

## Introduction

This section contains image quality repair procedures to assist in correcting image quality defects. These procedures provide defect samples, definitions and specifications to help identify the type of defect that exists, the test pattern to use, and actions required to correct the defects.

Throughout these procedures, the term “vertical” refers to the process direction (the direction paper travels through the printer); the term “horizontal” refers to the scanning direction (the direction the laser beam scans across the page).

Be sure to check the paper tray to determine whether paper is being fed long edge or short edge first. This determines “vertical” and “horizontal” for paper fed from that particular tray.

Cleaning procedures should always be performed before beginning any Print Quality Repair procedure.

Be sure that the paper meets printer specifications. Changing the paper, or using paper from a previously unopened ream, will resolve many print quality issues.

After resolving an image quality problem, return to Image Quality Checkout to verify that no other image quality defects exist.

Sample reproductions of the various image quality patterns are included under Image Quality Specifications.

Use the Image Quality RAPS to further diagnose machine problems.

In the Y/N (Yes/No) steps of the RAPs, a Yes response will lead you to the next step. A No response will indicate a corrective action, or will direct you to another step. When the indicated corrective action has been completed, go to Section 1 and restart the Initial Actions to verify that the problem has been corrected.

## Image Quality Defect Definitions

The System Controller Test Print is used to evaluate each of the print quality parameters. Each area of the test pattern is used for a print quality parameter. The areas and the print quality parameters are listed in Image Quality Checkout.

**Table 1 Image Quality Defect Definitions**

| <b>Defect Definitions</b>   | <b>Go To:</b> |
|---|---------------|
| LIGHT PRINTS: The overall image density is too light.   | IQ RAP 1      |
| BLANK PRINTS: Prints with no visible image.   | IQ RAP 2      |
| SPOTS: There are spots of toner on the page.  | IQ RAP 3      |
| HORIZONTAL DELETIONS: There are areas of the image that are extremely light or missing entirely. These areas run horizontally across the page in the direction of scanning.   | IQ RAP 4      |
| VERTICAL DELETIONS: There are areas of the image that are extremely light or missing entirely. These areas run vertically along the page in the direction of paper movement.  | IQ RAP 5      |
| SPOT DELETIONS: Solid areas are marked with irregular white areas.  | IQ RAP 6      |
| VERTICAL STREAKS: Extraneous dark lines/bands in the process direction.   | IQ RAP 7      |
| HORIZONTAL STREAKS: Extraneous dark lines/bands in the direction of scan.   | IQ RAP 8      |
| RESIDUAL IMAGES: The image from a previous print, which was not removed during the cleaning process, has been developed on the current print.   | IQ RAP 9      |
| BLACK PRINTS: The print is completely covered with toner and has no visible image.  | IQ RAP 10     |
| BACKGROUND: Uniform toner contamination in non image areas. Refer to the Background specification.  | IQ RAP 11     |
| UNEVEN DENSITY: The text/line darkness and solid area density image varies across the print.  | IQ RAP 12     |
| SKEWED IMAGE: Angular displacement of the image from its intended position on the print. Refer to the specification.  | IQ RAP 13     |
| DAMAGED PRINTS: Creases, wrinkles, excessive curl, cuts, folds or embossed marks.   | IQ RAP 14     |
| REGISTRATION (lead edge to trail edge): Displacement of the image, in the process direction, from its intended position on the print.(inboard to outboard): Displacement of the image, in the direction of scan, from its intended position on the print. | IQ RAP 15     |
| SKIPS / SMEARS: Skip-Loss or stretching of the image in bands across the process direction. Smear-The distortion of the image in bands across the process direction that cause it to appear to be blurred or compressed.                                  | IQ RAP 16     |
| UNFUSED IMAGE: Part of or all of the image is unfused. Refer to the specification.  | IQ RAP 17     |
| RESOLUTION: At 600 DPI, the two pixel lines and halftone patches cannot be reproduced clearly on the print.   | IQ RAP 18     |

## Image Quality Checkout

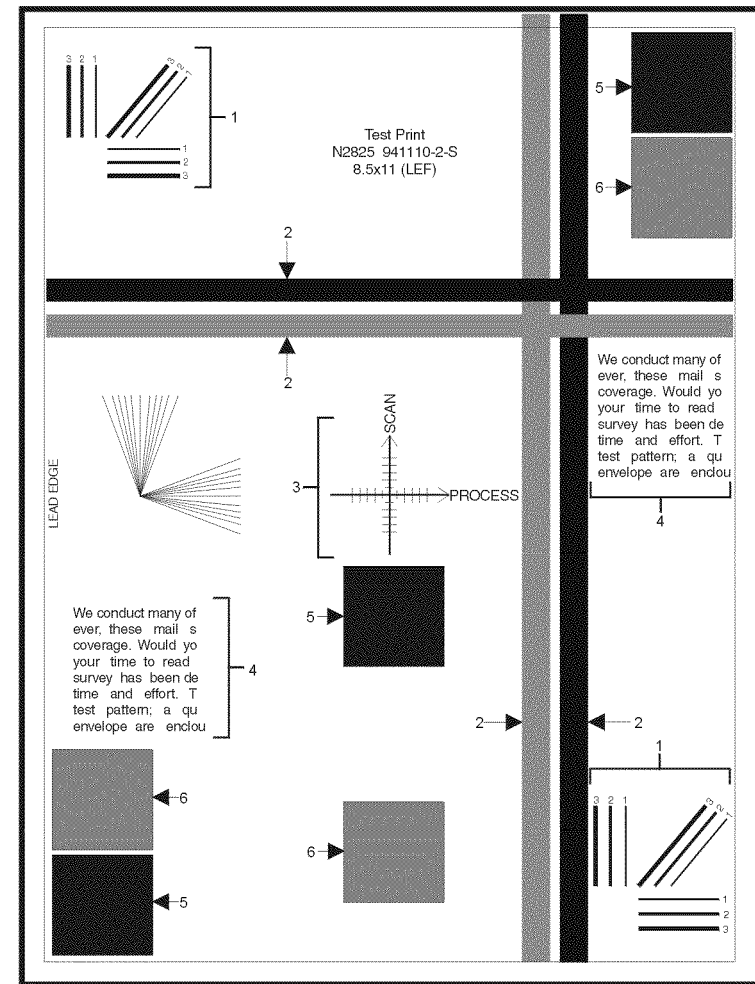
The System Controller Test Print is used to evaluate and ensure that the printed image meets the printer specifications.

Use new paper, whenever possible, to check the image quality of prints. Make five (5) prints of the System Controller Test Print (Figure 1) (GP 6.1). Discard the first two prints and retain the remaining prints for image quality analysis.

The Image quality Checkout is used to evaluate the following:

1. Resolution (2 places) (Figure 1)
2. Skips and Smears (4 places) (Figure 1)
3. Registration (1 place) (Figure 1)
4. Resolution and Uniformity (2 places) (Figure 1)
5. Solid Area Density (3 places) (Figure 1)
6. Half Tone Resolution (2 places). (Figure 1)

Go to Solid Area Density.



3021

Figure 1 System Controller Test Print.

# Solid Area Density

## Procedure

Ensure the printer is set for 600 dpi. Compare the solid areas on the System Controller Test Patterns with the Output Reference document (82P520) (Figure 1). **The solid areas on the print are at the 1.20 density square on the scale or higher, and all the solid areas on any print differ in density less than one density square.**

Y

N

The solid area density is uniform.

Y

N

Go to IQ RAP 12 Uneven Density.

The prints are too faint.

Y

N

The prints are black.

Y

N

Go to IQ RAP 11 Background.

Go to IQ RAP 10 Black Prints

Go to IQ RAP 1 Light Prints

The Solid Area Density is within specifications. Go to Background.

