

**service  
manual**

**hp** designjet  
copier cc800ps



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Serious shock hazard leading to death or injury may result if you do not take the following precautions:

- Ensure that the ac power outlet (mains) has a protective earth (ground) terminal.
- Disconnect the product from the power source prior to performing any maintenance.
- Prevent water or any other liquids from running onto electrical components or circuits, or through openings in the enclosure.

### Electrostatic Discharge

Refer to the beginning of Chapter 4 of this manual, for precautions you should take to prevent damage to the Printer circuits from electrostatic discharge.

### Safety Symbols

General definitions of safety symbols are given immediately after the table of contents.

## WARNING

The Warning symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a Warning symbol until the indicated conditions are fully understood and met.

## CAUTION

The Caution symbol calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a Caution symbol until the indicated conditions are fully understood and met.

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# service manual

hp designjet  
copier cc800ps

## Using this Manual

### Purpose

This Service Manual contains information necessary to troubleshoot and service:

- **hp** designjet copier cc800ps - Model Q1262A

For information about using this product, refer to the corresponding User and Quick Reference Guides.

This Service Manual is about the Scanner and the integration with the printer as a copier. In order to troubleshoot the printer, refer to the corresponding Service Manual for the printer.

### Readership

The procedures described in this Service Manual are to be performed by HP Certified service personnel only.

### Part Numbers

Part Numbers for service parts are located in Chapter 3.

### Conventions

A small arrow  $\Rightarrow$  is used to indicate other parts of the Service Manual where you can find information related to the topic you are consulting.

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# Troubleshooting

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## Guide to Troubleshooting the hp designjet copier

### Is the Problem with the Printer or Scanner

If you encounter the following symptoms, the problem could be related to the scanner:

- System Error on the Touch Screen.
- LED's flashing on the Scanner Operator Panel.
- WIDEsystem error message.
- 1 vertical white, black or color line.

If you encounter the following symptoms, then perform an Image Preview and send a Test Print:

- Image Quality Problems.
- No Output.
- Output is not as expected.

If the Image preview fails, this points to a problem with the Scanner. If the Test Print fails, this points to a problem with the Printer.

### Image Quality Problems

If you have Image Quality problems in any prints, try the following:

- 1 Print out a file already stored or print out a demo file.
- 2 Once the print is finished, insert it into the Scanner.
- 3 Once scanned, print out the scanned image.
  - If the original print is the same as the copied print, then the problem is associated with the Printer.
  - If the original print is NOT the same as the copied print, then the problem is associated with the Scanner.

### Output Problems

If the output is not as you expected it to be, try the following:

- Check all the settings in the Software: Color Settings and Margins.
- Check media settings: Media profile (in software) and media loaded in the printer (front panel selection) should be the same.
- Perform Color Calibration (both Scanner and printer).

If there is no output at all, then try the following:

- Check the USB connection to the Printer.
- Check the selected settings: List, Collate, Scan to file...



## Troubleshooting System Error Codes

Chapter 2 - *System Error Codes* contains a list of system error codes and their respective descriptions and recommended corrective actions. Only try one recommended action at a time and check if the error code has disappeared.

## Using the SCANtest 6 Diagnostic Software

The purpose of the SCANtest 6 diagnostic software is to support the troubleshooting and adjustment of the Scanner.

When the SCANtest 6 diagnostic software has been started, the Scanner is switched ON in Test Mode, and the Diagnostic LED on the Operator Panel is turned ON.

Scanner Test Program Menu

- Test 1: Scanner Information
- Test 2: LED Test
- Test 3: Key Test
- Test 4: Original-Sensor Test
- Test 5: Lamp Test
- Test 6: Motor Test
- Test 7: Complete Hardware Test
- Test 9: Camera Adjustment
- Test 11: Stitching and Vertical Alignment
- Test 12: Adjust Y-Axis Scaling
- Test 13: Switch Scanner to Test Mode
- Test 20: Noise Test
- Test 21: Scan Dump

If SCANtest 6 is started when the scanner is in Error Mode, the Error Code Number and a short description of the error will be displayed on the screen.

### Test 1: Scanner Information

This test displays general information regarding the scanner. When executed, the test displays the following:

- Scanner Model:
- Firmware Release:
- Firmware Release Date:
- Firmware Build:
- FPGA Revision:
- FPGA Release Date:
- Boot Code Revision:
- Boot Code Release Date:
- Scanner ID Switch:
- SCSI ID:

**Test 2: LED Test**

This test checks the functionality of the LED Indicators on the Operator Panel. When the test is executed, all the LEDs are sequentially switched ON/OFF until Test 2 is terminated. If any of the LEDs fail, you will NOT get an error message, instead the LED will NOT switch ON or OFF. If the LED test fails, replace the Right Cover (which contains the Operator Panel).

**Test 3: Key Test**

This test checks the functionality of the Keys on the Operator Panel. When the test is executed, each key on the Operator Panel will turn an LED ON when pressed.

Key	LED
Forward and Reverse	Ready (Green)
Power	Wait (Yellow)

The only way to know if the test fails is by inspection, there is no error message that is displayed.

If the Key test fails, replace the Right Cover (which contains the Operator Panel).

**Test 4: Original-Sensor Test**

This test checks the functionality of the Media Sensors and the Media Thickness Detector.

When the test is executed, the following LEDs turn ON when one of the Media Sensors is activated, or when one or both Adjustment Sliders for Media Thickness are pulled out from Normal position:

Actuator	LED
Media Entry Sensor	Ready (Green)
Media Exit Sensor	Ready (Green)
Adjustment Slider for Media Thickness	Wait (Yellow)

To test the Adjustment Slider for Media Thickness (located on the Guide Plate), press the slider to one side and the Wait LED switches On.

To test the Media Sensors, load a Sheet of media (A4) and the Ready LED switches ON and when you remove it the Ready LED switches OFF.

If the test fails (if any of the LEDs fail to switch ON), then the problem will be related to corresponding Sensor.

### Test 5: Lamp Test

This test checks the functionality of the Lamp and associated electronics.

When the test is executed, a message on the screen will indicate whether the **Lamp** is turned ON or OFF (Lamp power is turned ON/OFF) and whether the **Light** is ON/OFF (Light is detected or not). The Lamp is delayed for approximately 2 seconds when switched ON.

### Test 6: Motor Test

This test checks the functionality of the Stepper Motor and any associated electronics.

When the test is executed, a menu appears that allows you to select the motor speed and the motor direction.

If the Stepper Motor fails to run when the test is executed, then the Stepper Motor should be replaced.

### Test 7: Complete Hardware Test

This test checks the various functions of the Driver and Camera Boards.

### Test 9: Camera Adjustment

This test contains a Software Oscilloscope that allows you to check and adjust the CCD-Cameras. The following functions can be selected from the Test Program Menu.

- Uncorrected or Corrected Light Profile.
- Red, Green, or Blue Color Channel.
- Special Detail Views for Light Profile, Scan Width, and Vertical Positioning.
- Forward / Reverse controls for the Camera Motor.
- Save screen images.
- Print screen images.

The content of the Detail Views is marked on the upper overview window by red vertical lines. The continuous lines refer to the left Detail View and the dashed lines to the right Detail View.

To perform the Camera Adjustment, refer to Chapter 5 of this Service Manual.

### Test 11: Stitching and Vertical Alignment

This test is also included in the Scanner Maintenance Software.

This test performs Automatic Vertical Alignment and Horizontal Stitching.

Once the test has been started:

- Insert SM Calibration Sheet.
- Select Vertical Alignment to align the cameras.
- Select Horizontal Stitching to stitch the cameras.

The screen image can be saved or printed.

This test allows manual setting of the Stitch Values. The Stitch Values are stored in the Flash Memory on the Driver Board.

The Vertical Alignment may be adjusted manually by controlling the Camera Motor from the control field '<<dddd>>'. The two buttons marked '<<' respectively '>>' are used to start the motor and to determine the direction of rotation. When started, the motor runs for dddd milli-seconds as entered into the control field.

### Test 12: Adjustment of Y-Axis Scaling

This test allows you to adjust the Y-Axis Scaling.

The scaling (dpi) in the mechanical scan direction (Y-Axis) depends on the speed of the stepper motor relative to the scanline Exposure Time. The default motor speed can be changed  $\pm 1\%$ , either from Test 12 or by using the 'Scanner Setup/Correction factor ...' option of SW copying. The correction factor is stored in the Flash Memory on the Driver Board.

### Test 13: Switch Scanner to Test Mode

This test allows you to switch the scanner back to Test Mode. Useful if the scanner gets out of Test Mode, e.g. if it has to be turned OFF/ON during troubleshooting.

### Test 20: Noise Test

The purpose of this test is to detect and locate the possible cause (dust, dirt, scratches,..) of vertical lines running from top to bottom of the scanned image.

When the test is executed, it scans the White Calibration Area of the SM Calibration Sheet and displays, for each color channel, the graytone values of each separate pixel averaged over the scanned band.

The displayed image of the SM Calibration Sheet will be superimposed by low level noise caused by the CCD chip, and larger spikes most likely caused by dust, dirt, scratches, or similar defects on the Glass Plate. In rare cases, larger spikes may be caused by dust, dirt, or pixel faults on the CCD chip.

The positions of larger spikes are shown by the numbers (cm or inch units) opposite to the spikes. The numbers refer to the Sideload-ruler on the

scanner. Larger spikes going downwards are often caused by dust, dirt, scratches, or similar defects on the Glass Plate and may be removed by cleaning the Glass Plate. Downward spikes often show up as darker vertical lines in the scanned image.

Larger spikes going upwards are often caused by dust or dirt present on the Glass Plate during the last calibration with Scanner Maintenance. These defects are memorized by the Light Profiles stored in the Flash Memory and can only be removed by cleaning of the Glass Plate followed by running Scanner Maintenance again. Upward spikes show up as very bright vertical lines in the scanned image.

White vertical lines in the scanned image may be found even if Noise Test shows a perfectly 'clean' scanner. In this case, the cause may be white dust or particles on the backside of the Glass Plate having the same color as the white background. In this case, the Light Profiles of SCANTest 6, Test 9 may show upwards going spikes when a dark original is placed in the scan-area.

### **Test 21: SCANDump**

The purpose of this test is to create a file, SCANDump.con, which contains Light Profiles and other scanner data for diagnostics purposes.

When the test is executed, the file SCANDump.con will be placed in the directory c:\Temp\. The files contained in SCANDump.con may be unpacked by SCANview 6 by double clicking on SCANDump.con. The unpacked Light Profiles may be viewed by SCANview 6. If other files are included, use an appropriate reader or viewer.

The files are also placed as a button on the active desktop and is called SCANDump. The files can be stored on a disk and can be sent by e-mail.

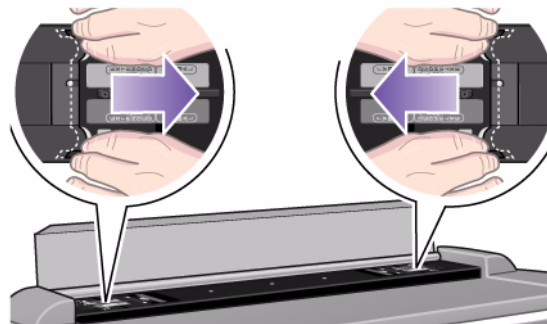
## Cleaning the Scanning Area

**When cleaning any part of the scanning area DO NOT use abrasives, acetone, benzene or fluids that contain these chemicals. Do not spray liquids directly onto the scanner glass plate or anywhere else in the scanner.**

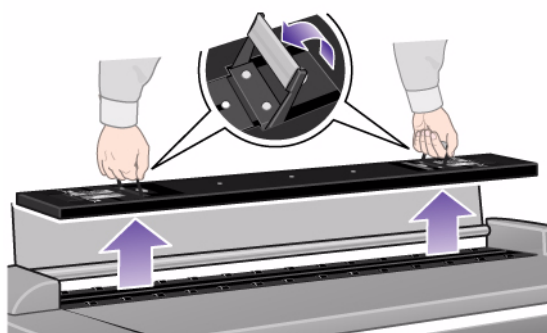
- 1 Turn the scanner power off.
- 2 Disconnect the scanner power cable.
- 3 Open the scanner cover by placing your fingers just inside the insertion slot and flip the cover upwards to expose the scan area.



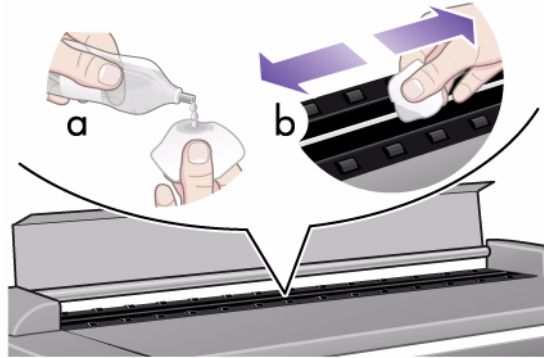
- 4 Remove the Guide Plate by pressing down on the Plate as you pull the left and right sliders towards the scanner's center until the metal safety buttons on each side of the scanner, pop up.



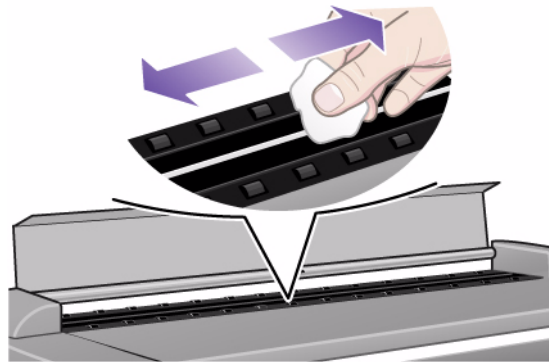
- 5 Use the two handles to lift out the Guide Plate as soon as you feel the sliders disengage.



- 6** Gently wipe the Glass Plate. Clean the glass with a lint-free cloth and a mild, streak-free, glass cleaner.



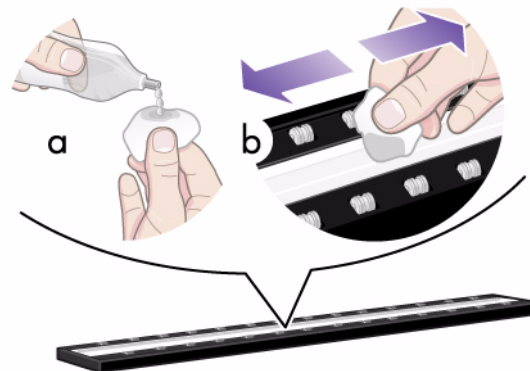
- 7** Dry the glass completely using a separate clean, dry lint-free cloth like the one provided with the maintenance kit.



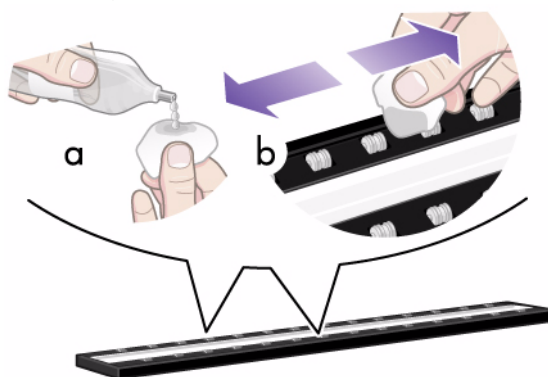
- 8** Turn the Guide Plate, that was removed in step 5, upside down.



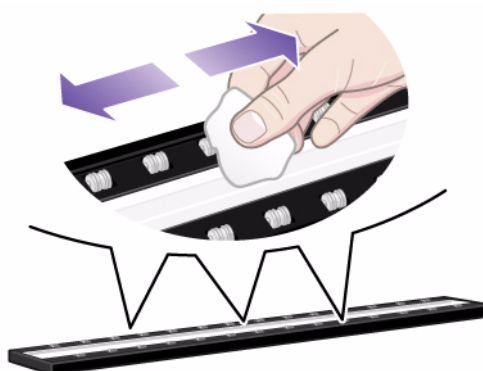
- 9** Clean the white background assembly. Wipe the white metal area with a lint-free cloth and a mild, streak-free, glass cleaner.



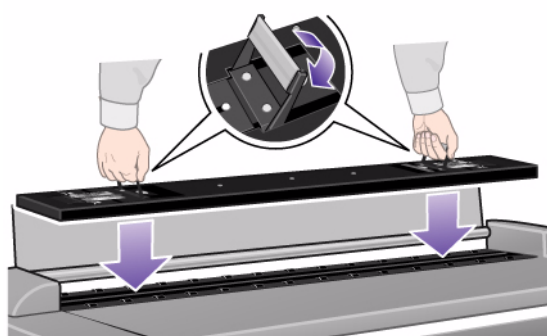
- 10** Clean the platen rollers. Wipe the rollers with a lint-free cloth and a mild, streak-free, glass cleaner.



- 11** Dry the platen and rollers completely using a separate clean, dry lint-free cloth.



- 12** Replace the Guide Plate.
- Lift the Guide Plate into its original position.
  - Press down on the metal safety buttons while pulling the slider towards the center of the scanner to let the two sliders move back and lock the Plate into place.



- 13** Close the scanner cover.



## Adjusting the Driver Board

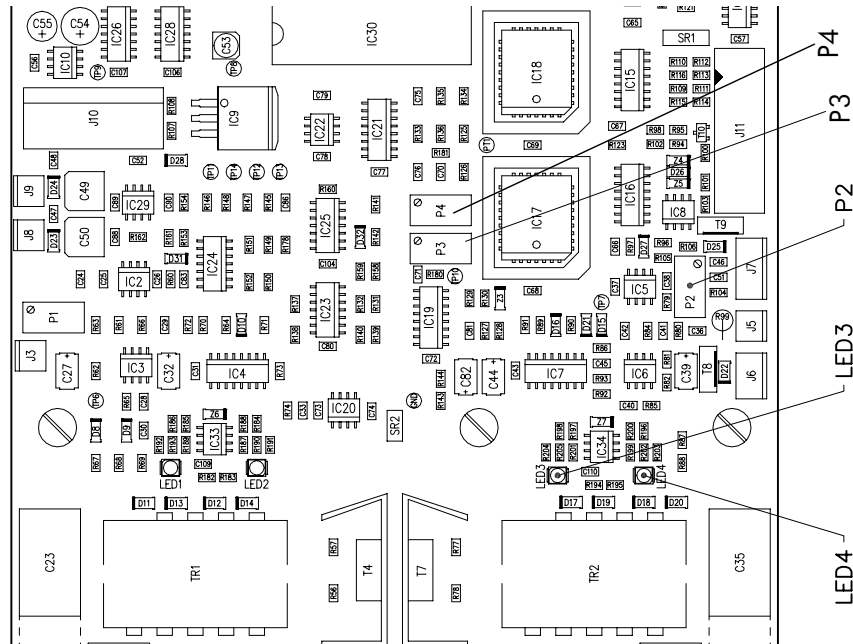
**After reinstalling the Driver Board or the Lamp Sensor, you must adjust the Driver Board as follows:**

1. Switch the scanner ON and leave for at least 30 minutes.
2. Turn P2 Counter-Clockwise until LED 3 switches OFF (LED 4 should be ON).
3. Slowly turn P2 Clockwise until LED 3 switches ON.

The correct voltages are:

- P3 until TP12 = 10mV±10mV
- P4 until TP13 = 10mV±10mV

**If P2 is turned further Clockwise, LED 4 will eventually turn OFF. If both LED's are ON, the lamp driver is within the acceptable working range. If either of the LED's is OFF, the lamp driver should be adjusted.**





# System Error Codes

# 2

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50-xxx (17 to 28, 51 to 81 and 90 to 99) 2-5

50-100 to 50-214 2-6

60-xxx (2 to 34, 82, 83) 2-6

## System Error Codes for the Copier Only

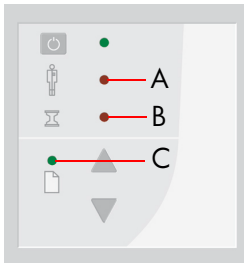
### Introduction

The following pages contain a list of system error codes and their respective descriptions and recommended corrective actions. Only try one recommended action at a time and check if the error code has disappeared.

If you have an error code which is not documented in this Service Manual or you have an error which you cannot resolve, then report the error to the HP Response Center or the nearest HP Support Office. When reporting the error, have the following information ready:

- Model and Serial Number of the copier.
- Which firmware revision the printer and the scanner is using.
- SW copying version.
- The complete error number.
- ScanDump of Light Profiles.

### Error Codes Displayed on the Operator Panel



A flashing Diagnostic Indicator indicates an error condition. The error can be identified by an error code number being displayed on the Touch Screen and/or by the following combination of flashing indicators on the Operator Panel:

Diagnostic LED (A)	Wait LED (B)	Ready LED (C)	Error Description
Flashing	Flashes Once	OFF	Correction of camera A failed
Flashing	Flashes Twice	OFF	Correction of camera B failed
Flashing	OFF	Flashes Once	Error on Camera Drive Board
Flashing	OFF	Flashes Twice	Error on Camera Board
Flashing	OFF	Flashes 3 times	Invalid Scanner ID setting
Flashing	OFF	Flashes 4 times	Error on Interface Board
Flashing	OFF	Flashes 5 times	Invalid Smart Card
Flashing	Flashing	Flashing	Scanner is in Boot Mode
Flashing	OFF	OFF	Refer to Error Codes
OFF	Flashing	Red	Guideplate assembly is not in the right position, to solve it press down the guideplate to move it to the original position (step 0: 2mm/0.8")

<b>System Error:</b>	08-147
<b>LED Code</b>	Not Applicable.
<b>Problem Description:</b>	Error related to the switch setting on the Operators Panel.
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Check the ID switch settings on the Operators Panel (00011000 (0=OFF, 1=ON)).</li><li>■ Check that the Operators Panel is correctly connected.</li><li>■ The Operators Panel is faulty, replace the Right Cover ⇒ Page 4-8.</li></ul>
<b>System Error:</b>	08-149
<b>LEDs Code</b>	Diagnostic = Flashing, Wait = OFF, Ready = Flashes 5 times.
<b>Problem Description:</b>	Error related to the Smart Card.
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Check that the Smart Card Reader is correctly connected to the Controller Board.</li><li>■ Check that the Smart Card is correctly inserted.</li><li>■ Replace the Smart Card.</li><li>■ Replace the Smart Card Reader ⇒ Page 4-29.</li></ul>
<b>System Error:</b>	08-208
<b>LED Code</b>	Not Applicable.
<b>Problem Description:</b>	Operators Panel check failed.
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Check that the Operators Panel is correctly connected.</li><li>■ The Operators Panel is faulty, replace the Right Cover ⇒ Page 4-8.</li></ul>

**System Error:** 30-140  
**LEDs Code** Diagnostic = Flashing, Wait = Flashes once, Ready = OFF.  
**Problem Description:** Correction of Camera A failed.  
**Corrective Action:** Try the following:

- Make sure that the Glass Plate and the White Background Plate are clean.
- Run SCANtest 6, test 9 and check the light profile. If the light profile is distorted, the cause maybe:
  - Incorrect vertical positioning of the camera.
  - Incorrect vertical alignment, run SCANtest 6, test 11 or Scanner Maintenance.
  - If the lamp does not turn ON, replace the lamp and if necessary, replace the Driver board ⇒ Page 4-24.
  - Corrupted Basic Calibration - Erase the parameter block and run the Scanner Maintenance.
  - Replace the Camera Board for Camera A ⇒ Page 4-16.

**System Error:** 30-141  
**LEDs Code** Diagnostic = Flashing, Wait = Flashes twice, Ready = OFF.  
**Problem Description:** Correction of Camera B failed.  
**Corrective Action:** Try the following:

- Make sure that the Glass Plate and the White Background Plate are clean.
- Run SCANtest 6, test 9 and check the light profile. If the light profile is distorted, the cause maybe:
  - Incorrect vertical positioning of the camera.
  - Incorrect vertical alignment, run SCANtest 6, test 11 or Scanner Maintenance.
  - If the lamp does not turn ON, replace the lamp and if necessary, replace the Driver board ⇒ Page 4-24.
  - Corrupted Basic Calibration - Erase the parameter block and run the Scanner Maintenance.
  - Replace the Camera Board for Camera B ⇒ Page 4-16.

<b>System Error:</b>	32-144
<b>LEDs Code</b>	Not Applicable.
<b>Problem Description:</b>	Stitching failed (it has not been possible for the processor to detect one and only one image of the stitching wire in the scanned input).
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Make sure that the Glass Plate and the White Background Plate are clean.</li><li>■ Run SCANTest 6, test 9 and check the Camera A and B images of the stitching wire.</li><li>■ The CCD-centering of one of the CCD-Cameras maybe so much out of adjustment that the image of the stitching wire falls outside the range where it can be detected by the copier - Run SCANTest 6, test 9 and check the CCD-centering.</li><li>■ Run the Scanner Maintenance.</li><li>■ Replace the Main Electronics Board ⇒ Page 4-27.</li></ul>
<b>System Error:</b>	40-xxx
<b>LEDs Code</b>	Diagnostic = Flashing, Wait = OFF, Ready = Flashes twice.
<b>Problem Description:</b>	Error on Camera Board.
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Run SCANTest 6, test 7 to verify the error.</li><li>■ Check that all the cable are connected correctly.</li><li>■ Run SCANTest 6, test 9 and check the light profiles.</li><li>■ Erase the Parameter Blocks.</li><li>■ Run the Scanner Maintenance.</li><li>■ Replace the Camera Board ⇒ Page 4-16.</li></ul>
<b>System Error:</b>	50-xxx (17 to 28, 51 to 81 and 90 to 99)
<b>LEDs Code</b>	Diagnostic = Flashing, Wait = OFF, Ready = Flashes once.
<b>Problem Description:</b>	Error on the Main Electronics Board.
<b>Corrective Action:</b>	Try the following: <ul style="list-style-type: none"><li>■ Check that all the cables are connected correctly to the Main Electronics Board.</li><li>■ Replace the Main Electronics Board ⇒ Page 4-27.</li><li>■ Run Scanner Maintenance.</li><li>■ Upgrade the Scanner Firmware.</li></ul>

**System Error:** 50-100 to 50-214

**LEDs Code** Not Applicable.

**Problem Description:** Firmware related error.

**Corrective Action:** Try the following:

- Upgrade the Firmware.
- Erase the Parameter blocks.
- Run Scanner Maintenance.

**System Error:** 60-xxx (2 to 34, 82, 83)

**LEDs Code** Diagnostic = Flashing, Wait = OFF, Ready = Flashes 4 times.

**Problem Description:** The touch screen does not detect the Scanner.

**Corrective Action:** Try the following:

- Reboot the Scanner.
- Open the WIDSystem (more information maybe available).
- Check that all cables are connected correctly.
- Replace the USB Cable.
- Replace the Interface Board ⇒ Page 4-31.



