# DOLPHIN (Machine Code: B010) SERVICE MANUAL

# **MIMPORTANT SAFETY NOTICES**

### PREVENTION OF PHYSICAL INJURY

- 1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
- 2. The wall outlet should be near the copier and easily accessible.
- 3. Note that some components of the copier and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
- 4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
- 5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
- 6. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

#### **HEALTH SAFETY CONDITIONS**

- 1. Never operate the copier without the ozone filters installed.
- 2. Always replace the ozone filters with the specified ones at the specified intervals.
- 3. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

#### **OBSERVANCE OF ELECTRICAL SAFETY STANDARDS**

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.

- 1. **SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL** Do not incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
- 2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
- 3. Dispose of replaced parts in accordance with local regulations.
- 4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

#### Lithium Batteries (Memory Back-up)

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The danger of explosion exists if a battery of this type is incorrectly replaced.

Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

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#### **Conventions in this Manual**

This manual uses several symbols.

Symbol	What it means
•	Refer to section number
CT	See Core Tech Manual for details
Ĩ	Screw
E	Connector
Û	E-ring
$\langle \overline{O} \rangle$	Clip ring



Lengthwise, SEF (Short Edge Feed)



Sideways, LEF (Long Edge Feed)

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# SPECIFICATIONS

1	COPIER ENGINE	SPEC-1
2	2ND ROLL TRAY (OPTION)	SPEC-4
3	MACHINE CONFIGURATIÓN	SPEC-5

#### PREPARATION

# 1. INSTALLATION PROCEDURE

### 1.1 PREPARATION

### **1.1.1 ENVIRONMENT**

- 1. Temperature Range: 10°C to 32°C (59°F to 86°F)
- 2. Humidity Range: 15% to 80% RH
- 3. Ambient Illumination: Less than 1,500 Lux (do not expose to direct sunlight).
- 4. Ventilation: Minimum space 20 m<sup>3</sup> (approx. 700 cubic ft.) Room air should turn over at least 3 times per hour.
- 5. Ambient Dust: Less than 0.075 mg/m<sup>3</sup>
- 6. If the installation place is air-conditioned or heated, place the machine as follows:
  - a) Where it will not be subjected to sudden temperature changes from low to high, or vice versa.
  - b) Where it will not be directly exposed to cool air from an air conditioner in the summer.
  - c) Where it will not be directly exposed to reflected heat from a space heater in the winter.
- 7. Avoid placing the machine in an area filled with corrosive gases.
- 8. Avoid any area higher than 2,000 m (6,500 ft) above sea level.
- 9. Place the machine on a strong and level base.
- 10. Avoid any area where the machine may be subjected to frequent strong vibration.

### 1.1.2 MINIMUM SPACE REQUIREMENTS



- 3. Right: 450 mm (18")
- 4. Left: 400 mm (16")

### **1.1.3 MACHINE LEVEL**

- 1. Front to back: Within 0.15 mm/1000 mm (0.006"/39.4") of level
- 2. Right to left: Within 0.15 mm/1000 mm (0.006"/39.4") of level Make sure that the machine is level using a carpenter's level.

### 1.1.4 POWER SOURCE

The machine must be installed in a building /facility equipped with a protective device such as a circuit breaker, as the machine relies on such devices for protection against over-current and short circuits

1.	Input Voltage Level:	120V, 60Hz More than 20 A (for the U.S.A. version)
		220 ~ 240V, 50/60Hz More than 10 A (for the European version)
2.	Permissible Voltage Fluctuation:	± 10%
3.	Do not set anything on the	power cord.

**NOTE:** 1) Make sure the plug is firmly inserted in the outlet. 2) Avoid multi-wiring.

## **1.2 COPIER INSTALLATION PROCEDURE**

### 1.2.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

D	Description	Q'ty
	Paper Holder	4
	Original Guide Tray	1
	Original Guide Tray Hinge – Right	1
	Original Guide Tray Hinge – Left	1
	Upper Original Exit Guide	3
	Upper Original Exit Guide Joint (B010-22, -27 only)	2
	Rear Original Tray	3
	Rear Copy Tray Guide - Large	1
	Rear Copy Tray Guide - Small	1
	Rear Copy Tray	3
	Rear Copy Tray Holder	3
E	Cushion - Rear Copy Tray Holder (B010-22, -27 only)	3
	Guide Mylar - Small	3
	Guide Mylar - Large	1
	Front Copy Tray	1
	Leveling Shoes	4
	Tapping Screw – M4 x 8	6
	Screw with Washer – M4 x 10	2
	NECR (B010-17, -27 only)	1
	Decal - Operation (B010-22, -27 only)	1
	Decal - Paper Tray (B010-22, -27 only)	1
	Decal - Toner Supply (B010-22, -27 only)	1
	Copy Instructions Guide (B010-17 only)	1
	System Instructions (B010-17 only)	1

### **1.2.2 INSTALLATION PROCEDURE**

**NOTE:** Since the installation procedure is not packed with the copier as an accessory, always bring this manual with you.



### ▲ CAUTION Keep the power cord unplugged when starting the following procedure.

- **NOTE:** 1) Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.
  - 2) Insert the leveling shoes [D] under the leveling feet [E], and level the machine before starting the installation.
- 1. Unpack the machine box and place the copier onto a flat floor using lifting equipment (a fork lift).

#### 

The machine weighs approximately 225 kg (496 LB). If a fork lift is not available, at least 4 people, one on each corner of the machine, are needed to lift it from the pallet.

- 2. Remove the upper original tray pack [B] from inside the upper unit.
- 3. Remove all strips of tape [A], [C] as shown above.



- 4. Pull out the upper tray [A] and remove strips of tape.
- 5. Take out the four paper holders [B]. Remove the tapes (x2 each).
- 6. At the rear, remove two shipping blocks [C] from the original junction gate.
- 7. Release the lock lever [D]. Open the original feed unit [E] and remove the cushions and bubble pack [F].
- 8. At the front, remove the tapes [G], and then from the rear remove the shipping blocks [H] and tape [I].
- 9. Open the exit cover [J] and junction gate unit [K], then pull the red ribbon [L] to remove the protection sheet [M].

#### COPIER INSTALLATION PROCEDURE



- 10. Open the upper unit [A] and remove two strips of tape [B] from the transfer corona unit.
- 11. At the front, peel off three strips of tape, and take out the drum protection sheet [C] by pulling out the red tape.
- 12. Open the toner hopper cover, remove the left exit tray [D], remove the strip of tape [E] from the corona wire cleaner, then reinstall the exit tray ( x 2).

#### 

The tape is looped around the corona wire drive screw. To avoid damaging the drive screw, gently peel the tape from the mylar or cut it with scissors.

13. Place a level [F] in the middle of the guide plate as shown in the illustration. Make the machine level by turning the bolts [G] on the machine's four feet.NOTE: The gap [H] must be less than 2 mm for the bolt to clear the 3rd roll feeder (option) when the feeder is opened and closed.



- 14. Install the upper original tray [A] by using the original guide tray hinges [B] ( x 1 each).
- 15. Install the upper original exit guides [C], joints [D] and the rear original trays [E].
- 16. Adhere the cushions [F] to the rear copy tray holders [G].
- 17. Install the rear copy tray holders ( x 2 each) and insert the rear copy trays [H].
  NOTE: The rear copy tray holders must be installed to cover the holes and the bare section of the frame.
- 18. Attach the large rear copy tray guide [I] in the center, then attach the two small rear copy tray guides on either side of the large guide.
- 19. Attach the small guide mylars [J]. The guide mylars should be on the rear copy tray guide.
- 20. Hook the large guide mylar [K] on the rear center copy tray.
- 21. Attach the front copy tray [L].

E



- 22. Raise the upper unit [A] and open the toner hopper cover [B].
- 23. Remove the sheet [C] covering the developer entrance.
- 24. Pour 2.4 kg (1.2 kg x 2) of developer [D] into the development unit evenly across its width, while rotating the knob [E] clockwise as shown.
- 25. Install the toner cartridge [F]. Refer to the decal attached on the left side of the machine.
  - 1) Shake the cartridge 5 to 10 times and insert it into the toner hopper.
  - 2) Peel off the green tape [G] from right to left to expose the clear tape and toner supply holes.
  - 3) Rotate the knob [H] of the cartridge clockwise until it stops.
- 26. Close the toner hopper cover and upper unit.



- 27. Plug in the power supply cord and turn on the main switch.
- 28. Enter SP mode as follows:
  - 1) Press the Clear Modes key C/.
  - 2) Enter (1)(0)(7)
  - 3) Hold down Clear/Stop 😁 for more than 3 seconds.
  - 4) On the touch panel, press Copy SP.
  - **NOTE:** Do not attempt to make copies until after SP3-001-02 has finished in step 31.
- 29. To initialize the developer, execute SP2801 (Developer Initial Setting). This takes two minutes.
- 30. To initialize the drum, execute SP2923 002 (Drum Set Mode). This takes a few seconds.
- 31. Open the upper unit [A], turn the pressure lever [B] to the right to push the cleaning blade against the drum, then close the upper unit.
- 32. To initialize the ID sensor, execute SP3001 002. This takes a few seconds.
- 33. Set SP2924 (Developer Mixing) to "YES".
- 34. Exit the SP mode and make copy samples.



# **1.3 ROLL TRAY INSTALLATION PROCEDURE**

### 1.3.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list: Description Q'ty

1. Positioning Pin2
2. Screw – M4x64
3. Flat Harness (taped to right side of machine)1
4. Hexagonal Tapping Screw with Flat Washer – M4 x 84
5. Screw with Spring Washer – M4 x 61
6. Right Slide Rail1
7. Left Slide Rail1
8. Stepped Screw – M44
9. Screw – M4 x 616
10. Positioning Pins – (M4 x 4)2
11. Harness Clamp – FCW522
12. Harness Clamp – LWS-0511Z2
13. Harness Clamp – LWS-2111Z1
14. Tapping Bind Screw M3x64
15. Edging1
16. Screw – M4x66
17. Decal – Tray 31
18. Paper Holder2
19. Installation Procedure1
20. Decal – Operation (B340-27 only)1
21. Decal – Roll Feeder (B340-27 only)1

### **1.3.2 INSTALLATION PROCEDURE**



#### 

- 1. Unplug the main machine power cord before starting the following procedure.
- 2. Before starting the installation, insert the leveling shoes under the leveling feet, and level the machine.
- 3. The machine is very heavy. To avoid serious injury, make sure that you have a sufficient number of people to assist, and use proper lifting equipment for lifting or moving.
- 4. The feed tray is weighs 32 kg (14.5lbs) and requires at least two people to lift and install.

**NOTE:** Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.

- 1. Turn off the copier main switch.
- 2. Remove the following covers:
  - 1) Right front [A] and rear [B] covers (4 screws, 6 screws).
  - 2) Left front [C] and rear [D] covers (4 screws, 6 screws).
  - 3) Rear covers [E] (9 screws).
- 3. Remove the lower cover [F] and two brackets [G] (2 screws each).
- 4. Remove the power supply unit [H] (4 screws, 16 connectors).

**NOTE**: Before removing the Line and Neutral bayonet connectors [I] from the PSU, mark them "L" and "N" to prevent reversing their positions when they are re-attached. "L" (Line) is on the right, and "N" (Neutral) is on the left.

5. Remove the toner collection bottle [J]



B010I507.WMF

- 6. Install the right and left slide rails [A] ,[B] (2 stepped screws, 5 screws ea. M4x6).
- 7. Install the positioning pins [C] in the center hole on each slide rail.
- 8. Install the positioning pins [D] (2 screws ea. M4x6).
- 9. Install two harness clamps [E] (2 tapping bind screws ea. M3x6).



- 10. Install the harness clamp [A] and edging [B].
- 11. Install the connector [C] (4 hex. tapping screws M4 x 8 with flat washers).
- 12. Loosen the three screws that secure the drawer connector [D].
- 13. Remove the shipping material from the flat cable [E].
- 14. Install the 3rd roll feeder [F] on the slide rails, and fit it over the positioning pins [G].
- 15. Use the four screws [H] (2 screws ea. M4 x 6) to attach the tray to the side rails [I].



- 16. Draw out the 3rd roll feeder and route the flat cable [A] as shown.
- 17. Loosen the positioning brackets [B] of the 3rd roll feeder (2 screws each).
- 18. Remove the plastic bags from the lock levers and push in the 3rd roll feeder slowly.
- 19. Align the positioning bracket and the drawer connector [C] then secure them (2 screws each, 3 screws).



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- 20. Install the two harness clamps [A] and connect the cables [B], [C], [D], and [E]. **NOTE:** Be sure to clamp cable [C, E] as shown with the pre-installed clamp [F].
- 21. Secure the ground (earth) wire [G] (1 screw M4x6 with spring washer).
- 22. Reinstall the lower front cover [H] and attach the decal [I] (2 hex. tapping screws M4x8 with flat washer).
- 23. Reinstall the power supply unit, toner collection bottle, and covers. **NOTE:** Connect the "N" (Neutral) connector on the left and connect the "L" (Line) connector on the right.

#### 

When you position the power supply unit for re-installation, make sure that the flat ribbon cable is not pinched at the top right.

# 1.4 HDD INSTALLATION PROCEDURE

### 1.4.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

### Description

Q'ty

•	
1. HDD	1
2. DC Harness – Power Source	1
3. DC Harness	2
4. Harness Clamp	2
5. Philips Tapping Screw – M4 x 8	2
6. Philips Tapping Screw – M3 x 8	2

### **1.4.2 INSTALLATION PROCEDURE**



### **ACAUTION** Unplug the power cord before starting the following procedure.

- 1. Remove the copier right and left rear covers ( $\hat{k} \times 9$ ).
- 2. Remove the serial number decal from the HDD unit and attach it on the rear frame, next to the machine's serial number decal.
- 3. Remove 2 cushions from the HDD unit.
- 4. Install the HDD unit [A] onto the base plate ( $\hat{\mathscr{F}} \times 2$ ).
- 5. Connect the DC harnesses [B] (ℰ x 1, ⊑ x 2 ea.).
- 6. Connect the power source DC harnesses [C] ( $\mathbb{Z}$  x 3).

Ę

- 7. Enter SP mode as follows:
  - 1) Press **c/**
  - 2) Enter 101
  - 3) Hold down (\*\*) for more than 3 seconds.
  - 4) On the touch panel, press Copy SP.
- 8. Enter 4960 015 (HDD Connection On/Off) and then press On.
- 9. Turn off the main switch and reassemble the machine.

# 1.5 STAMP BOARD INSTALLATION PROCEDURE

### 1.5.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

#### Description

Q'ty

1. Stamp Board.....1

### **1.5.2 INSTALLATION PROCEDURE**



### 

#### Keep the power cord unplugged when doing the following procedure.

- 1. Remove the copier rear left cover ( $\cancel{P} \times 5$ ).
- 2. Install the stamp board [A] on the IPU board [B].
- 3. Plug in the power cord and turn on the main switch.
- 4. Enter SP mode as follows:
  - 1) Press <u>⊂/</u>⊚.
  - 2) Enter (1)(1)(7)
  - 3) Hold down 😁 for more than 3 seconds.
  - 4) On the touch panel, press Copy SP.
- 5. Enter 5137 (Stamp Function On/Off), and then press Enabled.
- 6. Reassemble the machine.

# 1.6 ORIGINAL TRAY INSTALLATION PROCEDURE

### 1.6.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

Description Q	}'ty
1. Base Frame2	
2. Base Stay2	
3. Middle Frame2	
4. Original Tray Stay2	
5. Original Tray1	
6. Size Decal Sheet1	
7. Original Stopper2	
8. Original Guide2	
9. Cap – Base Frame2	
10. Cap – Original Tray Stay2	
11. Hexagonal Bolt – M8 x 4012	2
12. Washer – 8 mm20	)
13. Tapping Screw – M4 x 86	
14. Hex Nut – M88	
15. Caster –	
16. Caster –	

### **1.6.2 INSTALLATION PROCEDURE**



- 1. Snap the casters [A, B] onto the base frames [C]. [A]: Caster –  $\phi$ 40 Stopper [B]: Caster –  $\phi$ 40
- 2. Install the base stays [D] on the base frames (4 bolts, 4 washers).
- 3. Install the caps [E] on the base frame.
- 4. Install the middle frames [F] (4 bolts, 8 washers, 4 nuts).
- 5. Install the original tray stays [G] (4 bolts, 8 washers, 4 nuts).
- 6. Install the caps [H] on the original tray stays.

Installation





- 7. Install the original tray [A] on the original tray stays ( $\hat{\not}$  x 6).
- 8. Attach the size decals (A1입, A0입, 34"입, 36"입, 44"입, 48"입).
- 9. Attach the original stoppers [B] and original guides [C].

## **1.7 I/F BOARD INSTALLATION PROCEDURE**

### 1.7.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

### 

### **1.7.2 INSTALLATION PROCEDURE**

### 

### Unplug the power cord before starting the following procedure.

- 1. Remove the following covers.
  - Left Rear Cover [A] (6 screws).
  - Left Front Cover [B] (4 screws).
  - Rear Left Cover [C] (5 screws).
- 2. Remove the cover bracket [D] (1 screw).



- 3. Install the I/F board unit [E] on the left frame (3 screws).
- Connect the I/F Video cable [F] to the I/F board and IPU board [G] (1 screw each).
   NOTE: Make sure the connector is inserted completely.
- 5. Install the wire saddle [H] and connect the DC harness [I] from the main frame to the I/F board.



#### I/F BOARD INSTALLATION PROCEDURE

6. Remove the small covers [A, B] from the left rear and left front covers [C, D] (2 screws each).



- 7. Install the following covers.
  - Left Front Cover
  - Left Rear Cover
  - Rear Left Cover
- 8. Connect the I/F Ctl Cable [E] between I/F board and printer controller.



aintenance

# 2. PREVENTIVE MAINTENANCE

### 2.1 PM TABLE

**NOTE:** Amounts (K) in the **PM Interval** column indicate kilometers (1,000 meters). Symbol key: I: Inspect, **R**: Replace, **C**: Clean, **L**: Lubricate, **A**: Adjust

Part Number	Description	Q'ty	PM Interval	PM	Comments
Original Feed					
Original Feed / Exit Rollers			10K	С	Alcohol or water, dry cloth
Original Sensors			60K	С	Blower brush
Original Table			10K	С	Water, dry cloth
Optics					
White Platen Roller			10K	С	Alcohol or water, dry cloth
Exposure Glass			10K	С	Water, glass cleaner
Development					
Developer		2	40K	R	Replace if necessary.
Development Filter		1	20K	R	Replace if necessary.
Development Roller Gear <sup>1</sup>		1	200K	R	Replace if necessary
Cartridge Holder			10K	С	Blower brush, dry cloth.
Registration Upper Guide Plate			10K	С	Damp cloth, then dry cloth.
Side Seals			10K	I/C	Dry cloth
Development Unit Gears <sup>*1</sup>			10K	L	Silicone Grease G501.
Development Lower Casing			10K	С	Damp cloth, then dry cloth.
Used Toner Bottle			10K	I	Empty used toner.
Cleaning					
Cleaning Blade		1	30K	R	Replace if necessary.
Cleaning Entrance Seal			20K	С	Dry cloth.
Side Seals			20K	С	Dry cloth.
Pick-off Pawl			20K	С	Dry cloth.
Around the Drum					
Charge Corona Wire		1	10K	C/R	Replace if necessary.
Corona Wire Cleaner Pad		1	10K	R	Replace.
Charge Corona Casing			10K	С	Damp cloth, then dry cloth.
Grid Wire			10K	С	Damp cloth, then dry cloth.
Transfer Corona Wire		1	10K	C/R	Clean with dry cloth. Replace if necessary.
Separation Corona Wire		1	10K	C/R	Clean with dry cloth. Replace if necessary.
T&S Corona Casing / Guide			10K	С	Damp cloth, then dry cloth.
Quenching Lamp			20K	С	Dry cloth
ID Sensor			20K	С	Blower brush.
LPH (LED Print Heads)			10K	С	Dry cloth. No chemical cleaners. After wiping, touch to discharge static.

<sup>\*1</sup>: See 2.2 Lubrication points.
Part Number	Description	Q'ty	PM Interval	РМ	Comment
Paper Feed					
Cutter Unit		1	10K	С	Replace if necessary (approx. service life: 12K cuts)
Paper Feed /	Exit Rollers		10K	С	Alcohol, dry cloth
Cutting Senso	r		20K	С	Blower brush
Registration R	ollers		10K	С	Alcohol, dry cloth
Registration S	ensor		20K	С	Blower brush
Transport Belt			10K	С	Alcohol, dry cloth
Timing Belt			10K	I	Adjust tension if necessary.
Fusing Unit					
Hot Roller		1	30K	R	Replace if necessary.
Fusing Cleaning Roller		1	30K	R	Always replace these parts
Bushing – Hot Roller		2	30K	R	together.
Pressure Roller		1	30K	R	Replace if necessary.
Hot Roller Stripper			10K	С	Dry cloth.
Pressure Roller Stripper			10K	С	Dry cloth.
Thermistor			30K	С	Dry cloth.
Fusing Exit Guide Plate			10K	С	Alcohol, dry cloth.
Fusing Unit Gears*2			120K	L	Barrieta JFE 55/2
Fusing Pressure Screw Shaft* <sup>2</sup>			40K	L	Barrieta JFE 55/2
Fusing Drive Gears			10K	L	Silicone Grease G501
Exit Turn Guide			10K	С	Damp cloth, then dry cloth.
Paper Exit Sensor			10K	С	Blower brush
Exit Rollers			20K	С	Alcohol, dry cloth
Others					
Ozone Filter		1	10K	R	Replace.

\*2: See 2.2 Lubrication points.

# 2.2 LUBRICATION POINTS

## 2.2.1 FUSING SECTION



- [A]: Fusing Gears (Barrieta JFE 55/2)
- [B]: Fusing Drive Gears (Silicone Grease G501)
- [C]: Fusing Pressure Screw Shaft (Barrieta JFE 55/2)

### 2.2.2 DEVELOPMENT SECTION

- [A, B] Development Unit Gears (Silicone Grease G501)
- **NOTE:** Development Roller Gear [A] should be checked every 200 km and replaced if necessary.



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# 3. REPLACEMENT AND ADJUSTMENT

### 

Before you attempt any procedure described in this section, always switch off the main power switch on the machine and disconnect the machine from the power source.

# 3.1 OPENING AND CLOSING THE MACHINE



- [A]: Operation panel release
   CAUTION: To close the operation panel, always press down evenly on both sides.
- [B]: Upper unit releases CAUTION: To avoid bending the catch and release mechanisms, always release and raise the right and left sides together.
- [C]: Hopper cover
- [D]: Roll tray release
- [E]: Paper exit cover
- [F]: Paper exit guide plate

### 3.2 EXTERNAL COVERS

### 3.2.1 FRONT VIEW



- [A]: Right rear cover ( $\hat{\mathscr{F}} \times 6$ )
- [B]: Right front cover  $(\hat{P} \times 4)$
- [C]: Left rear cover ( $\hat{\mathscr{F}} \times 6$ )
- [D]: Left front cover  $(\hat{\beta} \times 4)$
- [E]: Left inner cover ( x 1)

- [F]: Right inner cover ( $\hat{\beta}^2 \times 2$ )
- [G]: By-pass feed table  $(\hat{\beta} \times 4)$
- [H]: Left upper unit cover ( $\beta^2 \times 2$ )
- [I]: Right upper unit cover ( $\mathscr{F} \times 2$ )
- **NOTE:** Always remove the left and right covers together, the rear cover first and then the front cover. To avoid scratching the paint on the covers, always re-attach the front cover first and then the back cover.

### 3.2.2 REAR VIEW

- [A]: Rear right cover ( $\hat{\mathscr{F}} \times 5$ )
- [B]: Rear left cover ( $\hat{k}$  x 5)



SCANNER

## 3.3 SCANNER

## 3.3.1 OPERATION PANEL

[A]: Original roll take-up (<sup>2</sup>/<sub>ℓ</sub> x 2, bracket x 2)



- [A]: Left original guide plate  $(\hat{\mathscr{F}} \times 1)$ [B]: Right original guide plate  $(\hat{\mathscr{F}} \times 1)$ [C]: Operation panel front plate  $(\hat{\mathscr{F}} \times 4)$



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- [A]: Scanner stop switch ( $\hat{\beta} \times 2$ ,  $\exists \forall x 1$ ) [B]: Operation switch ( $\hat{\beta} \times 2$ ,  $\exists \forall x 1$ )

Open the operation panel unit.

[A]: Lower sensor cover  $(\hat{\beta}^2 \times 4)$ [B]: Operation panel  $(\hat{\beta}^2 \times 4, \exists \exists x 2)$ [C]: Upper scanner cover  $(\hat{\beta}^2 \times 6)$ 



### 3.3.2 ORIGINAL SIZE SENSORS, ORIGINAL SET SENSOR, **ORIGINAL REGISTRATION SENSOR**

Raise the operation panel unit.

- Left, right original guide plates ( $\hat{\beta} \times 2$ ) (- 3.3.1) [A]: Operation panel lower cover ( $\hat{\beta} \times 4$ )
- [B]: Original path upper bracket ( x 2)





	[A]	:	Clamp
--	-----	---	-------

ി	Original registration sensor	
2	Original set sensor	<b>A</b> * <sup>1</sup>
୭	(A4 Lengthwise)	B
3	(A3 Lengthwise)	D
4	Original size sensor	С
	(A2 Lengthwise)	
5	Original size sensor	D
	(A1 Lengthwise)	
6	Original size sensor	Е
	(A0 Lengthwise)	
*1	US paper sizes.	



### 3.3.3 WHITE PLATEN ROLLER

- [A]: Raise the operation panel unit
- [B]: Left operation panel unit cover ( 2 x 2)
- [C]: Right operation panel unit cover ( x 2)
- [D]: Original table ( x 4)

- [A]: Door switch bracket ( x 1)
- [B]: Original transport guide ( x 4)



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- [A]: Remove.
- [B]: Loosen but do not remove.
- [C]: White platen roller.
  - Press the white platen roller out to the *left* to remove it.
  - Lift straight out to prevent the stopper or gear from dropping off either end.
  - Before re-installation, make sure the stopper on the left end of the white platen roller is snug, inside the roller.

#### SP Adjustment Required After Replacement

SP4428 002	Scanner Adjustment (see section 3.10.1)
------------	---

**NOTE:** When re-installing, set the right end of the white platen roller first.



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## 3.3.4 ORIGINAL UPPER TRANSPORT UNIT AND EXIT SENSOR

Original roll take-up, operation panel, upper scanner cover, lower sensor cover (see section 3.3.1)

Lower the operation panel frame.

- [B]: CIS cover ( 🖗 x 7)
- [A]: Original exit unit cover (<sup>2</sup>/<sub>8</sub> x 2)
- [B]: Original exit sensor ( x 1)





[A]

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### 3.3.5 ORIGINAL TRANSPORT ROLLER

Upper original transport unit ( 3.3.4) [A]: Original transport roller ( x 4)



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## 3.3.6 CIS (CONTACT IMAGE SENSOR)

Upper original transport unit (- 3.3.4) CIS cover ( $\hat{\not}$  x 2) [A]: CIS unit ( $\hat{\not}$  x 2, = x 3)

SP	Ad	iustment	Rea	uired	After	Re	placeme	nt
•••					/		014001110	

SP4428 002	Scanner Adjustment (see section 3.10.1)
	Section 5.10.1)



# 3.4 AROUND THE DRUM

### 3.4.1 VDB (VIDEO DRIVE BOARD)

Open the upper unit, and remove the exit tray if it is attached.

- [A]: Left copy tray (<sup>2</sup> x 2)
- [B]: Right copy tray ( x 2)

**CAUTION**: To avoid damaging the pawls on the bottom of the covers, hold the cover level as you pull it straight out.

[C]: VDB (斧 x 7, ⊑╝ x 7)



leplacemer Adjustmen

## 3.4.2 LPH (LED PRINT HEAD)

Remove the exit tray if it is attached. Open the upper unit.

Remove the left and right copy trays (-3.4.1)

Remove the left and right upper unit covers. ( - 3.2)

- [A]: LPH connectors on VDB (E<sup>I</sup> x 4)
- [B]: Grounding wire (
  x1)
- [C]: Grounding wire (loosen  $\hat{\mathscr{F}} x1$ )
- [D]: LPH
- [E]: Three ROMs.
- If you intend to replace the LPH, you must replace the ROMS on the VDB with the three ROMs provided with the new LPH kit.
- Reading top to bottom on the board, the ROMs are marked LPH-L (left), LPH-C (center), and LPH-R (right).
- To confirm that each new ROM is installed in the correct position, match the numbers of the new ROMs with the numbers printed on the labels of the LPH unit.



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[C]

## 3.4.3 CHARGE CORONA WIRE, GRID WIRE, WIRE CLEANER

LPH ( 3.4.2)

- [A]: Wire cleaner drive motor bracket (<sup>2</sup>/<sub>8</sub> x 2)
- [B]: Remove the white plastic coupling from the drive screw.

**CAUTION**: To avoid losing this coupling, always remove it before removing the charge corona unit.

- [C]: Left, right grounding plate springs (<sup>3</sup>/<sub>2</sub> x 2)
- [D]: Charge corona unit

# SP Adjustment Required After Replacement

SP2803 Charge Corona Wire Cleaning



- **NOTE:** 1) When removing this unit, shift the unit to the right and lift the left part of the unit up.
  - 2) Confirm that the grounding plate edge is securely set in the holes.
- [A]: Grid wire
- [B]: Right cover
- [C]: Left cover
- [D]: Charge corona wire
- [E]: Shock absorbers
- [A]: Charge corona wire cleaner

#### SP Adjustment Required After Replacement

SP2803	Charge Corona Wire Cleaning

When replacing wires:

- Make sure the grid wires are correctly positioned in the correct slots and not crossed.
- If replacing wires, hold them by the ends. Oil from hands could cause uneven charge on the drum.
- Handle wires carefully. Never bend or stretch them.