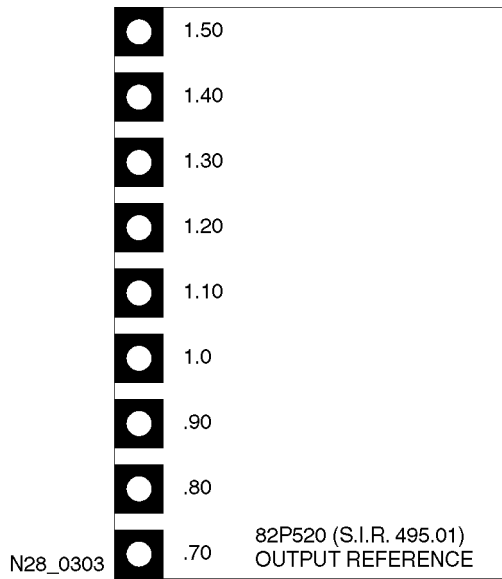


Figure 1 Output Reference Document

# Background

## Procedure

Compare the Test Prints with the Visual Scale (82P284). The worst background area on any print should be at, or below, area 3 on the rating guide (Figure 1). **The print is at the area 3 or below.**

Y

N

The background is uniform.

Y

N

Go to IQ RAP 12 Uneven Density.

Go to IQ RAP 11 Background.

The printed test patterns meet the Background specification. Go to Deletions.

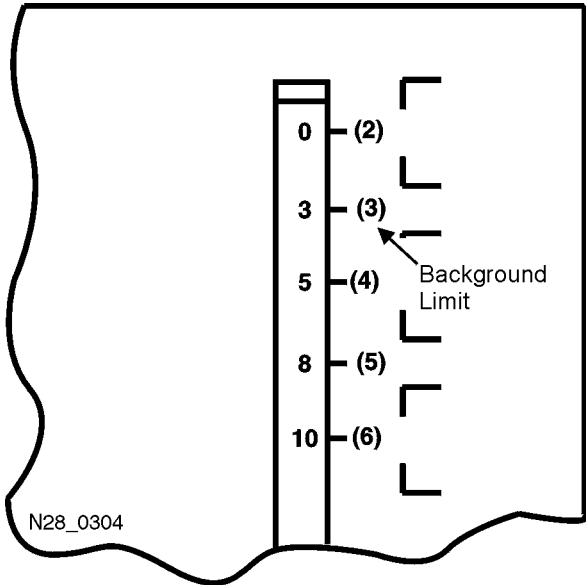


Figure 1 Rating Guide

## Deletions (Line, Band, Spots)

### Procedure

Inspect Test Prints for the presence of deletions (missing image). There should be no deletions with a diameter larger than 0.5 mm visible on test prints (Figure 1). **There are deletions on the test prints.**

Y N  
Go to Fusing.

**There are vertical (in direction of paper movement) Line/Band deletions present.**

Y N  
**There are Horizontal (in direction of scanning) Line/Band Deletions present.**

Y N  
**There are Spot Deletions present.**

Y N  
Go to Fusing.

Go to IQ RAP 6 Spot Deletions.

Go to IQ RAP 4 Horizontal Deletions.

Go to IQ RAP 5 Vertical Deletions.

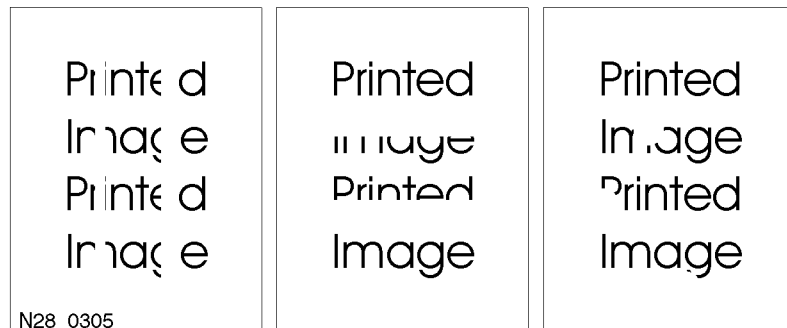


Figure 1 Line, Band, or Spot Deletions.

## Fusing

### Procedure

**NOTE:** The operating environment of the printer is from 41o F (5o Celsius) at 15% relative humidity to 95o F (35o Celsius) at 85% relative humidity. The fusing performance of the printer will vary according to the environment.

- A cold environment will affect the warm-up time.
- The weight (lb. / gsm) of the paper or transparency will affect the fusing of prints.
- High humidity will have an adverse affect on the fusing of prints.

Check the fusing quality of the image of a System Controller Test Print (Figure 1). Rub the image three times with a soft cloth or tissue. The image should not lift off of the surface of the print. **The fusing quality of the image meets the specification.**

Y N  
Go to IQ RAP 17 Unfused Image.

The printed test patterns meet the Fusing specification. Go to Resolution.

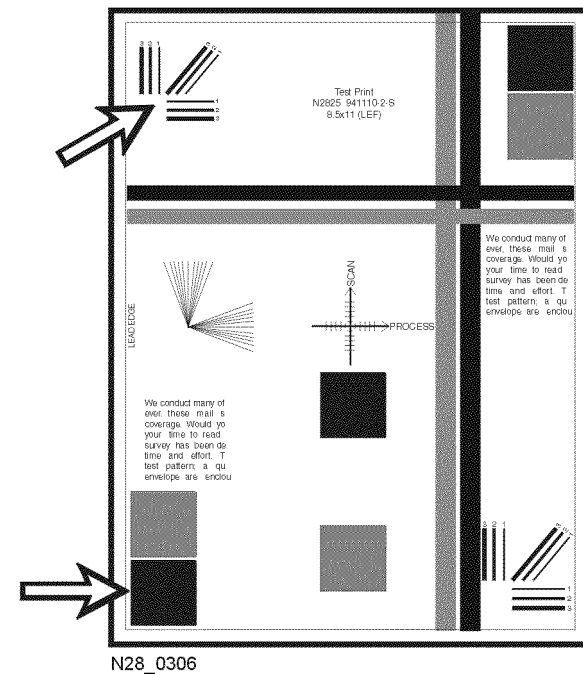


Figure 1 Fusing Quality.

## Resolution

### Procedure

Refer to Figure 1. Observe the three image areas on several System Controller Test Patterns. Check the resolution of the images in each of the areas:

#### Arrow 1

The two pixel vertical, horizontal and diagonal lines should be clear and continuous. The diagonal lines might appear to be narrower than the others.

#### Arrow 2

The text paragraphs should be roughly equal in density.

#### Arrow 3

The half-tone patches adjacent to the solid blocks in the corners should be uniform in appearance. **The three checks (arrows 1, 2, & 3) are within specification.**

Y N

Go to IQ RAP 18 Resolution.

The printed test patterns meet the Resolution specification. Go to the Registration (Side to Side).

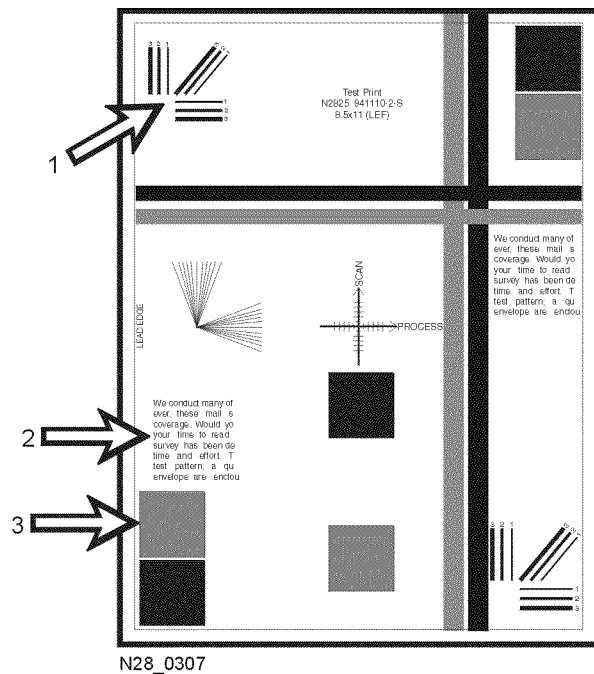


Figure 1 Resolution.