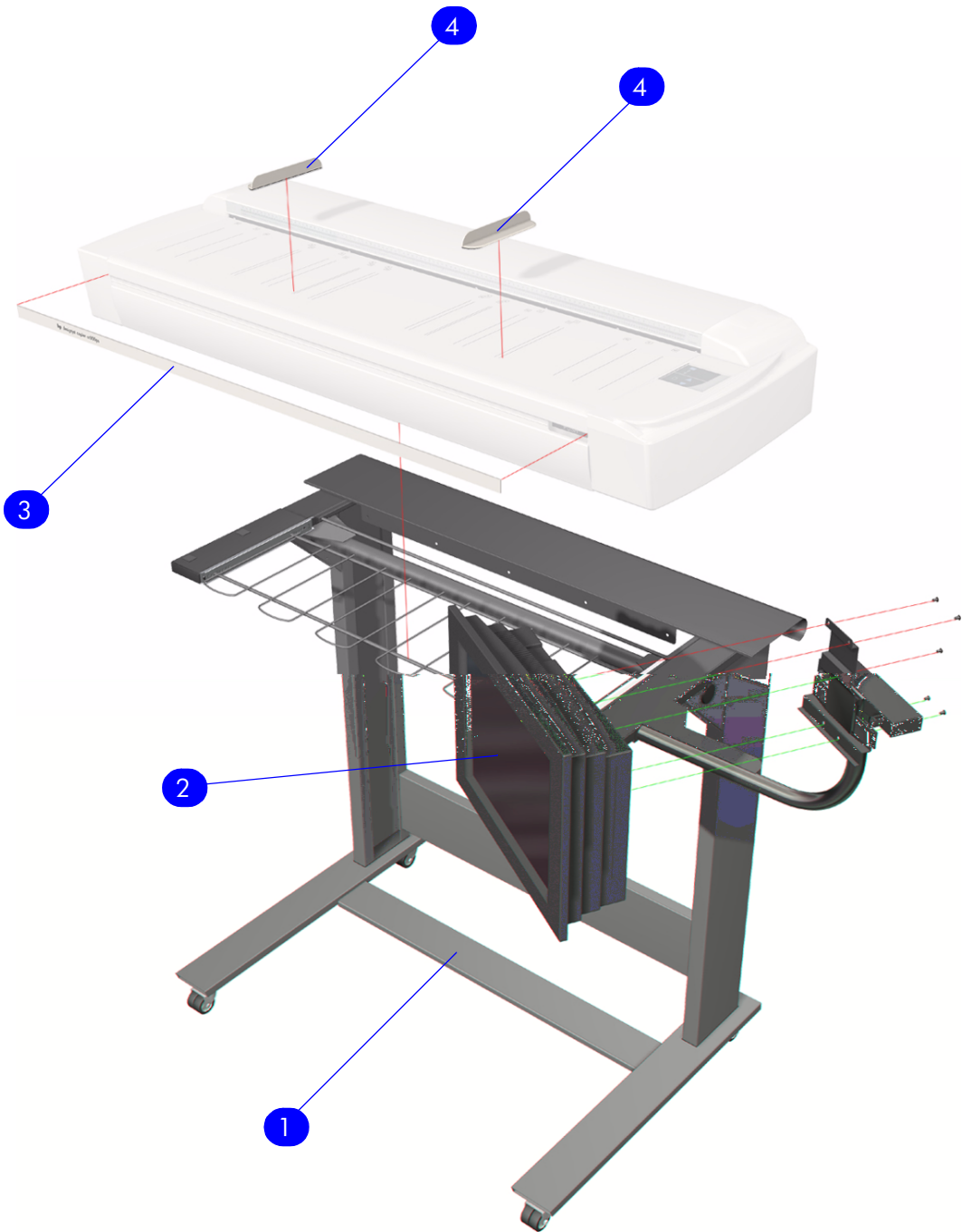
# Parts and Diagrams

# 3

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## Copier Stand, Touch Screen and Misc. Items

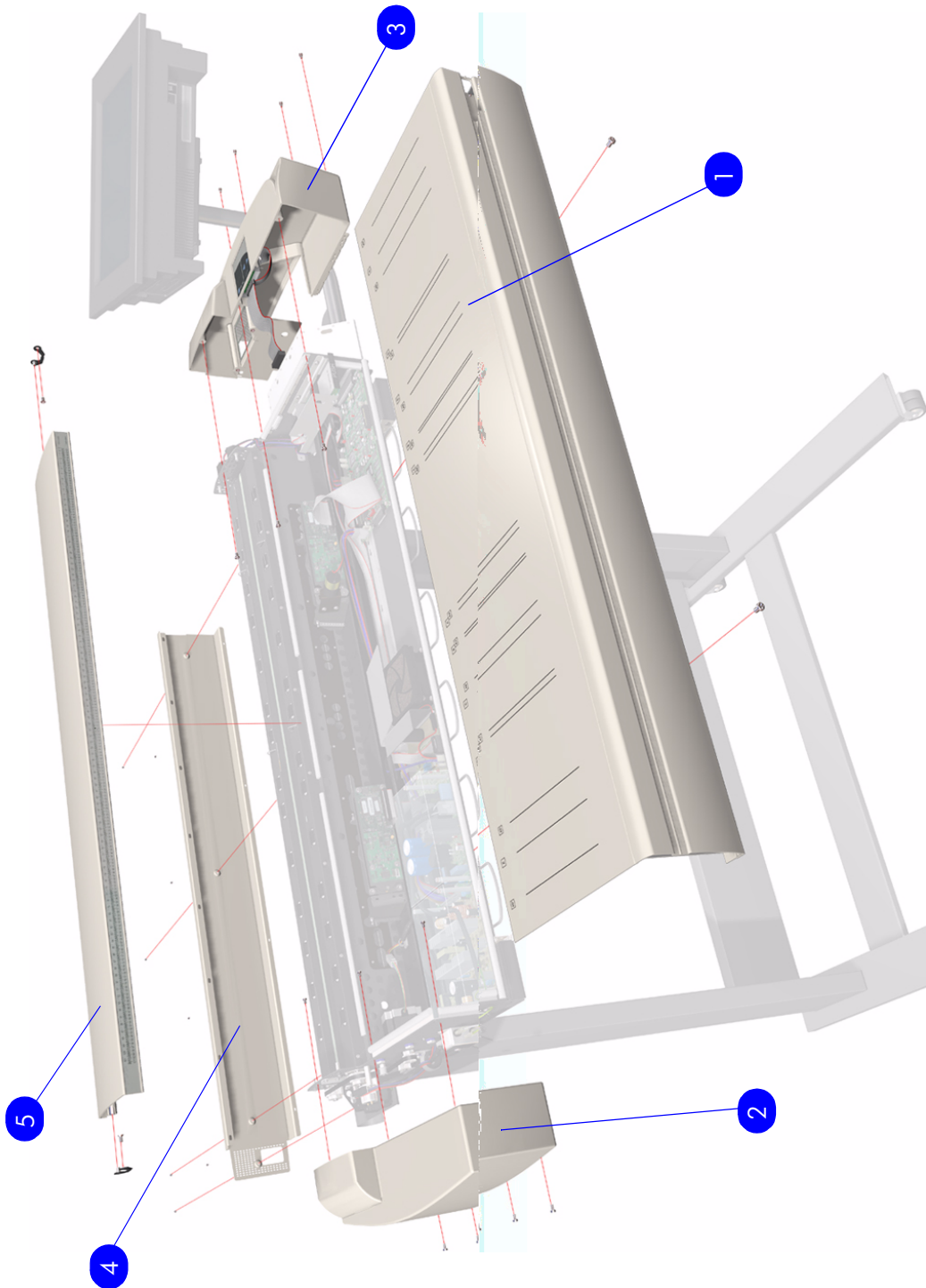
<b>Copier Stand, Touch Screen and Misc. Items</b>			
<b>Reference on Drawing</b>	<b>HP Part Number</b>	<b>Quantity</b>	<b>Description/Comments</b>
1	Q1261-60009	1	Stand
2	Q1261-60022	1	Touch Screen (Exchange Part)
3	Q1261-60030	1	Nameplate
4	Q1261-60036	1	Paper Guides
-	Q1261-60024	1	Hardware Kit
-	Q1261-60037	1	Service Patterns (includes the focus pattern and the calibration sheet)
-	Q1261-60038	1	Optical Pattern



**Figure 1: Copier Stand, Touch Screen and Misc. Items**

## Copier Covers

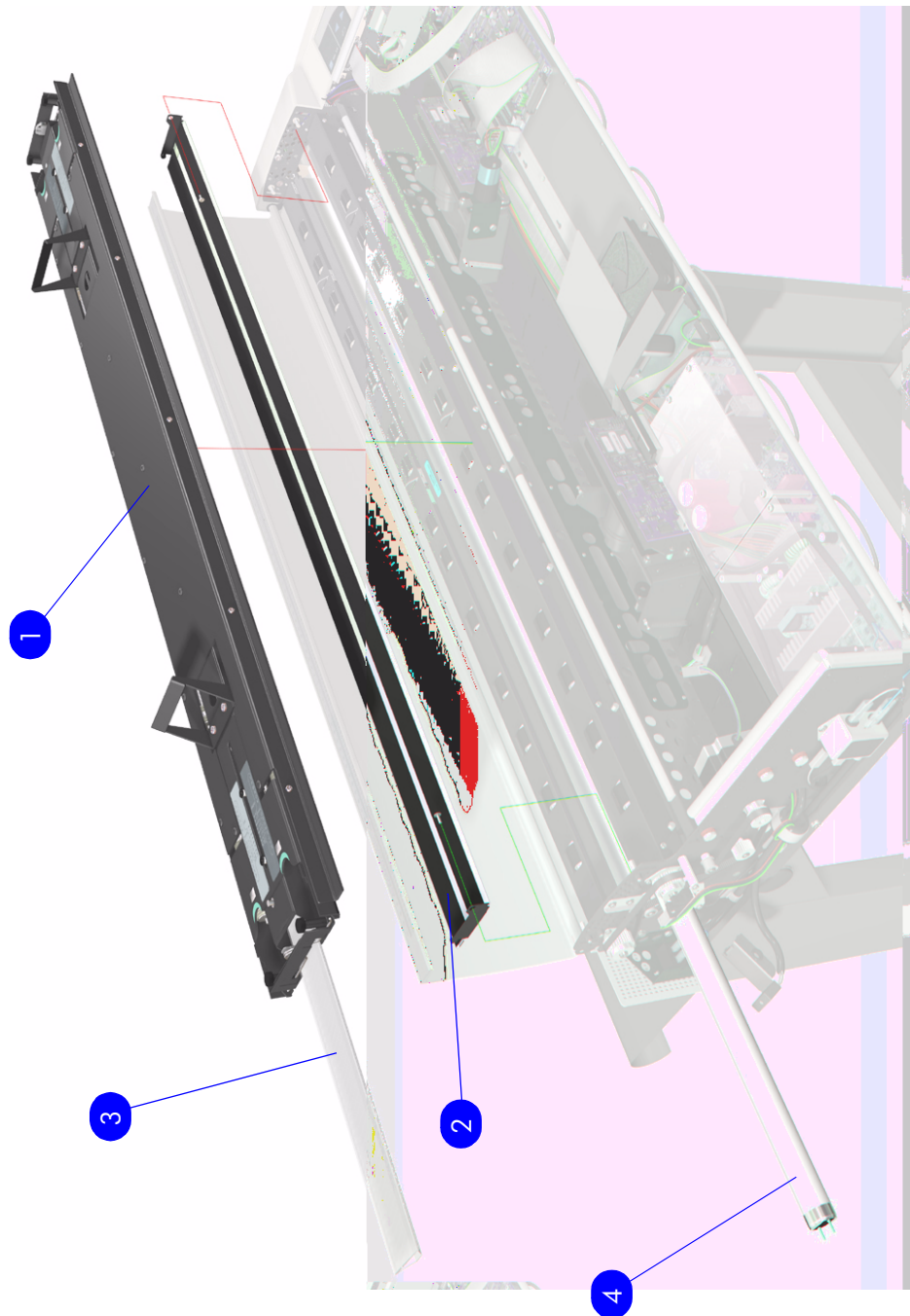
Copier Covers			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60003	1	Top Cover
2	Q1261-60004	1	Left Cover
3	Q1261-60005	1	Right Cover (includes Operator Panel)
4	Q1261-60006	1	Rear Cover
5	Q1261-60007	1	Top Profile



**Figure 2: Copier Covers**

## Top Assemblies

Top Assemblies			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60028	1	Guide Plate (includes the White Background Assembly)
2	Q1261-60010	1	Glass Plate
3	Q1261-60026	1	White Background Assembly
4	Q1261-60027	1	Fluorescent Lamp

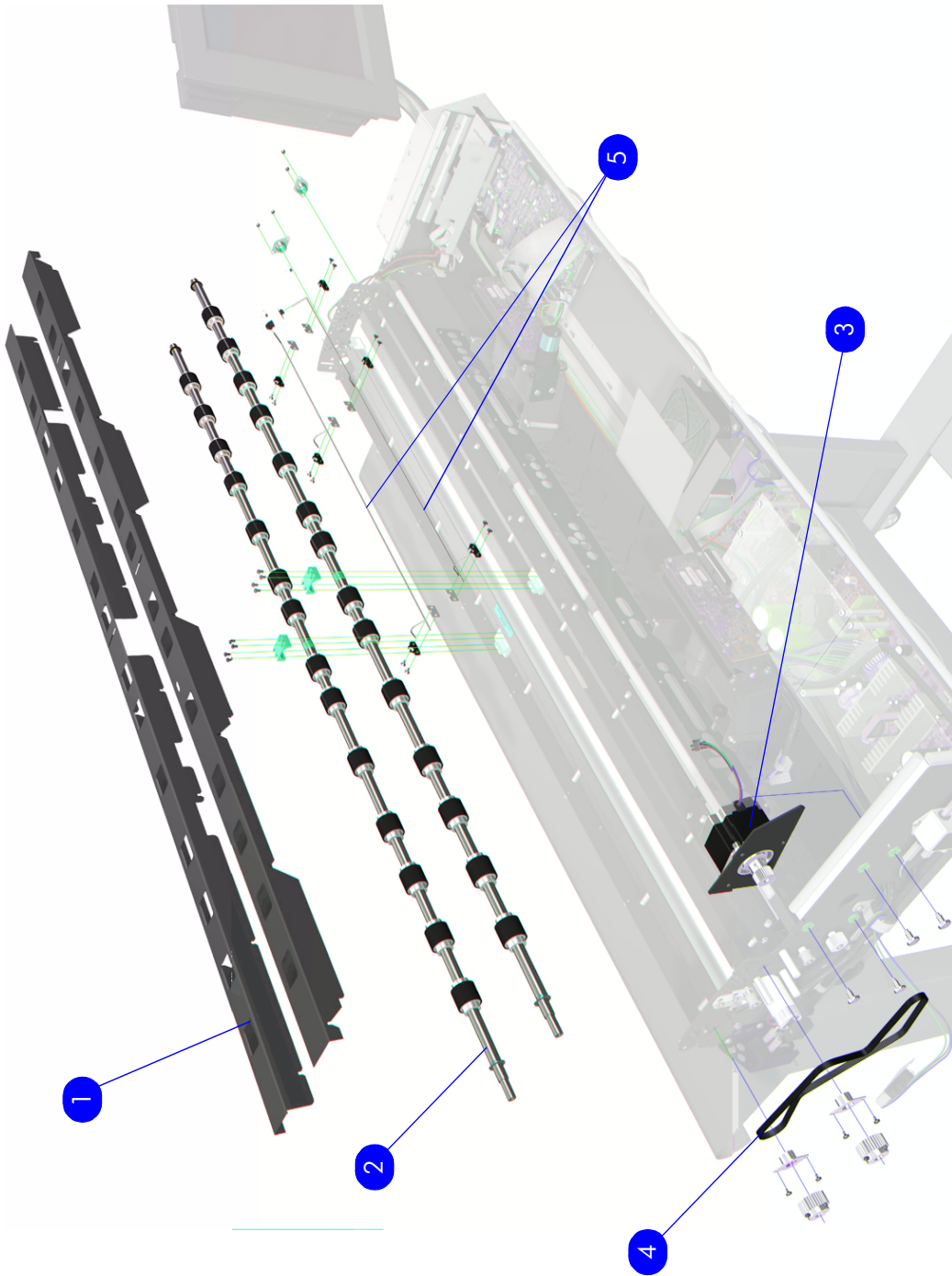


**Figure 3: Top Assemblies**

## Drive Assemblies

Drive Assemblies			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60035	1	Roller Shields
2	Q1261-60025	1	Rollers
3	Q1261-60018	1	Stepper Motor Assembly
4	Q1261-60029	1	Belt
5	Q1261-60033	1	Media Detector Wires

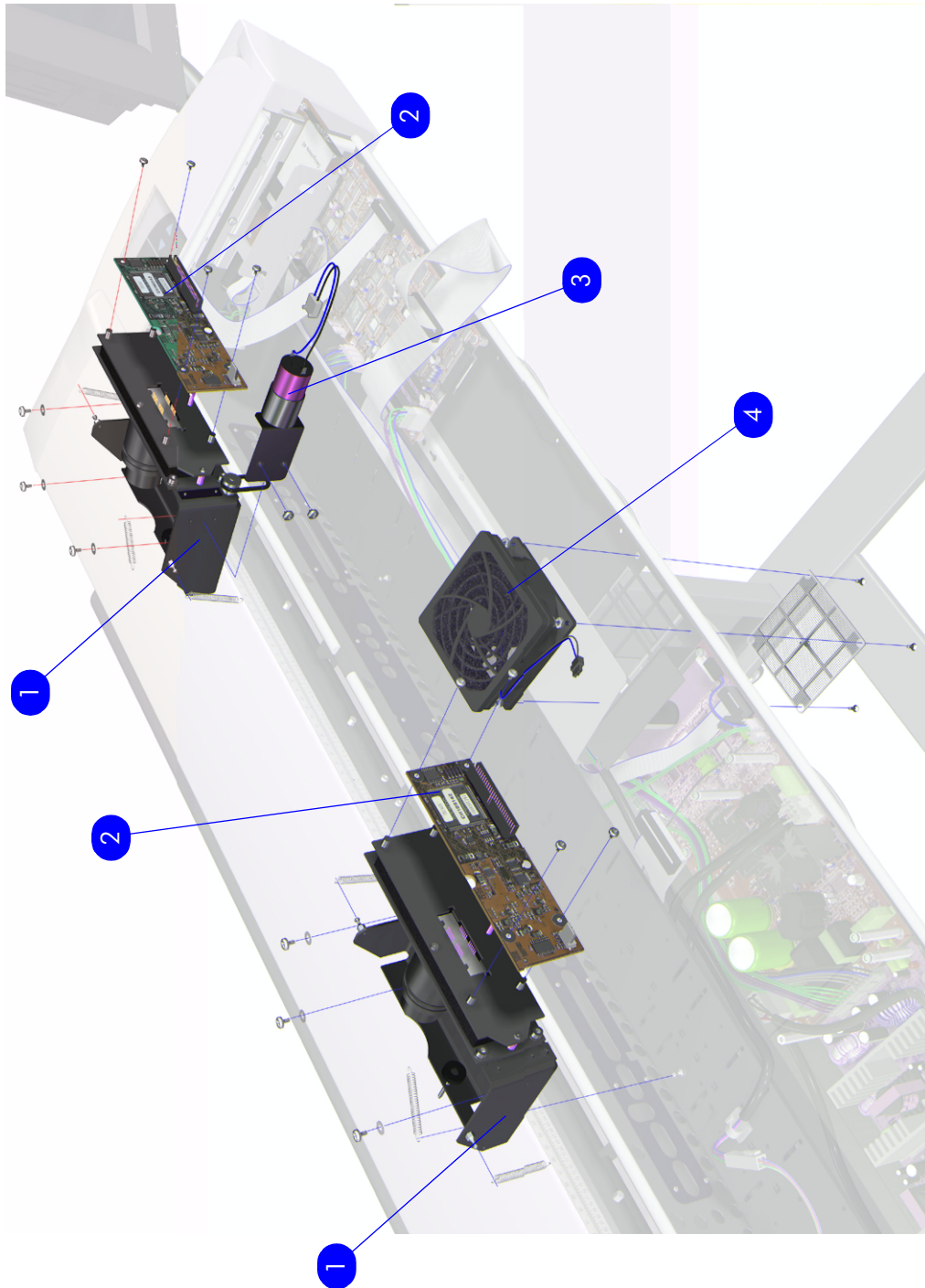




**Figure 4: Drive Assemblies**

## Camera Components and Fan

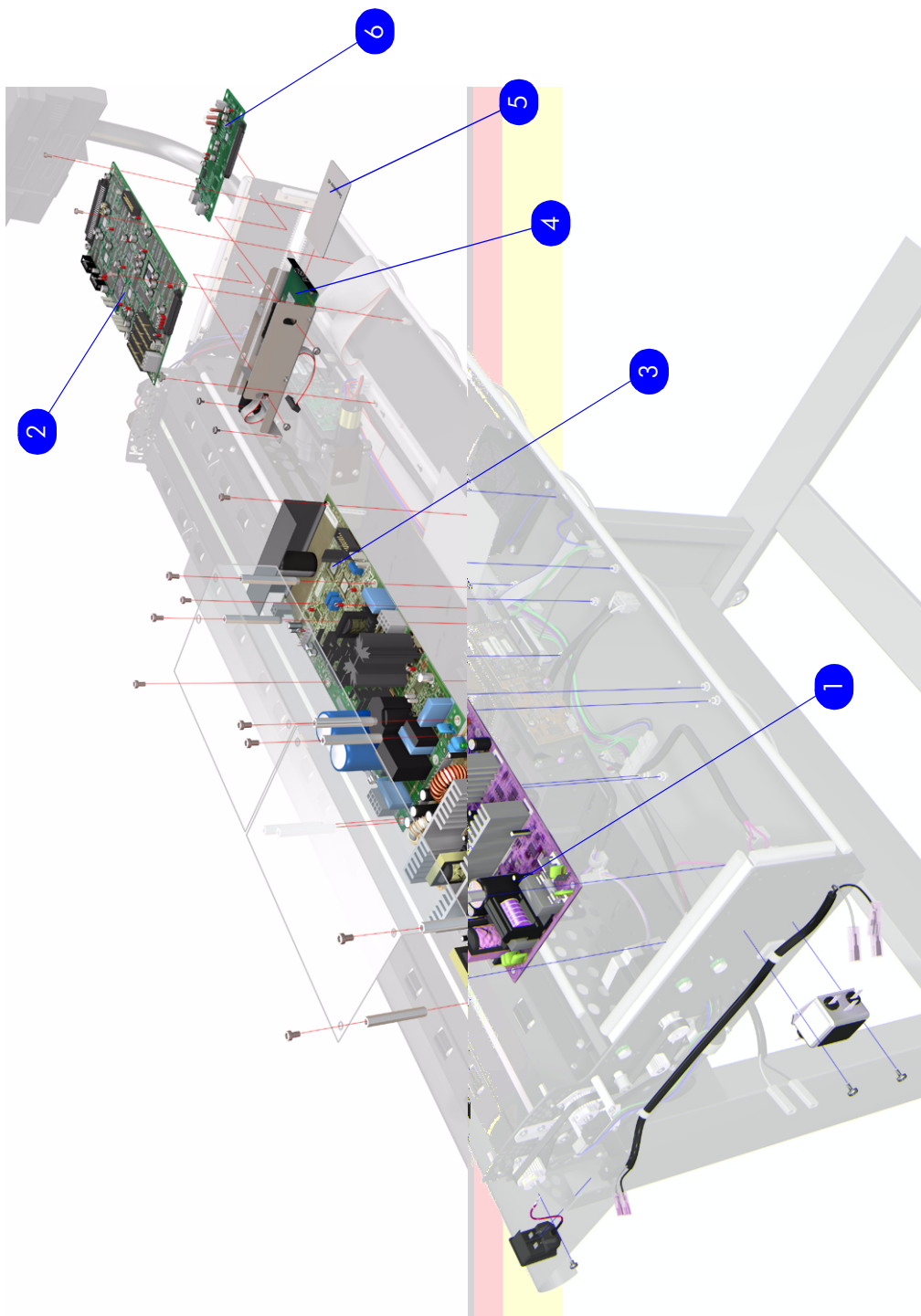
Camera Components and Fan			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60034	2	Camera Lens
2	Q1261-60013	2	Camera Board
3	Q1261-60019	1	Camera Motor
4	Q1261-60020	1	Fan



**Figure 5: Camera Components and Fan**

## Electronic Boards

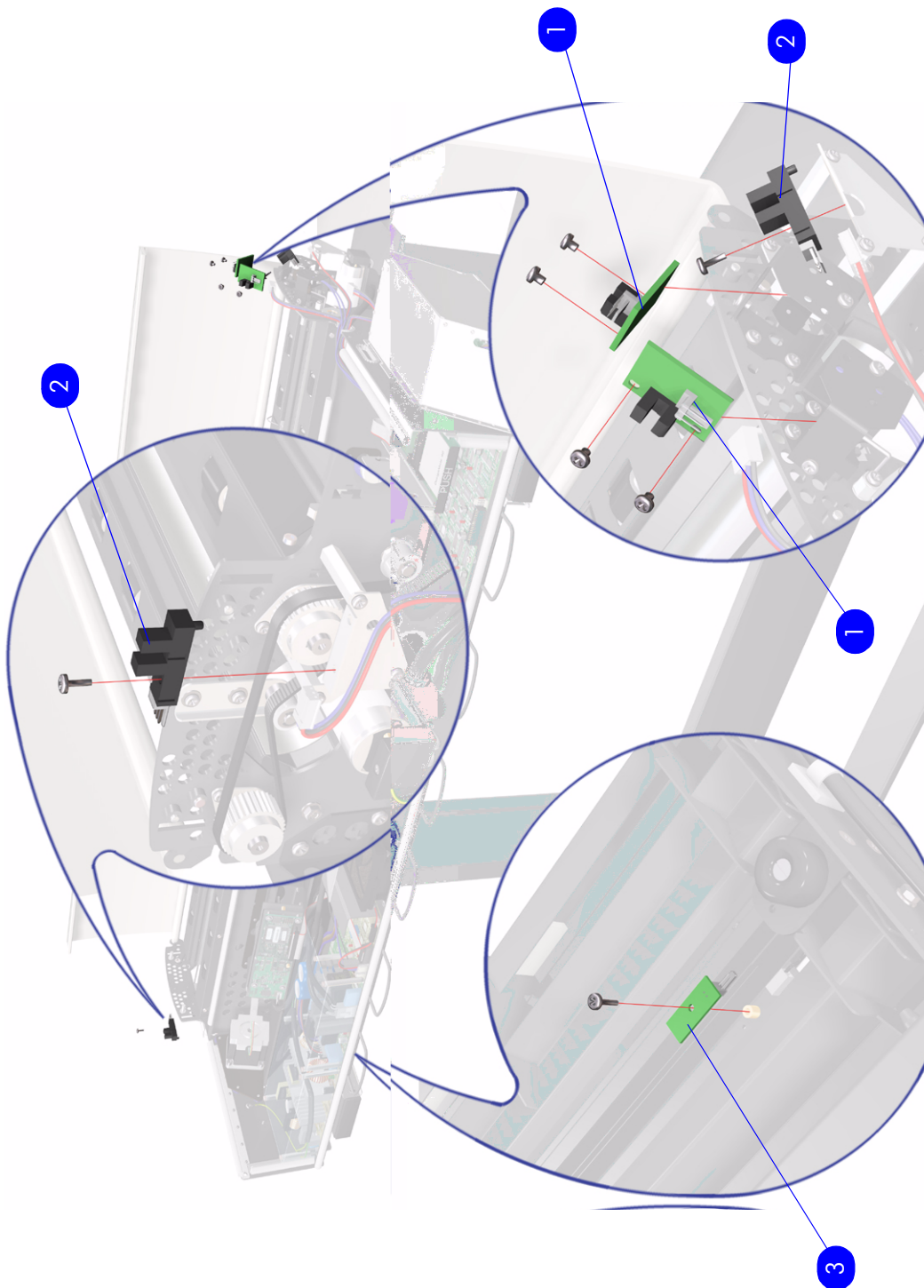
Electronic Boards			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60001	1	Power Supply (includes the switcher and filter)
2	Q1261-60002	1	Main Elelectronics Board
3	Q1261-60011	1	Driver Board
4	Q1261-60014	1	Card Reader Assembly
5	Q1261-60032	1	Smart Card
6	Q1261-60015	1	Interface Board



