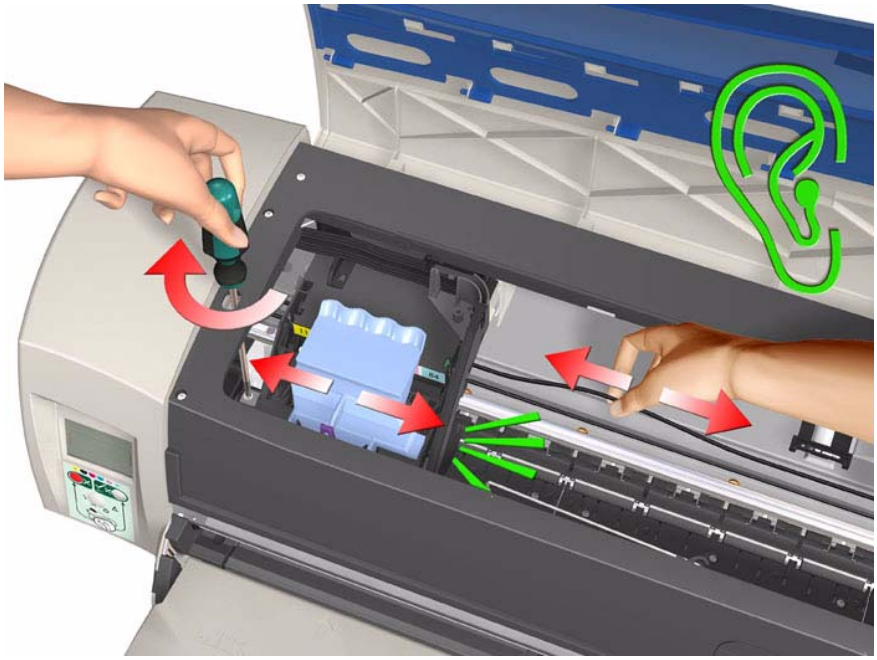
4 Move the Carriage Assembly to the left hand side of the Printer (to the position shown).

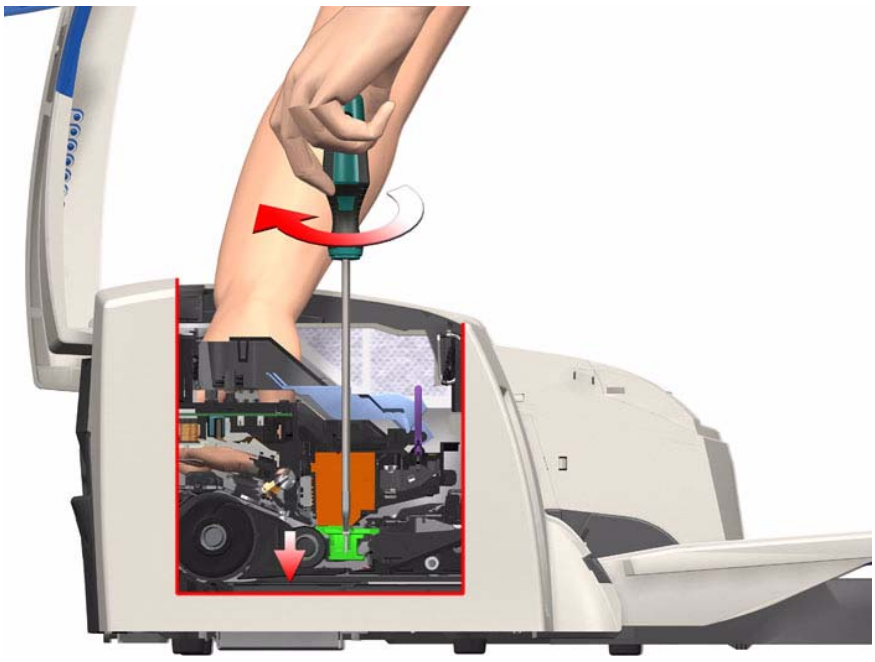


5 Using the belt, move the Carriage Assembly backwards and forwards over the Pivot Assembly (but staying on the left hand side of the printer), carefully listening for a scraping sound.