## Registration (Side to Side)

### Procedure

Measure the registration on two consecutive System Controller Test Patterns. Fold the paper in half (top edge to the bottom edge). Observe the fold line of the paper with reference to the cross hairs of the target, Figure 1. **The fold is within +/- 2.0 mm of the target cross hairs (each line on the target is 1 mm).**

Y N

Go to IQ RAP 15 Registration.

The test prints meet the Lead Edge to Trail Edge registration specification. Go to Registration (Lead Edge to Trail Edge).

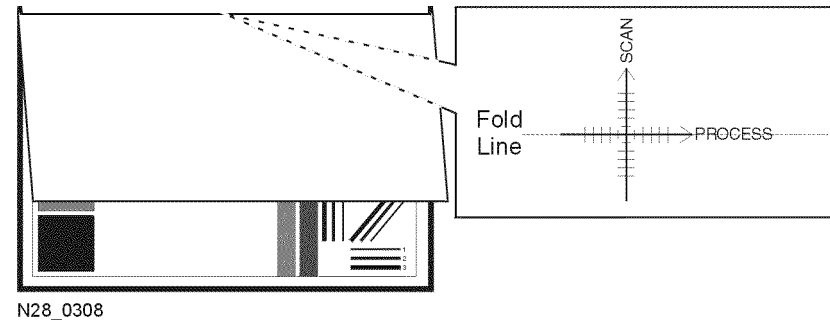


Figure 1 Registration (Side to Side).

## Registration (Lead Edge to Trail Edge)

### Procedure

Measure the registration on two consecutive System Controller Test Patterns. Fold the paper in half (lead edge to Trail Edge). Observe the fold line of the paper with reference to the cross hairs of the target. **The fold is within +/- 2.0 mm of the target cross hairs (each line on the target is 1 mm) (Figure 1).**

Y N  
Go to IQ RAP 15 Registration.

The printed test patterns meet the lead edge to trail edge registration specification. Go to Skew.

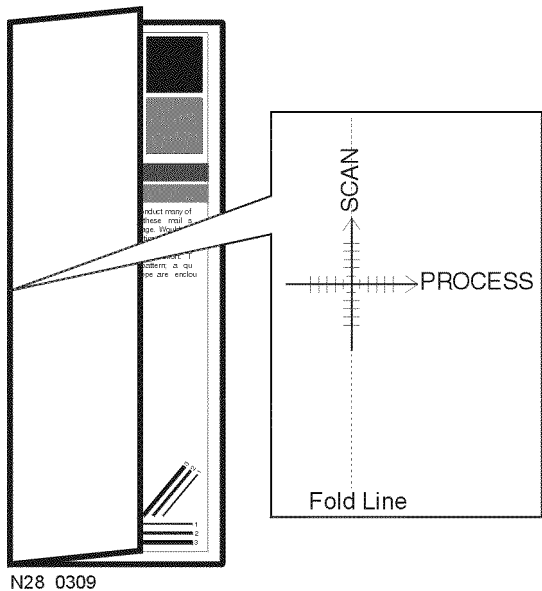


Figure 1 Registration (Lead Edge to Trail Edge).

## Skew

### Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Observe the test pattern. Measure the dimensions 'A' and 'B' (Figure 1) on two consecutive test patterns. The difference between 'A' and 'B' should be 1.5 mm or less. **The skew on the test patterns meets the specification.**

Y N  
Go to IQ RAP 13 Skewed Image.

The printed test patterns meet the Skew specification. Go to the Skips and Smears.

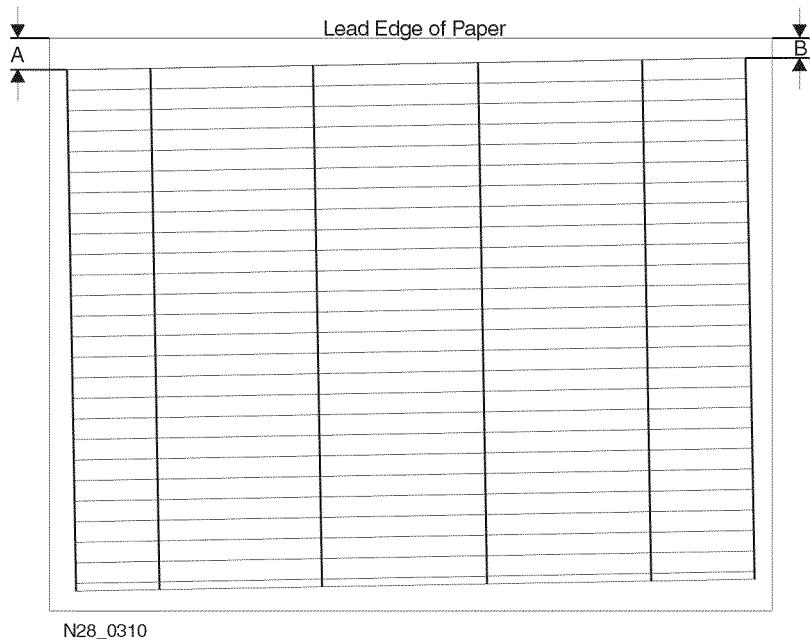


Figure 1 Printer Engine Controller Test Pattern.

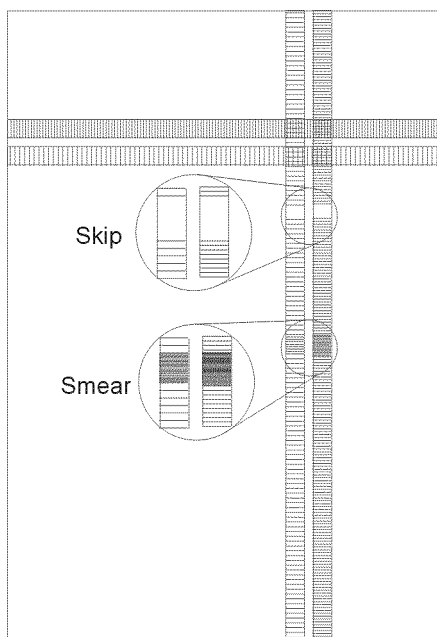
## Skips / Smears

### Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Inspect the ladder chart test pattern. The pattern should be free from skips and smears (Figure 1). **The test prints are free from skips and smears.**

Y N  
Go to IQ RAP 16 Skips/Smears.

Go to the Spots checkout



N28\_0311

Figure 1 Skips / Smears.

## Spots

### Procedure

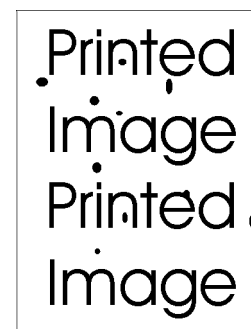
From the menu mode, run a Config Sheet. Inspect the print for spots (Figure 1). Within a 208 x 95 mm square:

- There should be no spots larger than or equal to 0.5 mm visible on the prints.
- There should be no more than 1 spot measuring between 0.4 mm and 0.5 mm visible on the print.
- There should be no more than 16 spots measuring between 0.25 mm and 0.4 mm visible on the print.
- Any spot measuring less than 0.25 mm is acceptable.

**The prints are free of spots or the spots that are visible fall within the acceptable range.**

Y N  
Go to IQ RAP 3 Spots.

Go to Other Print Defects.