**Figure 6: Electronic Boards**

## Sensors

Sensors			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60017	2	Media Sensor
2	Q1261-60021	2	Thickness Sensor
3	Q1261-60012	1	Lamp Sensor

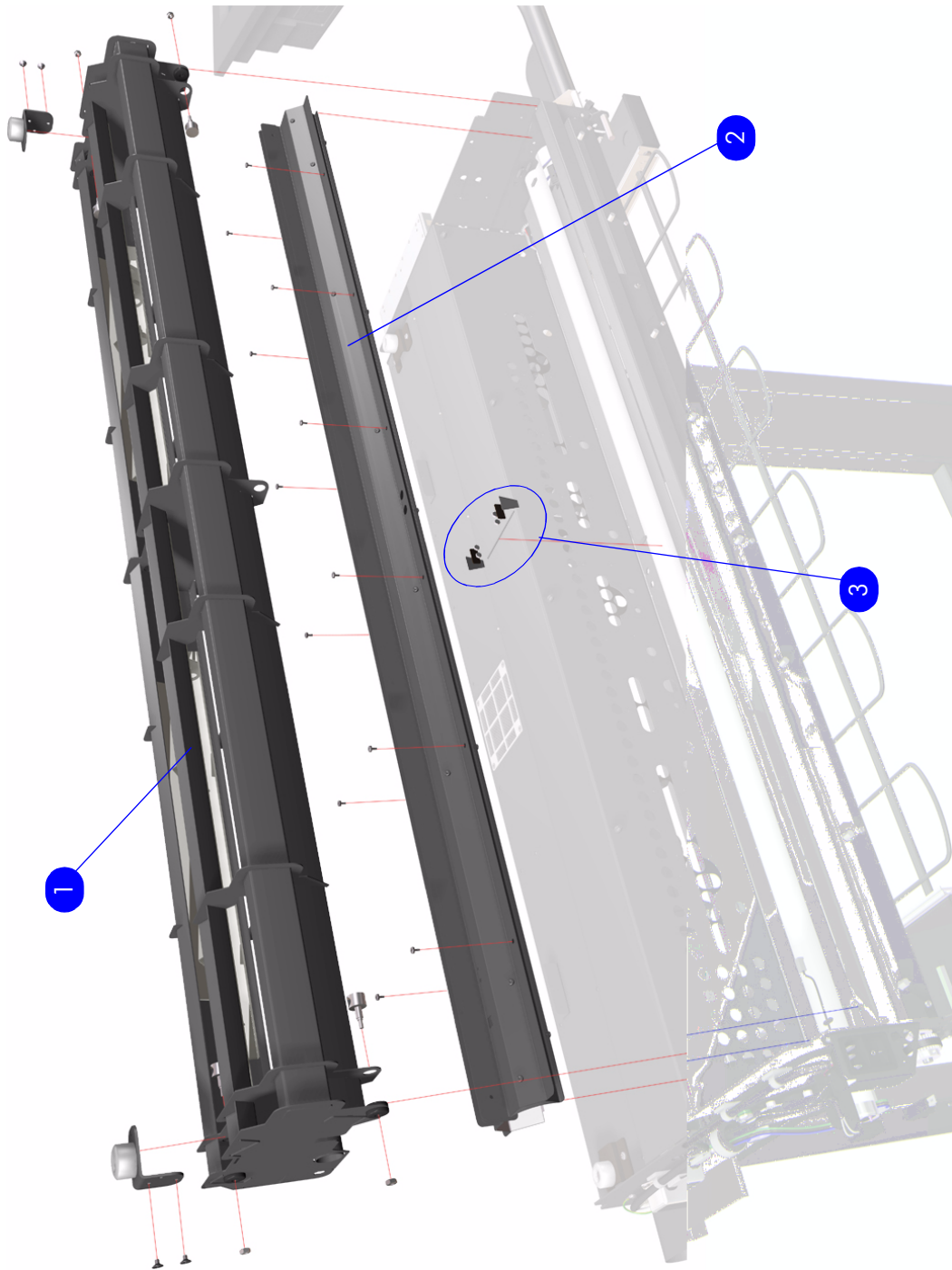


**Figure 7: Sensors**

## Bottom Assemblies

Bottom Assemblies			
Reference on Drawing	HP Part Number	Quantity	Description/Comments
1	Q1261-60023	1	Mirror Chassis
2	Q1261-60031	1	Reflector Assembly
3	Q1261-60008	1	Stitching Wire





**Figure 8: Bottom Assemblies**



# Removal and Installation

# 4

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## Introduction

*This chapter is a step by step guide to the removal and installation of the key components in the product. You may find it useful to tick off the steps as they are performed. Use the illustration at each procedure to identify the parts referred to in the text.*

*The procedures appear in order of removal. So the whole product can be stripped down by starting at the beginning of this chapter and working through the subsequent procedures.*

## Safety Precautions

*Review WARNING and CAUTION symbols and instructions before you service the product. Follow these warnings and cautions for your protection and to avoid damaging the product.*

**Serious shock hazard leading to death or injury may result if you do not take the following precautions:**

**Ensure that the ac power outlet (mains) has a protective earth (ground) terminal.**

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

**Prevent water or other liquids from running onto electrical components or circuits, or through openings in the module.**

## Electrostatic Discharge (ESD) Precautions

To prevent damage to the Product circuits from high-voltage electrostatic discharge (ESD):

1. Do not wear clothing that is subject to static build-up.
2. Do not handle integrated circuits (ICs) in carpeted areas.
3. Do not remove an IC or a printed circuit assembly (PCA) from its conductive foam pad or conductive packaging until you are ready to install it.
4. Ground (earth) your body while disassembling and working on the scanner. This can be done by touching any metallic part of the scanner.
5. After removing a cover from the scanner, attach an earthing (ground) lead between the PCA common and earth ground. Touch all tools to earth ground to remove static charges before using them on the scanner.
6. After removing any PCA from the scanner, place it on a conductive foam pad or into its conductive packaging to prevent ESD damage to any ICs on the PCA.

## Required Tools

The following tools are required to disassemble and repair the scanner:

- PZ2 Screwdriver (90 mm blade)
- PZ1 Screwdriver
- Screwdriver (0.8 x 5)
- 1.3 mm Allen Key
- 1.5 mm Allen Key
- 2 mm Allen Key
- 2.5 mm Allen Key
- 3 mm Allen Key
- 4 mm Allen Key
- 5 mm Allen Key
- 5.5 mm Wrench
- 6 mm Wrench
- 7 mm Wrench
- 8 mm Wrench
- 13 mm Wrench

## Top Cover

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



1. Remove the 2 screws along the lower edge of the Top Profile.



2. Pull the front part of the Top Cover away from the scanner in order to release the upper part of the Top Cover.



3. Lift up the Top Cover and remove from the scanner.

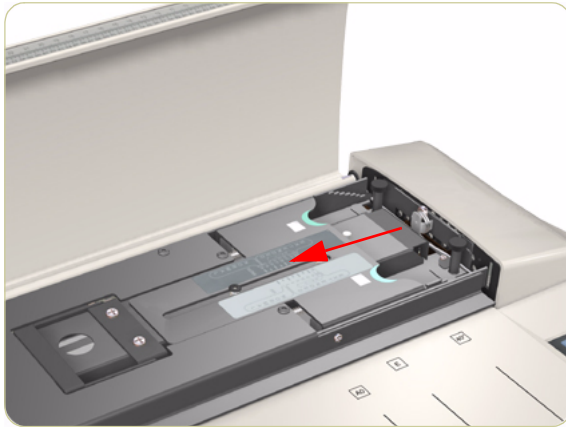
## Guide Plate

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



**1.** Open the Top Cover.



**2.** Release the lock on both sides of the Guide Plate.



**3.** Raise both levers and lift up the Guide Plate.

## Left Cover

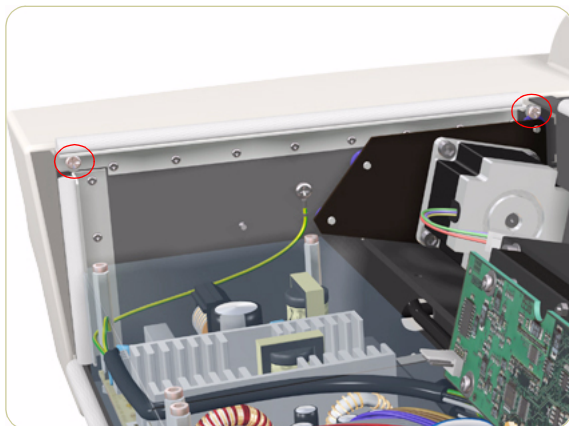
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

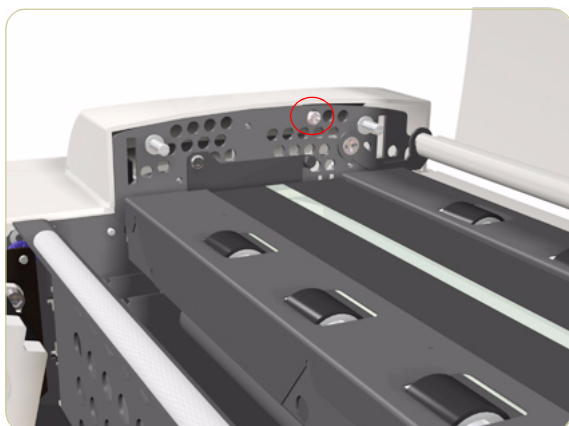
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove 4 screws that secure the Left Cover from underneath.



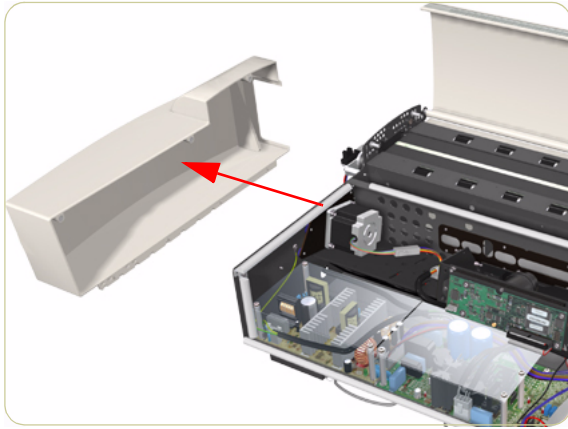
4. Remove 2 screws that secure the Left Cover from the side.



5. Remove 1 screw that secures the Left Cover from the top.







**6.** Remove the Left Cover from the scanner.

## Right Cover

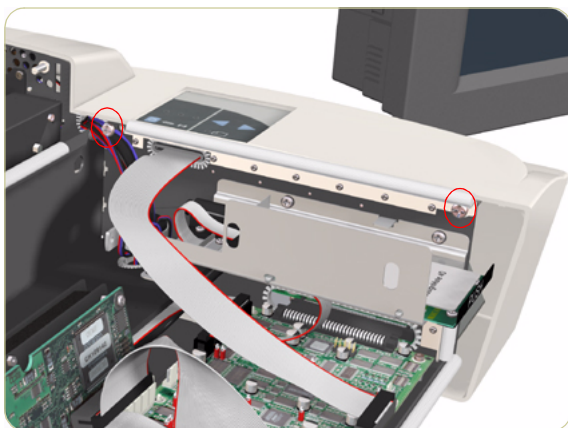
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove 4 screws that secure the Right Cover from underneath.

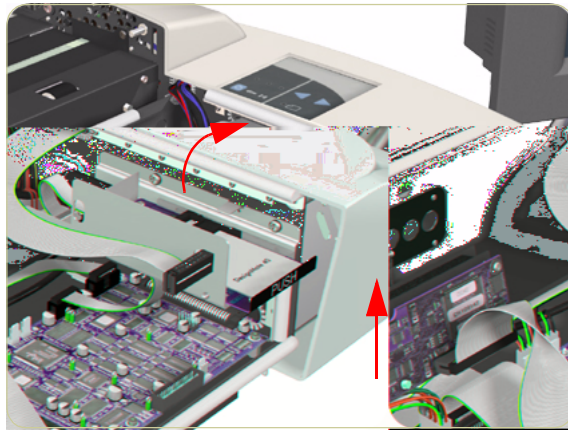


4. Remove 2 screws that secure the Right Cover from the side.

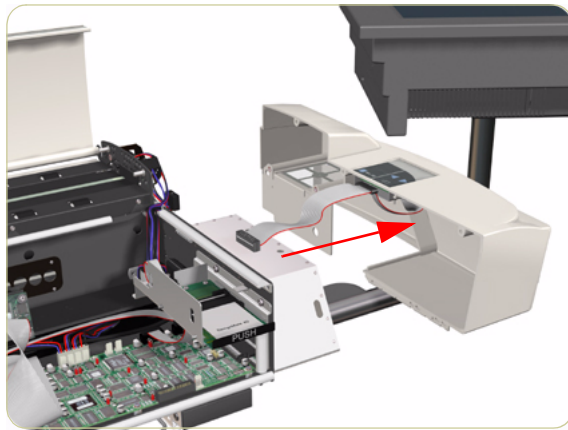


5. Remove 1 screw that secures the Right Cover from the top.





6. Disconnect the Operator Panel Cable from the Main Electronics and pass through the access hole.



7. Remove the Right Cover.

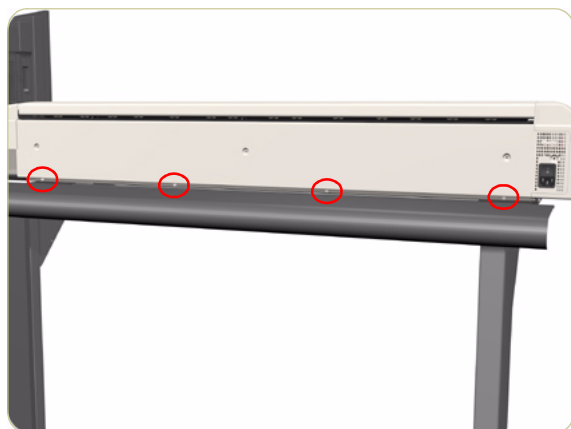
## Rear Cover

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



1. Remove 4 screws that secure the Rear Cover to the rear of the scanner.



2. Remove 4 screws that secure the Rear Cover to the lower edge of the scanner.



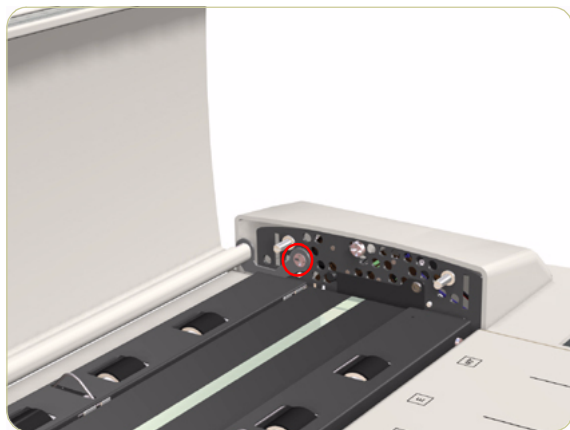
3. Remove the Rear Cover from the scanner.

## Top Profile

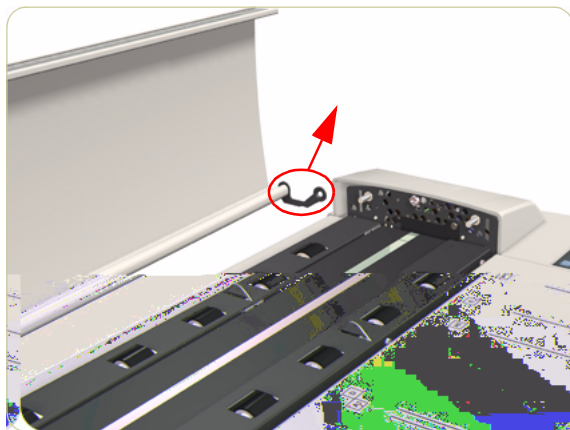
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

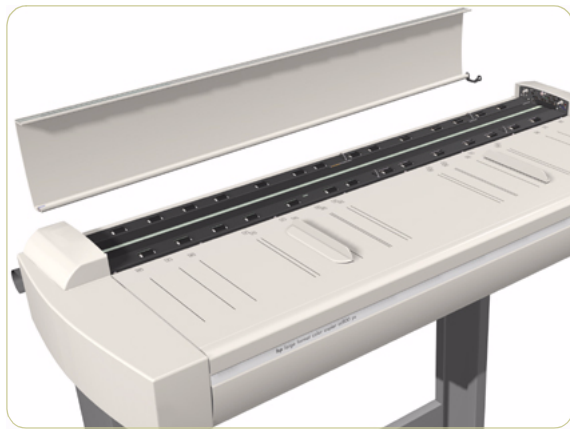
1. Remove the Guide Plate ⇒ Page 4-5.
2. Remove 1 screw from one of the bearings of the Top Profile.



3. Slide the bearing out of the pivot in the Top Profile.



4. Remove the Top Profile from the scanner.



## Glass Plate

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



1. Remove the Guide Plate ⇒ Page 4-5.
2. Remove 1 screw from each side of the Glass Plate.

**Take note of the orientation of the bearings when removing the Glass Plate.**



3. Carefully lift up the Glass Plate and remove from the scanner.

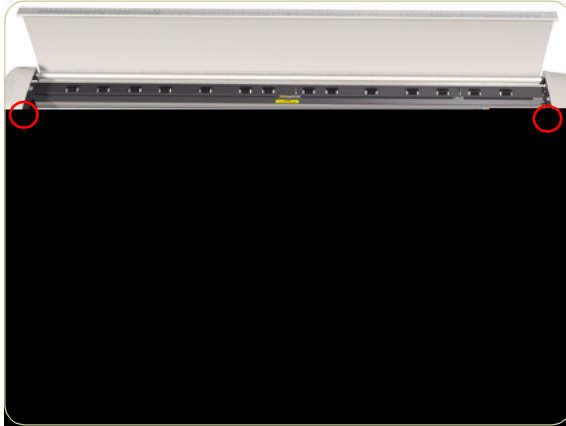
**Always clean the glass before replacing the Glass Plate.**

## Entry Roller Shield

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

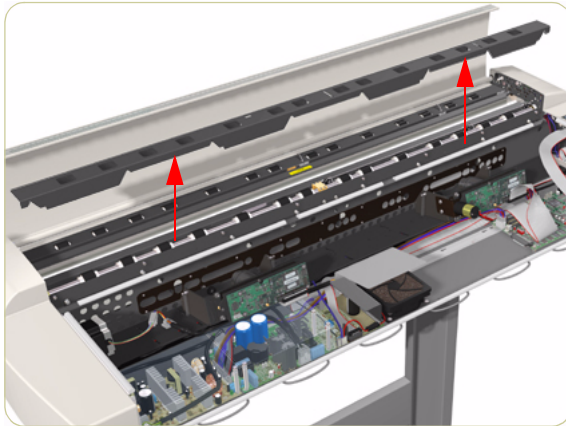
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the 2 front most guide pins for the Guide Plate.



5. Loosen 16 screws on the front side of the Entry Roller Shield.



6. Gently remove the Entry Roller Shield from the scanner. Be careful NOT to bend it or damage it while removing.



## Exit Roller Shield

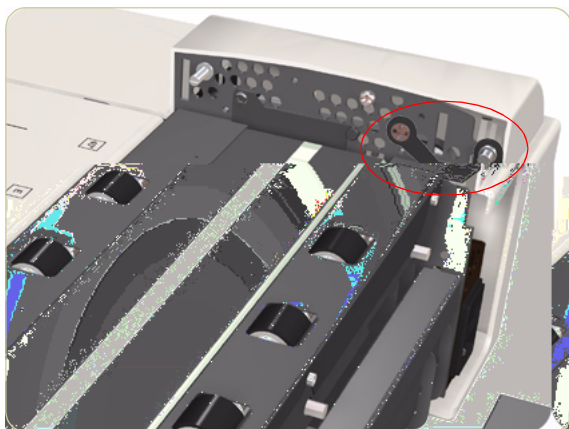
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Profile ⇒ Page 4-11.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Rear Cover ⇒ Page 4-10.
4. Remove the 2 rear guide pins for the Guide Plate.



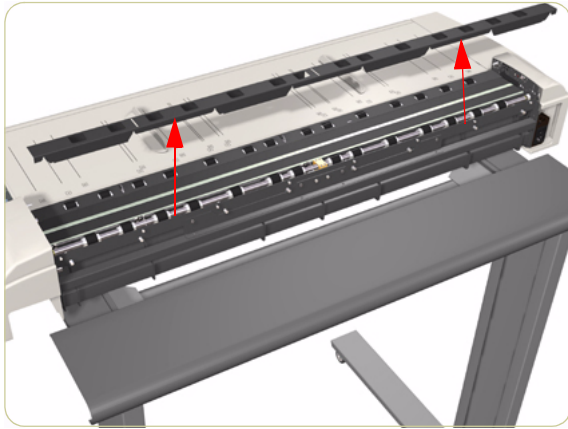
5. Remove the left and right hinges for the Top Profile.



6. Loosen 16 screws on the rear side of the Exit Roller Shield.







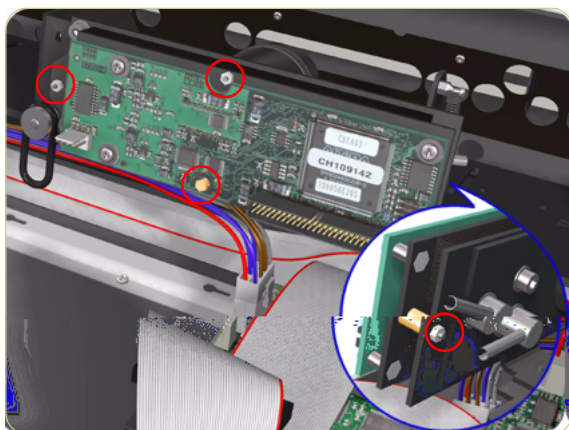
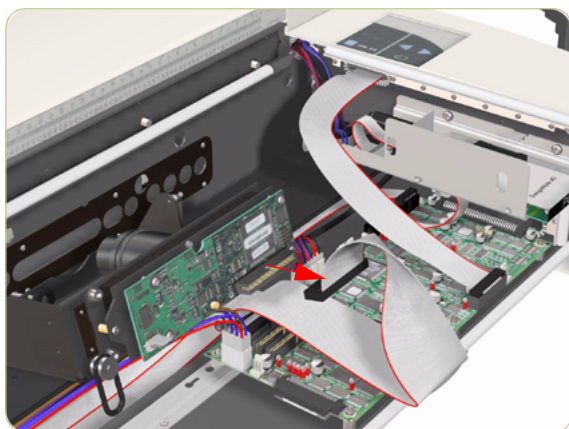
7. Gently remove the Exit Roller Shield from the scanner. Be careful NOT to bend it or damage it while removing.

## Camera Board

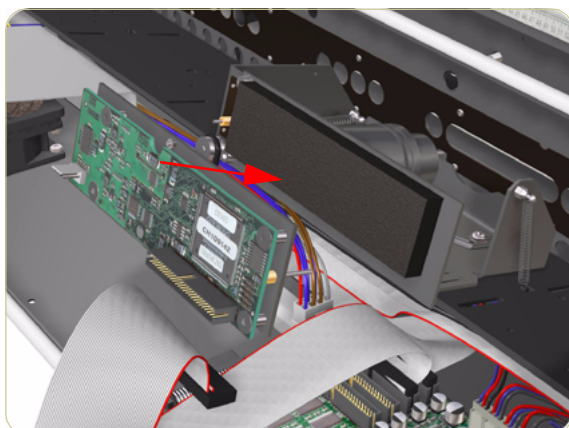
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Camera Motor ⇒ Page 4-17.
3. Disconnect the cable from the Camera Board that needs to be replaced.



4. Remove 4 nuts that secure the Camera Board.



5. Remove the Camera Board from the scanner.

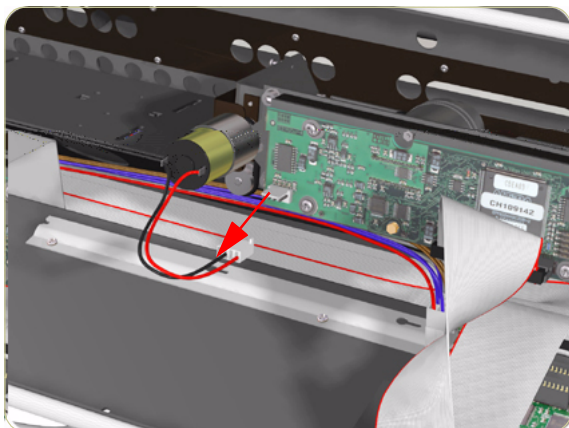
**Make sure you perform the Camera Adjustment procedure after replacing the Camera Board.**

## Camera Motor

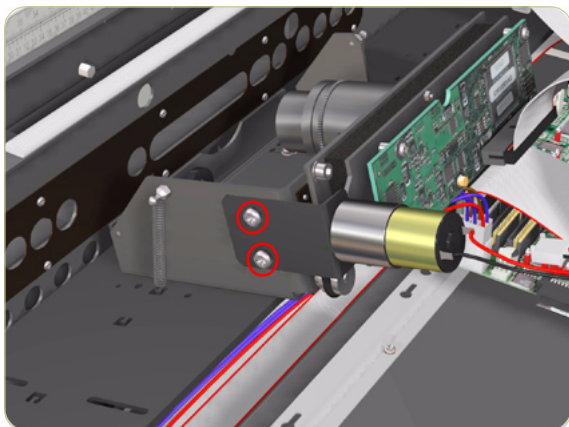
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

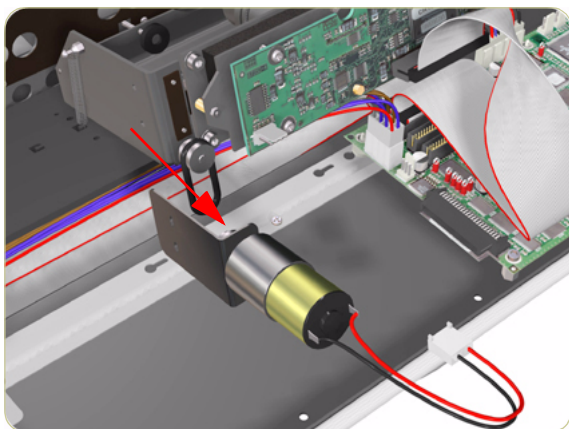
1. Remove the Top Cover ⇒ Page 4-4.
2. Disconnect the Camera Motor cable.