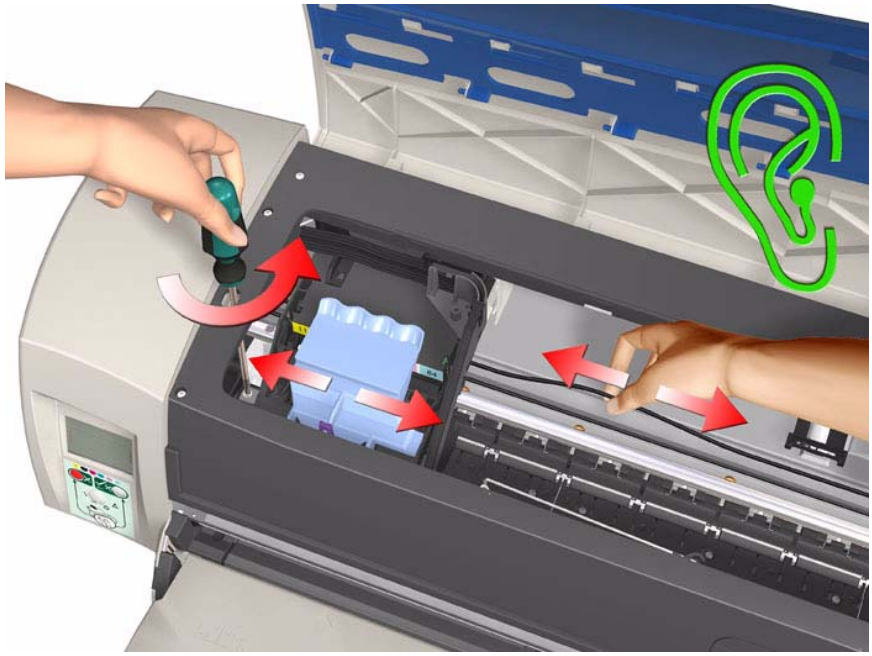
6 If you hear a scraping sound, that means that the Pivot Assembly is too high and needs to be lowered slightly. Lower the Pivot Assembly slightly by turning the T-8 screw 1/8th of a turn clockwise and then check for a scraping sound again as shown previously in **step 5**.