## 3.4.4 QUENCHING LAMPS

Charge corona unit ( 3.4.3)

- [A]: Lamp bracket, left (ℱ x 2, ⊑ x 1)
- [B]: Lamp bracket, right (ℱ x 2, 🗊 x 1)
- [C]: Quenching lamp arrays x 2



# 3.5 DRUM AND DEVELOPMENT UNIT

## 3.5.1 DEVELOPMENT UNIT

- [A]: Left upper unit cover ( $\hat{\beta}^2 \times 2$ )
- [B]: Right upper unit cover  $(\hat{F} \times 2)$
- [C]: Right inner cover  $(\hat{\mathscr{F}} \times 2)$

[D]: Lower toner cartridge cover. (Slides out, no screws need to be removed.) [A]



**CAUTION**: The development unit weighs 10.4 kg (22.9 lb.) with the toner cartridge installed, or 8 kg (17.6 lb.) without the toner cartridge.

Raise the upper unit.

[A]: Development bias connector ( $\mathbf{E} \mid \mathbf{X} \mathbf{1}$ ) Make sure the upper unit is open. Do not attempt to remove the development unit with the unit closed.

**CAUTION**: To avoid damaging the fragile wings on either end of the development unit, never attempt to remove or install the development unit in the machine with the upper unit closed.



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[A]

[B]

[A]

[A]

## 3.5.2 DEVELOPER

Remove the toner cartridge (follow the instructions on the decal on the front left side of the machine.

- **NOTE:** To avoid damaging the bias terminal on the left end of the development unit, handle it carefully.
- [A]: Toner supply casing ( $\hat{P} \times 2$ )
- [B]: Development filter and bracket.
- **NOTE:** Make sure that the filter is re-installed with the holes facing down. [B]
- [A]: Raise the clutch-end up about 45° to remove the developer, and then lay to flat.

- [A]: Rotate the unit to remove more developer.
- [B]: Rotate the knob to remove the remaining developer.

#### SP Adjustment Required After Replacement

SP2801	Developer Initial Setting		
SP3001 002	ID Sensor Initial Setting		

## 3.5.3 BY-PASS FEED SENSOR, REGISTRATION SENSOR

- [A]: Development unit ( 3.5.1)
  [B]: Registration bracket ( x 2)
  [C]: Registration guide ( x 2)
  [D]: By-pass feed sensor
  [E]: Registration sensor



### 3.5.4 TONER SUPPLY CLUTCH

- [A]: Development unit ( 3.5.1)
- [B]: Toner supply clutch ( $\mathscr{F} \times 1$ ,  $\mathbb{C} \times 1$ , bushing x1, bracket x 1)
- [C]: Impeller

**NOTE**: After re-installing the toner supply clutch, make sure that the clutch pin is inserted correctly in the slot [D] of the hopper. If not inserted correctly, the rotating clutch could damage the clutch cable.



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### 3.5.5 DRUM DRIVE MOTOR



## 3.5.6 DRUM UNIT, ID SENSOR, AND CLEANING BLADE

Development unit (
 3.5.1)

To the right of the drum drive gear, loosen the screw to relieve the tension on the drive belt.

- [A]: Drum drive gear and belt (𝔅<sup>2</sup> x1, use a hex wrench)
- [B]: ID sensor connector (E<sup>I</sup> x 1)
- [C]: Left drum bracket ( $\hat{\beta} \times 2$ )
- [D]: Right drum bracket ( $\beta x 2$ )
- [E]: OPC drum assembly **NOTE:** Cover the OPC with a sheet of paper to protect it from light.



eplacemen djustment

- [A]: Drum unit left side ( x 1, spring x 1, bushing x 1)
- [B]: Drum unit right side ( x 1, spring x 1, bushing x 1)
- [C]: OPC drum
- [D]: Rubber plates When installing a new drum, remove both rubber plates inside the old drum and install them in the new drum. (These plates reduce the noise caused by inertia when the drum starts and stops.)
- [F]: Pick-off pawl solenoid (𝔅 x 1, ⊑ x 1)

#### SP Adjustment Required After Drum Replacement

SP2923	Drum Set Mode (see the next page)
SP3001 002	ID Sensor Setting – Initial Setting



[A]: Cleaning blade ( $\hat{\beta}^2 \times 2$ )



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# SP Adjustment Required After Cleaning Blade Replacement

SP2923 002	Drum Set Mode – Execute
------------	-------------------------

### **Drum Set Mode**

Make sure that the drum protection sheet is removed.

- 1. Set the pressure lever [A] to the left.
- 2. Plug in the power cable and switch the main power switch on.
- 3. Press **c**/℗.
- 4. Enter (1)(1)(7)
- 5. Hold down (\*\*) for more than 3 seconds.
- 6. On the touch panel, press Copy SP.
- 7. Enter 2923, press <sup>(₱)</sup>, then press Start to execute Drum Set Mode.
- 8. After it has finished, set the pressure lever [A] to the right.
- 9. If you have replaced the OPC drum, enter 3001 002, press (#), then press Start to initialize the ID sensor.



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# 3.6 PAPER FEED

### 3.6.1 CUTTER UNIT

- [A]: Roll tray cover ( 3 x 2)
- [B]: Loosen side plate ( $\hat{F} \times 2$ ).
- [C]: Guide plate (pressure release).



eplacemen Adjustment

- [A]: Left cutter HP switch connector ( I → x 1)
- [B]: Left spring, hook ( x 1)
- [C]: Side plate ( X 2)
- [D]: Right cutter HP switch connector (⊑<sup>J</sup> x 1)
- [E]: Cutter motor connector ( I x 1, clamps x 2)
- [F]: Cutter unit ( x 2). (Slide out to the left.)



# 3.6.2 CUTTING SENSOR AND FEED EXIT ROLLER

- [A]: Lock plate ( $\hat{\mathscr{F}} \times 2$ ) [B]: Sensor bracket
- [C]: Cutting sensor ( $\mathbb{E} x 1$ ,  $\hat{\mathbb{P}} x 1$ )





Left inner cover. (•3.6.3)

Right inner cover. (Raise out of position without disconnecting cable.) (-3.6.3)

- [D]: Bushings ( $\mathbb{C} \times 2$ )
- [E]: Guide plate ( x 4)
- [F]: Feed exit roller
  - **NOTE:** Re-install the left end first (viewed from the front.)



### 3.6.3 ROLL TRAY

### 

# The roll tray weighs 36 kg (80 lb.) At least two technicians are needed to remove it and re-install lit.

Before removing the roll tray, prepare a clean flat surface to set the unit on after removal. As the paper feed motor is mounted *under* the roll tray, a strong table, or four blocks, to raise the roll tray slightly, is ideal and will make it easier to service.

Right covers ( 3.2.1)

- [A]: Rear right cover ( $\hat{\beta}^2 \times 5$ )
- [B]: Open the harness clamps x 3
- [C]: Connectors (⊑<sup>I</sup> x 2)
- [D]: PSU ( 3.9.1)



Replacemer Adjustmen

- [A]: Left inner cover ( 3 x 3)
- [B]: Right inner cover  $(\hat{\beta} \times 2)$
- [C]: Harness clamp at the corner of the right inner cover.



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[A]: Harness clamps inside the machine (x 2)



- [A]: Roll tray (
   <sup>ŷ</sup> x 4 with washers)
   Do not remove the stainless steel spotting screws on either side of the roll tray.
- [B]: Pull the connector from the back to the front of the machine. Coil it and then place it inside the roll tray.With a technician on either side of the roll tray, lift it off the rail and set it down on a clean flat surface. The roll tray weighs about 32 kg (70.5 lb.)



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### 3.6.4 PAPER FEED DRIVE MOTOR

The paper feed drive motor is located *under* the front left corner of the roll tray.

### Roll tray

- Left inner cover (<sup>2</sup>/<sub>2</sub> x 3)
- [A]: Paper feed drive cover, left rear corner ( $\hat{\beta}^2 \ge 1$ )
- [B]: Loosen adjustment screw.
- [C]: Remove pressure spring
- [D]: Motor assembly (≝<sup>i</sup> x 1, *≩* x 2 top, *≩* x 2 side)
- [E]: Paper feed motor ( $\hat{\mathscr{F}} \times 2$ )



## 3.6.5 FIRST FEED ROLLER AND CLUTCH

### Roll tray

- [A]: Bushings (C x 2)
- [B]: First feed roller ( $\textcircled{0} \times 1$ )
- [C]: Paper feed clutch ( I x 1, clamps x 2)

# Adjustment Required After Replacement

Adjust the cut length.

SP1920-001 ~ 081	Cut Length Adjustment
SP1921-001 ~ 025	Cut Length Adjustment



## 3.6.6 SECOND FEED ROLLER AND CLUTCH

### Roll tray

- [A]: Bushings (C x 2)
- [B]: Second feed roller ( ( x 1)
- [C]: Paper feed clutch (≝ x 1, clamps x 2)

# Adjustment Required After Replacement

Adjust the cut length.

SP1920-001 ~ 081	Cut Length Adjustment
SP1921-001 ~ 025	Cut Length Adjustment



B010R713.WMF

### 3.6.7 REGISTRATION MOTOR

Main machine left covers ( 3.2.1)

- Top cover plate  $(\hat{\mathscr{F}} \times 1)$
- [A]: Open clamps
- [B]: Registration motor bracket (<sup>™</sup> x 3, <sup><sup></sup>⁄</sup> x 3)
- [C]: Registration motor ( 2 x 4)



B010R915.WMF

### 3.6.8 REGISTRATION CLUTCH

Registration motor (
 3.6.7)

- [A]: Stopper bracket (<sup>2</sup>/<sub>ℓ</sub> x 1)
- [B]: Registration clutch
- **NOTE:** Use the flat head of a small screwdriver to release the lock on [A] the clutch.



teplacemen Adjustment

## 3.6.9 REGISTRATION ROLLER

Left and right covers, By-pass feed table (
 3.2.1)

Registration motor ( 3.6.7)

Registration clutch ( 3.6.8)

- [A]: Cover plate ( $\hat{\mathscr{F}} \times 2$ )
- [B]: T&S power pack ( x 2, 1 x 1)
- [C]: Torque limiter bracket ( x 2)
- [D]: Torque limiter ( $\hat{\mathscr{F}} \times 1$ )



- [A]: Guide plate ( $\hat{\beta}^2 \times 4$ )
- [B]: Aluminum guide plate ( $\hat{\mathscr{F}} \times 4$ )
- **NOTE:** Hold the plate level as you pull it out so the plastic flaps do not fall from either end.
- [C]: Registration roller ( $\mathbb{C}$  x 2, bushings x 2)



# 3.7 TRANSFER UNIT

### 3.7.1 TRANSFER AND SEPARATION CORONA WIRES

Left, right upper unit covers ( $\bigcirc$  3.2.1) Left inner cover plate ( $\bigcirc$  3.2.1) Right inner cover plate ( $\bigcirc$  3.2.1)

- [A]: Loosen (do not remove) ( $\hat{\beta} \times 2$ )
- [B]: T&S corona unit connectors (国型 x2)
- [C]: T&S corona unit. (Press down on the covers on both ends to prevent them from falling.)

**CAUTION**: Remove the T&S corona unit carefully to avoid touching or scratching the OPC drum above.

[D]: Paper Guide



- [A]: End block covers
- [B]: Insulator plates (x 4)
- [C]: Transfer and separation wires
- **NOTE:** The single wire at the front and double wire at the back are both spring loaded on the left.

When replacing wires:

- Make sure the wires are correctly positioned in the correct slots and not crossed.
- If replacing wires, hold them by the ends. Oil from hands could cause uneven charge on the drum.
- Handle wires carefully. Never bend or stretch them.



B010R703.WMF

## 3.7.2 TRANSPORT UNIT

Drum drive motor ( $rac{-}3.5.5$ ) Fusing drive motor ( $rac{-}3.8.10$ ) Fusing unit ( $rac{-}3.8.1$ )

- [A]: Duct vent (<sup>2</sup>/<sub>ℓ</sub> x 2)
- [B]: Internal duct. Push left and then right to disconnect.
- [C]: Transport unit (<sup>2</sup>/<sub>ℓ</sub> x 4, <sup>□</sup>/<sub>ℓ</sub> x 2)

### 

When disconnecting the connectors from the transport unit, avoid touching or hitting the sharp stripping pawls above the transport unit.





## 3.7.3 TRANSPORT BELTS

- [A]: Guide plate  $(\hat{\mathscr{F}} \times 2)$ [B]: Left transport fan motor  $(\hat{\mathscr{F}} \times 2)$ [C]: Right transport fan motor  $(\hat{\mathscr{F}} \times 2)$



- [A]: Arm bushings ( $\hat{\beta}$  x 3) [B]: Bracket ( $\hat{\beta}$  x 1)
- [C]: Bushings x 2
- [D]: Drive gear
- [E]: Drive shaft
- [F]: Transport belts



## 3.8 FUSING SECTION

## 3.8.1 FUSING UNIT

### 

To avoid serious personal injury, before removing the fusing unit, switch off the main power, unplug the machine from its power source, and allow the fusing unit to cool.

- [A]: Fusing lower cover ( 2 x 2)
- [B]: Connector (⊑ x 1)
- [C]: Grounding wire  $(\mathscr{F} \times 1)$
- [D]: Paper exit cover (hinges x 2)



[A]: Grounding wire ( $\hat{\beta}$  x1)

[B]: Paper exit guide plate (hinges x 2)

B010R503.WMF

- [A]: Left connectors (⊑<sup>IJ</sup> x 4)
- [B]: Right connectors (⊑ x 5)
  - **NOTE**: Mark the large bayonet connectors before you disconnect them so you can re-connect them in the correct order.
- [C]: Fusing unit (
  <sup>[]</sup> x 2)

### CAUTION:

- The fusing unit is heavy, about 14 kg (31 lb.) Grasp it carefully at both ends when you remove it from the machine, and place it on a flat clean surface.
- Re-install the fusing unit carefully to avoid hitting the PCBs as the fusing unit passes over them.



## 3.8.2 PAPER JUNCTION GATE SOLENOID/EXIT SENSOR



### 3.8.5 PRESSURE ROLLER THERMISTOR

- [A]: Thermistor bracket (Â x 1)
- [B]: Open clamp
- [C]: Thermistor



B010R507.WMF

### 3.8.6 THERMOFUSE/HOT ROLLER THERMISTOR

- [A]: Thermofuse bracket (<sup>2</sup> x 1)
- [B]: Thermofuse (<sup>2</sup>/<sub>8</sub> x 2)
- [C]: Thermistor (🖗 x1, É w1)



## 3.8.7 FUSING CLEANING ROLLER

- [A]: Cleaning roller assembly  $(\hat{\mathscr{F}} \times 4)$
- [B]: Bushings ( $\hat{F} \times 2$ )
- [C]: Fusing cleaning roller



### 3.8.8 FUSING LAMPS

Cleaning roller assembly (
 3.8.7)

### Left end of fusing lamp

- [A]: Fusing lamp harness ( $\hat{F} \times 2$ )
- [B]: Fusing lamp cover  $(\hat{\beta}^2 \times 2)$
- [C]: Left fusing lamp bracket (Â<sup>2</sup> x 1) Rotate the rubber cushions until the cutout faces down, then remove the harnesses from the bracket.



B010R510.WMF

(eplaceme Adjustmen

### Right end of fusing lamp

- [A]: Open clamps x 4
- [B]: Fusing lamp cover ( $\hat{F} \times 1$ )
- [C]: Fusing lamp bracket ( $\beta \times 1$ )
- [D]: Turn the rubber cushion until the cutout faces down, then remove the harnesses from the bracket.
- [E]: Fusing lamps
- **NOTE:** After the lamps are reinstalled, make sure that the rubber cushions are rotated so the slits are facing up to prevent the lamps from slipping out.



## 3.8.9 HOT ROLLER AND PRESSURE ROLLER

- Fusing lamps (
   3.8.8)
- [A]: Wire clamp
- [B]: Gear
- [C]: Hot roller bushings
- [D]: Hot roller



Fusing cleaning roller (
 3.8.7) Hot roller strippers (
 3.8.5)

- [A]: Fusing entrance guide ( $\hat{\mathscr{F}} \times 1$ )
- [B]: Pressure plate ( X 1)
- [C]: Bushings
- [D]: Pressure roller



### After Replacing Hot Roller or Pressure Roller

### Rough Adjustment

- 1. Execute SP1914 001 (set to On) to ensure that the pressure motors [A] are at the home position.
- 2. Measure the length of the spring [B] with calipers.

#### Correct spring length:

Outside 28.8± 0.3 mm

 If the spring length is longer or shorter than the correct measurement, adjust the position of the home position sensor [C].





Move sensor:	To make the spring:
Toward the motor	Longer
Away from the motor	Shorter

4. Measure the spring length again with calipers to confirm that it is correct.

### Fine Adjustment

During normal operation the spring, bracket, and sensor move out of the home position to the correct position determined by automatic software calculations for the paper type, fusing mode setting, and fusing roller temperature.

The following SP codes can be used to select the pressure control correction settings if skewing occurs after changing the paper length selection.

SP1914 002	Right Pressure Adjustment
SP1914 003	Left Pressure Adjustment

Changing these SP codes does not change the position of the bracket and sensor immediately after adjustment. The position is adjusted only during copying.

If these SP codes are adjusted, the settings must be the same size but of opposite sign

(Example: Right Pressure +1 / Left Pressure -1)

## 3.8.10 FUSING DRIVE MOTOR

Main unit left covers ( $rac{-}3.2$ ) Left inner cover ( $rac{-}3.2$ )

- [A]: Spring x 1
- [B]: Fusing drive motor unit (<sup>2</sup>/<sub>2</sub> x 3, <sup>2</sup> x 1)
- [C]: Fusing drive motor ( $\hat{P} \times 4$ )
- **NOTE:** When re-installing the fusing drive motor, make sure that the drive shaft is correctly engaged with the timing belt [D].


# 3.9 BOARDS

### 3.9.1 PSU (POWER SUPPLY UNIT)

Left covers (☞ 3.2.2) [A]: PSU (斧 x 4, ≅ x all) NOTE:

- Before removing the Neutral and Line bayonet connectors [B], mark them "N" and "L" before you remove them so you can match them with the N (left) and L (right) notations on the board when you re-connect them.
- If a copy tray support has been installed below the board, you may need to remove it in order to remove all the screws from the PSU board.



B010R907.WMF

# 3.9.2 IOB (INPUT OUTPUT BOARD), MCU (MAIN CONTROL UNIT)

- [A]: Cables
- [B]: IOB (𝔅 x 8)
- [C]: MCU (Â x 5)
- **NOTE:** When replacing the MCU, always reattach the three NVRAMs (IC101, 108, 109) on the new MCU.



### 3.9.3 IPU (IMAGE PROCESSING UNIT)

- [A]: Ribbon cables
- [B]: Optional stamp board (if installed)
- [C]: IPU (𝔅 x 8)



B010R552.WMF

B010R554.WMF

# 3.9.4 HDD REPLACEMENT

Rear right, rear left covers ( 3.2.2) [A]: HDD Unit (곍 x 4, ⊑ x 4)



[B]: HDD Cover ( 3 x 4) [C]: HDD ( 🕅 x 3)

The machine cannot operate with only one functional HDD. A defective HDD must be installed to restore full operation.

Both disks must be the same model and capacity.

Execute the following SP:



If a new HDD is	not available
4960 015	Execute to disable HDD access so the customer can continue using the machine.
After installing	a new HDD, do the following in the order listed below
4960 007, 008	After installing the HDD, execute to clear the bad sector count stored in NVRAM for the old HDD1 (007) or HDD2 (008).
4960 003, 004	After installing the HDD, execute to format HDD1 (003) or HDD2 (004).

# 3.10 ADJUSTMENTS

## 3.10.1 CIS AND WHITE PLATEN ROLLER ADJUSTMENT

Perform this adjustment after replacing the CIS (Contact Image Sensor) or the white platen roller.

This adjustment achieves even image density, even if the image density of the white platen roller is uneven. The *standard original* used for this adjustment is one-sheet of plain paper (cut sheet or roll) paper with a horizontal main scan and vertical sub scan (945 W x 210 L mm  $\pm$  5mm).

**NOTE:** The width of the main scan direction must be 926 mm or more.

- 1. On the operation panel, press  $\boxed{c/2}$ .
- 2. Enter 107
- 3. Hold down <sup>(\*)</sup> for more than 3 seconds.
- 4. On the touch panel, press Copy SP.
- 5. Enter 4428 002, press (#), and then press Start to execute the image scan adjustment.
- 6. Insert the original.
- 7. Enter 4428 001, press (#) and then press Start to confirm that the previous SP executed correctly.

### 3.10.2 LPH ADJUSTMENT

#### Summary

Remove the LPH, replace the three ROMs on the VDB, and then install the new LPH. (See section 3.4.2.)

Before replacing the right copy tray, read the LPH settings from the labels attached to the LPH.

SP2965 001 (ML) aaa      SP2965 002 (MR) bbb      SP2965 003 (SL) ccc      SP2965 004 (SR
---

Write down the four numbers on the right side of each label (aaa, bbb, ccc, d). These are the recommended factory settings for each SP.

After replacing the LPH (LED Print Head) and inputting the above settings, execute a test print in the IPU Test Pattern mode to make sure that the LPH joints are aligned correctly.

#### Entering the LPH Factory Adjustments

- 1. Press 🔊 🔊.
- 2. Enter (1) (1) (1) and then hold down (2) for over 3 seconds to enter the SP Mode.
- 3. On the touch panel, press Copy SP.
- Enter 2965 001, enter the recommended setting for the first SP, and then press (₱).
- 5. Enter the settings for 002, 003, and 004. (Just press **Thext** to move to the next SP.) Make sure that you press **(#)** after you enter each setting
- 6. Press the Exit button, enter 2941 001, and then press (#).
- 7. Enter 03 for IPU Test Pattern 3, press (#), and press Exit. The machine is now in the IPU Test Pattern mode.
- 8. At the top of the screen press Copy Mode to return to the main operation screen.

#### Printing and Checking the Test Pattern

- 1. Feed any wide original 914 mm (36") wide and at least 297 mm (11") long. (A blank sheet cut from the roll is sufficient.) After a few seconds, the IPU Test Pattern prints.
- 2. Fold the printed pattern and measure 150 mm (about 6") to the left and right from the center fold

The LPH has three sections: LPH1 on the left, LPH2 in the center, and LPH 3 on the right. The LEDs overlap slightly where the segments are joined at LPH1, LPH2 [A], and at LPH2, LPH3 [B].

If the lines are faint and appear neither white nor black, the LPH is adjusted correctly.





B010R561.WMF

If black or white lines are clearly visible (see the diagram below), the LPH joints are out of adjustment.

B010R568.WMF

At LPH1, LPH2 [A] too many LEDs are switched off and the result is a white line. At LPH2, LPH3 [B], too many LEDs are switched on, and the result is a black line.



#### ADJUSTMENTS

- 3. If the left line is black, adjust SP2965 001 up, and if it is white, adjust it down.
- 4. If the right line is black adjust SP2965 002 up, and if it is white, adjust it down.
  - Insert the wide original between each adjustment to print another pattern and check the effect of each adjustment.
  - Adjusting these SPs up in intervals of 10 (410, 420, etc.) switches off one LED for every interval, and adjusting down 10 switches on one LED.
  - Adjusting these SPs up less than 10 (411, 412, etc.) decreases the light intensity of the LED, and adjusting down less than 10 increases the light intensity.
  - Adjust the lines until they are faint; the lines cannot be completely erased.
- 5. Broken lines across the IPU Test Pattern indicate that the sub scan timing between LPH1, and LPH2 [A], or between LPH2 and LPH3 [B] is incorrect.



B010R564.WMF

6. To adjust the timing at the joints:

SP2965 003 (SL)	Adjusts the timing at LPH1, LPH2 [A]
SP2965 004 (SR)	Adjusts the timing at LPH2, LPH3 [B]

- a) First adjust 2965 003, and make a test print.
- b) If the timing at joint [A] is incorrect, adjust 2965 003 again.
- c) When the timing at joint [A] is correct, adjust 2965 004 until the timing at joint [B] is correct.

# 3.10.3 IMAGE POSITION, MAGNIFICATION, MARGIN ADJUSTMENTS

Do these adjustments if the customer is unhappy about the above properties of the output.

Before you do any measurements, allow the test print output to cool for three minutes.

NOTE: Always do these adjustments in the order prescribed below.



3-41

#### 1. Skew adjustment for long printouts

- 1. Set normal weight plain paper (841 mm wide/E size, from roll 1) and print an IPU dot pattern with SP2941-1 (IPU Test Pattern Pattern 11), of length 6 m, and output to the rear exit.
- 2. At the rear paper exit, measure the amount of skew on the output. Make sure it is within the standards below.

Allowed skew < 1 mm per meter

3. If the amount of measured shift is not within standards, adjust the right and left fusing pressure from the pressure roller with the following SP codes.

SP1914 002Fusing Pressure Roller Motor – Right Pressure AdjustmentSP1914 003Fusing Pressure Roller Motor – Left Pressure Adjustment

If the paper is skewed to the right, weaken the pressure on the right roller, then increase the pressure on the left roller.

To determine if there is skew, look at the trailing edge.

The SP values must be the same size, but of opposite sign (for example, if SP 1914 002 is -10, SP 1914 003 must be + 10). The difference between the two SP values must be less than 30.

If roller pressure adjustment is not successful, return the SP settings to their previous values. Then do the next procedure to adjust the line speed, and then try again to adjust roller pressure.

#### 2. Printer sub-scan magnification adjustment

- Set normal weight plain paper (841 mm wide/E size, from roll 1) and print an IPU dot pattern with SP2941-1 (IPU Test Pattern – Pattern 11), of length 6 m, and output to the rear exit.
- 2. Within one A0 length (1189 mm) of the leading edge, measure the lengths of six strips of 20 squares on the test pattern, as shown on the drawing.
- 3. Also, within 50 mm of the trailing edge, measure the length of one strip of 20 squares on the test pattern.



•	
Standard	Ave. length of the 7 patterns = $108.373 \text{ mm} \pm 0.3\%$

- If the measurements are not within standard, execute SP1915-001 (Magnification Adj. by Fusing Motor Speed). Setting a *larger* value *stretches* the image.
- If skew could not be adjusted in the previous procedure, set a smaller value for SP1915-001 that is within the above standard.
- If horizontal lines are blurred at the trailing edge, set a smaller value for SP1915-001 that is within the above standard.

#### 3. To set the scanner mask for the adjustments

- 1. Execute SP5990 002 to print the SMC Copy List (a list of the SPs).
- 2. Set the following SPs to zero to make measurement easier.

SP4012-1	Scanner Erase Margin – Leading Edge
SP4012-2	Scanner Erase Margin – Trailing Edge
SP4012-3	Scanner Erase Margin – Left
SP4012-4	Scanner Erase Margin – Right

#### 4. To set the erase margin

Set the following SPs to 5 mm to make measurement easier.

SP2101-1	Printing Erase Margin – Leading Edge
SP2101-2	Printing Erase Margin – Trailing Edge
SP2101-3	Printing Erase Margin – Left

#### 5. To adjust leading edge registration for the printer

- Set normal weight plain paper (841 mm wide/E size, from roll 1) and print an IPU dot pattern with SP2941-1 (IPU Test Pattern – Pattern 11).
- 2. Measure the leading edge registration.

Standard 5±0.5 mm

3. Adjust SP1001 (Leading Edge Registration) if necessary.



#### 6. To adjust side-to-side registration for the printer

- Set normal weight plain paper (841 mm wide/E size, from roll 1) and print an IPU dot pattern with SP2941-1 (IPU Test Pattern – Pattern 11).
- 2. Measure the side-to-side registration.

Standard  $5 \pm 0.5$  mm

3. Adjust SP1002 (Side-to-Side Registration) if necessary.



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#### 7. To adjust cut length

- 1. Using the Preset Cut feature, make standard cuts of plain paper for A4 sideways, A3 sideways, A1 lengthways, and A0, A sideways, B sideways, D lengthways, and E.
- 2. Measure the cuts and check them against the standards in the table.

Up to 297 mm	Less than $\pm 2 \text{ mm}$
298 - 800 mm	Less than $\pm$ 3 mm
801 - 1189 mm	Less than $\pm 4 \text{ mm}$
1190 - 2500 mm	Less than $\pm$ 7.5 mm
2501 - 3600 mm	Less than $\pm$ 11 mm
3601 - 6000 mm	Less than $\pm$ 20 mm

3. If a measurement does not meet the standard, then adjust the following SPs for each roller and paper type.

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SP1920-1~81 Cut Length Adjustment SP1921-1~25 Cut Length Adjustment

#### 8. To adjust scanner magnification

- 1. Copy an OS-A-1 Test Chart with plain paper (cut sheet or roll).
- 2. Measure the length and width of the images on the original and the copy.

3. If the measurements do not meet the standard, adjust the following SP codes.

SP4101	Scanner Main Scan Magnification
SP4008	Scanner Sub Scan Magnification

#### 9. To adjust scanner leading edge registration

- Copy an OS-A-1 Test Chart with plain paper (cut sheet or roll).
  NOTE: Make sure that you execute the copy with manual density set at the operation panel.
- 2. Measure the leading edge registration.

|--|

3. If the measurement does not meet the standard, adjust the following SP code.

SP4010 001 Scanner Sub Scan Registration

#### 10. To adjust scanner side-to-side registration

- Copy an OS-A-1 Test Chart with plain paper (cut sheet or roll).
  NOTE: Make sure that you execute the copy with manual density set at the operation panel.
- 2. Measure the side-to-side registration, within 50 mm from the leading edge of the copy .