3. Remove 2 screws that secure the Camera Motor.



4. Release the belt and remove the Camera Motor from the scanner.



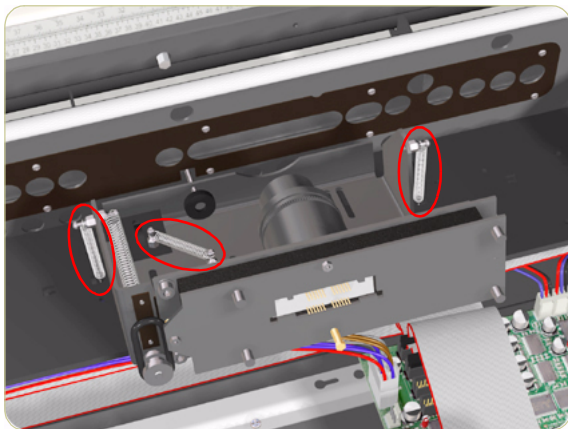
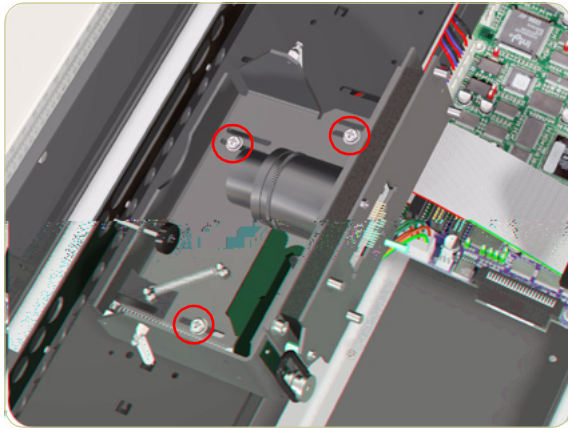
**After reinstalling the Camera Motor, make sure you run the Scanner Maintenance.**

## Camera Lens

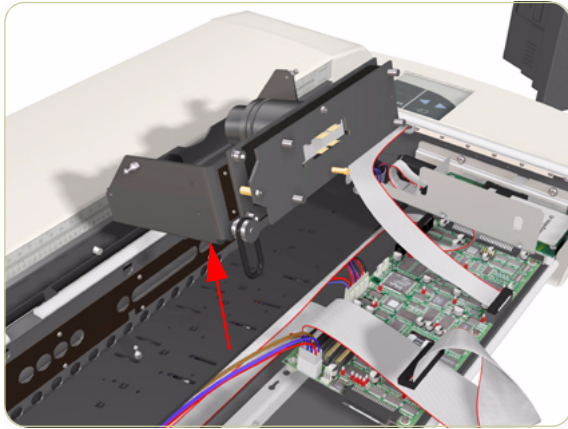
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Camera Board ⇒ Page 4-16.
3. If installed, remove the Camera Motor ⇒ Page 4-17.
4. Remove 3 screws that secure the Camera Chassis.



5. Release the 3 springs securing the Camera Chassis.



6. Remove the Camera Lens from the scanner.

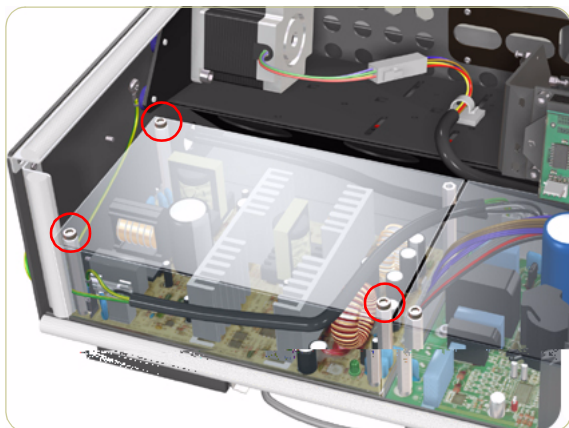
**Make sure you perform the Camera Adjustment procedure after replacing the Camera Lens.**

## Power Supply Unit

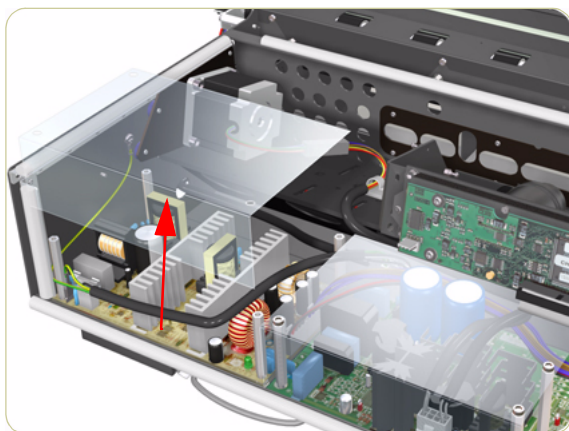
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

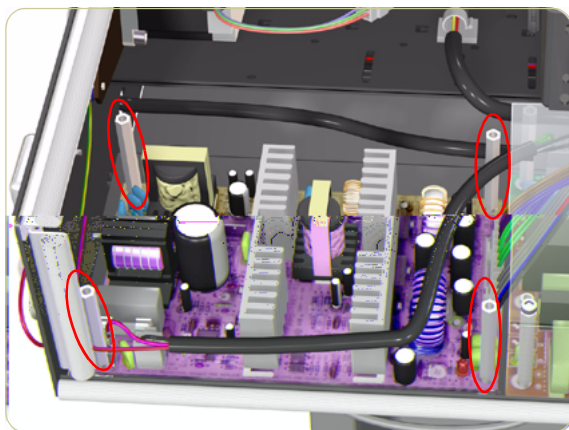
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Left Cover ⇒ Page 4-6.
4. Remove 3 screws from the Plastic Protector that covers the Power Supply Unit.

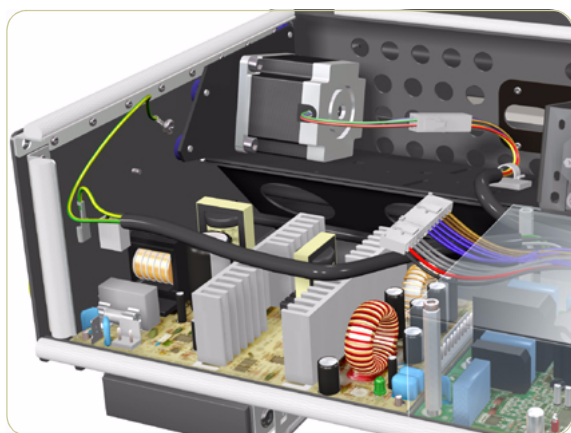


5. Remove the Plastic Protector.

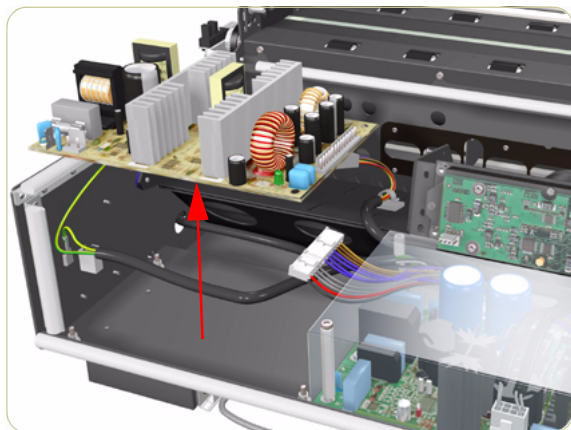


6. Remove the 4 screws that secure the Power Supply Unit.

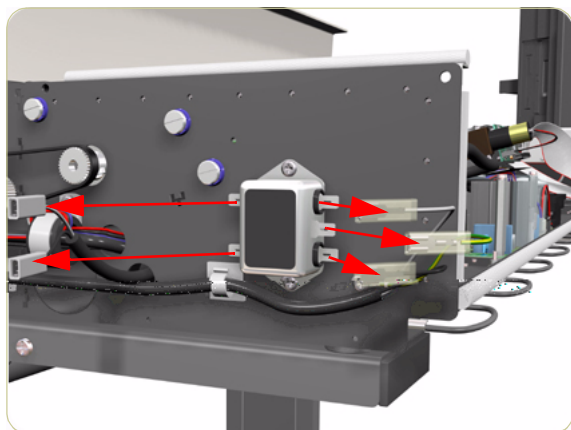




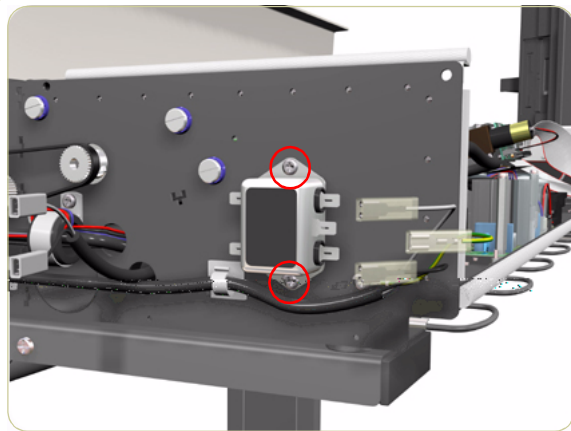
**7.** Disconnect ALL the cables from the Power Supply Unit.



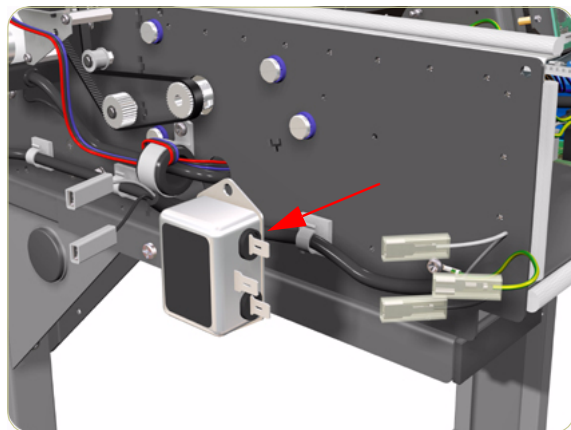
**8.** Remove the Power Supply Unit from the scanner.



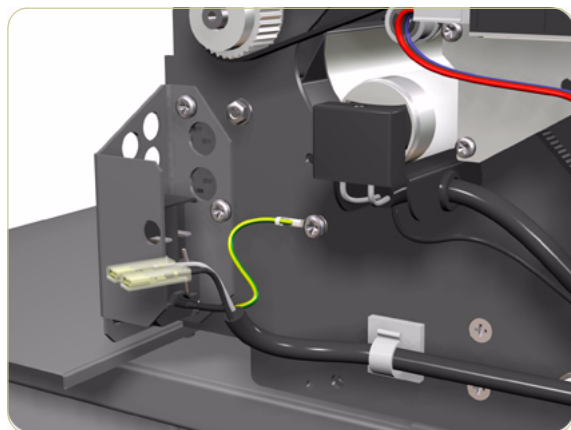
**9.** Disconnect the cables attached to the RFI Filter.



**10.** Remove 2 screws that secure the RFI Filter.

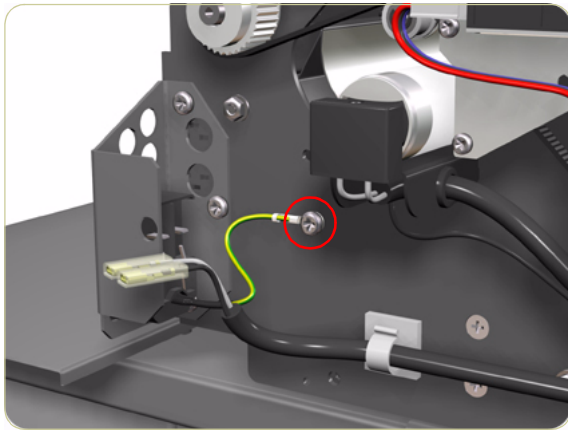


**11.** Remove the RFI Filter from the scanner.

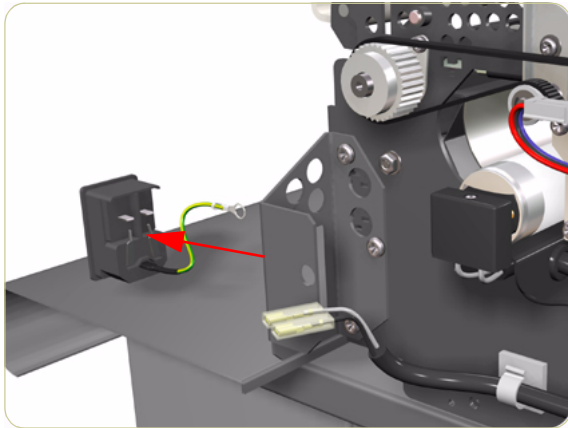


**12.** Disconnect the cable attached to the Power Switch.





**13.** Remove the screw that secures the grounding cable to the chassis.

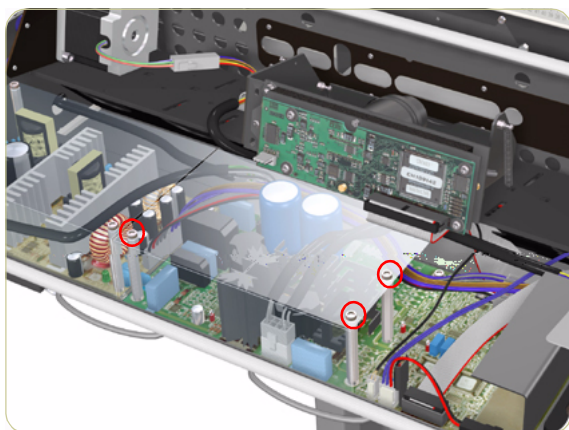


**14.** Release the securing clips for the Power Switch and remove from the scanner.

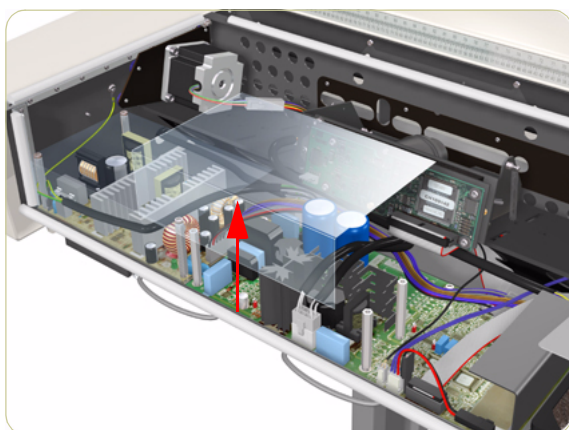
## Driver Board

### Removal

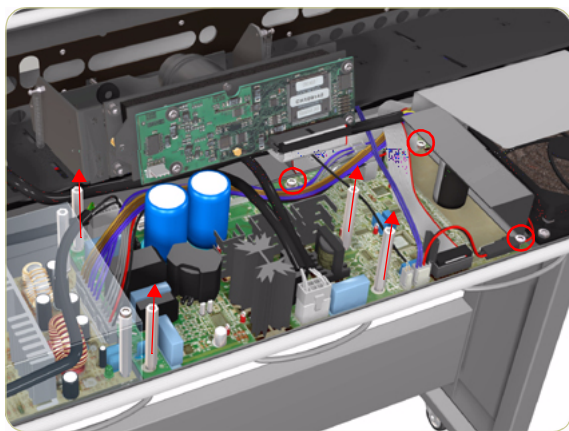
**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



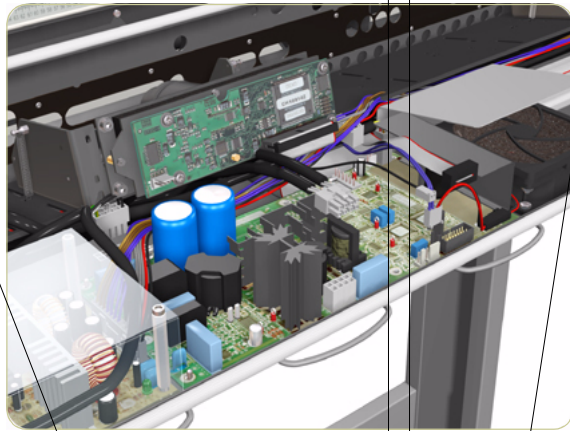
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove 3 screws from the Plastic Protector that covers the Driver Board.



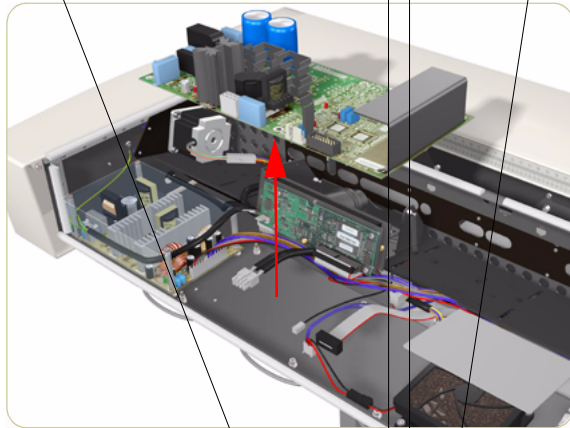
3. Remove the Plastic Protector.



4. Remove the 3 screws and 4 long nuts that secure the Driver Board.



5. Disconnect ALL the cables from the Driver Board.

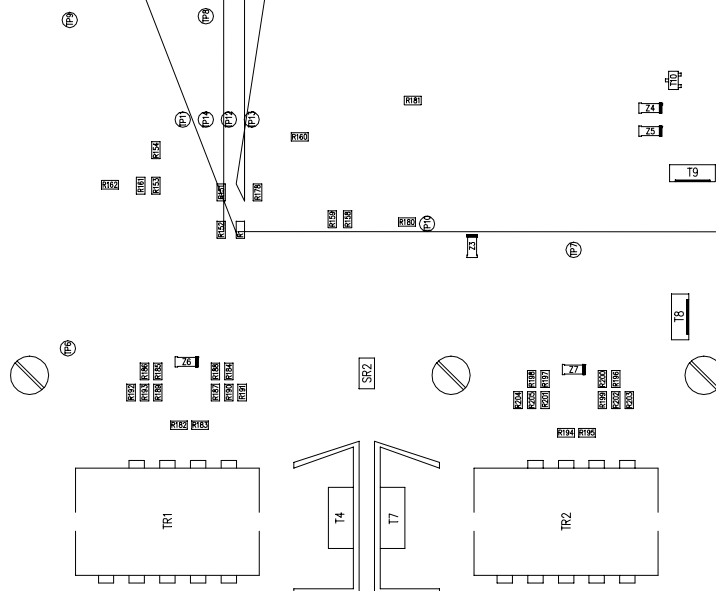


6. Remove the Driver Board from the scanner.

**After reinstalling the Driver Board, you must adjust the Lamp Driver as follows:**

1. Switch the scanner ON and leave for at least 30 minutes.
2. Turn P2 Counter-Clockwise until LED 3 switches OFF (LED 4 should be ON).
3. Slowly turn P2 Clockwise until LED 3 switches ON.

**If P2 is turned further Clockwise, LED 4 will eventually turn OFF. If both LED's are ON, the lamp driver is within the acceptable working range. If either of the LED's is OFF, the lamp driver should be adjusted.**

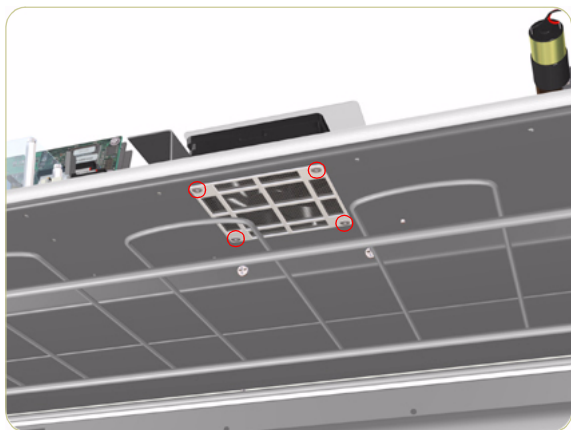


## Fan

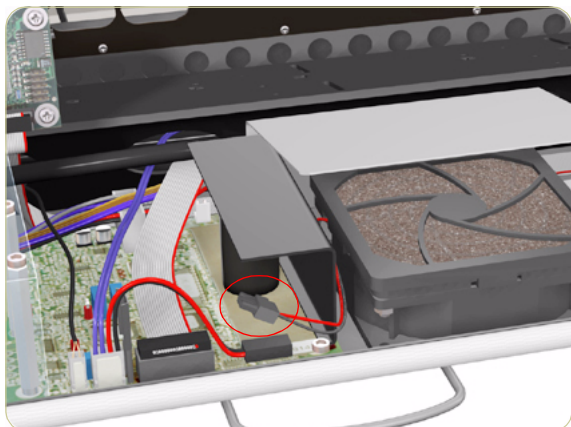
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

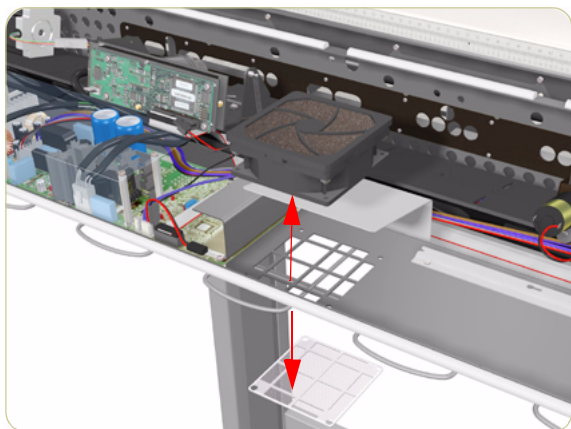
1. Remove the Top Cover ⇒ Page 4-4.
2. Gripping the nuts from the top, remove the 4 screws from the bottom that secure the Fan.



3. Disconnect the Fan Cable.



4. Remove the Fan from the top and the Fan shield from the bottom of the scanner.

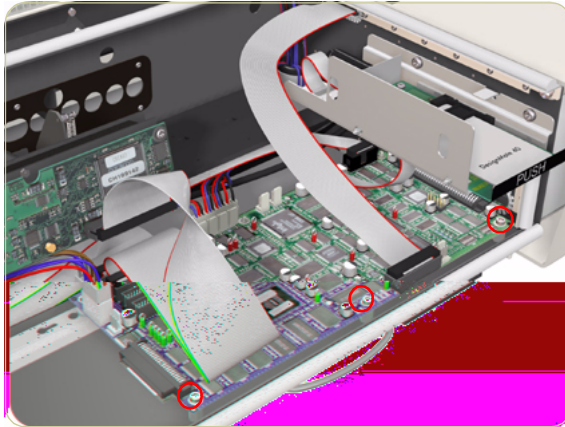


## Main Electronics Board

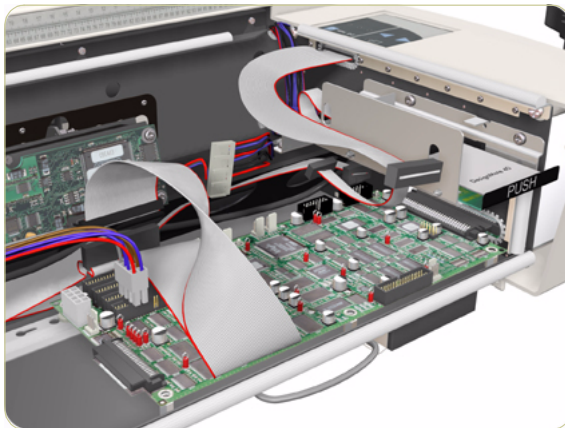
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

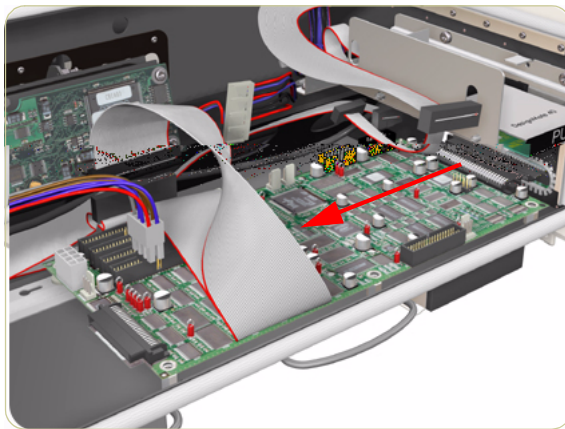
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove 3 screws that secure the Main Electronics Board.

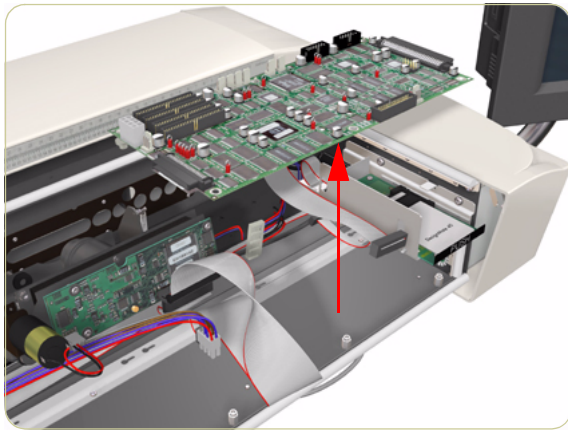


3. Disconnect ALL the cables from the Main Electronics Board.



4. Move the Main Electronics Board to the left to disconnect it from the connector and to release it from the 3 plastic locators (located at the rear of the Board).





5. Remove the Main Electronics Board from the scanner.

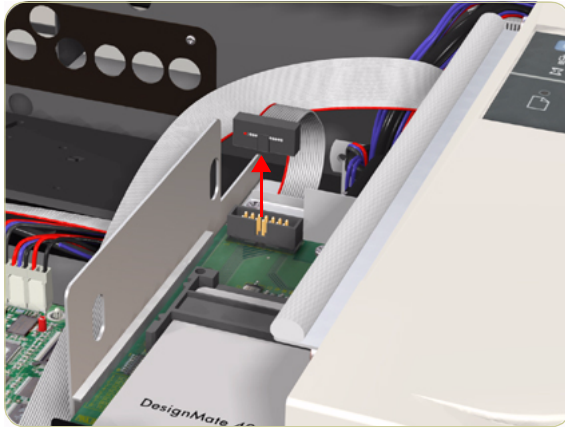
**After reinstalling the Main Electronics Board, make sure you run the Scanner Maintenance.**

## Smart Card Reader

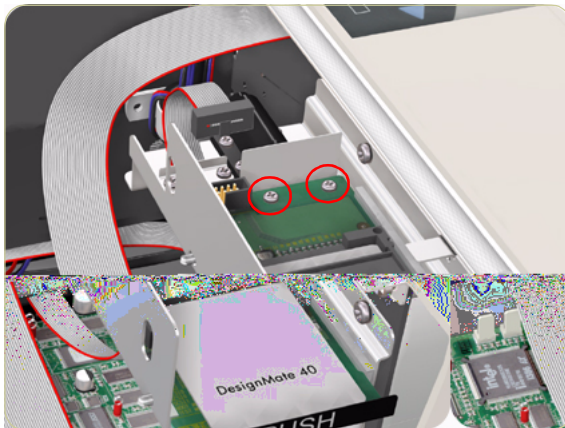
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

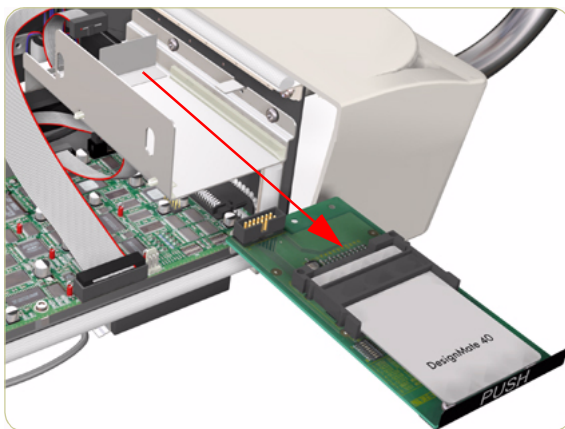
1. Remove the Top Cover ⇒ Page 4-4.
2. Disconnect the cable from the Main Electronics Board.