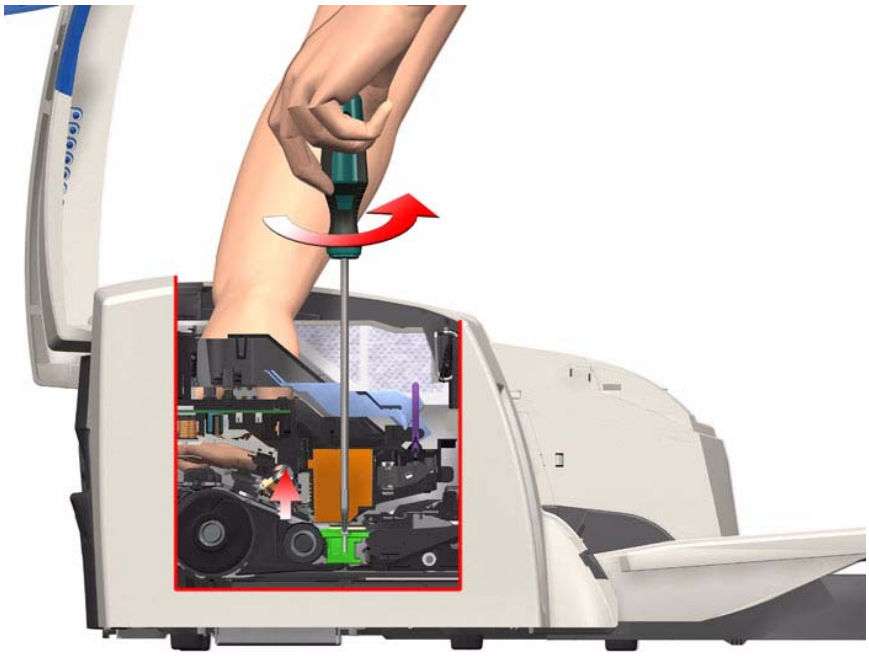




Cross-Section - Lowering the Pivot Assembly

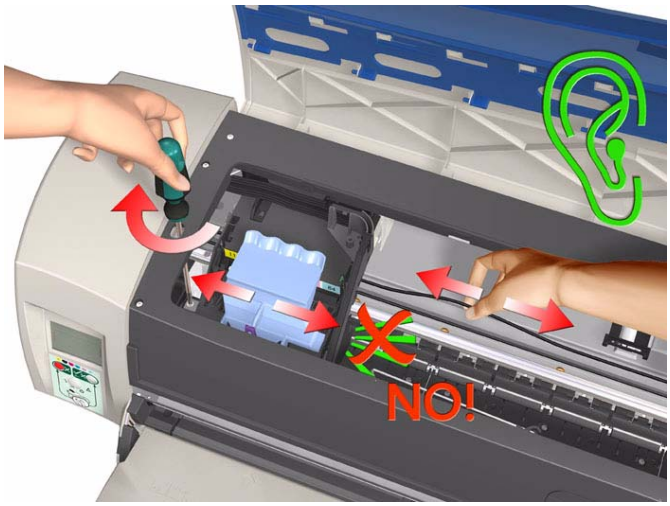
7 If you don't hear a scraping sound, that means that the Pivot Assembly is too low and needs to be raised slightly. Raise the Pivot Assembly slightly by turning the T-8 screw1/8th of a turn anti-clockwise and then check for a scraping sound again as shown previously in **step 5**.





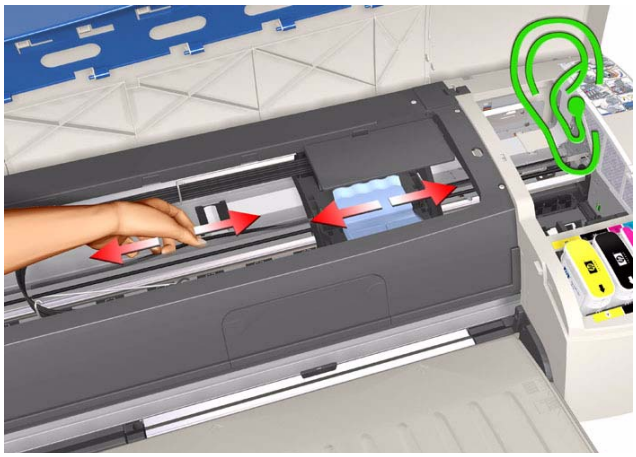
Cross-Section - Raising the Pivot Assembly

8 Repeat steps 5 to 7 until you reach a point where you will hear the scraping sound and by turning the screw just 1/8th of a turn clockwise, the scraping sound will disappear.