Standard	Within ±2 mm
----------	--------------

3. If the measurement does not meet the standard, adjust the following SP code.

SP4011	Scanner Main Scan Registration

#### 11. Printer/scanner trailing edge registration (synchro-cut)

- 1. Prepare two originals. One must have length 210 mm, and the other must have length 1000 mm.
- 2. Make a copy of each original with plain paper in the synchro cut mode.
- 3. Compare the original and cut copy paper lengths.
- 4. If the measurements do not meet the standards (see the table below), adjust the following SP settings.

SP4961 001	Original Adjustment – Synchro Cut Adjustment 210 mm
	Standard: 210 mm ±0.5 mm
SP4961 002	Original Adjustment - Synchro Cut Adjustment 1000 mm

SP4961 002 Original Adjustment – Synchro Cut Adjustment 1000 mr Standard: 1000 mm ±1 mm

#### 12. To reset the scanner mask

Reset SP4012 001~004 (Scanner Erase Margins – Leading, Trailing, Left, Right) to the previous settings (see the SMC list printed earlier).

#### 13. To reset the print erase margin

Reset the print erase margins to the previous settings (see the SMC list printed earlier).

SP2101 001Printing Erase Margin – Leading EdgeSP2101 002Printing Erase Margin – Trailing EdgeSP2101 003Printing Erase Margin – Left

# 4. TROUBLESHOOTING

# 4.1 SERVICE CALL CONDITIONS

### 4.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent the machine from being damaged, the SC can only be reset by a service representative (see the note below). The copier cannot be operated at all.	Enter SP mode, then turn the main power switch off and on.
В	The SC can be reset by turning the main power switch off and on if the SC was caused by incorrect sensor detection.	Turn the operation switch or main power switch off and on. A level B' SC can only be reset by turning the main power switch off and on.
С	The copier can be operated as usual except for the unit related to the service call.	Turn the operation switch off and on.
D	The SC history is updated. The machine can be operated as usual.	The SC will not be displayed. All that happens is that the SC history is updated.

**NOTE:** 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.

- 2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
- 3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to Level B' codes.
- 4) Some of these SC codes contain more than one level (SC303-1, SC303-2, SC303-3, etc.); however, some SCs may display a "-1" even if there is no second or third level (-2, -3).

# 4.2 SC CODE DESCRIPTIONS

#### SC192: AMDP download error

These SCs could occur at original scanning.

No.	Meaning
SC192-1	AMDP1 program load error
SC192-2	AMDP2 program load error
SC192-3	AMDP3 program load error
SC192-4	AMDP4 program performance error
SC192-5	AMDP5 program performance error
SC192-6	AMDP6 program performance error

Definition: D

The AMDP ROM enable signal could not be detected within 8 ms after program download to the AMDP started. Program download failed three times consecutively.

Possible Cause

- AMDP program defective.
- IC card defective
- IPU defective

#### SC302: Charge Corona Output Error

Definition: D

Charge corona feedback voltage of less than 1V was detected for more than 200 s.

- Charge power pack is defective.
- High voltage cable is defective.
- Poor connection of the power pack connector.
- Dirty charge corona unit caused leakage.

SC303: Charge corona wire cleaner error

No.	Definition: D	Possible Cause
SC303-1	Wire cleaner motor feedback voltage of less than 0.1 V was detected for more than 1s.	Wire cleaner motor connector disconnected.
SC303-2	Corona wire cleaning did not complete within 80 s.	Wire cleaner motor connector disconnected. Wire cleaner motor is operating without a load.
SC303-3	Charge wire cleaner did not return to the home position.	Wire cleaner stops due to an overload.
SC303-4	Cleaner does not move from the home position.	Wire cleaner motor drive circuit malfunction.

**Temporary Solution** 

The charge corona cleaner function should be switched off with SP2804.

### SC306: Charge grid output error

Definition: D

Control PWM duty value is higher than 1% (FB less than 1V) for more than 200 ms (a grid current leak).

Possible Cause

- CBG power pack is defective.
- High voltage cable is defective.
- Poor connection of the power pack connector.
- Dirty charge corona unit causing leakage

### SC330: Writing ASIC signal error

ASIC: Application Specific Integrated Circuit

Definition: D

At power on, the stamp function could not execute successfully twice.

Possible Cause

- SP5137 setting incorrect
- Stamp board defective
- Poor stamp board connection

#### Temporary Solution

Use SP5137 to switch off the stamp function.

#### SC353: ID sensor malfunction

Definition: D

No.	Definition	Remarks
SC353-1	Vsp is 0V or more than 2.5 V	During the copy cycle, these SCs are
SC353-2	Vsg is 0V or more than 2.5 V	displayed after the copy is executed.
SC353-3	Edge pattern voltage (2.5 V) cannot be detected	
SC353-4	LED drive current (PWM value) is over 1000 or fixed at 0.	This SC could occur while the ID sensor is initializing.
SC353-5	Vsg cannot be adjusted to 4 ±0.2V within 20 s.	

**Possible Cause** 

- ID sensor defective
- ID sensor connector defective
- IOB malfunction
- CBG power pack defective
- Dirty ID sensor
- VDB defective
- LPH defective

#### SC360: Hard disk connection error

Definition: D

The connection of the optional HDDs could not be confirmed.

No.	Meaning
SC360-1	Hard disk 1 error
SC360-2	Hard disk 2 error

Possible Cause

- Hard disk connectors disconnected.
- Hard disk defective.
- IPU board defective

**Temporary Solution** 

Use SP4960 015 to switch off HDD access so the customer can continue to use the machine until a replacement HDD becomes available.

shooting

No.	Meaning
SC360-1	Bad sectors Max.: HDD1
SC360-2	Bad sectors Max.: HDD2
SC360-3	Verifying error: HDD1
SC360-4	Verifying error: HDD2
SC360-5	Formatting error: HDD1
SC360-6	Formatting error: HDD2
SC360-7	Device error: HDD1
SC360-8	Device error: HDD2
SC360-9	Device error: HDD1
SC360-10	Device error: HDD2

#### SC361: Hard disk read error

#### Definition: D

Image data on the HDD cannot be read.

Possible Causes	What Happens
Bad sectors created on the hard disk during operation.	Bad sector information is written to NVRAM and these bad sectors will no longer be accessed for writing information to disk.
Bad sectors created on the hard disk while executing SP4960-1,-2 (HD media check).	Use SP4906 003, 004 to format the disk and replace bad sectors with other sectors.
Bad sectors created on the hard disk while formatting SP4960-3,-4 (HD formatting).	The affected hard disk requires replacement (too many bad sectors exist already).

or
(

No.	Meaning
SC362-1	Video input error
SC362-2	Video output error
SC362-4	Mode setting error
SC362-51	DMA transfer error: HDD1
SC362-52	DMA transfer error: HDD2

Definition: D

At the IPU, an error was detected during data compression with the GAIMAC ASIC or during data transfer to memory.

Possible Cause

• Software error, IPU defective. Update the firmware. If this does not solve the problem, replace the IPU board.

#### SC365: Image processing parameter error

Definition: D

An image processing data file not stored in the memory was required when writing started due to software error.

**Possible Cause** 

• Software error. Replace software (all three firmware modules).

#### SC391: Development bias error

Definition: D

A development bias feedback voltage of less than 0.25V was detected for more than 200 ms while the PWM duty value was more than 1% (development bias leak).

Possible Cause

- Bias power pack defective
- Bias cable defective
- Poor bias cable connection
- Bias leak

#### SC401: Transfer corona leak error

Definition: D

A transfer corona feedback voltage of less than 0.25V was detected for more than 200 ms.

- T&S power pack defective.
- Transfer corona cable defective.
- Poor transfer corona cable connection.
- Dirty T&S corona unit caused leak

#### SC411: DC separation corona current leak

Definition: D

A dc separation feedback voltage of less than 0.5V was detected after more than 200 ms while the PWM duty value was more than 17%.

Possible Cause

- T&S power pack defective.
- Paper separation current cable defective.
- Poor paper separation current cable connection.

#### SC440: Drum drive motor lock

Definition: D

The motor lock signal is on longer than 5 s while the drum drive motor is on.

Possible Cause

- Drive mechanism overload.
- Motor defective.

#### SC441: Development drive motor lock

Definition: D

No.	Meaning
SC441-1	Development drive motor lock signal is low longer than 5 s when the development motor stops.
SC441-2	Development drive motor lock signal is high longer than 5 s when the development motor rotates.

**Possible Cause** 

- Drive mechanism overload
- Motor defective
- Motor disconnected

#### SC506: Registration motor lock

Definition: D

The registration motor lock signal is high longer than 5 s during operation.

- Drive mechanism overload.
- Motor defective.

#### SC508: Cutter 1 home position error 1

Definition: B

Both left and right home position switches of the upper cutter were on just after the main switch was turned on, or just after the upper feed tray was opened and closed.

**Possible Cause** 

• Right or left home position switch defective.

#### SC509: Cutter 1 home position error 2

Definition: B

No.	Meaning
SC509-1	Left home position switch stays on 300 ms after the cutter starts moving from left to right.
SC509-2	Right home position switch stays on 300 ms after the cutter starts moving from right to left.

Possible Cause

- Cutter motor cable disconnected
- Cutter motor overload
- Motor defective

#### SC510: Cutter 1 home position error 3

Definition: B

No.	Meaning	
SC510-1	Right home position switch stays off 1 s after the cutter starts moving from left to right.	
SC510-2	Left home position switch stays off 1 s after the cutter starts moving from right to left.	

- Cutter motor cable disconnected
- Cutter motor overload
- Motor defective

#### SC511: Cutter 2 home position error 1

Definition: B

Both left and right home position switches of the lower cutter were on just after the main switch was turned on, or just after the lower feed tray was opened and closed.

Possible Cause

• Right or left home position switch defective.

#### SC512: Cutter 2 home position error 2

Definition: B

No.	Meaning	
SC512-1	Left home position switch stays on 300 ms after the cutter starts moving from left to right.	
SC512-2	Right home position switch stays on 300 ms after the cutter starts moving from right to left.	

Possible Cause

- Cutter motor cable disconnected
- Cutter motor overload
- Motor defective

#### SC513: Cutter 2 home position error 3

Definition: B

No.	Meaning	
SC513-1	The right home position switch stays off 1 s after the cutter starts moving from left to right.	
SC513-2	The left home position switch stays off 1 s after the cutter starts moving from right to left.	

- Cutter motor cable disconnected
- Cutter motor overload
- Motor defective

#### SC541: Fusing thermistor open

Definition: A

The fusing temperature detected by the thermistor was below 7 °C for 10 s.

Possible Cause

- Fusing thermistor defective
- Thermistor cable disconnected

#### *SC542: Fusing temperature warm-up error*

No.	Definition	
SC542-1	After switching on the machine, or after opening and closing the machine, during warmup the hot roller did not attain the ready temperature within 5 minutes.	
SC542-2	After the ready temperature, the hot roller did not reach the target control temperature within 5 minutes.	

Possible Cause

- Fusing lamp defective
- IOB board defective
- MCU board defective

#### SC543: Fusing overheat error 1 (software)

Definition: A

A fusing temperature of over 215 °C (419°F) was detected for 5 s

Possible Cause

- IOB board defective
- MCU board defective
- PSU defective

#### SC544: Fusing overheat error 2 (hardware)

Definition: A

The BICU detects an overhead error even if the software overheat protection does not work.

SC544-1	Latch signal remains on for 50 ms	
SC544-2	Normal signal on for 1 s	

- IOB board defective
- MCU board defective
- PSU board defective

#### SC545: Fusing lamp overheat error 3

Definition: A

After reaching the ready temperature, the hot roller does not rotate, and the fusing lamp stays on at full power for 50 s.

**Possible Cause** 

• Hot roller thermistor not positioned correctly

#### SC546: Unstable fusing temperature

Definition: A

No.	Meaning	Remarks
SC546-1	Fusing temperature rapidly	Temperature fluctuates greater
	fluctuating.	than 20°C (68°C) at 1 second
		intervals.
SC546 -2	Fusing temperature fluctuating over a long interval.	Temperature fluctuates 20°C (68°C) more than 3 times during 60 s interval.

**Possible Cause** 

• Poor thermistor connection

#### SC547: Zero-cross signal malfunction

Definition: A

No.	Meaning	
SC547-1	Abnormal mains frequency was detected more than 10 times.	
SC547-2	No zero-cross signal detected for 1 second.	
SC547-3	No zero-cross signal detected for 2.5 s after the main switch is turned on.	

**Possible Cause** 

- Electrical noise on the power line.
- PSU defective.

#### SC549: Pressure roller thermistor abnormal

Definition: D

SC547-1	During fusing motor rotation, pressure roller temperature detected lower than 7°C (44.6°F) for 5 s.
SC547-2	Pressure roller temperature detected higher than 235°C (455°F) for 5 s.

- SC547-1: Thermistor disconnected or connector damaged.
- SC547-2: Thermistor shorted or connector damaged.

#### SC550: Left fusing pressure motor home position error 1

Definition: D

The left pressure motor did not return to home position 9 s after the left pressure motor started.

Possible Cause

- Motor drive mechanism overload.
- Motor defective.
- Pressure home position sensor defective.

#### *SC551: Left fusing pressure motor home position error 2*

Definition: D

The left pressure motor was still at the home position 1.5 s after the start signal turned on.

Possible Cause

- Motor drive mechanism overloaded.
- Motor defective.
- Pressure home position sensor defective or disconnected.

#### SC552: Right fusing pressure motor home position error 1

Definition: D

The right pressure motor did not return to home position 9 s after the right pressure motor started.

Possible Cause

- Motor drive mechanism overloaded.
- Motor defective.
- Pressure home position sensor defective.

#### *SC553: Right fusing pressure motor home position error 2*

Definition: D

The right pressure motor was still at the home position 1.5 s after the start signal turned on.

- Motor drive mechanism overloaded.
- Motor defective.
- Pressure home position sensor defective or disconnected.

#### SC554: Fusing drive motor error

Definition: D

The fusing drive motor lock signal stayed on (remained HIGH) for 5 s.

Possible Cause

- Fusing motor drive mechanism overloaded.
- Motor defective.

#### SC600: Operation panel/MCU communication error

Definition: D

The operation panel and MCU are not communicating.

Possible Cause

- Loose harness
- MCU defective

#### SC601: IPU/CIS communication error

Definition: D

The IPU and CIS are not communicating.

Possible Cause

- MCU defective
- Loose harness

#### SC602: Communication error between IPU and HDC

Definition: D

The IPU and HDC (hard disk controller chip mounted on the IPU) are not communicating.

**Possible Cause** 

- IPU board defective
- HDC mounted on IPU incorrectly

#### SC603: IPU/AMDP communication error

Definition: D

The IPU and AMDP are not communicating after 6 AMDP data transmissions.

Possible Cause

• IPU defective.

#### SC605: BICU/MCU error

Definition: D

The BICU and MCU are not communicating due to a serial data communication error or a serial data receive buffer overflow.

Possible Cause

• MCU defective



#### SC951: F gate signal error

Definition: D

The paper is ejected with no image (or a partial image) because the FGATE signal that triggers image writing failed to switch off after 60 s.

**Possible Cause** 

- Software defective. Replace the software (all three firmware modules).
- MCU defective
- IPU defective

#### SC953: Scanner image setting error

Definition: D

The IPU did not issue the signal required for the scanner to start image processing.

**Possible Cause** 

• Software defective. Replace the software (all three firmware modules).

#### SC954: Printer Image Setting Error

Definition: D

The IPU did not issue the signal required to start image processing for the printing mode.

**Possible Causes** 

• Software defective. Replace the software (all three firmware modules).

#### SC955: Memory Setting Error

Definition: D

Settings required for memory to start image processing are not sent from the IPU.

**Possible Causes** 

• Software defective. Replace the software (all three firmware modules).

#### SC964: Scanner start signal error

Definition: D

The scanner receives another start signal after scanning has already started.

Possible Cause

• Software defective. Replace the software (all three firmware modules).

#### SC965: Print start signal error

Definition: D

The printer received another print start signal after print job has already started.

Possible Cause

• Software defective. Replace the software (all three firmware modules).



#### SC980: HDD access error

Definition: D

Incorrect parameter sent to the HDC (hard disk controller chip mounted on the IPU) from the BICU.

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No.	Meaning
SC980-1	IDNF error (HDD1)
SC980-2	IDNF error (HDD2)
SC980-3	ABRT error (HDD1)
SC980-4	ABRT error (HDD2)
SC980-5	Sequence error (HDD1)
SC980-6	Sequence error (HDD2)

- Software defective. Replace the software (all three firmware modules).
- MCU defective

#### SC981: HDD response error

#### Definition: D

No response from the hard disk within 5 s after the BICU chip on the main board sent read/write commands to the HDD controller.

No.	Meaning	
SC981-1	Power off wait (HDD1)	
SC981-2	Power off wait (HDD2)	
SC981-3	DMA transfer answer wait (HDD1)	
SC981-4	DMA transfer answer wait (HDD2)	
SC981-5	Spindle motor answer wait (HDD1)	
SC981-6	Spindle Motor answer wait (HDD2)	

Possible Cause

- Software defective. Replace the software (all three firmware modules).
- HDD defective or poor connection due to vibration

#### SC982: MSU error

MSU: Memory Supercharger Unit (hard disk with hard disk controller)

Definition: D

MSU (Memory System Unit) memory configuration does not meet specifications.

SC982-1	HDD1
SC982-2	HDD2

Possible Cause

Hard disk capacity is insufficient (does not meet specification).

#### SC984: IMAC initialization failure

Definition: D

A hard disk was accessed when the context table RAM of the IMAC (Image Memory Access Controller) is initialized at the beginning of the copy cycle.

Possible Cause

• Software defective. Replace the software (all three firmware modules).

#### SC997: HDD Read Error

Definition: D

Memory could not be swapped during long original scanning.

No.	Meaning
SC007-0	Copier application
SC997-1	Scanning application
SC997-2	Internal error (memory stack failure)

Possible Cause

• Software defective. Replace the software (all three firmware modules).

#### SC998: NVRAM Error

Definition: D

An error occurred in the NVRAM.

No.	Meaning
SC998-1	At power on, 00h could not be read as "00h" when the NVRAM was checked.
SC998-2	At power on, 55h could not be read as "55h" when the NVRAM was checked.
SC998-3	At power on, AAh could not be read as "AAh" when the NVRAM was checked.
SC998-4	At power on, FFh could not be read as "FFh" when the NVRAM was checked.

- NVRAM not installed correctly
- MCU board defective

# 4.3 JAM CODE TABLE

#### **Printer Unit**

Code	Jam Detection Condition	Location* <sup>1</sup>	Remarks
1	At power on	Not specified	
3	Paper not reached roll lead edge sensor 1.	A2	These are jams when
4	Paper not reached roll lead edge sensor 2.	A2	paper does not
5	Paper not reached roll lead edge sensor 3.	A1	activate the sensor.
11	Paper not reached cutting sensor 1.	A2	
12	Paper not reached cutting sensor 2.	A1	
13	Paper not reached registration sensor.	В	
15	Paper not reached exit sensor.	С	
16	Paper not reached upper exit sensor.	С	
34	Paper not reached by-pass feed sensor.	A3	
53	Paper stays at roll lead edge sensor 1.	A2	These are jams when
54	Paper stays at roll lead edge sensor 2.	A2	paper stays at the
55	Paper stays at roll lead edge sensor 3.	A1	sensor.
61	Paper stays at cutting sensor 1.	A2	
62	Paper stays at cutting sensor 2.	A1	
63	Paper stays at registration sensor.	В	
65	Paper stays at exit sensor.	С	
66	Paper stays at upper exit sensor.	С	
84	Paper stays at by-pass feed sensor.	A3	

\*1 A1,A2, B, C and P refer to the area of the jam in the illustration that is displayed on the touch panel when an error occurs.

#### Scanner Unit

Code	Jam Detection Condition	Location* <sup>1</sup>	Remarks
1	At power on.	Р	
32	Original does not reach the registration sensor.	Р	
33	Original registration sensor does not switch off.	Р	
34	Original stays at the registration sensor.	Р	
38	Original stays in scanner unit, but does not reach the registration sensor.	Р	
40	Scanner stop switch is pressed	Р	
41	Original does not reach the original exit sensor.	Р	

\*1 A1,A2, B, C and P refer to the area of the jam in the illustration that is displayed on the touch panel when an error occurs.

# 4.4 COVER OPEN

Location	Shut off line
Original Feed Unit Safety Switch	Original feed motor, original exit gate solenoid (DC 24V line)
Toner Hopper Cover Open Switch	Development drive motor (DC 24V line)
Upper Unit Safety Switch	Development drive motor, CGB power pack,
	TD power pack, registration motor.
Paper Exit Cover Switch	Registration motor, drum motor, left fusing pressure motor, right fusing pressure motor, paper junction gate solenoid, pick-off pawl solenoid (DC24V lines)
Upper Roll Tray Safety Switch	Roll feed motor (DC 24V line), anti-condensation heaters (AC line)
Cutter Safety Switch 1 (Upper)	Cutter motor (DC 24V line)
Lower Roll Tray Safety Switch	Roll feed motor (DC 24V line), anti-condensation heaters (AC line)
Cutter Safety Switch 2 (Lower)	Cutter motor (DC 24V line)
Original Feed Unit Open Sensor	Original feed motor, original junction gate solenoid (DC 24V line)
Upper Unit Open Sensor	Development drive motor, CGB power pack, TD power pack, registration motor.

Troubleshooting

# 4.5 IMAGE DATA PROCESSING FLOW CHART

### 4.5.1 DATA FLOW IN 1-TO-1 COPY MODE



B010T502.WMF

### 4.5.2 DATA FLOW IN REPEAT COPY MODE



B010T501.WMF

Troubleshooting

### 4.5.3 DATA FLOW IN SCANNING MODE



B010T503.WMF

# 4.5.4 DATA FLOW IN PRINTING MODE (A0 OR SMALLER)



B010T504.WMF



# 4.5.5 DATA FLOW IN PRINTING MODE (LARGER THAN A0)

B010T505.WMF

Troubleshooting

### 4.5.6 DATA FLOW IN TEST PATTERN PRINTING



B010T506.WMF
### 4.6 IMAGE PROBLEM TROUBLESHOOTING

### 4.6.1 FLOW CHART



Troubleshooting

B010T500.WMF

**NOTE:** For the VDB/IPU test patterns, use SP2942.

### 4.6.2 SCANNING

# 1. No image (blank copy/print, or no image with only vertical black lines on the output)

Possible causes:

- 1) Connection problem between CIS and IPU.
- 2) CIS defective

# 2. No image (solid black copy/print, or no image with only vertical white lines on the output)

Possible causes:

- 1) Connection problem between CIS and IPU.
- 2) CIS defective

### 3. Light image

Possible causes:

- 1) Low CIS output
- 2) IPU board defective

#### 4. Vertical black lines

Possible causes:

- 1) Dirty exposure glass
- 2) CIS defective

#### 5. Vertical white lines

Possible causes:

- 1) Dirty exposure glass
- 2) Dirty or scratched white platen roller
- 3) CIS defective

B010T512.WMF



B010T513.WMF



B010T514.WMF



B010T515.WMF



### 6. Black or white bands with no image-width 1/8 A0 (E) size

Possible causes:

- 1) Connection problem between CIS and IPU
- 2) CIS output error
- 3) IPU board adjustment error



B010T516.WMF

#### 7. White lines every 1mm pitch in halftone areas

Possible causes:

CIS defective

### 8. Bands/lines every 8mm pitch in halftone areas

Possible causes:

LPH defective

Troubleshooting

### 4.6.3 PRINTING

### 1. No Image (blank copy/print)

Possible causes:

- 1) VDB board defective
- 2) IPU board defective
- 3) LPH (LED head) defective

### 2. Band with no image-width 1/3 of image

Possible causes:

Connection problem between VDB and LPH



B010T517.WMF



B010T518.WMF

# 3. Bands with no image-width 1/8 A0 (E) size

Possible causes:

VDB board defective



B010T519.WMF

### 4. Vertical white and black line at 150 mm from center.

Possible causes:

LPH Joints adjustment error

( 3.10.2 )



### 5. Horizontal line broken at 150 mm from center.

Possible causes:

LPH subscan timing error at joint position

( 3.10.2 )



B010T521.WMF



# 5. SERVICE TABLES

### 5.1 SOFTWARE UPGRADING

### 5.1.1 OVERVIEW

The MCU (Main Control Unit) board flash-memory contains the software for this machine. To upgrade the software, you need three IC cards:

- BICU (1 card)
- SCU (1 card)
- AMDP (Advanced Multi-media Display Processor) (1 card)

To copy the software into the flash memory on the MCU board, insert the cards in the MCU slots as explained in the following procedures.



### 5.1.2 UPGRADING THE SCU FIRMWARE

- **CAUTION:** 1) Always turn the main switch off before inserting or removing an IC card.
  - 2) Keep the main switch on during software installation.
  - 3) Protect IC cards from heat, humid air, and sunlight.
  - 4) Handle IC cards with care to avoid damaging them.

Check the checksum value displayed on the panel at the end of installation. For a Notes release document, check the "16BitSum (Little Endian)" total checksum.

Follow this procedure to upgrade only the SCU.

- **NOTE**: If you need to upgrade both the SCU and BICU, they can be upgraded together. ( 5.1.4)
- 1. If you need to check the current version of the software installed in the machine, enter the SP mode and check the SCU version number displayed below the Copy SP button on the touch panel.
- 2. Turn the main switch off.
- 3. Remove the rear right cover.
- 4. Make sure that TB101 [A] is set to 1-2 Short
- 5. With Side A of the IC Card [B] facing up, insert it into the upper right slot.



6. Turn the main switch on. LED 102 and 104 start flashing, and the following display appears on the touch panel.

Y Flash Card Utility Card → ROM Card: 80105192 ROM: 800000 Install this card?	
VERIFY INSTALL (# Key)	
B0105501 \	

**NOTE:** If the message does not appear, the IC card may contain corrupt data. In this case, turn the main switch off and discontinue installation.

7. Confirm that the card has the required version.

- 8. On the touch panel, press INSTALL to start the installation. On the MCU board, LED101 lights and MCU LED102 starts flashing faster.
  - The "Erasing" progress bar tells you that the old software is being erased, and then will be replaced by the "Writing" progress bar that indicates the new software is being downloaded from the card.
  - The Erasing and Writing progress bars will display alternately until the data transfer is completed.
  - Installation requires 2 or 3 minutes.
  - When you see the following message, the update is completed.

Y Flash Card Utility	
	Card → ROM Installation or verifying is completed. Turm main switch off and pull the card. B0105192 Dec 31 2001 SUM: 9FF9h
	ОК
	B0105502 WI

- 9. Turn the main switch off.
- 10. Remove the IC card.
- 11. Turn the main switch on.
- 12. Confirm that the machine starts normally. If the machine does not start normally, redo the procedure.

### 5.1.3 UPGRADING THE BICU FIRMWARE

Follow this procedure to upgrade only the BICU firmware.

- **NOTE**: If you need to upgrade both the SCU and BICU, they can be upgraded together. (• 5.1.4)
- 1. If you need to check the current version of the software installed in the machine, enter the SP mode and check the BICU version number displayed below the Copy SP button on the touch panel.
- 2. Switch the main switch off.
- 3. Remove the right rear cover.
- 4. With side A of the BICU Card [A] facing up, insert it into the *bottom* slot of the MCU.
- 5. Make sure that jumper TB101 [B] is set to 1-2 Short



- 6. Turn the main switch on. LED 102 and 104 start flashing. When LED 103 lights and goes off after about 30~50 seconds, LED 102 and LED 104 flash slower, and this means that the upgrade is completed. (No message is displayed to indicate when the upgrade is completed.)
- 7. Turn the main switch off.
- 8. Remove the IC card.
- 9. Turn the main switch on, and then confirm that the machine starts normally.

Tables

### 5.1.4 UPGRADING THE SCU AND BICU TOGETHER

The SCU and BICU cards can be inserted at the same time in order to update both with one operation.

- 1. If you need to confirm the version numbers of the currently installed software, enter the SP mode and check the SCU and BICU version numbers displayed below the Copy SP button on the touch panel.
- 2. Switch the main switch off.
- 3. Remove the right rear cover.
- 4. On the MCU, make sure that jumper TB101 [A] is set to 1-2 Short .
- 5. With side A facing up, insert the SCU card [B] in the upper right slot.
- 6. With side A facing up, insert the BICU card [C] in the lower left slot.



7. Turn the main switch on. LED 102 and 104 start flashing, and the following display appears on the touch panel.



- The "Erasing" progress bar tells you that the old software is being erased, and then will be replaced by the "Writing" progress bar.
- The Erasing and Writing progress bars will display alternately until the data transfer is completed.
- Installation requires 3 or 4 minutes.

• When you see the following message, the update is completed.



- 8. Turn the main switch off, then remove the IC cards.
- 9. Turn the main switch on, then confirm that the machine starts normally.

### 5.1.5 UPGRADING THE AMDP FIRMWARE

Follow this procedure to upgrade the firmware for the AMDP (Advanced Multimedia Display Processor).

- **NOTE**: Upgrading AMDP firmware requires that you change jumper TB101. Do not attempt to install the AMDP with the SCU firmware IC card in the upper right slot. If you need to update the SCU, upgrade it separately. ( 5.1.2)
- 1. Set jumper TB101 [A] to 2-3 short
- 2. With side A of the AMDP IC card [B] facing up, insert it into the lower slot.



- 3. Turn the main switch on. LED102 and LED104 start flashing. LED103 lights and LED104 starts flashing faster. The installation starts. There are no messages on the screen.
- 4. Wait for about 30 seconds. LED 103 goes off, then LED104 starts flashing slower.
- 5. Turn the main switch off, then remove the IC card.
- 6. Turn the main switch on, then confirm that the machine starts normally.
- 7. Before you install the back cover, re-set TB101 to 1-2 Short (Normal).