3. Remove 2 screws that secure the Smart Card Reader.



4. Remove the Smart Card Reader from the scanner.

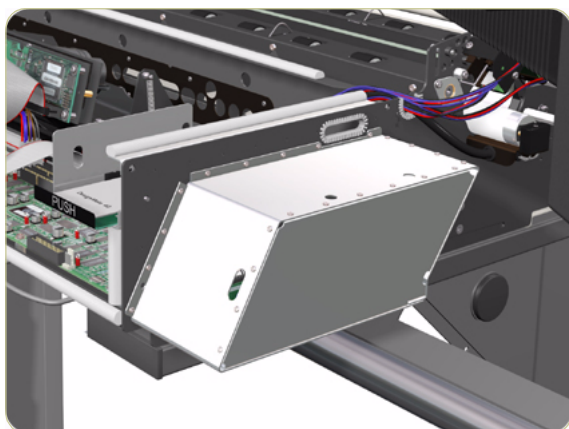


## Interface Board Cover

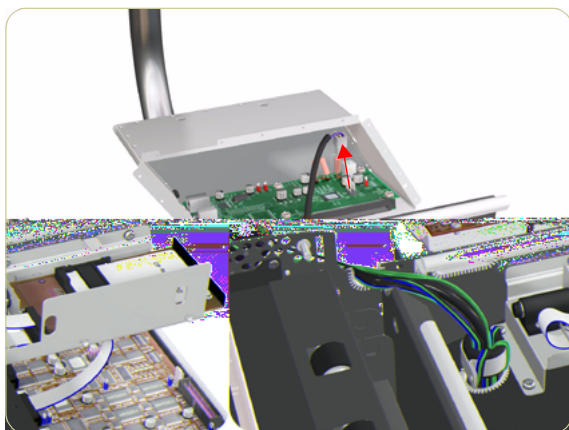
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

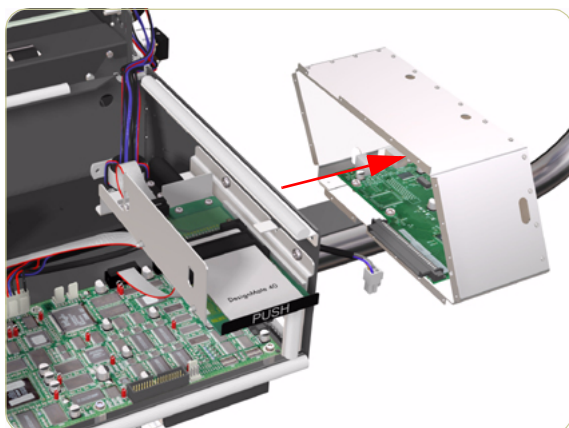
1. Remove the Top Cover ⇒ Page 4-4
2. Remove the Right Cover ⇒ Page 4-8.
3. Remove 18 screws that secure the Interface Board Cover.



4. Pull out the Interface Board Cover slightly and disconnect the cable that is connected to the Interface Board from inside.



5. Remove the Interface Board Cover from the scanner.





## Interface Board

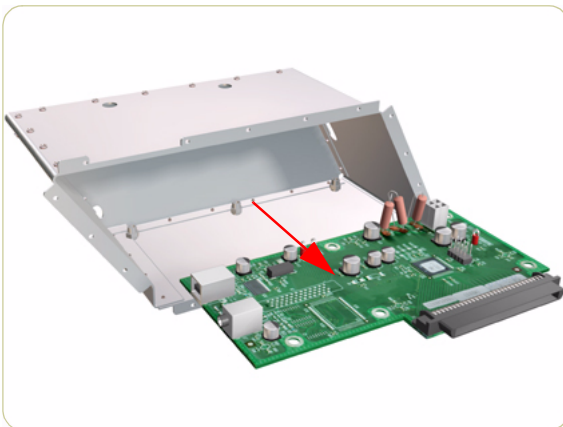
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4
2. Remove the Right Cover ⇒ Page 4-8.
3. Remove the Interface Board Cover ⇒ Page 4-30.
4. Remove 3 screws that secure the Interface Board.



5. Remove the Interface board.

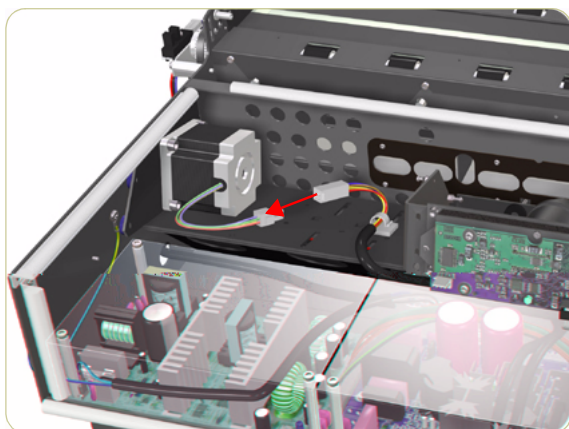


## Stepper Motor

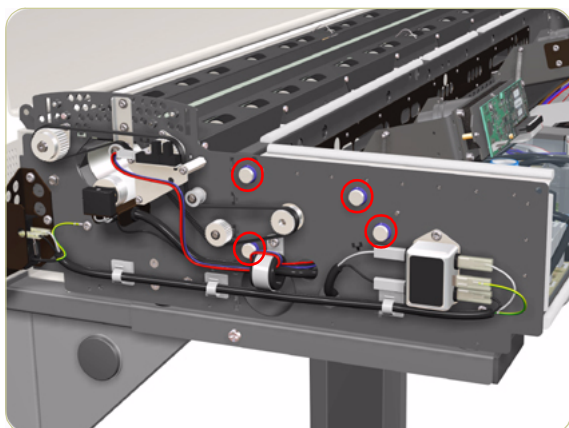
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

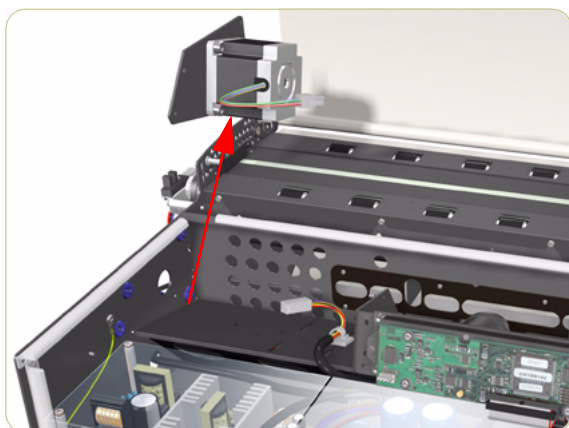
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Left Cover ⇒ Page 4-6.
3. Disconnect the Stepper Motor cable.



4. Remove 4 screws that secure the Stepper Motor to the chassis.



5. Remove the Stepper Motor from the inside.

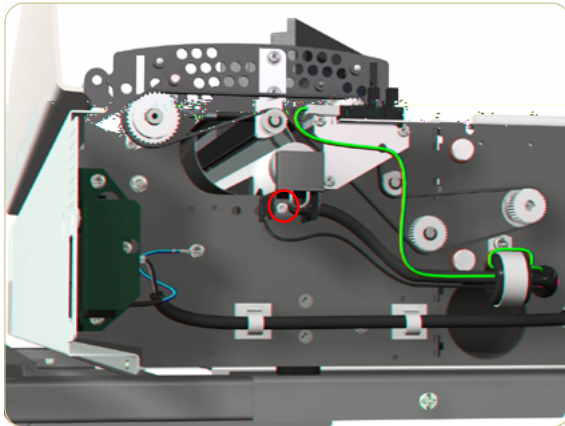


## Fluorescent Lamp

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

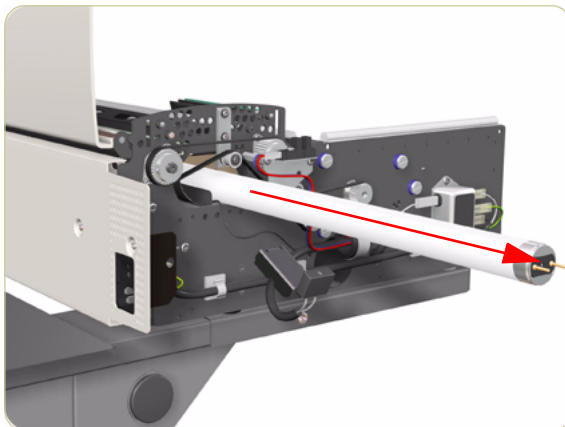
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Left Cover ⇒ Page 4-6.
4. Remove 1 screw from the Lamp Socket.



5. Remove the Lamp Socket and slide out the Fluorescent Lamp.

**Take care not to touch the Stitching Wire while removing or installing the Fluorescent Lamp.**

**Also take care that the Fluorescent Tube does not get caught on the Sensor Cable.**

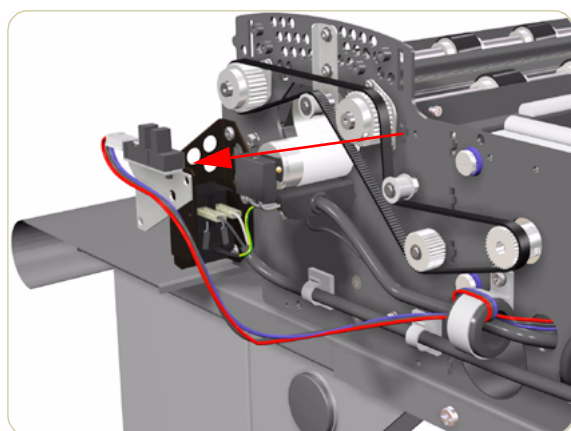
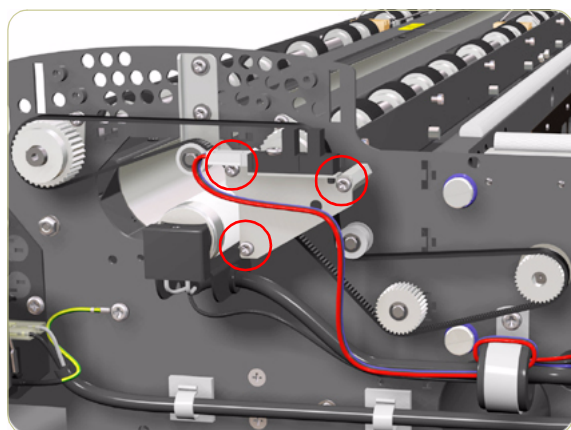


## Rollers

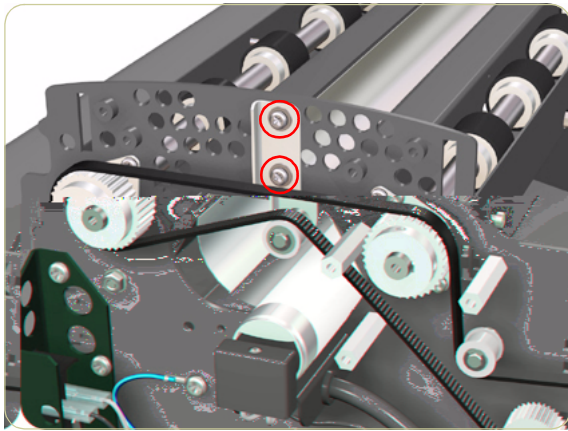
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

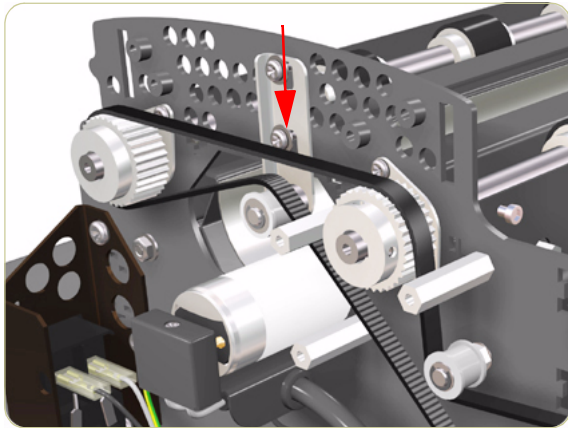
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Entry Roller Shield ⇒ Page 4-13.
6. Remove the Exit Roller Shield ⇒ Page 4-14.
7. Remove 3 screws from the Guide Plate Sensor Support.



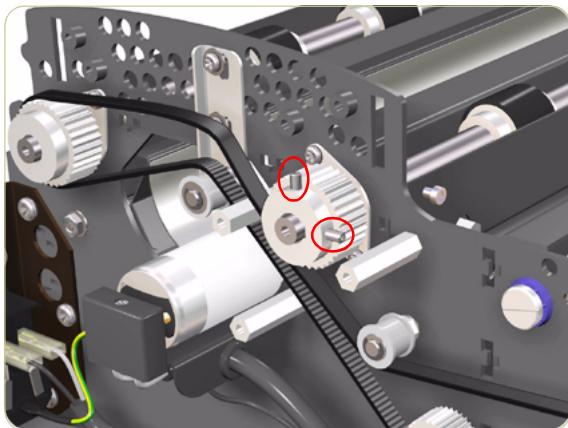
8. Remove the Guide Plate Sensor Support.



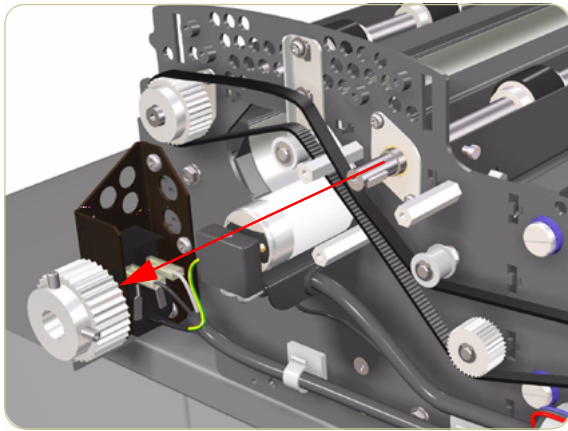
**9.** Loosen 2 screws from the Tension Bracket.



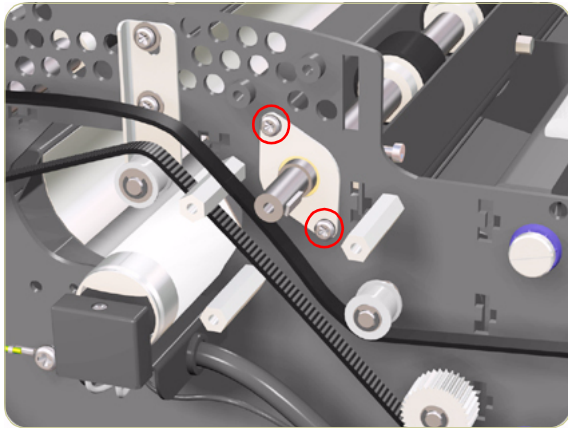
**10.** Lower the Tension Bracket to release the Belt.



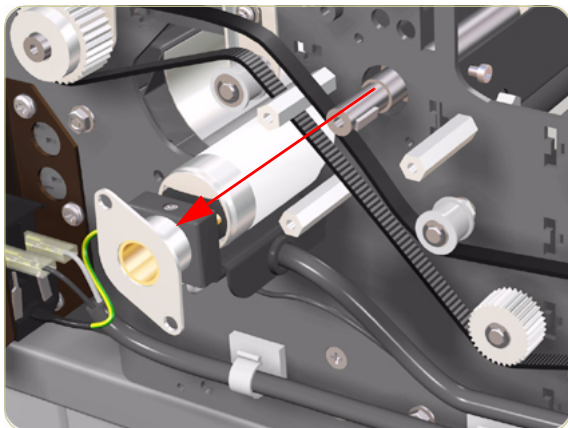
**11.** Loosen the Allen screws from the Roller Gears on the left side of the scanner.



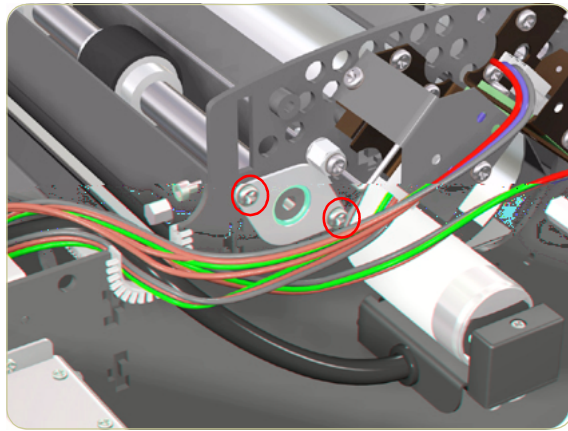
**12.** Remove the Roller Gears taking care not to lose the metal wedges.



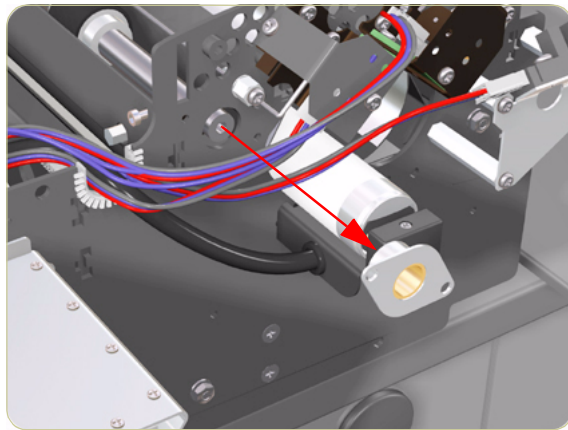
**13.** Remove 2 screws from the Roller Mount Bushing on the left side of the scanner.



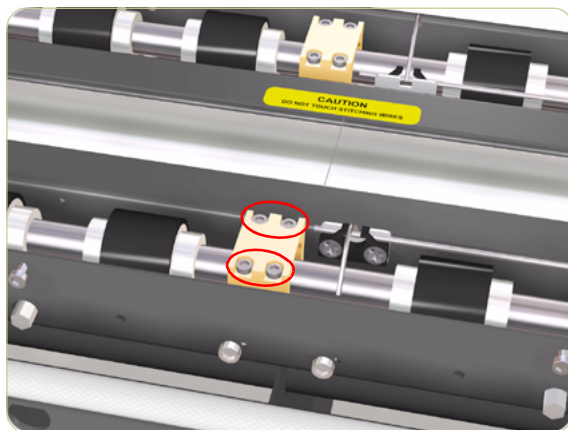
**14.** Remove the Roller Mount Bushing.



- 15.** Remove 2 screws from the Roller Mount Bushing on the right side of the scanner.

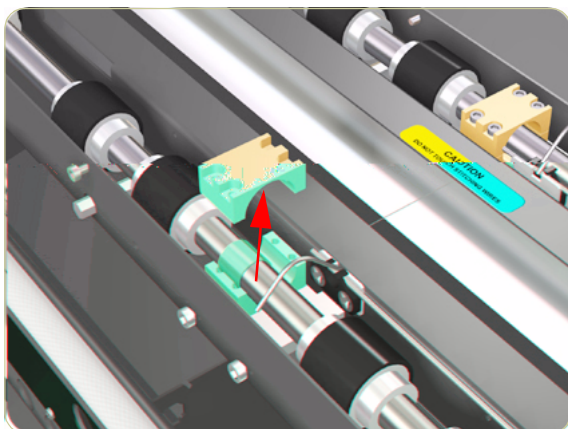


- 16.** Remove the Roller Mount Bushing.

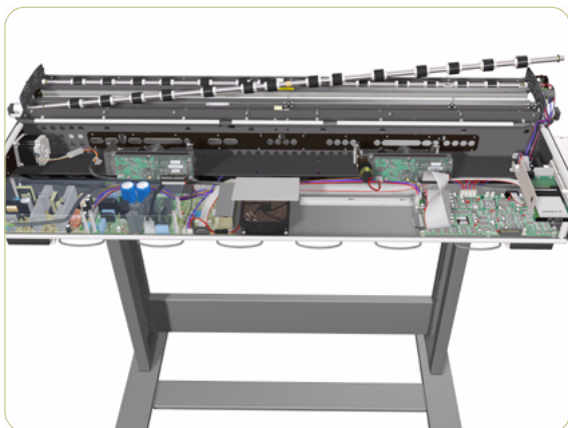


- 17.** Remove 4 screws from the Roller Clamp that secures the Roller.

**The Roller Clamps for the Entry and Exit Rollers must not be interchanged, so please mark the top Roller Clamp before removing.**



**18.** Remove the Roller Clamp.



**19.** Slide the Roller towards the pulley end to pull it out of the bearing at the opposite end. Hold onto the center of the Roller and flex it slightly to allow the Roller to pass the bearings of the Media Detector Wires. Raise the Media Detector Wires to the upright position and lift out the Roller.

**When removing the Roller, note the number of washers on the end of the shaft so that they can be replaced later.**

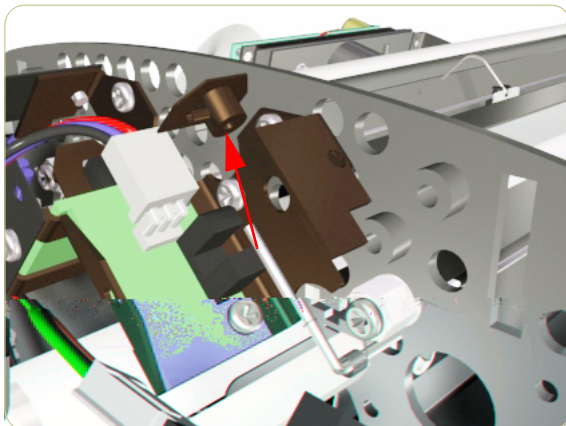
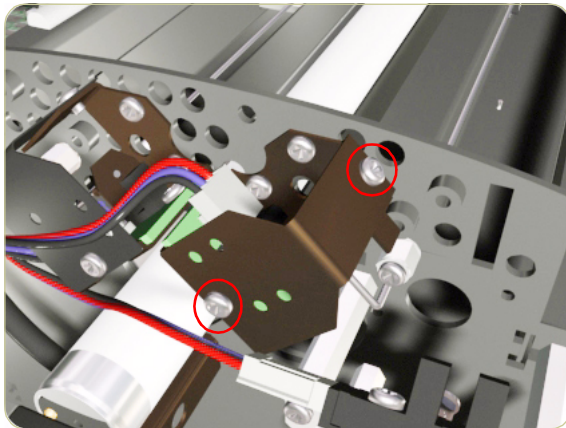


## Media Detector Wires

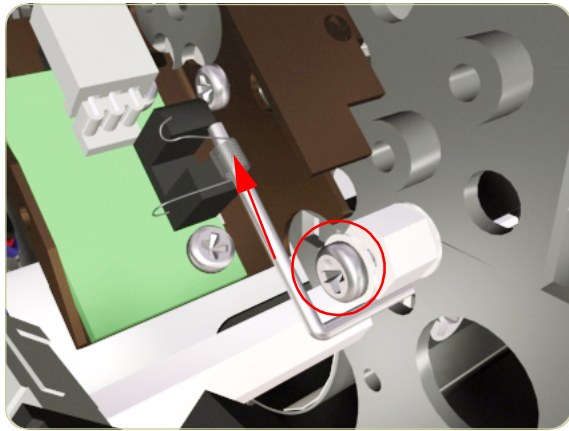
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

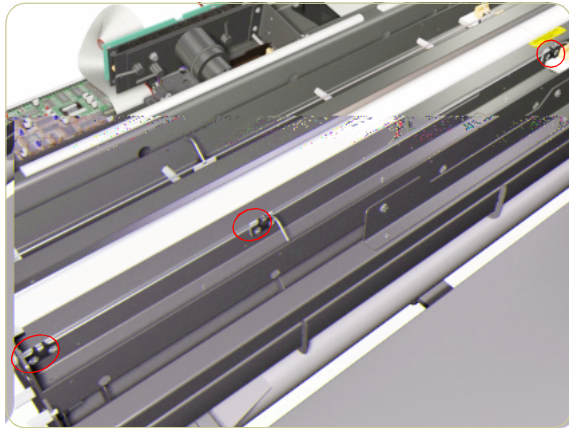
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Entry Roller Shield ⇒ Page 4-13.
6. Remove the Exit Roller Shield ⇒ Page 4-14.
7. Remove the Rollers ⇒ Page 4-34.
8. Remove 2 screws that secure the Media Sensor Bracket. Remove the Media Sensor Bracket.



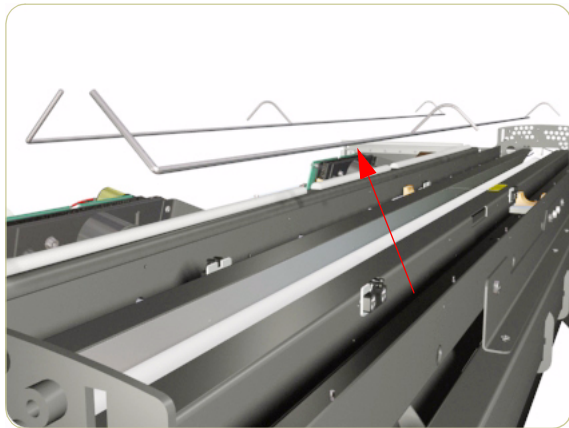
9. Loosen the Allen Screw that secures the Shutter Plate. Remove the Shutter Plate.