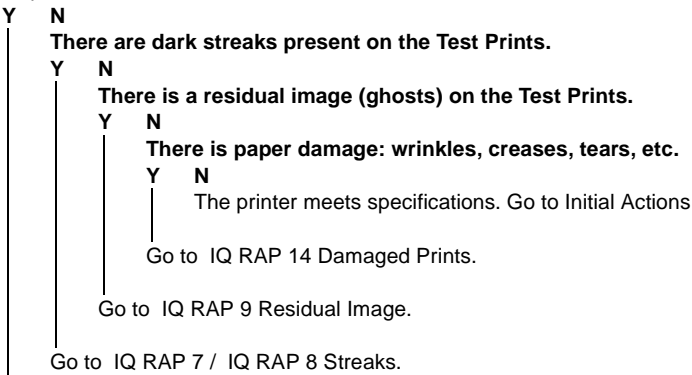
N28\_0312

Figure 1 Spots.

## Other Print Defects

### Procedure

Inspect the Test Patterns for other Print Defects. **Test Prints are free of defects.**



Go to Final Actions

## IQ RAP 1 Light (Undertoned) Prints

The overall image density is too light (Figure 1).

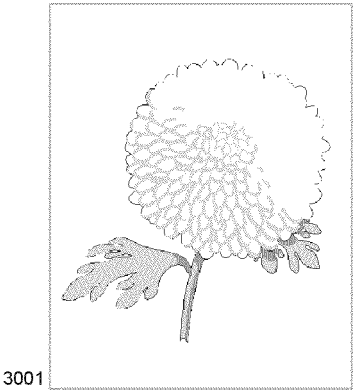


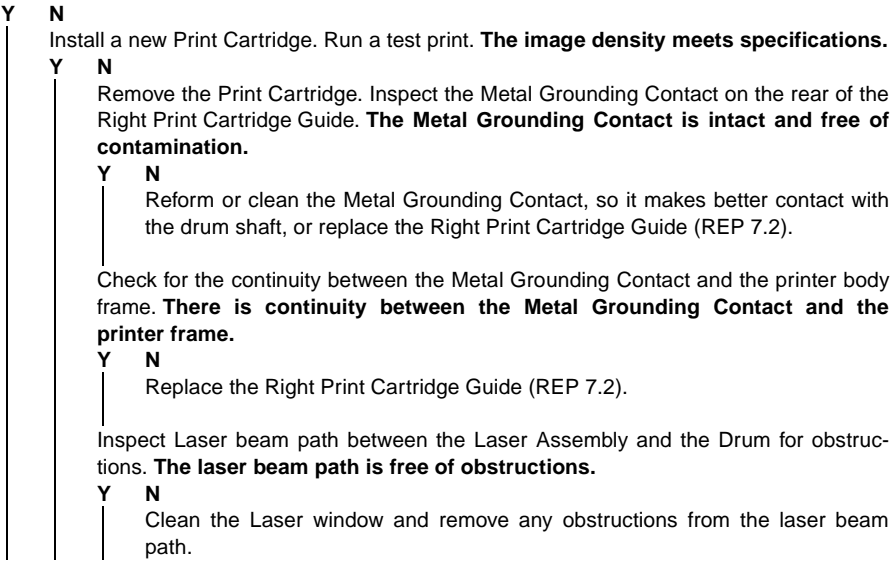
Figure 1 Light Prints

### Initial Actions

- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Ensure there are no obstructions in the Laser path.

### Procedure

Load fresh, dry paper. Run a test print. **The image density meets specifications.**



A B C



| A | B | C  |
|---|---|--|
|   |   | The BTR is intact and is free of contamination.  |
|   | Y | N  |
|   |   | Replace the BTR (REP 7.7).   |
|   |   | Generate a Test Print and switch OFF the printer power halfway through the print cycle. Carefully remove the Print Cartridge and inspect the toner image on the drum just before the transfer area (BTR). <b>The image on the drum is completely developed with sharp, black, easily read areas.</b> |
|   | Y | N  |
|   |   | Go to RAP 43.  |
|   |   | Inspect the toner image on the drum immediately after the transfer area (BTR). <b>The toner image on the drum is transferred completely to the paper.</b>  |
|   | Y | N  |
|   |   | Go to RAP 43.  |
|   |   | Replace in order until the problem is solved: BTR Assembly (REP 7.7), Fuser Assembly (REP 5.1), HVPS PWB (REP 8.2), Laser Assembly (REP 7.1), LVPS Assembly (REP 8.6), Right Print Cartridge Guide (REP 7.2), Print Engine Controller PWB (REP 8.5), Paper Transport Assembly (REP 4.1).             |
|   |   | Problem Solved.  |
|   |   | Problem Solved.  |

## IQ RAP 2 Blank Prints

No visible image anywhere on the output print (Figure 1).

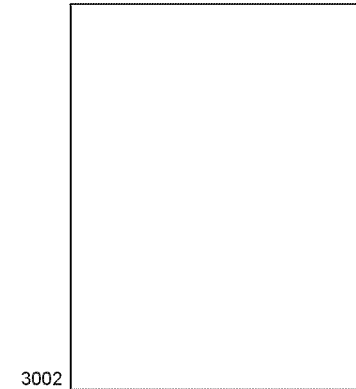


Figure 1 Blank Prints

### Initial Actions

- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Ensure there are no obstructions in the Laser path.
- Ensure the blank prints are not the result of multisheet feeds.

### Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Run five test prints. **The test prints are blank.**

|   |  |
|---|--|
| Y | N  |
|   | Exit diagnostics and enter the Menu Mode. Print a Config Sheet. <b>The prints are blank.</b>   |
| Y | N  |
|   | The problem appears to be with the host computer or the cables. If the problems persist, replace the System Controller PWB (REP 8.1).  |
|   | Remove and reseal the System Controller PWB. If the problems persist, replace the System Controller PWB (REP 8.1).   |
|   | Install a new Print Cartridge. Run a test print. <b>There is a normal image on the paper.</b>  |
| Y | N  |
|   | Remove the Print Cartridge. Inspect the Metal Grounding Contact on the rear end of the Right Print Cartridge Guide. <b>The Metal Grounding Contact is intact and is free of contamination.</b> |
| Y | N  |
|   | Reform or clean the Metal Grounding Contact, so it makes better contact with the drum shaft, or replace the Right Print Cartridge Guide (REP 7.2).   |

|   |   |   |
|---|---|---|
| A | B | Check for continuity between the Metal Grounding Contact and the printer frame. <b>There is continuity between the Grounding Contact and the printer frame.</b>   |
|   |   | Y N<br>Replace the Right Print Cartridge Guide (REP 7.2).   |
| Y | N | <b>The BTR is intact and is free of contamination.</b>  |
|   |   | Y N<br>Replace the BTR Assembly (REP 7.7).  |
| Y | N | Generate a Test Print and switch OFF the printer power halfway through the print cycle. Carefully remove the Print Cartridge and inspect the toner image on the drum just before the transfer area (BTR). <b>The image on the drum is completely developed; with sharp, black, easily read areas.</b> |
|   |   | Y N<br>Go to RAP 43.  |
| Y | N | Replace in order until the problem is solved: HVPS PWB (REP 8.2), Laser Assembly (REP 7.1), BTR Assembly (REP 7.7), Print Engine Controller PWB (REP 8.5), LVPS (REP 8.6), Right Print Cartridge Guide (REP 7.2).   |
|   |   |   |

Problem solved.

## IQ RAP 3 Spots

There are spots of toner randomly scattered on the page (Figure 1).

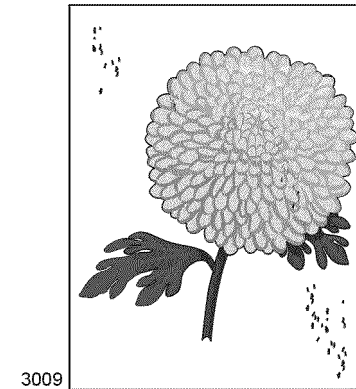


Figure 1 Spots

### Initial Actions

- Check that the paper supply is clean, dry and fresh (recycled paper may have spots).
- Ensure there are no obstructions in the Laser path.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Check that rollers and other components in the paper path are clean and unobstructed.