### 5.2 UP (USER PROGRAM) MODE

### 5.2.1 INITIAL SYSTEM SETTINGS

On the left side of the touch panel, press (\*), then on the touch panel press System Settings, then press a tab. Press the Next and Prev buttons to browse all the available items.

Item	Default Setting
General Features	
Fuser Adjustment: Paper Tray	
By-pass Tray Paper Type	Plain
Original Size Detect	A Series
Tray Paper Size	A Series
Paper Volume Setting	
Tray Paper Type	
Original Output Tray	Upper
Copy Output Tray	Front
Paper Exit Hold	On
(TNext)	
Original Feed Delay 1	Wait 1 sec.
Original Scan Delay 2	Wait 1 sec.
Function Priority	Copier
Function Reset Timer	3 sec.
System Reset Timer	60 sec.
Fine Magnification: Copier	0.0%
Fine Magnification - Printer	0.0%
Auto Paper Roll Switching	Off
(VNext)	
Panel Tone	On
Ready Tone	On
Copy Count Display	Up
Panel Off Level	Level 4
Panel Off Timer	60 sec.
Panel Off Timer	15 min.
Date/Time	
Date	MM/DD/YYYY
Time	00hr. 00mi. 00sec.
Key Operator Tools	
User Code Access	Off
Key Counter Access	Off
Set Key code	Off
Key Operator Access	Off
Auto Off Timer	60 min.
AOF (Keep It On) * <sup>1</sup>	On
Optional Hard Disk	Installed

<sup>\*1</sup> Enables auto off for Energy Star and should not be changed without the consent of the customer.

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### **5.2.2 INITIAL COPIER SETTINGS**

On the left side of the touch panel, press (\*), then on the touch panel press Copier Features, then press a tab. Press the Next and Prev buttons to browse all the available items.

Item	Default Setting
General Features	
Initial Mode Set	Standard
Copy Reset Timer	60 sec.
Original Mode Priority	Text
Auto Image Density Priority	On
Density Level Priority	0
Auto Paper Select Priority	On
Paper Roll Priority	Paper Roll 1
Print Start Trigger	Set Original
Original Size Auto Select	On
(VNext)	
Memory Status Display	Page
Maximum Copy Quantity	99 copies
Noise Reduction	
Original Mode Quality Level	
Original Mode Density Level	
Sort Copy Setting	Copy After Each Scan
Sample Copy Priority	0
Partial Copy Priority	0 ~ 210
Feed Start Trigger	Set Original
Reproduction Ratio	
User Reproduction Ratio 1	70.7% /
User Reproduction Ratio 2	100.0%
User Reproduction Ratio 3	141.4%
Preset Reduce/Enlarge Priority	100%
Shortcut Reduce/Enlarge	71%
User Auto Reduce/Enlarge	A Series
Use Auto R/E Original Size Detect	Original Orientation
Adjust Image	
Margin Adjust Priority	Top +20 Bottom 0
Shift Image Area Priority	Up 1 Right 20
Border Erase Priority	10 mm
Image Repeat Separation Line	None
Double Copies Separation Line	Separation Line
Program/Delete, Overlay Format 1	Programmed
Program/Delete, Overlay Format 2	Not Programmed
Program/Delete, Overlay Format 3	Not Programmed
Program/Delete, Overlay Format 4	Not Programmed

Stamp	
Preset Stamp Priority	COPY
Preset Stamp Format Priority	
Preset Stamp Position Adjustment	
Date Stamp Format Priority	MM/DD/YYYY, 1X, Horiz. Top Left
Date Stamp Position Adjustment	Left 24, Center 0, Right 24, Bottom 24
Background Numbering Format	1X Dark
Vext	
User Stamp Format	—
User Stamp Position Adjustment	—
Program Delete/User Stamp	—
Page Numbering Format	1, 2,, Horiz., Top Left
Page Numbering Position Adjustment	Left 24, Center 0, Right 24, Top 24, Bottom 24
Key Operator Tools	
Check/Reset/Print Copy Counter	—
Program/Change/Delete User Code	—

### 5.3 SERVICE PROGRAM (SP) MODES

### 5.3.1 ENTERING SP MODE

#### To enter and leave SP Mode

- 1. On the operation panel, press .
- 2. On the key pad, press 100
- 3. Hold down 😁 for 3 seconds.
- 4. On the touch panel, press Copy SP. -or-
- 5. If the machine has a printer controller, press Copy SP/Printer SP.

S7 Made (Service)	Copy Mode Prev. Menu Exit
SP Made Select	XXXX-XXX
SP-1XXX Feed	SP-6XXX Periphs.
SP-2XXX Drum	SP-7XXX Data Log
SP-3XXX Process	SP-8XXX Data Log2
SP-4XXX Scanner	SP-9XXX Etc.
SP-5XXX Mode	▲ Prev. ▼Next
	B010S508.WMF

6. To leave the SP Mode, press the Exit button in the upper right corner.

#### Switching between SP Mode and Copy Mode

Use the Copy Mode and SP Mode buttons on the touch panel to toggle between the Copy Mode screen and the SP Mode screen.

- 1. Enter the copy SP mode. ( 5.3.1)
- 2. On the touch panel, press Copy Mode [A] to return to the initial screen.

Copy Mode Prev. Menu	Exit
XXXX-XXX	
SP-6XXX Feriphs.	
SP-7XXX Data Log	
SP-8XXX Dats Log2	
SP-0XXX Etc.	
▲ Prov. ▼	lext
	SP-8XXX Periphs. SP-8XXX Data Log SP-8XXX Data Log SP-9XXX Etc. A Prev. V

B010S510.WMF

- 3. Select the paper size and print mode.
- 4. Press SP Mode [B] to return to the SP Mode screen.



- 5. Set up the print job (feed source, paper size, etc.)
- 6. Press the SP mode button to return to the SP mode, and then select the SP code for the report that you want to print (SP5902-002 for example).

### 5.3.2 HOW TO USE THE SP MODE

#### SP mode level

The SP (Service Program) are assigned three-level coded numbers. For example, SP2101-002 (Printing Erase Margin – Trailing Edge) where:



**NOTE**: For a detailed listing of all SP codes see, refer to the tables later in this chapter.

When you open the SP mode, you will see the SP codes listed with the first 4 numbers. Press the appropriate button on the touch panel to access the SP function.

- An asterisk (\*) at the end of a number means that sublevels exist for that SP code.
- SP codes without the asterisk are accessed immediately and have no sublevels.

#### Important points to remember about entering settings for SP codes

- In some cases, the screen is not large enough to present all the SP codes at once. If you do not see the SP code that you want, press the Next and Prev buttons in the lower right corner of the screen to browse the lists.
- After entering a number for a setting, *always* press (#).
- To toggle between a +/- press the <sup>™</sup>.
- After you press the button of an SP code that requires a setting, a box opens so you can enter a number, press a Yes or No button, etc. After entering the number setting, *always* press (#), and then press Exit to close the entry box.

### To open select SP codes for setting

Use one of the following methods to find the entry level of any SP code.

**Direct Entry.** Use this method if you know all the numbers or at least the first four digits.

- 1. Use the number pad on the operation panel to enter the number.
  - If you know the complete number, make sure that you always enter 3 digits for the last number. For example, to access SP2102-2, you must enter 2102 002
  - If you enter only the first 4 digits, the entry box for that SP code (or *first* option) will open automatically. For example, if you enter only 2102, then the entry box for SP2102-1 will open. To scroll to the next setting, press the Next button.
- 2. Press (#).

**Browsing.** You can browse the lists if you do not know the number of the SP code that you need.

- 1. Press the appropriate button to display the next level.
- 2. If you do not see the number of the SP you are seeking, use the Next and Prev button to display more SPs.

#### To print an SMC report

The SP mode settings are adjusted before shipment, and are listed in the copy of the SMC print provided on the original table. Keep this SMC print in the used-toner-bottle cabinet as a record of the default settings.

Follow this procedure if you want to print another copy of the SMC list.

- 1. Enter the SP Mode. ( 5.3.1)
- 2. Press Copy Mode to return to the initial screen and select the feed source and other settings for the print job, and then press SP Mode to return to the SP Mode.
- 3. Enter 5990 002 and then press (#).
- 4. Press Start.

### To initialize the SP settings

Follow this procedure to initialize the SP settings and restore them to their factory default settings.

- 1. Enter the SP Mode. ( 5.3.1)
- 2. Print an SMC list (see the procedure above).
- 3. To initialize the SP settings, enter 5801, press <sup>(#)</sup>, and then press Start. **NOTE:** The total counter is not cleared when RAM is cleared.
- 4. After initializing the SP settings, use SP5811 to re-enter the serial number of the machine.

### 5.4 TOUCH PANEL CALIBRATION

Follow this procedure to calibrate the touch panel.

- 1. On the operation panel, press  $(1)^{(9)}$
- 2. Press and release 🖤 5 times to open the menu.
- 3. Without touching the touch panel, press (#). After a few moments, two circles will appear, one in the upper left corner and one in the lower right corner.
- 4. With a blunt instrument, press the circle in the upper left corner. CAUTION: Never press the touch panel with a sharp object.
- 5. Touch the center of the circle in the lower right corner.
- 6. Touch any location on the touch panel, and make sure that the a circle appears at the point you touched.
- 7. Repeat Step 6 several times to confirm that the touch panel is correctly calibrated.
- 8. To leave the touch panel calibration mode, press OK, press q:EXIT, then press EXECUTE.
- 9. Wait for the panel to go off, then turn the machine off and on.

### 5.5 SOFTWARE RESET

To reset the software, hold down  $\bigcirc$  and  $\oplus$  together for 10 seconds. This software reset is the same as turning the machine off on and with the main power switch.

**NOTE**: You cannot use this procedure to reset the software when the operation panel has stalled or if a fusing-related SC code has appeared.

### 5.6 PRINTING TEST PATTERNS

### 5.6.1 IMAGE PROCESSING TEST PATTERNS

Print an IPU Test Pattern if you experience problems with image processing (poor halftones, line widths, etc.)

- 1. Enter the SP mode. ( 5.3.1)
- 2. Enter 2941 001 (IPU Test Pattern Pattern), then press ⊕.
- 3. Enter a number to select a pattern, then press #.

Item	Pattern	
0	No pattern	
1	Gray scale 1: 128 dots, 16 grades, Vertical gray scale	
2	Gray scale 2: 16 dots, 256 grades, Vertical gray scale	
3	Gray scale 3: 256 lines, 16 grades, Horizontal gray scale	
4	Gray scale 4: 16 lines, 256 grades, Horizontal gray scale	
5	Density patch	
6	Vertical line 256 dots	
7	Vertical line 1 dot	
8	Vertical line 2 dots	
9	Horizontal line 1 dot	
10	Horizontal line 2 dots	
11	Cross stripe 1 dot	
12	Cross stripe 2 dots	
13	Slanting cross stripe 1 dot (128-dot interval)	
14	Slanting cross stripe 1 dot - even/odd reversal (128-dot interval)	
15	Slanting cross stripe 2 dots (128-dot interval)	
16	Slanting cross stripe 2 dots - even/odd reversal (128-dot interval)	
17	Slanting cross stripe 1 dot (64-dot interval)	
18	Slanting cross stripe 1 dot - even/odd reversal (64-dot interval)	
19	Rope pattern 1 dot	
20	Rope pattern 1 dot main scan even/odd reversal	
21	Rope pattern 2 dots	
22	Rope pattern 1 dot main scan even/odd reversal	
23	Rope pattern	
24	Frequency characteristic - Vertical	
25	Frequency characteristic - Horizontal	
26	Frequency characteristic - Vertical/Horizontal	
27	Gray scale 5 - Vertical/Horizontal	
28	Gray scale 6 - Vertical/Horizontal	
29	Black	
30	White	
31	AMDP evaluation counter	
32	Gray scale / - Vertical/Horizontal	
33	Independent 1 dot (16-dot interval)	
34	Independent 1 dot (32-dot interval)	
35	Independent 1 dot (64-dot interval)	
36	Independent 1 dot (128-dot interval)	

Item	Pattern
37	Independent 1 dot (256-dot interval)
38	Independent 2 dots (16-dot interval)
39	Independent 2 dots (32-dot interval)
40	Independent 2 dots (64-dot interval)
41	Independent 2 dots (128-dot interval)
42	Independent 2 dots (256-dot interval)
43	Independent 1 dot (4-dot interval)
44	Independent 1 dot (8-dot interval)
45	Independent 2 dots (8-dot interval)

### 5.6.2 IMAGE DATA PATH TEST PATTERNS

Print an IPU test pattern to check that the CIS and IPU are operating correctly. Print a VDB test pattern to check that the LPH and VDB are operating correctly.

1. Set the original.

**NOTE** The original should be 914 mm (W) x 297 mm (L) (36" x 11"). A blank sheet cut from a roll is sufficient.

- Select the feed source and other settings, then enter the SP mode. (
   5.3.1)

   NOTE: If you need to adjust print settings, use the Copy Mode and SP Mode buttons to toggle between the initial screen and the SP mode screen.
- 3. Enter 2942 001 (Print Test Pattern Mode) and press (#). Then select either IPU or VDB.
- 4. Enter 2942 003 (Print Test Pattern Pattern) and press (#).
- 5. Enter a number to select a pattern, and then press (#).

Item	Pattern	Remarks
0	No pattern	
1	Vertical line 2 dots (5.4-mm pitch)	
2	Horizontal line 2 dots (5.4-mm pitch)	To check the jitter deviation of the printer engine
3	Vertical line 2 dots	
4	Basic frame (AOT)	
5	Grid pattern	To check the magnification deviation in the printer engine

**NOTE:** 1) Do not touch any other key until printing is completed.

2) The output has the same width as the original.

### 5.7 INPUT CHECK

You can check the sensors and switches with SP5803.

- Select one of the modes in the tables.
- Each mode displays an 8-digit number, numbered 7~0 reading from left to right.
- Each bit indicates the current status of the corresponding sensor or switch by displaying a 0 or 1. For example:

 Display
 1
 1
 0
 0
 0
 1
 0

 Bit
 7
 6
 5
 4
 3
 2
 1
 0

[1] P1E	Input	Status
bit-7	Toner overflow sensor	0: End, 1: Not end
bit-6	Registration sensor	0: Paper present, 1: No paper
bit-5	Right pressure HP sensor	0: Home position, 1: Not home pos.
bit-4	Left pressure HP sensor	0: Home position, 1: Not home pos.
bit-3	Roll tray 1 safety switch	0: Closed, 1: Open
bit-2	Roll tray 2 safety switch	0: Closed, 1: Open
bit-1	By-pass feed sensor	0: Paper present, 1: No paper
bit-0	Paper exit sensor	0: Paper present, 1: No paper

[2] P1F	Input	Status
bit-7	Exit cover switch	0: Closed, 1: Open
bit-6	Toner hopper cover open switch	0: Closed, 1: Open
bit-5	Upper unit safety switch (24V)	0: Closed, 1: Open
bit-4	Upper unit safety switch (5V)	1: Closed, 0: Open
bit-3	Fusing motor lock	1: Locked, 0: Operating
bit-2	Registration motor lock	1: Locked, 0: Operating
bit-1	Drum drive motor lock	1: Locked, 0: Operating
bit-0	Development motor lock	0: Locked, 1: Operating

[3] P1H	Input	Status
bit-7	Factory use only	
bit-6	2nd roll tray installed	0: Installed, 1: Not installed
bit-5	VDB pixel count	0: None, 1: Ok
bit-4	Zero cross	0: On, 1: Off
bit-3	Key card set (Japan only)	0: Set, 1: Not set
bit-2	Key counter set (Japan only)	0: Set, 1: Not set
bit-1	Fusing overheat	0: Normal, 1: Overheat
bit-0	Fusing latch overheat	0: Normal, 1: Overheat

[4] P2E	Input	Status
bit-7	Paper end sensor 3	0: End, 1: Not end
bit-6	Auto feed switch 3	0: On, 1: Off
bit-5	Auto feed switch 2	0: On, 1: Off
bit-4	Auto feed switch 1	0: On, 1: Off
bit-3	Cutter 2 HP switch (right)	0: Home position, 1: Not home pos.
bit-2	Cutter 2 HP switch (left)	0: Home position, 1: Not home pos.
bit-1	Cutter 1 HP switch (right)	0: Home position, 1: Not home pos.
bit-0	Cutter 1 HP switch (left)	0: Home position, 1: Not home pos.

[5] P2F	Input	Status
bit-7	Roll end sensor 3	0: Not end, 1: End
bit-6	Roll end sensor 2	0: Not end, 1: End
bit-5	Roll end sensor 1	0: Not end, 1: End
bit-4	Roll lead edge sensor 3	0: Paper present, 1: No paper
bit-3	Roll lead edge sensor 2	0: Paper present, 1: No paper
bit-2	Roll lead edge sensor 1	0: Paper present, 1: No paper
bit-1	Cutting sensor 2	1: Paper present, 0: No paper
bit-0	Cutting sensor 1	1: Paper present, 0: No paper

[6] P1C	Input	Status
bit-7	Paper end sensor 2	0: Not end, 1: End
bit-6	Paper end sensor 1	0: Not end, 1: End
bit-5	Cutter safety switch 2	0: Closed, 1: Open
bit-4	Cutter safety switch 1	0: Closed, 1: Open
bit-3	-	Not used
bit-2	-	Not used
bit-1	-	Not used
bit-0	-	Not used

[7] IRI	Input	Status		
These settings are used during design and development to detect the current settings of				
the DIP switches on the MCU (Main Control Unit) board.				

[8] Scanner 1	Input	Status
bit-7	-	1000 0000
bit-6	Original size A4/A sensor (Original set sensor)	0100 0000
bit-5	Original size A3/B sensor	0010 0000
bit-4	Original size A2/C sensor	0001 0000
bit-3	Original size A1/D sensor	0000 1000
bit-2	Original size A0/E sensor	0000 0100
bit-1	Original registration sensor	0000 0010
bit-0	Original set sensor (Original size A4 sensor)	0000 0001

[9] Scanner 2	Input	Status
bit-7	-	Not used
bit-6	-	Not used
bit-5	-	Not used
bit-4	Original upper exit sensor	0000 0000
bit-3	Original exit sensor	0000 1000
bit-2	Scanner stop switch	0000 0100
bit-1	Original feed unit safety switch	0000 0010
bit-0	Original feed unit open sensor (right)	0000 0001

## 5.8 OUTPUT CHECK

You can check the listed parts with SP5804.

ltem	Parts	
1	Roll feed clutch 1	
2	Roll feed clutch 2	
3	Roll feed clutch 3	
5	Registration Motor	
6	Registration Clutch	
7	Paper Junction Gate Sol.	
8	Transport Fan Motors	
9	Cutter 2	
10	Roll Feed Motor 1 - Forward	
11	Roll Feed Motor 1 - Reverse	
12	Roll Feed Motor 2 - Forward	
13	Roll Feed Motor 2 - Reverse	
14	Cutter 1	
15	Drum Drive Motor	
16	Fusing Drive Motor	
17	Right Fusing Pressure HP Position	
18	Right Fusing Pressure Jam Position	
19	Left Fusing Pressure HP Position	
20	Left Fusing Pressure Jam Position	
22	Charge Corona Wire Cleaner Motor	
23	Development Motor	
24	Toner Supply Clutch	
25	Pick-off Pawl Solenoid	
29	LPH (LED Print Head)	
30	Quenching Lamp	
31	ID Sensor LED	
32	Charge Corona	
33	Charge Grid – Image Area	
34	Charge Grid – ID Sensor Pattern	
35	Charge Corona and Grid – Image Area	
36	Development Bias – Image Area	
37	Development Bias – ID Sensor Pattern	
38	Transfer Corona – Leading Edge Plain Paper	
39	Transfer Corona – Plain Paper	
40	Separation Corona – Leading Edge Plain Paper	
41	Separation Corona – Plain Paper	
42	Total Counter	
43	Anti-condensation Heater	
50	Drum Potential Measuring Mode	
51	Original Junction Gate Solenoid	
52	Original Feed Clutch	
53	Original Feed Motor – Forward	
54	CIS LED	

# 5.9 SP (SERVICE PROGRAM) MODE TABLES

SP Table Key			
Notation	What it means		
[range / <b>default</b> / step]	Example: $[-9 \sim +9 / +3.0 / 0.1 \text{ mm step}]$ . Setting can be adjusted in the range $\pm 9$ , value reset to $+3.0$ after and NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.		
italics	Comments.		
DFU	Denotes "Design or Factory Use". Do not change this value.		
Japan only	Feature or item is for Japan only. Do not change this value.		

#### SP1-XXX Feed

	1		Mode Number/Name	Function / [Setting]
	1001	Leadir	ng Edge Registration	·
		001	1st Roll	Adjusts the printing leading edge registration.
		002	2nd Roll	[+10.0 ~ -10.0 / <b>0.0</b> / 0.1 mm/step]
		003	3rd Roll	To delay the starting position of the image, increase the
		005	By-pass feed	value.
	1002	Side-t	o-Side Registration	
		001	1st Roll	Adjusts the printing side-to-side registration.
		002	2nd Roll	[+10.0 ~ -10.0 / <b>0.0</b> / 0.1 mm/step]
		003	3rd Roll	To shift the starting position to the right, increase the value.
		005	By-pass feed	
Ξ	1103	Fusing	g Idling	Selects the fusing idling time.
				[0 ~ 3/ <b>0</b> / 1 min. step]
				0: No idling
				1: 1 minutes
				2: 3 minutes
				3: 5 minutes
	1104	Fusing	g Temperature Control	Sets the fusing temperature control.
				[0~3, <b>0</b> , 1/step]
				0: On/Off (Pressure Roller Temp. Feedback)
				1: On/Off (No Pressure Roller Temp. Feedback) DFU
				2: Phase Control (Pressure Roller Temp. Feedback)
				3: Phase Control (No Pressure Roller Temp.
				Feedback) <b>DFU</b>
	1105	Fusing	r Toma Adi	If the power supply to the machine is unstable, select 2.
	1105	Fusing	j Temp. Adj.	Cate the service all fusing terms wature
		001	Copy Ready Temperature	[130 ~ 150 / <b>143</b> / 1°C/step]
				Copying can begin at this temperature, before the hot roller reaches the control temperature.
		002	Constant Temperature Control	Sets the fusing temperature for the constant temperature control. <b>DFU</b>
				[130 ~ 210 / <b>185</b> / 1°C/step]
		003	Low Power Mode	Sets the fusing temperature for low power mode.
				[90 ~ 125 / <b>90</b> / 1°C/step]
		005	Fusing Temperature Calibration	Calibrates the scale for the fusing temperature settings. DFU
				[-10 ~ +10 / <b>3</b> / 1°C/step]
		006	Pressure Temp. Calibration	Calibrates the scale for the pressure temperature control. <b>DFU</b>
				[-10 ~ +10 / 0 / 1°C/step]

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1	Mode Number/Name		Function / [Setting]	
1106	Fusing Temperature Display		Displays the hot roller and pressure roller temperatures.	
1911	By-pass Feed Start Timing Adj.		Adjusts the waiting time for the by-pass paper feed. [0.5~8.0 / <b>2.0</b> / 0.1 second/step]	
1912	Feed I	Motor Speed Correction		
	001	1st Roll	Adjusts the feed motor speed. <b>DFU</b>	
	002	2nd Roll	[-15 ~ +15 / <b>-7</b> / 1% /step]	
	003	3rd Roll		
1913	Fusing	g Motor Speed Adj.		
	001	RPM	Adjusts the fusing motor speed. DFU	
			[-100 ~ +100 / <b>+24</b> / 2/step]	
	002	Adj. Span in High Speed	Adjusts the unit for the fusing motor speed control. <b>DFU</b>	
		Control	[0.0 ~ +18 / <b>10</b> / 2%/step]	
1914	Fusing	Pressure Motor		
	001	Home Position Stop Mode	Resets the fusing pressure roller motor to the home	
			position.	
			[1 = ON, <b>0 = OFF</b> ]	
	002	Right Pressure Adjustment	Adjusts the pressure.	
	003	Left Pressure Adjustment	[-25 ~ +25 / 0 / 1/step]	
1915	Magni Speec	fication Adj. by Fusing Motor I	The fusing motor of this machine rotates faster than the paper feed motor to stretch the paper slightly and prevent wrinkles between the registration roller and the fusing unit. Stretching the paper excessively could cause distortion of	
	001	Diaire	the image.	
	001	Plain	Adjusts the printer line speed.	
	000	There also a set David and	[[0.0~1.0 / <b>0.7</b> / 0.1/Step]	
	002	Translucent Paper	Adjusts the printer line speed.	
	000	Film	[0.0~1.0 / <b>0.0</b> / 0.1/Step]	
	003	FIIM	Adjusts the printer line speed. $[0.0_{\text{eff}}, 0.0]$	
1020	CutLa	path Adjustment	[0.0 <sup>-2</sup> 1.0 / <b>0.4</b> / 0.1/step]	
1920		1 of Poll 210 mm/8 5" or 9"	Adjusts the 210 mm out length	
	001	Plain Paper	$I_{-10.0} \sim 10.0 / 0.0 / 0.1 / eten]$	
	002	1 all 1 aper	Adjuste the 297 mm cut length	
	002	Plain Paper	$I_{-10,0} \sim \pm 10,0 / 0,0 / 0,1/\text{step}$	
	003	1st Boll 420 mm/17" or 18"	Adjusts the 420-mm cut length	
	000	Plain Paper	$[-10.0 \sim +10.0 / 0.0 / 0.1 / step]$	
	004	1st Boll 594 mm/22" or 24"	Adjusts the 594-mm cut length	
	004	Plain Paper	$[-10.0 \sim +10.0 / 0.0 / 0.1 / step]$	
	005	1st Boll 841 mm/32" or 34"	Adjusts the 841-mm cut length	
	000	Plain Paper	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$	
	006	1st Boll, 1189 mm/44" or 48".	Adjusts the 1189-mm cut length.	
		Plain Paper	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$	
	007	1st Roll. 2000 mm/78". Plain	Adjusts the 2000-mm cut length.	
		Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	
	008	2nd Roll, 210 mm/8.5" or 9".	Adjusts the 210-mm cut length.	
	_	Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	
	009	2nd Roll, 297 mm/11" or 12".	Adjusts the 297-mm cut length.	
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	
	010	2nd Roll, 420 mm/17" or 18",	Adjusts the 420-mm cut length.	
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	
	011	2nd Roll, 594 mm/22" or 24",	Adjusts the 594-mm cut length.	
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	
	012	2nd Roll, 841 mm/32" or 34",	Adjusts the 841-mm cut length.	
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]	

1	Mode Number/Name		Function / [Setting]
1920	013 2nd Roll, 1189 mm/44" or		Adjusts the 1189-mm cut length.
		48", Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	014	2nd Roll, 2000 mm/78", Plain	Adjusts the 2000-mm cut length.
		Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	015	3rd Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	016	3rd Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	017	Plain Paper	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	017	Blain Paper	Adjusts the 420-mm cut length.
	018	2rd Roll 594 mm/22" or 24"	Adjusts the 594 mm out length
	010	Plain Paper	$[-10.0 \sim +10.0 / 0.0 / 0.1 / sten]$
	019	3rd Boll 841 mm/32" or 34"	Adjusts the 841-mm cut length
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	020	3rd Roll, 1189 mm/44" or 48",	Adjusts the 1189-mm cut length.
		Plain Paper	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	021	3rd Roll, 2000 mm/78", Plain	Adjusts the 2000-mm cut length.
		Paper	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	031	1st Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
		Iranslucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	032	1st Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	000		[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	033	Translucent	Adjusts the 420-mm cut length. $\begin{bmatrix} 10.0 \\ m \end{bmatrix}$
	024	1 at Poll 504 mm/22" or 24"	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	034	Translucent	$I_{-10.0} \sim \pm 10.0 / 0.0 / 0.1 / sten]$
	035	1st Boll 841 mm/32" or 34"	Adjusts the 841-mm cut length
		Translucent	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$
	036	1st Roll, 1189 mm/44" or 48",	Adjusts the 1189-mm cut length.
		Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	037	1st Roll, 2000 mm/78",	Adjusts the 2000-mm cut length.
		Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	038	2nd Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
		Iranslucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	039	2nd Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	0.40	Iransiucent	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	040	Translucent	Adjusts the 420-mm cut length. $[-10.0 \sim \pm 10.0 / 0.0 / 0.1/step]$
	041	2nd Boll 594 mm/22" or 24"	Adjusts the 594-mm cut length
	041	Translucent	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$
	042	2nd Roll. 841 mm/32" or 34".	Adjusts the 841-mm cut length.
	• · -	Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	043	2nd Roll, 1189 mm/44" or	Adjusts the 1189-mm cut length.
		48", Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	044	2nd Roll, 2000 mm/78",	Adjusts the 2000-mm cut length.
		Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	045	3rd Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
	0.10	I ranslucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	046	Bra Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	047	3rd Boll 420 mm/17" or 19"	Adjusts the 120.mm out longth
	047	Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]