**10.** Loosen the screw that holds the Torsion Spring. Remove the Torsion Spring.



**11.** Loosen the screws from the bearings that secure the Media Detector Wires.

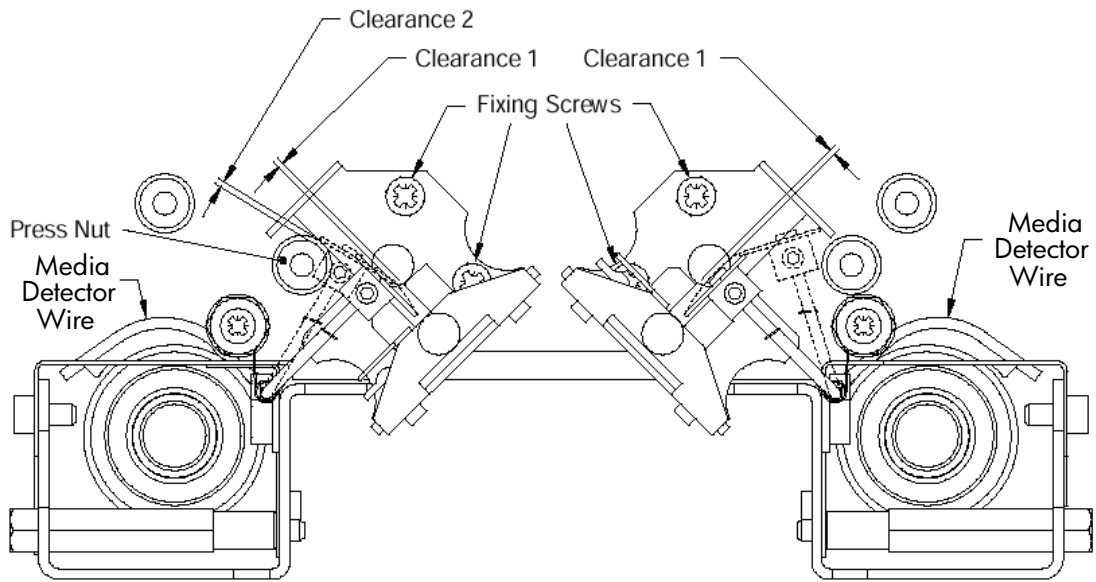


**12.** Remove the Media Detector Wires from the scanner.

## Media Detector Wires

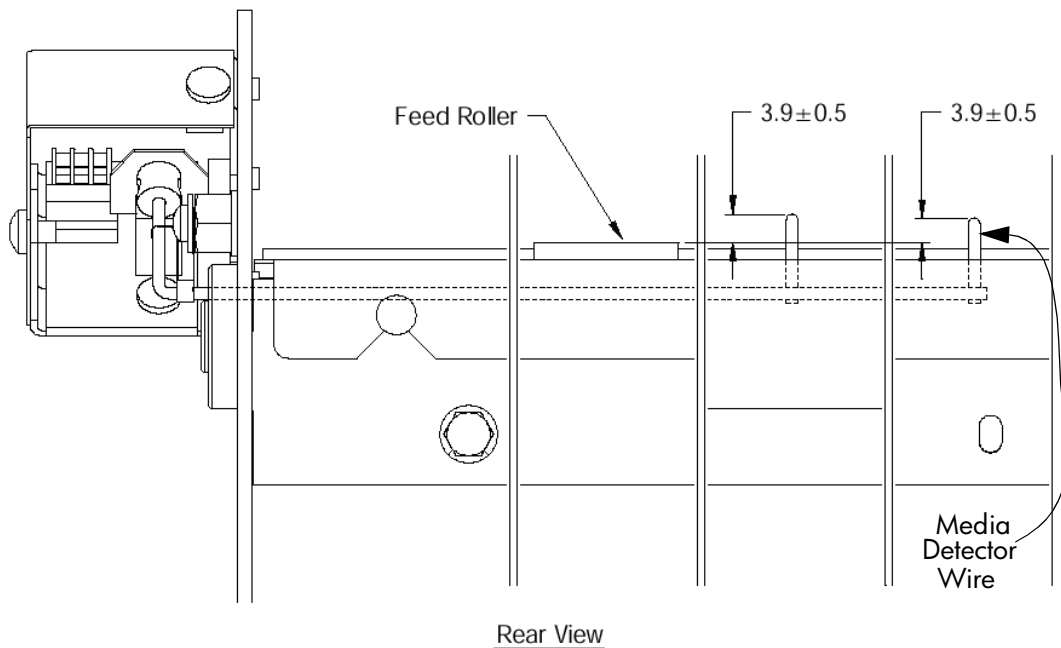
### Installation

When installing the Media Detector Wires, make sure you achieve the following tolerances:



Clearance 1: Make sure that the shutter plates do NOT touch the legs of the Media Sensors when moving (Clearance > 0.5 mm)

Clearance 2: Make sure that the shutter plates do NOT touch the press nut when moving (Clearance > 0.5 mm)

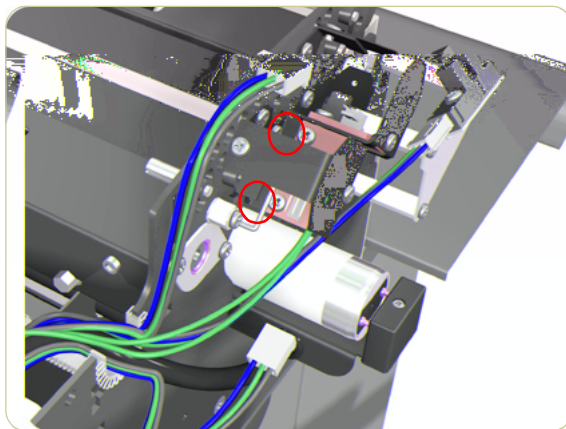
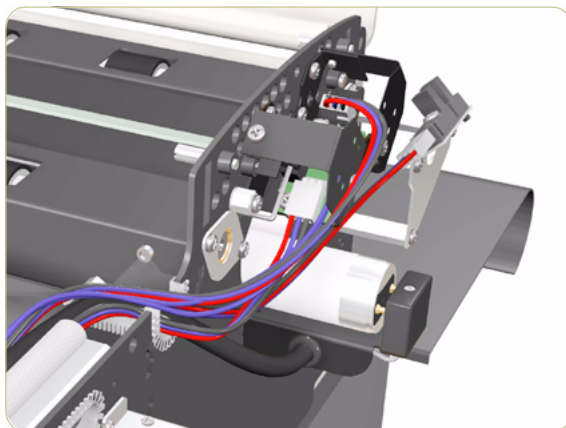


## Media Sensors

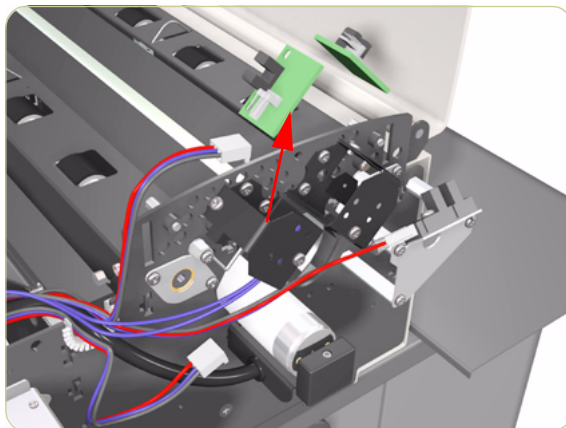
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Right Cover ⇒ Page 4-8.
4. Disconnect the cables from the 2 Media Sensors.



5. Remove 2 screws from each Media Sensor.



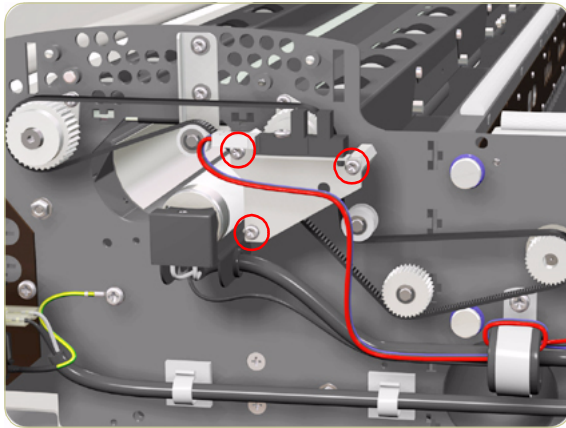
6. Remove both Media Sensors.

## Belt

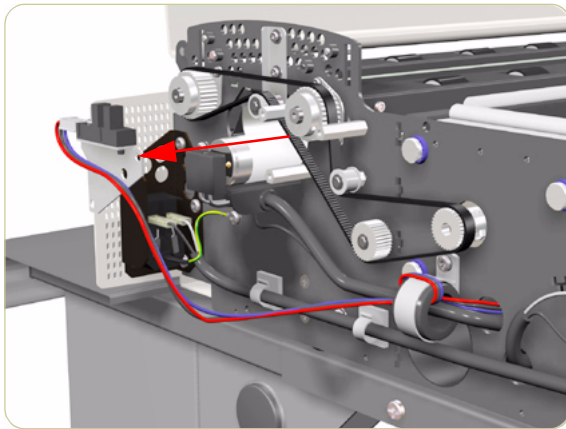
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

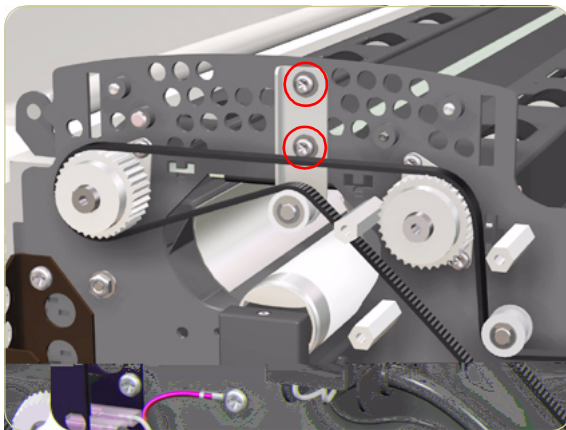
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Left Cover ⇒ Page 4-6.
4. Remove 3 screws from the Guide Plate Sensor Support.

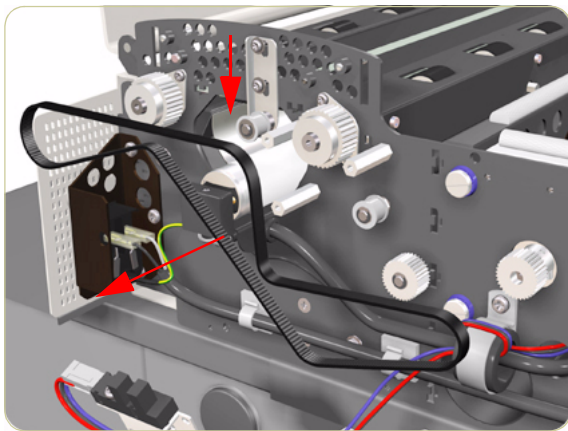


5. Remove the Guide Plate Sensor Support.



6. Loosen 2 screws from the Tension Bracket.





7. Lower the Tension Bracket and remove the Belt from the scanner.

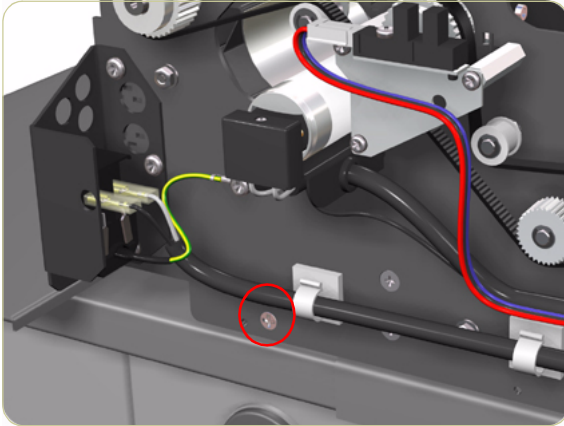
**When reinstalling the Belt, make sure that you adjust the belt tension when securing the Tension Bracket.**

## Bottom Cover

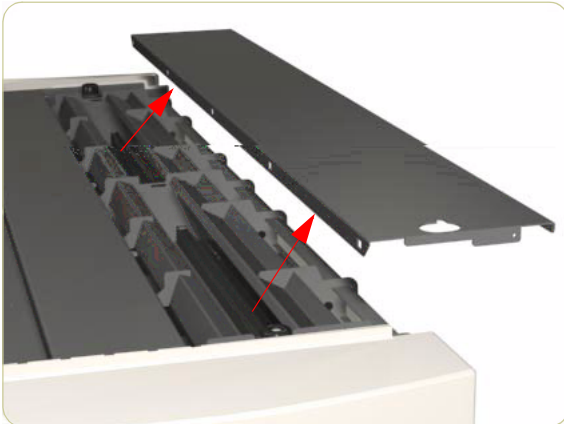
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Rear Cover ⇒ Page 4-10.
2. Remove the Left Cover ⇒ Page 4-6.
3. Remove the Right Cover ⇒ Page 4-8.
4. Turn the scanner upside down.
5. Remove 1 screw from each side of the Bottom Cover.



6. Raise the cover slightly from the front and then remove.

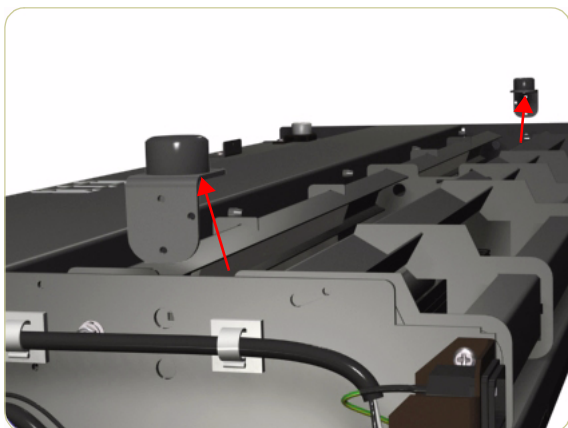
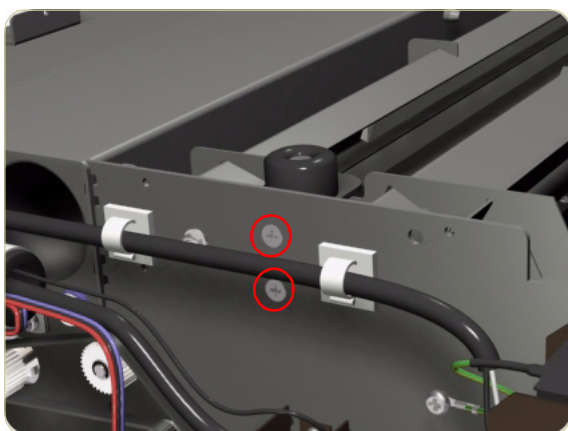


## Mirror Chassis

### Removal

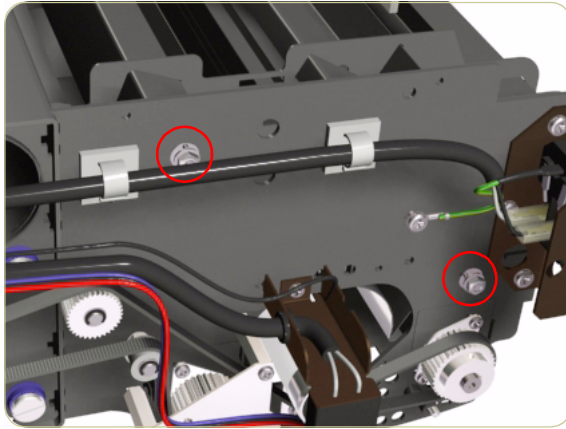
**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Right Cover ⇒ Page 4-8.
6. Remove the Bottom Cover ⇒ Page 4-45.
7. Remove 2 screws from each plastic foot (only the 2 rear ones).

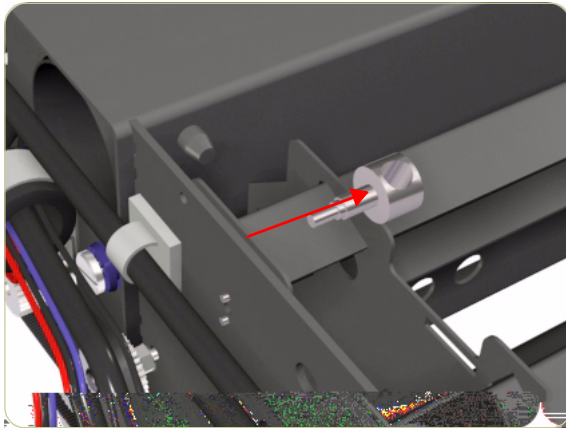


8. Remove the plastic feet.

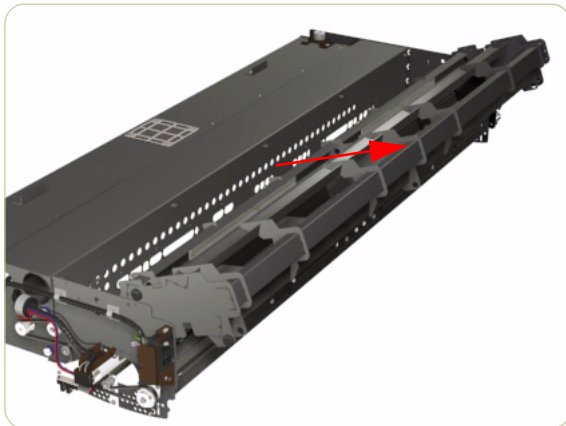




9. Remove 2 nuts from each side of the Mirror Chassis.



10. Remove the 2 locating screws from both sides of the Mirror Chassis.



11. Rotate the Mirror Chassis towards you, lift up and remove from the scanner.

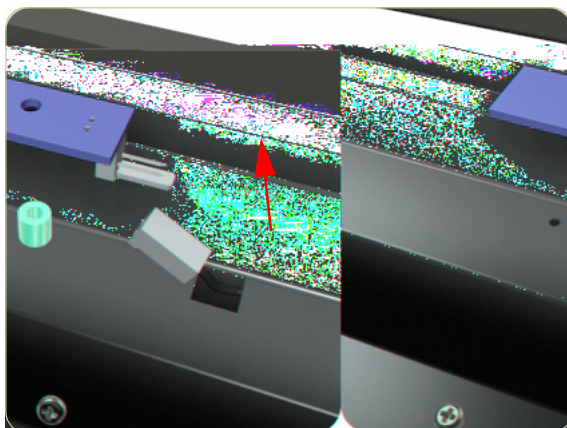
**Always clean the mirrors before replacing the Mirror Chassis.**

## Lamp Sensor

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Right Cover ⇒ Page 4-8.
6. Remove the Bottom Cover ⇒ Page 4-45.
7. Remove the screw that secures the Lamp Sensor.



8. Disconnect the cable from the Lamp Sensor and remove from the scanner.

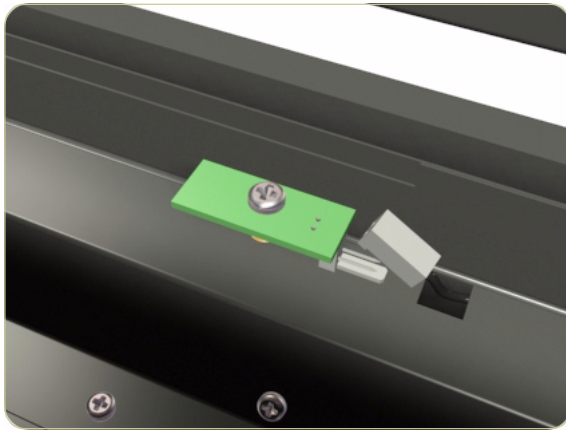
**After installing the Lamp Sensor, you must adjust the potentiometer on the Driver Board.**

## Reflector Assembly

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Right Cover ⇒ Page 4-8.
6. Remove the Bottom Cover ⇒ Page 4-45.
7. Remove the Mirror Chassis ⇒ Page 4-46.
8. Disconnect the Cable for the Lamp Sensor.



9. Remove 12 screws from the Reflector Assembly.



10. Remove the Reflector Assembly from the scanner.

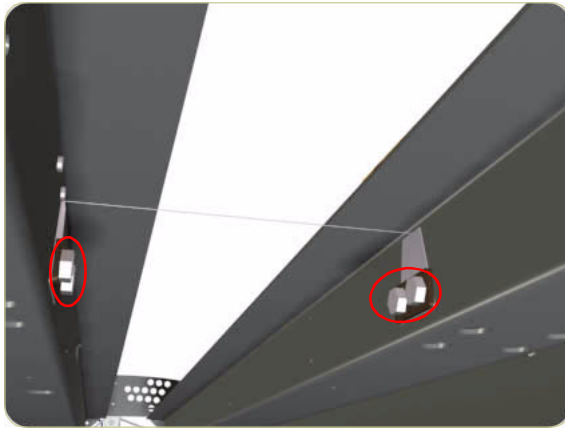
**To prevent damage to the Stitching Wires when replacing the Reflector Assembly, the notches in the Reflector Assembly must be aligned with the Stitching Wires. This can be done by carefully keeping the holes for the fixing screws aligned with the holes in the Scanner Chassis.**

## Stitching Wire

### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

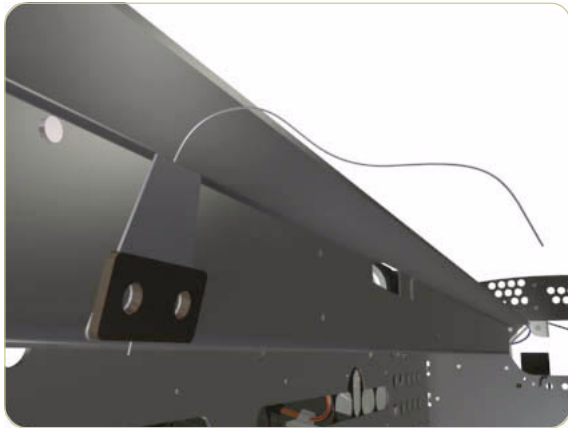
1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Glass Plate ⇒ Page 4-12.
4. Remove the Left Cover ⇒ Page 4-6.
5. Remove the Right Cover ⇒ Page 4-8.
6. Remove the Bottom Cover ⇒ Page 4-45.
7. Remove the Mirror Chassis ⇒ Page 4-46.
8. Remove the Reflector Assembly ⇒ Page 4-49.
9. Remove 4 screws that secure the Leaf Springs.



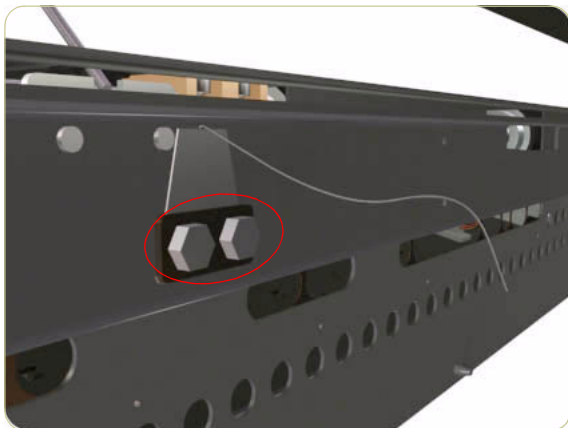
10. Remove the Leaf Springs and the Stitching Wire.

## Stitching Wire

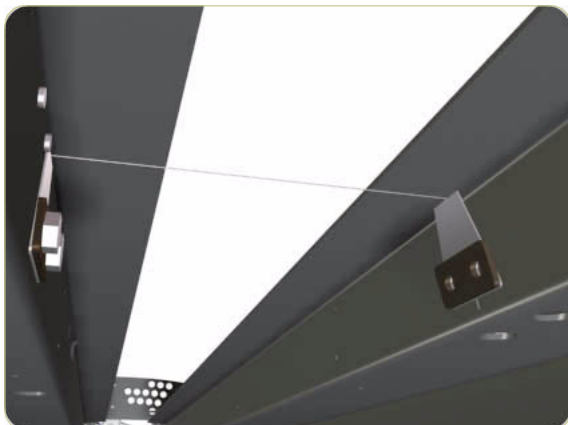
### Installation



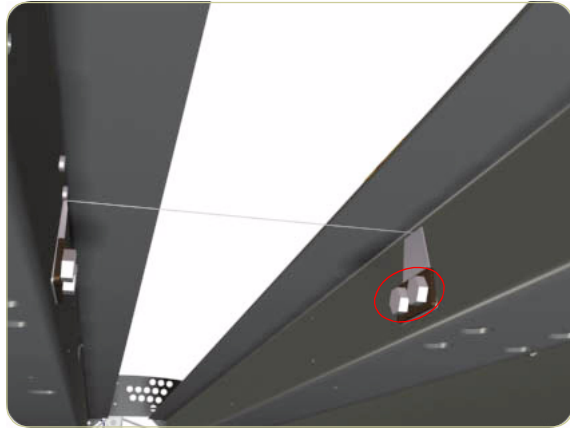
1. Wrap the Stitching Wire around one of the Leaf Springs.



2. Install the Leaf Spring using 2 screws.



3. Tension the Stitching Wire around the second Leaf Spring.

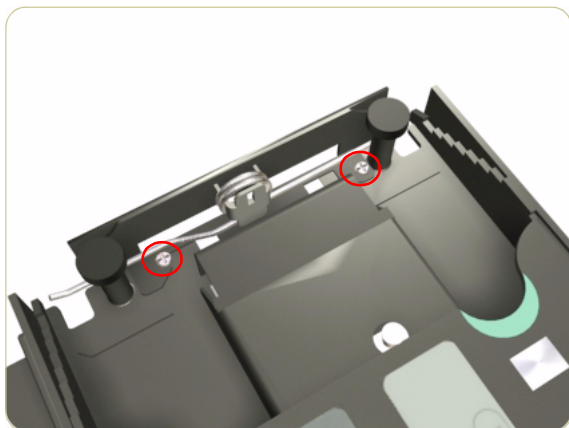


4. Install the second Leaf Spring using 2 screws, making sure the wire is continuously tensioned.

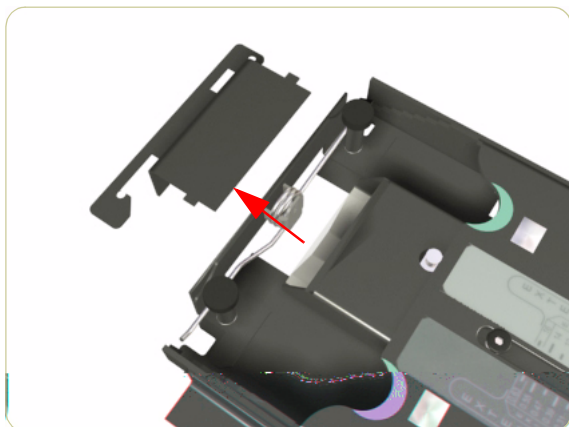
## White Background Assembly

### Removal

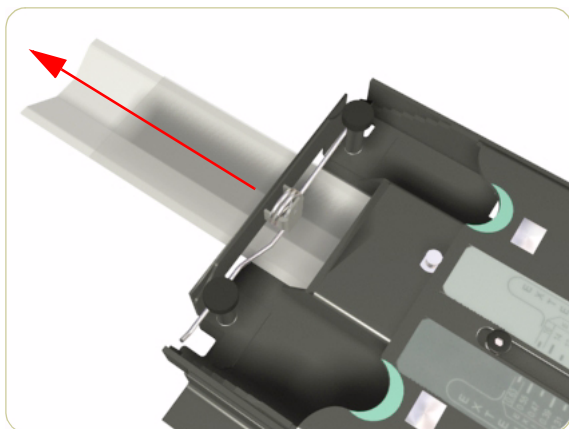
**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**



1. Remove the Guide Plate ⇒ Page 4-5.
2. Remove 2 screws from the Stop Bracket at one end of the Guide Plate.



3. Remove the Stop Bracket from the Guide Plate.



4. Slide out the White Background Assembly from the Guide Plate.

**When installing the White Background Assembly, press down on the leaf springs while sliding the Assembly in to the Guide Plate.**

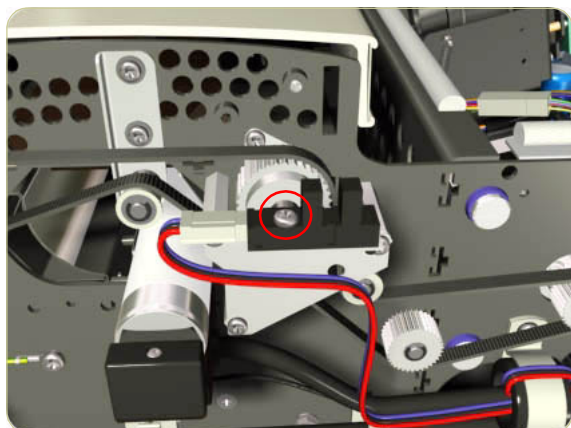


## Thickness Sensors

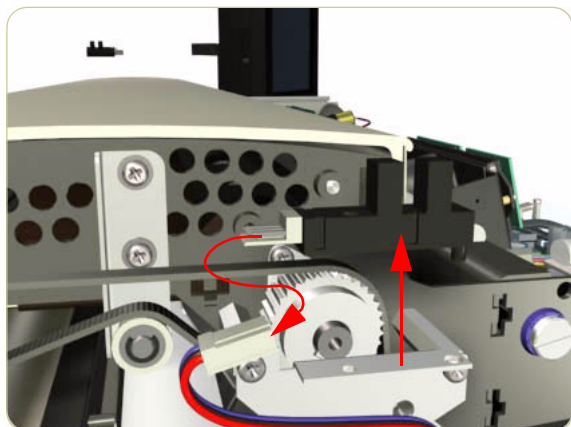
### Removal

**Switch the printer, scanner and the PC OFF, and disconnect them from the power source prior to performing any maintenance.**

1. Remove the Top Cover ⇒ Page 4-4.
2. Remove the Guide Plate ⇒ Page 4-5.
3. Remove the Left Cover ⇒ Page 4-6.
4. Remove the Right Cover ⇒ Page 4-8.
5. Remove 1 screw that secures the Thickness Sensor to the scanner.