### Procedure

Install a new Print Cartridge. Run a Test Print. **The spots are gone.**

|   |   |   |
|---|---|---|
| Y | N | Inspect the BTR Assembly for contamination and wear. <b>The BTR is free of contamination and wear.</b>  |
|   |   | Y N<br>Replace the BTR Assembly (REP 7.7).  |
| Y | N | Generate a Test Print and switch OFF the printer power halfway through the print cycle. Carefully remove the Print Cartridge and inspect the toner image on the drum just before the transfer area (BTR). <b>The image on the drum is completely developed; with sharp, black easily read areas and no spots.</b> |
|   |   | Y N<br>Go to RAP 43.  |

A B

## WARNING

If the printer has been switched on, the Fuser will be hot.

Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N

Replace the Fuser Assembly (REP 5.1).

Replace the following, in order, until the defective component is found: BTR Assembly (REP 7.7), Fuser Assembly (REP 5.1), Paper Transport Assembly (REP 4.1), HVPS PWB (REP 8.2), Laser Assembly (REP 7.1), Print Engine Controller PWB (REP 8.5)

Problem solved.

## IQ RAP 4 Horizontal (Scan) Deletions

A deletion is an area of the print where the image is missing or extremely light. Horizontal deletions extend across the long dimension of the page (Figure 1).

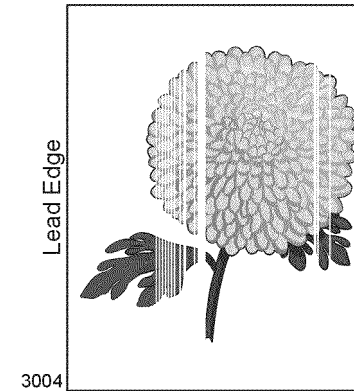


Figure 1 Horizontal Deletions

### Initial Actions

- Check that the paper supply is dry and fresh.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Check that rollers and other components in the paper path are clean and unobstructed.

### Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Run five test prints. **The test prints have horizontal deletions.**

Y N

Exit diagnostics and enter the Menu Mode. Print a Config Sheet. **The problem is still present.**

Y N

The problem appears to be with the host computer or the cables. If the problems persist, replace the System Controller PWB (REP 8.1).

Remove and reseal the System Controller PWB. If the problems persist, replace the System Controller PWB (REP 8.1).

Load fresh, dry paper. Run a test print. **The problem is still present.**

Y N

Problem solved.

Install a new Print Cartridge. **The problem is still present.**

Y N

Problem solved.

A

A

Inspect the BTR Assembly for contamination and wear. **The BTR is free of contamination and wear.**

Y N

Replace the BTR Assembly (REP 7.7).

Generate a test print and switch OFF the printer power halfway through the print cycle. Carefully remove the Print Cartridge and inspect the toner image on the drum just before the transfer area (BTR). **The image on the drum is completely developed, with sharp, black, easily read areas and no horizontal deletions.**

Y N

Go to RAP 43.

Inspect the toner image on the drum immediately after the transfer area (BTR). **The toner image on the drum was transferred to the paper.**

Y N

Go to RAP 43.

### WARNING

**If the printer has been switched on, the Fuser will be hot.**

Warning: the Fuser may be hot. Open the Exit Assembly and remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N

Replace the Fuser Assembly (REP 5.1).

Replace in order until the problem is solved: HVPS PWB (REP 8.2), Right Print Cartridge Guide (REP 7.2), BTR Assembly (REP 7.7), Paper Transport Assembly (REP 4.1), Laser Assembly (REP 7.1), Print Engine Controller PWB (REP 8.5), Fuser Assembly (REP 5.1), MBF Assembly (REP 2.1), Registration Clutch (REP 4.3), Rear Chute Assembly (REP 3.2), Turn Roll Assembly (REP 2.4).

## IQ RAP 5 Vertical (Process) Deletions

A deletion is an area of the print where the image is missing or extremely light. Vertical band deletions are deletions which extend across the short dimension of the page (Figure 1).

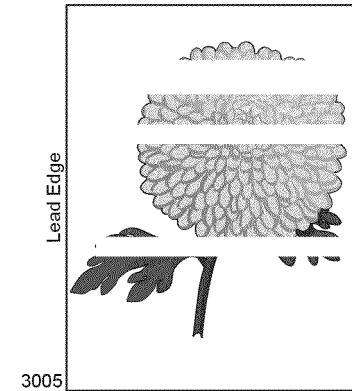


Figure 1 Vertical Deletions

### Initial Actions

- Check that the paper supply is dry and fresh.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Ensure there are no obstructions in the Laser path.
- Check that rollers and other components in the paper path are clean and unobstructed.

### Procedure

Load fresh, dry paper. Run a test print. **The problem is still present.**

Y N

Problem solved.

Install a new Print Cartridge. Run a test print. **The problem is still present.**

Y N

Problem solved.

Inspect the laser beam path between the Laser Assembly and the Drum. **The laser beam path is free of obstructions.**

Y N

Remove any obstructions from the laser beam path.

Inspect the paper path, between feed and exit, for contamination or obstructions. **The paper path is free of obstructions.**

Y N

Remove obstructions or contamination from the paper path.

A

A

Inspect the BTR Assembly for contamination and wear. **The BTR is free of contamination and wear.**

Y N

Replace the BTR Assembly (REP 7.7).

### WARNING

**If the printer has been switched on, the Fuser will be hot.**

Open the Exit Assembly and remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N

Replace the Fuser Assembly (REP 5.1).

Replace in order until the problem is solved: BTR Assembly (REP 7.7), Laser Assembly (REP 7.1), Fuser Assembly (REP 5.1), Print Engine Controller PWB (REP 8.5).

## IQ RAP 6 Spot Deletions

Solid areas are marked with irregular white areas.

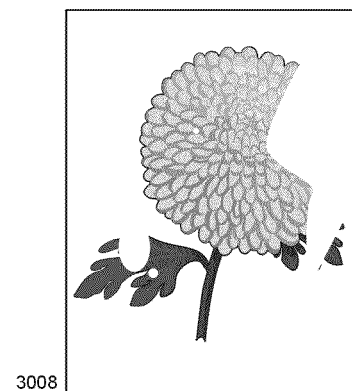


Figure 1 Spot Deletions

### Initial Actions

- Check that the paper supply is dry and fresh.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.

### Procedure

Load fresh, dry paper. Run a test print. **The problem is still present.**

Y N

Problem solved.

Install a new Print Cartridge. Run a test print. **The problem is still present.**

Y N

Problem solved.

Inspect the toner image on the drum immediately after the transfer area (BTR). **The toner image on the drum transferred to the paper.**

Y N

Replace the BTR Assembly (REP 7.7).

### WARNING

**If the printer has been switched on, the Fuser will be hot.**

Open the Exit Assembly and remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N  
Replace the Fuser Assembly (REP 5.1).

Replace the following, in order, until the defective component is found: BTR Assembly (REP 7.7), Paper Transport Assembly (REP 4.1).

IQ RAP 7 Vertical (Process) Streaks

Extraneous dark lines/bands in the process direction (in the direction of paper travel) (Figure 1).

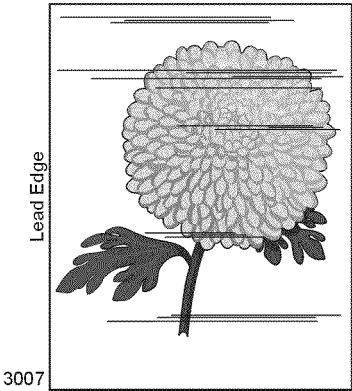


Figure 1 Vertical Streaks

Initial Actions

- Check that the paper supply is dry and fresh.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Check that the paper is within specifications.
- Inspect the paper path, between feed and exit, for contamination or obstructions.

Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Run five test prints. **The test prints have vertical streaks.**

Y N  
Exit diagnostics and enter the Menu Mode. Print a Config Sheet. **The problem is still present.**

Y N  
The problem appears to be with the host computer or the cables. If the problems persist, replace the System Controller PWB (REP 8.1).

Remove and reseal the System Controller PWB. If the problems persist, replace the System Controller PWB (REP 8.1).

Install a new Print Cartridge. Run a Test Print. **The vertical streaks are gone.**

Y N  
Inspect the laser beam path between the Laser Assembly and the Drum. **The laser beam path is free of obstructions.**

A

Y N  
Remove any obstructions from the laser beam path.

Inspect the BTR Assembly for contamination and wear. **The BTR is free of contamination and wear.**

Y N  
Replace the BTR Assembly (REP 7.7).

### WARNING

**If the printer has been switched on, the Fuser will be hot.**

Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N  
Replace the Fuser Assembly (REP 5.1).

Go to RAP 44.

Problem solved.

## IQ RAP 8 Horizontal (Scan) Streaks

There are black lines running horizontally across the page (at a right angle to the direction of paper travel) (Figure 1).

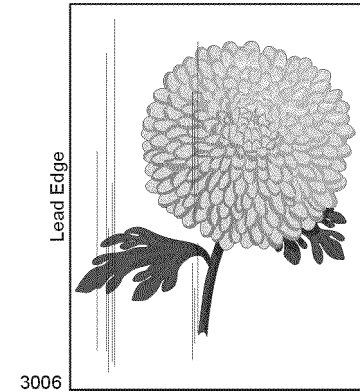


Figure 1 Horizontal Streaks

### Initial Actions

- Check that the paper supply is dry and fresh.
- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.

### Procedure

Enter Diagnostics and select Test Print. Scroll to Print Pattern and press Enter [4]. Run five test prints. **The test prints have horizontal streaks.**

Y N  
Exit diagnostics and enter the Menu Mode. Print a Config Sheet. **The problem is still present.**

Y N  
The problem appears to be with the host computer or the cables. If the problems persist, replace the System Controller PWB (REP 8.1).

Remove and reseal the System Controller PWB. If the problems persist, replace the System Controller PWB (REP 8.1).

Install a new Print Cartridge. Run a test print. **The horizontal streaks are gone.**

Y N  
Remove the Print Cartridge. Inspect the Metal Grounding Contact on the rear end of the Right Print Cartridge Guide. **The Metal Grounding Contact is intact and is free of contamination.**

Y N  
Reform or clean the Metal Grounding Contact, so it makes better contact with the drum shaft, or replace the Right Print Cartridge Guide (REP 7.2).

A B

|                 |   |   |
|-----------------|---|---|
| A               | B | Check for the continuity between the Metal Grounding Contact and the printer body frame. <b>There is continuity between the Grounding Contact and the Printer Frame.</b>  |
|                 |   | Y N<br>Replace the Right Print Cartridge Guide (REP 7.2).   |
|                 |   | Inspect the BTR Assembly for contamination and wear. <b>The BTR is free of contamination and wear.</b>  |
|                 |   | Y N<br>Replace the BTR Assembly (REP 7.7).  |
|                 |   | Generate a Test Print and switch OFF the printer power halfway through print cycle. Carefully remove the Print Cartridge and inspect the toner image on the Drum just before the transfer area (BTR). <b>The image on the Drum is developed; with sharp, black, easily read areas and no horizontal streaks.</b>  |
|                 |   | Y N<br>Go to RAP 43.  |
|                 |   | Inspect the toner image on the Drum immediately after the transfer area (BTR). <b>The toner image on the Drum was transferred to the paper along with any horizontal streaks.</b>   |
|                 |   | Y N<br>Replace the BTR Assembly (REP 7.7).  |
|                 |   | Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. <b>The Heat Roll and the Pressure Roll are free of scratches and contamination.</b> |
|                 |   | Y N<br>Replace the Fuser Assembly (REP 5.1).  |
|                 |   | Go to RAP 44.   |
| Problem solved. |   |   |

## IQ RAP 9 Residual Image

The image from a previous print, which was not removed during the cleaning process, has been developed on the current print.

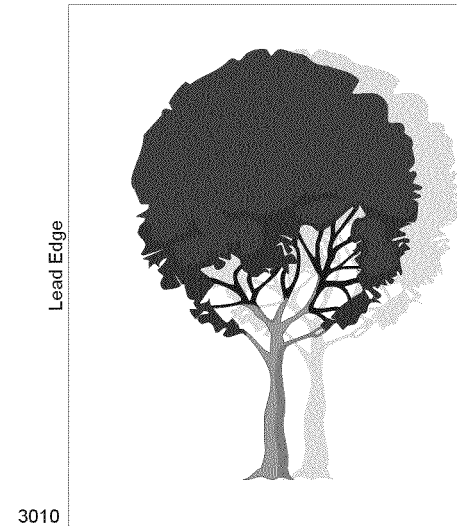


Figure 1 Residual Image

### Initial Actions

- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Verify the fuser temperature (NVM).

### Procedure

Replace paper with fresh, dry paper. Run a test print. **Residual images still appear.**

Y N  
Problem solved.

Install a new Print Cartridge. Run a test print. **The residual images still appear.**

Y N  
Problem solved.

Inspect the BTR Assembly for contamination and wear. **The BTR is free of contamination and wear.**

Y N  
Replace the BTR Assembly (REP 7.7).



A  
I

**WARNING**

If the printer has been switched on, the Fuser will be hot.

Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y    N

Clean or replace the Fuser Assembly (REP 5.1).

Replace the following, in order, until the defective component is found: BTR Assembly (REP 7.7), Fuser Assembly (REP 5.1), HVPS PWB (REP 8.2), Right Print Cartridge Guide (REP 7.2).

**IQ RAP 10 Black Prints**

A totally black output print. There is toner on the paper with no visible image.

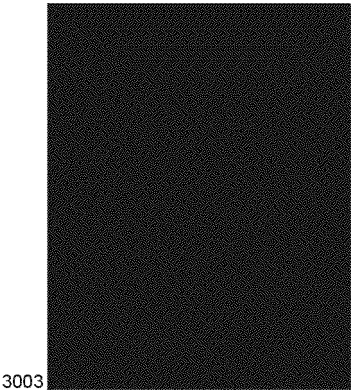


Figure 1 Black Prints

**Initial Actions**

- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Ensure the machine covers are in place and fit well so no outside light can enter the machine.

**Procedure**

Install a new Print Cartridge. Run a Test Print. **The print is normal.**

Y    N

Shield half of the window of the Laser Assembly. Run a Test Print. **The print is half white and half black.**

Y    N

Go to RAP 43.

Go to RAP 30.

Problem solved.

## IQ RAP 11 Background

There is toner contamination on all or part of the page. The contamination appears as a very light gray dusting (Figure 1).

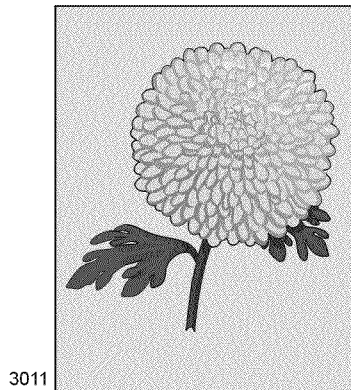


Figure 1 Background

### Initial Actions

- Inspect the printer paper path for items such as staples, paper clips and paper scraps.
- Check installation of the Print Cartridge.
- Check that the Print Cartridge ground contact points are clean.
- Ensure the machine covers are in place and fit well so no outside light can enter the machine.