1		Mode Number/Name	Function / [Setting]
1920	048	3rd Roll, 594 mm/22" or 24",	Adjusts the 594-mm cut length.
		Translucent	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	049	3rd Roll, 841 mm/32" or 34",	Adjusts the 841-mm cut length.
		Translucent	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	050	3rd Roll, 1189 mm/44" or 48",	Adjusts the 1189-mm cut length.
		Translucent	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	051	3rd Roll, 2000 mm/78",	Adjusts the 2000-mm cut length.
	0.01		[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	061	1st Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
	060	Filli 1 at Dall 207 mm/11" at 12"	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$
	062	Film	$\begin{bmatrix} 10.0 \\ \sim 110.0 \end{bmatrix} = \begin{bmatrix} 297 \\ -11111 \\ 0 \end{bmatrix} \begin{bmatrix} 10.0 \\ -1111 \\ 0 \end{bmatrix}$
	063	1st Boll 420 mm/17" or 18"	Adjusts the 420-mm cut length
	000	Film	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$
	064	1st Roll. 594 mm/22" or 24".	Adjusts the 594-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	065	1st Roll, 841 mm/32" or 34",	Adjusts the 841-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	066	1st Roll, 1189 mm/44" or 48",	Adjusts the 1189-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	067	1st Roll, 2000 mm/78", Film	Adjusts the 2000-mm cut length.
			[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	068	2nd Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
	0.00		[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	069	2nd Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	070	2nd Poll 420 mm/17" or 18"	Adjusts the 420 mm out length
	070	Film	$I_{-10,0} \sim \pm 10,0 / 0,0 / 0,1 / step]$
	071	2nd Boll 594 mm/22" or 24"	Adjusts the 594-mm cut length
	071	Film	$[-10.0 \sim +10.0 / 0.0 / 0.1/step]$
	072	2nd Roll, 841 mm/32" or 34",	Adjusts the 841-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	073	2nd Roll, 1189 mm/44" or	Adjusts the 1189-mm cut length.
		48", Film	[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	074	2nd Roll, 2000 mm/78", Film	Adjusts the 2000-mm cut length.
			[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	075	3rd Roll, 210 mm/8.5" or 9",	Adjusts the 210-mm cut length.
	070		[-10.0 ~ +10.0 / 0.0 / 0.1/step]
	076	3rd Roll, 297 mm/11" or 12",	Adjusts the 297-mm cut length.
	077	3rd Boll 420 mm/17" or 19"	Adjusts the 420 mm out length
	011	Film	$[-10, 0 \sim \pm 10, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,$
	078	3rd Roll, 594 mm/22" or 24"	Adjusts the 594-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	079	3rd Roll, 841 mm/32" or 34".	Adjusts the 841-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	080	3rd Roll, 1189 mm/44" or 48",	Adjusts the 1189-mm cut length.
		Film	[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
	081	3rd Roll, 2000 mm/78", Film	Adjusts the 2000-mm cut length.
			[-10.0 ~ +10.0 / <b>0.0</b> / 0.1/step]
1921	Cut Le	ength Adjustment	
	001	11st Roll, 3600 mm/141",	Adjusts the 3600-mm cut length.
	1	Fiain Paper	[-20.0 ~ +20.0 / <b>0.0</b> / 0.1/step]

1	Mode Number/Name		Function / [Setting]
1921	002	1st Roll, 6000 mm/236",	Adjusts the 6000-mm cut length.
		Plain Paper	[-30.0 ~ +30.0 / <b>0.0</b> / 0.1/step]
	003	2nd Roll, 3600 mm/141",	Adjusts the 3600-mm cut length.
	004		[-20.0 ~ +20.0 / <b>0.0</b> / 0.1/step]
	004	2nd Roll, 6000 mm/236", Plain Bapar	Adjusts the 6000-mm cut length.
	005		$[-30.0 \sim +30.0 / 0.0 / 0.1/step]$
	005	3rd Roll, 3600 mm/141", Plain Papar	Adjusts the 3600-mm cut length.
	000	Fiairi Faper	$[-20.0 \sim +20.0 / 0.0 / 0.1/Step]$
	006	Blain Paper	Adjusts the 6000-mm cut length.
	011	1 all 1 aper	Adjusts the 2600 mm out length
	011	Translucent	$\begin{bmatrix} 20.0 \\ \sim \end{bmatrix} = \begin{bmatrix} 20.0 \\ \sim \end{bmatrix} \begin{bmatrix}$
	012	1 st Boll 6000 mm/236"	Adjusts the 6000 mm cut length
	012	Translucent	$L_{30.0} \sim 130.0 / 0.0 / 0.1 / step]$
	013	2nd Boll 3600 mm/1/11"	Adjusts the 3600-mm cut length
	015	Translucent	$1_{200} \sim \pm 200 / 00 / 01/sten]$
	014	2nd Boll 6000 mm/236"	Adjusts the 6000-mm cut length
	014	Translucent	$[-30.0 \sim \pm 30.0 / 0.0 / 0.1/sten]$
	015	3rd Boll 3600 mm/141"	Adjusts the 3600-mm cut length
	015	Translucent	$[-20.0 \sim \pm 20.0 / 0.0 / 0.1/sten]$
	016	3rd Boll 6000 mm/236"	Adjusts the 6000-mm cut length
	010	Translucent	$[-30.0 \sim \pm 30.0 / 0.0 / 0.1/sten]$
	021	1st Boll 3600 mm/141" Film	Adjusts the 3600-mm cut length
	021		$[-20.0 \sim +20.0 / 0.0 / 0.1/step]$
	022	1st Boll_6000 mm/236" Film	Adjusts the 6000-mm cut length
			[-30.0 ~ +30.0 / <b>0.0</b> / 0.1/step]
	023	2nd Roll. 3600 mm/141".	Adjusts the 3600-mm cut length.
		Film	[-20.0 ~ +20.0 / <b>0.0</b> / 0.1/step]
	024	2nd Roll, 6000 mm/236",	Adjusts the 6000-mm cut length.
		Film	[-30.0 ~ +30.0 / <b>0.0</b> / 0.1/step]
	025	3rd Roll, 3600 mm/141", Film	Adjusts the 3600-mm cut length.
			[-20.0 ~ +20.0 / <b>0.0</b> / 0.1/step]
	026	3rd Roll, 6000 mm/236", Film	Adjusts the 6000-mm cut length.
			[-30.0 ~ +30.0 / <b>0.0</b> / 0.1/step]
1925	Cut Le	ength Offset Correction	This setting corrects for factors that affect paper slippage during feed, such as paper surface characteristics. <b>DFU</b> [0 ~1 / <b>1</b> / <b>1</b> step]
			0: Japanese paper (Factory standard)
			1: Other countries paper
1950	Paper	Exit Control	
	002	Copy Paper Hold Length Adj.	Adjusts the amount of paper grabbed at the edge for
			feeding.
			[-50 ~ +50 / <b>-14</b> / 1 mm/step]
			The friction from grabbing the paper 14 mm from the edge
			of the paper could cause poor image quality where the
			the paper (less than 14 mm for example), adjust this setting
			for less than -14.
1	L	1	

### SP (SERVICE PROGRAM) MODE TABLES

1		Mode Number/Name	Function / [Setting]
1955	Trans	oort Fan Rotation	
	001	Very Thin Paper	Selects the transport fan rotation speed for Japanese chemical paper. <b>Japan Only</b> Press the appropriate button: OFF, 100%, or 20% <i>The suction created by the transport motor below the paper</i> <i>feed path keeps the paper straight. The force of this suction</i> <i>could be too great for extremely thin paper.</i>
	002	Stand-by Condition	Selects the transport fan rotation speed for stand-by mode. Press the appropriate button $(30\% \sim 100\%)$

### SP2-XXX Drum

2		Mode Number/Name	Function / [Setting]
2001	Charg	e Corona Adjustment	
	001	Image Area	Adjusts the charge corona output. <b>DFU</b> [900~1500 / <b>1250</b> / 1V/step]
	002	Grid for Image Area	Adjusts the charge grid output. <b>DFU</b> [560~960 / <b>875</b> / 1V/step]
	003	Grid for ID Sensor Pattern	Adjusts the charge grid output for the ID sensor pattern. DFU
2101	Printin	ng Frase Margin	SP2946 must be at On, or these settings will be ignored.
L	001	I eading Edge	Adjusts the printing margin.
	002	Trailing Edge	$10 \sim 100 / 0 / 0.5 \text{ mm/step]}$
	003	I eft	
	004	Right	[0 ~ 100 / <b>0</b> / 0.5 mm/step]
2201	Devel	opment Bias Adjustment	
	001	Image Area	Sets the development bias to adjust the toner amount for the image area. [-900 ~ -100 / <b>-705</b> / 1V/step]
	002	ID Sensor Pattern - Low Duty Copy Jobs	Sets the development bias to adjust the toner amount for the ID sensor pattern. I-600 ~ -100 / <b>-405</b> / 1V/step]
	003	ID Sensor Pattern - High Duty Copy Jobs	Sets the development bias to adjust the toner amount for the ID sensor pattern. I-600 ~ -100 / -475 / 1V/step]
	004	Copy Jobs	Determines the mode used for generating the ID sensor pattern. See section 6.6.3 for details. Press the appropriate button: High Duty Copy Jobs, <b>Low Duty Copy Jobs</b>
2207	Force	d Toner Supply	
	001	Forced Toner Supply	Press the start button to execute a forced toner supply. If this switched on, this SP supplies more toner to darken light copies. For every execution, toner is supplied one time. After doing this SP, make a copy and check the copy density.
2208	Toner	Supply Setting	
	001	Gain	Adjusts the toner supply for ordinary operations by adjusting the GAIN *(Vsp/Vsg). <b>DFU</b> [0~9 / <b>1</b> / 1/step] <i>This setting may require adjustment for a customer with</i> <i>special needs, e.g. continuous copy jobs of photographs.</i>
	002	Supply Capacity	Selects the toner supply capacity for the job load. [0.1~2.5 / <b>1.0</b> / 0.1/step] The 1 setting is good for up to about 20% coverage, but can be set to 2 for long copy jobs up to 100 copies. However, if the image coverage is greater than 50%, even the 2 setting may not be sufficient.
	003	Toner Supply Mode	<ul> <li>Selects toner supply mode and switches off the ID sensor.</li> <li>[0~2 / 0 / 1 step]</li> <li><b>Detect Mode</b></li> <li>1: Fixed Mode (3%)</li> <li>2: Fixed Mode (6%)</li> <li>If the ID sensor is damaged and cannot be replaced immediately, set to 1 or 2 so the customer can continue to use the machine until a new ID sensor is available for replacement. After installing a new ID sensor, reset to 0.</li> </ul>

2	Mode Number/Name		Function / [Setting]
2301	Transfer Corona Output:		
	001 Plain Paper, Leading Edge		Adjusts the transfer output power. DFU
	002	Plain Paper, Central Image	[150~1000 / <b>500</b> / 1/step]
	003	Plain Paper, Trailing Edge	
	004	Plain Paper, Coefficient	Adjusts the transfer output coefficient for the leading edge,
			central image, and trailing edge. <b>DFU</b>
	0.05		[0.5~2.5 / <b>1.0</b> / 0.1/step]
	005	I ranslucent, Leading Edge	Adjusts the transfer output power. <b>DFU</b>
	006	Translucent, Central Image	[150~1000 / <b>500</b> / 1/step]
	007	Translucent, Trailing Edge	
	800	I ranslucent, Coefficient	Adjusts the transfer output coefficient for the leading edge,
			$[0.5 \times 2.5 / 1.0 / 0.1/ctop]$
	000	Film Leading Edge	Adjusts the transfer output power <b>DEU</b>
	009	Film Central Image	[150~1000 / <b>500</b> / 1/sten]
	010	Film Trailing Edge	
	012	Film Coefficient	Adjusts the transfer output coefficient for the leading edge
	012		central image, and trailing edge, <b>DFU</b>
			[0.5 ~ 2.5 / <b>1.0</b> / 0.1/step]
2401	Separ	ation DC Timing Adj.	Adjusts the separation dc timing. DFU
			[-300 ~ 0 / <b>-100</b> / 1/step]
2402	Separ	ation AC Voltage Setting:	Adjusts the separation ac voltage setting. DFU
	-		[2600~6200 / <b>4200</b> / 1V/step]
2403	Separ	ation DC Voltage Setting	
	001	Plain - Leading Edge	Adjusts the separation dc voltage.
	002	Plain	[-300 ~ 0 / <b>-200</b> / 1 μA/step]
	003	Translucent - Leading Edge	If this is too high, toner will be re-attracted from the paper to
	004	Translucent	the drum after transfer.
	005	Film - Leading Edge	
	006	Film	
2801	Develo	oper Initial Setting	Execute this SP only after replacing the developer.
			Press Start to initialize.
			Executing this SP raises the chargeability of the developer
2803	Chara	o Corona Wiro Cloaning	Pross Start to clean the charge corona wire. Executing this
2003	Charge Corona wire Cleaning		SP also ensures that the cleaning had is set at the home
			position.
			Cleaning requires about 60 seconds.
2804	Coron	a Wire Cleaning Interval	Selects the interval.
			[0~6 / <b>3</b> / 1 step]
			0: None (no cleaning)
			1: After the main switch is turned on.
			2: After 300 m of copies
			3: After 600 m of copies
			4: After 900 m of copies
			5: After 1200 m of copies
0010	D		6: After 1500 m of copies
2812	Drum	Cleaning Interval	I he drum reverses after this number of jobs, to clean the tip
			In the cleaning blace. Set to 0 to disable this real of $0 \sim 5 / 1 / 1$ lob (stop)

2	Mode Number/Name		Function / [Setting]
2923	Drum	Set Mode	
	002	Execute	After replacing the OPC or cleaning blade, run this SP and press Start.
			After OPC or cleaning blade replacement, dusts the drum and blade with toner to reduce friction between the new drum and/or new blade, reducing the chance of scouring the drum or bending the blade.
2924	Develo	oper Mixing	Press Yes to enable developer mixing every time the power
			is switched on.
			Normally, the developer is mixed every time the machine is powered on. However, this is not done the first time the machine is powered up, to prevent the drum from rotating while the packing material around the drum is in place. This SP should be executed only after all packing material has been removed. For details, see the installation section
2925	Tranef	er Corona Timing	been removed. For details, see the installation section.
2323	001	On Timing	Adjusts the on timing.
			[-10.0 ~ +10.0 / <b>-4.2</b> / 0.1/step]
	002	Leading Edge	Adjusts the timing to switch from the leading edge to the center.
			[0~30 / <b>16</b> / 1 /step]
	003	Trailing Edge	Adjusts the timing to switch from the center to the trailing
			eage.
2926	llsed .	L Toner Overflow Detection	Enables/disables the used toner full detection. Press Yes to
2020	0000		enable, or No to disable. Normally, keep at Yes.
2927	Toner	(Near) End Detection	
	001	Near End Level	Selects the near end level (Vsp/Vsg). DFU
			[0~5 / <b>2</b> / 1 step]
			0: 0.150
			<b>2: 0 200</b>
			2: 0.200 3: 0.225
			4: 0.250
			5: 0.275
			Higher settings thin toner, lower settings thicken toner.
	002	Toner End Level	Selects the toner end level until the add toner lamp lights, based on copy length (not the number of copies). See section 6.6.7 for more details.
			[0~3 / <b>1</b> / 1 step]
			0: 1000 cm
			1: 1500 cm
			2: 2000 cm
			5. 5000 cm
2928	Toner	End Becovery	
2020	001	Recovery Level	Selects the recovery level (Vsp/Vsg), <b>DFU</b>
			[0~5 / <b>4</b> / 0.25 step]
			0: 0.075
			1: 0.100
			2: 0.125
			3: 0.150
			4: 0.175
			5: 0.200

2	Mode Number/Name		Function / [Setting]
2928	002	Recovery Detection	Sets how many times the judgement is aborted when the toner end detection is not nullified. <b>DFU</b> [1~25 / <b>12</b> / 1/step]
2941	IPU Te	est Pattern	Execute an IPU Test Pattern when a problem with image processing is suspected. The IPU Test Pattern is also used to check the alignment of the LPH components. For details, see the <i>Replacement and Adjustment</i> section.
	001	Pattern	Selects the pattern.
			[U~45 / T / T Step] 0: None
			1: Grav scale 1 (vertical)
			2: Grav scale 2 (vertical)
			3: Gray scale 3 (horizontal)
			4: Gray scale 4 (horizontal)
			5: Density patch
			6: Vertical stripe
			7: Vertical line 1 dot
			8: Vertical line 2 dots
			9: Horizontal line 1 dot
			10: Horizontal line 2 dots
			12: Cross stripe 2 dots
			13: Slanting cross stripe 1 dot (128-dot interval)
			<ul> <li>14: Slanting cross stripe 1 dot even/odd reversal (128-dot interval)</li> </ul>
			15:Slanting cross stripe 2 dots (128-dot interval)
			16:Slanting cross stripe 2 dots even/odd reversal (128-dot interval)
			17:Slanting cross stripe 1 dot (64-dot interval)
			<ol> <li>Slanting cross stripe 1 dot even/odd reversal (64-dot interval)</li> </ol>
			19: Rope pattern 1 dot
			20: Rope pattern 1 dot main scan even/odd reversal
			21: Rope pattern 2 dots
			22: Rope pattern 2 dots main scan even/odd reversal
			23. Rope patient
			25: Frequency characteristic (vertical)
			26: Frequency characteristic (vertical/horizontal)
			27: Gray scale 5 (vertical/horizontal)
			28: Gray scale 6 (vertical/horizontal)
			29: Black
			30: White
			31: AMDP evaluation counter
			32: Gray scale 7 (vertical)
			33: Independent 1 dot (16-dot interval)
			<ul> <li>p4. independent 1 dot (32-dot interval)</li> <li>p5: Independent 1 dot (64-dot interval)</li> </ul>
			36: Independent 1 dot (128-dot interval)
			37. Independent 1 dot (256-dot interval)
			38: Independent 2 dots (16-dot interval)
			39: Independent 2 dots (32-dot interval)
			40: Independent 2 dots (64-dot interval)

2		Mode Number/Name	Function / [Setting]
2941			41: Independent 2 dots (128-dot interval)
			42: Independent 2 dots (256-dot interval)
			43: Independent 1 dot (4-dot interval)
			44: Independent 1 dot (8-dot interval)
			45: Independent 2 dots (8-dot interval)
	003	Black Density	Adjust the density of the test pattern. <b>DFU</b> .
			[0 ~ 3 / <b>1</b> / 1 step]
			0: All Black
			1: ID - 10/15
			2: ID = 5/15 2: ID = 0/15
	004	White Density	3. ID = 0/13
	004	White Density	Adjusts the density of the test pattern. <b>DFO</b> $[0 \sim 3/1/1]$ test
			0. All White
			1. ID – 10/15
			2: ID - 5/15
			3: ID – 0/15
2942	Print 1	est Pattern	1
	001	Mode	Selects the test pattern mode. To select the pattern, press
			IPU Pattern or VDB Pattern button.
			Pressing IPU prints the IPU test pattern to confirm correct
			data flow from the CIS to the IPU. If the pattern is abnormal,
			there may be a problem with the contact image sensor.
			pressing VDB lesis VDB/LPH image processing. If the
			VDB or LPH.
	003	Pattern	Selects the test pattern.
			[0 ~ 5 / <b>0</b> / 1 step]
			0: None
			1: Vertical Lines: 2-dot 5.4 pitch
			2: Horizontal Lines: 2-dot 5.4 pitch
			3: Vertical Lines: 2-dot
			4: A0T
00.10	_		5: Grid Pattern
2946	Erase	Setting	Press On or Off to switch on or off the leading/trailing edge
2960	і ры т	hin Line Mode	
2000	003	5-bit On/Off Setting	Enables/disables the thin line mode Press On or <b>Off DEU</b>
	003	Correction Data 01	Sets data correction for 2-bit Data 01 to 5-bit <b>DFU</b>
	004		$[0 \sim 31/7/1 \text{ step}]$
	005	Correction Data 10	Sets data correction for 2-bit Data 10 to 5-bit. <b>DFU</b>
	000		[0 ~ 31 / <b>17</b> / 1 step]
	006	Correction Data 11	Sets data correction for 2-bit Data 11 to 5-bit. Adjusts
			vertical and horizontal printer pixels proportionally. DFU
			[0 ~ 31 / <b>25</b> / 1 step]
2965	LPH J	oint Adjustment	
	001	LPH 1-2 Main Scan	Adjusts the LPH joint between LPH1 and LPH2.
			[0 ~ 999 / <b>500</b> / 1/step]
			Adjust only after replacing the LPH.
	002	LPH 2-3 Main Scan	Adjusts the LPH joint between LPH2 and LPH3.
			[0 ~ 999 / <b>500</b> / 1/step]
			Adjust only after replacing the LPH.
2		Mode Number/Name	Function / [Setting]
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2965	003	LPH 1-2 Sub Scan	Adjusts the data delay (due to misalignments of the LPH 1- 2 joint). [102 ~ 267 / <b>168</b> / 1/step] Adjust only after replacing the LPH.
2965	004	LPH 2-3: Sub Scan	Adjusts the data delay (due to misalignments of the LPH 2- 3 joint). [2 ~ 100 / <b>5</b> / 1/step] <i>Adjust only after replacing the LPH.</i>

### SP3-XXX Process Control

3		Mode Number/Name	Function / [Setting]
3001	ID Ser	nsor Setting	
	001	PWM Setting	Adjusts PWM. DFU
			[0~1000 / <b>281</b> / 1/step]
	002	Sensor Initialization	Automatically adjusts the output to 4.0 V. During auto adjustment, the voltage applied to the ID Sensor LED depends on the PWM value.
			Press the Start button to initialize the ID sensor LED with the value entered for the PWM.
			Initialization requires about 15 seconds. Do this adjustment only after replacing the drum or the developer.
3103	ID Ser Vsg)	nsor Output Display (Vsp,	Displays the values for Vsp/Vsg (0.0V~5.0V)
3910	Development Bias Timing		
	001	On Timing	Adjusts the development bias on timing.
			[-222 ~ +222 / <b>0</b> / 1 ms/step]
	002	Off Timing	Adjusts the development bias off timing.
			[-222 ~ +222 / <b>0</b> / 1 ms/step]
3920	ID Sensor Timing		Determines the intervals between ID sensor checks. An ID sensor pattern is made after printing a page, if the print length since the last ID sensor check has reached the specified value. The numbers below are centimeters. [20~1000 / <b>100</b> / 10 cm step]

#### SP4-XXX Scanner

	Mode Number/Name	Function / [Setting]
Scan	ner Sub Scan Magnification	Adjusts the magnification by changing the scanning speed. [-0.9 ~ +0.9 / <b>0</b> / 0.1 %/step]
Scan	ner Sub Scan Registration	
001	Leading Edge	Fine adjusts the time between the sensor-on position and the leading edge of the image. [-10 $\sim$ +10 / <b>0</b> / 0.1 mm/step]
002	Trailing Edge	Fine adjusts the time between the sensor-off position and the trailing edge of the image. This determines the timing for the CIS to stop reading the image after the original has passed the registration sensor. [-10 ~ +10 / $0.0$ / $0.1$ mm/step]
Scan	ner Main Scan Registration	Adjusts the scan registration. [-4 ~ +4 / <b>0.0</b> / 0.1 mm/step]
Scan	ner Erase Margin	, - · · · · · · · · · · · · · · · · · ·
001	Leading Edge	Adjusts the non-scanning area.
002	Trailing Edge	[0.0 ~ +9.0 / <b>0</b> / 0.1 mm/step]
003	Left	
004	Right	
Scan	ner Free Run	
001	Start	To start the free run, press the Start button.
		To end the free run, press the Stop button.
		The free run simulates scanning pages of length determined by SP4013 003, with the interval between each page determined by SP4013 002.
002	Page Interval Setting	Adjusts the scanner free run (see the description for 4013 001). $[0 \sim 250 / 100 / 1 \text{ s step}]$
003	Original Length Setting	Adjusts the scanner free run (the description for 4013 001). $[0.1 \sim 10 / 1.2 / 0.1 \text{ m step}]$
Scan	ner Main Scan Magnification	Adjusts the side-to-side scan magnification. [-0.9 ~ +0.9 / <b>0.0</b> / 0.1 % step]
Origir Lengt	als Smaller Than A4 hwise.	Enables/disables the processing for small size originals. [0 ~ 1/ 0 / 1 step] 0: Copying disabled 1: Copy taken as A4 Lengthwise
Image	e Scan Adjustment	
001	Flag Display	Displays "Adjusted" after executing 4428 002.
002	Start	Press the Start button to adjust the standard white level. After adjustment, check the result with SP4428-001.
Image	e Setting	
006	Smoothing Filter Level - Photo	Selects the four-value diffusion filter level for the Photo (Hard Tone) mode. [0 ~ 5 / <b>0</b> / 1 step] This setting is effective only if the user has selected Photo (Hard Tone) at the operation panel. The zero default setting switches four-value error diffusion off. To weaken the effect, select a low number (e.g. 1), or to strengthen the effect select a higher number (e.g. 3).
	Scani 001 002 Scani 001 002 003 004 Scani 001 002 003 004 Scani 001 002 003 004 Scani 001 002 003 004 Scani 001 002 003 004 Scani 001	Mode Number/Name         Scanner Sub Scan Magnification         001       Leading Edge         002       Trailing Edge         002       Trailing Edge         001       Leading Edge         002       Trailing Edge         001       Leading Edge         002       Trailing Edge         001       Leading Edge         002       Trailing Edge         003       Left         004       Right         Scanner Free Run       001         001       Start         002       Page Interval Setting         003       Original Length Setting         Scanner Main Scan Magnification         Originals Smaller Than A4         Lengthwise.         Image Scan Adjustment         001       Flag Display         002       Start         Image Setting       O06         006       Smoothing Filter Level -         Photo       Photo

4	Mode Number/Name			Function	/ [Setting]	
4905	Line Thickness Mode					
	001	Generation	Selects the thick/thin line mode (for the copied original mode). [0~15 / <b>10</b> / 1/step ] For example, the default setting of 10 selects 'Thin Level 2' for the main scan and for the sub scan (see the table below). Then, the setting of 4905 002 adjusts the sensitivity of the main scan direction setting, and the setting of 4905 003 adjusts the sensitivity of the sub scan direction setting. 0 is weak 5 is strong. For example is the setting is 5 line			
			widtl	h correction will be done r	nore often.	
				Main Scan Direction	Sub Scan Direction	
			0	Disabled	Disabled	
			1	Disabled	Thin Level 1	
			2	Disabled	Thin Level 2	
			3	Disabled	Thick	
			4	Thin Level 1	Disabled	
			5	Thin Level 1	Thin Level 1	
			6	Thin Level 1	Thin Level 2	
			/	Thin Level 1	Thick	
			8	Thin Level 2		
			9	Thin Level 2		
			10	Thin Level 2		
			10		Dischlad	
			12	Thick	Thin Lovel 1	
			1/	Thick	Thin Level 1	
			15	Thick	Thick	
	002	Main Scan - Generation	See	the description for 4905 (	01	
	002	Sub Scan - Generation	10~5	/ 5 / 1/sten ]		
	004	Text	Sele mod [0~1	cts the thick/thin line moc es). 5 / <b>10</b> / 1/step ] the description for 4905 (	le (for the text and blue line	
	005	Main Scan - Text	See	the description for 4905 (	001.	
	006	Sub Scan - Text	[0~5	/ 2 / 1/step ]		
	007	Text/Photo	Sele	cts the thick/thin line mod	le (for the text/photo mode).	
			[0~1 See	5 / <b>0</b> / 1/step ] the description for 4905 (	001.	
	008	Main Scan - Text/Photo	See	the description for 4905 (	001.	
	009	Sub Scan - Text/Photo	[0~5	/ <b>5</b> / 1/step ]		
4906	Filter	Setting				
	005	Full Size Mode	Forc oper	es the reproduction ratio ration panel setting for the	to be 100%, regardless of the job. Press Yes or No.	
	007	Image Shift in Magnification	Adju [0~3 <i>Can</i>	sts the magnification ima 2767 0 / <b>00000</b> / 1/step] <b>I</b> be set for each pixel.	ge shift. DFU	
	010	Main Scan MTF-A Filter Level: Generation 25%- 49.9%	MTF 25% [0 ~	-A filter strength in the m -49.9%) <b>DFU</b> 5 / <b>2</b> / 1 /step]	ain scan direction (Copy Mode	
	011	Sub Scan MTF-A Filter Level: Generation 25%~49.9%	MTF 25% [0 ~	-A filter strength in the su -49.9%) <b>DFU</b> 5 / <b>2</b> / 1/step]	b scan direction (Copy Mode	

4	Mode Number/Name		Function / [Setting]
4906	012	Main Scan MTF-A Filter Level: Generation 50%~154.9%	MTF-A filter strength in the main scan direction (Copy Mode 50% - 154.9%). <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	013	Sub Scan MTF-A Filter Level: Generation 50%~154.9%	MTF-A filter strength in the sub scan direction (Copy Mode 50%~154.9%). <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	014	Main Scan MTF-A Filter Level: Generation 150%~256.9%	MTF-A filter strength in the main scan direction (150%~256.9%). <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	015	Sub Scan MTF-A Filter Level: Generation 150%~256.9%	MTF-A filter strength in the sub scan direction (150%~256.9%). <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	016	Main Scan MTF-A Filter Level: Generation 260%~400%	MTF-A filter strength in the main scan direction (260%~400%) <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	017	Sub Scan MTF-A Filter Level (260%~400%)	MTF-A filter strength in the sub scan direction (260%~400%). <b>DFU</b> $[0 \sim 5 / 2 / 1/step]$
	018	γ Correction Data	Selects correction for gamma data. <b>DFU</b> [0 ~ 5 / <b>2</b> / 1/step]
	020	Filter Level: - Text 25% - 49.9% (Main Scan)	MTF correction filter level (text mode, 25 ~ 49.9%). [0~6 / 6 / 1/step]
	022	Filter Strength -Text 25% - 49.9% (Main Scan)	MTF correction filter strength (text mode, 25 ~ 49.9%). [0~5 / <b>2</b> / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	024	Filter Level - Text 50% - 154.9% (Main Scan)	MTF correction filter level (text mode, $50 \sim 154.9\%$ ). [0~6 / <b>6</b> / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	026	Filter Strength - Text 50% - 154.9% (Main Scan)	MTF correction filter strength (text mode, $50 \sim 154.9\%$ ). [0 ~ 5 / <b>2</b> / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	028	Filter Level - Text 155% - 256.9% (Main Scan)	MTF correction filter level (text mode, $155 \sim 256.9\%$ ). [0 ~ 6 / <b>6</b> / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	030	Filter Strength - Text 155% - 256.9% (Main Scan)	MTF correction filter strength (text mode, 155 ~ 256.9%). $[0 \sim 5 / 2 / 1/step]$ Select a low number for a weak effect, a high number for a strong effect.
	032	Filter Level - Text 257% - 400% (Main Scan)	MTF correction filter level (text mode, $257 \sim 400\%$ ). [0 ~ 6 / 6 / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	034	Filter Strength - Text 257% - 400% (Main Scan)	MTF correction filter strength (text mode, $257 \sim 400\%$ ). [0 ~ 5 / 2 / 1/step] Select a low number for a weak effect, a high number for a strong effect.
	037	Filter Setting Filter Level: Photo Mode (Smoothing)	Selects the filter coefficient for the photo mode. <b>DFU</b> $[0 \sim 4 / 4 / 1/step]$ Select a low number for a weak effect, a high number for a strong effect.