**There are 2 Thickness Sensors in the scanner, one on the left side and one on the right.**



6. Disconnect the cable and remove the Thickness Sensor from the scanner.



# Adjustments

# 5

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## Introduction

This chapter explains how to adjust the copier for optimal scanning-quality. It describes the adjusting procedures in detail and provides additional information regarding wrong and right.

A general concept when adjusting the copier is to loosen screws just slightly. If you loosen the screws too much, you will have difficulties controlling the adjustments, because of too much play in the adjustment levers and other adjustment points. Unless this chapter states otherwise, always loosen screws and nuts **only** slightly.

## Terminology

Throughout this chapter a number of visual elements will be used to guide you through the adjustment process.



The exclamation mark will be used to point out possible sources of errors. If something can go wrong when doing a specific action, this visual item will describe it.



Thumbs up will be used with hints, tips and tricks that make a specific action easier to complete.



A hand in an illustration means that this particular adjustment does not require a tool. It can be adjusted with your fingers.



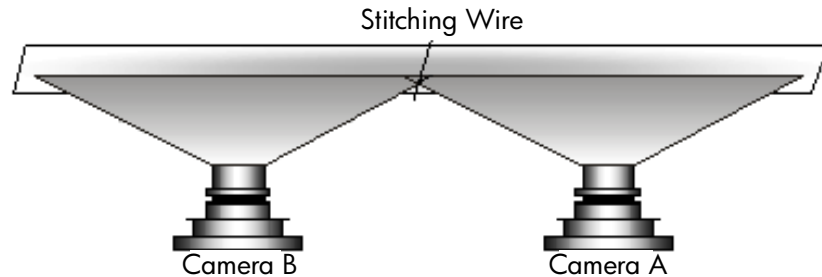
A screwdriver in an illustration means that this particular adjustment requires a tool. It can't be adjusted with your fingers alone.

Text in **bold** describes a mechanical part, an item or a program button, which can be located in one of the illustrations.

## Camera Design

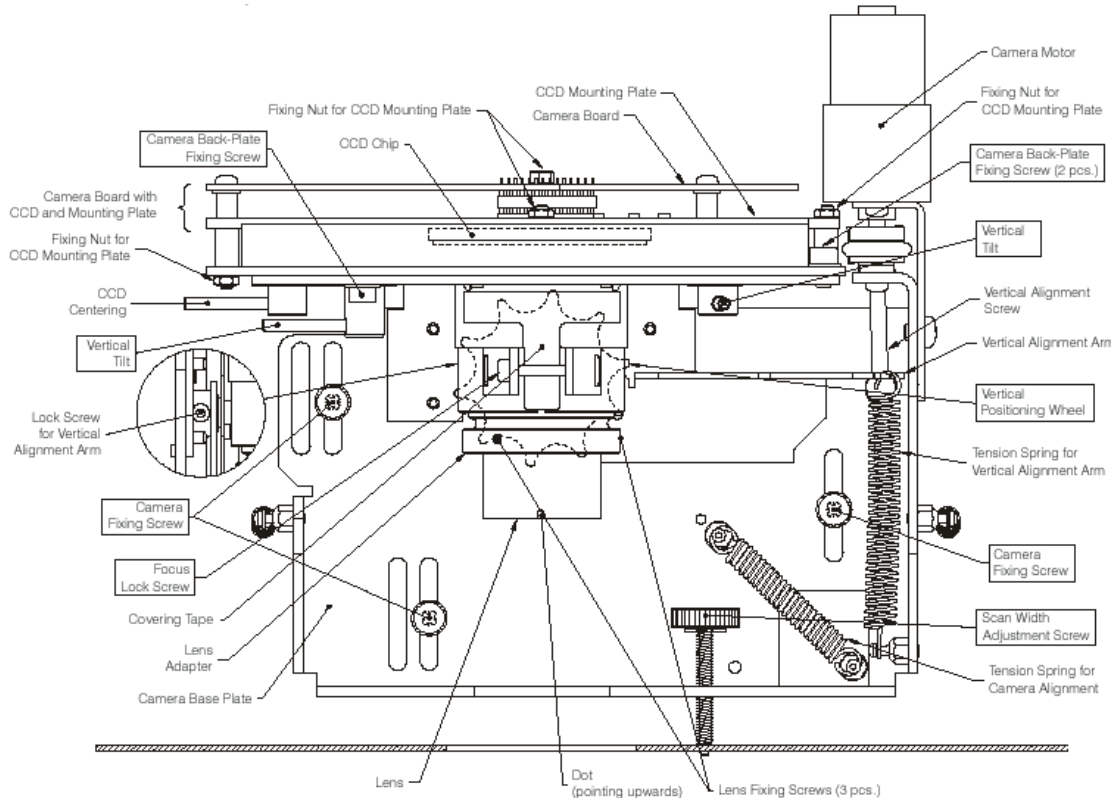
### Introduction

The hp designjet copier cc800ps uses 2 cameras, where each camera scans its own part of the image.

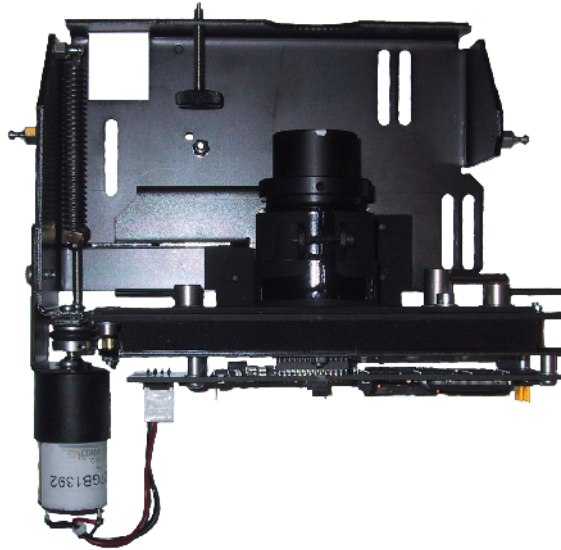


The cameras are named A to B and when positioned in the copier, Camera A is on the right (the one closest to the Operator Panel).

The cameras scan-area overlaps to ensure that the scanner scans the complete image. Most of the scanner adjustments are focused on getting the correct Scan-Width. The adjustment ensures that a camera scans the right amount of image data so that the basic DPI resolution of the camera is precise. This fine-tunes the accuracy of the scanner. A metal wire (**stitching wire**) in the overlapping area helps the copier to adjust the cameras electronically.



The following picture shows how the camera actually looks like. Only Camera A has a motor at the rear (Camera B does not have a motor).



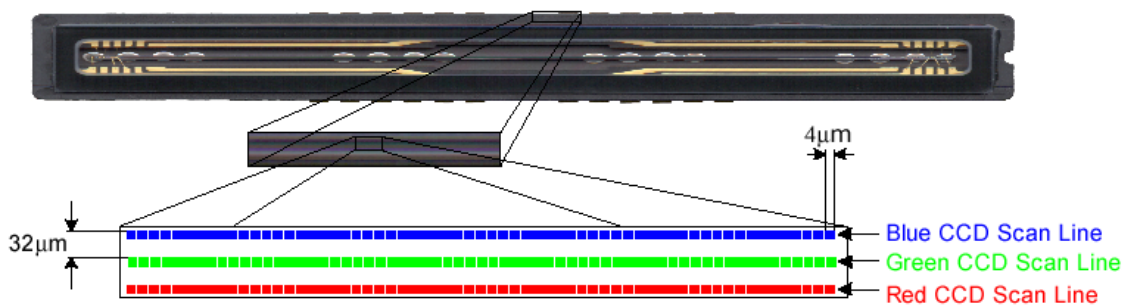
### The CCD Element

The central component of the Camera is the Sony CCD (Charge Coupled Device) element, which is responsible for capturing the colors reflected from the original image.



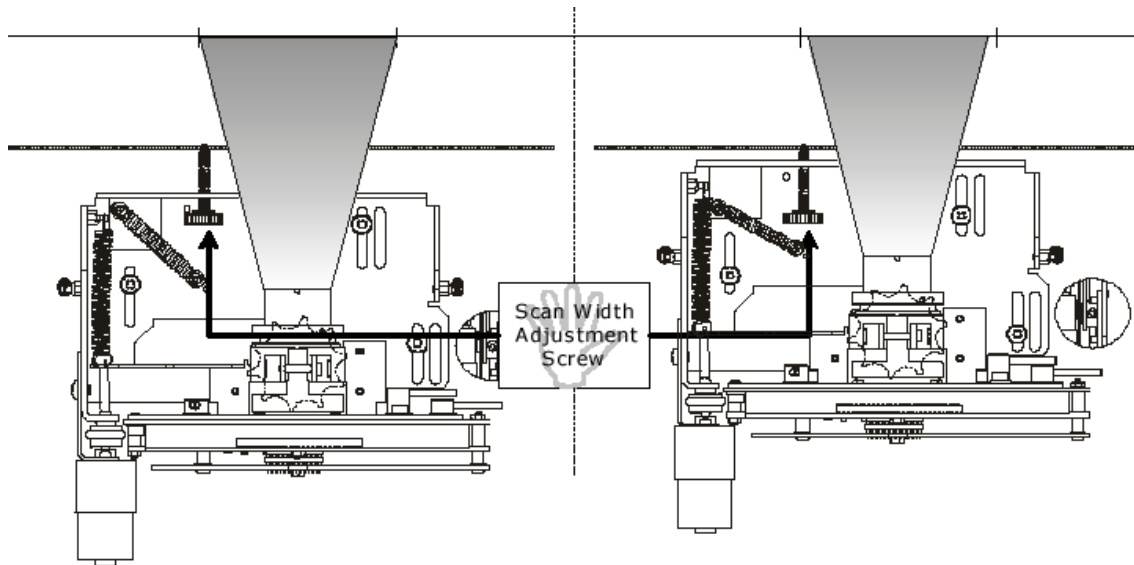
The CCD is formed as a chip, and is inserted into a standard dual in-line socket just like a normal chip. The chip has 3 rows each containing 10000 pixels.

The 3 rows each scan a different color. Combined, the 3 rows provide 24 bit color. Each CCD pixel is formed as a square with a side length of  $4\ \mu\text{m}$ . There is  $32\ \mu\text{m}$  between adjacent lines.



## Camera Board Adjustments

The **Scan-Width Adjustment Screw** moves the camera backwards and forwards, which influences the Scan-Width of the camera.

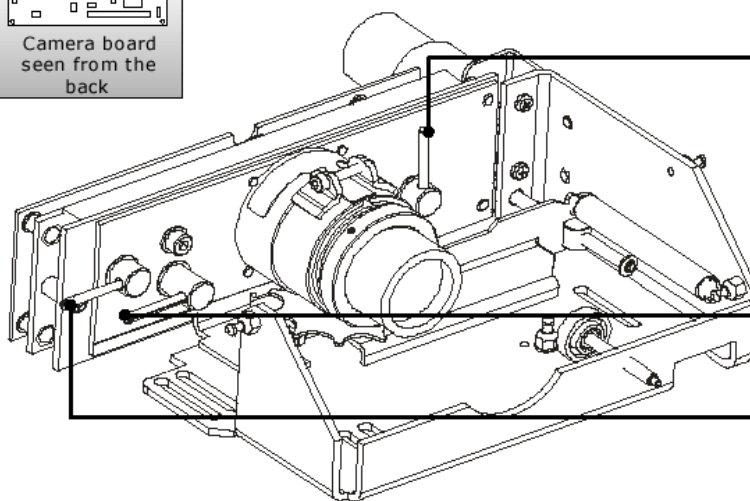
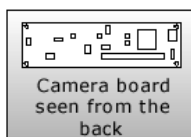


When the **Scan-Width Screw** is screwed all the way in, as illustrated on the left side of the above picture, the camera has the maximum possible scan-width. When it is screwed all the way out (right side of picture), the camera has the smallest possible scan-width.

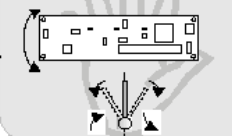


The **Scan-Width Screw** is only fixed on the camera itself and not on the scanner chassis. This means, that when screwing the screw backwards, you have to push the camera forward manually to decrease the scan-width. When screwing forward, the screw will push the camera backwards on it's own.

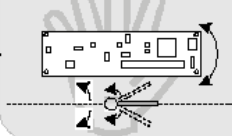
The CBE Camera Board, where the CCD is placed, can be moved relative to the camera using 3 adjustment levers.



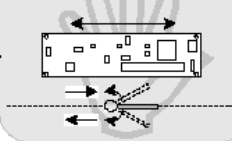
Vertical Tilt - Left



Vertical Tilt - Right

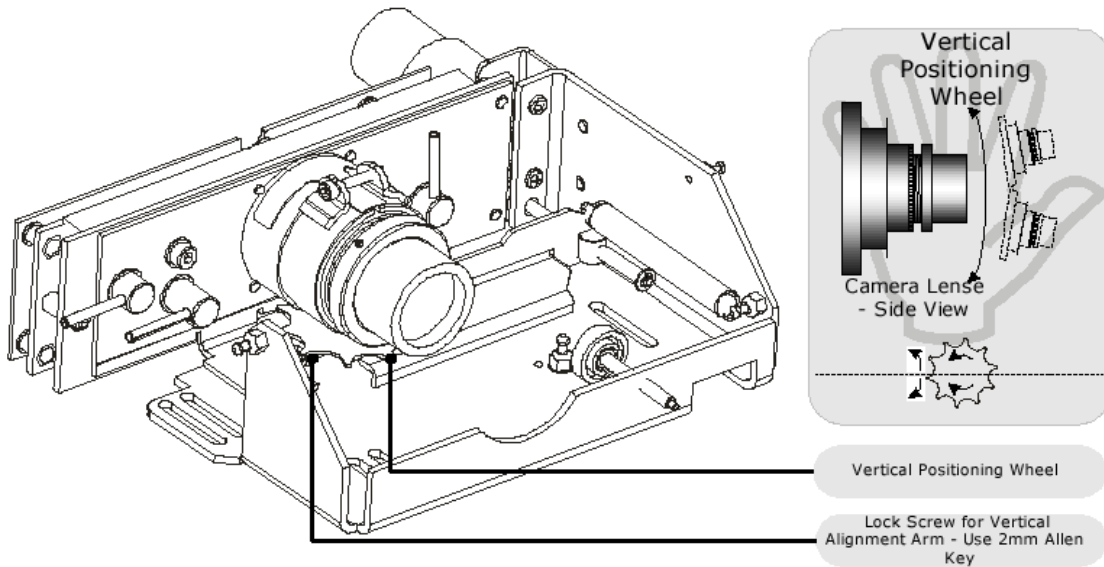


CCD-Centering



This is an easy and quick way of adjusting the camera, as it does not involve moving the camera itself, but only the camera board, which can be done very precisely.

- Vertical Tilt – Left: moves the left upper edge of the **CCD Mounting Plate** and the **CBE Camera Board** up and down, making the field of vision tilt in proportion to the horizon.
- Vertical Tilt – Right: moves the right upper edge of the **CCD Mounting Plate** and the **CBE Camera Board** up and down, making the field of vision tilt in proportion to the horizon.
- CCD Centering: moves the **CCD Mounting Plate** and the **CBE Camera Board** horizontally left and right and thereby making the field of vision move horizontally left and right.



The camera itself can be tilted up and down which causes the field of vision to move up and down. The **Vertical Positioning Wheel** is used for coarse adjustments and the **Vertical Alignment Screw** is used for finer adjustments. When you turn The **Vertical Alignment Screw** clockwise you raise the camera and the field of vision and vice versa. The **Vertical Positioning Wheel** works opposite of the **Vertical Alignment Screw**.



When using the **Vertical Positioning Wheel**, loosen the **Lock Screw** first, so that **Vertical Alignment Arm** doesn't move simultaneously. You will normally not adjust directly on the **Vertical Alignment Screw**, but instead via an extension and through a hole in the scanner front.



## Preparing the Copier

Before you start make sure that you have the following items, which are necessary to complete the Camera Adjustment:

- The SCANtest6 is installed in the touch screen (programs - Scanner Test Program - Scantest 6).
- Focus Pattern sheet (included in the Service Patterns pn Q1261-60037).
- Optical Pattern (pn Q1261-60038).

Make sure that the copier you are adjusting is fully functional. If the copier is not operational, you will not be able to adjust the camera.

## Adjusting the Camera



**This Chapter explains how to adjust Camera A, but the procedure is exactly the same for Camera B.**

### Light Profile

**Make sure that the left and right covers are installed and the top cover is removed. The scanner and the touch screen must be switched ON.**

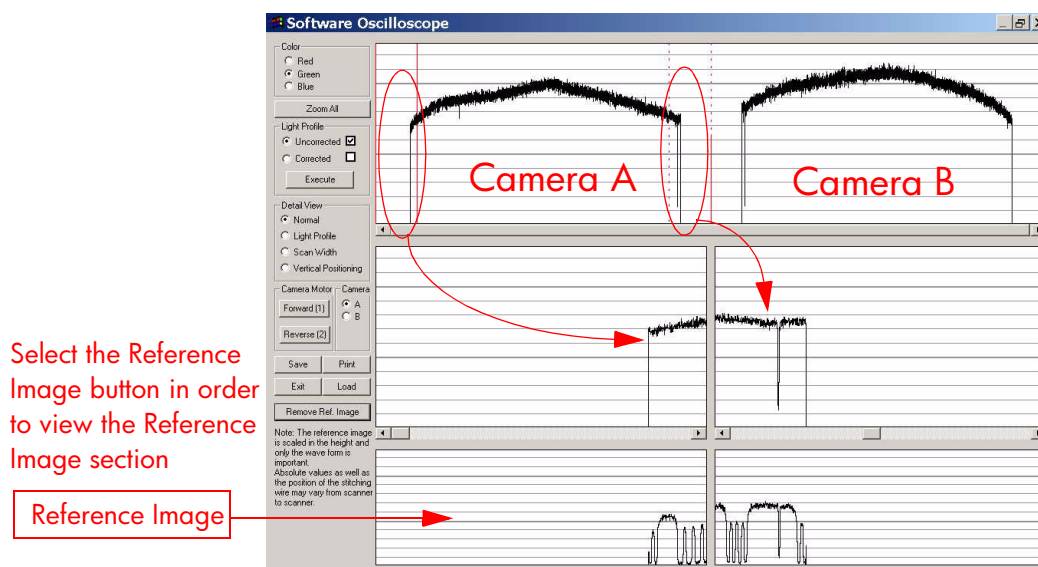


When you install the scanner in the copier again the camera may be completely out of adjustment. If you get an Error 30 from SCANtest when setting the Light Profile to **Corrected**, start with **Uncorrected** and follow steps 3 and 4 as well as you can and then start over with the **Corrected Light Profile** again.

The first thing to be done before adjusting the camera that has been replaced is to ensure that the camera is at least looking in the right direction.

- 1** Make sure that camera is completely installed and all cables are correctly connected.
- 2** Select button **9. Camera Adjustment** in SCANtest 6.

- 3 A software oscilloscope is now activated and looks something like this:

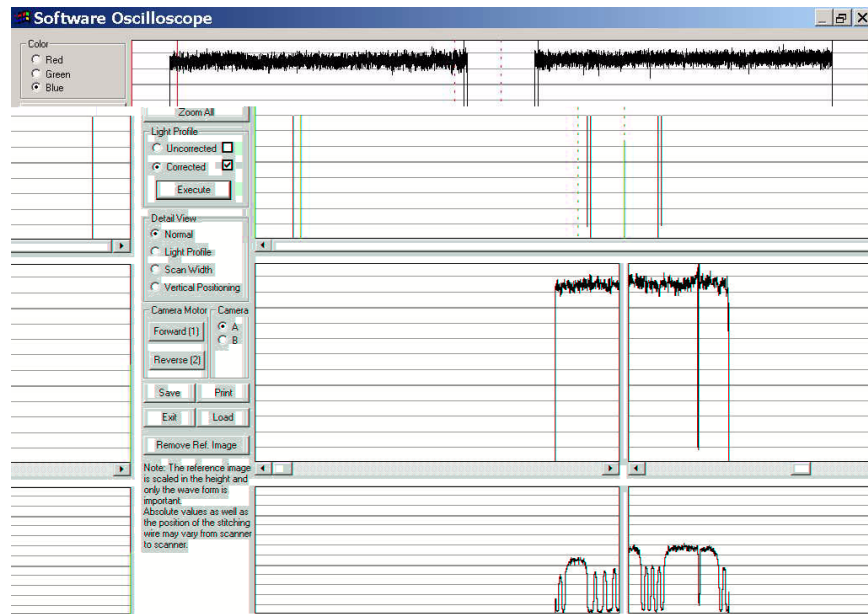


- 4 You see the uncorrected light profile, for Cameras A & B, that the copier receives from the reflection of the white background plate on the back of the original guide. Camera A is on the left, Camera B is on the right. You can zoom in with the buttons on the touch screen. You can see that the output is lower at the edges. This is because of the lens in the camera. If you get a screen that looks distorted in comparison with the above image, then your camera is maybe looking into the chassis instead of the mirrors in the copier. To correct this, loosen the **Lock Screw for Vertical Alignment Arm** and rotate the **Vertical Positioning Wheel** left or right until you get an oscilloscope image similar to the one above. Remember to fasten the **Lock Screw for Vertical Alignment Arm** afterwards again.

## Focus Adjustment

The first adjustment that you need to make is the focus. This adjustment ensures, that the camera has the right focus, so that the following adjustments aren't blurred out. The focus setting is not so sensitive to the following adjustments, which makes it perfect to start with. When you are finished with all the adjustments, you should check the focus again just to be sure that it's still OK.

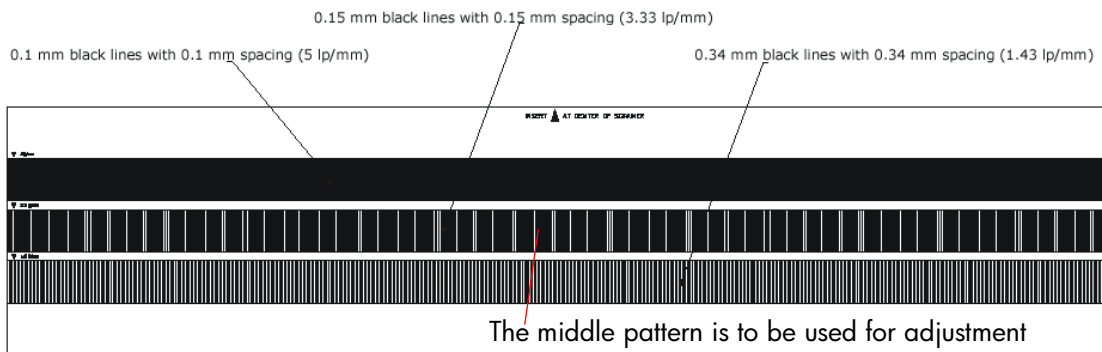
- 1 Stay in the Software Oscilloscope and select **Corrected** and press the **Execute** button (make sure that the Blue Channel is selected).
- 2 Wait approximately 90 seconds until SCANtest 6 is ready.



**3** Insert the Focus Pattern in the scanner.

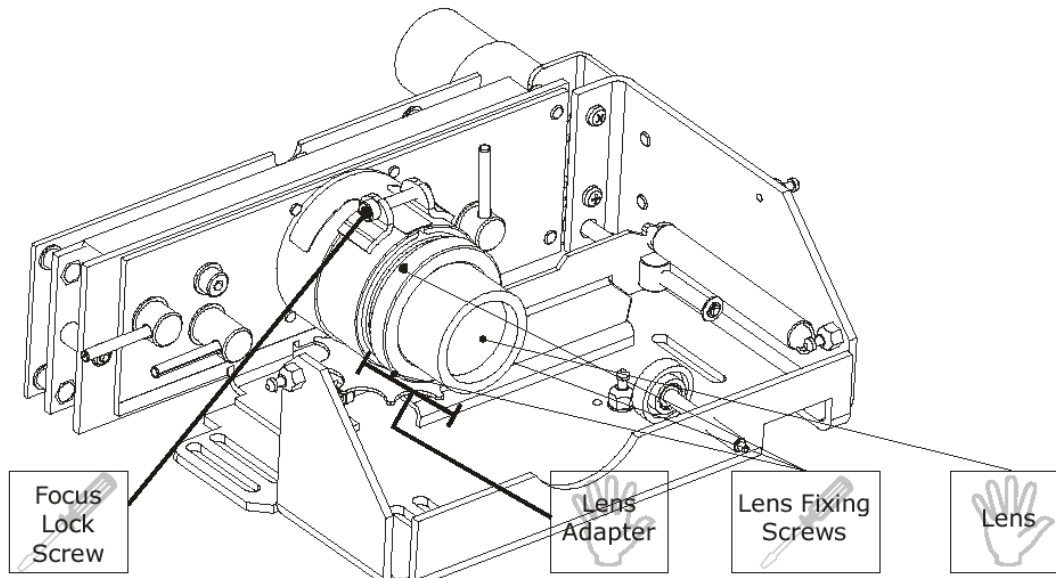


It's best to insert the sheet from the back of the copier and use the Reverse Key to position the pattern correctly. This way the sheet won't cover the cameras when you adjust them. It requires a little practice but makes the focus adjustment a lot easier.



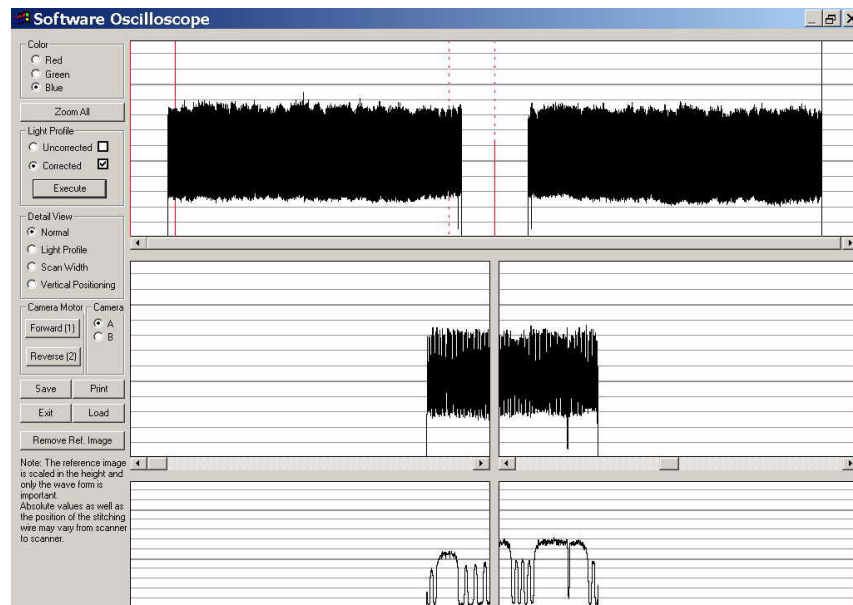
Use the operation panel keys to move the sheet so that the cameras see the 3.33 lp/mm pattern.