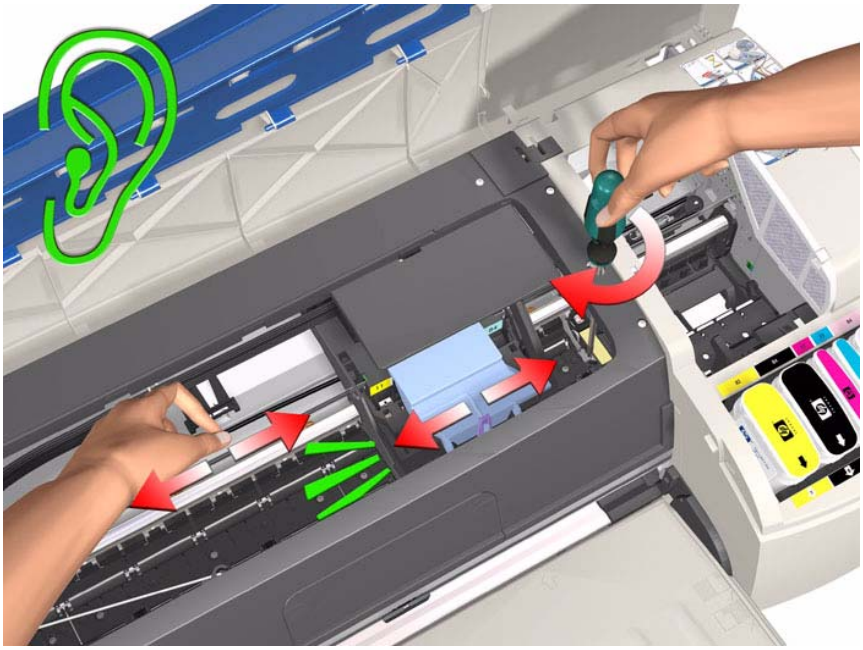


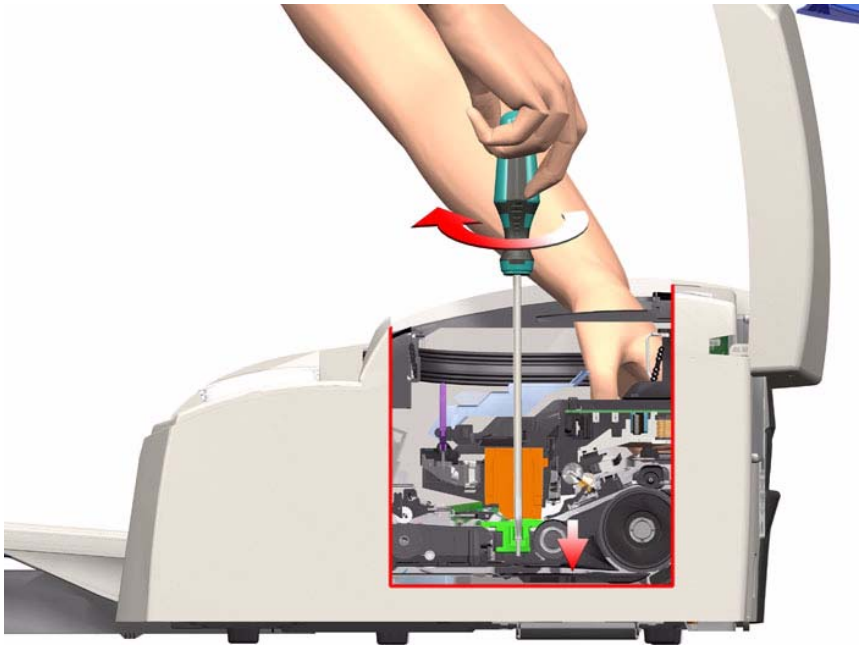
9 Move the Carriage Assembly to the right hand side of the Printer (to the position shown).

10 Using the belt, move the Carriage Assembly backwards and forwards over the Pivot Assembly (but staying on the right hand side of the printer), carefully listening for a scraping sound.



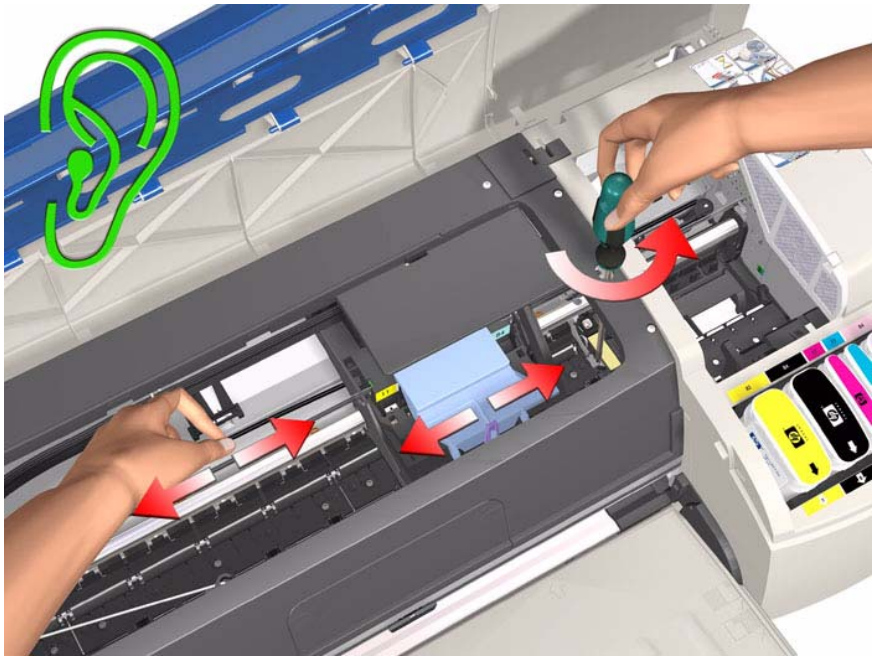
11 If you hear a scraping sound, that means that the Pivot Assembly is too high and needs to be lowered slightly. Lower the Pivot Assembly slightly by turning the T-8 screw 1/8th of a turn clockwise and then check for a scraping sound again as shown previously in **step 10**.