4		Mode Number/Name	Function / [Setting]
4906	038	Filter Strength: Photo Mode	MTF correction filter strength for the photo hard tone mode.
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
	020	Filter Lovel Toxt/Dhote 25%	strong effect.
	039	- 64 9% (Main Scan)	$[0 \sim 6 / 6 / 1/\text{step}]$
			Select a low number for a weak effect a high number for a
			strong effect.
	041	Filter Strength - Text/Photo	MTF correction filter strength (text/photo mode, 25 ~
		25% - 64.9% (Main Scan)	64.9%).
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
	0.40	Filter Laure L. Taut/Dirate 050(	strong effect.
	043	154 9% (Main Scan)	MTF correction filter level (text/photo mode, $65 \approx 154.9\%$ ).
		- 134.3 % (Main Scan)	[0 ~ 0 / 0 / 1/Step] Select a low number for a weak effect, a high number for a
			strona effect.
	045	Filter Strength - Text/Photo	MTF correction filter strength (text/photo mode, 65 ~
		65% - 154.9% (: Main Scan)	154.9%).
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
			strong effect.
	047	Filter Level - Text/Photo	MTF correction filter level (text/photo mode, $155 \sim 256.9\%$ ).
		155% - 256.9% (Mail Scall)	$[0 \sim 6 / 6 / 1/step]$
			strong effect
	049	Filter Strength - Text/Photo	MTF correction filter strength (text/photo mode, 155 ~
		155% - 256.9% (Main Scan)	256.9%).
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
	051	Filter Lovel Toxt/Dhoto	Strong effect.
	051	257% = 400% (Sub Scan)	with correction interfevel (text/photo mode, $257 \approx 400\%$ ).
			Select a low number for a weak effect, a high number for a
			strong effect.
	053	Filter Strength - Text/Photo	MTF correction filter strength (text/photo mode, 257 ~
		257% - 400% (Main Scan)	400%).
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
	055	Filter Laurele Date Original	strong effect.
	055	Filter Level: Pale Original	IN TE correction filter level (for pale originals).
			[0 ~ 0 / <b>3</b> / 1/Step] Select a low number for a weak effect, a high number for a
			strona effect.
	056	Filter Strength: Pale Original	MTF correction filter strength (for pale originals).
			[0 ~ 5 / <b>2</b> / 1/step]
			Select a low number for a weak effect, a high number for a
			strong effect.
	057	Filter Level: Generation Copy	MIF correction filter level (for generation mode).
			[U ~ 13 / b / 1/Step] Select a low number for a weak affect a birth number for a
			strong effect
	1		

4		Mode Number/Name	Function / [Setting]
4906	058	Filter Strength: Generation	MTF correction filter strength (for generation mode).
		Сору	$[0 \sim 5/2/1/\text{step}]$
			strong effect.
	070	Independent Dot Erase - L:	Selects the independent dot erase setting (for generation
		Generation	mode).
			[0 ~ 14 / <b>5</b> / 1/step]
			Zero switches off this feature. A lower setting is erases
	071	Independent Dot Frase - M:	Selects the independent dot erase setting (for generation
	071	Generation	mode).
			[0 ~ 14 / 7 / 1/step]
			See SP 4906 070 for an explanation.
	072	Independent Dot Erase - H:	Selects the independent dot erase setting (for generation
		Generation	[0 ~ 14 / <b>9</b> / 1/step]
			See SP 4906 070 for an explanation.
	073	Independent Dot Erase - L:	Selects the independent dot erase setting (for generation
		Text	mode).
			$\begin{bmatrix} 0 \sim 14 / 5 / 1 / \text{step} \end{bmatrix}$
	074	Independent Dot Frase - M <sup>.</sup>	Selects the independent dot erase setting (for generation
	071	Text	mode).
			[0 ~ 14 / <b>7</b> / 1/step]
			See SP 4906 070 for an explanation.
	075	Independent Dot Erase - H:	Selects the independent dot erase setting (for generation
			[0 ~ 14 / <b>9</b> / 1/step]
			See SP 4906 070 for an explanation.
	076	Independent Dot Erase - L:	Selects the independent dot erase setting (for generation
		Text/Photo	mode).
			$[0 \sim 147371/step]$ See SP 4906 070 for an explanation
	077	Independent Dot Erase - M:	Selects the independent dot erase setting (for generation
	-	Text/Photo	mode).
			[0 ~ 14 / 7 / 1/step]
	070	lader enderst Det Freese III	See SP 4906 070 for an explanation.
	078	Independent Dot Erase - H:	Selects the independent dot erase setting (for generation mode)
			[0 ~ 14 / <b>9</b> / 1/step]
			See SP 4906 070 for an explanation.
	079	Independent Dot Erase - L:	Selects the independent dot erase setting (for generation
		Pale Original	mode).
			See SP 4906 070 for an explanation
	080	Independent Dot Erase - M:	Selects the independent dot erase setting (for generation
		Pale Original	mode).
			[0 ~ 14 / 7 / 1/step]
	001	la des es dest Det Exerce da	See SP 4906 070 for an explanation.
	081	Pale Original	mode).
			[0~14 / <b>9</b> / 1/step]
			See SP 4906 070 for an explanation.

4		Mode Number/Name	Function / [Setting]
4906	090	Edge Data - Smoothing Filter	To enable or disable the edge data saving, press <b>No Keep</b> or Keep. <b>DFU</b>
	091	Edge Date Threshold- Smoothing	Adjusts the threshold value for the edge data saving. <b>DFU</b> [0 ~ 255 / <b>200</b> / 1/step]
	092	Blue Line Erase Level	Selects the level for blue line erase mode (drop-out blue). $[0 \sim 2 / 0 / 1/\text{step}].$
			0: Weak
			1: Medium
4007	Imag	Path Change	2: Strong
4307	001	Scanner Image Correction	Changes the path of the scanner image correction <b>DFU</b>
	001		$[0 \sim 7 / 7 / 1 \text{ step}]$
			0: After the scanner gamma correction
			1: No correction
			2: Before shading
			3: Before scanning gamma correction
			4: White shading data
			5. Test pattern through 6: Scapper-reading through
			7: Normal
	013	Printer Mask	Changes the path from the printer mask forcefully. <b>DFU</b>
			[0 ~ 5 / <b>5</b> / 1 step]
			0: Image from application
			1: Image from MSU
			2: Magnification
			3: Test pattern
			4: Scanned Image
	020	Image from Application	Changes the path from the application program forcefully
	020		Press the Test Pattern button or <b>Normal</b> button. <b>DFU</b>
	021	Image to Application	Changes the path to the application program forcefully. DFU
			$[0 \sim 4 / 4 / 1 \text{ step}]$
			0: Neutral
			1: MSU 2: Seenned Image
			2: Jest Pattern
			4: Normal
	022	Scanner Test Path Selection	Changes the path from the application program. <b>DFU</b>
			[0~4 / 4 / 1 step]
			0: After scanner image correction
			1: After magnification process
			2: After pre-filter process
			3: After mask process
			4: After image quality process
	1		

# Service Tables

	4		Mode Number/Name	Function / [Setting]		
	4960	HDD				
		001	HDD1 Media Check	Press Start to detect defective sectors on the hard disk.		
		002	HDD2 Media Check	Before shipment, the original defective sector information is stored in the non-volatile memory. This information allows the hard disk to avoid accessing the defective sectors. If other sectors become defective after shipment, this sector information must also be stored in non-volatile memory, to prevent output of abnormal images. During media checks, new defective sector information is stored in the IPU non- volatile memory. This information allows the IPU to avoid accessing the bad sectors. As check processing proceeds, the progress is indicated by the displayed numbers (0 ~ 100). Time required for execution depends on the hardware specifications.		
		003	HDD1 Formatting	Press Start to format the hard disk.		
		004	HDD2 Formatting	Required time for execution depends on hardware specifications. If defective sectors are not found, check SP4960-001, 002. If a defective sector is found, some extra time is required for sector substitution.		
E		005	HDD1 Spindle Control	Press Off or On to switch the hard disk off and on.		
		006	HDD2 Spindle Control	The hard disk should stop operating whenever possible to prevent noise and to protect the hard disk. However, if the hard disk is not operating, the fast copy speed may slow down, waiting for the hard disk to start.		
		007	HDD 1 Bad Sector Information Reset	Press Start to clear the bad sector from the NVRAM. Perform this setting after removing a defective disk and		
		008	HDD 2 Bad Sector Information Reset	replacing it with a new disk.		
		009	HDD1 Bad Sector Display	Displays the number of defective sectors on the hard disk.		
		010	HDD2 Bad Sector Display	The number is based on the defective sector information that the IPU has created during operation. When the number reaches 51, SC361 is displayed, then format the hard disk with SP4960 001, 002.		
		011	HDD1 Model Name Display	Displays the hard disk model name (40 characters) on the		
		012	HDD2 Model Name Display	touch-panel display.		
		013	IDE Interface Form Selection	Selects the data transfer format. DFU Press the button for Ultra DMA or Multi Word DMA		
		015	HDD Connection On/Off	Press On or Off to enable or disable hard disk detection		
		010		Set to Off to disable a defective hard disk if either hard disk malfunctions, so the customer can continue to use the copier functions while waiting for a replacement disk.		
	4961	Origir	nal Adjustment			
		001	Synchro-cut Adjustment 210	Adjusts the synchro-cut position.		
			mm	[-9.9 ~ +9.9 / <b>0.0</b> / 0.1 mm/step]		
				Use the 210-mm position in the sample to check the difference. This difference is used to calculate the motor clock count for adjusting the difference.		
		002	Synchro-cut Adjustment	Adjusts the synchro-cut position.		
			1000 mm	[-9.9 ~ +9.9 / <b>0.0</b> / 0.1 mm/step]		
				Use the 1000-mm position in the sample to check the		
				clock count for adjusting the difference		
		003	Original Length Display	Display the original length.		

#### SP5-XXX Mode

	5	Mode Number/Name	Function / [Setting]
	5024	mm/inch Display Selection	Selects the unit. Press mm or inch.
	5113	Optional Counter Type	Selects the setting for the keycard/MF accounting device. Japan Only [0 ~ 5 / 0 / 1 step] 0: None 1: Key Card _ BK2_BK3_Bk4
			2: Key Card – Count-down type
			3: Pre-Paid Card
			5: MF Keypad
	5118	Disable Copying	Enables/Disables printing. Japan Only
			Press Yes or No to enable or disable this feature.
	<b>F100</b>	Mada Olara Ostina Ostata	For CSS use only:
	5120	Removal	determines the next action when a copy job halts because the card is removed, the card expires, or if the paper supply runs out. <b>Japan Only</b> $[0 \sim 2 / 0 / 1 \text{ step}]$ <b>0: Yes</b>
			1: Stand-by
	F107		2: No
	5137	Stamp Function On/Off	Press <b>Enabled</b> or Disabled to enable or disable the stamp function. Switch this on after installing the optional stamp board.
	5501	PM Alarm Interval	Selects the PM interval for issuing a PM alarm on the
			operation panel.
	<b>FF04</b>		[0 ~ 100 / <b>10</b> / 1 km/step]
	5504	Jam Alarm Level	Colorte the issue lowel for on planes call. Jamon Only
		001 Interval Setting	Selects the jam level for an alarm call. Japan Only $[0, \sqrt{2}/3, 1]$ step]
			$[0 \sim 3 / 3 / 1 \text{ Step}]$
			2 <sup>°</sup> Middle
			3: High
		002 Jam Alarm	Press <b>On</b> or Off to enable or disable the jam alarm. <b>Japan Only</b>
	5505	Error Alarm Interval	Selects the error alarm interval. Japan Only
			[0 ~ 255 / <b>800</b> / 1 m /step]
E	5507	Paper Supply Call Level	Adjusts the supply management call level. Japan Only [100 ~ 10,000 100 / 300 / 10 m/step]
		096 914 mm (A-Size)	_
		097 841 mm (A-Size)	_
		098 594 mm (A-Size)	_
		100297  mm (A Size)	-
		100237  mm (A-Size)	-
		102 660 mm	-
		104 880 mm	-
		105 800 mm	-
		106 728 mm (B-Size)	-
		107 515 mm (B-Size)	-
		108 364 mm (B-Size)	┥
		109 257 mm (B-Size)	1
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Service Tables

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	5	Mode Number/Name		Function / [Setting]
	5507	110	182 mm (B-size)	
		128	Others	
	5590	Auto 0	Call Setting	
		002	Door Open Alarm	Enables/disables the auto call. Japan Only
				Press On or Off to enable or disable the setting.
		003	Paper Supply Alarm	Enables/disables the auto call. Japan Only
				Press On or Off to enable or disable the setting.
		004	Toner Supply Alarm	Enables/disables the auto call. Japan Only
				Press On or <b>Off</b> to enable or disable the setting.
	5801	Memo	ory All Clear	Press Start to initialize the non-volatile RAM.
				Before initializing, print out an SMC report (SP5990-2).
	5802	Print F	Free Run	Conducts a free run in the previously specified mode.
				Press On or <b>Off</b> to switch on or off.
	5803	Input	Check	Allows you to test component input (     5.7)
	5804	Outpu	t Check	Allows you to test component output (     5.8)
	5811	Machi	ne Serial Number	The serial number is set with this code before shipping.
	5812	Servic	e Tel. No. Setting	
		001	Service Tel. Number	Set the telephone number (up to 20 digits).
		002	SMC Report Transfer Fax	
	5010	000 5	INO.	
	5816	001	-unction	Enclose / disclose the versete maintenance function
		001	Function Setting	Enables/disables the remote maintenance function.
		000		Press fees of <b>NO</b> to enable of disable. <b>Japan Only</b>
		002		Japan Only
	5821	CSS F	PI Device Code	Selects the PI device code. Japan Only
	5907	Plug 8	& Play	Displays the model name (up to 50 bytes). <b>DFU</b>
	5914	Printer Counter Display On/Off		Press Yes to have the printer controller output displayed on the screen when the User Tools/Counter key is pressed on the operation panel. <i>This SP is effective only after the optional printer controller</i>
				is installed.
	5945	Black and White Reversal		Press No or Yes to switch off/on the display of the user
		001	Preset Stamp	stamps in reverse.
		002	User Stamp	-
		003	Page Numbering	_
		004	Date Stamp	_
=	5050	10.005	Background Numbering	
	5958	IU m s	Setting	Enables or disables the optional special order firmware that increases the maximum original and copy lengths to 10 meters. $[0 \sim 1 / 0 / 1 \text{ step}]$ <b>0: Enable</b> 1: Disable
	5961	Paper	Remaining Display Function	Press the <b>Enable</b> or Disable button to enable or disable the paper remaining display on the operation panel. If this SP is disabled, it cannot be switched on with the UP mode settings.
	5965	Resta	rt Copy Function	Enables/disables the restart copy function. [0 ~ 1 / <b>0</b> / 1 step] <b>0: Enable</b> 1: Disable

5	Mode Number/Name	Function / [Setting]
5980	Counting Units: Total Counter	Selects the units for North America. North America Only $[0~2/1/1 \text{ step}]$
		0: Feet
		1: Yaros 2: Meters
		Do not change this setting after installation.
5990	SMC Printout	Print Start to output the print.
	001 ALL	The paper roll is automatically selected, and the by-pass
	002 SP	feed cannot be used. The image is output in an A4 LEF
	003 User Program	SIZE.
	004 Logging Data	
5997	Optional Counter Unit	Selects the units for the key counter. Japan only
		Press x1/10 or press x1.
		For North America, the key counter units depend on SP5980.

### SP7-XXX Data Log

7	Mode Number/Name	Function / [Setting]
7001	Drum Drive Motor Operation Time	Displays the drum drive motor operation time (for checking
7002	Original Counter	
1002	001 Total Sheet Count	Displays the count for accessed features
	002 Copy Mode Sheet Count	
	003 Scapper Mode Sheet Count	
	006 Total Length	
	007 Copy Mode Length	
	008 Scapper Mode Length	
7003	Print Counter	Displays the count for accessed features
1000	001 Total Length	
	002 Copy Mode Length	
	003 Print Mode Length	
	004 Total Sheet Count	
	005 Copy Mode Sheet Count	
	006 Print Mode Sheet Count	
7101	Total Print Length Count by Paper W	lidth
1,101	096 914 mm	Displays the print length for each paper roll width
	097 841 mm	
	098 594 mm	
	099 420 mm	
	100 297 mm	
	101 210 mm	
	102 660 mm	
	104 880 mm	
	105 800 mm	
	106 728 mm	
	107 515 mm	
	108 364 mm	
	109 257 mm	
	110 182 mm	
	128 Other	
	225 36 inch	
	226 24 inch	
	227 18 inch	
	228 12 inch	
	229 9 inch	
	230 30 inch	
	234 34 inch	
	235 22 inch	
	236 17 inch	
	237 11 inch	
	238 8.5 inch	
7202	Copy Mode Scanning Counter	1
	128 Other	Displays the original scanning count as a 7-digit number
	129 A0	
	130 A1	
	131 A2	1
	132 A3	1
	133 A4	
	134 A5	

7		Mode Number/Name	Function / [Setting]
7202	138	B1	Displays the original scanning count as a 7-digit number.
	139	B2	
	140	B3	
	141	B4	
	142	B5	
	160	11 inch	
	166	8.5 inch	
	181	36 inch	
	182	24 inch	
	183	18 inch	
	184	12 inch	
	185	9 inch	
	186	30 inch	
	187	34 inch	
	188	22 inch	
	189	17 inch	
7204	Total S	Sheets Count by Roll	
	001	1st Roll	Displays the total copy count for each feed station.
	002	2nd Roll	
	003	3rd Roll	
	005	By-pass feed	
7301	01 Total Sheet Count by Reproduction Ratio		Ratio
	001	25.0 ~ 35.3%	Displays the total copy count for each reproduction ratio (for
	002	35.4 ~ 49.9%	fixed reproduction ratios).
	003	50.0 ~ 70.6%	
	004	70.7 ~ 99.9%	
	005	100%	
	006	100.1 ~ 199.9%	
	007	200.0 ~ 400.0%	
	008	Direct Mag.	Displays the total copy count for each feature.
	009	Direct Size Mag.	
	010	Size Mag.	
	011	Fixed Mag.	
	012	User Auto R/E	
	013	Fine Tune	
7304	Total S	Sheet Count by Copy Mode	
	001	Text	Displays the total copy count for each copy mode.
	002	Text/Photo	Each counter counts up at the time of paper feed.
	003	Photo	
	004	Pale Original	
	005	Generation	
	006	Blue Erase	
	007	Patched Original	
	008	Photo (Hard Tone)	
	022	Length Adjust	
	023	Shift	
	024	Border Erase	
	025	Delete Inside	
	026	Delete Outside	
	031	Double Copies	
	032	Image Repeat	

Service Tables

7		Mode Number/Name	Function / [Setting]
7304	033	Positive/Negative	Displays the total copy count for each copy mode.
	034	Mirror Image	Each counter counts up at the time of paper feed
	035	Image Overlay	
	036	Copy Merge	
	041	Background Numbering	
	042	User Stamp Repeat	
	043	Preset Stamp	
	044	User Stamp	
	045	Date Stamp	
	046	Page Numbering	
	051	Sort	
	052	Rotate Sort	
7305	Multip	le Copy Job Counter	
	001	1 to 1	Displays the job count for each multiple copy mode
	002	1 to 2-5	
	003	1 to 6-10	
	004	1 to 11-20	
	005	1 to 21-50	
	006	1 to 51-99	
7306	Numb	er of Jobs per Mode	
	001	Sample Copy	Displays the job count for each mode.
	002	Partial Copy	
	003	Sort/Rotate Sort	
7401	Total SC Counter		Displays the total SC count as a 4-digit number.
7403	SC History		
	001	Latest	Displays the latest 10 SC codes.
	002	Latest 1st	
	003	Latest 2nd	
	004	Latest 3rd	
	005	Latest 4th	
	006	Latest 5th	
	007	Latest 6th	
	008	Latest 7th	
	009	Latest 8th	
	010	Latest 9th	
7501	Total.	lam Counter	Displays the total paper iam count (copy paper and original)
/001	rotart		as a 4-digit number.
7502	Total I	Paper Jam Counter	Displays the total paper jam count (copy paper) as a 4-digit number.
7503	Total	Original Jam Counter	Displays the total paper jam count (original) as a 4-digit number.
7504	Paper	Jam Counter by Location	
	001	At Power On	Displays the jam count for each location.
	003	Roll Lead Edge Sensor 1:	For 001~034: Paper fails to activate the sensor (non-feed).
		Not On	
	004	Roll Lead Edge Sensor 2: Not On	
	005	Roll Lead Edge Sensor 3: Not On	
	011	Cutting Sensor 1: Not On	
	012	Cutting Sensor 2: Not On	
	013	Registration Sensor: Not On	
	015	Exit Sensor: Not On	

7		Mode Number/Name	Function / [Setting]
7504	016	Upper Exit Sensor: Not On	Displays the jam count for each location.
	034	By-pass Feed Sensor: Not On	For 001~034: Paper fails to activate the sensor (non-feed).
	053	Roll Lead Edge Sensor 1: Not Off	053~084: Paper fails to move from sensor location.
	054	Roll Lead Edge Sensor 2: Not Off	
	055	Roll Lead Edge Sensor 3: Not Off	
	061	Cutting Sensor 1: Not Off	
	062	Cutting Sensor 2: Not Off	
	063	Registration Sensor: Not Off	
	065	Exit Sensor: Not Off	
	066	Upper Exit Sensor: Not Off	
	084	By-pass Feed Sensor: Not Off	
7505	Origin	al Jam Counter by Jam Locatio	on
	001	During Standby	Displays the jam count for each location.
	032	Registration Sensor: Not On	]
	033	Registration Sensor: Not Detect Off	
	034	Registration Sensor: Not Off	
	038	Stays Original/Paper	
	040	Emergency Stop Original	
		Feed	
	041	Exit Sensor: Not On	
7506	Copy	Jam Counter by Paper Width	
	096	914 mm	Displays the jam count for each paper width.
	097	841 mm	
	098	594 mm	
	099	420 mm	
	100	297 mm	
	101	210 mm	
	102	660 mm	
	104	880 mm	1
	105	800 mm	1
	106	728 mm	1
	107	565 mm	1
	108	364 mm	1
	109	257 mm	1
	110	182 mm	1
	128	Other	1
	225	36 inch	1
	226	24 inch	1
	227	18 inch	1
	228	12 inch	1
	229	9 inch	1
	230	30 inch	1
	234	34 inch	1
	235	22 inch	
	236	17 inch	1
	237	11 inch	1
	238	8.5 inch	1
	200		

Service Tables

7		Mode Number/Name	Function / [Setting]
7507	Jam H	listory	
	001	Copy Latest	Displays the latest 10 jams.
	002	Copy Latest 1st	
	003	Copy Latest 2nd	
	004	Copy Latest 3rd	
	005	Copy Latest 4th	
	006	Copy Latest 5th	
	007	Copy Latest 6th	
	008	Copy Latest 7th	
	009	Copy Latest 8th	
	010	Copy Latest 9th	
	011	Original Latest	
	012	Original Latest 1st	
	013	Original Latest 2nd	
7507	014	Original Latest 3rd	Displays the latest 10 jams.
	015	Original Latest 4th	
	016	Original Latest 5th	
	017	Original Latest 6th	
	018	Original Latest 7th	
	019	Original Latest 8th	
	020	Original Latest 9th	
7801	ROM	Version	•
	001	SCU	Displays the ROM serial numbers.
	002	BICU	
	003	LCDC	
	004	CSS (PI) (Japan Only)	
	005	HDC	
	006	Scanner	
	007	Printer	
7803	PM Co	ounter Display	Displays the PM counter.
7804	PM Co	ounter Clear	To clear the PM counter, press Start (SP7803).
7807	Jam/S	C Counter Clear	To clear the Jam/SC count to 0, press Start.
7808	Count	er Clear	To clear non-accounting counters to 0, press Start.
			The following counters are not cleared: total counter
			(electronic counter), copy counter, print counter, P/O
			counter, C/O counter.
7810	Key O	perator Code Clear	To clear the key operator code, press Start.
			Nullifies the key operator code.
7811	Origin	al Counter Clear	To clear the original counters, press Start (SP7002)
7816	Total S	Sheet by Roll Counter Clear	
	001	1st Roll	Clears the copy counter for each roll (SP7204)
	002	2nd Roll	
	003	3rd Roll	
	005	By-pass feed	
7819	Total S	Sheet Count by Paper Width	Press Start to clear the copy counter for each roll width
	Clear		(SP7101)
7822	Total S	Sheet Count by Reproduction	To clear the copy counters for SP7301 reproduction modes,
	Ratio	Clear	press Start.

7	Mode Number/Name	Function / [Setting]
7825	Total Feed Meter Clear	<ul> <li>To clear the electronic total counter, press Start: This can only be done under the following conditions.</li> <li>1. The counter displays a negative value (the counter does not display a value from 0 to 9999999)</li> <li>2. The counter has not been cleared before (clearing the counter makes it display a value from 0 to 9999999)</li> <li>This SP mode does not show whether the counter can be cleared. Check the initial settings counter to make sure if this is possible.</li> <li>When the electronic counter exceeds 0, the mechanical total counter synchronously starts counting. (The initial value of the mechanical total counter is 0.)</li> </ul>
7904	Total Sheet Count by Copy Mode Clear	To clear the counter of the total copies by copy mode, press Start (SP7304).
7905	Multiple Copy Job Count Clear	To clear the counter of the copy job number of each multiple copy mode, press Start (SP7305).
7906	Copy Mode Scanning Count Clear	To clear mode scan count, press Start (SP7202).
7907	Number of Jobs per Mode Clear	To clear number of jobs per mode, press Start (SP7306).
7908	Copy Mode Original Counter Clear	To clear copy mode original count, press Start (SP7002 002, 007).
7917	Original Counter Clear	To clear the original counter, press Start (SP7002).

# 6. DETAILED DESCRIPTIONS

## 6.1 OVERVIEW

## 6.1.1 MACHINE LAYOUT



2-bit image data.

Detailed Description

- 1 Image Writing Unit
- 2 Scanner Unit
- 3 Cleaning Unit
- 4 Fusing Unit
- 5 OPC Drum and Surrounding Units
- 6 Roll Trays (2nd Tray optional)
- 7 By-pass Tray
- 8 Development Unit

The by-pass tray can be used to feed individual sheets of copy paper.

The units located around the OPC drum do the charging, image

the most suitable fusing temperature and nip band width.

Uses an LPH (LED Print Head) capable of 32-level gradation to write

Uses a CIS for 256-level scanning. To minimize black lines caused by dust or other particles, the original is scanned from above.

Fusing is done using a hot roller containing two halogen lamps. For

the given paper type/size selected by the user, the machine chooses

writing, development, transfer, separation, cleaning, and quenching.

Toner is attracted from a single magnetic roller to the low charge areas on the OPC drum. The ID sensor inside the unit is used to control the toner concentration.

The drum is cleaned with a counter blade.

Paper is supplied from continuous rolls.

## 6.1.2 MECHANICAL COMPONENT LAYOUT



- 1. Front Copy Tray
- 2. OPC Drum
- 3. Original Table
- 4. Charge Corona Unit
- 5. Cleaning Unit
- 6. Original Feed Rollers
- 7. Upper Original Exit Guide
- 8. Original Exit Rollers
- 9. Upper Original Exit Rollers
- 10. Rolled-up Original Exit Tray
- 11. Original Exit Junction Gate
- 12. Rear Original Tray
- 13. White Platen Roller
- 14. Upper Exit Rollers
- 15. Fusing Cleaning Roller
- 16. Paper Exit Junction Gate
- 17. Exit Rollers

- 18. Hot Roller
- 19. Copy Tray Guide
- 20. Pressure Roller
- 21. Rear Copy Tray
- 22. Transfer & Separation Corona Unit
- 23. Roll Holders
- 24. 2nd Feed Rollers
- 25. 3rd Feed Rollers
- 26. 2nd Roll Tray (option)
- 27. Cutter Units
- 28. 3rd Feed Exit Roller
- 29. 1st Feed Rollers
- 30. 1st Roll Tray
- 31. 1st/2nd Feed Exit Roller
- 32. Registration Rollers
- 33. Development Unit
- 34. Toner Cartridge

Detailed Descriptions

## 6.1.3 DRIVE LAYOUT



B010V907.WMF

- 1. Original Feed Motor
- 2. Drum Drive Motor
- 3. Registration Motor
- 4. Roll Feed Motor 2

- 5. Roll Feed Motor 1
- 6. Development Motor
- 7. Fusing Drive Motor

## 6.1.4 ORIGINAL/COPY PAPER PATHS



- A Paper path from the by-pass feed table
- **B** Paper path from the 1st/2nd roll tray
- **C** Paper path from the 3rd roll tray (option)
- **D** Original paths

# 6.2 SCANNER

## 6.2.1 OVERVIEW



B010D901.WMF

Only one original can be placed in the feeder at once.

The original size sensors and original set sensor detect paper size.

The original feed roller [A] feeds the original to the white platen roller and CIS area [B].

The CIS scans the original.

While the scanned image is being processed, the exit roller [C] feeds the original out of the machine at either the rear exit [D] or upper exit [E], depending on which exit the user has selected.