### Procedure

Install a new Print Cartridge (PL 8.1). Run a Test Print. **The background is gone.**

**Y N**  
Generate a Test Print and switch OFF the printer power halfway through the print cycle. Carefully remove the Print Cartridge and inspect the toner image on the drum just before the transfer area (BTR). **The undeveloped areas of the drum are clean and without background.**

**Y N**  
Go to RAP 43.

Remove the Print Cartridge. Check for the continuity, from the front opening, between metal parts of the Paper Transport Assembly and the Printer Frame. **The Paper Transport Assembly Baffle is grounded.**

**Y N**  
Remove and clean the contact areas of the Paper Transport Assembly (REP 4.1). Reinstall the assembly so that it is grounded properly. If the problem persists, replace the Paper Transport Assembly (REP 4.1).

Clean or replace the Fuser Assembly (REP 5.1). **The background is gone.**

**A**

**Y**

**N**

Replace the following, in order, until the defective component is found: HVPS PWB (REP 8.2), Fuser Assembly (REP 5.1), Paper Transport Assembly (REP 4.1), Laser Assembly (REP 7.1), Right Print Cartridge Guide (REP 7.2), Print Engine Controller PWB (REP 8.5).

Problem solved.

Problem solved.

**A**

## IQ RAP 12 Uneven Density

Image density varies within the page in either direction (Figure 1).

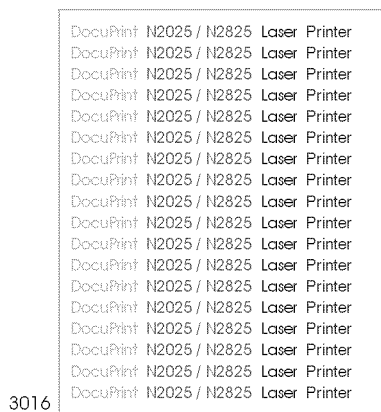


Figure 1 Uneven Density

### Initial Actions

- Load fresh dry paper.
- Check that the correct Print Cartridge is properly installed and not empty.
- Ensure that the machine is reasonably level.
- Check to make sure the Laser path is clean and unobstructed.
- Remove the Print Cartridge and check the Left and Right Guides for wear, contamination, obstructions, etc.
- Clean the Laser window.

### Procedure

Run a Test Print. **The Test Print output image contains uneven print.**

**Y N**  
Go to 1.5 Final Actions.

Install a new Print Cartridge (PL 8.1). Run a Test Print. **The Test Print output image contains uneven print.**

**Y N**  
Problem solved. Go to 1.5 Final Actions.

Check the Bias Transfer Roll (BTR) for contamination, even spring pressure, and proper installation. **The BTR is in good condition (not contaminated) and properly installed.**

**Y N**  
Repair or replace the BTR Assembly (REP 7.7).

Check the Fuser Assembly for worn parts and for contamination on the Fuser Roll or Pressure Roll. **The Fuser Assembly is in good condition.**

**Y N**  
Replace the Fuser Assembly (REP 5.1).

**A**

**A**

Panic stop the printer half way through the print cycle. Look at the image on the drum. **The image on the drum has even density.**

**Y N**  
Replace the Laser Assembly (REP 7.1).

Look at the print on the paper before the Fuser. **The print on the paper has even density.**

**Y N**  
Replace the BTR (REP 7.7).

Replace the Fuser Assembly (REP 5.1).

IQ RAP 13 Skewed Image

The image is not parallel to the edges of the print sheet (Figure 1).

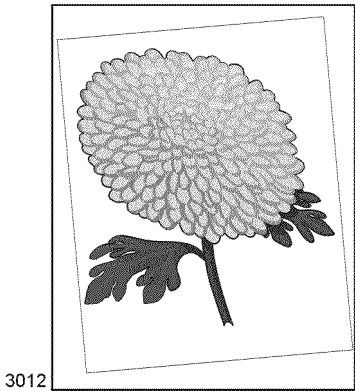


Figure 1 Skewed Image

Initial Actions

- Check the paper tray(s) installation and the paper in the tray(s).
- Load fresh dry paper.
- Paper meets specification.
- Check the paper path for any obstructions or debris that might hamper the passage of the paper.
- Ensure the Print Cartridge is properly installed.

Procedure

Run 5 test prints, single sided, from each paper tray. If the printer has a Duplex Assembly, run five duplexed prints from each tray. **The skewed image appears only on duplexed prints.**

|     |   |  |  |
|-----|---|--|--|
| Y N |   | The skewed image occurs on prints fed from all trays.  |  |
| Y   | N | The skewed image occurs on prints fed from the MBF Tray.   |  |
| Y   | N | The skewed image occurs on prints fed from Tray 1.   |  |
| Y   | N | The skewed image occurs on prints fed from Tray 2.   |  |
| Y   | N | <ul style="list-style-type: none"><li>• Check the Tray 3 Feed Rolls. Clean or replace if necessary.</li><li>• Check the Tray 3 Retard Pad/Retard Roll. Clean or replace if necessary.</li><li>• If a 2000 Sheet Feeder, check the Nudger Roll. Clean or replace if necessary.</li><li>• Check the feed chute between Tray 3 and Tray 2. Check for obstructions or contamination. Clean as necessary.</li></ul> |  |

|   |   |   |   |   |  |
|---|---|---|---|---|--|
| A | B | C | D | E | <ul style="list-style-type: none"><li>• Check the Tray 2 Lower Turn Rolls. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the Tray 2 Rear Chute. Check all rolls for obstructions or contamination. Clean or replace as necessary.</li></ul>  |
|   |   |   |   |   | <ul style="list-style-type: none"><li>• Check the Tray 2 Feed Rolls. Clean or replace if necessary.</li><li>• Check the Tray 2 Retard Pad/Retard Roll. Clean or replace if necessary.</li><li>• If a 2000 Sheet Feeder, check the Nudger Roll. Clean or replace if necessary.</li><li>• Check the feed chute between Tray 2 and Tray 1. Check for obstructions or contamination. Clean as necessary.</li><li>• Check the Tray 1 Lower Turn Rolls. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the Tray 1 Rear Chute. Check all rolls for obstructions or contamination. Clean or replace as necessary.</li></ul> |
|   |   |   |   |   | <ul style="list-style-type: none"><li>• Check the Tray 1 Feed Rolls. Clean or replace if necessary.</li><li>• Check the Tray 1 Envelope Feed Rolls. Clean or replace if necessary.</li><li>• Check the Tray 1 Retard Pad. Clean or replace if necessary.</li><li>• Check the Tray 1 Turn Rolls. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the feed chute between Tray 1 and the Registration Rolls. Check for obstructions or contamination. Clean as necessary.</li></ul>   |
|   |   |   |   |   | <ul style="list-style-type: none"><li>• Check the MBF Feed Rolls. Clean or replace if necessary.</li><li>• Check the MBF Retard Pad. Clean or replace if necessary.</li><li>• Check the MBF Chute. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the Registration Sensor. Check actuation and for obstructions or contamination. Clean or replace as necessary.</li></ul>  |
|   |   |   |   |   | <ul style="list-style-type: none"><li>• Check the Registration Sensor. Check actuation and for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the Registration Rolls. Clean or replace if necessary.</li><li>• Check the BTR Roll and bearings. Clean or replace if necessary.</li><li>• Check the Print Cartridge. Replace if necessary.</li><li>• Check the Paper Transport Assembly. Check for obstructions or contamination. Clean or replace as necessary.</li></ul>   |
|   |   |   |   |   | <ul style="list-style-type: none"><li>• Check the Fuser Assembly. Check for worn parts or rolls. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check all rolls and drives in the Exit Assembly. Check for obstructions or contamination. Clean or replace as necessary.</li><li>• Check the Duplex assembly. Check for worn parts or rolls. Check for obstructions or contamination. Clean or replace as necessary.</li></ul>  |

- Check the rear chute between the Duplex Assembly and the Registration Rolls. Check for worn parts or rolls. Check for obstructions or contamination. Clean or replace as necessary.