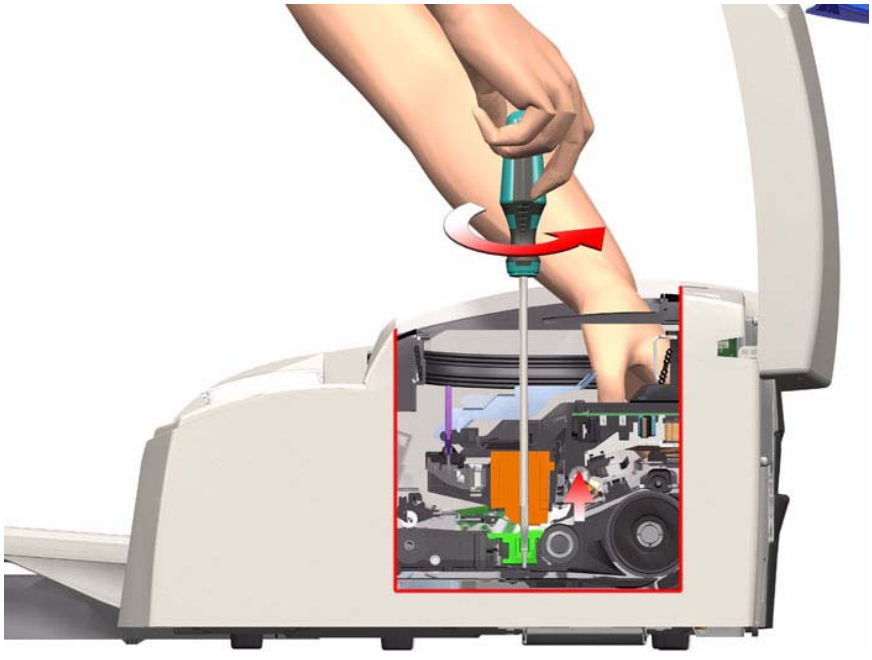




Cross-Section - Lowering the Pivot Assembly

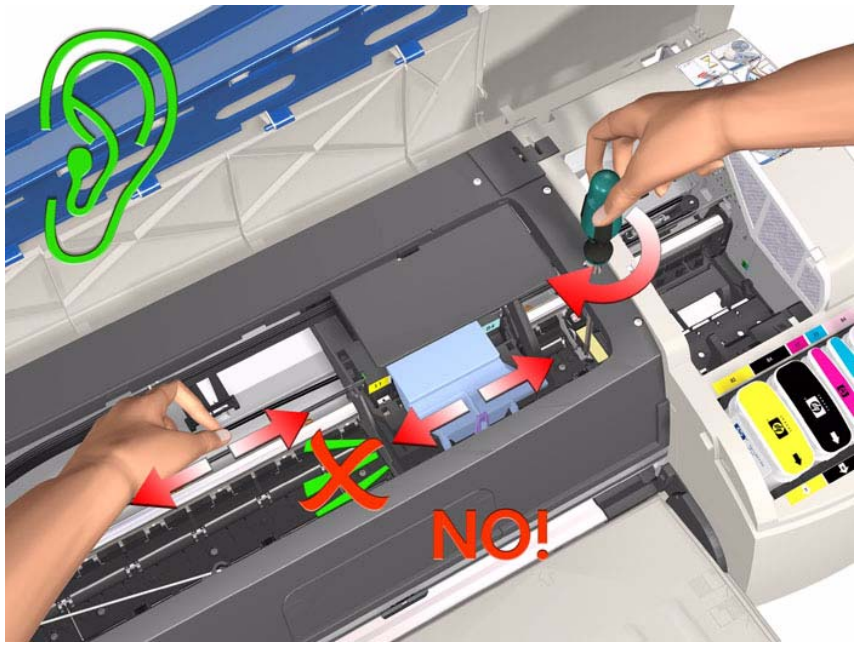
12 If you don't hear a scraping sound, that means that the Pivot Assembly is too low and needs to be raised slightly. Raise the Pivot Assembly slightly by turning the T-8 screw1/8th of a turn anti-clockwise and then check for a scraping sound again as shown previously in **step 10**.