## 6.2.2 ORIGINAL SIZE DETECTION

Five sensors detect the original width; four original size sensors and the original set sensor.

The sizes detected depend on the Original Size Detect user tool setting (see the table below). In metric models, this is either A series or B series. In inch models, it is either Engineering (ANSI) or Architecture.

The original set sensor detects A4 or B4 SEF and North American A size originals. The original size sensors detect larger sizes.

Europe	A Series	A4 SEF	A3 SEF	A2 SEF	A1 SEF	A0 SEF
	B Series	B4 SEF	B3 SEF	B2 SEF	B1 SEF	
North		Α	В	С	D	E
America	Eng. (ANSI)	81/2 x 11"	11 x 17"	17 x 22"	22 x 35"	34 x 44"
	Arch.	9 x 12"	12 x 18"	18 x 24"	24 x 36"	36 x 48"

SEF (short edge feed) = lengthwise, LEF (long edge feed) = sideways

## 6.2.3 ORIGINAL FEED MECHANISM

The original feed motor [A] (stepper motor) and timing belt [B] drive all the rollers in the original feed path, including the white platen roller [C].

The original feed clutch [D] controls the original feed roller (on/off timing is based on the output from the original set sensor).



## 6.2.4 ORIGINAL FEED SPEED

The speed of the original as it passes through the original path increases as the rate of reduction is lowered.



B010D515.WMF

## 6.2.5 ORIGINAL TEMPORARY DELAY

Inserting the leading edge of the original [A] into the feed slot switches on the original set sensor [B], and brings it into contact with the edge of the original feed roller [C].

The interval between the time the original set sensor switches on until the feed roller starts turning is called Delay 1. It can be set from 1 to 5



seconds with the "Original Feed Delay 1" user tool. This delay allows the user to manually shift the original from side to side to correct the alignment of the original.

After Delay 1 expires, the original is fed at 105 mm/s to the registration sensor [D], where the original pauses again for 1 to 5 seconds. This is called Delay 2 and this delay allows time for the user to pull the original out if it has fed incorrectly. The length of Delay 2 can be set with the "Original Feed Delay 2" user tool.

### 6.2.6 SCANNING MECHANISM

In this machine, the scanning unit [A] is above the original feed path [B]. This eliminates copy quality problems caused by foreign objects falling into the scanner.

This machine also uses a contact image sensor [A] (CIS System **GI**), which scans black and white originals up to 926 mm (361/2") wide at 600 dpi.

The original moves past the scanning unit. So, to increase the scanning speed of this machine, the CIS consists of 16 blocks of self-focusing lenses [B] arrayed in a straight line.



## 6.2.7 AUTO IMAGE DENSITY CORRECTION

Auto Image Density Correction corrects the background density.

The CIS reads the surface of the white platen roller and uses this reading (white point =0) as a reference point for density correction.

Next, the CIS starts 5 mm from the leading edge and reads 70 mm to the left and right of center to perform image density correction line by line.



B010D514.WMF

## 6.2.8 ORIGINAL EXIT SWITCHING MECHANISM



An operation panel setting determines whether the original exits the upper exit [A] or rear exit [B]. When the upper exit is selected, the solenoid stays off, and the original exits at the upper exit. This is the default setting.

When the rear exit key is selected, the solenoid switches on when the registration sensor detects the leading edge of the original, and the original exits at the rear [B].

## 6.3 IMAGE PROCESSING

## 6.3.1 GENERAL IMAGE PROCESSING FLOW CHART

The IPU and the AMDP chips on the IPU board do the image processing. MSU: Memory Supercharger Unit (hard disk with hard disk controller)



B010D512.WMF

## 6.3.2 ORIGINAL MODES

### Overview

Here is a brief summary of the original modes that the user can select for this machine at the operation panel.

Mode	Function		
Text	Best reproduction of text and sharp lines. When Text is selected, the auto image density feature is automatically switched on.		
Photo	Conducts dither processing for photo originals to remove jagged edges. Achieves the best reproduction for copied photographs. When Photo is selected, the auto image density feature is automatically switched off.		
Text/Photo	Achieves the best reproduction for originals with text and photos on the same page. When Text/Photo is selected, the auto image density feature is automatically switched on.		
Pale	Best reproduction of originals which may be difficult to read, such as penciled documents, thin sheets, copies of copies of forms, and any original of low contrast that may require enhancement. When Pale is selected, the auto density feature is automatically switched on.		
Generation	Similar to the Text mode, but attempts to reduce the thickness of thick characters, restore the thin or broken lines of originals, ignore the background texture, and erase independent dots that tend to appear in copies of originals which are 2nd, 3rd, etc. generation copies themselves.		
Patched Original	Prevents the background from appearing in copies of originals where the textures of the backgrounds differ. For example, this mode will even out the backgrounds and eliminate the shadows and lines on pages or boards pasted up for design layout.		
Blue Line	Ignores only blue lines in the original. For example, the blue grid squares of graph paper, or the markings with a dropout blue pencil do not appear in copies.		
Photo (Hard Tone)	Uses 4-value error diffusion. Good for copying posters that contain photos with text overlays. 4-Value Error Diffusion is applied in the Photo (Hard Tone) mode. It can be adjusted with SP4903 006 Image Setting – Smoothing Filter Level Photo.		

Tables on the following pages show which SP modes can be used for each original mode. However, the following SP settings are only effective if the "Copier Features - General Features - Original Mode Quality Level" user tool is set to "Special"

SP4903-006, SP4906-020, -022, -024, -026, 028, -030, -032, -034, -037, -038, -039, -041, -043, -045, -047, -049, -051, -053, -055, -056, -057, -058, -090, -091.

#### Text Mode

Text mode does not distinguish between areas of the page that contain text, graphics, or photographs; the entire page is processed as a text original. However, straight lines appear sharp in the copies.



#### Photo Mode

Photo mode achieves the best possible copies of photo originals.



Detailed Jescriptions

#### Text/Photo Mode

Text/Photo mode achieves excellent reproduction of originals with text and photos on the same page. Grayscaling is more accurate than that obtained with Text mode.



#### Pale Mode

Pale mode is designed to process images scanned from originals of low contrast (thin originals, faded forms, etc.)

	Image Processing Flow	Related SP Modes
Scanner Image Correction	Shading Correction	]
	$\downarrow$	-
Conversion Processing	Main Scan Resolution Conversion	]
	$\downarrow$	
Filtering	MTF Filtering Independent Dot Erasure	SP4906-55 MTF filter coefficients.
		SP4906-56 MTF filter strengths SP4906-79, 80, 81 SP4930-4 Independent dot erasure settings.
	$\downarrow$	
Density Control	γ Correction	]
Quality Processing	4-Value Error Diffusion	]

Detailed Descriptions

#### Generation

Processing similar to that of the Text mode, but attempts to reduce the thick characters, restore the thin or broken lines of originals, ignore the background texture, and erase independent dots that tend to appear in copies of originals which are themselves 2nd, 3rd, etc. generation copies.



### Patched Original Mode

The patched original mode processing prevents the background of an original from appearing in a copy.



Detailed Descriptions

#### Blue Line Mode

Blue line mode processing ignores blue lines and markings on originals. For example, blue grid squares of graph paper or markings with a dropout blue pencil do not appear in copies.



**NOTE:** SP4906 092 adjusts the level for blue line erase.
#### Photo (Hard Tone) Mode

Good for copying posters that contain photos with text overlays.



Detailed Descriptions

## 6.3.3 INDEPENDENT DOT ERASURE

The user selects the required amount of independent dot erasure, using a user tool (Copier Features – General Features – Noise Reduction). There are four settings: Off, Low, Medium, and High.

The threshold values for each setting can be adjusted with SP modes 4906 70~81.

The user tool setting applies to the Text, Pale, Text/Photo, and Generation Copy original modes. Independent dot erasure is also used with the Blue Line and Patched Original modes, but there are no user or SP adjustments.

For example, Text mode uses the following SP modes.

- 4906 073: Low (L)
- 4906 074: Medium (M)
- 4906 075: High (H)

The adjustment is done on a  $5 \times 5$  pixel matrix with the 10 pixels to the left and right of the matrix.

SP4906 070~081	Independent Dot Erasure
0	Independent dot erasure is not executed.
1~14	When surrounding pixels are each less than the selected SP mode value (nn), the targeted pixel is removed.

As shown in the table below, as values are selected farther to the right, more dots are erased.

SP Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Text Mode	8	16	24	32	40	48	56	64	72	80	96	112	128	144
Example	_		_		L		М		Н	_	_	_		—

L: Low, M: Medium, H: High



The surrounding area tested before application of independent dot erasure.



The algorithm operates as follows:

- If any value in the shaded pixels in the above diagram is larger than the SP setting, the target pixel is not removed.
- If no value in the shaded pixels in the above diagram is greater than the SP setting, then the 10 pixels to each side of the matrix are checked:
  - If any value in the 10 pixels to each side of the matrix is larger than the target pixel, the target pixel is not removed.
  - If no value in the 10 pixels to each side of the matrix is greater than the SP value, the target pixel is removed.

# 6.3.4 FOUR-VALUE ERROR DIFFUSION

This method of error diffusion, implemented for the first time on a wide format copier, is similar to 256-grayscale error diffusion but with one important difference. Instead of testing each matrix and assigning it a value on the 0~255 scale, each matrix is tested and then processed according to which one of 4 ranges it fits into on the 0~255 scale.

The  $0\sim255$  scale is divided into 4 sections. Sections 1, 2, 3, and 4 are assigned binary values (00, 01, 10, 11) in ascending order.

This method of error diffusion is not as accurate as true error diffusion. However, it requires much less memory, resulting in much faster processing times and less demand on memory resources.

This feature is only used with Photo (Hard Tone) Mode.

The strength can be adjusted with SP4903 006.

# 6.3.5 MTF SETTINGS

The MTF (Modulation Transfer Function) filter coefficient and strength can be adjusted for the following requirements:

- Sharp reproduction of text and lines on the same page.
- Sharp lines in copies reduced in size.
- Removal of rough textured background.
- Improved reproductions of low-contrast originals.

The settings for an MTF filter coefficient and strength can be adjusted separately, in order to achieve optimum performance according to how the customer is routinely using the machine.

If higher values are selected for both the coefficient and strength settings, the performance of the filter is enhanced. If the strength of the filter is increased, the reproduction of low contrast documents is improved but the occurrence of moiré increases.

**NOTE:** For Photo (Hard Tone) Mode (4-Value Error Diffusion) the strength can be increased only with SP4903 006 (Image Setting – Smoothing Filter Level Photo).

For more details about the range of SP adjustments available, see Section "5 Service Tables".



Detailed Descriptions

## 6.4.1 OVERVIEW



B010D102.WMF

- 1. LPH (LED Print Head)
- 2. Charge Corona Unit
- 3. Quenching Lamp (LED Array)
- 4. Charge Corona Grid Wires
- 5. Cleaning Blade

- 6. Pick-off Pawl
- 7. Separation Corona Unit
- 8. Transfer Corona Unit
- 9. Registration Rollers
- 10. Development Roller

Drum diameter	φ80 mm (3.2")
Drum speed	90 mm/s
LPH	3 arrays, each array the same width as one A3 sheet
Corona wire	Gold-plated to facilitate cleaning and minimize charge leak.

## 6.4.2 DRUM DRIVE

The drum drive motor [A] drives the OPC drum [B] through gears, a timing belt, and the drum drive pulley [C].

The drum drive motor only drives the drum.



# 6.4.3 CHARGE CORONA UNIT

The charge corona unit [A] comprises one gold-plated charge wire ( $\phi$ 80  $\mu$ m) and 10 grid wires, and employs the Scorotron (Negative) Charge Method **G**.

About -6.0 kV are applied to the charge wire, to achieve a -850V charge on the grid wires. Charge passing between the grid wires brings the charge on the surface of the drum to -900V.

## 6.4.4 CORONA WIRE CLEANING

The charge corona wire has an automatic cleaning device. After 600 m of paper has passed though the machine or the current copy job ends, the wire cleaner [A] cleans the wire.

The wire cleaner motor [B] drives the cleaner.

The interval between automatic charge wire cleanings can be adjusted with SP2804.



## 6.4.5 CLEANING THE DRUM

This machine uses a counter blade system to clean toner from the photoconductive surface of the drum.

In a counter blade system, the cleaning blade [A] is mounted opposed to the direction of drum rotation.



B010D310.WMF

The counter blade has a pressure release lever which can be moved easily between the opened [A] and closed [B] position to release it from the drum. The blade must be released before the drum is removed from the machine.



B010D311.WMF

## 6.4.6 COLLECTING USED TONER

The toner collection coil [A], driven by the registration motor, collects the used toner from the drum and sends it through a tube [B] to the used toner tank.

The toner overflow sensor [C] monitors the level of the toner in the used toner tank [D], and triggers a warning message on the operation panel when the used toner tank is almost full.

The capacity of the used toner tank is 4600 cc (about 25.3 k copies/A1 sideways [LEF] or 15 km at 6% coverage)

- After the near overflow warning, the machine can continue to operate and will copy up to 20 m.
- After the 20 m copies are completed, the overflow warning is issued and copying can no longer be done. If the 20 m limit is exceeded during a copy job, the copy job is terminated and a message will be displayed on the operation panel.
- To release the machine from the overflow shutdown, first turn the main power switch off/on. If the message does not appear after 1 second, you can continue to use the machine. However, if the message appears again, the used bottle must be emptied.



B010D206.WMF



## 6.4.7 QUENCHING

This machine uses an LED array [A] for quenching **Q**.

This LED uses red light to reduce drum fatigue.



B010D203.WMF

## 6.4.8 ANTI-CONDENSATION HEATERS

There are two anti-condensation heaters [A] below the transfer and separation corona units [B]. They prevent the formation of condensation in areas around the OPC drum [C].

The anti-condensation heaters turn on when the main power switch is turned off.



# 6.5 IMAGE WRITING

## 6.5.1 LED HEADS

This machine uses LED heads [A] that shine light directly onto the OPC to form a latent image with 32 levels of gradation.



The A0-size 600-dpi print head is an array of connected self-focusing lenses [A] above an LED array [B] and drive board [C], and mounted in a heat sink [D].

**NOTE:** The maximum operational width of the print head is 930 mm (36.6").

The unit is called the LPH (LED Print Head).



B010D101.WMF

# 6.6 **DEVELOPMENT**

## 6.6.1 OVERVIEW



- 1. Development Filter
- 2. Augur
- 3. Doctor Blade
- 4. Development Entrance Seal
- 5. OPC Drum
- 6. Development Roller (with sleeve)

- 7. Paddle Roller
- 8. Development Agitator
- 9. Toner Agitator
- 10. Toner Cartridge
- 11. Separator

This machine uses the dual component development method with toner concentration control **G**.

The paddle roller picks up developer in its paddles and transports it to the development roller. Internal permanent magnets in the development roller attract the developer to the development roller sleeve.

The rotation of the sleeve carries developer toward the OPC drum. Developer back spill from the doctor blade goes either to the separator then the agitator, or to the augur then the paddle roller.

A filter relieves the pressure that tends to build up in the development unit.

The toner density is constantly monitored by an ID sensor (there is no TD sensor).

## 6.6.2 DEVELOPER CROSS-MIXING

The doctor blade [A] trims the developer to the specified thickness. The developer then passes to the separator [B]. The separator guides the developer at an angle, so that it cross mixes from left to right.

Toner falls through a hole [C] at the right end of the separator. The augur [D] transports this toner in the opposite direction of the separator, from right to left, to achieve cross-mixing.

Together with toner density control, this method of cross-mixing prevents fluctuations in toner density, which can cause uneven printing.

The rotation of the toner agitator [A] sends new toner to the developer agitator [B], where it is mixed with developer back spill from the separator [C] and sent to the paddle roller [D].



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B010D306.WMF

## 6.6.3 DEVELOPMENT BIAS

#### Copying

The CBG (Charge, Bias, Grid) power pack applies [A] a negative bias (-700V) to the development roller, slightly higher than the residual charge on the drum.

The development bias during copying depends on SP 2201 001.

#### Making ID Sensor Patterns

The machine has two ways of making the ID sensor patterns. These are Low Duty Mode and High Duty Mode. The mode used depends on SP 2201 004.

If the average copy volume is high (2.5 km/month or more), should be switched to High Duty Mode to prevent toner scattering.



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However, if the machine is in High Duty Mode and the average copy volume becomes low again, image density may become lower. If this happens, switch back to Low Duty Mode.

The ID sensor pattern development bias voltages for high and low duty modes can be adjusted with SP 2201 002 and 003, as shown in the following table.

2201 002	Development bias for the ID sensor pattern (Low Duty Mode)	Default setting: -410 V
2201 003	Development bias for the ID sensor pattern (High Duty Mode)	Default setting: -475 V
2201 004	Selects Low Duty Mode or High Duty Mode	Default setting: Low Duty Mode

## 6.6.4 DEVELOPMENT DRIVE MECHANISM

The development motor [A] drives the development unit through a timing belt [B].



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## 6.6.5 TONER SUPPLY MECHANISM

The toner agitator [A] rotates inside the toner cartridge to move toner to the development unit agitator [B].

The amount of toner supplied to the development unit is controlled by switching the toner supply clutch on and off. Clutch on/off timing is based on readings from the ID sensor.



Detailed Description:

## 6.6.6 ID SENSOR

The ID sensor [A] checks the density of a temporary image (known as the ID sensor pattern), projected onto the drum with the LED print head.

The density is used to determine whether more toner is needed.

The ID sensor pattern is made after each copy, if 100 cm of copies have been made since the last ID sensor pattern check. This interval can be changed with SP3920 (ID Sensor Timing).



## 6.6.7 TONER END/NEAR-END CONTROL

#### **Near-end Detection**

Near-end occurs if the ID sensor reads Vsp/Vsg values three times in succession that are larger than the Vend value specified with SP2927 001 (Toner End Level),.

#### End Detection/Recovery from Near-end

After the machine enters the near-end status, the ID sensor pattern check accelerates from 100 cm to 20 cm intervals.

Then, the machine changes status in accordance with the following conditions:

• **Toner End:** Toner end occurs if Vsp/Vsg stays continuously more than Vend while a certain length of paper is printed. Then the toner end message is displayed, and machine operation halts. The length of paper depends on SP 2927 002 (default setting: 1500 cm).

If Vsp/Vsg drops below Vend, the distance count stops. But, if the next Vsp/Vsg reading exceeds Vend again, the count begins again from the previously accumulated total.

- **Recovery from Near-end:** If Vsp/Vsg drops below Vend three times in succession, then the following happens:
  - The machine is released from the near-end status
  - The distance counter is reset to zero
  - The ID sensor pattern check interval is restored to its original value (this interval depends on SP3920; the default is 100 cm intervals).

## 6.6.8 TONER END RECOVERY

The flowchart below illustrates the toner end recovery cycle.

Toner end recovery entails opening the toner hopper cover when the near toner or toner end messages are displayed, then closing the cover after replacing the toner cartridge.

If the toner cartridge is replaced during a long print job, the job can be restarted by pressing the restart key.



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## 6.6.9 TONER DENSITY CONTROL

#### Overview

The machine controls toner density by switching the toner supply clutch on/off, with on/off timing determined by the ID sensor readings from the sensor pattern on the drum.

#### **Toner Supply Modes**

This machine has three toner supply modes. These are detect mode, fixed mode (3%), and fixed mode (6%).

The mode that is used depends on the setting of SP 2208 003. The default is detect mode.

In detect mode, the machine uses the ID sensor to control toner supply.

If the ID sensor breaks, SC code 353 is generated. The machine does not automatically switch over to fixed supply mode.

If a spare sensor is not available, SP 2208 003 must be set to fixed mode. For example, select fixed mode (3%) if the user's copies are generally 3% black coverage.

Then, after installing a new ID sensor, set SP 2208 003 back to detect mode.

Cutting Sensor

Exit Sensor

**Registration Sensor** 

## 6.6.10 DEVELOPMENT TIMING CHART

#### [MS] Drum Motor, Quenching Lamp Corona Grid Corona Charge Wire 10770~10990 18610 ~ 18830 ՄԼ LPH 11560 1' Development Motor **49**10 J 1**940**0 **Development BIAS** 5020<u>5100</u> 12870 12950 Transfer Corona Separation dc Separation ac ID Sensor Read + 50ms Fusing Motor U<sub>200</sub> Registration Motor 4650 Π Registration CL 17390 18100 Feed Motor Feed CL 30 Cutter

#### Tray 1 A1 (LEF), one original, two copies, drum speed: 90 mm/s)



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# 6.7 PAPER FEED AND REGISTRATION

## 6.7.1 OVERVIEW



- 1. Registration Roller
- 2. By-pass Feed table
- 3. Cutting Sensor 1
- 4. Feed Exit Roller 1
- 5. Cutter 1 (Upper Tray)
- 6. Roll Lead Edge Sensor 1
- 7. 1st Feed Roller
- 8. Roll Lead Edge Sensor 2
- 9. Cutting Sensor 2
- 10. Feed Exit Roller 2
- 11. Cutter 2 (Lower Tray)

- 12. Roll Lead Edge Sensor 3
- 13. 3rd Feed Roller
- 14. Paper End Sensor 3
- 15. Roll End Sensor 3
- 16. Paper End Sensor 1
- 17. Roll Tray 1 Safety Switch
- 18. 2nd Feed Roller
- 19. Paper End Sensor 2
- 20. Roll Tray 2 Safety Switch
- 21. Roll End Sensor 2
- 22. Roll End Sensor 1

The paper feed section consists of two roll trays and the by-pass feed table. Each paper source can be selected from the operation panel.

The first roll tray contains two rolls (roll 1 is at the front of the machine, and roll 2 is towards the rear). The second roll tray (optional) contains one roll (roll 3).

Inserting the original starts the feed motor and the registration motor, and paper feed begins. The paper is fed from the paper supply source, passes the feed exit roller and is fed into the machine by the registration rollers.

The registration rollers halt temporarily to allow paper skew correction, and then start again to feed the paper to the drum.

Next, the cutter cuts the paper after the specified paper length has been fed (monitored by the cutting sensor). The starting time of the cutter depends on the cutting mode selected at the operation panel (preset cut, synchro cut, or variable cut).

After the last cut of a job, the feed roller reverses and returns the edge of the paper to its home position away from the vertical part of the feed path. This ensures that the paper path is not obstructed when paper feed starts for the next job.

# 6.7.2 PAPER HOLDER

The racks [A] where the paper rolls are mounted in the paper tray units are adjustable to allow loading paper rolls of different width.





[A]

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# 6.7.3 PAPER WIDTH AND MEDIA TYPE SETTINGS

The machine does not detect the paper width or the type of media.

After a roll has been installed, the width and media type must be selected on the operation panel screen, and special settings input with user tools, before printing from that roll. These settings determine machine parameters, such as toner supply and temperature and pressure in the fusing unit (- 6.10.4).

The Tray Paper Size display is selected with the User Tools, System Settings for Europe [A] or North America [B].



# 6.7.4 ROLL TRAY FEED MECHANISM

Each tray has an independent motor that drives the feed rollers and exit rollers for the tray.

The feed motor [A] and feed clutches [B] are on the left side of the tray.

There are two knobs [C] attached to the timing belts on the right side of the tray to allow removal of paper jams manually.



## 6.7.5 BY-PASS FEED MECHANISM

Inserting a cut sheet from the by-pass feed table into the machine switches on the bypass feed sensor [A].

The by-pass feed sensor switches on the drum motor, registration motor [B] and the registration clutch [C], and the paper starts to move.

The registration clutch switches off temporarily so the user can adjust the position of the paper. This delay time can be adjusted with SP1911 (By-Pass Feed Start Timing Adj.).

# 6.7.6 REGISTRATION

The registration motor [A] and registration clutch [B] drive the registration roller [C].

When the paper arrives at the registration roller, the registration clutch switches off temporarily in order to remove any skew, and then switches on again to resume feed.







Detailed Descriptions

## 6.7.7 CUTTING MECHANISM

There is a cutter unit on each roll tray.

The rotary disk cutter [A] can cut in either direction. When it comes to rest at the home position [B] on either end of the cutting unit, a cam opens the paper holder for the next paper feed.

Before cutting, the registration roller continues to rotate at normal speed, but the roll feed motor speed increases slightly. This causes the paper to buckle slightly between the registration roller and the top of the cutter.

When the cutter motor switches on, the cutter starts to move. This closes the paper clamp to hold the paper at the cutting position. The cutter disk pushes the paper against a horizontal blade behind the paper, and moves across the paper, cutting as it moves.



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The registration roller continues to turn during cutting. At this time, the slack generated between registration roller and cutter is taken up. This allows paper feed past the drum to continue at the same speed during cutting.

To cut a sheet from a roll of freshly loaded paper, press the auto feed key for the 1st or 2nd roll to feed paper, then release the key to cut. Paper will continue to feed for as long as the auto feed key is pressed.

The paper can also be cut by pushing the handle on the cutter to the left or right.

# 6.7.8 ROLL END DETECTION

Roll end is detected with reflective photosensors that detect the exposed, black core of an empty roll.

In the 1st roll tray unit, the photosensors [A] are mounted above the two paper rolls.

In the optional 2nd roll tray unit, the photosensor [B] is mounted in front of the paper roll.

In addition to the photosensors, two paper end sensors [C] are mounted in the 1st roll tray, and one paper end sensor [D] is mounted in the optional 2nd roll tray. These paper sensors detect the end of the paper roll if the core of the paper roll is any other color than black and cannot be detected by the photosensors.



# 6.7.9 CONDENSATION PREVENTION

There are two anti-condensation heaters [A] for each paper roll, and a heater switch [B] for each tray.

Normally the switch is set to OFF.

OFF	The anti-condensation heaters are powered off when the main power switch is powered off.
ON	The anti-condensation heaters turn on after the main power switch is powered off.



## 6.7.10 PAPER FEED TIMING CHART

Feed timing is controlled by the copy signal (original at the original registration sensor, or when Start is pressed for a multi-copy job).

Feed Start from Scann	Signal er		
Pulse Count Starts Drum Motor, Quenching Lamp	Feed Gate Signal	Paper Roll Reverse	1
Feed Clutch			After 7.82 s OFF
After 0.77 s ON Feed Motor		Acceleration Before Cutting	After 1.24 s OFF
After 3.73 s ON Registration Clutch			
Cutting Sensor			
Registration Sensor			_
Cutter Motor			
Cutter HP Sensor			

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# 6.8 IMAGE TRANSFER AND PAPER SEPARATION

### 6.8.1 OVERVIEW

The transfer corona unit [A] uses a tungsten wire ( $\phi$ 80  $\mu$ m) which at transfer applies about –5 kV to transfer toner from the drum to the paper.

The separation corona [B] applies about ac 4.5 kV and dc -350V to separate the paper from the drum.



## 6.8.2 TRANSFER AND SEPARATION TIMING CONTROL

SP2925 002 determines when the machine switches the transfer current over from the current for the leading edge (relatively weak) to the current for the image (relatively strong).

If there is insufficient toner transfer at the leading edge of the image, adjust this SP so that the switchover point is earlier. However, this can cause paper separation at the leading edge to be less effective.

Also, if paper separation at the leading edge is poor, adjust the SP so that the switchover point is earlier. However, this can cause insufficient toner transfer at the leading edge of the image.

Detailed Descriptions

## 6.8.3 PICK-OFF PAWL OPERATION

The pick-off pawls separate paper from the drum when the separation corona fails.

The pick-off pawl solenoid brings the pick-off pawls into contact with the drum.

When the leading edge of the paper on the drum enters the separation corona unit with about 198 mm (7.8") of the paper in contact with the drum, the solenoid [A] switches on. The pick-off pawl shaft starts to rotate, and the pawls [B] attached to the shaft are held against the drum by a spring.



# 6.9 PAPER TRANSPORT

## 6.9.1 OVERVIEW

The paper separated from the drum by the separation corona unit goes to the transport belt [A].

Suction from the transport fans [B] below the separation transport tank [C] hold the paper on the belt. Then, the belt transports the paper to the fusing unit.

**NOTE**: The transport fans [B] also cool the fusing unit, even when the machine is in standby mode.

The fusing motor drives the transport unit and the fusing unit.

An ozone filter [D] at the exhaust port reduces the amount of ozone that is released from the machine.



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# 6.10 FUSING UNIT

## 6.10.1 OVERVIEW



- 1. Hot Roller
- 2. Fusing Cleaning Roller
- 3. Hot Roller Strippers
- 4. Pressure Roller Strippers
- 5. Pressure Roller Thermistor
- 6. Fusing Pressure Motor

- 7. Pressure Release Lever
- 8. Pressure Roller
- 9. Fusing Lamps
- 10. Thermofuse
- 11. Hot Roller Thermistor

7

Detailed Descriptions

## Hot roller:

Hot roller:		120V Version	220 ~ 240V Version		
	Main	1300W	700W		
195°C (383°F)	Sub	300W	700W		
143°C (289°F) B010D559.WMF	<b>120V Version:</b> Both Main (1300W) and Sub (300W) fusing lamps light to attain the ready temperature of 143°C (289°F) within 120 s. Then, the sub fusing lamp switches off. The sub lamp is used only during warmup. To maintain the control temperature, only the main lamp is used.				
	<b>220</b> ~ <b>240V Version:</b> Both lamps switch on until the ready temperature is attained. Then, both lamps switch on and off to maintain the control temperature.				
Pressure roller thermistor	<ul> <li>Contacts the pressure roller to monitor pressure roller temperature.</li> </ul>				
Cleaning roller	Mounte and pre	ed above the hot r	oller to clean the hot roller		
Pressure roller	After th pressur temper	e ready temperat re is applied to co atures until the co	ure is attained, more mpensate for low ontrol temperature is reached.		
CPM Down Control	The bas and typ	sic fusing motor s e.	peed depends on paper size		
	Howeve the CP temper	er, to maintain the U reduces the cop ature falls too far	e control fusing temperature, by speed if the fusing during copying.		
	CPM: C	Copies Per Minute	)		

Extremely thin (1.6 mm) with two fusing lamps.