### IQ RAP 14 Damaged Print

The printed page comes out of the printer either wrinkled, creased, or torn (Figure 1).

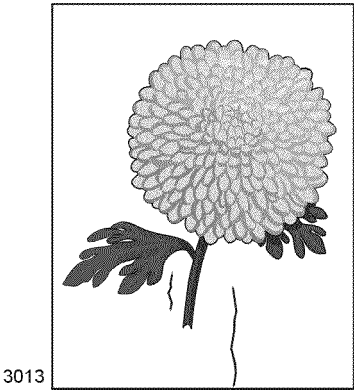


Figure 1 Damaged Print

#### Initial Actions

- Check that the paper supply is dry and fresh.
- Check that rollers and other components in the paper path are clean and unobstructed.
- Ensure that paper is within specification.

#### Procedure

Observe paper feed as you run a test print. **The paper fed crooked.**

|   |   |
|---|---|
| Y | N   |
|   | Replace paper with fresh, dry standard paper. Run a Test Print. <b>The paper is still damaged.</b>  |
| Y | N   |
|   | Problem solved.   |
|   | Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. <b>The Heat Roll and the Pressure Roll are free of scratches and contamination.</b> |
| Y | N   |
|   | Clean or replace the Fuser Assembly (REP 5.1).  |
|   | Inspect the paper path between the feed tray and the exit tray for contamination or obstructions. <b>The paper path is free of obstructions.</b>  |
| Y | N   |
|   | Remove obstructions or contamination from the paper path.   |
|   | Inspect all of the rolls along the paper path, between the feed tray and the exit tray, for contamination, wear or damage. <b>The paper path rolls are free of contamination, wear, or damage.</b>  |

A

Y N

Replace the damaged or worn roll (REP 3.1).

Install a new Print Cartridge. Run a Test Print. **The print is still damaged.**

Y N

Problem Solved.

Replace the following, in order, until the defective component is found: Fuser Assembly (REP 5.1), Paper Transport Assembly (REP 4.1), BTR Assembly (REP 7.7), MBF Feed Roll Assembly (REP 2.2), Retard Holder Assembly (REP 2.5), Rear Chute Assembly (REP 3.2), Turn Roll Assembly (REP 2.4), Feed Roll (REP 2.2/ REP 2.10), Tray Assembly (PL 2.1/ PL 2.2).

Go to IQ RAP 13.

## IQ RAP 15 Registration

The image is not positioned correctly on the paper. It may be off in either the process direction or in the scan direction (Figure 1).

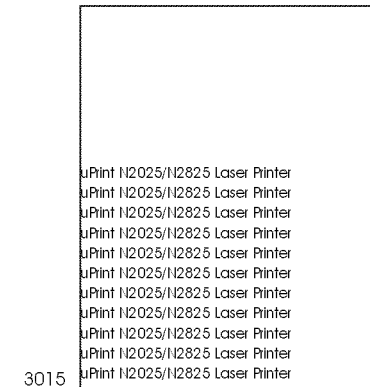


Figure 1 Registration

### Initial Actions

- Check to ensure that the paper is within specification.
- Check that the paper supply is dry and fresh and loaded correctly.
- Check that the Paper Tray guides are set correctly.
- Check that rollers and other components in the paper path are clean and unobstructed.

### Procedure

Run a test print. **The Test Print output image is properly registered.**

Y N

Perform the registration check (ADJ 1.1). **The printer registration is set correctly.**

Y N

Perform the registration procedure (ADJ 1.1).

If misregistration occurs in the process direction, replace in sequence as necessary: Registration Rolls (REP 4.4/ REP 4.5), Registration Clutch (REP 4.3), Main Gear Drive Assembly (REP 6.1), Main Drive Motor Assembly (REP 6.2), Registration Sensor (REP 4.6), Print Engine Controller PWB (REP 8.5), or System Controller PWB (REP 8.1).

If misregistration occurs across the process direction, replace in sequence as necessary: Laser (PL 8.1), System Controller PWB (REP 8.1).

Have the customer send another print job. **The print image is properly registered.**

Y N

Have the customer contact the Xerox Customer Support.

Problem Solved.

## IQ RAP 16 Skips / Smears

A disturbance of the image which lengthens or shortens the image in the process direction. A darkening across the process direction or a repeat of the image in the process direction (Figure 1).



Figure 1 Skips / Smears

### Initial Actions

- Check that the paper supply is dry and fresh.
- Check to ensure that the paper is within specification.
- Check the paper path for any obstructions or debris.

### Procedure

Run a test print. **The image has skips or smears.**

Y N  
|  
Problem Solved.

Check, clean, or replace as necessary in the following sequence:

- The Paper Transport gears, pulleys, or other components (REP 4.1).
- The Main Drive components (REP 6.1).
- The Fuser drive components (REP 5.4/ REP 5.5).
- The Fuser Assembly (REP 5.1).

**The defect still occurs.**

Y N  
|  
Problem Solved.

Replace the Print Cartridge (PL 8.1).

## IQ RAP 17 Unfused Image

The printed image is not fully fused to the paper. The image rubs off easily (Figure 1).

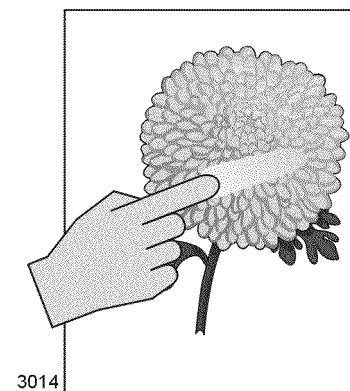


Figure 1 Unfused Image

### Initial Actions

- Check to ensure that the paper is within specification.

### Procedure

Replace the paper with fresh, dry paper from an unopened ream. Run a test print. **The problem is still present.**

Y N  
|  
Problem solved.

Refer to Nonvolatile Memory Setup Mode and check the Fuser setting. **The NV code is set to the factory default value.**

Y N  
|  
Set NV code to the factory default value. Run 25 test prints. **The problem is still present.**

Y N  
|  
Problem Solved.

Increase the fuser temperature by one increment.

**The overall print density is within specification.**

Y N  
|  
Go to IQ RAP 1

Open the Exit Assembly. Remove the Fuser Assembly. Turn the Fuser Assembly upside down. Rotate the fuser idler gear manually and inspect the Heat Roll. Turn the Fuser Assembly right side up. Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the Pressure Roll. **The Heat Roll and the Pressure Roll are free of scratches and contamination.**

Y N  
Clean or replace the Fuser Assembly (REP 5.1).

Open the fuser jam access cover. Rotate the fuser idler gear manually and inspect the contact between the Heat Roll and the Pressure Roll along the rotation. **The Heat Roll and the Pressure Roll are contacting each other uniformly.**

Y N  
Replace the Fuser Assembly (REP 5.1).

Replace the following, in order, until the defective component is found: Fuser Assembly (REP 5.1), Print Engine Controller PWB (REP 8.5), Low Voltage Power Supply (REP 8.6).

IQ RAP 18 Resolution

The two pixel lines and halftone patches cannot be reproduced clearly on the print.

Initial Actions

- Ensure that the print density is set to the default value.

Procedure

Install a new Print Cartridge (PL 8.1). Run the image quality test print. **The Test Print output resolution is good.**

Y N  
Replace the following, in order, until the defective component is found: Laser Assembly (REP 7.1) then the High Voltage Power Supply (REP 8.2).

Problem Solved.