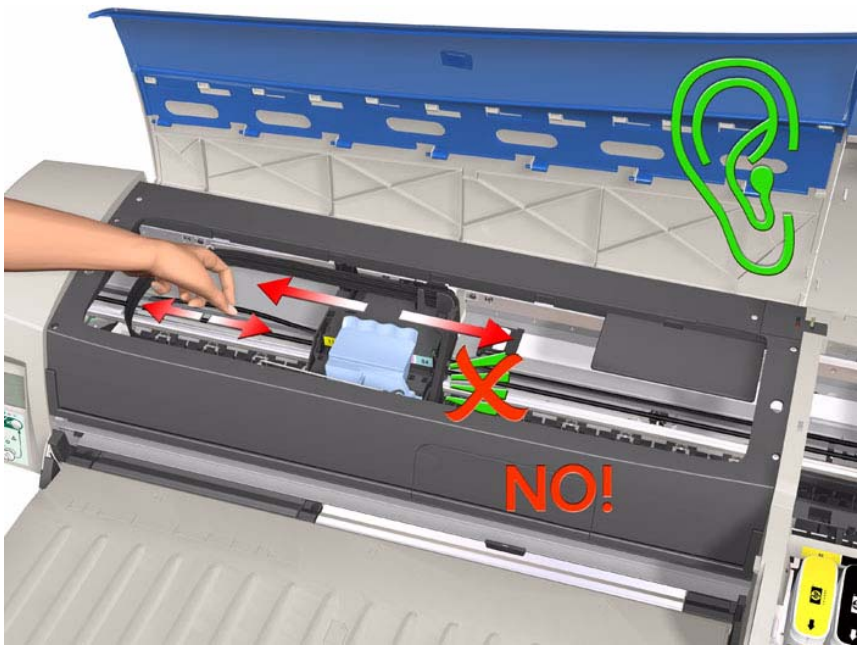
Cross-Section - Raising the Pivot Assembly

13 Repeat steps 10 to 12 until you reach a point where you will hear the scraping sound and by turning the screw just 1/8th of a turn clockwise, the scraping sound will disappear.

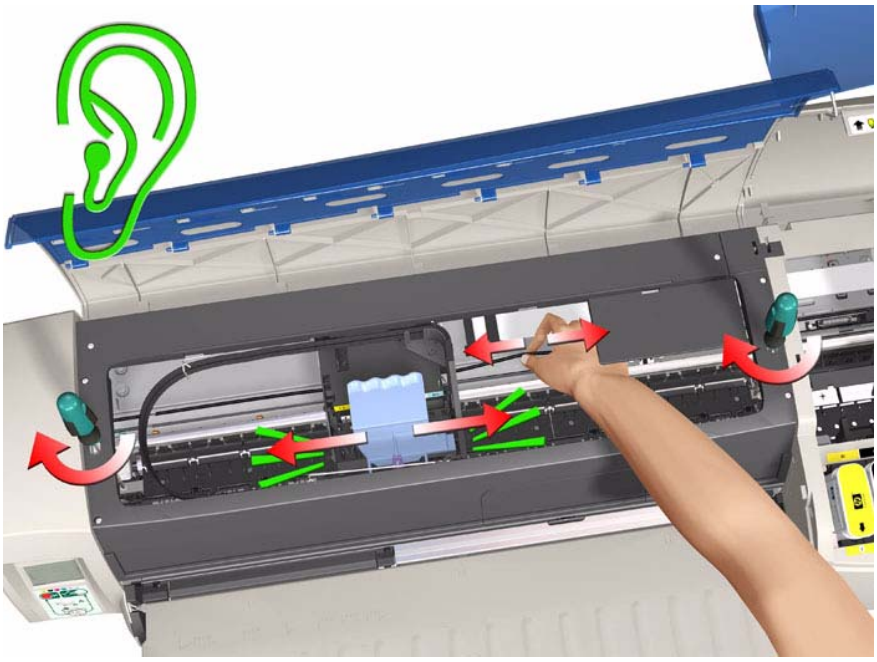


14 Move the Carriage Assembly along the length of the Printer, listening carefully for the scraping sound.

15 If you don't hear the scraping sound, then the PRS Adjustment is correct, go to **step 17**.



16 If you hear the scraping sound, then you will need to lower the Pivot Assembly slightly by turning the T-8 screw 1/8th of a turn clockwise on both the left and right hand side of the Pivot Assembly. Check for a scraping sound again as shown previously in **step 14**.



17 Remove the Carriage Height Tool.