## 6.10.2 FUSING PRESSURE CONTROL MECHANISM

The spring loaded pressure levers [A] mounted on the pressure roller shaft [B] force the pressure roller [C], a silicone rubber roller, against the hot roller [D] above.

The pressure of this spring can be adjusted. For details, see "Hot Roller and Pressure Roller" in Section 3.

The fusing temperature and amount of pressure applied by the pressure roller is adjusted for the paper in use. Two stepper motors [E] are provided on either end of the pressure roller. The fusing pressure motors are controlled with SP settings that determine the amount of pressure applied by the pressure roller on the hot roller above.



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SP1914 002	Right Pressure Adjustment
SP1914 003	Left Pressure Adjustment

If a jam occurs, the left and right fusing pressure stepper motors reverse to release the pressure on the rollers and the gears in the fusing unit. The fusing unit powers down when the paper exit cover or the upper unit are opened to ensure safe removal of the jammed sheet.

## 6.10.3 TEMPERATURE AND PRESSURE CONTROL

The fusing pressure is automatically adjusted, so nip-band width is not required.

During warmup and during printing, the pressure roller thermistor [A] monitors the temperature of the pressure roller to determine the target control hot roller temperature. ( Table 6-1)

The hot roller thermistor [B] monitors the actual temperature of the hot roller, and the CPU determines the difference between the actual temperature and the target control temperature. Based on this data, the pressure on the hot roller [C] is increased or decreased, until the leading edge of the paper reaches the fusing unit. (Table 6-2)

If the hot roller temperature drops below a certain level during printing, the CPU uses CPM Down Control to reduce the hot roller speed. ( Table 6-3)



PLAIN PAPER						
Pressure Roller Temp. Target Hot Roller Temp.						
Temp. Control 1	Below 117.5°C	195°C				
	168°C ~ 117.5°C	-0.6667X + 273.33°C				
	Above 168.5°C	161°C				
Temp. Control 2	Below 96.5°C	195°C				
	96.5°C ~ 156.5°C	-0.6667X + 259.33°C				
	Above 156.5°C	194.5°ºC				
Temp. Control 3	Below 70°C	194.5°C				
	70ºC ~ 125°C -0.0048X <sup>2</sup> + 0.3086X + 19					
	Above 125°C	160°C				
Temp. Control 4	Below 63.5°C	195°C				
	96.5°C ~ 156.5°C	-0.6667X + 237.33°C				
	Above 111.5°C	163°C				

#### Table 6-1 Pressure Roller and Hot Roller Temperature

X: Pressure roller temperature

TRACING PAPER					
	Comments				
Temp. Control 1			Idling: Control		
Above 841 mm (W)	Entire area	205°C	temp for pressure		
Below 840 mm (W0	Below 160°C	205°C	roller is 145°C ~		
	160°C~185°C	-0.0243X <sup>2</sup> +7729X -256.73°C	160°C*'		
	185°C	156°C			
Temp. Control 2					
Above 841 mm (W)	Entire area	195°C	Idling: Control		
Below 840 mm (W0	Below 150°C	195°C	temp for pressure		
	150°C~175°C	-0.179X <sup>2</sup> +4.6607 <sup>2</sup> -102.86°C	roller is 115°C ~		
	Above 175°C	165°C	130°C**		
Temp. Control 3					
Above 841 mm (W)	Entire area	195°C	No idling control.		
Below 840 mm (W0	Below 150°C	195°C			
	150°C~175°C	-0.0179X <sup>2</sup> +4.6607X-102.86°C			
	Above 175°C				
Temp. Control 4					
	Entire area	165°C			

#### Table 6-1 (cont.)

X: Pressure roller temperature

\*1 When copying starts with tracing paper with Temperature Control 1, the target hot roller temperature is 205°C and the target pressure roller temperature is above 145°C.

\*2 When copying starts with tracing paper with Temperature Control 2, the target hot roller temperature is 195°C and the target pressure roller temperature is above 115°C.

#### Table 6-2 Adjustment for Actual/Target Temperature Difference

If the temperature difference is above 15°C, the machine must make an adjustment to the to the benchmark pressure settings in Table 6.10.4. The following table shows the required adjustment.

Temp. Difference	Plain Paper	Tracing Paper	Film
Above 30°C	+55N	+20N	+55N
15°C~30°C	+15N	+10N	+15N
Below 15°C	0N <sup>1</sup>	0N	0N

"N" means "Newton"

- This correction is done at the start of every page.
- The fusing temperature when the print start (F-gate) signal is issued at the start of each page determines the initial correction from the pressure roller motors. The temperature difference is monitored and the pressure is continuously adjusted until the leading edge of the media reaches the fusing unit. Then, the pressure is fixed at the current level while printing that page.

#### Table 6-3 CPM Down

When the fusing temperature drops, the CPU reduces the copy speed. This ensures that the fusing temperature is high enough to fuse the toner properly, especially for long print jobs.

PLAIN PAPER, FILM						
	CPM Down 1 CPM Down 2 CPM Down 3,4,5 CPM					
Hot	Above 160°C	Above 155°C	Above 155°C	Base CPM		
Roller	150°C~160°C	145°C~155°C	142°C~150°C	Base CPM*0.75		
Temp.	Below 150°C	Below 145°C	Below 142°C	Base CPM*0.38		

	CPM Down 1	CPM Down 2	CPM Down 3,4	CPM Down 5	СРМ					
Hot Roller Temp.	Above 175°C	Above 170°C	Above 166°C	Above 155°C	Base CPM					
	165°C~175°C	160°C~170°C	155°C~166°C	145°C~155°C	Base CPM x 0.75					
	Below 165°C	Below 160°C	Below 155°C	Below 145°C	Base CPM x 0.38					

Detailed Descriptions

#### 25 May, 2001

## 6.10.4 FUSING CONTROL SETTING TABLE

This is a summary of the user tool settings (System Settings – General Features – Fusing Adjustment: Paper Tray).

Table 1: Plain Paper (Roll Paper, By-pass Feed)									
	Mode 1 (Thick)	Mode 2	Mode 3 (Default)	Mode 4	Mode 5 (Thin)				
Fusing line speed	Plain paper speed 1	Plain paper speed 1	Plain paper speed 1	Plain paper speed 2	Plain paper speed2				
Fusing pressure	95N (248 steps)	85N (311 steps)	75N (374 steps)	65N (436 steps)	55N (499 steps)				
Fusing temperature	Plain paper: Temp. Control 1	Plain paper: Temp. Control 2	Plain paper: Temp. Control 3	Plain paper: Temp. Control 3	Plain paper: Temp. Control 4				
CPM Down Control	Plain paper: CPM Down 1	Plain paper: CPM Down 2	Plain paper: CPM Down 3	Plain paper: CPM Down 4	Plain paper: CPM Down 5				
Media	110g/m <sup>2</sup>	90g/m <sup>2</sup>	70g/m <sup>2</sup>	60g/m <sup>2</sup>	50g/m <sup>2</sup>				
Table 2: Tracing Paper (With the exception of line speed, same conditions as for as roll paper, by-pass feed)									
	Mode 1 (Thick)	Mode 2	Mode 3 (Default)	Mode 4	Mode 5 (Thin)				
Fusing line speed (roll paper)	Tracing paper spd 1	Tracing paper spd 1	Tracing paper spd 1	Tracing paper spd 2	Tracing paper speed 2				
Fusing line speed (by-pass feed)	Tracing paper spd 1	Tracing paper spd 1	Tracing paper spd 1	Tracing paper spd 2	Tracing paper speed 3				
Fusing pressure	130N (28 steps)	120N (91 steps)	110N (153 steps)	75N (374 steps)	60N (468 steps)				
Fusing temperature	Tracing paper: Temp. Control 1	Tracing paper: Temp. Control 2	Tracing paper: Temp. Control 3	Tracing paper: Temp. Control 3	Tracing paper: Temp. Control 3				
CPM Down Control	Tracing paper: CPM Down 1	Tracing paper: CPM Down 2	Tracing paper: CPM Down 3	Tracing paper: CPM Down 4	Tracing paper: CPM Down 5				
Media	70~90g/m <sup>2</sup>	70~80g/m <sup>2</sup>	70~80g/m <sup>2</sup>	50~70g/m <sup>2</sup>	Very Thin				
Table 3: Film (Roll Paper, By-pass Feed)									
	Mode 1 (Thick)	Mode 2	Mode 3 (Default)	Mode 4	Mode 5 (Thin)				
Fusing line speed	Film speed 1	Film speed 1	Film speed 1	Film speed 2	Tracing paper speed2				
Fusing pressure	95N (248 steps)	80N (342 steps)	65N (436 steps)	65N (436 steps)	60N (468 steps)				
Fusing temperature	Plain paper: Temp. Control 1	Plain paper: Temp. Control 2	Plain paper: Temp. Control 3	Plain paper: Temp. Control 3	Plain paper: Temp. Control 4				
CPM Down Control	Plain paper: CPM Down 1	Plain paper: CPM Down 2	Plain paper: CPM Down 3	Plain paper: CPM Down 3	Plain paper: CPM Down 5				
Media	Thickness: 0.07mm ~ 0.095 mm			Thin	Very Thin				

# 6.10.5 HOT ROLLER CLEANING

The cleaning roller [A] is diagonally above the hot roller, and presses slightly against the hot roller [B] to maintain constant contact. It is coated with material saturated with silicone oil.

To prevent the oil from streaking, at the start of rotation, the hot roller reverses briefly to wipe its surface against the cleaning roller.

The hot roller and pressure roller [C] both have stripping pawls.



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# 6.10.6 HOT ROLLER THERMOFUSE

A non-contact thermofuse (rated for 192°C) [A] near the hot roller [B] prevents accidental overheating which could lead to a fire hazard.



6.10.7 FUSING UNIT DRIVE MECHANISM

The fusing motor (a stepper motor) [A] drives the fusing unit, the transport belt, and the paper exit unit via one gear train [B] and two timing belts [C].



#### 6.10.8 WRINKLE PREVENTION



The speed of the paper at the fusing rollers [A] is slightly faster than at the registration rollers [B] to ensure that the correct amount of tension is maintained on the paper [C] between the registration and fusing rollers. This prevents wrinkling in the fusing unit.

However, after the paper leading edge is grabbed by the fusing unit, the paper moves past the drum faster than previously, which could enlarge the image slightly in the sub scan direction. To prevent this, both the registration and fusing motors slow down slightly (by the same amount) when the leading edge of the paper reaches the exit sensor.

The distance between the registration roller and exit sensor is about 360 mm (14.2"), so this motor speed correction is only used when paper is longer than 360 mm.
### 6.11 PAPER EXIT

#### 6.11.1 OVERVIEW

After the paper passes through the fusing unit, it is fed to the paper exit. The paper exit section contains a jam sensor (the exit sensor).

#### 6.11.2 PAPER EXIT DRIVE

The paper exit section is driven by the fusing motor [A], gear train [B], and timing belts [C].



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### 6.11.3 PAPER EXIT ACCESS

The paper exit cover [A] and the paper exit guide plate [B] can be opened to make it easier to remove jammed paper from the fusing and exit sections.



#### 6.11.4 SWITCHING EXITS

Paper longer than A1 sideways paper must exit at the rear, because the front paper exit does not have a large tray.

Selecting the paper exit on the operation panel switches the paper junction gate solenoid [A] on and off to open and close the junction gate [B], which selects the paper exit path.

• Solenoid on: Rear exit

The machine does not automatically select the correct exit if the paper is longer than A1 sideways. Change the exit selection on the operation panel.



The exit sensor [A] in front of the rear exit rollers [B] detects paper jams.





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### 6.12 ELECTRICAL COMPONENTS



#### 6.12.1 MCU

The MCU (Main Control Unit) is the main board. It controls the entire machine and system processing. Two CPUs are mounted on the MCU-one operates the SCU software and the other the BICU software. Specifically:

- SCU (System Control Unit). Performs system control, scanner control, operation panel control, and controls the BICU.
- BICU (Base Image Control Unit). Controls image processing in the IPU (Image Processing Unit) and operation of the printer engine.



**NOTE:** The DIP switch settings are provided for your reference only. They should always be set OFF (default) and they should never be changed in the field.

No.	Function	Default		Comment
1	Image evaluation device data output. DFU	OFF	OFF	No output
			ON	Output
2	IPU debug mode. DFU	OFF	OFF	Normal mode (no debug)
2		OFF	ON	Debug mode
3	AMDP operation mode selection. <b>DFU</b>	OFF	OFF	AMDP path
5			ON	AMDP on
л	Error diffusion selection. <b>DFU</b>	OFF	OFF	Selective error diffusion
4			ON	General error diffusion
5	CIS register setting. <b>DFU</b>		OFF	CIS function testing
5		OFF	ON	CIS design testing
6	Not used			
0		OFF		
7	Not used	OFF		
0	Not used	OFF		
0				

MCU DIP	SW Settinas	(Address:	SW101)	Yellow	Knob
	011 001	(7.44.000)	•••••		

#### 25 May, 2001

**NOTE:** The DIP switch settings are provided for your reference only. They should always be set OFF (default) and they should never be changed in the field.

No.	Function	Default		Comment
1	Not used	OFF		
2	Not used	OFF		
2	Gate control for Text RXD. DFU	055	OFF	IC137-On
3		UFF	ON	IC137-Off
4	Block operation, recognize IC card. DFU	OFF	OFF	SCU_IC-Card
4		ULL	ON	BICU_IC-Card
5	Software switch input. <b>DFU</b>	OFF	OFF	Pull-up
5		ULL	ON	Software switch press
6	Not connected	OFF	OFF	Not defined
7	Not connected	OFF	OFF	Not defined
8	Not connected	OFF	OFF	Not defined

#### MCU DIP SW Settings (Address: SW102) Orange Knob

#### MCU DIP SW Settings (Address: SW103) Black Button

No.	Push SW	Default	Comment
	System reset		Reset executes only when this button is pressed.

#### Pin Head Address: TB101, 3 Pins

Socket Insert	Definition	Default	Comment
1-2 Pin	OFF (normal)	0	
2-3 Pin	Internal mode	Х	Set for AMDP software download

#### 6.12.2 IPU

**NOTE:** The DIP switch settings are provided for your reference only. They should always be set OFF (default) and they should never be changed in the field.

The IPU (Image Processing Unit) conducts image processing. This involves processing image data from the CIS (Contact Image Sensors), sending it to the VDB (Video Drive Board), and then to the LPH (LED Print Heads). The IPU also controls the HDD unit and the printer board, and the printer control/scanner control functions.

LED	Sending	Meaning	Comment
LED 101	Green	HDD 1 display	Lights: Normal
LED 102	Green	HDD 2 display	Flashes: HDD standby
LED 103	Orange	Printer FGATE output status	Lights: Printer FGATE signal being sent
LED 104	Green	Original registration input status	Lights: Original registration signal being received

#### 6.12.3 IOB

The IOB (Input/Output Board) controls each sensor, motor, solenoid, and high voltage supply board. It also contains the drive circuits for these components. It also performs process control, transfers serial data between the machine and peripherals, and controls the fusing unit.

**NOTE:** The DIP switch settings are provided for your reference only. They should always be set OFF (default) and they should never be changed in the field.

No.	Function	Default	Comment	
1	North America	OFF	ON	Enables North American
				Specifications ( $\rightarrow$ BICU)
2	Europe	OFF	ON	Enables European
				Specifications ( $\rightarrow$ BICU)
3	Jam Detection OFF	OFF	ON	No jam detection ( $\rightarrow$ BICU)
4	SC Detection OFF	OFF	ON	No SC display ( $\rightarrow$ BICU)
5	Not connected	OFF		
	Not connected	OFF		
6	Not connected	OFF		
7	Not connected	OFF		
8	Not connected	OFF		

#### DIP SW Address: SW101 Yellow Knob

#### Pin Head Address: TB101, 3 Pins

Socket Insert	Definition	Default	Comment
1-2 Pin	Terminal (120 $\Omega$ ) present	Х	Independent circuit connection with machine, or not connected
2-3 Pin	Terminal (120Ω) not present	0	Relay circuit connection with machine

#### 6.12.4 VDB

The VDB (Video Drive Board) controls the LPH. It processes the image information sent from the IPU and sends it to the LPH.

#### 6.12.5 RFDB

The RFDB (Roll Feed Drive Board) controls the motors, solenoids, and clutches inside the paper tray.

#### 6.12.6 FPDB

The FPDB (Fusing Pressure Drive Board) controls the two pressure roller motors mounted at either end of the pressure roller.

#### 6.12.7 PSU

The PSU (Power Supply Unit) supplies dc for every electrical component in the machine, and controls ac input to the fusing lamps and anti-condensation lamps.

#### Fuses

Namo	Connector	Rati	ing	v	Load
Name	Connector	120 V	220 - 240 V	v	Luau
FU001	CN101, 102, 103, 104	20 A 380 V		AC	AC drive input section
FU002	CN103, 104	5 A 125 V	5 A 250 V	AC	Fusing lamps, anti- condensation heaters
FU101		8 A 125 V	5 A 250 V	AC	AC power
FU301	CN126-1	6.3 A 125 V	5 A 250 V	24 V (1) safety	IOB and 24 V system via safety switch: development motor, CGB and TS power packs
FU302	CN126-2	6.3 A 125 V	6.3 A 250 V	24 V (2) safety	IOB and 24 V system via safety switch: drum motor, fusing motor, registration motor
FU303	CN126-3	6.3 A 125 V	6.3 A 250 V	24 V(3)	IOB, FPDB, fusing pressure motor, pick-off pawl solenoid, quenching lamp, toner supply clutch, registration clutch, total counter, key counter, key card
FU304	CN126-4	6.3 A 125 V	6.3 A 250 V	24 V(4)	IOB, operation panel, original feed motor, original feed clutch, original junction gate solenoid.
FU305	CN126-5	6.3 A 125 V	6.3 A 250 V	24 V(5)	IOB, RFDB, 24 V for the roll trays
FU306	CN129-1	6.3 A 125 V	6.3 A 250 V	24 V(7)	CIS

Detailed )escription

## SPECIFICATIONS

### **1. COPIER ENGINE**

Configuration:	Console				
Copy Process:	Dry electrostatic transfer system				
Originals:	Sheet				
Original Image Size: (W x L)	Maximum: 914 x 6,000 mm (362" x 236") Max. through-put width: 950 mm (37") Minimum: 210 x 182 mm (81/2" x 9")				
Max Original Width:	950 mm (37.4")				
Original Weight	Rear Straight: 20.0 ~ 157 g/m <sup>2</sup> (5.32 ~ 41.7 lb.), 30 μm ~ 1.1 mm				
	Upper : 20.0 ~ 104.7 g/m² (5.3 ~ 27.8 lb.) Document Roll: 52.3 ~ 104.7 g/m² (13.9 ~ 27.9 lb.)				
Copy Paper Size: (W x L)	Maximum: Roll Feed : 914 x 6,000 mm (36" x 236") Rolls 1 to 3 Bypass feed: 914 x 2,000 mm (36" x 78")				
	Minimum:1st/2nd Roll Feed:210 x 210 mm (81/2" x 81/2")Bypass Feed:210 x 182 mm (81/2" x 9")3rd Roll Feed (Option):210 x 250 mm (81/2" x 10")				
Copy Paper Weight	52.3 ~ 104.7 g/m² (13.9 ~ 27.9 lb.)				
Copying Speed: (cpm: copies / minute)	4 cpm (A0/E lengthwise) 7 cpm (A1/D sideways)				
Photoconductor:	Organic photoconductor drum				

Reduction/Enlargement:

	Inch V	Matria Varsian	
	Engineering	Arch.	
Reduction	25,32,50,65 %	25,33,50,67%	25, 35, 50, 71%
100%	100 %	100 %	100%
Enlargement	129,259,400 %	133,267,400 %	141, 200, 283, 400%

25 ~ 200% (0.1%/step) 200 ~ 400% (0.2%/step)
Scanning 600 dpi, Printing 600 dpi
Scanning: 256 levels Printing: 4 levels
Within 2 minutes (Room temperature 23°C, 120V: US, 230V: EU)

#### SPECIFICATIONS

#### First Copy Time:

	Metric Version	A1 sideways	A0 lengthwise
	1st Feed 2nd Feed 3rd Feed	18 s 19 s 21 s	25 s 26 s 28 s
	Inch version	D sideways	E lengthwise
	1st Feed 2nd Feed 3rd Feed	18.5 s 19.5 s 21.5 s	25.4 s 26.4 s 28.4 s
Copy Number Input:	Ten-key pad, 1 to	99 (standard size	es only)
Copy Paper Capacity:	Roll Feed: Max. Diameter: 175 mm (6.9") Max. Length: 150 m (16.4 yds) Roll Core Diameter: 76.4 ± 0.25 mm (about 3") Bypass Feed: 1 sheet		
Output Tray Capacity:	Front 99 sheets: A1 sideways (Plain paper) 10 sheets: A1 sideways (Application paper)		
	Rear 10 sheets: A0 1 sheet: A0	lengthwise (Plain lengthwise (Appli	paper) cation paper)
Original Stack Capacity	Rear Straight 1 sheet Upper 50 sheets: A1 20 sheets: A1 Document Roll 1 sheet	sideways (Plain p sideways (Applic	aper) ation paper)
	Application paper example, film or ti	: Anything other th racing paper)	nan plain paper (for
Memory Capacity:	RAM: 160 MB HDD: More than 4	1.3 GB x 2 (option	)
Toner Replenishment:	Cartridge exchange (800 g/cartridge)		
Toner Yield:	2,200 copies (A1 sideways, 6% full black, 1 to 99 copying, Text mode)		
Power Source:	North America: 12 Europe/Asia: 220	20 V, 60 Hz, 20A ~ 240 V, 50/60 H	z, 10 A

#### Power Consumption

120V version

	Mainframe	Full system *1
Warm-up	1.7 kW	1.7 kW
Ready *2	0.2 kW	0.2 kW
During Copying	1.4 kWh	1.4 kWh
Maximum	1.7 kW	1.7 kW

220 ~ 240V version

	Mainframe	Full system *1
Warm-up	1.6 kW	1.6 kW
Ready *2	0.2 kW	0.2 kW
During Copying	1.5 kWh	1.5 kWh
Maximum	1.8 kW	1.8 kW

\*1 Full System:

Mainframe with 2nd Roll Tray, HDD, and Stamp Board

\*2 Ready:

The anti-condensation heaters are switched off.

The measurements were made in accordance with ISO 7779 at the operator position

#### Sound Power Level

	Copier Only	Full System
Stand-by	50.6 dB (A)	51.1 dB (A)
Copying	65.7 dB (A)	65.7 dB (A)
Copying (from memory)	65.7 dB (A)	65.7 dB (A)

North America: Less than 1.7 kW Europe/Asia: Less than 1.8 kW

1,250 x 740 x 1,200 mm (49.2" x 29.4" x 47.2")

Dimensions

 $(W \times D \times H)$ :

Maximum Power

Consumption:

Noise Emission:

Weight:

Optional Equipment:

- Less than 225 kg (496 lb)
- 2nd Roll Tray (B340)
- Original Tray (B341)
- HDD (B342)
- Stamp Board (B321)
- Roll Holder Unit (B394)
- Printer Controller (TBA)
- I/F Board (TBA)

## 2. 2ND ROLL TRAY (OPTION)

Copy Paper Size: (W x L)	Maximum: 914 x 6,000 mm (36" x 236")		
	Minimum: 210 x 250	mm (81/2" x 10")	
Copy Paper Weight	52.3 ~ 104.7g/m <sup>2</sup> (13	3.9 ~ 27 lb.)	
Copy Number Input:	Ten-key pad, 1 to 99 (standard sizes only)		
Copy Paper Capacity:	Roll Feed: Max. Diameter: Max. Length: Roll Core Diameter:	75 mm (6.9") 150 m (137.6") 76.4 ± 0.25 mm (about 3")	
Power Source:	From main frame		
Weight:	32 kg (70.5 lb.)		

4

### 3. MACHINE CONFIGURATION



No.	Item	Machine Code
1	Main Frame	B010
2	2nd Roll Tray	B340
3	HDD	B342
4	Stamp Board	B321
5	Original Tray	B341
6	Roll Holder	B394
7	Printer Controller	G067
8	I/F Board	G068



# **B010 COPIER ELECTRICAL COMPONENT LAYOUT (1/2)**

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# **B010 COPIER ELECTRICAL COMPONENT LAYOUT (2/2)**

Symbol	Name	Index No.	P-to-P
Boards			
PCB1	Operation Panel (LED Board)	1	F6
PCB2	Operation Panel (LCD Board)	2	F6
PCB3	Operation Panel (Key Board)	3	F6
PCB4	T&S (Transfer & Separation) Power Pack	7	F10
PCB5	CBG (Charge, Bias, Grid) Power Pack	9	G10
PCB6	CIS (Contact Image Sensor)	14	H2
PCB7	VDB (Video Drive Board)	11	F2
PCB8	Original Feed Board	18	E2
PCB9 ~ 10	FPDB (Fusing Pressure Drive Boards)	31	D5, D6
PCB11	Power Supply Unit (PSU)	53	B1
PCB12	IOB (Input Output Board)	55	E7
PCB13	MCU (Main Control Unit)	56	H8
PCB14	IPU (Image Processing Unit)	57	E9
PCB15	RFDB (Roll Feed Board) 1	83	B10
PCB16	RFDB (Roll Feed Board) 2 (Option)	86	B8
PCB17	Stamp Board (Option)	-	H5
PCB18	I/F Board (Option)	-	F7
Motors	•		
M1	Original Feed Motor	21	E2
M2 ~ 3	Transport Fan Motors	23	E10, F10
M4	Drum Drive Motor	27	D7
M5	Wire Cleaner Motor	29	F10
M6	Registration Motor	42	D10
M7	Development Motor	43	D10
M8	Fusing Drive Motor	44	C10
M9	Left Fusing Pressure Motor	46	C6
M10	Right Fusing Pressure Motor	51	C5
M11	Cutter Motor 2	61	C7
M12	Roll Feed Motor 2	65	C7
M13	Cutter Motor 1	67	B11
M14	Roll Feed Motor 1	75	C11
M15	PSU Cooling Fan	54	C3

Symbol	Name	Index No	P-to-P
Switches	Nulle	index no.	1.01
SW1	Operation Switch	4	F6
SW2	Scanner Stop Switch	5	F6
SW3 ~ 4	Upper Unit Safety Switches	8	D4
SW5	Toner Hopper Cover Open Switch	12	D10
SW6	Original Feed Unit Safety Switch	13	E2
SW7	Lower Roll Tray Safety Switch	29	A3
SW8	Exit Cover Switch	32	C4
SW9	Main Power Switch	40	C1
SW10	Upper Roll Tray Safety Switch	58	A3
SW11	Left Cutter HP Switch 2	62	C7
SW12	Auto Feed Switch 3	63	C7
SW13	Anti-condensation Heater Switch 2	66	A5
SW14	Left Cutter HP Switch 1	68	B11
SW15	Auto Feed Switch 1	69	C11
SW16	Auto Feed Switch 2	70	C11
SW17	Anti-condensation Heater Switch 1	73	A5
SW18	Right Cutter HP Switch 1	84	B11
SW19	Cutter Safety Switch 1	85	A11
SW20	Cutter Safety Switch 2	87	A7
SW21	Right Cutter HP Switch 2	88	C7
Clutches			
MC1	Original Feed Clutch	22	E2
MC2	Registration Clutch	28	H10
MC3	Toner Supply Clutch	60	G10
MC4	Roll Feed Clutch 3	64	B7
MC5	Roll Feed Clutch 1	71	B11
MC6	Roll Feed Clutch 2	72	B11
Solenoids			
SOL1	Original Junction Gate Solenoid	19	D2
SOL2	Paper Junction Gate Solenoid	34	C6
SOL3	Pick-off Pawl Solenoid	35	C7

Symbol	Name	Index No.	P-to-P
Sensors			
S1	Toner Overflow Sensor	6	E10
S2	Original Upper Exit Sensor	15	F5
S3	Original Exit Sensor	16	F5
S4 ~ 7	Original Size Sensors	17	F5
S8	Original Feed Unit Open Sensor	20	F5
S9	Original Set Sensor	25	F5
S10	Original Registration Sensor	26	F5
S11	Exit Sensor	33	D7
S12	ID (Image Density) Sensor	36	D7
S13	Registration Sensor	38	H10
S14	By-Pass Feed Sensor	39	G10
S15	Upper Unit Open Sensor	41	H10
S16	Left Fusing Pressure Motor HP Sensor	45	D6
S17	Right Fusing Pressure Motor HP Sensor	52	D6
S18	Cutting Sensor 1	74	A11
S19	Roll End Sensor 1	77	E10
S20	Roll End Sensor 2	78	E10
S21	Paper End Sensor 1	79	A11
S22	Paper End Sensor 2	80	A11
S23	Roll Lead Edge Sensor 1	81	B11
S24	Roll Lead Edge Sensor 2	82	A11
S25	Paper End Sensor 3	89	A7
S26	Roll End Sensor 3	90	B7
S27	Roll Lead Edge Sensor 3	91	B7
S28	Cutting Sensor 2	92	B7
Others			
LPH1 ~ 3	LPH (LED Print Head)	10	G1, G2, G3
TC1	Total Feed Meter	24	F10
QL1 ~ 2	Quenching Lamps	30	F10
H1 ~ 2	Anti-condensation Heaters (Drum)	37	B4
TH1	Hot Roller Thermistor	47	A3
TF1 ~ 2	Fusing Thermofuses	48	A2, A3
L1 ~ 2	Fusing Lamps	49	A3
TH2	Pressure Roller Thermistor	50	A3
H3 ~ 10	Anti-condensation Heaters (Tray)	76	A5, B6
HDD1	HDD1	_	H3
HDD2	HDD2	_	H4