4 Loosen the **Focus Lock Screw** and turn the **Lens Adapter** to adjust the focus.



The Focus adjustment greatly influences the Scan-Width adjustment. Therefore the Scan-Width must be checked and readjusted if necessary when the Focus adjustment has been changed. On the other hand, the Focus adjustment is relatively tolerant to changes in the Scan-Width adjustment.

Loosen the **Focus Lock Screw** and ensure that it is not too loose. Turn the **Lens Adapter** until you get this picture on the software oscilloscope (Camera A has been zoomed in):



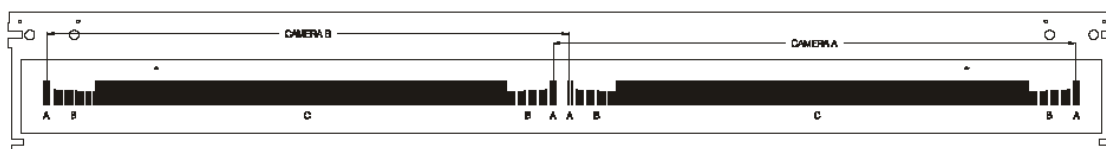
The signal has to be as even as possible and especially the ends have to be at their highest possible level.

When the focus is right, tighten the **Focus Lock Screw**.

There is a mark on every lens, which indicates its “best position”. If you have completed the focus adjustments and this mark isn’t pointing upwards, mark the upward position on the **Lens Adapter**. Turn the **Lens Adapter** and loosen the **Focus Lock Screw** and the three **Lens Fixing Screws** (with a 1,5 mm Allen key). Then turn the Lens so that the mark is pointing upwards, tighten the **Lens Fixing Screws** again. Turn the **Lens Adapter** back again and check that the focus is still correct before tightening the **Focus Lock Screw**.

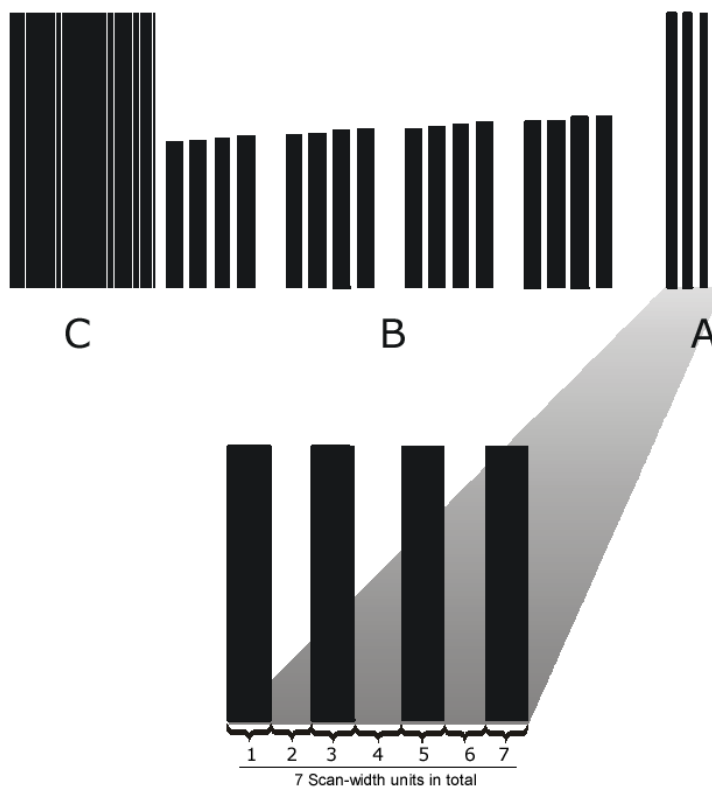
## Scan-Width Units

When adjusting the Scan-Width, you adjust up against some line on an **Optical Adjustment Pattern**.



The Optical Adjustment Pattern is a metal construction with a pattern glued on one side. This pattern contains three sub-patterns: A, B and C.

- Sub-pattern A contains a pattern used for Scan-Width adjustment.
- Sub-pattern B contains a pattern used for Vertical Position adjustment.
- Sub-pattern C contains a pattern used for coarse Focus adjustment.



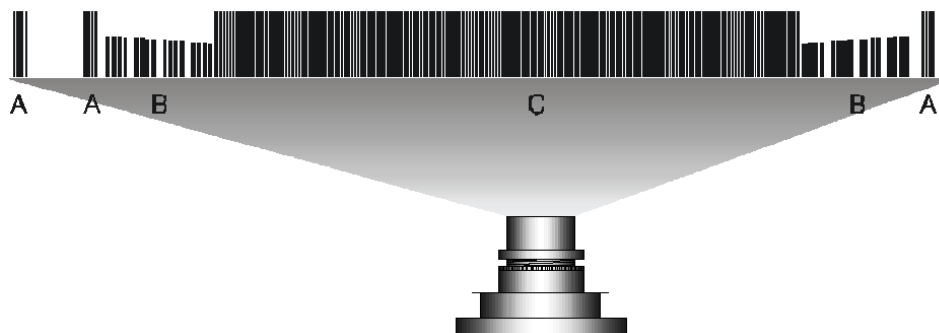
The **A** part of the pattern consists of scan-width units (SWU).

Each of the black lines represents a scan-width unit (SWU) as does the white space in between the lines. This makes a total of seven SWU's.

The black lines and whites spaces work like a marker or indicator that tells you how wide the camera scan-width is.

The scan-width units help you adjust the cameras, so that they have the correct scan-width. This ensures that the scanner has the correct optical resolution. Thereby ensuring that the scaling factor of the scanner is correct.

**Camera A** has three **A** patterns in its view:



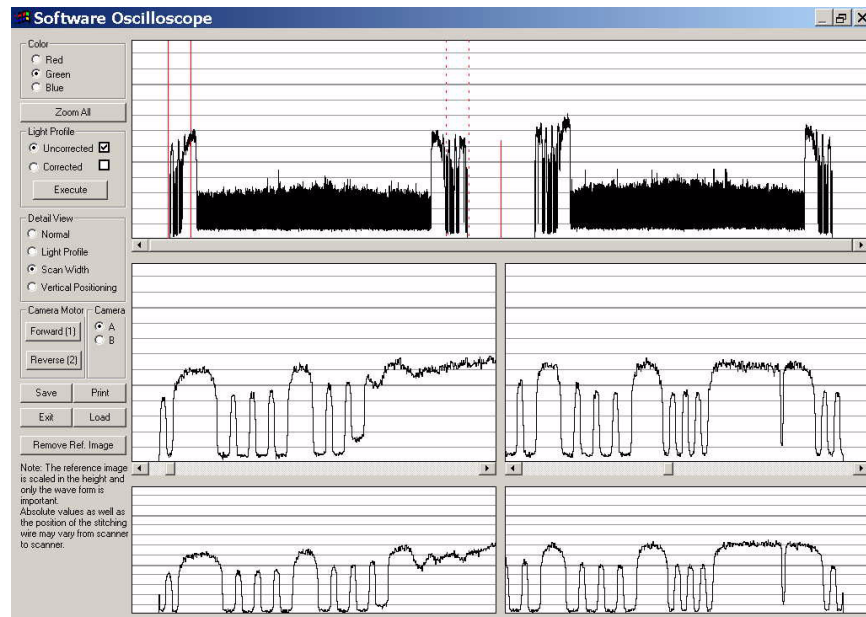
To ensure that the camera has the correct optical resolution, you are going to adjust the camera, so that it covers six scan-width units. This means that the camera has to see a total of six units at the ends of the view field. This can be two on the left and four on the right or five on the left or one on the right. The unit arrangement is not important as long as there are six in total.

Later on you will center the camera, so that there will be three units at each end.

## Scan-Width Adjustment

The purpose of Scan-Width adjustment is to position the camera so the field of vision is correct.

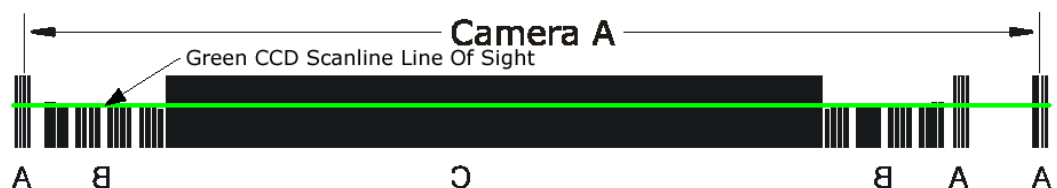
- 1 Remove the guide plate and place the Optical Pattern on the scanner. Align the pattern by pressing it to the right towards the operator panel and backwards toward the back of the scanner.
- 2 If not selected, select button 9 in SCANtest 6. Select **Uncorrected** Light Profile and press **Execute** (make sure that the Green Channel is selected).



- 3 This is what **Camera A** is going to see, when the scan-width adjustment is finished:

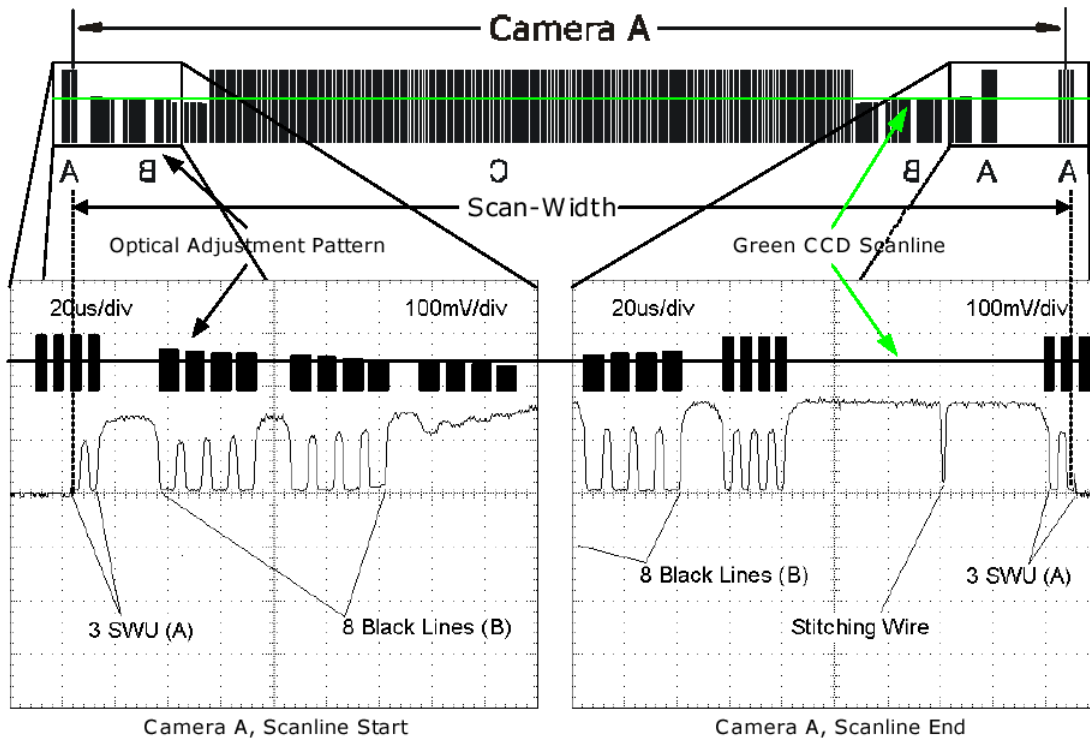


Camera A scans from right to left, so the image above is a mirrored section of the total **Scan-Width pattern** as the copier actually sees it. The camera only sees a single line of pixels with the green CCD pixel line that we enabled under step 2. The goal is to adjust the camera so that the green pixel line of the CCD is positioned as the green line below:



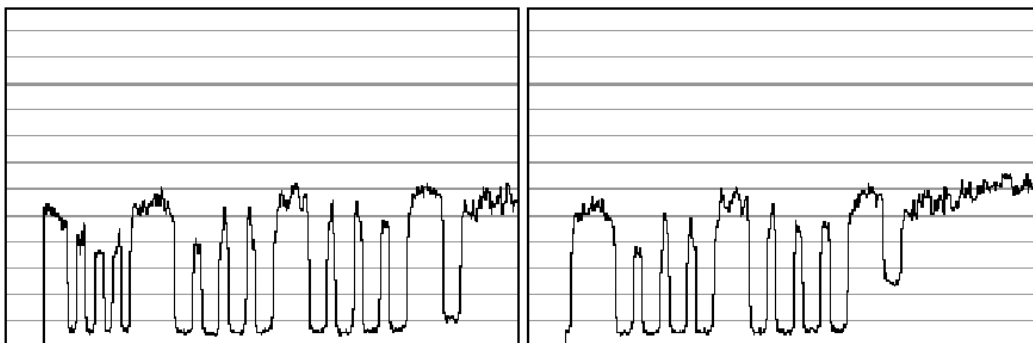
When you have succeeded in getting this, most of the adjustments for **Camera A** are finished.

But first we start by setting the Scan-Width of Camera A. You use the software oscilloscope to guide you, and this is what you are going to see:



In the image you see a real oscilloscope image of the left- and the right most part of the **Camera A Scan-Width pattern**. Whenever the camera sees a black line, the output level goes down. It goes up when seeing white. When the **Green CCD Scanline** is in the correct position, each end of the camera output will have the appearance as shown.

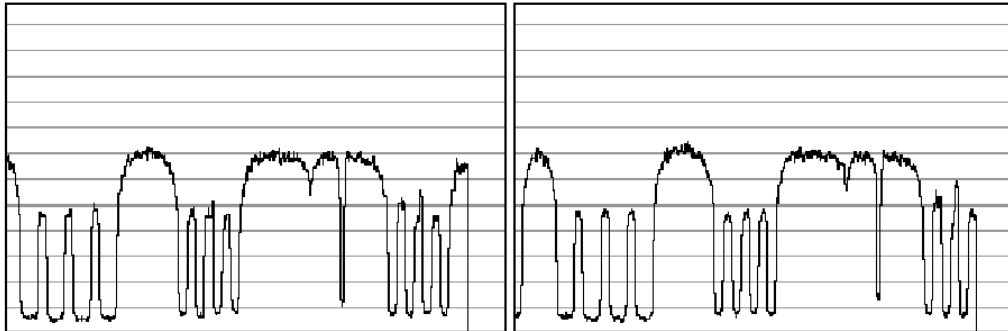
- Now press **Scan Width** under Detail View on the software and the program automatically zooms in on the left and right part (Scanline Start/End) of the output. On the left side you will get an output like one of these (or something in between):





The output we are aiming for can be seen below, therefore:

- The left output is too much to the left – if you have an output like this, you need to slide the CCD board to the right by turning the **CCD Centering** tab upwards.
  - The right output is too much to the right – if you have an output like this, you need to slide the CCD board to the left by turning the **CCD Centering** tab downwards.
- 5 When you have one, two or three scan-width units (SWU) on the left side of the camera, look at the right side of the camera.
  - 6 On the right side (Scanline End) you will get output like one of the following:



Remember how many scan-width units you had on the left side and remember that there has to be six in total.

If you had three SWU's on the left side of the output you also have to have three on the right and the output we are aiming for is as shown below. Therefore:

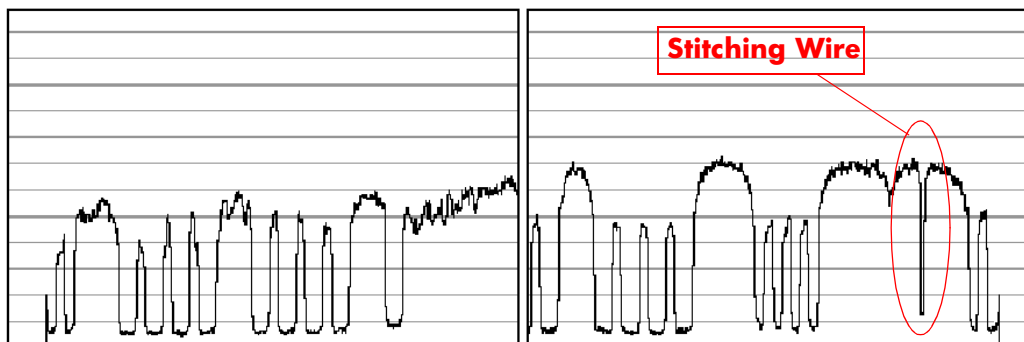
- On the left picture above the Scan-Width is too wide – if you have an output like this, you need to move the camera forward to decrease the Scan-Width.
- On the right picture above the Scan-Width is too narrow - if you have an output like this, you need to move the camera backward to increase the Scan-Width.



Look for the **Stitching Wire**. There's only one of these on the right side of the camera. If you don't see the Stitching Wire, then the camera has to be pulled back quite a lot because the scan-width is too narrow.

- 7 Repeat steps 4 to 6 until the camera sees a total of six SWU's.

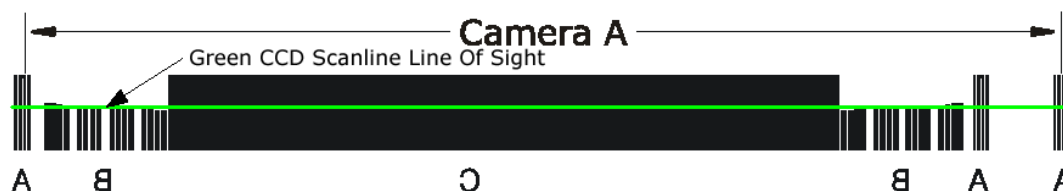
- 8 When you have six SWU's in total, use the **CCD-Centering** lever to adjust the camera so that there is three SWU's on each side of the camera as shown below:



- 9 Check the focus again because large changes to the Scan-Width adjustment also affects the focus.
- 10 If the focus needed adjusting, start over with the Scan-Width from step 4, because a slight change in the focus will affect the Scan-width considerably.
- 11 When you are finished, and both the focus and the Scan-Width are correct, tighten the three **Camera Fixing Screws** without moving the camera.
- 12 Proceed to the Vertical Positioning section without altering anything about your set-up.

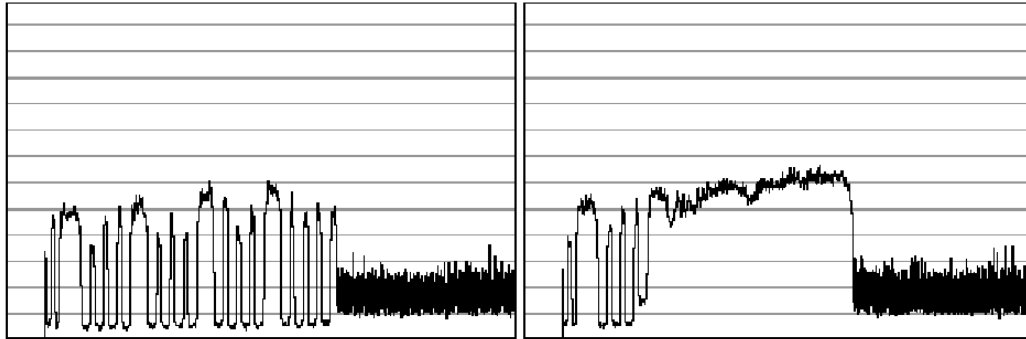
## Vertical Positioning

The purpose of the vertical positioning is to adjust the camera, so the **Green CCD Scanline** looks at the correct vertical position on the **Optical Adjustment Pattern** as seen on the picture below. Furthermore it ensures that the Scanline is horizontal.



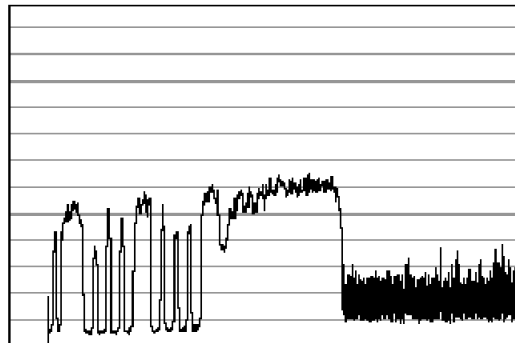
- 1 SCANTest 6 should still show **Uncorrected Light Profile, Green**. If not, change it to those settings.
- 2 Loosen the **Camera Back-Plate Fixing Screws** if they are not already loose.

- 3** Select **Vertical Positioning** under Detail View and look at the left part (Scanline Start) of the camera output. You will get an image similar to one of these (or even less lines than shown on the right image):

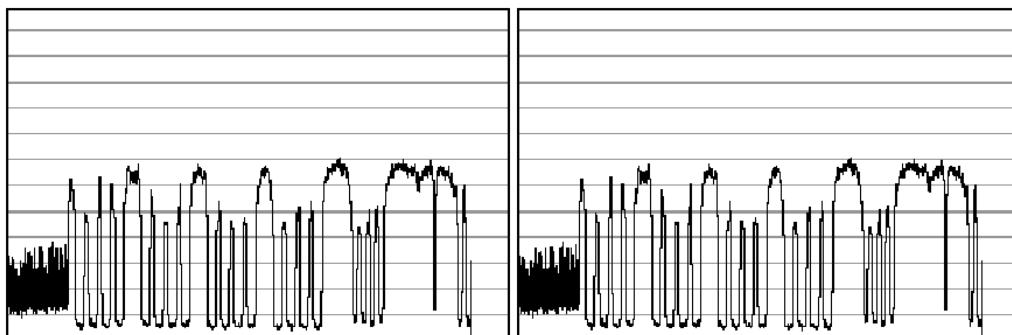


The output we are aiming for can be seen below, therefore:

- On the left image the vertical position is too low – if you have an output like this, you need to lower the left side of camera with the left **Vertical Tilt** lever, by turning to the left.
- On the right image the vertical position is too high - if you have an output like this, you need to raise the left side of camera with the left **Vertical Tilt** lever, by turning it to the right.



- 4** When you have adjusted the Vertical Tilt so that the output displays 8 black lines (your output does not have to be identical to the above picture or the Reference Image, just close) on the left side of the camera, look at the right side of the camera.
- 5** On the right side (Scanline End) you will get an output similar to one of these:





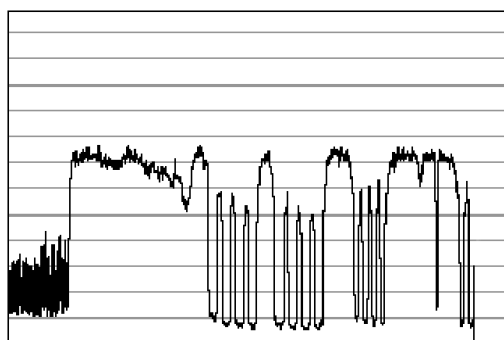
The **Vertical Tilt** lever can't be moved very far before it loses its grip. If this happens while you are adjusting the camera, move the **Vertical Tilt** levers back to the middle position and use the **Vertical Position Pre-Set Screw** to make a coarse adjustment. Then fine tune again with the **Vertical Tilt** lever.



When adjusting the Vertical Position, you continuously have to readjust the CCD Centering (3 scan-width units) with the **CCD Centering** lever, because the **Vertical Tilt** lever moves the camera a little in the horizontal direction.

The output we are aiming for can be seen below, therefore:

- On the left image the vertical position is too low – if you have an output like this, you need lower the right side of camera with the right **Vertical Tilt** lever, by turning downwards.
- On the right image the vertical position is too high - if you have an output like this, you need raise the right side of camera with the right **Vertical Tilt** lever, by turning it upwards.



When you have adjusted the Vertical Tilt so that the output displays 8 black lines and 4 smaller lines (it doesn't have to be precise, just close to the above picture) on the right side of the camera, look at the left side again to check that it's still okay (it's properly not). It very likely that you have to go back and forth between left and right a couple of times until both sides are adjusted the right way. That is because adjusting one side affects the other side a little.

- 6 Check that the CCD Centering is OK. That is that you still have 3 SWU's on each side of the Camera. If you don't then adjust it with the **CCD Centering Lever**.
- 7 Tighten the **Camera Back-Plate Fixing Screws** gently to prevent the camera from moving out of adjustment.

## Scanner Maintenance

Once the cameras are adjusted, you will need to adjust the whole copier to fine-tune it by performing the Scanner Maintenance. Scanner Maintenance does the following three things **automatically**:

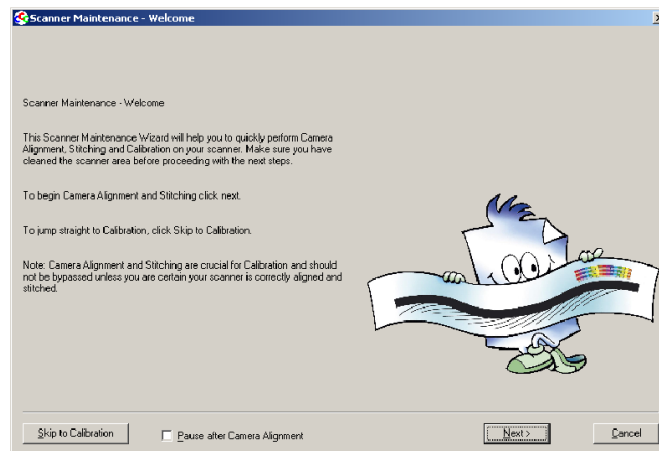
- 1 Runs Vertical Alignment, which adjusts the vertical position of the Cameras.
- 2 Adjusts the Stitching, which controls the overlap between the Cameras.
- 3 Color Calibrates the Scanner to get optimal colors and gray tones.

### Performing Scanner Maintenance

For this part of the adjustments you will need the following item:

- Scanner Maintenance Calibration Sheet 40" (included in the Service Patterns pn Q1261-60037).

- 1 Start by removing the **Optical Adjustment Pattern**, putting back the Original Guide Plate (after cleaning the scanning area) and finally place the top cover on the scanner again.
- 2 Exit the Software Oscilloscope and exit SCANtest 6.
- 3 Wait for the Scanner to reboot and then start Scanner Maintenance when only the green lamp is lit up on the scanner keyboard.



- 4 Insert the Scanner Maintenance adjustment sheet and press **Next** two times.
- 5 Wait for Scanner Maintenance to finish. It takes about 20 minutes.
- 6 Remember to put the calibration sheets back into the original packing, so that they last longer.



**About this Edition**

This is the 1st edition of this Service Manual

1st edition, titled

**hp** designjet copier cc800ps service manual (model Q1262A) - March 2002

## **What's in this Service Manual**

This manual contains information necessary to test, calibrate and service:

- **hp** designjet copier cc800ps- Model Q1262A

For information about using these printers, refer to the corresponding User and Quick Reference Guides.

The procedures described in this manual are to be performed by HP-qualified Service Personnel only.